

The SHORT WAVE Magazine

VOL. XX

OCTOBER, 1962

NUMBER 8

THE KW77

A NEW STANDARD IN COMMUNICATION RECEIVERS FOR THE RADIO AMATEUR



The KW77 is in use at many stations at home and overseas, and has already received world-wide acclaim, particularly for its fine C.W. and S.S.B. performance.

Price, complete with 8 crystals £120, carriage extra

Easy terms available in U.K.

- ★ Triple Conversion
- ★ Geared Precision Drive
- ★ Slot Filter
- ★ Covers all Amateur Bands 10-160 metres
- ★ Crystal Controlled 1st Mixer
- ★ Built-in Crystal Calibrator
- ★ Sideband Selection
- ★ Audio Filter
- ★ Absolute Frequency Stability
- ★ 4 Passbands—3.8, 2.1, 1.0 and 0.5 kc
- ★ AVC Two Speeds
- ★ A Perfect Match to the KW 'Viceroy' and KW 'Vanguard' Transmitters etc

KW

ELECTRONICS LTD Vanguard Works

1 HEATH STREET, DARTFORD, KENT

Cables: KAYDOUBLEW, Dartford

Phone: DARTFORD 25574

H. WHITAKER G3SJ

Court Road - Newton Ferrers - SOUTH DEVON

Telephone 320
Newton Ferrers

(A.R.B. APPROVED)

Precision crystals of all types in a wide variety of bases covering the complete range 50 kc/s to 18 mc/s in fundamental frequencies. All are made to extremely fine tolerances and frequency adjustment can be given up to .005%. Plated electrodes of gold, silver, or aluminium with wired in spot welded contacts are available. Quotations can be given for any type of cut, or mode of oscillation, including a complete range of filters with zero temperature co-efficient over a sensibly wide temperature range.

Special Offer :

400 crystals in the range 7100 to 7150 kc/s inclusive. Brand new and unused post-war production. Specification : BT cuts, zero temperature co-efficient, gold plated electrodes, wired into FT 241 type holders with standard 1/2" pin spacing. Accurately calibrated. Better than average activity, EPR is better than 14 K. Ohms at 30 pf. input capacity. Price 18/- each, post free. All fully guaranteed and unrepeatable at today's prices. The offer applies only to the range mentioned above, all frequencies between 7100 and 7150 kc/s available.

VHF ENTHUSIASTS

No more chains of doublers ! A complete new range of crystals for DIRECT output up to 74 mc/s when using only a simple RF pentode oscillator such as Z77, EF80, etc., full details of this range on request.

PETER SEYMOUR

COMMUNICATION EQUIPMENT SPECIALISTS

AR88LF with /E modifications including "S" meter, IF gain, etc. Fully reconditioned and aligned. 75-560 Kc. and 1.5-30 Mc/s. 115/240 AC input ... 40 0 0
Special dual diversity RTTY system comprising 2AR88D/E.
 Matching RCA terminal unit to feed T.P. direct and special BTR scope to match the two receivers. In fitted cabinet. 100/240 AC input 540 Kc.-32 Mc/s. ... 135 0 0
EDDYSTONE 670 MARINE. 110-230 AC, DC ... 30 0 0
TELEPRINTER TAPE REPERFORATOR ... 2 10 0
HAMMARLUND HQ170E. 1.8-54 Mc/s. Amateur bands, triple conversion, as brand new. Makers guarantee ... 150 0 0
HALLICRAFTERS SX101A. Double conversion. 3.5-30 Mc/s., makers guarantee ... 145 0 0
HALLICRAFTERS SX28. 540 Kc.-45 Mc/s. 240 AC input, "S" meter, etc. ... 30 0 0
EDDYSTONE 680X. As new, 480 Kc.-30 Mc/s. 240 AC input ... 85 0 0
EDDYSTONE S750. The latest type made. 480 Kc.-32 Mc/s. Double super ... 50 0 0
EDDYSTONE 358X. As new with all coils. 40 Kc.-30 Mc/s. and matching power unit ... 17 10 0
MOSLEY CMI. As brand new. Makers guarantee ... 65 0 0
MARCONI CR100/8-B28. 60 Kc.-30 Mc/s. Brand new ... 35 0 0
MARCONI CR100/8-B28. 60 Kc.-30 Mc/s. Grade A ... 18 10 0
MARCONI CR100/8-B28. 60 Kc.-30 Mc/s. Grade B ... 15 0 0
R209. 1-20 Mc/s. 12v. DC input, suitable for mobile ... 15 0 0
AIRMEC C864. 15-45 Kc. and 300 Kc.-30 Mc/s. ... 90 0 0
ALL BAND CONVERTER. 1.6 Mc/s. output. 1.8-30 Mc/s. Amateur bands, built in stabilized power unit for 240 AC mains ... 15 0 0

REGENCY TRANSISTOR CONVERTER. No external supplies needed. IF output, 1230 Kc. Built-in BFO/Q mult. 3.5-30 Mc/s. amateur bands ... 15 0 0
HRO SENIOR. With six coils to 30 Mc/s. and matching power unit ... 20 0 0
PANDA CUB. 1.8-30 Mc/s. 10-25 Watts A3, 45 Watts A1 ... 35 0 0
LABGEAR LG50. 80-10 Mtrs. 50 Watts A1/A3 ... 30 0 0
TOP BAND COMMAND RX. With original 12 Volt power unit ... 7 10 0
RTTY TERMINAL UNIT, type WG44. Feeds direct from speaker trans. ... 20 0 0
GONSET G66. 600 Kc.-2.0 Mc/s. and 3.5-30 Mc/s. Amateur bands. Xtal controlled. Second osc., double conversion with matching 12v. DC power unit ... 60 0 0
NEW KW VICEROY. With extra half lattice filter. BRAND NEW ... 150 0 0
JOHNSON VIKING MOBILE TX. With remote VFO. 60 Watts, A3. with suitable power unit for 12v. DC ... 45 0 0
HRO IF TRANSFORMERS. Three for £1.0.0. ... 3 6
COLLINS TCS BFO UNITS
 For the SSB man. **GLOBE LINEAR 440 WATTS,** P.E.P. 80-10 Mtrs. ... 55 0 0
 Works reconditioned **BC348.** 200-550 Kc. and 1.5-18.5 Mc/s. ... 20 0 0
HEATHKIT BALUN COIL UNIT. 80-10 Mtrs. ... 3 10 0
TAYLOR VALVE VOLTMETER. Type 171 ... 7 10 0
THREE INCH SCOPE. American. General purpose ... 12 10 0
FIFTY MICRO AMP METERS. Latest type. Ruggedised 2 1/2 in. circ. ... 1 15 0

WE WANT TO BUY. WE WANT TO SELL. HIGHEST TRADE-INS ON YOUR USED EQUIPMENT. HIRE PURCHASE TERMS TO SUIT YOU ON EQUIPMENT OVER £35.0.0. FULL INSURANCE AGAINST UNEMPLOYMENT AND SICKNESS THROUGHOUT THE FULL PERIOD. ALL ITEMS ADVERTISED ARE IN STOCK AT THE TIME OF GOING TO PRESS. WE GIVE BY RETURN POST SERVICE. TERMS 20% DEPOSIT 12/18/24 months to pay. EXPORTERS TO ANY PART OF THE WORLD. MINIMUM FREIGHT.

410 BEVERLEY ROAD - HULL - YORKSHIRE

Tel.: HULL 41938 (41166 after 6 p.m.)

Why not make good use of your spare time

AND JOIN THE

ROYAL NAVAL RESERVE COMMUNICATION BRANCH



Men and women between 16 and 26 may join but men with previous experience of this branch of the Royal Navy may be accepted up to the age of 45. Training takes place 2 or 3 evenings a week with opportunities for training at sea which might well entail visits to foreign ports.

You will not be out of pocket

as Pay, allowances, bounty and uniform are provided.

Although we take our work seriously there is a social side giving you the chance to meet people with the same interests in a friendly atmosphere.

There are Communication Centres and Units in many towns throughout the country.



Write for full details of this interesting service to:-

**ADMIRAL COMMANDING RESERVES,
LILLIE ROAD, LONDON, S.W.6.**

or ask at your nearest Royal Naval Careers Office.

Technical Publications— Short Wave Magazine

Magazines by Subscription

73 MAGAZINE.....	One Year	30s. 0d.
CQ, RADIO AMATEUR'S JOURNAL.....		44s. 0d.
QST, ARRL.....		48s. 0d.

Post free, ordinary mail only

Easibinders for Short Wave Magazine, holds 12 issues (one volume) 13s.

LATEST ISSUES

Radio Handbook (New 16th Edition)

Published by *Editors & Engineers*, W6-U.S.A. 800 pages. Durable binding. Available early November. Price 78s. post free

Radio Amateur Call Book

The CALL BOOK is published in two parts: *American* Section only, at 45s. post free; *Foreign* (non-American) Section at 27s. post free. Both Editions appear quarterly and include latest callsign/address listings for all countries, with much DX data. The only complete directory to the radio amateur stations of the world.

American Section, Autumn Edition 45s.; *Foreign* (non-American) section Autumn Edition, 27s.

The two together at 65s. post free

Radio Amateur's Handbook

1962 EDITION — 740 pages fully indexed
(See Review p.121, May)

Published by the *American Radio Relay League*
Price: Standard Binding 37s. 6d. post free
Bound in *Buckram, de luxe*, 47s. 6d. post free

DX Zone Map (Latest Revision)

(Great Circle, centred U.K.)

Linen Backed (*de luxe*) 11s. 9d. post free

Amateur Radio Map of World

Much DX Information — In Colour, 8s. 6d. post free — Second Edition

World Short Wave Radio Map

(General SWL and BC coverage, with handbook) 8s. 6d. post free

Radio Amateur's World Atlas

8s. 3d. post free. A new publication

Available from Stock

	Post Free
A GUIDE TO AMATEUR RADIO.....	4s. 0d.
AMATEUR RADIO HANDBOOK (<i>new Publication by R.S.G.B.</i>), 550 pp.....	36s. 6d.
ANTENNA HANDBOOK (<i>Published by A.R.R.L.</i>) (9th Edition).....	19s. 0d.
A COURSE IN RADIO FUNDAMENTALS (4th Edition).....	10s. 6d.
AUTOMOBILE ELECTRICAL EQUIPMENT BASIC MATHEMATICS FOR RADIO AND ELECTRONICS.....	31s. 0d.
BEAM ANTENNA HANDBOOK.....	18s. 3d.
BETTER SHORT WAVE RECEPTION.....	24s. 6d.
CALL BOOK (U.K. only).....	24s. 0d.
CHART OF INTERNATIONAL FREQUENCY ALLOCATIONS — GENEVA, 1960 (<i>Official</i>), 10 Kc to 40 Gc, 51" x 34", wall mounting.....	5s. 0d.
COMMAND SETS (<i>Published by CQ</i>) Information on conversion of many Command Transmitters and Receivers.....	8s. 3d.
COMMUNICATION RECEIVERS (<i>R.S.G.B. publication</i>).....	12s. 6d.
CQ ANTHOLOGY.....	2s. 10d.
DXERAMA (3rd Edition).....	16s. 9d.
FOUNDATIONS OF WIRELESS.....	16s. 0d.
GUIDE TO BROADCASTING STATIONS (13th Edition) pp. 112.....	17s. 3d.
HAMS INTERPRETER (<i>Published by OH2SQ</i>) (4th Edition).....	3s. 10d.
HINTS AND KINKS, Vol. 6.....	7s. 0d.
HOW TO BECOME A RADIO AMATEUR★.....	11s. 0d.
HOW TO IMPROVE YOUR SHORT WAVE RECEPTION.....	5s. 0d.
HOW TO LISTEN TO THE WORLD 1962.....	14s. 9d.
HOW TO GET THE BEST OUT OF YOUR TAPE RECORDER.....	12s. 6d.
LEARNING MORSE.....	9s. 1d.
LEARNING THE RADIO TELEGRAPH CODE.....	1s. 9d.
LOG BOOKS Spiral bound (<i>Published by A.R.R.L.</i>)★.....	4s. 6d.
MOBILE HANDBOOK (<i>Published by CQ</i>) (2nd Edition).....	7s. 6d.
MOBILE MANUAL (<i>Published by A.R.R.L.</i>).....	24s. 0d.
NEW RTTY HANDBOOK.....	23s. 0d.
NEW SIDEBAND HANDBOOK (<i>Published by CQ, latest issue</i>).....	32s. 0d.
NOVICE HANDBOOK, Tx and Rx, 150 pages.....	25s. 6d.
OPERATING AN AMATEUR RADIO STATION (<i>Published by A.R.R.L.</i>)★.....	23s. 6d.
PORTABLE TRANSISTOR RECEIVER.....	2s. 8d.
QUAD ANTENNAS.....	3s. 0d.
RADIO AMATEURS' EXAMINATION MANUAL (2nd Edition).....	23s. 0d.
RADIO CONTROL MANUAL.....	5s. 6d.
RADIO DATA CHARTS.....	25s. 0d.
RADIO DESIGNERS HANDBOOK (4th Edition) 1,498 pp. (<i>F. Langford Smith</i>).....	11s. 3d.
RADIO AND ELECTRONIC LABORATORY HANDBOOK (7th Edition, by <i>Wireless World</i>).....	57s. 6d.
RADIO INTERFERENCE SUPPRESSION.....	57s. 3d.
RADIO VALVE DATA (<i>New Edition</i>) 4,800 types listed.....	11s. 3d.
S-9 SIGNALS.....	6s. 6d.
SCATTER PROPAGATION THEORY AND PRACTICE (<i>H. W. Sams</i>).....	8s. 6d.
SHORT WAVE RECEIVERS For The Beginner.....	25s. 0d.
SHORT WAVE AND THE IONOSPHERE.....	6s. 6d.
SINGLE SIDEBAND FOR THE RADIO AMATEUR (<i>A.R.R.L.</i>).....	11s. 9d.
STEREO HANDBOOK.....	14s. 6d.
SURPLUS SCHEMATICS (<i>Published by CQ</i>).....	11s. 4d.
SURPLUS HANDBOOK (<i>See p.420, Oct. '61</i>) ..	21s. 0d.
SURPLUS CONVERSION MANUAL.....	24s. 0d.
Volume 1 (3rd Edition).....	24s. 0d.
Volume 2.....	24s. 0d.
Volume 3.....	24s. 0d.
TELEVISION EXPLAINED.....	13s. 6d.
THE RADIO AMATEUR OPERATOR'S HANDBOOK (<i>Data Publications</i>) (<i>New Edition</i>).....	3s. 10d.
TRANSISTORS: THEORY AND PRACTICE (<i>Published by Gernsback</i>).....	23s. 0d.
TRANSISTOR THEORY AND PRACTICE (<i>Published by World Radio Handbook</i>).....	9s. 6d.
TRANSISTOR TECHNIQUES (<i>Gernsback</i>).....	12s. 6d.
VHF HANDBOOK (<i>Orr W6SAI</i>).....	24s. 0d.
VHF FOR THE RADIO AMATEUR (<i>CQ</i>).....	28s. 0d.
WORLD RADIO HANDBOOK, 1962 Edition, 228 pages.....	19s. 0d.

(★ Not strictly applicable under U.K. conditions)

SEE and HEAR



the
imaginatively
designed

MOSLEY CM-1 receiver

- First low priced receiver with double conversion and crystal controlled first oscillator.
- First receiver with 5 dual-purpose valves of one type and 4 semi-conductor diodes which perform all functions usually requiring 12 or more valve sections.
- First low priced receiver with selectivity, sensitivity and stability that equals receivers selling for upwards of £50 more.

FEATURES and PERFORMANCE:

Diode detector for a.m. and product detector for s.s.b. and c.w.

Calibration every 5 kc. WWV reception at 15 Mc.

Selectivity: 2.5 kc. at -6 db. Automatic noise limiter.

Sensitivity: ½ microvolt for 10 db. signal-to-noise ratio on ten metres.

Stability: Less than 500 cycles drift after one-minute warm-up.

Less than 200 cycles change for 10% line voltage change.

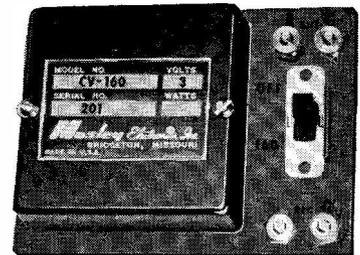
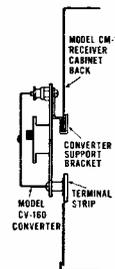
Image and i.f. rejection: 35 db. minimum.

Power consumption: 33 watts. (230 volts a.c., 50 to 60 c.p.s.)

Rear chassis accessory facilities: Transmitter relay terminals, accessory power socket, external speaker/VOX terminals.

Write for complete descriptive brochure and the name of the dealer handling the CM-1 in your area.

Net Price £86. (All crystals included).



New! MOSLEY 160 METRE CONVERTER Model CV-160

Converts the 160 metre band, 1750-2000 kc. for reception on most 80 metre band receivers.

Transistorized, crystal controlled, printed circuit and self powered.

Designed to attach directly to rear of the Mosley CM-1 and adaptable to most other receivers.

Net Price £7. 10. 0.

"Worlds Leading Manufacturer
of Amateur Radio Aerials"



Electronics Ltd.
15 Reepham Rd., Norwich, Norfolk

CRYSTALS & COMPONENTS LTD



TEL: TEM.1189 2.4. EARLHAM STREET W.C.2.

Near Cambridge Circus. A few minutes walk from Leicester Square or Tottenham Court Road Underground Stations.

HOURS OF BUSINESS: 9 to 6. Saturdays 9 to 1. OPEN ALL DAY THURSDAY

QUARTZ CRYSTALS

ALL FIGURES GIVEN ARE IN KC/S AND ARE FUNDAMENTALS. TO SAVE SPACE WE ARE OMITTING THE FIRST TWO FIGURES OF THE FREQUENCY BUT COMMENCE EACH RANGE WITH THE COMPLETE FIGURE, THUS : 2700 05 20 36 indicates 2700 2705 2720 2736. All crystals are 1/2" 10X type except where indicated * thus, which are 1/2" 10xJ type. Prices are, under 3 Mc/s over 9 Mc/s every 5/- each. 1700 kc/s at 2/6 each. A handling charge of 1/6 on all orders.

333 370 440 385 983.2 1190.5 1565 1550.62 1566.75 2067.5 87 89 2118.25 50 81 86 95 96 2201 22 36 40 41 52 61 72 90 95 2300 04 09 15 25 30 33 45 55 66 72 81 84 85 86 89 94 96 2410 31 42 2617 40 49 96 2700 05 20 36 52 62 83 2810 17 47 65 66 73 2903 31 35 49 87 90 3040 74 75 95 3101.25 08 15 33.5 35 46 50 73 3345 70 85 87 94 35 85 3805 40 50 52 72 80 85 3925 4080 4100 10 25 35 45 63 75 78 86 90 4205 36.5 70 4301 40 64 79 95 4400 25 70 4640 72 4700 4860* 79 4955 90 5000 30 40 5100 50 80* 85 5200 20 30 40 50 60 70 80 95 5320* 30 40* 50 70 80 90 5400 10 20 30 40 50 60 70 80 90 5526 40 50 55* 60 66 5610 15 40 48 50 66 70 80 95.5 5700 20 25 30 40 62 75 5900 10* 20 30 40 45 50 60 70 80 90 6010* 21* 50 76 90 6110* 60 80 6200 02.5 10* 17.5 40 44.5 47 50* 62.5 65* 67 80 91 6300 18 35 40* 46 50 52.5 54.75 66* 76 80 82.5 6400 10 20 60 70 80 88 90 98 6500 10 20 30 40 50 60 61 90 92.5 6602 10 15 16.67 25.5 27 30 50* 62.5 66 70* 83 85 6700 08 20* 30 40 50 54.75 55 65 70 80* 83 90 6805 10 25 27 30 50 60 65 70 80 90 92.5 6900 05 10 20 38.88 40* 50* 60 70 80 90 7002.5 50* 62 7100 10 20 30* 40 50 54 60 70 80 90 7210 20 40 60 70* 80 90 7300 04.4 10 30 40 50 60* 70 75* 90 7420* 40 50 70 80 90 7500 152 20 30 7530 40 50 70 80 7700 10 20 30 7810 40 50 60 7910 20 30 8001.43 20 21.54 27.14 35 61 68 89 90.7 91.43 92 8103.53 04.29 10 15 17 26* 37 40 42.86 46 55 60 61.54 64.54 70 71.25 76 77.65 80 81.43 87.2 88 93.75 94 95.4 98.8 8202 07 20 24 25 27 28 35.8 36 38.4 60 69 80 84.6 90 8301.82 04.7 08 20 22.8 26 33 50 8415 23 28 40 41.25 51.43 52 55 65.45* 69 70 76 77.1 78.4 80 81 82 90 92.3 98 8500 12 25 47 63.6 67 96 8612.73 45.45 66.6 78 8710 90* 9065 70 9150 9273 9400* 22 88 95 9622 60* 75* 9720 9811 44 9935

FT243s Series I

3840 85 3940 90 95 4035 45 80 95 4135 65 75 4215 40 55 80 95 4330 40 95 97.5 4445 90 95 4535 40 80 4620 35 95 4710 80 4840 52.5 80 4900 30 5030 5205 17.5 85 5327 97.5 5435 37.5 5545 87 5645 87.5 5730 80 5820 70 5907.5 95 6042.5 6142.5 85 6235 6315 25.5 62.5 6405

Series II

5706.6 40 5806.6 40 73.3 5906.6 40 73.3 6006.6 6106.6 40 73.3 6206.6 40 73.3 6306.6 40 73.3 6406.6 40 73.3 6506.6 40 73.3 6606.6 40 73.3 6706.6 40 73.3 6806.6 40 73.3 6906 40 73.3 7106.6 40 73.3 7206.6 40 73.3 7306.6 40 73.3 7406.6 73.3 7506.6 40 7606.6 40 73.3 7706.6 40 73.3 7840 40 73.3 7906.6 40 73.3 8106.6 40 73.3 8206.6 40 8306.6 40

Series III

5675 5700 25 50 75 5800 25 50 75 5900 25 50 75 6025 50 6100 25 50 75 6200 50 75 6300 50 75 6425 50 75 6525 50 75 6600 75 6700 25 50 75 6825 50 75 6900 25 50 75 7100 25 50 75 7200 25 50 75 7300 25 50 75 7400 25 50 75 7525 7600 25 50 75 7700 25 50 75 7825 50 75 7900 25 75 8125 8200 25 50 75 8300 25 50 8400 8425 50 75 8525 50 75 8600 25

FT241 72nd HARMONIC CRYSTALS

CHANNEL 270 to 310 and 350 to 388 at 2/6 each.
CHANNEL 311 to 319 and 342, 346, at 5/- each.
CHANNEL 321 to 327 and 330, 334 to 339 at 7/6 each.

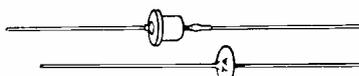
CRYSTAL FREQUENCY STANDARDS. 10X TYPES

500 kc/s 7/6 each 1,000 kc/s 15/- each 2,000 kc/s 7/6 each 5 Mc/s 5/- each.

TYPE 46 TRANSCEIVERS

The best buy today! These Walkie Talkies are now available in new condition complete with all accessories at a give-away price. Three channel crystal control TX and RX supplied complete with one pair crystals, coil box, aerials, lead and plugs, valves, balanced armature headset with throat mike. 1 Watt output. Coverage : 3.6-4.3 Mc/s. or 6.7-7.6 Mc/s. by means of plug-in coil boxes. Inland buyers supplied with crystals in 3.5 or 7 Mc/s. band (state which preferred) other frequencies available for export. Requires only 150v., 15v. and 3v., dry batteries. Range over 10 miles. Full instructions and circuit supplied. These units have been "demobbed" by the removal of the send-receive switch. A replacement switch with fitting instructions is supplied. We offer this fine unit with all the accessories listed above at the ridiculous price of 30/- each or two for 57/6. Or fitted with the original switch 10/- extra per set. Batteries available at 24/- per set. (P.P. 6/6).

SILICON RECTIFIERS



Miniature silicon power diodes at new prices. Made by leading British manufacturers. Type (1) 500 P.I.V. at 250 mA D.C. output. Price 3/6 Type (3) 800 P.I.V. at 550 mA. Price 7/6. Type (4) 1,000 P.I.V. at 450 mA. Price 8/6 each.

50 MICROAMP METERS

Made by Sangamo-Western. Brand new and boxed. Type S145 Size 3" x 2 1/2". 850 Ohms resistance. Four scales operated by lever "Set Zero" 0-3 to 0-300. Easily coupled to rotary range switch by cord or lever. Easily adjusted to 25-0-25 microamps, 20/- (P.P. 1/6).

BC960D FREQUENCY METER

14.5 to 23.5 Mc/s. with 2" 0-500 Micrometer, extending aerial with calibration charts. In new condition, £5/10/- (P.P. 4/-).

G.P.O. 5 LINE KEYBOARDS

Brand new in wooden case. Circuit printed on side of case. Size 7 1/2" x 9" x 7 1/2", 15/- (Carr. 5/-). Or Used but in new condition, 12/6.

G.P.O. RECTIFIER UNITS TYPE 43A

Primary 200/250v. A.C. Output 110v., 7 amps D.C. adjustable ± 36 volts will in fact give at least 1 1/2 amps., 55/- (P.P. 6/6).

VALVES! VALVES!

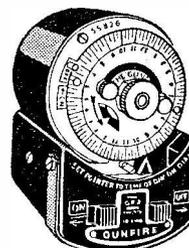
EF70, EF71, EF72, EF73, EN70, EC70 Equiv. 12AT7, 6X4 Equiv. EF91 Equiv. 13 D3. All these are wire ended. Also 6C4, 6AL5, 6B8, ECC31, 6G6, 6Q7, EF91, EF92, EL91, EAC91, EB91, EY91, TT11, 12A6, all at 1/9 each. 6X4, 5Y3GT, 714, 6G6, 6V04/7, 12AT7, VR150/30, 12AU7, 150B3, 3/6 Each or 3 for 10/-

LATEST MODEL.

BRAND NEW

"GUNFIRE" TIMES SWITCHES

Price with one pair of switching on/off arms, 79/6 (P.P. 2/6) Additional arms (switch takes maximum of 2 pairs) 4/- per pair (Not available for the 10 amp type).



Self starting non reversing synchronous motor operating from 200/250 volts A.C. supply. Once again available in 10 amps. at 250v. A.C. Price 62/6 or 20 amps 250v. A.C. enclosed in strong metal case with perspex cover and incorporating the latest type insulated switching device.

RII4 2-Meter RECEIVERS

Ex. 1985-86 series with valves, 15/-; 7575 Kc/s. Crystal, 5/-; I.F. Trans., 2/6. P.P. 2/6.

TERMS OF BUSINESS

CASH WITH ORDER. Handling charge of 1/6 on all orders under 20/- where P.P. is not otherwise stated.

INDEX TO
ADVERTISERS

	PAGE
Anglin	443
Avo, Ltd.	398
Bracken Electric Co., Ltd. <i>cover iii</i>	
Brookes Crystals	444
Crystals & Components ...	396
Daystrom <i>cover iv</i>	
Dependable Relay Co., Ltd.	446
D.N.R.	393
Electroniques, Ltd.	448
G3HSC (Morse Records) ...	448
G.W.M. Radio	445
Home Radio	447
K.W. Electronics ... <i>front cover</i>	
Minimitter	444
Mosley Electronics	395
Norman Birkett, Ltd. ...	447
Partridge Electronics, Ltd.	446
Peter Seymour <i>cover ii</i>	
Rollet	448
Short Wave (Hull) Ltd. ...	442
Small Advertisements	443-448
Southern Radio	448
Southern Radio & Elec. ...	446
Southern Radiocraft (Tx) Ltd. <i>cover iii</i>	
S.W.M. Publications	394
Tiger Radio, Ltd.	443
Webb's Radio	398
Whitaker <i>cover ii</i>	
Withers	445
Young <i>cover iii</i>	

SHORT WAVE MAGAZINE

Vol. XX

OCTOBER, 1962

No. 228

CONTENTS

	Page
Editorial	399
Improved Anode-Dip Oscillator, <i>by G. Auton (G3IHI) and J. Grogan (G3PJG/T)</i>	400
Regulated Transistor DC Supply	403
Transmitter Circuit Improvements, by M. A. Sandys (G3BGJ) ...	404
Radiating Systems for Confined Spaces, <i>by F. G. Rayer, Assoc.Brit.I.R.E. (G3OGR)</i>	407
Precision Paddle for Electronic Keyers, by S. Woolley (G8RQ) ...	409
RTTY Topics, by W. M. Brennan (G3CQE)	411
DX Commentary, by L. H. Thomas, M.B.E. (G6QB)	415
Rules — 1962 “CQ” World-Wide DX Contest	416
Light-Weight Vertical Aerial Construction, <i>by D. A. Bunday, Grad.I.E.E., Grad.Brit.I.R.E. (G3JQQ)</i>	422
The Mobile Scene	423
Transistor Superhet for Top Band, by G. E. Storey (G3HTC)	426
Design for Multi-Range DC Millivoltmeter	427
VHF Bands, by A. J. Devon	429
Another R.109A Modification, Notes by G3JON	433
Miscellany — Comment on the Times	434
New QTH'S	435
The Other Man's Station — G3EHB	436
The Month with The Clubs — From Reports	438
Rules — MCC, 1962 <i>(Seventeenth Annual Top Band Club Transmitting Contest)</i>	440

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

Advertisement Manager : M. GREENWOOD

*Published on the first Friday of each month at 55 Victoria Street,
London, S.W.1. Telephone : Abbey 5341/2*

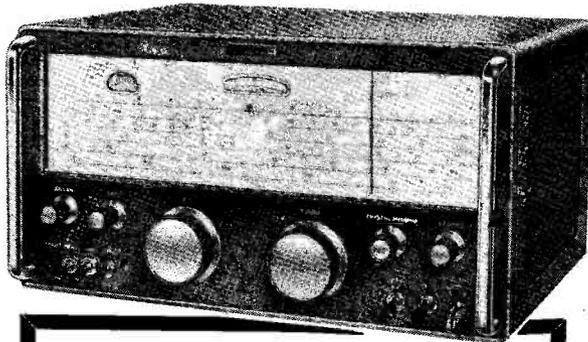
Annual Subscription : Home and Overseas 36s. (\$5.25 U.S.) post paid

© Short Wave Magazine Ltd.

AUTHORS' MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets, with diagrams shown separately. Photographs should be clearly identified on the back. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

For Truly High Performance...



the NEW EDDYSTONE "940"

COMMUNICATIONS RECEIVER
PRICE £125

A cascode type R.F. amplifier contributes to exceptionally good figures for signal/noise, cross-modulation and inter-modulation. The "940" has a host of features in its 14 specialized circuits. Here are a few:—

- * Two R.F. stages
- * Two I.F. stages
- * Three-position selectivity including crystal
- * Has carrier level meter
- * Separate A.M. and CW/SSB detectors
- * Efficient noise-limiter
- * Push-pull output 2.5 and 600 ohms.

Designed for the Professional or the Amateur who demands the best!

In stock at Webb's and we can offer reasonable terms, cash price £125 or deposit £25 followed by 12 monthly payments of £8.16.8 or 18 at £6.1.2.

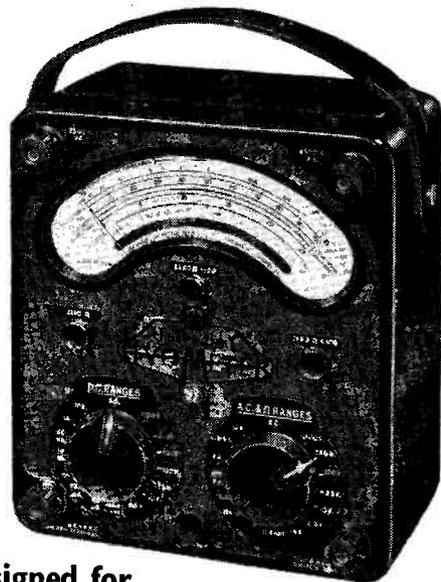
Write for details or call and handle this impressive instrument at

WEBB'S RADIO

14 SOHO STREET, LONDON, W.1.

Telephone: Gerrard 2089 and 7308. Cables: CRISWEBCO LONDON.

Model 8 Universal AVOMETER



Designed for Dependability

The Model 8 Universal AvoMeter is a high sensitivity multi-range a.c./d.c. electrical testing instrument providing thirty ranges of readings on a 5-inch hand calibrated scale. Range selection is effected by two rotary switches for a.c. and d.c. respectively.

The instrument has a sensitivity of 20,000 ohms per volt on d.c. voltage ranges and 1,000 ohms per volt on a.c. from the 100-volt range upwards, and meets the accuracy requirements of B.S.S.89/1954 for 5-inch scale length portable industrial instruments. It is robust, compact, and simple to operate, and is protected by an automatic cut-out against damage through inadvertent electrical overload.

VOLTAGE		CURRENT		RESISTANCE
D.C.	A.C.	D.C.	A.C.	First indication 0.5Ω Maximum indication 20MΩ
2.5V.	2.5V.	50μA.	100mA.	0—2,000Ω using internal batteries
10V.	10V.	250μA.	1A.	0—200,000Ω using external batteries
25V.	25V.	1mA.	2.5A.	0—20MΩ
100V.	100V.	10mA.	10A.	0—200MΩ
250V.	250V.	100mA.	—	
500V.	—	1A.	—	
1,000V.	1,000V.	10A.	—	
2,500V.	2,500V.			
				DECIBELS — 15 dB to + 15 dB

Various external accessories are available for extending the above ranges of measurement. Leather carrying cases are also available if required. Dimensions: 8½ × 7½ × 4½ inches. Weight: 6½ lb.

Write for fully descriptive Folder or for complete Catalogue of AVO instruments.



AVO LTD
AVOCET HOUSE, 92-96 VAUXHALL BRIDGE ROAD,
LONDON S.W.1



Tel: VICTORIA 3404
(12 lines)

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

E D I T O R I A L

Convention

The official title of our annual exhibition has been changed to "International Radio Communication"—but whatever it's called, it is still one of the most important events of the Amateur Radio year, where people can meet, see and be seen. As usual, there will be all the latest in the way of amateur-band equipment on view, and many interesting trade and Service stands.

This year, not only is the name changed, but also the location. Note that the International Radio Communications Exhibition will be at the Seymour Hall, Seymour Place, near Marble Arch, London, W.1, and that the dates are Wednesday, October 31 to Saturday, November 3, open all day and late into the evening every day.

For those who would prefer to avoid the crowds, the quietest times are usually Thursday and Friday mornings — otherwise, it's pretty hectic. We have a larger stand this year, and it will be fully manned throughout the period of the Exhibition. We look forward to meeting many new readers and old friends.

*Austin Fobler
G6FO.*

WORLD-WIDE COMMUNICATION

IMPROVED ANODE DIP OSCILLATOR

VERSATILE DEVICE WITH WIDE
RANGE OF APPLICATIONS

D. AUTON (G3IHI) and J. GROGAN (G3PJG/T)

The instrument discussed here can be described as an improvement and an advance on the conventional GDO — an improvement because it uses an inherently stable oscillator circuit and gives very sensitive indication; and an advance because it has a wider range of applications. In other words, the ADO takes the GDO principle a bit further. It is easily built and calibrated, and the general design can be adapted for any range of frequencies, from LF up into the VHF region.—Editor.

MANY GDO circuits have been presented to the MAT fraternity in the past, but none, it is believed, has offered quite the versatility of the one described here.

It is a complete GDO contained in one unit for one-hand operation, with an extended range of applications. These include crystal frequency and activity checks, correct measurement of mobile whips and the use of two-terminal coils.

Extra sensitivity is obtained with this circuit, which is very similar to that of a valve-voltmeter; this enables a large dip or kick to register with the minimum of coupling; in turn, this minimises the pulling of the GDO frequency, so calibration is preserved. The device is henceforth referred to as an ADO, since resonant indication is by way of anode voltage difference and not grid current.

Circuit Description

A double triode is employed, in which the first half consists of a simple parallel-tuned circuit between grid and chassis; hence, one side of the coil is always at earth potential. This stage is cathode coupled to the second triode, which is a grounded-grid amplifier, providing in-phase feedback to the grid of the first stage, thus producing sustained oscillation in the manner of the Franklin circuit.

Both triodes form a bridge, and balance is achieved by VR1;

in effect, measuring a voltage difference. VR1 requires a different setting for each coil or crystal used.

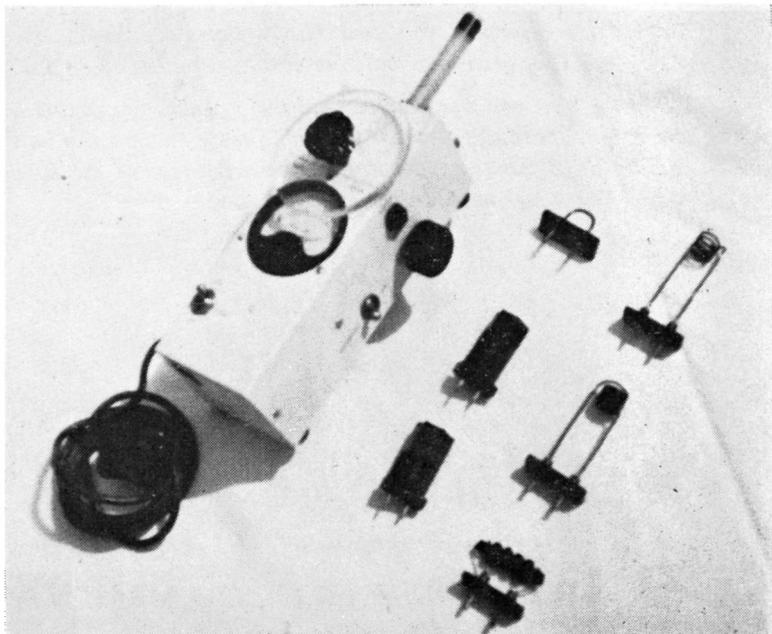
A closed-circuit jack in the cathode lead is for monitoring, or introducing modulation. By inserting a microphone, or key, here transmission can be achieved over short distances, resorting to phones for reception.

Many experiments were carried out on this project to determine the layout, components and values. The result is that any combination of valves and components shown in the list will function admirably. R1/R2 should be of similar value, preferably within 2% of one another. An HT switch is required for coil changing and to use the unit for reception, or as an absorption wavemeter. In the latter case, meter readings will be for maximum deflection.

Mains supply is derived from a miniature transformer, out of a television converter. If one of these is used, check that the LT supply is 6.3v. and not higher, as required for some other valve types. A bridge contact-cooled rectifier was used, as this was to hand, but there is no reason why the alternative circuit of Fig. 2, using a half-wave rectifier, should not be satisfactory.

Coils

Two-terminal coils are used throughout the frequency range, which extends from 50 kc to 200 mc in the present model. All coils are mounted on the bases removed from 10X and FT-241 non-active crystals; this utilises the dual-purpose crystal-holder



Impression of the ADO (Anode Dip Oscillator) described by G3IHI/G3PJG, with a selection of the plug-in coils used to give a coverage from LF into the VHF region. Some applications of the ADO are outlined in the text.

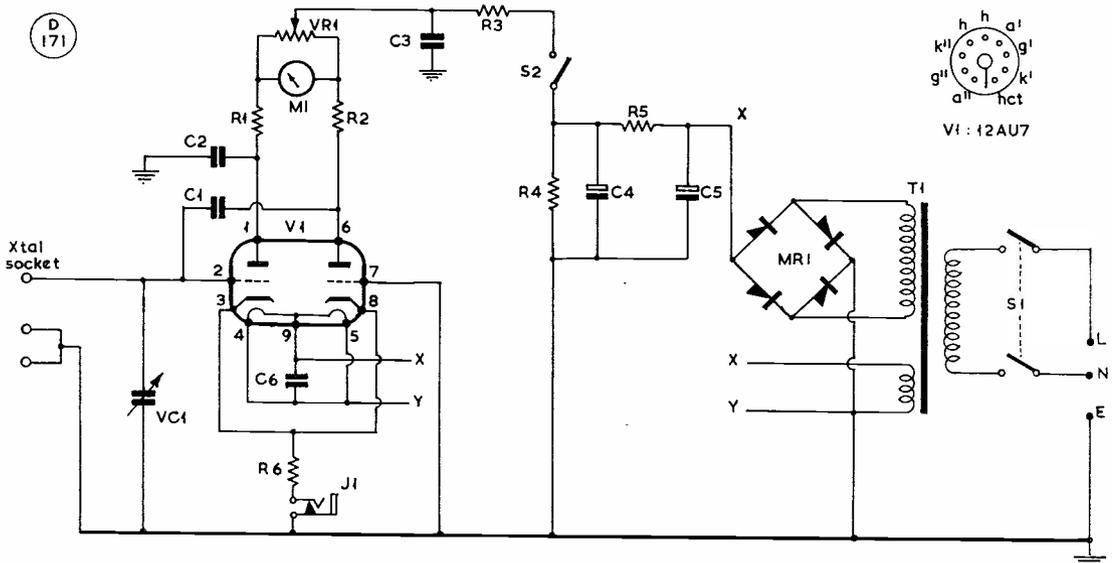


Fig. 1. The anode-dip oscillator described by G3IHI/G3PJG is an improvement on the basic GDO concept, in that it is much more sensitive and has a wider range of applications. By using a Franklin oscillator, with the indicating meter across the bridge, good stability can be achieved on the higher frequencies with clear meter indications under conditions of loose coupling. Another advantage is the use of two-terminal coils only, and a very wide frequency range can be covered — from LF up to 200 mc on the instrument as described here. An alternative power supply arrangement is shown in Fig. 2, overlaid.

mounted at the head of the chassis.

No precise specification on coil diameters or wire gauges is given, simply because most people will prefer to use what is to hand. However, here is a "loose guide" only to the writers' coils.

For the 50 kc range, an RFC was used; up to 1.5 mc, sections of IF coils wired in series; for 1.5-10 mc, Litz wire removed from IF's, between 24 and 18 gauge up to 80 mc; and above that, the thickest wire available, to make solid self-supporting windings. Shunt capacitors or dust cores were not used in the prototype, but their use is optional. Commercial coils could likewise be used, with the mounting suitably adapted.

The method employed in arriving at the correct coil size was to wind a random quantity of wire on a former; this was temporarily connected to the ADO and the fundamental sought on a suitable receiver. Having found the beat, the coils were then trimmed to provide the frequency range required, allowing a generous overlap.

Construction

The only specific constructional suggestion called for is that the tuned circuit should have the shortest possible distances between the grid of V1a to the fixed vanes of VC1 and to the coil/crystal socket. Wiring these points is best done by using a thick single-strand wire pulled tight between connectors whilst soldering, thus obtaining a reasonable degree of mechanical stability. VR1 should be brought out to the side of the chassis for meter adjustment with each coil.

A ready-made chassis was purchased for a few

Table of Values

Figs. 1 and 2. Circuit and Power Supply. Anode Dip Oscillator

C1 = 10-100 $\mu\mu\text{F}$	R5, R6 = 1,000 ohms, $\frac{1}{2}$ -w.
C2, C3 = .01 μF , disc ceramic	MR1 = 150/250v. bridge rectifier
C4, C5 = 8-16 μF , elect., 350v. DC wkng.	MR2 = Alternative $\frac{1}{2}$ -wave rectifier
C6 = .001 μF disc ceramic	T1 = 150/250v. 30/60 mA xformer
VC1 = 50-100 $\mu\mu\text{F}$, tuning	S1 = DPST toggle
VR1 = 25-100,000 ohms, $\frac{1}{2}$ -w. matched 2%	S2 = SPST toggle
R1, R2 = 27-47,000 ohms, $\frac{1}{2}$ -w. matched 2%	J1 = Jack, close cct.
R3 = 2,700-5,600 ohms, 1-w.	M1 = 0-1 mA, or 0-500 μA m/c meter
R4 = 100,000 ohms, 1-w.	V1 = 12AU7, 12AT7 or equiv.

shillings, and all the metalwork done and holes made prior to painting. This gave a good finish to the unit. Transfers were used on all the small wordings.

Applications

The two methods of indication previously mentioned available on the meter in the resonating function is the "dip" or "kick." Either can be arranged simply by connecting the meter positive to the grounded-grid side of VR1 for a dip, reversing the leads for a kick indication.

During the initial setting up of the ADO, VR1 should be in the centre of its track. When the unit warms up, control the meter needle rise for a centre reading with VR1. Whatever value is used for VR1, it will be sensitive to control, so do not swing it side-to-side if the meter is to be preserved.

For those who are not completely conversant with the numerous applications of an ADO, here are some

ways in which it can be used:

Finding the resonant frequency of mobile whips: The chassis of the ADO is taken to the vehicle body, then a three-turn link is connected across the coax lead from the whip at the point at which it plugs into the transmitter. Place the ADO coil in close proximity to the link and then tune on VC1 until the meter gives an indication.

Crystal checking: With VC1 at minimum capacity, plug-in the crystal and listen on the station receiver, with the BFO on, for the crystal beat.

Crystal activity: Two or more crystals of the same frequency can have their activity determined by comparison; the one giving the highest meter reading is the most active.

Tuned circuits: Any parallel or series-tuned coil and condenser frequency range can be determined by placing the ADO coil close to the unknown circuit and repeating the process as for mobile whips.

Aerials with balanced feed lines: To find the resonant frequency of an aerial with open-wire feeders, connect a three-turn link across the transmitter terminating end of the feeder and earth the link at the mid-point. Repeat the process as for mobile whips.

Random end-fed wires: Place a three-turn link between the aerial and earth. Repeat as for mobile whips.

Morse practice oscillator: Insert key in jack socket and listen for carrier on receiver with the BFO on.

Signal generator: Calibrating a receiver or other equipment depends on the accuracy of the initial calibration of the ADO, but, for amateur purposes, an accuracy of one per cent is acceptable. Use the MSF and WWV standard frequency transmissions to obtain this. Place the ADO near the receiver aerial and then track the ADO beat across the frequency coverage required, noting receiver dial readings accordingly.

Field strength indication: Place the ADO within

R.A.F. AMATEUR RADIO SOCIETY — G8FC

This callsign is well-known on the amateur bands as emanating from the Hq. station of the Royal Air Force A.R.S. at Locking, Somerset. The station has been modernised and re-equipped and at an inaugural ceremony on September 22 (at which *SHORT WAVE MAGAZINE* was not represented) it is understood that the visitors were considerably astonished, even if impressed, by the fact that the main items of the new equipment are of American manufacture! Since G8FC is the official station of the amateur organisation of the Royal Air Force, is sited at an R.A.F. training school, and the money for the re-equipment, to the tune of £660, was provided by a prominent Forces Trust, it may well be asked how *American* equipment came to be chosen in such a context. The question of whether or not it was the best immediately available is beside the point—and, in any event, G8FC

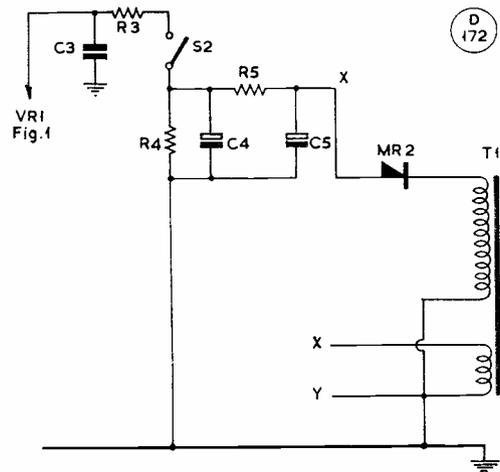


Fig. 2. Suitable half-wave rectifier arrangement for the ADO, showing where it connects to the circuit of Fig. 1. Values are given on p.401.

the strong field of the radiating aerial and adjust tuning-up for max. reading. HT is switched off for this application.

Phone or CW monitor: Insert headphones in jack socket and tune to transmitting frequency or second harmonic. For phone, HT is switched off and, for CW, the HT is on, using the BFO action to produce the keyed audio tone.

QRP transmitter: A link winding round the ADO coil and connected to an aerial will produce short-distance QSO's!

Many more applications of the ADO are possible, but enough has been said to indicate the versatility of the instrument. The construction time, including making the coils and the calibration, can be within 48 hours.

will be judged not by the dazzling equipment items listed on their QSL card, but by the manner in which the station is conducted on the air. And we all know that expensive gear is not necessary for putting out a good signal. Without wishing to criticise the R.A.F. Amateur Radio Society people at Locking too severely, it seems to us that a mistake has been made over this matter.

THE "NEW QTH" PAGE

Readers are reminded that as U.K. agents for the *Radio Amateur Call Book*, which is published quarterly, we need new callsign/addresses and changes of address just as quickly as they can be notified, in order to keep the lists up-to-date. All new QTH's that we receive are published in the next available issue of *SHORT WAVE MAGAZINE*, and are airmailed to the *Call Book* people in Chicago.

"Short Wave Magazine" can be obtained to order through newsagents in practically all countries

REGULATED TRANSISTOR DC SUPPLY

LOW VOLTAGE, VARIABLE OUTPUT — FROM AC MAINS

WITH the ever increasing use and applications of transistors, and the higher-voltage types becoming available, there is a positive need for a reliable "mains" DC supply source—capable of high current output, as required for transistor modulators and other AF amplifiers. And it needs to come from the AC mains, without having to fiddle with dry cells or mess with accumulators.

This sounds like something of an anachronism—it being that transistors are usually thought of as low-voltage devices, intended to be run off batteries under loads of a few milliamps only. But the fact is that most of us are connected to an AC supply and, as many transistors and transistor circuits are intended for relatively high DC voltages, at currents up to several amps, batteries on the bench or in fixed-station applications become nothing but a nuisance.

Hence the circuit shown here, which will give a DC output pretty well stabilised at any voltage between about 6v. and 24v. (set by potentiometer R6) at currents up to 400 mA or so—in other words, within these limits any current can be drawn at the selected terminal voltage, with a high degree of voltage stability. The arrangement is thus the transistor counterpart of the "Voltage Regulated Power Pack" described in the May 1962 issue of SHORT WAVE MAGAZINE, and performs exactly the same function.

Some Constructional Points

As regards circuit details, the mains transformer can either be a *Radiospares* 24-volt "Lovolt" or,

the cheaper approach, the windings of unused heater transformers could be series'd to produce approximately the 25-0-25v. centre-tapped secondary. Alternatively, a suitable transformer could be home-contrived by over-winding 340 turns of 24g. on an existing primary, and taking out a centre-tap. The actual full load output voltage obtained by this method would depend, of course, on the dimensions of the original primary, and whether there were any other secondaries between the primary and the new winding—so, if using this method of deriving the 24/25v. secondary, the voltage output should be checked and the turns adjusted as required before doing anything with it. But the suggested 340 turns of 24g. on the average LT transformer should give about the right starting point.

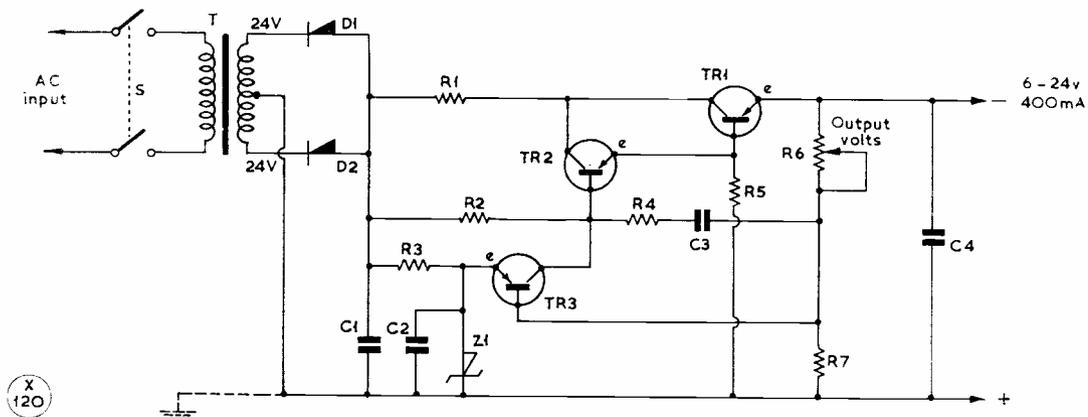
The transistor TR1 must be given a generous heat-sink, of at least 9 sq. in. of aluminium sheet, painted black. It is also very important to ensure that there is proper insulation at the mounting points of this and the other transistors.

There are no other particular constructional points to mention, except that R1 and TR1 (which are the heat-producing items) should be kept away from Z1 and TR2, TR3. The putting-together of the pack can otherwise be as convenient, the actual chassis dimensions being largely determined by the size of the mains transformer and the heat-sink area for TR1. The mains on-off switch and the output voltage

Table of Values

The Regulated Low-Voltage DC Supply

C1 = 500 μ F, 50v.	R7 = 330 ohms
C2 = 100 μ F, 12v.	S = D P S T mains toggle
C3 = .02 μ F, 25v.	T = 24-0-24v., $\frac{1}{2}$ -amp. (see text)
C4 = 100 μ F, 25v.	
R1 = 25 ohms, 10-w.	D1, D2 = OA210 rectifiers
R2 = 4,700 ohms, $\frac{1}{2}$ -w.	Z1 = Zener OAZ201
R3 = 2,000 ohms, 1-w.	TR1 = OC16
R4 = 100 ohms, $\frac{1}{2}$ -w.	TR2 = OC72
R5 = 2,700 ohms, $\frac{1}{2}$ -w.	TR3 = OC75
R6 = 1,000 ohms, w/wound	



Circuit of the transistor power pack discussed in the article. It is intended to give a voltage-regulated output with high current capacity, and is suitable for many applications in which the latest audio power transistors are used. The mains transformer T can either be a commercial type, or could be contrived on the bench, as suggested in the text.

control R6 could be brought out to a front panel, with the output terminals, and the panel could be further decorated with a small voltmeter and 0-500 mA milliammeter to check exactly what is happening on the output side. All values are given in the table.

TRANSMITTER CIRCUIT IMPROVEMENTS

SOME USEFUL MODIFICATIONS TO A BASIC DESIGN

M. A. SANDYS (G3BGJ)

MOST amateurs have their own strong views on the desirable features a transmitter should possess. Given a straightforward piece of equipment lacking these merits, they will eventually succumb to the temptation to modify it. This is an account of some of the circuitry that has evolved around the writer's transmitter since it first went into operation.

Fig. 1 shows the present development. Shorn of its switchery, it reduces to a conventional five-band CW unit, following the familiar pattern of Clapp VFO on 3.5 mc, two buffer/multipliers and 807 PA with clamp tube protection. As such, it will not be of much interest, but around each stage in turn new circuitry has appeared, and it is this which may stimulate the reader, if not to copy, at least to criticise.

Principal Modifications

The main modifications are, in chronological order:

- (1) Switching to allow V2 to be used as a crystal oscillator.
- (2) The single-switch or break-in facility described by the writer in the May, 1961, SHORT WAVE MAGAZINE.
- (3) Improved bandspread coverage as suggested by the writer in the May, 1962, SHORT WAVE MAGAZINE.
- (4) A cathode-follower between *pi*-circuit and receiver, providing an output suitable for connection to the usual low-impedance receiver input.

These will now be described in more detail. Only those circuit values applicable to the modifications are given. The rest of the circuit follows standard practice and values, and are as usual for a basic design of this kind.

VFO/Xtal Facility

Introduced originally to overcome a lack of drive on 21 mc and 28 mc, this has two advantages. It allows one to radiate a highly stable signal on 21 mc and 28 mc, if the need should arise, and it is very useful to have a crystal oscillator handy at all

Those interested in a more detailed discussion on transistor-regulated DC supplies, with an explanation of the action of the circuit, are referred to *QST* for October 1961, on which the model described here is largely based—with acknowledgements to W3RXI.

times with which to check the receiver and VFO calibration.

Switch Sw.1 performs the following functions when switching from VFO to xtal:

- (1) Disconnects the grid of V2 from the VFO output and brings in the crystal.
- (2) Removes the short from RFC2 and connects V2 cathode to the capacity tap across the crystal.
- (3) Breaks the VFO cathode and inserts the key in the CO cathode.

To enable the crystal oscillator to function when the netting switch is operative, the screen is supplied from the same source as the VFO, namely, the stabilised 150v. line. Netting is effected by the simple expedient of removing HT from the multipliers, leaving it on the VFO, V2 screen and PA (see Fig. 2). This arrangement is not entirely satisfactory, and a three-position switch—send, receive and net—would be preferable. Originally the drive control was in V3 screen circuit, but the requirements of the break-in system preclude its use in that stage and it was accordingly moved to V2. A 3.5 mc crystal permits operation on all bands.

Break-In System

This was fully described in the May, 1961, issue of the *Magazine*. The only change since then has been the replacement of the Type 600 relay by a miniature one having two change-over contacts. Briefly, it confers the two-fold benefit of single-switch working or full break-in. There are two requirements for its incorporation: The HT to all stages must

Power Supply Switching Circuit on p406

C1	= 100 μ F, pre-set	VR1	= 5,000 ohms, w/
C2, C4	= 25 μ F, pre-set	VR2	= 5,000 ohms, w/
C3, C5	= 15 μ F, VAR.	RFC1,	
C6	= .001 μ F, mica	RFC2,	
C7, C15	= 100 μ F, mica	MR1	= 2.5 mH RF choke
C8, C11	= .01 μ F, mica	TI	= 6.3v. 1.5A heater
C12, C14	= .01 μ F, paper		xformer, with sec.
C18, C20	= 3-30 μ F, Philips	R1	= 5,000-ohm, relay,
C9	= .01 μ F, trimmer		two c/o contacts
C10	= 220 μ F, mica	Sw1	= 4-pole, 2-way
C13	= .01 μ F, mica	Sw2	= 2-pole, 2-way
C16, C17	= 16 μ F, 350v. elect.	L1	= 39 turns 28g. close-wrd. on 1-in. dia. former
R1, R2	= 47,000 ohms	V1	= 6AC7
R3, R4	= 50 ohms	V2, V3	= 6AG7
R5	= 470 ohms	V4	= 6V6
R6	= 1 megohm	V5	= 807
R7	= 15,000 ohms	V6	= 6C4
R8	= 330 ohms		
R9	= 100,000 ohms		

TRANSMITTER CIRCUIT IMPROVEMENTS

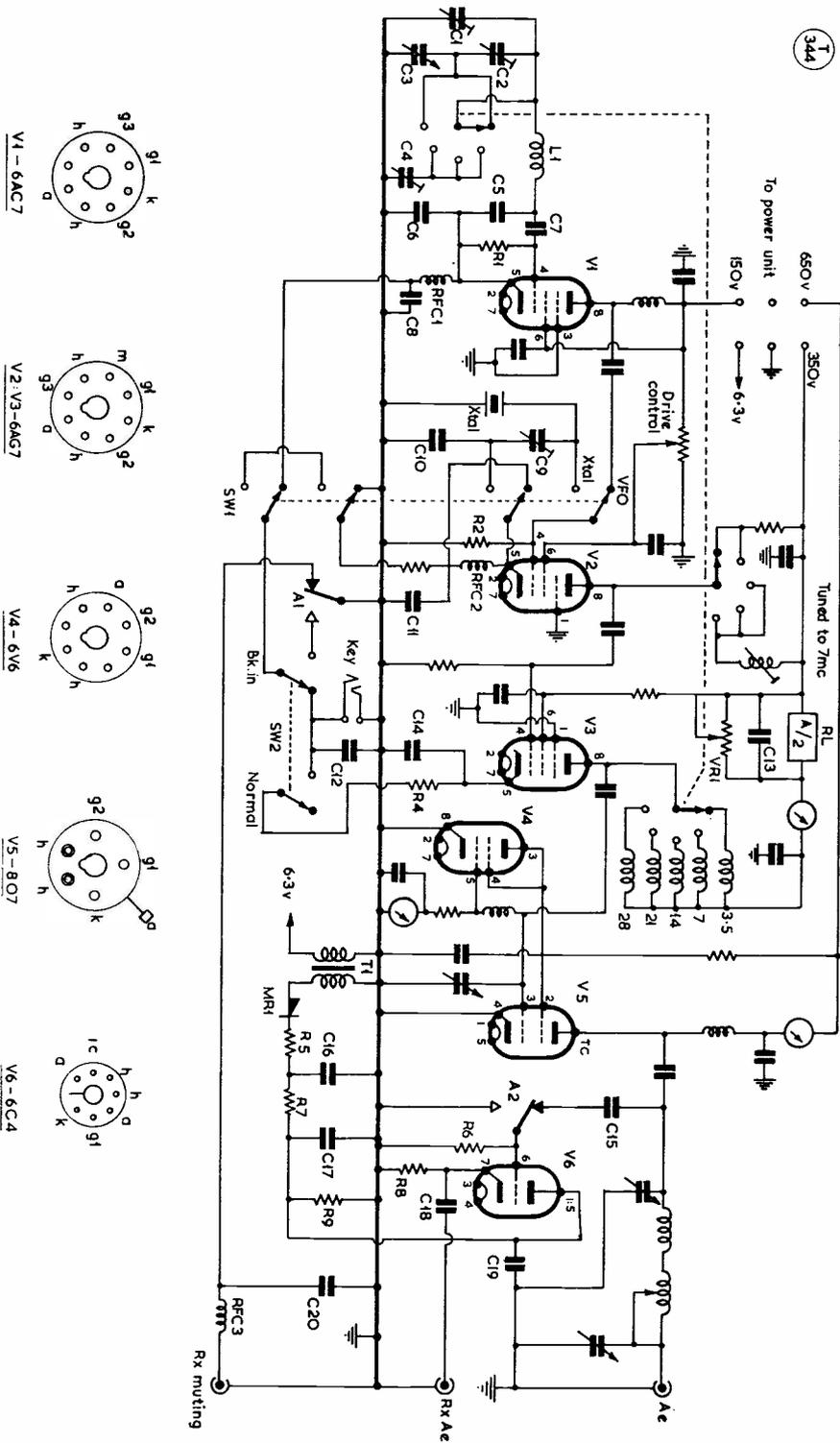
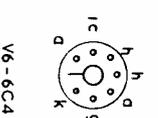
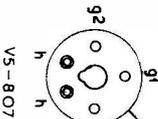
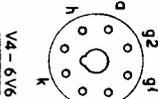
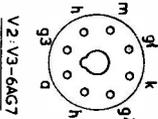
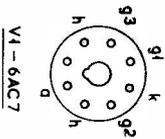


Fig. 1. Showing the circuitry, discussed in the text, included in a basic transmitter of conventional design — this can be traced by the unmarked circuit elements, the additions or modifications only being numbered. The Clapp VFO is switched to 3.5 mc; V2 is a straight amplifier with the VFO, or a crystal-controlled drive oscillator; V3 also doubles on 14, 21 and 28 mc, the VFO being band-switched; V4 is a straight amplifier on 3.5 mc, a doubler on 7 and 14 mc, a tripler to 21 mc, and quadruples for 28 mc. On the PA side, V6 is a clamper with its own power supply, and the control switching arranges for receiver muting as well as for giving the Rx a tuned input.



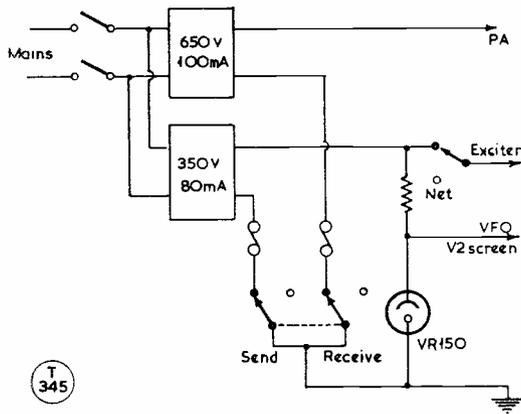


Fig. 2. A suitable power supply switching arrangement, in which the HT toggle on the negative side of each power unit constitutes the send-receive switch. The latter could well be combined with the "net" switch, with provision made for the oscillator to be separately keyed.

be applied by one switch, this being in effect the send-receive switch, and V3 must have a standing current, with key up or down, somewhat more than that required to operate the relay. Fig. 2 illustrates the power unit arrangements. Used normally,

switching the HT energises relay $\frac{A}{2}$. Contact A1

mutes the receiver, A2 disconnects the aerial and earths V6 grid. On BK V3 performs the additional function of relay keyer, the oscillator, either VFO or CO, being keyed by contact A1. Although the purist may question the advisability of using one of the transmitter stages as a relay keyer and the perfectionist may point out that the radiated symbol must be shortened by the relay lag, the fact remains that it works exceedingly well; and since the addition of modification (4) key clicks have been almost completely suppressed. Normally, the writer prefers single-switch operation, secure in the knowledge that any request to use break-in can be met.

Note that with Sw.2 at Bk-In the netting facility is not available. Removing HT from V3 prevents the relay, and therefore the oscillator, from being keyed. This can be rectified by using a three-position control switch, as already mentioned.

Bandsread Circuit

The article in the May, 1962, Magazine showed the feasibility of improving bandsread by using this circuit. Here it is applied to the Clapp VFO. C3 bandsreads the 3.5 mc and 28 mc bands; on 7 mc, 14 mc and 21 mc a section of the band-change switch places C2 in series with C3. C2 is set so that the 14 mc band is exactly covered, whilst C4 is adjusted to retain the lower band edge in the same position. The bandsread achieved is 3.5 to 3.8 mc, 7 to 7.175 mc, 14 to 14.35 mc, 21 to 21.525 mc and 28 to 30.4 mc—a gratifying case of practice

not only conforming to theory, but bettering it!

The Cathode Follower

This is a modification of an electronic T/R ("send-receive") switch described in the October, 1958, SHORT WAVE MAGAZINE, in which it is shown permanently connected across the pi-tank. Whilst T/R devices of this nature, in conjunction with the receiver AVC, may be suitable for voice operation, it is the writer's contention that CW break-in calls for different treatment if one is to retain ear-drums intact. Two criteria appear necessary. First, there should be complete isolation of the receiver front end from the aerial. Secondly, the receiver (which should be under manual gain control) must be in its muted condition before the transmitter radiates. Any system in which the transmitter comes on before the muting functions, e.g., electronic T/R switch. AVC action, seems inevitably to produce a loud and uncomfortable thump when the key is pressed. Hence the retention of A2 contact to fulfil the first requirement. The second requirement is already met by A1 contact. Before it has traversed its gap to key the transmitter, the receiver is muted. Although introduced primarily to achieve a better match between pi-circuit and low-impedance receiver input, a secondary effect was a considerable reduction of key clicks on BK. In fact, the most irritating noise is now the clatter of the relay.

As the transmitter is now run, a separate power supply is required for V6. This is provided by a half-wave rectifier with RC filter, fed from a small heater transformer placed back-to-front, as shown in the circuit by R5. C16, R7, C17 and R9.



" . . . Yes, a pair of 813's in the final can be very handy . . . "

RADIATING SYSTEMS FOR CONFINED SPACES

SOME IDEAS AND SUGGESTIONS

F. G. RAYER, Assoc. Brit. I.R.E. (G3OGR)

Though it might well be thought that the subject of Aerials had been just about covered in recent issues, in fact there is always a great deal to be discussed in regard to radiating systems generally, especially the simpler layouts for restricted locations. The aerials described here would be equally effective for the SWL interested mainly in the amateur bands.—
 Editor.

SEVERAL transmitting aerial arrangements which can be put up in relatively confined spaces have been tried, and are described here. In general, they are intended to work on one chosen band, with a 75-ohm or similar feeder, or for use on 80, 40, 20, 15 and 10., with an open-wire feeder. Where dimensions are such as to permit use on 80 metres, it is of course in order to scale the aerial size down, if this band is not required.

As a guide to the possibility of erecting any of these aerials in the space available, the approximate length of a half-wave, for about the middle of the various bands, is as follows: 3.65 mc, 128 ft.; 7.05 mc, 66 ft. 6 in.; 14.17 mc, 33 ft.; 21.2 mc, 22 ft. 1 in.; 28.8 mc, 16 ft. 3 in.

As will be well known, the use of a coax or similar feeder means that the aerial can be employed on one band only (excepting that a 7 mc aerial will operate reasonably well on the 21 mc band), while the use of an open wire, tuned feeder will generally allow the aerial to be energised on several bands. Aerial length is also less critical with a tuned feeder, because tuning at the transmitter end allows the whole system to be resonated. But for a single band, using coax or similar feeder, the aerial should be cut more exactly.

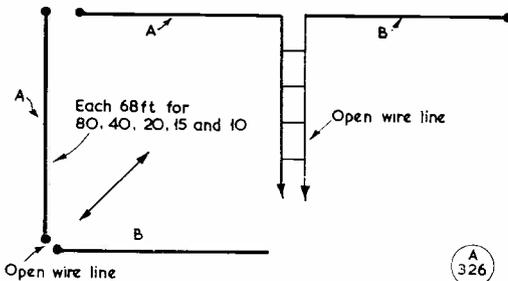


Fig. 1. An aerial system requiring about 68ft. square in plan, or 100ft. by 50ft. With an open-wire feeder, five bands could be worked, doublet fashion.

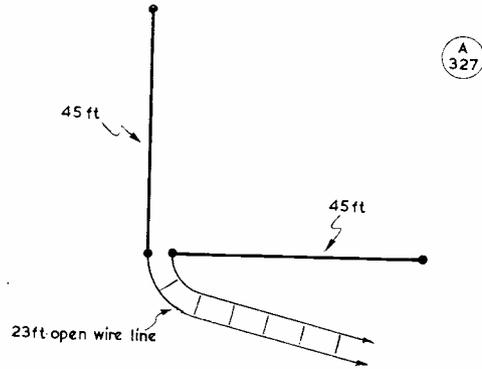


Fig. 2. A "reduced system," but still for five bands, which could be accommodated in an area 50ft. square.

Fig. 1 shows an aerial which was found to work well on all the bands indicated. It is virtually a tuned doublet with legs at right angles. The space required is about 68 ft. x 68 ft., or 100 ft. x 50 ft., according to the position of supports. There is some directivity in the two directions of the double-headed arrow, gain approaching 3 dB on the 14 mc band, and 4 dB on 21 mc. Tests suggest there is good radiation in other directions.

The open-wire line length, and its influence on tuning, will be mentioned later. For one band only, with a low impedance feeder, the total can be about one half-wave, for the selected band. The aerial is then virtually a single-band dipole, with elements at right angles.

A shortened version of the system is shown in Fig. 2, and needs a space of about 45 ft. x 45 ft., or 66 ft. x 33 ft., plus a little for supports. These lengths are intended for use with about 23 ft. of open-wire line, and the system can then be used on all the bands mentioned. Gain is less than 3 dB on 21 mc, with directivity as in Fig. 1.

With aerials of the type of Fig. 1, used with an open-wire line, the whole system should be a multiple of half-waves, on the bands required. That is, A plus B will need to equal some figure which may be divided approximately by any of the half-wave lengths listed. Due to the absence of end effect on inner half-wave portions, the physical length more nearly approaches one half-wave, instead of the usual 0.95 of a half-wave, when the wire is a multiple of half-waves long.

With an arrangement like that in Fig. 2, the total length of the system, including both wires of the feeder, needs to approach a half-wave for the lowest frequency band required. Fig. 2 has no advantage over Fig 1, other than needing less space.

Sloping Dipole

Sloping aerials, erected as in Fig. 3, seem to give quite a good performance. When the height of the anchor point approaches the length of the aerial, little additional space is needed, and the wire can be even more vertical. (Note that children or others

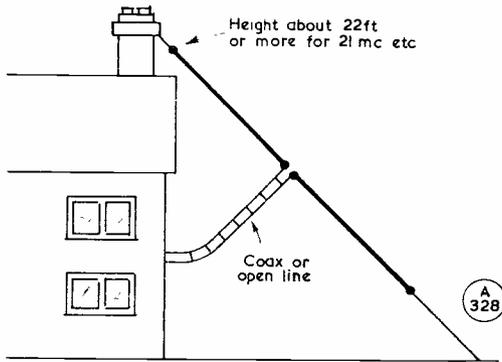


Fig. 3. A semi-vertical system, either a dipole, or a tuned doublet for the HF bands. This arrangement has been found to work particularly well in practice, the slope often conferring an angle-of-radiation advantage.

half-wave length to be got up, where it would otherwise be impossible.

Dropped Ends

Turning down one, or both, ends, as in Fig. 5, allows a half-wave to be erected between supports which are somewhat too close together. The feeder currents are more likely to be balanced if the aerial is symmetrical, with equal lengths turned down each end. Despite this, aerials with one end only turned down have been found to give good results.

The usual overall length will probably need to be increased slightly, for a single-band dipole with a low-impedance feeder. With a tuned feeder, the exact length is less important, since any reasonable impedance can be matched. The loss of efficiency, from turning down a moderate proportion of the length, seems to be small. The same method will work with part of the aerial indoors, as in Fig. 4.

Feeders

It will be seen that all the aerials are centre fed, and the feeder is an important item. End-fed aerials may, of course, be used in limited spaces, but often have disadvantages. For example, the Marconi will not perform properly unless the earthing is really effective. Ways of loading up short end-fed aerials are well known. However, centre-fed aerials do have advantages, including less susceptibility to some kinds of interference on reception.

When the aerial has a low-impedance feeder, this must be attached at the centre, and the whole aerial should be a half-wave long. This is a simple way of working one band.

When the aerial has an open-wire line, some form of tuner or coupler is required at the transmitter end. This is commonly a coil tunable to the operating frequency. Parallel tuning can be employed for all bands except 80, with the aerial in Fig. 2. On 80

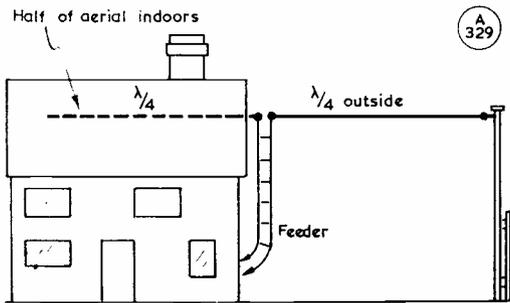


Fig. 4. Half the aerial can, if necessary, be accommodated indoors, as shown here.

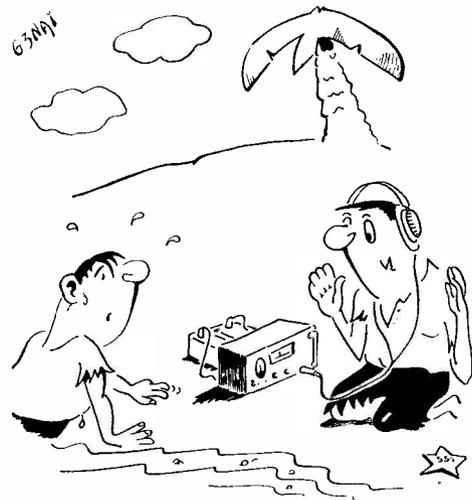
might touch the lower end of the aerial, if it is too near the ground, so this must be remembered in some locations.)

The directivity of such an aerial will depend on its angle and other factors. Such aerials, used with angles from about 45° to nearly vertical, have performed well on the HF bands.

The same feeder situation exists as with the other aerials mentioned—a low impedance feeder is used for one band, or a tuned open wire feeder for more than one band.

Dipoles for 10, 15 and 20 metres, erected vertically, were also found very useful. The top was supported from a wire strained between a chimney and a second high point, and the aerials were several feet clear of the house.

Another dipole requiring reduced garden space is shown in Fig. 4, a portion of the aerial being indoors under the roof space. One advantage is to avoid the large earth circuit currents arising with a Marconi. It is not necessary that the two sections should be in line, nor is it essential they both be of the same length, if a tuned feeder is used, though the feeder will then be unbalanced. But it may allow a complete



“ . . . I don't suppose you've brought a piece of wire—say, about 132 feet long? . . . ”

metres, series tuning is required, or a loop round the parallel tuned aerial tank coil.

With the other aeriels, parallel tuning can be used when half the top and the feeder comes out near a half-wave, or multiple of half-waves. For example, if the length of half the top, *plus* the length of the feeder, were about 67 ft., then this would be one half-wave on 40m., two half-waves on 20m., and so on, allowing parallel tuning. But if the total of these lengths is an uneven number of quarter-waves, series tuning (or a coupling loop) will be wanted. For example, around 99 ft. would be series tuned on 40 metres (three quarter-waves) but parallel tuned on 20m. (three half-waves). Any of the conventional and well known aerial tuner circuits should be suitable.

On the HF bands, a change of a few feet in the feeder length may considerably influence tuning, and can easily be tried, if necessary. A short piece of coax (with TVI or low-pass filter, if needed) would be used between transmitter and tuner, and the transmitter would be operating into the appropriate low impedance load of 50- to 75-ohms or so. If the

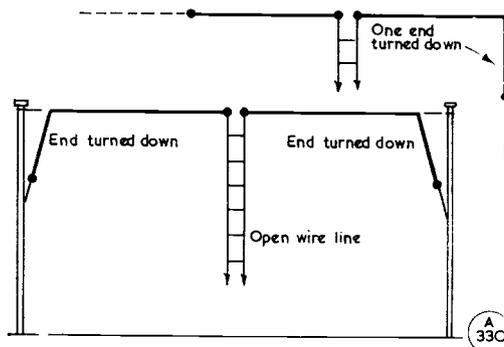


Fig. 5. Gaining length by turning down the ends of a transmitting aerial. This also is quite practicable where space is limited. Tuning and feeding can be as for a normal doublet arrangement.

receiver has a 75-ohm input impedance, feeding it from the transmitter line will also produce maximum signal strength on reception.

PRECISION PADDLE FOR ELECTRONIC KEYERS

DESIGNED FOR ACCURATE SPEED SENDING

S. WOOLLEY (G8RQ)

TO obtain a really good sending style in CW operating is (or should be) the ambition of most who use a Morse key. Whilst some amateurs become really excellent operators, others fail, despite years of practice.

Perhaps the main reason is the human nerve. Few amateur operators nowadays use a straight key, and fewer still send really well at speeds of more than 12-15 words per minute. The "glass arm"* type on straight keys are unable to produce dots at a sufficiently high speed, and consequently the formation of characters and spacing suffer. For all "glass arm" operators the use of an automatic or semi-automatic key will overcome this difficulty.

Perhaps the main objection to the automatic types is the surplus dots or dashes so often produced. These are due to the operator's incorrect timing, and defects in the paddle mechanism; errors due to the former can never be completely eliminated, even with the best of users. Mistakes brought about by the latter can be overcome if a precision paddle is used, and the writer has experimented with quite a number

of types. The one shown here is easy to make, calling for a minimum of skill and very small expenditure.

Assuming the use of an electronic keyer, the paddle can be constructed to have a superior movement that requires only a delicate touch, no bumpy action being needed in view of the absence of the dot-producing "ditherer," which is part of the true bug-key action.

The sketches herewith show the general construction and assembly. Inspection of an old alarm clock (the one put aside for mending!) will reveal that the section of the clock that houses the balance wheel makes a very fine pivoting device for the paddle. The balance wheel and hair-spring are not needed and can be discarded.

Cut out this section of the frame of the clock, and all that is now required is to fit a piece of steel, sharpened at each end, and hardened, of the same length as the spiked piece that fits through the balance wheel, and fix this in the end of the paddle bar to act as a pivot on the clock bearings. The paddle bar is made of 4 in. x ½ in. x ¼ in. brass, and the spiked piece is fitted through a hole ½ in. long. This calls for precision drilling, and the work is best done with a fixed bench drill to get the hole dead accurate. Be sure to make the pivot a tight fit and sweat it into position. The frame can be reinforced if necessary. The contacts are now fitted to the paddle, and two pieces of paxolin are rivetted to the other end of the paddle bar to form the handle.

Steadying Action

The paddle arm is steadied by two "pistons"—see Fig. 3—which are made as follows: Two brass angle pieces are required, and it is not advisable to have these less than ½ in. thick, because they are to become the "cylinder" for the "pistons" and need width for good action. Four 4 BA long brass bolts,

* "Glass arm," or "glass elbow"—a term used by professional telegraphists of earlier days who experienced a stiffening of the arm muscles due to prolonged operating on a heavy straight key.—
Editor.

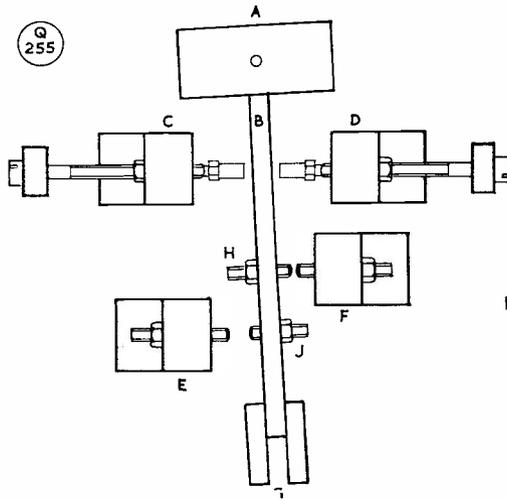


Fig. 1

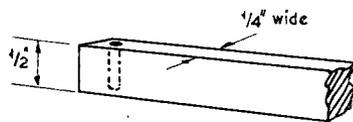


Fig. 2

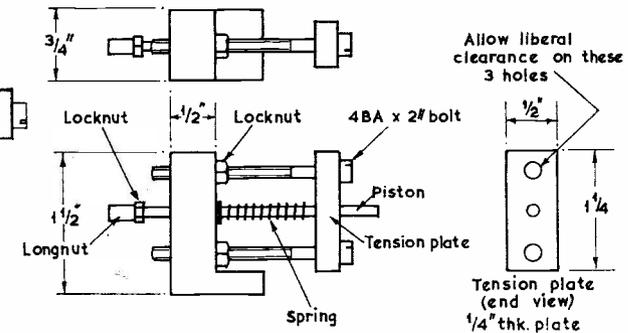


Fig. 3

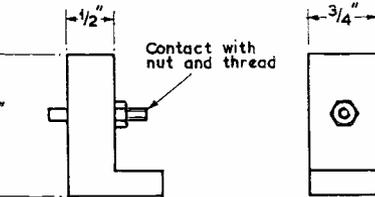
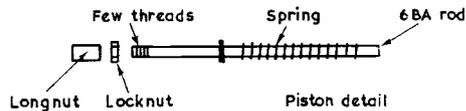


Fig. 4

Showing the general assembly and the parts required for the damped bug-key panel described by G8RQ. In Fig. 1, A is the pivoting mount, cut out of an old alarm-clock — see text; B is the paddle bar; C, D, are the piston assemblies for the damping action; E, F, angle brackets with contacts; G, handle end; H, J, contact sets. Fig. 2 shows section of paddle bar. Fig. 3, piston assemblies and construction. Fig. 4, angle brackets for signal contacts.

two pieces of unthreaded 6 BA brass rod, two spring tension plates, two springs made from No. 26 piano wire, two washers for sweating on to the 6 BA rods (one on each to form the piston stops), two 6 BA lock-nuts and two long 6 BA nuts complete the parts required. The writer does not know of nuts of suitable length, and these were made from BA rod tapped 6 BA internally, and cut half-inch long.

The brass angle pieces are drilled right through and tapped 4 BA to take the 4 BA bolts, and a 6 BA hole is drilled in each angle-piece for the 6 BA rods ("pistons"). These rods should be a nice slide fit. The springs can be wound round the 6 BA rod, the gauge of wire and number of turns being chosen to suit the individual operator's touch. Tension is adjusted by tightening the 4 BA bolts; see that the lock-nuts are tightened after making this adjustment.

Fig. 4 shows the angle brackets made to hold the

contacts, which are of brass. If the constructor is not in possession of junk-box contacts, suitable types fitted with nuts and bolts can be obtained from the local garage. However, if this type is fitted to the paddle bar, the angle brackets holding the adjacent contacts must be suitably located.

The whole assembly is best mounted on a piece of one-inch thick paxolin, or some similar heavy base if paxolin is not available.

Adjustment

The paddle bar should be set to give an exact neutral position by adjusting the long nuts, the lock-nuts on the two pistons, and the spring tension adjusting bolts. There should be no play whatsoever and no follow-through, i.e., pressure past neutral. Thin oil can be used to lubricate the pistons. The action should be easy but without shake, with firm pressure on the bar just before the contacts make.

RTTY Topics

DISCUSSING THE PERFORATOR MODEL 44. MK.II— RTTY CONTEST PROSPECTS

W. M. BRENNAN (G3CQE)

This feature appears in alternate months, and deals with radio-teleprinter operation on the amateur bands. The August contribution discussed DC loop layout and also went into the problem of reconciling keying systems.—Editor.

WHEN a new and unfamiliar piece of RTTY gear arrives in the shack, a good motto to bear in mind is "Clean it, oil it and if it works then leave it." Without the aid of the manual, the temptation to "do the job properly" and strip the machine too often results in the expenditure of many weary hours to get it back into one piece again. Moreover, even when this stage has been reached, more time will still have to be given to resetting the various adjustments (many of them interdependent) all of which will have been disturbed in the stripping process. Better then just to clean and oil the machine (removing the minimum number of parts in the process) and then see if it will work. If it does, then its operation can be studied and some idea formed of what-does-what-and-why. In this way, it is easier to rectify any faults that may occur and major overhauls can later be attempted with more confidence and less frustration. Perhaps the real art of being an amateur teleprinter mechanic lies in knowing which bolts *not* to unscrew and *when* to unscrew the rest!

The Perforator No. 44, Mark II

A recent windfall for those interested in RTTY in this country was the sale of a large number of keyboard perforators No. 44 by an active RTTY amateur at the very reasonable price of two for 35s. The condition of these machines was very good and although the idea was to supply at least one machine that was good and the other merely for spares, in actual fact in most cases both machines could be made serviceable with a reasonable amount of attention. With two identical machines available, any puzzles that crop up during the overhaul of one can usually be solved by referring to the other. However, little information seems to be available on the Perforator No. 44 and the following notes may help those who have run into difficulties and be of interest to those who have not.

This machine is of course used for the preparation of the perforated tape required for the automatic transmission of T/P signals. The tape used is the

standard 11/16-in. wide parchment variety. The required character is selected on the keyboard, the key depressed and the machine then punches the holes corresponding to the T/P code into the tape. A standard T/P keyboard is used, but in addition, there is a back-spacing key which enables the operator to move the tape back again over the punches and erase errors by punching the "letters shift" character (five holes) over the incorrect one. Since the letters-shift signal produces no carriage movement or printing on a page T/P, this virtually amounts to erasing the error. Another facility provided is the "end-of-line" indication. The machine counts the number of characters punched and at 54, *i.e.*, 14 characters before the end of a line on British T/P's, warns the operator by means of a small signal lamp that the functional signals "line feed" and "carriage return" must shortly be added in order to meet the requirements of a page receiving machine. Subsequent operation of the "carriage return" key re-sets the counting mechanism and switches off the lamp.

The first thing that may strike the new owner of a Model 44, is the lack of an electric motor. Indeed, this is one of the very few items of RTTY gear that does *not* have a motor. The mechanical power necessary for the punching operation comes from a large solenoid. The picture shows the machine with the tape threaded through the punchblock at the left hand side. A small chute carries the "confetti" down into a box just below it. Behind the punchblock is the case containing the E.o.L. counting mechanism and the signal lamp can be seen to the right of it.



When G3CQE (seated) was visiting G2FUD (Hale, Ches.) recently, he took over the machinery, G2FUD being an active RTTY operator. His power supply unit for the Perforator Model 44 is described in this month's "Topics." In addition to running an RTTY station and contributing this feature, G3CQE (Norwich) is /M on two metres and Top Band (but not with his T/P!).

The operating solenoid is in the main body of the machine immediately behind and below the E.o.L. case. The unused tape is contained in a box to the rear of the keyboard and rests on a capstan which rotates as the tape is pulled on to the punchblock. The lid of the tape box also acts as a support for a "music stand" which can be hinged upwards when required to hold any sheets of paper for copying purposes. The photograph shows this in the down position. The backspace key can just be seen to the left of the confetti chute.

Briefly, the operation of the machine is as follows: As with the Creed Model 3 and 7 T/P's, the movement of any key positions five combination bars. Attached to the left hand end of each of these is a series of levers connecting it to an extension bar which is immediately below one of the five code punches on the punchblock. Movement of the combination bar withdraws the extension bar, creating a gap between the bottom of the punch and the maximum travel of the punch hammer, thus preventing the operation of that punch. When, therefore, any key on the keyboard is pressed, the initial movement selects which punches will operate. Further travel of the key makes a pair of electrical contacts. This energises the solenoid, the armature of which moves the punch hammer, which in turn strikes the selected punches *via* the extension bars. Releasing the key breaks the circuit and the solenoid armature reverts to its original position. In doing so, it moves a ratchet mechanism which moves the tape forward ready for the next character. The same armature movement also steps another ratchet in the E.o.L. counting mechanism forward one notch. A mechanical linkage between the "carriage return" key and the E.o.L. unit trips the ratchet of the latter when the key is pressed.

The Electrical Circuit

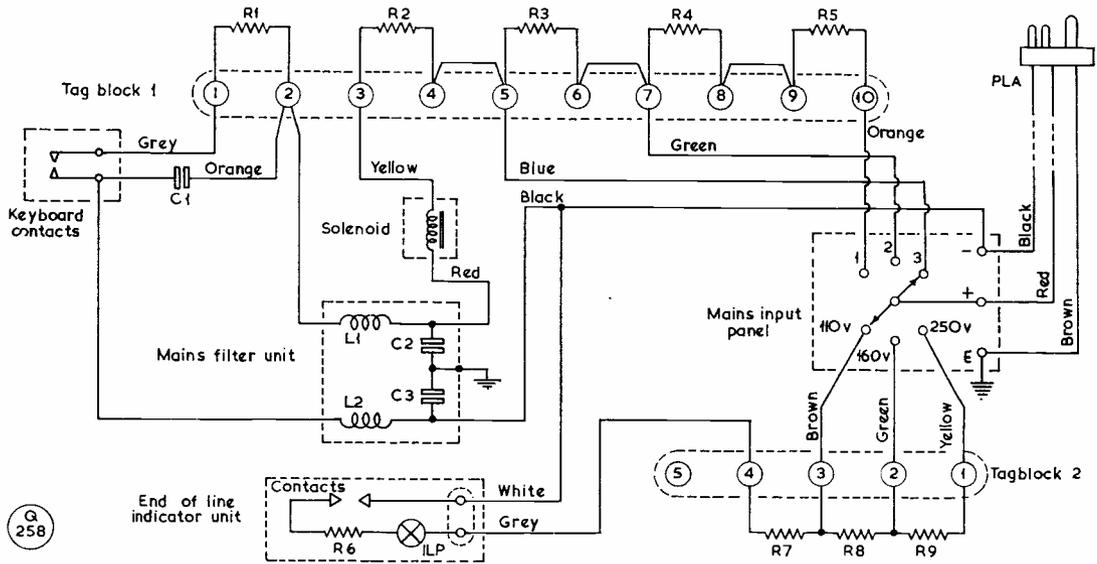
Fig. 1 shows the circuit as traced out on the writer's machine. The solenoid possesses two windings and these are wired in series, their total resistance being 100 ohms. The normal operating current for the solenoid is 450 to 500 mA. Three resistors are provided to compensate for different DC mains input voltages in this circuit and one tapped resistor for the same voltages applied to the signal lamp circuit. A single strap on the mains input panel changes the amount of resistance in both circuits. Although the tapping points on this panel are labelled 110v., 160v. and 250v., the actual ranges covered are 90/120v., 140/180v. and 220/280v. respectively. The mains filter unit consists of two RF chokes each having a resistance of 1 ohm and also two 0.1 μ F capacitors. These items

are completely encased in wax and are housed in a metal box underneath the chassis of the machine. In the E.o.L. unit is another 1,000-ohm resistor in series with the 6v. 0.5a bulb. The wiring is all colour coded and this is shown in the diagram.

Depending upon how well the adjustments on the solenoid magnetic circuit and the punching mechanism have been set up, it is quite possible to obtain satisfactory operation of the mechanism with solenoid currents of 300 mA or less. Therefore, if a suitable power supply is not available it is quite possible that a supply of a lower voltage could be used. As can be seen from Fig. 1, even on the 110v. range there are still two 60-ohm resistors in circuit. By strapping between terminals 3 and 4 on the larger tag block, the unit will work from a 50/80v. supply. The remaining 60-ohm resistor should be retained since in addition to dropping the voltage to the solenoid, it and the 1 μ F capacitor are part of a spark suppression circuit across the solenoid operating contacts. It is quite feasible to operate the Model 44 from an existing power supply which also runs a T/P. There would no doubt be occasions when it is necessary to have both machines on at the same time, *i.e.*, when the T/P is receiving a message and the operator is preparing a reply on the Model 44. Although the perforator only takes current when the keys are actually pressed, the maximum drain on the power unit at this time will be quite heavy and may result in poor voltage regulation which can affect the speed of the T/P motor. Some improvement would be obtained by operating the Model 44 on the next highest mains tap, *e.g.*, by selecting the 160v. tap for a supply of 110v. This reduces the current drain to just over 300 mA and in no way impairs the operation of the machine. It is worthwhile experimenting even further in this direction.



General appearance of the Perforator Model 44, Mk. II. This machine punches tape, enabling a message to be set up prior to transmission, and uneven or uncertain keyboard operation avoided under actual transmitting conditions. Details are discussed in the text.



Q 258

Fig. 1. Circuit complete of the Perforator Model 44, Mk. II, as used for preparing tape for automatic transmission by radio-teletypewriter. In his article, G3CQE explains the working of the Perforator, and in Fig. 2 is shown a suitable independent DC power supply unit for the Perforator.

Getting It To Work

As with most surplus RTTY gear these machines have been in storage for some time and require cleaning with turps. substitute; all the moving parts should be lubricated. Particular attention should be paid to the punchblock; it can be removed from the main chassis by unscrewing four bolts. Unless it proves to be absolutely necessary, the punchblock should be stripped no further. The edges of the punches can be easily damaged when replacing them in their guides and re-grinding them is a job for an expert. If any of the punches appear to be sticking in their guides, liberal application of 3-in-one oil will usually clear them. (The surplus oil can be removed by punching a couple of feet of tape.) If no wires appear to be broken, a quick resistance test should give a reading of 220 ohms between the + and - terminals on the mains input panel when the key is pressed—this with the mains tap set to 110v. There should be no continuity between either of these terminals and the frame of the machine. If there is, the short will probably be the mains suppressor unit.

Table of Values

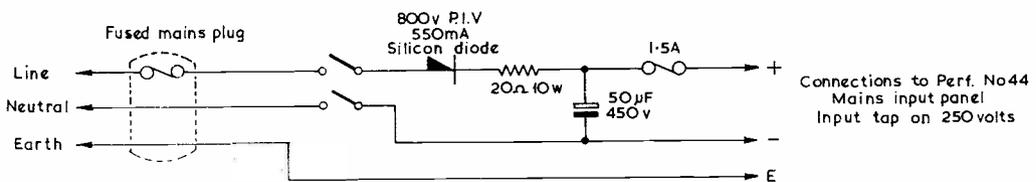
Fig. 1. Working circuit, Perforator No. 44, Mk. II

C1 = 1.0 μ F	R6, R7,
C2, C3 = 0.1 μ F	R8 = 1,000 ohms
R1, R2 = 60 ohms	R9 = 1,600 ohms
R3 = 125 ohms	L1, L2 = Filter unit
R4, R5 = 100 ohms	PLA = Mains plug
	ILP = Panel lamp, 6v.

This has been found to be about the only real source of trouble with these machines.

A Compact Power Supply Unit

There is quite a lot of space under the chassis of the Model 44 and G2FUD (Hale, Ches.) has used this for a built-in power supply unit for the machine. The circuit of this is given in Fig. 2; it can be fitted under the chassis. G2FUD built the original unit using a five-way tagstrip (none of the tags earthed!); the toggle switch and fuseholder were mounted at the top of the machine at the right hand side and these can be clearly seen in the first photo-



Q 259

Fig. 2. Circuit, by G2FUD, for the Perforator Model 44, Mk. II, to make it a self-contained unit. As the Perforator has several input taps, the DC output given by the power pack can be as convenient. An under-side photograph shows how the DC supply can be accommodated on the chassis of the machine.

graph. A fused mains plug was also used and the fuse should have a three amp rating. With a non-fused plug, then some other provision should be made for fuses, and in the interests of safety the mains earth should be connected to the frame of the machine. Such a power unit makes the use of the perforator independent of other gear in the shack and when it is not required, it can be quickly unplugged and stored away.

The RTTY Contest

The 20th of this month is the date for the World-Wide RTTY Sweepstakes Contest, a weekend which will certainly provide a high level of activity on the air. If everyone who is able to do so makes a point of putting in at least a couple of hours' operating, the results will be more interesting and the contest even more enjoyable for everybody. Not everyone can operate on the DX bands, but there are at least eight European countries represented on 80m., and the "80m. only" stations should still be able to find a lot of interest there. Saturday morning seems to be when this band is less crowded with other users and so may be a good time to seek some QRM-free QSO's. IIRIF will be printing on 80m. in the evening and this is also a good time for LA contacts. On other bands, 20m. will probably be the most active and for early risers it can provide Asian and Australasian QSO's between 0500 and 0900 GMT, as well as Europeans. Later on during the day the American continents usually appear at good strength and this is the time to look for W, VE, KP4, KZ5, OA, XE, PY, and such. 15 metres has been very variable recently but it is not unknown for KR6MF to be the only amateur signal on the band between 0800 and 0930 GMT. Something can usually be heard from South America and most times from North America, too, from midday onwards. Forty can provide some easy contacts with GM and other European countries during the daytime and so should not be neglected either. *Frequencies*: Around 21090 kc for 15m., 14090 kc for 20m., but here the DL stations are restricted to the use of 14100-14125 kc for RTTY. 7040 kc is the international RTTY calling freq. for 40m., and 3750 kc or near is the usual spot for 80m. Again on this band the DL's are restricted to 3575-3600 kc and this seems to be the favourite spot for OZ stations, too. On the DX bands of course, the 45.5 baud speed is used. The main idea behind a contest is for the participants to enjoy it and usually everyone does but, as in most contests, it saves a little trouble when every station comes on the air only after having read the rules properly! They can be found on page 390 of the August issue of SHORT WAVE MAGAZINE.

OCTOBER DISTRIBUTION DELAY

When this issue went to press, a railway strike was threatened for Wednesday, October 3. If it did take place, distribution by both mail and rail would be seriously affected, causing delays beyond our control.



G2FUD (Hale, Ches.) has designed a power supply unit (see Fig. 2) for the Perforator Model 44. It fits under the chassis of the machine, making the Model 44 self-contained for power.

There are some AT stations who will not join in a contest because they do not run high power rigs and have poor aeriels. This should of course be just one more reason why they *should* get on and enjoy the high level of activity. As far as RTTY is concerned, it is worth mentioning that an S7 emanating from a station using correct shift and speed will probably produce better copy than an S9 signal from some station with a 50 c/s shift error and a T/P motor running 200 r.p.m. slow!

Finally, all U.K. operators entering the Contest are asked to send a summary of their results to G3CQE, c/o The Editor, for this feature. Good hunting and see you at the December inquest!

STUDY THE BOOK LIST

Every month, in the front advertising section, we include an extensive book list—see p.394 this issue—covering all aspects of Amateur Radio and also dealing under separate titles with its specialist branches, such as Mobile, VHF, RTTY and SSB. We also have now a range of interesting maps for the DX operator and SWL. All these publications have been carefully chosen and are recommended reading for the fields they cover. Our Publications Dept. supplies from stock, usually by return.

DX COMMENTARY

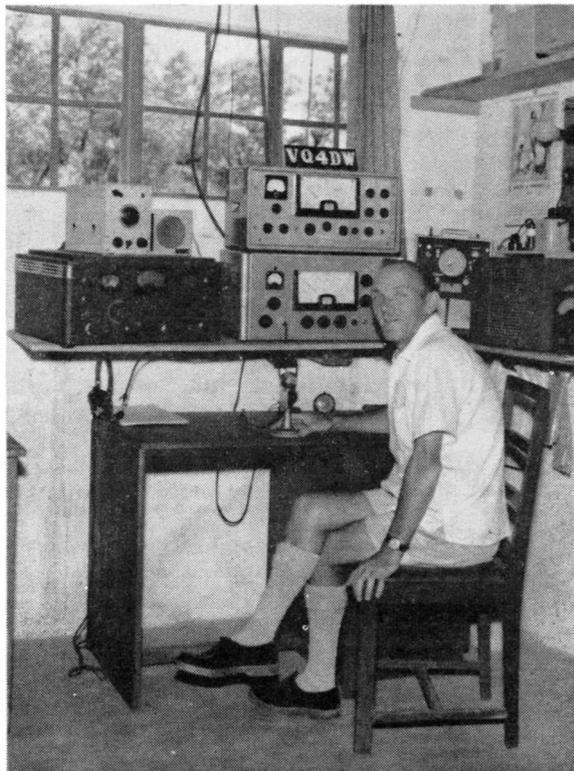
L. H. THOMAS, M.B.E. (G6QB)

CONDITIONS have been pretty variable, and rare DX hard to come by, but there are signs of an improvement already, and we are approaching another good DX season for the LF bands. The probability is that two HF bands (Twenty and Fifteen) will be pretty flourishing, despite the low sunspot numbers, since even now Fifteen is showing some remarkably good openings, even to the West Coast of U.S.A.

Fortunately, it doesn't much matter which bands are open—the DX-chaser can always find somewhere to amuse himself, and Top Band is providing plenty of scope when all else fails. This is precisely why this "Commentary" is never a long list of rare DX worked, heard or believed to be on. Such news may be of breathless interest to about 500 people in the whole world, but it is important that we should always remember how narrowly-specialised an activity this "top-layer" business really is.

To the newly-licensed G3R -- an OH or a UA9 can be rare DX; to the man with a year or so of experience, there is still a thrill in working W's and VE's; and to countless others, VK, W6, ZL and ZS represent almost the ultimate. We have to cater for *all* our readers—not just for the few (a dozen or so?) who are on or near the 300 mark.

For this reason we are glad to see that most of the letters received are full of varied interest and original ideas rather than bare lists of call-signs worked. So many different subjects are covered, or merely touched on,



VQ4DW

CALLS HEARD, WORKED and QSL'd

this month that a compact presentation of them all is a problem for your conductor. However, we will press on and try not to leave out anything that is of interest. (We have a hard core of correspondents to whom the strange antics of the DX gang are more interesting and amusing than the actual working of the stuff . . . we certainly don't intend, ever, to leave *them* out of the picture!)

DX-Quotes from Readers

From G3FPK: Worked AP2IJ on August 30th, and it turned out to be KH6IJ *en route* for U.K.; he phoned on September 12 and was leaving for Seattle, same day . . . CR9AH is now operated by

John Jr., son of the other, regular, John . . . MP4QBB cranks down his tower on September 30 and after a few days in Muscat will collect his XYL in Paris and come to London for the Exhibition . . . DU7IM is now active again on 14 mc SSB; also a new one, DU1JC (Manila) running 100 watts SSB to a dipole.

From G2DC: A new generator shipped to Danny Weil should arrive about October 10, and the earliest operation we can expect from Manihiki Is. is about October 21 . . . Frank, VS1FJ, is planning a visit in the early Spring to Christmas Island (the VK9 one) . . . A Willis Is. expedition is also likely in the Spring.

when VE7ZM, VE7ALE, VK3WX, VK5AB and W9JFF are proposing a 15-day blitz on the island; there is a possibility of following it up with a visit to Timor . . . The Trinidade Is. DX-pedition has been signing PY1BCR, but is due to change to /Ø or to PYØNG. They will be there for two months, and are on 14085 kc CW between 2200 and 2330 GMT.

From GW3AHN: VR3L/VR1 was active from Canton Is. on several bands (August 21-28) and was worked by many Europeans, although some of the reports they gave them were of the "RS Five One" or even "Five Zero" variety! The equipment was that

normally in use at KB6CL; QSL's to WA6MAZ . . . There will probably be a DX-pedition to Marcus Island, towards the end of October, or possibly early November.

From ZE3JO: ZE3JJ and 3JO will be operating as ZD6JJ and 6JO from the hotel at the top of the Zomba Plateau, Nyasaland, October 13-21; all bands, phone and CW, with a Viking Ranger and an Eddystone 888A. As there are only about two permanent stations in ZD6-land, this operation should prove quite popular. All contacts will be QSL'd, and "there will be none of this QSL-manager or MC rubbish." If conditions are good, QSO's will

be of the rubber-stamp variety. Mal concludes "All contributions will be gratefully received, and skeds will be arranged only for those who support us . . . I don't think—that'll be the day!"

Undefeated Champion ?

GW3AHN (Cardiff) has achieved his ambition of getting 300 countries confirmed with 25 watts input, and now announces his retirement and requests that we should withdraw his call from the Five-Band Table. This we have done, with regret. Tom now intends to "relax a little, and take DX as it comes." In our opinion he has set up a record which has certainly not been ap-

RULES : 1962 "CQ" WORLD-WIDE DX CONTEST

October 27-28, Phone : November 24-25, CW.

CONTEST PERIOD :

PHONE SECTION: 0001 GMT, Saturday, October 27 to 2359 GMT, Sunday, October 28, 1962.

CW SECTION: 0001 GMT, Saturday, November 24 to 2359 GMT, Sunday, November 25, 1962.

BANDS :

Contest activity will be in the 1.8, 3.5, 7, 14, 21, and 28 mc amateur bands.

TYPE OF COMPETITION :

1. PHONE SECTION:
 - (a) Single Operator.
 - (b) Multi-Operator, single transmitter.
 - (c) Multi-Operator, multi-transmitter.
2. CW SECTION:
 - (a) Single Operator.
 - (b) Multi-Operator, single transmitter.
 - (c) Multi-Operator, multi-transmitter.
3. INTER-CLUB.

SERIAL NUMBERS :

- (1) Phone stations will exchange serial numbers consisting of 4 numerals, the first two being the RS report and the last two their own Zone number.
- (2) CW stations will exchange serial numbers consisting of 5 numerals, the first three being the RST report and the last two their own Zone number.
- (3) Stations in Zones 1 to 9 will prefix their Zone number with zero. (01, etc.)

POINTS :

- (1) Contacts between stations on *different* continents will count three (3) points.
- (2) Contacts between stations on the *same* continent but *not* in the same country, will count one (1) point.
- (3) Contacts between stations in the *same* country will be permitted for the purpose of obtaining a Zone and/or Country multiplier but *no* QSO points will be credited.
- (4) Only one contact per band with the same station, will be permitted.

MULTIPLIER :

Two types of multipliers will be used.

- (1) Multiplier of one (1) for each Zone contacted on each band.
- (2) Multiplier of one (1) for each Country worked on each band.

SCORING :

- (1) The score of *each* single band will be the *sum* of the Zone and Country multiplier for that band, *multiplied* by the total contact points on that band.
- (2) The total all-band score will be the *sum* of Zone and Country multipliers of all bands, *multiplied* by the sum of the contact points on all bands.
- (3) Those sending in logs for a single band will be eligible for a single band award only. If a log is sent in for more than one band, indicate which band is to be judged, *otherwise it will be judged as an all band entry*.
- (4) A station will not be eligible for more than one award.
- (5) Single-operator contestants must show a *minimum* of 12 hours of operating time to be eligible for an award. If a contestant operates on more than one band and wishes to be judged for a specific single band, he must show a *minimum* of 12 hours on that band.
- (6) *Exception:* Contestants using the 21 or 28 mc bands will be required to show a *minimum* of only 8 hours.
- (7) Multi-operator stations must show a *minimum* of 24 hours of operating time to be eligible for an award.
- (8) Multi-operator stations will *only* be judged on the basis of an all band score.

ZONES and COUNTRIES :

The *Zone Map* and the ARRL and WAE country lists will be used as standards. The continental boundaries used for WAC will also be recognized. Should any question arise as to the positive location of a station the official definition will be final.

AWARDS :

Certificates will be awarded for each section of the Contest as follows:

- (1) To the highest scoring single operator

station on each single band in the following areas:

- (a) Each call area of the United States, Canada and Australia.
- (b) All other countries.

- (2) To the station having the highest all band score (more than one band) in the following areas:
 - (a) Each call area of the United States: Canada and Australia.
 - (b) All other countries.

DISQUALIFICATION :

Violation of the rules and regulations pertaining to amateur radio in the country of the contestant, or the rules of this contest, or unsportsmanlike conduct, will be deemed sufficient cause for disqualification.

LOG INSTRUCTIONS :

- (1) In keeping a log, fill in Zone number and Country, only the first time it is contacted.
- (2) Use a separate sheet for each band and a tally sheet or report form.
- (3) Keep all times in GMT.
- (4) All contestants are expected to compute their own scores. Logs should be checked for contact duplications and a proper point credit before they are sent in.
- (5) Make sure name and address is clearly noted on each log. **Print or type.**
- (6) Each contestant must sign a pledge that all rules and regulations have been observed and that the report is a true one.
- (7) If official forms are not available, rule up a duplicate form; the size is 8½ in. x 11 in. with 40 contacts to the page. Log heads are: Date, Time/GMT, Station worked, Serial Nr. sent, Serial Nr. received, His Zone Nr., Country, Points.

DEADLINE :

All logs must be postmarked No Later than December 1, 1962 for the Phone section and January 15, 1963 for the CW section. Address to: **CQ, 300 West 43rd St., New York 36, N.Y., U.S.A. (Att. Contest Committee—Indicate Phone or CW Section).**

proached before, and possibly will never be achieved in the future. When one thinks of the thousands of kilowatt-wielders who will never get within sighting distance of that magic figure of 300, which has only been gained by roughly 40 of the world's 350,000 amateurs, one can appreciate the performance of a 25-watter in reaching that goal. Congratulations to GW3AHN, and may he enjoy his retirement . . . until he finds something more difficult to tackle! In the meantime, he must rank as one of the world's top DX men.

DX-peditionary Tales

Such conflicting rumours concerning Gus, W4BPD, have been in circulation of late that we can only feed them all into our little (transistorised) computer and see what comes out . . . Sorry, after all the programming had gone through, the thing gave a kind of hiccough and passed out a tape worded "What was that again, please?"—so we shall have to do it by the old-fashioned brain-power.

To start at the beginning . . . Gus was signing VQ9A/8C last month, from Chagos. This led to a certain amount of brouhaha with the licensing authorities, so that he was in no position to proceed to Agalega. Harvey (VQ9HB) decided to do this one alone (Gus acting as MC, if necessary, from VQ9A). But the call Harvey hoped to use (VQ8BFA) was being pirated 24 hours before he arrived there, and in any case had not been officially allocated to him when the expedition started. So, although he was ashore on Agalega, Harvey apparently continued to sign VQ9HB/MM.

What with a drifting transmitter, a receiver past its prime, and an operator admittedly not used to the red-hot DX technique the situation demanded, things got rather out of control. MC's came and went, pirates abounded, Klots of all sizes and colours flourished on the frequency . . . in fact, Things Were a Mess.

One cheerful item emerges: The skipper of the ship which plies between the islands (Capt. Bouic),

already an experienced CW operator, has become interested in Amateur Radio, and intends to take out a licence.

Returning to Gus . . . he himself says his future plans are "fluid." Possibilities for future operation, at the time of writing, include both Ruanda and Burundi (9U); Marion Is. (ZS2M); Bouvet Is. (LA/P); Gough Is. (ZS9); and it seems likely that AC3 and AC5 will be covered late in the winter.

All previous statements concerning VQ8AIR (Rodriguez) and other VQ8 operation are now definitely out of date. Comoro and Tromelin plans also seem to have been changed. Ah, well, it's an interesting life.

DX News from Everywhere

The following have been operational or, in some cases, may still be on now: Trinidad Is. (PYØNG)—but see previous note from G2DC . . . AC4NC, said to be on 7015 kc CW, week-ends . . . AP5AH, East Pakistan, QRV on various crystal frequencies, 14 mc, 1800 GMT . . . PJ5MB, from Sint Maarten . . . VR6TC, Pitcairn—said to be on 14165 kc, both AM and CW, every Tuesday at 0500-0530.

ZL4JF, Campbell Is., is on 14150 kc SSB, 0200-0300 every night; but at week-ends he uses 14290 kc . . . VR3L (Christmas Is.) is on the low edge of 7 mc, between 0600 and 1000, and made several appearances during the last few weeks . . . VK9LA (Cocos) has new gear and is said to be on all bands, CW and SSB.

The following are promised for some time in the future: TT8AG has been posted for a one-year tour at FB8ZZ, followed by two years in Madagascar (5R8) . . . VS9/Kuria Maria Is., first week in October (or thereabouts), with possible Kamaran Is. operation, same month . . . Heard Island operation may be undertaken by Steve (VKØVK), probably in January.

Other DX shorts, of all kinds: VP8GB is on South Shetlands (Deception Is.); SV1AI has been operating from OD and EP lands, and says he's going to AP2, AP5, 9N, XZ, HS, 3W8 and other choice

ones; VP5XG (Peter, ex-VU2XG and VS7XG) is on 7004 kc CW, 0530-0600; VR2BZ/VR1 was heard from Tarawa on 14 mc CW. Likewise a VR3BZ—so it seems he's travelling.

Top Band DX

Everything promises well for the coming season, which should, by rights, be even better than last winter. W1BB has the American side well under control, as usual, and quite a number of new countries are liable to show up on the band. How many will be within the reach of ten British watts is a little problematical.

G3CHN (Kingsbridge) worked VP8GQ on 21 mc, and Peter said he would be starting his watch on DHJ in December, and would come on the band whenever it seems to be open at a week-end.

Norman Smith (Petts Wood) is an SWL of very old standing and

FIVE BAND TABLE

Station	21 mc	14 mc	7 mc	3.5 mc	1.8 mc	Countries Worked
G2DC	268	286	145	101	12	307
G3FXB	265	272	155	87	9	304
G3FPQ	252	262	138	107	23	290
G3DO	222	273	51	57	10	298
G3NOF	183	180	18	25	2	231
G3LHJ	173	135	47	23	11	204
G3BHJ	165	65	29	11	1	180
G3IGW	127	131	99	51	25	184
G2YS	125	178	96	75	20	201
G3NEV	118	85	39	49	16	164
G2BLA	96	94	73	39	9	146
G3JWZ	77	107	62	52	9	132
G3KMQ	75	168	64	42	12	189
G3JVJ	71	89	68	41	4	128
G3PEU	63	119	10	14	4	131
G3IDG	62	49	25	17	9	90
GW3CBY	31	75	53	35	15	95
G3PEK	17	58	32	22	8	66
G3NYQ	17	32	38	30	11	53
G3PLQ	16	20	14	19	10	?

(Failure to report for three months entails removal from this Table. New claims can be made at any time).

wide experience, who is especially interested in Top Band DX. He reports as follows: September 1, W2EQS and W3GQF heard at 0423, the latter peaking at 569; September 2 W3FBV at 0509; September 7, W3GQF and W2IU in QSO at 0400, W2IU giving 459; September 8, W3GQF identified at 0530. So things are stirring pretty early in the season.

G3PLQ (Salisbury) passes on the news that G3ERN heard W3FBV and W1SMU on September 2, peaking 569; also that G2FIX worked W3GQF and VE1ZZ on *Eighty* recently, and the former went on Top Band for a possible cross-band contact. G2FIX heard him (very weakly), although it was before midnight.

MDT—Magazine Daylight Tests

One belated report is to hand concerning the first MDT, on August 12. G3FVC was operating from Capel Dewi, Cardigan, as GW3FVC/A, and he worked G2FIX and G3PU (both 196 miles) and also G3OLN (140 miles), while using a 120-ft. wire only 15 feet high. Later, he hauled it up to some tree-tops and really went to work, collecting 33 counties and an OK. He will be back there next Easter; meanwhile, in company with many

others, he wants another daylight test.

As there is not now time to arrange one which can be reported in the November issue (deadline being only one week after publication day), we are fixing MDT No. 2 as follows: **Sunday, October 21, 1100-1300 GMT.** Call "CQ MDT" (if it is necessary to call CQ at all!) and report, by the November deadline date (the 16th), on your best QSO's of over 100 miles. And remember, this is a test, *not* a contest. So take it easy.

One or two readers have asked that the next test should be fixed for an afternoon rather than a morning, but the majority favour the morning period. And, in any case, by that time of year an afternoon test, which could not be started before 1400 and would therefore go on until 1600, would not be a true trial of daylight conditions . . . towards the end of the period the DX would be altogether too easy! So make a date of it for October 21 and report accordingly.

G3IDG (Basingstoke) makes the following sound suggestions: Less CQ'ing and more careful listening; *no* calling stations under 100 miles; prepare beforehand a map of the British Isles with a

100-mile circle marked; don't bunch too much on the band; and send, with the list of QSO's, a list of all call-signs *heard* during the period. (The latter is not strictly necessary, but would be a good idea.)

Still on the subject of daylight DX, G3OUV (High Wycombe) writes to say that he recently called CQ at 0945 GMT, and OK1ANO came back with signals at 439/559; G3OUV's report was 459. After closing this QSO he heard GM3BF calling "CQ DX" and eventually working the OK. (The reason for the choice of 1100-1300 GMT for the MDT is that conditions *can* be like this up to 1000 or thereabouts, before the true daylight conditions take over. QSO's of over 100 miles are very easy in the region of 0800-0900, and sometimes later.)

Flash—T/B DX Opening!

The first Trans-Atlantic crossing of the season on 160 metres is reported: At 0510 GMT, September 16, G6BQ (Gravesend) worked W3GQF . . . G3PU (Weymouth) was also heard giving W3FBV RST-229 . . . Other G's were calling these two stations, and getting a few QRZ?'s in reply. Peak conditions were around 0500 GMT, with a steady falling-off after that, and QRN was troublesome at both ends. (Thanks to GW8PG for the notes.)

Top Band—Normal Usage

G3NPB (Northumberland) thanks GM3JEQ/P for his 89th and 90th counties and now spends half his time lying in wait for the other elusive eight. He describes himself as "a confirmed Top Band addict" and thinks that the achieving of his goal (98/98 on *both CW and phone*) might be a lifetime's work!

G3PDM (Durham) is in the throes of a complete rebuild—full BK on CW, without relays or negative PSU's, and optional transceiver-type operation. All activity is on One-Sixty at the moment, but the new rig will cover all bands.

Sour note from G3OXI (Woking): "There are a few types on the band who act as if theirs is the only station entitled to use



An odd conjunction of signs and symbols. The car is owned by J. Hum, G5UM (Knebworth) and he had no difficulty whatever in getting that registration. He and his wife stopped at the A.A.'s "Box 88," at Caxton Gibbet on the A14 Royston-Huntingdon—just to see if there were any QSL cards in the litter-bin. And, as G5UM points out, even this Box 88 is in the radio context.

the frequency, and some are Old Timers who should be setting a better example. If a few more of the GDX stations would treat them as GB2IC did, they would soon give it up."

G3PLQ (Salisbury), after sundry postponements, now finds that he will *not* be going /MM. for health reasons. He still collects some good GDX, but badly needs Orkney and Anglesey.

G3PMR (Gainsborough) says he will be operating from Bangor (Caernarvon) as GW3PMR from the beginning of October until about a week before Christmas. Top Band work will be mainly at week-ends. They (meaning himself and two SWL helpers) may take the gear across to Anglesey for a few days to see what can be done from there.

The rarity-status of Hereford as a county has been somewhat downgraded of late, and G3RJB, the very latest addition, sends us a list of no fewer than 13 stations *active* from Hereford, but not necessarily on Top Band. G3RJB



ON4QX operating LX3QX, of the Antwerp expedition into Luxembourg, with old-timer ON4GK (who has been on the air since 1923) keeping the log.

TOP BAND LADDER

(G3O-- and G3P-- stations only)
(Starting January 1, 1962)

Station	Counties	Countries
G3PLQ	85	9
G3PRM	79	9
G3OLN	78	9
G3OXI	73	7
G3PHO	72	9
GM3PBA	68	10
G3PDM	68	9
G3PGN	65	10
G3PPU	64	9
G3OWR	63	6
G3PSB	51	5
G3PEK	48	8
G3ORH	44	10
G3PJD	42	4
G3OQT	39	14
G3PPF	36	6
GW3PHH	32	7
G3OHL	21	4
GW3PPF/A	20	3
G3PHS	15	1

New Claims for this Table may be made at any time. Confirmations not required.

himself is an ex-SWL who reached the score of 275 countries *confirmed*—no mean achievement and the only problem now is to work them! He will be on Top Band soon.

Eighty Metres

Reports on this band are pretty scarce, and no one could pretend that the DX season has shown signs of opening up as yet. Even the SSB types are content with local nattering! But some quite potent linears have been added to the collection this summer, and once the DX shows itself on 3800 we foresee some pretty stiff competition by the "band-edge gang."

However, G3JVJ (Haywards Heath) comments that VE1ZZ is workable on CW almost every night, and sometimes peaks at 589. G3JVJ has also worked DJ1ZG/M1 and OH5TK/Ø for a couple of new ones, and for a change he tried out some real QRP (2 watts to a trap dipole) and raised G, GW, ON, DL and OZ with it.

Regarding SSB on this band. G3NWT says "I don't often venture on Eighty, because weak as my transmissions are, they usually have enough range to

cause me to be collared by some perfectionist who tears strips off my transmission and didacticises on the duties of a radio amateur towards himself. Last time this occurred I was QRT for a fortnight!"

G3DO (Sutton Coldfield) worked PX1RV and DJ1ZG/M1 on SSB for new ones on this band, and says he has now installed a Mosley V-4-8 Vertical, which ought to help with the DX this season.

Forty Metres

G2DC thinks that this "old DX band," so ill-treated, so cluttered up with unauthorised transmitters and badly operated amateur signals, will come into its own this winter. And he adds "If all those YU stations will cease from coming back to CQ DX calls from G stations, then quite a nice little season will be possible." Jack raised two new ones on the band—ZK1BY (0520) and VS1FJ (1630). The latter says he has worked quite a few Europeans, but G2DC was his first U.K. station. Others worked were EL2C, EP2BN, VU2BK, UI8, UM8, VK2SA, ZL2AWZ and 2ADE, all W's except 7, VE's, VO and 5A3CJ. G3POI (London,

S.E.22) worked VP6RG (2150) and EA6AM (1950).

At the time of writing, the VK's and ZL's are making an occasional appearance between 0600 and 0800; and most probably VK will soon be workable in the early evenings. In short, the band

is well worth keeping an eye on.

Twenty Metres

And so to "good old Twenty," which has still carried the bulk of the DX traffic, notwithstanding variable conditions, short-skippery and general nuisances.

GW3AHN worked VR5AR and VQ9HB/MM (Agalega) on CW; KB6CL and VR3L/VR1 on SSB. G3NOF (Yeovil), on SSB, raised AP2IJ, DJ1ZG/M1, KP4AVQ, PJ5MB, 5B4CT and 4PC, 9M2GV and sundry /MM's. In the early mornings he has been hearing KH6, KJ6, VR3 and the like; in the afternoons KG6, KR6, 9M2, VS1, VK and DU.

G3LHJ (Newton Abbot) used CW to raise FP8AA, FS7GS, MP4QBB and UN1BK. G3FPK, same mode, collected DJ1ZG/M1, PX1RV and VU2SU, while SSB brought him AP2IJ, CR9AH, DU1JC and 7IM, EP2AC, MP4QBB, PJ5MB, VS6EK, VE3FFW/SU, UD6, UH8, VQ9A, VR3L/VR1, XW8AT, YV6AP, ZP5CF, 9G1YL, 9M2CR and 2GV.

G3BHI (Norwich) worked SSB with DU7IM, MP4QBB, OX3KW, PJ5MB, UA9 and UW9. He adds that MP4QBB promised activity from MP4MAL in early October, before returning to the U.K.

From the long list of GM3JDR (Golspie) we select the following SSB QSO's: BV1US, CT3AV, DU7IM, EL6A, FG7XT, HH2PW, KB6BZ, KC6BK, KG6AKZ, WA6LFK/KJ6, PJ5MB, PX1RV, VK6RU, VQ1GDW, VQ9A, VS1AU, 9G1EB, 1YL, 9M2CR, 2GV. He has now made his 200 on two-way SSB (180 confirmed) and hopes to have a Quad going soon, all the former DX having been pulled in with just a dipole.

G2DC collected three all-time new ones, which isn't so easy when you're already on the 300 mark! They were VR3L/VR1, PK5PL and VQ9HB/MM. Others included AP5HQ, K5FOQ, K5OQ/KS6, KR6NG, MP4QBB, VS6EC, VQ1GDW, VQ9A, VR3O, VU2BK and 2GG, UAØ's and W4LCY/KM6.

G3DO, on SSB, raised KJ6BZ, W4LCY/KM6, VQ9A, VR3L/VR1, VR5AA and VR5AR.

G3POI stuck to CW and collected 6W8DE, 5T5AD, VQ9A, VP8GQ, ZP5LS, 9G1DT, TT8AL, FP8BD, FS7GS, CT3AB, OX3AY, VP9AK, 5N2JKO, CR7IZ and VQ4DW.

G3KMQ (Shaftesbury), also on CW, found new ones in K1EGI/Rhodes, 5R8BX, KR6NG, PJ5MB, FS7GS and AP5AH; and he also raised VP8GB, FP8BD, FY7YF, 9M2, VS6, KH6, HK and VU.

Fifteen Metres

A pretty unreliable band this month, Fifteen; but some good openings at times, including a few days when even W's were still coming over quite late at night. And at the very last moment (September 17) it was even open for W6 in the afternoon.

The longest list for the month comes once more from GW3AHN; CW fetched in CR6CA, TT8AL, VP5GT, VP8GQ, VQ9A, VS4RS, VU2BK and 2GG, WG6ALS, YV4BE, ZE3JJ, 5R8BW and 9U5AS (Ruanda). 9U5BH, also Ruanda, was raised on AM; and SSB accounted for HC5EJ, KP4AQQ, MP4BDC, PY5AM, VP8GQ, VQ4IE, VS4RS, ZP5CF and 5CN, ZE1JE, ZS, 5N2HTA and 9G1EB.

G2DC didn't find any new ones here, but worked CW with CP5EZ, CR6FF, CR7IZ, HZ1AB, MP4QBB, VS1FJ, VU2BK, VQ5IG, VQ9A, 4S7EC, 9U5DD and 9M2UF. G3FPK worked 3V8CA on CW, DJ1ZG/M1 on SSB. He found the band dying pretty early, but on August 28 he tuned the top end at around midnight and heard a colossal SSB signal from K2TAP. After working him, he was called by one W after another until he thought he was back in 3A2-land.

G3LHJ worked ZD6RM, VU2BK and 5B4IP on CW; DU1MR, CR6JA, PY, YV5FH, XW8AL and 5H3IW on AM. G3NOF worked only W's, but reports hearing VS4RS on the band one afternoon for ninety minutes with no other DX coming through. He, too, comments that the band suddenly opens to North America around 2330 on occasions; and that afternoon openings have been good for VK, VS1 and south-east Asia.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
<i>CW and Phone</i>		
GM3COV	98	98
G2NJ	98	98
GM3OM	98	98
G3LWQ	92	93
G3MBW	91	92
G2CZU	90	92
G3NPB	89	90
G3NNO	84	92
GM3KLA	84	88
G3OHX	84	87
G3OIT	81	93
G3OLN	79	89
G3PLQ	73	85
G3LHJ	73	80
G3PDM	72	78
G3PGN	69	75
G3OXI	68	73
G3JFO	66	79
G3OWR	64	77
G3MGI	58	66
G3PHO	54	81
G3IDG	48	51
G2BP	43	54
G3PEK	40	60
G3NAI	34	60
<i>Phone only</i>		
GM3OM	89	90
G3FS	85	86
G3NPB	82	83
G2CZU	69	69
G3NAA	65	67
G3NNO	60	72
G3PLQ	35	41
G2NJ	33	35
G3OIT	31	58
G3OLN	30	48
G3LHJ	20	27

(Failure to report for three months entails removal from this Table. New claims can be made at any time.)

Our Heading Photograph (p.415)

VQ4DW is operated by Jock Perrett, P.O. Box 220, Nakuru, Kenya, whose main interest is CW on 15-20m. His Tx is a K.W. Vanguard, the receiver a Hallcrafters SX-28, and the aerial a Cubical Quad. He describes himself as "fairly active" and mentions that his near neighbour on the air is VQ4RF, only a mile or so away.

General Chat

Some highly quotable items, as always, from G3NWT (Sandiacre): "SSB in my opinion is a classless, featureless ant-hill of a mode. It guarantees a contact and by the same token guarantees the eventual death of interest. Get 600 watts p.e.p. and the one-up boys are one-up no longer; you get the same report as they, and they get the same report as you. Poor old Retarded Reg, up the road, gets the same report too, with his one 6146, except that he has to wait for someone to take a breath. What a life! What happens when this new-country-a-day DX proliferation dries up? How sweet to get on Fifteen AM again, swing the beam on Africa, note the subsidence of QRM on the channel, and the exact amount by which old enemies QSY."

From same source: "Yes, I heard the VR3/1, very weak, with an II MC'ing and collecting call-signs in tens. Presumably he had some sort of decade-scaler with an alarm bell to remind him to call the VR1 and see if he was still there."

VS1GC (Changi), who sends a nice photograph of himself and the XZ's on his recent visit to Rangoon, says he's not been very active of late, but still manages to work G's at week-ends, on 14 or 21 mc according to conditions.

G3NMH (Swindon) recently worked 4U1ITU, and Gunther, the op. at the time, told him that he would be operating as 4U1ITU/SU for about one year. He's there by now, but the gear probably is not (it will be the new Hallicrafters FPM-200, on SSB).

Doug Higgins of VQ6AB, 6O2AB and MP4TAN is now all set as DL2DF. At present he is on 3.5 and 7 mc, but it won't be long before he is on 14 mc as well.



Picture taken during a recent visit to Burma by VS1GC. Left to right: XZ2VK, XZ2KN, VS1GC and XZ2DW. The background is the Electronics Laboratory of the Burma Research Institute.

A little vitriol, now, from G2DC (Ringwood): "Unnecessary QRM is still uppermost — commercial QRM on supposedly exclusive amateur bands is rife, and there are numerous amateurs operating with signals that they should be ashamed to put a call-sign to. Recently, in one hour, I checked 16 apparently commercial stations working between 14001 and 14112 kc. (At first I made it 17, but discovered that one noisy station with bad key-clicks was none other than the official UA Hq. station, UA3KAA, operating on 14100 kc and sending endless five-letter cipher groups.) Concerning QRM from amateurs, the highlight was the recent WSEM Contest, during the week-end September 8-9, with hundreds of stations on 7 and 14 mc working full blast, and not half a dozen T9 notes among the lot!"

G3IDG (Basingstoke) was delighted to hear W4 telling a K1 "First you swish your VFO on frequency, then you tune up on my QSO, then you call me for a long time when only a one-by-one is necessary. No offence meant, but don't you think this kind of operating has the makings of a first-class Lid?"

Late Flashes

The very latest on Gus Browning

(received September 17) more or less confirms the earlier note, but adds VQ1, some of the FB8 islands, FR7, another stab at the VQ8's, then on to India and the Asian prefixes. The only way to keep really up-to-date on this fellow is to watch his activity day by day!

A further "do" from Aves Island, YVØ, is promised by the Radio Club of Venezuela—probably in January . . . PY4RT/PY7 showed up from Fernando do Noronha around September 15 . . . CR8AB, still in Timor, is being sent an HT-37 by CR9AH . . . A new one in Labuan (ZC5BU) was reported on 14 mc CW in mid-September . . . PJ5MB (Sint Maarten) now works on 14104 kc, listening from '250 up.

And so to the signing-off, which we do this month with acknowledgments and thanks to the *WGDXC Bulletins*, W4KVX's *DX Magazine* and, of course, all our correspondents, regular or casual. Next month's deadline is **first post on Friday, October 12**. And for the December issue (far-flung readers please note!) the target is *November 16*. Address all your news and comment to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. 73 and BCNU.

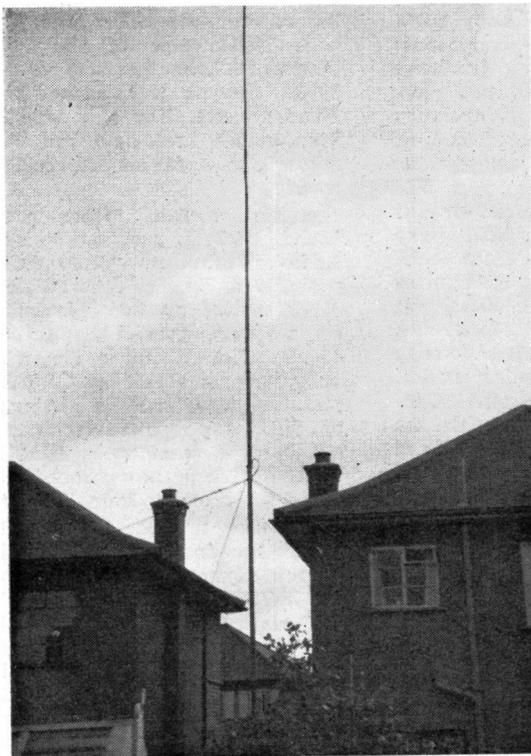
LIGHT-WEIGHT VERTICAL AERIAL CONSTRUCTION

USING CHEAP MATERIALS

D. A. BUNDEY, Grad.I.E.E., Grad.Brit.I.R.E.
(G3JQQ)

AS aluminium tubing is fairly expensive the following approach to the construction of a vertical aerial may be found useful. In this particular case a 14 mc Ground Plane is described, but the method would be applicable both to mobile whips and beam elements.

Two bamboo canes were selected for the vertical element, one being ten feet in length, the other eight feet. They were arranged to taper from about $1\frac{1}{2}$ inches at the base to $\frac{1}{4}$ inch at the top. The smaller cane was chosen to be a tight fit when plugged into the top of the larger cane. The joint was completed



The 14 mc ground-plane as constructed by G3JQQ, using bamboo canes with a wrapping of household aluminium foil, taped and painted. It is 16½ ft. long from the base, which is actually at the feeder loop seen between the two chimney stacks. The radials, just visible, are drooped about 45°.

using a wood adhesive and bound with nylon line to increase its strength.

To form the element a strip of aluminium kitchen foil was wrapped around the cane, working from the bottom upwards, leaving some 15 inches clear at the base for mounting purposes. A coating of rubber adhesive on the bamboo assisted in holding the foil in place. The aluminium foil is wide enough to allow a generous overlap. The amount of overlap will increase as the diameter decreases. For this reason it may be found convenient to taper the strip towards the end of the whip.

Rolls of aluminium foil (readily obtainable for household purposes) are only about 15 feet in length. For the 16ft. 6in. 14 mc whip a joint is required. Flux cored aluminium solder may be used or one section of foil can be overlapped longitudinally on to the previous section. The final binding will ensure adequate contact pressure.

After the rubber adhesive had set the connection to the element was made at the base using the outer braid of a piece of co-ax to form a ring. The ring was then soldered to the foil, although a twisted connection would have been sufficient.

A final binding was provided by a layer of electrician's black tape, lapped from the base upwards. The binding was performed carefully and a fair amount of tension used so that the result would be tight and weatherproof. As an added precaution a layer of black bitumen paint was applied.

The photograph shows the ground plane in position. Metal clamps secure it to the wooden pole. The four horizontal wires are sloped at about 45 degrees in order to raise the input impedance, thus making it more suitable for the 52-ohm feeder.

The optimum height (base above earth) for a ground plane aerial is given as one half wavelength or more. (Elevation was necessary in this instance in order to clear the XYL's washing!)

Consistent 579 reports have been received from the States using an input of only 15 watts. Technical information on ground plane design can be obtained from the A.R.R.L. *Antenna Book*, as advertised by the Publications Department, SHORT WAVE MAGAZINE, in current issues.

(Editorial Note: Another way of constructing a vertical metal rod aerial or ground-plane is to solder together the required number of the cans now commonly used as containers for drinks such as bitter lemon (and beer). Having disposed of the contents in the usual way, keep the tins. They will be found to solder easily round the flanges, and when completed the assembly can be given a painted finish. This is not a new idea, but is worth a reminder. It is understood (via SWL Gray of Co. Durham) that W2ZXM/MM, captain of Flying Enterprise II, is now using just such a ground-plane on 14 mc. Capt. Carlsen says that the best part of the job of construction is getting the material together!)

● ● ● *The Mobile Scene* ● ● ●

BUXTON, HAREWOOD, POLESDEN LACEY AND LINCOLN RALLIES

REPORTED — NEWS AND PICTURES — MORE THAN 1,200

U.K. MOBILE LICENCES NOW IN ISSUE

JUST as this issue was going down, we checked with the G.P.O. on the current licence figures, and they gave it that by the end of August 1,203 amateur mobile licences were in force. This is, again, a steep percentage increase and proves the enthusiasm there is for amateur /M working in the U.K.

This year, mobileers have been well served not only by the amount of technical information published on mobile equipment, but also by the number of organised rallies, and their subsequent reporting in these pages — we aim always to print “this month’s news in next month’s issue,” and we go to a good deal of trouble to get the necessary information (it being impossible for the *Magazine* to be represented “personally,” so to speak, at all Rallies). And here we must acknowledge the co-operation and support we have had from Rally organisers, as without their help in supplying the details, there would not be very much to report.

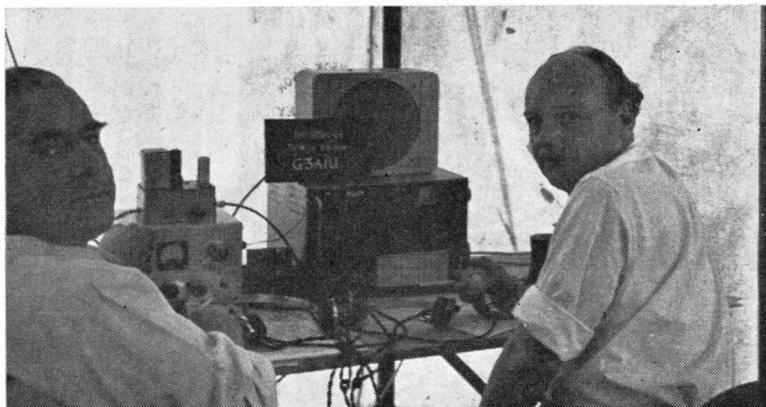
The **Buxton** (Stockport Radio Society) event on August 26 took place, of course, after the September issue closed for press, but we now have their report, which shows that very bad weather reduced the attendance to about 350 people, with only 30 vehicles fitted /M. This was a great disappointment to the Club’s organising committee — G2ARX, G3FYE, G3NUQ, G3OWW, G3PEK and G6DN—who had laid on a good programme. However, they had ample cover in the Buxton Pavilion, in which an energetic trampoline display was given by a group from Stockport; some of the visitors showed that they could do it, too. Winner of the treasure hunt was G3GJV (Batley) in a Morris Traveller, with G2AKR (Manchester) second in a Ford Zodiac.

On September 2, there were two big Rallies. The Thames Valley Amateur Radio Transmitters’ Society organised what for them was their first such event, at **Polesden Lacey**, Surrey, which is National Trust property and a well-known beauty spot. A fine, warm day brought a large gathering in no less than 70 cars fitted mobile, and G3AIU/A (Top Band) and G3JIP/A on two metres were kept very busy—they worked between them 60 of

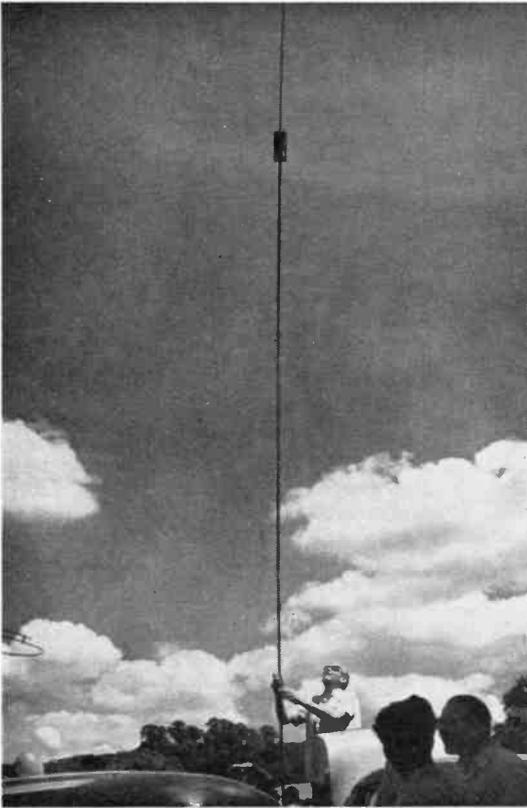
the visiting /M’s. The prize for the best all-round mobile rig went to G3LTZ, and for the longest distance travelled on the day to G3PJH (Leicester); a special prize for the best 6v. installation was awarded to G3JEQ. In addition to a small equipment show, the Surrey Constabulary co-operated with a police dog display and had also laid on their road safety and crime prevention exhibition. The whole affair is described as having been a great success from the organisers’ point of view, and the Club committee responsible will, in due course, be reporting the date for next year’s T.V.A.R.T.S. Mobile Rally.

The Northern Amateur Radio Mobile Society also had a good day for their first national event at **Harewood** on September 2. The estimated attendance was 600 people, in 210 vehicles carrying a /M installation; the Top Band talk-in station, G3NBI/A, worked 65 mobiles. A long prize list included no less than 140 items, and a big attraction was a surplus equipment sale, arranged in a separate marquee. The frequency measuring test was won by G4JW, and the major prize was a double-beam scope. At this very successful Rally, which had much better support than had been expected, N.A.R.M.S. enrolled their first overseas member.

For the **Lincoln** group, the big day was September 16—as it happened, it was also a fine, dry day, and in the end the attendance recorded was about 500, with 100 vehicles fitted /M, these figures being greater than on previous occasions for this event. Indeed,



Top Band talk-in station G3AIU for the Thames Valley A.R.T.S. Rally at Polesden Lacey, Surrey, on September 2—G2ANX (left), with G3AIU (hon. secretary, T.V.A.R.T.S.). They worked more than 50 of the 70 mobiles attending this very successful first event for the Club.



When G5UG (Weston-s-Mare) wants to operate static-mobile, he can put a centre-loaded whip up to 30 feet, from his car.
A G3GMN print



General view of part of the mobile car park at the Woburn Rally on September 9—a well-attended event held in fine weather.

A G3GMN print



A familiar scene at most of this season's Mobile Rallies—the eager anticipation at the time of the prize draw at the Woburn Mobile Rally, as the numbers of the winners were called. Some very good prizes have been given at many of the rallies this year.

A G3GMN print



G3FUR (Stamford) has a particularly impressive two-metre mobile Tx/Rx, installed in his Simca. The lever is for change-over control (just a flick), and the panel in the glove compartment on the left is for main switching and auxiliary charging.

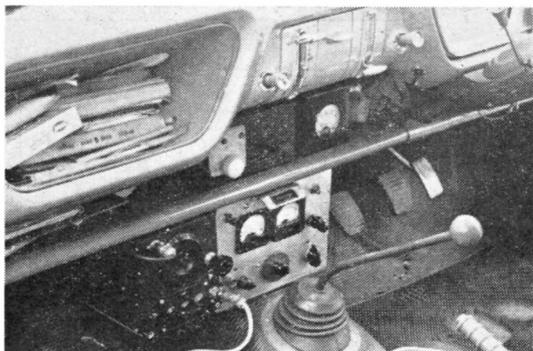
A G3GMN print



A good example of a two-metre mobile transceiver installation, seen at one of the recent rallies. Fitted on the passenger side, it still leaves ample leg-room.

A G3GMN print

"Short Wave Magazine" is independent and unsubsidised and has a world-wide circulation among Radio Amateurs



The 160m. mobile rig fitted in his Ford Thames by G3MFO (Stanmore, Middx.). He was at the Derby Mobile Rally.
A G3GMN print



When G2HKU/M (Sheerness) visited his old friend G6AB (Holland-on-Sea, Essex) and a well-known callsign on Top Band, the latter decided that what G2HKU really needed was a proper loading coil designed on the principles of utmost RF efficiency and highest-Q, to 1930 standards. The thing came out to be about 12 times larger than the Tx and, as it also constituted a built-in head-wind for G2HKU's car, it was found impracticable to use it on the road — but it does work!

the Rally organisers, G3BCA and G3ESR, report the response as "overwhelming in every sense of the word." The best mobile installation, for which the judging was done by G5CP, was found to be the two-metre rig shown by G2BVW/M of Leicester. As usual, the raffle was a great success, as was G3FGY (Derby) as auctioneer for the surplus sale! Visitors came from as far as Sussex, Shropshire and



Together at the A.R.M.S. Rally at Barford in June. On left, Austin Forsyth, G6FO, managing editor, "Short Wave Magazine," with John Clarricoats, G6CL, general secretary, Radio Society of Great Britain. They have been personally acquainted for the last 35 years, and both have held their calls for about the same period.

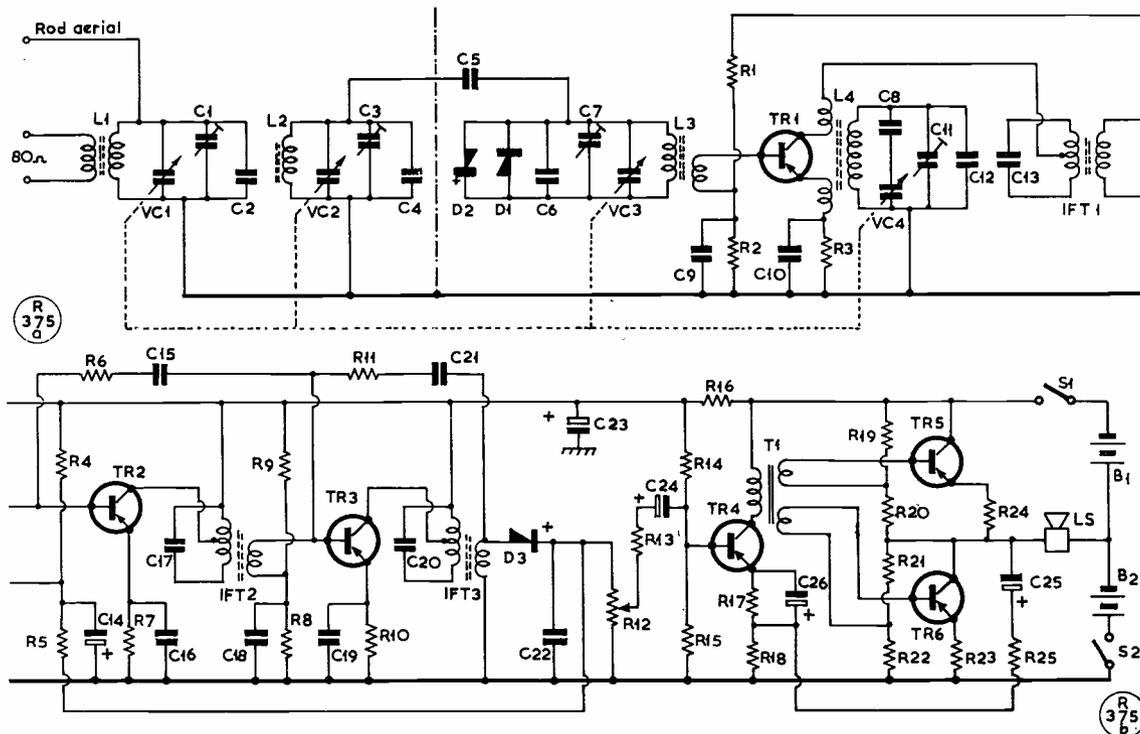
Newcastle, and, once again, the Lincoln organisers can rest content in the knowledge of a job well done—and they have booked September 15, 1963, for their next effort!

Question of Safety

A letter from G2FUX (Ruislip, Middx.) suggests that a joint committee should be set up for carrying out what he calls "an unbiased inspection" of mobile installations at Rallies, in the interests of safety. G2FUX says he is appalled at the poor standard of some of the /M outfits now to be seen, and points out the dire consequences of a road accident attributable to mobile operating or equipment. Road safety and all that pertains to it is so much in the public eye these days that, says G2FUX, we cannot allow a situation to develop that might lead to trouble for mobile operators in general.

His suggestion is that a panel of volunteers should be appointed, "willing to make fearless but constructive criticism of installations seen at Mobile Rallies." He is well aware that plenty of people might resent being given unasked-for advice or criticism, but feels that this would come better from a fellow mobile operator rather than from the authorities (the police, of course, have the necessary powers to examine and report on any vehicle for road safety).

As there are a good many practical problems involved in this idea put forward by G2FUX, readers are invited to let us hear their opinions.



Circuit of the transistor receiver, covering 1790-2010 kc, designed by G3HTC, using standard circuitry and components. A feature is the passive pre-selector front-end tuner, to give improved selectivity. The diodes D1, D2 are to avoid over-loading the mixer transistor TR1, as when working mobile in the near vicinity of strong signals. The receiver can be used either mobile or portable and is self-contained for power. By using different AF transistors, as explained in the text, the audio output can be increased to about one watt, ample for overcoming almost any sort of vehicle noise.

(Note: This circuit should be read from top left to lower right)

TRANSISTOR SUPERHET FOR TOP BAND

MOBILE, PORTABLE OR
FIXED-STATION OPERATION

G. E. STOREY (G3HTC)

THE circuit spread out above—it first appeared in *Mobile News* for June 1962—is of a receiver designed as a general-purpose, very low consumption job for mobile, portable or fixed-station purposes, and covering Top Band only. Its main function with G3HTC is for hearing the talk-in station at a Rally, or maintaining a listening watch for other mobiles it is desired to meet.

For simplicity, standard parts are used as far as possible, and cost dictated keeping them to a minimum. Thus, from the first IF transformer through to the speaker, standard circuitry is used to the recommendation of the manufacturers; standard transistor types are also employed.

However, the frequency changer TR1 is a different matter. Here, a suitable transistor must be used, such as the OC170; an OC171 would do equally well.

Again, standard coils are used for the front end, but some circuit modifications were necessary for satisfactory performance.

Passive Pre-Selector

It was found that using only the recommended coils and arranging them to tune their whole range 1.5-4.0 mc had two disadvantages: First, there was very little attenuation of unwanted signals, and secondly, the RF/Osc. tracking was not good enough to maintain level performance over the whole range.

Because of this, it was decided to add the tuned circuits L1, L2, to work as a passive pre-selector; this changed the picture entirely, and good front-end discrimination is obtained—in other words, the receiver tunes sharply, and is much more selective. The pre-selector consists of the two additional coils L1, L2, each of 40 turns of 38g. on an Aladdin FP5892 former with an iron-dust slug; the coils are inductively coupled by spacing them just over lin., centre-to-centre; a 4-turn link is provided at the earthy end of L1.

L2 is capacity coupled into the mixer tuned circuit L3 (*Repenco* type XTA31) through the 2 μ F condenser C5 only. To limit signal input to TR1—as when a station in the near vicinity starts up suddenly—two OA81's (D1, D2 in the diagram) are shunted

Table of Values

Circuit of the Transistor Top Band Receiver

VC1-VC4 = 75 μ F each, ganged (<i>see text</i>)	R12 = 5,000 ohms, var.
C1 = 35 μ F, trimmer	R17 = 220 ohms
C2, C4, C6 = 240 μ F	R18 = 15 ohms
C3, C7, C11 = 3-30 μ F, trimmer	R19, R21 = 2,700 ohms, 5%
C5 = 2 μ F	R20, R22 = 100 ohms, 5%
C8 = 480 μ F	R23, R24 = 5 ohms
C9, C10 = .01 μ F	L1, L2 = 40 t. 38 g. on Aladdin FP5892 former; 4-turn link on L1
C12 = 110 μ F	L3 = Repanco type
C13, C17, C20 = In IFT cans	L4 = Repanco type
C14 = 8 μ F, elect.	IFT1, IFT2 = Repanco type
C15 = 56 μ F	IFT3 = Repanco type
C16, C18, C19, C22 = .04 μ F	T1 = Weymouth type
C21 = 18 μ F	S1, S2 = SPST toggle
C23, C26 = 100 μ F, elect.	B1, B2 = Each 4 $\frac{1}{2}$ -volt
C24, C25 = 2 μ F elect.	D1, D2 = OA81
R1, R4 = 56,000 ohms	D3 = OA70
R2, R15 = 10,000 ohms	TR1 = OC170
R3, R7, R10, R16, R25 = 1,000 ohms	TR2, TR3 = OC45
R5 = 6,800 ohms	TR4 = OC71
R6 = 1,200 ohms	TR5, TR6 = OC72
R8, R13 = 4,700 ohms	
R9, R14 = 33,000 ohms	
R11 = 3,900 ohms	

across L3; silicon diodes type OA202 would be rather better for this purpose. In any event, signal limiting must be provided to prevent the OC170 being overloaded; signals below a certain level are not much affected by the presence of these diodes.

As regards the four-gang 75 μ F tuning condenser assembly, VC1-VC4, this can be made up from the condensers to be found in the RF-26 or RF-27 units.

Alignment

The procedure for aligning the receiver is as usual, and simple enough, but it was found very necessary to "kill" the tuned winding of the mixer input coil L3 (by shunting with an 0.5 μ F capacitor) when setting up the tuning coverage of the oscillator side L4; this is a standard *Repanco* item, type XOT33. Adequate injection from a signal generator can be obtained simply by clipping its live output lead to the insulated covering of the connection between the link coil L3 and TR1.

When aligned correctly, the receiver covers 1790-2010 kc with the values given, and it can be used either with a rod or an open-wire aerial.

Sensitivity has proved quite satisfactory without an RF stage—an additional IF amplifier would be a cheaper and easier way of increasing the gain should this be required. Also, depending on the type of car, the audio output could be increased if necessary to over-ride vehicle noise. To do this the audio side could be altered from the OC71/OC72 arrangement to an OC81D driving two OC81's: this would boost the

audio output from 200 mW to about one watt. The speaker used is 35-ohm.

The set is powered by a 4 $\frac{1}{2}$ /4 $\frac{1}{2}$ volt dry battery; this not only makes it self-contained, but also avoids the necessity of providing a "dropped" 9-volt supply if it were run off the vehicle battery.

DESIGN FOR MULTI-RANGE DC MILLIVOLTMETER

TRANSISTORISED, EIGHT SWITCHED RANGES

WHILE in amateur practice the need for millivolt measurements does not often arise, a sensitive and reliable instrument capable of making them will be found very useful once it has been built—especially if it is transistorised, with high-stability internal resistors of good quality (such as *Painton*), and has a sensitive wide-scale panel meter.

The circuit on p.428 is from a recent issue of *Mullard Technical Publications* (Vol. 5, No. 48). It works from a 9v. -HT line (battery), consuming about 0.7 mA; has an input resistance of 1000 ohms per millivolt; eight switched ranges, from 10 mV to 32v., full scale deflection; a calibration circuit, from an internal 1 $\frac{1}{2}$ v. cell; and is designed for an 0-100 μ A panel meter, for indication.

Circuit and Adjustment

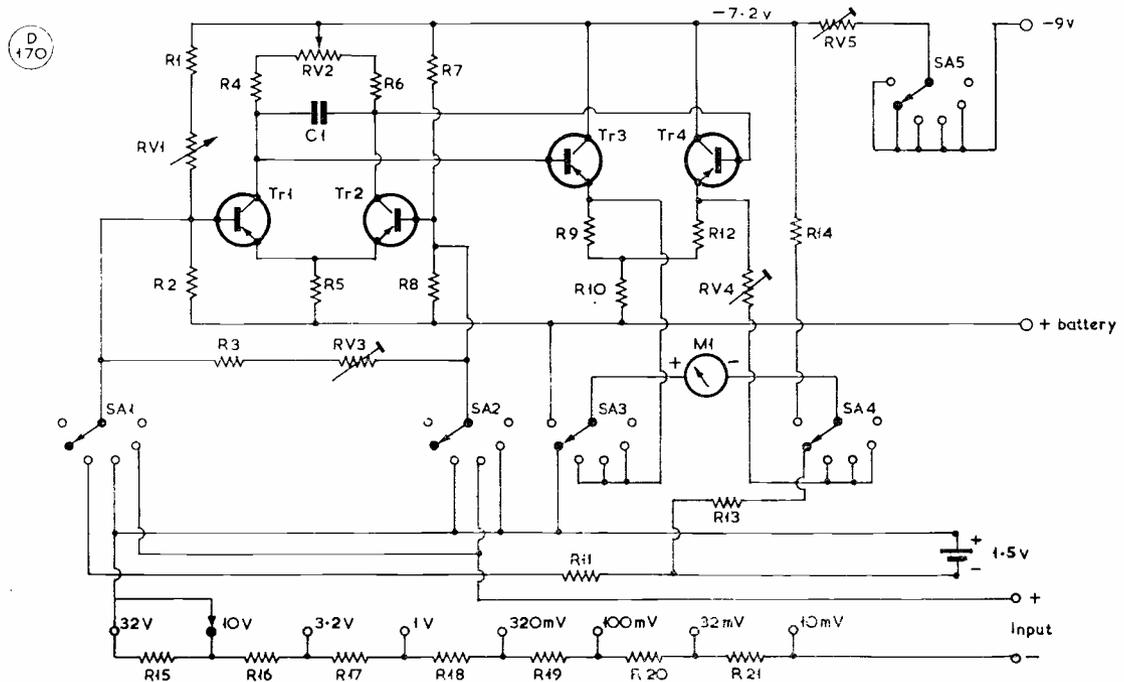
In the collector-balance configuration, the first two transistors TR1, TR2 take individual collector currents of 50 microamps. Since voltage gain is a function of transistor current, a variable resistor RV5 is included in the HT line to enable setting to a given level (in this case, about 7.2 volts). In use, the switch SA is put to posn. 1 (set HT) and RV5 adjusted so that the meter reads full scale. After this is done, the instrument is switched to the 10 mV range and the open-circuit (RV1) and short-circuit (RV2) balance controls are adjusted for zero meter reading with the instrument switched either to SA4 or SA5. Usually, adjustment of RV2 will be necessary only at the beginning of a series of measurements, any subsequent slight zero-drift being corrected by RV1 on the range in use and with the input terminals open-circuit.

The variable resistor RV4 is used to calibrate the instrument immediately on completion and is preset so that the meter reads correctly on the 10 mV range when the input terminals are connected to an external 10 mV source having self-resistance not greater than 100 ohms. RV4 need not be accessible from the front panel because it should not normally require any re-adjustment once the instrument has been set up initially.

A 1 $\frac{1}{2}$ -volt cell is included to provide a means of calibration which is independent of the cell voltage, provided this is large enough to give a reasonable meter reading. In SA switch posn. 2 (Ref), current is fed to the meter *via* the high-stability resistor R13.

OCTOBER DISTRIBUTION DELAY

When this issue went to press, a railway strike was threatened for Wednesday, October 3. If it did take place, distribution by both mail and rail would be seriously affected, causing delays beyond our control.



The Mullard-developed circuit for a transistorised and highly sensitive multi-range DC millivoltmeter, covering 10 mV to 32v. in eight switched ranges, and using Mullard BCZ11 transistors throughout. Indication is on a 0-100 microamp. meter, which should be a moving-coil panel instrument of good quality. For accuracy and consistency, the resistors should be 1% high stability, such as those of Painton manufacture. The SA1-5 switch positions give: 1, check HT; 2, reference voltage; 3, calibrate; 4, read HT plus; 5, read HT negative; and 6, off. The power supply is a 9v. battery and the total current drain less than 1 mA. See text for details.

Table of Values

Circuit of the 8-range DC Millivoltmeter

C1 = 0.25 μ F	R16 = 6.8 megohms
R1 = 250,000 ohms	R17 = 2.2 megohms
R2, R8 = 100,000 ohms	R18 = 680,000 ohms
R3, R5 = 10,000 ohms	R19 = 220,000 ohms
R4, R6 = 33,000 ohms	R20 = 68,000 ohms
R7 = 300,000 ohms	R21 = 22,000 ohms
R9, R12 = 3,300 ohms	RV1 = 100,000 ohms, var.
R10 = 4,700 ohms	RV2 = 25,000 ohms, var.
R11 = 2.2 megohms	RV3 = 50,000 ohms, var.
R13 = 22,000 ohms (incl. meter resistance)	RV4, RV5 = 5,000 ohms, var.
R14 = 72,000 ohms (incl. meter resistance)	TR1-TR4 = Mullard BCZ11
R15 = 22 megohms	

Note: All fixed resistors standard 1% high stability, $\frac{1}{4}$ -watt

This current is the amplifier gain times the current fed to the amplifier through another resistance R3 on the calibration range, switch posn. 3. The amplifier gain is calibrated by making the two meter readings (in posns. 2 and 3) coincide, using RV3 after first checking that there is no open-circuit zero error on one of the operating ranges. The actual range selected for this check is not important, and may conveniently be the one to be used for actual measurement. Once calibration is complete, and given that standard 1% high-stability resistors are used, the error on any

range should not be more than 3.5%. Scale linearity is adequate for most practical purposes, and the zero-error stability with temperature is better than 5% of full scale under the fairly extreme condition of a 20°C. rise in temperature.

Construction

This will be very much a matter of individual taste, and will depend to some extent on what may be available in the way of boxes. To make the best of this instrument, obviously a good-quality 0-100 microamp. moving-coil panel meter, with an open scale, is a necessity; it should not be less than 2in., and could be 3in. with advantage.

Panel space and box dimensions will be determined mainly by this meter, allowing also for the switch assembly SA1-5; the knobs for controls RV1-RV3 and RV5 (RV4 being internal preset); the range selector switch, and the input and battery terminals.

The resistors can be arranged in clusters and the four BCZ11 transistors will take up very little space. By making the box large enough, the 9v. HT battery as well as the 1½v. calibration cell could be accommodated internally. With a suitable carrying handle, a neat, practical and sensitive test instrument would be the result.

THOUGH in the ordinary way it rarely happens that a spell of good conditions—EDX and all—coincides with a VHF contest, that is in fact the break we had for the I.A.R.U. affair over September 1-2. The band had begun to open about the Thursday before (as foretold by A.J.D.'s bones—see last time) and by midnight on the Saturday, at the height of the Contest, conditions were about at their peak. So there was a turn up for the book, and everybody able to be on had a pretty good time. The opening was mainly east-west, and there was a very good selection of European DX available, as far east as DL7 (it should be noted that all DL7's are in the area of Berlin), though not a great deal from Scandinavia, and the GM's were more or less out of it. As is usual on these occasions, signals generally were very strong, and contacts were being made by frequency selection as much as by beam heading—in the sense that when a wanted station is S9 off the back of the beam, there is no particular need to swing the beam. QRM was intense!

After the Contest excitement, things quietened down again until about September 14, when conditions began to improve once more, with occasional GDX openings. This brings us to the week beginning Monday, September 17, when the glass started rising steadily and held steady at over 30.6ins.—producing another fine EDX/GDX opening (September 20, and onwards) just as this was going to press.

So, though rather late in the season, and long after it could reasonably have been expected, we have after all been able to get on to the Continent this year, and many U.K. operators have had their first experience of EDX working.

It was during this latter opening that EI2W scored another "First" of outstanding interest and importance. At 2145 clock on September 24 he worked F8MX/A on 70 centimetres, running only 3w. input and using that 32-ele beam shown here last time, with an RS-59 report. F8MX/A had 30w. input on 434.85 mc, with a

VHF BANDS

A. J. DEVON

16-ele beam, and he was RS-58 in Dublin; Harry's frequency is 433.186 mc. They are both to be congratulated on this very fine contact, over a considerable distance (about 380 miles) and a path lying right over some of the highest parts of Wales—so the refracting layer in the troposphere must have been pretty high and very well formed.

The QSO itself was set up by the assistance of G3BA and G6NB, who alerted F8MX/A for EI2W, and passed the necessary information about frequencies and so forth. Incidentally, during the opening referred to (right at the end of the period) EI2W worked some ten G stations on the 430 mc band, including G3NJO/T over in Norfolk, and about the ultimate in terms of GDX from Dun Laoghaire—well, Kingston, if you like.

More Centimetric Results

Going still higher in frequency, we have a very interesting report from G3JHM/A (Worthing), who now has gear for 10,000 mc (3-centimetre band) and has been running tests with G3GVM/M/P. The latter has a portable transmitter, consisting of a reflex klystron giving about 20 mW RF output into a 10-inch dish; the klystron is modulated by a 3 kc

square-wave, and the whole thing is carried on a tripod (all-same camera mounting), the power supply being a transistor-inverter operated off the car's 12v. battery.

The receiver in use at G3JHM's /A QTH (Washington, 6m. north of Worthing, and at 500ft. a.s.l.) is a superhet with the local oscillator fed to a single-ended crystal mixer (xtal CV2155), giving an IF of 45 mc into the Pye IF/AF amplifier, this being the well-known surplus item.

Using 70 mc as the cross-band talking channel, *via* G3PUR/P on Reigate Hill, G3GVM/M was doing the transmitting on 10,000 mc and G3JHM/A the listening. After much adjustment of the Tx klystron and careful alignment of the paraboloids, a weak S2 3-cm. signal was built up to S9, with G3GVM/M about 26 miles away over a line-of-sight-path. G3JHM reports that the 4-metre talking channel was found essential for setting up the dishes correctly, and once the 3-cm. signal had been caught, it was only a matter of fidgeting to bring it up good-and-strong. As they now have a TWT (travelling-wave tube) available capable of giving about 1-watt output, G3JHM expects to be able to work two-way over much more difficult paths, and at distances up to 100 miles or so. The Worthing group—it was a co-operative effort by G3GVM, G3JHM and G3PUR,—is to be congratulated on a very interesting and worth-while result. We look forward to hearing more from them on their 3-centimetre work.

Harking back to the G3IUD /G3NLZ results reported here last time, we now have it that they used 2355/2400 mc, with a common IF of 45 mc (as advocated by G3BAK in his series of articles on amateur microwave equipment, in *SHORT WAVE MAGAZINE* earlier this year). Their contact was duplex, signals being RS-58 both ways, using 17-in. dishes. GW3IUD/P was located 500ft. up the Great Orme, Llandudno, and G3NLZ/P was on Cold Fell, Cumberland. The aerial system at each end was double-dish, with a cavity-tuned CV90 as local

oscillator, and a cavity-tuned crystal mixer. The distance is 80 miles, and the date was June 11 (the reason the QSO was not reported earlier, explains G3IUD, was that they subsequently tried to increase the distance to 100 miles, but were beaten by the Wx every time). So much for their 12-cm. results. But these two chaps also have gear for 8 centimetres (3400 mc) and on that band have worked /P over a distance of 38 miles, actual frequencies being 3415/3460 mc, again with the 45 mc common IF; contact was duplex MCW, at about S4-5, using a single-dish system, with a 726A klystron and crystal mixer at each end.

For both their contacts, G3IUD /G3NLZ used 160m. /M gear as the talking channel. They are evidently doing well and gathering a lot of know-how on centimetric working—if with the Worthing group they could get on the same band (or by an exchange of gear, try it cross-band) we might see an amateur microwave QSO across England. And that would be quite something. But it would call for a lot of preliminary survey work, and a few dummy runs at short distances, before any possible GDX path could be investigated.

Positions in the Tables

Now, let us take a look at the tabular matter. The current tables only are spread out this time, and the first one to look at is Annual Counties, 1961-62; this shows Bob, G5MA, at the head of affairs (and G3BA remarks that he "could not have been beaten by a nicer gentleman"). It is not the first time G5MA has headed the Annual and, of course, he has done exceedingly well to make it with so many counties in such a poor season; in fact, anyone with more than 55C this year has put up a very good show, representing much diligence on the two-metre band. Others to mention are EI2A, with 54C from a GDX location (we hope he won't mind being called a G in this context!); G8VZ, who never runs more than his 12w., and hasn't a great deal of operating time; G3OJY, most of whose 38C must have been

GDX from where he is; G3PLS, who has not been licensed long but yet managed 34C; and G2DHV, who got his 31C by going out /P on his own.

The new Two-Metre Annual has got off to a very good start—reflecting very accurately the improved conditions during September—and we hope that it will be well supported, particularly by the more recently-licensed operators. And we also hope that claims will be reported as they accrue, so that the Table will truly represent the current state of affairs.

On 70 centimetres, honours in the Annual are even between three well-known Midlands operators, who are regularly on the band and have done much to encourage and maintain activity. And G2CIW says that his future plans are to concentrate more on 70 cm.; he already has a claim in for the new Annual on this band (as have one or two others)—but we want a few more before re-starting it again.

Two-Metre Reports & News

Among the many portables out for the Contest was GW3KMT/P, near Oswestry, operated by five members of the Wolverhampton group, who made a determined effort; they came out with 191 contacts for 37,600 points. G3MDH/P, from near Southampton, made 34,859 points and worked 34 EU's.

Another determined team out /P for the Contest signed G3OHF/P from a site near Leek, Staffs. Made up of members of the well-known North-West VHF Group, they booked in no less than 218 contacts for a claimed score of 43,104 points, the break-down being QSO's with 8 countries, 45 counties, nine mobiles and 35 other /P's—but no EI's or GI's were worked, and only one GM. G3AOS also reports that around midnight on September 1/2, a station was heard thought to be signing EA6(??), but was lost in the terrific QRM.

Without any positive information as to how the leading EU's fared, it is not possible on this

occasion to compare scores, but those quoted seem good enough.

Heard from for the first time is GC3OBM (St. Peter Port, Guernsey), who has been on two metres since June; he made 22 QSO's during the Contest, in three countries, and now stands at 16C worked; he runs 12w. to an 832 on 144.24 mc, with a 5-ele Yagi, and has a G2IQ-type converter

TWO METRES

ANNUAL COUNTIES

Final Placings 1961-'62

Worked	Station
68	G5MA
67	G3BA
64	G2CIW
57	G3BNL
56	G4LU
55	G3NNG
54	EI2A
51	G3BOC, G3CO
50	G3JYP, G3LTF
48	G3PBV, G8VZ
45	G3KPT, G3NUE
41	G5DW
40	G2AXI
38	G3OJY*, GW3MFY
37	G3JLA
36	G2BHN
35	G3GWL
34	G3PLS, G5DS
31	G2DHV/P, G3FUR, G13ONF, GW3ATM
28	G3OAA, G5UM
27	G3BYY, G3OSA
26	G3GSO
24	G5QA
23	G3FIJ, G3NPF
20	G3HWR
19	G3JWQ
18	G8VN
17	G2BLA, G3ICO, G3OBD

This Annual Counties Worked Table closed on August 31st, 1962. Above are the final placings for the year. The new Annual Table for 1962-1963 opened w.e.f. September 1st, 1962.

into an MR44; he is on most evenings from 6.30 p.m., looking for contacts with anybody. G3EMU (Canterbury) says that this year has been the worst he has experienced since starting on the band; it took him eight months to work his 100th PA station; for previous years his log has shown many S9 EDX contacts, whereas this year they have been rare. Much the same comment comes from G8VZ (Princes Risboro'), who has kept a regular schedule with G3JWQ (Ripley, Derbys.) for the last seven years; they have now had about 1,600 QSO's, so Jack is in a position to judge!

G3LTN (Andover) had a good time during the Contest, working DJ/DL, F, ON and PA, with some of the distant DL's "as strong as locals." G2DHV (Oxted, Surrey) has got to 37C for the All-Time, and G3GSO (Derby) also goes up in the tables.

G3LTF (nr. Chelmsford) has been going great guns, as usual; during the opening early in September he had about 20 European contacts, including DM2ADJ (East Germany) and several DJ/DL's in the Bremen-Hamburg-Kiel area; also worked were four SM's, with OZ5AB heard. During the night of September 1/2, Dresden TV (a very reliable conditions-marker for the two-metre band) was up to S9. Going further back still, to the Perseids MS of August 9-15, G3LTF ran MS schedules with I1KDB, UR2BU, SP5SM and OH1NL; of this lot he worked SP5SM (for his 19th country) and heard OH1NL and UR2BU, which is pretty nice going—though G3LTF remarks that this year's Perseids did not prove as good as usual.

G3OHD (Petts Wood) got in amongst the EU's during the opening, with DJ/DL, ON and PA worked, and was also glad to raise several GW/P's to build up his county score; the gear has been improved with a new modulator, a reflectometer and an ATU which, G3OHD hopes, has eliminated a third-harmonic emanation on 70 cm.

Over in Banwell, Som., Louis of G3EHY was pitching into the EDX in fine style; he had a baker's dozen of EU contacts during September 1/2, and reports himself as "well satisfied"; later in the period, he found the Birmingham University boys, GM3IUB/P, in Lanarks., having previously worked them in Cumberland. G3EHY has been running a schedule with EI2W, which has given 100% contact with signals usually S9 both ways, and mentions EI3S as another station for Co. Dublin, on 145.5 mc, worked frequently from Banwell.

Nice to hear again from G5QA (Exeter), and to know that Herbert is hitting on all six once more. Already he has knocked up 23C for the new Annual, with F and ON also worked. Tom, G3BA (Sutton Coldfield) had a holiday in Cumberland with G3BW and then went on home to Edinburgh, where he found a lot of activity as GM3BA/M. At the base QTH, G3BA now has the SSB rig running on full power, and he is extending the transverter idea so as to get on to 4 metres and 70 centimetres with full VFO control, and operation in all modes. Tom also remarks, anent his recent GW trip with G4LU, "I feel sure we'll be up to something again next year if we are spared."

G3JMA was /P down in Devon towards the end of August, and from sites near Teignmouth and Moretonhampstead had a number of good QSO's in the London area and East Anglia, including G2XV and G3IIT in Cambridge, and G3LQR (Colchester); G3JMA gives the best signals out of London as G3JXN, G3OSS, G6OX and G8SK, in that order, while an interesting contact was with G3GNV, nr. Littlehampton, using an indoor beam at sea-level.

After nearly five years' silence, G3CKQ (Leicester) writes in again to report that he is now settled at the new QTH and is running 25w. input, with a slot-fed 6/6 at 25ft.; this has already got him 18C for the new Annual. G3OJY (Penzance), who moved QTH during the VHF year, had 38C for the old Annual before leaving for Cornwall; his latest for that Table

TWO METRES

COUNTRIES WORKED SINCE
SEPTEMBER 1, 1962

Starting Figure, 14

From Home QTH Only

Worked	Station
38	G3BA
36	G4LU
27	G2DHV/P
26	G3CO, G3NUE
25	G3FIJ
23	G5QA
18	G3CKQ, G3OJY
14	GW3ATM

This annual Counties Worked Table will close on August 31, 1963. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. QSL cards or other proofs are not required when making claims. The first claim should be a list of counties with the stations worked for them. Thereafter, counties may be claimed as they accrue. Note: While new claims can be made at any time in the period from now to end-June 1963, all operators are asked to send in amended scores as often as possible, in order to keep the Table running up-to-date. After June 30, 1963, only amended scores from those already standing in the Table at that date will be accepted.

were GC2TR (Jersey) and G3GHO (Northants.). On a query he raises about scoring for the All-Time: Totals from different QTH's are shown separately, the change of QTH being marked*.

EI2W (Kingston) heard nine EDX stations during the Contest, but they were called in vain; of these, F2SO and F3LP were the strongest at up to S8-9, and DL6AH the most distant, at RS-44. GW3ATM (Portskewett, Mon.) goes up in the two-metre All-Time with five more, and is anchor-man for the new Annual at 14C.

G3CO (Hartley, Kent) has made a very good start for the VHF year, and was there for the Contest opening, during which he worked DJ/DL, F, ON and PA, though nothing was heard from Scandinavia. G3CO tried a /P expedition into the northern counties towards the end of August (using a Gonset loaned by G3OSS), but

bad weather ruined the trip and they had to make an early run for home. G3CO was unfortunate with GB2IC, as it now transpires that they did hear each other on their sked. G3KWH (Welwyn) worked DJ7NL/P during the opening, as well as several ON/PA stations, and G5ZT/P for Devonshire; he runs 30w., with a 5-ele Yagi at 30ft.

G4LU (Oswestry) had a couple of good EU contacts, F3LP and ON4AB/P, on September 1/2, and for the new VHF year has already worked several of the more difficult English and Welsh counties; his mid-day schedules now include GW3KXX/A in Llandrindod Wells and G3EJO/G3EDD in Cambridge. During the week-end of September 8/9, G4LU was /P in the Midlands area, and had a number of contacts from Bucks. and Warwickshire. G3BNL (Keyworth, Notts.) claims for all three bands 70 mc to 70 cm, and shows four counties worked on 4 metres.

70-Centimetre Items

G3KPT (West Bromwich) turns in good scores for this band, and G3NNG (Harwell) finishes at 14C

in the old Annual. Likewise G3NJO/T gains two more for the 70 cm All-Time, and also worked PAØCOB, a very nice one for 430 mc, on September 2.

GW3ATM gives notice that he will be operating /P from a good site near Chepstow during October 22/23, on 432.78 mc, and hopes to make some new contacts. For those who may want schedules, he is *QTHR*.

G2FNW (Melton Mowbray) shares the hot seat in the final count on 70 cm. for the last VHF season. G3LTN (Andover) would like it to be known that he is now regularly on 432.15 mc, running 90w. to a QV06-40 in the PA, into a slot-fed 6/6, with a G3BKQ 70 cm. converter headed by a pre-amp. using A.2599-A.2521; the G3BKQ design (described in detail in the July, 1954, issue of *SHORT WAVE MAGAZINE*) was years ahead of its time and is still one of the hottest things you can have for this band—it is in the same category as a crystal-controlled G2IQ with a 6CW4 pre-amp. Having got going on the 70-cm. band, the first QSO for G3LTN was with G3KEQ (Sanderstead, Sy.).

G2CIW (Birmingham) is a very keen 430 mc man; Jack worked G3NJO/T for a first contact on September 2, also G3FP, G3JMA, G3KEQ, G3LQR and G3NOX/T, with PAØCOB heard; others in G2CIW's heard-list include G2WJ, G3CCH and EI2W.

It was after closing time for the I.A.R.U. Contest when G3JMA (Harlow) found the 430 mc band well open; he worked PAØCOB and PAØKPO, also G3PJE/T in Ipswich and G3LQR (Colchester). Herbert, G5QA (Exeter), comes in with 5C worked for the new VHF year, his best 70 cm. DX so far being G3KEQ over in Sanderstead, Sy.

G3LTF (nr. Chelmsford) went on to 70 cm. during the latter part of the Contest—having tried a number of his EDX contacts on two metres for a 70 cm. test—and obtained QSO's with DJ2YF and PAØKPO. G6NF (Croydon) gets three more for the All-Time :

Alfred is also on 23 centimetres, using a CV90 tripler driven by the 430 mc PA, and has worked G3FP and G8AL, using an 8-ele stack with a plane reflector consisting of perforated sheet; his Rx is an R.1294.

Some 4-Metre Items

G3NUE (Worcester) has now worked 19 stations in 14 counties on the 70 mc band, and has heard G3JHM/A and G3IUL (he thinks); G3NUE mentions G8DT (Cheltenham) as being on 4 metres again, with a very strong signal.

Over in Colchester, G3FIJ has come back on to 4m.—he now runs all three VHF bands—and on 70 mc the gear consists of an 832 PA at 30w. input, a small beam at no great height, and a CC converter with a 6BQ7A as RF amplifier; his Tx frequency is 70.231 mc. G3FIJ reports that locals G3LQR and G4AC are putting out good signals on 4 metres, and that G3ANB (Brightlingsea) is getting ready for the band.

During the coming winter season, we hope to hear of much more activity on four metres—it is just about ideal for U.K. working in the VHF context. An Annual Counties table will be started just as soon as sufficient claims have been received. Let us have them right up-to-date for next time.

Conclusion—

That's just about it for this time—and, *yes thanks*, to the several who kindly enquired, your A.J.D. did have a very good cruise; with a crew of three only, in a fairly big boat, it involved a lot of deckwork, as the motor was on for only about four hours altogether, the long passages being made strictly under sail. Radio activity was confined to the navigational aids and the echo sounder.

Deadline for our next is **Wednesday, October 17**—address it all to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on November 2, at the Exhibition.

70 CENTIMETRES

ANNUAL COUNTIES

Final Placings 1961-'62

Worked	Station
20	G2CIW, G2FNW, G3KPT
18	G3KEQ, G3NOX/T
17	G3LQR
14	G3NNG
12	G3HAZ
11	G3BYY, G3JHM/A
10	G3HWR
9	G3LHA
8	GW3ATM, G5UM
7	G5QA
5	G3FIJ

This Annual Counties Worked Table closed on August 31st, 1962. Final placings for the year are as above. The new 70 Cm Annual Table opened w.e.f. September 1st, 1962.

ANOTHER R.109A MODIFICATION

POWER SUPPLY FROM THE MAINS

From Notes by J. BELL (G3JON)

IN the August 1962 issue of SHORT WAVE MAGAZINE there appeared an article on the R.109A surplus receiver, discussing various ways in which it could be modified.

As regards the problem of operating the set from the mains, those who run an R.109A might be interested in a modification devised by G3JON (Sheffield). The effect of this—the circuitry being

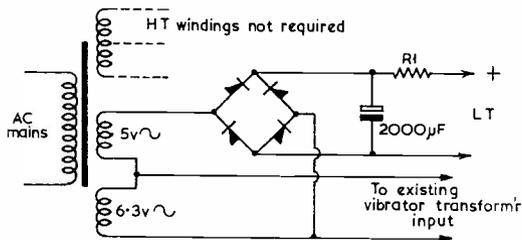


Fig. 1

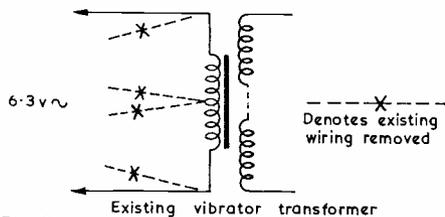


Fig. 2

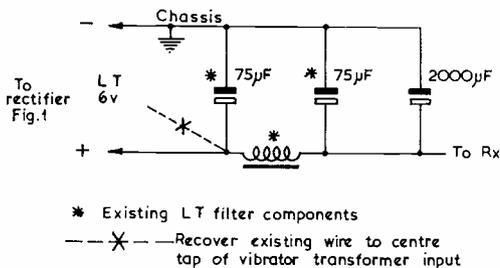


Fig. 3

R 377

shown in Figs. 1, 2 and 3—is not only to get DC for the valve filaments (Fig. 1), but also to eliminate altogether the vibrator pack in the receiver HT section (Fig. 2) by feeding low-voltage AC to the Rx power transformer. In Fig. 3 is shown the LT connection to the DC rectifier circuit of Fig. 1.

The components needed are: Small Rx-type mains transformer with 6.3v. and 5.0v. secondaries, HT windings not required; 6-volt 2 amp. rectifier; and two 12v. high-capacity condensers of about 2000 µF. If not to hand, these can all be “Radiospares” items, obtainable through dealers, or otherwise by shopping around the usual surplus sources. The circuit is as Fig. 1, with the 6.3v. and 5.0v. windings in series, and R1 must be adjusted so that the LT output is exactly 6v. on load; this is easily done by juggling with some resistance wire.

On the HT side, Fig. 2, the existing wiring to the primary filter circuits should be removed and the vibrator taken out. The HT rectifying circuit on the secondary of the receiver's own power transformer remains as-is, and supplies the receiver as it would do with the vibrator input. No other wiring needs to be disturbed and the bias produced by the HT—line comes up as in the original.

Elimination of the vibrator has the important advantage of cutting out any hash background, and with this HT modification the receiver will be found to be absolutely quiet. The R.109A performs well, and is a very good buy at around £3 on the surplus market. The proposed modifications (including that for Top Band suggested by G3NJQ), make it even more useful, as it then covers the three LF amateur bands, and operates directly off the mains. Of course, by modifying for mains operation exclusively, it means that the receiver becomes unsuitable for portable work with a battery supply—no doubt, however, the input circuitry could be so arranged that both facilities are retained.



Sketches to illustrate the power supply modification explained in the text. It enables the R.109A to be run from an AC mains supply.

“ . . . I told you it's better not to try winding your own coils . . . ”

Miscellany

INCIDENTAL INFORMATION, AND ITEMS OF TOPICAL INTEREST

(The heading under which almost anything may appear)

"Why do radio amateurs use the Royal prerogative to the word 'we' on the air? ('We have a 6146 in the PA,' and so on.) Let the English stations speak English and stop this use of the American vernacular."
(Letter from G2DRT)

— • • • —

"I'm sure you would have a darned fine signal if only I could receive you properly."

(WA2, on 14 mc SSB)

— • • • —

An article in *The New Scientist* suggests, in passing, that amateurs find that the pursuit of "something rare" exercises archetypal hunting instincts and at least is fun, healthy and usually harmless. The subject referred to, however, is not DX-chasing, but . . . bird-watching!

— • • • —

A high-gain, low-noise transistor pre-amplifier for Two Metres is described in *QST*, August. VHF transistors have hitherto been somewhat expensive, but new types, now available in the States at less than \$3.00, will give a noise figure of 5.5 dB and a power gain of 16 dB at 200 mc. Home-made printed circuits are included in the design.

— • • • —

"I have decided to calibrate my S-meter back-to-front. This will give the QRP boys a break, and drive the owners of large linears frantic."

(G6, on 80-metre SSB)

— • • • —

Just released in the U.S.A. is a device known as the "Nuvistaplug." Consisting of 6CW4 and 6DS4 Nuvisitors in a cascode circuit, it is built in such a form that it can be plugged straight in as a replacement for many 7-pin miniature pentodes as used in the first stages of commercial receivers. All voltages are taken from the RF amplifier socket, and it is claimed that the only adjustment needed is minor re-peaking of front-end circuits. No great increase in gain is claimed, but a greatly reduced noise figure gives a worthwhile improvement in signal-noise ratio.

— • • • —

After moving into a new home, K5YEE, with the help of some other amateurs, put up a couple of masts and an 80-metre doublet. Before the antenna installation was even completed, he had

received four TVI complaints! ("QST," August)

— • • • —

A device known as the "Jamsistor" has been produced with a view to dealing with the menace of portable transistor radios. This very effectively wipes out a range of frequencies on the medium-wave band . . . but unfortunately could be a major headache for local amateurs, apart from being entirely illegal. These things are on sale in various parts of the country, and amateurs encountering them are asked to report their findings to the GPO immediately.
(*"Radial," RAIBC*)

— • • • —

"Some people drop AM and take up SSB so irrevocably—like saying goodbye to the world and entering a monastery."
(*Heard on 3.7 mc by G3IDG*)

— • • • —

"To any of your older short-wave listeners, who think they are too old to 'have a go,' may I say that I was 45 when I began to study for R.A.E. and 46 when I began to learn Morse, at which stage I did not know the Morse symbol for a single character . . . but eventually succeeded in both tests. It takes longer as you get older, but you can get there if you really want to."

(Letter from newly-licensed G3R--)

— • • • —

"How is it that foreigners with only one tenth of our vocabulary seem to be able to turn a phrase of English so terse and apposite as to cause envious despair? For example, EA2CA, addressing an interloper when he was trying to work some weak DX, said 'Drop dead . . . then pick yourself up and die again!'"
(Letter from G3NWT)

— • • • —

"When you do a bit of figuring, you find out that this sponsoring of DX-peditions is good business. Let us assume that it costs \$4,000 to finance a trip somewhere. Now it is not unusual for a good operator to chalk up 10,000 QSO's; from my own experience in 3A2, I have had several W's send me a dollar bill for a QSL. I can assure you that several of the top DX men would pay much more for a QSL from a brand new country. So, if only 5,000 in our example send an average of one dollar, you would come out of it with a nice profit. I think I'm in the wrong business."

(Letter from G3FPK)

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 are 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.

- DL2AM**, A. Milham (*ex-GW3OPL*), 21 Regt. R.A., B.F.P.O., 30, B.A.O.R.
- DL2OX**, G. D. Griffiths (*ex-ZC4FR/G3POX*), No. 3 Flat, 212 Hollen-Zollen Strasse, Munchen-Gladbach, Western Germany.
- G3OOF**, E. E. Payne, 3 Old Harrow Road, St. Leonards-on-Sea, Sussex.
- G3PXJ**, S. A. Gaunt, 43 Appian Close, Kings Heath, Birmingham, 14. (*Tel.: HIGHbury 4312*).
- G3PXM**, R. A. K. Pavey, Edgehill, Seaway Lane, Torquay, Devon.
- G3PZO**, C. H. Shilley, 1 Greywell Avenue, Lordswood, Southampton, Hants.
- G3RAK**, J. A. Hall, 19 Wendover Road, Aylesbury, Bucks.
- G3RBP**, R. J. Parsons, The Haven, Radley Road, Abingdon, Berks. (*Tel.: Abingdon 1021*).
- GM3RCS**, Radio Club of Scotland, St. Andrew's Hall, Glasgow, C.3.
- G3RCV**, Cray Valley Amateur Radio Society, c/o S. W. Coursey, 49 Dulverton Road, London, S.E.9.
- G3RCX**, L. H. Gibson, No. 3 Flat, 117 Leigham Court Road, Streatham, London, S.W.16. (*Tel.: Streatham 5746*).
- G3RDE**, S. Riley, 33 Watkin Street, Nottingham, Notts. (*Tel.: Nottingham 50417*).
- G3RDG**, K. B. Michaelson, 40 The Vale, London, N.W.11. (*Tel.: Speedwell 8831*).
- G3RDH**, J. H. Barnes, 21 St. Alban Road, Bridlington, East Yorkshire.
- G3RDK**, Dr. D. Doyle, 300 Battersea Park Road, London, S.W.11.
- G3RDL**, C. W. Campbell, 117 Warwick Road, Earls Court, London, S.W.5.
- G3RDN**, E. J. Sharp, 32 Butts Meadow, Wisborough Green, Sussex.
- G3RDO**, B. J. Matson, 90 Lonsdale Road, Thurmaston, Leicester.
- G3RDV**, S. P. Brindle, 192 Grane Road, Haslingden, Rossendale, Lancs.
- G3RDX**, C. R. Templer, Parsonage House, Woodbury, nr. Exeter, Devon. (*Tel.: Woodbury 364*).
- G3RDZ**, J. A. Walker, 38 Ash Close, Peterborough, Northants.
- G3REA**, C. F. Peers, 4 Culcheth Hall Drive, Culcheth, Warrington, Lancs. (*Tel.: Culcheth 2332*).
- G3REB**, R. A. Cole, 58 Thicket Road, Fishponds, Bristol.
- G3RED**, D. C. Sylvester, 10 Ivy Grove, Gunthorpe, Peterborough, Northants.
- G3REI**, Reigate Amateur Transmitting Society, c/o J. Duckworth, 43 Carlton Road, Redhill, Surrey.
- G3REP**, R. E. Parkes, Great Oaks, Green Lane, Blackwater, Camberley, Surrey. (*Tel.: Camberley 21018*).
- G3REU**, G. F. Hearn, 591 Signals Unit, R.A.F. Station, Digby, Lincs.
- G3REV**, R. E. Pulling, 65 Gaywood Green, Broad Lane, Kirkby, Liverpool, Lancs.
- G3REX**, J. G. Ogg, Jamaica, St. Leonards Way, Ashley Heath, Ringwood, Hants. (*Tel.: Ringwood 1077*).
- GW3REY**, E. Lynn, 3 Trehwfa, Coed Mawr, Bangor, Caerns.
- G3RFA**, D. E. Garrington, 60 Woodsend Road, Flixton, Manchester.
- G3RFB**, R. W. Lauchbury, c/o Sgts' Mess, R.A.F. Station, Colerne, nr. Calne, Wilts.
- G3RFE**, T. H. Bell, 22 Newton Brow, Barrow-in-Furness, Lancs.
- G3RFG**, H. S. Brown, 50 Gonville Crescent, Stevenage, Herts.
- G3RFH**, K. J. Randall, 5 Greenfield Road, Oakdale, Poole, Dorset.
- GD3RFBK**, D. C. Dodd, Somerset, Stanley Mount, Ramsey, I.O.M.
- G3RFL**, J. Hudson, 68 Glebe Street, Great Harwood, Blackburn, Lancs. (*Tel.: Great Harwood 3395*).
- GM3RFR**, S. Polson, M.A., Schoolhouse, Baltasound, Unst, Shetland Islands.
- G3RFX**, M. C. Phillips, 8 Hill Road, Theydon Bois, Essex. (*Tel.: Theydon Bois 3288*).
- G3RGD**, R. G. Dobbinson, 73 Watwood Road, Hall Green, Birmingham, 28.
- G3RGE**, K. G. King, 33 Adelaide Road, Edgeley, Stockport, Cheshire.
- G3RGF**, R. D. V. Young, 3 Bell Hill, Danbury, Chelmsford, Essex.
- G3RGL**, E. A. Hays, 77 Humber Road, Blackheath, London, S.E.3.
- G3RGM**, D. R. Mullins, 1 St. Michael's Road, Farnborough, Hants.
- G3RHB**, J. E. Wright, 12 West Heath Road, Cove, Farnborough, Hants.
- G3RHF**, A. Wheeler, 22 Meadow Road, Ashford, Middlesex. (*Tel.: Ashford 5265*).
- G3RHO**, J. W. Bickmore, 44 Temple Lane, Silver End, Witham, Essex.
- G3RHP**, J. Garrett, Windle, The Common, Berkhamsted, Herts. (*Tel.: Berkhamsted 1741*).
- G3RHV**, Miss Margaret Preece, c/o Langdon, 20 Upper Marsh Road, Warminster, Wilts.

CHANGE OF ADDRESS

G3JXN, Dr. J. E. Tindle, No. 5 Flat, 149 Hamilton Terrace, London, N.W.8. (*Tel.: EUSTon 5223*).

G3MET, R. L. Thompson, Roseville, Brackley Way, Totton, Hants.

G3PFT, A. N. Heeley, 1 Marshbrook Road, Pype Hayes, Birmingham, 24.

G3POX, G. D. Griffiths. *QSL to DL2OX*.

AMENDMENTS

G3PCL, M. Shaw, 14 Woodfield Road, Ealing, London, W.5. (*September*).

G3PCP, W. H. Ward, 8 Melrose Avenue, Crosby, Liverpool, 23. (*September*).

GM3PLY, G. J. McNeil, 1 Craigmount Grove, Edinburgh, 12. (*August*).



THE OTHER MAN'S STATION

G3EHB

ONE fine day in 1947 the postman arrived at 9 a.m., and five minutes later G3EHB was calling CQ on Top Band CW! The station was in an old country house with no mains, so power was obtained from a bank of GPO-type accumulators charged by an ex-WD generator (bought for 6d. a pound by weight!), this being driven by a 1914 paraffin engine having a pair of nail heads for contact-breaker points. These conditions prevailed for three years, when the station moved to a caravan and a small outside shack, this time with mains. All phone bands were worked, down to a couple of contacts on 70 cm.

In 1955 the operator became a technician with the Forces Broadcasting Service in Kenya and the call-sign VQ4GB was obtained. Phone rag-chewing was the main pastime on any band that was open; the highlight of that period was when eight Japanese call areas were worked in 47 minutes, one afternoon. Excursions were made on two metres, but activity on this band was very limited, as there were only about six VQ4's equipped for the VHF's. A skeleton slot

was used, and as the station was located at an altitude of 7,400 ft. a.s.l., a great opportunity was lost.

At a time when 10 metres was open, a small portable Tx was being tested one night, and four W's were found calling VQ4GB! This rig was running 5 watts to a QV04-7! The aerial was a "ZL Special," which intrigued the natives immensely. An oscilloscope was connected to the rig, and great pains taken to explain to them that, on rotating the aerial, a "piksha" could be obtained, showing the presence of any trespassers on our land. While our neighbours were continually complaining of intruders, by this simple device we remained totally immune during six years in Kenya. That 'scope was more effective than a 12-bore! Further security was ensured by the surreptitious use of a converter which tuned to the Nairobi Police, a signal which the native staff recognised immediately with awe-struck exclamations of "That's 999."

The old U.K. call-sign was resumed in 1961, since

when the only bands worked to any extent have been 160 and 80. The rig standing on the HRO runs a 5763 VFO, 6146 PA on Top Band and 80, while on the left is the all-band transmitter using 5763's to another 6146 PA. Aerials in use are 66 ft. end-on and a small doublet. The shack itself is the converted single bedroom of a large caravan and precludes the use of much equipment until more economy of space can be devised. It has been very disappointing to

find it impossible to work back into VQ4 from the U.K., especially as they have been heard in contact amongst themselves.

The wander bug has bitten again, and it is expected that the G3EHB call will be dropped once more—either for a DL, ZE or ZS—in the not-too-distant future. The present address of G3EHB is W. C. N. Larsen, Gillott's School, Henley-on-Thames, Oxon.

U.S. "CITIZEN'S BAND"

As Citizen's Band activity is not touched upon in any of the American periodicals and handbooks devoted to Amateur Radio, we are often asked what it means. Briefly, individuals are free to operate phone transceivers in the band 26.96-27.26 mc, using very low power only (90 milliwatts without any licence at all being required, and up to 5 watts maximum by licence granted on application, without formality). Readers whose experience goes back some years will recognise 26.96-27.27 mc as the old 11-metre band, for which at one time American amateurs were licensed for normal operation (the ZL's still have it). Before that, it was known as the "diathermy band," because electro-medical apparatus of the older pattern was supposed to have the oscillator tuned to 27 mc. One result of the opening of the Citizen's Band—on which anyone can operate within the power limitation, subject to being crystal-controlled and under certain aerial restrictions—is that astronomical numbers of CB transceivers are in use throughout the United States, operated on short-range private communications networks of all sorts, for business and pleasure, as well as on emergency services to back up local fire, police, ambulance, electricity and other public utilities. To go with all this is a large manufacturing capacity and a considerable literature.

The reason why we are not likely to have the same sort of Citizen's Band opened in this country, on 27 mc or any other frequency, is because the P.M.G. has monopoly control over all such communication, and there is a considerable revenue factor involved. In the United States, however, all telephone and many radio systems are privately owned and operated, so the American licensing authority, the F.C.C. (Federal Communications Commission) is not much concerned about the possible loss of revenue to the telephone companies! Anyway, the only effect on them is that a certain amount of local traffic goes over CB radio instead of by wire.

ROYAL SIGNALS AMATEUR RADIO SOCIETY

Though it has now been in existence for over a year, and membership has grown steadily, it is felt that there must be many past and present members of the Corps who have not yet heard of the Royal Signals Amateur Radio Society. Its inaugural meeting was held at Blandford, Dorset, in June 1961. To serving members of all ranks, the Society offers the full facilities of an active Amateur Radio organisation. A regular newsletter, *Mercury*, is circulated and an Hq. station, signing G3C10, is maintained in the

heart of the Signals country, at Catterick, operating all bands and modes with modern equipment and an extensive aerial system. Contacts from G3C10 (which is also permitted to sign GB3RCS on special occasions) are always sought with past and present members of the Corps—indeed, during the Old Comrades Reunion week-end this year, some 300 Corps QSO's were made and many visitors welcomed to the station. The annual subscription to R.S.A.R.S. is a modest 2s. 6d. (with life membership for those who care to spring two guineas), and all members and ex-members of the Corps with an interest in Amateur Radio are invited to apply for details to: The General Secretary, Royal Signals Amateur Radio Society, 11 Signal Regiment, Catterick Camp, Yorkshire, stating Army number and units in which served or serving.

THE AMATEUR LICENCE TOTALS

We are informed by the Post Office that as at August 31 last, the U.K. amateur transmitting licences in issue totalled 9,748. Of these 1,203 were endorsed for /M operation. The ATV licence total was 107. It should be noted that these figures are not, and never have been, additive, except for a certain small number of amateur TV licensees who, not having passed the Morse test and being allowed on 430 mc only, are not included in the full-licence total of 9,748.



THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for November Issue : October 12)

(Address all reports for this feature to "Club Secretary")

ONCE more the time has arrived to discuss MCC, and for clubs to get down to the serious business of organising themselves in readiness for it. The rules and scoring system are given, in full, overleaf.

Points worth mentioning here, however, are that the scoring remains on the same basis as last year, except that a deliberate boost has been given to the Scottish stations by upgrading them to *ten* points for each contact with the Southern zone, *eight* with the Midland and Western zones, and *six* with the Northern zone.

While this system, according to your Club Secretary's calculations, makes it *possible* for a Scottish station to win, it still does not make it too easy for them. The high points the GM's will score for their QSO's may induce a few more of them to participate; they will also be an encouragement to other stations, particularly in the South, to spend a reasonable time looking for GM stations instead of simply working the strongest signal they can hear.

There is an alteration to Rule 4, occasioned directly by many complaints from last year's contestants about long-winded CQ calls, which wasted much time and caused unnecessary QRM. The "three times three" should be regarded as a *maximum*, not a minimum! Usually a single CQ, or one group of three, should suffice to bring in another station . . . but those who turn in the highest scores are seldom heard calling CQ at all.

Finally, note that there has been a complete breakaway from previous years in confining the contest to *one* week-end. This has been done for three reasons: First, to avoid unnecessary clashes with other contests; secondly, to avoid possible charges of unleashing an unreasonable amount of QRM on a shared band; and thirdly, to make the whole thing more exciting for those taking part. With only two sessions, it will be essential to score very near maximum points in both of them if a winning score is to be turned in. And all must be right with the gear (and the operators) from the very start, at 1700 GMT on November 17!

ACTIVITY REPORTS

Two amateurs with definitely opposing ideas will be "Face to Face" at **Aberdeen** on October 5. They will be discussing various aspects of Amateur Radio, and they are GM3ALZ and GM3NOV. On the same day—October 5—**Cambridge** will be hearing from G3FUR about his 40-valve receiver; on the 23rd

they combine with the Cambridge University Wireless Society for a film show—"This is the BBC." And November 2 is the date for a Social Evening—a dinner and ragchew at Coton, near Cambridge.

Derby are holding a Technical Forum (questions in advance, in writing) on October 10, a Film Show on the 17th and an Open Evening on the 24th. **Hastings** have an Open Meeting on October 9; and on the 23rd G3BDQ will be talking about Radio Model Control. November 6 is the date for their AGM.

A meeting is to be held in **Jersey** on October 15 of the newly-formed Jersey Amateur Radio Club. There is, as yet, no secretary, and this notice is an invitation to all interested persons to attend the YMCA, New Street, at 8 p.m. on that date. It is hoped, on that occasion, to settle a future programme and also to find a volunteer for the post of secretary.

The October meeting at **Morecambe** will be over by the time this appears, having been held on the 3rd. The subject was The Problem of Interference, with a GPO engineer giving advice; November 7 is the date of the next meeting, with F. R. Stoodley talking on The Development of Radar.

Northern Heights will be discussing arrangements for the Scout Jamboree-on-the-Air at their meeting on October 10; on the 23rd they have a Mullard Film Show (at St. George's Hall, Bradford) and on the 24th an informal meeting at their own headquarters.

The **QAU Club** (Jersey) has no connection with the recently-formed Jersey ARC (see above). It was founded in 1950 and has a limited membership. The Hon. Sec. (GC2CNC) has just gone into a Liverpool hospital for an eye operation and hopes to meet local amateurs during his stay there.

There is an informal Club Night at **Reigate** on October 6, and on the 20th they hold their Junk Sale. Two members passed in the recent R.A.E. and one, who had already passed the Morse test, went straight up to the GPO with the necessary documents and came away with the call G3RCY, arriving home just in time for the local Top-Band natter. (Since then,

THE SEVENTEENTH MCC

Dates November 17/18, 1700-2000 GMT each day. Rules and scoring on pp.440-441. Clubs not included in serial-number allocation, p.441, and wishing to enter, should apply before October 12 for supplementary list to be published in November issue.

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club publications: **Wolverhampton** (*Newsletter*, August and September); **ARMS** (*Mobile News*, August); **South Hants.** (*QUA*, September); **Reigate** (*Feedback*, July); **Purley** (*Splatter*, September); **Southgate** (*Newsletter*, September); **BATC** (*CQ-TV*, 48); **Crystal Palace** (*Newsletter*, No. 82); **Dudley** (*Local Oscillator*, September); **RAIBC** (*Radial*, September); **WAMRAC** (*Circular Letter* No. 22); **Surrey** (*SRCC Monthly News*, September); **Radio Club of Scotland** (*GM Magazine*, August).

other members have acquired G3RIM and G3RIN.)

Sheffield now meet on the second and fourth Fridays (not Wednesdays, as in the past), with no fixed programme of talks. A social event, to be arranged in November, will take the form of a dinner and general discussion. **Southgate** will be gathering on October 11 (at Arnos School, Wilmer Way, N.14) for a talk on Army Radio.

South Yorkshire, with headquarters in Doncaster, have now gone over to weekly meetings, which will be held every Thursday; a new series of Radio Theory lectures is shortly starting, under the guidance of G3JLZ. See panel for new secretary's QTH.

The next two occasions for **Sutton Coldfield** are on October 11 (Components—their Uses and Abuses) and 25th (Club Night). Both at their headquarters, 92 The Parade, Sutton Coldfield. **Wessex**, who meet at The Cricketers Arms, Windham Road, Bourne-mouth, had a Bring-and-Buy Sale on October 1, and meet again on November 5 for a film and lecture on London Transport.

Wolverhampton are holding their AGM on October 8 at Neachells Cottage, Stockwell End, Tettenhall (8 p.m.), and meet again on the 22nd—subject not yet announced.

Acton, Brentford & Chiswick will be discussing their winter season's programme at the next meeting—October 16 at the AEU Club, 66 High Road, Chiswick, W.4. **Clifton** held their final D/F Day in September, the event being won by G3OYU; the D/F Shield went to G3PJB, who located the transmitter in all five events and was first in two of them. At the AGM, G3FVG was elected chairman and G3IWL secretary.

The **BATC** (British Amateur Television Club) held their Sixth Convention and General Meeting on September 8, with demonstrations of a wide range of amateur-built equipment throughout the day. Their journal, *CQ-TV*, contains a wide variety of technical information as well as news of individual members' activities.

Recent activities at **Crawley** included a talk by G8RW on 23-cm. operation, and a visit to Gatwick Airport. Four members passed R.A.E. and expect licences shortly. On October 24 Mr. H. J. P. Lees will be giving his annual Film Show.

Cray Valley also had a Film Show recently; their October meeting was on the 4th, the day before publication. Future activities will include participation in the Scouts' Jamboree-on-the-Air (October 20-21), for which the Royal Eltham Scouts have been allotted the call GB3RES. The club's own call,

recently acquired, is G3RCV; next meeting, November 1, for a talk on the Avo range of products.

Crystal Palace will meet on October 20 for a talk and demonstration on Hi-Fi and Stereo. **Dudley** ran their exhibition station GB3DAR, on August 31 and September 1, from the Dudley Public Library. Six operators handled all bands, 160 to 20 metres phone and CW, and about 260 visitors were welcomed on the stand. Good Press notices followed. The AGM is on October 12 at 8 p.m., and on the 26th there is a Demonstration and Talk, by the Wolverhampton Model Radio Control Society. (Both at Priory Hall, Dudley.)

[over

Names and Addresses of Club Secretaries reporting in this issue:

ABERDEEN: G. A. Roberts, GM3NOV, 111 Great Southern Road, Aberdeen.
 ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.
 ARMS: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.
 BATC: D. S. Reid, M.A., 21 Silverdale, London, S.E.26.
 CAMBRIDGE: H. Lowe, 47 Hurst Park Avenue, Cambridge.
 CHESHAM: Capt. C. G. Stephenson, G3CLJ, 21 Lynton Road, Chesham.
 CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley.
 CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
 CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
 DUDLEY: D. H. W. Pratt, G3MHS, 23 Kent Street, Upper Gornal, Dudley.
 EXETER: S. Line, 46 Roseland Crescent, Heavitree, Exeter.
 HARROW: A. C. W. Biddell, G3GNM, 114 Kingshill Avenue, Kenton, Middx.
 HASTINGS: W. E. Thompson, 8 Coventry Road, St. Leonards-on-Sea.
 MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham, 17.
 MITCHAM: B. Blandford, 1 Biggin Avenue, Mitcham.
 MORECAMBE: K. J. Singleton, G3NLM, 8 Westmoor Grove, Heysham.
 NEWBURY: G. T. Allen, G3JTK, 83 Huntshook Road, Tadley, Basingstoke.
 NORFOLK: J. D. Simpson, G3NJQ, 50 Vicarage Road, Norwich.
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
 NORTH NOTTS: E. W. Badger, G3OZN, 20 Tennyson Drive, Worksop.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 QAU CLUB: E. Banks, G2CNC, 23 Marett Court, Marett Road, Jersey, C.I.
 RAIBC: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
 REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
 SHEFFIELD: D. R. A. Hill, 16 Tynley Road, Sheffield, 2.
 SLADE: C. N. Smart, 110 Woolmore Road, Birmingham, 23.
 SOUTHGATE: R. W. Howe, G3PLB, 162 Victoria Road, London, N.22.
 SOUTH HANTS: G. J. Meikle, G3NIM, 34 Victoria Road, Netley Abbey.
 SOUTH YORKSHIRE: D. Critchlow, G3PTV, 63 Gattison Lane, Rossington, Doncaster.
 SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
 SUTTON COLDFIELD: L. E. R. Hall, G3IGI, 24 Calthorpe Road, Walsall.
 WAMRAC: Rev. A. Shepherd, G3NGF, 121 Main Street, Ashfordby, Melton Mowbray.
 WESSEX: G. J. Fowle, 138 Surrey Road, Branksome, Poole.
 WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
 WOLVERHAMPTON: J. Rickwood, 738 Stafford Road, Fordhouses, Wolverhampton.
 YEovil: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

Chesham have instituted a second weekly Club Night; in future Tuesdays will be devoted to Morse and practical training, Thursdays to R.A.E. lectures and practical demonstrations. The monthly meetings continue, at 10 a.m. on the first Sunday of each month. An autumn "spring-clean" and the building of a 150-watt transmitter are the main activities at present.

Exeter meet on the first Tuesday of the month, and the September meeting was an "Any Questions?" session. (YMCA, St. David's Hill, Exeter.) **Harrow** will be holding their Junk Sale on October 26, and meet every Friday at Roxeth Manor County School, Eastcote Lane, 8 p.m.

Civil Service paid a visit to Southampton, with trips over the liners *Queen Mary* and *Canberra*; they also visited Ford of Dagenham and London Airport. The new session opened with a lecture on Two-Metre Equipment (TW) and it is hoped that the club will soon be active on that band. On October 16, at an informal meeting, GB2SM will be on the air; November 6 is booked for a talk on Radio Interference—Problems and Cures (Belling-Lee).

"Monkey Glands for the HRO" is the title of a lecture by GM3PQU at **Lothians** on October 11; he will also give a demonstration of TVI-proofing. On the 25th the South Lanark, Fife and Falkirk groups will be entertained at a visitors' night, and a film will be shown. Both meetings at the YMCA, 14 South St. Andrew Street, Edinburgh 2.

The **Norfolk** Amateur Radio Club is a newcomer whose membership already numbers 50. They meet four times a month at the 35th Norwich Sea Scouts' Hq., Mousehold Avenue, on Monday evenings. Morse instruction is given by G3PNR and G3NJQ, and the club holds the call G3PXT. During the winter, meetings will be changed from Monday evenings to Sunday afternoons.

Peterborough held a D/F Contest at their Alwalton site in September, and the winners were G3QS and G3KPO; their winter meetings are to be held on the first Friday of the month at Peterborough Technical College, Room 14. The AGM will be on November 2.

Slade will be hearing a lecture from C. N. Smart (October 19) on a Transistorised D/F receiver; October 31 is the date of their Annual Dinner. **West Kent** announce an Exchange and Mart on October 12, a talk on Nucleonics, by G2UJ, on the 26th, and a Film Show on November 9. Meetings are held at the Kent County Council Adult Centre, Culverden House, Tunbridge Wells, at 7.30 p.m.

Midland announce a meeting on November 20 at the Birmingham and Midland Institute—no particulars given. The Annual Constructional Contest at **Newbury** will be held on October 26; on the same evening Mr. P. Sterry will be talking on Noise Generators—with demonstration; he will also judge the contest.

Surrey (Croydon) will be meeting on October 9, when G2PL will talk about Portable Operation and demonstrate some of his gear, including a transistorised receiver. QTH, as usual, The Blacksmith's Arms, South End, Croydon.

[continued p.442

MCC—SEVENTEENTH ANNUAL TOP BAND CLUB TRANSMITTING CONTEST

RULES

- Duration:** Saturday, November 17 and Sunday, November 18; on both days between the hours of 1700 and 2000 GMT (six operating hours in all).
- Frequency and Power:** All contacts to be made in the 1800-2000 kc band, using CW, with a power input not exceeding 10 watts to the final stage. All reasonable precautions will be taken to avoid interference with other services using the band.
- Call Signs:** Where a Club has its own transmitting licence and call-sign, that call-sign is to be used. Clubs without their own call may nominate a member's station as their official entry.
- Calling:** Clubs will call "CQ MCC," using the "three times three" technique. Infringement of this rule by the use of long CQ calls may entail disqualification.
- Scoring:** Other Club stations may be worked on each of the two days, and these contacts will count for points each time (see scoring instructions opposite). Non-Club stations may be worked once only, and will count for one point only. Inter-Club contacts will take the form of an exchange of six-character groups comprising RST, Zone letter (see map) and Club identification number (see list and examples opposite).
- Non-Club Contacts:** Contacts with non-Club stations, counting for one point, will take the form of logging the RST and the other station's QTH. The Club's own QTH, not the identification number, should be sent to complete the QSO.
- Logs:** Contest logs are to be neatly set out as follows: One side only of quarto or foolscap sheets should be ruled into eight columns, with *name and call-sign of Club station on each sheet*, headed thus: Col. 1, *Date and Time*. Col. 2, *Call-sign of station worked*. Col. 3, *Outgoing six-figure group*. Col. 4, *Incoming six-figure group*. Col. 5, *RST out-going* (to a Non-Club station). Col. 6, *RST incoming* (from a Non-Club station). Col. 7, *QTH of Non-Club station*. Col. 8, *Points claimed for contact* (see scoring instructions). Col. 8 is to be totalled at the foot of each page, and the running totals brought forward. The last page of the log should contain the following summary:
Total number of Club contacts; total number of non-Club contacts; total score. Comments on the equipment used, number of operators employed, general impressions and experiences are also invited, and should be added at the end of the log.
- Any Club station radiating a note consistently worse than T9 will be liable to disqualification.
- Logs, addressed to "Club Secretary," SHORT WAVE MAGAZINE, 55 Victoria Street, London, S.W.1, must be posted to reach us not later than Friday, November 30, 1962. The Editor's decision on the results will be final, and will be published in the January, 1963 issue of SHORT WAVE MAGAZINE.

THE MCC ZONES

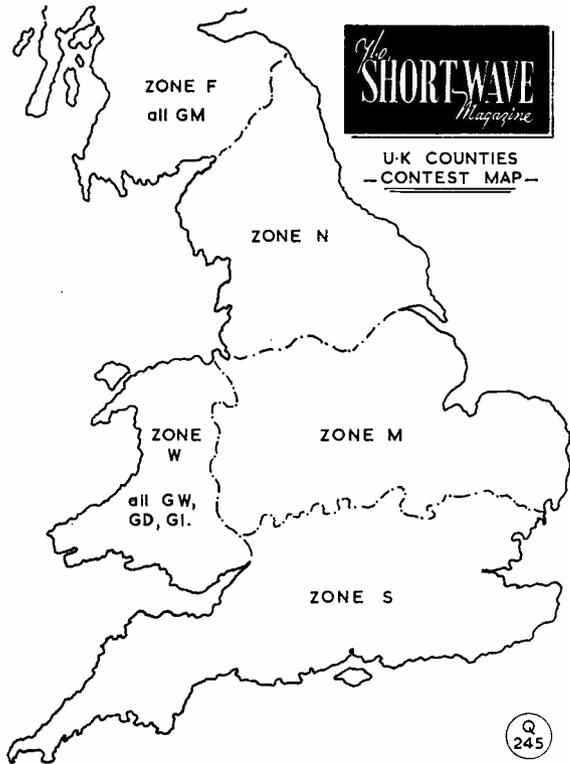
- Zone F (Far North):** All GM counties.
- Zone N (Northern):** Northumberland, Durham, Cumberland, Westmorland, Lancashire, Yorkshire.
- Zone M (Midland):** Cheshire, Derby, Shropshire, Stafford, Hereford, Worcester, Warwick, Nottingham, Lincoln, Leicester, Rutland, Northampton, Bedford, Huntingdon, Cambridge, Norfolk, Suffolk.
- Zone S (Southern):** Cornwall, Devon, Somerset, Dorset, Gloucester, Wilts., Berks., Hants., Oxford, Bucks., Herts., Middlesex, Surrey, Sussex, Kent, Essex, London.
- Zone W (Western):** All GW and GI counties and GD (Isle of Man). GW includes Monmouth.

Scoring:

- Contacts between Zones S and M, 4 points.
- " " " S and W, 5 "
- " " " S and N, 5 "
- " " " S and F, 10 "
- " " " M and W, 4 "
- " " " M and N, 4 "
- " " " M and F, 8 "
- " " " N and F, 6 "
- " " " N and W, 5 "
- " " " W and F, 8 "
- Contacts within one's own Zone count 3 points.
- Contacts with non-Club stations, in any Zone, count 1 point.

Examples:

Scarborough works *Medway*: Scarborough signs N69, Medway signs S46, both claim 5 points . . . *Aberdeen* works *Port Talbot*: Aberdeen signs F01, Port Talbot signs W55, both claim 8 points . . . *Reigate* works *Leicester*: Reigate signs S63, Leicester signs M42, both claim 4 points. In all QSO's, the Zone letter precedes the Club number, following the RST group, e.g. "579 M42" or "569 F43".



IDENTIFICATION NUMBERS FOR CLUBS IN "MCC"

- | | | | |
|---|--------------------------|---------------------------|----------------------------------|
| 01 Aberdeen | 24 Derby | 51 Nottingham | 72 South Manchester |
| 02 Acton-Brentford and Chiswick, London | 25 Dursley, Glos. | 52 Norwich | 73 South Shields |
| 03 Ainsdale, Lancs. | 26 East Kent | 53 Overstone, Northants. | 74 STC, Harlow |
| 04 Aldershot | 27 Edgware | 54 Plymouth | 75 Stevenage |
| 05 Albright & Wilson (Birmingham) | 28 Exeter | 55 Port Talbot, Glam. | 76 Stoke-on-Trent |
| 06 ATC (Staffs. Wing) | 29 GEC Research, Wembley | 56 Painton (Northants) | 77 Stourbridge |
| 07 Bailleul, Hants. | 30 Grafton | 57 Preston | 78 Surrey (Croydon) |
| 08 Barnet | 31 Gravesend | 58 Purley | 79 Sutton and Cheam |
| 09 Blackpool | 32 Greenford | 59 RAF Watton | 80 Thanet |
| 10 Blackwood, Mon. | 33 Grimsby | 60 RAF Little Rissington | 81 Torbay |
| 11 Bradford Grammar School | 34 Guildford | 61 RAFARS, Locking | 82 University of Durham |
| 12 Brentwood | 35 Hallamshire, Yorks. | 62 Ravensbourne, Kent | 83 Wanstead and Woodford, London |
| 13 British Timken (Northants.) | 36 Harlow | 63 Reigate | 84 Wellingborough |
| 14 Burnham, Somerset | 37 Harwell (AERE) | 64 Rotherham | 85 Wirral, Cheshire |
| 15 Bury | 38 Harrow | 65 Rugby | 86 Wolverhampton |
| 16 Cheltenham | 39 Hartlepoons | 66 St. Benedict's, London | 87 Wolverton, Bucks. |
| 17 Chester | 40 Kingston | 67 Salisbury | 88 Dollis Hill |
| 18 City and Guilds, London | 41 Leeds University | 68 Scunthorpe | 89 92nd Sig. Regt., Forfar |
| 19 Clifton (London) | 42 Leicester | 69 Scarborough | 90 Radio Club of Scotland |
| 20 Cornish | 43 Leven, Birme | 70 Sheffield | 91 K.W. Radio Club |
| 21 Coventry | 44 Liverpool | 71 South Birmingham | |
| 22 Crawley | 45 Macclesfield | | |
| 23 Danbury, Essex | 46 Medway | | |
| | 47 Mitcham | | |
| | 48 Morecambe | | |
| | 49 Newbury | | |
| | 50 North Kent | | |

Note: This list includes all the Clubs participating in "MCC" for the last three years. Other Clubs desiring to enter for this year's event should write in for a serial number, enclosing a stamped addressed envelope, before October 12, for publication next month. Letters should be addressed "MCC," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

Yeovil, whose present premises are to be demolished, have found a new clubroom at the area Youth Centre, Park Lodge, and will be moving there shortly. It is hoped that G3CMH will be taking the air more frequently after the move. Recent events have been a talk on the Army Wireless Emergency Reserve (G3OMH); a visit by DL4FX and DL4SF, with tales of their experiences in the U.S.A., Germany and Monaco; and a colour film of Longleat.

At North Notts they had their AGM on September 6, when G8ON was elected president, G3OZN hon. secretary, G3OZO treasurer, and G3NHE to a post described as "organiser"; an SWL member was also co-opted on to the committee. The financial statement for the year shows a comfortable balance in hand, and the Club has recently acquired its own call, G3RCW, active on Top Band. The general feeling at North Notts is of progress, enthusiasm and a well-planned programme in the hands of a competent committee.

SCOUT RADIO-JAMBOREE STATIONS

In connection with the Scout Jamboree-on-the-Air, October 20-21, a number of Scout groups will be operating, or participating in the operation of, amateur stations laid on for the occasion. The hope and the intention is world-wide communication between Scout formations and with the Hq. station VE3WSB, Ottawa, Canada. As the primary object is to make Scout QSO's—the event is *not* a contest, and no prizes are given—most stations will use all bands, including Top and two metres. The general call "CQ

Jamboree" will be used, and GB3BPH (the London Hq. station, at Baden-Powell House, Queensgate, S.W.7) will start the proceedings at midnight on October 20 with a call on 80 metres, and will remain on the air for the 48 hours thereafter.

Following are some of the other U.K. stations taking part:

GB3GBS, Great Yarmouth: Arranged by the Yarmouth and District Amateur Radio Club, for the 10th Great Yarmouth Scouts, and operated from the Scout Hq. All bands 10-80m. will be tried, a special QSL card is being issued, and the address for confirmations is: P. J. Wright, 10 Avenue Road, Gorleston, Great Yarmouth, Norfolk.

GB3HAR, Ilford, Essex: On behalf of the Ilford East Scout group, established at the Hargreaves camp site, working AM/CW on 15-80m., QSL address: H. L. Braham, G3OJS, 25 Chiltern Road, Newbury Park, Ilford, Essex.

GB3RES, Eltham, London: Operated by the Cray Valley Amateur Radio Society for the Royal Eltham Scouts, using all bands 10-160m., and two metres. QSL address: S. W. Coursey, 49 Dulverton Road, London, S.E.9.

GB3RSS, Brighouse, Yorks: Operated by the 1st Rastrick Scouts Amateur Radio Club, under senior scoutmaster F. D. Walker, G3JWN, assisted by G3MMK and G3HPD, running all bands 15-160m., AM/SSB, and in continuous operation for the 48 hours. Address for QSL's: M. Firth, G3MMK, 48 East Street, Lightcliffe, Halifax, Yorkshire.

SHORT WAVE (HULL) RADIO

G5GX

NEW EQUIPMENT

	£	s.	d.
NATIONAL NC 190X. General coverage ...	113	4	0
NATIONAL NC 155. Amateur Bands 80 to 6 ...	106	17	6
NATIONAL NC 109. General coverage ...	63	6	0
NATIONAL NC 60. General coverage ...	32	7	8
EDDYSTONE 940 ...	125	0	0
EDDYSTONE 840C ...	58	0	0
EDDYSTONE 870A ...	33	0	0

	£	s.	d.
HALLICRAFTERS S120 ...	35	0	0
HALLICRAFTERS SX140 ...	44	10	0
HALLICRAFTERS SX140 KIT ...	37	10	0
HALLICRAFTERS HT40 TX KIT ...	32	0	0
K.W. VANGUARD ...	70	7	0
K.W. VICEROY MARK III with extra filter ...	150	0	0
MOSLEY CMI. Amateur Bands ...	86	0	0
HY GAIN. 10 element 2 metre beams 13.4 DB Gain ...	6	5	0

SECONDHAND EQUIPMENT

HALLICRAFTERS HT 33A. Linear PA. Up to 1 kW.	250	0	0
HALLICRAFTERS HT 37. SSB TX. 80, 40, 20, 15, 10	175	0	0
HALLICRAFTERS SKY CHALLENGER ...	9	19	6
NATIONAL HRO 60 ...	135	0	0
NATIONAL NC 109. General coverage plus Amateur bandspread, complete with Xtal. Cal. ...	84	0	0
NATIONAL NC 188. General coverage plus Amateur bands ...	59	0	0
HEATHKIT 3" SCOPE ...	20	0	0
HEATHKIT ARR. Short Wave Receiver ...	13	10	0
MINIMITTER MR 44 ...	39	0	0
MINIMITTER AMATEUR BAND CONVERTER ...	12	0	0
MINIMITTER PA. Pair TT21's ...	12	0	0
PANDA PR 120. TX ...	65	0	0
GELOSO VIBRATOR UNIT. For Tape Recorders. 110v. output ...	10	0	0
EDDYSTONE 888A. With S meter and speaker ...	85	0	0
EDDYSTONE 888A ...	75	0	0

EDDYSTONE 840C ...	48	0	0
EDDYSTONE 840A ...	38	0	0
EDDYSTONE. 6v. Vibrator Unit. 640, 740, etc. ...	5	0	0
EDDYSTONE 358X. Power Unit ...	3	0	0
G.E.C. BRT 400. Immaculate ...	85	0	0
R.C.A. AR88D. New Condition ...	75	0	0
R.C.A. AR88D ...	40	0	0
TIGER 200 TX ...	75	0	0
LABGEAR TOP BAND TX ...	17	10	0
BEE NBFM ADAPTOR. For TX ...	1	10	0
STELLA FOUR TRACK TAPE RECORDER ...	29	0	0
G4ZU BIRD CAGE AERIAL for 20 and 15 ...	12	0	0
MOSLEY TA 32 JUNIOR. 2 Element Beam for 20, 15 and 10 ...	12	0	0
AERIAL ASSEMBLIES. 10 Rods of 10' to 3' with base in box ...	3	10	0
R.S.G.B. HANDBOOK ...	1	14	0

FULL RANGE OF ARMSTRONG CHASSIS ALWAYS IN STOCK

GELOSO VFO's, MICROPHONES, MOSLEY BEAM AERIALS ALWAYS IN STOCK

30-32 PRINCES AVENUE, HULL

Carriage extra on all above items

Tel. 408953

Your enquiries are welcome

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

9d. per word, minimum charge 12/-. No series discount: all charges payable with order. Insertions of radio interest only accepted. Add 25% for Bold Face (Heavy Type). No responsibility accepted for errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1

TRADE

CALL SIGN NAME PLATES, white letters engraved in Black Polished Lampac, 6in. x 2in., on free standing base. A "must" for every Amateur Station, price 8s. 9d., post free.—Wilson, 63 Jacey Road, Shirley, Warwicks.

"COMMUNICATOR" 2- or 4-metre Mobile Tx/Rx's for 12v. operation, £90 complete. "Telecomm" tunable 13 valve VHF Rx's, 78-175 mc or 96-230 mc, limited quantity available, £100.—R.E.E. Telecommunications, Ltd., Crewkerne, Somerset.

BINOCULARS AND PERISCOPES wanted in exchange for Radio equipment.—Details to Busfield's, Astro-Marine Sales, 45/47 Eastborough, Scarborough, Yorkshire.

WANTED FOR CASH: Good clean communications receivers and SSB equipment. Please state price. — Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. (Tel. 18953.)

QSL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

QSL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST. PROMPT DELIVERY. SAMPLES. — ATKINSON BROS., PRINTERS, LOOE, CORNWALL.

WEBB'S LOG BOOK for recording signals heard and worked; 112 pages 9½ in. x 8 in., approved format, semi-stiff covers. Excellent value; 6s. 0d. post free, or callers 5s. 4d.—Webb's Radio, 14 Soho Street, London, W.1.

QSL CARDS: Buff, blue, pink, green, 100, 14s. 6d.; 250, 23s.; 500, 40s.; 1,000, 75s.—Samples (s.a.e.): Reilly, Panxworth, Norwich, 56.Z.

RADIO AMATEUR COURSE.—A postal course for those wishing to take the Amateur Examination. A sound basic training in radio communication. Very reasonable terms. Send for brochure.—Premier School of Radio, BCM/Wireless, London, W.C.1.

WANTED FOR CASH: All types of radio equipment. — Details of Busfield's, Astro-Marine Sales, 45/47 Eastborough, Scarborough, Yorkshire.

MOHICAN HF Communications Receiver, excellent condition, £35. Communicator 4-metre Mobile Tx/Rx, good condition, £40. Marconi VHF Walkie-Talkie, converted for use on 4-metre amateur band, £40.—Box No. 2670, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

NECKTIES featuring your own Call Sign actually woven into the Tie in Gold or White on either Navy, Black, Wine or Green background. Minimum of two Ties in same colour at 31s. 6d. per pair post paid. Cash with order to Macaseta Ltd., Goodall Street, Macclesfield, Cheshire.

THE BEST FOR V.H.F.

CONVERTERS :

TRANSISTOR 2 METRE CONVERTER. Uses AFZ12 and OC170 Transistors. I.F. 24-26 mc/s. Noise factor 3db. Power supply 6.3v. A.C. or 12v. D.C. £11/10/-, plus 3/- P.P.

NUVISTOR 2 METRE CONVERTER. Over 60 sold. Two 6CW4 Nuvistors. Noise factor 2.9db. £11/10/-, plus 4/- P.P.

70 cm CONVERTER. High gain. Noise factor 6db. £16/10/-, plus 4/- P.P.

TRANSMITTERS :

TR2M QRO 2 Metre Transmitter. 100 watts input on 5 switched crystals. KT 88 Modulators. Gives you a signal with punch. **80 guineas.**

TR2P QRP 2 Metre Transmitter. 15 watts input. Crystal controlled. 6BW6 Modulators. **26 guineas.**
TR2P Mains PSU, 14 guineas.

NEW NEW NEW

THE IDEAL FOR MOBILE WORKING

A Transistor Converter to work into a Car Radio. Covers 160 and 80 Metres, I.F. output 600-900 kc/s. High gain. Low noise. Size: 5" by 3" by 4" including battery. £9/5/-, plus 3/- P.P.

Send S.A.E. to:—

TIGER RADIO LTD.

36A, KIMBERLEY ROAD, SOUTHBOURNE,
BOURNEMOUTH, HANTS.

Telephone: Bournemouth 48792.

G4GZ's BARGAINS

VALVES: EA50, EF50, 1/6. 6H6M, EB34, 6K7G, 2/-, 2X2, 6B8G, 12SC7M, EF36, EF50(S), 2/6. 6AL5, 6AM6, ARP12, AR8, EAC91, EB91, EF91, EL32, TT11, VP23, Z77, 3/-, 1L4, 6C4, 6J6, EF39, 3/6. 6AC7M, 6SN7GT, 1626, 1629, DC70, DF73, DL70, 4/-, 6AK5, 6J7G, 6ST7M, 12A6M, 12K7G, 12Q7G, 12S17M, 35Z4G, 959, EBC33, 5/-, 3Q4, 6BH6, 6BJ6, 6F6M, 6K8G, 6S17M, 6SL7GT, 6X4, 5/6. 1S5, 1R5, 6AU6, 6/-, 12AU7, 12AT7, 80, KT33C, ECC81, ECC82, PY80, 6/6. 12AT6, 6L6G, 6V6G, 12AU6, 12BE6, 12C8M, 42, GT1C, PCF82, PY83, VR150/30, 7/6. 2A3, 6L7M, 12SQ7M, ECC84, EBF80, 8/6. 3A5, 6K8M, 6L6M, PCC85, 9/-, 50L6GT, EM80, 5R4GY, 6Q7GT, EL84, 9/6. 12K8M, 836, EABC80, EC80, GZ32, VLS631, DET24, 10/-, 5763, 446A, ECH42, 10/6. 805, 3E29 (829B) 25/-, 4E27 (HK257B) 40/-.

Post/packing 6d. per valve. Free over £3.

SPECIAL QUANTITY OFFERS !!!

EC80 (GGT, 12 m/a pv), 3 for 20/- (P/P 1/6); £25 per 100. 446A, 3 for 20/- (P/P 1/6); £25 per 100. EF91, EB91, 6AM6, 15/- doz. (P/P 2/6); £5 per 100.

AR88 cer. tub. trimmers, 4 for 6/-, AR88 smoothing chokes, 3 for 21/-; 65/- doz. ET4336 Transformers, 190-250v. input, 10v. CT 10A, 2½v. CT 10A twice, 35/- each; £16 per doz. Potted U.S.A. xfms. 230v. input; 32, 34, 36v. 2A output, 17/6.

MC METERS: 3½" rd.fl. (2½" dial) 0-500 m/a, 16/6; £7 per doz. 0-15v. AC (MI Cal. at 50 cps.), 16/6 each; £7 per doz. 2½" rd.fl. (2" dial) 0-1 m/a, 22/6. 2" rd.fl. 0-500µ amps, 17/6. 0-30 m/a (5 m/a basic), 10/6. 2½" rd. plug-in electrostatic 0-1500v., 19/6 each; £8 per doz.

B9A moulded valveholders and cans, 11/6 doz.; 75/- gross. Micalex ditto, 13/6 doz.; 90/- gross.

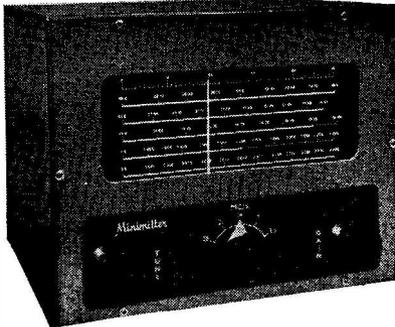
GEC Pyranol 10 mfd. 2Kv. condensers, oil filled, 27/6 each. 25 pfd. ceramic air spaced trimmers, 3 for 5/-; 17/- doz.

also

EDDYSTONE RECEIVERS — FERROGRAPH TAPE RECORDERS — LEAK — QUAD — GOODMAN'S — WHARFEDALE, ETC. HI-FI EQUIPMENT. FINEST SELECTION IN THE COUNTY.

JOHN ANGLIN

385, CLEETHORPE ROAD, GRIMSBY, LINCS. Tel. 56315

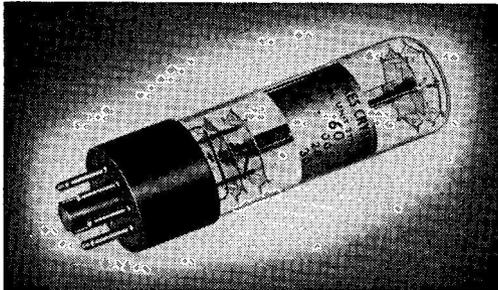
MINIMITTER**The World Famous Converters**

These compact, self-contained Units will transform any receiver capable of tuning to 1.5 mc/s. (200 Metres) into a high performance Double Superhet for the Amateur Bands. Fixed or Mobile operation.

Two Models are available:		£	s.	d.
The Amateur Band Converter.	5 Bands...	17	0	0
The MC.8. Converter	8 Bands...	20	0	0
Minimitter F.B.5 Ferrite Loaded All-Band Antenna		5	0	0
Double Stack of above.	12DB gain	9	10	0
The Minibeam 10/15 G4ZU Antenna		16	10	0
The "X20" 20 Metre. G4ZU Antenna		10	0	0
34 foot Telescopic Mast with all fittings		10	0	0
The MR44/II Communications Receiver		65	0	0
MINIMITTER Mobile Transmitter. 20 watts		16	10	0
Transistor Power Supplies		11	11	0
Mobile Whip Antennas 160-80-40 Metres		6	0	0

For full details of any of the above, please send S.A.E. to:—

THE MINIMITTER Co. Ltd. 37 DOLLIS HILL AVENUE,
LONDON, N.W.2. Tel: MAIda Vale 5588

BROOKES Crystals

mean DEPENDABLE
frequency control

● Illustrated above is a Type OB Crystal unit with a frequency range of 50-110 kc/s. Frequency Tolerance $\pm .005\%$ of nominal at 20°C.

ALL Brook's Crystals are made to exacting standards and close tolerances. They are available with a variety of bases and in a wide range of frequencies. There is a Brook's Crystal to suit your purpose—let us have your enquiry now.



BROOKES CRYSTALS (1961) LTD.

Suppliers to Ministry of Supply, Home Office, BBC, etc.

CORNHILL FACTORY, ILMINSTER, SOMERSET

Tel.: Iminster 2402

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-. payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

TR300 Tiger Radio Transmitter, all bands, impressive DX, TVI proof, as new. In store, 20 spare valves, sacrifice, £87 o.n.o.?—Details Box No. 2688, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Panda Explorer, LPF, mic., £40 o.n.o.? **HRO-MX GC** and three BS coils, PU, £15. Offers Heathkit Mohican Rx, new, £35 o.n.o.?—Box No. 2689, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: KW Vanguard 10-160m., with ATU, LP Filter, set valves including 6146, as new, £40. Gelson 209R 10/160m. negative bias muting, unmodified, mint, £45; both money back guarantee.—Box No. 2690, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Dynamotor 12v. 10A. to 300v. 215 mA., £1. Valves, new, plus bases, 3/813, £1 each; 3/836, 15s. each. RF-27 minus dial, 12s. 6d. — Burton, 47 Bede Street, Sunderland, Co. Durham.

SALE: Erskine Laboratories Type 13A Oscilloscope, £30 o.n.o.? R.1392D with power unit Type 3 (two meters), £6 together. Xtal Cal. No. 10, mod. for 90v. and 3v. working with special pulsing neon for modulation, £5. Homelab No. 10 signal generator, 100 kc to 100 mc, £4. Tape Recorder, good working condition, £5. All items excellent condition. — A. Hardwick, 44 Station Road, Woodville, Burton-on-Trent, Staffs.

WANTED: HRO Senior in good unmodified condition, reasonable. Also 2m. converter.—Hely, 25 High Street, Olney, N. Bucks.

WANTED (buy or borrow): *Short Wave Magazine* Oct. '57, April, '60. — Nichols, Roquebrune, Carlton Road, South Godstone, Surrey.

BENDIX RA1B Receiver with Eddystone PSU and matching loudspeaker, complete coverage 150 kc to 15 mc, converter for 15 and 10, £10. Unmodified brand new BC-453 (Q'5er), but less BFO coil and baseplate, £3 (would exchange for MW version).—G3KNB, 8 Oak Avenue, Walton Heights, Stafford.

CENTRAL ELECTRONICS Multiphase RF Analyser Model MM1, £12. Vacuum tube volt meter, £12. Heathkit grid dip meter, £5. Antenna impedance meter, £1 10s. BC-221 frequency meter, £8. Variac transformer, £2 10s. 20m. SSB transmitter and receiver in one cabinet, with mains power supply, can be used mobile, £15. Kit of parts for W2EWL transmitter with BC-458, all ready for assembly, £7 10s. Several partially built 80m. and other frequency SSB transmitters, £5. Dow coax relay 110v. AC, £2. G.R. precision standard condenser, £1 10s. Number of Command receivers, transmitters and modulators, £1 10s. Add carriage to above. — G2MF, 51 Townhead Road, Dore, Sheffield.

WANTED: Power Supply Unit, output HT 300v. at 60 mA, LT 12.5v. at 1.7 amp., must be in good working order.—S. Jesson, 181 Kings Acre Road, Hereford.

SALE: Receiver HRO-MX with full set of plug-in units, power supply and speaker, in good condition, £15.—Write R. Gagne, 5 Arcadian Gardens, London N.22.

SMALL ADVERTISEMENTS, READERS—continued

£2.10 offered for ARC1 manual, also many others wanted W.H.Y.? For sale TR-1920, 115-145 mc VHF Tx/Rx; TR-1985; both complete, offers? Valves 12AT7, 3A4, 3s.; IT4, IL4, 6AM6, EY91, 6C4, 6AQ4, 6AM5, 2s. 6d. Crystals mounted in miniature B7G bulbs, freq. between 10058.3 and 10391.6 kc in steps of 33.3 kc, 3s.; please give second choice. Would exchange for 10X, 10XJ, FT-243 type crystals. — Clarke, 29 Leighmohr Avenue, Ballymena, Antrim, N. Ireland.

TOWER STEEL, self-supporting, telescoping, crank T up and down and tilt over, 50 feet high, complete with ground post and two winches. Hot dip galvanized, brand new, can be seen working, £120.—G3BXI, Farlow, 49 Mount Pleasant Road, Chigwell, Essex. (HAI 4546.)

SALE: KW Converter; HRO-MX, 9 coil sets, PSU, speaker, £30 complete.—Wilson, Orchard House, Sutton Green, Guildford. (Guildford 5783.)

WANTED URGENTLY: Coils for National WRAS 5, 3.5 to 7 mc. Also handbook or data.—Eastbourne Sea Cadets, 231 Southbourne Road, Eastbourne.

100W. 5-band Tx (Geloso 4/102-TT21) with modulator and power supplies, £30. 160-metre Tx with modulator, £6. Cowl gill motor, £2. Wyndors Viscount Tape Recorder, £25. Lots of other gear, valves, magazines, etc. Send s.a.e. for list. — Richardson, 170 Orchard Way, Croydon, Surrey.

FOR SALE: Heathkit DX-40U with VF1U VFO. Professionally wired, air test if required, £40 o.n.o.? Matched pair 46 Sets with 80-metre crystals, working, £9 o.n.o.? Delivered London Region. Wanted: UL output transformer for pair of EL34's, 15 ohms, please state price.—D. Fernie, 261 Brooklands Road, Weybridge, Surrey.

FOR SALE: KW Valiant 10-80m. CW, plus phone parts and two power packs, £25. After 6 p.m.—G3OZU, 8 Brewery Road, London, S.E.18.

FOR SALE or exchange: CKB74028 Het. Freq. meter, 125 kc to 20 mc, brand new (part of LM-14 equipment). **WANTED**: HRO or BC-348 or similar.—Box No. 2691, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Geloso Amateur Band converter, in very good working order, £12.—A. J. Martin, East Road Down, Gomshall, Guildford, Surrey. (Shere 2361.)

FOR SALE: Signal generators, TF144; one for £20 and one for £25. Offers considered.—Box No. 2692, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Receivers Hallicrafters SX-24, £16; S-27, £27, with manuals. Also 35ft. steel tower with telescopic top section, fittings, and rotary control included, £25. Will part exchange any of above for AR88D and/or K.W. Vanguard.—Frost, 64 Lucas Avenue, Harrow, Middx.

SALE: Surplus to requirements, manufactured Geloso G212TR transmitter, TVI-proof, CW/Phone, cost £75, nearest £40, mint condition. UM3 mod. transformer, £3 10s.—G5KS, Bevington, 42 Bloxidge Street, Langley, Birmingham.

R. 107, excellent performance and appearance, re-aligned, S-meter, 15m. xtal converter, regret unable to deliver, £11. — G3OFS, QTHR (Tel.: Aldershot 21871.)

WANTED: Eddystone 680X; valve tester, signal generator, oscilloscope, full particulars, please.—Heath, 235 Thorne Road, Doncaster.

G. W. M. RADIO LTD.

ALL ITEMS in last month's advertisement available

RECEIVERS, CANADIAN, type 52. 1.75 to 16 mc/s. in 3 bands 1 R.F., 2 I.F. stages. 10 valves plus 3 valve crystal calibrator, 10, 100, 1,000 kc/s. Oscillator has separate vernier control for accurate frequency setting. Crash limiter, broad/sharp selectivity. 500 mic./amp. valve check and signal level meter. 3" speaker, phone jack. Power required 150 volts H.T., 12 volts L.T. Receiver in steel cabinet with installation kit for 230v. a.c. mains or 12v. d.c. supplies comprising power unit ZE12, connecting cables and spares, etc., £10/10/-, carriage paid.

ALSO, set only in cabinet, £6, carriage £1; or less cabinet £5/10/-, carriage £1. Installation kit only £4/10/-, carriage 10/-.

CO-AXIAL AERIAL FILTERS, for fitting in transmitter output co-ax to cut out all r.f. at higher frequency than 30 mc/s. Type AP56152, 30 mc/s. Low pass. Just the thing for cutting out television interference, 9/-, post 1/6.

RECEIVERS. 68 set. 3 to 6 mc/s. fair condition, 27/6, post 2/6, also American 48 set. 6 to 9 mc/s., 42/6 as new, post 1/6. CR100/B28 good condition, tested before dispatch, £17/10/-, carriage £1.

VALVES. Ex good condition equipment, guaranteed. 6V6, EL32 at 1/6. AR8, ARP12, ATP4 at 1/-, post 9d. singly, dozen free; also 38 set valve kit in steel box, 3 ARP12, 1 ATP4, 3/-, post 2/-.

BSR AUDIO OSCILLATORS, type LO50, good condition, £7/10/-, carriage 15/-.

METERS, 500 mic./amp. scaled 0-15, 0-600 volts, ex 22 set, tested and guaranteed, 8/6, post 1/6.

TOGGLE SWITCHES, ex equipment 1 pole C.O., 1/-, post 3d. **22 SET VIBRATOR POWER PACK**, 12 volts in, 300 volts d.c. at 80 m/a. out, 10/-, carriage 5/-.

AERIAL INSULATORS, ribbed Pyrex glass, 3", 9d. each, post 1/-, 6 or more free.

AERIALS, 8ft. collapsible in two wired sections, 12" when folded, 6/-, post 1/-, Headset rubber covered with lapel mike, low impedance, 6/-, post 2/-.

SILICON RECTIFIERS. 420 peak a.c. at 200 m/a. two of these will suffice for 250v. d.c. at 200 m/a. supply, guaranteed, 2/-, post 6d.

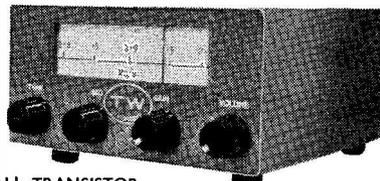
HEADPHONES, type CLR or DLR, low resistance, 6/6, post 1/-.

All equipment offered is complete but not tested unless otherwise stated. Carriage charges are for Mainland only.

Terms: Cash with order. Early closing Wednesday.

40-42 PORTLAND RD., WORTHING, SUSSEX

IT'S TW IT'S TRANSISTOR IT'S THE "TOPMOBILE"



19
gns.

- ALL TRANSISTOR
- FULLY BANDSPREAD 1.8-2.0 mc/s.
- SENSITIVITY 1 μ V FOR FULL PHONE OUTPUT
- REALLY EFFICIENT NOISE LIMITER AND B.F.O.
- V.H.F. TRANSISTORS UP TO THE 2nd DETECTOR
- FULL 1 WATT OF AUDIO
- SIZE 6" WIDE, 2 $\frac{3}{4}$ " HIGH AND 6" DEEP

ALSO AVAILABLE FOR 2 METRES:—

TW-2 10W TX, complete with modulator ... 23 gns.

TW NUVISTOR CONVERTER (you choose I.F.) 11 gns.
with Built-in P.S.U. ... £15

TW MAINS P.S.U. control unit (all supplies necessary for TW-2 and Converter) ... 13 gns.

TW MOBILE P.S.U. control unit, 12v. ... 13 gns.

TW 2m. EXCITER, 10w. add P.A. or 70 cm stage ... 10 gns.

TW HALO AERIAL. Easily mounted ... £2. 17. 6

For full details write to:—

T. WITHERS (Electronics)
15b GILBERT STREET, ENFIELD, MIDDX.
G3HGE Tel.: Waltham Cross 26638 G3HGE

We have solved your **ANTENNA** PROBLEM!

Are you a flat dweller, or do you live in a city centre with no space for antennas? With the "JOYSTICK" for 6 bands, INDOORS or outdoors, for mobile, boat, tent, caravan, field day, DX-peditions, etc. THIS... is the ANTENNA YOU'VE BEEN LOOKING FOR!! BE ON THE AIR IN SECONDS WITH THE MOST VERSATILE AND COMPACT 6 BAND ANTENNA IN THE WORLD!!!

- Works ALL BANDS, 160, 80, 40, 20, 15, 10 metres, used INDOORS or outdoors.
- Overall length 7ft. 6in. (4ft. 4in. collapsed for travel).
- Short feeder (supplied).
- No traps, radials, co-ax or other gadgets.
- Comes apart in seconds. Assembled and on the air in seconds.
- NO COILS TO CHANGE.
- Omni-directional radiation.
- THE IDEAL RECEIVING ANTENNA.

Fantastic performance figures on request, e.g., VQ9A and JAs on 15m. by G3NFV ("JOYSTICK" INSIDE BUNGALOW); 5 and 8/9 report from GM2CPC on 40m. by GB3WRC using "JOYSTICK" standing on ground; Regular 5 and 9 reports received by G3HVI running 5 watts on 80m. with an INDOOR "JOYSTICK"; G3BKT exchanged 579 with OK1ZC on 160m. and gets excellent reports on 80 CW with 4 watts (all with an INDOOR "JOYSTICK"). Detailed additional reports available on request.

PRICE: £3/10/-, or £4/10/- for De-luxe model with all copper RF elements. Carriage and packing FREE by passenger train Great Britain and N. Ireland.

PARTRIDGE ELECTRONICS LTD 17 Ethel Road BROADSTAIRS Kent
Telephone: THANET 62839

G2ACC offers you . . .

POPULAR CATALOGUE ITEMS

Transmitting Valves: G.E.C. TT21, 33/9; Mullard QV06-20(6146), 40/-; QV04-7, 25/-; 5763, 20/-; 5R4GY, 17/6. So-Rad Pi-net P.A. Choke: 150 watt r.f. input. Suitable for TT21, 813 or pair of 807's. QV06-20's, 6146's, etc. Single $\frac{3}{8}$ " dia. hole mounting with ceramic feed-through for h.t. lead below chassis, 10/-.

Eddystone Products: Diecast boxes: 650, $4\frac{1}{2}$ " x $3\frac{1}{2}$ " x 2", 9/4; 845, $7\frac{1}{2}$ " x $4\frac{1}{2}$ " x 2", 14/8; 896, $4\frac{1}{2}$ " x $2\frac{1}{2}$ " x 1", 6/8. All with lid. 898 100-1 Geared Slow-motion Drive for individual calibration for receivers, v.f.o.'s, etc., 71/4. Other components in stock.

Postage extra on orders under £3

Catalogue No. 12. 56 pages, illustrated on art paper. Over 2,000 new guaranteed items by best makers, 9d. post free (refunded on first order).

SOUTHERN RADIO & ELECTRICAL SUPPLIES

SO-RAD WORKS . REDLYNCH . SALISBURY . WILTS
Telephone: Downton 207

STILL AVAILABLE

The famous **DEPENDAPAC 12v.** Transistor Inverter — the only one of its kind on the world market giving maximum efficiency in the "Receive" as well as the "Transmit" position! Two built-in relays operate the two outputs of 250v. 100 ma and 500v. 220 ma.

150 WATTS OF TRANSISTORISED POWER

For only 21 Gns. Terms available.

A MUST for the keen mobile operator.

Other voltages made to special order —

Send for illustrated brochure to:

DEPENDABLE RELAY CO. LTD.
8a, Ainger Road, London N.W.1.
Telephone: Primrose 8161

SMALL ADVERTISEMENTS, READERS—continued

SELLING quantity valve cans suitable nine-pin miniatures, 1s. each. AR88D instructions, 25s. Handbooks CR-100, CR-300, 35s. each. Send unwritten P.O.—Box No. 2693, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE American Radio Magazines for *Radio Handbook* by Editors and Engineers, 11th, 12th, 13th Edition, 1 mA meter, RF27, sell valves 1s. to 5s.; s.a.e. list.—Bowers, 88 Grenfell Avenue, Saltash, Cornwall.

GOING QRT SALE: Tx LG50 with Labgear GLPF, hand xtal mike, £28. Rx Hallicrafters S-120 with step down trans., £15; both in new cond. *RSGB Handbook* 1961, new, 25s. Class-D W-meter, AC mains, 30s. Station Monitor 0-V-0 with p/pack, 10s. Young's absorption w/meter, 5s. Callers after 8.30 p.m., any time week-ends.—A. H. Parker, 59 Juniper House, Pomeray Street, New Cross, London, S.E.14.

FOR SALE: Large quantity wireless periodicals in excellent condition; must go, s.a.e. details. — Young, 1 Rugby Avenue, Neath, Glamorgan.

WANTED: *Who's Who in Amateur Radio* (USA, 1934); *Calling CQ* (DeSoto, 1941); *For Murder Will Speak* (Connington, 1942).—G3IDG, 96 George Street, Basingstoke, Hants.

TRANSISTOR 1 mc xtal calibrator, £2 10s. CR-100 spares kit, new, £3. Consider exchange W.H.Y.?—Bradley, 6 Linden Grove, Folkestone Street, Hull, E. Yorks.

SALE: 30-Lesson Amateur Radio Examination Course, complete with questions and answers, £3.—Box No. 2694, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELL: Eddystone S.640, S-meter, £20. Bendix STW12 Tx, £4. BC-221, no charts, £5. Offers considered.—Moulton, Oakwood, The Street, Wenhampton, Suffolk.

COMMAND Rx 1.5-3 mc, high and low impedance aerial inputs, LS output, BFO switch, AF gain control, 12-volt heaters, mint, £4. ZC1 Mk.II, xtal mike input, loudspeaker output, £5.—Bate, 63 Dosthill Road, Twogates, nr. Tamworth, Staffs.

WANTED: AR88D for spares, damaged one considered.—Beadle, 6 Chapel Row, Thearne, Beverley, E. Yorks.

MOHICAN, FB condition, £30, or PX on AR88D. —G3KPW, 3 Mayfield Villas, Moss Road, Askern, Doncaster, Yorks.

KW VALIANT Tx. 10-80m, 12-volt rotary, £25; K matching mobile Rx, £17 10s.; or £40 the pair. Table top Tx complete 10-80m. 60w. AM/CW, £15. UM2 £1 10s. Various transformers; s.a.e. for details.—Gay, 84 Bonner Road, London, E.2 (Phone: Advance 2896 evenings.)

SALE: Panda Cub Tx, FB cond., new PA and mod. S valves fitted, £30. Motor gen. 12v. in — 350v. 250 mA + 6 volts out, 50s. Power supply 500-1000v. 500 mA, £5. Slow Morse record, £1.—G3PYL, 9 Leslie Road, Sheffield, 6. (Phone: 345372.)

MAGAZINES AND BOOKLETS: 20 *Short Wave Magazines*, Jan. '61-Sept. '62, cost about £3, 25s. o.n.o.? 20 *Tape Recording Magazines*, May '61-Sept. '62, cost 30s., 15s. o.n.o.? Eight radio booklets (beginners), cost 28s., 15s. o.n.o.? Morse Key (British enclosed), 5s. Please add postage.—Taylor, 14a Trongate, Stonehouse, Lanarkshire.

WANTED: RCA AR88D, must be in good unmodified condition, can arrange collection.—F. S. Lee, 2 Arnworth Avenue, Fauvic, Grouville, Jersey, C.I.

SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: CR-100 with manual, working, £12, buyer collects. — G3PEK, 3 Moelfre Drive, Cheadle Hulme, Cheadle, Cheshire.

HRO JUNIOR RECEIVER, built-in crystal filter unit, PSU, speaker, coil container, 8 coils, covers 10-160m. amateur bands, coil socket stiff, excellent working condition, offers? — Taylor, 14a Trongate, Stonehouse, Lanarkshire.

FOR SALE: Tri-Band Quad, £10. Two transistorised DC Converters, 12-18v. in, 200-250v. out, 200 mA, £6 each.—G3LCS, *QTHR*.

PANORAMASCOPE SA-1 455 kc input, spare 5in. CRT, £18. *CQ* bound copies, 1954/5, 25s. each; 1956 2 vols., 32s. 6d.—Stevens, 51 Pettits Lane, Romford, Essex.

EXCHANGE Eddystone 680X with built-in xtal calibrator, mint condition, under two years old, for Eddystone 888A or Hammarlund HQ-110.—G3NQX, 1 Gib Lane, Hoghton, Nr. Preston, Lancs.

PHILIPS CAR RADIO, MW-LW, complete with speaker, 12 volt, £10. Power supply 350v. 250 mA, GZ32, 6-3v. 5v. 4v. LT, £2. Relay panel containing three relays, mains unit, £2. Minimitter amateur band converter, 1.5 mc. 1F, £10. *Principles Radar*, by Penrose, 25s.; *Newnes Radio Servicing*, Vol. one, 15s.; *Television Servicing*, Vol. two, 15s.; *Television Servicing*, Spreadbury, Vol. one, 12s. 6d., Vol. two, 12s. 6d. GEC pickup arm, weight gauge, £1. Carriage extra.—G3HJG, 17 Torbay Road, Urmston, Manchester.

HALLICRAFTERS Sky Champion Receiver with manual, in excellent order, 500 kc-45 mc, band-spread band-switch wafer sections renewed, silicon rectifiers, £22 10s. o.n.o.? Buyer collects.—Nichols, 8 Swanns Meadow, Great Bookham, Surrey.

WANTED: TCS Tx, with or without modifications.—Please send details to J. Connelly, 84 Crowlin Crescent, Glasgow, E.3.

WANTED: Modern Communication Receiver in exchange for Exakta Varex single lens reflex 35 mm. camera, fitted Pentaprism, F2 biotar close-up tubes, tripod, E.R. case filter, lens hood, cable release, excellent condition.—Apply Morrison, 47 Raymond Avenue, West Ealing, W.13.

AMERICAN ZENITH All-Transistor Trans- Oceanic 1000, 8-band, fair condition, £70 o.n.o.? —Box No. 2695, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

MINIMITTER MR44 converted to Mk. II by makers, need the cash, first £40 secures.—Woods, 531 Glasgow Road, Wishaw, Lanarkshire, Scotland.

SALE: Viceroy Mk. II complete, mint condition, few hours' use only, delivered London, Home Counties, £110 o.n.o.?—Box No. 2696, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

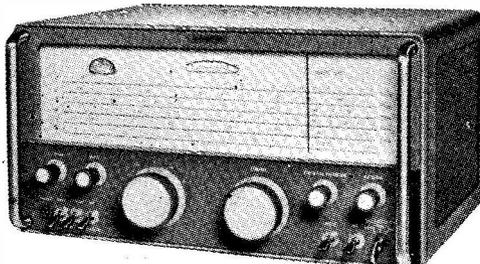
EXCHANGE BC-221 frequency meter, complete with individual calibration book, manual and p/pack, for receiver AR77E, HRO, SX-16, or W.H.Y.? —Healey, 169 Rushams Road, Horsham, Sussex.

AR 88LF, excellent condition, with manual and headphones, £30. Also all-wave signal generator, £8. Carriage arranged.—Blackwell, 40 Seymour Road, Chingford, London, E.4.

COLLINS 51-J-3/R-388/URR Receiver, with case, tools, manual; also AR88LF Receiver, 550 kc-32 mc, both mint.—Wright, 4A Nepal Avenue, Atherton, Manchester. (Tel. 991.)

FOR SALE: Spares for AR88D and AR88LF; send s.a.e. for list. BC-453, £5.—A. J. Reynolds, 139 Waller Road, New Cross, London, S.E.14. (Tel. New Cross 1443 after 7.30 p.m.)

HOME RADIO OF MITCHAM
FOR YOUR NEW
EDDYSTONE RECEIVER



- EDDYSTONE 870A ... £32. 2.0
- EDDYSTONE 840C ... £58. 0.0
- EDDYSTONE 940A ... £125. 0.0

Delivery from stock. Overseas shipping arranged

- WE ALSO STOCK:**
- HEATHKIT DX40 Transmitter Kit £33. 19. 0
 - HEATHKIT DX100 Transmitter Kit £74. 19. 0
 - HEATHKIT S.S.B. Adaptor Kit ... £39. 5. 0
 - HEATHKIT VFO and GDU Kits, etc.

- AERIALITE SPO80XU 8 element
2 metre Array £3. 19. 0
plus carriage 5/-

Dept. S., 187 London Road, Mitcham, Surrey. MIT 3282
Shop hours 9-6 p.m. (Weds. 1 p.m.)

THE SPOT **G3EKX** **THE SPOT**
DERBY Tel. 41361

- EDDYSTONE 940. De luxe finish £125
- EDDYSTONE 840C. Grey and chrome £58
- EDDYSTONE 870A in 3 colours, 5 w/band £33
- HALLICRAFTERS SX111. Brand new £120
- EDDYSTONE 888A with speaker. Mint £90
- EDDYSTONE 640. Very good condition £25
- CR100/B28. Grey. Good condition £22
- EDDYSTONE 870A. As new £24
- MOHICAN. Ready built. As new £35
- T.W. cascode CONVERTER. New. 28-30 m/cs. 1F. 11 gns. £39 10s.
- DARTRONIC 381. Oscilloscopes. New £39 10s.
- AR88D. Very good condition £40
- COLLINS TX. 80-10m. 6146 in O/P, T9X and very stable. Mint condition £45
- COMMANDER DOUBLE SUPERHET. General coverage and bandspread on Ham Bands. Very good condition. Tremendous performance £45
- DRAKE 2B. Complete. Mint condition £118
- AR88 CASES. New, grey and black crackle 89/6 ea. 10/6 carr.
- BIRKETT'S BETTER BEAMS. 8 element Yagi. Wide spaced for 2 metres, 59/- with 1" to 2 1/2" adjustable bracket. 5 element, 39/6. Add on 3 element for fitting to 5 element, 19/6. All plus 3/6 carriage.
- VIBRATOR 12v. SUPPLIES. Mint condition with spare vibrator and leads, in original packing, unopened, 25/- each, 7/6 carr. Don't miss this real bargain offer.
- AERIAL MAST KITS. NB48', £15; NB36', 12 gns.; NB24', 7 gns. 14 feet x 2" O/D Dural Masts, 63/9 each; 16 feet x 2" O/D, 75/- All plus carriage.

Many other Bargains in RX and TX's at The Spot
Send SAE with enquiries. Carriage extra. TX and RX's. Callers only. All on demonstration and tested before purchase.
Part Exchanges

NORMAN BIRKETT LTD
THE SPOT, 26 OSMASTON ROAD, DERBY

SMALL ADVERTISEMENTS, READERS—continued

WANTED National One-Ten Receiver VHF.—Davies, 35 Kensington Road, Stockton-on-Tees, Co. Durham.

EXCHANGE/SELL: BC-221 as new, for receiver, E S.640, SX-24, HRO, etc., W.H.Y. ?—G3LIN, 12 Woodwards Road, Daisy Hill, Westhoughton, Bolton. **£60** OFFERED for 680X, state date of purchase when new (Essex)—Box No. 2697, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: AR88D with speaker and phones. Perfect condition, £27. Buyer collects.—Dyer, 60 Gilbourne Road, Plumstead Common, London, S.E.18.

WANTED: AR88 gear train assemblies, please advise condition.—Box No. 2698, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: 30s. offered for U.S.A. Manual No. TM-11-2627 (for 1-177B tube-Tester).—M. Gee, 11 Whitehorse Lane, Stepney, London, E.1.

GOING TO CYPRUS SOON. Will exchange for best offer in Receiver or Transmitter a 19-valve commercial Hammobile Tx/Rx for 144 mc, Tx 15 watts, QQV03-20A in final, modulated by pair 6BW6's; Rx double super, AC and DC power supplies, mike, key, and Halo aerial. Would sell also to best offers, reply to—D. Tanner, 52 Waitworth Road, Catterick Camp, Yorks.

MANUALS AR88D 25s., R1475 30s. **WANTED**: M 888A, KW Converter, TW Nuvistor 2-metre converter, and AVO-8 Mk. II.—Details and price to Box No. 2699, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

CLEARING SHACK Heathkit DX-40U mint condition, works perfectly, £25. Companion VFO, mint, £10.

KW/GELOSO TUNER with power pack, 1.8-29.7 mc, high-gain low-noise, internal power supply, condition perfect, output 4.6 mc, £15.

MINIMITTER "MULTI-Q" adds high selectivity to older receivers without modification, internal power pack, hammer finish case, £5 10s.

R.C.A. AR77 in good clean working order, excellent bandspread, £20.

PROFESSIONALLY Built 813 200 watt transmitter, AM/NBFM, 80-10 metres, double Pi-circuitry, completely screened in 6 ft. cabinet, no TVI, worth £75, accept £25.

CRYSTAL CALIBRATOR No. 7 1000/100/10 kc, £3 10s. All above seen working at 45 Green Lane, Purley, Surrey (UPL 2896) or s.a.e. details. First offer secures, allow carriage.

ONE HEATHKIT "Warrior" completed and working but unused, input 240v.-50 c/s, £100. Two BC-453 units, £4 each. One BC-221 with power supply, £8. One HT supply 300v.-100 mA in grey metal case, 9 ins. x 7 ins. x 6 ins., £2 5s. One HT and LT supply unit for Tx and Rx, 400v. 200 mA 6.3v. 4A and 250v. 65 mA, 6.3v. at 3A in black metal case, £4 10s. 1BC-458 £2. 1TU9B case, 10s. One case, new, 10½ ins. x 7 ins. x 7 ins., in grey metal, £2. Cabinet 16 ins. x 11 ins. x 8 ins., new, in grey enamel, £3. New unused coils by Airdux and B & W, 3 ins. diam., 10 t.p.i. x 10 ins. to 1¼ ins. diam. x 4 t.p.i. x 10 ins., 12s. 6d. each. Two lengths of Perspex tube 12 ins. x 2 ins. and 12 ins. x 2½ ins., 5s. One Woden UM1 transformer, £2 10s. Two variable condensers, type 816, unused, 10s. 6d. each. One 12v. motor, 250v. 65 mA and 6.6v. 2.5a., £1. One PSU for Mk. 19 set, £2. Two 8 x 8 x 4 µF 650v., working, 5s. each.—Yates, 134 Whitliffe Lane, Ripon, Yorkshire.

SPECIAL AMATEUR LICENCE MORSE COURSE

THE NEW "RHYTHM" METHOD of teaching takes all the drudgery out of learning Morse. Passes secured in all cases, even after previous failures.

By using SPECIALLY prepared recordings students learn automatically and without effort, perfect Morse in half the time required by any other method. Please S.A.E. for booklet.

"ROBUCK" 3-speed Tape Recorders NOW IN STOCK
G3HSC, 45 GREEN LANE, PURLEY, SURREY

SOUTHERN RADIO SUPPLY LTD

11 LITTLE NEWPORT STREET
LONDON, W.C.2.

GER 6653

All goods still available as previously advertised

NYLON · P.T.F.E

ROD, BAR, SHEET, TUBE, STRIP, WIRE

No Quantity too Small

List on application

BRASS, COPPER, BRONZE,
ALUMINIUM, LIGHT ALLOYS

H. ROLLET & CO. LTD.

6, CHESHAM PLACE, LONDON, S.W.1

BELgravia 4300

Works: 36 ROSEBURY AVENUE, LONDON, E.C.1

Branches at LIVERPOOL, MANCHESTER, BIRMINGHAM, LEEDS

'STABQOIL'

(Registered Trade Mark)

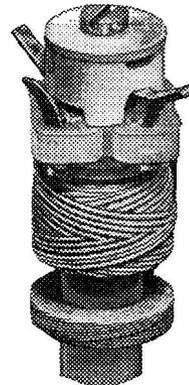
The only coil with a built-in adjustable capacity trimmer, plus

Meet Us on Stand 16

I.C. Exhibition

British & Foreign Patents

- ★ Temperature Compensation
- ★ Litz Wound LF Ranges
- ★ Silver Plated HF Ranges
- ★ Adjustable Ferrite Core
- ★ Exceptionally High 'Q'
- ★ Inductance from 1µH to 10mH
- ★ Easy Simple Fixing, etc.



1½ x full size.

Now there are over 150 different types, with more being constantly added. Ranges include GENERAL COVERAGE bands, plus all HAMBANDS BANDSPREADS, at either 470 Kc/s or 1.6 Mc/s I.F. In addition, we have a range of superb I.F. Xfrs for 85 Kc/s to 2.2 Mc/s, some being suitable for Xtal filter use. Other types include C.T. designs and low impedance output. Also special units with Built-in Audio and A.G.C. Diodes with all decoupling. Other products include 'Q' multiplier coils, I.F. whistle filters, R.F. chokes, and high stability oscillator units, suitable for conversion oscillators or BFO use. Send 3d. stamp for abridged details, or 1/4 for copy of our latest loose-leaf catalogue and technical data sheets, which also includes full information on our famous HAMBANDS, BANDSPREAD 'OILPAX' & 'GENERAL COVERAGE' front-end units. G2DAF Rx and Tx components, also all items for the G3BDQ and G3KWG Rx Designs, and many other unusual items.

ELECTRONIQUES

RADIO WORKS
FELIXSTOWE

(FELIXSTOWE) LTD

'PHONE: 4500

BRIDGE ROAD
SUFFOLK

EVERYTHING FOR THE ENTHUSIAST

AERIAL EQUIPMENT

TWIN FEEDER. 300 ohm twin ribbon feeder similar K25. 6d. per yard. K35B Telcon (round) 1/6 per yard. 750 ohm twin feeder 6d. per yard. Post on above feeders and cable, 1/6 any length.

COPPER WIRE, 14G, H/D, 140 ft., 17/- ; 70 ft., 8/6, post and packing 2/-. Other lengths pro rata.

RIBBED GLASS 3" AERIAL INSULATORS. 1/9 each, P. & P. 1/6 up to 12.

SHELL INSULATORS 2" 9d. each. P. & P. 2/- up to 12.

FEEDER SPREADERS. 6" Ceramic type F.S., 10d. each. Postage 1/6 up to 12.

CERAMIC CENTRE PIECE for dipoles, Type AT, 1/6 each, P. & P. 1/-.

2 METRE BEAM, 5 element W.S. Yagi. Complete in box with 1" to 2 1/2" masthead bracket. Price 49/- P. & P. 3/6.

SUPER AERIAL, 70/80 ohm coax, 300 watt very low loss, 1/8 per yard. P. & P. 2/-.

FOR THE DX ENTHUSIAST MOSLEY TRAP BEAMS

Vertical 3 Band V3 ... £7 10s.
3 Band 3EL Beam TA 33dr. £24 15s.
Also the **NEW Single Band Power Beams.** Send for details.
50 ohm, 300w. 1/2" coax Low loss. Ideal for Mosley and other beams, 1/9 per yd. P. & P. 2/-.



BAND CHECKER MONITOR

This new, sensitive, absorption wavemeter is fitted with a 0-500 microammeter and is also a most useful phone monitor. Covers 3.5-35 mc/s. in 3 switched bands.

A "MUST" AT ONLY 3 gns.

FOR THE MOBILEER

ROTARY TRANSFORMERS

12v. input 490v. 65 Ma. output 17/6 each, P. & P. 3/- 6v. in 250v., 125 Ma, only 17/6, P. & P. 3/-.

SHADED POLE MOTORS. 230v. or 110v. operation, ideal for fans, blowers or models. One only 12/6, P. & P. 2/- or pair 20/-, P. & P. 2/6.

FERRITE BEADS for the S Band Aerial, 50 for 15/- or 100 for 30/- post paid.

TOUGH POLYTHENE LINE. Type MLI (100 lbs.) 2d. per yard or 12/6 for 100 yards. Type ML2 (220 lbs.) 4d. per yard, or 25/- per 100 yards, post free.

Absorption Wavemeters. 3.00 to 35.00 Mc/s. in 3 Switched Bands. 3.5, 7, 14, 21 and 28 Mc/s. Ham Bands marked on scale. Complete with indicator bulb. A MUST for any Ham Shack. ONLY 22/6 EACH. Post free.

VARIABLE CONDENSERS. All brass with ceramic end plates and ball race bearings. 50pf, 5/9, 100-6/6, 160, 7/6, 240, 8/6 and 300pf, 9/6. Extension for ganging, P. & P. 1/-.

RACK MOUNTING PANELS: 19" x 5 1/2", 7", 8 1/2", or 10 1/2", black crackle finish, 5/9, 6/6, 7/6, 9/- respectively. P. & P. 2/-.

AMERICAN 807 VALVES. Ex. W.D., 7/6 each or 4 for 25/- P. & P. 2/-.

GELOSO VFO UNITS. 4/102 with new dial and escutcheon. Outputs on 80, 40, 20, 15 and 10. For 2-807 or 6146 Tubes. Only £8 5 0. 3 valves to suit, 24/- ALL POST FREE.

MIKE CABLE. 1st Grade, 9d. yd. plus postage.

12-CORE SCREENED CABLE. 2/- yd.

10-CORE (5 PAIRS) SCREENED CABLE, 1/8 yd. All wires. P. & P. 1/6.

* No C.O.D. on orders under £1. Please print name and address.

CHAS. H. YOUNG LTD.

Dept. 'S,' 110 Dale End, Birmingham. CENTRAL 1635

DO NOT DELAY

Special Summer Prices end on October 30th

Type TX	Power	List	S/Prices
T50S	50W	£66	£56/10/0
T50X	70W	£70	£60
T100S	100W	£80	£68/10/0
T100X	100W	£88	£75
T150S	150W	£100	£86
T150X	150W	£110	£94
T200S	200W	£125	£107
T200X	200W	£150	£125
T200/CW	200W	£100	£90

A Genuine 150W TX for ONLY £86

Olympic Z-Match Couplers £6/10/0

Special 250W Couplers £8/10/0

Olympic Dplxers ONLY 5/6 each

Olympic Alloy Masts and Mast Kits

Send 3d. stamp for leaflets to —

Olympic Works, Winton, Bournemouth

BRACKENSTAT POWER SUPPLIES

MODEL 12/30, designed specifically for mobile transmitters/receivers. Input 13v. D.C. Output 280v. at 100 M/A, D.C. PRICE: £8/16/- each.

MODEL 12/30/2. Input 13v. D.C. Output 280v. at 90 M/A and 140v. D.C. for supplying oscillator stabilisers, etc. PRICE £9/6/- each.

MODELS 12/30/GB and 12/30/2/GB as above but having an additional output of 20v. D.C. Negative for bias. PRICE £9/16/- and £10/16/-.

Efficiency typical 85% foolproof and runs offload, and stops working when overloaded. Size: 4 1/2" x 3" x 3 1/4", robust construction.

Other outputs are available, state requirements. Trade enquiries invited. Postal Service, cash with order to—

BRACKEN ELECTRIC CO. LTD.

ST. ANDREWS STREET
NORTHAMPTON

For Highest Quality

Heathkit
DAYSTROM

at Lower Cost

All models are available either in kit form or assembled
(kit prices are given here— assembled prices on request)



DX-40U

AMATEUR TRANSMITTER Model DX-40U. Compact and self-contained. From 80-10 m. Power input 75 W. CW., 60 W. peak, C.C. phone. Output 40 W. to aerial. Provision for V.F.O. £33 19 0



DX-100U

AMATEUR TRANSMITTER Model DX-100U. Covers all amateur bands from 160-10 metres, 150 watts D.C. Input. Self-contained including power supply, modulator and V.F.O. £74 19 0

THE "MOHICAN" GENERAL COVERAGE RECEIVER, Model GC-1U. In the forefront of design with 4 piezo-electric transmitters, 10 transistors, variable tuned B.F.O. and Zener diode stabiliser. An excellent fully transistorised general purpose receiver for both Amateurs and Short-wave listeners. Other features include printed circuit boards, telescopic whip antenna, tuning meter, and large slide-rule dial approximately 70 inches. £39 17 6



GC-1U

HI-FI 18W. STEREO AMPLIFIER, Model S-99. Ganged controls; Stereo-Mono gram., radio and tape-recorder inputs; push-button selection; printed circuit boards. £27 19 6

TAPE RECORDING/PLAYBACK AMPLIFIER. Thermometer type recording indicators, press-button speed compensation and input selection. Printed Circuit Board. Mono. Model TA-1M £19 2 6
Stereo Model TA-IS £24 10 0



SB-10U

SINGLE SIDEBAND ADAPTOR, Model SB-10U. May be used with most A.M. transmitters. Less than 3 W. R.F. input power required for 10 W. output. Operation on 80, 30, 20, 15 and 10 m. bands on U.S.B., L.B.S. or D.S.B. £39 5 0

R.F. SIGNAL GENERATOR, Model RF-1U. Provides extended frequency coverage in 6 bands from 100 Kc/s. to 100 Mc/s. and up to 200 Mc/s. on calibrated harmonics. Up to 100 mv output on all bands. £12 15 6

6-W STEREO AMPLIFIER, Model S-33. 0.3% distortion at 2.5 W/chnl. Inputs for Radio (or Tape) and Gram., Stereo or Monaural £13 7 6

VAR. FREQ. OSCILLATOR VF-1U. Calibrated 160-10 m. Fund. outputs on 160 and 40 m. Ideal for our DX-40U and similar transmitters. £11 17 6



VF-1U

GRID DIP METER, Model GD-1U. Continuous coverage 1.8 to 250 Mc/s. Self-contained. 5 plug-in coils supplied £10 19 6. Transistorised Version from 1.8 to 45 Mc/s. £10 18 6

"COTSWOLD" HI-FI SPEAKER SYSTEM. Acoustically designed enclosure "in the white" 26in. x 23in. x 15 1/2in., housing a 12in. bass speaker with 2in. speech coil, elliptical middle speaker and pressure unit to cover the full frequency range of 30-20,000 c/s. Complete with speakers, crossover unit, level control, etc. £23 4 0

AUDIO SIGNAL GENERATOR, Model AG-9U. 10 c/s to 100 Kc/s, switch selected. Distortion less than 0.1%. 10 V. sine wave output metered in volts and dB's. £21 9 6

RES.-CAP. BRIDGE, Model C-3U. Measures capacity 10 pF to 1,000 μF., resistance 100 Ω to 5 M Ω and power factor. 5-450 V. test voltages. With safety switch £9 5 0



The "Cotswold"

HI-FI AM/FM TUNER, FM: 88-108 Mc/s.; AM: 16-50, 200-550, 900-2000 m. Tuning heart (£5 5 6, incl. P.T.) and I.F. amplifier (£20 13 0) complete with cabinet and valves; self powered. Total £25 18 6

HI-FI FM TUNER, 88-108 Mc/s. Tuning unit (£3 2 0 incl. P.T.) with 10.7 Mc/s. I.F. output and I.F. amplifier (£12 6 0) complete with cabinet and valves; self powered. Total £15 8 0

VALVE VOLTMETER, Model V-7A. Measures volts to 1,500 (D.C. and RMS) and 4,000 pk. to pk. Res. 0.1 Ω to 1,000 M Ω. D.C. input imped. 11 M Ω. Complete with test prods, leads and standardising battery £13 18 6

R.F. PROBE, Model 309-CU. Extends the frequency range of our V-7A to 100 Mc/s. £1 13 6

Money saving "PACKAGE DEALS" of complete Stereo Equipment on request



O-12U



AW-1U



AG-9U

5in. OSCILLOSCOPE, Model O-12U. Has wide-band amplifiers, essential for TV servicing, F.M. alignment, etc. Vertical freq. response 3 c/s. to over 5 Mc/s. without extra switching. T/B covers 10 c/s to 500 Kc/s. in 5 ranges £38 10 0

ELECTRONIC SWITCH, Model S-3U (Oscilloscope Trace Doubler). Enables a single beam oscilloscope to give simultaneous traces of two separate and independent signals. Switching rates approx. 150, 500, 1,500, 5,000 and 15,000 c/s. £11 15 6

AUDIO WATTMETER, Model AW-1U. Up to 25 W. continuous, 50 W. intermittent £15 15 0

SHORT WAVE TRANSISTOR PORTABLE, Model RSW-1. Four bands (2 short, Trawler and Medium). £22 8 0



THE "GLOUCESTER" EQUIPMENT CABINET

All prices include free delivery U.K.

Deferred terms available on orders above £10.



GD-1U



CM-1U



OS-1

HI-FI SPEAKER SYSTEM, Model SSU-1. Ducted-port bass reflex cabinet "in the white." Twin speakers. (With legs £11 19 6) £11 5 0

HI-FI EQUIPMENT CABINETS. Range now available to suit all needs. From £11 12 6 to £18 10 0

2 1/2in. PORTABLE SERVICE 'SCOPE, OS-1. A compact, portable oscilloscope ideal for servicing and general laboratory work. Overall size 5" x 8" x 1 1/4" long, weight 10 1/2 lb. Y amplifier sensitivity 10 mV/cm, bandwidth 10 c/s, 2.5 Mc/s. Time base 15 c/s—150 Kc/s. Uses printed circuit board and 2 1/2" c.r.t. £19 19 0

CAPACITANCE METER, CM-1U. Direct-reading 4 1/2in. scale. Full-scale ranges, 0-100 μF, 0-1,000 μF, 0-0.01 μF and 0-0.1 μF £15 15 0

DUAL-WAVE TRANSISTOR PORTABLE, Model UXR-1. Medium and Long. Real hide case. £14 3 0

Please send me FREE CATALOGUE (Yes/No)
Full details of model(s).....

NAME.....
(BLOCK CAPITALS)
ADDRESS.....

SW10

DAYSTROM LTD

DEPT. SW10, GLOUCESTER, ENGLAND

A member of the Daystrom Group,
manufacturers of the

WORLD'S LARGEST SELLING ELECTRONIC KITS