

The SHORT WAVE Magazine

VOL. XXIII

JUNE, 1965

NUMBER 4

K. W. ELECTRONICS for all your Amateur Radio Requirements



The KW 2000 SSB Transceiver is now available on short delivery. SSB and CW, 10-160 metres mobile or fixed station. Voice control, built-in crystal calibrator, etc. A complete station costing £199.

CDR ROTORS and CONTROL UNITS

TR11A recommended for 2M ...	£14. 0.0
AR22 thousands in use ...	£21. 0.0
TR44 latest model ...	£37.10.0
HAM-M will handle a 'Big Bertha' ...	£61. 0.0
Carriage included.	

KW MODELS FOR 1965

KW 2000. SSB Transceiver
 KW 600. Linear Amp.
 KW 2000A. SSB Transceiver (180 watts)
 KW 77. Receiver—Triple Conversion
 KW "Viceroy." SSB Transmitter
 KW "Vanguard." AM/CW Tx
 ... and more to come ...

KW stock includes: Adaptors, Aerials, Airdux Coils, Beams, Converters, Filters SSB, Mechanical & Crystal Filters, Microphones, Mobile Whips, Nuvistor Plugs, Pi-Coils, Plugs, Receivers, Relays, R.F. Chokes, Rotors, Signal Generators, Sockets, SWR indicators, Towers, Transmitters, VFO's, Walkie-Talkies, Collins 'S' Line Equipment, etc., etc. U.S.A. Equipment.

We accept trade-in equipment. Easy terms available.

KW

ELECTRONICS LTD Vanguard Works

1 HEATH STREET, DARTFORD, KENT Kables: KAYDOUBLEW, Dartford Phone: DARTFORD 25574

now
 it's
imhofs
 for
eddystone

now you can buy
 the world renowned
 Eddystone multi-wave
 communication receivers
 from Imhofs famous
 New Oxford Street store



Alfred Imhof Limited Dept 11/6
112-116 New Oxford Street London WC1 tel Museum 7878

please send me

details of Eddystone communication receivers type

This Year of Hi-Fi 1965 Details of Guaranteed Export Service

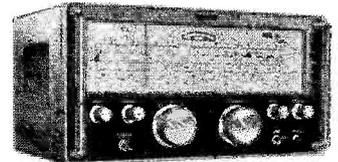
Details of Monthly Accounts Details of IM Styli Please tick appropriate squares

name

address

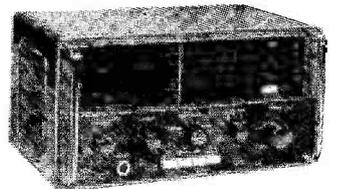
Imhofs are now the main distributors for Eddystone communication receivers for the London area including the Pool of London. Now you can come and see for yourself all the most popular units in a brand new department entirely devoted to Eddystone equipment. And, as you would expect at Imhofs, you can compare them all working side-by-side. If you are unable to visit us you can, of course, order by post with complete confidence. We have been sending precious equipment to all parts of the world for over 100 years and all items can be sent abroad, tax free, under our trouble-free personal and direct export schemes. When you buy your Eddystone receiver from Imhofs you can rest assured that you will get individual attention, prompt supply and after sales service that is second to none

Come to Imhofs for the Eddystone 840C



For worldwide reception — frequency coverage 480 kc. s-30 Mc/s in five ranges. Soundly engineered to give years of reliable service. £66.0.0d

Come to Imhofs for the Eddystone EC10



A really first class transistorised communications receiver that is light, rugged and compact. Powered by six 'U2' torch cells. £48.0.0d

Come to Imhofs for

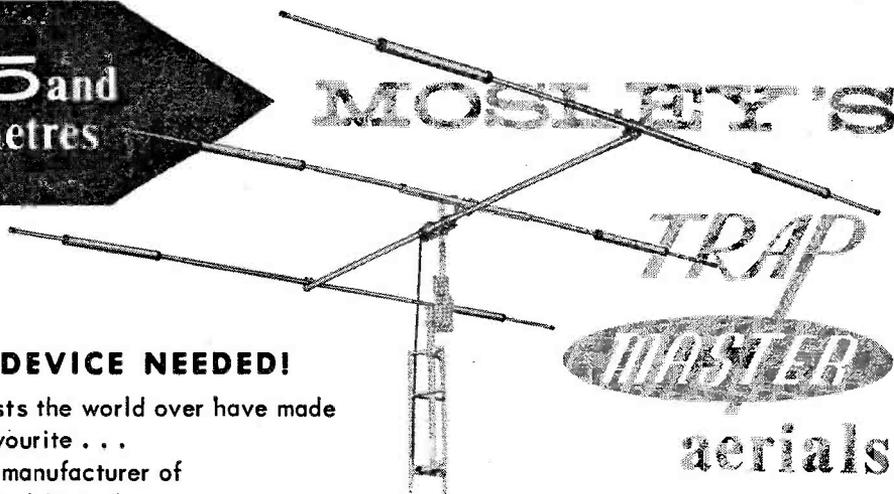
other Eddystone receivers including

870A	£36.10.4d	EB35	£71.5.0d
EA12	£185.0.0d	940	£133.0.0d

Information on any of the items that interest you will gladly be sent on request

for 10
15 and
20 metres
its

MOSLEY'S



NO MATCHING DEVICE NEEDED!

Amateur radio enthusiasts the world over have made TRAPMASTER their favourite . . . and Mosley the leading manufacturer of beam aerials in the United States!

- NEW** RV-4 Vertical. 10, 15, 20 and 40 metres, requires no radials.
 V-4-6 Vertical. 10, 15, 20 and 40 metres.
 V-3 Jr. Vertical. 10, 15 and 20 metres.
 VTD-Jr. Vertical. 10, 15 and 20 metres. For chimney or pole mounting.
 TW-3X. El Toro. Vertical. 20, 40 and 80 metres, requires no radials.
 TA-31 Jr. Vertical or Horizontal Dipole. 10, 15 and 20 metres. Self-supporting from centre. 700 watts p.e.p. s.s.b.
 TD-3 Jr. Trap wire Dipole. 10, 15 and 20 or 40 metres.
 D-4BC. Base loading Coil for 80 metres with V-4-6.
 MA-3. Mobile Whip. 10, 15 and 20 metres.
 SWL-7. Receiving Dipole kit. 11, 13, 16, 19, 25, 31 and 49 metres.
 RD-5. Receiving Dipole kit. 10, 15, 20, 40 and 80 metres.

- Beams** TA-33, TA-32, TA-36. 2 kw. p.e.p. s.s.b. 10, 15, and 20 metres.
 TA-33 Jr. TA-32 Jr. 700 watts p.e.p. s.s.b. 10, 15 and 20 metres.
 A-203-C. A-310. A-315. A-210. A-215. Single band power beams. 10, 15 or 20 metres.
 A-142. 14 Element 2 Metre Beam.

- Transmitter** Mosley Commando II S.S.B. 180 watts p.e.p. New styling.
 All Antenna Accessories. Rotators, Coax, Wire, Polystyrene Cord, Towers, etc.

- Indicator** S.W.R. will handle 10-500 watts continuously. Price £6.10.0.

- New** Polystyrene rope. $\frac{1}{4}$ -ton breaking strain, for supporting beams, etc. ML-6.
 No breaking up of guy ropes now necessary.

We are the Antenna People

Mosley Electronics Ltd. 40, Valley Road, New Costessey, Norwich, Norfolk Nor. 26K

TECHNICAL PUBLICATIONS

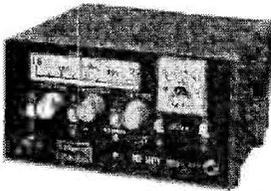
LATEST ISSUES

	Post Free
AMATEUR SINGLE SIDEBAND (Collins)	30s. 0d.
ANTENNA ROUND UP (by CQ)	25s. 0d.
ANTENNA HANDBOOK (A.R.R.L., 10th Edition)	19s. 0d.
BASIC MATHEMATICS FOR RADIO AND ELECTRONICS	18s. 3d.
BEAM ANTENNA HANDBOOK. New Edition	28s. 0d.
BETTER SHORT WAVE RECEPTION	24s. 0d.
CALL BOOK (U.K. only). 1965 Edition	5s. 6d.
CHART OF INTERNATIONAL FREQUENCY ALLOCATIONS—GENEVA, 1960 (Official), 10 Kc. to 40 Gc., 51" x 34", wall mounting	8s. 6d.
COMMUNICATION RECEIVERS	3s. 5d.
CQ ANTHOLOGY (1952—1959)	25s. 0d.
COURSE IN RADIO FUNDAMENTALS (A.R.R.L.)	10s. 6d.
ELECTRONIC CIRCUITS HANDBOOK	24s. 0d.
FOUNDATIONS OF WIRELESS	22s. 3d.
GETTING STARTED WITH TRANSISTORS (GERNSBACK)	28s. 6d.
GUIDE TO BROADCASTING STATIONS (Hiffe)	5s. 6d.
HAMS INTERPRETER (4th Edition)	8s. 6d.
HINTS AND KINKS Vol. 6	11s. 0d.
HOW TO BECOME A RADIO AMATEUR (A.R.R.L.)	10s. 0d.
HOW TO IMPROVE YOUR SHORT WAVE RECEPTION	14s. 9d.
INTERNATIONAL TRANSISTOR DATA MANUAL (AVO)	36s. 6d.
LEARNING MORSE	1s. 9d.
LEARNING THE RADIO TELEGRAPH CODE (A.R.R.L.)	4s. 6d.
MOBILE HANDBOOK (Published by CQ)	24s. 0d.
MOBILE MANUAL (Published by A.R.R.L.)	24s. 6d.
NEWS FROM AROUND THE WORLD	11s. 6d.
NEW RTTY HANDBOOK	32s. 0d.
NEW SIDEBAND HANDBOOK (by CQ)	25s. 6d.
NOVICE HANDBOOK, Tx and Rx. 150 pages	23s. 6d.
OPERATING AN AMATEUR RADIO STATION (A.R.R.L.)	2s. 8d.
PORTABLE TRANSISTOR RECEIVER	3s. 0d.
QUAD ANTENNA	23s. 0d.
RADIO AMATEUR OPERATOR'S HANDBOOK (Data Publications) (New Edition)	5s. 6d.
RADIO CONTROL MANUAL	25s. 0d.
RADIO CONTROL FOR MODELS (F. C. Judd)	16s. 0d.
RADIO DATA CHARTS (Hiffe)	11s. 3d.
RADIO DATA REFERENCE BOOK	14s. 0d.
RADIO VALVE DATA 4,800 types listed	8s. 3d.
S9 SIGNALS	8s. 6d.
SHORT WAVE RECEIVERS FOR THE BEGINNER (Data Pubs.)	6s. 6d.
SHORT WAVE RADIO AND THE IONOSPHERE (Hiffe)	11s. 9d.
SINGLE SIDEBAND FOR THE RADIO AMATEUR (A.R.R.L.) (3rd Edition)	18s. 6d.
STEREO HANDBOOK	11s. 4d.
SURPLUS SCHEMATICS (Published by CQ)	21s. 0d.
SURPLUS HANDBOOK (Editors and Engineers)	24s. 0d.
SURPLUS CONVERSION HANDBOOK (including "Command Sets") New!	24s. 0d.
SURPLUS CONVERSION MANUAL Vols. I, II and III, each	24s. 0d.
TELEVISION EXPLAINED (Hiffe)	13s. 6d.
TRANSISTORS: THEORY AND PRACTICE (Published by Gernsback)	23s. 0d.
TRANSISTOR CIRCUITS (Rufus P. Turner)	23s. 0d.
TRANSISTOR TECHNIQUES (Gernsback)	12s. 6d.
TRANSISTOR RADIO HANDBOOK (Editors and Engineers)	45s. 0d.
UNDERSTANDING AMATEUR RADIO	19s. 6d.
VALVE DATA MANUAL (AVO)	36s. 6d.
VHF HANDBOOK (Orr W6SAD)	24s. 0d.
VHF FOR THE RADIO AMATEUR (CQ)	28s. 0d.
WORLD RADIO HANDBOOK (1965)	26s. 0d.

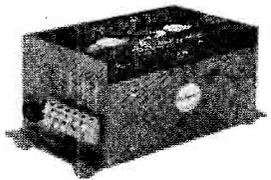
Available from Stock SHORT WAVE MAGAZINE

Publications Dept., 55 Victoria St., London S.W.1 • Abbey 5341

A COMPLETE RANGE to fill ALL your requirements


**Transmitter**

Covering the 160 metre band, 10 watt input, high level mod., aerial relay incorporated.
E.5140 price £15.15.0

**Power Supplies**

Transistorized unit for mobile use.
E.5141 price £8.0.0
A.C. supply for the home station.
E.5142 price £7.7.0

**Whip Aerial**

Wing mounting, adjustable tuning interchangeable loading coils for all band coverage.
E.5159 price to be announced

**Microphone**

Background noise free, with non kink lead and "press to talk" switch.
E.5150 price £3.4.0

Speech Compressor For maximum "talk power" from transmitter.
E.5143 price £5.0.0

Converter

Transistorized unit enabling the 160 metre band to be tuned on a M.W. car radio.
E.5144 price to be announced

Labgear

Labgear Limited

CROMWELL ROAD, CAMBRIDGE

Telegrams: Labgear Telephone: Cambridge 47301 (4 lines)
S.T.D. Code: OCA3

G. W. M. RADIO LTD.

MURPHY RECEIVER OUTFIT CAS. AP. 100335. A modern, high quality receiver issued in 1957, covering 59 to 555 kc/s. and 1.47 to 30 mc/s. Two R.F. separate oscillator with provision for crystal control. Three I.F., twin crystal filter. Three audio plus B.F.O. and noise limiter. Switched selectivity, 8, 3, 1 kc/s. and 200 c/s. (audio filter), I.F. is 800 kc/s. Audio 2 watts to 600 ohms. Size: 14" x 13" x 14½"; weight: 64 lbs. Supplied complete with power unit for 230 volt AC. In good working order, £25, carriage 25/-.

RECEIVERS. Ex-Admiralty P58. 300 to 650 mc/s. superhet. Audio and Video outputs, £7/10/-, carriage £1. Three only.

CATHODE FOLLOWER VALVE VOLT METERS, AS576. Six ranges, 100 microvolts to 100 volts over frequency range of 1 kc. to 150 kc/s. 100 megohms input impedance. 230v. AC power. 19" rack mounting, £6, carriage 10/-.

METERS. 500 microamp calibrated 0-500 or 0-15, 0-600 volts used, tested, 8/6, post 1/6.

TELEPHONE SETS. Admiralty sound powered. No batteries needed. Complete with generator which gives powerful howl, easily heard over noise. Only 17/6, post 7/6.

CR100/B28. 60 kc/s. to 30 mc/s., crystal filter, B.F.O., two R.F. and three I.F. stages. 6V6 output, 230 volts A.C. power pack built in, only needs speaker and aerial. Good condition and working order, £18/10/-, carriage £1.

PI04 (R1392). Crystal controlled 100 to 150 mc/s. 13 valves, A.G.C., B.F.O., R.F. and L.F. gains. Tuning meter. In good condition complete with simple instructions for conversion to tunable oscillator, £3/10/-, carriage 15/-.

P.A. Condensers 200 plus 200 PF. Made for 813 at 1200 volts, used, 7/6, post 2/6. Used 813 bases, 3/6, post 1/-.

CERAMIC INSULATED 3 GANG VARIABLES. 56 x 56 x 35pf., 3/6, post 1/6

All equipment offered is complete but not tested unless otherwise stated. Carriage charges quoted are for England and Wales only. Telephone Worthing 9097.

Terms: Cash with order. Early closing Wednesday.

40-42 PORTLAND RD., WORTHING, SUSSEX

S.S.B. PRODUCTS DERBY

SPHINX TX. 160m., 80m. (40m.), 20m. S.S.B., A.M., C.W. 70 watts P.E.P. Weighs 25 lb. Mains I/P. spec. and audio quality superb. Hand-built, £75.

"DELTA" TX. Control Unit. Contains Co-axial C/O, plus 2 sets of S.P.C.O. and extra make pair. Press to talk button on lead and long over SW. Made to use on any TX, £7.

"NAPOLEON" S.W.R. Bridge. Small, compact. Made for 72-80 ohm O/P's. Includes 500 micro-amp meter sensitivity control. For/Ref. S.V. A must at any Ham station. Really find out if it's going up the spout! £5 + 2/6 P.P.

"CANON BALL" 160m. TX. Size: 8½" x 6" x 5½". 1.8 mc/s. to 2 mc/s. S.S.B., A.M., C.W. spec. similar to Sphinx. 10w. P.E.P. (40w. linear and power unit available). 230v. D.C. 100mA. 6v. 3a. hrs. or mobile 12v., £24.

"SILPLUG" replaces 5Z4, GZ32, 5V4, etc. Contains 4-1000 volts silicon. 2½" x 1½" o/d. octal base. Cool power with low impedance. Only, 39/6 each.

"RX80" Receiver. .5 to 30 mc/s. Separate B/S dial on Ham Bands. Excellent S.S.B., A.M., C.W. All latest refinements, etc., £53 10s.

"BM3" "Mic." Black and chrome. S.S.B. filter included. Suits S.S.B. TX's, etc. (Stands extra), 40/- + 2/6 P.P.

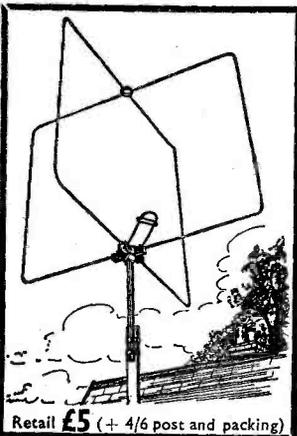
"DYNAMIC" Mic. Very suitable for any TX. Especially S.S.B. Reduced from 7 gns. to only 95/-.

RECONDITIONED equipment. CR100, £18. CR100 de-luxe. Partly rebuilt, £28. SX73, £110. TCS12, £12.

Write to S.A.E. please

7a Edward Street, Derby

Tel. 42909



MINIMITTER AMATEUR RADIO AERIALS

Retail £5 (+ 4/6 post and packing)

BIRDCAGE Aerials for 2, 4, 10, 15 and 20 m. (F.M. version illustrated)

HORIZONTAL "X" Aerials for 10, 15 and 20 m.

MINIBEAM Mk. III Aerials for 10, 15 and 20 m.

3-BAND "COMBO" Aerial for 10, 15 and 20 m.

FB.5A. "All" Wave Aerial for 10, 15, 20, 40 and 80 m. (has been used on 160 m.)

MOBILE WHIP Car Aerials for use at road speeds of 110 m.p.h. and above.

Order direct from **MINIMITTER (1964) Ltd.**
Albion Mews, Kilburn High Road, London, N.W.6
(MAIDA Vale 5588)

When conditions are good . . .

Make the most of them by installing first-class equipment!

TIGER TRANSISTOR VHF CONVERTER
144-146 mc/s., 24-26 mc/s. or 28-30 mc/s. IF: 6.3v. AC (30 mA) or 120v.
DC £11 10 0

TIGER MOBILE TRANSISTOR CONVERTER
For car radio or mains receiver, 600-1200 kc/s.: 1.8-3.8 mc/s. IF: suitable for any mobile whip £9 5 0

TIGER STANDING WAVE METER FOR COAX CABLES
Suitable for 52 or 80 ohms Coax lines £5 12 6

OLYMPIC ANTENNA COUPLERS
The best in the field! Covers all six Amateur Bands: eliminates indoor aerials £7 10 0
75W £8 10 0
150W £9 10 0
250W £10 10 0
500W £11 10 0

Postage and packing 3/6 any item (Orders over £15—POST FREE)

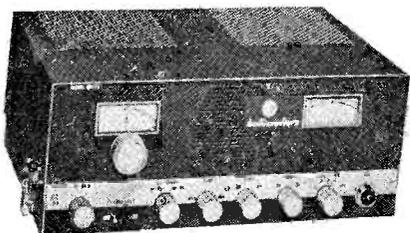
Send SAE for details:

TIGER RADIO LTD.
36A KIMBERLEY ROAD, SOUTHBOURNE,
BOURNEMOUTH, HANTS.

COURIER COMMUNICATIONS

U.K. DISTRIBUTORS OF *hallicrafters* PRODUCTS

Some models in stock, others on the way over. Send for details of the full range of this high quality amateur equipment.



Check these features :—

- 14w. input, final tube 7551
- Plate and screen modulation.
- 13CW4 neutralized nuvistor r.f. amp.
- Built-in speaker.
- AC and DC power supplies built-in (12v. vibrator extra).
- Four switched xtal positions (one supplied) plus v.f.o. using optional HA-26.

SR-42 two metre transceiver

Size : 12 $\frac{1}{8}$ " x 5 $\frac{1}{2}$ " x 8 $\frac{1}{4}$ "

£76 . 15 . 0

For the SSB enthusiasts, we recommend the incomparable

SR-150 TRANSCEIVER

Superbly engineered ; proven performance. 80 through 10 metre amateur transceiver. Each band covers 500 kc for fixed/portable/mobile operation on SSB/CW. 150 watt pep input on SSB. 125 watts on CW Crystal filter type sideband generation—carrier type CW operation. Amplified automatic level control (AALC), RIT control allows independent tuning of receiver plus or minus 2 kc of transmit frequency. Receiver sensitivity less than 1 microvolt. Audio passband 2.8 kc. I.F. shape factor 2 to 1. Eighteen tubes plus 10 diodes and 1 varicap. Aluminium construction. Size : 15" x 6 $\frac{1}{2}$ " x 13".

Price £299

P-150 AC power supply **£44**
P-150 12v. DC supply **£50**

For fixed station use, where maximum flexibility is needed, we recommend the **SX-117 Receiver** and the **HT-44 Transmitter**.

SX-117

Triple conversion SSB/CW/AM receiver. Can tune most frequencies, 85 kc through 30 mc, by insertion of proper crystal and use of HA-10 (low frequency tuner) below 3 mc. Product detector for SSB/CW. Envelope detector for AM. Crystal calibrator. "T" notch heterodyne rejection. VFO can be used as crystal locked oscillator. Thirteen tubes plus diode rectifiers. Size : 15" x 7 $\frac{1}{8}$ " x 13". Shipped with crystals for 80-40-20-15 metre amateur bands plus 28.5-29 mc coverage on 10 metres.

Price £190

HT-44

Phasing type AM/CW/SSB transmitter. Operates transceiver or independent with SX-117 receiver. 80 through 10 metre coverage. Final is a pair of 6DQ5's. Requires P-150 AC power supply. Dimensions : 15" x 7 $\frac{1}{8}$ " x 13".

Price £195

We offer a packaged deal, SX-117, HT-44 and P-150 AC for

£399

At last ! The renowned *hallicrafters* Master Kits. Very competitively priced. We invite comparison with any other similar products.

The HM-1, vacuum tube voltmeter, ohm-meter and MILLIAMMETER

£14 . 19 . 6

Ready wired **£24 . 7 . 6**

The HG-1, R.F. Signal Generator

50 kc to 880 mc 400 c/s modulation, coarse and fine attenuators, AC line filter.

£13 . 19 . 6

Ready wired **£26 . 15 . 0**

Our own products and supplies include :

The CTR-1 , 10-160m. SSB transceiver with the incomparable Collins Mechanical Filter	£175 . 0 . 0
CPS-1 , matching AC power supply and speaker 115/250v.	£33 . 10 . 0
808/C , 12v. DC supply for mobile use	£36 . 10 . 0
For the mobileer. Hand-held mikes are dangerous, why not use our superb boom mikes , ultra-lightweight	Standard type £7 . 10 . 0 Noise cancelling type £9 . 10 . 0
Cornell Dubilier, de-luxe antenna rotator, TR-44	£37 . 10 . 0
HW-3 , 10, 15, 20m. helical mobile antenna, exceptional results	£17 . 10 . 0

182, PENTONVILLE ROAD, LONDON, N.1.

Telephone : BRU 6358 (area code 01)

FREE INSIDE Practical Electronics

2 DOUBLE-SIDED BLUEPRINTS TO BUILD

ELECTRONIC TRUMPET

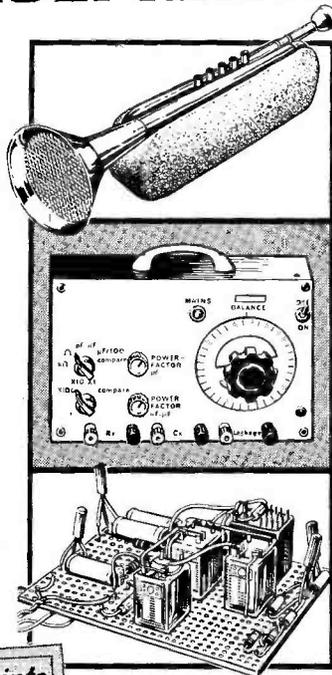
Full-size transistorised musical instrument which uses push-button note selection without the player blowing into the mouthpiece.

RESISTANCE/ CAPACITANCE BRIDGE

A valuable piece of test equipment for the workshop. Bridge balance indicated by magic eye valve. Linear scales on all ranges.

INTRUDER ALARM

Compact transistorised unit giving audible warning at a pre-determined time after entry through garden gate. Stopped automatically by ring at front door bell.



Also in
the June issue :

**ELECTRONIC
BUILDING BLOCKS**

**A.C. MAINS
VOLTAGE STABILISER**

**VOICE
DISPLAY UNIT**

June Issue
Out Now **2/6**

Look out for the July issue, out June 17th
Special Construction Feature :
'How to Build a Portable Stereo Record Player'

J. B. LOWE

115 Cavendish Road, Matlock, Derbyshire

TRADES

Try me for the best possible price against new equipment.

- Morse Keys. Good, fully adjustable 3/-
- Miniature Pots. 1K, 50K, 1 Meg. carbon ... 2/-
- Rotary Switches, all types, from 2/-
- Chokes ! Chokes ! Chokes ! — Lots.
- Special. Brand new surplus 470K 1½ watt resistors ... 2d.
- Special. Brand new Dubilier, 1,000 mF, 12v. miniature electrolytics ... 1/6 each ; 15 for £1
- Relays. Hundreds in stock, 6v., 12v., 24v. ... from 2/-
- AR88 Transformers. L.F.'s, B.F.O. and crystal load 2/6
- Brand New Resistors and Capacitors (not surplus), from 2d.
- Four pin Vibrators. 12v. ... 6d.

All the above items are brand new

- AR88D—"a good 'un" ... £45
- KW160. Excellent ... £20
- SPHINX SSB Tx, mint ... £55
- KW77 in stock, new, list price.

Immediate Delivery of NC-190X and NCX-3. (in stock)
Top trade-in deals on these.

- Sundries. Mobile Whips complete with base ... £1
- 19 set variometers 15/-

Brand new Marconi p.s.u. 12.6v. ac and about 175v. dc out 250v. ac in or 12v. dc. A beautiful job ... £2/10/-

Brand new 10v. dc supply unit — miniature, zener diode regulated ... 30/-

My stock of Rx's and Tx's turns over pretty fast so I may just have what you want at the price you are prepared to pay—worth a stamp to find out.

Lots of Other Good Buys

Orders over 10/-, post free ; 5/- and under add 1/- ; 10/- and under add 2/-.

A S.A.E. will get you on the mailing list.

73 de Bill

RADIO AMATEURS LICENCE

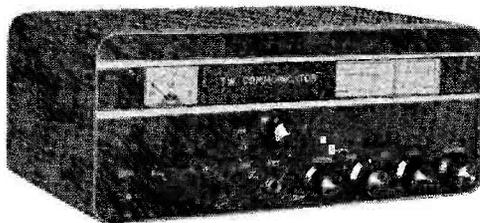
We supply a special course of home study prepared specifically for the Radio Amateurs sound and TV Licence as issued by the G.P.O. It covers every aspect of the syllabus—starting right from the beginning—so that no previous knowledge is necessary. The fullest details of the licence requirements, itself, are included and the method of sitting the examination and applying for the licence is fully described. At the end of the Course, a complete series of specimen exam. questions with fully worked model solutions are provided—giving invaluable revision before students take the exam. We also provide full training for the Morse Code—including morse key, transistor audio oscillator and 12 in. L.P. practice record. This latter equipment is available separately from the Course if required. Our record of successes by our students for the Exam. is unsurpassed by any other institute. Established 23 years. COURSES ALSO AVAILABLE for all subjects in Radio, TV and Electronics and for the City & Guilds Technicians Certificates, etc. Write NOW for full details without any obligation, to :-

DEPT. 20

BRITISH NATIONAL RADIO SCHOOL
Radio House, Russell Street, Reading, Berks.

THE TW COMMUNICATOR

MOBILE
FIXED
PORTABLE



DESIGNED FOR THE DISCERNING AMATEUR

A RANGE OF SELF-CONTAINED TRANSRECEIVERS FOR 2, 4 and 160m.

- All Transistor Receiver — Fully Bandsread. Efficient Noise Limiter. 1 watt of audio.
- Transistor Power Supply with true Toroidal Transformer (12v. + earth).
- Transmitter 10—15 watts input with C.W. and high level mod. P.T.T. control.
- Contemporary finish and styling in matt black, grey and chrome.
- Only 12in. wide, 4½in. high and 7in. deep. VHF, £69 ; 160m. £59.

ALSO AVAILABLE—TRANSMITTERS, CONVERTERS, RECEIVERS and POWER SUPPLIES.

Write for full details of our equipment. British made and proved the best!

*Congratulations to GW3RUF/P R.S.G.B. 70 Mc/s. Contest, 1st with a Communicator 4.

T. WITHERS (Electronics) 15(b) Gilbert St.—Enfield—Middlesex

Tel.: Waltham Cross 26638

PETER SEYMOUR LTD

COMMUNICATIONS EQUIPMENT SPECIALISTS

THE NEW SWAN 350 SSB TRANSCEIVER IS NOW ON DEMONSTRATION

400W P.E.P. NO LINEAR REQUIRED.

FULL COVERAGE. 80-10 METRES. ALL FOR £205. POWER UNIT £45

SEND FOR DETAILS NOW!

ALL ITEMS IN STOCK AT THE TIME OF GOING TO PRESS

	£ s. d.		£ s. d.
R.C.A. AR88 LF/E. Fully rebuilt with p.v.c. wiring. Fitted with "5" meter, I.F. gain, improved B.F.O. injection for S.S.B., etc. 115/240 a.c. input. Complete with new cabinet ...	40 0 0	COLLINS KWM2 OUTFIT. Comprising: KWM2 Transceiver, Ser. No. 11738 with all xtals; 312B-5 Remote V.F.O./Station Control/Direct Reading Wattmeter; 30L1 Linear, 1 kW. P.E.P.; 516F2, a.c. power supply; MM1 Microphone; All Cables and Connectors. This "Rolls Royce" of amateur stations cost new over £1,000 and is as new. Offered at ...	750 0 0
Less cabinet ...	35 0 0	GONSET GSB 100 TX. AM, CW, SSB, with auto transformer	100 0 0
HROMX. Rack version with all coils. 50 Kc.—30 Mc/s. and power unit 240 a.c. ...	17 10 0	HEATHKIT RGI. 600 Kc.—30 Mc/s. with matching xtal calibrator and speaker. Factory built. As brand new ...	45 0 0
HEATHKIT R.A.I. 160—10 Mtrs. Amateur bands only ...	30 0 0	AR88D. As new, 540 Kc.—32 Mc/s. ...	65 0 0
EDDYSTONE 888A. 160—10 Mtrs. Amateur bands only ...	75 0 0	KW VANGUARD TX. As new ...	40 0 0
MARCONI CR300 with matching power unit. 15 Kc.—25 Mc/s. KW VICEROY, Mk. II ...	17 10 0		
HALLCRAFTERS SX140 RECEIVER. Amateur bands only, 80—6 Mtrs. New ...	95 0 0		
JAPANESE all transistor electronic keyers. 240 a.c. input ...	30 0 0		
JAPANESE. Semi automatic keys ...	16 10 0		
RF40 FIELD STRENGTH INDICATORS. 1-250 Mc/s. Built-in meter, telescopic antenna and earpiece supplied ...	4 12 6		
JAPANESE MULTIMETERS. 1000 opv. 0-15-150-1000v. d.c./a.c. 0-100,000 ohms, 0-150 mA. ... (P/P 1/6)	2 0 0		
BY100 ... (P/P 6d.) each	4 4 6		
HALLCRAFTERS SR150 TRANSCEIVER with all matching accessories including a.c. and mobile power unit and mobile mounting rack, etc. ...	295 0 0		
EDDYSTONE S640. 1.8-30 Mc/s. Xtal filter, bandsread, etc. ...	25 0 0		
EDDYSTONE 840C. As new, 480 Kc.—30 Mc/s. 110/240 a.c.-d.c. ...	45 0 0		
NEW KW2000 with power unit. 160—10 mtrs. ...	199 0 0		
EDDYSTONE 770R/IL. 19-165 Mc/s. AM/FM. As new ...	135 0 0		
		WE are now taking orders for early delivery of the NATIONAL NCX5 TRANSCEIVER. 80—10 Mtrs. with a de-luxe specification complete with power unit for ...	308 0 0
		EDDYSTONE S750 in specimen condition. 480 Kc.—32 Mc/s. with matching speaker. Double conversion. 110—240 a.c. input	55 0 0
		AM 914/TRC UHF CONVERTERS. 220—400 Mc/s. Tunable IF output 30 Mc/s. ...	20 0 0
		RACAL RA 17 in mint condition ...	295 0 0
		HEATHKIT DX100U. 160-10 Mtrs. ...	60 0 0
		R.S.G.B. AMATEUR RADIO HANDBOOKS ...	1 14 0
		R.S.G.B. AMATEUR RADIO CALL BOOKS, 1965, 6d. P.P. ...	5 0
		FULLY POTTED TRAP SETS for a 80-10 mtr. dipole, 72 Ω feed, exceptional value. With full instructions, 2/6 P.P. Per pair	2 5 0

H.P. TERMS ON EQUIPMENT OVER £35/-, INCLUSIVE.

410 BEVERLEY ROAD - HULL - YORKSHIRE

Telephone Hull 41938 (43353 7.30 p.m.)

**INDEX TO
ADVERTISERS**

SHORT WAVE MAGAZINE

(GB3SWM)

	PAGE
B. J. Ayres & Co. ...	cover iii
British National Radio School ...	198
Codar Radio Co. ...	202
Courier Communications ...	197
Daystrom ...	cover iv
Finnigan Speciality Paints ...	252
G. Francis ...	253
G3HSC (Morse Records) ...	251
G.W.M. Radio ...	196
Halson Radio Services Ltd. ...	251
Henry's Radio ...	253
A. Imhof, Ltd. ...	cover ii
J. T. Supply ...	251
K.W. Electronics <i>front cover</i> , ...	254
Labgear ...	195
J. B. Lowe ...	198
Minimitter ...	196
Mosley Electronics ...	193
Partridge Electronics, Ltd. ...	252, 255
Peter Seymour ...	200
Practical Electronics ...	198
H. Rollet ...	256
Service Trading Co. ...	256
Short Wave (Hull)...	254
Small Advertisements ...	250-256
Smith & Co., Ltd. ...	199
S.S.B. Products ...	196
S.W.M. Publications ...	194, 249, 250, 256
Martin R. Tetley ...	253
A. J. Thompson ...	251
Tiger Radio, Ltd. ...	196
John Williams Electronics, Ltd. ...	256
Withers ...	200
Yukan Products ...	252
Z. & I. Aero Services, Ltd. <i>cover iii</i>	

Vol. XXIII JUNE, 1965 No. 260

CONTENTS

	Page
Editorial ...	203
Transistor Converter for Two Metres, <i>by B. J. P. Howlett (G3JAM)</i> ...	204
Modifications for The AR77, <i>Notes by G3SZC</i> ...	206
Noise-Limiter for the CR-100, <i>by A. E. Beales</i> ...	207
The Practical Applications of Semiconductors, Part X, <i>IF Amplifiers (RTTY) by M. I. Davis, B.Sc.</i> ...	208
Relay-Less Regulator for Car Alternators, <i>by R. A. Brett-Knowles</i> ...	210
RTTY Topics, <i>by W. M. Brennan (G3CQE)</i> ...	212
Miscellany— <i>Comment on the Times</i> ...	215
Tone Control Unit (<i>for Speech Compressor</i>) ...	216
More Bandspread for the HE-30, <i>by W. Bourke</i> ...	217
Key-Controlled Change-Over, <i>by C. P. Clarke (EI5AN)</i> ...	218
Transistor Converter for 40 Metres, <i>Notes by 5N2AAC</i> ...	220
VS9SJF on Socotra, <i>by J. Farrar (VS9SJF, ex-5B4JF)</i> ...	221
Visual Indication for the GDO ...	224
Communication and DX News, <i>by L. H. Thomas, M.B.E. (G6QB)</i> ...	225
The Mobile Scene ...	232
VHF Bands, <i>by A. J. Devon</i> ...	237
Electronic Dots and Manual Dashes ...	241
New QTH's... ...	242
The Other Man's Station—G3TUV ...	243
The Month with The Clubs— <i>From Reports</i> ...	244
Do You Know That ...	248

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

Advertising: Maria 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 42s. (\$6.00 U.S.) post paid

Editorial Address: Short Wave Magazine, BUCKINGHAM, England

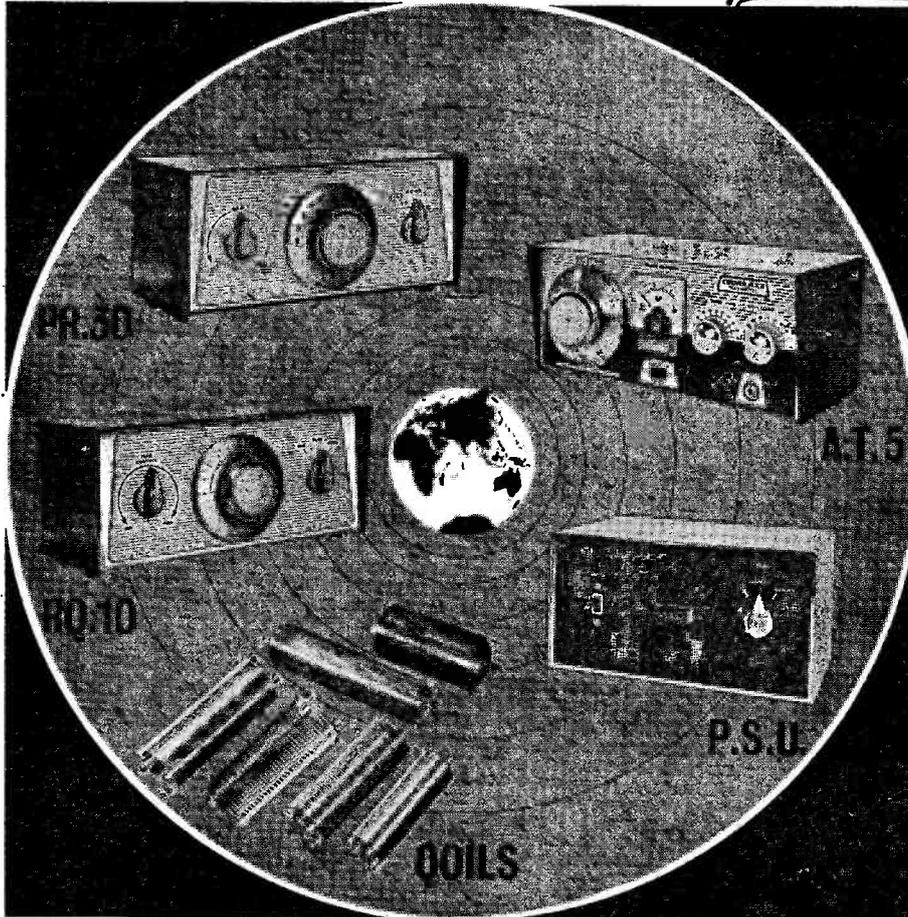
AUTHORS' MSS

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.

© Short Wave Magazine Ltd.

FOR PEAK PERFORMANCE AT LOW COST—PICK

CODAR AMATEUR RADIO EQUIPMENT



Advanced design and craftsmanship plus an unequalled reputation proved by the many hundreds of testimonials received from CODAR users is your guarantee of complete satisfaction. Only the best is good enough for CODAR—Mullard, Brimar, Jackson, Denco, Electroniques, Thorn, A.E.I. are just some of the famous names built into CODAR equipment. Illustrated leaflets available on request.

For the beginner and S.W. listener **CODAR CR66 Communication RECEIVER**

The finest superhet kit ever offered.

CR66 KIT £19. 15. 0.
(Ready Built £23 0 0)

CR66 'S' METER
MODEL KIT £22. 0. 0.
(Ready Built £25 0 0)

Carr. 7/6 on all models
(H.P. Terms available)

CODAR R.F. PRESELECTOR
Will considerably improve the performance of any superhet receiver. "Results are amazing." "Well worth the money."

Model P.R.30. Uses EF183 Frame Grid tuned R.F. Amplifier and provides up to 20 dB gain plus substantial image rejection, improved signal/noise ratio and selectivity. Selector switch for either dipole or single wire antenna. Power requirements 180-250 volts 12 M/A H.T., 6.3 volts 3 amp. L.T. Size: 8½" x 5" x 4". Ready built, complete with cables, plugs and instructions, £4. 19. 6, carr. 3/6.

Model P.R.30X. Self-powered version for 200-250v. A.C. and also provides 25 M/A, at 200v. H.T. and 6.3v. 1 amp. L.T. for other accessories, £7. 4. 0, carr. 3/6.

CODAR "Q" MULTIPLIER

Model R.Q.10. For use with any superhet receiver with an I.F. between 450 and 470 kc/s. Provides considerable increase in selectivity for either peaking or rejecting a signal on AM, CW or SSB. Both PEAK and NULL functions tunable over receiver I.F. passband. B.F.O. facility included. Size: 8½" x 5" x 4". Power requirements 180-250v. H.T. at 5 M/A. 6.3v. 3 amp. L.T. Ready built, complete with cables, plugs and instructions, £6. 15. 0, carr. 3/6.

Model R.Q.10X. Self-powered version for 200-250v. A.C. and also provides 25 M/A, at 200v. H.T. and 6.3v. 1 amp. L.T. for other accessories, £8. 8. 0, carr. 3/6.

CODAR A.T.5, 12 WATT 2 BAND TRANSMITTER.

The newest, most compact transmitter for fixed or mobile use on 160/80 metres. "The tiny TX with the BIG voice." Size only 8½" x 5" x 4" (Base area is less than 2/3rds of this page).

High stability new type calibrated V.F.O. 1.8-2.0 mc/s. and 3.5-3.8 mc/s. (up to 4 mc/s. export). Air-spaced CODAR-QOIL Pi-net output. P.A. Plate current meter, plus neon indicator. Plate/screen modulator. AM/CW switch and Panel key jack Plug changeover for 6 or 12 volt heater supply, £16. 10. 0, carr. 4/-.

A.T.5. POWER SUPPLY UNIT

Type 250/S. For 200/250v. A.C. with Standby/Net/Transmit and aerial changeover switching, stabilised V.F.O. supply neon standby / transmit indicator £8 0.0, carr. 6/6.

Type 12/MS 12v. solid state power supply unit, £11.5.0, carr. 5/-
Type 12/RC remote control and aerial switching unit £27.6, carr. 3/-.

CODAR-QOILS AIR- SPACED INDUCTORS.

A complete range of low loss air-spaced inductors developed by CODAR and suitable for all types of circuit application. Over 40 different sizes from 3" to 3" diameter suitable for all types of circuit application including V.F.O., P.A. Tank, Pi-network, A.T.U., aerial loading, etc. Full data and prices on request.

Codar-Qoil

U.K. Distributors:
ELECTRONIQUES Ltd.
Penfold Road, Felixstowe,
Suffolk.

CODAR RADIO COMPANY

BANK HOUSE, SOUTHWICK SQUARE,
Southwick, Sussex. Tel: 3149

Canada: Codar Radio of Canada, Tweed, Ontario.

The SHORT-WAVE Magazine

EDITORIAL

Vexations *In this issue are discussed various matters each affecting a certain number of U.K. AT-station operators in greater or less degree. First of all, there is the Minister of Transport's proposal to prohibit—except in a few specified and unavoidable categories—the use of radio-phone by the driver of a vehicle on the move. The possibility of this (it is as yet far from being the law) was first touched upon in our May issue. It could only have been thought up by the Ministry because a public mobile radio-telephone service, whereby business and commercial users can be connected into the ordinary landline system, is about to be introduced by the Post Office. As the intended prohibition cuts right across amateur /M working, established over the last ten years, it is being vigorously contested—see pp.232-233 of this issue.*

Secondly, there is the mounting volume of complaint about the hash being radiated, all over the country, by the Electricity Authority's overhead distribution system. This seems to be mainly due not so much to the super-grid at 275 kV, but to the secondary distribution at 11 kV. It is notoriously noisy, apparently because the insulators used for those of these lines first built in the post-war period have too short a leakage path and are liable to cracking. A leak of only a few milliamps, while not affecting the operation of the line for power transmission, can set up an intolerable racket over a wide frequency range—and can be carried, by the "aerial action" of the line, over a considerable distance.

Where a complaint can be justified—and it is for individuals affected to complain, firmly but politely, to the local G.P.O. radio interference branch and the maintenance department of the regional Electricity Board—it ought to be the duty and responsibility of the authorities concerned to put it right. There is nothing to prevent anyone with a portable search receiver or noise sniffer hunting along a line till the offending pylon, sub-station or whatever is located. There can then be no excuse for the Electricity people not taking action. Certain it is that nothing will be done unless those afflicted not only make it quite clear that they have a genuine grievance, but that they intend to keep on about it till the condition is rectified.

*Austin Forster,
G6FO.*

TRANSISTOR CONVERTER FOR TWO METRES

WITH LOW IF TUNING RANGE

B. J. P. HOWLETT (G3JAM)

This completes the range of modern transistor converters designed and described by our contributor, who is well known for his work in this field. His 160m. version appeared in our issue for February last, that for 4 metres in March, and for 70 centimetres in April. Construction of the two-metre converter described here can be as for those in the two latter issues. All are sound working designs, of which many models have been built.—Editor.

IT does not always follow that what works on four metres will also work on two metres, but in this case it has proved to be so. The middle of a set of three converters for 2m., 4m. and 70 cm. it is almost identical to the four-metre one described in *SHORT WAVE MAGAZINE* for March last—so much so that it might have been easier merely to issue a modification sheet! However, it was possible to ring the changes on transistor types with more noticeable results than on 4m. and the effort was very worthwhile.

Inevitably a large tobacco tin was used; these are so handy when concocting prototypes, as when borrowed or begged (as in the writer's case), they are extremely cheap, even beautiful, if one's powers of self-persuasion are good.

Circuit Description

Briefly, a grounded-base RF stage Tr1 feeds a grounded-base mixer, Tr2, which is R/C coupled to a grounded-emitter IF stage, Tr3. Since the chassis is connected to the negative side of the battery, all collectors return through their respective loads to chassis. As a result, the IF stage is connected directly to the main receiver and the Rx aerial tuning actually becomes the collector tuning of the IF stage. Losses and spurious resonances are undoubtedly reduced by this arrangement and the circuit performance becomes more predictable.

The local oscillator, as in the other two converters mentioned, is a Butler circuit, in which two transistors Tr4, Tr5, operate as follows: Tr4 is a grounded base amplifier tuned to the overtone frequency, in this case 35.55555 mc, and Tr5 is an emitter follower for this frequency and couples the collector of Tr4 through the crystal to the emitter of Tr4. Simultaneously, Tr5 is a producer of harmonics, and its collector is tuned by L3/C12 to the 4th, 142.2 (recurring) mc, for injection into the mixer, Tr2.

Originally, inductive injection into the RF coil

L1 was intended; most of the injection is however by bottom coupling, L1 and L3 having been given a single (common) ground lead. The rotation of turns is such that the true inductive coupling opposes the bottom coupling, making the arrangement much easier to adjust than seems possible at first sight.

An optional resistor, R14, is shown in the circuit diagram, and its value was 470 ohms. This was before the crystal self-capacity was neutralised by L4. As soon as this was done, all tendency to "pull," or squeg, ceased, and a direct connection made between Tr4 collector and Tr5 base.

A further optional component was found helpful in cases of IF breakthrough—the RFC across the aerial terminal. This consists of about 20 turns of 38g. wire, performed in the groove of a piece of 4 BA studding, "dunked" in cellulose varnish after removal, and hung up to dry until rigid.

Performance

The Intermediate Frequency range tuned by the main receiver is approximately 1.8-3.8 mc, which is very suitable for giving good bandspread on most general coverage receivers, and the gain is comparatively high. It follows from the wide-band nature of the IF coupling that there is absolutely no falling off of gain at the band edges, though this point is returned to later.

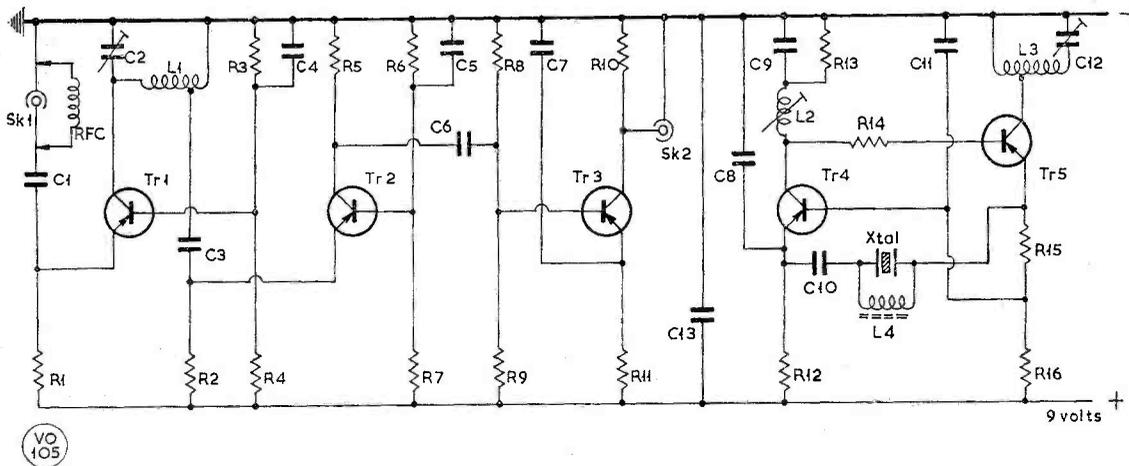
As for noise factor, very careful measurements were made on a few other types in the Tr1 position, although the range of types now available to the VHF enthusiast makes it impossible to try them all without ruining the appearance of the converter!

From previous experience the writer knows that the *Mullard* AF102 yields about 6 dB and the 2N1742 about 5 dB. Therefore, as these have been around for a long time now, it was decided to try *Mullard* AF186 and *Siemens* AF139, both capable of gain over Band 5. These types yielded noise factors between 3 and 4 dB and seemed very happy in the circuit.

However, the *Mullard* AF178 (two samples tested) bettered them, surprisingly, at 2.9 dB, all tests being carried out strictly under identical conditions. It would seem, therefore, that it is not vitally necessary to use a transistor having the maximum frequency range capability.

It is also probable that the most expensive transistor is not necessarily the best, neither is a published noise factor at frequencies higher than 150 mc, a good indication of relative performance at 150 mc because the noise/frequency curves of transistors are likely to be different from one another.

The effect of this on the mixer, Tr2, is much less, and little difference was noticed between the AF115, a VHF broadcast band mixer, and better types. Likewise, the oscillator operates quite well and gives adequate injection with the coupled coil arrangement. There are definite signs of second-channel suppression by the oscillator injection circuit, and if an analysis were possible it could probably be proved that some optimum coupling exists for this. This section of the chassis is a constructor's delight, and the coils are easily whipped in and out for tests.



The transistorised crystal-controlled two-metre converter described in the text by G3JAM. The RF/Mixer stages are Tr1, Tr2, with Tr3 as an amplifier at IF, in this case in the two-megacycle range, where most receivers used as IF/AF amplifier give good gain and have plenty of bandwidth. The oscillator-multiplier section is Tr4/Tr5, with L4 for xtal capacity neutralising (see text). The crystal frequency is 35.55555 mc, and is actually the overtone unit type CR32/U obtainable from Henry's Radio. Though certain transistors are specified in the Table of Values (because they were those used in the prototype) many other suitable types are available. Construction of this converter can be "tobacco tin," as so often used by our contributor for his transistor VHF converter designs.

Circuit Changes

It is quite usual for constructors to want a totally different IF from the one quoted, the most common being 28-30 mc, requiring a final oscillator injection of 116 mc. Although this has not been tried, there is no doubt that a crystal of 38.66667 mc (possibly with a single turn removed from L2 and extra capacity across C12), would suit this requirement excellently. Tr5 would be trebling instead of quadrupling of course, which should actually be easier; however, R/C coupling between Tr2 and Tr3 would not be a good thing.

If R5, the mixer collector load, is replaced by a coil similar to the overtone oscillator coil, L2, a new value for the interstage coupling capacitor, C6, can easily be found by temporarily substituting a trimmer of about 50 μF . No other changes should be necessary, save replacing Tr3 by one suitable for the new intermediate frequency—in the Mullard range, AF115.

Tuning has been tried on the original 1.8-3.8 mc IF and resulted in a marked increase in gain. An

Table of Values

Circuit of the G3JAM Two-Metre Converter

C1, C3,	R6 = 10,000 ohms
C4, C5,	R7 = 4,700 ohms
C6, C9,	R8 = 12,000 ohms
C11, C13 = .001 μF , ceramic	R9, R12 = 3,300 ohms
C2, C12 = 2-10 μF trimmer	R10 = 2,700 ohms
C7 = .01 μF	R14 = see text
C8 = 15 μF , ceramic	R16 = 1,500 ohms
C10 = 200 μF	Tr1 = AF178
R1, R11 = 1,000 ohms	Tr2 = AF115
R2, R4,	Tr3 = AF117
R13 = 2,200 ohms	Tr4,
R3 = 6,800 ohms	Tr5 = AF115
R5, R15 = 470 ohms	

Notes: Xtal is 35.5555 mc, CR32/U, overtone crystal unit, by Henry's Radio. RFC across Ae. socket is optional (see text). Transistors Tr1, Tr2 can be any good VHF germanium type; Tr3 should be AF116 for IF's chosen above about 5 mc; for Tr4, Tr5 many other types are suitable; those named are as used in the prototype, with the low IF tuning range as affecting Tr3. All transistors are p-n-p. Resistor tolerances can be 10%. C9, C13 are ceramic lead-through. Total current load with 9v. applied is 10.2 mA.

TABLE OF COIL DATA

- L1— 5 turns 18g. about $\frac{1}{4}$ -in. internal diam., wound on pencil and sprung off.
- L2— 11 turns 26g. enamelled on $\frac{1}{4}$ -in. slugged former.
- L3— 6 turns, wound as for L1, and mounted coaxially with L1 (see text).
- L4— About 10 turns 26g. enamelled, in groove of 0 BA dust-iron slug, as xtal capacity neutralising.

CURRENT CONSUMPTION

Tr1	...	...	...	...	2.2 mA
Tr2	...	...	...	...	1.3 mA
Tr3	...	...	...	...	1.9 mA
Tr4/5	...	...	...	...	2.52 mA
R3/4	...	...	...	...	1.0 mA
R6/7	...	...	...	...	0.61 mA
R8/9	...	...	...	...	0.67 mA
Total	...	...	...	...	10.2 mA

(With 9 Volts Applied)

inductor of low self-capacity was wound on an off-cut of rod aerial ferrite having an inductance of 200 μH , substituting C6 with a trimmer. The coupling characteristics with C6 at 10 μF only were similar to a low-pass filter, with highest gain at the HF end. Other types of coupling could be tried, of course

MODIFICATIONS FOR THE AR77

MODERNISING THE FRONT-END

From Notes by G3SZC

The R.C.A. AR77 is of late pre-war design—and therefore in the obsolescent category—but it was the forerunner of the well-known and still much-used AR88, and in fact incorporates features that would even now be very desirable in the AR88—for instance, it has excellent electrical bandspread, calibrated on a separate scale. The AR77 was widely used in R.A.F. ground stations during the last war, and was released in quite considerable numbers in the late 1940's.—Editor.

THE AR77 now in use at G3SZC was obtained very cheaply, originally for stand-by purposes only. However, when more carefully examined, it was realised that it could probably be turned into a very fine job for the amateur bands. It has a frequency coverage from MF right up to 31 mc, in six switched bands; the amateur ranges are fully bandspread with calibration right through (with the exception of 21 mc, as that band was not open to amateurs when this Rx was designed); a good

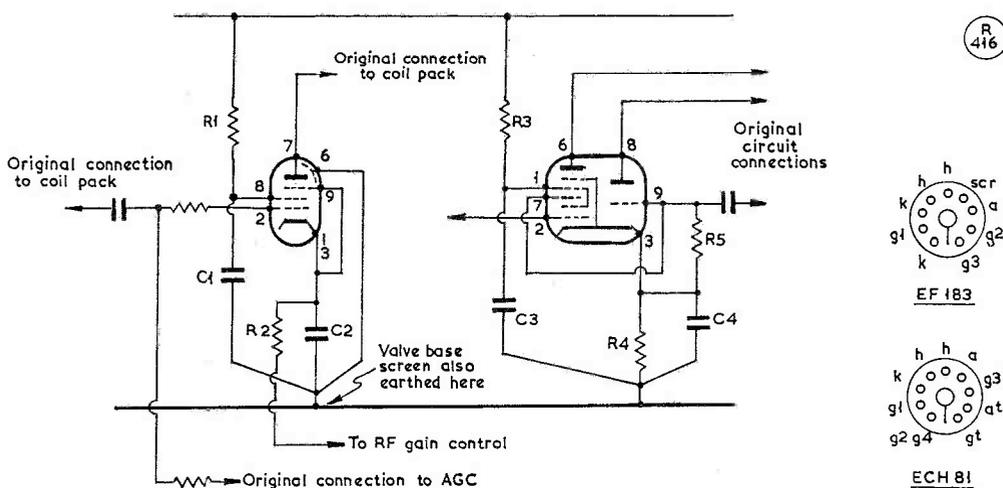
noise limiter, S-meter, BFO and aerial input trimming; five crystal selectivity positions, with a crystal phasing control, and a T/R switch. It is fully self-contained for power, and the rear chassis-drop has the input and output connections as usually found on the receivers of today—in fact, the AR77 is also arranged for diversity reception, using two or three receivers, and for phone-patch working!

It appeared to need only cleaning up and re-aligning, as on first switching on, the Rx was found to be sensitive although very much out of alignment. It was then that the possibility of a new front-end came to mind, as an easy-enough modification that should considerably improve its performance.

Accordingly, the RF and FC stage valve-holders were completely removed, with their associated fixed components (resistors and condensers), all of which were renewed when refitting for an EF183 in the RF stage and an ECH81 as frequency-changer. This involved certain new components; these are shown in the circuit diagram, and values are given in the caption. (Any items not valued in this circuit are as in the original.)

Additionally, since the EF183 is a very sensitive type, a small brass screen was soldered across its base, to isolate the grid from the plate; this screen is earthed to chassis through a short piece of 14g. wire.

Once this mod. operation had been completed, the IF amplifier stages were carefully aligned, using a wobulator (not essential, but definitely useful to make the best of the job) and after this the front-end was set up and the oscillator adjusted for band-edge



Though strictly an obsolete design, the AR77 is still as good as many of the much later surplus types — this is mainly because it was in essentials the amateur-band forerunner of the well-known AR88 — which has been described as "an AR77 without the bandspread." The U.K. version, the AR77E, was released in fair quantities shortly after the war, and there must be many of them in amateur hands. The circuit here shows how an AR77E front-end can be modernised to make it an extremely effective receiver for general amateur-band working, since the basic design already incorporates all the desirable features — see text. The old 6SK7/6K8 valves in the RF/FC stages are replaced by EF183/ECH81, vastly improving sensitivity and general performance. This circuit, with the text, is self-explanatory and values are: C1, C2, C3, C4, .01 μ F, disc ceramic; R1, R3, 27K; R2, 220 ohms; R4, 160 ohms; R5, 56K, all these resistors being rated half-watt. Circuit elements not listed are as original. If an R.C.A. manual on the AR77 is available or can be obtained, it will make the modification clearer and much easier to carry out.

calibration. Absolutely no difficulty was experienced with these operations as, constructionally speaking, the AR77 is very accessible.

The result is a very nice amateur-band receiver, to which even further improvements are possible—for instance, a product detector, audio-derived AGC and a crystal calibrator.

Bearing in mind that, as far as G3SZC was concerned, his AR77 was obtained more or less as scrap, the results are very gratifying, and visiting amateurs who have seen and handled it are always disposed to “make offers”!

(Editorial Note: There are two versions of this Receiver—the AR77 and AR77E, the only difference being that the E-type has a mains xformer adapted for 195-250v. 50/60 cycle AC mains. When originally released, the AR77E was issued with the usual very detailed R.C.A. instruction manual. It should be possible to obtain one, or perhaps even the receiver itself, by advertising for it through our Readers' Small Advertisements section. The AR77 is not covered in any of the Surplus Conversion manuals.)

that the unit could be wired in conjunction with the AF gain control, R42 in the original.

As shown, an EB34 double-diode is used (because it happened to be available) though in fact only a single diode is required. (The unused half of the EB34 could be adapted for an S-meter circuit, or any other refinement calling for diode action.) The anode pin 3 of the EB34 goes to the top cap of V8 via the 100K resistor and R42, and also through the SPST switch S1, which cuts the limiter in or out as required; S1 should be a front-panel control, or otherwise accessible. The cathode of the EB34 is taken to C91, the decoupling capacitor.

Action of the circuit, in the CR-100 with the values shown, is such that any signal is limited to about 0.5v. on its negative half-cycle, the positive half-cycle being unaffected; thus, a pulse of noise producing more than 0.5v. is severely limited.

Parts required are one diode valve and its holder, an SPST switch, and a 100K ½-watt resistor. All other items shown in the circuit here are as in the CR-100 original—and it would help a lot to have the manual, or at least the circuit, available when making the addition. This noise limiter can be built into a separate little box, mounted on the side of the Rx, if space is thought to be too scant inside.

NOISE LIMITER FOR THE CR-100

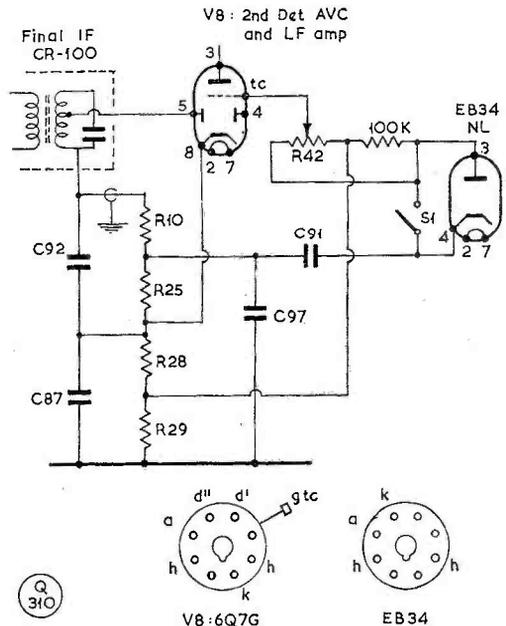
AS AN ODD-ON UNIT,
SUITABLE FOR OTHER
RECEIVERS

A. E. BEALES

IN a communications receiver, the purpose of a noise limiter is to remove, or reduce, those sharp spikes of interference caused by unsuppressed electrical apparatus—such as vacuum cleaners, neon signs, car ignition systems and the like—and including natural phenomena, e.g. charged rain and the static created by a local thunderstorm.

While “average noise” in a receiver may be low compared to the required signal, peaks of noise can far exceed it, and it is these peaks that a good noise limiter will reduce or smooth out.

Though the unit shown here was designed for use with the writer's CR-100, it would operate in the same way with any other type of superhet receiver, provided the correct internal connecting points can be located. For the CR-100, the limiter is inserted between the second detector and the first AF stage, i.e. the last IF transformer and the 6Q7G valve, V8 in the CR-100 circuit. It was found by experiment



As explained in the article, a basic noise-limiter circuit, using a diode, can be introduced at the audio end of the CR-100—or indeed at the same position in almost any superhet receiver. Though an EB34 twin-diode is shown here (as being a type most likely to be available) any other similar valve capable of giving diode action could be used. Beyond the fact that it would be desirable to have the manual, or at least its circuit, for any other receiver it might be intended to modify, there is nothing tricky about adding this NL to the CR-100. In the circuit, elements C87-C97 and R10-R42 are as in the original CR-100 nomenclature.

THE PRACTICAL APPLICATIONS OF SEMICONDUCTORS

IN THE AMATEUR STATION

Part X

IF Amplifiers (RTTY)

M. I. DAVIS, B.Sc.

This is really a continuation of Part IX in our May issue, dealing with IF amplifiers, and discusses a somewhat specialised application of transistors, for an RTTY Terminal Unit.—Editor.

SINCE radio-teleprinter working became practicable in the field of Amateur Radio, several circuits have been published covering the translation of FSK radio-frequency signals to the polarised DC needed to operate the printer solenoid.

The following represents an attempt by the author to outline the design of a simple, reliable and efficient terminal unit. The design of the RF stages of the receiver used may be taken as read, except for the provision of AFC. Bearing in mind receiver drift and the cramped conditions on the bands, the author considers this facility a necessity. The IF amplifier is of standard design, and again works at 470 kc; it is in this section of the receiver that the high selectivity (acceptable because of the inherently narrow bandwidth—about 1.5 kc—of an RTTY signal) is achieved. The more sophisticated circuitry appears after the detector where the “mark” and “space” signals are amplified and reconverted into true square-waves of the correct period. This operation includes a refinement which makes the two

signals mutually exclusive, *i.e.* if “mark” exists then “space” cannot, and *vice versa*. The printer magnet is then driven directly by semiconductors without the use of a high-speed relay, a component which frequently proves unreliable and difficult to adjust. A block diagram of the system appears in Fig. 4.

The RF amplifier is conventional, and its design is left to the reader's discretion, as is the signal-frequency section of the frequency-changer. The frequency of the oscillator is controlled by AFC under the influence of a variable-capacity diode, as described by the author in a previous article. The bias voltage for this diode is obtained from the detector. After AGC-controlled intermediate frequency amplification and detection, the “mark” and “space” signals are separated by frequency-selective filters. The author does not personally favour the use of R-C networks for this purpose, but prefers L-C combinations. These have in the past not been widely used, because of the difficulty of obtaining suitable inductors. The increasing popularity of RTTY has, however, precipitated the entry into this country from the States of considerable quantities of 88 mH telephone loading-coils, which are ideal for the purpose and small in size. Using these, simple and highly efficient filters can be constructed—see “RTTY Topics,” SHORT WAVE MAGAZINE, February, 1965.

At this point the signals are rectified and subsequently treated as square-waves; their amplitudes will be constant. We now have to ensure that the periods of “mark” and “space” are multiples of 22 milliseconds, the standard length of a coding-pulse for American 7½-unit teleprinter code. Some readers will wish to work at different speeds, and this has been catered for. When this has been done it is necessary to make the “mark” and “space” signals mutually exclusive. In order to achieve this, we put the outputs of the “mark” and “space” circuits into opposite sides of a flip-flop, the output of which feeds a current amplifier to drive the printer solenoid.

The squaring amplifiers are single-transistor Class-B stages with a zener diode to hold the output

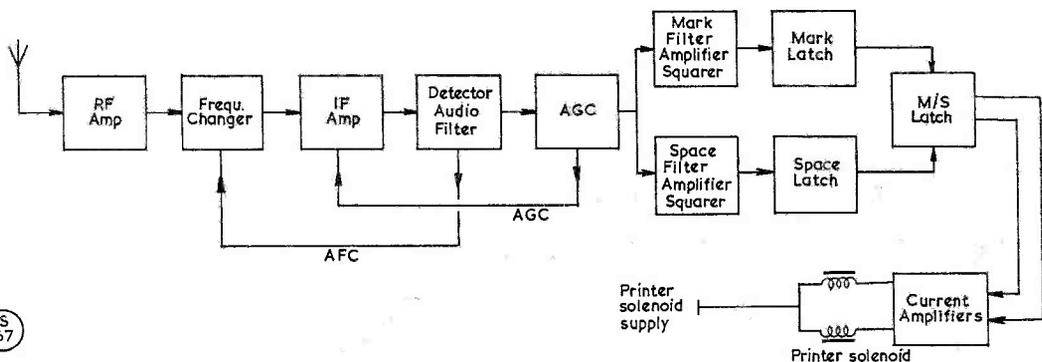


Fig. 4. Block diagram for an RTTY receiver, using some of the circuits discussed in the text. The characteristics of transistors lend themselves admirably to any circuit situation where switching, at any speed, is involved.

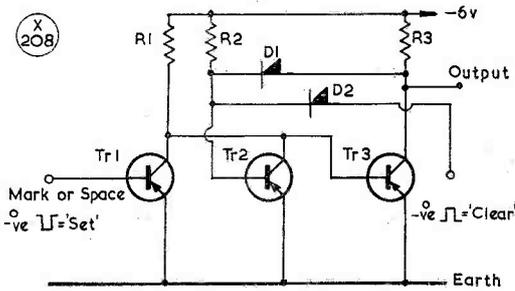


Fig. 5. To obtain "mark" and "space" latches — see text. Resistors R1, R2, R3 are each 1K; D1, D2 can be any germanium diode; and the transistors are of the type MAS21, MA393, or MDS33.

down to about 5 volts, and follow the filter stages, which are again single-transistor amplifiers with a load consisting of an 88 mH coil and the appropriate tuning capacitor.

Latching Circuit

It was mentioned earlier that stages are included to ensure that the "mark" and "space" signals

are always multiples of 22 mS in duration. This is done in the circuit shown in Fig. 5, which is a simple latch. It is turned on by the presence of the appropriate signal, and a free-running multivibrator attempts to turn it off and succeeds only if the signal has disappeared. This circuit may introduce to some readers for the first time the concept of using semiconductor as logic elements. The presence of a "mark" or "space" signal at the base of Tr1 will turn it on, thus turning off Tr3. If there is no clear pulse, neither D1 nor D2 will conduct—thus current will flow into the base of Tr2 via R2, and turn it on. Even if the set pulse is removed, the output will remain the same until a clear pulse occurs. This is the function of a latch. When a clear pulse occurs, D1 conducts the current which had been flowing into the base of Tr2, and providing the set no longer exists, the latch is reset.

Note that the transistors used must have a $V_{ce\ sat.}$ less than V_{be} for the circuit to work. Suitable devices are listed.

Fig. 6 shows the latch which prevents "mark" and "space" occurring simultaneously. The outputs of this are used to drive the current amplifier, which in turn drives the printer solenoid. This amplifier is again directly coupled, and high voltage transistors are necessary. Note the use of the zener diodes across the solenoid. These are made by the connection in series of sufficient low-voltage diodes to form a stack whose breakdown voltage in either direction exceeds by a few volts the solenoid supply voltage.

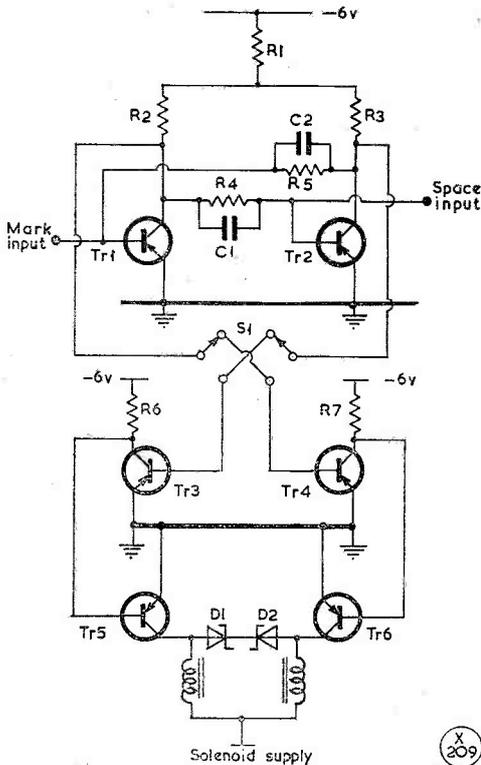


Fig. 6. Output stages for the RTTY receiver. The transistors Tr1, Tr2, Tr3, Tr4 are as in Fig. 5, with OC36's or any equivalent for Tr5, Tr6. Other values are: C1, C2, 470 μ F; R1, R2, R3, 470 ohms; R4, R5, 47K; R6, R7, 330 ohms. For D1, D2 see text.

The last circuit element to be considered is the free-running multivibrator which provides the timing pulse. Calculation of the period on the basis of $T = 0.7CR$ leads to the values given in Fig. 7, which are for 22 mS; readers may calculate their own values for other speeds.

While it is not claimed that the circuits shown here can be strung together to produce a working system, the information given should act as a guide for those RTTY enthusiasts who possess an oscilloscope and the ingenuity for successful experiment.

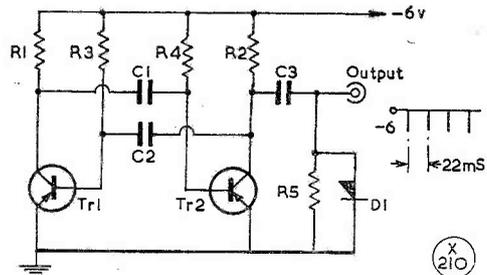


Fig. 7. A timing multivibrator, in which Tr1, Tr2 can be any low power transistor; D1, germanium diode; C1, C2, 3.3 μ F for a 22-millisecond period, possibly requiring trimming; C3, 1 μ F; R1, R2, 470 ohms; R3, R4, 4.7K, adjustable for final timing; and R5, 1K.

RELAY-LESS REGULATOR FOR CAR ALTERNATORS

NEW TRANSISTOR CIRCUIT AND ITS APPLICATION

R. A. BRETT-KNOWLES

With the introduction of the alternator for car electrical systems, certain new problems arise in the matter of output control. A more precise regulator can be made using transistors, at less cost than the commercial relay types. The importance of this development to the mobile operator is the absence of hash QRM and the elimination of noise spikes due to relay action.

—Editor.

IN the Alternator, rotation of the field winding instead of the armature, means that commutation difficulties and losses are avoided, and the construction permits higher rotation speeds. The step-up ratio from drive to generator can accordingly be made greater than with a DC dynamo, giving the possibility of adequate output at idling speed and no danger of the rotor bursting at full engine speed.

The great disadvantage in the past was that of necessity the output would be AC and rectifiers prior to the silicon junction diode all suffered from sufficient snags to make the idea unattractive. When the silicon junction diode was produced in a cheap form, the last objection to the introduction of the alternator was removed.

Owing to the internal reactance of the alternator, it behaves both towards load and speed variations as a constant current source. This rules out a permanent magnet rotor (unless an expensive saturable reactor control is used) and imposes the need for a field regulator to adjust the output current to that needed by the load. If the field winding has a suitable gauge of wire, the current output at maximum excitation can be so chosen that no damage to the stator can occur, and unless short circuit takes place, this current will not be exceeded even at highest engine revs. (because of the near independence of current on speed save at low revs.). Short circuit may cause damage as the alternator is not a perfect constant current source, and there is a wide difference between 12 volts back EMF and zero. Open circuit will cause damage unless the regulator can prevent the enormous rise of voltage which would damage the silicon diode rectifiers permanently.

Owing to the wide variation in speed and required output, the manufacturers have found it inadvisable to have the residual magnetism in the field large enough to allow self-excitation.

From this, the regulator requirements follow naturally.

The Regulator

As the maximum current is self-limited by the alternator (machines are available in the 35 to 60 amp range), there is no need for a current control, the sole function of which in a DC dynamo is to prevent the generator from damaging itself should the battery voltage be low. A cut-out is not strictly necessary, either, as the reverse current of the diodes only runs into micro-amps, but some regulators do have a cut-out to prevent damage to the system if accidentally the battery is connected with reversed polarity.

Owing to the impracticability of self-excitation, the field, which may draw up to 3 amps, must be connected to the battery (or battery side of cut-out) and once again there is a departure from the DC dynamo practice. The field takes its current through the regulator from the coil side of the ignition switch to avoid discharging the battery when the engine is not running.

The standard regulator has a relay with a change-over contact, as shown in Fig. 1. With low battery voltage, current flows directly to the field giving maximum excitation. As the generator and hence battery voltage rise the centre contact breaks and current now has to traverse R1 as well as the field, reducing the excitation. If the voltage rises further, the centre contact then shorts the field, giving no excitation at all and the output of the alternator must collapse (the residual magnetism was purposely made low for this very reason). In practice the centre contact vibrates on the upper contact if the volts are low and current high; floats at medium current, voltage and speed; and vibrates on the lower contact with high volts and low current.

As the field is inductive, R2 is placed in parallel with it to avoid the back EMF destroying the relay contacts when they open-circuit the field. A diode could be used to perform this task more efficiently and at only slightly greater cost.

A step in transistorising the regulator was made when the vibrating relay was used not to control the field directly, but to control the base current of a transistor which in turn controlled the field. However, the intermittent nature of this form of control is preserved, and it is not widely understood that an intermittent charge is not favourable to long battery life. (The alternator is 3-phase and the residual ripple after full-wave rectification is only slight). The semiconductor regulator now to be described removes this defect, and can be cheaply constructed.

A Relay-less Regulator

The vibrating relay of the transistor version is replaced by another transistor which only feeds base current to the field control transistor if the output is below a predetermined value. This value is set by two Zener diodes and only component failure can cause a drift away from this figure. Variation of voltage with temperature can readily be achieved by choice of Zener diodes.

RTTY Topics

CONTEST NOTES — STATION NEWS—OPERATING PROCEDURES

W. M. BRENNAN (G3CQE)

WITH the increasing interest in RTTY, it seems that hardly a day passes without some news of more activity in some part of the world. The echoes from the clamour of the recent B.A.R.T.G. Contest had only just died away when another RTTY Contest was announced by the SSB & RTTY Club of Como in Italy. Unfortunately, the actual timing of this announcement left little chance for any publicity, the dates being set for May 22-24. By the time you read this, therefore, the thing will be over. However, this contest looks like becoming a regular date.

From all reports, it appears that the B.A.R.T.G. Contest, in March, has already been voted an overwhelming success by all concerned. The level of activity for the event was undoubtedly the highest ever and conditions were at least fair if not good. Both Fifteen and Twenty were popular bands and Eighty also carried a fair share. This activity lasted well into the early hours of each day of the contest. SWL Colin Jones of Plymouth put in a good deal of time during the event—see picture p.153, May—and reports having printed no less than 135 stations. This included 20 countries in five continents on 20m., ten countries in five continents on 15m. and the usual run of Europeans on Eighty.

MP4BEK was one new country to turn up during the affray. He was heard calling CQ twice and it seemed that every RTTY station on the band replied to his calls. Whether or not he was overawed by the mass of RTTY around his freq., or merely concluded that his receiver was taking off, is not yet clear, but that was the last that was heard from him!

There was another and even rarer Asian country operational for about four hours of the contest. The noise generated by practically every RTTY Station in three or four continents calling at the same time on or around the same frequency was something that had to be heard to be appreciated! Those who managed to get in a QSO before the whole pack got the scent were fortunate, as later contacts were a combination of hard work and very good luck. The operator of this station was a well known European RTTY man who has written to ask that the callsign and country is not mentioned for the present since it might prejudice future operation from the same location. All those who were on 20m. at the time will be well aware of the callsign in any case, and QSL's have been sent to all those who made QSO. GM3ENJ had the distinction of being called three times by this station but the QRM was just too much each time! Nevertheless, there is a very good chance that a further period of operation will be possible

during one weekend in mid-June for the further "delight" of the country hunters.

OE2BSL provided many stations with a new country, too, as did FG7XT, who was using a newly acquired Model 28KSR Teletype machine. Both KG4CG and KP4AXM were also in the midst of the fray on 20m. and the VK stations also put in an appearance on this band in the early mornings although conditions were not so good for them. This B.A.R.T.G. Contest was very well supported by all the countries that are usually prominent in RTTY contests and in the case of the European countries there was even greater activity than usual. There were a large number of Italian stations active, some for their first outing on RTTY, but conspicuous by his absence was IIRIF, the winner of the last three RTTY contests. This was due to business commitments and IIRIF was only able to make his first QSO late on the second day of the affair.

Although the actual results will not be available until the next time this feature appears, the impression given by a number of those taking part is that the fact that there will be a winner is merely incidental to the enjoyment it provided for all concerned—except perhaps a few CW stations!

Still They Come

A news item that will cause a real stir in the DX ranks again came from SWL Colin Jones—this time in the shape of some RTTY copy of UG5AC in QSO with G3MWI! The actual copy is not very pretty because, as Colin explains, the Ukrainian RTTY'er seemed to be having trouble with his FSK keyer and at times was transmitting a mark and space at the same instant—and doubtless neither the T.U. nor the T/P would take kindly to this! However, this is very probably the first-ever amateur RTTY operation from Russia and therefore something of an historic event. This particular contact seems to dispel the fears of those who believed that there would be far too many difficulties caused by the differences in the Russian and our Roman alphabets to make this type of QSO possible. Certainly there is plain English in this copy, anyway—including the well-worn invitation to QSL *via* that well-known Box in Moscow! Congratulations, then, to the operator at UB5AC for having overcome not only the difficulties of starting in a new mode—probably with very little information about it, but also for being able to type in a foreign language with a different alphabet. And congrats. to G3MWI and Colin Jones at this end for their part.

Another new country for the list that will give great satisfaction to other U.K. operators is Wales. GW3TSM (Swansea) cranked his Model 3 up on 80 metres to become the first regular GW station on RTTY and to give many stations a long-awaited QSO. After a few teething troubles with the printer motor, GW3TSM cleared the hurdles and hoisted the flag for Wales. Although at present he is operational only on 80m., he hopes to make the HF bands also in the very near future.

Finally, there is one more prefix to add to the list (and a nice DX one at that) in the shape of PZ1AX (Surinam). This station is active on both

Fifteen and Twenty mostly at weekends in the early afternoon and evening. He has already made a useful addition to the scores of many of the European addicts.

Operating Practices

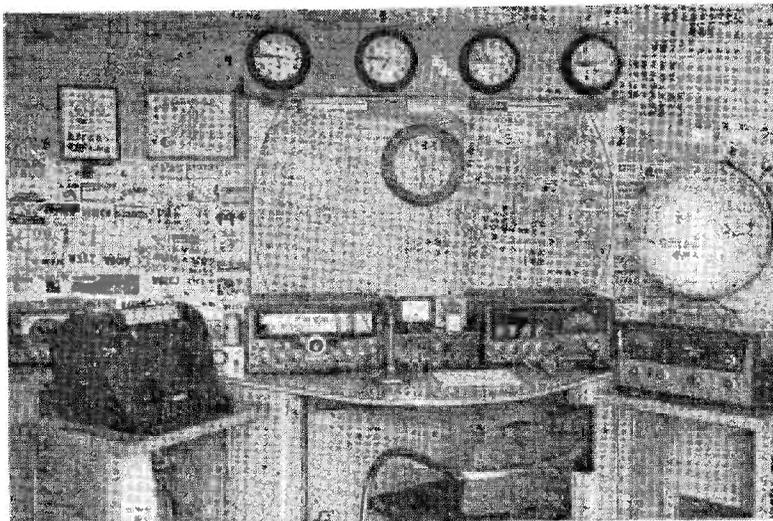
Two-way communication is the art of exchanging information and whenever time is short or communication is difficult, or both, the obvious remedy is only to exchange the minimum amount of information necessary to achieve the required effect. During a contest, for example, the chap at the other end would almost certainly prefer to get across a solid "rubber stamp contest QSO" rather than only part of the essential information plus some of the trimmings, such as even a brief run-down on the gear in use. Although this may seem rather obvious, it is surprising how many stations nevertheless are tempted into trying to put the lot across. When operating RTTY under difficult conditions, a little thought and care on the part of the sending operator can make all the difference between the success or failure of the contact. Perhaps one of the most important attributes of a good RTTY operator is not only the ability to anticipate the difficulties of the operator at the other end but also to have a ready appreciation of the sort of gear that will probably be in use—and its limitations. Such an operator will adapt both his operating and the subject matter of his QSO to the conditions prevailing at the time.

For example, during a contest the exchanges required are mostly groups of figures such as the message number, the signal report, time, date and band. Most RTTY operators would never dream of sending a single set of figures to get this information across but would give three or four repeats. However, many owners of Creed Model 7's do not realise that a large number of Teletype machines have the facility of being able to downshift from figures to letters on the receipt of either the normal letters shift signal or a space signal (the latter being the space between words of course). This facility is of some advantage when, due to QRM, the receiving printer is moved to upper-case and then, again because of QRM, the downshift signal is not received. Then the machine will revert to letters at the next space between words. However, this is a disadvantage when a space occurs between groups of figures since the machine reverts to letters after the first group. Thus, the message *QSO NUMBER 15 15 15 15* would appear as *QSO NUMBER 15 QT QT QT* on a Teletype machine. This might or might not mean something at the other end, depending upon whether the

beginning of the phrase was received.

A better way to get across a group of figures would be to space them with some appropriate upper-case character and also give a check by adding the version in letters—for example *QSO NUMBER 15—15—15—15—FIFTEEN*. This gives the receiving operator several checks even with a badly garbled message. The rest of the message can be treated in a similar manner, of course, and if it is believed that conditions warrant it, the whole thing can be repeated right through once more. This is where a reperf. comes in useful, for the first run through can be reperfed at the same time as it is being transmitted and the tape can be put through the Auto-Tx for the repeat—giving an identical copy of the original—which in itself is better than a slightly differently set out one—and at the same time giving the sending operator a bit of a breather. If after all this the receiving operator still asks for a repeat—well, it is all ready and waiting on the tape again. There are several differences in the upper-case characters of various makes of machine and indeed there are differences in the upper-cases and operational signals in the same make of machine when we consider the Creed Models 3 and 7. A complete list of these differences was given in "RTTY Topics," p.312 of the August, 1961, issue of *SHORT WAVE MAGAZINE*. It is as well to have such a list handy in order to decipher copy accidentally received in upper-case.

The operational signals for a T/P can of course just as easily be lost in QRM or QSB, but whereas the odd letter missed may hardly be noticed in a plain-language message, the loss of a carriage return signal can result in some 70 characters being over-printed and lost if the receiving operator is not hovering over the printer to correct such errors. Similarly, the loss



The home station of Rex Howell, WØRX (Box 270, Grand Junction, Colorado) shows a fine collection of the latest Hallicrafters gear. The printer on the left is a Teletype Model 26, and the T.U. with built-in tuning 'scope is at the middle of the picture. We are told that WØRX also operates at KØRX "when the Colorado Legislature is in session." As to what this might mean, your guess is as good as ours—the State capital of Colorado is Denver. Note the clocks showing inter-continental time.

of one line feed signal can lead to two lines of characters being overprinted and lost. Therefore, when conditions are poor, it is well worth while making sure that these signals have a fair chance of doing their job by doubling up on them and sending each one twice. Although this will result in double spacing of lines, the receiving operator will appreciate it. The same applies to the sending of the upper- and lower-case shift signals. Any typing errors should always be corrected after the usual four or five X's or E's, which is the standard erasure signal—this applies whether transmission conditions are good or not, since the object of the exercise is to impart information and not to start a guessing game at the far end. It is even more important to maintain a high degree of typing accuracy when it is expected that more than enough errors are going to be provided by conditions.

When working DX it is best to stick to short and well-known words, remembering that signals in the Q-Code provide an international language—but at the same time anything in Q-Code should always be transmitted at least twice, since the incorrect reception of either of the two last letters of a Q signal will impart completely wrong information to the other man! Finally, when the time comes to turn the transmission over, do this in a clear and deliberate manner, giving him at least three or four K's.

A short time is always required to tune in the signal to be received and most transmissions start with a five- or ten-second mark signal and perhaps a few RY's—though this only on the first transmission of a QSO. Most RTTY stations make use of an oscilloscope with various types of displays for tuning purposes, with such tuning devices the RTTY signal can be quickly and accurately acquired providing there is no QRM and a good signal-to-noise ratio. During poor conditions it may be difficult to sort out the signal from either the QRM or the noise by watching the 'scope and it is then that the ability to tune in the signal by listening to the two tones pays off. Some time ago W6CG and the writer put in a little research to find out why some RTTY stations did not answer weak RTTY calls and the answer was that such stations never actually listened to their receivers—they merely tuned for signals by watching the 'scope. This is a pity, of course, since on the DX bands it is quite often the weak signals that are the most interesting ones. Although under normal conditions the receiving operator can often go out of the shack and leave the receiving gear and printer to get on with the job by themselves—and often the transmitting operator will ring the bell on the T/P a couple of times before turning the transmission over—when reception conditions are poor, the presence of the operator is essential for correcting such things as a missed carriage return or a spurious shift into upper-case. Slight adjustments to the receiver tuning can often clear some interfering station out of the T.U. and it is often possible to get rid of QRM by moving the Rx BFO to the other side of the IF passband, reversing the keying switch on the T.U. at the same time.

Although RTTY involves a system of mechanical

telegraphy, it by no means renders the operator redundant. With CW the operator can slow down when the "information-rate capability" of the system, *e.g.*, conditions among other things, warrants it. With RTTY the *rate* of transmission is fixed and so the rate of information per minute is slowed down by repeating the information. The assessment of conditions, and how and when to slow down the information rate, is still the decision of the operator, as in CW. A good RTTY operator should have a very fine knowledge of the system's capabilities and limitations and when conditions are such as to be approaching the limit he must then use his skill and judgment to get the information over as quickly and efficiently as possible. Such skill and judgment can easily be the equivalent of a couple of S-points in terms of the message received at the far end!

Stop Press!

Another rare country that has popped up behind a keyboard with a real pile-up making capability is YS1RFE in San Salvador. This station has been heard working W's on twenty metres during 1700 to 2100 GMT. It is certainly true that quite a number of the stations now on RTTY are rare countries in any mode and this one is a country the writer was never able to include in a list of more than 250 countries worked on CW and Phone.

Finally, your parting scribe would like to claim having been the discoverer of a completely new way of wrecking 6146 valves. There is now definite experimental proof that two 6146's will crack their hot little envelopes if a cup of tea, is accidentally knocked over the PA compartment! It happened during the contest just as that mysterious Asian station called G3CQE!

Enjoy the good weather and don't forget to wear an odd cast-off 3X at all the better Mobile Rallies! Cheers, and see you in August with a small AFC Unit for the weekend builder. 73 de G3CQE.

THOUGHTS FOR THE BOOK

From the plethora of circulated paper, we are able to tell you that shortly the Japanese will be putting a transistorised, personalised, lightweight, 9-inch TV and UHF receiver on the U.K. market, guaranteed for 10 years and capable of accepting 625 or 819 line TV, thus covering the whole of Western Europe. The aim is to make personal TV receivers as conventional as portable transistor radios are at present.

And if this were not enough, we are also told that one of the Goonhilly super-high satellite communication frequencies is converted to high-gain IF at 70 mc (out of our 4-metre band, it is true, but still near enough).

Furthermore, we are officially informed that the Cambridge, Jodrell Bank and Malvern radio telescopes "are in danger of being subjected to local radio and electrical interference which could severely restrict their use" (this sounds to us like those leaky insulators on the Electricity Board's 11 kV lines for local distribution, now polluting the ether all over the country, and a constant source of annoyance).

Miscellany

HEADING UNDER WHICH YOU MIGHT FIND ALMOST ANYTHING

Heaven help us if "built-in obsolescence" invades Amateur Radio, but it already seems to have done so in the States. Just as everyone had settled down cosily to those rounded-edge "wrap-around" cabinets (Collins S-line, Drake 2B, the Heathkit range, and so on), now they're all changing into angular boxes you can cut your fingers on. There's hardly a rounded edge to be seen in the advertisements in the current *QST*. To quote a few, the new razor-edged items hail from National, Drake (the new R-4 receiver), Stoner, Swan, Squires-Sanders, and Galaxy. Furthermore, several of them have the same squiggly patterns on the front panel. We are used to these tactics with cars and washing machines, but do we want them in Communications? (*Memo*: Our ancient AR88D is right back in the smart fashion again, but a bit large, perhaps?)

The recent stray note about "Hi" (the CW man's laugh) has brought forth some fascinating correspondence from G3REX and others. According to him, the letters H and I never entered into it . . . the character sent *dit*, space, *dit* was, of course, the letter O in American Morse (compare *dit*, *dit*, *dah-di-dah* for "OK") and so the *dit-dit-dit-dit . . . dit . . . dit* meant "Ho," or, when repeated as it usually was, "Ho, Ho"—much more like a laugh. So this present-day "Aitch-Eye" business is off the beam and just plain stupid. G3REX also reminds us that the original type of bug key was designed for American Morse, in which the really awkward "bug" letters like J, O and P did not exist. (There were many other letters comprising spaced out dots instead of strings of dashes.) So the CW man with his habitual radio laugh is really sending "Ho Ho" and we might forgive a few phone operators if they would say just that instead of "Aitch-Eye."

Club Secretary's lament:—"If I write a letter it's too long; if I send a postcard it's too short. If I make a suggestion I'm a know-all; if I keep quiet I'm useless. If I ask for a sub., I'm insulting; if I don't, I'm lazy. If I ask for help, I'm incompetent; if I don't, I'm swollen-headed. If a meeting's a wow, the committee gets the praise; if it's a flop, I get the blame."
(*Letter from G3MQT*)

So you want a ground-plane or a good vertical? Try this recipe:—Acquire 400 acres, erect a centre mast of 748 feet and a ring of six outer masts of 618 feet each. The diameter of the ring should be 4300 feet. Bury 75 miles of copper wire, one foot below ground, for radials. If in difficulties, go to

Anthorn, Cumberland, and have a look at the prototype.

Coastal stations using SSB will soon be occupying channels on the 80-metre band. Could this possibly be a reversion to the old days when amateurs pointed the way? Has the success of the 80-metre sidebanders been noted? (It could hardly have been ignored, in any case.) The main difference is that 400 watts p.e.p. will be replaced by something more like 40 kW. Another problem for us . . .

"Lip-Artist . . . a more polite than usual variation on the names applied to amateurs who can't operate an amateur station except by means of the mouth!"

The year 1965 may be memorable for Amateur Radio in an unusual way. From statistics in the U.S.A. it seems possible that there will be fewer licensed amateurs at the end of the year than at the beginning. This fact may appear shocking (writes W8MGQ in *Auto-Call*) but there is nothing tragic about it. For years the bands have been over-saturated; good communication, as well as serious experimentation, has been handicapped. The average phone QSO is like six persons getting into a double bed which is already occupied. The potential newcomer may well say to himself "Why should I get a licence to participate in this madhouse?" And with that, he strolls into Eager Eddie's Electronic Emporium and buys a used Citizens' Band unit for 50 bucks. You've got to put more into Amateur Radio in order to enjoy it . . . so he, and hundreds like him, who only want to *take out*, may be lost for ever as an amateur, and who's crying?

"A radio engineer is a person who passes as an expert on the basis of being able to procreate with prolific fortitude an infinite series of incomprehensible formulae, calculated with micromatic precision from vague assumptions, based on debatable figures taken from inconclusive experiments carried out with instruments of problematical accuracy, by a person of dubious reliability and questionable mentality."
(*"QTC" East Africa*)

The secret is out at last . . . how to radiate splatter, spurious, clicks, chirp, phase modulation, frequency modulation, DSB, SSB and AM (and other unnamed horrors) with *equal* ease. An SSB transmitter circuit in a "Klub" magazine published in Eastern

Europe shows one power supply for the whole transmitter, with the VFO, carrier generator and everything else fed from the high-voltage power pack through a series of dropping resistors. No stabilisers and not much decoupling. Simple, isn't it? And here we were, thinking that one had to go to a lot of trouble to design transmitters that would put out that well-known noise!
(G9BF please note)



"Teenage radio hams are ruining television reception for thousands of viewers in New York," says the Federal Communications Commission. "Their chatter causes jiggling lines on the picture tubes. Their bad language is coming over loud and clear on the sound tubes." But be of good cheer—we are only quoting the *Daily Express*, and more detailed information shows that the offenders are (guess what?) Citizens' Banders. See earlier paragraph!



"Yet another modulator on the G3HRW rig has gone west—the dog barked again."
(The Tamar "Pegasus")



Back for a brief instant to Samuel Morse and his code. A recent paragraph about abbreviated numerals (N for 9, D for 8, B for 7 and so on) implied that there was no way of shortening the five dots of a 5. GM3IAA writes to say that during World War I he intercepted a cipher message which contained over 1000 four-figure groups, sent by a Turkish operator at Radio Damascus. One group which sounded like "DD" baffled him at first, until it turned out to be "NENE," which, being interpreted, was "9595." All the figures were sent "in short" with the exceptions of 4 and 6. (Incidentally, the station concerned, DAS, used a Telefunken spark transmitter of 50 kW or so,

with a high-pitched quenched note . . . "lovely to read," says GM3IAA).



If you are interested in narrow beam-widths for the reduction of QRM (and if you have the right sort of money) you can buy a transmitter with a five-mile range and a beam-width of 1/300th of a degree from I.B.M., Rockville, Maryland. It is voice-modulated and hand-held (definitely not for the aged or shaky) and, of course, the tube is a laser!



"Communicating, through the means of Amateur Radio, gives one a sense of supernatural ability. This compliments our *ego*, and a glow of satisfaction permeates our being. The truth is that our bodies need this stimulation and welcome it after a day of toil, or at any time we need relaxation."

(W3DEH, in "Auto-Call")



"Although standards change with time, today's amateur is still basically an experimenter striving to achieve that little bit extra from his equipment. In a day when scientific progress is generally thought to be synonymous with complex and expensive equipment, one might expect to find him lagging behind . . . but this is far from reality. He is just as much to the fore of scientific progress as he has ever been. Quite often the professional and the amateur are one and the same person—knowledge gained in one field is complementary to that gained in the other."

G2HIF in "QUA" (A.E.R.E., Harwell)



Quote from six-year-old daughter of G2FUU: "Mummy, there's a daddy-man on the radio, he's been called to lunch twice and he's still talking!" (They learn pretty fast these days.)

TONE CONTROL UNIT

FOR THE SPEECH COMPRESSOR

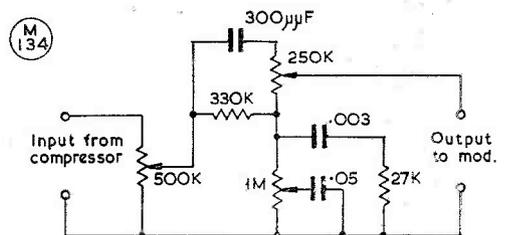
WHEN using the Speech Compressor, described in the February issue of *SHORT WAVE MAGAZINE*, with a normal speech-amplifier/modulator, it will be found that far more gain is available than is required.

This makes possible the incorporation of an equalising or tone control, which goes between the compressor and the modulator unit and enables the audio output to be adjusted, in terms of quality, for almost any type of microphone that may be used.

As we all know, what is "nice quality" for working the locals on Top Band can be quite unsuitable for competing under DX conditions, when much "sharper" and less bassy speech is usually desirable.

The circuit of the device is shown herewith,

balance (or "equalisation") being obtained by adjustment of the two variable resistors, without interfering with the settings of the speech compressor controls. Incidentally, it should have been mentioned, in the original article in the February issue, that V3 is to give a visual indication of the compression level. And that when using a speech compressor, with or without the tone control unit shown here, it is essential to have efficient side-tone, or monitoring, so that the adjustments can be made correctly.



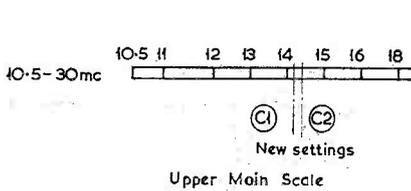


Fig. 1

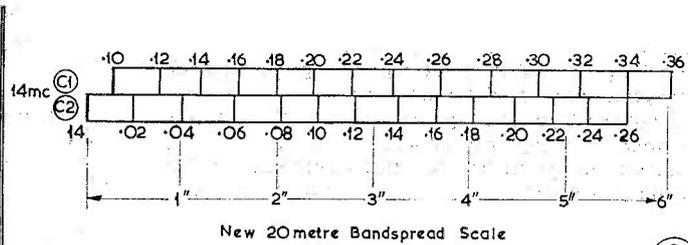


Fig. 2

Q 306

MORE BANDSPREAD FOR THE HE-30 ON TWENTY METRES

W. BOURKE

USERS of the Lafayette HE-30 receiver may find themselves disappointed by the rather restricted bandspread for the 20-metre amateur band, on which so much of the world's amateur traffic is conducted.

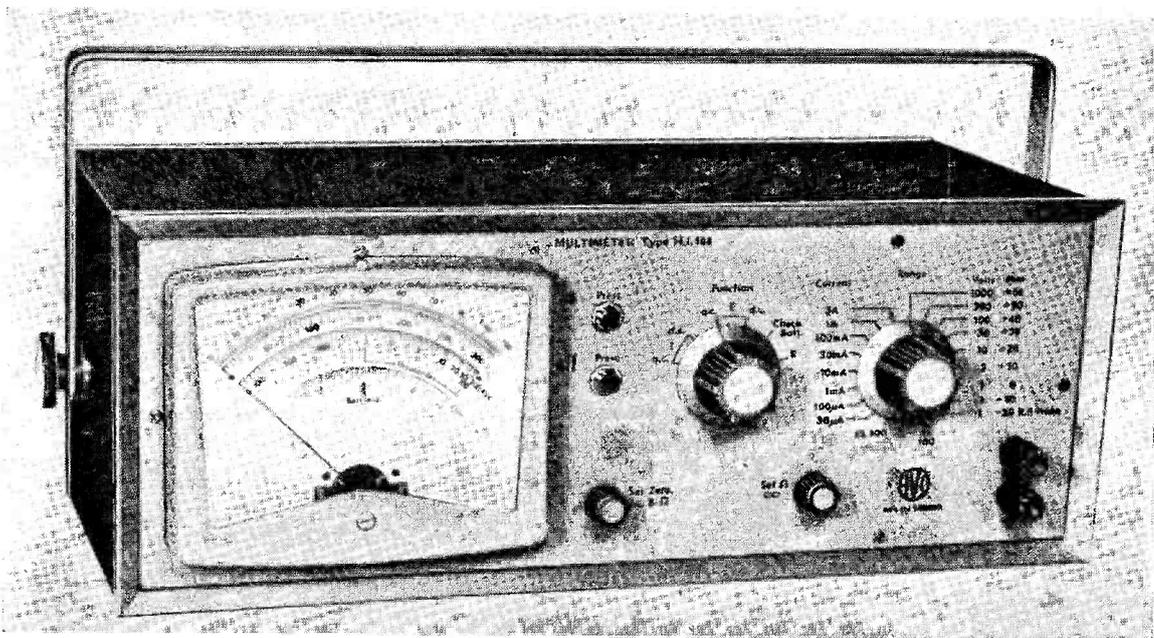
Much more bandspread can be obtained by using the upper main scale, 10.5-30 mc (which also takes in 14 mc), and providing a calibrated bandspread range over the top of the 7-17-7.35 mc bandspreading, which is not of much interest for amateur purposes. The 7-0-7-10 mc bandspread is left untouched.

The modification is carried out by putting a slip of gummed paper over the 7-17-7.35 mc bandspread range, drawing in the 14.0 mc zero line, and placing the lower bandspread pointer on this mark.

Then, with the aid of a marker oscillator, bring the uppermost scale pointer along on the top main scale until the 14 mc beat is heard; zero-beat this carefully with the Rx BFO on, and at centre; mark the "C1" point on the main scale, as shown in Fig. 1.

Next, the lower bandspread scale should be accurately calibrated from 14.00 to 14.26 mc, in 20 kc steps. If no local calibrated oscillator is available for this, a scale as in Fig. 2 can be drawn and will prove a reasonable guide. To produce scale "C2" accurately, the bandspread pointer is set to a mark slightly to the right of the 14.00 mc index line, and a mark made for 14.10 mc, located by CO check, by bringing the main scale pointer into position.

The "C2" scale is then calibrated as shown in Fig. 2. Considerable overlap is evident on the two scales required to cover the 20-metre amateur band fully—but the advantage is that the phone section, 14.10-14.35 mc, will be on one complete range.



The firm of AVO, well-known manufacturers of measuring instruments and test gear and now in the giant Metal Industries Group, have recently introduced a very fine new multi-range instrument for AC/DC voltage and current measurements over a wide range. Known as the Type HI.108, it has a maximum input impedance of 30 megohms, can measure dB as well as resistance, and has provision for the reading of RF voltages (up to 10v. at a frequency of 250 mc) using an external probe. It is very smartly styled.

KEY-CONTROLLED CHANGE-OVER

FOR CW WORKING USING TRANSISTOR RECEIVER

C. P. CLARKE (EI5AN)

THE circuit described here was designed specifically with a transistorised receiver, used in conjunction with a transmitter of reasonable power, in mind.

As owners of transistor communications receivers will probably be aware, the front-end is very intolerant to any overload from the Tx, and it must be afforded considerable protection. Even a short "pip" of RF energy fed into the Rx front end can ruin the base-emitter junction of the RF amplifier. Break-in keying was originally used by the writer, with separate aerials for Rx and Tx and a relay operated by the key to protect the receiver. After burning out three RF transistors it was concluded that a pip of high energy RF was hitting the receiver before it became properly protected.

The solution was simply to mute the Rx first and then to key the Tx. The circuit shown here does exactly this, very reliably, and since its incorporation at EI5AN no further RF transistor burn-outs have been experienced.

Key-Controlled

Of particular interest is the fact that on CW complete change-over from "receive" to "transmit" and back again is controlled entirely by the key. On first pressing the key, the receiver is muted, the Tx made ready for operation, and lastly the transmitter is keyed. During the natural pauses between letters and words in a CW transmission, the circuit "holds on" and keeps the Rx off and Tx ready. At the end of a keying sequence there is a short delay, of a second or so, and the Rx comes on with the Tx returned to stand-by. At any time during transmission the operator need only pause for a second or so and the channel can be checked. Thus, as stated, it is the key that controls the change-over.

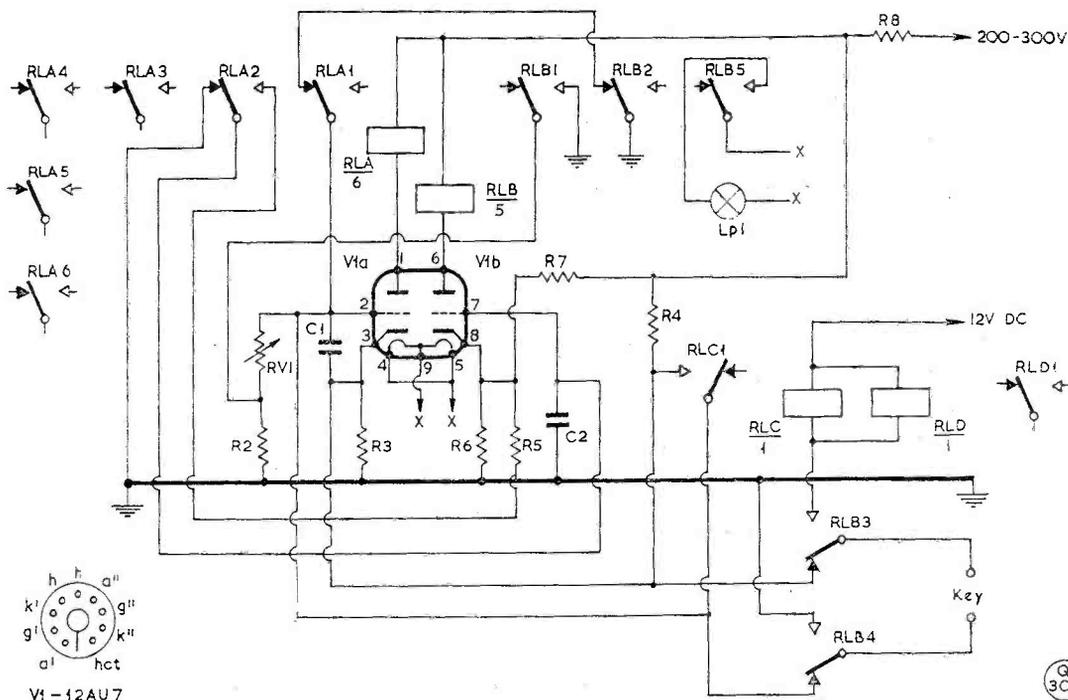
It could be argued that this is all that happens in keying, but as previously explained, this proved impractical with a transistorised Rx. In the writer's opinion, the operation control afforded by this circuit is preferable, because the Rx is not banging on and off with each separate Morse character sent, which can be very irritating after a while.

Circuit Analysis

Operation of the circuit is as follows: Both sides of the 12AU7 have a GPO Type 2000 relay in the anode circuit and each relay carries six sets of change-over contacts. Relay RLa performs the function of Rx muting and readying the Tx for transmission. Relay RLb is there as an interlock to ensure

the Rx is muted before transmission takes place. The positive voltage across R3, provided by potential divider R3-R4, holds V1a grid sufficiently negative to cut off V1a. C1 is charged to the potential across R3. The grid of V1a is earthed *via* contacts 1a and 2b; *via* contacts 3b and 4b the key is connected across C1. Thus, if the key is depressed even momentarily, C1 will be discharged and the grid and cathode of V1a are connected together and to earth. V1a conducts heavily, energising RLa. Contacts 1a open, removing the earth from V1a grid. For an instant the grid and cathode of V1a are at the same potential, before C1 begins to charge through RV1 and R2 and so making V1a grid negative. As soon as RLa is energised, contacts 3a, 4a, 5a and 6a mute the receiver and start the Tx. V1b was originally non-conducting due to the voltage developed across R6 of potential divider R6-R7. When RLa was energised, contacts 2a moved over, connecting the grid of V1b to its cathode through R5. V1b does not conduct immediately because C2 has to charge through R5 until the negative potential between grid and cathode drops sufficiently to allow V1b to conduct. When this happens RLb is energised and contacts 3b and 4b connect the key to the keyed circuit of the Tx. In the writer's case, a high speed relay RLd is keyed, and RLc carrying one set of energised-closed contacts is keyed along with RLd. (If a spare set of contacts is available on the actual keying relay, RLc may be omitted.) In any case, contacts 1c must be available to discharge C1 repeatedly and keep V1a conducting while keying is in progress. As long as V1a is energising RLa, contacts 2a hold V1b conducting. R6 limits the current to a safe value. Contacts 1b of RLb short out R2 so that the time taken for C1 to charge sufficiently to make V1a grid negative is controlled by RV1, which is a front panel control.

When keying is finished C1 is allowed to charge through RV1 to whatever potential exists across R3, and thus V1a grid approaches cut-off potential and RLa begins to drop out. Note that drop-out is *progressive* as V1a anode current falls. This calls for slight adjustment of relay contacts 2a and 1a (as explained later). As RLa drops out the grid of V1b is earthed and so the valve cuts off abruptly and RLb drops out, removing the keying leads from the transmitter. As a result of RLa dropping out, the Tx is switched off and the Rx brought on. The time-delay between the end of keying and the Rx coming on is controlled by the setting of RV1; thus, the "hold-on" time may be varied to suit operating speed and personal taste. As mentioned previously, RLa drops out gradually and drop-out is slowed down even further when R2 is reintroduced into the charging circuit of C1 by contacts 1b opening as RLb drops out. Slow drop-out of RLa is undesirable as it can cause bad sparking at contacts 3a, 4a, 5a, and 6a if they happen to switch inductive circuits such as other relays. To make the drop-out clean the *energised-open* contact of set 2a should be carefully bent nearer to the moving contact than normal so that as soon as the armature of RLa moves, RLb



Circuit of the control system for "send-receive," devised by EI5AN for the protection of a receiver having a transistorised front-end. Matters are so arranged that the Rx is cut right off before the transmitter can radiate any RF, nor can the receiver come on until after radiation ceases. The whole change-over operation is controlled by the key, with a slight time-delay to hold the transmitter "on" during a keying session at normal speed — all explained in the article.

will drop-out, as already explained; contacts 2b will then assume the position shown in the diagram. Contacts 1a should be treated in similar fashion to close at the same time as 2a. Thus, when RLB drops out, the grid of V1a is earthed via 1a and 2b, and V1a cuts off completely and RLa drops out abruptly. By adjusting contacts 1a and 2a and by the use of 2b it can be seen that the keying leads are removed from the Tx before the Rx is switched on. Thus, complete protection is given to the Rx at all times. The inclusion of R2 slows down the charging rate of C1 so that RLa holds on while the keying leads are transferred to the Tx. Otherwise, and particularly with RV1 at its minimum resistance setting, RLa would fall out before contacts 1c got a chance to close and keep V1a conducting.

Time Factor

The "hold-on" control RV1 is made front-panel so that hold-on time may be adjusted to suit keying and operating speed. Optimum setting is easily found after a bit of practice. The values shown for C1 and RV1 give a hold-on of about 1/2 to 3 seconds. If longer than 3 seconds is required increase C1 or RV1. However, two or three seconds are more than adequate. For push-to-talk phone operation set RV1 to minimum, when change-over will be fairly rapid. For CW working it will be found unnecessary to hold the key down until the Tx is ready to be keyed.

It is sufficient to send only one dot (which of course is not radiated) and wait until change-over is completed. As an indication of this, contacts 5b are used to light a "Tx Ready" lamp. This ensures that the beginning of each transmission is clean, which would not be the case if the key was held down until the "Tx Ready" light came on, by which time an unnecessary and meaningless sort of dash would have been put out. The procedure of sending a dot, waiting, and commencing transmission as the lamp lights will become automatic with a little practice.

The supply voltage may be anything around 200 volts. When voltages much above this are used, R8 should be chosen so that the actual circuit voltage is about 200v. in the key-down condition. In the writer's case the supply is 300 volts and R8 is 3.9K, 5 watt rating.

Circuit Values

For the circuit as shown here and in use at EI5AN, the values are: C1, 250 μF, 25v.; C2, 0.25-0.5 μF, 500v.; RV1, 25K potentiometer, hold control; R2, R5, 100K, 1/2w.; R3, 4.7K, 1w.; R4, R7, 220K, 1w.; R6, 10K, 1w.; R8, 3.9K, 5w., or as required for terminal voltage, see text; relays RLa, RLb, RLc, GPO type 2000, contacts as required. The valve can be a 12AU7 or an ECC82.

This circuit has been in use for the last seven months without the slightest hint of failure, even

once, so that it can safely be stated to be reliable.

Lastly, if the delay provided by V1b is not required, ignore contacts 2a, omit R2 and everything concerned with V1b, and earth V1a grid via contacts 1a only. The key should then be directly connected to RLC and RLd. On pressing the key, change-over will be nearly instantaneous and hold-on will be available as before. All-in-all the set-up has added greatly to CW operating comfort and pleasure.

TRANSISTOR CONVERTER FOR 40 METRES

SELF-OSCILLATING MIXER WITH BAND-PASS INPUT FOR IMAGE REJECTION

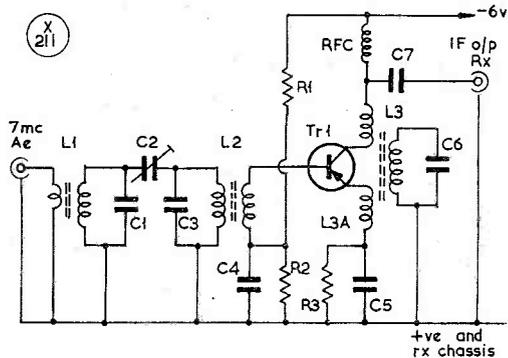
From Notes by 5N2AAC

SHOWN in the diagram is a converter which, though intended for the 40-metre amateur band, will work over any frequency range (depending on the cut-off of the transistor) with almost any sort of receiver used as a tuned IF/AF amplifier, e.g., a car radio or transistor portable, capable of giving the required IF tuning coverage.

The circuit consists of a self-oscillating mixer using an OC170, with band-pass coupling—L1, C1—C2—C3/C3, L2—to prevent IF and image break-through. Since the IF side is made aperiodic, any convenient tunable IF range can be selected. In the present case, the oscillator is on the high-frequency side of the signal band, at 9 mc, thus giving a tuning range of 2.0-1.9 mc on the main receiver for the 7.0-7.1 mc of the 40-metre amateur band, tuning being from HF to LF for LF-to-HF coverage because the oscillator is on the high side of the signal.

Of course, in a district where there is much activity on Top Band, with strong signals from local chums, the oscillator could be adjusted so that the tunable IF becomes 2.1-2.0 mc, thus minimising IF break-through—indeed, in the U.K. this would be desirable, particularly as most receivers capable of covering Top Band will give tuning beyond 2.0 mc.

By using standard *Denco* coils, the whole process of construction is much simplified, and the circuit can be built up on a piece of *Veroboard*, or printed-circuit board, about 4 inches square. The only point to note is that for L3, a *Denco* Range-4 "Red" coil has four additional turns of 26g. enamelled



Circuit discussed in the text.

wound over one end of the tuned winding to form L3A, as the oscillator coil in the emitter of the OC170.

To get the transistor oscillating, it may be necessary to reverse the connections to this winding, L3A. Assuming the 2 mc IF is being used (tuning either 2.0-1.9 mc, or 2.1-2.0 mc, on the main Rx, as already mentioned), set up the main receiver to its LF end, an external oscillator or crystal calibrator to give a beat at 7.0 mc, and adjust L3 to bring in the beat, having roughly checked L3 into the 9 mc area by using a GDO; depending on where the "9 mc oscillator setting" is to be for the required tuning at IF, it may be necessary to make C6 partly variable, by using a certain amount of fixed capacity with 50 μF or so in parallel as the tuning capacity.

Having found the 7.0 mc beat, and checked that it is the right one for 40-metre band edge, adjust the main Rx tuning for the 7.1 mc beat, to check that the 40-metre band is being covered. Then set C2 in the converter for a reasonable response at mid-band, 7.05 mc. Thereafter, all tuning is, of course, done on the main Rx.

Values for the circuit shown (for the "2 mc IF") are: C1, C3—220 μF ; C2—1.8 μF trimmer; C4, C5, C7—001 μF ; C6—about 120 μF , partly variable as mentioned; R1—10K; R2—1.8K; R3—1.2K; RFC—2.5 mH RF choke; L1, L2—*Denco* Range-4 "Blue," used back-to-back, with the smaller windings for aerial input and transistor base respectively; L3—*Denco* Range-4 "Red," with four additional turns for L3A; and transistor, *Mullard* OC170.

For best results at a fixed-station location use a 40-metre dipole with coax feed, and sharpen up the band-pass coupler input circuit by adjusting the slugs of L1, L2 against the setting of C2. Any adjustable iron-core coils giving 7 mc coverage are suitable for L1, L2—and similarly most miniature coils for 9 mc could be used for L3, provided L3A can be added conveniently.

"Short Wave Magazine" covers the whole field of Amateur Radio
More than 80% of U.K. licensed amateurs are regular readers of "Short Wave Magazine"

VS9SJF ON SOCOTRA

RESULTS AND EXPERIENCES ON A DX-PEDITION

J. FARRAR (VS9SJF, ex-5B4JF)

IT was back in April of last year that the proposed Army/RAF Expedition to the Island of Socotra was first mooted. Situated at the mouth of the Gulf of Aden, off the north-east tip of the coast of Somalia (Lat. 12° 30' N., Long. 54° E.), Socotra is under the administration of the Colony of Aden. The aim of the Expedition was to make a comprehensive survey of the western part of the Island and do a quick reconnaissance of the eastern end. At the same time plant and animal specimens were to be collected for the British Museum, and some very old markings, believed to be early Christian, photographed. The country is extremely rugged, the inhabitants are primitive, living in caves under almost Stone Age conditions—and the whole project would be a great test of fitness and stamina.

Capt. Peter Boxhall, organiser, was only too pleased to include an amateur station operator, and fully appreciated the DX-pedition angle. The party was to consist of nine members, to be on the Island for eight weeks, and would leave Cyprus early in December, 1964, by air for Aden, and on to Socotra via Riyan, a remote RAF station on the Aden coast.

During all the weeks prior to departure from Cyprus, various problems cropped up, as could be expected. First, the writer's tour of duty in 5B4 was near expiry, so an application had to be made for an extension, and got through in time for departure. The real snag arose when the 5B4JF licence was revoked by the Cyprus Government and the rig sequestered. After representations by the expedition leader, the gear was eventually released for taking away from 5B4. The licence for Socotra operation was to be issued from Aden.

For the record, the membership of the expedition was: Capt. Peter Boxhall, leader; Lieut. Peter Rostron, interpreter, treasurer and naturalist; Cpls. M. Guise and J. Durup, surveyors; L/Cpl. M. Whittle, asst. surveyor; Cpl. P. Goldberg, medical orderly; J/T D. Poston, wireless technician; SAC J. Farrar, photographer and radio amateur operator; and LAC A. Watson, wireless operator.

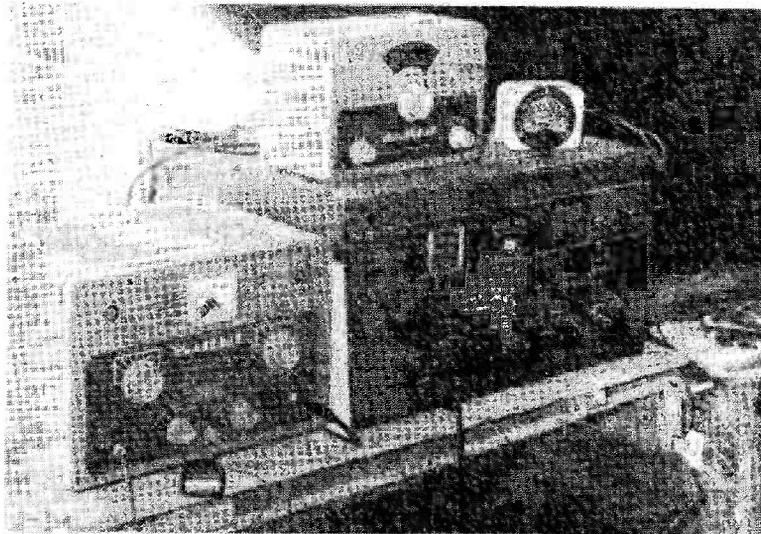
On November 28, a send-off party was held at Episkopi, attended by the C-in-C, Cyprus,

and many other senior officers. Early on November 30, a Sunday, the expedition boarded a Hastings aircraft for the eight-hour flight to Aden, sweltering in heat even though it was their "winter." Then came a five-day wait at the Red Sea Hotel, transit accommodation run by the RAF, for the onward flight to Socotra, via Riyan. This gave time to sort out the licence situation; the application was found to have been approved, and the callsign asked for, VS9SJF, issued.

On December 6, the party took off in a Beverley, this time loaded, in addition to all the equipment and personal baggage, with 40 boxes of compo. rations, one thousand cans of beer, and 12,000 cigarettes. On top of this was all the tentage, the cooking utensils, cans of petrol for the generators, and many other such items. It all went into the Beverley!

After refuelling at Riyan, on to Socotra. With twenty minutes to go before ETA, the writer went into the cockpit and up out of a bank of thick cloud loomed the Island, which was to be the expedition's home for the next two months. The pilot made two practice passes and then went in for his landing; from the cockpit, the runway looked much too short, but the Beverley stopped easily enough in the distance. It had taken six months of planning to get thus far.

The whole appearance of the landscape was desolate and forbidding. There were the Haggier Mountains, their peaks rising to 4,000ft. and shrouded in cloud. As if from nowhere a crowd of the local Bedouin and Africans had appeared and were set-to to unload the stores. This took nearly two hours. The first priority was to get the RAF's own signal station on the air. Two 30ft. masts were quickly erected, the aerial put up and, after a little trouble



The gear used by VS9SJF, as set up on a crate in his tent when on the Army/RAF Expedition to the Island of Socotra (Aden Protectorate). His transmitter was a Heathkit DX-40U, with its VF-1U VFO, and the Rx an AR88. With a trap dipole, a Vee-beam and a Joystick (as shown in another picture) this little rig gave him 575 contacts in 111 countries during the December-January '65 period. The article tells of some of the VS9SJF experiences — and we would bet that many readers would wish to have been with him.

getting one of the generators started, the RAF transmitter and receiver were unboxed and the signal station was in operation after only a couple of hours, communication with the home base being established immediately.

By now, the Beverley was unloaded and ready to take off for its return. With somewhat mixed feelings we watched it roar down the runway, climb into the

air and, circling round, come in over our heads with a wing-waggle in farewell. It was leaving our party to its own devices for the next two months.

While the RAF signals station was being installed, some tents had been put up, and though by now it was late afternoon, there was just enough light to erect another couple of masts for the amateur-band aerial. This was a trap-dipole, lent by ZC4GB.

VS9SJF—on the Air!

By the light of paraffin lamps, the amateur-band gear was got ready—a Heathkit DX-40U with its VF-1U VFO, an AR88D receiver, and aerial change-over arrangements, all mounted on a crate in the writer's tent. The generator was a 240v. job so there was no need for any PSU's. And so, at 1710z on December 6, the first "CQ de VS9SJF" went out on 14 mc CW. No answer. Another CQ call. No reply. Again a couple of CQ's, without any response. Heck, had the Tx developed a fault on the flight out? Then, tuning round the Phone section of the band, there was HZ1AT calling CQ with a good strong signal. A quick call, and back he came with a 5/9 report. At last! The first amateur QSO from Socotra ended with the assurance that the VS9SJF rig was working well. A change back to CW, and in quick succession contacts came with 4S7, ET3 and W3, with good signal reports; then, for a really warm glow inside, VR2DK called to give a 5/9 report. From then on there were no doubts about having fun on the air in the weeks to come.

The following day was spent in getting the camp straightened out, but there was time to work some Europeans in the late afternoon and evening, as well as VU and VK. Other contacts during that session were TI2LA, VS9ASP (the Aden club station), and ZC4GB—the latter naturally being pleased to know his aerial was working so well.

On December 11, two survey parties set out on their long and arduous task. They were scheduled to be away for at least four weeks. Left behind were Dave Poston, to look after the RAF station; Al Watson to operate it; and the writer to run the amateur rig.

Unfortunately, it was not possible to be on the air as much



VS9SJF with his "Joystick," used as a vertical aerial, which did well for him during the Socotra Is. expedition. This photograph gives a good idea of the terrain and the conditions under which the expedition (which was concerned with surveying, geology and archaeology) did its two months' work.

as had been hoped because, on working out the fuel situation in relation to operating hours for both radio stations, the arithmetic proved that there was only enough juice for four hours a day for each generator; as the RAF station often had to be on for six hours, the ration for VS9SJF was correspondingly reduced.

In the meantime, due to weather delaying the start of their field work, the survey parties began to run low on food, and three times the operator of VS9SJF had to forget about radio and help carry rations out to their camp, 25 miles away—on foot! The Island terrain makes travelling very difficult; there is no transport except by camel, and they come expensive.

However, between this travelling around, on-the-air operation was possible for a few hours most days, and the country score and number of QSO's mounted quite rapidly. The main objective was to work enough countries for a VS9SJF DXCC—which explains why the signal was heard frequency-hopping quite a lot, instead of sticking to one channel. Conditions on 14 mc were excellent the whole time, especially in the afternoons and evenings, when the band would often stay open until 11.0 p.m. local time. On the other hand, 21 mc was very poor, although ZC4TJ, the club station at Episkopi, was worked many times on Phone, and also KV4CX, sometimes the only signal to be heard on 15m. Looking at 7 mc, the QRM was terrible, although some JA's and W's were raised; a 40m. sked with G2DC failed, though he was heard at the VS9SJF end.

Aerial Improvements

For some days, the idea had been contemplated of trying some form of really large aerial. So on January 7, we put up a six full-wave Vee for 14 mc, with legs about 400ft. long and 30ft. high, using 600-ohm open-wire feeder with a balun to match into 70-ohm coax.

It goes without saying that results were an amazing improvement on the trap dipole, good as that was. In fact, when stuck at 80 countries, on the Vee 12 new ones were worked in one day.

On January 31, the survey parties arrived back at base—worn, unshaven, unwashed and obviously having had a rough time. As they were very tired, VS9SJF was kept off the air after about 1700z each evening, so that in trying to catch up on some much-needed sleep, they would not be disturbed by the staccato bark of the P-E set.

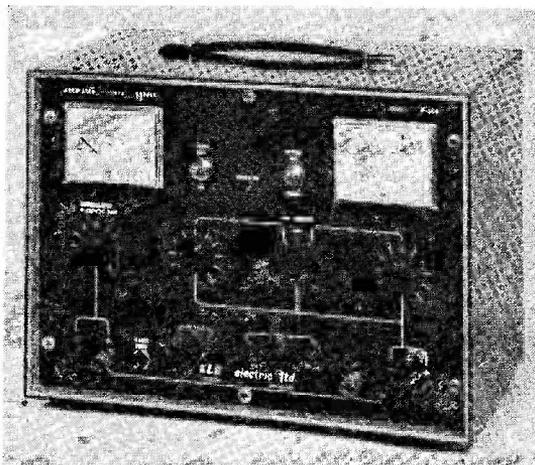
Our lift-off aircraft was due on February 6, so to enable the rig to be dismantled and crated and the masts packed up, the final QSO from VS9SJF on Socotra was made on the evening of February 4. The next couple of days were spent in getting ready for departure, and leaving the camp site as we had found it. Our big Beverley came in more or less on sked, and soon the Island of Socotra was slipping from view, back into its shrouds of cloud.

Summary and Conclusion

On the radio side, the statistics come out as follows: 575 contacts in 111 countries, most of the operation being on 14 mc CW. The aeriels used included the trap dipole, the Vee and a Joystick, which worked very well. The gear, which gave no trouble, consisted only of the DX-40U/VF-1U transmitter and AR88D receiver, with necessary ancillaries. Power came from a P-E set giving an AC output at a rather erratic and unstable 240v., which at times put a severe chirp on the note.

It was, of course, all a wonderful experience, and a chance that could come only to a radio amateur on a Service posting. But it was good to get back to civilisation after eight weeks on an island as inhospitable as Socotra. The only disappointment, for the writer, is that Socotra does not count as a separate country for DXCC—under the rules, it is just seven miles too near the Aden coast!

The new KLB regulated power supply unit offers as one PSU facilities for work either on conventional valve circuitry—for which it will provide 0-400v. DC at up to 150 mA.—or with transistor equipment requiring 0-50v. DC. The unit incorporates two meters for reading off voltage and current, and also gives the usual heater voltages and a negative bias supply. Price is £47, and the unit is catalogued as the KLB P.300.



VISUAL INDICATION FOR THE GDO

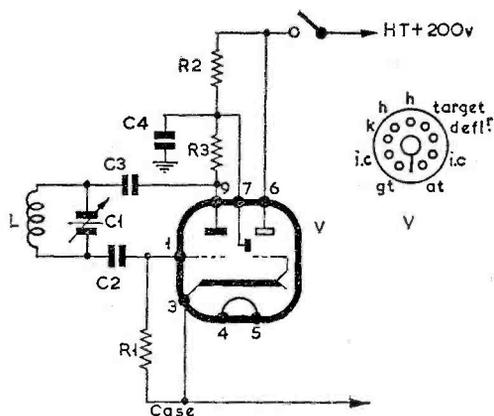
USING A TUNING INDICATOR TRIODE

THE introduction of tuning indicators with separate deflector electrode connection has made possible the use of the triode side in amplifier or oscillator circuits without causing any distortion of the indicator display.

A practical circuit employing this principle is in a Grid Dip Oscillator using one of these valves alone as both oscillator and "meter." By experiment, it has been found that the *Mullard* EM84 will oscillate quite readily up to Band I frequencies with a suitable L/C ratio, but this may be subject to variation between individual specimens.

The GDO circuit shown here consists of a Colpitts oscillator, thus eliminating the need for a tapped or double-winding coil. The triode anode is connected through a suitable load impedance to the deflector electrode. An RF choke can be used as the anode load, but a 22,000-ohm resistor was found to work as well. The deflector electrode is suitably decoupled and fed through the usual DC anode load resistor of 1 megohm; the cathode is connected direct to chassis, and the target to the HT rail. A high value of grid leak issued not only to avoid the loss of applied RF voltage, but also so that the variation in grid current will produce as large as possible a change of grid voltage. Thus, the mean triode anode current will change, so causing the deflector volts to vary, and hence the shadow length.

The prototype was found to meet all the require-



Circuit of the magic-eye GDO. Values for L are given in the table. C1 is 100+100 μ F connected series-gap; C2, C3 are 82 μ F; C4 is .002 μ F; R1, R2 are 1 megohm each; R3 is 22,000 ohms; and the valve is an EM84, which has the deflector connection brought out separately.



"... No, it's not his 100th birthday—he's just got his DXCC ..."

ments. The size of case will be dictated mainly by the size of tuning condenser available. By using a condenser quite small physically, the size of the unit can be kept down. For the prototype, the coils were wound on *Denco* octal-based plug-in formers without cores—but any small two-pin formers will do. Suggested winding data for ranges up to about 13 mc are given in the Table. Coverage for higher frequencies really needs a smaller tuning capacity and is a matter of experiment.

Power Requirements

An HT supply of from 150 to 250 volts at around 2 mA, and 6.3 volts at about 0.3 amps, is required and can be tapped off the power supply of almost any piece of equipment. A power supply for such low loading can, of course, be easily built into the case of the Grid Dip Oscillator itself provided the mains transformer is not mounted too close to the EM84, as this might cause defects in the display due to distorting magnetic fields.

Editorial Note: This article is based on material originally supplied by G3KEP and G3MAW.

COIL DATA

Coil One: 1800-4900 kc approx., 160 turns 38g. enam. close-spaced on $\frac{1}{4}$ -in. dia. former.

Coil Two: 4800-13000 kc approx., 55 turns 28g. enam. close-spaced on $\frac{1}{4}$ -in. dia. former.

COMMUNICATION and DX NEWS

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

COUNTLESS readers of this feature (well, some of them, anyway) have been enquiring about the health and activities of one Arabackle Oblifork, who has tended over the last fifteen years to make rare but startling appearances and then to vanish for long periods. Readers want to know what he is up to, where he hides himself and why he never seems to be on the air.

Actually, he is nearly always on the air, being quite an active type on all bands. But he has never allowed his QTH to be published (although he has quite a well-known callsign), and naturally he never says "the handle here is Arabackle," since nobody would believe it. On the bands he goes by the name of Bill, and his callsign is *not* G9BF, with which character he has no connection. He is (a) Technically sound, (b) Rather retiring by nature and (c) A little diffident about appearing on the air until he knows that his transmission will do him credit.

Arabackle now has a fresh crop of worries, and has come out of hiding once more to see if they can be aired. First and worst of them runs like this: "Is there any means by which I can establish a two-way QSO once again, like we used to have in the days when a CQ call by a G station was illegal?" Well, is there? There's no polite signal, he says, meaning "My friend and I are about to have a fairly long chat about some interesting phenomena and we don't *really* want any breakers who are immediately going to start talking at great length about something quite different." What a useful Q signal that would be—ought we, perhaps, to try "QZZ"?

Secondly, A.O. would like to know how to put it across that he wants to work a bit of DX, on the rare occasions when he really does. He says that the "CQ DX" call has become so devalued in certain countries that it is just a four-letter word meaning "CQ." A case for another Q signal,

meaning "I am not interested in replies from under 1000 miles—even from you."

He notes that when, say, a UB5 calls CQ DX and is replied to by a YO or a UA3 from next door, he happily embarks upon a QSO, complete with "Pse QSL," which seems pretty strange. Maybe one should call "CQ NO DX" and see what happens?

Likewise the number of stations who spend *all* their time calling CQ and never hearing the replies seems to indicate that some sort of "channel-holding" technique is in action—but what are they holding it *for*? (So that they can call CQ, of course . . . G6QB).

Squarish

Now Arabackle and his crowd, who embrace practically all holders of two-letter callsigns and an increasing number of G3--'s (up to about the E's, shall we say?) are in an age-group which

automatically labels them as Squares in the eyes of the "progressive" generation. Two-way QSO's, with breakers barred, went out with the spark coil; AM Phone is strictly for the birds; DX-ing in relative peace ended in the mid-fifties; home construction brands you as either an eccentric old man or a brilliant young technician. Communication now consists of putting out a signal and seeing what comes back, irrespective of band, conditions, location or gear.

Maybe it's all for the better, anyway, but it would be a pity if the original spirit of Amateur Radio eventually became just a legend, and a slightly ridiculous "squarish" atmosphere were to surround it. Fortunately it appears that a small but encouraging percentage of the newcomers, each time R.A.E. comes round, seem to have an instinctive desire to become good amateurs, in the

FIVE-BAND DX TABLE

Station	7 mc	3.5 mc	14 mc	21 mc	28 mc	Countries Worked
G2DC	166	112	306	280	169	320
G3PEK	119	75	142	88	18	175
G6QB	117	56	284	195	143	310
G3IGW	113	67	150	128	123	189
G3IVJ	101	83	306	259	175	316
G3KMQ	95	54	208	90	3	233
G3DQ	86	83	316	223	183	322
GW3AHN	71	21	322	294	151	332
G3FTQ	58	27	118	91	46	144
G3TJD	47	18	44	36	0	94
G3RJB	46	1	111	19	0	118
G3NOF	32	39	255	190	132	277
G3IDG	27	17	53	66	57	95
GM3RFR	13	10	49	49	4	75
G3MDW	7	6	46	41	43	81

widest sense. Surely their influence must make itself felt in due time. It would be a real tragedy if the bands became a shambles, like the roads of today, with a spot of courteous behaviour standing out so conspicuously that one is taken by surprise and wants to shout "Thanks" in a loud voice. Arabackle's last word about all this: "Progress is all very fine, so long as it is in the right direction."

Breakers Ahead!

We do not often hear from our American readers about their own particular troubles, but here is a letter from WA2WOR (who is also W4WFL) complaining about the very same things that friend Arabackle objects to. Morgan writes "Even when I do have the opportunity to get on, I find that I am less and less inclined to do so. The primary reason is the 'breaker.' It seems that it is now out of the question to have a DX contact without being continually assaulted by breakers, which is particularly annoying when I am attempting to have a contact with an old friend."

He adds that the typical breaker's contribution is rarely more than "Thanks for the report—just wanted to know how I was getting out"—then he leaves and looks for another QSO to break into! (But in a way WA2WOR is lucky . . . most of our breakers, once they get in, refuse to get out and usually end by running the QSO.) But there we have one WA2 who confesses to being forced to spend more and more free afternoons and evenings with a pipe and a good book.

Top Band Sorties

The One-Sixty DX may have left us (temporarily, we all hope) but the Top Band mobiles and portables are getting busy, and some rare spots will be on the air soon. GM3OWM/P (Newcastle University Radio Society) are to operate from Berwickshire, Phone and CW, between the dates of June 14 and June 19. The party is to consist of G3NOQ, 3RVM, 3OYP and 3OSW.

G3NRU hopes to be on Top Band from the Outer Hebrides (Isles of Lewis and Harris), mainly

located near Stornoway, between June 26 and July 3. On June 25/26 and July 3/4 he will be operating mobile while *en route* from Bletchley and when returning by the West Coast route and M6.

The Noise-Generators

Last month's query about troubles from overhead lines has produced some pretty indignant replies. G3SIH (Corsham, Wilts.) describes them as "the curse of mankind." He has a line-of-sight path of about 1½ miles to the super-grid (275 kV) and says it certainly is "super" at radiating, during wet or damp weather, from 550 kc to about 16 mc. On Top Band the noise is 40 dB above 1 microvolt, and on Eighty enough to enforce a QRT.

He contacted the G.P.O. about all this, and received an "incredible" reply stating that they would investigate on receipt of a written undertaking *to pay the whole cost of the investigation*, after which they would be "happy to assist." Although the G.P.O. will do nothing about amateur-band interference, except on such preposterous terms as this, they are quick enough to jump on any amateur suspected of causing BCI or TVI. (And there are probably cases in which an amateur is blamed for the very interference we are talking of.)

The point is that interference from electricity distribution systems is not an Act of God—it is something that can and must be cleared up by the electricity authorities, and the G.P.O. should be the mediator between the people causing the trouble and the people suffering from it—whether they be broadcast listeners, TV viewers or amateurs. We know of a few cases in which the Radio Interference Branch has taken action very effectively, and traced leaky insulators, which are almost invariably the cause of the trouble . . . and then they can tell the local electricity people what to do about it.

G3SM (North Harrow) is another sufferer from noise which affects all bands, emanating, he thinks, from a sub-station about 120 yards away. He has phoned the G.P.O. three times but has not yet been "honoured by a

visit" and is getting pretty fed up. And he adds that several members of the Harrow Radio Society are in the same boat. Some drastic action is certainly called for in these cases. (The line is, of course, to complain of TV, or VHF/FM, interference if you are affected on those channels. Then the G.P.O. will act—and your amateur-band trouble will disappear at the same time.)

From the same part of the world (Hatch End, Middx.) comes a complaint from G3TUX, who thinks the continuous S9 "hash" can only be due to a definite fault, but correspondence with the G.P.O. has produced no results. As he says, 160-metre QRM of the "normal" variety can be a challenge, but faulty HV lines and deliberate QRM (another sore subject) are just infuriating.

G3SED (Portsmouth) has a 275 kV monster a mere 300 yards away, but he says the only real trouble experienced is during wet weather, when the usual S8-9 hash appears.

G6QB is near a switching station and within 300 yards of a 132 kV run, with the 275 kV affair

TOP BAND LADDER

(G3S-- and G3T-- stations only)

(Starting Date, January 1st, 1965)

Station	U.K. Counties	Countries
G3SED	72	21
G3SWH	68	13
G3SYS	65	13
G3TBJ	64	12
G3SJJ	62	10
G3TYK	61	13
G3TVW	57	9
G3SVL	50	10
G3SHY	47	8
G3TSS	46	7
G3SGC	45	12
G3TTK	45	9
G3SZA	43	11
G3SVW	42	9
G3TON	41	8
G3SQX	33	7
G3TZM	28	6
G3TUX	19	5

Reporting the HF Bands

stretching from horizon to horizon at a distance of just under three miles. The latter is probably not "live" as yet, but the 132 kV line gives overpowering hash (on 160 and 80 metres only) in damp or misty weather, sometimes clearing when it is really wet. But there have been outbursts, on occasions, when every band down to Ten has been unworkable. Since a heavy shower of rain seems to put an end to these periods, it seems that salt and dirt on the insulators cause the trouble rather than any definite fault on the line. (But there was one devastating incident when some dear children succeeded in throwing a short length of wire—unattached, naturally—so that it remained hanging on one of the HV lines. That one messed up radio and TV as well, over a wide area, and produced pretty rapid G.P.O. action, which shows that it *can* be done!)

QRP Note

GW3PMR (Bangor) reports a QSO on Top Band with G3NHE, near Sheffield, who was using 50 milliwatts input to an OC201, and putting 469 signals into North Wales. This leads us to ask where all those "Ttx" stations have vanished to—there used to be lots of them on One-Sixty. Either they just can't be heard through some of the enormous signals on the band, or they have just got discouraged. Or what *are* they up to these days?

DX News from Readers

G3RFS writes from Trinidad, where he hopes to get a VP4 call very soon for operation on 7 and 14 mc. He goes from there to Jamaica for six months, and with a 6Y5 call he will definitely be on all bands, One-Sixty to Ten. He also hopes to visit the Cayman Is. (now VP5 but later to be ZF1) and promises more information later.

G13PLL is also on the move, and expects to be on from Gibraltar (with a ZB2 call, naturally) by the end of June. He has just spent his first month on

SSB with a Courier and a ground-plane, and was somewhat amazed when his very first QSO turned out to be VU2NRA! He finds that the ground-plane puts a better signal into the central States of U.S.A. than the Atlantic coast, and guesses that this confirms its low-angle radiation.

John Farrar, whose last spell of operation was from VS9SJF (Socotra)—see article in this issue—is now licensed as G3UCQ (RAF Wyton, Hunts.) and says that although all VS9SJF cards have been despatched, he still has a few left in case any went astray.

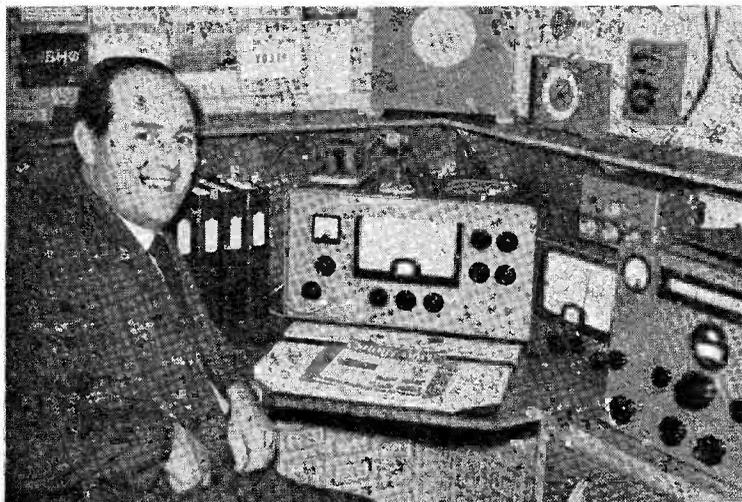
Likewise MP4BBE says he has now left Bahrein for good (QRT on January 24) but will complete all QSL'ing chores as soon as his blanks reach him. He hopes to be settled in the U.K. by June or July, and will take the R.A.E. in November. After 6000 QSO's in 200 countries from MP4-land, he quite looks forward to operating as a G.

DL2BJ rather indignantly disagrees with the remarks about German SSB stations published

last month. Out of 15 years of activity, he has spent five in Germany and insists that the DL's are second to none in their helpfulness and courtesy. As an example, he says "If you are absent from the local net for a couple of nights, they are round to see if you are in trouble, and to help." Derek's past callsigns are worth quoting: He is ex-G3RKN, SU1SS, MD5DL, VS9ADL, MP4TAF, MP4MAC, 5B4DL, VS1LE, 9M2AD and now DL2BJ!

From G2DC comes news of another possible DX-pedition of mammoth proportions, for which the *Yasme* Foundation may be revived. This time the globe-trotter is Lloyd Colvin, W6KG, who has already done enough travelling for about twenty people and has 60 or more callsigns from the past. He is prepared to visit all the rarer countries of the world during the next *ten years*, making a reasonable stay at each place. He will have a reserve of operators to call on, too, as his wife is KL7DTB/6, and his daughter is W4ZEW/6. Funds and equipment are already available, and it is hoped that he may set off for the first port of call by August. Watch this space!

G3SED calls attention to the International One-Sixty Society,



G3RLI is run by G. W. Lawrence, at 44 Elizabeth Road, Leamington Spa, Warwickshire. The Tx is a K.W. Vanguard for 10-80 metres, and the receiver a GR-100, with various trimmings. The present aerial system includes a doublet, a 20m. ground-plane, and a Mosley Trap Vertical, with preparations in hand for a 10-15m. Quad. G3RLI, who is ex-Royal Signals, wishes he had "taken out an amateur licence years ago, and regrets the lost time."

founded by W3AZR "to promote more enjoyment for the 160-metre amateur and to protect his interests." In the first month they have collected members in five countries and 20 U.S.A. states, but more support from Europe and the U.K. would be welcomed. The main aims are to help develop the interest of amateurs resident in DX countries, and to provide them with necessary help or technical information. Enquiries to W3AZR (QTHR) and membership fee \$2.00.

Contests Under Fire

Surprising, but encouraging, to find a protest about the number of weekends set aside for "playing numbers" in no less a publication

than the I.A.R.U. Region I *Bulletin!* The writer, G2BVN, acknowledges that all aspects of Amateur Radio must be catered for, but asks "Can anyone put forward a logical reason why, year after year, the same stations rush to contact each other for ten seconds, then rush away for similar contacts with others they have not worked for, perhaps, twelve months?" In particular he disapproves of the A.R.R.L. Contest, which occupies four whole weekends, with some 280,000 potential contestants, and often precludes normal QSO's for most of the time. To quote again: "Forty-eight hours per contest is bad enough, but 96 hours is surely selfish beyond all reason."

"CQ" Phone Contest Results

Results are to hand for the Phone half of the 1964 CQ Worldwide DX Contest, and W1WY, sending them across, comments "G entry slim—as usual." No U.K. stations appear in the Top Ten or the Top Sixes for multi-operator stations, the sole supporters of national prestige being G3FXB, who is Continental Leader (Europe) on the 14 mc band, and G13CDF, who holds a similar position on the 3.5 mc band.

World leaders in the single-operator category were YV5BIG, CX3BH, W3MSK, HC2JT and DJ6QT, all with scores of over half a million. The multi-operator (single-transmitter) winner was YV9AA with over a million, and the multi-operator (multi-transmitter) leader was YV5AKU with a slightly higher score of 1,463,871. What is it about these YV's, producing outright winners in all three categories?

G3FXB's score for 14 mc only was 251,640—a pretty terrific effort, we should say. The only higher one for the U.K., though scoring no award, was the multi-operator entry of GW3NWV (with GW3DIX), chalking up 403,782. And second to G3FXB in the 14 mc slot was G3LSF with 142,010.

All the rest of the British scores were in the five-figure category, and the total number of entries was only 20 or so. It seems pretty certain that the lack of enthusiasm

for this and other big contests (as evidenced in the U.K.) is due to the fact that so many non-DX contacts have to be made before a score worth entering is put up. W1WY himself has told us that many of the high scores from the mass of European stations are made up mostly of European contacts—SP to UA, UB5 to UA, and so on. These, to the average G operator, mean only swapping numbers on the air and writing up logs of colossal length without any of the thrills of chasing DX.

It has already been suggested to the organisers that the Contest would be improved if it were limited to contacts with stations in another continent, and we believe them to be sympathetic to this point of view.

Around the Bands

The past month has been very good, with a few dullish periods, but the DX has been there, especially on Twenty, all the time. The keen DX chasers were not slow to wrinkle out CEØXA for a brand new one (and what operating . . . we heard him making five QSO's a minute at one time!). Another rare one, not so well publicised, was the Kuwait Neutral Zone, activated by HZ3TYQ/8Z5 in a similar manner to his previous /8Z4 sortie. No other super-rarities appeared, but quite a few are promised for the future.

G2DC says he decided not to join the queue for CEØXA while the hordes of W's were on the hunt, and as they were working round the clock for some days, the better plan was to check on them during times that might favour propagation to Europe. This paid off, with QSO's on all bands from Eighty to Fifteen, no trouble at all (in fact the QSO came from the *first* call each time). For the record, Jack got 579 on Forty at 0630; 599 on Fifteen at 1530; 589 on Twenty at 1815; and 579 on Eighty at 0500—all on April 28 and 29.

Other points from G2DC: there have been a few days when Twenty (during the afternoon) has been full of S9 U.K. stations, mixed up with the Far East DX and little else . . . not even the European Klub stations coming in. Pacific areas well received most mornings,

TOP BAND COUNTRIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
GM3KLA	98	98
G2NJ	98	98
G3PLQ	92	95
G3SED	81	91
G3RTU	67	67
G3SWH	66	78
G3PPE	63	77
G3QJE	62	63
G3SGC	55	76
G3SVL	54	62
G3IDG	53	57
GW3PMR	53	72
G3LZZ	50	64
G3SJJ	48	82
GW3TLW	47	59
G3SHY	46	62
G3SVW	43	67
G3SQX	29	61
G3TVW	28	59
G3TSS	27	46
G3ING	16	41
<i>Phone only</i>		
G3PLQ	55	58
G2NJ	54	54
G3MDW	43	62

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

TEN-METRE ACTIVITY TABLE

(Starting Date: June 1st 1964)

Station	U.K. Countries Worked	Countries Worked
9J2DT	32	103
G2CDI	19	31
G3OAD	17	27
G3HCU	13	19
G3EHL	8	9
G3IDG	4	15
G2DC	2	14
G3SQX	2	2

0700-0800, and on May 14 twelve KH6 stations were worked in about 35 minutes. Others at good strength during the same period were KL7, VE6, 7 and 8. But there is one snag—when propagation is really good in a northerly direction, the whole band seems full of RTTY transmissions, sometimes one every 10 kc. Where do they all hail from?

Our old friend Gus has been doing great guns from AC3H and other spots with the AC5-9 prefixes, but hopes to run a brief spell as AC4H from you-know-where. The strange thing about all his activity is that his own gear is tied up in Customs in Calcutta and he is using borrowed equipment! Hence little time is spent on 7 and 3-5 mc.

G3KMQ managed six new ones during the month, all on CW and all on 14 mc. They were CEØXA, AC3H, ACØH, ZD7IP, UA1KED and HZ3TYQ/8Z5. VQ8BY was worked on 21 mc, but the LF bands seemed to be poor, with nothing of interest around.

G3FTQ joins the Five-Band Table but says he suffers from the common complaint—a small garden and a rather poor, very built-up QTH. Running 30-40 watts to a HyGain 14-AVS vertical, with the best earthing arrangements he can manage, he finds this the most effective all-band arrangement he has ever tried.

GM3JDR says conditions to the Pacific in the mornings have been very good except for "too much competition from the 500-watts-and-Quad boys." He was annoyed to find that many people working

CEØXA were making two QSO's with him, for some strange reason. A certain W even tried two consecutive ones. (Now is this some new menace, or just plain stupidity? For all we know, there might be some new certificate or award with a special gold nose-ring attached for everyone making more than one QSO with a rare one.) On CW, GM3JDR worked AC3H, HZ1AT/8Z4 (Ken Ellis, no other), JA's, UAØ's, VE8 and VK; on SSB, CR9AH, DU9FB, KH6, KL7, KR6, VS6, YS, ZS6YQ/9, 9A1BR/P and 9M4MF.

GM3RFR is one of our most northerly stations, on Unst, Shetland Is. He works with a completely home-brewed outfit—a double-conversion receiver, a 120-watt p.e.p. transmitter from 80 to 20 metres, and inverted-Vee aerials for all bands. Mainly on Twenty with this rig, he has raised VU, EP, VE8 and 5, and VP9; but he also runs a K.W. Victor for AM and CW on other bands.

Watching Ten Metres

G3IDG, his enthusiasm for Ten Metres unabated, heard 21 countries on that band during the month (15 of them on CW). 5Z4AA was logged on SSB;

several 9J's on AM and CW; EA6BC and ZE's on AM. He thinks this level of activity should get the Activity Table moving, but says it seems odd that all these Europeans who are just a nuisance on Twenty are cheerfully called and worked on Ten. (Wait until the real DX conditions open up—they won't be so welcome then!)

G3NOF only once heard signals on Ten—on May 9 at 1800. He worked 5Z4AA on SSB (S9 reports both ways). As Don says, openings are still very short, and you have to catch the band at the right moment. SSB activity on 21 mc has still been low, except for the /MM's, with whom it is very popular. On 14 mc there has been a big change, with the northerly path much better, and the path to VK over South America very poor. Some afternoons have been very good for the Far East, with VS6, 9M2, DU, XW8, AC3 and the like all workable. G3NOF's best on SSB were CEØXA, DU9FB, HS1F, HS3RP, HZ1AT/8Z4, HZ3TYQ/8Z5, KJ6, KX6, many VP2's, VK9DR, 9M6BM and a few more.

G3NWT says that ZD7GP wants as many G contacts as possible, and seems to be going about it



At the Amateur Radio station of the United Nations, Geneva, signing 4U1TU. Not unnaturally, at a centre at which people of all nationalities gather, there is a proportion with a practical interest in Amateur Radio. Here we see a group of African telecommunication trainees being shown round the station.

the right way—operating on Fifteen. Geoff wonders what has happened to many old friends in “not-so-rare” areas who used to be regularly on Fifteen. Nowadays one seems to hear only French, Portuguese and the odd American accent from EL or 9Q5. Have the others gone SSB and disappeared “under the fourth layer on Twenty?”

On the peculiar aura of SSB, G3NWT says “one of my old friends adopted the mode three years ago. Before this I had a hundred FB extended contacts; since then, three very ordinary ones. Mostly he seems to be the focal point of some terrifically topical DX forum, and I have an ambition to stumble on some absolutely white-hot piece of DX news, so I can report into it. Maybe I could make some up?”

GM3IAA reports on various matters, including a Top-Band station signing CK102 (or CTA102); ZD7IP working CR4AE on Fifteen; 9H1AD using the new Malta prefix; and the usefulness of OLU on the band-edge as an indicator of 15-metre conditions. Certainly he’s always on, and his greater usefulness is in indicating to listeners in DX parts whether the band is wide open to Europe. Certain W6’s are known to use him for this purpose . . . what the strength of his signals really indicates within Europe we don’t know.

Power Complex

After all the complaints about power lines, some more very bitter ones about power hogs—especially on Top Band. G3TTV (Cheshunt) says it is very common to hear stations on One-Sixty boasting of running an 807 or 6146 PA, modulated by a pair of 807’s, and so on. He can’t imagine these rigs being run at 10 watts or anything like it. Likewise commercial transmitters with a QRP switch . . . could it be forgotten now and then? And for the HF band users, there are 1 kW linears (there’s a 2 kW specimen if you want it), 300-watt AM transmitters and so on. Human nature being what it is . . .

Next G3RZH (Newport, Essex) acts as spokesman for ten others in condemning not only the

suspected use of very high power on Top Band, but this feature as “the main instigator of the competitive or cut-throat attitude, cheer-leading all and sundry into the ‘work the most at whatever the cost’ frenzy.” Who—us? But that’s absolute bunk, for we have been consistent opponents of this outlook for years past. Sad to think that so many “readers” can’t have read a word that has been written here! Surely they’re thinking of some other publication—*Pravda*, perhaps? “DX Commentary” and the present feature have been strongly anti-ratrace since before any of these disgruntled types got their licences.

However, what they have to say is serious enough, when it comes to an allegation that a G3-- runs 650 watts on Top Band; that another operator confesses to building a one-kilowatt linear for next winter on the band; that yet another says on the air that “the 813 is the ideal Top-Band PA,” and so on; and they suggest that the chaps who would have a chance to work the DX if the “big guns” stayed in bed (*see sugges-*

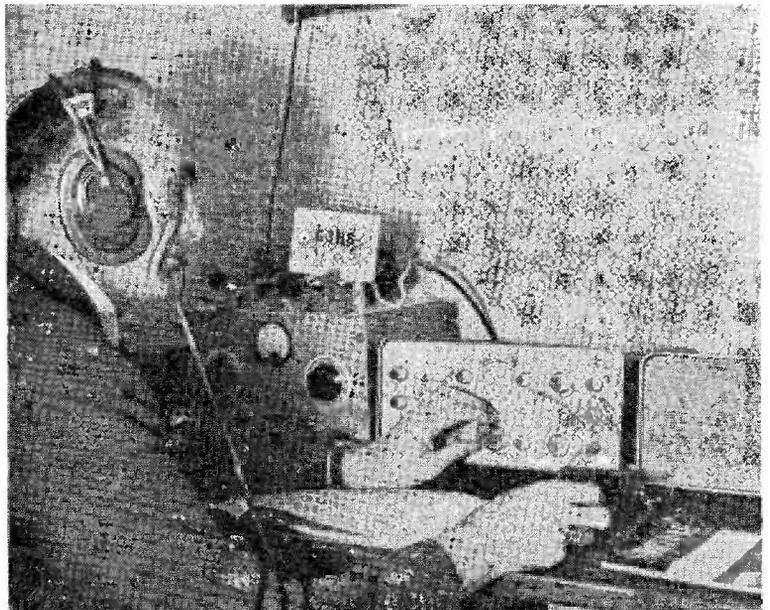
tion from G8PG, last month) are merely “those who bother about such tiresome details as licence regulations, power limitations and good manners.”

Well, we’re all in favour of cleaning out our own stables . . . also that the violators should be given a rough time on the air. But for Heaven’s sake don’t accuse “Communication and DX News” of fostering this sort of behaviour. Has everything written here for the last ten years been taken as some kind of double-talk, or what?

DX Gossip

The U.S. expedition to observe the Solar Eclipse on May 30 has placed a few exotic types around the Pacific. WAØIFW/FO8 is on Bellingshausen Is., and W2ZIA /ZK1 has been heard from Aitutaki. Manihiki (Danger Is.) is also said to be represented.

Others from the Pacific area, conditions varying strongly from one morning to the next, have included K5COK/KH6 (Kure Is.), KJ6BZ, W9FKL/KJ6, KM6CE, KM6DJ, KS6AL, KS6BQ,



G3HS is operated by D. T. Boffin, of Mosman, Woolstone, Uffington, Faringdon, Berks., who is keen on 160m. He provided A.E.R.E. Harwell's No. 2 station for the last MCC and, just recently, was the winner of the open section of the Grafton Club's Top Band contest. G3HS runs a KW-2000 transceiver, a very handy piece of equipment for the job, and his aerial for 160 metres is a centre-fed half-wave.

KX6BU, FU8AG, ZK1AA (Mangaia Is.), KB6EPN, KC6AA and KC6FM. Most of the foregoing on 14 mc SSB, but a few on CW.

The Andaman Is. gap should be filled by VU2DIA, who will be there for *three years* (he is VU2DI); and there's some talk of operation from the Laccadive Is. as well.

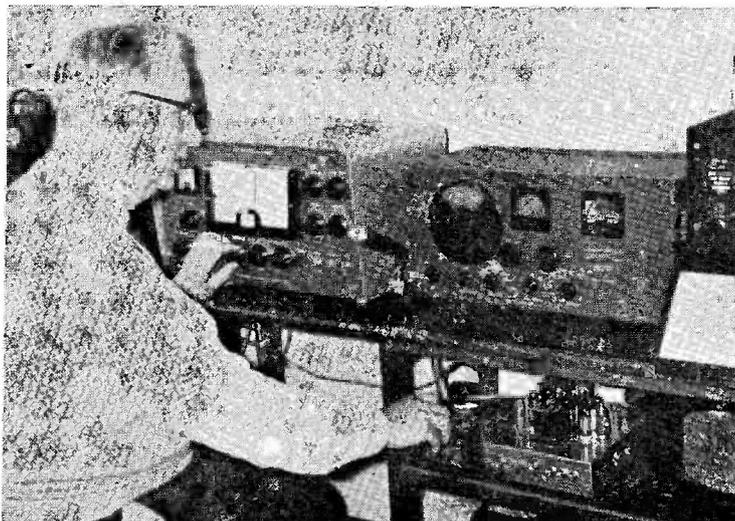
Those who are after the IOTA award will welcome IITRA (Ischia, in the Capri group), on 14300 kc SSB . . . TN8BK (21 mc AM) is ex-F5BD, with 100 watts and a Quad . . . ZL3VB, with a new operator, should be in full swing from Chatham Is. by now. (And the new op. is Ian, ex-ZL1ABZ.)

All non-residents operating from Monaco will from now on be issued with 3AØ calls, 3A2 being reserved for residents . . . 4WII is a new, and genuine, one from the Yemen . . . 5W1AZ (Western Samoa) has been reported on CW on 14040 and also 14085-14092 kc, 0730, working quick QSO's, contest style.

VK3AHO will be operating from CR8BH (Timor), May 27 until June 15, CW and SSB, all bands, with a linear and a Quad . . . FL8AK will be on from Djibouti, June 4-14. SSB on 14250 and 21250 kc, CW on 14040 and 21040 kc, also on 7 and 3-5 mc if permission is forthcoming . . . ON8 is the new Belgian prefix for non-Nationals operating under the "reciprocal" arrangement.

A few indentifications, from G3NOF and others: ZD8PI is WØPI, formerly active from KM6, KG1 and TF2 . . . VP3AA is K1RZW and ex-ZP5DD, YN1TAT, HH2P and others . . . KH6FBJ was formerly XW8AS, KG6SX, KR6EV and is also K5OSQ. HZ1AT is operated by Ken Ellis, G5KW, but he hopes later to get his own call with a "KW" in it.

W1PFA and W1MRQ had a hectic spasm from FP8 during May . . . QSL's to W1PFA/FP8BH. W5CGI/KH6 is on 14250 kc SSB from Tern Island (French Frigate Shoals) and as this location is 500 miles from Honolulu it may qualify for DXCC. YA4A is



A well-known old timer in the Bristol district is R. E. Griffin, G5UH, of 13 Alexandra Road, Uplands, who was battling for the local Club in the BARS-CARS-MARS contest, when the Bristol boys took on the Midland clubs. This is a keenly-fought event, with no quarter given or asked!

regularly on 14105 kc SSB, around 1530 . . . Chagos Is. (VQ8C . .) may soon boast an elaborate communications centre, and there should be some amateurs among the staff.

VU2NR, recently operating VU2NRA (Andamans) denies knowledge of VU2NRL (Laccadives) . . . VK4TE puts Willis Is. on the air every Saturday, 0600, on 7022 kc . . . 9M8RS (ex-VS4RS) is active again on 14 mc CW.

OR5RK has replaced the well-known OR4VN in Queen Maud Land . . . W6FAY is hoping for a licence for operation from Clipperton (FO8) . . . VR1S said to be on from Ellice Is. every weekend, 14015 kc CW.

Ten-Metre Activity Period

Logs for the May 23 Test are not yet in, of course, but there was certainly no shortage of activity. At 1000 GMT there were several strong DJ/DL signals on the band, nearly all seeming to be in or near Munich. G's were working them continuously. Then YU, OK, OZ, LA and I all appeared in quick succession, and, a little later, OH, SM, YO, HA and F were all heard.

In southern England G's were heard on ground-wave from up to about 100 miles, and then a couple

of GM's showed up with signals much too strong for ground-wave propagation—obviously a patch of sporadic-E on that path.

Inter-European working was really the order of the day, but many G's held on in case the DX should appear, which it did by 1500 GMT or earlier. On CW the first to be heard was CR7IZ, and almost immediately afterwards, CR6ACB appeared, both with good signals. ZE1JJ and 5Z4AA then showed up on Phone, and G's in other parts of England were calling Africans who were not audible in the southern counties. A patchy day, but very successful.

Sign-Off

That's the lot for this month, and a fairly meaty lot it has been, thanks to all those who have written to keep the pot boiling and to show us that our readers (well, most of them!) are still wide awake. Next month the full report on the Ten-Metre Activity Sunday will appear. Deadline is **first post on Monday, June 14**, and address everything to the new QTH: Editorial Dept., *Short Wave Magazine*, Buckingham, England, marking the letter "Communication and DX News." Until then we wish you Good Hunting, 73 and—BCNU.

• • • *The Mobile Scene* • • •

THE QUESTION OF SAFETY—NEGOTIATIONS WITH THE MINISTRY OF TRANSPORT

Referring to p.169 of our last, as soon as the May issue was out, contact was made with the Ministry of Transport (Road Safety and Vehicle Regulation Dept.) to find out exactly what was being proposed. The draft regulation is worded as below :

"The driver of a motor vehicle shall not, while the vehicle is in motion on a road, speak into any radio transmitting equipment.

". . . this regulation shall not apply to the driver of a motor vehicle being used for fire brigade, ambulance or police purposes . . . or the driver of a hackney carriage . . . who is using a microphone which is not required to be held by hand."

Clearly, this would prohibit completely amateur /M operating (by the driver) when on the move. It was immediately contested, and we were invited to submit views by "not later than May 14"—which did not give us a lot of time.

Accordingly, the Memorandum as reproduced here was prepared and forwarded, and copies of it were also sent to other parties and organisations thought to be interested—the GPO (Radio Services), the RSGB, ARMS and NARMS, the AA and the RAC.

The Automobile Association replied immediately—through their Motoring Policy department—to the effect that the AA, too, was contesting the proposed regulation, as it would affect not only those of their members already using radio-telephones, but also their own radio-control system for giving roadside assistance.

Our Memorandum had to be carefully drafted to explain the Amateur Radio position fully, since it was evident that nobody at the Ministry had any clear understanding of amateur /M operation, or was aware of the fact that there are now nearly 2,000 U.K. amateurs licensed for mobile.

It should be emphasised that this particular question of *safety* does not directly concern the GPO in any administrative sense. It is strictly a Ministry of Transport matter.

At the moment of writing, the outcome of these representations is awaited, and it is hoped that there may be more to say on the subject for the next issue. It should be added that, with the exception of the AA, as already quoted, we have not been informed of whatever action other interested parties may be taking—though it is understood that NARMS have written the Ministry endorsing our Memorandum. There is, of course, nothing to prevent individual mobile operators making their own views known to the Ministry—as a matter of interest, we would be glad

to have a copy of such correspondence, for which the address is: The Under-Secretary, Road Safety and Vehicle Regulation, Ministry of Transport, St. Christopher House, Southwark Street, London, S.E.1.

In case there are any /M's who may feel that we have not gone far enough, it should be explained that having considered all the factors, the conclusion was that since the Minister clearly intends to prohibit operation on the move as far as he possibly can, it would be a fair and acceptable compromise to put amateur /M's on the same footing as taxi-drivers for mobile working. Hence, it was a matter of making out a case for the taxi-cab type of microphone mounting—indeed, many G/M's already operate with a fixed microphone, while a large number of others either do not transmit at all while actually driving, or have another licensed amateur as passenger-operator.

* * * *

The only Rally event to report this time was that held by Thanet on May 9, near Ramsgate, for which they had wonderful weather, an attendance of over 200, with 60 cars in the park by mid-afternoon. The talk-in stations worked a total of 28 /M's on three bands. Among the visitors were G3TKC (who arrived by helicopter); GW3GIN/M, who made the longest journey; G3JEQ/M, who made the best DX contact with 160m. control; and G3AHY/M, with an all-transistor rig running a pair of BUY10's in the PA. A detachment from Royal Signals put on a very interesting and effective equipment display.

Though there is to be an interesting Mobile Rally in West Berlin during June 5-7, for which /M's permits are to be available for visiting foreign amateurs, various formalities had to be gone through in advance to get to West Berlin itself—unfortunately, G3BID did not receive the details soon enough for our May issue, so that this item is now only of news-interest. However, if by any chance any G/M did reach this Rally, we would be very glad to hear about it.

Turning now to the rest of the programme, we have some additional events scheduled, with June 20 and 26, and July 11, as the busy days. It seems now that Rally organisers are prepared to take their chance with a clash!

* * * *

MOBILE RALLY PROGRAMME

June 6: RSGB National Mobile Rally at R.A.F. (U.S.A.F.) Station Wethersfield, Essex, with talk-in stations on the air from 10.0 a.m., signing GB3RS on 160m., and GB2VHF on 4m. and two metres. There will be many displays, also a /M competi-

tion, a trade exhibition and a raffle. Refreshment stalls will be available, with a centralised car-park, and two acres of covered accommodation.

June 7: (Whit Monday) Mobile Rally organised by the Saltash & District Amateur Radio Club, at the Playing Field, Calstock, Cornwall (NGR SX.437685), on the River Tamar, two miles south of Gunnislake. Get on the A.390 Tavistock-Callington, and watch for the Rally sign-posting. Talk-in stations will be open during 10.0 a.m. to 2 p.m., on 160-80-4-2m., all operating as out-stations for the main control signing GB3SAL at the Rally ground. Good site facilities, with hard standings for parking; covered accommodation available; displays, competitions, and a prize draw. Visitors are asked to bring their QSL cards, and to send an s.a.e. to: D. Bowers, 95 Grenfell Avenue, Saltash, Cornwall, for any further information required.

June 20: Hunstanton Party, meeting at refreshment rooms (G3JEC), near station. Several prizes to be won, with 160m. talk-in by G3ANM. Details from: J. G. Taylor, G3SAW, 42 Station Road, Heacham, Kings Lynn, Norfolk.

June 20: Pembroke & District Radio Club Mobile Rally at the Regency Hall, Saundersfoot, Pems., West Wales, as an informal gathering for all /M's who care to try winning a £5 prize for the longest distance travelled from home to the Rally that day. Information from: J. M. Allen, GW3TUD, Coles Corner Café, Saundersfoot, Pems.

June 20: Reading Amateur Radio Club Mobile Picnic, at the Childe Beale Trust Pavilion, Lower Basildon, near Pangbourne, Berks. Talk-in on 1981 kc by G3EJA, and on 144.78 mc by G3TOQ. For parking convenience, car-screen stickers can be obtained on application, with an s.a.e. to: N. C. Taylor, G3TOQ, 83 Stoneham Close, Tilehurst, Reading, Berks.

June 26: (Saturday). Full-scale Mobile Rally mounted by Loughton & District Radio Society, at Loughton Hall, Rectory Lane, Loughton, Essex, a 16th Century mansion which is now occupied by the Debden Community Association. Facilities include refreshment room, licensed bar, and good parking. There will be an equipment exhibition, many displays, a prize raffle and bargain sale, competitions and dancing in the evening, with everything centralised under one roof and within

MEMORANDUM—On Proposed Regulation to Restrict Radio Transmission by the Driver of a Private Motor Vehicle while on the Move.

(AS AFFECTING RADIO AMATEURS.)

Ministry Ref.: VR 4/1/0171

Introduction:

(1) For the last ten years, a large number of individuals holding AT-station permits (licensed by the G.P.O. under the Geneva Convention for the operation of private radio transmitting stations, and known usually as "radio amateurs") have been additionally licensed by the Post Office to install and operate radio transmitting equipment in their private vehicles (usually called "mobile licences") for communication amongst themselves.

(2) At the present time, there are upwards of 11,150 licensed radio amateurs in the U.K. Of these, about 1,800 hold the additional permit for radio transmission under mobile conditions.

(3) Installation and operation of the transmitting equipment is entirely at the discretion of the licensee. No limits affecting road safety are, or ever have been, imposed by the G.P.O. as the licensing authority.

(4) Thus, there is already a very large body of practical experience in this field, built up over the last ten years.

Discussion:

(5) The national motoring organisations (A.A. and R.A.C.) have never taken any direct interest in this particular aspect of private motoring activity—and, indeed, it is doubtful if they are aware that nearly 2,000 individuals are already privately licensed for mobile radio transmission.

(6) During this ten-year period, there has been no known accident attributable to the use, by the driver of a private vehicle licensed for amateur mobile operation, of his radio transmitting equipment.

(7) At any time of the day or night, all through the week and particularly at weekends, there are radio amateurs operating mobile equipment from their vehicles—either on the move, or stationary. In some cases, the driver is accompanied by a friend as operator; in others, he is himself the operator. Some installations involve the use of a hand-held microphone; others have a fixed microphone, or taxi-type fitting, with automatic change-over control.

(8) Ever since the introduction of the radio amateur mobile licence, in 1955, there has been the strongest insistence on safety—by SHORT WAVE MAGAZINE, and the other Radio Amateur organisations interested—as regards both the installation itself and its operation while on the move.

(9) As shown by para. 6, results on the safety side have so far been extremely encouraging—not to say entirely satisfactory—

in view of the fact that radio amateurs have been operating mobile for so long.

(10) It is understood that the new regulation proposed is to cover the introduction of a public radio-telephone service for vehicle drivers, whereby owner-operators with no knowledge of radio techniques can be connected into the ordinary telephone system. This clearly implies the use of approved apparatus under G.P.O. licensing, installed on a commercial basis.

(11) Thus, it is entirely different from the communication situation affecting radio amateurs, in that they:

- (i) Design, install and operate their own apparatus, for use on their own frequencies,
- (ii) Communicate strictly amongst themselves, and not through the public telephone system,
- (iii) Are private individuals with a considerable practical knowledge of radio communication techniques, as distinct from the prospective users of the public radio-telephone service,
- (iv) As implied by para. 6, are also responsible motorists.

(12) The type of traffic, or "pattern of communication," in the case of radio amateurs operating mobile amongst themselves or with amateur fixed-stations is very similar to that involved in taxi-cab working by radio—that is to say, short transmissions with loudspeaker reception in the vehicle.

Conclusion:

(13) It is evident that, so far as radio amateur licensed mobile stations are concerned, any total prohibition on transmission while on the move would be an irksome and unnecessary restriction, quite unjustified on the evidence of years of experience.

(14) With nearly 2,000 radio amateurs already licensed for mobile operation, of whom the majority are accustomed to transmit while actually on the move, any severe restriction would be virtually unenforceable.

(15) Since taxi-cab installations are in any event to be exempted, it would be a fair compromise to draft into the proposed new regulation a form of words giving U.K. radio amateurs licensed by the G.P.O. for mobile operation the same exemption—that is to say, prohibiting only the use of hand-held microphones for transmitting on the move.

(Signed)

Austin Forsyth
(Managing Editor),
SHORT WAVE MAGAZINE,
55 Victoria Street,
LONDON, S.W.1.

12 May 65

easy motoring distance of London. The control station signs GB3LOU and more details can be obtained from: A. W. Sheppard, G3JBS, 11 Barfields, Loughton, Essex.

June 26: (*Saturday*). Special Rally organised by ARMS in conjunction with a large Red Cross event taking place at Melbourne Park, Chelmsford, under the *aegis* of the Essex Branch of the British Red Cross Society. ARMS will install a demonstration SSB station, and local talk-in will be available. There will be good car parking and refreshment facilities, adequate cover if wet, and the site will be well sign-posted. A long list of events and attractions includes a pageant with a cast of 150, band performances, and a demonstration of helicopter operations by the Army. Entry 1s. a head, children 6d., and a large 160 pp. handbook, with full details, is available at 3s. 1d. post free from: Mrs. Sylvia Margolis, 95 Collinwood Gardens, Clayhill, Ilford, Essex. This handbook admits free and all proceeds go to the Red Cross.

June 27: Longleat Mobile Rally, organised by the Bristol Group, in the grounds of Longleat House, home of the Marquis of Bath, on the A.362 between Frome and Warminster, Wilts. The house and gardens are open to the public and ample catering facilities are provided. Starting at 10.0 a.m., talk-in stations will operate on 1880 kc, and in the 4m. and 2m. bands. There will be various events and attractions, but this Rally is essentially a get-together for West of England /M's. Further information from: D. Iles, G3COP, 23 Dryleaze Road, Stapleton, Bristol.

July 11: Torbay Amateur Radio Society Mobile Rally at Royal Signals, Denbury Camp, Newton Abbot, with talk-in by G3NJA/A on 1880 kc, G3PYZ on 3660 kc, and by G3LMG/A on 70.25 and 144.13 mc. Attractions include a regimental band and a heated swimming pool (open to visitors) and there will be good (Army-type) catering arrangements. Some indoor entertainments will also be provided. More details from: Mrs. G. L. Western, G3NQD, hon. secretary, Torbay A.R.S., 118 Salisbury Avenue, Barton, Torquay, Devon.

July 11: The South Shields & District Amateur Radio Club Annual Mobile Rally, at Bents Park Recreation Ground, Coast Road, South Shields, Co. Durham, adjacent to a wide expanse of sandy beach. Opening at 2.0 p.m., talk-in will be by G3DDI on 160m. from 11.0 a.m. and local 145.8 mc on stand-by. Competitions will include judging of mobiles, driving tests over a short course, and a transmitter test. Light refreshments will be available on site. This is a well-established event and in previous years has drawn visitors from all over the country. For more information: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

July 11: Tenth Anniversary Mobile Rally, Oxford, at the College of Technology, Headington (off the A.40, on the north side of the city), with talk-in

on both LF bands and on 4m./2m. A good programme is being organised for the interest of everyone, refreshments will be obtainable, with complete cover and good car parking. Further details from: F. A. Jefferies, G8PX, 1 Lovelace Road, Oxford—or RSGB Hq.

July 18: Mobile Picnic organised by the Worcester & District Amateur Radio Club, with talk-in on 160m., 4m. and 2m. (*details later*).

July 25: Cornish A.R.C. Rally, Newquay, Cornwall (*as last year*).

August 15: Derby & District A.R.S., at Derby (*as last year*).

August 30: (*Bank Holiday*), Peterborough Rally.

September 12: U.B.A. (Belgian) International Rally for which temporary licences for /M working will be issued to foreign visitors—general arrangements as last year (*more details later*).

September 12: RSGB Rally, Woburn Abbey, Beds. (*as last year*).

September 26: Harlow A.R.S., at Magdalen Laver, Essex.

September 30: Peterborough Mobile Rally and Treasure Hunt.

Organisers are reminded that for advance details to appear in the July issue of *SHORT WAVE MAGAZINE*, we must have the information by *June 14*, and for the August issue by *July 19*—addressed Editorial Dept., Short Wave Magazine, Buckingham.

QSL BUREAU—NEW QTH

Those entitled to use our QSL Bureau—confined to readers who obtain *SHORT WAVE MAGAZINE* by annual subscription direct with us—are asked to note that, with immediate effect, it has a new address:

QSL Bureau,
62 Belmore Road,
NORWICH NOR.72.T.

Direct subscribers using the Bureau will no longer need to lodge envelopes, since cards incoming for any U.K. amateur will automatically be cleared through I.A.R.U. channels (which, in fact, has been the practice for some time now). Those concerned should also erase the "BCM/QSL" address if printed on their own QSL cards.

INSTRUCTION FOR THE R.A.E.

It is not too early to be thinking about this, for aspirants taking Subject No. 55 either at the end of the year, or in May next. As usual, we shall start publishing lists of instruction centres—local Technical Colleges, Evening Institutes, and courses arranged by the education authorities—with the August issue of the *Magazine*. Those responsible for arranging these courses are asked to let us have necessary details as soon as possible—and in any case, not later than *July 19* for the August issue.

In the meantime, we are asked to say that if there are sufficient applicants, an R.A.E. evening class will be started for the Woking area. If interested, apply immediately to: H. C. Pryse, 36 Hart Road, Byfleet, Weybridge, Surrey.

SPECIALLY ON THE AIR

Those notified for the coming weeks are as follows :

GB3SAL, June 7 : Operating in connection with the Mobile Rally being held by the Saltash & District Amateur Radio Club at Calstock, Cornwall, and working on all bands. QSL address : H. Griffiths, G2DFH, 4 Westbourne Terrace, Saltash, Cornwall.

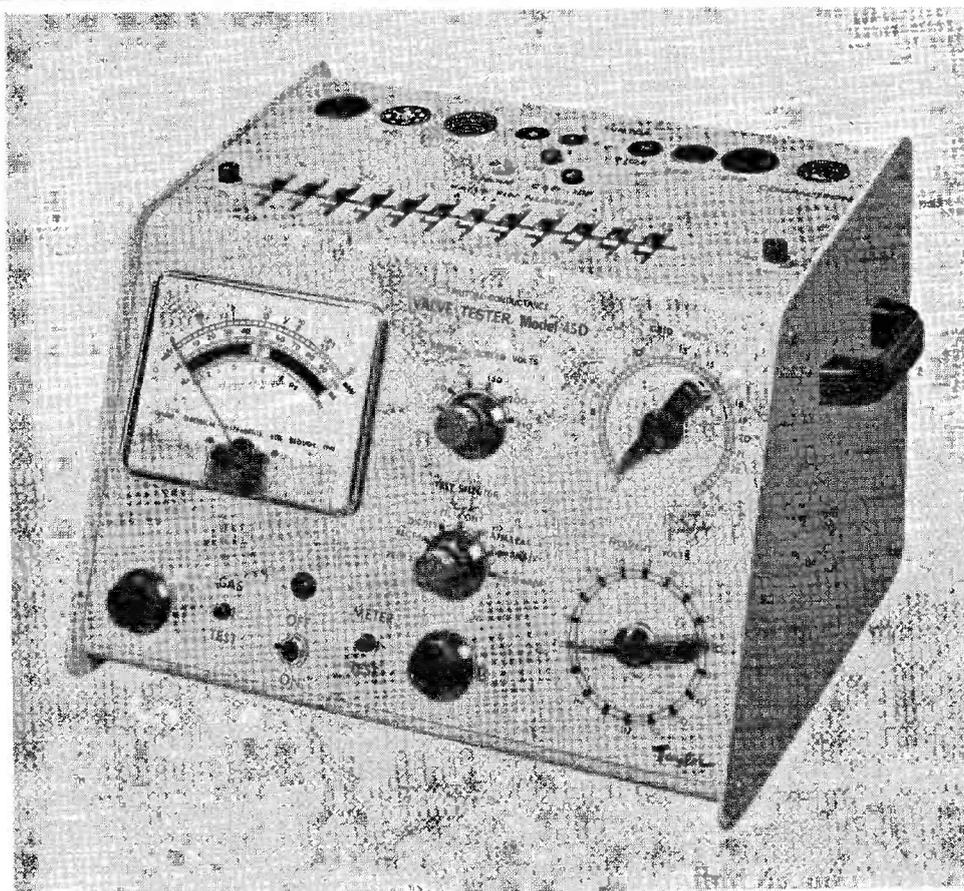
G3TIH/A, June 12 : Demonstration station, operating on 20 and 160 metres, at the St. Thomas' Church Garden Party, Garretts Green, Birmingham. QSL address: A. A. Bickers, G3TIH, Garretts Green Lane, Birmingham, 26.

GB3MAA, June 26 : The Marconi Apprentice Association will demonstrate Amateur Radio to the public on the occasion of the Annual Gala of The Marconi Company, at Chelmsford. Operated by G3OCM, G3RHU, G3RTF, G3SXX and G3TJK, all bands will be worked, including two and four metres. A special card is being minted to confirm all contacts. QSL address: G3SXX, South Holt, Danbury, Essex.

GB3RCS, June 25-27 : During the annual Royal

Signals reunion at Catterick Camp, the Hq. station of the Royal Signals Amateur Radio Society will be on the air daily, 0800-2200z, with simultaneous operation on all bands as operators serve and conditions allow, using 20m. as the main working channel for GB3RCS. QSL to : Royal Signals A.R.S., c/o 2 Sqdn., 8th Signal Regiment, Catterick Camp, Yorkshire.

GB2YC, July 5-10 : Operated by members of the Yeovil Amateur Radio Club (G3CMH is their own callsign) as a contribution to the local Youth Centre Exhibition to introduce young people to the various activities in the district in which they can take part. It is also hoped that this effort will enthuse and encourage adult specialists in various fields to give more time to helping the young. GB2YC will be on the air daily, 0900-2100z, on all bands 10-160m., in the AM/CW/SSB modes. Those interested can arrange schedule QSO's, which would be most welcome, by getting in touch with : D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.



The new Taylor Model 45D Valve Tester has ten bases, enabling tests to be carried on all the latest types of valve. Special care has been given to the problem of clear indication on the meter. The instrument includes a remarkable chart which gives the test data for some 7,000 different valve types, in British, American, Continental and Russian makes.

"GENERATOR FOR ACCURATE NOISE MEASUREMENT"

The author of this article, G8AFL, in the March issue, asks us to point out that the expression for Noise Factor, equation (1) on p.12, should have been given as:

$$F \text{ (dB)} = 10 \log_{10} (20 \text{ Id.Rs})$$

and not as written. He apologises for the error.

INFORMATION ABOUT EXHIBITIONS

To nobody's surprise, this year's Radio Show (the "'65 Show," so called) announced for August, has been cancelled. The reason given is that many of the largest radio manufacturing firms would not support it, apparently on the grounds that it was likely to degenerate into one long pop-music session. (Oddly enough, an echo of what was said in the *Magazine* some years ago on that very topic.)

However, this does not in any way affect our International Radio Communications Exhibition (as the Amateur Radio Show each year is now known) which will take place, during October 27-30, at the Seymour Hall, London, W.1, as last year.

And shortly before that, on Sunday, October 10, the newly-constituted "Northern Radio Societies Association"—formed from about a dozen of the stronger radio clubs in the Cheshire-Lancashire area—will take over Belle Vue, Manchester, for a comprehensive Amateur Radio exhibition, with a long programme of events to interest everybody. This is an enterprising venture, about which we shall be publishing further details later on.

THE POSTAGE INCREASES

It now costs us 6d. to post a copy of SHORT WAVE MAGAZINE to a U.K. address. Our general postage bill, which includes distribution of the *Magazine* in bulk quantities for bookstalls and newsagents, and already very heavy, will be increased by about one-third, costing us several hundreds of pounds a year more—just like that. This punitive increase is imposed by the P.M.G. with the bland suggestion that it be "absorbed."! And it is not even as if the service were any better—in the experience and considered opinion of all large users of the mails (as distinct from those who post an occasional letter, and never look at a postmark) things are rather worse now than they were when the last increases were slapped on, in October 1961 and April 1963. They are much worse than they were in 1938!

In view of all this, we would again remind our direct subscribers, who receive the *Magazine* by post, that in any instance of late or delayed delivery, they should complain immediately to their local head postmaster, with the wrapper, and demand an explanation. The despatch postmark will always be dated the day before publication, and subscribers may be assured that despatch is effected early that day, in good time under the G.P.O.'s own rules for next-day delivery in the U.K. This matter of prompt despatch is watched carefully every month—by our

printers, the main Post Office to which bulk deliveries are made, and by ourselves. It is fair to say, that no blame can attach at the sending end.

SMALL ADVERTISEMENTS—NEW LOOK

The volume of Reader small advertisements we are now carrying has made it desirable to try to find some more economical way of presenting them, so as to save on space. The type-face normally used for the body of SHORT WAVE MAGAZINE is *Times*, in all its variations. However, to attain some space-saving, at the suggestion of our printers the Small Advertisement section is now being set in *Corona 7pt.*—and readers may agree that the result is not unpleasing.

Rates remain unchanged at 3d. a word, minimum charge 5s., for Readers' private advertising (Trade 9d. a word, minimum 12s.) and we hope that this section will continue to give the sort of results indicated by the following quote: "Pse pass my thanks to the Readers' Advert. Dept. for the fantastic response to my ad. in the April issue of the *Magazine.*" (G3LNK, Formby, Lincs.)

SHORT AND TO THE POINT

Our acceptable address for all feature articles and anything requiring Editorial attention is now simply **Short Wave Magazine, Buckingham**—this will reach us from anywhere in the world if you just add **England**. It is only a coincidence that the blessed word *ham* occurs in this address!

CONTEST RESULTS

Each year, the Grafton Radio Society—one of the stronger London club groups—puts on a Top Band contest of its own. In the members' section, the first three were G3SIL, G3ONS and G3RPB, the latter also getting the award for the highest CW score. In the open section, the leaders were G3HS, G3ERN and G3TIR; the best CW score was made by G3HS, and on Phone by G3SWC. Grafton runs its own station, G3AFT, and the hon. secretary is A. E. Bristow, 37 Tyndale Mansions, Upper Street, London, N.1.

SYMPOSIUM ON AMATEUR RADIO

Over the weekend September 11-12, a course for youth leaders and teachers in Nottinghamshire is being held at the Residential Youth Centre, Ollerton, Notts. The subject is to be Amateur Radio, and parallel with it will be a lecture-course for licensed amateurs—though the subjects selected for this sound a bit dreary—the idea being to communicate the enthusiasm and expertise of established AT-station operators to the beginner side, who will also have lectures and demonstrations. The effort is being organised by the Newark & District Amateur Radio Society, in collaboration with the County authority. The idea is a good one, and deserves to be successful.

VHF BANDS

A. J. DEVON

THE birthday of your A.J.D. was mildly celebrated by a slight uplift in conditions—at least, that's what most reports say about the period around May 10-12, when the Wx looked as if it might stabilise under the large anti-cyclone covering most of the U.K. and the Channel area. However, though some good GDX was worked on two metres, and there were EU's getting across, the condition did not last. Since then, things have been rather quiet on the two-metre band.

Not so four metres. The RSGB's contest over the May 15-16 weekend brought on quite a high level of activity, as this month's claims for that band show. Several of our correspondents maintain that there is now more doing on 70 mc than on 144 mc—but your A.J.D. suggests that this probably depends on where you are, and which Band I TV channel is in local use. Anyway, on this particular point G8VN (Leicester) lists about twenty 4m. stations, several of them /M's, which he has been finding to work on Sunday mornings.

EDX by MS Again

EA4AO (Madrid) sends full details of his *Lyrids* contact with G5YV (as mentioned last month) and gives his frequency for these operations as 144.102 mc—he will be there whenever a meteor shower opportunity presents itself. According to our gen. sheet, the

next look like being the *Aquarids*, July 26-31, and the well-known *Perseids*, often in the past the propagator of good EDX contacts, during August 10-14. There are some lesser showers scheduled for dates in between, but these are the reliable ones—and we may be sure that the MS boys will be fixing their skeds accordingly.

Which brings us to G5YV (Leeds), who got his 26th country by working UR2CQ on May 5, using the shower known as the *May Aquarids*; the contact was at 0130z, reports exchanged being S25/S26, with S9-pings at times. Harold also reports that UR2CQ would like to arrange MS schedules with other EU's interested in this sort of work. Another such is UP2ON, who worked YU1EXY during the May appearance — incidentally, and quite off the MS point, EA4AO and G6AG may be interested to know that UP2ON heard them both through *Oscar III*.

G5YV passes on a most remarkable report from SV1AB (Athens), to the effect that "some time last September" beacon GB3VHF was heard out there. Harold has MS skeds with him for the July period, and also for the much less dense *Scorpiids* due during June 2-17. SV1AB, using a high-gain beam directed on the U.K. and with 150w. input on 144.70 mc, is putting out auto-CW (*de SV1AB*) every evening for the half-hour 2100-2130z. This is worth listening for, as it would be quite something to hear SV1AB in the U.K. by any propagation mode.

The Tabular Matter

The position at the top of Countries Worked, with three active and representative EDX operators each on 26C, is very interesting. The loose ones between them are GD, LZ and YU, and to move out into the hot seat, each must get the one of these that he needs.

UP2ON, a very keen VHF /EDX man who made several good contacts using *Oscar III*, moves to 24C and, by special request, UR2CQ comes in at 15C. It should perhaps be explained

that—just for the fun of it and so as not to offend susceptibilities—we do allow these chaps on the other side of the Curtain to claim DM (Eastern Germany) as a separate country—but that is not so for other Europeans. Irrational, you may say, but could Solomon have given a better judgement in view of the political situation between East and West as affect-

TWO METRES

COUNTIES WORKED SINCE
SEPTEMBER 1, 1964

Starting Figure, 14

From Home QTH only

Worked	Station
53	G3EDD
52	G3SAR
47	G3HRH
40	G2AXI, G2BJY
38	G3AHB, G3CO, G3LAS
37	G3OWA
36	G3FNM
35	G3TLB
34	G3GWL, G3TNO
33	G2CDX
32	G3PSL
31	G3FLJ
30	G3KWH
29	G3PTM, G4LU
28	G3JHM/A
27	G3TKQ
26	G5UM
25	G3SML, G13SLI
23	G3THC, G8VN
22	G3SXX
21	G2BDX
20	G3KQF
19	G3IOE
18	G3GSO
17	G3CKQ
14	G5FK, GW3CBY

This annual Counties Worked Table will run till August 31, 1965. All two-metre operators who work 14 or more Counties on the band are eligible for entry. QSL cards or other proofs are not required. After the first 14 worked, simply claim from time to time with counties as they accrue, giving call sign and date for the county worked. To keep the Table up-to-date, claims should be made at frequent intervals. Operators new to VHF are particularly invited to join Annual Counties.

ing DL/DM! (Perhaps we ought not to allow the Russian side to claim DL, but think of the turmoil *that* could set off!)

In the Three-Band Annual, becoming more interesting every month, G3BNL has nudged G3EDD out of the lead, having added no less than 26 points since last time, suggesting a high level of activity from Keyworth, Notts.—indeed, G3BNL has gained points on all three bands. G3EDD picked up his 11 additional pts. on four metres. There are also some good movements further down this table, with two new entrants, G3SKR (77) and G3TKQ (50).

Some DX-Peditions

For the fortnight from July 3, G6AU (*QTHR*) will be operating /P and /M on four metres from Dartmoor and round about; he should be a good contact for Devon, and possibly Cornwall.

At about the same time, July 4-18, "various rare Scottish Counties" will be visited, this time on two metres, by G3PZE and G3PZJ, signing GM3PZE/P on frequencies in the appropriate zone, and offering to arrange skeds. Both are from Luton, Beds. and are *QTHR*.

G3AMM (Scunthorpe) writes that he was interested to see about the /M, /P visits to Ireland by G3BHT and G3JHM—because he will be over there the fortnight immediately following, August 4-18; using 145.548 mc only, he will sign EI5AX/M and GI3AMM /M. The dates work out in such a way that, between them, these three explorers cover the whole period July 8-August 18! (The other two are to operate on four metres—see p.172, May.)

Notes on

23 Centimetres

G2CIW (Birmingham) is working G3BNL (Keyworth, Notts.) regularly over their 50-mile path, but Jack says tests with G3GWL and G3KEF have so far proved abortive.

G3BNL himself also writes on the same topic—he now joins the very select "operating-four-VHF-band" club—and gives some

further details; his Tx frequency is 1296.82 mc, with 54 watts input and a paraboloid. In addition to G2CIW, he can get over to G3NBQ (Coventry) and says he would welcome test arrangements with anyone else interested. G3BNL is on most evenings after 8 o'clock. (*QTHR*.)

On Frequency Measuring

G4LU (Oswestry) has been applying himself to the absorbing problem of really accurate frequency measurement. The first approach was to set the xtal calibrator against the MSF signal on 5 mc and check off the resultant beats with GB3VHF against an audio oscillator; one disadvantage found with this method is that as the frequencies come spot-on, the beat output is low in the audio pass-band.

His alternative method is to off-set the calibrator by 25 c.p.s. each side of zero with MSF (determined on a 'scope by Lissajous figures against mains

frequency) then taking the mean of the two beats on the 2m. Rx. This seems just as accurate as the first method, and gives very nice beats.

Incidentally, these researches have disclosed some interesting facts about the GB3VHF signal. Stan says it shows hour-to-hour fluctuations of 10-20 c.p.s.—really not very much, having regard to the fundamental frequency—and during that warm weather we had for a few days a while back, there was a daily drift of 30 c.p.s.—which nobody could call serious. The thing is to be able to detect it!

On 70 Centimetres

G3AHB (Slough) reports himself as now active on this band, looking for QSO's in all directions and asking for skeds (*QTHR*). He has a 10-ele "Skybeam," shortly to be joined in stack by another, and runs 35w. to a QV03-20A.

Also with the same sort of PA for 70 cm. is G8AAY (Poole, Dorset) whose beam is a 12-ele stack at 35ft., and the Rx a

THREE-BAND ANNUAL VHF TABLE

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3BNL	29	3	41	11	19	4	107
G3EDD	15	2	53	13	17	2	102
G3OWA	31	4	37	8	—	—	80
G3HRH	15	2	47	9	5	1	79
G3SKR	48	5	19	5	—	—	77
G2BJY	27	2	40	5	—	—	74
G2AXI	22	3	40	8	—	—	73
G3FIJ	21	2	31	6	9	3	72
G3LAS	14	2	38	11	—	—	65
G5UM	16	2	27	3	12	3	63
G2CIW	—	—	17	5	26	7	55
G3EKP	17	5	20	5	3	1	51
G3TKQ	12	1	27	6	2	2	50
G3TLB	—	—	35	6	—	—	41
G3OHH	28	5	—	—	—	—	33
G3HWR	14	3	6	1	7	1	32
G5FK	12	1	14	1	3	1	32
G2DHV	9	1	12	1	1	1	25

Scores are since September 1st, 1964, and will accrue until August 31st this year. Position is shown by last-column total, as aggregate of all scores. Own county and country score as one each. Entries may be made for a single band, any two, or all three. Claims should be sent in as often as possible to keep the table up-to-date. New entries can be made at any time.

G3BKQ-type converter having an A.2521 pre-amp., with IF tuning over 16.2-18.2 mc on an AR88D. His site is not a good one, but G8AAY has worked G3MPS at 50 miles, and during that brief opening earlier in the period he heard F3YY—so the equipment is functioning all right.

Four-Metre Notes

And now on to a much busier band. G3EKP (Nr. Blackburn) has a 5-ele Yagi for 4 metres, and is getting out much better, with strong signals from most GDY directions. He comments on that new and rather irritating phenomenon—the B.44 users who have not modified the Rx side to be tunable, and hence can only be raised by calling on the right frequency.

G8VN is a /M specialist on 70 mc, using Beacon Hill in Leics. of a Sunday morning for his operations. With only 4 watts and a quarter-wave whip on the car, numerous fixed and portable mobile stations have been worked, with G3NDF in Surrey as best DX; another nice QSO was with G3DEF/M above Broadway, giving RS-57 both ways. His Rx for 4m./M is the front-end of a Pye PTC.112, which is xtal-controlled, feeding out at 13.98 mc into an EC-10. G3IUD (Wilmslow, Ches.) reports working G13CDF/P and GW3RUF/P for new counties, and G3LAS (Berkhamsted) would like skeds with any 4-metre station in Devon, Cornwall and Scotland; he has a new SSB rig for 2/4m. about ready to go, and lately was in a little TVI trouble on Ch.9.

Much the same problem of TVI at GC3OBM (Guernsey), who has now got to 20C on 4m., with G3ENY/A a very good one for Shropshire.

G3EDD was there for the contest, but Brian says he is not very happy about four metres, in the sense that with him signals always seem to be a good deal weaker than they ought to be by comparison with two metres. He wonders if everyone else is using polarisation different from him—G3EDD is horizontal in this particular sense!

G13HXV (Belfast) was glad to catch the GW3RUF/P party on



As reported in recent issues, G6AG — C. J. McClelland, Four Elements, 12 Garners Road, Chalfont St. Peter, Bucks.—did very well during the "Oscar III" manifestation. Holding one of the special VHF licences, Mac runs a one-kilowatt transmitter on two metres, with a pair of QY3-125's in the PA, driven by a QOV06-40A. The Rx set-up is an E88CC cascode converter into an AR88D tuning 24-26 mc, and the aerial is an 8-over-8 J-Beam at 50ft., with a good take-off in all directions. Professionally, G6AG is chief engineer of the Airborne Telecommunications Laboratory at Ultra Electronics, Ltd., Western Avenue, London, W.3.

Snowdon, for a nice 4-metre contact, and says that GI activity on 70 mc is now such that all six counties of Ulster can be covered—though a lot of the GI boys are yet to have a 'cross-water QSO on 4m.

G2BJY (Walsall) also mentions GW3RUF/P, and says he is *not* satisfied that TVI is a valid reason for avoiding 70 mc—he has found that reducing input from 30w. to about 8 watts or so will practically eliminate it with either A1 or A3. He is all for people trying to get round this problem and remarks, quite rightly, that "a weak CW signal is better than no signal at all."

Two Metres

The correspondence for this band is mainly claims for the tabular matter—and this time we have got the 2m. Annual in again. Writing for the Cornish VHF Group, G3XC (*QTHR*), shows that there are now five of them regularly active down there, and constituted as a separate body within the local club. They hope to take regular part in all the VHF goings-on—for instance, they went out with G2BHW/P and G3XC/P for the recent contests—and very much hope that any VHF-type visiting on holiday will make contact. Their next meeting is on June 17, 7.30 p.m. at the

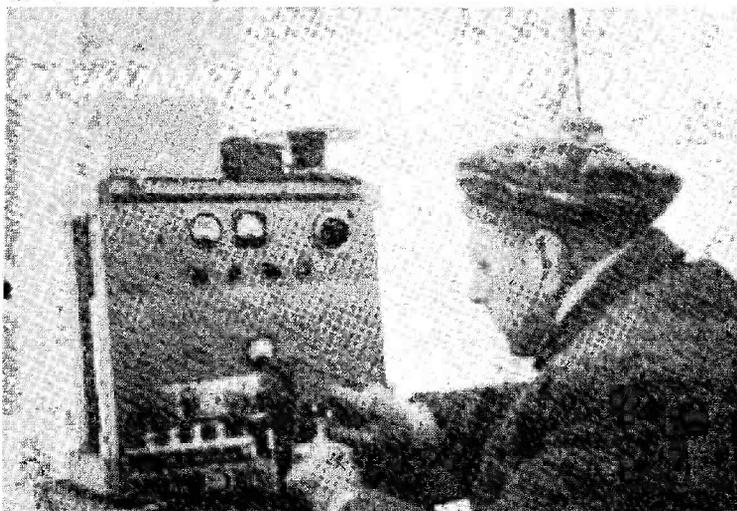
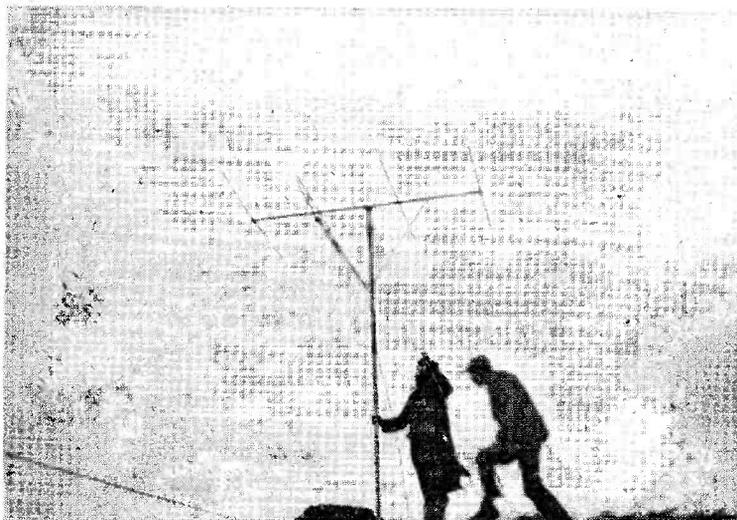
Coach and Horses, Pydler Street, Truro, and any new faces will be made most welcome.

G3AOS (Hale Barns, Ches.) is on 2-metre SSB and may have his QRO linear at full puff by the time this appears; it should make Geoff a potent force on the band, and he has always been a very effective AM signal. Talking of SSB on two metres, the next letter on the pile is from a more distant

follower of this piece—WA2WOR (New York), who is running a 44-ele Yagi with a QRP Tx. And in the EDX context, DL2BJ writes that over there 2m. activity is on the increase; their club station, DL2VR, has a 90w. Tx with an 8/8 beam, and they look for U.K. contacts.

And so to conclude: It is intended to bring out all the tables as time goes on, so keep your

scores up-to-date. And whether or not we strike it lucky with old-man Condx. during the next few weeks, send all your VHF news to: A. J. Devon, Editorial Dept., Short Wave Magazine, Buckingham, by **June 18** latest for the next issue. Have a good Whitsun—73 de A.J.D.



Above, the four-element beam for 70 mc, being erected by G2DQX and G3STT. Below, G2CUZ, in what he calls his "/P bonnet" with the two-metre gear. The occasion was the Ainsdale Radio Club's Easter VHF outing into Westmorland, for which they had to endure very cold and windy weather, turning to storm conditions in the afternoon, with a high noise-level. This meant that all their GDX skeds were lost, as only the strongest signals could be read through the QRN. The total bag was, for G2DQX/P on 4 metres, 19 contacts; and for G2CUZ/P on two metres, 9 QSO's. But in spite of the difficulties they enjoyed themselves, and will be having another go later on.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

- 26 ON4FG (DL, EA, EI, F, G, GC, GI, GM, GW, HB, HG, LA, LX, LZ, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UR, YU)
- 26 G3LTF (DL, EA, EI, F, G, GC, GD, GI, GM, GW, HB, HG, LA, LX, LZ, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UR)
- 26 G5YV (DL, EA, EI, F, G, GC, GD, GI, GM, GW, HB, HG, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UR, YU)
- 25 UA1DZ (DL, DM, G, HB, HG, LA, LZ, OE, OH, OH0, OK, ON, OZ, PA, SM, SP, UA, UB, UC, UO, UP, UQ, UR, YO, YU)
- 24 UP2ON
- 21 G3HBW
- 20 G3CCH
- 19 OK2WCG
- 18 G2JF, G6NB, ON4BZ
- 16 G3BA, G3BLP, G3CO, G3GHO, G3KEQ, G5MA, G6RH, G6XM, PA0FB
- 15 G2CIW, G2XV, G3AYC, G3DKF, G3EDD, G3FZL, G3HRH, G3RMB, G4MW, GM3EGW, UR2CQ
- 14 G2FJR, G2HDZ, G3AOX, G3FAN, G3HAZ, G3IQO, G3JWQ, G3KPT, G3LAS, G3NUE, G3PBV, G3SAR, G3WS, G4LU, G5BD, G5DS, G6LI, G8OU
- 13 G2HIF, G2HOP, G3AOS, G3DMU, G3DVK, G3EDD, G3EHY, G3GPT, G3GWL, G3IIT, G3LHA, G3NNG, G3OHD, G3PSL, G6XX, G8VZ
- 12 EI2A, EI2W, F8MX, G2BJY, G2CDX, G3BNC, G3GFD, G3GHI, G3JAM, G3JLA, G3JXN, G3OBD, G3PTM, G3WW, G5CP, G5JU, G5ML, G8DR, GW2HIY, GW3MFY
- 11 G2AJ, G2AXI, G2CZS, G3ABA, G3AHB, G3BDO, G3BOC, G3PLJ, G3GSO, G3IUD, G3JHM/A, G3JYP, G3JZN, G3KUH, G4RO, G4SA, G5UD, G6XA, GC2FZC, OK1VR, PA0VDZ
- 10 G2AHP, G2FQP, G3BK, G3DLU, G3GSE, G3KQF, G3LAR, G3LRP, G3LTN, G3MED, G3OSA, G3RTF, G3XD/A, G5MR, G5TN, G5UM, G8IC, GW3ATM, GW5MQ
- 9 G2BHN, G2DHV, G2DVD, G2FCL, G3BOC, G3BYI, G3FUR, G3OJY, G3OWA, G3SXX, G4LX, G8GP, GC3EBK, G3ONF, GM3DIQ, GM3LDU
- 8 G2BDX, G2DDD, G2XC G3AEP, G3AGS, G3CCA, G3EKK, G3FNM, G3GBO, G3HCU, G3HWJ, G3KHA, G3PKT, G3MPS, G3VM, G5BM, G5BY, G8SB, GM3JFG

ELECTRONIC DOTS AND MANUAL DASHES

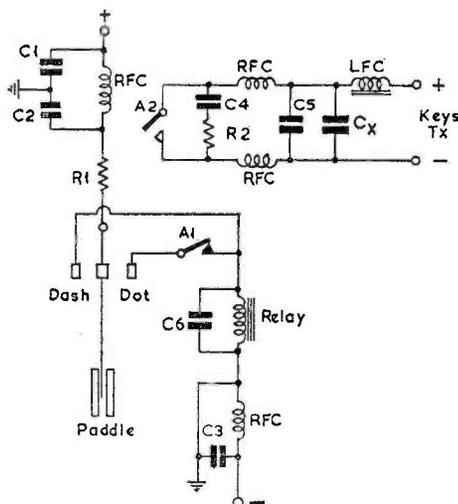
AUTOMATIC MORSE KEY

It is suggested that the simple key shown will be found to compare very favourably with the commercial mechanical bug. However, very severe TV interference can be caused by electronic keys. The instrument described here, the full circuit of which is given in the diagram, is completely free of this trouble. Without the key-filter elements, C4, R2, RFC, C5, Cx and LFC serious interference would be caused and, further, the key clicks and thumps might be heavy.

It is probable that few amateurs realise the importance of correct key-click filtering. With this key a suitable click filter and supply leads filtering must be used, as shown in the diagram.

If monitoring is required (a "must" in the case of bug keys), then this filter is the minimum that should be fitted, to all keys—straight or bug—where cathode or plate keying is employed.

The instrument can be built on a small chassis, and all parts except the paddle and LFC are mounted below chassis, with the paddle and audio choke on top. The chassis is fitted in a small box, and the box is slotted over the top of the paddle, for easy access and adjustment of the key, with a



The keyer discussed in the article. Condensers C1-C5 are all .001 μ F; C6 is 2 μ F; the value of Cx depends upon several factors — see text. R1 is 10,000 ohms for a 240v. DC supply and a relay of 10,000 ohms; R2 is 100 ohms. All RF chokes are standard 2.5 mH. C6 can be varied (by switching) from 0.5-2 μ F to change the dot speed. LFC is a 30-Hy. choke and the relay should be a G.P.O. type having one set of contacts closed (A1) and one pair open (A2) in the "rest" position.

hole cut in the end of the box to allow the paddle handle to protrude.

It will be noted that with this type of key, as compared with the mechanical bug, paddle construction is very simple, because no "ditherer" is necessary. The dots are produced electronically by the action of the circuit. Dashes are made manually, as with a Vibroplex type of key.

Actual paddle construction is a matter of individual mechanical ingenuity—all that is required being a springy arm moving between the two fixed contacts.

Adjustment

A 30-Henry choke is used in the main keying lead, and this will be found ample to cover a wide range of keyed stages, from PA to buffer amplifiers. LFC will be large, possibly the full 30 Henry, in the case of a stage taking small current. However, the inductance can be reduced by shunting the choke with a 10K-20K resistor if considerable current is to be keyed.

The value of Cx likewise will depend on the current keyed, and will be between 0.1 and 2 μ F. The network C4, R2, C5, Cx and LFC will affect the quality of the note, and it is possible to make the note sound "hard," "soft" or chirpy.

Anyone who has been using a straight key, or "pump-handle," will find this an easier and better way of sending Morse. After getting the hang of its manipulation, there will not be much likelihood of returning to the old pump-handle. Power supply requirements are very small and 240-300 volts at low current will suffice.

Editorial Note: This article is based upon a design originally suggested by G8RQ. It will give very pleasing results for the CW operator.



"... Dad wants to know if it's OK for him to go up to the shack now—pse Ma..."

NEW QTH's

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

- G3EJZ**, J. W. Cobb, 109 Birch Hall Lane, Manchester, 13. (*Re-issue.*)
- G3JGE/A**, V. Owen, 235 (1st Stoke-on-Trent) Sqdn. A.T.C., T.A. Centre, Cobridge, Stoke-on-Trent, Staffs.
- G3OQC/A**, J. W. Woods (*ex-VS6FA/VSIMA*), 23 A.M.Q., Langtoft, Market Deeping, Lincs.
- G3TOV**, G. P. Miles, 50 Chaddesden Lane, Chaddesden, Derby.
- G3TYE**, I. Barton, 23 Moss Side, Liverpool, 14.
- G3TZB**, J. M. McKinney, 13 Belmont Church Road, Belfast, 4.
- G3TZO**, P. J. Holland, 19 Kingsley Road, Gt. Boughton, Chester.
- G3UAO**, A. L. Gilham, 13 Kingsway Gardens, Westville, Hucknall, Notts.
- G3UAZ**, E. A. Sweetman, 2 Manor Crescent, Stapleton, Leics. (*Tel. Earl Shilton 2008.*)
- G3UBE**, F. H. Gill, 67 Pottinger Street, Ashton-under-Lyne, Lancs.
- G3UBG**, Amateur Radio Club, Blake County Secondary Boys' School, Marston Road, Hednesford, Staffs.
- G3UBI**, M. J. Fisher, 64 Caldene Avenue, Mytholmroyd, Halifax, Yorkshire. (*Tel. Calder Valley 3166.*)
- GW3UBV**, D. R. Roberts, 33 St. Martin's Park, Haverfordwest, Pems.
- GW3UCB**, Amateur Radio Society, Dept. of Electronic Engineering, School of Engineering Science, University College of North Wales, Dean Street, Bangor, Caerns.
- GM3UCF**, A. Passmore, 26 Ravenshill Road, Thurso, Caithness.
- GM3UCH**, (*name?*). 46 Braemar Drive, Falkirk, Stirlingshire.
- G3UCN**, F. J. Hetherington, 11 Woodland Way, Chasetown, Walsall, Staffs.
- G3UCR**, W. R. Byrom, 54A Chapel Road, Tadworth, Surrey.
- G3UCS**, N. Smith, 54 Clopton Road, Stratford-on-Avon, Warks.
- G3UDE**, N. W. Roberts, Preshute House, Marlborough, Wilts.
- G3UDK**, C. J. R. Oliver, 8 Woodthorpe Park Drive, Sandal, Wakefield, Yorkshire.
- G3UDO**, A. S. Barraclough, 115 Northway Road, Addiscombe, Croydon, Surrey.
- G3UDZ**, G. L. Bolton, Pelynt House, Lancaster Lane, Leyland, Preston, Lancs. (*Tel. Leyland 21320.*)
- G3UEC**, N. Stanley, 3 Palmer Grove, Bare, Morecambe, Lancs.
- G3UEL**, Amateur Radio Club, c/o Sports and Social Club, Ultra Electronics Ltd., Western Avenue, Acton, London, W.3.
- G3UFA**, T. W. Gladwin, 99 Warren Way, Digswell, Welwyn, Herts.
- GM8AHP**, A. Wang, 66 St. Andrew's Drive Glasgow S.1. (*Tel. IBROX 0298.*)
- G8AHQ**, R. B. Porter, 11 Cranmore Avenue, Crosby, Liverpool, 23.

CHANGE OF ADDRESS

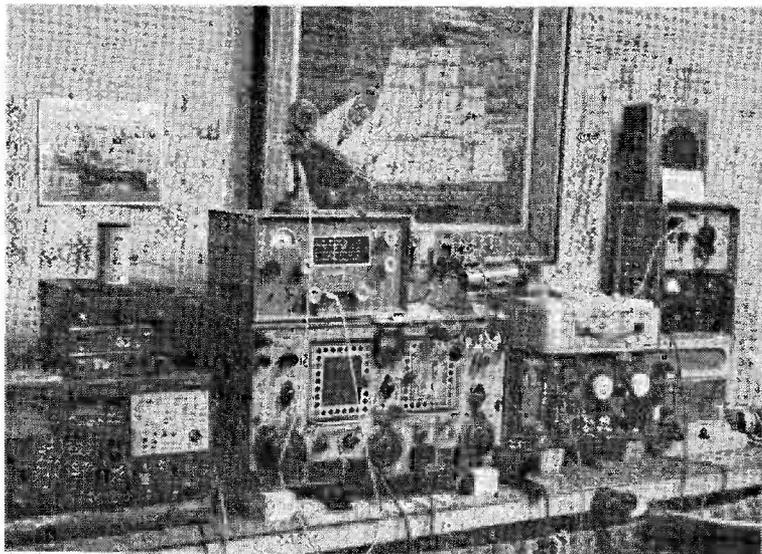
- G3ASG**, R. F. Fautley, 13 Gaskyns Close, Rudgwick, Horsham, Sussex.
- G3ATH**, H. Pain, (*9M4MT*), 6 Granville Street, Skipton, Yorkshire.
- G3CZA**, W. B. S. Marsters, 6 Barton Road, Ely, Cambs.
- G3DD**, D. A. G. Edwards, Selwyn House, 33 Ladywood Road, Sutton Coldfield, Warks.
- G3GIO**, D. O'Connor, Gatton, 26 Nightingale Road, Guildford, Surrey.
- G3GPX**, P. J. Bartram, Kimand, Warren Lane, Elmswell, Bury St. Edmunds, Suffolk.
- GW3GRY**, F. L. Wiseman (*ex-G13GRY*), 17 Wynn Avenue, Old Colwyn, Denbighshire.
- G3IFB**, F. H. Bliss, 49 Dovers Park, Bathford, Bath, Somerset.
- G3ISV**, F. H. Lindsey, 3 Orchard Road, Redcar, Yorkshire.
- G3JAP**, E. J. Andrews, 56 Windsor Road, Swindon, Wilts.
- G3JHI**, R. L. S. Hathaway, A.F.C. (*ex-VSIMC/9M4MC*), R.A.F. Liaison Office, R.A.F. Chicksands, Shefford, Beds.
- G3LNO**, P. H. Hawkes, Midway, Monks Kirby, Rugby, Warks.
- G3MZS**, R. K. Flaherty, c/o Rose Cottage, Cuttle Bridge, Swarkestone, Derby.
- G3NOR**, R. P. D. Ryder, Durnsford House, Mildenhall, Marlborough, Wilts.
- G3NRW**, A. I. H. Wade, Berries, Spring Elms Lane, Little Baddow, Essex.
- G3OFW**, A. C. Blake (*ex-ZC4TB*), 19 Segsbury Grove, Harmanwater, Bracknell, Berkshire.
- G3OXP**, M. H. M. Chamberlain, 11 Fernhill Close, Hawley, Camberley, Surrey.
- G3PLL**, (*ex-G13PLL*) abroad. *Pse QSL via C. A. Moore*, 5 Agate Road, Clacton-on-Sea, Essex.
- G3RSB**, R. Scaife, 16 Headlands Drive, Hessele, Yorkshire, E.R.
- G3RYV**, P. R. Cox, 38 Ridgeway Crescent, Tonbridge, Kent.
- G3RZB**, E. J. Matthews, 29 Spencer Street, Carlisle, Cumberland.
- G3RZP**, P. E. Chadwick, 121 Lady Lane, Chelmsford, Essex. (*Tel. Chelmsford 2700.*)
- G3SQH**, A. D. Reffold, 33 New Road, Hedon, Hull, Yorkshire, E.R.
- G3SKN**, Amateur Radio Club, R.A.F. Station, Newton, Notts.
- GW3SYJ**, R. I. Taylor, 51 Edward VII Avenue, Newport, Mon.
- G3TXH**, B. G. Levett, 71A Sutton Common Road, Sutton, Surrey.
- G5GJ**, F. W. Benson, M.B.E., A.M.I.E.R.E., Assoc.I.E.E., Jahra, Westlands Way, Leven, Hull, Yorkshire, E.R.

AMENDMENT

- G3LNK**, C. J. Bourne, 38 Ashcroft Road, Formby, Lancs.

THE OTHER MAN'S STATION

G3TUV



THIS time, it is a bit unusual—the station of Jack Philip-Nichols, G3TUV, R.N. (retd.), of The Old Ship, Halford Road, Ickenham, Middlesex, who says he first put on a pair of headphones in 1921, and has been at it in one way or another ever since.

He describes G3TUV as a “museum-type station” and says that, being a great believer in gear built like a battleship, he tends to buy it by weight! The only pieces of really modern equipment he possesses are mainly out of action, allegedly because of their generally skimpy proportions. Weight and size are undoubtedly of considerable importance to G3TUV, as by voice-power alone he has damaged beyond repair four crystal microphones and one moving-coil type—the only mike that will stand up to his voice is the Army Mk.IV, which is a real hefty job.

Main working items are a No. 12 Set (120 lbs.) as transmitter and 19 Set as receiver, which do keep the station in continuous operation. Telephony working has become an interest only recently, G3TUV having been nurtured and brought up on the key. He looks upon radio, and in particular Amateur Radio, primarily as a means of communication, and the type of contact he likes best is a long yarn over the air with some old ship-mate. So far as he knows, he creates no interference; in that happy state he intends just to go on communicating, and will not join in any of those QSO-parties in which the main object is to discuss who has got the latest super-salesman-type gear.

G3TUV apologises for not making his station look like an Electricity Board switch-room or the crew's rest-room on an American submarine! He says he has seen plenty of stations that have been prettied up specially to have their picture taken. The G3TUV you see here is the station as you would find it at any time.

And so we leave him to the dust, dead flies and rusty nails which, he says, lurk behind his panels—so long as he gets out with a respectable signal, what does it matter! (Well, we said earlier on that it would be a bit unusual this month, and it is all as G3TUV has told it to us.)

WHEN STICKING UP A MAST OR TOWER

—Remember that you can be made subject to the Town and Country Planning Act of 1962. The provisions of this are drawn so wide that while in one district a lattice tower could be put up to 60 or even 100ft. with no more than formal permission being required from the local council (and readily granted) in another area you might have to go through the palaver of a public inquiry to have a stub mast on your chimney stack. There are authenticated cases of amateur aerial masts, towers, etc. being up for years until somebody from the Council got round to calling to say “You can't do it—take it down, or else.” All such cases should be vigorously contested, to the point of demanding Ministerial inquiry. Since this costs time and money, it may sometimes be as well to contend that all you want is an outside erection for better TV reception—for if it's anything to do with TV, the official Council opposition tends to scratch its head, and collapse. Good reception of TV is something everyone can understand and sympathise with, especially in a location in any way difficult. If you intend to use your officially-approved TV mast to hold up one end of a trap-dipole for multi-band working, or to support a two-metre beam, that is entirely your own business. But it is as well to avoid TVI, and to get a copy of the Town & Country Planning Act, which should be on file with your local rating authority.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for Next Issue: Friday, June 11)

(Address all reports for this feature to "Club Secretary," Editorial Dept., SHORT WAVE MAGAZINE, Buckingham.)

SEVERAL very interesting and ambitious Club Publications have been received this month, and are commented upon in the course of this feature. Of course it takes a large club, with considerable resources and many willing helpers, to produce a really good monthly affair; but the humble news sheet, if carefully and *regularly* turned out, works wonders in holding a club together.

Members who tend to drift away from the meetings through a temporary lack of interest, provided they are on the mailing list, are not allowed to feel that they have really separated themselves from the club, and they usually experience a revival of enthusiasm and return to the fold.

A news sheet is nearly always self-supporting—club funds plus a *slight* surcharge on the subscription to cover postage will usually see to that. But the essential is to find a member, with both feet on the ground, who will take on the job and see it through.

One single sheet is better than nothing—especially if it gives full details of forthcoming meetings. Unfortunately, many of those we receive leave us completely in the dark in this respect, and devote the bulk of their space to reviews of *past* meetings. We feel that these are only of value to the members who don't turn up; but they would be equally so if they gave fuller particulars of the future instead of the past.

Search round among the members and find a "volunteer" who can be press-ganged into typing a couple of quarto sheets, if nothing more . . . we feel strongly that any club with a news sheet has established a slight one-upmanship on those who have not, as yet, published anything

ACTIVITY REPORTS

Bedford will be holding their usual "post-NFD discussion" on June 24, and on July 13 they have a talk on Transmitters. At present they meet twice monthly, with regular Morse classes and an accent on the social and technical sides, with operating "a trifle in the background;" more members would be welcomed.

Loughborough have their SWL Night on June 4, a Constructional Evening on the 18th, and their AGM on the 25th. Morse classes continue every Monday until further notice—Bleach Yard, Wards End, Loughborough. **Mid-Warwickshire** are paying a visit of some kind ("details later") on June 14,

and the next meeting, on the 28th, will be devoted to Members' Equipment. Their new Hq. at 7 Regent Grove, Leamington Spa, was officially opened by the Mayor of Leamington on May 10, and all future meetings will be held there.

Derby will be involved in NFD Preparations on June 9, and a D/F Practice Night on the 16th; on June 23 Mr. R. E. F. Street is giving An Introduction to Colour TV, and the 30th is booked for a non-radio subject—Problems of Effluent and its Treatment (Mr. G. D. Kelsey, B.Sc.). **Cray Valley** met on the day before publication (June 3) and their next occasion is on July 1, when G3MCG will be talking about Mobile VHF, at the Congregational Church Hall, Church Road, Eltham, S.E.9.

Northern Heights are running a demonstration station at Halifax Charity Gala on June 6, and another at Forest Cottage Gala on June 27. June 9 is the date of their visit to the Manchester Radio Society; the 17th is the first of three visits to Moor-side Edge BBC Transmitter, and the 24th is booked for yet another visit, to Wharfedale Loudspeakers; On July 1, still visiting, they go to Bradford Fire Brigade station.

Stade, at their meeting on June 11, will hear a replay of the tapes sent to them by the Catalpa A.R.S. of Birmingham, Mich., U.S.A. Several D/F dates are imminent, and the Wednesday evenings in the shack continue with a "new look," with Morse practice and a constructional project (a flying-spot scanner, which will be built "from scratch" in the shack).

Halifax (Newsletter No. 3) pay a visit on June 29 to the R.N.V.R. Communications Centre at Manor Buildings, Manor Row, Bradford (meet at the Beehive and Crosskeys, 7.30 p.m.) **Spen Valley** will be making a visit (to be announced) on June 10, and June 24 is their Open and Final meeting of the present session; the new session will open with the AGM on July 8.

West Kent have a Film Show booked for June 11, and their Audio Night ("Please show us your latest gear") for June 25; the July 9 meeting will be devoted to Seventy Cms., with a talk and demonstration. All at Culverden House, Tunbridge Wells, 7.30 p.m.

Crawley recently heard about the Shell Communications System from G3IDF, after which they visited Shell House. Scheduled for June 23 is the annual Members' Evening, when home-built equipment will be taken along and demonstrated.

Manchester have their usual full programme, with a talk on Procedure (G3ETU) on June 9, a "discussion and tidy-up" after NFD on the 16th, a talk on the RA-1 receiver (G3RTU) on the 23rd and an R.A.E. and CW Practice session on the 30th.

Stoke-on-Trent, at their recent AGM, elected their former secretary to the post of chairman; the new secretary is G3UBU (see panel for QTH). VHF contests and work for NFD are keeping the members busy; after these events, decorations to the clubroom will be started. **South London Mobile Club** will see a Slide Show by G3TSW on June 5, and will hold a general discussion on club matters on the 19th. Potential new members are asked to contact the secretary.

Newbury report a very successful meeting on the "Any Questions?" theme, the panel of experts including all members present! On May 28 they were due for a talk by G3JNQ on Receiver Construction, and a full programme has been arranged for the coming session. **Aldridge** say their membership is on the increase, and the subject for the next meeting (no date given, though) is "30 watts on the LF Bands" — aimed chiefly at those who will shortly be showing up with brand-new callsigns.

Surrey (Croydon) report the resignation of Syd Morley (G3FWR), who has been their secretary for so long that his name is the only one to appear on our file card for this club; his place has been taken by G3KGA (see panel for QTH), and we wish them both well. Club meetings will continue as before, on the second Tuesday at the Blacksmiths Arms, South End, Croydon.

Peterborough, at their May 7 meeting, heard about the thrills of chasing new stars rather than DX, Astronomy being the subject. Next lecture-date at Peterborough Technical College is June 4, but visitors are welcome at the Mill Clubroom on Friday evenings and Sunday mornings.

Reading will devote their June 26 meeting to the Design and Construction of VHF and UHF Equipment, and visitors from neighbouring clubs will be welcome; they will also be holding the first of their Mobile Picnics, on June 20, at the Childe Beale Trust Pavilion, Lower Basildon, near Pangbourne.

Cheshunt went out on their second annual Field Day on May 1, when GB3CRC made about 100 contacts, with 10 watts on Top Band and 15 watts on Eighty. The gear worked without a hitch (except for a stool which came apart!) and the whole affair was considered a great success. **Bromsgrove** will be holding their AGM on June 11 in the Co-operative Rooms, High Street, Bromsgrove, at 8 p.m. Plans are

going ahead for more outdoor and social events during the summer, and on June 26 there will be a get-together of OM's, YL's and XYL's, 7 p.m. at the Ewe and Lamb, Stoke Prior (on B.4091). A mobile picnic has also been fixed for August 1.

Torquay held their AGM recently, and elected G5SY president, G3LHJ chairman, G3NQD secretary and SWL P. Hunt treasurer. In addition, G3LKJ is p.r.o., G3MEP auditor and there is a committee of four members. **Chesham** report poor attendances, which fortunately picked up during the second half of April; most of the activities centred round their "Open Day" on May 23.

Uxbridge, also, suffered from poor attendances—in fact the secretary remarks that he has been apprehensive about the club's future. However, they will be showing two films on June 14, and a lecture-demonstration by J-Beam Aerials Ltd. on the 21st, both meetings being in the Scout Hut which serves as their temporary headquarters while the hostelry is being decorated.

Guildford will be holding an open-air meeting (place to be arranged) on June 25, and on July 9 will welcome G2YL with the colour slides of her worldwide tours. **Luton** will have their NFD Inquest on June 15, and hope to be joined by the Cambridge club on the 22nd, for their debate on VHF *versus* HF. June 29 is the date for their Constructors' Contest, and the club then recesses during July and August.

East Kent report that they now have so many teenage members that their station G3LTY will be run on NFD entirely by them. G4WK will also be on, but handled by the older members. The club is gaining strength, and R.A.E. classes will be organised if the demand is great enough. On June



Winners of the competitions held by Thanet Radio Society, the trophies for which were presented at their recent annual dinner, at which 90 members, guests and friends were present. At left is G3DNR, holding up the Constructor's Cup; then come G3BAC and SWL Collin Barkham with another constructional trophy; and at right is G3JMB, who won Thanet's transmitting contest. Though not a large Club, and somewhat out on a limb in the geographical sense, Thanet take part in most of the national on-the-air activities and always turn in a creditable score.

30 they are to have a lecture—on Burglar Alarms! Later in the year there will be an inter-club Quiz with Thanet and Ashford clubs, and a visit to North Foreland Radio, GNF.

Acton, Brentford and Chiswick will be discussing "QSO's and QSL Cards," under the leadership of G5ZA, on June 15. 66 High Road, Chiswick, at 7.30 p.m. **Wimbledon** heard all about Mobile Rallies and portable working from G3JEQ (well-known expert) at their meeting on May 9, and later in the month they were due to operate from the local Hobbies Exhibition and also to run their own Constructional Contest. Average attendance at their meetings is now 30—second Friday of the month, 8 p.m. at the Community Centre, 28 St. George's Road, Wimbledon, 8 p.m.

Some Club Publications

Apart from the various useful Newsletters, from the single-page effort to the four- or five-page version with some technical gen. included, we are

now receiving a large number of far more ambitious publications which merit more than just a note of acknowledgment.

The *MARTS Newsletter* (Malaysian A.R.T.S.) runs to over 50 pages and includes DX reports from members, technical articles with circuit diagrams, personal news concerning 9M2 and 9M4 operators, some very detailed gen. on *Oscar III* and (spread over the covers) an up-to-date list of countries. A very ambitious and useful effort, edited by 9M2CL and produced every two months by 9M2CR.

A second *MARTS Newsletter* comes from the **Medway A.R.T.S.**, and, though a quarter of the size of the Malaysian one, is very lively and interesting. The April issue includes a mobile section, a "DX Commentary" (where have we seen that title before!), many technical snippets and some personal notes.

QRV is the journal of the **R.A.F.A.R.S.**, and the current issue contains matter ranging from Boolean Algebra to hints on "How to Get Out," from a

Names and Addresses of Club Secretaries reporting in this issue:

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
 A.E.R.E. (HARWELL): V. J. Galpin, Building 347.3, A.E.R.E., Harwell, Didcot.
 ALDRIDGE: R. K. Furness, G3RUI, 17 Hillingford Avenue, Pheasey Estate, Birmingham 22A.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.
 BEDFORD: J. R. Clarke, G3OWQ, 12 Robin Hill, Brickhill, Bedford.
 BLACKPOOL & FYLDE: J. Boulter, G3OCX, 175 West Drive, Cleveleys, Blackpool.
 BRADFORD: J. D. Midgley, G3SAO, 77 Brantwood Road, Bradford 9.
 BROMSGROVE: J. K. Harvey, 22 Elm Grove, Bromsgrove.
 CHESHAM: D. Kind, 19 Hollybush Road, Chesham.
 CHESHUNT: B. B. Charge, 16 The Green, Church Lane, Cheshunt.
 CORNISH: M. J. Harvey, Oak Farm, Carnon Downs, Truro.
 COVENTRY: A. J. Wilkes, G3PQQ, 141 Overslade Crescent, Coundon, Coventry.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 5 Filbert Crescent, Gossops Green, Crawley.
 CRAY VALLEY: S. W. H. Harrison, G3KYV, 30 Plaistow Grove, Bromley, Kent.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
 DUDLEY: R. W. Fisher, G3PWJ, 63 Swan Crescent, Langley, Oldbury, Worcs.
 EAST KENT: E. S. Wood, G3TMI, 18 Dover Street, Canterbury.
 GUILDFORD: M. Birch, G3KMO, Sorrento, White Lane, Ash Green, Aldershot.
 HALIFAX: J. Ingham, G3RMQ, Lambert House, Greetland, Halifax.
 HUDDERSFIELD: R. Higton, 5 Brian Avenue, Dalton, Huddersfield.
 LEYTON & WALTHAMSTOW: A. W. Rix, G3RYF, 17 Forest Drive East, London, E.11.
 LOUGHBOROUGH: G. P. Bateman, G3LCG, 24 Farndale Drive, Loughborough.
 LUTON: P. W. Thompson, G3TUI, 1 St. Michaels Crescent, Luton.
 MANCHESTER: K. Kahn, G3RTU, 12 Cliffdale Drive, Manchester 8.
 MEDWAY: M. J. Winter, G3OHP, 47 Watling Street, Strood.
 MIDLAND: C. J. Haycock, G3JDI, 29a Wellington Road, Birmingham 20.
 MID-WARWICKSHIRE: H. C. Loxley, 51 Guy Street, Warwick.
 NEWARK: G. Francis, G3TWV, 93 Balderton Gate, Newark.
 NEWBURY: H. E. Newland, G3TEK, c/o 42 Woodlands Road, Baughurst, Basingstoke.
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogdon, Halifax.
 NORTH KENT: P. G. Wells, 25 St. Davids Road, Hextable, Swanley.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
 PLYMOUTH: B. J. Curnow, 112 Mount Gould Road, Plymouth.
 R.A.F.A.R.S.: R.A.F. Locking, Weston-super-Mare, Somerset.
 R.A.I.B.C.: Mrs. F. E. Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln.
 RADIO CLUB OF SCOTLAND: A. Barnes, GM3LTB, 7 South Park Terrace, Glasgow.
 READING: N. C. Taylor, G3TOQ, 83 Stoneham Close, Reading.
 REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
 RODING BOYS: R. J. Phipps, G3UAJ, 51 James Lane, London, E.11.
 ROYAL SIGNALS A.R.S.: J. E. Hodgkins, G3EJF, 2 Sqn., 8 Sig. Regt., Catterick Camp, Yorks.
 SALTASH: D. Bowers, 95 Grenfell Avenue, Saltash, Cornwall.
 SLADE: D. Wilson, 177 Dover Road, Four Oaks, Sutton Coldfield.
 SOUTH BIRMINGHAM: J. Rowley, G3TQO, 195 Castle Lane, Solihull.
 SOUTHGATE: R. E. Wilkinson, G3TXA, 23 Ashridge Gardens, London, N.13.
 SOUTH HANTS: G. J. Meikle, G3NIM, 34 Victoria Road, Netley Abbey.
 SOUTH LONDON MOBILE: R. J. Doughty, 17 Hookham Court, Patmore Estate, London, S.W.8.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
 STEVENAGE: P. J. Burgess, 51 Fawcett Road, Mobbbsbury, Stevenage.
 STOKE-ON-TRENT: E. Swinnerton, G3UBU, 51 Bailey Road, Heron Cross, Stoke.
 SURREY (CROYDON): R. Morrison, G3KGA, 33 Sefton Road, Addiscombe, Croydon.
 TORBAY: Mrs. G. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay.
 UNIVERSITY COLLEGE, NORTH WALES: P. D. Symes, GW3SWL, c/o Dept. of Electronic Engineering U.C.N.W., Dean Street, Bangor, Caerns.
 UXBRIDGE: F. J. P. Offord, 43 Grays Road, R.A.F. Uxbridge.
 VERULAM: G. Slaughter, G3PAO, 6 Leggats Wood Avenue, Watford, Herts.
 WAMRAC: Rev. A. Shepherd, G3NGF, 1 North Street, Crewe, Cheshire.
 WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
 WIMBLEDON: E. N. Hurlle, G3RZN, 156 Monkleigh Road, Morden, Surrey.
 WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
 WORCESTER: G. W. Tibbets, G3NUE, 25 Greenford Gardens, Martley Road, Worcester.
 YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

Overseas

MALAYSIA: Box 777, Kuala Lumpur, Malaysia.



This happy picture marks an occasion — the award of their DXCC to the City of Belfast Radio Club, signing GI6YM — when the opportunity was taken to hold a celebration dinner. Those in view, left to right, are GI3KYP, GI3IWD, GI3NOH, GI6TK (a well-known old timer, holding up a selection of the DXCC cards), GI3AXI (displaying the Certificate), SWL Evans, GI3HXV (who is one of Northern Ireland's VHF men), SWL's Bunting and Nelson, then GI5UR and GI3UFH. Qualifying for DXCC by a Club station in the heart of a busy city like Belfast — with all the local noise interference and the restricted hours of operation usual where Club activity is involved — is no mean achievement. We congratulate the GI boys on having brought it off.

description of a DX-pedition to a complete list of members—36 pages full of “real meat.”

Mercury comes from the **Royal Signals A.R.S.** and is likewise full of useful and interesting gen., including a long article on Mods. to the Army WS.36—a transmitter which is used by many of the affiliated clubs.

Mobile News, the journal of the **Amateur Radio Mobile Society**, is well produced, lively and always controversial, with the social side prominent.

GM Magazine emanates from the Radio Club of **Scotland**, and is always a lively effort. Activity reports, “Meet the Members,” VHF, colour TV and many items of prime interest to Scottish amateurs and a Tape Section go to fill its 30 pages.

Other publications which are removed from the simple News Sheet by way of size, presentation, printed covers and so on are acknowledged from **South Hants (QUA)**, **Cornish (Cornish Link)**, **Coventry (CQ CARS)**, **Midland (MARS News Letter)**, **R.A.L.B.C. (Radial)**, **Wolverhampton (Newsletter)**, **Southgate (Newsletter)**, **B.A.T.C. (CQ TV)**, **Saltash (Tamar Pegasus)**, and **Reigate (Feedback)**.

More Club Activities

Huddersfield recently had a lecture-demonstration on Oscilloscopes, and also report that their station's new QTH is very encouraging for Top-Band GDX; several members are awaiting the results of the May R.A.E.

Newark now have their own call, G3UEB. They have just made a cine film of a typical club night—picture by G3TWV, sound by G3TWX—it would be interesting to see this or just a few stills from it. Meetings are on Mondays and Thursdays at The Hall, Guildhall Street, Newark, with Morse tuition in

full swing on Thursdays.

Dudley had a demonstration of the Eddystone EA-12 and EC-10 receivers, and also a talk by G5PP giving a comparison of 160-metre and two-metre results with mobiles. On June 26, G3RXX/A will operate from the Quinton Garden Fete, using SSB from One-Sixty to Ten. Membership of this Worcester-shire Club is still increasing, and meetings are on alternate Fridays, 8 p.m. at the Art Gallery, Dudley.

Roding Boys' Club are working on a new P-E set for field-day work, to give them a little more power than has hitherto been possible. Four members sat for the May R.A.E. and anxiously await results.

Crystal Palace (Newsletter No. 114) will be there on June 19 to hear about a visit to the U.S.A. by G3COX (the “Mast and Ladder Man”) and also “How I Started,” by G2VB. **Plymouth (QUA, May)** held their AGM and elected new officers (see panel for new secretary); on June 18 they will visit Saltash for the W1BB tape-lecture, with slides, and on July 11 they will support Torbay's Mobile Rally.

Leyton and Walthamstow report a successful Field Day on May 2, with 56 contacts on Top Band. Later in the month they operated from the

IMPORTANT NOTICE

Club secretaries and others concerned are reminded that the address for this feature is: Editorial Department, Short Wave Magazine, Buckingham, England, with the letter marked “Club Secretary.” Reports must reach us by the date given at the head of the article each month, and must also include the QTH of the hon. secretary for the address panel.

local Leisure Exhibition, signing G3SDQ/A. For this group meetings are fortnightly at the Leyton Senior Institute, Essex Road, next after publication being on June 8.

Bradford have held their AGM, visited the Bradford Institute of Technology to see their computer, and run an exhibition station in the Technical College, to mark the official opening of the Westbrook extensions. The call G3NN has been re-issued to the club—it was last used in 1938, when it was held by (according to our 1939 *Call Book*) the "Bradford Short Wave Club"! After June, all meetings (alternate Tuesdays, 7.30 p.m.) will be in Bradford Technical College—the club's first move since its inauguration in the 1920's.

WAMRAC (*Circular Letter* No. 52) held their third Activity Weekend, May 22-24. They acknowledge an excellent response to their appeal for the Hq. Station Fund, and the gear (*ex-G2FUX*) is now at Crewe, ready for installation as G3NJB, the club's official station.

North Kent (*Newsletter*, May) devote both their June meetings to Field Day topics. They hope shortly to pay a visit to an electronic music studio—more details shortly. **A.E.R.E., Harwell** (*QAV*, No. 43), heard G3LTF on Moonbounce for their May lecture, and the club's very strong interest in VHF matters continues. Their technical supplement for this issue of *QAV* deals with a high-power transistor transmitter for 80m.

Reigate, now recording a membership of 38 (with 27 callsigns among them) will be seeing a demonstration of Green & Davis equipment on June 19, at the George and Dragon, Redhill. **Saltash** report that their meetings on alternate Fridays are well attended, with new members still coming in. On June 4 the subject is "Planning a Mobile Rally," and on June 18 W1BB's tape-lecture will be featured; the Burraton Toc H Hall, Warrington Road, Saltash, is the QTH for both.

Yeovil operate their club station, G3CMH, at each meeting, when a CW session is also held. Members will be visiting the Mobile Rally at Longleat in force on June 27. Normal meetings, at which new members are always welcome, are on Wednesdays, 7.30 p.m. at the Yeovil Youth Centre.

Wirral plan to be operating from Birkenhead Horse Show on Whit Monday, and a mobile rally with an unknown venue in North Wales is also proposed. The June 16 meeting will be concerned with Field Day occurrences and a tape lecture is scheduled for July 7.

Though at the moment of writing we do not know what G4KD may have met with on his visit to the **Verulam** (St. Albans) Amateur Radio Club on May 19—according to their *News Sheet* No. 13, they should be all right behind him as great-white-chief of Region 7—what we can tell you is that G3STA (another of these self-evident callsigns) now has its own Tx, constructed by G3LXP, and capable of working all bands 10-160m., CW or phone, using a Geloso multi-band driver into either an 832 PA for QRP, or a QQV06-40 for higher power. This

is another of those Club sheets which tell nothing of time, date, place or subject for the *next* meeting after which this can appear in print.

Up at **Bangor**, the University College of North Wales Amateur Radio Society now has more than 50 members, nine of whom are licensed, with GW3UCB (again self-evident) as its own callsign. The president is GW3JGA, supported by GW3PMR and GW3SWL, and included in Scilly Isles party—operating on Top Band during July, as reported in another place—will be GW3PMR.

From the **Blackpool & Fylde** Amateur Radio Society, we hear that they have weekly meetings during June, each Monday evening (except June 7, *Bank Holiday*), at their Hq. at Pontins, Squires Gate Holiday Camp—and we suppose that there will be at least a few reading this who may remember Squires Gate as "a good pull-in for Erks R.A.F." during Hitler's War. That it has now become a Holiday Camp is just one more sign of how affluent is our society! This is just an aside—the important thing is that the Blackpool & Fylde group have *weekly* meetings fixed right through until February of next year!

The programme for **Worcester** shows a wide range of activity, including Construction and D/F (with a photographic competition to be decided in the autumn), and various events are scheduled for the next two months.

Do You Know That —

— A coil of ten turns or so of insulated wire, bunch wound and taped over, with a germanium diode and a pair of headphones in series, will serve not only as a modulation monitor but as a sniffer for mains-borne interference, commutation and overhead-line noises, and in similar "stethoscope" applications. The coil should be about two inches in diameter and well insulated, in case of accidental contact with an RF or HT voltage source. (*G3TUV.*)

— Coiled spring-type microphone leads of professional appearance can easily be made from p.v.c. sheathed and insulated cable. It is wound tightly on a $\frac{3}{8}$ in. diameter, or similarly-sized, former as a mandrel, with the ends fastened off to prevent uncoiling. Keeping the free ends clear, the lot is boiled in water for 5-10 minutes, and then allowed to cool off. This will "fix" the turns and, after slipping the mandrel out, you will be left with the desired springy mike lead. (*G4LU.*)

— Two crystals in the FT-243 mounting will plug neatly side-by-side into an ordinary octal valve holder. The spare pins on the holder are convenient anchoring points for associated components. (*G3SCD.*)

— To finish off constructional work done in aluminium, it is a good idea to rub over the work with the fine domestic steel wool as sold for pot-and-pan scouring. It will not only put a gloss on the job, but will erase those careless scratches made in the course of construction. (*E18AR.*)

— Surgical forceps, which at a glance look like scissors, are more than an excellent substitute for fine-nosed pliers. The long handles not only enable a firm grip to be obtained on wire or other delicate items, but also have a locking device by which the grip can be held. This enables a small nut or screw to be urged into a tricky position without losing it down the chassis, or into some other inaccessible hiding place. (G3ESP.)

— A very effective insulation stripper for plastic-covered cables of any type or diameter can be made by clipping a narrow strip of thin copper round the heater-element casing of an electric soldering iron, making the strip protrude for half-an-inch or so at right angles to the bit, and fixing it with a nut-and-screw clamp. In this protruding section a V is cut, to make a slot into which the cable end can be fitted for stripping. Due to the heat, the whole of the insulation will come away neatly with no damage to the wire. (G3FDW.)

— A handy tool to have around is a long screw-driver magnetised by wiping it over the thick part of a PM speaker—or in any other way to induce magnetism. Not only is it very useful for retrieving nuts and bolts lost down the chassis, but it can be used for the careful placing of a metal screw in an inaccessible position. (GM3TQH.)

— Very small capacities, of 1-5 μF , can easily be contrived by twisting a few turns of insulated wire together, the connections being made to the bared ends of the wire. This method is very helpful if a critical capacity is called for in the circuit, e.g., neutralising at VHF, since the capacity is easily altered by adding to or unwinding the twisted pair. (G3NUN.)

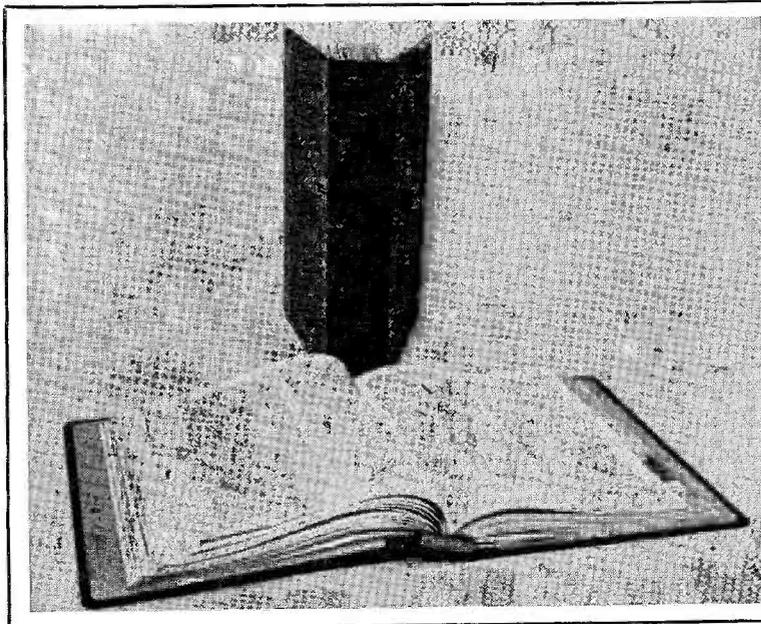
— The old 78 r.p.m. motor from your first and now obsolete radiogram can be fitted with a small fan cut from tinplate, and used as a cooler for the QRO job. It can also be adapted to drive, through a suitable gear-train, a light-weight beam mounting. When you gear a 78 r.p.m. radiogram motor down to normal beam-rotating speeds, you will be surprised at the turning power you have available. (G3KPO.)

— Ordinary household vinegar, as found in the XYL's store cupboard, is a very handy substitute for penetrating oil when trying to move reluctant screws or nuts. (G3RZN.)

— Since reference books used by radio amateurs have to take a terrific amount of wear-and-tear—soon becoming soiled, dog-eared and unsightly about the sitting-room—they can be preserved by being given a cover of what is known as interfacing canvas—a most excellent and hard-wearing material obtainable in the haberdashery department of most draper's shops. The cover is, of course, put on by the YL or XYL who provides the interfacing canvas, as it is only she who knows what it is and where to buy it. (G3SPR/YL.)

Quite a number of useful ideas this time, for which we are glad to pay half-a-guinea. But as this little feature has been running for quite a while now, we detect a tendency for the same notion to come up again, and again. They have to be discarded. What we are looking for are useful, original and practical suggestions, explained in a few sentences without diagrams or drawings.

—Editor.



CREATE YOUR OWN REFERENCE LIBRARY

by binding copies of Short Wave Magazine in the "EASIBINDER."

The "EASIBINDER" is designed to bind 12 copies of the Magazine as you receive them month by month, eventually providing a handsomely bound volume for the bookshelf.

No need to wait until twelve copies are assembled. As each copy is received, it is quickly and simply inserted into the binder. Whether partially or completely filled, the binder is equally effective, giving the appearance of a book, with each page opening flat.

Strongly made with stiff covers and attractively bound in maroon Leathercloth and Milskin, the binders have only the title gold blocked on the spine.

Price 14s. 0d. post free.

PUBLICATIONS DEPARTMENT
SHORT WAVE MAGAZINE
55 VICTORIA STREET,
LONDON, S.W.1

TECHNICAL PUBLICATIONS-

Available from Stock

LATEST ISSUES—Post free

Amateur Radio Circuit Book

(by R.S.G.B.) 8s.

Aerial Handbook

(by G. A. Briggs.) 13s. 3d.

Amateur Radio Handbook

(by R.S.G.B.), 550pp. 36s. 6d.

Call Book (Spring Edition)

"DX Listings," 27s. "US Listings" 45s.
The two together, covering the World, 66s.

Radio Amateur's Handbook

(by A.R.R.L.) 42nd Edition. Paper edition, 42/6
Buckram edition, 52/6

Radio Handbook

Sixteenth Edition, 86s.

LOG BOOKS

A.R.R.L. (spiral bound), 8s. 6d.

A.R.R.L. (Minilog) 4ins. by 6ins., 5s. 6d.

Webbs Radio (G.P.O. approved), 6s. 3d.

MAPS

Amateur Radio Map of World

Mercator Projection — Much DX Information — In Colour. Second Edition, 8s. 6d.

Radio Amateur Map of the U.S.A.

State boundaries and prefixes, size 16ins. by 36ins., paper, 4s. 3d.

Radio Amateur's World Atlas

In booklet form, Mercator projection, for desk use. Gives Zones and Prefixes. 8s. 6d.

SHORT WAVE MAGAZINE

PUBLICATIONS DEPARTMENT
55 VICTORIA ST · LONDON S.W.1

Telephone : ABBey 5341

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, London, S.W.1.

TRADE

COMMUNICATION Receivers required (not necessarily working but must be complete). The new SB-34 Transceiver available soon.—Contact Moecan, Westbury Road, Cheltenham, Glos.

PANDA Cub Transmitter, very good condition, £20. Labgear LG.50, as new, £25. R.209 receivers, very good condition, £10.—Atlanta Radio Ltd., 123 Bournemouth Road, Parkstone, Poole, Dorset.

GOVERNMENT Surplus Electrical and Radio Equipment. Our new catalogue No. 16 ready now, 2s. 6d. post free. Cost refunded on first purchase of goods over £2 value.—Arthur Sallis Radio Control, Ltd., 93 North Road, Brighton, Sussex.

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

NORTH-WESTERN Agents for K.W. Electronics, Joystick, Codar, Green & Davis and Electronics. National and Eddystone equipment also supplied. In stock for sale: Drake 2B Rx, £90; KW-160 (Top Band CW/Phone Tx), £18; Heathkit "Apache" Transmitter, £75.—James-Stephens, 70 Priory Road, Liverpool, 4 (Phone ANField 3602.)

BRAND-NEW AR88D Receivers, latest in original cartons, with manual and cleaning tools, £75, carriage 40s., HP terms available. Panoramic Adaptors, excellent condition, £25 each. Top Band "Command" Rx, £5 10s. Diversity Units, used AR88, CR-100, 52 Sets and a host of other equipment at—Amateur Electronics, 240 Lichfield Road, Aston, Birmingham, 6. (Tel. East 1497).

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-. payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 Extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, S.W.1.

SALE: Going SSB. 100-watt Tx and PSU, 10-80mc., £15. 350v. 300 mA xformer, 25s. 5 Hy 250 mA choke, 10s. Philips EL3541, 4-track, £32. All plus carriage.—G3OHC, 24 Wood Green Road, Birmingham, 18.

WANTED: Manual or any information about Gelson G.209 Rx.—C. R. Doherty, 53 Bedford Street North, Liverpool, 7.

FOR SALE: Creed 3X Teleprinter, spare ink rollers, 45 and 50 baud governors, 5 reels of tape, excellent condition, £12 o.n.o.? Would EXCHANGE for good quality oscilloscope.—G3NPF, 130 Ashington Road, Rochford, Essex.

SALE: AR88, unmodified, S-meter, manual, R.C.A. phones, speaker, £35.—G3JBA (QTHR), or ring MELville 2845 after 6.0 p.m.

SALE: R.C.A. AR77 receiver, 540 kc to 30 mc, £7 10s.—G. Jones, 105 Boundary Road, Wood Green, London, N.22.

"SHORT WAVE MAGAZINE," Vols. 13-21, bound, 12s. 6d. each, plus postage, or the lot for £5 10s. post free. — Cameron, Coombe Cottage, Pitchcombe, Glos.

CRYSTALS! Crystals! For that converter, 100 brand new Brush 10X overtone cut; anything between 5.0 and 7.0 mc, 5s. each, plus 6d. p. and p.—12 Leslie Road, Winton, Bournemouth, Hants.

SMALL ADVERTISEMENTS, READERS—continued

WANTED: Books about Tesla coils, shocking coils and spark coils; condition unimportant provided readable; state condition and price and please enclose s.a.e.—Offers to 1 Rose Cottage, Summers Lane, Freshwater, Isle of Wight.

WANTED: All-band short wave Receiver with loudspeaker output. Must be in good condition.—R. Duffell, 17 Crewes Avenue, Warlingham, Surrey.

SALE: R.1155N, Top Band model, with PSU, S-meter, output stage, etc., £7 10s. — Apply Graham, 121 Bletchingley Road, Merstham, Surrey.

FOR SALE: DX-40U and VF-1U, £20. Minimitter Amateur-Band Converter, 1.5 mc IF, £10. Xformer 650-550-350-0-350-550-650v. 250 mA, LT's 5v. twice, brand new and boxed, 25s. Buyers collect.—G3KVE, 24 Stuart Road, Bootle 20, Lancs., or ring Sefton Park 5202.

WANTED: Manuals and Circuits for R.206 Mk. II and DST-100 Mk. III Receivers.—Everall, 36 Eleanor Road, Waltham Cross, Herts.

HRO-Mx Receiver, PSU, five GC coils, £12. Minimitter 5-band Converter, 1.5 mc IF, £10. Buyer collects.—16a Sussex Crescent, Northolt, Middlesex (Tel.: BYRON 0846).

SALE: Copies RSGB "Bulletins," Vol. 38 (Nos. 1, 3, 4, 7, 8, 9, 11); Vol. 39 (No. 1); Vol. 40 (Nos. 1-12). "Short Wave Magazine," Vol. 21 (Nos. 2, 5, 6, 7, 8, 9, 10, 11, 12); and Vol. 22 (Nos. 1-12)—all 1s. 6d. each, plus p. and p.—Livermore, Kentons, Barrow, Bury St. Edmunds, Suffolk.

SALE: G2DAF Receiver, £45. Partially-built, all-band SSB Transmitter (details on request), £40. G4ZU beam, £5. Gelofo VFO 4/104, £5. 20 FT-241 crystals, £6. Prefer buyers collect. — G3PJT, 504 City Road, Birmingham, 17.

WANTED: "Zenith" Trans-Oceanic Transistor Receiver, or Eddystone EC-10. — R. Shelley, School House, Pilling, Preston, Lancs.

WANTED: Good Communications Rx (SX-28, AR88D, AR88LF, etc.) in EXCHANGE for man's 5-speed super de-luxe cycle, as-new condition, cost £35.—Phone Bywood 2654 after 8.0 p.m.

SALE: Drake TR3 Transceiver, remote VFO RV3, Drake AC power supply, Drake 12v. mobile PSU, with Shure mic. All equipment absolutely mint and perfect. Today's price £420 —will sell for £290. Private sale, but no objection to terms.—Box No. 4129, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: AR88D, good condition, with spare set of valves and manual. Best offer secures.—Creighton, 21 Mounbatten Avenue, Chatham, Kent.

WANTED: AR22 Beam Rotator, or similar. **SALE:** New Loaded Z-Match, £7. New Heathkit OS-1 'scope, nearest £18. Four-metre Rx/Tx, with PSU, £8. "Bulletins" and "Short Wave Magazines" to date, 9d. each.—Lawn, 20 Croft Road, Godalming, Surrey. (Phone: GOD 3606).

CLEARANCE All useful items, not junk. Transformers, meters, valves, CRT's, relays, etc., etc. Offers.—G3JAO, 19 Wistaria Close, Birmingham, 31.

FOR SALE: Panda Cub Tx, 80-160m., £30. Minimitter Mobile Tx, 40-80-160m., with transistor PSU and 160m. transistor converter, 1.5 mc IF, £25. HRO-Mx, with nine GC coils and some BS, incl. PSU and speaker, £25. Gelofo 10-80m. converter, complete with power pack, 4.6 mc IF £12. E.M.I. 3in. 'scope, DC to 2.5 mc, £18. 4EPI 'scope CRT (new), with mu-metal screen, hood and base, £8. Table top 100w. Tx, 10-80m., with modulator and PSU. in two units, £35. Power supply unit, 500v. at 300 mA DC. 6v. and 12v. AC. with separate 0-30v. DC at 6-10 amps. o/p, £6. CRT Display Unit, £1 10s. Top Band "Command" Rx, 1.5-3.0 mc, £3 10s. Gelofo VFO 4/101, £4 10s. Carriage extra on all items.—Allen, 4 Carton Avenue, Poynton, Cheshire.

HALSON MOBILE (3FIF) ALL-BAND ANTENNA
Now acclaimed the most efficient and unobtrusive Mobile Whip, at **£6 10s.** complete with coil of choice; extra coils **£3 10s.** each.

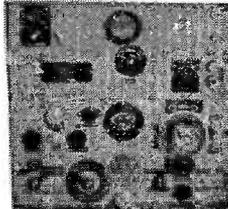
Our appointed agents are:

K.W. Electronics, Dartford, Kent; N.W. Electrics, Manchester; Chas. H. Young, Birmingham; and Green & Davis, London;

or write direct to—

HALSON RADIO SERVICES LTD.
Dover Road Works, Blackpool, Lancashire
or 2 Sefton Street, Blackpool

MARCONI CANADIAN RECEIVER NO. 52



SHIPPING AMATEUR BROADCAST

Magnificent 10-valve receiver in three switched wavebands covering 1.75-16 Mc/s. (19-170 metres), plus 3 valve crystal calibrator employing dual crystal to provide marker check at 10-100-1000 kc/s. One RF and two IF stages. Other refinements: valve, HT, and Signal check meter. Internal bin, speaker and two H/Phone outputs with switched control. RF-AF Gain, Noise Limiter, Filter, BFO, Heterodyne pitch control, Wide and Narrow Bandwidth, Man or AVC on CW and RT. Fast and Slow tuning with lock. Additional OSC Tuning (plus and minus). Power requirements HT 160v. 60mA; LT 12v. 1 1/2 amp. Size 15 x 14 x 12in. Fully tested and working. ONLY £9. 19. 6 Carr. 15/6 or complete with Power supply unit suitable for 115/230v. AC mains and 12v. DC, £12. 19. 6, Carr. 20/-.

No. 52 GROUND STATION also available. S.A.E. all enquiries.
A. J. THOMPSON (Dept. SWM)
"Eiling Lodge," Codicote, Hitchin, Herts. Tel. Codicote 242

Guaranteed Brand New in original wood packing crate CANADIAN MARCONI 52 RECEIVERS

Few only at **£10. 10. 0**
MAINS POWER UNIT £2. 0. 0
Supplied with Outer Case, Handbook and Circuit.
Set has Crystal Calibrator, Speaker, etc.
Range 1.75-16 Mc/s.

J. T. SUPPLY Government Surplus Telecommunication Equipment
Office & Shop: **38 MEADOW LANE, LEEDS 11**

AMERICAN MAGAZINES BY SUBSCRIPTION

CQ	...	...	44s. per annum
QST	...	...	60s. per annum
73	...	...	34s. per annum

Short Wave Magazine
55 Victoria Street, London, S.W.1

MORSE MADE EASY !!

The famous RHYTHM RECORDED COURSE cuts practice time down to an absolute minimum!
One student, aged 20, took only 13 DAYS and another, aged 71, took 6 WEEKS to obtain a G.P.O. pass certificate. If you wish to read Morse easily and naturally, please enclose 8d. in stamps for full explanatory booklet to:

G3HSC, 45 Green Lane, Purley, Surrey

'JOY' NEWS No. 10

Did you notice ZL4GA's small ad. last month?

We're repeating it in case you didn't:—

FREE! On 3501-3505 kc CW, on most days except Fridays, I will present the first U.K. station to make contact with me—while we are both using indoor "Joysticks" with only the 8ft. of feeder as supplied—to one year's free subscription to the New Zealand Association of Radio Transmitters (N.Z.A.R.T.), which includes a monthly issue of *Break-In* and an up-to-date ZL call book. This offer is not impossible, because G5WP has worked me on 3.5 mc and gave me RST-569, when I was using the "Joystick" against the shack wall. Pse use the code-word "Joyin," and I will tune up my indoor "Joystick" immediately. Who will be the first G?—73 de Alan Frame, ZL4GA, and QTHR.

PARTRIDGE ELECTRONICS LTD.

(Dept. S) PROSPECT ROAD, BROADSTAIRS, KENT

HAMMER FINISH PAINT

The modern finish for electronics. Can be BRUSHED or sprayed. Blue or silver. 2½ oz. tins 3/6, post 8d.; ½ pint, 7/6, post 1/9; 1 pint 15/-, post 2/9. Orders over 30/- post free. Retailers supplied. S.A.E. for details. Amazing results! Return of post service.

Every workshop needs a tin of this.

FINNIGAN SPECIALITY PAINTS (SW)

Mickley Square, Stocksfield, Northumberland

YUKAN SELF-SPRAY

Get this Air-drying Grey HAMMER FINISH NOW—

IT'S SUPERB THE PUSHBUTTON WAY!

YUKAN Aerosol spraykit contains 16 ozs. fine quality durable easy instant spray. No stove baking required. Available in Grey Hammer at 14/11 at our counter or 15/11, carr. paid, per pushbutton self-spray can. SPECIAL OFFER: 1 can plus optional transferable snap-on trigger handle (value 5/-) for 18/11. Please enclose cheque or P.O. for total amount to:



YUKAN

Dept. SWM/6 307a EDGWARE ROAD LONDON W.2

(Closed Thursday afternoons, open all day Saturdays)

Choice of 13 self-spray plain colours and primer (motor car quality) also available

SMALL ADVERTISEMENTS, READERS—continued

SALE: "Third Method" SSB Tx, 80m. only, 140w. with pair 6146's (see "Bulletins" mid-'62), perfect, in Philpotts cabinet, £25. Its PSU, 800v. at 200 mA and 300v. at 100 mA (not pretty, but effective), £5. Admiralty Type-H ATU, for end-fed wire, 10-80m., £5. Accept £32 for lot. Prefer buyer collects. Also other 3rd-method components, filters, etc., available.—Gearing, 65 Ringwood Close, Crawley, Sussex.

ATTENTION — Glasgow Area. Complete TCS-6 Station: Rx with Q-Multiplier, Tx with Modulator, modified for 15-20m. as per G2VV and GD3FBS ("Short Wave Magazine" April-May-June '59) with modification data and all cabling, £20 o.n.o.? Original manual, speaker, power supply and pre-amp. extra. Station ideal for new licensee.—Offers to J. J. Connelly, GM3RGU, 84 Crowlin Crescent, Glasgow, E.3 (or ring CRAnhill 4316).

SELLING: Heathkit RA-1, professionally constructed, very little used, genuinely excellent condition, with phones, cover, manual and prints, bargain, £27 10s. "Joymatch" Tuner, Type 2 cost 45s. used twice, 25s.—Pengelly, 25 Vanguard Terrace, Keyham, Plymouth, Devon.

FOR SALE: Heathkit DX-40U Tx and VF-1U VFO, the pair £26. Also a TCS-12 Rx, £4.—G3TVL, 8 Mall Court, Ealing, London, W.5. (Tel. EALING 2587).

FOR SALE: In Derby, SX-28 and manual, good condition, £25. In Surrey, R.1155 with PSU and output stage, £7. 600v. heavy-duty p/pack, £3. 250v. p/pack, output stage, £2. Xtal-controlled 100 mc Tx/Rx complete, 50s. 2/RF.26, 1/RF.25, 10s. each. Or near offers? Buyer collects.

WANTED: Bug key; LP filter; Eddystone S.750.—G3OCA, 216 St. Helier Avenue, Morden, Surrey.

FOR SALE: Heathkit Mohican, factory assembled, plus battery eliminator, £28 o.n.o.? **WANTED:** Eddystone EC-10 in good condition.—Low, Hatherleigh, Matfield, Tonbridge, Kent.

SELL R.107, £11 or offer, carriage extra. 1-1-17 mc, S-meter, HRO geared dial, manual, BFO, etc.—Atkinson, Brada, Beadnell, Northumberland.

WANTED: QRO 2m. PA stage, metal-work Lecher line, less QQV06-40A. Also 70-cm. trebler PA stage. W.H.U.?—G2DHW (QTHR), or ring FOOTSCRAY 1649.

SALE: Dow-Key 52-ohm coax relays, new, boxed with 220v. AC coils: DK60, £4; DK60-2C, £5; DK60G, £5; DK60G-2C, £5 10s. S.a.e. with enquiries.—Box No. 4130, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Standing Wave Indicator, 1M-81/UP, unmodified mint.—Box No. 4131, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Minimitter Converter, amateur-bands only model, FB for mobile or fixed station, £9; s.a.e. please.—Box No. 4132, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING Collins 75-S1 with accessory 500-cycle filter and extra crystals, £140. Buyer collects.—V. Stagg, 2 Jackson Close, Easthampstead, near Bracknell, Berkshire.

FOR SALE: Home-brew receiver covering amateur bands 10-80 metres, Gelošo front-end and xtal oscillator into BC-453 as 85 kc IF strip; includes BFO, AVC, Q-Multiplier, NL, RF and AF gain controls, muting, S-meter, loudspeaker and xtal calibrator, £25, o.n.o.?—Thomson, D.W.S. Hostel, Bletchley Park, Bletchley, Bucks.

FOR SALE: HRO-Mx, four coils plus PSU and speaker, mint condition, £20 o.n.o.?—Phone Bywood 2654 after 8 p.m.

SALE: CR-100 Receivers, rough, but appearance-wise OK, £8 each to clear. RTTY: Creed 7B Page teleprinters, 110/250v. DC motor, working condition, £15 each. Both plus carriage.—G3LSD, Netherton Cottage, The Elms, Stoke Damerel, Plymouth, Devon.

SMALL ADVERTISEMENTS, READERS—continued

SELLING Eddystone S.740, with matching speaker and S-meter, nearest £25. Two-metre Tx, QQV03-20A PA modulator p/p EL84's, metered, in cabinet, 13 x 7 x 5in., £12 10s. 60-watt Modulator, 807's, UM2, £5 o.n.o.? Transformers, etc., from T-14H/TRC-1; s.a.e. details. Delivered within 50 miles.—G3EHB, 3 Newcomen Grove, Redcar, Yorkshire.

SALE: Amateur-band receiver, 1.8-30 mc, G3LOK design, 12 valves, double-conversion, Eddystone dial, all new components, £15. BC-454 and BC-455 receivers, £5 each. Evenings only.—Beales, near School, St. Osyth, near Clacton-on-Sea, Essex.

SALE: 19 Set receiver, built-in PSU and speaker, also manual. Offers, please; buyer collects.—165 Loreny Drive, Kilmarnock, Scotland.

WANTED: Mainly for CW, all-band Tx, about 50w. (DX-40U, K.W. or similar type, or home-built), TVI-free.—Details and price to: Box No. 4051, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELL: Bandspread 20-metre HRO coil, £2. Thermo-couple RF ammeter, 0.3 amp., 7s. 6d.—Stone, 18 Glenlue Road, Blackheath, London, S.E.3.

SPECIAL OFFER: Communications quality 465 kc IF strips: Seven transistors, five diodes, made by world-famous manufacturer to rigid specification; high gain, low noise; compact dimensions; ideal for mobile or portable use; tested and aligned, circuit supplied. 52s. 6d. post paid.—James, Shalimar, Post Office Road, Frettenham, Norfolk.

FOR SALE: R.1155A with PSU and output stage; original condition; circuit diagram and notes, £5 10s. **W**ANTED: Tx for 160m. /M; state price and condition.—A. Hawker, 233 Ullswater Road, Southmead, Bristol.

SALE: Heathkit SB-10U single sideband adaptor; new, unused and in perfect unmarked condition, with instruction manual; £27 10s. o.n.o.?—Hayward, 19 Alford Road, Purbrook, Portsmouth, Hants.

WANTED: All-band (or several band) CW/SSB Exciter, home or factory built, to drive 6146.—Details and price to: Box No. 4051, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

METROPOLIS MINUS TWELVE MILES — GLORIOUS EPPING FOREST — FOR LOUGHTON & DISTRICT MOBILE RALLY — BCNU SATURDAY, 26 JUNE—DON'T BE LATE!

FOR SALE: Eddystone S.740, good condition, speaker, manual, £15, carriage extra.—W. Hardwick, 79 Church Street, Elsecar, near Barnsley, Yorkshire.

SALE: Commercial 60-watt 10-80m. table-top Tx, type G.212TR, FB condition, £36. Pye C.12 twin transmitter, unmodified, minus PSU, £10. B.44 Mk. II with 70-26 mc xtals, 12v. DC input, professional mods., mike, £7. Tx No. 12 Set, 20-160m., VFO/Xtal (heavy baby, this devil-box), complete, £8. Manuals, except for 12 Set. Reason for sale: Cannot get in my shack, and QRO. Buyers collect; no hagglers; enquirers please ring East Dean 2212 after June 5, or write—Doug. V. Richey, G3KLX, The Fridays, East Dean, Eastbourne, Sussex.

WANTED: Oscillator, Mixer and RF coils, 1.5-3.0 mc, for R.1155 Rx.—Whitbread, 108 Gascoigne Road, New Addington, Surrey.

SALE: Creed 8B page printer, spare motor, cover, and Marconi RB150 Bridge. £25 o.n.o.?—Melbrook, Branch Road, Mellorbrook, Blackburn, Lanes.

FOR SALE: Eddystone Bug Key, 40s. Western Electric Field Strength Meter, model 1-106A, calibrated 95-160 mc, 35s. Londex coax relay and plugs, 12s. 6d. Class-D Wavemeter, Type 1, modified for 230v. input, with handbook, 35s. Parmeko transformer giving 620-550-375-0-375-550-620v. at 200 mA, and 250 mA across 375-0-375v., with 5v. 3 amps. twice, 230v. input, 25s. Postage extra all items.—G3HCT, Brooklands, Ullenhall, Solihull, Warwickshire. (Tel. Henley-in-Arden 2176.)

CRYSTALS		TRANSISTORS	
100 Kc/s. R.C.A.	... 15/-	Brand New 1st Grade	
500 Kc/s. 10X.	... 15/-	MULLARD	
100 + 1000 Kc/s.	... 22/6	AC107	12/6 OC75*
1000 Kc/s. HC/6U	... 25/-	AF115	9/6 OC76*
27.255 Kc/s. HC/6U	... 15/-	AF116	8/- OC81*
		AF117	6/- OC82*
		AD118	17/6 GET114*
		AD119	17/6 GET115
		AD140	15/- GET116*
		OC44	6/- OC83*
		OC45	5/- OC84*
		OC71*	4/- OC170
		OC72*	6/6 OC171
		2N711A	15/- AF139
		OC22	15/- OC35*
		OC25	12/- OC36*
		OC26	7/6 OC205
		OC28*	17/6 AD140*
		OC29*	17/6

Over 600 types available from 100 Kc/s./50 meg. Send 1/- for Lists

NEW 96 PAGE 2/6 Post Paid
ILLUSTRATED CATALOGUE
Valve, Transistor, Crystal list 1/-

*Matched Pairs available Send for New List

HENRY'S RADIO Ltd. PAD 1008/9
303 Edgware Rd., London, W.2 Mon.-Sat. 9-6 p.m. Thurs. 9-1 p.m.

THE G3RIX MOBILE ANTENNA

This popular antenna remains as previously advertised but we have pleasure in introducing a new line:—

MT6 A 60", 3 section, chromium plated telescopic aerial with detachable base. This universal base will also fit our standard range of coils and will mount vertically on any surface inclined at no more than 40 degrees to horizontal. Price each £2/5/-

MT1 Coil units for 160, 80, 40, 20 or 15 metres ea. £3
MT2 Adaptor for 10 metres operation ... 9/6
MT3 Two-piece, 8ft. whip aerial ... 17/6
MT4 Insulated mounting pillar complete ... 15/-
MT5 Capacity hat ... 9/6

Postage extra
Mk. I antenna comprising MT1, MT3 and MT4 £4/15/-, carr. paid
Mk. II antenna comprising MT1, MT3 and MT6 £6/5/-, carr. paid

Enquiries invited. All letters and parcels by return of post
Please send stamp for illustrated and fully descriptive leaflets to:
MARTIN R. TETLEY, G3RIX
18, Alexandra Park, Scarborough, Yorks.

GEORGE FRANCIS, G3TWW

LAFAYETTE HE40 ... £19. 19. 0
BARGAIN COMPONENT KITS at ... 3/-, 5/6, 10/-
Worth 3 times as much. We only have a few.
300Ω FLAT, 6d. yd.; 75Ω, 7d. yd.; 52Ω Low Loss, 1/10 yd.; 52Ω ordinary, 1/1 yd.
MAINS TRANSFORMER BARGAIN. 250-0-250v. 80 mA's, 4v., 5v., 6.3v. and 4v. ... 17/6
BM3 MICS, 39/6, Stands, 12/6; Hand Mics, 15/-; DF21, 39/-; DF3, 7/-
100FT. COILS PVC COVERED WIRE ... 3/6
SOLON SOLDER IRONS ... 24/- and 26/-
TK20A. 1000Ω/volt ... 39/6
MODEL 500. 30,000Ω/volt ... £7. 17. 6
EAPHONES. Low and high ... 13/- and 16/-
TEST LEADS ... 5/-
CHASSIS PUNCH SET ... 39/11
SCREWDRIVER KITS ... 5/11
EDDYSTONE 898 DIAL ... £4. 19. 6

Agents for: KW ELECTRONICS, EDDYSTONE, LAFAYETTE, HEATHKIT.
ALL EQUIPMENT BRAND NEW
Carriage extra LET US HAVE UR REQUIREMENTS 73 es BCNU
93, BALDERTON GATE, NEWARK, NOTTS.
Tel. Newark 4733. After 6 p.m. 2578.

"DX" LISTINGS
"CALL BOOK"
WINTER 1964—1965

SPECIAL OFFER!

A few at 18/6 + 1/6 postage

Box No. 2929, Short Wave Magazine

K.W. Corner No. 10

(A monthly review of news, views and advice)

The KW2000A SSB Transceiver and KW600 Linear Amplifier are now in production and we are now busy clearing the backlog of orders. Place your orders now for early delivery as we expect plenty of export orders for this equipment. The KW VESPA is coming soon—a new SSB transmitter 10-160 metres. Watch for further announcements.

A NEW VFO by GELOSO, model 4/105, is now available. This has exactly the same physical dimensions as the earlier models but employs a crystal-mixer vfo circuit with excellent stability figures. Write for details.

Bargain Corner. Owing to bulk purchases and in spite of rising costs we can offer the following: each

Kokusai Mechanical Filters MF455-10K £9.10.0
C.D.R. Rotators TR11A with Control Unit £12.10.0
Tokai Walkie-Talkies, 28.5 mc/s. £13.10.0

The Rotators are very suitable for 2 and 4 metre Beams and the Walkie-Talkies are the high power 200 mW. model. Buy now while stocks last.

Write to us for our list of "Trade-in" equipment—Receivers, Transmitters and Keys, etc.

K.W. ELECTRONICS LIMITED
VANGUARD WORKS,
1 HEATH STREET, DARTFORD, KENT

SHORT WAVE (HULL)

G5GX

Second-hand

£ s. d.

HALLICRAFTERS HT 33A LINEAR AMPLIFIER. Up to 1 kilowatt, 80 to 10, very little used	150	0	0
HALLICRAFTERS SX108, 550 kcs. to 32 mcs. Amateur bandspread. Excellent condition	44	0	0
EDDYSTONE 840C. Immaculate	50	0	0
EAGLE RX 60, 550 kcs. to 30 mcs., bandspread	17	10	0
NATIONAL NC270. Amateur bands, Xtal controlled 2nd Oscillator. Calibrator, 'S' meter, Notch filter	75	0	0
FT 241A CRYSTALS. Channels 0-15, 17-33, 36, 39, 40, 41, 61-68, 71-79, 273, 275-279 each	4	0	
LABGEAR LG 50 TX. 60 watts CW, 40 watts AM	29	0	0
LABGEAR TOPBANDER TX. Excellent condition	18	0	0
New Equipment			
RX 80 RECEIVER. 535 kcs. to 30 mcs. Amateur bandspread, Q multiplier, S meter, AM/CW/SSB	52	10	0
SPHINX SSB TX. Ex stock	75	0	0
EDDYSTONE 870A	36	10	4
EDDYSTONE 840C	66	0	0
EDDYSTONE 940	133	0	0
EDDYSTONE EC 10. New transistor receiver	48	0	0
EDDYSTONE EA 12. New Amateur bands receiver	185	0	0

Carriage extra on all the above

£65 allowed on your Eddystone 888A against a new EA 12

Radio Control gear by Grundig, REP, MacGregor, O.S., etc. Models by Keil, Veron, Frog, Graupner, Ripmax, etc. Wanted—your modern receivers, SSB gear, etc.

24a NEWLAND AVENUE, HULL

Telephone: 408953

SMALL ADVERTISEMENTS. READERS—continued

WANTED: Viceroy Mk. IV; small 'scope. SALE: BC-453, modified, £4; new 813, 35s.; S-meter for HRO, £3 10s.—Box No. 4134, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: Walkie-Talkie, 28.5 mc crystal control, 5 x 2½ x 1in., £5. No. 48 Set battery superhet receiver, 6.9 mc, 25s. Send s.a.e. for list of valves and components.—Box No. 4133, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: SR-40 Rx, one year old, good condition, £12, delivered London.—Watts, 27 The Avenue, London, N.10. (Tel. TUDOR 5908.)

FOR SALE: K.W. Viceroy Mk. IIIA, mint condition, with extra half-lattice filter, £95. Drake 2B receiver, with 2BQ speaker and Q-Multiplier, £82 10s. Eddystone S940 receiver, perfect, £75. Heathkit Warrior 1 kW linear amplifier, immaculate condition, £70. Apply—G3RDW, QTHR. Tel. Brownhills 3550.

FOR SALE: R.107 receiver, excellent condition, £13 o.n.o.? Buyer collects.—G3TYB, 29 Newtown, Ashford, Kent.

RTTY: 7B Printer, 7TR Reperforator, 110v. and 80-0-80v. PSU's, and AFSK generator, £17. Buyer collects, or delivery 100 miles at cost.—G3MEW, 17 Testcombe Road, Gosport, Hants.

HEATHKIT AM/FM Tuner and S99 Stereo Amplifier, factory built, as-new condition, £39 10s. the pair. AN/APG5 12 Cm. Transceiver, 70s. Studio Vidicon and J. Tanner coils, £10. FT-243 xtals: 7050, 7075, 7125, 7150 kc, 12s. 6d. set. Carriage extra.—V. Cedar, 2A Convent Hill, London, S.E.19. (Tel. LIV 8489.)

WANTED: Amateur-band Rx—HQ-170, KW-77, RA-1 or similar—in good condition (seller delivers); also coax c/o relay. Age, price, etc., to—David Power, G3SCJ, Chapel Green, Fillongley, Coventry.

SELLING: American Bendix Communications Receiver type RA-1B, 150 kc-1.5 mc, and 1.8-15.0 mc, in six bands, with 100:1 precision tuning, BFO, 8 valves, fantastic selectivity and sensitivity, in first-class condition, complete with 200-250v. AC mains PSU, two loudspeakers and headphones, must sell, £30 or offers? Or W.H.Y.?—Sutton, 86 Cuckoo Avenue, Hanwell, London, W.7 (Tel. WAXlow 1951.)

WANTED: Mosley Vertical and Joystick aeriads; Top Band phone Tx. SALE: Eddystone S.640, £10. R.1155 and PSU, suitable for spares, 50s. Tiger 2-metre converter, self-powered, IF 21-3-23-3 mc, £10. Buyers collect.—Dell, 109 West Heath Road, Cove, Farnborough, Hants.

WANTED: Beginner's Tx, CW/Phone, with PSU. SALE Gelo 4/104 VFO, unused, £6.—M. W. Meredith, 16 Galloway Avenue, Birchington, Kent.

FOR SALE: Vibroplex presentation model de-luxe bug key, used 9 months, in mint condition, £9 o.n.o.? 116 copies "Short Wave Magazine," 1952-'63, 30s. Carriage extra.—Hainsworth, Wadlands Farm, Farsley, Pudsey, Yorkshire.

SALE: AR88D, with manual, £35. R.1155B, with PSU and speaker, £10. BC-312, rebuilt, with PSU, £10. Collins TCS Tx, £5. 4-125 valves, offers?—Pilkington, 23 Southport Road, Ormskirk, Lancs. (Tel. 3209.)

SALE: G. & D. Linear, perfect; Anache TX-1, perfect. Offers?—Box No. 4136, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Marconi CR-150, with matching PSU, excellent condition. £25. Prefer buyer collect.—Ring Maldon (Essex) 204.

SELLING: National NC-183D, superior double-superhet Rx, new, with manual, £80. AVO Wide-Range Signal Generator, 80 kc-80 mc, new, in transit case, with manual, etc., £13 10s. Q'Fiver, new and neatly modified, £6 10s. WANTED: VHF Converter AM/TRC-913: good price paid, or will EXCHANGE new AM/TRC-914 model, 200-400 mc. also Halli-crafters 5-10 Rx.—Box No. 4135, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—continued

SELLING for Space: R.107 Rx, FB, £14. R.208, with pre-selector 10-15-20m., phones and manual, £8. PCR Rx, with PSU and phones, £6 10s. Eddystone 358, with 4 coils and speaker, £6. ARR3 FM Rx, 24v. PSU and speaker, £5. Eddystone 12v. PSU, £2. BC-457 Tx, less valves, 15s. BC-1066, 35s. Amplifier Unit A.1413, 6V6, PSU, for rack mounting, £2. Wavemeter No. 4 Mk. II, £2 10s. Wavemeter W.1310, £2 10s. R.1124 Rx, 12v., £1. HRO dial drive unused, £3 10s. 2/RF-26's, £1 10s. RF-27, £1. RF-25B, 17s. 6d. Info, circuits with Rx's. BC-624 Rx complete, £2. Spares. Collect if possible; postage extra; s.a.e. with enquiries. Offers invited for "Modern Radio & Television," Caxton, 3 vols. Newnes "Radio & Television Servicing," 5 vols., ditto 1955-'56, 1958-'59. "Practical Television," 1952-'57. "Practical Wireless," 1944-'56. "Radio Constructor," 1950-'57. "Short Wave Magazine," 1946-'55. All bound, FB condition, some vols. to date unbound.—T. E. Port, 11 Bournemouth, Ham Street, near Ashford, Kent.

WANTED: Compact all-band transmitter, small size essential, main interest CW, must be TVI-proof for Band 1 on 14 mc.—G3FVC, 37 Headington Road, Maidenhead, Berks. (Tel. 20107.)

WANTED: Late model Viceroy, Hammarlund HX-50, or similar. Also Linear Amplifier. Must be mint.—Box No. 4137, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: K.W. Valiant Tx, 10-160 metres, good condition, £25. Dependapac transistor PSU for same, 12v. in, 225v. out, 500v. out, £10. TCS receiver and transmitter, DC rotary PSU, control box and connecting cables, £15. Minimitter MC-8 amateur-band converter, 1.5 mc IF, self-powered, £10. PSU Type 234A, 300v., 6.3v. and 12v. AC, £2. Tiger 200-HF transmitter, AM, with QY-365 in PA, 200w., £65.—G3NNC, 124 Carlyon Avenue, South Harrow, Middlesex (Phone BYRon 6155.)

SALE: G2DAF Linear (pair 813), complete with 2.5 kV power supply, with 24 silicon diodes, relay switching, etc., £22 10s. o.n.o.? BC-453 (Q'Fiver), 59s. 6d. BC-455, 25s. A.M. Type 11 Oscilloscope, £3. C-core transformer, 2000-1500-0-1500-2000v., ideal for Linear, 35s. 4/U19's, 7s. 6d.; 2/813's, 25s., all new. Battery charger, 12v. 3 amp., 25s. Cossor DB 'scope, repairable, spare tube, 30s. Type 78 coax relay, 8s. 6d. Relay PSU, 10s. Four-metre phone Tx, 15-watt, complete with xtal and PSU, £5. Carriage extra; s.a.e. enquiries, please.—G2HCV, 34 Grasmere Avenue, London, W.3.

SALE: HRO, 6 coils and PSU, £12 10s. VRL Rx, with PSU and speaker, £5. Eddystone bug, £2 10s. Delivered London, or buyer collects.—Box No. 4138, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

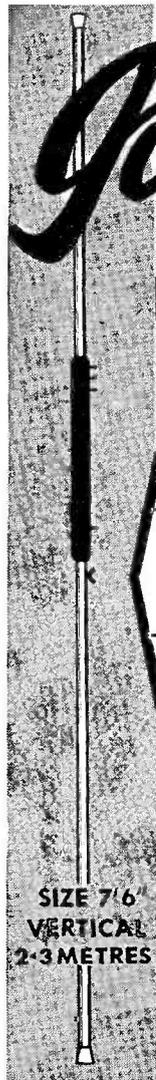
WANTED: Signal Generator; GD meter; Aerial Impedance Bridge; and Tx/Rx/PSU/Ae. for Mobile. Mid-Lancs. Full details to—Box No. 4139, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE: For Hallicrafters S.27 and cash, R.C.A. AR88D, in good condition, with manual, or sell £30.—Beil, 27 Churchill Avenue, Horsham, Sussex.

WANTED: 1200v. 150 mA power supply; please state price including postage. **SELL:** Complete photographic dark-room outfit, £35, or W.H.Y.? Please write for details.—James, 21 Meteor Row, Leuchars, Fife, Scotland.

WANTED: DX-100U, not more than three years old. Viceroy might suit. Full details please. Collect reasonable distance, or by arrangement.—G3CHW, 38 Huckford Road, Winterbourne, Bristol.

WANTED: VHF Receiver, 60-150 mc approx., continuous coverage. Also Ground-Plane, Joystick, Tx crystals 14000-14100 kc.—Box No. 4140, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.



THE UNIQUE

Joystick

VARIABLE FREQUENCY ANTENNA

The DX aerial for any QTH!

Hear and work that spicy DX with the Joystick—lift yourself out of the frustration of "lump of wire" local contacts—pump out a real beefy signal—yes even from inside a flat or bungalow.

The COMPLETE SYSTEMS listed below comprise de luxe or standard "Joystick" (as indicated) plus "Jojmatch" tuners and everything else necessary except transmitter and/or receiver!

A life time of experience and aerial "know-how" has gone into the development of this revolutionary principle of a Variable Frequency Antenna on which World Patents are now pending. Possessing the unique property of an even performance over all frequencies between 1.5 : 30 mcs. the Joystick's special matching facilities and associated A.T.U. ensures efficiency on any frequency. Peak performance for transmission and maximum voltage for reception—the Joystick is a major break-through for ardent SVLs and all licensed stations. Thousands of stations all over the world are already equipped with the Joystick.

SIZE 7'6"
VERTICAL
2-3 METRES

Something for FREE !!

(See "Joy" News No. 10 on page 252)

A poor QTH is now no excuse for a weak signal — act . . .

ORDER YOUR JOYSTICK NOW

Full "money-back" **GUARANTEE** if you're not completely satisfied. Still not convinced? Complete the coupon below for a detailed brochure and showers of testimonials!

PARTRIDGE ELECTRONICS LTD.,
Prospect Road, Broadstairs, Kent
Thonet 62535

Please supply Joystick system as below:

- Complete JOYSTICK TRANSMITTING system, £8 17s. 6d.
- Same as above but Standard model, £7 16s. 6d.
- Complete JOYSTICK RECEIVING system, £7 7s. 6d.
- Same as above but STANDARD model, £6 6s. 6d.
- Complete JOYSTICK MOBILE system, £7 16s. 6d.
- Please send brochures and testimonials.

NAME Callsign

ADDRESS

Town County S4

SMALL ADVERTISEMENTS, READERS—continued

SALE: K.W. Vanguard transmitter, 1964, factory assembled, 10-80m., £48. KW-160 transmitter, £18 10s. TCS-12 receiver with PSU, £6 10s. KW-Match, £3 10s. KW Trap Dipole, £4 15s. All in excellent condition. Prefer buyer inspects.—G3PYF, QTHR.

WANTED: DX-100U, preferably factory-built, must be in as-new condition and reasonably priced.—Thompson, 134 Royal Oak Road, Manchester, 23. (Tel. Wythenshawe 2897.)

SALE: Mohican Receiver, perfect condition, factory tuned 1962, seen London, £25 o.n.o.—Box No. 4141, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Collins S-Line Equipment, in good condition, at a sensible price.—Laburnums, Chertsey Road, Chobham, Woking, Surrey. (Tel. Chobham 8483.)

NYLON · P.T.F.E.

ROD, BAR, SHEET, TUBE, STRIP, WIRE

No Quantity too Small

List on application

**BRASS, COPPER, BRONZE,
ALUMINIUM, LIGHT ALLOYS,
STAINLESS STEEL**

H. ROLLET & CO. LTD.

HOWIE STREET, S.W.11

BATersesea 7872

Branches at LIVERPOOL, MANCHESTER, BIRMINGHAM, LEEDS,
GLASGOW.**TRANSISTOR REFERENCE
CATALOGUE**

Our Catalogue contains Gen on British, American and Continental Semiconductors, grouped as selections for various specific purposes, e.g.:

Transmitters, UHF and VHF Amplifiers, Tunnel Diodes, Etc.

There are also selections of useful miniature components specially chosen for Transistor circuitry applications.

Please send one shilling (stamps) for Reference Catalogue—sixpence for March Supplement.

Please remember our new address:—
(Callers welcome all day Saturday)

176 HAGLEY RD., HALESOWEN, BIRMINGHAM

JOHN WILLIAMS ELECTRONICS LIMITED (J. Williams & Co.)

SEMI-AUTOMATIC "BUG" SUPER-SPEED MORSE KEY. Seven adjustments, precision toolled, speed adjustable 10 w.p.m. to as high as desired. Wt. 2½ lbs. £4. 12. 6 post paid.

KEYING LEVER. Especially designed for use with all types of electronic keys. Fully adjustable, micro switch action, no contact bounce, precision made, finely polished parts, screw down base. £4. 4. 0 post paid.

TRANSISTORISED FULLY AUTOMATIC ELECTRONIC KEYS. (Illustrated) 230v. AC or battery operated. Incorporates built-in monitor oscillator, speaker, and keying lever. Adjustable speeds, giving either auto, semi-auto or hold. 7 transistors, 4 diodes. Price £18. 10. + 4/6 p. and p.

TRANSISTORISED MORSE OSCILLATOR. Fitted 2½" moving coil speaker. Uses type PP3 or equiv. 9v. battery. Complete with morse key. 22/6 + 1/6 p. and p.

All mail orders, also callers to:—

SERVICE TRADING COMPANY

47, HIGH STREET, KINGSTON-ON-THAMES, SURREY
Personal callers only at KIN 9450
9, Little Newport Street, London, W.C.2 GER 0576



**NEW
TITLES
AVAILABLE
FROM
STOCK
SHORT
WAVE
MAGAZINE**

ABBEY 5341/2

55 VICTORIA STREET - LONDON, S.W.1
PUBLICATIONS DEPARTMENT

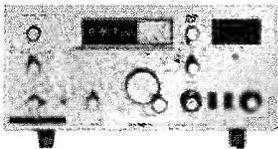
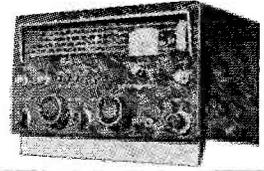
AMATEUR RADIO ANTENNA HANDBOOK. 157 pages (by H. D. Hooton, W6YTH)	24/-
AMATEUR RADIO (by F. G. Rayer, G3OGR)	31/6
BEGINNER'S GUIDE TO RADIO (Newnes)	9/-
BEGINNER'S GUIDE TO ELECTRONICS	15/6
DICTIONARY OF ELECTRONICS (Penguin Books)	8/-
ELECTRICAL HOBBIES (Collins)	5/6
HAM ANTENNA CONSTRUCTION PROJECTS, 157 pages (Sams)	24/-
HANDBOOK OF HAM RADIO CIRCUITS (by W9CCA)	24/-
RADIO ASTRONOMY FOR AMATEURS. 220 pages (by Frank Hyde)	26/6
RCA TRANSISTOR MANUAL	18/-
RCA TUNNEL DIODES	17/-
RADIO & ELECTRONIC HOBBIES (by F. C. Judd, G2BCX)	22/-
SHOP & SHACK SHORTCUTS (by W6TNS)	32/-
SHORT WAVE AMATEUR RADIO (by PAØHH, Philips Technical Library)	22/-
SINGLE SIDEBAND COMMUNICATIONS HANDBOOK. 285 pages (by W6YTH)	56/-

NC190X

JUST LOOK AT THESE FEATURES:
 Double conversion — product detector —
 calibrated bandspread — S-meter — 540 kc/s
 to 30 Mc/s in 5 bands — sensitivity better
 than 1.0 µv or 10 dB S/N — Price: £99 0.0

NTS-3B matching speaker £8 7 9. Terms:
 NC190X and NTS-3B deposit £16 7 5

Write now for illustrated leaflet.



THE FINEST ON THE MARKET!
 200 watt 5-band transceiver — SSB/AM/CW —
 digital counter read-out — receiver sensitivity
 0.5 µv for 10 dB S/N — solid state VFO —
 transceiver vernier — VOX/PTT/MOX —
 8-pole crystal lattice filter — and only
 £255.10.1. **NCXA** mains p.s.u./speaker
 console £52. 9. 11. **NCXD** 12v. D.C. mobile
 p.s.u. £57. 1. 7. Terms: NCX-5 and NCXA,
 deposit £38.

NCX-5

**JUST WRITE OR PHONE
 FOR FURTHER DETAILS**
 — HIRE PURCHASE —
 — PART EXCHANGE —

**WE HAVE A
 COMPREHENSIVE
 STOCK OF
 SECOND-HAND
 EQUIPMENT**

NATIONAL
NCX-3 transceiver £168. 1. 9
NC121 receiver £60. 8. 3
NC77X receiver £32. 8. 9
NCL-2000 linear amplifier £255. 10. 1
HRO-500 receiver £606. 2. 9

BRIAN J. AYRES & CO.

21 VICTORIA ROAD, SURBITON, SURREY

100 yards from Surbiton station

Tel.: Elmbridge 2833 and Lower Hook 2000

Opposite Victor Value

Z & I AERO SERVICES LTD.

Head Office: 44a, WESTBOURNE GROVE, LONDON, W.2.
 Retail Branch: 85, TOTTENHAM COURT ROAD, LONDON, W.1.

Tel: PARK 5641-2-3
 Tel: LANGHAM 8403

Please send all correspondence and Mail orders to the Head Office. When ordering by Mail please include 2/6 in £ for packing and postage. Regret no C.O.D. orders accepted

VALVES FOR RADIO, T.V. AND AUDIO APPLICATIONS

OA2 ... 6/-	6A76 ... 4/-	10C2 ... 12/-	35A5 ... 11/-	EBC81	6/6	EL181 ... 8/6	PCF82	7/6	TP2620	7/6					
OB2 ... 6/6	6A U6 ... 6/6	10D1 ... 7/-	35C5 ... 6/6	EBF80	6/6	EL184 ... 8/6	PCF84	8/6	TT15	35/-					
OC3 ... 6/6	6A V6 ... 6/6	10F1 ... 14/-	35D5 ... 11/-	EBF83	7/6	EL185 ... 8/6	PCF86	8/6	U25	32/-					
OD3 ... 5/1	6B8G ... 5/1	10F3 ... 8/6	35L6GT	7/6	EBF89	6/9	PCF801	10/6	U26	11/-					
IA5GT	5/1	6BA6 ... 4/9	10F9 ... 10/-	35W4	5/1	EBL1 ... 14/-	EL360	22/-	PCF802	10/6					
IA7GT	8/6	6BE6 ... 5/1	10F18 ... 9/-	35Z4G	4/-	ECC8 ... 12/-	EL821	6/6	PCF805	10/6					
IB3GT	7/6	6BH6 ... 7/6	10I1 ... 7/6	35Z52G	6/6	ECC90 ... 2/6	EM31 ... 5/6	PCF806	13/6	U251	12/6				
IH5GT	7/6	6B16 ... 8/6	10LD11	10/-	50A5 ... 12/-	ECC84	6/6	EM34 ... 9/6	PCL81	9/6	U281	13/6			
IN5GT	8/6	6B N6 ... 7/6	10P13	12/6	50B5 ... 7/6	ECC85	6/6	EM80 ... 6/6	PCL82	7/6	U282	14/6			
IQ5GT	8/6	6B O7A ... 8/6	10P14	13/6	50C5 ... 6/6	ECC88	10/6	EM81 ... 7/6	PCL83	8/6	U301	12/6			
IR4 ... 6/6	6BR7 ... 11/6	12A H8	11/6	50C6DG	25/6	ECC80	7/6	EM84 ... 8/6	PCL84	8/6	U403	7/6			
IS4 ... 5/6	6BR8 ... 5/6	12A L5	7/6	50L6GT	6/6	ECC82	7/6	EM85 ... 9/6	PCL85	9/6	U801	18/6			
IS5 ... 5/6	6BS7 ... 16/6	12A T6	5/6	85A1 ... 25/6	ECC86	11/6	EM87 ... 7/6	PCL86	9/6	U4020	7/6				
IS4 ... 4/6	6BW6 ... 9/6	12A T7	4/6	85A2 ... 8/6	ECC82	10/6	EY51 ... 7/6	PEN45	7/6	UABC80	6/6				
IT4 ... 3/6	6BW7 ... 9/6	12A U6	6/6	805 ... 30/6	ECC35	12/6	EY81 ... 8/6	PEN45DD	UAF42	8/6	G.E.T.114	5/6			
IU4 ... 6/6	6C42 ... 5/6	12A U7	5/6	807 ... 9/6	ECC42	8/6	EY83 ... 12/6	UAC41	7/6	G.E.T.115	7/6	G.E.T.573	20/6		
IU5 ... 7/6	6CH6 ... 6/6	12A Y7	10/6	884 ... 15/6	ECC83	7/6	EY86 ... 6/6	PEN46	6/6	UBC81	7/6	Micro-Alloy:			
IX2A ... 7/6	6CL6 ... 9/6	12B A6	6/6	954 ... 5/6	ECC80	6/6	EZ281 ... 4/6	PEN220A	7/6	UBF80	6/6	MAT101	8/6		
IX2B ... 7/6	6CW4 ... 12/6	12B E6	5/6	955 ... 3/6	ECC82	7/6	EZ282 ... 10/6	PEN384	12/6	UBF89	7/6	TI166	6/6		
2CW4 ... 12/6	6D34 ... 15/6	12B H7	8/6	956 ... 2/6	ECC83	9/6	GZ34 ... 10/6	UCC85	9/6	UCC85	9/6	SILICON SEMI-CONDUCTOR			
2D21 ... 6/6	6E A8 ... 10/6	12C 7GT	5/6	980 ... 12/6	ECL96	8/6	HABC80	8/6	PL36 ... 10/6	UCC85	9/6	POWER RECTIFIERS			
3A4 ... 4/6	6E F8G ... 10/6	19A Q5	5/6	5654 ... 8/6	EF36	4/6	HL123DD	6/6	PL38 ... 16/6	UCH80	9/6	5X631, 100 p.i.v., 750 mA	4/6		
3A5 ... 7/6	6F13 ... 6/6	20F2	15/6	5763 ... 10/6	EF37A	8/6	HL133DD	10/6	PL81 ... 7/6	UCH21	8/6	BD006, 400 p.i.v., 500 mA	6/6		
3D6 ... 4/6	6F17 ... 7/6	20L1	14/6	6146 ... 27/6	EF39	5/6	HL133DD	10/6	PL82 ... 7/6	UCH42	8/6	OA210, 400 p.i.v., 500 mA	6/6		
3Q4 ... 6/6	6F23 ... 9/6	20P1	14/6	6159 ... 32/6	EF40	9/6	HR2 ... 15/6	PL83 ... 6/6	UCH81	7/6	5X634, 400 p.i.v., 500 mA	7/6			
3Q5GT ... 6/6	6F24 ... 11/6	20P3	12/6	CL33 ... 9/6	EF41	7/6	HR7 ... 15/6	PL84 ... 6/6	UCH82	8/6	15004, 600 p.i.v., 750 mA	7/6			
354 ... 5/6	6F25 ... 11/6	20P4	14/6	DK92 ... 7/6	EF42	6/6	KT41 ... 7/6	PL500	15/6	UCH83	10/6	BY100, 700 p.i.v., 450 mA	7/6		
3V4 ... 5/6	6F28 ... 10/6	20P5	12/6	DAF91	4/6	EF54	6/6	KT44 ... 5/6	PX25	10/6	UF41	7/6	OA211, 800 p.i.v., 400 mA	9/6	
4THA ... 10/6	6K8GT ... 8/6	25A 6G	5/6	DAF92	6/6	EF80	6/6	KT63 ... 6/6	PY31	7/6	UF42	8/6	DD058, 800 p.i.v., 500 mA	12/6	
5R4GY ... 5/6	6N7GT ... 8/6	25A 6G	8/6	DAF96	6/6	EF83	10/6	KT66 ... 15/6	PY33	9/6	UF80	6/6	BYZ10, 800 p.i.v., 6 amps	7/6	
5U4GB ... 6/6	6L6GA ... 7/6	25Z 24G	7/6	DF96	6/6	EF85	6/6	KT88 ... 20/6	PY81	6/6	UF85	8/6	ZENNER DIODES		
5V4G ... 6/6	6L18 ... 8/6	25Z 26GT	8/6	DK40 ... 11/6	EF86	6/6	N78 ... 15/6	PY82 ... 6/6	UF86	10/6	UF86	10/6	OA2202, 5.6v., 6/6	7/6	
5Y3GT ... 5/6	6Q7G ... 6/6	30C15	10/6	DK92 ... 9/6	EF94	6/6	OC971 ... 24/6	PY83 ... 6/6	UL41	8/6	UF89 ... 6/6	6/6	OA2204, 6.8v., 6/6	6/6	
5Z4G ... 7/6	6QGT ... 8/6	30C17	12/6	DK96 ... 7/6	EF95	5/6	ORP12 ... 12/6	PY88 ... 8/6	UL41	8/6	UL84 ... 6/6	6/6	OA2208, 4.3v., 6/6	6/6	
6/30L2 ... 10/6	6U4GT ... 10/6	30C18	10/6	DL96 ... 6/6	EF98	10/6	ORP60 ... 10/6	PY80	8/6	UM80	7/6	UL84 ... 6/6	6/6	OA2211, 7.5v., 5/6	7/6
6A8 ... 8/6	6V6 ... 7/6	30F5	9/6	DM70 ... 5/6	EF183	8/6	PABC80	7/6	PY800	8/6	UM80	7/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F11	11/6	DY80 ... 5/6	EF183	8/6	PC86 ... 12/6	QV03-10	UY21	8/6	UY21	8/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v., 6/6	6/6	
6A8 ... 8/6	6V6 ... 7/6	30F15	12/6	DY86 ... 5/6	EF184	8/6	PC88 ... 12/6	QV04-7	UY41	6/6	UY41	6/6	OA2213, 12.0v.,		



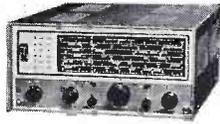
Highest quality kits—at lower cost

A wide range of British and American models to choose from

Deferred terms available on all orders over £10



DX-40U



RG-1



RA-1



GC-1U

HIGH SENSITIVITY GENERAL COVERAGE RECEIVER, Model RG-1. A high performance, low cost receiver for the discriminating short-wave listener. Frequency coverage from 600 Kc/s. to 1.5 Mc/s. and 1.7 Mc/s. to 32 Mc/s. Send for details. £39.16.0 Kit £53.0.0 Assembled

AMATEUR TRANSMITTER, Model DX-40U. From 80-10 m. Power input 75 W. CW., 60 W. peak, C.C. phone. Output 40 W. to aerial. £33.19.0 Kit £45.8.0 Assembled

SINGLE SIDEBAND ADAPTOR, Model SB-10U. For use with most A.M. transmitters. Less than 3 W. R.F. input power required for 10 W. output. Operation on 80, 40, 20, 15 and 10 m. on U.S.B., L.B.S. or D.S.B. £39.5.0 Kit £54.18.0 Assembled

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. £37.17.6 Kit £45.17.6 Assembled
Suitable Battery Eliminator, Model UBE-1. £2.17.6 Kit

VARIABLE FREQ. OSCILLATOR, Model VF-1U. Calibrated 160-10m. fund. outputs on 160 and 40 m. Ideal for our DX-40U and similar TX. £10.17.6 Kit £15.19.6 Assembled

REFLECTED POWER METER, Model HM-11. Indicates Antenna/Transmitter match. £8.5.0 Kit £10.10.0 Assembled

AMATEUR BANDS RECEIVER, Model RA-1. Covers all amateur bands 10-160 metres. Half-lattice crystal filter at 1.6 Mc/s I.F. Provision for fixed, portable or mobile uses. Switched USB and LSB for SSB. £39.6.6 Kit £52.10.0 Assembled

OPTIONAL EXTRAS. Crystal Calibrator CL-1 £4.12.0 Kit. Loudspeaker Cabinet SG-4 £1.9.6. Loudspeaker £1.4.5 incl. P.T.

AMATEUR TRANSMITTER, Model DX-100U. Covers all amateur bands from 160-10 metres, 150 watts D.C. input. Own power supply. £79.10.0 Kit £104.15.0 Assembled

2 1/2 in. PORTABLE SERVICE SCOPE, OS-1. A compact, portable oscilloscope ideal for servicing and general laboratory work. Compact size. £22.18.0 £30.8.0 Assembled

Q MULTIPLIER KIT, Model QPM-11. May be used with receivers having 450-470 kc/s. I.F. Provides either additional selectivity or signal rejection. Self powered. Model QPM-16 for 1.6 Mc/s. I.F. Either model £8.10.0 Kit £12.14.0 Assembled

GRID-DIP METER, Model GD-1U. Continuous coverage 1.8 to 250 Mc/s. Self-contained. £10.19.6 Kit £13.19.6 Assembled

MANY OTHER BRITISH MODELS

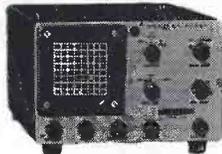
Covering a wide range of equipment, including models for the discerning Radio Amateur, instruments for laboratory, service, test and workshop, presents for the youngsters, Hi-Fi equipment, and models for home and office.

PLEASE SEND FOR

FREE BRITISH CATALOGUE

AMERICAN HEATHKIT SINGLE-SIDEBAND EQUIPMENT

All imported models are subject to any additional surcharge in force at time of importation



HO-10E



HW-12

FILTER-TYPE SSB TRANSCEIVER, Models. For the 80, 40, or 20 metre bands. 200 W. P.E.P. input TX. 1 µV sensitivity RX. Employs easy-to-build printed board techniques, with pre-aligned circuits. Power Req.: 800v. D.C. at 250 mA., 250v. D.C. at 100 mA., 125v. D.C. at 5 mA., 12v. A.C. or D.C. at 3.75A.

Model HW-12. 80m. } £60.1.0 each. Kit
HW-22. 40m. }
HW-32. 20m. }
GH-12. Push-Talk Microphone £3.13.0 Assembled

3" MONITOR SCOPE, Model HO-10E. A must for the SSB station. Gives at-a-glance, visual indication of your transmitted signal and the incoming signal, displaying envelope patterns. Built-in two-tone generator ensures a clean output signal. Power Req.: 115/230v. A.C. 50/60 c/s. £33.0.0 Kit

"CANTENNA" TRANSMITTER DUMMY LOAD, Model HN-31. Simplifies servicing and testing. £5.4.0

SEND FOR THE COMPREHENSIVE ILLUSTRATED
AMERICAN HEATHKIT CATALOGUE
SHOWING RANGE. Sent for only 1/- post paid.



SB-300E



SB-400E

SB-300E AMATEUR 80-10m. BANDS RECEIVER. This de-luxe receiver offers unsurpassed value to the Radio Amateur. Of advanced concept, employing up-to-date design and construction techniques its ultimate specification ensures unparalleled performance. Full specification and details on request. Weight 22lb. Power Req.: 115/230v. A.C. 50-60 c/s. 50 watt. Size: 14 7/8" x 6 3/8" x 13 3/8". £133.14.0 Kit (Less speaker)

A fitting companion for this receiver is the SB-400E Transmitter which is designed for "lock-in" facility with the SB-300E. A self-powered filter type Tx covering the "Amateur" bands, 80 to 10m. with a P.E.P. of 180 watts. Weight 33lb. Power Req.: 115/230v. A.C. 50-60 c/s. Size: 14 7/8" x 6 3/8" x 13 3/8". £165.4.0 Kit

Please send me **FREE BRITISH CATALOGUE** (Yes/No)
AMERICAN HEATHKIT CATALOGUE 1/-.

Full details of model(s).....

NAME
(BLOCK CAPITALS)
ADDRESS.....

SW6

DAYSTROM LTD

DEPT. SW6, GLOUCESTER, ENGLAND

THE BRITISH HOME OF HEATHKIT MODELS

Printed by The Courier Printing Co. Ltd., Tunbridge Wells for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The Short Wave Magazine is obtainable abroad through the following: Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd.; AUSTRALIA AND NEW ZEALAND — Gordon & Gotch, Ltd.; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. June, 1965.