

# The SHORT WAVE Magazine

VOL. XIX

JULY, 1961

NUMBER 5



**MAXIMUM  
PERFORMANCE**  
— **MINIMUM COST**

## hallicrafters S-38E

### FEATURES

- ★ FULL VISION VERNIER  
DRIVEN SLIDE RULE DIAL
- ★ ELECTRICAL BAND SPREAD
- ★ BUILT-IN 5" SPEAKER
- ★ OUTPUT FOR HEADSET  
CONTROLLED BY SWITCH
- ★ 4. BAND FREQUENCY
- ★ COVERAGE—540KC to 32MC
- ★ BEAT FREQUENCY  
OSCILLATOR

The current version of Hallicrafters S-38 series combines an easily read full vision dial in an attractive and functional case finished in Grey, Mahogany or White. New tube complement makes for even finer performance than its predecessors. The S-38 E cannot be surpassed for maximum performance at minimum cost.

**£28.0.0**

## SCOTT'S

20 GROSVENOR PLACE LONDON SW1 Telephone: SLOANE 7278

JAMES SCOTT (ELECTRONIC ENGINEERING) LTD.

68 Brockville Street,

Carntyne Industrial Estate, Glasgow, E.2.,

Tel: Shettleston 4206

# 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 for 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  $\frac{1}{2}$ " 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.

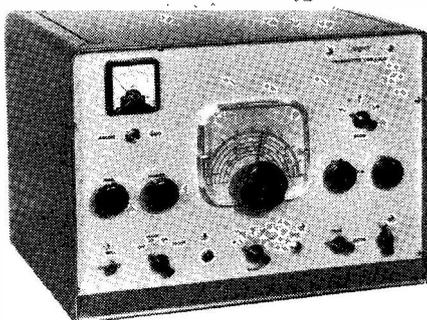
### VHF ENTHUSIASTS

No more change 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.

FOR THE **FINEST VALUE** AND THE **BEST RESULTS**

**The LG50 leads the field !**

- ★ Full "netting" facilities
- ★ Built-in modulator
- ★ Stable V.F.O.
- ★ Pi-output circuit
- ★ Band Switched
- ★ 6146 P.A.



- ★ 60 watts C.W.
- ★ 40 watts 'phone
- ★ 10-15-20-40-80m.
- ★ 75-ohms co-ax output
- ★ 110-250 V.A.C. input
- ★ 16" x 12 $\frac{1}{2}$ " x 14"
- ★ 35 lbs.

A complete 50 watt Transmitter for only 39 gns. H.P. Terms : £4 2s. 0d. deposit, 24 monthly payments of £1 16s. 0d. Immediate delivery. S.A.E. for illustrated leaflet.

**Labgear Limited**

Telephone : 88022/3/4.

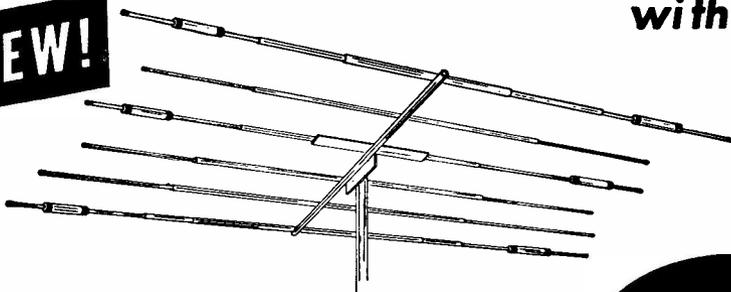
**CROMWELL ROAD  
CAMBRIDGE**

One of the **PYE** Group of Companies.

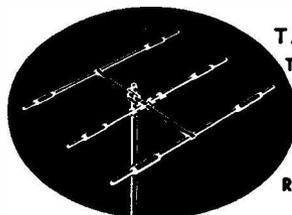
# OUTSTANDING PERFORMANCE

## with MOSLEY AERIALS

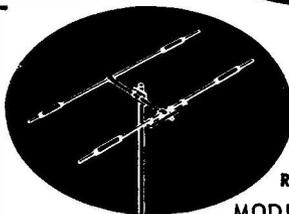
**NEW!**



The Three Band Beam that will give your signal that DX punch . . . for 10, 15 and 20 metres. Maximum legal amateur power. Low SWR with high gain and front-to-back ratio. Fully rust and corrosion proof.  
MODEL TA-36



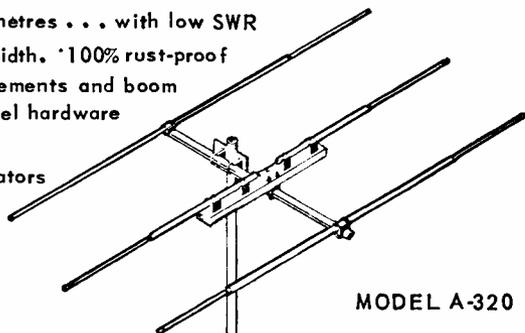
TA-33 Jr.  
Three-element rotary beam aerial.  
10-15-20M.  
Rated to 300W.



Two-element rotary beam aerial.  
10-15-20M.  
Rated to 300W.  
MODEL TA-32 Jr.

### COMMAND YOUR BAND with a MOSLEY POWERMASTER AERIAL

For 10, 15 or 20 metres . . . with low SWR over entire bandwidth. 100% rust-proof . . . aluminium elements and boom . . . stainless steel hardware . . . high impact polystyrene insulators . . . all the finest . . . all built to last!



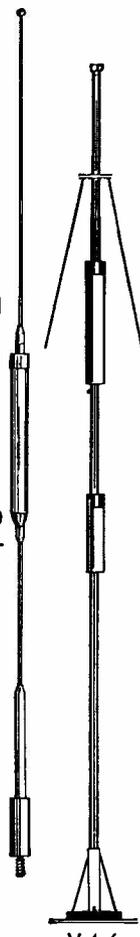
MODEL A-320

3 Band Mobile Whip Aerial for 10, 15 and 20 metre bands. Use with standard base loading coils for 40 and 80 metre operation.

MODEL MA-3

Vertical Aerial, 10 thru 40 no bandswitching is necessary.

MODEL V-4-6



V-4-6

## new! 7-Band SWL/DX Dipole Kit for 11·13·16·19·25·31·49 meters



Here's a low cost 7-band receiving dipole aerial kit that will pick up those hard-to-get DX stations. Everything included . . . just attach the wires and you're on the air! Weatherproof traps enclosed in Poly-Chem for stable all-weather performance.  
MODEL SWL-7

Complete with

- 8 Trap Assemblies
- Transmission Line Connector
- Insulators
- 45 ft. No. 16 Tinned Copper Wire
- 100 ft. of 75 ohm twin lead

<b>AUSTRALIA</b> MAGNECORD AUSTRALASIA PTY. LTD. Kyle House, 31 MacQuarie Place, Sydney	<b>DENMARK</b> HANS HOLTMAN, OZ9DC SØBAKKEN 21, Charlottenlund	<b>RHODESIA</b> STUDIO FOUR Salisbury, Rhodesia	<b>FINLAND</b> OSMO A. WIIIO, OM2TK Laajalahdentie 24 A1, Mukkiniemi
--	---	--	---

**Mosley Electronics Ltd.** 15 Reepham Road, Norwich, Norfolk, Telephone 45069

O. J. Russell, G3BHJ, Manager

# TESTGEAR COMPONENTS (London) LTD

15 Arcany Road · South Ockendon · Essex

Phone: AMBassador 1958

The enormous response to our recent advertisements has overloaded our despatch organisation. To our many customers who have patiently endured the delays, we offer our apologies. The situation is being rapidly improved, and we hope to have an opportunity of serving you again.

## OFFICE DICTATING MACHINES

An obsolete type but the biggest bargain ever. Contained in Portable Carrying Case, Wind-Up Double Spring Clockwork Motor, 4 Valve Oscillator Amplifier (B7G Type Valves) Six Minute Play Recording Mechanism using magnetic plastic discs that may be re-used indefinitely. Complete with crystal mike that doubles as playback Speaker. Send for full details. Complete with 10 Discs (Extras 1/6). Price 63/-. Batteries (67½v. and 6v.) Price 10/6

## POT CORES

Mullard Vinkor complete assembly type LA2509. Build your "Q" Multiplier with this and obtain a "Q" of over 4,000. Price 12/6.

## DYNAMOTORS

### HOOVER No. 2

Input 12v. Output 600v. 250 M/A. Price 45/-.

### TYPE 1520

Input 26v. Output 288v. 165 M/A. and 50v. 50A. Has a magnetic Clutch and 480-1 Stepdown Gear Box. May be used as a mains motor. Price 10/-.

### TYPE APN1

Input 28v. Output 275v. 65 M/A. (Command Type). Price 7/6.

## CRYSTALS

FT.241 72nd Harmonic Type. 120 Crystals with fundamentals from 370 Kc/s. to 540.277 Kc/s. in steps of 1.388 Kc/s. (Channels 270-389). From 448.611 to 472.222 inclusive and 500 Kc/s. Price is 7/6. All others 2/6 each or 6 for 10/- for any six consecutive channels. Special quotations for other assortments.

Most of the Crystals advertised in the May Short Wave Magazine are still available, plus hundreds of new types. Send your order stating frequency latitude (if any), it is fairly sure we can supply.

## TYPE 46 TRANSCEIVERS

The best bargain for many years. These fine Walkie Talkies are now available in new condition complete with all accessories at a give away price. 3 Channel Crystal controlled T/X and R/X, supplied complete with one pair crystals, coil box, rod aerial, leads and plugs, valves, balanced armature headset with throat mike and carrying satchel. 1 watt output. Coverage 3.6-4.3 Mc/s. or 6.4-7.6 Mc/s. by means of Plug-in Coil Box. Inland buyers supplied with crystals in 3.5 or 7 Mc/s. band (state which required) other frequencies available for export. Requires only 150v., 12v. and 3v. dry battery. Range over 10 miles. Full instructions and circuit supplied. These Units have been "demobbed" by removal of the "Send Receive" switch. A replacement switch with fitting instructions is supplied. We offer this fine unit with all accessories as listed above at the ridiculous price of 30/- or two for 57/6. We will supply an extra 46 set, complete with valves (but no accessories) as a source of spares for only 7/6 extra. Batteries are available at 18/6 per set. A low priced Transistorised Kit of Parts for operation of above from 6v. or 12v. D/C will soon be available.

## B.C.221

The fine frequency meters are available in "as new" condition, complete with crystal, original calibration manuals and canvas cover. Price £16. A few with modulation available at £19.

## 50 MICROAMP METERS

Made by Sangamo Weston. Brand new. Type S.145, Size 3" x 2½". 850 ohms resistance. 4 Scales operated by lever, "Set Zero", "0-3", "0-30", "0-300". Easily coupled to rotary range switch by cord or lever. Complete with suggested circuits, a gift at 20/-. Easily adjusted to 25-0-25 Microamps.

## METER BOXES

A range of attractive useful Meter Cabinets that can be supplied ready punched to take above Meter. Useful for all kinds of testgear: a quality job with fully-formed pressed steel lids, welded construction, grey hammer finish enamel. Price: 4" x 5½". Panel in depths of 2, 3 or 4", 9/-, 9/6, and 10/- respectively, or with 4½" x 7½" panel, 10/9, 11/3 and 11/6. Available punched to take above meter, 1/6 extra.

## SILICON RECTIFIERS

Miniature silicon power Diodes at new low prices. Made by one of England's greatest manufacturers. 250 M/A. D/C output. Type (1) 400 P.I.V. Price 3/6. Type (2) 600 P.I.V. Price 5/6. Type (3) 800 P.I.V. Price 7/6.

## 2 METRE R/X

Receiver Portion of the SCR.522 TX/RX. Brand new with valves and conversion details for continuous tuning 144-146 Mc/s. Price 30/-. Relay if required 7/6.

## RELAYS

As used in 1958, etc. Series Aircraft Transmitters. Size: 1½" x 1½" x 2". 700 ohm coil. Operates on 12-24v. Double pole changeover or single pole normally open (10 amp. contacts). Either type. Price 3/6 post paid.  
**U.S.A. P.O. Type Relays.** Type AFHC. 6500 ohm, 12v., 2 M/A. S.P.C.O. Price 2/6. Type APLC. 3500 ohm, 6 M/A. S.P.C.O. Price 2/6.  
**Aerial Changeover Relays.** 12-24v. Operated 4 P.C.O. Price 3/6.

## VALVES

(All new and guaranteed)

12SQ7, 12SK7, 12A6, EL33, 6F33, 6L18, EF80, VR150/30, 50L6GT, 12AT6, 12AT7, 12Q7GT, 7B6, 25L6GT, 12AU7, 85A1, 12SA7, 354, 5U4G, 616, 6K8G, 6V6G, 6N7GT, 6AG7, 7Z4, 6SG7, 6Q7G, EY91, EF73, EF70, EC70, EF71, EN32, 90CV (Photo Tube). 6AK5, 6CH6, 1R5, 1S5, 1T4, 1L4.  
 All above types 5/- each post paid

## TRANSMITTING VALVES

Brand new and guaranteed

813. Price 37/6. 5B/255M (Miniature 807). Price 12/6. 5B254G (Miniature 807). Price 12/6. QQV06/40. Price 30/-. 1625. Price 2/6. QV04/7. Price 5/-.

# TESTGEAR COMPONENTS (London) LTD

15 Arcany Road • South Ockendon • Essex

Phone: AMBassador 1958

## ELECTROLYTIC CONDENSERS

New Perfect Goods at Bargain Prices — Reductions for Quantities				
CAPACITY	WKG VOLTS	SIZE	FITTING	PRICE
500	6	$\frac{3}{8}$ " x $1\frac{1}{4}$ "	Clip	1/-
8	450	$\frac{3}{8}$ " x 2"	Clip	1/-
100	15	$\frac{3}{8}$ " x $1\frac{1}{8}$ "	Wire End	1/-
50	25	$\frac{3}{8}$ " x $1\frac{1}{8}$ "	Wire End	1/-
50	350	1" x 3"	Clip	1/-
40/40	150	1" x 2"	Clip	1/6
16	450	$\frac{3}{8}$ " x 2"	Clip	2/-
50	50	$\frac{3}{8}$ " x $1\frac{1}{8}$ "	Wire End	1/-
50/30	150	1" x 2"	Wire End	1/-
50/30/20	150/150/25	$1\frac{1}{8}$ " x 2"	Wire End	1/6
500	12	$\frac{3}{8}$ " x $1\frac{1}{2}$ "	Clip	1/-
16	350	$\frac{3}{8}$ " x 2"	Clip	1/-
50/50	275	1" x 3"	Clip	1/6
50	12	$\frac{3}{8}$ " x 1"	Wire End	1/-
1600	12	3" x $1\frac{1}{2}$ "	Clip	1/6
250	50	2 $\frac{1}{2}$ " x $1\frac{1}{8}$ "	Clip	1/6

## SUB-MINIATURE ELECTROLYTIC CONDENSERS

CAPACITY IN MFDS	WORKING VOLTAGE	SIZE
.25	15	1/10" x 15/32"
3.2	70	3/16" x 23/32"
20	15	1/4" x 25/32"
10	15	3/16" x 23/32"
8	3	1/8" x 21/32"

Price: (All types) 1/-

## TRANSISTORISED D/C — D/C CONVERTER KITS

**Type (1)** Input 12v. Output 300v. or 250v. or 200v. at 30w. A complete kit of parts incorporating high grade toroid transformers, silicon (Bridge) rectifiers, New Market V30/10P Transistors. Full audio and R/F filtering to VHF operating frequency 400c. Efficiency 85%. All component parts mount on heatsink which is supplied completely drilled. Size 5" x 4" x 3"H. Price: £5 15s.

**Type (2)** As above but output 45w. Uses OC35 Transistors. Price: £6 17s. 6d.

## OSCILLOSCOPE BASIC KIT

Consists of one 3 $\frac{1}{2}$ " diam. Electrostatic C/R Tube (CV1547) and socket, EHT Transformer, Metal Rectifiers and smoothing condensers for EHT supply. All new perfect material. A gift at £1, post paid.

## I.F. AMPLIFIER STRIPS

3 Stage I.F. Amplifier Strips ex the TR.1985/1986 series Transmitters. Frequency 9.72 Mc/s. Widely used as an F.M. Amplifier, etc. Price complete with 6 valves 10/-.

## MODULATOR UNITS

Ex the above Unit, 2 Stage Speech Amplifier. Push Pull 7 watt audio output. Input high and low impedance. Output matches TT15. Price: 10/-, Complete with valves.

## TRANSMITTER UNITS

The transmitter portion of the 1986. Unusable in its present form, but a useful basis for a 2 Metre T/X. Contains many useful parts including a 5 Gang Butterfly Condenser. 10 Air Trimmers, etc. Price 5/-, or complete with QV04/7 (Driver) and TT15 (15w. input on 144 Mc/s. with 300v. plate) Final. Price 27/6.

## R/X UNIT TYPE R.114

An excellent basis for a 2 Metre Converter. See February *Short Wave Magazine*. Complete with valves and Jones plug and socket. Price 15/- post paid. Extras if required, 7580 Crystal 5/-. I.F. Trans. as specified (unconverted) 2/6.

## NUVISTORS

Now available the R.C.A. 6CW4 at a new low price. The hottest front end for 2 Metres. Price 12/6 each. Write for details of Kits using this amazing tube.

## PIEZO ELECTRIC CRYSTAL ELEMENTS

Originally made for crystal pick-ups. Flying lead connections

Type (1) Size 3/4" x 1/5" x 1/20" thick. Price 4 for 2/6. Type (2) Size 1 5/8" x 1 5/8" x 1/5" thick. Price 2/- each.

## MOBILE RADIO TELEPHONES

Type B.44 Mk.2 covers 60-95 Mc/s. Crystal controlled. Receiver is crystal controlled double superhet. Fully tropicalised, in robust waterproof aluminium case, built-in speaker and 12v. power supply. Uses modern B7G tubes. Output 3 watts. Supplied in perfect order and aligned to your specified frequency. Size: 14" wide, 7" high, 13" deep. Complete with Manual and Plugs. Price: £20 carr. paid U.K. or F.O.B. London. Extras required are M/C Microphone. Price 17/6. Pair of Crystals (our selection in 4-metre band). Price 22/6, or supplied to your specified frequency £6. Available for amateur use or export only.

## TERMS OF BUSINESS

All prices include postage or carriage. Handling charge of 1/6 on orders under 10/-, Payment cash or C.O.D. over £1. Export orders welcomed. If you have ever written to us you will receive a copy of our comprehensive list within a few days, if not, then please let us have your name and address.

**TECHNICAL PUBLICATIONS | SHORT WAVE MAGAZINE**

**PUBLICATIONS DEPARTMENT, 55 VICTORIA STREET, LONDON SW1 - ABBEY 5341**

**AVAILABLE FROM STOCK**

	Post Free		Post Free
ANTENNA HANDBOOK (Published by A.R.R.L.) (9th Edition)	19s. 0d.	RADIO DATA CHARTS	11s. 3d.
A COURSE IN RADIO FUNDAMENTALS (4th Edition)	10s. 6d.	RADIO DESIGNERS HANDBOOK (4th Edition) 1,498 pp. (F. Langford Smith)	55s. 0d.
AUTOMOBILE ELECTRICAL EQUIPMENT	31s. 0d.	RADIO INTERFERENCE SUPPRESSION	11s. 3d.
BASIC MATHEMATICS FOR RADIO AND ELECTRONICS	18s. 3d.	RADIO VALVE DATA (New Edition now available)	6s. 6d.
BEAM ANTENNA HANDBOOK	22s. 0d.	S-9 SIGNALS	8s. 6d.
BETTER SHORT WAVE RECEPTION	24s. 0d.	SCATTER PROPAGATION THEORY AND PRACTICE (H. W. Sams)	25s. 0d.
COMMAND SETS (Published by CQ.)		SURPLUS SCHEMATICS (Published by CQ)	21s. 0d.
Information on conversion of many Command Transmitters and Receivers	12s. 6d.	SHORT WAVE RECEIVERS For The Beginner	6s. 6d.
CQ ANTHOLOGY	16s. 9d.	SHORT WAVE AND THE IONOSPHERE	11s. 9d.
DXERAMA (3rd Edition)	16s. 0d.	SINGLE SIDEBAND FOR THE RADIO AMATEUR (A.R.R.L.)	14s. 6d.
DX GUIDE (New Edition)	16s. 9d.	SURPLUS HANDBOOK	24s. 0d.
FOUNDATIONS OF WIRELESS	15s. 9d.	SURPLUS CONVERSION MANUAL	
GUIDE TO BROADCASTING STATIONS (Twelfth Edition) pp. 112	3s. 10d.	Volume 1 (3rd Edition)	24s. 0d.
HAMS INTERPRETER (Published by OH2SQ (4th Edition))	7s. 0d.	Volume 2	24s. 0d.
HINTS AND KINKS, Vol. 6	11s. 0d.	Volume 3	24s. 0d.
HOW TO BECOME A RADIO AMATEUR★	5s. 0d.	THE INTERNATIONAL RADIO AMATEUR YEAR BOOK	4s. 0d.
HOW TO LISTEN	7s. 0d.	THE OSCILLOSCOPE	18s. 6d.
LEARNING MORSE	1s. 9d.	THE RADIO AMATEUR OPERATOR'S HANDBOOK (Data Publications)	3s. 10d.
LEARNING THE RADIO TELEGRAPH CODE	4s. 6d.	THE RECORDING AND REPRODUCTION OF SOUND (H. W. Sams)	64s. 0d.
LOG BOOKS Spiral bound (Published by A.R.R.L.)★	7s. 6d.	TRANSISTORS—	
MOBILE HANDBOOK (Published by CQ) (2nd Edition)	24s. 0d.	THEORY AND PRACTICE (Published by Gernsback)	23s. 0d.
MOBILE MANUAL (Published by A.R.R.L.)	23s. 0d.	TRANSISTOR THEORY AND PRACTICE (Published by World Radio Handbook)	9s. 6d.
NEW SIDEBAND HANDBOOK (Published by CQ, latest issue)	25s. 6d.	TRANSISTOR TECHNIQUES (Gernsback)	12s. 6d.
NOVICE HANDBOOK, Tx and Rx	23s. 6d.	UHF ANTENNA, CONVERTERS AND TUNERS	12s. 6d.
OPERATING AN AMATEUR RADIO STATION (Published by A.R.R.L.)★	2s. 8d.	VHF HANDBOOK	24s. 0d.
QUAD ANTENNAS	23s. 0d.	WORLD RADIO HANDBOOK, 1961 Edition, 216 pages	17s. 9d.

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

**MAGAZINES BY SUBSCRIPTION**

	One Year		One Year
73 MAGAZINE	30s. 0d.	RADIO ELECTRONICS	40s. 0d.
AUDIO	40s. 0d.	"ELECTRONIC TECHNICIAN!"	65s. 0d.
*CQ, RADIO AMATEUR'S JOURNAL	44s. 0d.	TELEVISION	55s. 0d.
ELECTRONICS (Trade only)	160s. 0d.		
POPULAR MECHANICS	39s. 0d.		
POPULAR SCIENCE	48s. 0d.		
QST, ARRL	43s. 0d.		
HIGH FIDELITY	56s. 0d.		
ELECTRONICS WORLD (formerly "Radio and Television News")	48s. 0d.		

\*Binders for CQ 30s. 0d.

Post free, ordinary mail only

Subscription Service for all American Radio and Technical Periodicals

**LATEST ISSUES**

New and Greater Edition of the

**Radio Handbook (15th Edition)**

Published by *Editors & Engineers*, W6-U.S.A.  
800 pages, durable binding.  
Price 68s. post free, from stock

**Radio Amateur Call Book**

The CALL BOOK is published in two parts: American Section only, appearing quarterly at 41s. 6d. post free; Foreign (non-American) Section half-yearly in March and September, at 25s. post free. Includes 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, Summer Edition, 41s. 6d. Foreign (non-American) Section, Spring/Summer Edition, 25s.  
The two together at 60s. post free.

**Radio Amateur's Handbook**

1961 EDITION—700 pages, fully indexed  
Published by the American Radio Relay League.  
(See review p. 156 May issue)  
Price (standard binding) 34s. post free.  
Bound in Buckram, de luxe, 44s.

**DX Zone Map (Latest Revision)**

(Great Circle, centred U.K.)  
Linen Backed (de luxe) 11s. 9d. post free

**Amateur Radio Map of World (Mercator Projection)**

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

**TRANS-RECEIVER No. 22.** 2 megacycles to 8 Mc/s. Built almost exactly as Number 19. Set much more economical in battery consumption. Complete in fully working condition with power pack for 12 volts, head-gear and microphone assembly, key. £9/19/6. Carriage 15/-.

**U.H.F. SIGNAL GENERATOR TYPE TS14** 3,200-3,370 mc/s., power measuring range 20-200 mW. R.F. output power—20 to 100 dbm below 1 mW. Power supply 115 w. A.C. Price £15. Carriage 15/-.

**TELEPHONE HANDSET.** Standard G.P.O. type new, 12/-, P. & P. 1/6.

**MARCONI SIGNAL GENERATOR.** TF 144G, 85 Kc/s.—25 Mc/s. Made up to new standards, £70. Delivered free.

**H.T. CHOKES** made by Bendix Radio (U.S.A.) 3 henrys .600A D.C. 25 ohms D.C. resistance 18 volts R.M.S. 60 cycle test £1/12/6. P. & P. 6/-; Ditto 10 henrys .250 amps. D.C. 90 ohms D.C. resistance 1500 R.M.S. 60 cycle test 16/6. P. & P. 3/6.

**CARBON INSET MICROPHONE,** G.P.O. type 2/6. P. & P. 1/-.

**B.P.5 TRANSCEIVERS.** Specially built for Parachutists during the war. Receiver superhet. Transmitter crystal controlled. C.W. and phone. 2-8 mc/s. B29 valve as output. 60w. on C.W. 15w. on microphone, together with mains power pack 120/220v. Two Rotary converters to work from 12v. battery, microphone, key and dipole aerial. Price £15. Carriage 30/-.

**VACUUM CONDENSER.** 32,000v., 50pF., 12/6. P. & P. 3/-.

**SPECIALLY BUILT POWER PACK** for TCS Receiver. 230 volts A.C. mains, including 6X5 GT valve. £3/10/-, Carriage 5/-.

**COMPLETE SET OF STRONG AERIAL RODS** (American). Screw-in type MP49, 50, 51, 52, 53, total length 15ft. 10ft. top diameter 0.615in., bottom diameter 0.185in., together with matched aerial base. MP37 with ceramic insulator, ideal for car or roof insulation, £2/10/-, Post free.

**BRAND NEW ORIGINAL SPARE PARTS FOR AR88 RECEIVERS**

**I.F. TRANSFORMERS.** 1st, 2nd, 3rd, 4th (for type D), 12/6 each or complete set of 6, 60/-.

**I.F. TRANSFORMERS.** Crystal Load, 12/6 each.

**PLATES** escutcheons (for D and LF), 15/- each.

**DIALS** (for type D), 10/- each.

**LOGGING DIAL** (for D and LF), 10/- each.

**FILTER CHOKES** (for D and LF), 22/6 each.

**OUTPUT TRANSFORMERS** (for LF), 30/- each.

**CRYSTAL PHASING** (D), 2/6 each.

**ANTENNA TRIMMERS** (LF and D), 2/6 each.

**FILTER CONDENSER** 3 x 4µF, £2/10/-.

**CONDENSERS** 3 x .25µF (D and LF), 2/6 each.

3 x .01µF (D and LF), 2/6 each.

**RF ANTENNA INDUCTORS** (D and LF), 7/6 ea.

**MAINS TRANSFORMERS** (LF), £3 each.

**SMALL TRIMMING TOOL,** 7/6

Small mica condensers, various values, 1/6 each.

**INSTRUCTION MANUAL FOR AR88D,** £1.

**TCS RECEIVERS** made by Collins of U.S.A., in fully guaranteed working condition. 1.5-12 Mc/s. Line-up: 12S7 (1), 12SQ7 (1), 12A6 (2), 12SK7 (3), power requirements 12 volts L.T., 225 volts H.T. £11/10/-, carriage 12/6.

**VARIOMETERS** for W/S No. 19. Fully tested and working 12/6. Post and packing 2/6.

**RADIO COMMUNICATION TRANSCEIVER TYPE A.R.11.** Very compact, external dimensions 12" x 8 1/2" x 5". Total weight 18 lbs. C.W. 4.4-16.3 mc/s., 110/220v. Power output about 10w. Crystal controlled. Receiver superhet. Price £12. Carriage 20/-.

**A HUGE SELECTION OF VALVES AT VERY LOW PRICES**

Write or phone your needs.

**MARCONI CR-100 COMMUNICATIONS RECEIVER.** 60 Kc/s.—30 Mc/s. with noise limiter. Completely reconditioned £25. Carriage and packing 25/-.

**RECEIVER TYPE BC.342.** 110v. A.C. 1.5-18 mc/s., £22/10/-, Carriage 30/-.

**RECEIVER TYPE BC.312.** As above but 12v. Battery, £22/10/-, Carriage 30/-.

**R209 RECEPTION SET.** A 10 valve High-Grade Super Heterodyne Receiver with facilities for receiving R/T (A.M. or F.M.) and C.W. Frequency 1 Mc/s.—20 Mc/s. Hermetically sealed. Built on miniature valves and incorporating its own vibrator power supply unit driven by a 6v. battery (2 point connector included). The set provides for reception from rod, open-wire or dipole aerial with built-in loudspeaker or phone output. Overall measurements:—length 12", width 8", depth 9". Weight 23 lbs. In as new, tested and guaranteed condition. £23/10/-, including special headphone and supply leads. Carriage and packing £1.

**SUPPLY UNIT RECTIFIER, No. 21.** Fully sealed enabling all sets built for 6v. (R209, R109, etc.) to work from A.C. mains. Input 90v.—260v. A.C. (Taps at 10v. intervals). Output excellently smoothed up to 10 amps with meter indicating exact output voltage. Measurements 12" x 9" x 10". Price £8. Carriage and packing 15/-.

**19 SET OWNERS.** To increase output of your set 6 to 10 times use RF AMPLIFIER No. 2 with built-in rotary converter for 12v. input. Four 807 valves output. Simple connection with transmitter. Fully tested condition £9/15/-, including necessary connectors and instructions. Carriage and packing 15/-.

**AR88's.** Completely rebuilt with new PVC wiring Type "D" £75; Type "LF" £70.

**P. C. RADIO LTD**  
170 GOLDHAWK RD., W.12  
SHEpherds Bush 4946

• Southern Radio's Wireless Bargains •

**PORTABLE TEST METERS.** 0-5000 ohms; 0-60 m.a.; 0-1.5v. 0-3v. (Featured in Practical Wireless, March issue). 12/6 each

**METERS.** 30-0-30 and 3-0-3 Volts, with leads ..... 15/-

**ATTACHMENTS FOR "38" TRANSMITTER-RECEIVER:**  
HEADPHONES, 15/6; THROAT MICROPHONES, 4/6;  
JUNCTION BOXES, 2/6; AERIALS: No. 1 2/9, No. 2 5/3;  
WEBBING, 4/-; HAVERSACKS, 5/6; VALVES—A.R.P.12,  
4/6, A.T.P.4, 3/6; SET OF FIVE VALVES, 19/-.

Postage on each item, 1/6 extra (except valves).  
**ATTACHMENTS FOR "18" Transreceiver.** HEADPHONES, 15/6; MICROPHONE 4s, 12/6; AERIALS, 5/-; MORSE KEY, 6/6; VALVES—ARP12, 4/6, ATP4, 3/6, AR8, 7/6; SET OF SIX VALVES, 25/-.

Postage extra (except Valves) 1/6 each item.  
**OFFICIAL BOOKLET.** "18" T-R Circuits, etc., 6/6, post paid.  
**QUARTZ CRYSTALS.** Types F.T.241/F.T.243. 2-pin 1/2" spacing. F.T.241, 20 to 38.9 mc/s. (54th and 72nd Harmonic). F.T.243, 5700 to 8650 kc/s. (Fundamental), 4/6 each. Lists of available frequencies on request. Crystal Holders for F.T.241/243, 1/3. F.T.241/243 Crystals New but not guaranteed (ideal for using the case or regrounding), 12/6 per dozen, post paid.

**RECORDING BLANKS.** New 13", 6/- each or 15 complete in tin ..... £4

**BOMBSIGHT COMPUTERS.** Ex-RAF. Wealth of gears, motors, blowers, etc. Ideal for experimenters £3/12/6 carr. paid

**RESISTANCES.** 100 Assorted. Useful values, new wire-ends 12/6 per 100

**CONDENSERS.** 100 Assorted. Mica, Elec., Tubular, etc. New 15/- per 100

**MORSE PRACTICE SETS.** Key with Buzzer on Base, with battery ..... 12/6, postage 2/-

**LUBRA HOLE CUTTERS.** Adjustable. 3/4" to 3 1/2" ..... 7/3

**STAR IDENTIFIERS.** I-AN; covers both Hemispheres ..... 5/6

**VISUAL INDICATORS (IOQ4).** Type 3 with 2 Meter movements, 2 Neons. New ..... 12/-

**MAGNETS.** Strong Bar. 2" x 1/2" ..... 1/6 each

**COMMAND RECEIVERS.** B.C. 454 3-6 Mc/s. B.C. 455 6-9 Mc/s. Complete with 6 valves. New condition ..... 47/6 each

Post or Carriage Extra. List of Radio Publications, etc., 3d.

**SOUTHERN RADIO SUPPLY LTD**

11 LITTLE NEWPORT ST., LONDON, W.C.2. GER 6653

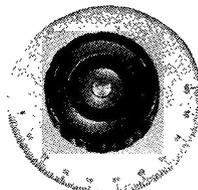
**HOME RADIO OF MITCHAM**

**EDDYSTONE LOUDSPEAKER**



New handsome speaker suitable for extension or main unit. Strong metal case with latest light grey hammer finish and distinctive grill set off by EDDYSTONE motif. Good quality high flux 5" unit, 3 ohms impedance. Size approx. 7" x 7" x 3 1/2". PRICE £2.17.6, post 1/-.

**NEW JACKSON DIAL DRIVE**



Using their well-proved 6:1 reduction epicyclic drive in conjunction with 4" diameter dial calibrated 0-100. Complete drive mounts on front of panel thus taking up no internal space. Takes standard 1/2" spindle. PRICE 18/9, post 1/- (over-seas 7/-).

**TRANSMITTERS** KW ELECTRONICS VALIANT, VANGUARD and VICTOR IN STOCK.

**RECEIVERS** EDDYSTONE 870A, 840A, 888A, and 680X IN STOCK.

Dept. 8, 187 LONDON ROAD, MITCHAM, SURREY MIT 3282  
Shop hours 9-6.30 p.m. (Weds. 1 p.m.)

# K. W. ELECTRONICS *for ALL your Amateur Radio Requirements*

## SUPERB EQUIPMENT FOR SSB

**FEATURES :**

- ★ 180 watts P.E.P. input.
- ★ Unwanted Sideband suppression 40 db down at 2 kc or better.
- ★ Carrier suppression 45 db down or better.
- ★ Crystal Filter exciter.
- ★ 5 Bands, 10-80 m. Pi Output.
- ★ Full TVI precautions taken.
- ★ All crystals included.
- ★ Automatic linearity control.
- ★ Full Voice Control and anti-trip.
- ★ Rugged Construction.
- ★ Operates A.M. and C.W.

**THE KW "VICEROY" SSB TRANSMITTER & POWER SUPPLY**



**THE KW "VICEROY" SSB EXCITER**  
 Very SUITABLE FOR DRIVING THE P.A. of your A.M. transmitter. It is not difficult to change your Class "C" stage to a linear. Similar in appearance to the KW "Viceroy" but with self contained power supply. 8 watts P.E.P. sufficient to drive Linear 6146's, TT21's, 4/125A, etc. Low impedance output. Full VOX control and anti-trip.  
**£87. 10. 0 plus carriage**

**THE KW500 LINEAR AMPLIFIER**  
 500 watt P.E.P. input, grounded grid P.A. Suitable for being driven by the KW "Viceroy" or similar transmitter. Including 1750 volt H.T. supply.  
**£87. 10. 0 plus carriage**

**TALKING SSB . . .**

Experts generally favour the Filter system of SSB generation compared with the Phasing system. A large majority of U.S.A. manufacturers have changed to the Filter system over the past year or so. Our experience has confirmed that this is the most reliable and efficient system. Three years ago our SSB development started with a phasing rig and over 2 years ago we changed to a crystal filter arrangement. If you are thinking about an SSB Adapter for your AM transmitter you should ask yourself two questions. Is my VFO really stable enough for SSB operation? With my existing line up of doublers and frequency multipliers am I going to be better off from the TVI point of view? In answering the first question one must remember that cycles matter in SSB operation (not kilocycles). Secondly, in a well designed SSB transmitter all stages run in Class "A" or "AB" which are inherently very low in harmonic content — no frequency multipliers are used to obtain output on a higher frequency band — only mixers. All these matters have been considered in the KW Viceroy design. The Viceroy has now been in production for more than a year and a half. Development still continues to bring you the best equipment at the right price. When you change to SSB make sure the equipment you buy has the backing of this experience.

**We stock:—**

- HY-GAIN ANTENNAS.** The TH4 "Thunderbird" Beam and Verticals.
- MOSLEY.** Beams and Vertical.
- K.W. TRAP DIPOLES.**

*Most available on easy terms.*

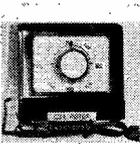
**Again Available:—**

The famous **KW-GELOS** CONVERTER. Remarkable Bandsread and Stability. Self contained Power Supply, 4.6 mc/s. output. The "Rolls-Royce" of converters. Price £23 plus 10/- carriage.



**CDR ROTATORS (USA) AND CONTROL UNIT**

Rotator handles a 150 lb. load with ease. Fits tubing 1/2" to 2" dia. Weighs only 10 lbs. Weather proof. Instantaneously reversible, magnetically released mechanical brake. Input 220v. A.C. Price: Rotator and Table Indicator. **£19. 10. 0**



Make sure you buy a new Receiver that is "peaked to perfection." Our engineers take a pride in adjusting all imported Receivers to meet manufacturers specification.

*Main Distributors for Hallicrafters and*



**HQ170**

HQ170. Triple Conversion, selectable sidebands, full bandsread 6, 10, 15, 20, 40, 80 and 160 m. 17 tubes 100 kc crystal calibrator. Excellent performance, **£184.** (Other models in stock).

KW ELECTRONICS FOR **HAMMARLUND** AND **HALLICRAFTERS** EQUIPMENT. **GELOS** EQUIPMENT, AERIALS, **MOSLEY** BEAMS AND VERTICALS, **DOW-KEY** RELAYS AND TR SWITCHES, FRONT END CONVERTERS, MICROPHONES, HIGH AND LOW PASS FILTERS, KW MATCH, Etc.

EASY TERMS AVAILABLE

TRADE IN YOUR RECEIVER FOR A NEW ONE !

# K.W. ELECTRONICS LTD., VANGUARD WORKS

1 HEATH STREET, DARTFORD, KENT.

Cables: KAYDOUBLEW - Dartford.

Tel. Dartford 25574

**INDEX TO  
ADVERTISERS**

	PAGE
Anglin ... ..	274
Avo, Ltd. ... ..	277
Brookes Crystals ... ..	<i>cover iii</i>
Daystrom ... ..	<i>cover iv</i>
Forth Motor Co. ... ..	280
G2YH Electronics ... ..	280
G3HSC (Morse Records)... ..	280
G.W.M. Radio ... ..	<i>cover iii</i>
Harris, P. ... ..	278
Home Radio ... ..	229
Jack Tweedy ... ..	280
James Scott & Co., Ltd. <i>front cover</i>	
Labgear ... ..	<i>cover ii</i>
K.W. Electronics ... ..	230
Minimitter ... ..	274
Mosley Electronics ... ..	225
Norman Birkett, Ltd. ... ..	277
P.C. Radio ... ..	229
Peter Seymour ... ..	<i>cover iii</i>
Radiostructor ... ..	280
Small Advertisements	275-280
Smith & Co. (Radio) Ltd. ... ..	232
Southern Radio ... ..	229
Southern Radio & Elec. ... ..	280
Southern Radiocraft (TX) Ltd. ... ..	<i>cover iii</i>
S.W.M. Publications ... ..	228
Testgear Components, Ltd. 226 & 227	
Tiger Radio, Ltd. ... ..	279
Whitaker ... ..	<i>cover ii</i>
Withers (Electronics) ... ..	279
Young ... ..	232

# SHORT WAVE MAGAZINE

Vol. XIX

JULY, 1961

No. 213

**CONTENTS**

	<i>Page</i>
Editorial ... ..	233
<b>Top Band Reception with the BC-454 — Clamp Control for the TCS Transmitter, by J. N. Roe, M.I.R.E., F.R.S.A. (G2VV) ... ..</b>	<b>234</b>
<b>Diversity Unit for the G3BST RTTY Converter, by J. B. Tuke (G3BST)</b>	<b>238</b>
<b>Simplified Two-Metre Portable, From Notes by G3GOP ... ..</b>	<b>242</b>
<b>Transistorised Converter for the DX Bands, by H. Mee (G5MY) ... ..</b>	<b>246</b>
<b>DX Commentary, by L. H. Thomas, M.B.E. (G6QB) ... ..</b>	<b>248</b>
<b>The Mobile Scene ... ..</b>	<b>256</b>
<b>The Other Man's Station — G3LES ... ..</b>	<b>261</b>
<b>VHF Bands, by A. J. Devon ... ..</b>	<b>262</b>
<b>SWL — Listener Feature ... ..</b>	<b>265</b>
<b>New QTH's... ..</b>	<b>270</b>
<b>The Month with the Clubs — From Reports ... ..</b>	<b>271</b>

**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 33s. (\$5.00 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.*

# G.W. SMITH & CO (RADIO) LIMITED

Phone: GERRARD 8204/9155  
Cables: SMITHEX LESQUARE  
3-34 LISLE STREET, LONDON, W.C.2

## AR88 D RECEIVERS

New release of these world famous receivers. Frequency coverage 550 kc/s to 32 mc/s. Operation 110-240 volts A.C. Supplied reconditioned and in perfect order.

Carriage 30/-.

Only

£35

## BC221 FREQUENCY METERS

Frequency coverage 125 kc/s to 20 mc/s. Available complete with all valves, crystal and calibration charts. A limited number available as above less only calibration charts £9/10/0 each.

Carriage 10/-.

Only, each

£16

## NATIONAL HRO RECEIVERS

Senior model, table mounting. Supplied with complete set of 9 coils covering 50 kc/s to 30 mc/s. Each receiver is in perfect order, fully tested and aligned. Power units are available at 59/6 each extra.

Carriage 12/6.

Only, each

21GNS

## COLLINS TCS RECEIVERS

Frequency coverage 1.5 to 12 mc/s. Complete with 7 valves, 12SA7, 12SQ7, 2-12A6 and 3-12SK7. Power requirements 12v. L.T. and 225v. H.T. New condition internally but externally a little shop soiled.

Carriage 10/-.

Only, each

£5'10'0

## THE MONTHS BARGAINS

### AERIAL EQUIPMENT

**TWIN FEEDER.** 300 ohm twin ribbon feeder similar K25, 6d. per yard. K35B Telcon (round) 1/6 per yard. Post on above feeder 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.

**FEEDER SPREADERS.** 6" Ceramic type F.S., 10d. each or 9/- doz. Postage 1/6.

**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 AERAXIAL,** 70/80 ohm coax, 300 watt very low loss, 1/8 per yard. P. & P. 1/6.

### FOR THE DX ENTHUSIAST MOSLEY TRAP BEAMS

Vertical 3 Band V3 ... £7 10s.  
3 Band 3EL Beam TA 33 dr. £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, 1/6 per yd. P. & P. 1/6.



## 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

Miniature 12v. in 360v., 30 Ma or 310v., 70 Ma. 12/6 each or 22/- for two. P. & P. 2/- 6v. in 250v., 125 Ma, only 17/6, P. & P. 3/-.

\* 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

**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/-.

**NATIONAL HRO CRYSTAL FILTER UNITS.** 455 kc/s with Crystal, Sel. and Phasing Controls. New, boxed, only 19/6, P. & P. 1/6.

**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. or 6/- per doz. yds.

**12-CORE SCREENED CABLE.** 2/- yd.

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

FOR THE RADIO AMATEUR AND AMATEUR RADIO

# The SHORT WAVE Magazine

## EDITORIAL

**Communication** For about 25 years — and it is now very nearly as long as that since SHORT WAVE MAGAZINE first appeared — we have laid stress, and conditioned our policies, upon the fact that the motive force in Amateur Radio is the desire to communicate — be it “across the parish or across the world.” Radio amateurs as individuals may have other interests, even some outside radio altogether, but in the great majority of cases they become licensed in order to go on the air.

Years ago, going on the air meant starting up with CW on what are now the DX bands, with phone working as very much a secondary consideration. In fact, in some circles it was considered not quite the thing to use telephony at all unless you ran a large station (itself thought a little vulgar) avowedly designed and operated for phone working exclusively. The normal ploy was to work CW, the DX contact being asked “stand by while I try my phone” only if conditions seemed good enough to make the test worth while; after making the phone transmission, the sending station would revert immediately to CW, before going back for the report; whether or not the DX station copied the phone was incidental to the fact that communication had been established between the two stations.

What, you may reasonably ask, is the point of all this? Nowadays, you could say, things are quite different. Most people start up on phone and, anyway, with the CW and phone band areas separated, “tests” of the sort they used to do years ago are no longer practicable. Either you are on CW or you are on phone, only a minority of operators being organised to work both as a matter of course.

Which, in fact, makes our point: That there should be far more CW worked by U.K. stations on all bands, Top to Two. So far as DX is concerned, on any band CW is an easier and more reliable — and nearly always a faster — means of communication than phone. It is also more economical, in terms of equipment and frequency-space, than telephony; and it calls for the sort of operating skill that has a fascination of its own.

With the conditions now prevailing on the HF bands, the effect of congestion would be reduced, many more solid contacts made, and much more DX worked if there was a return to the idea of CW as a principle rather than phone as a habit.

Austin Fobler  
G6FO.

WORLD-WIDE COMMUNICATION

# Top Band Reception with the BC-454

## Clamp Control for the TCS Transmitter

USEFUL MODIFICATIONS,  
EASILY CARRIED OUT

J. N. Roe, M.I.R.E., F.R.S.A. (G2VV)

WITH the present supply shortage of the 1.5-3.0 mc Command Receiver, the more readily obtainable BC-454, 3.0-6.0 mc model, converted for full Top Band coverage, is a most useful and sensitive receiver for fixed or mobile operation. Some information has already been published giving details of Top Band conversion for the BC-454. Whilst *part* of the 1.8-2.0 mc band has been covered—usually the HF end of the band only—total coverage has been somewhat problematic.

The modifications to be described—which are simple and inexpensive—consist of fitting additional parallel capacitors in the RF, mixer and oscillator tuned stages *plus* the adaptation of the existing pre-set variable oscillator padder for *manual* operation. Considerable time was spent in attempting full Top Band coverage with various arrangements of additional condensers for the tuned stages with one fixed setting of the variable padder in the oscillator circuit. A wholly satisfactory compromise could not be obtained in this way. Subsequently, it was found that the band could be covered, with full tuning gang swing, for two different settings of the variable oscillator padder. Once the desired settings are found by experiment they can be readily re-set manually during operation.

### Practical Details

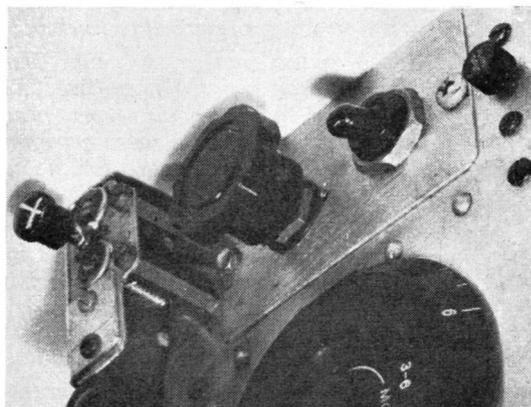
Remove the oscillator pre-set variable padder, on its bracket (situated behind front panel at top right). Carefully solder a one-inch length of 6 BA screwed brass rod on to the slotted spindle head of the padder. To this fit a small insulated  $\frac{1}{2}$ -inch diameter knob or terminal head. Mark an arrow to indicate

position of moving plates. Construct an aluminium shield to protect the side and base of the padder and bend over to secure in existing holes on the original mounting bracket. Fit two  $\frac{3}{4}$ -inch long stand-off pillars to bottom right-hand side of BC-454 front panel, to correspond with existing holes on padder mounting bracket. Fit small circular capacitor (originally mounted on padder bracket) to side of main deck, at right-hand side, under gang assembly. Take original padder "live" lead down through BC-454 deck and out through front panel for connection to padder in its new position, and solder to tag. Re-connect the small circular condenser. Secure padder assembly to stand-off pillars. This modified assembly can be clearly seen in the photographs.

Miniature ceramic capacitors are wired direct to coil tags as shown in Fig. 1 and photograph of top deck. Values are as follows: RF section, CA, 330  $\mu\mu\text{F}$ ; Mixer section, CB, 380  $\mu\mu\text{F}$ ; Oscillator section, CC, 400  $\mu\mu\text{F}$ . A Philips miniature air-spaced 30  $\mu\mu\text{F}$  trimmer is wired in parallel with the aerial tuning condenser (bottom left, front panel) and can be seen at lower left in the under chassis photograph on p.237.

### Trimming Operations

Where it is desired to cover the full 1.8-2.0 mc range, the station transmitter (or signal generator) should be tuned for output at 1.9 mc. Set the original aerial tuning capacitor and the oscillator variable padder (now on the



Mounting of the variable padder capacity for front panel control, as described in the text. The marked knob is adjusted for full Top Band coverage with the BC-454, which normally covers 3-6 mc. The lower panel controls are a further modification — as described in our manual "Command Sets" — the switch being for BFO on-off and the knob for gain control.

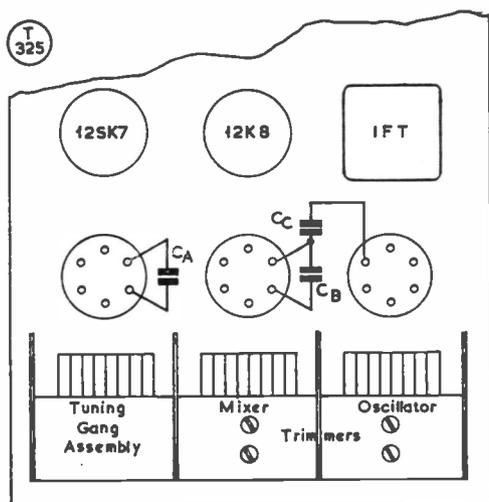


Fig. 1. Fitting of the fixed parallel capacitors above-chassis in the BC-454, for the Top Band modification. Values are given in the text, and the photograph below shows the mounting.

front panel) to midway positions, *i.e.*, with the plates half-mesh. Proceed to peak the mixer and oscillator trimmers (on the top plate of gang assembly) for maximum signal gain. Finally, adjust the Philips aerial trimmer for maximum signal.

Checking on actual incoming signals is worthwhile, as it may be found that better overall gain for the full band can be obtained by varying the oscillator padder and re-setting the main tuning-gang position. It should be found that, when the plates of the padder are fully meshed, 1.8 mc to 1.9 mc will be covered by the lower half-position of the main gang, *i.e.*, plates full-meshed to half-meshed. By setting the padder plates to half-mesh, the gang will tune from 1.9 mc to 2.0 mc by rotation from half-mesh to the fully unmeshed position. The best overall balance between padder and main gang settings will be found by experiment and this operation should not be hurried. Time spent at this stage will be well rewarded by the ultimate results. Having once determined the pre-set positions for the padder, these are noted for quick re-set when tuning over the full band.

These modifications constitute a compromise to obtain Top Band coverage with the BC-454 and it will be found that signals tend to crowd a little at the LF end of the band. This non-linear condition will remain with any combination of tuning-padder settings. Where reception is required for only a given part of

the band, the tuned circuits should be peaked for the desired frequency.

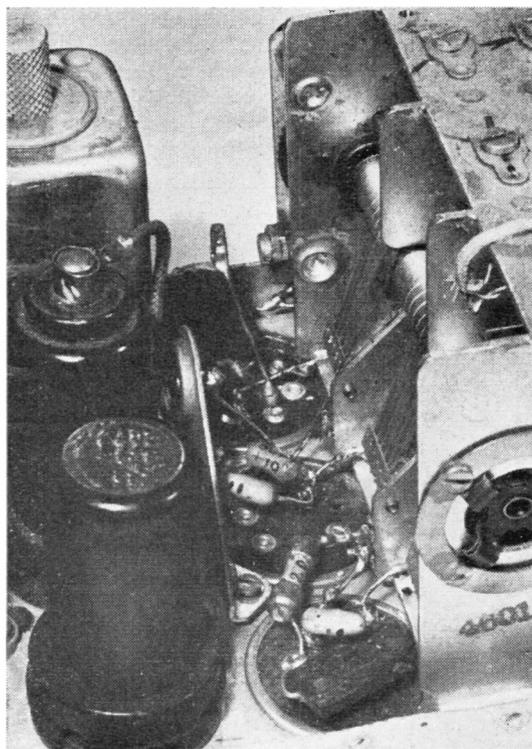
For those who may wish to peak the IF transformers, a signal at 1415 kc is required.

#### Additional Modifications

Considerable increased sensitivity of the BC-454 has been achieved by changing the 12K8 cathode resistor (R4 in the original circuit) from 620 ohms to 150 ohms. Some increase in the anode current results from this operation but has produced no harmful effects. With the increased gain, the background hiss rises to quite an extent. This can be effectively reduced by the inclusion of a  $.005 \mu\text{F}$  condenser wired from the anode of the 12A6 output valve, to ground.

The writer's BC-454 has been further modified to include a gain control and BFO switch — seen under the tuning dial in the photograph. These modifications are fully described on p.21 of the publication *Command Sets*, available from the Publications Department of Short Wave Magazine, Ltd.

The actual receiver shown in the photo-



Miniature condensers wired into the front end of the BC-454, at the positions shown in the circuit at Fig. 1. Values are given in the text.

graphs is used for Top Band mobile operation by G2VV and gives excellent results in conjunction with an unloaded rod aerial fitted at the rear of the car.

### CLAMP CONTROL FOR THE TCS TRANSMITTER

In the writer's original article, "Modifying the TCS Transmitter" (*Short Wave Magazine*, April 1959), it will be seen that protective bias for the PA stage was obtained by the use of a small HT battery. Since then, the necessity for such a battery has been obviated by putting in a 12A6 clamper valve as a safeguard in the key-up position during CW operation. This modification works very well and with the recommended 400 volts HT supply, the standing PA current runs between 80-100 mA. During phone operation the clamper valve heater is switched off. No adverse effects, when using telephony, have been observed through the inclusion of the clamper circuit.

#### Practical Details

The 12A6 valve and holder are fitted in the underside section of the transmitter chassis. With the transmitter removed from its housing and resting on its left hand side (viewed from front) the octal valveholder is secured by mounting one side on the ceramic pillar which

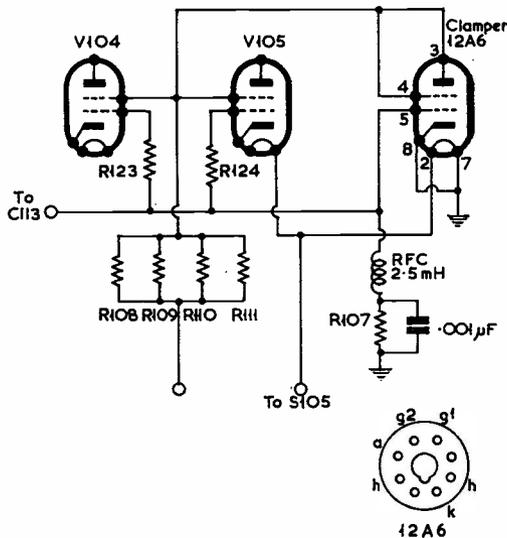
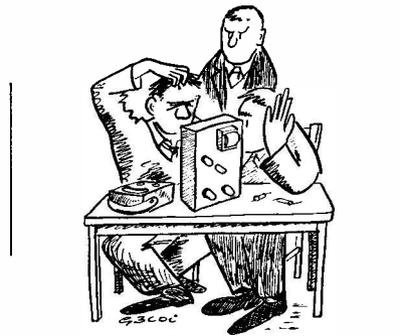


Fig. 2. Those many who are using the TCS transmitter, modified for amateur-band operation, will be interested in this circuit, devised by G2VV, for adding a clamper valve to the PA stage, thus dispensing with the battery bias arrangement. A 12A6 is used for clamping and the details are discussed in the text.



is fitted on the coil can assembly between the markings "L104, L105." The other mounting hole of the valveholder is secured by a stout wire anchored to the metal bracket supporting switch assembly S104 (the original oscillator switch). The 12A6 valve, when in position, occupies the space available between T101 (original microphone transformer) and the bottom of the chassis, with the top of the valve towards the rear of the transmitter.

#### Wiring Details

In the original circuit of the TCS6 transmitter, V104 screen is fed via R108, R109, and V105 screen via R110, R111. As will be seen in Fig. 2 these four resistors are now parallel-connected as a common feed to both V104, V105 screens. (This alteration can easily be carried out by connecting a wire between the screen pins on the appropriate valveholders.) Again, originally V104 and V105 had separate grid resistors R107, R112 respectively; the latter is now removed from circuit and the ends of the two grid stoppers R123, R124 are commoned and taken to ground via a choke (RFC) and R107. This choke, together with the .001  $\mu$ F mica condenser, are the only additional components required in the modified circuit.

To enable the clamper valve heater to be switched off during phone operation, the "live" side of the heater circuit is wired to S105 in common with the "live" side of V105 heater circuit. In this way V105—which is not operative during phone working—and the clamper valve are simultaneously switched out of circuit.

#### Keying Oscillator Stage

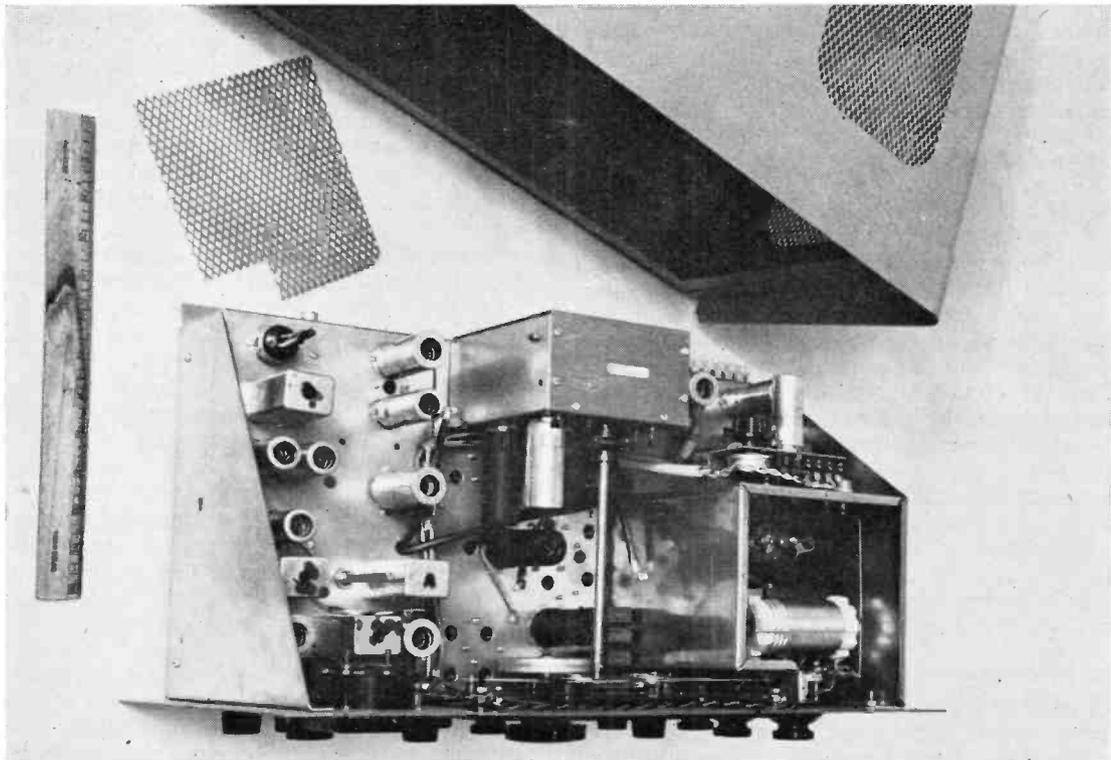
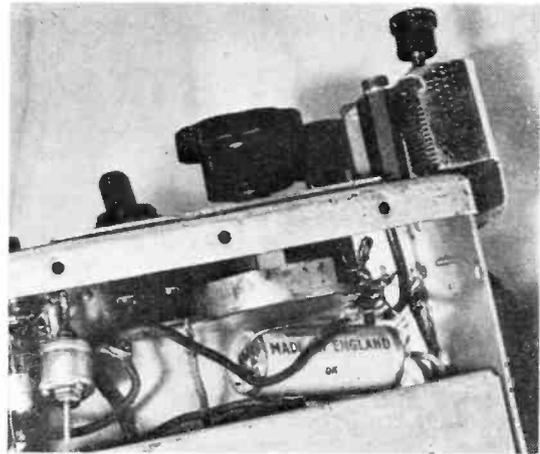
This is a further change carried out since the original modifications were published. Reference to p.66, April 1959 issue, will show that keying was done in the anode supply to V101, V103. This method functions quite

The 3-30  $\mu\text{F}$  Philips air-trimmer wired in parallel with the BC-454 aerial tuning condenser is shown at left in this under-chassis view of the receiver. The outrigger parallel condenser, for obtaining Top Band coverage, is at upper right.

satisfactorily but in order to reduce clicks for easier BK working the key has been removed from the anode circuit of the two stages and is now wired in the cathode of V101.

To affect this alteration, disconnect the leads from the key socket on the front panel, join them together and insulate connection. Take two screened leads from the key socket, remove wire from cathode of V101. Connect one key lead to cathode pin and the other to the wire removed from the valveholder.

The TCS6 transmitter modified as described produces a clean-cut CW signal for BK operation combined with safe PA performance.



Interior view of the K.W. "Viceroy" Sideband transmitter, withdrawn from its cabinet. The expanded aluminium shape near the 12-in. rule is the cover for the PA section, at lower right; this takes a pair of 6146's, and the pi-tank is switched through all bands 10-80 metres. The VFO is in the box at the middle of the rear edge of the chassis, and is controlled through the latest Eddystone dial assembly, giving ample bandspread and very accurate re-setting. As well as being an excellent performer on Sideband, the "Viceroy" is also a very fine CW transmitter.

# Diversity Unit for the G3BST RTTY Converter

COUNTERACTING  
INTERFERENCE OR FADING  
ON "MARK" OR "SPACE"

Part I

J. B. TUKE (G3BST)

*Over a year ago, in SHORT WAVE MAGAZINE for March-April, 1960, our contributor produced an original design for a receiving adaptor or converter unit for taking FSK (radio T/P) signals off an ordinary communications receiver. Here he discusses another equally ingenious idea by which the FSK signal lost by fading or interference, on either "mark" or "space," can be interpreted and replaced automatically, enabling perfect printing to continue with either "mark" or "space" channel in-operative. In Amateur Radio T/P circles, this new unit will make as great an impact as his original RTTY Converter design.—Editor.*

WHILE the RTTY terminal unit described by the author in the March-April, 1960, issues of *Short Wave Magazine* is capable of successful teleprinting from very weak and noisy radio signals, it is not capable, in its original form, of dealing with more complex propagation conditions or the condition where either the "mark" or "space" frequency is interfered with by a continuous carrier exactly on one of these frequencies.

In the reception of RTTY signals, we are faced with the usual problems of distortion and fading. Not much can be done about distortion of the signal *en route* (without complex repeaters), and by amateur standards this is unlikely to be very serious in any case—but what about fading?

## The Problem

Fading of the signal as a whole is, to some extent, almost certain to occur and will be countered to a large degree by AVC and limiter action in the receiver and terminal unit, while reduction below a certain minimum level must result in complete loss of signal. But how often does the signal fade right out? Since FSK is used, and the "mark" and "space" signals are separated from each other by 850 c/s, it frequently occurs that while "mark" may drop

out for a moment, "space" is still there and *vice versa*. This is another manifestation of the selective fading which is such a curse to AM users. The conventional terminal unit will give faulty printing under these conditions since it relies on the *shift* from one frequency to the other to operate the relay (or other device) which in turn produces the reversal of the current in the teleprinter coils. If, for example, the "space" signal is absent for a few moments the machine will remain on "mark" even though the actual "mark" signals continue to come and go. The same thing applies in reverse if the mark-signal should fade while the space-signal remains.

The fact that this type of fading results in misprinting can be correctly described as a weakness in the design of the terminal unit—although it is the correct mode of operation for all conventional types—since a little thought will show that the transmitted intelligence is still present at the receiving end provided either "mark" or "space" remains (but obviously not if both disappear!), since the absence of a mark-signal implies a space-signal, and *vice versa*. This selective type of fading has, in fact, momentarily changed the received signal from FSK to an amplitude modulated signal, *i.e.* on-off keying of "mark" or "space" alone.

Therefore, if, during such a fade, the remaining signal could be applied to an amplitude sensitive detector, the system could be made to print successfully, subject only to the limitation regarding direct interference. Hence some modification to a terminal unit to achieve this result would be worthwhile.

The other condition that will completely upset printing from a conventional T.U. is interference from a continuous (or keyed) carrier exactly on the "mark" or "space" frequencies. It has already been shown that with suitable design, interference quite close to "mark" or "space" frequencies can be tolerated, but once a carrier settles exactly on the "mark" or "space," the signal is lost—again due to the absence of *shift* potentials, as with selective fading. However, as before, the intelligence to be received does remain on the frequency other than the one which is being jammed and, if the terminal unit can be made to print from one frequency, the intelligence can be extracted. This is the type of interference that is common in amateur communication, and it often happens that the other frequency remains relatively clear.

It should not be inferred from the foregoing that the author is setting out to prove that FSK is inferior to single-frequency on-off key-

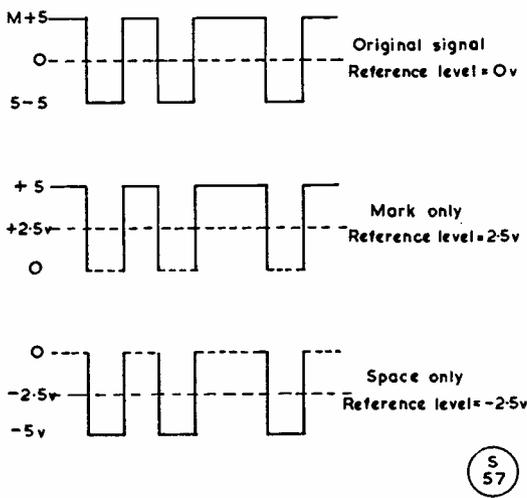


Fig. 1. Diagram to suggest how the "mark" and "space" T/P signals carry the received intelligence independently, i.e., because one of the "mark" characters is missing, it must be present in the "space" sequence.

ing for RTTY working. It is, however, obvious that under certain transient conditions, the ability to print successfully from one signal alone would be valuable—as either "mark" or "space" can be said to carry the received intelligence independently. This can be shown—see Fig. 1—by referring the individual voltages to new zero points instead of the common one between them.

**Approaching the Solution**

The output from the discriminator load resistor of the T.U. consists of voltage reversals where one direction of voltage, with reference to earth, represents "mark," and the reverse voltage represents "space." It is important to note that this is a DC output and has not, at this point, passed through any AC couplings which would remove the zero reference point. If we now consider a series of reversals (as shown in Fig. 2) and we then remove the space voltage (point A), we are left with on-off keying using the "mark" voltage alone. Each time the "mark" voltage returns to zero, there should be a space—but there is not one because it has faded out. But there is no question that once the mark voltage falls to zero, a space voltage should follow. If, therefore, we can devise an electronic circuit which will insert "space" signals whenever "mark" is absent, the original waveform will be restored (point B), and could be passed on to the printer.

And once a circuit is devised to replace lost

"space" signals it would not be difficult to use it in the reverse phase to replace lost "mark" signals. The only thing we cannot do is to supply both when the signals disappear altogether!

A terminal unit such as that outlined would, in fact, be providing a simple form of frequency diversity reception where the individual frequencies are those of "mark" and "space." A diversity system increases the chance of successful reception since it is capable of dealing with the individual frequencies as well as considering them together, and will plainly give a worthwhile improvement in printing capabilities, particularly under difficult conditions.

Assuming such a circuit can be devised, then the temporary absence of mark or space signals individually due to fading will not cause misprinting as the absent signals will be inserted automatically. Also, if an interfering signal completely blocks out one frequency or the other, a shorting switch in the terminal unit can be arranged to remove the offender while printing continues on the remaining frequency. The deliberate removal of either "mark" or "space" while printing continues uninterrupted on the other can be very useful. For one thing, it allows the use of a simple crystal filter in the receiver as the signal can be peaked on one frequency, and for another it enables signals with non-standard shift to be printed. Single-frequency printing will not, of course, show the same ability to withstand noise as FSK proper, but whereas with a sharply tuned T.U. a non-standard shift signal simply will not print, the temporary use of a single frequency will generally permit printing even if, due to noise, it is not entirely 100%.

**Practical Unit**

The circuit of the diversity unit is shown in Fig. 3 and the description of it, which follows, should be studied in conjunction with the waveform diagrams (Part 2). The voltages appearing across the discriminator load (actually R39 in the original converter, p.12 March 1960)

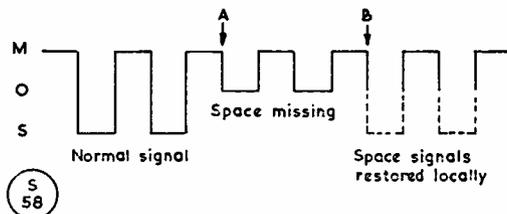


Fig. 2. This diagram should be read with Fig. 1, and is explained in the text.

which are around plus/minus 3 volts, are applied *via* a filter L1 and C1 to a potentiometer VR1. This filter is of the utmost importance since it is necessary to remove entirely the AC (audio) component from the DC reversals. The values chosen are a fair compromise between retaining the sharp attack and decay of the DC signal, and yet removing, as far as possible, the audio component. The voltage across the potentiometer VR1 is then tapped off and applied to the grid of V1A, and the wave-shape at this point is shown in Fig. 4 (Part 2).

The voltage output from V1A, which is a reversal of the input, is applied *via* a large capacitor C5 to the grid of V2A (to which we shall return later), and also by a potentiometer network VR2, R5 and R6, to the grid of V1B. This network is such that the overall gain from the anode of V1A to the anode of V1B is unity — but, of course, the phase is reversed—this, in fact, being the object of V1B. The output of V1B is coupled *via* C6 to the grid of V2B. We arrive, therefore, at condensers C5 and C6, with two signals identical in amplitude but reversed in phase. These are shown in Fig. 4, Pt. 2, as B and C. (It will be seen that they are similar to the original signal except that, due to the AC couplings employed, the DC component has been lost).

At this point, diodes V4 and V5 come into the picture. The positive-going outputs from C5 and C6 cannot build up any voltage on V2A and V2B since the diodes conduct under these conditions. Negative-going voltages will, however, remain unaffected. The signals actually applied to the grids are, therefore, entirely negative-going (and are shown in Fig. 4 as lines D and E—see Part 2).

We will now leave the general description temporarily at this point and study valves V3A and V3B. These are connected as a bi-stable multivibrator. Under quiescent conditions, either V3A conducts and V3B is cut off, or *vice versa* — and either condition is completely stable. Let it be assumed that V3B is conducting and V3A is cut off. In order to reverse the situation, it is necessary to provide one of two things — either a negative going trigger voltage at the grid of V3B, or a positive going trigger at the grid of V3A. The trigger voltage required to initiate the change-over action need only be a sharp “spike” of quite short duration. The presence of a positive trigger at the grid of the non-conducting valve will cause it temporarily to conduct, thus applying a large negative voltage to the conducting valve and cutting it off—thereby reversing the condition of the multivibrator. Similarly, a negative going trigger

at the grid of the conducting valve will cut it off, and the consequent positive going signal at the anode is passed on to the grid of the non-conducting valve and causes it to conduct.

Either of these trigger signals will, when applied to the correct valve, reverse the multivibrator condition causing V3B to cut off and V3A to conduct. Reversion to the original condition will result from the application of further trigger signals of the right polarity to the correct valve.

If we consider V3B conducting to be representative of the “mark” condition, then a space-signal from the discriminator load resistor must provide a positive trigger at the grid of V3A (or a negative at V3B), and a mark-signal must provide a positive trigger at V3B (or a negative at V3A). It may also be said that the *removal* of a mark-signal should provide a similar trigger to that produced by a space-signal, and the removal of a space-signal should likewise result in a trigger similar to that initiated by a mark-signal. If this is so, the multivibrator will change over to the “space” condition when a space-signal is received — or whenever a mark-signal is removed. Similarly, it will change to the “mark” condition on receipt of a mark-signal — or upon the removal of the space-signal.

If the condition of the multivibrator can be arranged to control the direction of current through the teleprinter coils, then it will have succeeded in supplying the missing signals discussed earlier. This is what the unit shown in Fig. 3 actually does.

#### Change of Wave-Shape

We can now return to V2A. It will be seen that the anode circuit uses a coupling capacitor and following grid leak, far too small for the frequency in use (25 c/s max.). The effect of this is to change



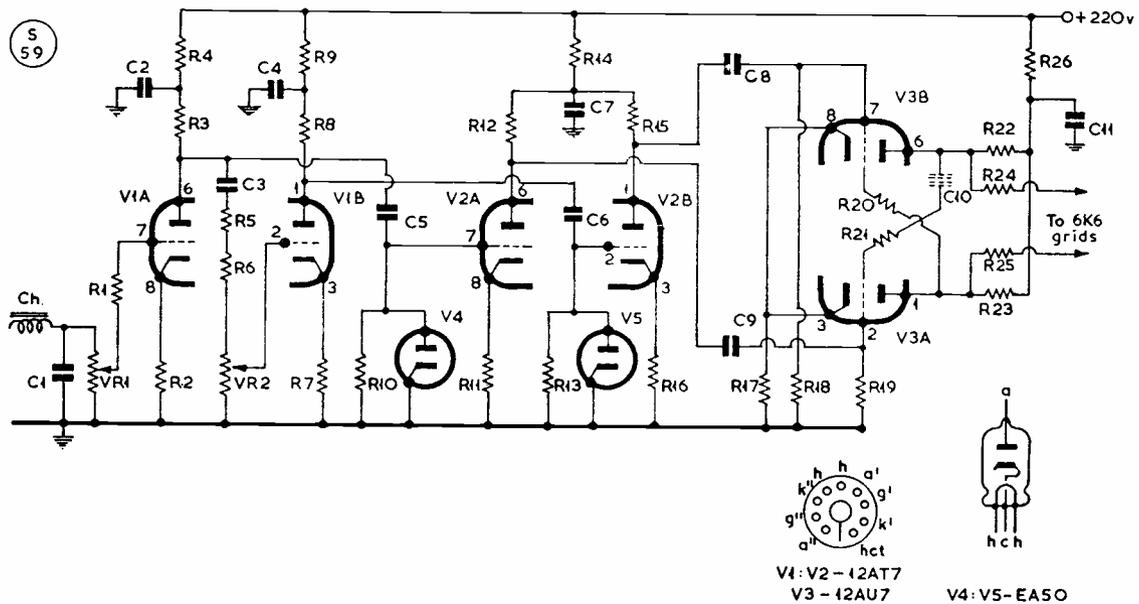


Fig. 3. Circuit of the G3BST diversity unit, to work with the FSK converter previously described by him. The unit shown here will in effect fill in for either "missing mark" or "missing space," thus counteracting the effects of fading or over-ride interference on one channel. Since the original G3BST FSK converter, designed to work a teleprinter from any usual communication receiver, with any FSK coding likely to be encountered, will already follow a radio T/P signal at or under noise level, the new adaptor discussed here goes one step further by making the whole system virtually single-channel.

**Table of Values**

Fig. 3. Circuit of the Diversity T/P Unit

C1, C8, C9 = .01 $\mu$ F	R9, R17, R26 = 10,000 ohms
C2, C10, C11 = 8 $\mu$ F elect.	R12, R15 = 100,000 ohms
C3 = 0.1 $\mu$ F	R14 = 22,000 ohms
C4, C7 = 16 $\mu$ F	R18, R19 = 470,000 ohms
C5, C6 = 1.0 $\mu$ F	R22, R23 = 150,000 ohms
R1, R4, R10, R13, R20, R21 = 1 megohm	R24, R25 = 220,000 ohms
R2, R7, R11, R16 = 1,000 ohms	VR1 = 1 meg pot' meter
R3, R8 = 33,000 ohms	VR2 = 0.5 megohm pot' meter
R5, R6 = 2 megohm	Ch. = 10 Henry
	V1, V2 = 12AT7
	V3 = 12AU7
	V4, V5 = EA50

(All resistors rated  $\frac{1}{2}$ -watt)

the wave-shape in its passage from the anode of V2 to the grid of V3 (A and B being similar in this respect). When a sharp negative going leading edge of a signal is applied to the grid of a valve, its anode current drops and its anode potential rises. The increase of positive charge on the left-hand plate of C must be counterbalanced by an increased negative charge on its right-hand plate—so electrons will flow through R from bottom to top, developing a polarity (see Fig. 5, Part 2). If the time constant of C and R is small compared with the length of time between individual square-wave teleprinter signals as applied to the grid, then, before any further change of grid voltage appears, C will have balanced its charge and the voltage across R will have fallen to zero. When, eventually, the negative voltage is removed from the grid, its anode current will rise, the anode potential

falls and the condenser C will rid itself of its surplus charge by discharging through R. The effect of this is to produce a negative-going voltage across R. The values chosen for C and R (coupling V2 to V3 in the practical circuit of Fig. 3) are such that the condenser will be well on its way to balancing its charge before the next reversal appears. It has already been shown that the shortest signals (in the radio T/P coding system) will have a duration of 20 milliseconds, so the time constant chosen is 5 ms. Since the design of V3 circuitry fixes R at 0.5 megohm, C becomes .01 (.01  $\times$  .5 = 5/1000 sec.), so that by the time 5 ms. has elapsed after the commencement of the signal, the capacitor has discharged by 63%—and, by the time the full 20 ms. has elapsed, the capacitor is, for all practical purposes, discharged.

This differentiating action turns the square-wave T/P signals into a series of spikes, the polarity of which depends upon the direction of change of voltage of the original signal.

*Part II to follow.*

**"I SPELL . . ."**

We apologise for two slight but irritating spelling errors—one on the circuit diagram, receiver section, on p.242 of this issue, where the word should be "tunable", and the other on p.209 of the June issue (left-hand column, 6th line down) where, according to correct English usage, the word should be "sizable." We sent the man out to eat earth . . .

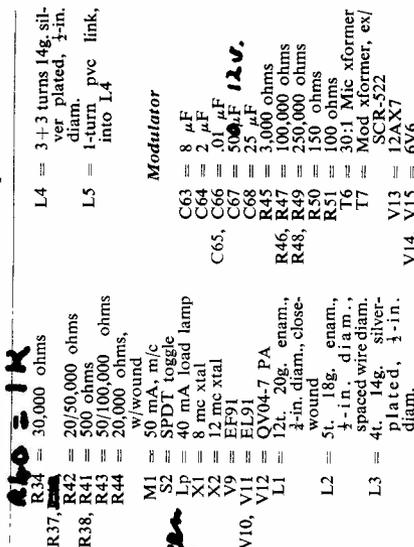


Table of Values — Circuit of the G3GOP Portable Tx/Rx.

<b>Receiver</b>	R3, R7, R11, R13, R18 = 5,000 ohms	<b>Transmitter</b>	R34 = 30,000 ohms
C1, C11 = 3-30 $\mu$ F trimmer	R4 = 2 megohm	C40 = 10 $\mu$ F	R37 = 20,500 ohms
C4, C8 = 1-8 $\mu$ F trimmer	R5 = 330,000 ohms	C41 = 30 $\mu$ F	R42 = 500 ohms
C16 = 5+5 $\mu$ F variable, with s/m	R8, R10 = 220 ohms	C43, C44 = 30 $\mu$ F	R38, R41 = 50/100,000 ohms
C2, C3 = 0.01 $\mu$ F	R15, R22 = 1 megohm	C45, C48 = 2,200 ohms	R44 = 20,000 ohms, w/wound
C5, C10 = 0.01 $\mu$ F	R17 = 250,000 ohms	C49, C50 = 20,000 ohms	M1 = 50 mA, m/c
C21, C30 = 500 $\mu$ F	R19 = 30,000 ohms	C52, C53 = 220,000 ohms	S2 = SPDT toggle
C7, C31 = 20 $\mu$ F	R20 = 270 ohms	C55, C58 = 1,000 ohms	Lp = 40 mA load lamp
C9, C33 = 200 $\mu$ F	R21 = 500 ohms, var.	C56, C57 = 100 $\mu$ F	X1 = 8 mc xtal
C12, C13 = 20 $\mu$ F	R23, R24 = 3,500 ohms	C61 = 1-5 $\mu$ F trimmer	X2 = 12 mc xtal
C14, C15 = 20 $\mu$ F	R25, R28 = 2,200 ohms	C62 = .001 $\mu$ F, mica	V9 = EF91
C16, C17 = 20 $\mu$ F	R29 = 20,000 ohms	R31, R35 = 100,000 ohms	V10 = EL91
C18, C19 = 20 $\mu$ F	R30 = 3,500 ohms	R39 = 330 ohms	V11 = QV04-7 PA
C20, C24 = 20 $\mu$ F	R32 = 1,000 ohms	R33, R36 = 2,000 ohms	V12 = 12L, 20g, enam., 3-in. diam., close-wound
C22 = 0.1 $\mu$ F	R34 = 3,500 ohms, w/wound		L1 = 12L, 20g, enam., 3-in. diam., close-wound
C23 = 100 $\mu$ F	S1 = Noise-limiter		L2 = 5L, 18g, enam., 1-in. diam., spaced wire diam.
C26, C29 = 25 $\mu$ F	W = Silicon diode		L3 = 4L, 14g, silver-plated, 1-in. diam.
C34, C35 = 8 $\mu$ F	V1, V2 = 6AK5		
C37 = 50 $\mu$ F	V3, V4 = 9003		
C39 = 200 $\mu$ F	V5 = EAC91		
Cc = Small coupling — see text	V6 = 6C4		
	V7 = 12A17		
	V8 = 12A17		
	T1, T2 = 5.5 mc IF — see Fig. 2, p. 246		
	T3, T4 =		
R1, R6 = 50,000 ohms			
R9, R12 = 350 ohms			
R2, R14 =			

cap between lamp and panel

Fig. 1. Circuit complete of the two-metre portable transmitter-receiver, built as one unit, designed and constructed by G3GOP. The receiver, with an IF channel at 5.5 mc approximately, is claimed to give very satisfactory results under /P conditions. The transmitter and modulator, though relatively low-powered, perform very well from a good portable location, with a simple beam. It was with this rig that G3GOP/P worked YUICW on 2-metre phone.



# Simplified Two-Metre Portable

DESIGN FOR A  
TRANSCEIVER

From Notes by G3GOP

It will be remembered that on May 7 last, G3GOP/P happened to be at the right place—in terms of time and distance—to work YUICW by sporadic-E. On two metres, an opportunity like this is given only about once in a lifetime—and, if the chance is offered at all, it can be taken on tackle that does not need to be elaborate. While G3GOP would be the first to agree that the element of luck favoured him, the gear must still be good enough to cope at the moment the opportunity presents itself. This article outlines the design of a transceiver of the type which is most useful for two-metre portable work. It happens also to be the equipment on which G3GOP got his YUICW contact.—Editor.

**P**ORTABLE operation demands equipment that is economical of power, reliable in use and reasonably compact. The design discussed here takes in these requirements, while using readily available parts in circuits that have been well tried. Low current-consumption valves have been chosen throughout, and their heater lines are arranged for a 12v. supply, the total loading being under 2½ amps.

A careful study of the circuit (opposite) and the photographs will show the lines along which this transceiver has been worked out. It is a transceiver only in the sense that transmitter and receiver are built on to the one chassis and go into a single cabinet—as the circuit shows, there is no dual function between Tx and Rx sides (as in the usual transceiver design) and the transmitter and receiver function as separate units, but from a common power supply.

In the receiver, a 6AK5 in the (flat-tuned) RF stage gives adequate gain with stable operation, for which purpose it is thoroughly screened and decoupled. The RF amplifier is capacity coupled into the mixer, another 6AK5 which effectively is triode connected. With a self-excited oscillator, injection into the mixer grid (at 150 mc) is through the very "thin"

capacity Cc, made by twisting a couple of wires together till the injection is "enough"—if you have green fingers, you soon arrive at what this degree of coupling should be; if you haven't, you just experiment, either with a signal generator or local strong signals, until you settle on that degree of injection which does not kill weak signals but is yet sufficient to make strong signals sound loud.

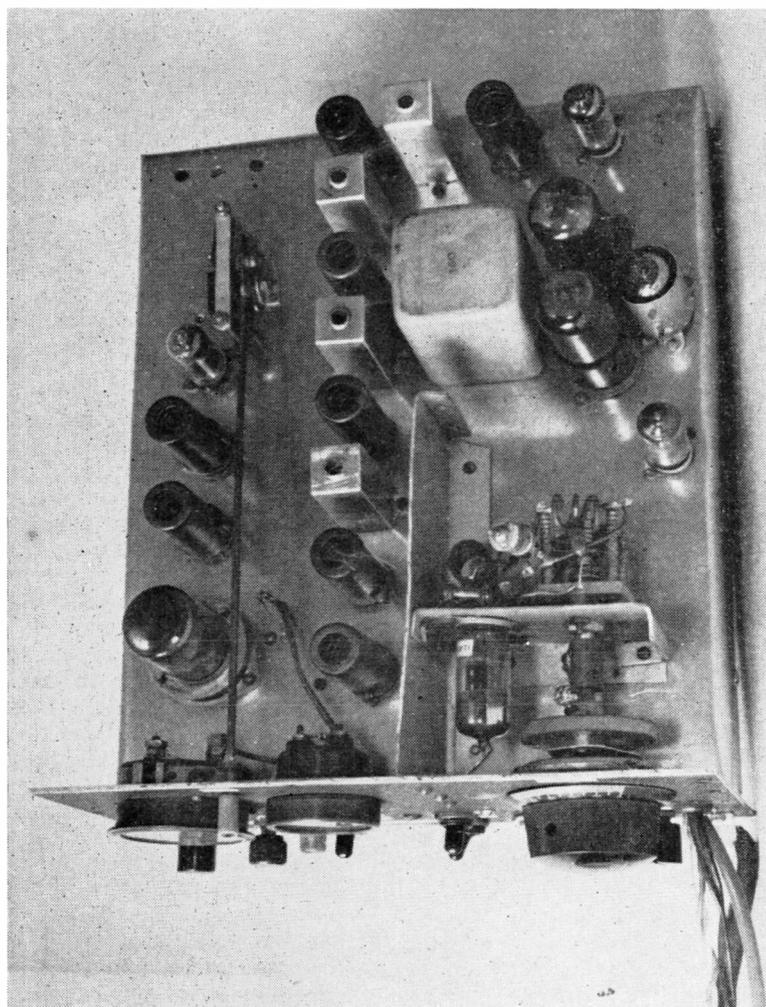
Three stages of IF amplification at 5.5 mc, using home-made transformers and 9003's, give ample gain and acceptable bandwidth. The detector/first AF stage is an EAC91, with a 6C4 as the output audio amplifier. The noise-

limiter stage, W, takes a silicon diode.

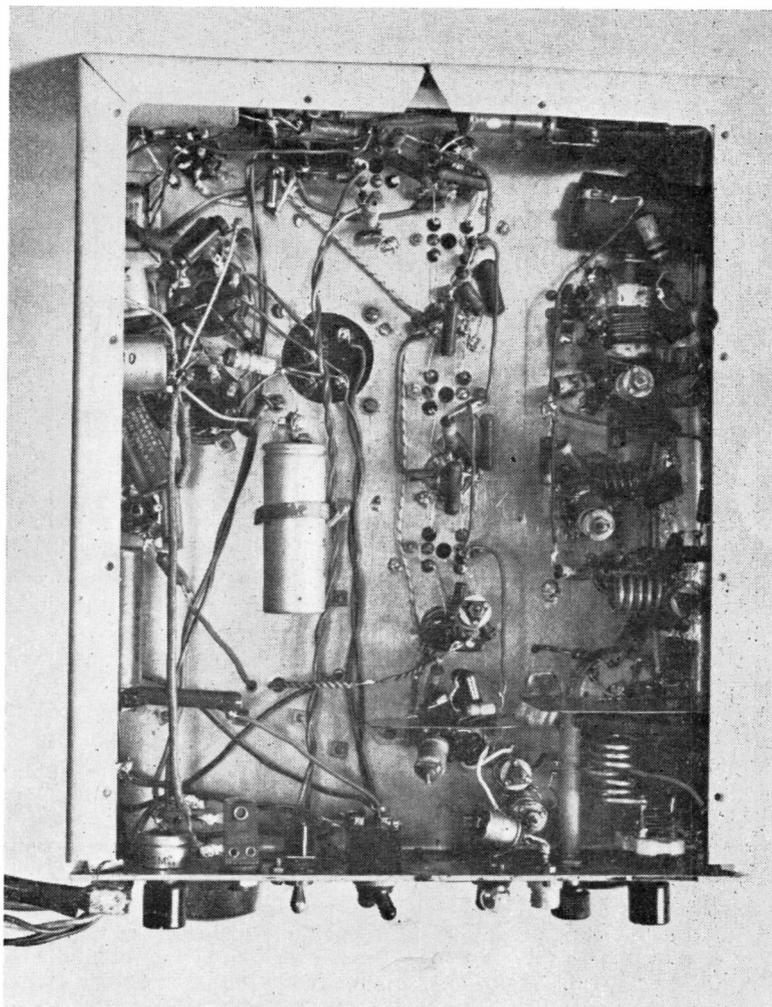
The tunable oscillator is to a basic oscillator-doubler design (generating at 75 mc, and coming out at 150 mc) using a 12AT7, to give high-side injection. This makes L9/C33 the important elements in the receiver circuit, and calls for very stable construction round the SEO stage.

#### Transmitter Circuit

This, as shown in the diagram, is a straightforward arrangement, the main point to watch in setting up being to tune the circuits in the correct sequence to 24 mc (L1) and 72 mc



General layout view of the two-metre portable transmitter/receiver assembly used by G3GOP for JP operating. Receiver side at centre, SEO on right. The sectional arrangement can be worked out from the circuit diagram and the accompanying photograph. G3GOP/P was lucky enough to be in the right place at the right time to bring the YU1CW down on him — the chance of a lifetime, brought about by the manifestation of sporadic-E — see p. 205 June issue for full discussion and explanation.



Under-chassis view of the G3GOP/P transmitter/receiver, with the transmitter section on the right. The receiver is the central assembly, with the aerial (RF stage) side at the lower (panel) end. It will be noticed that the output coupling loop (lower right) on the panel control rod is variable to give correct Tx load control.

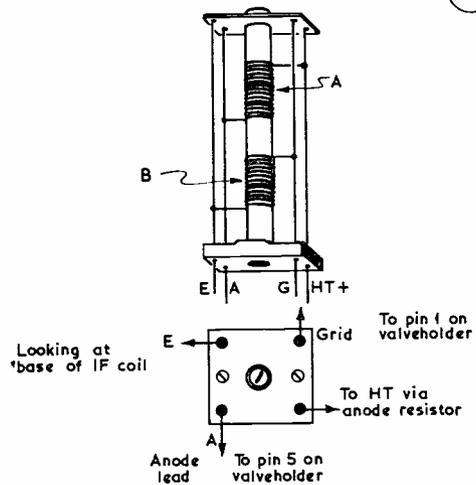
(L2), after which the driver, L3, and PA stages are both tuned to 144 mc.

It is important to feed driver and PA stages through separate HT paths in order to avoid stray coupling effects; two leads are passed through the chassis to make separate connections from the same supply. A metal screen is fitted across the QVO4-7 (PA) holder, bolted and soldered along the base and one side. Mica disc or small ceramic condensers are used for by-passing; for C40 and C41 in the crystal oscillator, at C46 and C51 for inter-stage coupling, and for C62 in the PA, silvered mica condensers should be used.

To ensure maximum drive through the trans-

mitter section, the coils should be adjusted by varying the turn spacing. It is also important to have the full 6.3v. on the heater pins of each valve—this can be something very different from what is measured at the input end of the heater supply line. In the G3GOP/P set-up, HT is supplied by a machine run from the same 12v. (accumulator) source from which the 12v. heater LT is derived; it has been found helpful to connect a 2v. accumulator in series with the 12v. (car) battery to compensate for LT drop in the line; the result of this is that 6.5v. appears across the actual valve pins, dropping to 6.3v. after a longish run. The valves can thus be relied upon to give full

Fig. 2. The home-made 5.5 mc (nominal) IF transformers designed by G3GOP for the receiver section of his two-metre portable rig. The former used is a standard 5/16-in. diameter type, with iron-dust slugs, A being the primary (54 turns of 36g. s.s.c.) and B the secondary winding (58 turns); the windings are 11.5 mm. long, spaced 1 cm., and each section has a 50  $\mu$ F silvered mica condenser in parallel.

R  
349

output.

With a 100K grid resistor at R31, 0.5-0.75 mA of grid current should be obtained in the PA, depending upon the activity of the crystal and whether an 8 mc (x3) or 12 mc (x2) crystal is used. Maximum RF in the aerial is indicated by a 40 mA pea-lamp, Lp, the small series condenser C61 being adjusted just to show glow. When tuning up and loading the PA, the aerial link is first very loosely coupled, then the PA is dipped (for minimum plate current), then C60 is adjusted for maximum glow, and if the PA is not then fully loaded, the link coupling is increased and the process repeated.

As shown in the diagram, the modulator is about the simplest possible, the carbon microphone being energised by the output stage cathode current; the 12AX7 loads the pair of 6V6's amply for full modulation of the QVO4-7 PA. The speech quality is adequate for communication purposes and, with gentle treatment of the microphone, can be quite good. One final point: To conserve LT during

long listening periods, the switching should be so arranged that the transmitter heaters can be switched off.

Using a three-element knock-down beam, very good reports on the Tx/Rx as described here have been obtained from all stations worked and, although the receiver is of a simple design, signals are tuned with ease.

## TRANSISTORISED CONVERTER FOR THE DX BANDS

DESIGN FOR 10-15-20 METRES  
USING STANDARD PARTS

H. Mee (G5MY)

**B**ECAUSE of the high cut-off frequency of some of the latest transistors, and the remarkable performance of several commercial VHF/FM transistor sets, the writer became intrigued with the possibility of DX working without valves.

Initial experiments were with a single mixer oscillator using a Mullard OC170 feeding into a standard transistor radio. Encouraging SW broadcast results were obtained, though adjustment for various bands was rather tricky. Later refinements included a separate mixer and oscillator, which were

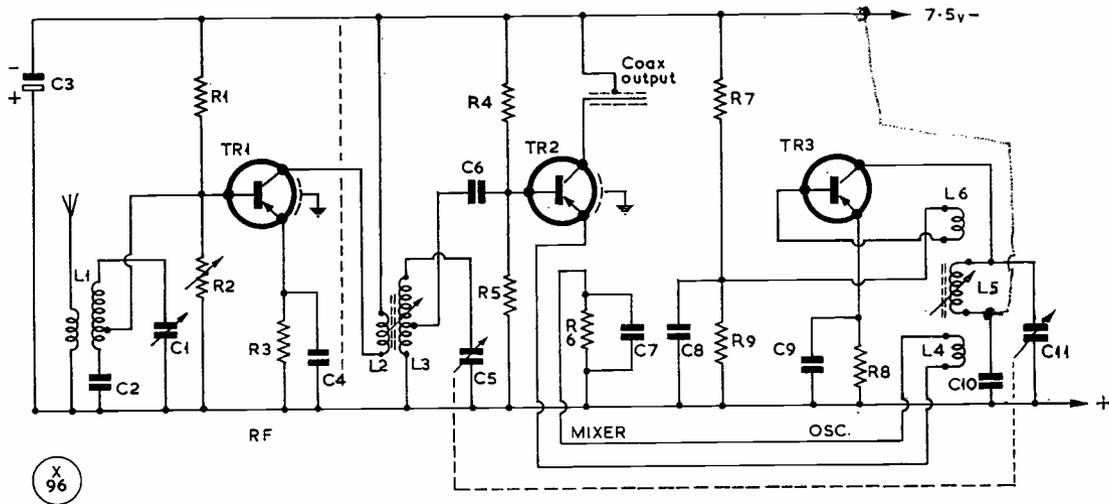
more flexible, and an RF stage, giving a useful gain and eliminating serious second-channel troubles.

### Circuit and Arrangement

The whole unit was built on a small commercial chassis, which was originally intended for VHF reception, the tuning drive and two-gang condenser supplied with it being quite suitable. The RF stage was arranged to cover 10, 15 and 20 metres in one sweep. It was first tested as a preselector feeding the station HRO. The "lift" on 28 mc was very pleasing. Precautions should be taken to avoid large RF voltages from the transmitter into the transistor input. A crystal diode across the first coil, biased by a small dry cell, and switching of the coax input, are advisable.

Philips TV-type plug-in Band I coils, suitably rewound, and slug-tuned for band setting, were used in the mixer and oscillator. The mixer output can be fed into the ferrite rod of any standard transistor portable tuned to 200 metres. The car socket on most of these feeds into a few turns wound on the ferrite rod aerial. This provides the necessary DC path for the mixer collector, and is a suitable impedance match. Care should be taken to ensure that

*Short Wave Magazine is an Independent Publication with  
a World-Wide Circulation*



Circuit of the 10-15-20 metre transistor converter suggested by G5MY, with which he is getting very good results into an ordinary transistor portable as IF/AF amplifier tuned to 200 metres, for an IF channel of 1.5 mc. This sort of arrangement has obvious advantages (and attractions) as a mobile/portable set-up run from the car 12-volt battery. A little searching through current catalogues will show that standard parts can be used throughout for this circuit.

**Table of Values**

**Transistorised HF Band Converter**

- C1 = To tune 10-20m. with L1
- C2, C4, C6, C7, C8, C9, C10 = .01  $\mu$ F, ceramic
- C3 = 50  $\mu$ F, 12v. elect.
- C5, C11 = 30  $\mu$ F, ganged
- R1 = 33,000 ohms
- R2 = 5,000 ohm, var.
- R3, R6 = 1,000 ohms
- R4 = 100,000 ohms
- R5 = 4,700 ohms
- R7 = 10,000 ohms
- R8 = 470 ohms
- R9 = 2,200 ohms
- TR1, TR2 = OC171
- TR3 = OC170

**NOTES ON COILS**

As explained in the text, TV-type plug-in coils, suitably rewound, can be used. Commercial types for the coverage required, in the Denco, Osmor or Weyrad ranges, are available from Home Radio (Mitcham) or Southern Radio (Salisbury). For home-constructed coils, make L1 to tune 10-20m. with C1; L3, L5 should be slug-tuned for adjustment into the band required; L2, L4 are 2-turn link windings; the taps on L1, L3 are made 1/4-way up from the earthy end; and L6 should be 1/4-size L5. In the case of oscillator squegging, L6 should be adjusted.

the aerial input is inductively coupled, and that first-grade transistors are being used. The measured gain will be about 100-150.

This simple arrangement was found to be as sensitive as the station HRO. though an IF amplifier with filters must be developed in order to obtain comparable selectivity. As it stands this transistor converter facilitates economical mobile DX working, or monitoring a band from the car, while retaining the broadcast facilities of the main receiver.

The complete solution to mains-borne QRM, audio and HT problems offered by transistors has already enabled the writer to reduce his transmitter to two valves, and it is hoped that it will not be too long before HF power transistors become available.

**COURSES FOR THE R.A.E.**

The next Radio Amateurs' Examination may seem a long way off, but preparations for it need to be put in hand in good time. The purpose of this note is to remind organisers of R.A.E. study courses that, with the August issue of SHORT WAVE MAGAZINE we shall start publishing details of courses, as in previous years. To catch the August issue, we need the information by July 14—or by August 11 to get into the September issue, for those centres of instruction linked to the local education authority, which normally recommence towards the end of September.

Readers who may be contemplating a shot at the next R.A.E. are reminded that they can get the syllabus, a list of text books, and a set of question papers for the last three years from: Sales Section, City and Guilds of London Institute, 76 Portland Place, London, W.1, the total cost being 3s. Be sure to ask for the papers for "Subject No. 55—Radio Amateurs' Examination", as this saves time and unnecessary correspondence.

Those who want to know about the conditions governing the issue of a U.K. amateur transmitting licence should write to: The Radio Services Dept., G.P.O. Headquarters, St. Martin's-le-Grand, London, E.C.1. And don't wait to do all these things until after you have had your holiday—do them now!

**JUST A THOUGHT . . .**

Anyone who will tolerate being called a "ham" probably is one—in the full connotation of that obnoxious word. (From *Collector & Emitter* of the Aeronautical Center A.R.C., Oklahoma City).

# DX COMMENTARY

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

**P**LENTY of lively comment this month, and no shortage of DX, either. This is just how we like it, and we are glad to see that so many correspondents have responded to the request to say something about the gear they use.

Last month's preamble on the subject of the sunspot cycle has brought forth some interesting remarks, and another favourite topic is that recent and rather futile craze, the "MC." Comment on these and other matters appears under appropriate headings.

Condolences to one contributor who wrote "I always enjoy reading the Commentary, but the moan with which you generally start it makes me depressed!" While not admitting the accusation, he can be assured that no such moan will appear this month (although one *could* find topics on which to weep bitter tears), and that our short preamble will be consistently cheerful.

The future behaviour of the sun and its spots—although it may mean that easy DX, as we have known it, is out for some time—should be a stimulus and a challenge rather than a damper. We must work out a better way of using our bands; in particular we should be able to avoid overcrowding on the LF bands by shifting some of the local natter elsewhere (who uses that 70 mc band for cross-town chatter? Not many!).

We do not know what the future of moon-bounce and satellite-bounce communication may be. If radio techniques change as drastically during the next twenty years as they have over the past twenty, we may well find ourselves



GM3NOV

## CALLS HEARD, WORKED and QSL'd

much more independent of the ionosphere before the next maximum comes round.

### DX Gossip

There are now ten active and *genuine* Albanian stations, four of them operated by YL's, according to ZA1KFF. ZA1KFJ, with the help of UA3FE, is building an SSB rig . . . JY2NZK had a very successful sortie on 14 mc SSB . . . AC5PN is back on 14 mc CW.

The much-discussed CR10 operations (also a CR8 possibility) both fell by the wayside owing to licensing difficulties . . . Likewise the rumours about a ZC4 expedition to Jordan proved to be unfounded—they arose as the result of some tentative enquiries, but the Jordan authorities apparently said "No" to that one.

ZL3VH, who put Chatham Island on the map last year, now

plans to visit ZM7-land, whence he hopes to make trips to ZM6 and VR2; he should be in ZM7 by now, and will be there for about six months.

7G1A will probably be heard shortly, signing 7G1A/FF7 from Mali . . . VS9ARM is a newly-licensed station who will be operating from Riyan, in the Qu'aiti State of the East Aden Protectorate; mostly phone, 14 mc in the evenings. (He is the only licensed AT station in the E.A.P.). QTH: Cpl./T. D. G. Marsh, RAF Riyan, BFPO 69.

EP2BD is another new one, operated by ex-VS9AE; he is on 21 and 14 mc phone from "an ideal location" on Kharg Island, off Abadan; at present he has only a dipole, but a Quad is on the way. QSL *via* US Embassy. EP QSL Manager, APO 205, c/o Postmaster, New York, N.Y.

VR4CB is active from the Solomons—a pretty scarce one these days . . . KL7DNE is on St. Paul Island, and will be there until early 1962 . . . There is a slight possibility that the Pribilof Islands (of which St. Paul is one) might eventually be counted as a DXCC country.

Airmail QSL's are arriving from PK2HT and PK2SPT (G3GHE has them both, with full mailing addresses) . . . VQ6AC is looking for Europe at 0500 GMT, Wednesdays, 14140 kc SSB (note that frequency!) . . . ZK2AB likewise, but 0700 Tuesdays . . . KH6EDY is a permanent station on Kure Island . . . JY2NZK was operated by ex-VQ4NZK . . . VR4CB on 14 mc AM, 2000 GMT.

The HB9TL expedition to the neutral zone adjoining Kuwait *did* come off, but not with the proposed call-sign 9K4A; he was signing 9K3TL from Kuwait, and 9K3TL/Portable or 9K3TL/NZ from the neutral zone . . . PK1SX is on 14 mc SSB, but not legit. for DXCC credit unless he signs K3HVN/PK1 . . . 5N2AMS worked on 21 mc CW and AM as 5U7AMS/M for a couple of days; he wants to make it clear that this operation was fully authorised, that rumours of illegal working are quite unfounded, and that he has all the documentary evidence in support.

ZK1BS, KC6UZ, KC6CG and KG6IJ (new station on Iwojima) all active on 14 mc SSB—some of them using 14150 kc and thereabouts . . . VS5WS will soon be on all three HF bands with an Apache, SX-100 and three-band Quad; G3MCN will act as QSL manager for Europe, Africa and North American contacts—others direct to VS5WS.

ZD7SA and 7SE active from St. Helena—and W9FJY acts as QSL manager for both . . .

#### Some Overseas Items

VK9PJ (Papua) is on the air with a Tiger TR-100 and a three-band Quad, getting out well into America and Europe in particular; he will be leaving VK9 before you read this, and probably in Western Australia, returning to the U.K. in August—his home call is G3MIU (Keston, Kent).

From *Lebanon* Bryan Bisley of

the many calls (we never know which one to pin on him!) writes to say that the rumour about "4X5DS" from the Dead Sea was obviously sour, the Dead Sea being entirely in Jordan . . . any entry of 4X4's would have made front-page news all over the world; he also takes us to task for quoting PK1SX as "FCC-authorized" and points out that the FCC has no jurisdiction on there; what was meant was that the FCC had apparently permitted US amateurs to work him. Apparently, too, our passed-on rumour about HV1D was no good . . . Bryan has, of course, operated from Vatican City and says definitely that HV1CN is the only station that the authorities will permit there.

Bryan continues that his OD and EP licences are on the way, and he will probably be signing OD5EB from Beirut—all bands, Ten to Eighty on AM, CW and SSB, also Two on AM only. He will be doing many trips round the Middle East and will be on with his four different MP4 calls, also operating from new spots as conditions permit.

News of a large-scale *Luxembourg* expedition comes from ON4QX, who says that *sixteen* CW operators will keep the station on the air during July 21-23; they will work from a church tower at Berlé, four bands (21 to 3.5 mc) and hope to make 2000 QSO's. Three transmitters, two receivers . . . QSL's to WOSA, Box 331, Antwerp . . . call 5 kc up or down and don't expect much more than RST and operator's name.

From *Tripoli* we hear that 5A2TG hopes to be on 7, 3.5 and Top Band very shortly; the op. is Stan Crabtree, ex-VQ4GQ and VQ1SC. Incidentally if anyone is short of QSL from either station, he will oblige; the QTH is No. 1 Forces Broadcasting Station, BFPO 57. With three years to go, Stan hopes to better the results of his four years' operation in Kenya (145 countries confirmed, 46 states worked).

#### Strange Story

Ever had an aerial shot down? This is what happened to G3NVK (Melton Mowbray), when a rook-shooting neighbour hit his Windom

but missed the rook! No BCI or TVI complications entered into this one—the neighbour apologised and said he couldn't do it again if he tried, and 'NVK hopes he won't.

Readers may remember that G6QB was put off the air by a woodpecker, but this was a long-term effort—it was years before the mast became unsafe and had to be pulled down. But the two episodes show that "our feathered friends" could get together and constitute a menace . . . we await the first report of a GM portable being carried off by an eagle.

#### Story From Malaya

From the MARTS Newsletter No. 4 we read that complaints were made by amateurs of interference from Radio Malaya on 7014.5 kc (its allotted frequency being 7200 kc). The chief engineer of the broadcasting company replied to a letter from the Controller of Telecoms. to the effect that he had been listening in the 7 mc band and had heard a certain 9M2 amateur station with the Radio Malaya programme obviously being picked up through his microphone. Further, the said amateur had been heard to remark that he enjoyed the request programmes from Radio Malaya and was leaving his transistor radio switched on! (On one occasion he purposely increased the volume so that the station he was working could hear it better.)

This come-back not only cleared Radio Malaya of any suspicion of spurious emissions, but also brought a rocket from the Director-General of Telecoms., pointing out that repetition of this practice would be regarded as very serious indeed, and appropriate



action . . . and so on. *Moral*: That saying about glass houses probably applies.

### All-Asia DX Contest

This one has already been mentioned; this is to remind you of the dates (August 26, 1000 GMT to August 27, 1600 GMT) and of the fact that the contest is for CW only, with two categories—single-band, single operator and multi-band, single operator. OM's sign RST plus the two figures of their age; YL's give their age as 00! Score is the number of contacts for each band, with a country

multiplier for each band. Logs, by September 30, to JARL, PO Box 377, Tokyo Central. (Last year's winner was 4X4JU, with nearly ten times as many points as the runner-up, UB5WF.)

### RTTY Success Story

G3CQE (Norwich) made history for RTTY on May 15, when he worked VS1HU (G3JFF) for the one and only RTTY contact between Asia and Europe. A few days later, he completed his RTTY/WAC by working PY1KU, whom he printed for about an hour with only five errors. This was another "first," not only for Europe/PY but for Europe/South America. PY1KU is QRX for European RTTY on 14080 kc, every week-end at 2130 BST. VS1HU, on the other hand, has left Singapore, but operates as G3JFF/MM on 28 mc only. When he reaches the Pacific he will be able to operate on 21 mc also.

VS1HU's future movements are as follows: *June*: Papua and New Hebrides; *July*: arrive Fiji (VR2MA); *September*: Gilbert and Ellice Islands (VR1M); *November*: Sail for New Zealand; *January, 1962*: return to VR1; *April-May*: Sail for Solomon Islands (VR4M); *June*: return Singapore and U.K.

G3JFF/MM, when in territorial limits, will operate under the normal amateur licence conditions; when on the high seas, on 28 mc. The equipment consists of a Panda Cub driving a pair of 6146's to 150 watts. Readers will be kept posted of G3JFF's movements as news comes in.

### WPX and Suffixes

There has always been some misapprehension about the circumstances in which *suffixes* count as if they were prefixes for WPX purposes (we have suffered from quite a lot of it ourselves!) G3DO (Sutton Coldfield) kindly puts things right, as follows: A VE6/SU counts as "SU6," but only because there is no number after the SU. If he signed VE6/SU1, then he would be just an SU1. A W7/VO2 likewise counts as a VO2, *not* as a VO7 (this was one of our mistakes in an earlier note). Thus a K1/KL7 and a W1/KL7 are just plain

KL7's and nothing else.

In short, a suffix can only create a new scoring unit when no figure is given with it; in which case the figure of the *prefix* is adopted. Where the suffix has a number, the entire suffix, number and all, counts as if it were a prefix. Sounds a bit confusing, but it's really quite straightforward. Thanks to G3DO for clearing it up.

Apart from the slight confusion that might be caused by this suffix complication, WPX remains one of the cleanest and simplest methods of scoring, for those who want to "score." We still boggle at the idea of an up-to-date countries list, with so many more changes in the offing. (For instance, what is going to emanate from ZS under the new regime?) Suggestions on hand are that those who want to stay with their "DXCC Countries" should do so; that we should publish a list based on a modern atlas (how modern?); that we should quote the list from Stanley Gibbons' stamp catalogue; and that there must be available, somewhere, a United Nations official list (but even that keeps changing).

Whatever we might do, someone else would be sure to come out with something quite different, so, for the time being, we propose to do . . . nothing. There are more than enough known and recognised countries for most people to work through, and any oddities or border-line cases can be considered on their merits. In other words, no need to start worrying until you have worked 200 countries.

### Sunspots Again

Apparently last month's preamble on the prospects for the next sunspot cycle, which were meant to be purely factual, have struck dire depression into the hearts of some who read them. G3MTB (Barton - on - Humber) writes "You left me feeling miserable. The future of the HF bands makes me very depressed and I feel like selling all the gear and going in for another hobby such as bird-watching. I was one of the New Boys who started in 1958 and sampled some of the DX which could be worked with-

### P & Z TABLE

STATION	PREFIXES WORKED	ZONES WORKED
<i>CW Only</i>		
G2DC	445	40
G13NPP	438	40
G3HZL	379	40
G3WP	375	36
G3ABG	336	40
G2BLA	325	39
GW3CBY	280	23
G3LZF	238	34
G3IDG	235	27
G2BP	228	31
VK6AJ	199	36
GW3MLU	195	31
ZC4CT	194	28
G3OQK	138	14
G2HLU	135	24
<i>Phone Only</i>		
G3DO	639	40
MP4BBW	455	40
G3GHE	400	39
GB2SM	370	37
G3MCN	352	38
G3NWT	349	39
G3LKJ	347	38
G3BHJ	320	37
G3NFV	292	37
G3ABG	261	32
G3HZL	140	26
GW3MLU	127	23
G2BLA	110	21
G2FQW	99	6
G3WP	80	25

out a big array of aerials—what are we going to do now?" The answer to that is—keep right on working DX, without a big array of aerials! Not so often, perhaps, and not so easily, but you'll do it.

G3FYR (St. Ives), on a much more cheerful note, says "in the years of the last sunspot trough 14 mc used to open in the morning to VK and ZL and swing over to the West (USA) in the afternoon. In fact 14 mc in the trough behaved much as 28 mc did in the peak. There is a lot to learn about propagation and the ionosphere, and, as you stated, records have not been kept long enough to predict just what is going to happen in the future."

G3NWT (Sandiacre) contributes this thought: "The sun has been in existence for perhaps a few hundred million of these cycles; who can say that it will 'refer back' over a couple of hundred years (or even a couple of million) to decide what sort of a show to put on next? The parameters upon which an intelligent forecast can be made are at the best inexact—there just haven't been enough recorded maxima so far."

Whatever the next cycle may bring, we have got to face the declining years of this one. These will bring better DX conditions to the LF bands, with the inevitable overcrowding that is bound to result. Obviously it is up to us to cope with this situation. To take an example: If all the stations who habitually worked DX on *Ten*, finding that band unusable for the purpose, were to crowd on to *Forty* there would be chaos. But couldn't much of the local-natter on *Forty* transfer itself to *Ten*, which is an excellent band for 'cross-town working?

An even more extreme case: If the short-hop workers on One-Sixty were to find themselves embarrassed by a welter of CW stations taking advantage of the better conditions to work GDX and European DX, couldn't they explore the possibilities of the *Four-Metre* band? Far from being a hardship, this would provide the kind of stimulus that changing conditions always do; the virility of Amateur Radio depends upon people who are



G3OOH is also DJØBF at Altena, in the Dortmund-Wuppertal area of West Germany. When in the U.K., he operates from G3OFI, London, S.E.14.

prepared to make drastic changes rather than sit on one spot, with the same gear, year in and year out, saying the same things to the same people.

Food for thought, and plenty of it . . . there is much that can be done to make better use of the bands that we have. There's no sense in leaving *Ten* and *Fifteen* practically empty for a few years, just because the ionosphere won't play—they can be put to some use which is independent of that uncontrollable region. (Shall we start a WABC Ladder for *Ten* Metres?) Think it over and let us have your suggestions . . . but we don't even want to hear from those who say "I've been using *Forty* (or *Eighty*) for fifteen years and I don't see why I should move now."

#### Round the DX Bands

No cause for sorrowing as yet! The only band that we have lost (and that not completely) is *Ten*, where very little happens except the odd North/South DX contact. *Fifteen* has remained excellent, and *Twenty*, as ever, is bristling with everything imaginable—all at once!

The DX worked appears, as usual, in tabulated form, but if anyone thinks he has got to use high power and a high-gain beam to raise it, he might well correlate some of the lists with the descrip-

tion of the gear appearing herewith. Some of the stations with the simplest rigs and aerials have produced the longest lists.

Another terrific log of contacts on *Twenty*, SSB, comes from GM3JDR (Sutherland), who uses a single TT21 PA and a dipole. Since March 7 he has worked 129 countries in 37 Zones, and the accompanying list covers only May 14-June 11.

GW3AHN (Cardiff) also turns in lengthy logs for *Twenty* and *Fifteen* SSB; he runs a K.W. "Viceroy" with home-built power packs (500 volts only on the PA); the receiver is an S.640 "well modified"; and the aerial a Minibeam which is hardly any better than a dipole on *Twenty*, and only 25 feet high. GW3AHN writes "Not very ambitious, I admit, compared with some of the G stations using high power and aerial farms, but the station works reasonably well and provides me with a lot of enjoyment." (Seeing that list, we can well understand it.)

G2VV (Sunbury) still uses an indoor aerial and about 70 watts, and says "I make a point of telling the W's, and it really shakes them. Usually they're running a kilowatt and a 3- or 4-el. beam, and we get the same reports both ways. This is my sixth year of indoor aerial work and it's been

## AM PHONE DX WORKED

- 21 mc Band**
- G3DO:** HK2YO, TN8AZ, TT8AD.
- G3NWT:** SV0WO, BV1USB, JA5FT, 6MW, VS9MB, 5N2ATU, 2JKO, CR7GF, VSSGS, ZE4JE, 4JW, VQ2, 3, 4, 5, 9M2's, VS1's.
- G3MBL:** VP4NC, YN6HH, YA1AO, KZ5TD, VU2RG, 9K2AP, 9M2GV, EP2AR, 9U5NC, PZ1BE, 9G1CC, CR6BU, VS9MB, OK3KM.
- G3BID:** VP5CH, FQ8HZ, VS9MB, VP8EM, 9U5PD, VS9APH.
- G3NAC:** CE3RC, EP2BD, FQ8HL, HK4BQ, TT8AC, TN8AW, VS9MB, VS1FE, VQ2, 4, VK, VK9AS, VSSGS, VP3RW, MP4BDC, ZS3AH, 3AJ, 5N2ATU, 2BRG, 2AMG, 2JKO, 6W8CK, 8CY, 9U5DS, 5PD, 9Q5CI, 9M2EW, 9K2AP.
- G3GHE:** FG7XL, JA's, KR6IR, 6MF, OD5AJ, 5CQ, 5CU, PK2HT, 2SPT, PZ1BW, VK9RO, VP5CH, VQ5IB, VR2DS, VS1's, VS6CL, 6EC, VS9's, VS9MB, VU2BK, 2RG, XW8AL, YN6HH, 4S7YL, 5N2AMS, 2ATU, 2BRG, 5U7AMS/M, 9K2AG/M, 9K2AP, 9M2AD, 9N1MM, 9U5NC.
- G3FXB:** CR5BA, EP2AT, FQ8HN, HP15B, TU2AH, TT8AD, UI8AG, VQ8BM, VSSGS, VS9MB, 5U7AH.
- G3NOF:** CE3RC, FFTAG, KZ5TD, PJ2CN, PZ1BK, 1BW, TL8AC, TT8AC, 8AD, VP2AR, VP5CH, VP6AM, 6WR, 9DL, VS1FE, 9MK, VU2BK, YA1AW, YN6HH, 9G1CC, 9Q5CE, 5CI, 5N2JKO, 2AMS, 6W8CU, 5U7AMS/M.
- 14 mc Band**
- G3GHE:** OH0NF
- G3NAC:** AP2MR, DU9PET, EA9EA, SV0WH, YV5AXQ, VS9APH, VQ3HS, VE4EM, 6W8BP.

## SSB DX WORKED

- 14 mc Band**
- GM3JDR:** CE3HL, CN2AR, CR6CA, EA8BA, EA0AC, EL2G, EP2AG, FB8CM, HK2YO, HV1CN, HZ1AB, JY2NZK, KG4AP, KH6DLF/KH6, K11FS/KL7, KP4AEQ, KR6HL, 6KA, 6KV, 6QW, LX1DE, 3MA, M1B, OAAJ, OD5CN, 5CT, PJ2AA, PZ1AX, 1BJ, T12PZ, UA9, UA0, UD6, UG6, UJ8, VK3AHO, VQ2AB, 3GX, 4EZ, 9DC, VS1FO, VU2RX, ZD1ES, ZS7F, 5A5TA, 6W8BP, 9K2AM, 2AP, 9K3TL, 9K3TL/NZ, 9M2DB, 2GA, 9G1CY.
- GW3AHN:** HK2YO, HZ1AB, JY2NZK, KL7DNE, KM6BJ, KR6HL, KX6DB, LX3MA, OAAJ, PZ1AX, 1BJ, SV0WT, UA0, UD6, UG6, UH8, VK7AI, VP2AB, VQ3GX, VR2BJ, VU2CQ, 2RX, XE1CV, ZD1ES, 9K3TL, 9K3TL/NZ.
- MP4BBW:** SV0WT, JY2NZK, SL3ZO, 6W8BP, HH9DL, 9K3TL/NZ, HK2YO, LX3MA, PK1SX, JA8AA, UA2AO.
- G3DO:** CE2AK, HC1KA, 1JU, HR3HH, HS1X, HS2A, HV1CN, JA, JY2NZK, KA7AA, KG6IJ, KH6EDY (Kure), LX3MA, UA9, UG6, UH8, UJ8, UD6, VP6WD, VQ3GX, ZD1ES, 9K3TL/NZ, 9Q5US.
- G3NWT:** VQ3GX, UG6, KH6DLF, VU2RX, LX3MA, 9K3TL, DL0.
- G3BID:** DU7SV, UR2, UA1, SV1AO, SP5PO, 9K2AM, SV0WN, PZ1AX.
- G3FXB:** CT3AV, CR9AH, EL2G, EP2AG, HC1FG, HH9DS, JY2NZK, KG6, KL7, KH6EDY, HP1JF, HV1CN, PJ2AA, PZ1AX, OA4DI, UD6, UG6, UH6, UL7, VR2BJ, VP5RD, XE1CV, YS1MS, ZD1ES, ZK2AB, SV0WT, 9M2DB, 9K3TL/P.
- G3NOF:** HV1CN, JY2NZK, KR6KV, LX3MA, PZ1BJ, SV0WT, UA0BP, VK6MK, VO2QB, VQ4RF, YN1CK, ZE4JN, 5A5TA, 9K3TL/P.
- 21 mc Band**
- G3NAC:** VS6CL, FB8CM.
- G3BID:** HZ1AB.
- GW3AHN:** EL2AC, EP2BB, HZ1AB, LU's, OA4EU, 4J, PY's, VQ2AB, VSSGS, YV1EE, 5A2TZ, 9G1CC.
- 21 mc Band**
- G3NAC:** VS6CL, FB8CM.
- G3BID:** HZ1AB.
- GW3AHN:** EL2AC, EP2BB, HZ1AB, LU's, OA4EU, 4J, PY's, VQ2AB, VSSGS, YV1EE, 5A2TZ, 9G1CC.
- 21 mc Band**
- G5BZ:** 9U5TT, 5N2IND, MP4TAC, VS9MB.
- G5BZ:** EP2BB, ET3AZ, HC5CN, 5C R C, H K 3 T H, JA1-2-3-4-6-7-0, JT1KAA, KG1FD, KH6ACC, KL7DNE, KM6BI, KR6MS, 9K3TL/NZ, 9M2FR, UA's, UA1KED, UH8BI, 8DA, UI8AT, UM8KAB, 5U7AC, VP3MC, VP5CD, VP8FD, VS6EN, VS9ADM, YV6BS, ZK1AK (between 1800-2200 GMT).
- G13NPP:** CR9AH, DU7SV, EA0AB, FK8BI, HS2M, JT1KAA, JY2NZK, KM6BI, KW6DF, K X 6 B U, LA 7 R F / V R 4, MP4MAH, TU2AL, UA1KED, VR6KV, ZD3P, ZK1AK, 5U7AC, 9K3TL/NZ.
- G2HLU:** EA8DO, KP4ANS, KV4AA, 4CI, T12LA, UA9XG, UH8BI, UI8AP, VS1FH, VS9AAC.
- G2VV:** CE1AD, HP1IE, HK1QQ, KZ5's, OX3BL, UG6KAA, 9U5TT, ZL4JP (indoor aerial).
- 21 mc Band**
- G5BZ:** 9M2MA, ZD3P, VQ2WM, CX2AZ, VSAKQ, VS9MB, 9Q5AV, JA1-5-8, VU2XG, 4S7OE, 5A3TO, KP3AEQ.
- G3LPS:** VQ5IB, VS1's, VS9AHH, VS9MB, UL7GL, VO2DP, ZD3P, 7G1A, EA6AM.
- GW3AHN:** JA4HM, VQ5IB, 5IG, VSSGS, ZD7SA, 5N2ATU, 5U7AC, 5U7AMS/M, 6O1MT, 9K3TL/NZ.
- G3HZL:** SV0WO, 0WZ, VS1JW, VS9MB, 9M2FS, 9U5MC.
- 28 mc Band**
- G5BZ:** ZS1OA, 9Q5EH.

## CW DX WORKED

## 14 mc Band

- GW3AHN:** JY2NZK, UA0BP, 9K3TL/NZ.
- G3LPS:** UI8AZ, OD5CQ, ZS3DA, VS6EC, VR2DK, VQ5IB, VS9ACC, ZS7S, HP1IE, KZ5MQ, KG4AB, VP9QQ, VP7NE, KH6DLW, ZE1AK,

very interesting indeed."

G2HLU (Reading) makes a welcome re-appearance—he used to be ZD4AM (Gold Coast), before 1950. In 1956-58 he came on occasionally, using the old ZD4AM rig, but since this spring he has been more active with a TVI - proofed outfit running 100 watts (QRO) or 30 watts (QRP). The receiver is an ancient R.107, plus an RF-24 for Fifteen and Ten. Aerials are dipoles for Forty, Twenty and Ten, all joined at the centre and feed with the same feeder, via a balun, to co-ax output from transmitter. Only 24 feet high, but they work quite well (even on Eighty) and the 7 mc dipole is used for 21 mc.

G3FXB (Southwick) returns to the chase, now with SSB, having equipped himself with a Viceroy and the KW-500 Linear; working on Twenty only, he has netted 77 countries in the first nineteen days of operation. Prior to this, he was mostly on Fifteen AM.

G3MBL (London, N.12) has worked some nice AM DX on Fifteen, using 20 watts to a 2E26 PA with a two-el. rotary 30 feet

high; a Geloso VFO is used, with plate-and-screen modulation of the final, the whole lot being in one box. The receiver is an AR-88; aerials (apart from the beam) are a dipole for Twenty and a 200-ft. wire for the LF bands. With this outfit (and trolley buses past the door) 101 countries have been worked on phone (83 confirmed).

G3OQK (Davyhulme) has just moved from Eccles—only three miles, so he doesn't have to start again on the ladders; he has a home-built rig for Ten to Eighty, with 50-60 watts, and a Top-Bander on the way. Receivers, an R.107 for LF bands; a home-brew 16-valver for the others. Aerials, like those in the previous paragraph, three dipoles connected to one feeder. DX-ing has not yet started, but eagerly awaited.

## Top Band Topics

Even if this is the off-season as far as DX is concerned, One-Sixty is fairly humming with activity—especially with phone at the HF end, where GDX is flourishing from about 1800 onwards. One item of good news which just

missed last month's deadline is that the OH's are now permitted to use the band. Hitherto this has only been allowed on special licences (remember OH3NQ and his WABC a few years back?). We shall hope to see lots of them this coming winter.

'Way back we mentioned the fact that G3NNO (Leeds) would be mounting a GM expedition; this plan has now been changed, and he tells us that he, with G3OGZ and G3OHH, will be touring *Wales* for about ten days from July 29, operating from as many counties as possible. Call-sign, GW3NNO/P. However, the Cheltenham club propose to operate GM5BK/P, late July and early August.

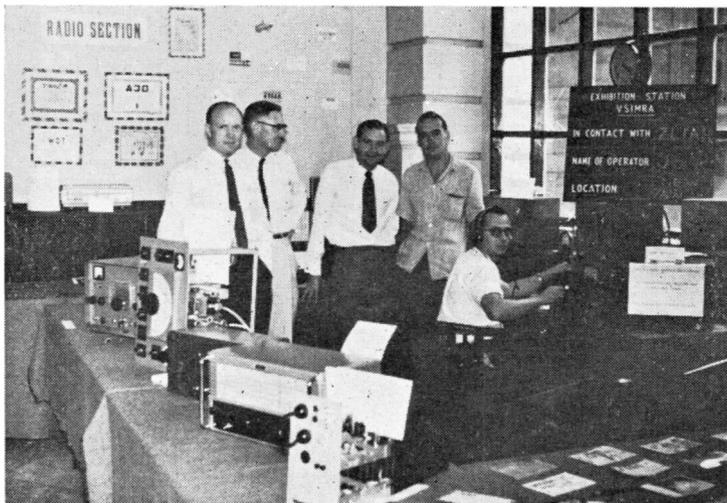
G3IGW (Halifax) has been exclusively on Top Band for the past three months . . . G3NPB (Hexham) has boosted his score with GM3OM/P (Peebles) and GW3FNQ/P (Anglesey), both on phone . . . G3NAA (Chelmsford) worked DL2BL on phone, and received his anxiously-awaited card from ZC4AK . . . G3NVO (Middlesbrough) was just as pleased to get his from UB5WF;

**L F BANDS TABLE**

(Countries Worked)

Station	1.8 mc	3.5 mc	7 mc
G2YS	20	73	93
G3FPQ	19	85	134
G3IGW	19	51	95
G3NFV	15	12	27
GW3CBY	14	29	50
G3NYQ	11	4	22
G3NNO	10	23	24
G3FXB	9	78	152
G2BLA	9	39	70
G3NYA	9	21	22
G3DRN	9	13	42
G3IDG	9	16	20
G3NPB	9	8	21
G3HZL	8	44	81
G4JA	7	40	57
G3OQK	7	5	23
G2DHV	5	25	33
G2FQW	1	4	33

*This Table derives from Countries Worked. Order is based on band in first column, changed monthly.*



The VSIMRA stand at a recent exhibition in Singapore. Standing, left to right: VS1FZ, who is also G2ATM; VS1KF; VS1KV, who also signs VK9JF; VS1HU, well known in the U.K. as G3JFF, and now working RTTY on the DX bands; and VS1JW on the rig. This is said to have been a very successful demonstration of what Amateur Radio means in DX parts.

he confirms that his Roxburgh expedition is still "on," and should be starting around July 22.

GM3COV (Caithness) has got up to the fine total of 92 (87 confirmed), and is dying to hear news of Sark or the Scillies; he doesn't do much on phone, but has worked 23 counties so far—he wants all 98 on CW first, and then will start on the other mode, probably SSB. GM3COV says "I can hear quite a lot of stations in daylight but don't seem to get many replies." However, he has worked G3CMJ and G3PU (Wilts and Dorset) in daylight, which seems pretty good; and for the next couple of months it will hardly be dark at all up there, so he hopes for more "daylight" contacts.

**The Middleman**

One of our regular 'chasers suggests that "MC" is too dignified a title for a personage who should be known, henceforth, as "the Middleman." The idea, when it started, was all very well; one good operator with a good station, keeping order around the frequency of a weak DX-pedition. But what has happened to it since then? Self-appointed MC's crop up all over the place (absolute lids, some of them, too!); DX

stations refuse to work callers whom they can hear perfectly well unless they go through the MC, whom they can't; all sorts of stupid troubles which wouldn't exist if the MC would pull out and go to bed.

Brief summary of this month's views: "System OK provided the MC is in roughly the same geographical position at the DX-station. Europeans copying KH6EDY (Kure) at S9 plus were denied contacts because they were inaudible to his MC, in W6 - land" . . . (GI3NPP) "Listened for a couple of hours to the handling of LX3MA on 14 SSB—rarely heard a greater shambles or more time-wasting procedure. Half the stations calling on the queue frequency, half on the DX frequency—the time taken by the MC sorting his lot out and passing them over, having them read back and nattered over, resulted in most of the organised stations losing the QSO through changing conditions" . . . (G3GHE).

"I have heard competent AM DX-pedition operators (such as PX1PF and VQ1HX) work twenty in the time some of these SSB chaps take to work one—and without an MC" . . . (G3NWT).

### Hancock and That

Quite a number of the 'chasers seem to have seen the Hancock excursion into what was alleged to be Amateur Radio, and most of them envy the ease with which he made his contacts with Malaya and Japan . . . A few are indignant because they thought the programme held our hobby up to ridicule—but we're not insured against that contingency, anyway. G3JDK (Rotherham), on the other

hand, thought that The Boy's efforts to despatch a bread pudding to Malaya were no more odd than many of the genuine QSO's one can hear, and he adds that with all the Funny Men blossoming out at week-ends we might agree that the bands are filling up with budding Hancocks. Final comment—G3JDK is taking down his Great Circle Map and substituting a large mirror . . . he says it might help others, too.

### Not So Funny

Talking of Funny Men, one of the whistling types in the Midlands, who obviously thought it deliriously humorous to swish his VFO and provide the maximum of QRM all round, is now doing a spot of re-thinking. He was caught, prosecuted, fined £85 with eight guineas costs, and had "about £45-worth of equipment" confiscated. It seems that it cost the GPO £350 (in wages!) to catch a few of these types. The one referred to said in court that his intention was to add "lively interest" to certain transmissions which he felt were rather boring. We all hope that he had his £85-worth of fun and will now turn to some other hobby to which he can add some more lively interest. (Thanks to G3KDK of Halesowen, and others, for press cuttings and so on concerning this case.)

### Our Heading Photograph (p.248)

GM3NOV is operated by G. A. Roberts from 111, Great Southern Road, Aberdeen; he is also hon. secretary of the Aberdeen Amateur Radio Society and (some of the members say) he is so seldom off the air that, as the photograph proves, he operates in his sleep! However that may be (and we are only repeating gossip) GM3NOV started before the war as 2FNC ("artificial aerial") and was in the R.A.F. for the duration. Licensed as GM3NOV in August 1959, he has suffered from DXitis ever since, and his score now stands at 143C worked and 110C confirmed, with WAS and 39 zones in the bag.

The rig is home-brew, with a pair of 807's in the PA, series-gate modulated, completely TVI-proof

and running 100w. The receiver is a Hallicrafters SX-100 and the aerial system consists of a long-wire for the LF bands, a 20-metre dipole, and a Cubical Quad for 10-15 metres.

### Miscellany

Last month's brief list of forthcoming contests (*see* p.195, June) shook quite a few of our readers, and some scathing comments have resulted. G3BID points out that on some occasions we have two contests overlapping—one on CW and one on Phone—which removes the last hope of the non-contestants to escape the crush. Fortunately for all those who can't stand the RST rat-race, we have other bands to choose from; many whom we know of retire to Top Band or two metres for the duration of these affairs.

From G4JA: Report of the month . . . two Eastern Europeans on 14 mc, one reporting the other "Ur RST 594, vy FB"! And G4JA on contests and general competitive stuff: "Too frequently on Twenty, what should be a pleasant bit of DX work develops into an exhibition of sheer brute force. The USA, in hitting on the prefixes K and W, found a great bit of coincidence, as a kW is the only answer in some of these affrays." However, he found ZD7SE calling fruitless CQ's on Twenty one morning and got him "first pop."

G3NYA (Sutton Coldfield) has been working W's on Forty with 20 watts and 84 feet of wire, getting reports of 569 and 579; even better was a 559 from PY4ADC. After dividing his first year's work between Top Band and Eighty, G3NYA finds that even with QRP he can get a lot of interest out of 40 metres. He also tells us that K1MMB was planning to work from FP8-land from June 17 onwards, mostly on 7003 kc. He *may* still be on by publication date, so we mention it on the chance.

MP4BBW arrived back at Awali, after his globe-trotting vacation, on June 3 and had the station back on the air after a few hours. His projected VR1 trip (Canton Island) was dropped because he had the "wrong colour passport," but he met many of his

### TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
<i>CW and Phone</i>		
G2NJ	98	98
GM3OM	97	98
G6VC	96	97
G3APA	91	92
GM3COV	87	92
G2CZU	83	85
G2DF	81	81
G3NFV	79	79
G3NNO	76	86
G3MXJ	76	80
GM2HIK	75	76
G3NVO	73	82
G3NPB	73	79
G3LWQ	71	80
G3OHX	65	66
G3OAG	61	64
G3NXQ	61	63
G3OGI	60	65
G3NNF	57	61
GW3CBY	42	54
G3IDG	42	48
G4JA	33	42
<i>Phone only</i>		
GM3AVA	83	84
GM2UU	80	81
GM3OM	80	81
G3FS	74	76
G2CZU	69	69
G3NBT	65	68
G3NPB	60	65
G3NAA	56	60
G3NNF	49	51
G3NNO	39	61
G3NOW	39	44

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

SSB contacts all over the world and had a fine time, especially at two of the USA conventions—Des Moines and Dayton. On arriving home he found himself still short of the Zone 19 card for his SSB WAZ; and to add insult to injury his SSB confirmations totalled 199, but he should be well over the double century by now. While visiting EI8P he was on the air as EI4BBW for three days.

G3NWT quotes 5N2JKO as saying, "If you want to cut down the number of replies to a CQ, put up a poorer aerial!" And he tells us that VQ3PBD hopes to be on Twenty SSB shortly. Other comments from G3NWT: The ARRL seems to have overlooked Athos as a DXCC country; it is an autonomous republic off the mainland of Greece, concerned only with the upkeep of its monasteries and the reception of "approved tourists." These do not include YL's, so a DX-pedition should be able to manage round-the-clock operation. And a thought on some S-meters and reports . . . JY2NZK never moved G3NWT's S-meter above S1, yet EU's and G's working him usually gave him reports of 5 and 7. This only seems to happen with DX-peditions—why?

G3WP (Chelmsford) still operates early mornings only, and has been finding conditions poor at the times he can get on. However, a YV1 and several new European prefixes helped to put up his P-and-Z score.

G3LPS (Blackburn) used to be a 40-metre specialist, then he graduated to Twenty, and now confesses to a great liking for Fifteen, his old love being quite

neglected. He wonders what some of the DX stations do with the s.a.e.'s that he sends them—particularly British operators in the Commonwealth countries.

G3NAC (Bourton-on-the-Water) runs a lot of tests with VS9APH, which have recently been very successful on the three HF bands. He suggests that the deadness of Ten is still due more to inactivity than conditions, as the VS9 has often been S9 on a "dead band." To quote: "I am convinced that if all UK stations who work Fifteen and Ten would send out test calls for, say, five minutes on the hour, and overseas stations would listen at the same time, what is now apparently a dead band would come to life. Even on Fifteen, VS9APH has many, many times been the only signal, but at 5 and 9 plus."

We have often found out for ourselves that contacts can be made on sked when one would have described the position as hopeless. (For instance, G6QB worked a *daily* sked with a W2 right through the last sunspot trough, usually with cracking good signals both ways, and without one single "miss.") How about getting organised for the odd CQ DX on the hour . . . will overseas stations who read this please let us know at what hours they are prepared to QRX, even on a "dead band"?

#### Late Flashes

A last-minute letter from Bryan Bisley gives the full gen. on 9K3TL. He, with HB9TL, OD5CT and W1TYQ, handled this very successful affair, starting from Kuwait as 9K3TL on June

8 and 9. The neutral zone operation (9K3TL/NZ) began on June 10 and continued until the 16th. Pile-ups were "fairly dignified" and calls on the frequency were ignored. Continuous operation was maintained from their air-conditioned trailer, covering the three HF bands with two dipoles and a ground-plane (and, of course, the KWM-2).

Bryan has just received the call EP2BG for Teheran, and has already made a few contacts. He expects to be signing OD5EB from Beirut shortly, and during late July will operate from MP4QAO, MP4TAE and MP4MAB. In Kuwait he has applied for the call 9K2BG and thinks it will be forthcoming.

An AC3 expedition is expected to appear during the last week in July and the first week in August. Call unknown, but crystal control on 14011, 14060, 21018 and 21090 kc CW; 14150 and 21225 kc AM phone. QSL's will be handled by W7GUV.

Which rounds things off for another month—and a pretty busy one at that. Let's keep it this way with another good post-bag for the next period. Acknowledgments, as ever, to all our sources of information, especially the WGDXC *Bulletins*, W4KVX's *DX*, the NCDXC's *DX-er* and our own never-tiring sleuths who pick out all the interesting fragments on their own pet bands. More, please, and the deadline for it all is first post on **Friday, July 14**, addressed to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Please don't be late. Meanwhile, Good Hunting, 73 and—BCNU.

#### SPECIAL-ACTIVITY AMATEUR STATIONS

During this time of year there are those occasions—fêtes, charity functions, local trade and handicraft displays and exhibitions, and community efforts of various kinds—up and down the country, at which Amateur Radio is represented in one way or another, and as such is "shown to the public".

For instance, on July 8, the Silverthorn Radio Club will have G3OZL/A on the air from the Chingford Day Carnival, Ridgeway Park, South Chingford, Essex. During July 12-15, the Liverpool Amateur Radio Society will have their own stand at the Liverpool Annual Show, with a station signing GB2LS on the air for the duration—no mean undertaking, this, as apart from the preparation and

general lay-on, four days' stand work will be involved. Then on July 29, the Harrow Amateur Radio Society will be running G3EFX/A as a demonstration station at the local Gayton Fair, Harrow. The North Kent group plan to have GB3ENT operating from Erith Show on Bank Holiday, August 7. The Southgate club will have an Amateur Radio stand, with a station on the air, at the Annual Wood Green Show, North London, on September 9-10.

The work behind these efforts is usually taken on by a small but devoted band of enthusiasts, whose only reward is the success of the show. They deserve the thanks and merit the support not only of their own members locally, but also of all who are interested in the progress of Amateur Radio.



General view of the setting for the Northern Mobile Rally, held at Harewood House, near Leeds, and organised by the Spen Valley group. This event attracted some 900 visitors in 240 cars, of which about 80 were fitted for two-way mobile.

Official party at the Trentham Gardens mobile rally opening ceremony. The Lord Mayor and Lady Mayoress of Stoke-on-Trent — the oldest of the Five Towns of the Potteries — are flanked by (left) G3BA, president of the strong and old-established Midland Amateur Radio Society (MARS) and on the right by G3COY, representing the Stoke-on-Trent Amateur Radio Society. These two Midlands amateur organisations, working together, sponsored and organised the Trentham Gardens Mobile Rally, reported in the June issue of the Magazine.



General view of the car park at the Southern Counties Mobile Rally, held at Beaulieu Abbey, New Forest, Hants, when the estimated total attendance was 600, with some 155 vehicles actually fitted mobile — among these was the bus, likewise fitted mobile, in which members of the Hastings Club journeyed to the Rally. For this annual Southern Counties event, we are told that everything ran smoothly without a hitch — especially, we must hope, for G3CUZ of Leek, Staffs., who received a gallon of oil for making the longest distance travelled to the Rally. The crowd shown here round the marquee is hearing about whose tickets were coming up in the prize draw.

## • • • The Mobile Scene • • •

AN HISTORICAL NOTE—OVERSIZE MOBILE ANTENNAE—  
RECENT RALLIES REPORTED—FORTHCOMING EVENTS

THE very first Mobile Rally in this country was held at the "Perch Inn," Binsey, Oxford, on October 9, 1955—it was organised by the Oxford and District Amateur Radio Society — and was reported in detail in *SHORT WAVE MAGAZINE* for November 1955. This report mentions that there were 23 cars actually fitted mobile, with the majority on Top Band. The callsign listing shows that of that original group at Binsey, there are several still going regularly round the Rallies—notably G3HCK, G3WW and G5CP.

A first warning about safety in mobile operation was sounded in the March 1956 issue of the *Magazine*. The possibility of regular rally activities, combining motoring and /M radio operating, was first touched upon in the editorial comment in the April 1956 issue. On the subject of safety again, some more positive assertions about better mobile installations and operating were made in the June 1957 Editorial.

While there has been much progress on the mobile front in these last five years, on the equipment side there is one respect in which development has not been so satisfactory—there are still far too many whips in use that are far too long. These can be seen at any mobile rally. They are unsafe, unsightly and unnecessary—to say nothing of the fact that a 12 ft. whip, with a bulbous loading coil, swaying from the rear bumper of a small car, looks ridiculously out of proportion. It has been amply proved that if the aerial system as a whole is properly designed, constructed and adjusted, a top length of more than about 5 ft. above the loading coil is not required; provided that the loading coil itself is clear of the roof-line of the vehicle, a top length of 3 ft. is quite sufficient.

### Tuning a T/B System

If radiation efficiency seems to improve with a very much longer top section, the system was not properly adjusted in the first place—see *SHORT WAVE MAGAZINE*, June 1956, "The Resonant Whip for Mobile Working on Top Band." There is no significant radiation off the upper end of the assembly—all the top section does is to assist in bringing the loading coil to resonance (considered as part of the system as a whole) by introducing some capacity effect. If a flatter aerial response is required, this can be achieved by mounting a small capacity hat (a wire ring 12 ins. or so in diameter, supported by three or four radials) just above the loading coil.

The point to bear in mind is that it is not possible, in a mobile installation for Top Band, to begin to approach what would approximate to a

fixed-station 160-metre aerial by the artifice of going in for a whip of inordinate length. You can't do it, nor get anywhere near it. What, then, should you be trying to do? It is to look upon your vehicle, with its aerial system, as a single unit working as a sort of "moving ground-plane," in which the capacity between the car and the road is part of the system. By suitably proportioning your aerial loading coil (considered with the top section and the coil mounting) you bring the whole mass to resonance (by adjustment of the loading coil) and find the (low impedance) feed point at which it is most convenient to pump in RF power. It is as simple as that, and is the explanation why some Top Band mobiles do so very much better than others who imagine that what the loading coil does is to bring the top section of the whip to resonance, and that the longer the top section the better the radiation. The idea of having the loading coil above the roof-line of the vehicle is because there is (or should be, in a properly tuned system) a current antinode somewhere in the loading coil, and it is from this that the greater part of the radiation actually takes place.

If the conception outlined here is the right one—and experiment has proved that it is—then it is clear that a long top section is unnecessary. But without a top section at all (a theoretical possibility) you would never in practice "catch the resonant point."

Another interesting experiment in this context is to try the effect of "a good earth"—done simply by standing the vehicle on different sorts of soil, damp or dry, and measuring (or in practice, comparing) radiation on a field strength meter at a fixed distance for each test. If you are in the true quarter-wave or ground-plane mode, the results will be interesting. No aerial adjustments are necessary for this test and, of course, no physical earth connection is involved.

Finally, it is necessary to emphasise that the



foregoing arguments apply only where the frequency is low in relation to practicable whip lengths, as on our LF bands. On the upper HF bands, quite different design considerations apply, as it is possible to achieve whip lengths which are themselves resonant, or nearly so, at the frequency.

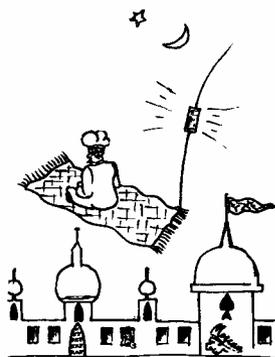
\* \* \* \*

### Northern Mobile Rally

Held at Harewood House, by kind permission of H.R.H. The Princess Royal, in fine and sunny weather on May 28, this annual event drew an attendance of about 900 in 240 cars, of which 80 were fitted for mobile—these figures show an increase on last year's support. As usual, most of the /M's were on Top Band, and G3MMK/A, the talk-in station, succeeded in working some 70 of them. The prizes for the neatest commercial installation went to G3FIF/M (Blackpool) and G3LHQ/M (Birkenshaw); for the best home-built mobile rigs, the winners were G2HAP/M (Manchester) and G3ABK/M (Darlington). The prize for the longest distance covered went to G3JDM of Wolverhampton. The Rally organisers were a committee of the Spen Valley Amateur Radio Society, consisting of G3JJC assisted by G3GJV and G3MMK. About 250 amateurs actually signed the visitors' book, and to each was handed a free, numbered entry form entitling them to go in for the competitions, of which there were several, including a lucky-dip for the (82) children who were let in on this. Two entire Club groups attended, by coach—Royston Amateur Radio Society and the Hetton Amateur Radio Society—while members of the Army Apprentice School, Harrogate, Amateur Radio Club were also present with two vehicles of their own equipment.

### Southern Counties Mobile Rally

Also on May 28, and likewise now an annual event, the Rally organised by G2FGD was held at Beaulieu Abbey, New Forest, Hants., where the attractions included the Montagu Vintage Car Museum, boat trips down the river and the Abbey itself. The estimated total attendance was 600, there being 155 cars actually fitted mobile, with 160m. by far the most popular band. The Top Band talk-in station was G3IVP/A, with G3ION/A holding up the two-metre end. There were only 10 starters for the mobile treasure hunt (events of this sort never seem to attract much support, probably because in the main what people want to do is to meet, talk, see and be seen) which was won by G5UJ/M. Winner for the best home-



constructed /M rig turned out to be G3ODR/M (Top Band), and for two metres it was G3FRV/M. The visitors included a coach-load from the Hastings Club, complete with mobile rig. From the point of view of the organisers, everything went smoothly in quite good weather and the attendance exceeded that of last year.

### Hunstanton Mobile Rally

There is no doubt that for some not very obvious reason, May 28 was one of the popular dates for this year's rallies—in face of the competition from Harewood and Beaulieu, the Peterborough Amateur Radio Society had fixed the same date for their meeting at Hunstanton—"the East Coast resort facing west." The total attendance was around 100, rather more than last year, and they had 24 cars in actually fitted mobile. The prize for the greatest distance covered to the Rally went to G2ADR/M (York) and for some competition not clearly described G2FJR of Sutton Bridge—well known for his two-metre activity—picked up a TV receiver. G3ANM/A handled the talk-in on Top Band and one of the /M's worked was a visitor who had blown a gasket at Kings Lynn; he said that he was "in dire straits, with the water gushing into the cylinder head." So two mobileers already at the Rally went back to his assistance, repaired the engine (!) and got "our hero" into Hunstanton just in time to start bidding at the junk sale, conducted by G3JEC, the local host. During the afternoon, G3EEL took his boat out into the middle of The Wash and, on a sandbank b.s.l. when the tide is in, set up a /A station to work the beach. The local group, of which G3KPO (ex-GC3KPO) is hon. secretary, felt that the effort had been worth while and that all concerned had had a good day—even the party involved in the Kings Lynn *contretemps*.

\* \* \* \*

### Harlow Mobile Rally

This took place on June 11, organised by the Harlow & District Radio Society, with an attendance estimated at 400 people, arriving in about 100 cars. The weather was fine after a shaky start, and G3ERN/A on Top Band, with G3JMA/A backing up for the two-metre mobiles, had enough to keep them busy. Visitors were welcomed by G6UT—one of the oldest active OT's now on the air, who is himself /M—and the prize for the DX traveller went to G3HES of Stamford, Lincs. An innovation on the refreshment side was a hot-dog stand run by G3ONE and his xyl. Organisers of this Rally included G2ARN, G3ERN, G3HJL, G3LIT and G6UT.

### A.R.M.S. Mobile Rally

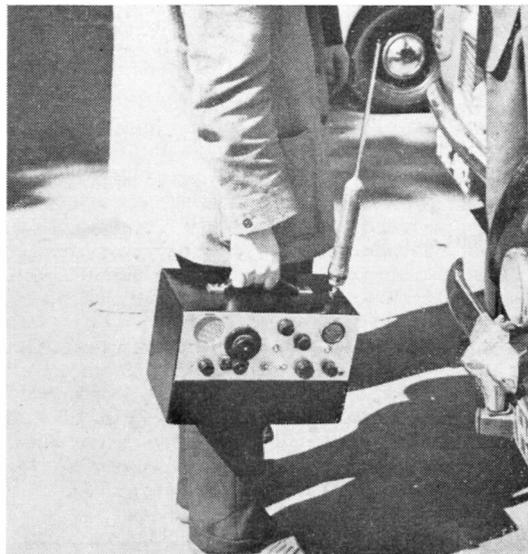
There was a distinct American tang about the event at Barford St. John, Oxon., on June 18, when the Amateur Radio Mobile Society held their annual mobile meeting. Barford is an American communications centre on a disused R.A.F. satellite airfield leased by the U.S.A.F. from the Air Ministry; an American band, that of the 3rd U.S. Air Force,

played for over two hours during the afternoon: American-type refreshments were consumed in great quantities; there were a number of Americans present, officially and unofficially, including Colonel Halfman, the Base Commander; and the attractions included Go-Kart racing as in the U.S.A., and an American baseball match. Aided by brilliant weather, the attendance was much in excess of last year, there being something like 200 cars on the ground fitted /M. The Top Band talk-in station, using a K.W.160 Tx lent by K.W. Electronics, Ltd., and signing G3NMS/A, worked about 100 mobiles, while the two-metre base station was G3HGE/A, using Withers (Electronics) equipment: it was estimated that about 85% of the mobiles were on 160m. and 12% on two metres, with the remaining 3% "various." During the afternoon, G8KW/A, using K.W. Electronics Sideband equipment, kept the interest going on the 3.5 and 14 mc bands. As last year, G3MZW (Deddington) handled the out-station T/B talk-in commitment in very efficient style. The winner of the A.R.M.S. safety competition was G3BMN/M, of Halesowen, Worcs. No prize was offered for guessing the owner of the smart new station wagon registered as KW-73! The other competitions were for "women and children only" and appear to have been well supported. The Amateur Radio Mobile Society is to be congratulated on having organised another successful social occasion in the radio amateur calendar.

\* \* \* \*

So much for the current activity report. Following are the events scheduled for the next few months:

- July 8:** Mobile Rally organised by the South Birmingham group, starting at 6.00 p.m., at Park Hill School, Alcester Road, Moseley, Birmingham, rally competition (for both Top Band and two-metre mobiles) running from 8.30 p.m. till 10.30 p.m., with 160m. talk-in by G3OHM/A and on two metres by G3GVA. There will be numerous contest and raffle prizes, a surplus sale (of ex-Govt. equipment), a running buffet from 7.30 p.m. until midnight, and a crèche for the children.
- July 9:** South Shields Mobile Rally at Bents Park Recreation Ground, Coast Road, South Shields, with G3KZZ/A as talk-in on 1980 kc, and G3DDI on 3600 kc. For full details, see p.211, June.
- July 16:** Informal get-together, starting at the Tavern Inn, Shoal Hill, Cannock, Staffs., at 3.30 p.m., with G3ABG on 1920 kc talk-in. Tea will be available by prior notification, and an evening tour of Cannock Chase has been arranged. Further details from: C. J. Morris, G3ABG, 24 Walhouse Street, Cannock, Staffs.
- August 12/13:** Two-day Mobile Rally and Hamfest organised to celebrate the golden jubilee of the Derby Wireless Club. For further details see p.211, June issue. Visitors wishing to bring caravans for an overnight stay should first contact the hon. organiser: T. Darn, G3FGY, 44 Laurel Avenue, Ripley, Derbyshire, from whom all further information can be obtained (s.a.e., pse.).



Seen at the Cheltenham Mobile Rally — a portable 160-metre transceiver owned by G3NNE (Taunton).

- August 20:** Mobile Rally organised by the Luton & District Radio Society, at Stockwood Park, Luton, Beds., opening at 2.30 p.m., with G3JZW/A talking in on Top Band, and G3CGQ/A on two metres. Light refreshments will be available, and the usual lucky-number raffle and junk sale are being laid on. Hon. secretary: D. Bavister, 70 Crawley Green Road, Luton, Beds. (Tel. Luton 4768.)
- August 26:** To coincide with the well-known Hetton Show, which is a Saturday event, a Mobile Rally is being held at the Show Ground, Easington Lane, Hetton-le-Hole, Co. Durham. The main attraction will be the Show itself—which includes a display by the Northern Command Gymnastics Team, a brass band contest, and show jumping — in connection with which the Houghton & District Radio Amateur Club will have their own stand. Details from: S. L. McAteer, G3CKC, 20 Kirkdale Street, Low Moorsley, Hetton-le-Hole, Co. Durham.
- August 27:** Stamford Rallyfest at Burghley Park, near Stamford, Lincs., organised by the Stamford Radio Club. This is the first time the Park is being used for a Rally event. Talk-in facilities will be provided on both bands, there will be all the usual attractions and catering will be available on site without advance booking. Further information from: D. Page, G3KWC, 57 Queens Street, Stamford, Lincs.
- August 27:** The annual Mobile Rally organised jointly by the South Manchester and Stockport groups is being held at the Pavilion Gardens, Buxton, Derbyshire, the main competitive event being a radio-navigational exercise for which cars will start from the Davenport Theatre Car Park, Stockport, at 1.45 p.m. Talk-in will be given by G6NM/A on 1920 kc from Stockport until

The chaps who did the work at Harewood this year, for the Northern Mobile Rally—centre, G3IJC/M, of Spen Valley Amateur Radio Society, who was Rally secretary, with G3MMK/A (left) and G3GJV/M, members of the Committee.

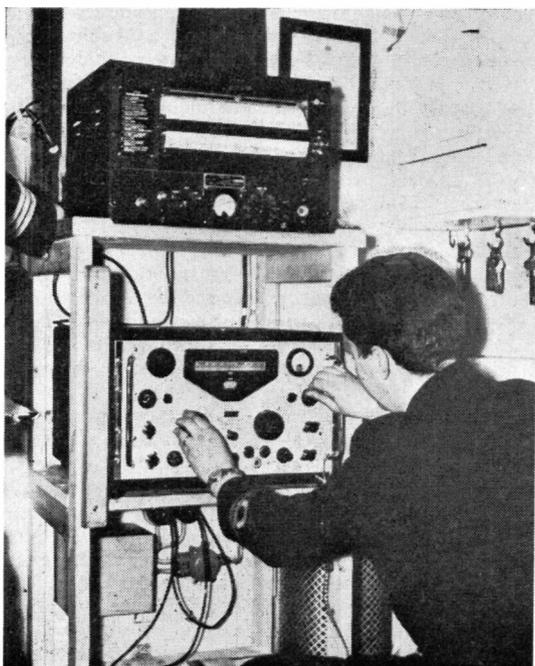
1.30 p.m., and by G3FVA/A on 1950 kc from Buxton until 4.00 p.m. There are many attractions at the Pavilion Gardens, including boating, a miniature railway, band concert and illuminations. For the Rally, competitions and demonstrations are being arranged. For further details write: C. M. Denny, G6DN, 18 Willoughby Avenue, Didsbury, Manchester, 20, who can supply official car stickers allowing entry to the Gardens at the special inclusive charge of 2s. 6d.

**September 17:** Mobile Rally and Hamfest organised by the Lincoln Short Wave Club, at North Kesteven Grammar School, Newark Road, North Hykeham, Lincoln. G2UK will give a talk and show some exceptionally interesting colour slides, and there will be attractions for all comers. Further details from: Mrs. F. E. Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln.



#### MORE FT-241 CHANNELS BY FREQUENCY

By the courtesy of G3IUG (Poole, Dorset) we have some additions to that very useful list of FT-241 channel/frequency relationships given on p.203 of the June issue of *SHORT WAVE MAGAZINE*. They are: *Channel 15*, 398-148 kc, 21.5 mc; *Ch. 16*, 400-00 kc, 21.6 mc; *Ch. 23*, 412-963 kc, 22.3 mc; *Ch. 56*, 474-074 kc, 25.6 mc; *Ch. 63*, 487-037 kc, 26.3 mc; *Ch. 73*, 505-555 kc, 27.3 mc. In each case, it is the fundamental frequency that is given in kc.



#### GEOFFREY PARR, OF THE TELEVISION SOCIETY

The sudden passing of Geoffrey Parr, M.I.E.E., on May 30, at the age of 62, came as a great shock to his many friends and removed a strong personality from the fields of television and technical publishing. As its honorary secretary for many years, Geoffrey Parr was largely responsible for the progress and development, into a recognised scientific institution, of The Television Society. A former Editor of our contemporary *Electronic Engineering*, he gave this up to become technical director of Chapman & Hall, the well-known scientific publishers, and had been with them for 12 years at the time of his death.

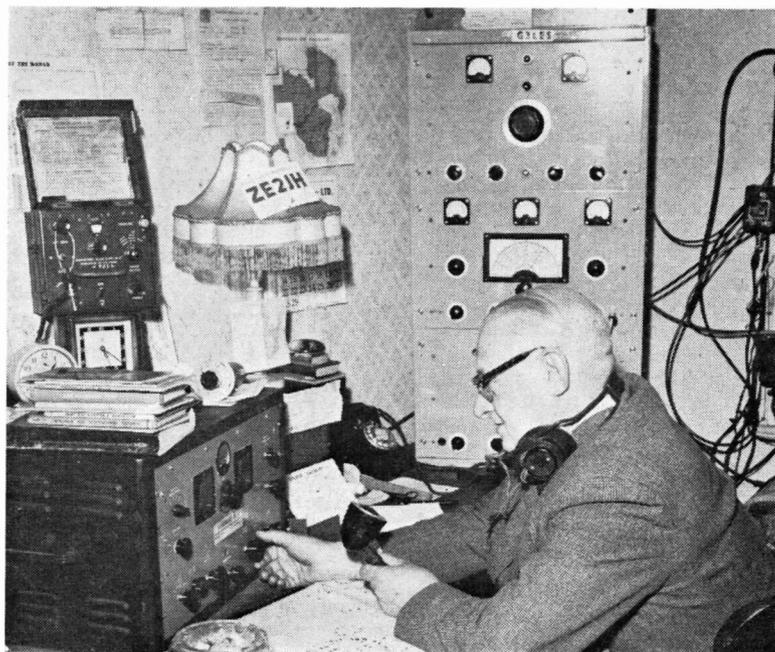
#### BOOKS FROM THE LIBRARY

Readers who want any of the books we advertise each month are reminded that they should be obtainable on loan through their local public library—not, probably, on demand, but by going on the order list. Simply give the title of the book required, its post-free price as listed by us, and our name and address as "publishers, or source of supply", and it should come through in due course. We are already supplying books to several libraries up and down the country, and we should be happy to extend this service. Our address for this purpose is: Publications Department, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

The new Holland-Amerika Line passenger ship "Sommelsdyk" is fitted with a Racal RA.17 receiver, which can be fed into a Seafax facsimile receiver, used for the production of weather maps for navigational purposes. One of the requirements for good map reproduction by this method is exceptional receiver stability. The Racal RA.17 in this installation can also be used as a normal communications receiver over the range 1-30 mc, its unique circuit design being such that this can be covered without the necessity for band-changing. More than 4,000 RA.17's have now been sold.

# THE OTHER MAN'S STATION

**G3LES**



THE not-so-young holder of the comparatively recent callsign G3LES—Stanley Smith, Westonia, 20 Dunkirk Road, Hillside, Southport, Lancs.—is one of the real old timers of the radio world. He first became interested in wireless (as it was then called) in 1913, went to sea in 1914 as an operator in ships of the Atlantic convoys of the First World War—during which he was torpedoed, wrecked and shot at—and then, in the period between the wars, became a radio officer in liners on the Atlantic passenger run.

So G3LES, as he signs himself now, has watched the development of radio communication from the earliest days—of the magnetic detector, multiple tuner, induction coil transmitter, quenched gap spark set and most of the early Marconi marine equipment—right down to the present time.

The gear now in use includes a Hammarlund

Super-Pro receiver and a Tiger 200 transmitter, complete with Z-Match and all other necessary accessories, including a receiver for two metres. From the shack at ground level (the QTH is a bungalow) aerial connections go out to a Labgear Bi-Square for 10 metres, a 15-metre dipole, and a multi-band dipole for 20-40-80 metres. Main interest at G3LES is working stations in South Africa and the Rhodesias on 10 metres, but all bands 10-80 are covered as opportunity offers and the spirit moves.

G3LES is no longer professionally connected with radio and describes himself as “now purely an amateur.” But he still holds a 1st Class P.M.G. Certificate and can knock out 30’s on the key. So, if ever you should hear or work the fine old gentleman signing G3LES, Southport—mind you show proper respect!

## THOSE PRE-WAR “AA” LICENCES

Arising from the comment on p.217 of the June issue of SHORT WAVE MAGAZINE, we have had a number of queries as to what was meant by “AA licence.” The answer is that amateurs before the war could, if they so wished, take out an “artificial aerial” transmitting-licence (which cost only 10s.) if they were unable to pass the Morse Test and wanted simply to experiment with transmitting equipment prior to coming on the air (for which, of course, the Morse Test had to be taken). The main requirement of the licence was almost impossible to meet—that radiation should not be detectable outside the immediate neighbourhood of the transmitter—but the basic idea was nevertheless very sound, as it meant that an amateur could build and test hfs equipment

before getting going on the air. On passing the Morse Test, the three-letter call was relinquished and a new two-letter callsign issued. Those who held AA callsigns after the war had either to give them up entirely, or pass the Morse Test if they did not hold acceptable Service operating qualifications—which, of course, the great majority did.

## ANOTHER VOIBAL TWIST

During the extremely interesting broadcasts on the exploit of the astronaut Cdr. Alan Shepard, U.S.N., on May 5, from “K.K. Beach” (Cape Canaveral) and elsewhere, several new space-age terms were being bandied about. One of these was “AOK” meaning, apparently, not just fairly OK, or pretty OK, or more or less OK, or as OK as could be expected, but—Absolutely OK.

WITH conditions showing signs of building up for an opening right at the end of the period, it is probable that most of the interesting news will be next month. On the barograph trace opposite, it is in the week following that the curve starts moving upwards, and with the right sort of weather to go with it—well, things should have started to happen.

The report this month discloses no particular high-lights, but nevertheless there are a number of matters of interest to discuss. First, we have it from EA4EO (Madrid), that a group of EA's plan a VHF expedition to a 7,300ft. mountain, near Madrid, to be operational on two metres during August 13-20, using reasonable power (829 PA), a high-gain beam, and with CW as the primary mode. They will be looking for EDX, know all about the U.K. VHF set-up, and will be listening for CW all through the band. Next month, we hope to be able to give the station callsign and frequency, and the planned operating periods. The point is that these boys are going to have a good try—from an advantageous location, and at the right time of year—to work U.K. stations. So it will be a matter of keeping beams headed on about 205° for that week in August.

During recent months, reports generally have mentioned the steadily increasing number of stations new to two metres to be heard on the band. G3FAN (Ryde, I.o.W.) a very well-known VHF operator who has been on it since February, 1949, is able to confirm this increased activity in a most convincing way: He has now (as at June 17) worked more than 1,000 different stations on two metres, the actual 1,000th contact being with newcomer G3OZV, making his own first QSO on the band, and who turns out to be the son of G5US, himself a keen VHF man. So we are now getting into the second generation of two-metre operators. This calls for congratulations all round.

Further statistics quoted by G3FAN are that his 1,000 stations have produced 683 QSL cards, from all counties G/GW, and 14

# VHF BANDS

A. J. DEVON

**Chance for EA during August—  
G3FAN Has Worked  
1,000 Stations—**

**G2DTO on GDX Tour—  
Gossip, Notes and News—**

countries. As is well known, G2HCG/G3FAN have run a regular schedule, over their path-distance of about 110 miles, for many years; this sked now totals up to some 1,500 contacts on two metres alone—the point being that G2HCG (Northampton) has also been worked on two other VHF bands as well: 70 mc and 430 mc. For two metres, G3FAN has push-pull 8011's in the PA, run at 150w., and modulated by 242B's in p/p; the aerial system is a 4/4/4 J-Beam, the QTH is 140ft. a.s.l. to the centre of the beam, and the converter has a 417A pre-amplifier. Finally, Tony says, "If the xyl won't let you have a few minutes in the shack now and again, burn the rig and go fishing"—by which he means that his own wife is infinitely patient and tolerant.

### Some Special Activities

The North-West VHF Group will be running GB3UHF at the Electronics Exhibition and Convention being held at the College of Science and Technology, Manchester, during July 6-12; operating times are to be: *July 8*, 10.0 a.m. to 6.0 p.m.; *July 10-12*, 1.0 to 2.0 p.m., 6.0 to 9.0 p.m. The station frequency will be in Zone H (145.5-145.8 mc), and the beam will be a slot-fed 6/6, well sited. Last year, the group achieved very

satisfactory results, when they were represented at this same Exhibition, tickets for which can be obtained on application to: W. Birtwistle, Inst. of Electronics, 78 Shaw Road, Rochdale, Lancs.

Later in the month, G2DTO (Mitcham—QTHR) has an extensive two-metre tour of the more needed counties planned for the period July 21-30, when he will be going through Northumberland, Cumberland, Westmorland, North Wales, Mid-Wales and South Wales, working /M on 144.2 mc.

### TWO METRES

COUNTIES WORKED SINCE  
SEPTEMBER 1, 1960

Starting Figure, 14

From Home QTH Only

Worked	Station
55	G2CIW
54	G3HBW
51	G3JWQ
50	G3KPT, G6XA
47	G3NNG
44	G3MPS
41	G3BNL, G3LAR
40	G6GN, G8VZ
39	G3MTI
38	G3CO
36	GW3ATM
35	GW3MFY
33	G3OJY
32	G3KQF
31	G2BHN, G3NAE
30	G3HWR, G5QA, G5ZT
27	G2CVV, G3OBB
26	G3MHD, G3OBD
25	G3HS, G3OSA
23	G2AXI
22	G3FIJ
20	G3GSO, G5UM
18	G3KMT, G3NNK
15	G3ICO

*This Annual Counties Worked Table opened on September 1st, 1960, and will close on August 31st, 1961. 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.*

and /P on the Zone frequency applicable to the area of operations. This should be an interesting trip and, given the conditions, there is no doubt that G2DTO/M/P will be kept pretty busy.

**Table Positions**

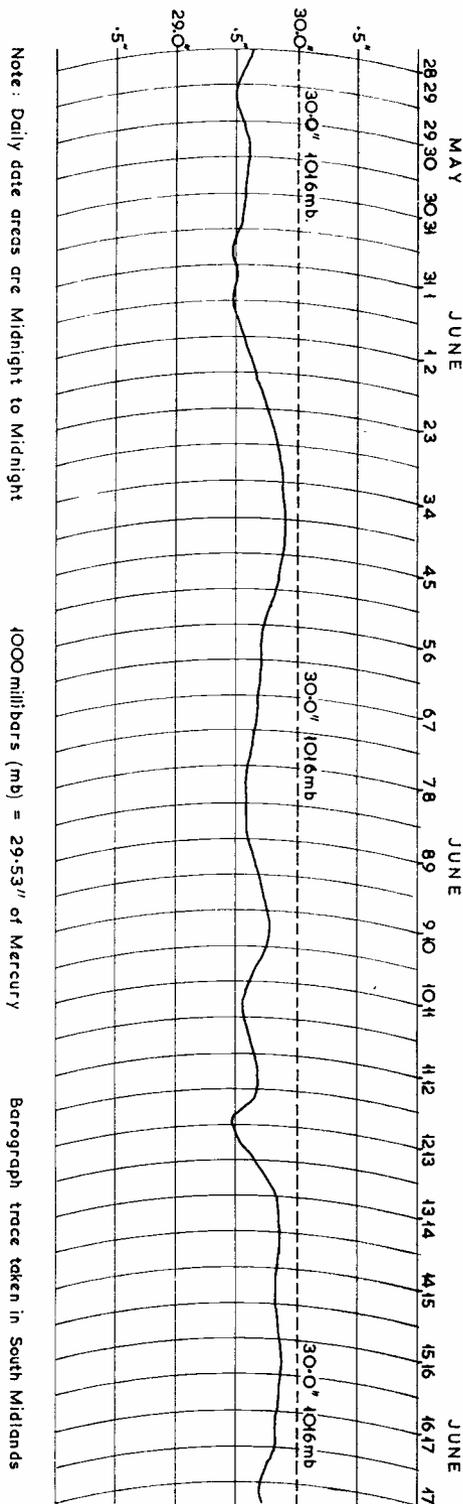
G2C1W (Birmingham) has slipped into the lead in the Annual; he had quite a number of interesting contacts on both bands during the period, and now runs a regular 10.30 p.m. schedule with G3LTF on 430 mc; the path-length is around 120 miles, and they find they can make it two-way most times. Jack has changed his 70 cm pre-amp. to an A.2521 and finds it better than the 6AN4 used previously. He also remarks that so far as he is concerned he would very much like to work Norfolk—see p.207, last time—as it is the only one he needs for all/G counties on two metres.

G2XV (Cambridge) is now comfortably in front in Seventycem Counties, with 36 worked; his latest were G5QA in Exeter for Devon, and GW3ATM for Monmouthshire, and both booked in during this last period; Gerry says he is now on 434.250 mc and eager for contacts, as ever.

GC2FZC (Guernsey) writes in for the main purpose of claiming a new country—his first after five years! It came in the shape of G13GXP, worked during the period to June 18, and puts GC2FZC up to 9C in Countries: he says he has never even heard GD or GM. The sked with G3JGJ, across in South Devon, has now been running almost nightly for seven years (!) and GC2FZC says they are always on the band around 1730-1800 GMT “or later if there are any signals about.”

G5ZT (Plymouth) continues actively to work the mobile line, and has now chalked up no less than 121S under /M conditions—nice going, and it shows what location can do for you, as he says. Haytor has turned out to be a first-class /M/P site, even though it is 1½-hours’ run from the home QTH; however, G5ZT /M is up there every Wednesday evening, looking for QSO’s with all comers: from Plymouth itself,

Barograph trace for period May 28 to June 18. It shows no very great activity, and indeed it was not until right at the end of the date-area covered here that the two-metre band began to open up, as the pressure increased and anti-cyclonic conditions started to develop over a wide area. We hope that these monthly charts are proving of interest to readers, and that they are able to correlate their own results with them. We would also like to see readers’ own charts, based on observations made on GB3VHR at GDX distances.



his only regular contact outside the local area is G3LTN, Andover, apparently workable at any time, night or day, which suggests that it should be possible to reach G5ZT from the London area under reasonable conditions. During a recent mobile tour through London-Dover - Reading - Newbury he worked about 70 stations, never previously heard! G5ZT remarks: "I travelled 1,000 miles for those QSO's, and I reckon they cost me £1 a time!!"

#### More Station News

G3MPS (Farnborough) now has the 4X150A PA breathing on two metres, with another one (coaxial line circuit) on 70 cm, both driven from the same exciter as required; so he can put in 150w. on both bands and has worked 17 counties on 430 mc since March—which, when you think about it, is good

#### SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED  
Starting Figure, 4

Worked	Station
36	G2XV
28	G3HBW, G6NF
27	G3JWQ, G3KEQ, G5YV
26	GW2ADZ
25	G3HAZ
24	G2CIW
23	G3BKQ, G6NB
21	G3IOO
20	G3HAZ, G3KPT
17	G3MPS
16	G2DDD, G3LHA, G3MED
15	G3NNG, G4RO
14	G2HDZ, G3FAN
12	G5BD
11	G3AYC, G3LTF, G6XA
10	G2OI, G3IRW
9	G5DS
7	G2HDY, G3JHM
6	G3JMA, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G5ML, GW3ATM
4	G3JGY, G5QA

*On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue*

going for 70 cm.

Likewise GW3ATM (Chepstow, Mon.) is able to claim for the Seventycent Table, with G5QA now being regularly worked, and G2XV his best GDY contact for that band; he runs an 832 tripler at the moment, but is building for a straight-driven QQVO3-20; the 70 cm beam is a 12-ele stack at 40ft. GW3ATM remarks that on June 19 he was copying G3HAZ (Birmingham) on 430 mc, but could not raise him.

On Sunday, June 18, a very loud signal from "near Aylesbury" turned out to be G3JMA/P, assisted by G3LTF, trying out a new portable site—to such good effect that in a few hours they worked 32S, from G6GN in Bristol, G3MNQ (Notts.) G2DQ (Danbury) round to G3KMP in Hastings "all at fabulous strength." G3LNM, in the Birmingham area and only running 6w. with an indoor beam, was also a 5/9 signal. G3JMA (Harlow) says that for him 70 cm is of greatest interest at the moment, contacts including G3MPS, G5NF and G6GN, all at good distances. G3OSA (Wimborne, Dorset) has now got up to 25C worked, with 102S logged, in the five months he has been on the band; with the Rx side buttoned up, his next move is an 829B PA stage to get a better signal out.

G3NAQ (West Bromwich) puts in claims and reports that one of his future projects involves a QQVO6-40A PA to follow the 832; this is running 30w. only, with a slot-fed 6/6. He also puts in a strong vote for keeping the Zone Plan just as it is. (It looks as if that proposal, about a change in the frequency arrangements on two metres, need not be pursued.) G3MTI (Malvern) says that he has heard G2CPL from East Anglia "but in spite of many calls in that direction, Norfolk and Suffolk remain much-wanted counties." Where are those East Anglians?

G2AXI (Basingstoke) raised F3LP for his first EDX contact, making it a total of 143S now worked, still on just the 3-ele indoor beam. . . . G3OBB (Christchurch, Hants.) claims for the tables and says that he and G3OBD (Poole) will be busier on the two-metre band, as there are

#### TWO METRES

##### COUNTRIES WORKED

Starting Figure, 8

- |    |   |
|----|---|
| 20 | G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)                        |
| 19 | G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, ON, OZ, PA, SM, SP)                            |
| 18 | G5YV, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP)                           |
| 17 | ON4BZ   |
| 16 | G3GHO, G3KEQ, G5MA, G6XM, PA0FB   |
| 15 | G2XV, G3FZL, G4MW, GM3EGW   |
| 14 | G2FJR, G2HDZ, G3AYC, G3FAN, G3HAZ, G3IOO, G3JWQ, G3WS, G5BD, G6LI, G8OU, OK2VCG                             |
| 13 | G3BLP, G3DMU, G3DVK, G3GPT, G3KPT, G5DS, G6XX, G8VZ   |
| 12 | EI2W, F8MX, G2HIP, G3EHY, G3GFD, G3GHI, G3LTF, G3WW, G5CP, G5ML, G6RH, GW2HIY                               |
| 11 | G2AJ, G2CIW, G2CZS, G3ABA, G3CO, G3JZN, G3KUH, G3LHA, G4RO, G4SA, G5UD, G6XA, OK1VR                         |
| 10 | G2AHP, G2FQP, G2HOP, G3BDQ, G3BK, G3BNC, G3DLU, G3GSE, G3GSO, G3JAM, G3KQF, G3MED, G3NNG, G5MR, G8IC, GW5MQ |
| 9  | G2DVD, G2FCL, G3DKE, G3FIJ, G3FUR, G3IUD, G4LX, G8DR, G8GP, GC2FZC, GC3EBK, GM3DIQ, GW3ATM                  |
| 8  | G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EXX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB          |

now about 15 stations active in the Bournemouth area alone. G3JWQ (Ripley, Derbs.) moves in the tables and shows a total of 536 different stations worked. . . . G3FIJ (Colchester) sends what he says is his "first report for some years," during which time new gear has been built throughout; he has 50w. into a QQVO6-40 on 2m., with an A.2599/A.2521 cascade converter, and an 8-ele aerial. On 70 cm, the PA valve is the same, running 40w., and the Rx has an A.2521 in g.g., with a CV-253 mixer, the beam being a 24-ele array.

#### In Conclusion —

So that's it for the time being. Deadline for our next is **Wednesday, July 19**, with everything addressed: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. And see you on August 4, all being well. . . .

# SWL • • • • •

## CONVERTERS FOR BEGINNERS — READERS' NEWS AND VIEWS — SOME STATION NOTES — THE HPX LADDER

ONE of the subjects that many readers have suggested should be covered is that of Converters—their why, wherefore and how. Especially from the beginner's point of view, there seems to be a widespread demand for more information on this subject. And a lot of confused thinking certainly exists, concerning *why* a converter is beneficial to anyone who already has a tolerably good receiver.

Starting from scratch, therefore, and assuming that all who read this use a superhet of some kind for their reception, it may as well be pointed out that the early part of any superhet incorporates a converter. We may call it a mixer or a frequency-changer, but the fact remains that a frequency-conversion has to take place—from the frequency of the signals coming into the *intermediate frequency* at which most of the effective amplification in a superhet takes place.

The reason for such frequency conversion is that a lot of RF amplification (meaning signal-frequency) is awkward to achieve because each stage must be tuned to the signal; by beating the signals with an oscillator, which, itself, is tuned to remain a definite number of kilocycles away from the signal frequency, we produce a heterodyne and "convert" the signal

to a *fixed* frequency at which it can be amplified almost without limit, and without the need for variable-tuned circuits.

### The Second Step

Let us suppose, then, that you have a superhet receiver which is not particularly hot on Ten and Fifteen metres. Far less trouble than rebuilding the RF stages is the method of providing a *converter*. This converter will have a really good RF stage (or stages) designed specifically for those bands, without the need for lossy wave-change switching over a wide range of frequencies. Depending upon the spacing of its oscillator frequency from the signal frequency, its IF may be made any convenient figure . . . and whatever frequency is decided upon for the IF, the main receiver will then be tuned to that frequency.

Fig. 1(a) shows the block diagram of a simple converter of this type, although we happen to have chosen the 14 mc band for this example. The oscillator is ganged with the RF and mixer controls, in the normal way, to cover a frequency range 2 mc away from the signal frequency. Thus as the RF and mixer input circuits tune from 14.0—14.5 mc, the oscillator will tune from 12.0—12.5 mc; the resulting beat will occur at 2 mc; and the receiver with which the converter is used will also of course be tuned to 2 mc and left alone.

Another method of achieving this kind of result is to use a crystal controlled oscillator in the converter, Fig. 1(b); with the oscillator at a fixed frequency, the IF will of course vary. In the example shown, 12.0 mc has been chosen as the oscillator frequency, and as the RF and mixer stages are tuned over the range 14.0—14.5 mc, the IF will vary from 2.0 to 2.5 mc. In other words, the main tuning control will now be that of the main receiver; tuning it from 2.0 to 2.5 mc will have the effect of covering the 14.0—14.5 mc band.

Of course, the latter part of the receiver remains

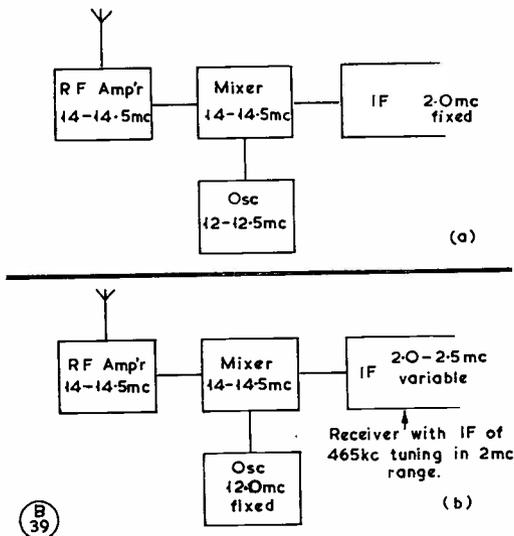


Fig. 1(A). In this type of converter the oscillator is ganged with the RF and mixer stages, but at 2 mc "away," giving a fixed IF of 2 mc — this being the frequency to which the main receiver (considered simply as an IF/AF amplifier strip) is tuned. In (B), we have the fixed-oscillator type of converter, usually crystal-controlled, with the IF variable and tuned on the main receiver — which thus becomes the tuning element; the converter RF circuits only need slight touching up for opposite ends of the band covered.

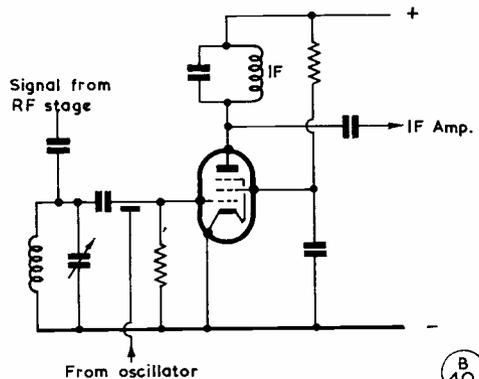


Fig. 2

Fig. 2. Simple pentode mixer, the oscillator voltage being introduced (or "injected") into the grid by stray coupling. A lead can be taken from the mixer grid and simply led into the oscillator compartment, coupling being adjusted for the right degree of injection.

B 39

B 40

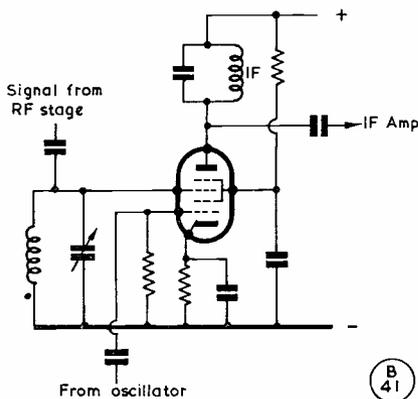


Fig. 3.

Fig. 3. Pentagrid mixer, with the oscillator voltage applied to one grid and the signal voltage to another, mixing taking place in the electron stream.

quite unaltered—but whereas what was the receiver's RF section is now the *first IF*, the normal receiver IF becomes the *second IF*. It has become a double-conversion superhet. If, in the arrangement shown in Fig 1(b), the RF circuits are designed for broadband operation, the whole outfit is still operated by a single control—the normal receiver tuning knob. (The RF tuning may need just a touch for different parts of the band, but when tuning through signals in a narrow section of the band, it certainly will not.) So you will now be able to cover 14.0–14.5 mc with the same ease of tuning that the receiver formerly gave you for 2.0–2.5 mc—another great advantage of using a converter.

### Two Bands For One

All sorts of “trickery” is indulged in by converter enthusiasts. For instance, suppose you have a crystal-controlled unit resembling the Fig. 1(b) layout, but use a 17.5 mc crystal. Then, if you tune

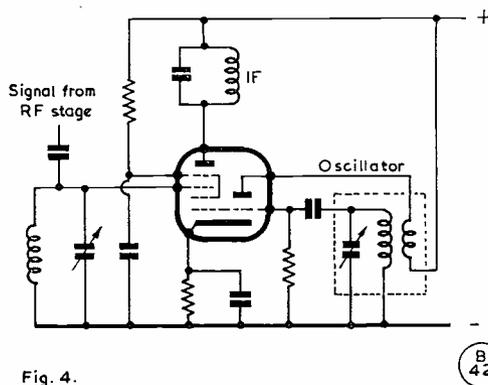


Fig. 4.

Fig. 4. A well-known method of mixing the oscillator frequency and the signal frequency to derive the intermediate frequency (IF) is to use a triode-hexode, as shown here. The triode section is used as the oscillator, with its grid internally connected to one electrode of the hexode.

the receiver to 3.5 mc, you can cover the 14 mc or 21 mc bands at will, merely by altering the tuning of the RF and mixer circuits. But you will have to get used to a reversal of tuning for one of the bands as compared with the other, since the 14.0–14.5 mc band will now necessitate tuning the receiver from 3.5 to 3.0 mc, whereas the 21 mc band (call it 21.0–21.5 mc) will mean tuning from 3.5 to 4.0 mc. The selectivity of the RF circuits will, of course, decide which band you listen to, and there will be no question of breakthrough from one band to the other.

So much for the general principles, and now a few brief details of the mixer circuits themselves. Many different arrangements will work equally well, and which you use is largely a matter of personal preference, which in turn will be dictated by practical experience.

### Mixer Circuits

Fig. 2 shows one of the simplest possible methods with a pentode used as a detector, and the oscillator output loosely coupled into its grid circuit (probably merely by stray capacity between the grid lead and a short length of wire introduced from the oscillator side). The circuit is sensitive and works well with most high-gain pentodes.

It is usually considered preferable, however, to carry out the mixing in the actual electron stream within the valve, and this leads us to Fig. 3, the pentagrid converter. In this case the signal voltage from the RF section is led to one grid and the oscillator output to another. Very little oscillator power is needed, either for this circuit or the previous one. The pentagrid method is extensively used in commercial receivers.

With both these circuits the oscillator itself is quite separate, probably using a simple Hartley or Colpitts circuit and a triode. The two functions of oscillator and converter can be combined within one envelope by using a triode-hexode, another commercial design favourite. Fig. 4 shows this one, with the triode section of the valve serving as a Hartley oscillator. The first grid of the hexode is mechanically connected inside the envelope to the triode grid, and thus the oscillator injection takes place without any external connection being necessary. The signal is fed to the third grid, the second and fourth grids being in parallel and serving as the screen. Note, therefore, that there is a screen between the oscillator and signal electrodes as well as between the anode and the other grids. This serves to minimise “pulling”—the phenomenon which is all too prevalent in many other types of mixer, and which arises from variations in the signal input tuning being communicated to the oscillator tuning, and *vice versa*.

Yet another type of mixer, and one extensively used for VHF purposes, is shown in Fig. 5. This uses a simple double-triode, which receives the signal at one grid and the oscillator voltage at the other; the two halves are cathode-coupled by virtue of the common cathode resistor. This arrangement has

practically no disadvantages when a separate oscillator is used, but there are also several variations whereby half of the triode is actually used as the oscillator. Since this necessitates bringing the anode into use and spoiling the simple elegance of the circuit as shown, it does introduce design complications. But these have all been surmounted many times and all sorts of different arrangements are possible.

We merely present (and especially for the beginner for whom this is written) the Fig 5 circuit as the simplest possible mixer arrangement, and one which is very extensively used and known to be effective and reliable. The ratio between the signal voltage and the oscillator voltage is very easily controlled, if an external oscillator is used, merely by varying, experimentally, the coupling from the oscillator side into the grid of the triode. Again, it will often take the form, in practice, of a lead from the grid merely introduced into the can in which the oscillator coils are set.

So much, then, for this elementary introduction to converters. Their flexibility and possibilities are enormous, and any SWL with a small amount of experience might well decide to build himself a converter for his own particular requirements, although it might be years before he would tackle the job of constructing a fully-fledged communication receiver. As a matter of fact, a converter is quite a useful thing to have *without* a superhet receiver, for the building of a fixed-frequency IF amplifier is a relatively simple job. That, however, is another story, which we will return to later on.

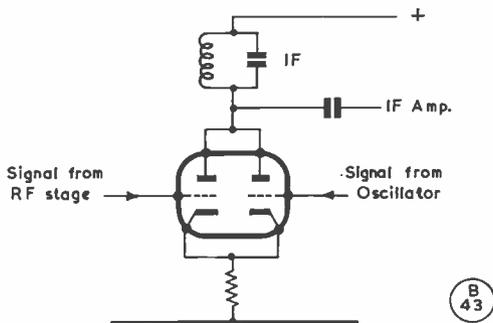
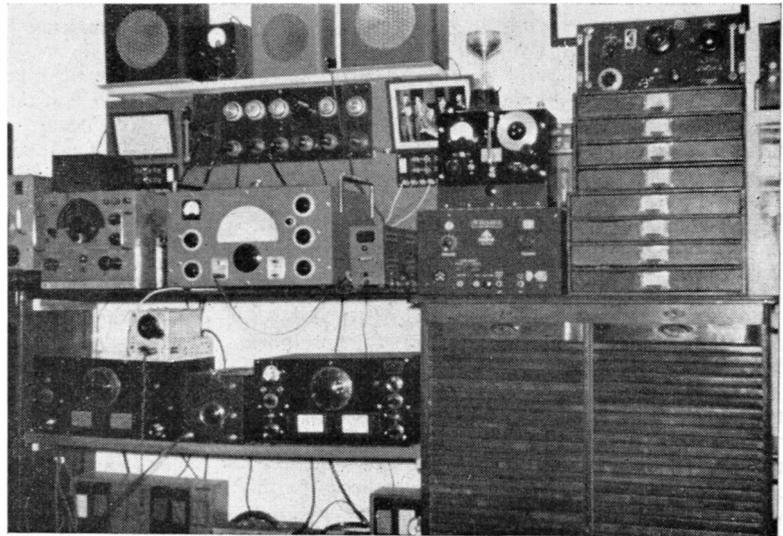


Fig. 5

Fig. 5. A very practical and efficient method of mixing, especially at the upper HF's and on VHF. A double-triode is used, with the oscillator voltage on one grid and the signal voltage on the other. The anodes are connected together and cathode coupling, by means of a common cathode resistor, is used.



T. E. Port, of 11 Bournewood Estate, Hamstreet, Kent, started short wave listening in 1922 — and this was when he left the Royal Navy, after having been indoctrinated by war-time service (1914-1918) in a ship called H.M.S. "Rattlesnake," operating in the Med. The fine layout shown here covers all short-wave ranges, aerials being a 90 ft. wire for general listening and a 21 mc dipole. SWL Port mentions that he has been a reader of "Short Wave Magazine" since the first issue, dated March, 1937.

#### READERS' FORUM

A few of our regular correspondents have written from time to time to say that they find this feature most interesting on account of the comments from fellow-SWL's, which they would not otherwise come across—since SWL's can't talk to each other on the air! This serves, in fact, as an airing-ground for the sort of general chat that their transmitting friends burn up their watts on.

The compilers of this feature likewise find it most interesting, because so many SWL's have worthwhile experiences to talk about. While the transmitting fraternity are frantically chasing DX and exchanging RST at the maximum possible rate, the SWL's are actually *listening* to what someone is saying! Ponder this, any transmitting types who may be reading these words, and decide whether you do enough listening.

This month we will deal first with the letters covering matters a little out of the ordinary. First comes *Michael Smith (Knightwick, Worcs.)*, whose QSL card addressed to 5A5TM (Libya) travelled 51,000 miles in order to reach him at his present QTH in Australia, where he signs VK3AJM. It went to Texas, thence to Australia, then back to Texas, being improperly addressed, then to Australia again, and finally back to SWL Smith as a curio! Probably record DX for a QSL—can anyone cap this one?

Next to *Mrs. Chris Kiddell (London, S.E.6)*, to whom we alluded in the March issue; with the double object of keeping up her nine-year-old son's lively interest in Amateur Radio and of helping him with his geography, "Chris" started chasing

island call-signs (GC, GD, EA6, OY and so on), and they came across VS9MB's outstanding signals from the Maldives several times; an SWL report sent to VS9MB brought back a six-page letter with an assurance that the QSL and letter had "given the boys a great kick," and had found an honoured place in the Club station's souvenir box. Certainly "the boys" at VS9MB put over all the gen. about life on the Island, making themselves very popular on the air and obviously enjoying every minute of it.

C. N. Rafarel (Poole) is another who treats the hobby in a versatile manner, enjoying what he hears and not merely the rarity or distance of the stations concerned. He covers short-wave broadcast as well, of course, and heard the news of the Russian and American space-flights direct from Moscow and New York; on April 25 he logged Radio Algiers on a pocket transistor portable and heard some of the emergency broadcasts. As star stations on the amateur bands he mentions VS9MB (see previous paragraph) and also 5U7AMS/M, a beautiful mobile transmission emanating from ZD2AMS in the Niger Republic. His DX/TV reception now includes Milan and a Belgian station.

### How They Started

Recent descriptions of various SWL's "first downward steps" into the hobby seem to have stirred up much interest, and we have a few more accounts of how some of them got started. Henry Davison (Ashtead) owes his start to a bout of TVI which ruined an evening's viewing when he was thirteen years old! He dug out an old receiver of his father's, to try to find out what it was all about, and then had things explained more fully by a friend who knew the Facts of Life about Amateur Radio. Now, at the ripe old age of sixteen, he is studying for the R.A.E., and we wish him luck!

Pete Chadwick (Worksop) had a more straightforward start in Amateur Radio—his father happens to be G8ON! At the age of fourteen (in fact, on his fourteenth birthday) Pete sat for the R.A.E., but he is not optimistic about the result. He has a home-built TRF receiver and an R.1116; favourite band is One-Sixty; pet hate, SSB operators who don't give call-signs. And this last one is shared by many, many other readers, at least one of whom asks that we publish a black-list of them. (How can we—we don't know who they are!)

Talking of SSB men without call-signs, we have an SWL without a name. He writes from London, N.14, and sends a very interesting list of DX heard on Forty; this includes UM8KAA, UJ8AC, VP9EU, JAILZ and 6ACO, and HC1SM (all on CW); in addition he logged TG5HC and HR3HH on SSB (0510). But we have no idea who he is!

### Modifications Successful

Rod Lawson (Solihull) writes to say that he modified his R.107 for SSB, according to the gen. in our March issue, and the results he has had since then have been "fb." Likewise, quite a handful of

correspondents have referred to the article on the BC-348 (in "SWL" for the May issue) and said that they found some very helpful information therein . . . and that the normal mods. are well worth while.

Yet again, J. M. Middleton (London, N.W.7) modified his CR-100 according to the gen. in the April, 1960, issue of SHORT WAVE MAGAZINE, and says this was most successful except for a spot of instability about which he would like some hints (short of moving the aerial trimmer).

### Station Descriptions

Readers seem to prefer detailed descriptions of a few selected stations, rather than a long list giving the barest particulars from many different ones. We therefore quote at greater length from a few which justify it. Dave Quigley (Cowes) sends a formidable list of gear which has been added to his station; this includes Minimitter MR44 and Scott SLR/F receivers, a complete TCS-13 Tx/Rx, RF-24 and 26 units, home-built two-metre converter, and a home-built 70-cm. TV receiver; the aerial farm has also been extended.

Neville Bethune (London, N.14) sends a photograph (unfortunately not sharp enough for publication) showing his R.1155E, home-built two-stage amplifier, modified Command Receiver, RF-24, 25 and 26 units, and ATU. For aeriels he has 14 and 28 mc dipoles, a 134-ft. wire and a 20-ft. vertical. Since last July he has logged 184 countries (82 on 7 mc CW. SWL Bethune is 15 and hails from VP5-land (Jamaica).

John Ingham (Halifax) started showing interest in radio when he was ten (in 1954). Three years later he read about Amateur Radio and began tuning around Forty on the family broadcast receiver (seems a familiar story, this!). Last year an R.1155 was acquired, then another similar receiver, and then an Eddystone 358, which is still used together with an R.109. Twenty is now his best band for DX.

I. K. Gurney (Chalfont St. Peter, Bucks.) has some interesting bits of wire outside; the main aerial is a 14 mc V-beam (he doesn't say how long the legs are). Halfway along this V, he uses the wires to support, strung between them, a 21 mc dipole and reflector. For Eighty and Ten he has a 132-ft. Zepp-fed arrangement on the other side of the house. This "aerial farm" works into a 21-valve triple-conversion superhet which, he says, was easy to make since it is constructed in units: RF amplifier, first detector/oscillator, and so on, each tested out separately before being built into the frame.

---

*Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the September issue. Good photographs of SWL stations can be used and are paid for on publication; prints should be accompanied by adequate descriptive notes. The closing date is July 28 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.*



# NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, 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.

**E15AJ**, E. Cassidy, Plunkett House, Dooradoyle, Limerick.

**G2FMR**, R. F. W. Broomfield, Groombridge, West Car Lane, Walton-on-Thames, Surrey. (*Re-issue.*)

**G30PV**, P. J. Critchley, 24 Holyrood Street, Chard, Somerset.

**G30RC**, R. Cairns, 161 Darnley Road, Gravesend, Kent.

**G30TK**, R. F. Harris, New Cross, South Petherton, Somerset.

**G30UI**, I. H. Dickinson, Cross House, Ilminster, Somerset.

**G30VH**, A. F. Abbey, Flat 4, The Woodlands, Bills Lane, Shirley, Solihull, Warks. (*Tel.: SH1 7370.*)

**G30VX**, H. W. Hammett, 7 Chalfont Road, Holloway, London, N.7.

**G30XH**, K. W. Brooker, 5 Park Avenue, Northfleet, Kent.

**GW3OYJ**, A. K. Jones, 24 Brynrhodfa, Treorchy, Rhondda Valley, Glam.

**GW3OYR**, W. S. Llewellyn, Corner House, St. Florence, Tenby, Pembs.

**G30ZC**, J. Holstead, 1 Watson Road, Farnworth, Bolton, Lancs.

**G30ZE**, J. H. Grainger, 6 Fulford Cross, York.

**G30ZH**, B. Gibbs, 29 The Vineyard, Welwyn Garden City, Herts.

**G30ZK**, M. D. James, 36 Iver Lane, Iver, Bucks.

**G30ZM**, D. P. Jackson, 44 Trent Street, Worksop, Notts.

**G30ZN**, E. W. Badger, 20 Tennyson Drive, Worksop, Notts.

**G30ZO**, J. Whittington, 32 Shrewsbury Road, Worksop, Notts.

**G30ZP**, P. Smith, 39 Sherborne Avenue, North Shields, Northumberland.

**G30ZQ**, N. Horsman, 28 Clegborne Street, Heaton, Newcastle-on-Tyne, 6.

**G30ZT**, R. A. E. German, 8 Beverley Road, Hythe, Southampton, Hants. (*Tel.: Hythe 3198.*)

**G30ZU**, A. A. Brind, 8 Brewery Road, Plumstead, London, S.E.18.

**G30ZV**, J. H. Croysdale, 11 Malwood Road, Hythe, Southampton, Hants.

**G30ZW**, P. Dynes, 13 Irish Street, Dungannon, Co. Tyrone, Northern Ireland.

**G30ZY**, G. R. Sweet, 9 Southall Court, Lady Margaret Road, Southall, Middlesex.

**G3PAH**, B. R. J. Pooley (*ex-VK5BP*), Scowles Manor, Corfe Castle, Dorset. (*Tel.: Corfe Castle 312.*)

**G3PAJ**, J. A. Nye, 90 Helredale Road, Whitby, Yorkshire.

**G4WH**, C. C. Newman (*ex-ZC6CN/G6NC/ZBIJ/VS9AN*), Kenton, Gorran Haven, St. Austell, Cornwall. (*Re-issue.*) (*Tel.: Mevagissey 3151.*)

## CHANGE OF ADDRESS

**G2DML**, T. Crossfield, 311 Marsh House Avenue, Billingham, Co. Durham.

**G2NK**, H. W. F. Miles, 13 Forde Avenue, Bromley, Kent. (*Tel.: RAVensbourne 0602.*)

**GM3BN**, A. E. Sutton, Longcroft. Auchterhouse by Dundee. (*Tel.: Auchterhouse 261.*)

**GM3CEA**, A. M. McGuffie, Ellar-ton, Royal Crescent, Stranraer, Wigtownshire.

**G3CHW**, D. V. Newport, 38 Huckford Road, Winterbourne, Bristol.

**G3FQN**, R. F. Gilding, 24 Con-way Street, Hove 3, Sussex.

**G3FXP**, J. L. Bowley, 74 Eastfield Avenue, Melton Mowbray, Leics.

**G3HCQ**, R. T. Gabriel, 25 Little-moor Road, Ilford, Essex. (*Tel.: Ilford 5031.*)

**G3IDF**, A. R. Dyer, 3 Wold Close, Gossops Green, Crawley, Sussex.

**G3IGK**, W. W. Humphries, 32 Stockwell Road, Tettenhall, Wolverhampton, Staffs.

**G3JVL**, M. H. Walters, 130 Middle Park Way, Leigh Park, Havant, Hants.

**G3JYF**, B. Bellringer, 8 St. Day Road, Redruth, Cornwall.

**G3KBI**, T. S. Waller, c/o 78 Gunnergate Lane, Marton, Middlesbrough, Yorkshire.

**G3KQF**, J. Anthony, 10 Manor Road, Borrowwash, Derbyshire.

**G3LYO**, J. H. Cox, 43 School Road, Shirley, Solihull, Warks.

**G3MDO**, D. N. T. Williams, Seletar, New House Lane, Canterbury, Kent.

**G3MFO**, P. J. Elliot, 1 The Quad-rangle, Belmont Lane, Stanmore, Middlesex.

**G3MFO**, S. A. Kerrison, 32 Tiercel Avenue, Sprowston, Norwich, Norfolk. *NOR.76.R.*

**G3MHW**, J. R. R. Baker, Clovelly, St. Mark's Road, Windsor, Berks.

**G3NBC**, K. A. V. Hurrell, 2 Alma Cottages, Church Lane, Great Warley, Brentwood, Essex.

**G3NSN**, J. G. Waring, 8 Lostock Road, Davyhulme, Manchester, Lancs. (*Tel.: URMston 4324.*)

**G3NSU**, B. G. Ellis, 33 Bamford Street, Clayton, Manchester, Lancs.

**G3OQK**, A. D. Fairgrieve, 91 Canterbury Road, Davyhulme, Manchester, Lancs. (*Tel.: URMston 2638.*)

**G3OSF**, H. King, 6 Grange Crescent, Rednal, Birmingham.

**G3XC**, W. J. Colclough, Trebudannan Cottage, Trebudannan, St. Columb, Cornwall. (*Tel.: St. Columb 2141.*)

**G40V**, A. R. Osborne, Pucks Knoll, Lamberts Castle, Bridport, Dorset. (*Tel.: Hawkchurch 336.*)

## AMENDMENT

**G8JK**, R. Chadbone, 101 Alresford Road, Winchester, Hants.

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for August issue : July 14)

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

IT is well known that there are some extremely old-established Clubs within the Amateur Radio movement, still going strong and still, happily, with many of their very early members continuing to take an active part.

**Stoke-on-Trent** remind us that they are very much in this category, their history dating back to before the 1914-18 War, when a keen group of wireless enthusiasts were led by Col. Wenger and none other than Sir Oliver Lodge. Immediately after that war the Stoke-on-Trent Wireless Club was re-formed, and within a few years several members were licensed.

A page of pictures in the first issue of *Popular Wireless* (June 3, 1922) shows 2VG, 2WN, 6TW, 5VG and two others who later became G8IX and G3UD. 2VG was Col. Wenger himself, and the only member no longer with them, having passed on in 1945.

The club was again re-formed after the 1939-45 War, and present-day meetings often turn into ragchews concerning the old days of 440-metre operation. Local amateurs also co-operated with the BBC when they opened their station 6ST, with John

Snagge as announcer! Two of the YL club members of those days ran the only wireless shops in the area, and are *still* active in the radio and TV trade as engineers. The present-day club call-sign is G3GBU, and GB3SOT is issued for special occasions such as exhibitions.

(We shall be pleased to receive similar details from other old-established clubs with a recorded history.)

**Barnet** will meet on July 25 for a talk on SSB, by G2BVN. This will be at the Red Lion Hotel, Barnet; there will be no August meeting. **Bradford**, on the same day (July 25) have a talk by G3LZW on Audio Amplifier Design and Construction, and on August 15 they have an informal meeting. They open the new session on September 12.

**Cheltenham** recently heard a talk on Receivers by G2HDU, at which several pieces of equipment were shown, culminating in a demonstration of the Racal RA-17, which members were able to handle after the meeting. New members and visitors will always be welcome on Wednesday evenings at the St. Mark's Community Centre.

[over



The Grimsby Amateur Radio Society recently held a very successful Hamfest which drew a total attendance of about 75 — most of whom are shown in this photograph. The main discussion was on D/F techniques, which was followed by a sale of surplus equipment — a certain attraction at any amateur gathering if the gear is worth having and is offered by somebody who knows how to sell from the rostrum — and the presentation of prizes to visiting mobiles; G3ISB/M from Scarborough was found to have made the longest journey. Unfortunately, we have no identification key, so cannot say who all the cheerful people are in this photograph.

**Guildford** report a change of secretary (*see* panel), and we gather that recent meetings have been successful. On every Thursday except the second in the month, they meet at 41 Egley Road, Woking. There is also a Top Band net on Thursday evenings. **Halifax**, now meeting at the Beehive and Crosskeys Hotel, are due for a Ragchew on July 18, and a Display of Members' Gear on August 1. **Harrow** have a Junk Sale booked for July 21, and on the 29th they will be showing a fully operational station at the Gayton Fair, Harrow; the call will be G3EFX/A and they will be on the air from 1300 GMT onwards. Their secretary, Mr. S. C. J. Phillips, is at present

in hospital, and correspondence should go to G2TA, Winton's End, Springfield, Bushey Heath.

**Hastings** received their news letter *Natter-Net Notes* from Germany this month, their secretary having been there on holiday at the time its publication was due! It was "run off" by DL9SQ; G3MQT and G3HRI attended the Convention of the DARC at Dortmund, a four-day event.

**Hull**, now permanently established once more at their old QTH, the Royal Oak Hotel, Ferensway, meet on the second and last Tuesday. On June 27 G3OMO gave a talk about High Gain IF Valves; July 11 is booked for an Amateur Film Show; and on July 25 G3AGX will discuss the subject of Aerials.

**Northern Heights**, at a recent meeting, heard G2SU's account of Fifty Years of Radio; July 12 is the date for their Junk Sale, July 26 an informal meeting, and August 9 is booked for a discussion on the Scout Jamboree-on-the-Air.

**North Kent** report a change of secretary (*see* panel for new QTH). Their next meetings are on July 13 and 27 at the Congregational Hall, Clock Tower, Bexleyheath 8 p.m.) and GB3ENT will be active from the Erith Show and Sports on Bank Holiday, August 7.

**Southgate** will meet for a talk on Crystal Filters (Standard Telephones and Cables Ltd.) on July 13; there is no August meeting, but G3HGE will be showing the TW range of VHF equipment on September 14. Meetings, as usual, at Arnos School, Wilmer Way, at 8 p.m.; the club will also be running an exhibition station at the Wood Green Show, September 9 and 10.

**Sutton Coldfield** visited the GPO station at Rugby on June 30; on July 13 they will hear a talk by Vernon Sutton on Civil Defence, and on the 27th Tom Parton will talk on The Lighter Side of Servicing.

**Acton, Brentford & Chiswick** meet on July 18 for a talk and demonstration of his SSB Transmitter for Top Band, by G3NEH—at the AEU Club, 66 High Road, Chiswick, W.4, 7.30 p.m.

**Crystal Palace** have a Morse class at G3FZL's QTH on July 4; their regular meeting, at Club Headquarters, is on Saturday, July 15. **Lichfield** get together on the first Monday and the third Tuesday of every month at the King's Head, Lichfield; all visitors and new members welcome.

**Liverpool** are again holding their own annual Amateur Radio Exhibition at the Liverpool Show, when GB2LS will be on all bands from 2200 on July 12 until 1900 on July 15, keeping a special lookout for mobiles. Last year the Show was attended by 72,000 people; and this year the Club's part of the Show will include a closed-circuit TV demonstration, home-built equipment, and commercial gear.

The **Torbay** meeting in June was attended by 27 members; their first annual coach trip and "bucket-and-spade party" to Sidmouth is arranged for August 13; the club Tx is an all-band rig, ready for air-testing at their headquarters (rear of 94 Belgrave Road, Torquay). On July 8 there will be an "Ask-me-Another" Quiz between Torbay and Plymouth

**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.  
**A.R.M.S.:** N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.  
**BARNET:** E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.  
**BRADFORD:** M. Powell, G3NNO, 28 Gledhow Avenue, Roundhay, Leeds 8.  
**CHELTENHAM:** J. H. Moxey, G3MOE, 11 Westbury Road, Leckhampton, Cheltenham.  
**CHILTERN:** C. Simpson, G3OOZ, 2 Mead Street, High Wycombe, Bucks.  
**CORNISH:** W. J. Gilbert, 7 Poltair Road, Penryn.  
**CRAWLEY:** R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.  
**CRYSTAL PALACE:** G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.  
**DERBY:** F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.  
**ENFIELD:** V. Croucher, G3AFY, 15 Nelson Road, London, N.15.  
**GRIMSBY:** P. Mason, G3NNN, 213 Clee Road, Cleethorpes.  
**GUILDFORD:** J. R. Barker, 35 Bandens Rise, Merrow.  
**HALIFAX:** A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.  
**HARROW:** S. C. J. Phillips, 131 Belmont Road, Harrow Weald.  
**HASTINGS:** W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.  
**HULL:** G. G. Wray, G3MVO, 93 Wolfreton Lane, Willerby, Hull.  
**LICHFIELD:** T. L. Painter, G3NEU, 98 Gaia Lane, Lichfield.  
**LINCOLN:** C. Lathwood, G3MUL, 40 Grange Crescent, Lincoln.  
**LIVERPOOL:** H. James, G3MCN, 448 East Prescott Road, Liverpool 14.  
**LOTHIANS:** L. Lumsden, 33 Hillview Drive, Edinburgh 12.  
**LUTON:** D. Bavister, 70 Crawley Green Road, Luton.  
**MIDLAND:** C. J. Haycock, G3JDD, 360 Portland Road, Birmingham 17.  
**NORTHERN HEIGHTS:** A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.  
**NORTH KENT:** B. J. Reynolds, G3ONR, 49 Station Road, Crayford.  
**OXFORD:** F. A. Jerries, G8PX, 1 Lovelace Road, Oxford.  
**PADDINGTON:** N. Lambert, G3LVK, 22 Sunderland Terrace, London, W.2.  
**PURLEY:** E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.  
**R.A.I.B.C.:** W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.  
**REIGATE:** F. D. Thom, G3NKT, 12 Willow Road, Redhill.  
**SILVERTHORN:** B. A. Lea, G3ICY, 9 Balgonie Road, Chingford, London, E.4.  
**SOUTH BIRMINGHAM:** T. W. Legg, Flat 3, 80 Alcester Road, Birmingham 13.  
**SOUTHGATE:** R. Pedder, G3NEE, 6 Greenall Close, Cheshunt, Herts.  
**STEVENAGE:** A. E. Latham, G3JLA, 114a, High Street, Stevenage.  
**STOKE-ON-TRENT:** V. J. Reynolds, G3COY, 90 Princes Road, Hartshill, Stoke-on-Trent.  
**SURREY (CROYDON):** S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.  
**SUTTON & CHEAM:** F. J. Harris, G2BOF, 143 Collingwood Road, Sutton.  
**SUTTON COLDFIELD:** L. E. R. Hall, G3IGI, 24 Calthorpe Road, Walsall.  
**TORBAY:** Mrs. G. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay.  
**WIRRAL:** A. Seed, G3FOO, 31 Withert Avenue, Bebington.

clubs, and the August meeting will take the form of a talk on Air-Sea Rescue, by G3BBF.

Crawley will meet on July 26 at the West Green Centre, when G3JKF will talk on Radar Simulation; a party from this Club recently visited the BBC at Tatsfield; two members entered for the recent RAE. Silverthorn will be running a Field Week-end over the Bank Holiday Period, with the Club station GB3SRC operating under canvas — Top Band only. From the evening of August 4 until the Monday afternoon four operators will keep them on the air, and the objective is to make WABC on phone. On July 8 they are also running a station, G3OZL/A, from the Chingford Day Carnival Fete in Ridgeway Park. Meetings every Friday at South Chingford Community Centre.

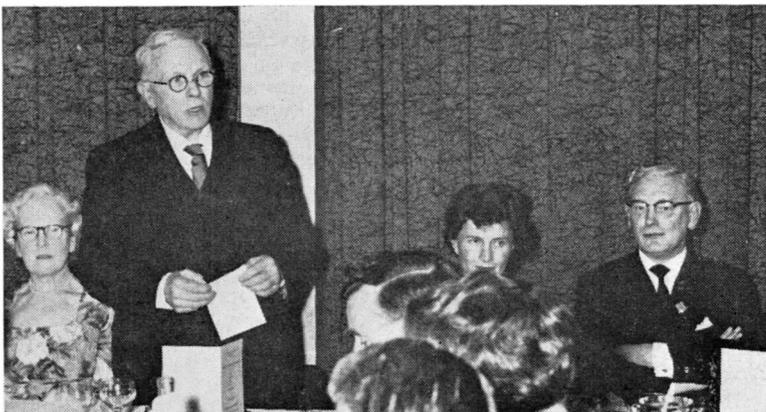
South Yorkshire have a Ladies' Evening on July 13—all XYL's and friends welcome; on July 27 G3GNN will talk on Mobile Working (with G3KPW on Filters as a possible alternative). August and September are left "open."

Cornish met in Falmouth on June 7, and saw two films in colour as well as discussing the details of the Mullard Award for 1961. This will take place at St. Teresa's, Penzance, on July 9. Next regular meeting, July 5 at the Falmouth YMCA.

Midland meet at 7.30 on July 18 to hear G5BJ on SSB Topics, at the Birmingham and Midland Institute, Paradise Street, Birmingham. Sutton & Cheam assemble on the same day at The Harrow, High Street, Cheam, for a lecture on the same subject, by G3CDJ.

Oxford hold their meetings at the Club Room, Cherwell Hotel, Watereaton Road, on the second and fourth Wednesdays, 7.30 p.m. On July 12, G5RP will be demonstrating the Collins 75-S1 receiver; on July 26 there will be a ragchew. A full programme of D-F events is under way for the summer. G8PX, well known in the district, has just been elected secretary—see panel for his QTH.

Aberdeen announce a talk by GM3ALZ on



At the recent commemoration of the founding of the Derby Wireless Club — now known as the Derby & District Amateur Radio Society — fifty years ago, among those present was Mr. A. T. Lee, who held the callsign LYX before the First World War; he responded to the toast of the Club and the Society, being supported in the body of the hall by C. L. Drury, XDB, and G. E. Mart, URX, who were present as founder members. The president of the Club at the present time is a local surgeon, Mr. A. G. C. Melville, who is seen to the right in this photograph.

Aerials and Transmission Lines for July 7, "Ragchew and Operating Nights" for the 14th and 21st, and a Grand Sale of Radio Equipment for the 28th—all at 6 Blenheim Lane, Aberdeen.

Derby have a full programme, mostly of the outdoor variety, with a Two-metre Field Day, D-F Practice Run (July 12), D-F Challenge Match v. Burton (July 16), a visit to a place of local interest (July 19) and an Open Night (July 26). Then in August they have their Derby Golden Jubilee Year Mobile Rally and Hamfest, held at Rykneld Schools on the 12th and 13th. For more details see "The Mobile Scene."

Grimsby attracted about 75 members to a very successful Hamfest in May; forthcoming meetings, at the Abbey (RAFA), Abbey Drive, are on July 6 (lecture) and July 21 (Junk Sale); G3HTT's Night School classes for the RAE, Morse and Construction are being arranged for the autumn. G4GZ recently held a "reduced price sale" for members only—many bargains were snapped up.

Lincoln hold their annual Hamfest and Mobile Rally on September 17 at North Kesteven Grammar School, Newark Road, North Hykeham, and at this event G2UK will give a film show of some of his extensive travels. Luton continue to meet at Surrey Street School, every Monday at 8 p.m. during school terms. Paddington meet every Wednesday, 7.30 p.m., and recent activities have included a Junk Sale and many interesting talks. Late in June they operated from the Little Venice Fair, using their long-awaited and recently-received call-sign G3PAD.

Reigate hope to stage two exhibition stations on July 15, one at Nutfield and the other at Woodhatch, the latter using the call G3NKT/A. The same evening they will hold a club meeting at The Tower, Redhill, and an informal meeting is also booked (same QTH) for August 3.

[over

#### CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, receipt of the following Club publications: Surrey (SRCC Monthly News, June); Reigate (Feedback, June); Purley (Newsletter, June); Grimsby (News Sheet, Vol. 1, No. 7); South Yorkshire (News Letter, June); R.A.I.B.C. (Radial, June); Crystal Palace (Newsletter, No. 64); Wirral (Newsletter, Vol. 14, No. 2); Southgate (Newsletter, June); South Birmingham (QSP, Vol. 2, Nos. 5 and 6); North Kent (Newsletter, Nos. 45 and 46); Lothians (Lothians Radio Amateur, Vol. 2, No. 1); Hastings (Natter-Net Notes, No. 20); Guildford (Monthly Natter, No. 7); Enfield (Lea Valley Reflector, May); A.R.M.S. (Mobile News, Vol. 2, No. 7).

**Stevenage** took part in the annual "Stevenage Day" event on June 10, with GB3SAD on the air on 160, 40, 20 and 2 metres, using a variety of equipment and aerials; a good spell of QSO's with Europeans suitably impressed the public. Local noise rather spoilt results on two metres, but quite a number of stations were worked.

**Surrey** (Croydon) report that in spite of changing membership they can still muster a figure around the 80 mark. Their meeting on June 13 was very encouraging, and they hope to hold a two-metre D-F hunt during the summer. On June 21 an unusual event was a club Car Rally and Treasure Hunt, with an entry of about forty people—ten cars and a scooter!

**Wirral** hold a Junk Sale on July 19 and an Open Night on August 16. There is no meeting on August 2, owing to repairs at their new QTH—they are moving to The Guide House, Balls Road, Birkenhead. On the afternoon of July 9 there is a D-F Contest, and plans are afoot for another DX-pedition.

**South Birmingham** hold their evening Mobile Rally on Saturday, July 8, commencing at 6 p.m. Everything laid on for a pleasant evening with a running buffet, a Junk Sale, and amusements for the juniors. Full details in "The Mobile Scene."

From the southern part of the county of Buckinghamshire, the **Chiltern** Amateur Radio Club report a membership in the region of 35, of whom 20 hold tickets, including several OT's in the G5/G6/G8 category. Meetings are on every last Thursday of

the month at the British Legion Hq., St. Mary's Street, High Wycombe, visitors are always welcome, and membership is open to those with an interest in any aspect of radio.

### BELFAST EXHIBITION RESULTS

At a Holiday & Hobbies Exhibition held in Belfast, Northern Ireland, during April 5-15, the local Y.M.C.A. Radio Club had GI6YM on the air, and a stand covering Amateur Radio activities. With the support of several manufacturers, including Daystrom (Heathkit), K.W. Electronics, and James Scott (Electronic Engineering), Ltd., lending their products, a successful demonstration was given to a large number of visitors. The exhibition station, consisting of a Hallicrafters HT-37 and SX-101A provided by James Scott and an 8KW trapped dipole, had about 300 contacts in 44 countries on the 15-80m. bands, most of the working being on 20m. Sideband. Some representative home-built equipment was also shown, with a good selection of Amateur Radio literature, maps and periodicals.

### IRAN AND LEBANON AMATEUR POPULATION

Bryan Bisley, who is EI5AI and G3OFI, sends us lists showing all the licensed EP's and OD's. From these, we see that there are 19 EP's, mainly in Teheran, the capital of Iran, and more than 50 OD's, mostly in and around Beirut.



**£65**  
Complete

## The Minimitter MR44/II Communications Receiver

	£ s. d.		£ s. d.
● Mercury '200' Transmitter	110: 0:0	● Minibeam G4ZU	16: 0:0
● MCB All Band Converter	20: 0:0	● Minibeam Minor	8:10:0
● Amateur Band Converter	17: 0:0	● Birdcage Dual	16: 0:0
● Mobile Transmitter	16:10:0	● Birdcage 20/40	17:10:0
● Mobile Transistor Power Unit	11:11:0	● Telescopic Mast	10: 0:0
● Mobile Whip Aerials	6: 0:0	● 'Multi-Q' Units	5: 0:0

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

## The MINIMITTER Co. Ltd.

37 DOLLIS HILL AVENUE, LONDON, N.W.2. Tel. PAD 2160  
Callers to 16 St. Michael's Street, Paddington, W.2.

## G4GZ's BARGAINS

**VALVES**: EA50, EF50, 1/6. 6H6M, EB34, 6K7G, 2/-, 2X2, 6B8G, 6F32, 12SC7M, EF36, EF50(S), 2/6. 6AL5, 6AM6, ARP12, AR8, EAC91, EB91, EF91, EL32, TT11, VP23, Z77, 3/-, IL4, 6C4, 6J6, EF39, 3/6. 6ACTM, 6SN7GT, 1626, 1629, DC70, DF73, DL70, 4/-, 6AK5, 6J7G, 6ST7M, 12A6M, 12K7G, 12Q7G, 12SJ7M, 35Z4G, 959, EBC33, 5/-, 3Q4, 6BH6, 6BJ6, 6F6M, 6K8G, 6SJ7M, 6SL7GT, 6X4, 5/6. 1S5, 1R5, 6AU6, 6BA6, 6/-, 12AU7, 12AX7, 80, ECC83, KT33C, PY80, 6/6. 12AT6, 6L6G, 7/-, 6Q7G, 6V6G, 12AU6, 12BE6, 12C8M, 42, GT1C, PCF82, PY83, VR150/30, 7/6. 2A3, 830B, 6AQ5, 6BW6, 6L7M, 12SQ7M, EBF80, 8/6. 3A5, 6K8M, 6L6M, PCC85, 9/-, 50L6GT, EM80, 5R4GY, EL84, 9/6. 12K8M, DET24, EABC80, EC80, GZ32, VLS631, 10/-, 446A, ECL80, ECH42, 10/6. HK24G, 805, 3E29 (829B) 25/-, ECC84, 8/6.

**SPECIAL OFFER** for VHF men. EC80 (GGT. 12 m/a PV. original cartons) 3 for 20/- (1/6 P/P).

Post/packing 6d. per valve. Free over £2.

**AR88**. Cer. w/ch. switches and screens, 17/6.

**AR88**. Cer. tub. trimmers, 4 for 6/-.

**POTTED U.S.A. XFMRs.** 230v. input. 3 x 6.3v., 3A O/P., 16/6; 32, 34, 36v. 2A., 16/6.

Boxes of 50 assorted resistors 10% Tol. ½-2w., 6/-.

**MC METERS**: 3½" rd.fl. (2½" dial) 0-500mA, 0-30mA, 0-15v. AC (Cal at 50cps), 15/-, 2½" rd.fl. (2" dial) 0-1mA, 22/6. 2" rd.fl. 0-500µA, 17/6. 2½" rd. plug-in 0-1500v. Electrostatic, 16/6. 0-250µA, 22/6.

**PARMEKO TRANSFORMERS.** New Boxed, 200-250v. input. 750-630-0-630-750v. 96mA (OK for 140mA) 6.3v. 2A, 4v. CT 3s., £1 each. ET4336 trans. 190-250v. input. 10v. 10A., CT 2½v. 10A CT twice, 28/6. BC906D frequ. meter 145-235m/cs., NEW, 32/6. Res. Unit 231 (12.50w. 80 ohm carbon res.) 15/-, Octal 4.6m/cs. xtals., 6 for 7/6. B9A moulded v/hdrs. and screens, 11/6 doz. Micalox ditto, 13/6 doz. Pyranol 10mfd. 2Kv. oil-filled, 25/-, Command RX 3-6 m/cs., used, 38/6. **BSR MONARDECKS.** New and boxed, £7/10/-, **AR88 CHOKES** (10H. 100 mA) 3 for 18/6.

All carriage paid U.K. mainland.

SAE enquiries.

## JOHN ANGLIN

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

## 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.

## SITUATIONS VACANT

**AIR MINISTRY** have vacancies for **CIVILIAN RADIO TECHNICIANS** at R.A.F. Sealand, Cheshire and various other R.A.F. stations throughout the United Kingdom, for the servicing, repair, modification and testing of air and ground radio and radar equipment. Commencing salary (National) (according to age) is £630 to £810 p.a., max. salary £930 p.a. Rates are subject to small deduction at certain provincial stations. A limited number of houses may be available for renting at West Kirby, some 15 miles from Sealand.—Apply to Air Ministry, C.E.3h Princes House, Kingsway, London, W.C.2 or to any Employment Exchange quoting City O/N 3057.

## TRADE

**VALVES**, new or old types, thousands in stock, all at makers' list prices, plus tax, no surplus or seconds. Also transistors, diodes, metal rectifiers, industrial-type valves, etc. C.W.O. post free (s.a.e. please for enquiries).—M. I. Newey (Valves), 23 Lea-House Road, Oldbury, Birmingham.

**KW TESTED**: Two AR88D's (mint) with S-meter, last to be made, £60 each. SX100 £90. Demonstration 888A and S-meter, £88. AR77E, £23. Minimitter MR37, £25. MR44's, £30. Eddy-stone 840A (mint), £40.—K.W. Electronics, Vanguard Works, Dartford, Kent.

**WANTED FOR CASH**: Good clean communication 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 9½in. x 8in., approved format, semi-stiff covers. Excellent value; 6s., post free, or callers 5s. 3d.—Webb's Radio, 14 Soho Street, London, W.1.

**EQUIPMENT** constructed, serviced, modified, kits assembled/tested, manual sections copied, etc.—Enquiries welcomed, s.a.e. to G2VV, 53 Thames Street, Sunbury-on-Thames, Middlesex.

**WANTED URGENTLY**: Number of HT-11 HT-11A Tx/Rx, preferably unmodified, but modified and unserviceable units considered.—Box No. 2467, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**QSL CARDS**: Buff, blue, pink, green. 100 14/-, 250 22s. 6d., 500 40s., 1,000 75s. Samples (s.a.e.).—Reilly, Panxworth, Norwich.56.Z.

## 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.

## READERS

**DX-100U** Wanted.—Full details to A. W. Owen, G2FUD, Gwernarth, 184 Hale Road, Hale, Cheshire (Altrincham 1321).

**TEN CREED TELEPRINTERS**, 75s. each, or £35 the lot, collect only, need cleaning and adjustment.—G3IEF, Silverleat, Lower Road, Stoke Mandeville, Aylesbury, Bucks.

**WANTED URGENTLY**—R.107 manual, also R.208 receiver in good condition. Your price paid. All letters answered.—Thompson, 13 Byass Avenue, Bridlington, Yorkshire.

**SHROPSHIRE** amateur wants neat tower, 30-40ft. If possible quote for delivery and erection, or supervision with assistance. Also wanting good compact 160/80 metre 12-volt mobile Tx/Rx.—Box No. 2477, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

**HRO**—really mint, nine G/C matched coils in transit case, illuminated S-meter, power pack, 10 spare valves, £30. UM2, £3 5s. Carriage paid.—G3HID, Armadale, Burnham-on-Sea (Tel. 2511).

**RECEIVER** for Sale—Eddystone 888A, Maker's speaker, S-meter, latest silver grey finish, as brand new, very little used owing to long illness. Give away price, £65 cash. No offers.—Burns, 28 Market Street, Fordham, Ely, Cambs.

**EX-APQ43 UNITS**: 30 mc IF strip, requires seven 6AK5, 6AG7, 6AL5, 12ATC; gold plated, superior, 12/6. 4 mF 600v. wkng. paper, very small, 3/6. Small C-core choke, one Hy, 100 mA, 2/- . Parcel of fixed, variable resistors, condensers, tag-boards, dust-cored coils, etc., 5/- . 6AK5, 6C4, 6J6, EF91, EF92, EL91, 5663, VS110A, 3/6; 829B, TZ40, 723 A/B, £1; 2K25, 25/- . 30 mc pre-amp, requires four 6AK5, 3/- . AFC unit, requires two 6AK5, 6AL5, two 5663, 2/6. 50K w/wound centre-tapped cam-corrected potentiometer, 10/- . 2-gang 5K w/wound 3½in. dia., 10/-; both taken from equipment in maker's wrappings. Marconi TF144G late model, £40. Cintel square-wave and pulse generator, Type 1873, £35. Please add carriage on all items. **WANTED**: 3 cm. gear; HRO (octal valves), untouched.—Branson, 2 Park Avenue, Burnley, Lancs.

**WANTED**: Chassis and Valveholders for AR88D, or defunct AR88D for spares if chassis O.K.—Scott, 21 Mirfield Grove, Hull.

**SALE**: Collins TCS12 Rx, NL, mains PSU, speaker, good condition, £9 o.n.o.? Carriage extra.—Bartle, 3 Stamfordham Avenue, North Shields, Northumberland.

**QUICK SALE**: Labgear Topbander, brand new, £15. Regentone RT50 3-speed Tape Recorder, with microphone and one reel of tape, cost £55, going for £25, new tape deck fitted last month by makers. National NC-300C two xtal controlled 2-metre converter, brand new and tested, perfect, cost £19, selling at £15.—A. M. Laidler, Pondsides, Sandy Lane, Churt, Farnham, Surrey.

SMALL ADVERTISEMENTS, READERS—*continued*

**H**RO Receiver, PSU and coils, £18. 2m. superhet by Bendix, £18. High-speed relays, 4/6. Rx valves 508, 5/- . Heathkit VFO, new, £6 10s. Bulle Battery clock, mantel type, 50/- . Binoculars, Ross 7 x 50, £18.—H. H. Thompson, West Hill Cottage, West Knoyle, Warminster, Wilts.

**W**ANTED: Good quality commercial built Tx, AM or SSB, 50 watts upwards. Have the following for part exchange or highest cash offer: Airmec Teletet type 877, as new condition, original cost 56 gns. 9in. Ekco TV type TMB 272, 13-channel portable, with VHF radio, as new, 230v. AC or 12v. car battery, original cost 78 gns. Labgear Electronic Fault Tracer B346c consisting of R/C bridge, AF and RF oscillators, signal tracer, etc. Labgear TV field strength meter, 13-channel type E5107, original cost 35 gns. Admiralty type torque motors, Tx and Rx, 50 c.p.s. 230v. AC, capable of turning heaviest mast and beam. Binoculars 10 x 50 with leather case, as new, original cost 25 gns.—Box No. 2478, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

**B**LIND LISTENER, member R.A.I.B.C., requires Rx receiver, R.1155 or similar, details and price please.—Whitehouse, Hill House, Colburn Village, Catterick Camp, Yorks.

**E**DDYSTONE S.640, good condition, with S-meter and mounting blocks, £20 o.n.o.?—P. R. James, 49 Courtaulds Avenue, Slough, Bucks.

**W**ANTED—Hire or purchase R.S.G.B. *Bulletin* issues containing description and circuit of G2DAF Receiver; terms, etc.—Elkington, 35 Kirkstone Avenue, Peterlee, Durham.

**M**INIMITTER Mercury and LPF, immaculate condition, £70 o.n.o.? Set FT241A crystals, Channels 0-80, 70/- . *QST* 1953 bound volumes, 25/-.—Stevens, 51 Pettits Lane, Romford, Essex.

**A**R 88LF, good condition, with manual, £27. Minimitter MC8 8-band converter, power supply included, as new, £10. Will separate.—Jenkinson, 23 The Cottages, Peabody Estate, Hammersmith, W.6.

**A**R 88D Receiver, nice condition, with S-meter, £45; or will exchange for Ferrograph recorder or good Hi-Fi equipment.—L. Carrier, 47 Green Street, Eastbourne, Sussex.

**W**ANTED: CR-100 or CR-150 Receiver. Good condition and reasonable.—Box No. 2479, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

**C**LEAN UNUSED HRO coil sets, 100-200 kc only. 10s., plus postage. **W**ANTED: Command Receiver and crystals for 160 metres.—Box No. 2472, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**M**ORSE RECORD with instructions, £1. BSR TU9 4-speed turntable and crystal pick-up, mounted on baseboard, as new, £3.—G3NXT, Holmdale, Martin, Lincoln.

**F**OR SALE: Elizabethan Tx, commercially made, very smart, TVI-proof, band-switched, requires slight attention. What offers? Also Class-D Wave-meter; buyer collects.—Clarke, Westaway, School Lane, Newton, Kirkham, Lancs.

**F**OR SALE: BC-348 with built-in power supply for £200/250 mains, £12. Buyer collects.—M. White, 69 Brixham Drive, Wyken, Coventry.

**G**3KZA (Burton-on-Trent Grammar School Club), Old T.1154, now *kaput*, seeks commercial Tx with QRK maximum 30.—Ward, 21 Rangemore St., Burton-on-Trent, Staffs.

**S**ALE: Labgear WBC, UM1 modulation transformer, etc. Please send s.a.e. for list of equipment available.—Box No. 2473, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**£50** OFFERED for Eddystone S.680X less than 3 years old. Selling quantity used 12AX7, 12AU7, 3s. each.—Box No. 2474, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**W**ANTED: CR-150, cheap; condition not important.—D. Hatcher, Sankey, Church Street, Rickmansworth, Herts.

**W**ANTED: 1.5-3 mc Command Receiver; will pay up to £6 for set in first-class condition. **F**OR SALE: TCS6 Receiver, new and mint condition, unmodified with external power supply, £7 10s., plus carriage. Medium-wave Command Receiver, as new, £5.—Hodgkinson, 19 Stoney Lane, Galgate, Lancaster, Lancs.

**E**I's AND GI's: Sale, Eddystone 888, £66; E American Johnson Challenger all-band Ph/CW Tx, £43; both good condition. 30-watt Tx (Geloso 807), use by itself, or to drive Challenger, £8.—Burchell, Dukes Lane, Ballykelly, Co. Derry, N. Ireland.

**A**R 77E, £20. Elizabethan Tx, 150 watts, no power, £7. Cossor 477 Sig. Gen., 6.5 mc to 95 mc, modulated, calibrated output, Lab. instrument, £7. Oscilloscope, 4 range timebase, X and Y amps., sync., etc., £5. UM3 70s., HRO power pack 40s., BC-453 50s. Partridge 1000-800-0-800-1000v. at 300 mA, 65s. Matched pair transformers, 230v. in, 288-288v. out, and 6.3v. 4 amp., 5v. 3 amp, 30s. Items to first offer, but willing to haggle.—A. Burt, 10 Sweetbank Drive, Markinch, Fife.

**H**OWARD 440 Rx complete, speaker, £10. Super-Pro rebuilt, £12. Cossor Tele-Check, £8. Cossor DB Scope 339, £9. Cossor VHF Sig. Gen. with charts, £8. AVO Electronic Testmeter, £15. AVO Vale Tester with charts, £7 10s. G.E.C. Selectest, £9. GEC Valve V/meter, £5. GEC Mini/Scope, £8 10s. DB Unit, £4. Wobulator, £5. 500v. Megger, £5. Trans P/P 300/285 with relay, £8 10s. R78 plus B-453, £4. AR88 mains trans. with chokes, £2 10s. 19 Set Rot/Con, £2; 250v. ¼-h.p., £3. 250v. 1/60-h.p., £2. 440v., 3-ph., ¼-h.p., £2. 373 Unit, £2. BSR m/c Mic., £1 10s. Taylor TV Patt. Gen., £5. Taylor 150A Power o/p Meter, £5. 8-watt stereo amp., £8. 4-watt amp. AC/DC, £5. Jenson 12in. M.E. Spkr., £2 10s. 10/D12 TZ40's Mod. Comp., £8. Smith's Electric World Clock, £3. 700v. 866's PU, 110v., £4. Power Unit No. 3, 240v. metered, £3 10s. Z-Match Unit, £3. 7in. Round & Ellip speakers, 5s. Parmeko 8in. Speaker in cabinet, 10s. Terry Anglepoise Lamp, £3. 80 ohm coax relay, 7s. 6d. Home-built PSU, 2/350v. stab., 5v., 6.3v., £5. AR88 coil pack, req. attention, £3. PU Type RL267/A, four at 300v. stab and 6.3, £5. Type 78 Rx, plus B-453, complete, £4. AR88 case, new Philpott, £4. Acos 39 xtal mic, £1.—G3BAY, 4 Hilders Road, Leicester.

## SMALL ADVERTISEMENTS, READERS—continued

**N**EEDED TCS 1500 kc 3-pin crystal, two TCS crystal holders. — Offers to P. Browning, 325 Staines Road, Twickenham.

**M**ARCONI CR-100 series six band, 60 kc to 30 mc, with technical handbook, £15. — (Ring Hounslow 8140 after 6.30.)

**W**ANTED: *Radio Handbook* by Editors & Engineers (please state edition number); also *Mobile, Antenna and Sideband* books by *CQ/QST*. — Price and particulars to Box No. 2476, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**W**ANTED by SWL in Devon: Good CR-100.— Particulars and price, etc., to Box No. 2475, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**W**ANTED: R.107, R.208, CR-100, AR88, etc., reasonable price.—Kohler, 54 Squirrels Heath Road, Harold Wood, Essex.

**CR** 100 for sale, in very good condition, with S-meter; bargain at £16.—Salata, 26 Manor Way, Colindale, London, N.W.9.

**N**ATIONAL 1-10 £10. R208, £5. S27, minus 2nd detector and AF, £5. 21/28 mc VFO, CW 807 Transmitter, 50s.; all carriage extra. Valves, chassis, components, s.a.e. list.—Box No. 2469, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**BC**-221, new, mint condition, complete with internal V/S power pack, spare valves, manual, etc., £15 10s. Q-Fiver, new, 85s.; another, used, 65s. RA34, mains power pack for BC-639A VHF receiver, new, £4; all plus carriage. **WANTED:** Top Band Command Receiver and Transmitter, TCS manual, KW Valiant (10-160m.) and TCS Tx, U.S. Army 1-177 valve tester; good prices paid or would part-exchange BC-221 for any of the above.—Box No. 2470, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**B2** Tx/Rx with coils (no PSU), £12; consider exchange commercial 2-metre converter, or W.H.Y.? All letters answered.—Box No. 2471, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**S**SB HEATHKIT SB10 adaptor, all latest modifications, standard English co-ax sockets, sideband indicator lamps, very effective Vox, manual, perfect, £30.—G3AFJ, 3 Hatherley Court Road, Cheltenham, Glos.

**S**HORT WAVE MAGAZINES, nearly complete, Nov., 1948 to April, 1958, offers? Send for details.—Westwood, 46 George Street, Oxford.

**S**ALE professionally built table-top Tx, Phone/CW, 120 watts, including power supplies in separate cabinet, single switch control, fully metered, TVI-proofed, complete with necessary inter-connecting cable. Line up: Geloso 4/102V, VFO, SB/254M BA, two 5/B254M PA, just plug it in, and you are on the air; little use, owner posted overseas, price £38 10s., carriage extra. R.1155A, built-in output stage, including mains power supply and speaker. £7 10s.—P. Champion, G3KKZ, 7 Leonard Road, Streatham Vale, London, S.W.16. (Pollards 4508.)



Safety first every time with these patented spring-loaded AVO Prodclips.

Cleverly designed for use as insulated prods, they are invaluable for reaching and holding test points which are difficult of access.

Suitable for use with AvoMeter, Multiminor and Avo Electronic Test Meter Leads.

post free 15/- per pair

**AVO LTD** AVOCET HOUSE,  
92-96 VAUXHALL BRIDGE ROAD, LONDON S.W.1  
Victoria 3404 (12 lines).

A MEMBER OF THE METAL INDUSTRIES GROUP OF COMPANIES

PC2

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

**THE TOP TEN**

- 1 **EDDYSTONE RX'S.** 680X, £140; 888A, £110; 840A, £55; 870A, £33. Full range of components, including 898 dial, 71/4; Doublet Aerial, £3/3/3 complete, etc., etc. Post extra!
- 2 **HALLICRAFTERS.** HT37, £215; SX101A, £187; SX111, £120; SX110, £78; S38E, £28.
- 3 **BIRKETT'S BETTER BEAMS.** We introduce an add on 3 element unit which fits any W.S. 5 element 2 mtr. Yagi — with 1", Boom Price, 19/6 each, plus 3/6 carr. Our usual 5 ele. W.S. Yagi and bracket to fit 1" to 2 1/2" masts at 39/6 + 3/- carr. 8 element W.S. Yagi 59/- plus 3/6 carr.
- 4 **EX522 MOD. TRANSFORMERS.** 7/-, 2/- P.P.; Driver, 6/-, 2/- P.P.; Anode Choke, 5/-, 1/6 P.P. Have you got a spare?
- 5 **JAP. STICK MIKE.** Black and chrome. Xtal. 100-8000 c.p.s. with switch and neckband. This mike is a low cost superior finished job with good output. Try one. Throw out that old insert and invest in a mike that will give you B.B.C. quality and last for years. Even the XYL will say it's nice! 45/- + 1/6 P.P. Heavy desk stand, 13/6 + 1/6 P.P.
- 6 **AR88 CABINETS.** Black crackle or grey hammer finish. Have one for your new TX, etc. Brand new, 89/6 each, carriage, etc. 10/6. Except for over 100 miles, then 15/6. Fits G2DAF Tx.
- 7 **1961 BOOKS.** By return post. Latest Call Book, 4/-, gd. post. ARRL Handbook, 32/6. SSB Book, 14/-, Mobile Book, 23/6. Antenna Book, 18/6. All the latest issues! Add postage.
- 8 **0-75 M/A F.S.D. METERS.** Only 1 1/2" hole (round) required. A real miniature bargain. Clearly marked, 15/- each, post paid. F.B. for new mobile.
- 9 **USED BUT GOOD RECEIVERS.** Eddystone's: 680X £85, 750 £50; RCA: AR7 £32 10s.; Hallicrafter Sky Champion and "S" Meter £30; CR100 £22 10s. Always will do a part exchange Good — 1155's, R107's, AR88's, 640's — in fact any receiver required if popular type.
- 10 **READ LAST MONTH'S ADVERT** for other lines. Still huge stocks of gear as advertised past few months available. S.A.E. please. Print address. Goods by return. Sorry for delays last month due to strike in and around London, not our fault OM!!

**NORMAN BIRKETT LTD**  
**THE SPOT, 26 OSMASTON ROAD, DERBY**

**SPECIAL VALVES.** TY-50, DA-41, DET-12, KT-8, U-19, U-23 all 15/- each (6d.). **AVO GEIGER COUNTERS.** New £9/10/-, **TBS RECEIVERS** 60/80 mc/s. less valves £4/10/- (20/-). **TURNER** 6" dia. 0/1 milliammeters £4 (2/6). **ELLIOTT** 2 1/2" dia. 2000 o.p.v. voltmeters 0/1; £1 (2/6). **PRECISION MAINS FILTER UNITS**, totally shielded 2 1/2 amps, 10/- (2/6). 2 1/2" **ELLIOTT BASIC METERS**, 2000 ohms per volt, scaled 0/1 v., 20/- (2/6). 2 1/2" dia. **MILLIAMMETERS** 0/30 or 0/100 or 0/500, 12/6 each (2/6); 0/1 m/a, 15/- (2/6). **5 FT. P.O. RACKS**, 19" wide, 55/- (15/-); 36" ditto, 40/- (7/6). **6 FT. BENDIX TRANSMITTER CABINETS**, open 19" front, full length rear door ventilated, 100/- (20/-). **BC-610 WHIP AERIALS** 9ft. long in canvas holdall, 30/- (5/-). **40" AMERICAN ONE PIECE MOBILE WHIPS** with loading coil in base effectively increasing height to 12 ft., 35/- (5/-). **20 FT. BC-659 TRANSMITTER-RECEIVERS**, 14 valves crystal controlled (less crystals and valves), 35/- (10/-). **BC-659 POWER UNITS** (for above, 6 or 12v. input (less vibrators), 25/- (10/-)). **BC-659 BATTERY BOXES**, 7/6 (5/-) — all above are matching units and form complete mobile set. **MODULATION TRANSFORMERS** Bendix interstage, 7/6 (1/6); R.C.A. driver, 15/- (3/6); Bendix 50 watts, 15/- (3/6); Woden 85 watts, 40/- (7/6); G.E.C. 200 watts, 65/- (7/6). **MINIATURE RELAYS.** 1700 + 1700 ohms, SPDT, 10/- (1/-).

40 PAGE LIST OF OVER 1,000 ITEMS IN STOCK AVAILABLE — KEEP ONE BY YOU

**COLLINS AUDIO AMPLIFIERS** with 3 transformers V/C 2 x 2000 ohms output 8 x 5 x 4 chassis, 15/- (less valves, requires 2 = 6V6 and 1 = 12SJ7) (3/6). **METAL RECTIFIERS.** 12v. 1A., 5/- (1/6); 24v. 12A., 20/- (3/6). **CABINET RECTIFIER SETS.** 200/250v. A.C. to 110v. 0.7A, 59/6 (7/6); 50v. 1A., 59/6 (7/6). **STEP DOWN TRANSFORMERS.** 250 watts double wound enclosed G.E.C. 23/0 115v., 40/- (5/-); 1350 watts, £6/10/- (15/-). **WODEN CHOKES.** 20H, 400 ma, 20/- (5/-). **BENDIX CHOKES** potted II-H, 270 m/a, 12/6 (3/6). **HIGH QUALITY INTERPHONE AMERICAN AMPLIFIERS**, 4 valves, 3 stages, P/P output (2 = 12A6), totally enclosed with dynamotor for 28v. D.C. input, 40/250 ohms output 3 watts easily convertible to hi-fi. size 9 x 5 x 5 with valves, 25/- (5/-). **AMERICAN MORSE KEYS J-47, 5/- (1/6);** British Morse Keys, enclosed type, 10/- (2/6). American T-27 desk carbon mikes, 12/6 (2/6). Chest Telephones T.39, 12/6 (2/6). **TRANSMITTER DOOR SAFETY SWITCHES.** DPST surface fixing, 3/6 (1/6). **SIEMENS H.S. POLARISED RELAYS.** 500 + 500 ohms, 6/- (1/6). Kurman RELAYS. 7000 ohms SPDT Sigma, 10,000 ohms, SPDT, 12/6 each (1/6).

We have large quantities of "bits and pieces" we cannot list — and invite your enquiries — we can probably help — every one answered.

Amounts in brackets are carriage England and Wales.

**P. HARRIS, Organford, Dorset**

## Short Wave Magazine Advertising

gives

## World-Wide Coverage

in the

## Amateur Radio Field

For Space Rates apply:

ADVERTISEMENT MANAGER,  
**SHORT WAVE MAGAZINE, LTD.,**  
55 Victoria Street, London, S.W.1.  
(Tel.: Abbey 5341)

SMALL ADVERTISEMENTS, READERS—continued

**TIGER TR 200/HF**, excellent condition, first £100 secures. Millen R9'er with 10, 15, 20m. coils, £15. Kit for GM3BQA 10-15m. Quad, £5. 100-1000 kc crystal calibrator, £3. Aerial change-over and receiver muting relay, with 24v. transformer, in cabinet, £5. London Area.—Box No. 2461, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**FOR SALE:** Minimitter MR.44 Rx, with matching S speaker, as new, £35. Eddystone 740 Rx, £15. HRO with 6 coils and P/S, £12. QY3-125 valve with ceramic socket, brand new, £4. Gee-Chain pulse display units, complete, £7. Philips AG.8109 Tape Recorder, with 3 tapes and mike, all in good condition, £18 or near. 500 FT-243 crystals, mostly below 7 mc, 2s. 6d. each.—H. Beaumont, 8 Ashfield Avenue, Morley, Leeds.

**SALE:** R.1155, power pack, moving coil phones, spare valves, manual, £8, o.n.o.? Buyer collects.—Weatherall, 6 St. Cuthbert's Terrace, Hexham, Northumberland.

**FOR SALE:** TCS Rx and Tx, with p/pack, good condition, cheap.—Write to Haggarty, 1 Lower Green, Tewin, Welwyn, Herts.

**TAYLOR MODEL 47A** dual Valve Tester/Multi-Range Testmeter, with current manual, £6 10s. Homelab Type 10 Signal Generator, 100 kc to 100 mc, £3 15s. Five Volumes Newnes *Radio and TV Servicing*, £4.—Hamilton, 383 Merry Street, Motherwell, Lanarks.

**TIGER 60-watt transmitter**, £40, or exchange for Panda "Cub" in good order. Minimitter "Mercury," £70. Both transmitters as new and BCI/TVI proof.—J. R. R. Baker, Clovelly, 35 St. Mark's Road, Windsor, Berks.

**R.1475**, 2-20 mc, scale length 20 ft., xtal cal., RF-24 for HF Converter, and mains power unit, £16, o.n.o.?—Write: Gaunt, Woodlands Court, Pudsey, Yorks.

**WANTED:** Command Receiver (BC series) covering Top Band, also Z-Match.—G3OSF, 6 Grange Crescent, Rubery, Rednal, Birmingham.

**DON'T FORGET** Stamford Rallyfest, August 27, Burghley Park, Stamford.—Details apply: G3KWC, D. Page, 57 Queen's Street, Stamford, Lincs.

**NEW TWO-METRE** Cascode Converter, on 18g. brass chassis, crystal controlled, output IF 4-6 mc, £6 10s.—Box No. 2466, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**T.1131 COMPLETE** and working on two metres. £10; another complete 2m. Tx, RK34 PA, £3. BC-312 with 2m. CC Converter, associated multi-purpose PU, £14. Buyer collects.—G8DA, 18 Lockingwell Road, Keynsham, Bristol.

**R 107 RECEIVER** for sale, good condition, S-meter, muting, £9. Buyer collects.—Trinick, York Cottage, Bolters Lane, Banstead, Surrey (Tel. Burgh Heath 1934).

**WANTED:** Electronic Key, full details of type, please.—Dodd, G3MLY, 36 Blenheim Street, Hull, Yorks.

SMALL ADVERTISEMENTS, READERS—*continued*

**SALE:** Tx 22 watts 80/40/20m. CW/phone, £10. G.E.C. Selectest Meter, £7. W1191 Wavemeter, £4. Electronic bug key, £2. All carriage paid.—G3MEW, 5 Testcombe Road, Gosport, Hants.

**FOR SALE:** CR100 with manual, modified RF and LF stages, S-meter, noise limiter, mostly rewired PVC, and all new resistors; spare set of valves, £15 inc. p. & p.—Allsop, 23 Audrey Crescent, Mansfield Woodhouse, Nr. Mansfield, Notts.

**SALE:** AR88LF £30, good condition, instruction manual, twelve spare valves. Deliver London area.—Robinson, 19 Manor Park Gardens, Edgware.

**SALE:** BC-453 Q5'er in case with PU/Speaker, £5. Also R11A same coverage, £4. Wanted, Minimitter MC8 or similar; ZC1 Mk. II.—Hardcastle, East Keswick, Leeds.

**TIGER TR300** for sale, excellent condition, PA professionally converted to Pi-output. Spare C1108 PA valve included. Bargain at less than half price at £95. No offers. Buyer collects.—Dr. Bousfield, Church Gate, Billingshurst, Sussex. (Tel. 142.)

**TIGER TR200**, little used and perfect condition, going SSB, £90, o.n.o.?—GM3LHV, 6 Clackmæ Grove, Edinburgh, 9.

**EDDYSTONE 888** Receiver for sale, excellent condition, recently thoroughly overhauled by makers, with mounting blocks and S-meter, £70 o.n.o.? Buyer collects or carriage extra.—G3NOF, 9 Cedar Grove, Yeovil, Somerset.

**SALE:** AR77E Rx, in excellent order and condition, with manual and spare valves, £25.—G3GNM, 114 Kingshill Avenue, Kenton, Middlesex.

**WANTED:** Woden UM3 Modulation Transformer, details and price, all letters answered.—M. T. Powell, G3NNO, 28 Gledhow Avenue, Roundhay, Leeds, 8.

**QST:** Offers invited for 272 copies QST, May 1934 to Dec. 1941, and Oct. 1945 to Sept. 1960, inclusive, unbound.—Box No. 2468, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

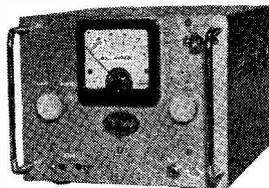
**FOR SALE:** DX-40U and VF1U, £25. UM2 50s. AR88 S-Meter 50s. RG1-240A (3) 10s. each. 83 (3) 7s. 6d. each. ARC5 Tx 3-4 mc, 45s. Want Eddystone S-Meter.—Swift, 54 Mozley Drive, Illingworth, Halifax, Yorks.

**URGENTLY REQUIRED:** Crystal for Bendix Frequency Meter Type LM13, 1000 kc, U.S. Navy type No. CRR-40023B. Your price paid, only genuine crystals for LM13 accepted. So if you have one please write.—R. Bennett, c/o 70 Park Lane, Chippenham, Wilts.

**WANTED:** Marconi CR-150 communications receiver, unmodified. One requiring attention or not working acceptable. All letters answered.—Price and details to Joslin, 13 Talbot Road, Skegness, Lincs.

**URGENT.** For sale before August: Marconi UR.1475 Rx, 2-20 mc, £20. Buyer collects.—Mardin, 104 Ivor Court, Gloucester Place, London, N.W.1.

**The TW-2 Miniature 2 Metre Tx**



10 watts input  
10 watts of audio  
C.W. facility  
Suitable for fixed or  
mobile operation  
23 gns.

ALSO AVAILABLE:—

- TW 6BQ7A Cascode Converter ... 11 gns.
- TW Converter P.S.U. ... 4 gns.
- TW Mains P.S.U./Control Unit for TW-2 and Converter ... 12 gns.
- TW Transistor P.S.U./Control Unit for Mobile-Portable Use ... 21 gns.
- TW Nuvisor Converter with P.S.U. £15 . 0 . 0
- TW Nuvisor Preamp : with P.S.U. 6 gns.
- TW Halo Antenna ... £2 . 17 . 6

AND SOON !

**The TW 2 metre V.F.O.**

Acclaimed at the 1961 V.H.F. Convention.

- 72 mc/s. Fundamental.
- C.W. and N.B.F.M. T9X Note.
- Bandspread 144-146 mc/s.

**T. WITHERS (Electronics)**

15b GILBERT STREET, ENFIELD, MIDDX.

Tel. Waltham Cross 26638

**Go** Tiger TR 200X  
**2** TIGER £170  
**FOR** Tiger TR 150X  
**QUALITY** £105  
**TRANSMITTERS** Tiger TR 100  
£87 . 10 . 0

**THE TIGLET**

(to rhyme with Piglet)

The smallest 160 and 80 metre transmitter available. Size 8" x 5" x 5 3/4". Input 10 watts CW and Phone. 6BW6 PA, ELL80 P.P. Modulator. High Level modulation.

The loud noise in the small box for fixed or mobile use. PRICE £24 less PSU

**TIGLET POWER SUPPLIES** in identical cases to the TIGLET.

- 200-250 V. A.C. PRICE £12 . 10 . 0
- 6-12 V. D.C. PRICE £13 . 5 . 0

SAE for details to:—

**TIGER RADIO Ltd.**

36a KIMBERLEY ROAD, SOUTHBOURNE, BOURNEMOUTH, HANTS.

Phone: 48792.

## SMALL ADVERTISEMENTS, READERS—continued

**F**OR SALE, or Exchange for best offer Transmitter: B2 Transmitter-Receiver, two crystals, key, headphones, coils and power supplies, also grid dip oscillator, Heathkit transistorised, both in very FB condition; also G4ZU Beam.—Offers to 22515880 Sgt. Tanner, D., W.O.'s and Sgts. Mess, 24 Signal Regt., Catterick Camp, Yorks.

**F**OR SALE: SX28 Receiver, with manual, in very good condition, £38; also 2-metre cascode converter, 28-30 mc IF, £6. Mullard 4140 RC Bridge, £3. Band 1 converter, see *Short Wave Magazine*, Sept. '59, £2; new valves and meters. Prefer buyer collect.—G3MLP, as *Call Book*. (Tel.: 2469.)

**A**R 88LF, good condition, needs slight attention, £25. CR-150, very good condition, £30. R.308, very good condition, £25. Eddystone 358X, brand-new, complete speaker, power pack, £14 10s. R.107, new condition, £14 10s.—If calling, mornings or week-ends only: Barnes, 53 Pretoria Road, Tottenham, London, N.17.

**D**ST-100: 50 kc-30 mc, double superhet, with PSU, excellent condition.—Seen at 45 Elswick Road, Newcastle—or write G3LBX, Longhoughton Vicarage, Northumberland. £20 o.n.o.?

**R**F<sup>32B</sup> (the RF24 with variable tuning), 27s. 6d. 100 kc xtal on sub-chassis with 6AU6, £1. Power unit, Type 640 (8 valves), 600v. 150 mA, 350v. 120 mA, 200-300v. 60 mA, stabilised, £2 15s. Power unit in neat grey case, 300v. 100 mA, 6·3v. 4 amp., 27s. 6d. 40-watt modulator (807's in AB1), less P/S, £2. TA12c VFO Box, 15s. Collect or pay carriage.—G3KGN, 126 Danescroft Drive, Leigh-on-Sea, Essex.

**K**W VANGUARD Tx. 10-80 metres, £36. G4ZU Minibeam, £9. Both excellent condition. Transport can be arranged.—Jones, 26 Monkams Lane, Woodford Green, Essex. (Tel.: *Buckhurst 2708*.)

## SPECIAL AMATEUR LICENCE MORSE COURSE

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

By using SPECIALLY prepared recordings (3 speed L.P. player required) students learn automatically and without effort, perfect Morse in half the time required by any other method. Please S.A.E. full details. Tape/Disc/Tape Service also available.

G3HSC, 45 GREEN LANE, PURLEY, SURREY

## JACK TWEEDY

### G 3 Z Y

#### SPEEDY AND RELIABLE SERVICE

First-class components only, listed in our new 72 page catalogue. Complete with full specification of each type.

electronic supplies

All items guaranteed

Catalogue 9d. post free  
(9d. refunded on first order)

21 BIRKIN LANE, GRASSMOOR,  
CHESTERFIELD, DERBYS.  
Telephone: Holmewood 506

## G2YH ELECTRONICS

### 2 METRE CRYSTAL CONTROLLED TRANSMITTER

30 watts input to high efficiency PA using a QOV03/20. Plate and screen modulation with 18 watts of Audio. Two A.C. power packs. RF and Audio in separate matching cabinets with 19" by 8½" panels finished in hammer grey. Complete with connecting leads and one crystal, price £50.

### 2 METRE CRYSTAL CONTROLLED CONVERTER

6BQ7A in low noise cascode circuit aligned by modern electronic equipment for best noise factor.

I.F. 21-23 mc/s. Requires 200 volts at 18 m/a. and 6.3 volts at 1 amp. Price including high stability crystal, £8 15s. A.C. Power pack, £4 5s.

COMMUNICATION RECEIVERS SERVICED AND ALIGNED BY MODERN METHODS.

62 HINTON WOOD AVENUE, HIGHCLIFFE, HANTS  
Highcliffe 2488

## LEARN

### RADIO AND TV SERVICING for your OWN BUSINESS/HOBBY

by a new exciting no maths system,  
using practical equipment recently  
introduced to this country

FREE Brochure from :

**RADIOSTRUCTOR** Dept. Reading, Berks  
G43

7/61

## GM3BQA

	£	s.	d.
TRIPLE QUAD, 10-15-20 metres, single feed line ...	17	0	0
50 and 75 ohm low loss coax ... per yd.		1	8
150 ohm twin lead ... per yd.			9
14 Gauge Copper Wire, enamelled or hard drawn per yd.			4
BEAM ROTATORS, 12-24 volts AC/DC ...	9	10	0
<b>BAMBOO POLES:</b>			
6ft. 2/3 ea.; 9ft. 2/6 ea.; 13ft. 4/6 ea.			
MAGSLIPS (selsynns) 3in. ... per pair	3	0	0
Specially imported Japanese XTAL MICRO-PHONES, stick type with switch and cable ...	2	10	0
			Postage extra

**FORTH MOTOR CO.** Dept. "M"  
Edinburgh Road, Cockenzie, East Lothian, Scotland

## G2ACC offers you—

**Aerial Material:** 14 s.w.g. h/d enamelled copper wire, 5d. yd.; Coaxial cable: 72 ohm standard low loss, 9d. yd.; extra low loss, 1/7½d. yd.; 50 ohm lightweight 0.159 in. dia., 9d. yd.; heavy duty ¾ in. dia., 2/9 yd. Balanced twin feeder: 72 ohm, 6d. yd.; 150 ohm, 9d. yd.; 300 ohm lightweight, 6d. yd. Samples free. Pyrex glass insulator, 3 in. 1/6. Ceramic dipole insulator (for wire), 1/6d. Ceramic 6 in. feeder spreader, 9d.

**Transmitting Valves:** QV06-20 (6146), 40/-; TT21, 33/9; 5763, 20/-; 5R4GY, 17/6. Postage extra on orders under £3.

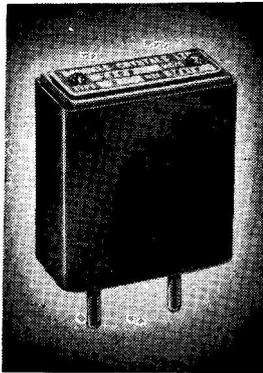
**Catalogue No. 12.** 56 pages. Illustrated with over 2,000 new guaranteed items by leading makers. 9d. post free (refunded on first order). U.K. and H.M. Forces only.

## Southern Radio & Electrical Supplies

SO-RAD WORKS . REDLYNCH . SALISBURY . WILTS

Telephone: Downton 207

# BROOKES Crystals



**mean  
DEPENDABLE  
frequency  
control**

Illustrated is a Type S Crystal unit from a range covering 100 kc/s to 15 Mc/s.

- Black bakelite case.
- 1 3/8" high x 1 1/8" wide x 3/4" thick.
- Two 1/8" dia. pins spaced 3/4" centres.

ALL Brookes 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 Brookes Crystal to suit your purpose — let us have your enquiry now.



## Brookes Crystals Ltd

Suppliers to Ministry of Supply, Home Office, BBC, etc.  
**LASSELL STREET, GREENWICH, S.E.10.**  
 Tel. GREenwich 1828 Grams: Xtals London, S.E.10

# G. W. M. RADIO LTD

**RECEIVERS** Type 52 Canadian. 1.75 to 16 mc/s. in 3 Bands. 1 RF, 2 IF stages. 10 valves plus 3 valve Crystal Calibrator, 10, 100, 1,000 kc/s. Oscillator has separate vernier control for accurate frequency spotting. Crash Limiter. Broad/Sharp selectivity. 500 mic/amp valve check meter. 3" speaker or 'phones. Power required: 150 volts HT, 12 volts LT, £5 carr. £1. Vibrator pack to suit, 12 volts DC input, 10/- carr. 2/6.

**COMPONENTS** removed from Transmitter. 813 valve tested in 'Ham Transmitter, £1 post 2/6. Base to suit, ceramic, 2/6 post 9d. Cooling Fans, 12 volt, 1 amp DC, compact unit 7/6 post 2/-. Aerial Relay, 2-pole C.O. 12 volts DC, 3/6 post 1/-. P.A. Tuning Capacitor, 200 + 200 pf. suitable for 1200 volt use, 7/6 post 2/-.  
**VALVES.** Ex-equipment. All heaters tested before despatch. EF91, EF92, EB91, 1/- each, 9/- doz.; 6V6, 2/6. All guaranteed. Post 3d. singly, dozen free.

**RECEIVERS B28/CR100.** Aerial tested before despatch. Overhauled and in good order, £17 10s., carriage £1.  
**230 VOLT TRANSFORMERS.** 250-0-250 at 80 m/a, 5v. 2a., 6.3v. 4.5a., 17/6, post 2/6. These are new spares for type 3 rack mounting power pack.

**One Only ET4336 TRANSMITTER** complete and in good order untested £10, Speech Amplifier £4 extra. Buyers collect.

**One Only HRO SENIOR** with all coils and power pack, good working order, £17 10s., carriage £1.

**AR88D RECEIVERS,** good order, nice and clean, tested and working, all faulty parts replaced, £32 10s. for callers only please.

**ANOTHER BATCH OF EX-NAVY 8-DAY CLOCKS,** excellent movements mostly Smiths Astral, £5 10s., post 5/-. Overhauled and guaranteed 12 months. Working order but not overhauled £4, post free.

**Three Only 358 RECEIVERS,** complete all coils and Power Pack, £14 10s., carriage £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**

G8VB presents his latest Rig —

## "OLYMPIC" T200/DSB

**THE RIG OF THE FUTURE!**

Read what Don Stoner (W6TNS) writes about the definite future of "Double Sideband" in the "New Sideband Handbook," No. 103.

Full 100 watts on A.M. (A3) } **£110**  
 Full 200 watts on Sideband }

No other British Sideband TX can offer **100 watts on A3** plus 200W (pep) Sideband in the same cabinet at anything like our price. Triple deck Console de Luxe.

Don't be obliged to retain TWO Rigs in the shack — One for A3 and one for Sideband!

Send 3d. stamp for our leaflet.

**SOUTHERN RADIOCRAFT (TX) LTD**  
 136 River Way, Christchurch, Hants.

# PETER SEYMOUR

COMMUNICATION EQUIPMENT SPECIALISTS

	£ s. d.
<b>NATIONAL H.R.O. 50-T1</b> with coils. Bandspread and general coverage. 1.7-30 Mc/s. including special 21 Mc. Accessories include 1000/100 calibrator and N.B.F.M. adaptor 115-230 A/C	145 0 0
<b>EDDYSTONE 5640.</b> 1.8-30 Mc/s. 200-250 A/C input with "S" meter	25 0 0
<b>R208</b> as new, 10-60 Mc/s. (P/P £1)	10 10 0
<b>B.T.H. P58</b> 280-680 Mc/s. built in power unit, "S" meter, etc. (P/P £1)	8 10 0
<b>MINIMITTER CONVERTER</b> 3.5-30 Mc/s. output, Ham bands only	12 10 0
<b>CR300</b> 15 Kc.-25 Mc/s. continuous. Original power unit, 24VDC 110-230 D/C or 230 A/C. Built-in calibrator, Speaker, etc.	25 0 0
	Used but O.K. 17 10 0
<b>MARCONI CR100</b> 60 Kc.-30 Mc/s. 200-250 A/C input (P/P £1)	18 10 0
<b>HEATHKIT SB10</b> single sideband adaptor wired and ready for use with existing T/x	35 0 0
<b>SCOTT MARINE RECEIVER,</b> 86-540 Kc. and 1.9-23.8 Mc/s. with built in 200-250 A/C power unit, BFO, etc. (P/P £1)	9 0 0
<b>BENDIX RAIB</b> 150 Kc.-15 Mc/s. in six bands as new (P/P 15/-)	15 0 0
<b>HALLICRAFTERS DOUBLE DIVERSITY RECEIVER TYPE DD1,</b> 25 valves, twin "S" meters, power unit, audio amplifier	25 0 0
<b>COLLINS TCS RECEIVERS</b> complete and in new condition	8 10 0
<b>COLLINS TCS RECEIVERS</b> soiled, a really good buy at We also have a small quantity of the famous TU series units, TUB's, 9's, etc.	5 10 0
	each (P/P 5/-) 1 15 0
<b>HRO</b> coils, general coverage, most types in stock	1 12 6
Brand new <b>HRO</b> I.F. transformers	3 for 1 0 0
Brand new <b>COLINS TCS</b> BFO units	(P/P 6d.) 3 6
<b>AR88</b> "D" dials, 10/-; windows, "D" and "LF" 12/6	2 10 0
Brand new <b>HRO</b> dials	2 10 0
<b>COLLINS 51J-3,</b> 30 bands from .15-30.5 Mc/s. Xtal controlled first osc. Famous Collins permeability tuned second osc. extreme stability dial calibrated in Kilocycles resetting accuracy 200 c.p.s. on any band	195 0 0

EXPORT TO ANY PART OF THE WORLD

Part exchanges, H.P. available on equipment over £35. Callers welcome. Wanted good post war receivers and tx's. Please mention your price

**410 BEVERLEY ROAD, HULL, YORKSHIRE** Tel. Hull 41938

# INTRODUCING TO YOU THE WORLD-FAMOUS

Easy-to-build kit-sets of highest quality at lower cost



**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. ... £81 10 0

**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. ... £32 10 0

**VAR. FREQ. OSCILLATOR VF-1U.** From 160-10 m. Ideal for our DX-40U and similar transmitters. ... £11 2 0

**GRID DIP METER.** Model GD-1U. Continuous coverage 1.8 to 250 Mc/s. Self-contained. 5 plug-in coils supplied ... £10 9 6

**TRANSISTORISED GD. METER** £10 8 6

**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 ... £11 18 0

**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 ... £8 6 6

**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. £19 19 6

**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 imp. 11 M Ω. Complete with test prods, leads and standardising battery ... £13 0 0

**R.F. PROBE.** Model 309-CU. Extends the frequency range of our V-7A to 100 Mc/s. and enables useful voltage indication to be obtained up to 300 Mc/s. ... £1 9 6

**5 In. 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 ... £36 10 0

**ELECTRONIC SWITCH 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. ... £10 15 6

**CAPACITANCE METER CM-1U.** Direct-reading 4½ in. scale. Full-scale ranges, 0-100 μF, 0-1,000 μF, 0-0.01 μF and 0-0.1 μF ... £14 15 0

**AUDIO WATTMETER.** Model AW-1U. Up to 25 w. continuous, 50 w. intermittent ... £14 14 0



S-33



UXR-1



S-88



FM TUNER



VF-1U



DX-40U



DX-100U



THE "GLOUCESTER" EQUIPMENT CABINET

**THE "MOHICAN" GENERAL COVERAGE RECEIVER, MODEL GC-1U.** In the forefront of design with 4 piezo-electric transistors, 10 transistors, variable tuned B.F.O. and Zener diode stabiliser. An excellent fully transistorised mobile or fixed station 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 ... £38 15 0

**HI-FI F.M. TUNER.** Tuning range 88-108 Mc/s. For your convenience this is available in two units sold separately as follows: Tuner Unit (FMT-4U) with 10.7 Mc/s I.F. output (£32/- inc. P.T.). I.F. Amp. (FMA-4U) complete with cabinet and valves (£11/11/0). Total £14 13 0

**TAPE RECORDING/PLAYBACK AMPLIFIER.** Thermometer type recording indicators, press-button speed compensation and input selection. Printed Circuit Board. Mono. Model TA-1M, £18 2 6. Stereo Model TA-1S £23 6 0

**HI-FI 16W STEREO AMPLIFIER.** Model S-88, 20 mV. basic sensitivity (4 mV. available, 7/6 extra). Ganged controls. Stereo/Monaural gram., radio and tape recorder inputs. Push-button selection. Two-tone grey metal cab. £26 12 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. £12 8 6

**HI-FI SPEAKER SYSTEM.** Model SSU-1. Ducted-port bass reflex cabinet "in the white." Twin speakers. With legs (£11/16/6) £10 15 6

**HI-FI EQUIPMENT CABINETS.** Range now available to suit all needs. From £11 5 6 to £17 18 6

**"COTSWOLD" HI-FI SPEAKER SYSTEM KIT.** Acoustically designed enclosure "in the white" 26 in. x 23 in. x 15½ in., housing a 12 in. bass speaker with 2 in. 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. £21 19 0

**SHORT WAVE TRANSISTOR PORTABLE.** Model RSW-1. Four bands (2 Short, Trawler and Medium). £21 18 6

**DUAL-WAVE TRANSISTOR PORTABLE.** Model UXR-1. Medium and Long £14 18 6

**2½" PORTABLE SERVICE 'SCOPE, OS-1.** A compact, portable oscilloscope ideal for servicing and general laboratory work. Overall size 5" x 8" x 1¼" long, weight 10½ lbs. 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 & 2½" c.r.t. £19 10 0

All prices include free delivery U.K. Deferred terms available on orders over £10

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

NAME  
(BLOCK CAPITALS)  
ADDRESS

SW7

## DAYSTROM LIMITED

DEPT. SW7, GLOUCESTER, ENGLAND

A member of the Daystrom Group,  
manufacturers of the

WORLD'S LARGEST-SELLING ELECTRONIC KITS