An improved version of our pre-war globe with new call-signs and continental boundaries. A really handsome and useful addition to any operating "shack." The larger diameter, now 13½ in., gives a considerable increase in area and the compass fitted in the base provides for true orientation.

**VALVES ! VALVES ! VALVES !**

We offer well-known transmitting and experimental types at rock-bottom prices.—YOU WILL NEVER BUY THEM CHEAPER

Webb's are not "surplus dealers," but this offer is too good to miss. All the valves are in makers’ boxes, tested and brand new. They are not unboxed valves, culled from broken-down equipment. (Please add 1/- for all post orders).

<table>
<thead>
<tr>
<th>Valve</th>
<th>Price</th>
<th>Type Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>955</td>
<td>4/-</td>
<td>ACORN TRIODE. 6.3v-0.15A.</td>
</tr>
<tr>
<td>808</td>
<td>15/-</td>
<td>TRIODE. 7.5v-4.0A. 1500v-150 M/A.</td>
</tr>
<tr>
<td>832A</td>
<td>25/-</td>
<td>DOUBLE PENTODE. 6.3v-1.6A. 12.6v-0.8A.</td>
</tr>
<tr>
<td>8012</td>
<td>18/6</td>
<td>TRIODE. 6.3v-2A. 1000v 80 M/A.</td>
</tr>
<tr>
<td>807</td>
<td>7/3</td>
<td>TETRODE. 6.3v-0.9.</td>
</tr>
<tr>
<td>100TH</td>
<td>35/-</td>
<td>TRIODE. 5v-7.5A. 3000v-225 M/A.</td>
</tr>
<tr>
<td>250TH</td>
<td>45/-</td>
<td>TRIODE. 5v-10.5A. 4000v-350 M/A.</td>
</tr>
<tr>
<td>832</td>
<td>25/-</td>
<td>DOUBLE PENTODE. 6.3v-1.6A. 12.6v-0.8A.</td>
</tr>
</tbody>
</table>

WEBB’S RADIO 14 SOHO STREET, LONDON, W.1
WEBB’S RADIO 41 CARRS LANE, BIRMINGHAM 4
In response to popular request, we are now pleased to announce the availability of the following accessories, which provide an inexpensive means of bringing the "Avo" Valve Tester completely up-to-date. Possession of these accessories will, furthermore, render it a simple matter to maintain the "Avo" Valve Tester in a condition capable of testing any new types of valves that may be produced in the future.

**ACCESSORIES for the 'AVO' VALVE TESTER**

**FILAMENT VOLTAGE EXTENSION UNIT**

For providing filament voltages of 1.4 to 117 volts for testing valves recently introduced into general use and which are not covered by the original "Avo" Valve Tester.

This unit is plugged in between the Meter panel and the S.S. panel, where it may be left permanently in position regardless of whether the original or the additional heater voltages are being used.

**Price : 12/6 nett.**

**VALVE BASE ADAPTORs**

These Adaptors have been specially designed for plugging into the international octal socket of any "Avo" Valve Tester Panel which is fitted with a rotary selector switch. The following types, covering recently introduced valve bases not provided for on the existing Valve Panel, are now available:

- **Type No. 1** .... B7G and B8A.
- **Type No. 2** .... B9G (EF50, etc.).
- **Type No. 3** .... B8B (American Loctal)
- **Type No. 4** .... Hivac Midget 4- and 5-pin and Midget Diode.
- **Type No. 5** .... Blank.

Other types will be made available as required, and Adaptors can also be supplied for any special valve base.

**Price : £5 nett.**

*Sole Proprietors and Manufacturers :*

AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.

WINDER HOUSE, DOUGLAS STREET, LONDON, S.W.1.

Telephone : Victor 3404-9
AMERICAN RADIO RELAY LEAGUE
MEMBERSHIP SUBSCRIPTION

It is not generally known that when we forward a subscription for the famous American Ham Magazine "QST" to A.R.R.L., the League automatically enrol subscribers as Associate Members of the Society.

All Member/Subscribers receive a "Certificate of Membership" in addition to monthly copies of "QST," and they are also entitled to all the facilities offered by the American Radio Relay League.

ONE YEAR MEMBERSHIP SUBSCRIPTION

DALE INTERNATIONAL
Publications Limited
105 BOLSOVER STREET, LONDON, W.1. Museum 1023

To: DALE INTERNATIONAL Publications, Ltd.
Please enter my Membership/Subscription to the American Radio Relay League.
I enclose 25/-

DALE INTERNATIONAL
Publications Limited
Museum 1023

A DEFINITE ADVANCE IN TUNING UNITS for High Grade COMMUNICATION RECEIVERS

CT4 COIL TURRET
175 Kc/s—36 Mc/s in 6 ranges.
Constant Gain. 1 u V Sensitivity.

Too many good features to enumerate here!
Ask your Stockist or write direct.

DENCO (CLACTON) LTD, OLD ROAD, CLACTON, ESSEX
Tel.: Clacton 807-8
HEADPHONES WHICH UPHOLD BRITISH PRESTIGE

The S. G. Brown Type "K" Moving Coil headphones supply that High Fidelity Reproduction demanded for DX work, monitoring and laboratory purposes, etc.

OUTSTANDING CHARACTERISTICS

D.C. RESISTANCE, 47 Ohms.
IMPEDANCE, 52 Ohms at 1,000 c.p.s.
SENSITIVITY, $1.2 \times 10^{-10}$ watts at 1 kc. = 0.0002 Dyne/cm$^2$.

Price £5 : 5 : 0 Per Pair

Your local dealer can supply Descriptive Literature on request

HEADPHONES WHICH UPHOLD BRITISH PRESTIGE

S. G. Brown, Ltd.

SHAKESPEARE STREET, WATFORD, HERTS. Phone: WATFORD 7241

---

ODEON RADIO

G4HV

THE NEW EDDYSTONE ‘640’

Reduced Price

£27.10.0

Free of Purchase Tax

SPECIALY DESIGNED FOR THE AMATEUR

A British Made Communications Receiver with Outstanding Performance on Amateur Bands

The Eddystone “640” Receiver has been designed in close collaboration with leading British Amateurs to ensure that it possesses the special requirements expected by Amateur Operators. An outstanding feature of the “640” is its unusually high signal-to-noise ratio, an attribute which enables the receiver to bring in, under adverse conditions, long distance weak signals with a high degree of intelligibility. This fact can be proved by actual demonstration alongside other receivers of similar characteristics. Air dielectric trimmer condensers and permeability-tuned coils contribute materially to the high sensitivity which is well maintained over each and every wave band. The crystal filter is of very modern design, and is most efficient. Mechanically the construction is very robust, and the receiver is thoroughly reliable in service. All materials used are of best quality and the practically all-metal construction, combined with tropicalised components, makes the “640” suitable for use in any climate. The finish is a fine ripple black of pleasing appearance.

IMMEDIATE DELIVERY FOR CASH WITH ORDER

EDDYSTONE “640” RECEIVER

for operation from 110 to 240 volt AC mains, £27-10-0
illustrated brochure and details of hire-purchase terms on request

ODEON RADIO

56 COLLEGERD., HARRROW, MIDDX

Telephone: HARrow 5778
RADIO CLEARANCE LTD.
27 TOTTENHAM COURT ROAD, W.1. MUS 9188

PERSONAL RECEIVERS, B.C.728C
7-Valve receiver with 1-4x valves, RF VT173, mixer VT171, osc. VT173, IF, VT173, det. and audio VT172. Output VT174, bias rect. VT174. Covers 2-6 Mc/s with 4 push buttons, adjustable 2-2.6, 2-3.5, 3-5-4.5, 4-5-6 Mc/s respectively. Operates from 2v acc. by 2v VIB, with 12v VIB for charging 2v acc. Carried slung on shoulder. Supplied brand new, with valves, telescopic aerial, 2v acc., 2-VIB, mounting accessories and instruction book. This set has built-in loudspeaker, and buttons A and B are easily adjustable by means of an additional condenser, on. Supplied on. M.W. £9/9/-. Available, sets of spare valves, 21/-, spare vibrators, 2 or 12v. With rec. only.

BENDIX RADIO COMPASS B.C.433G

R.F. UNITS
Type 26. Brand New and Boxed... 28/- Type 24. New and Boxed... 12/6
Type 27. In good condition... 22/6 Type 24. In good condition... 8/6
Type 25. In good condition... 10/6 All supplied complete with valves and guaranteed.

RECEIVERS R1481
10 Valves, coverage 65-86 Mc/s. I.F. 12 Mc/s. RF VR65, mixer VR65, osc. VR66, 3 IFS, VR53, det. AVC VR54, AF VR57, output VR67, B.F.O. VR65. We offer the remainder of our stock of these 19" rack mounting receivers, which are brand new in transit cases, at £6/10/- Power pack for same, also 19" rack, £2/19/6.

POWER PACKS, TYPE 46
In perforated metal cases, size 113/8" x 191/4" x 163/4". Input 200-250v 50 c/s. Outputs, 220v 110 mA D.C. 6.3v 13A D.C. Metal rectifiers. £4, carriage paid.

WAVEMETERS W.1191
We have a limited number of these excellent meters, freq. coverage 125 Kcs-20 Mc/s, in 8 ranges, with IM Xtal. £5/10/- Carriage £5/6.

G2AK The Month's Bargains G2AK

The First Time Offered for Sale in this Country

The TYPE LM7 Frequency Meter, the U.S. Navy Super BC221
Coverage 195 kc to 20 Mc, Xtal checked and fitted with Audio Modulation and Built-in stabilizers. Will take 6, 12 or 24v L.T. and 180 to 470v H.T. Brand new and with all charts. Complete with kit of spares including 3 Valves, 1,000 Kc Xtal, Ampl. transformer, Neon Stabilizers, Resistors, Condensers, etc. Separate L.T. and H.T. Switches. Very limited quantity available, first come first served. This month's bargain price, £12/10/-. Few of the above available as detailed but minus spares, £10.

A Few More Snips for the Early Birds
Genuine R.C.A. AR88 Mains Transformers, 110/240v 25/60 cycles input. These are the standard transformer fitted to the AR88D and AR88LF. Only one each, please, price 55/- each.

Precision Absorption Frequency Meters, with frequency calibrated scale, by America's finest maker of laboratory equipment, General Radio, Type No. 758A. Coverage 55 to 400 Mc. Completely enclosed. Our price 35/6.

See our last month's ad. for another pageful of bargains, there are still a few of most of these lines still on hand, except the RA10 Bendix receivers, which are now all sold.

Genuine National H.R.O. 4 Gang Tuning condenser units complete with gear box. Brand New in Original Wrapping. Our price only 50/- each.

PLEASE SEND S.A.E. FOR OUR NEW BARGAIN LIST WHICH IS NOW READY. POST, PHONE OR WIRE YOUR REQUIREMENTS TO:

CHAS. H. YOUNG, G2AK,
880 Washwood Heath Rd., Birmingham, 8. Phone: Stechford 2809

Callers may also collect our lines from:—

THE RED HOUSE
Phillips Street, Aston, Birmingham. Aston Cross 3381
INSTRUMENT CO.,
244, HARROW RD., LONDON, W.2. CUN 0508
WHEATSTONE BRIDGE
(new). Fitted in beautiful teak case; using heavy stud type selector switches and a precision galvanometer. Plus packing & ins. 2/6 £2/15/-
MAINS TRANS. Chassis type, Primary 200-250 volts, Secondary 350-0-350 80 mA, 5 volts 2 amps, 6-3 volts, 3 amps. £1
Send details of your requirements for Mains Trans, and we will endeavour to obtain what you require.
Ex-R.A.F. AMPLIFIER 1134. Ideal for use with a microphone, or can be used as an amplifier without modification. Complete with wooden transit case. 16/9 £12/9
Write for list of bargains to Dept. "M," INSTRUMENT CO., 244 Harrow Road, London, W.2 0508

SAMSONS SURPLUS STORES
SPECIAL OFFER
3170A RADAR RECEIVERS. Complete with valves; 8 EF50, 2 R3.7, 1 R16, 1 HVR2, 1 R3, 1 E550, 1 CV188, absolutely brand new, packed in maker's transit case. Post free.
A.M. RECEIVERS, TYPE R1355. Complete with 8 VR65, 1 SU-KG, 1 VU120. Ideal for television construction. 45/-, carriage 5/- No C.O.D.
R.F. UNITS, TYPE 25 & 27, for use with above receiver, complete with valves, 16/6 each, post 1/6.
MASTER OSCILLATORS BY R.C.A. Frequency range 0-10 m/c/s. Output sufficient to drive any P.A. Uses 807 valve in extremely stable circuits. Very accurate dial calibrations with unique dial mechanism. Metering of doubler or frequency range 0-10 m/c/s. Post paid.

Write for full list of bargains to Dept. "M," INSTRUMENT CO., 244 Harrow Road, London, W.2 CUN 0508

COMPLETE CLOCK-WORK MOTOR UNIT incorporates mechanically-operated contact which opens and closes at each movement of the balance wheel. Ideal for remote switching, etc. 8/9

SAMSONS SURPLUS STORES
SPECIAL OFFER
3170A RADAR RECEIVERS. Complete with valves; 8 EF50, 2 R3.7, 1 R16, 1 HVR2, 1 R3, 1 E550, 1 CV188, absolutely brand new, packed in maker's transit case. Post free.
A.M. RECEIVERS, TYPE R1355. Complete with 8 VR65, 1 SU-KG, 1 VU120. Ideal for television construction. 45/-, carriage 5/- No C.O.D.
R.F. UNITS, TYPE 25 & 27, for use with above receiver, complete with valves, 16/6 each, post 1/6.
MASTER OSCILLATORS BY R.C.A. Frequency range 0-10 m/c/s. Output sufficient to drive any P.A. Uses 807 valve in extremely stable circuits. Very accurate dial calibrations with unique dial mechanism. Metering of doubler or frequency range 0-10 m/c/s. Post paid.

Write for full list of bargains to Dept. "M," INSTRUMENT CO., 244 Harrow Road, London, W.2 CUN 0508
EX-GOVERNMENT STOCK DISPOSAL!

The finest RADIO VALUES ever offered!

Satisfaction guaranteed or money refunded!

2305 CONTROL UNIT
12/6
BRAND NEW


200/240v.
A.C. MOTOR
25/-

STAND TYPE MICROPHONES
2/6
Carbon insert. Press button on/off. Aluminium case. 2/6

2AP1, with base
CATHODE RAY TUBE
20/-

Just purchased, brand new in cartons with booklet. Mullard Capacity 10 P.F. to 10 M.F. resistance 1 to 10 megohms, measuring bridge type 4140 incorporates Electron ray tuning operation, standard A.C. mains.

£7.10.0 ! ! !

NEW VALVES
5U4G, 6B4, 6L6. 8/- 5V4 807, 5R4G, 6V6 2X2 6/- 6X5, 6G6, 6L5, 6K6, 6R7, 6SN7, 6SL7, 65A7, 68B, 25L6, 71A, O.C. 3, O.D. 3 6/- 6AC7, 6AG7, 6SK7, 6G7, 6G07, 6SS7, 6SR7, 61S, 65S7, 12A6, 12SG7, 12SH7, 1215, 12SK7, 12K8, 12AH7. 5/- 5C5, 6H6 4/-

WESTON PRODUCTS (Liverpool) LTD.
71 Great George Street, Liverpool • Telephone ROYAL 5754/5

To our Clients

We would like to thank you all for the excellent response to our first advertisement directed to the public in this magazine. Having received many repeat orders we know that you are satisfied with our service and business methods. We look forward to a continuation of these amicable relations, and assure you all of our personal attention and future interest in your requirements. Illustrated Lists are now being prepared and will be available to all in the very near future.

September 9th, 1948.

Yours truly,

H. S. WESTON,
Managing Director.
Now Available for Voltages 100-250

See range below

WODEN TRANSFORMER CO. LTD.

Mains Transformers

<table>
<thead>
<tr>
<th>Model</th>
<th>Watts</th>
<th>Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.T.M.11</td>
<td>200-0-200</td>
<td>60 m/a</td>
</tr>
<tr>
<td>D.T.M.12</td>
<td>225-0-275</td>
<td>150 m/a</td>
</tr>
<tr>
<td>D.T.M.13</td>
<td>300-0-350</td>
<td>120 m/a</td>
</tr>
<tr>
<td>D.T.M.14</td>
<td>425-0-495</td>
<td>150 m/a</td>
</tr>
<tr>
<td>D.T.M.15</td>
<td>500-0-550</td>
<td>150 m/a</td>
</tr>
<tr>
<td>D.T.M.16</td>
<td>650-0-650</td>
<td>200 m/a</td>
</tr>
<tr>
<td>D.T.M.17</td>
<td>750-0-750</td>
<td>250 m/a</td>
</tr>
<tr>
<td>D.T.M.18</td>
<td>1000-0-1000</td>
<td>150 m/a</td>
</tr>
<tr>
<td>D.T.M.19</td>
<td>1250-0-1250</td>
<td>250 m/a</td>
</tr>
<tr>
<td>D.T.M.20</td>
<td>2000-0-2000</td>
<td>350 m/a</td>
</tr>
<tr>
<td>D.T.M.21</td>
<td>2500-460-460-500</td>
<td>180 m/a</td>
</tr>
<tr>
<td>D.T.M.22</td>
<td>350-0-350</td>
<td>120 m/a</td>
</tr>
<tr>
<td>P.T.M.11</td>
<td>225-0-250</td>
<td>60 m/a</td>
</tr>
<tr>
<td>P.T.M.12</td>
<td>275-0-325</td>
<td>120 m/a</td>
</tr>
<tr>
<td>P.T.M.13</td>
<td>350-0-350</td>
<td>120 m/a</td>
</tr>
<tr>
<td>P.T.M.14</td>
<td>425-0-495</td>
<td>150 m/a</td>
</tr>
<tr>
<td>P.T.M.15</td>
<td>500-0-550</td>
<td>150 m/a</td>
</tr>
</tbody>
</table>

Also available in larger sizes

WATTS : VOLTAGES :

<table>
<thead>
<tr>
<th>Watts</th>
<th>Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 watt</td>
<td>100/110</td>
</tr>
<tr>
<td>125 watt</td>
<td>120/130</td>
</tr>
<tr>
<td>240 watt</td>
<td>100/110</td>
</tr>
</tbody>
</table>

Fitted with oval tapered bit or round pencil bit.

HENLEY SOLDERING IRONS

Electric Soldering Irons

Write TO-DAY for Folder Y.10

W. T. Henley's Telegraph Works Co. Ltd.,
Engineering Department,
Bargains in new and slightly soiled

GOVERNMENT SURPLUS

BC 348. De luxe communications receiver. 6 wave bands. Complete with built-in mains pack. In excellent condition. £17/10/-


TUNING UNITS, TNI6. 38-95 mc/s built-in motor to sweep whole or any part of band, in black transit case, with 3 button valves. In original wooden crates, 55/-.

0/300v. M.C. METERS. Complete with wire wound multiplier (external) new, boxed, 7/6. Slightly soiled, 5/.-

TU9 : TU10 ; TU26, in new condition, only 7/6.

NOISE SUPPRESSOR KITS. Completely assembled sub-chassis, with 12 page manual—double diode, etc.—new in sealed box, 5/.-

BC 221. Xtal checked frequency meters—125/20,000 kc/s, lab type instrument—with built-in mains pack, instructions, calibration charts, spare valves, canvas case—in excellent condition, only £10/15/-.

2 VALVE AMPLIFIERS. With 2 6C5 valves, output and mike transformers—new—in sealed boxes. Our price, 9/6.

1 VALVE AMPLIFIERS. Similar to above, but use 6F8 (double triode) valve, to clear. 5/-.

1125 BEACON RECEIVERS. 2 valve, 38 mc/s Rx. A few left at 5/.-

MOVING COIL HEADPHONES. Brand new, only 5/- pair.

MOVING COIL MIKES. New, 2/6 each.

REMOTE CONTROL UNITS. Containing bell, hand generator, condensers, switches, relay and Morse key. New, 7/6.

TESTERS. Rubber mounted moving coil test instrument, with 2 voltage, 1 current, and 2 resistance ranges. Black plastic case approx., 4 in. x 4 in. x 2 1/2 in. Nice job, only 19/6.

STAMP for lists. Please include sufficient for carriage. Phone 5568
VALLANCE'S SPECIAL OFFER

B2 RECEIVERS AND TRANSMITTERS

We have been fortunate in obtaining a small quantity of the above equipment, which we can supply from stock against early order.

SPECIFICATIONS

   (a) Mains supply—A.C. only. 97-140v, 190-250v, 40-60 cps.
   (b) Battery supply, 6v accumulator. Maximum drain, 10 amps.
   A spare Vibrator, 6v, non-synch, is supplied.

2. Transmitter
   Circuit : Oscillator. Doubler driving Class C amplifier, crystal controlled. Provision for frequency doubling. Plug-in tank coils to cover 3-0 to 16 mc/s. "Tune-Send-Receive" switch. Multi-range meter to read voltages and currents on transmitter and receiver. Plug-in transmitting key.
   Power Output : on A.C. Mains.
   (a) Average fundamental and second harmonic power, 20 watts.
   (b) 3rd harmonic power is 16 to 20 watts.

Batteries:
   (a) Average fundamental and second harmonic power is 18-20 watts.
   (b) 3rd harmonic power is 15-18 watts.

Receiver
   Circuit: Four-valve seven-stage superheterodyne receiver, essentially designed for C.W. reception. 3 Waveband switch selector, 3-1 to 15-5 mc/s, total coverage 50', slow motion vernier dial, B.F.O. pitch control incorporating on/off switch. Volume control and phone socket.
   Valves:-Frequency changer 7Q7, Locat L.F. amplifier. 7R7 Locat double diode pentode. 2nd I.F. amplifier and B.F.O. 7Q7. 2nd Detector and A.F. amplifier 7R7, I.F. frequency 470 kc/s, sensitivity 1-3 microvolts for 10 millivolts output at 1,000 cps. Selectivity-Bandwidth. 1 k/c 3db down from peak. 9 k/cts 20 db down from peak. Maximum output 50 milliwatts into 120 ohms telephones. (Impedance 500 ohms at 800 cps.)

Packed in two watertight containers as follows:
   Packing A, containing (a) Transmitter.
   (b) Receivers.
   Packing B, containing (a) Combination power pack for A.C. mains and 6-volt battery operation.
   (b) Spares box, containing—
       1. 60ft of aerial wire.
       2. 10ft of earth wire.
       3. Transmitting key.
       4. Telephone headset (L.R.).
       5. 12 Fuses 5, 10 amp 2, 1 amp 5, 500 m/a.
       6. 4 Spare valves, 7Q7, 7R7, EL32, 6L6.
       7. Screwdriver.
       8. Two brass pins to connect mains plug to continental fittting.
       9. E.S./BC adaptor.
       10. BC/2 Pin adaptor.
       11. Four tank coils : L1, 3-0-5-5 mc/s ; L2, 4-5-2-5 mc/s ; L3, 6-5-100 mc/s ; L4, 9-16-0 mc/s.

Crystals are supplied separately at 32/6 each.

Price: £15/10/-, carriage paid. A very limited quantity only available.

TYPE “A” MK III Transceiver. Frequency coverage 3-2-5-2 mc/s, 5-9 mc/s.
   Circuit. Pierce oscillator (7H7). Impedance coupled to Class C beam tetrode amplifier (7C5), doubling in anode circuit of amplifier.
   Power Output. (a) Average fundamental power, 5 watts. (b) 2nd Harmonic power, 3-25 watts.

Receiver. Frequency coverage 3-2-5-25 mc/s, 5-2-8-55 mc/s.
   Circuit. Superheterodyne (7Q7) pentagrid mixer—oscillator—band-pass transformer coupled to vari-mu pentode (7H7), coupled by tuned anode circuit to grid-leak regenerative detector.

Note.—The oscillator valve of the transmitter is used as an L.F. amplifier in the receiver. I.F. frequency, 1,200 kc/s.

Selectivity. For 2-4 kc/s, 6 db's down from peak. For 20-40 kc/s, 40 db's down from peak, at critical reaction.

Sensitivity. Less than 10 microvolts C.W. for 1 milli watt into 600 ohm load.

Modulation. 40% at 400 cps.

Signal/Noise Ratio. 10 db.

Maximum Output. 100 milliwatts.
   A.C. Power Unit. Mains supply A.C. only 100-130v, 200-250v.

Battery Power Pack. Supply 6v accumulator automobile type of the largest ampere-hour capacity. This battery is not supplied.

PACKED IN TWO WATERTIGHT CONTAINERS.

Container “C” contains:—(A) Combined transmitter, receiver and mains power unit. (B) Headband for telephones.

Container “D” contains:—(A) 6-volt Battery convertor pack. (B) Spare Vibrator. (C) Box of spares containing:—

1. Morse key assembly with lead.
2. Twin 10" battery lead assembly.
3. Universal lamp socket adaptor (B.C. E.S., or CONT.S. 2-pin).
4. Bulldog clip battery connectors.
5. Aerial 60ft. Earth lead, 10fc.
6. Valves type 7Q7, 7H7, 7C5 (one of each).
7. Fuses. 4-10 amp, 4-1 amp.
8. Button tune-on indicator.
9. Three continental pins for mains lead.
10. Three 15 amp universal pins for mains lead.
11. One 5-amp universal pin for mains lead.
12. Three screwdrivers.
13. One valve extracting tool.

Price £12/12/-, carriage paid. Limited quantity available.

Crystals are supplied separately, at 32/6 each.

Speedy Postal Service C.W.O. or C.O.D.

When sending C.W.O. please include sufficient extra, for post and packing.
The "HAMBANDER" COMMUNICATIONS RECEIVER
The Natural Choice for the Ham & S.W.I.

A complete receiving station for only £22.10.0. Direct from Factory to you. Hire Purchase Facilities.

Don’t delay, send today 2d. stamp for Illustrated Brochure.

RADIOVISION (Leicester) LTD
58-60 RUTLAND STREET
LEICESTER Phone: 20167

The leading makers of amateur communications receivers in the British Isles.

H. WHITAKER G3SJ

10 YORKSHIRE STREET, BURNLEY.

U.S. POWER SUPPLY TYPE 34. Brand New. We consider this the finest item we have ever offered. Output 1,200v D.C. at 450 mils, up to 13v A.C. at 14 amps. Both outputs are variac controlled by 3 variacs, 1 for H.T. one for L.T. H.T. has rough and smooth controls 100v steps and 10v steps, and can be controlled down to 150v. Two M/C meters show at a glance 0-15v A.C. 0-1,250v D.C. There is a further 12v D.C. supply metal rectified for relays available. Five relays are incorporated in the unit. Three circuit breakers, and 1 minute delay switch, with a further main switch which operates on door, killing everything when opened. The whole is push-button controlled. On switch on the Fil. volts are applied to the pair of 866 rectifiers and A.C. volts are available for outside source (say Tx final), after 1 min. delay the plate circuit of the 866 are automatically switched in, after a further delay, push-button control of high voltage output is now available, which when operated changes a green pilot lamp to red. The whole is absolutely fool-proof, putting H.T. to ground for instance simply trips plate circuit breaker, and releases push-button starter. The push-button starter will not make until the fault is cleared, ensuring valve safety. A very big factor, the whole is fan cooled thermostatically, according to temperature. The appearance is beyond reproach, and a pleasure to the eye. Will enhance appearance of any station. Size 18" x 15" x 16" deep. Black crackle, weight 250 lb. unpacked. Input 220v/110v 50 cycles.

Price £18, which isn’t the price of the 3 variacs. Cost of these units must have exceeded £100.

XTLS. We give below complete classification of an extremely fine purchase of over 12,000 ex-U.S. Sigs. XTLS. These are by all the leading U.S. manufacturers, R.C.A., VALPEY, BLILEY, STAND, M.P., WESTON, etc. All except the 3-5 Mc Band are the new U.S. standardised ¥ pin spacing in FT4 type holder, with raised edge air gap plates. Drift is less than 2 cycles per Mc. per degree centigrade, all up to 8,750 Kc are fundamental osc., suitable for pen or tritet osc. 28 Mc up are harmonic cuts, metallised types, mounted in air, in sealed holders, and osc. readily in Bliley’s circuit, Sept. 1947 QST.

PRICES.
3.5 Mc to 3.8 Mc, BC610 fitting, 15/-.
7 Mc, 7,100 Kc. Plus or Minus 1Kc, 12/6.
21 Mc Band. We offer choice 7,000/7,133 or 5,250/5,350 Kc. Plus or Minus 1Kc, 12/6.
28 Mc. 28,000/30,000 Kc. Weston Met. 30/- in 100 Kc steps.
144-148 Mc. 6,000/6,083, 12/6. 8,000/8,220, 15/-.
9,000/9,250, 15/-, 36 Mc to 37 Mc, 30/-, and a few only 70 Mc to 74 Mc, 30/-.
420 Mc to 540 Mc. 70 Mc to 76-6 Mc and 35 Mc to 38-3 Mc at 30/-.
1,000 Kc Octal. For BC 221. Few left only, 30/-.

Many other combinations will readily suggest themselves for multiplying to UHF Bands. Your enquiries welcomed, a large range available, between 70 Mc and 99-9 Mc. To commercial users and others we have large stocks available, between 2-7 Mc and 99-9 Mc. Also all spares for the above, Plates, Springs, Pins, etc.
The Pullin S Meter has been designed for use on amateur band communication receivers. The meter is mounted in a bench stand with terminals on top. Two scales are printed on the dial, thus serving as a dual purpose meter. An instructional leaflet is supplied with each meter. This gives the user full instructions for wiring up and explains in detail the value of the resistors and potentiometer to be used in the circuit. Price, £3.6.0.

Address all Enquiries to

MEASURING INSTRUMENTS (PULLIN) LTD.
Dept. K. Electrin Works, Winchester St., London, W.3. Phone ACOrn 4651/4

THE A.C.R.1155 COMMUNICATIONS RECEIVER. This superb R.A.F. 10-valve superhet receiver, covering 75 kcs-18.0 mcs in 5 wavebands, is now available for use on A.C. mains, and complete with speaker, at ONLY £18/10/- . An illustrated, fully descriptive leaflet, is available on request.

R.1132. A COMMUNICATIONS RECEIVER. A superb U.H.F. receiver covering 100-124 mcs. Incorporates large 180 degree dial with slow motion tuning, and 0-5 mA tuning meter. Chassis tropically treated. Complete with calibration chart, circuit diagram, parts list, and valves. ONLY 99/6 (carriage, etc., 10/-).

R.109 COMMUNICATIONS RECEIVER. An ex-Army superhet covering 1.8-8.5 mcs in two bands. Circuit consists of R.F. amp, mixer, with separate local oscillator, 2 stages of combined signal detector, I.F. and A.V.C., and first A.F. followed by an output stage. B.F.O. can be switched in for the reception of C.W. Has built-in 3" speaker, or can be used with phones. Power supply from 6v D.C. source to vibrator power unit, which can be removed, and set then operated from 2v L.T. and H.T. batteries. Complete in every way, with spare valves and vibrator, and instruction book. ONLY £6/15/- (carriage, etc., 10/-).

SHORT WAVE CONVERTERS. Ex-R.A.F. RF units operating from 6.3v and 240v. IF output 7 mcs. Types 24 and 25 operate on 5 pre-set frequencies, and cover 15-30 mcs and 40-50 mcs respectively. Easily adaptable to tunable units by replacing ceramic switch with 3 ganging type 15 pf condensers. ONLY 16/6 (postage 1/6). or BRAND NEW IN CARTONS, 25/-. Types 26 and 27 are tunable units covering 50-65 mcs and 65-85 mcs respectively. They are fitted with an illuminated slow motion dial, and are ONLY 27/6 each (postage 1/6), or BRAND NEW IN CARTONS 35/-.

C.W.O. please

S.A.E. FOR LISTS

U.E.I. CORP,
The Radio Corner, 138 Gray's Inn Road, London, W.C.1
(Phone: TERminus 7937)
Open until 1 p.m. Saturdays. We are 2 mins. from High Holborn, 5 mins. from King's Cross
TELCON PRODUCTS
that contribute to the efficiency of
MODERN RADIO TECHNIQUE

A complete range of co-axial and balanced twin screened and unscreened TELCON Cables is available for the reception and transmission of radio frequencies up to the centimetre range. In all of these “TELCO THERE” is employed as the dielectric with “TELCOVIN” as a protective sheathing. “TELCO THERE” insulated “hook-up” wire and sleeving in all sizes are also produced. Full technical data is contained in the Telcon R.F. brochure.

TELCON METALS are widely used in modern designs of radio components. The advantages of high permeability and low loss are utilised by the employment of MUMETAL, RADIOMETAL and RHOMETAL for transformers, chokes and magnetic shields. TELCUMAN, with its low temperature coefficient, is suitable for precision resistors and PYROMIC and CALOMIC can be employed where rise of temperature is likely. The age hardening high tensile ‘Cu.Bc.250’ BERYLLIUM COPPER alloy, with its high fatigue resistance, is particularly suitable for springs and electrical contacts. TELCOSEAL glass sealing alloys are available for practically all types of glass employed in radio and television, and TELCON BIMETALS are ideal for delay switches and components involving thermostatic action.

Manufactured by
THE TELEGRAPH CONSTRUCTION & MAINTENANCE CO. LTD.
Head Office: 22 OLD BROAD STREET, LONDON, E.C.2. Tel: LONdon Wall 3141
Enquiries to TELCON WORKS, GREENWICH, S.E.10. Tel: GREenwich 1040
INDEX TO ADVERTISERS

Page
A.C.S. Radio .......................... 596
Amateur Radio Service ............... 593
Automatic Coll Winders ................ 521
Barnes Radio .......................... 596
Belling & Lee .......................... 585
Berry's Ltd. .......................... Cover iv
Brighton Trade Service ............... 597
Britain (Radio) Ltd. ................. 589
Brookes Crystals Ltd .................. 589
Brown, S. G. .......................... 533
Bulls, J. ............................... 599
Candler System ........................ 597
Celestion ............................. 585
Classic Elec ........................... 598
Clydesdale Supply Co. Ltd ......... 590
Coulphone Radio ....................... 599
Date International .................... 522
Davis, Alec, Ltd ....................... 525
Denco ................................. 522
Electradix Radios ..................... 589
Fields ................................. 599
Fon Radio ............................. 600
General Sound & Vision Co. ....... 528
H.A.C. Short-Wave Products ....... 598
Hemleys ............................... 527
Hoile, A. C. ........................... 597
H.P. Radio Services Ltd. .......... 594
Instrument Co. ......................... 525
Johnsons .............................. 595
Laskys ................................ 587
Lyons Radio .......................... 589
Metropolitan Radio .................... 528
M.O.S. ......................... 595, Cover iii
Odeon Radio .......................... 523
Premier Radio ........................ 586
Pullin, M.I. ............................ 531
Quartz Crystals ....................... 567
Radford, Arthur H. .................... 591
Radio Clearances ..................... 524
Radiocraft ............................ 587
Radio Exchange ....................... 528
Radiovision (Leicester) Ltd ........ 530
Rock Radio ........................... 592
Sanata, Also, Ltd ..................... 525
Short Wave (Hull) Radio .......... 593
Small Advertisements ................. 594-600
Smith, H. L. .......................... 596
Smith, M. P. ........................... 600
Southern Radio Supply Co. ....... 598
Taylor Elec. .......................... 534
Telegraph Construction .......... 532
Tele-Radio (1943) Ltd. ............. 591
Torbay Elec. .......................... 594
Trading Post .......................... 593
U.E.I. Corp. ............................ 531
University Radio ..................... 600
Vallance & Davison Ltd. .......... 529
W.D. Sales ............................ 588
Watts M. .............................. 592
Webb's Radio .......................... Cover ii
Weston Products ...................... 526
Whitaker, H. ......................... 530
Woden Transformers ................. 527
Young ................................ 524

Mention the Magazine when writing to Advertisers—It Helps You, Helps Them and Helps Us

INDEX TO ADVERTISERS

Page
A.C.S. Radio .......................... 596
Amateur Radio Service ............... 593
Automatic Coll Winders ................ 521
Barnes Radio .......................... 596
Belling & Lee .......................... 585
Berry's Ltd. .......................... Cover iv
Brighton Trade Service ............... 597
Britain (Radio) Ltd. ................. 589
Brookes Crystals Ltd .................. 589
Brown, S. G. .......................... 533
Bulls, J. ............................... 599
Candler System ........................ 597
Celestion ............................. 585
Classic Elec ........................... 598
Clydesdale Supply Co. Ltd ......... 590
Coulphone Radio ....................... 599
Date International .................... 522
Davis, Alec, Ltd ....................... 525
Denco ................................. 522
Electradix Radios ..................... 589
Fields ................................. 599
Fon Radio ............................. 600
General Sound & Vision Co. ....... 528
H.A.C. Short-Wave Products ....... 598
Hemleys ............................... 527
Hoile, A. C. ........................... 597
H.P. Radio Services Ltd. .......... 594
Instrument Co. ......................... 525
Johnsons .............................. 595
Laskys ................................ 587
Lyons Radio .......................... 589
Metropolitan Radio .................... 528
M.O.S. ......................... 595, Cover iii
Odeon Radio .......................... 523
Premier Radio ........................ 586
Pullin, M.I. ............................ 531
Quartz Crystals ....................... 567
Radford, Arthur H. .................... 591
Radio Clearances ..................... 524
Radiocraft ............................ 587
Radio Exchange ....................... 528
Radiovision (Leicester) Ltd ........ 530
Rock Radio ........................... 592
Sanata, Also, Ltd ..................... 525
Short Wave (Hull) Radio .......... 593
Small Advertisements ................. 594-600
Smith, H. L. .......................... 596
Smith, M. P. ........................... 600
Southern Radio Supply Co. ....... 598
Taylor Elec. .......................... 534
Telegraph Construction .......... 532
Tele-Radio (1943) Ltd. ............. 591
Torbay Elec. .......................... 594
Trading Post .......................... 593
U.E.I. Corp. ............................ 531
University Radio ..................... 600
Vallance & Davison Ltd. .......... 529
W.D. Sales ............................ 588
Watts M. .............................. 592
Webb's Radio .......................... Cover ii
Weston Products ...................... 526
Whitaker, H. ......................... 530
Woden Transformers ................. 527
Young ................................ 524

SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

Vol. VI OCTOBER 1948 No. 63

CONTENTS

Page
Editorial .................................. 535
Modifying the HRO by I. E. Hill (G6Hl) .......... 536
Flexible Crystal-VF Oscillator by F. Butler, B.Sc., M.I.E.E. 540
Compact Transmitting Aerial by S. C. Clark (G2FC) .......... 543
Neutralising Tetrode Amplifiers by J. N. Walker (G5JU) ... 545
Another BC-453 Conversion by L. A. Lear .......... 546
Band-Spreading the Clapp by R. T. Reed (G2RX) .......... 547
Inexpensive Driver Unit by G. Moorfield (GW3DIX) .......... 548
DX Commentary by L. H. Thomas, M.B.E. (G6QB) .......... 550
More on the “AT” Code by W. Oliver (G3XT) .......... 557
Not All Fun by N. F. Joly (G3FNJ) .......... 559
Crystallizing the Type 27 Converter by I. Paul (G3CYY) .... 561
The VHF Bands by E. J. Williams, B.Sc. (G2XC) .......... 565
“Short Wave Magazine” VHF Contest Rules .......... 567
Transmitter for 420 mc Notes by G4LU ........ 571
Q-Max B4/40 Test Report .......... 574
Bringing in the DX by S. A. Herbert (G3ATU) .......... 576
New QTH’s .......... 578
Here and There .......... 579
Other Man’s Station—G3BDS .......... 580
Month with the Clubs—From Reports .......... 581
Extreme Sensitivity.

20,000 ohms, per volt A.C. & D.C.

Universal Taylormeter

Model 75A

- 50 ranges up to 1,000 volts and 5 amps. A.C. and D.C.
- Robust Meter with 4-inch scale and knife-edge pointer.
- Built-in buzzer for continuity tests.
- Instantaneous automatic meter overload protection.
- Self-contained resistance measurements from 1 ohm to 10 megohms.
- Steel case and panel.

MODEL 75A

PRICE £14.14.0

H.P. TERMS: £1.8.3 deposit and 11 monthly payments of £1.8.2

IMMEDIATE DELIVERY

Taylor

Best for TEST EQUIPMENT

Taylor Products include: Multirange A.C. D.C. Test Meters • Signal Generators • Valve Testers • A.C. Bridges • Circuit Analyzers • Cathode Ray Oscillographs • High and Low Range Ohmmeters • Output Meters • Insulation Testers • Moving Coil Instruments

TAYLOR ELECTRICAL INSTRUMENTS LTD
15-24 MONTROSE AVENUE, SLOUGH, BUCKS, ENGLAND

Telephone SLOUGH 21381 (4 lines)
Grams & Cables "TAYLOR SLOUGH"
EDITORIAL

Shadow

Once again mankind is troubled and, like millions of others, we ponder what the future may hold. It is neither our intention nor our function here to discuss the political events which are being watched so anxiously as the shadow from the East lengthens across the world.

But it is exactly ten years since it was our duty to comment, in this same space, on the situation as it affected Amateur Radio during that first period of extreme tension in our relations with Germany. History is repeating itself in much the same way, with only a slight change of focus but with a threat more evil, and many traitors within the gates.

To the newer generation of amateurs, discussion of this sort in the Short Wave Magazine may seem out of place, pompous and unnecessary. But we conceive it our duty to explain how Amateur Radio could be affected if an "extreme emergency" were to arise. All licences would be cancelled by proclamation, followed very quickly by the impounding of each operator's essential transmitting equipment. In 48 hours the curtain would fall, for the third time in living memory, on all amateur activity.

It is at a time like this that licensed operators—in their way the cream of the nation's reserve for the communications branches of the Services—ask themselves what their part could be. As the last war is so close behind us, a very large number of our readers (probably the majority) are themselves ex-Service and so liable to immediate or eventual recall. In a general way, the Service departments have outlined their plans for reserve formations; and we are told that sufficient information is available to the authorities to ensure that individuals are employed on the work for which they are best fitted.

Though we pray that there will not be another, it is certain that if war does come, amateurs will again acquit themselves with honour and distinction.
Modifying the HRO
Improving HF Performance

By I. E. HILL (G6HL)

(There are many pre-war HRO's in service and this article shows how to set about bringing a popular receiver up to 1948 standards on our HF communication bands. Extensive modification of a commercial design is never easy; though the article contains all the information necessary for the experienced constructor, our contributor rightly warns readers who may be obtaining what they feel to be satisfactory results to Leave Well Alone! His article is useful and instructive reading for those interested in receiver design generally.—Ed.)

A new receiver, fresh from the production line, gladdens the eye and can expect to take pride of place in any amateur station, but Father Time is remorseless and has already relegated the original HRO to the vintage class. However, in these difficult days the HRO is one of the few commercial receivers available at a reasonable price and even by 1948 standards it is still a useful job. Nevertheless, there are a few simple modifications which can readily be effected with a considerable improvement in performance—or one can go the whole way and utilise HRO component parts to build a new receiver.

The writer put an early-model HRO into service again in mid-1946. The following chronicle of modifications effected and results obtained may be of general interest. Not all these modifications were original and acknowledgments are due to many un-named operators for suggestions made in the course of late evening discussions on the 28 mc band.

HRO Limitations

When considering modification of a commercial receiver it is advisable first to determine the objective and likely effect of the modification contemplated. By 1948 standards the old HRO design has several weaknesses, among which are:

(i) Lack of noise limiter.
(ii) Lack of gain in the 28-30 mc band.
(iii) S-meter readings not related to signal on the higher frequencies.
(iv) Rather tricky routine for aligning coils.
(v) Excessive first oscillator frequency creep during the warming-up process, particularly on the 28-30 mc band.

Apart from these points—and, possibly, the inconvenience of plug-in coils—the HRO is a good receiver and very pleasant to handle. The amateur who operates in the LF bands only and has no ignition noise trouble is—in clover and is well advised to treat his receiver kindly by leaving well alone. But if HF performance—10 mc and above—is required and the use of a converter is rejected, then a few changes are profitable.

Some Modifications

First, the easy modifications which can be made with the minimum of effort and alteration from ex-works condition.

**IF Gain** can be increased by changing the cathode resistor of the second IF valve. The usual value is 1,000 to 2,000 ohms, but it can be reduced to 500 ohms with increased IF gain.

**Noise Limiter.** This is a necessity for operation on 28 mc (and 21 mc when we get it). Various limiters were tried at a main-road location in Hampshire. The standard HRO limiter is easy to install and provides fairly reasonable limiting effect but does not entirely remove the noise. Several other schemes were tested, including diodes, triodes and eventually a 6L7 substituted for the last IF valve and a "hole punching" circuit incorporated. Each scheme had disadvantages, mainly in the requirement of readjustment for individual signal-noise levels. Eventually the QTH was changed for one less frequented by traffic and a diode limiter (page 91, Tenth Edition, Jones Handbook) incorporated. It limits but does not remove the noise; as noise is only occasional this is acceptable—for the present.

**RF Gain on 28 mc.** The HRO 28 mc bandspread coil is required also to tune 30 to 14 mc on general coverage. To accomplish this and give satisfactory tracking a tertiary winding has been incorporated in the coils by the manufacturers. For 28-30 mc working on 21-30 mc coverage only, this results in a considerable loss of gain so
The modified HRO with the new sub-chassis in position; the 100 kc oscillator is behind the output valve, and tubular metal-cased by-pass condensers stand in front of the 6AK5 shields. New calibration charts have been made for each set of coils.

"Tear 'em up" and rewind the coils. Retain the oscillator coil as at present but rewind the RF and mixer coils on the lines suggested later. If the original valves are retained then the number of turns may have to be reduced. Easiest routine is to get the mixer coil right first and then rewind the RF coils exactly the same.

**Second Channel Interference** can be troublesome on 28 mc if a low IF is in use (455 kc in the HRO) and even two RF stages will not entirely remove it from local or exceptionally strong signals. The remedy is, however, quite simple and the HRO coils readily lend themselves to the modification of tapping the grid down from the "hot" ends of the secondary RF and mixer coils.

This arrangement was found necessary also at 14 mc in the more complete modification described later.

**Re-valving**

So much for the easy modifications each of which will considerably improve the performance of the receiver—particularly at 28-30 mc. Looking at the valves in the standard HRO an obvious thought towards improved gain is to change them for their more modern counterparts. An initial effort was made with a 6AC7 in the first RF stage but the result was an uncontrollable audio hoot. Reference to the HRO circuit diagram indicated the trouble as lack of decoupling. This was remedied and results were then a little more encouraging and the second RF valve was also changed for a 6AC7. The overall gain certainly went up but so did second channel trouble. It was at this stage that the grids were tapped down from the hot ends of the coils. A further change was made in favour of EF50's in the two RF stages but little improvement in performance was noted.

The next development centred around acquisition of several 6AK5's, but by this time the HRO chassis had suffered somewhat and to put the miniature valves in the original chassis positions would have thrown away the advantages of short leads in the RF circuits. So the two RF, mixer and 1st oscillator valves were removed and a strip constructed containing four 6AK5's, suitably placed to shorten wiring and including associated by-pass condensers. The circuit used was almost identical with that of the standard HRO, component values being suitably altered and decoupling provided to operate the first RF stage at 180 volts on the plate and the remaining 6AK5's at 150 volts; the 1st oscillator
was also stabilised with a VR150-30. Screen injection was retained to the mixer. Results on 28-30 mc were exceptionally good but some difficulty was experienced owing to pulling between first oscillator and mixer.

Further Improvement

The receiver functioned in this form until Christmas, 1947, and gave very satisfactory results, but it did not look pretty and there was still the pulling at the mixer stage. So dismantling was started once again. By this time the under-chassis looked a bit rough so the whole lot was stripped off, components removed and the condenser support attended to with a ½-in. cold steel chisel and 8-oz. hammer! A coat of light grey paint improved the chassis appearance. A sub-chassis was built up to take the condenser and the front end valves, together with associated resistors, condensers and so on. A new one-piece coil contact strip was made and bolted to the sub-chassis, which in turn could be bolted down to the main chassis. In this manner the “front end” could be self-contained and treated as a complete unit.

To overcome pulling, a 6SA7 was put in as the mixer; it had been intended to use the miniature equivalent 6BE6, but one could not be located. With the 6SA7, conversion gain and signal-noise ratio was not so good as with the 6AK5, but the pulling effect on the oscillator had disappeared. The first oscillator was changed to a 6C4 and its plate supply stabilised with a VR150-30. The HRO coil connections were also changed round somewhat to obtain reduced length of connecting leads.

Performance this time was equal to the all-through 6AK5 line-up, but the undesirable pulling effect between mixer and oscillator had largely been obviated. The first RF valve still operated at 180 volts on the plate and with fixed cathode bias. The second RF stage had 150 volts on the plate and a variable cathode bias resistor—a useful adjunct to vary gain without upsetting the S-meter operation. Remaining details in the circuit diagram of Fig. 1 are self-explanatory and readily adaptable to any similar receiver.

The two RF stages gave considerable effective gain but with grids connected to the “hot” ends of the coils second channel

---

**Fig. 1.** Circuit of G6IIL’s front end for the modified HRO drawn to emphasise the single-point earth connection in each section. Pre-set trimmers are those already existing in the HRO coils; where not otherwise stated in the table of values alongside, all by-pass capacities are .005 μF.
is troublesome at higher frequencies. However, this is easily overcome by tapping the grid one-third down the coils from the "hot" end. On 14 mc it was found that an untunable background noise was getting through to the IF stages and on removing the oscillator valve high-speed auto-signals could be heard beating with amateur signals. The auto signal was a strong one just outside the band and was beating with signals in the band 455 kc away. This was also completely cured by tapping the grid down the coils.

**Redesigned Coils**

Having got the receiver working satisfactorily, further attention was given to the coils, which it was decided should provide band-spread only. The RF and mixer coils were rewound with a considerable increase in the number of turns. The 28-30 mc coils were increased from 5 turns, ½ in. diameter, to 12 turns on a ½ in. diameter former, with the grids tapped on at the ninth turns. The trimmers were rewired so that one provided band-set adjustment and the other in series with the main tuning condenser gave band-spread. In adjusting the coils, the main tuning condenser is set at 480 degrees and the HF edge of the band located using the band-set trimmer. The main condenser is then rotated to 40 degrees and the LF end of the band set up using the band-spread trimmer. Some readjustment of the band-set trimmer will now be necessary, the main condenser being returned to 480 degrees. Subsequently, a further small adjustment of the band-spread trimmer may be required. The result is to spread the band over most of the dial, but increasing the L/C ratio has also had the effect of opening the tuning scale out at the LF end of the band. If this is considered undesirable the L/C ratio (or alternatively the size of the main tuning condenser) must be reduced. Unfortunately the latter has the effect of spoiling the HRO coverage on MF. In any case, the open scale at the LF end of the band is advantageous for CW working.

A few other modifications have also been made to the receiver. A 100 kc oscillator has been installed which can be brought into operation by a panel switch and is used for locating band edges and checking calibration. The S-meter has been changed to a bridge in the plate feed of the IF strip and a front-panel zero setting control provided. AVC is taken from the input

**Table of Values**

<table>
<thead>
<tr>
<th>Fig. 1</th>
<th>HRO Front-End Stages as Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C4 = 0.01 uF</td>
<td></td>
</tr>
<tr>
<td>C3, C5 = 0.1 uF</td>
<td></td>
</tr>
<tr>
<td>C6 = 100 uF</td>
<td></td>
</tr>
<tr>
<td>R1, R2 = 470,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R3, R4 = 220 ohms</td>
<td></td>
</tr>
<tr>
<td>R5, R7, R15 = 5,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R6 = 600 ohms</td>
<td></td>
</tr>
<tr>
<td>R8 = 20,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R9 = 50,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R10 = 25,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R11 = 2,500 ohms</td>
<td></td>
</tr>
<tr>
<td>R12, R14 = 30,000 ohms</td>
<td></td>
</tr>
<tr>
<td>R13 = 3,000 ohms</td>
<td></td>
</tr>
</tbody>
</table>

*Fig. 2. Rearrangement of HRO coil connections, referring to one coil pack. For 14, 21 and 28 mc the grid tap is one-third the way down from the grid end, and on the grid end for frequencies below 14 mc; approximately double the original number of turns is used. The original oscillator winding is retained for all bands.*
side of the last IF transformer and a separate diode used. Separate diodes (6H6) are employed for AVC second detector and noise limiter.

**Further Improvement Possible**

Results with the receiver are very satisfactory, but further changes are contemplated for the future and will be:

(i) Inclusion of 6AG5 in lieu of 6AK5 in the RF stages and increase of plate feed to 200 volts.

(ii) Change of 6SA7 to 6BE6 in the convertor stage.

(iii) Modification of the crystal filter to band pass 300 cycles and 3 kc.

The foregoing modifications have been applied to the HRO but are obviously adaptable to other pre-war commercially built receivers. However, before work is commenced the constructor (or should one say destructor) is well advised to refer back to an earlier paragraph. Consider carefully whether the modifications, when completed, are likely to give results in keeping with the requirements of the individual. In most cases, a 3.5 mc or 7 mc enthusiast will find little advantage in pulling an existing commercially built receiver to pieces—but for 28 mc, 21 mc or even 14 mc the story is very different and the labour involved well worth while.

---

**Flexible Crystal-VF Oscillator**

**Describing a New Driver Circuit**

*By F. BUTLER, B.Sc., M.I.E.E.*

In transmitter design, it is customary to employ quartz-crystal or variable-frequency oscillators as alternatives for the purpose of primary drive and frequency control. There are both technical and operational reasons for this functional separation, though in certain classes of equipment it is of advantage to be able to combine the two. It has been found possible to do this, using a circuit developed by the writer, a theoretical account of which has already been published. ("Series Resonant Crystal Oscillator," *Wireless Engineer*, June, 1946.)

It is the purpose of this article to give a simplified description of the new arrangement with sufficient practical detail to induce experimenters to give it a trial in comparison with more conventional circuits. The distinguishing feature of the new crystal oscillator is that it uses the series-resonant mode of vibration of the quartz plate, as against the more usual parallel-resonant mode. Before going into an explanation of the action of the oscillator, it is essential to understand the difference between these two modes.

It is possible to resolve into an equivalent electrical circuit and so to calculate the performance of most electro-mechanical apparatus, including telephones, loudspeakers, microphones, gramophone pick-ups, sound-boxes and piezo-electric and magnetostriction devices. The vibration modes of a quartz plate are particularly simple to determine by this technique, and without going into unnecessary detail, it turns out that there are two principal modes, the characteristics of which are simulated respectively by the series and parallel resonances of a coil and condenser circuit of extremely high "Q." It transpires that the two oscillation modes occur at slightly different frequencies, the series resonance being a few parts in a thousand lower in frequency than the parallel mode. A further point emerges, in that the series-resonant frequency is not greatly affected by changes in the parallel capacity shunting the crystal, whereas, in the parallel case, there is an appreciable variation. For this reason, the series mode is almost always chosen for employment in oscillators of the highest precision. It is more usual for crystals to be operated in circuits of the Pierce or Miller type, or in some variation of them, so that crystals...
are calibrated for the parallel-resonance operation which these employ. Though higher in absolute stability, the series-resonant crystals will operate at lower values than the frequencies marked on the holders and they must be measured or recalibrated in the alternative circuits to be described. This operation is easily performed, using a heterodyne frequency meter.

**Series-Resonant Oscillator Circuit**

One of the commonest drive-circuits used in amateur practice is the electron-coupled oscillator. This is a version of the Hartley circuit in which the anode of the oscillator valve is earthed at RF, and the cathode is taken to a coupling coil or to a tap on the tuning coil, one end of which is earthed and the other taken to the valve grid, through a grid-leak and condenser auto-bias circuit. The tuning capacity normally shunts the whole of the main tuning coil. If a pentode or tetrode valve is used, a further parallel-tuned circuit may be connected in the anode circuit (the screen being earthed at RF) and used to select the fundamental or, more usually, some harmonic frequency. This circuit forms the variable-frequency oscillator to be described, and it is the basis of the series-resonant quartz oscillator, the circuit of which is given in Fig. 1.

It will be seen that this is a conventional cathode-coupled oscillator, with a quartz plate joined in series with the coupling coil. At series resonance, the impedance of a tuned LC circuit degenerates to a very low resistance, being practically that of the coil alone. The quartz plate, at its series resonance frequency, is almost a short circuit and so permits sufficient feedback to sustain oscillation. The frequency is selected by the setting of the main tuning condenser C. Off resonance, the quartz plate simulates a high reactance, the feedback is altered in magnitude and phase, and oscillations stop. A milliammeter in the anode circuit shows a dip in current at the true resonant point, the rise on either side being almost symmetrical in form and quite different from the readings observed in the case of a Pierce or Miller circuit, where a markedly unsymmetrical characteristic is encountered. This tuning property is one very useful feature of the new circuit, and makes it extremely easy to set up on frequency.

To operate the system as a VFO it is sufficient to join a short-circuiting switch across the crystal.

The elementary arrangement in Fig. 1 suffers from one obvious and one more obscure disadvantage. In the first place, quartz is an insulator, and so the flow of
anode current is prohibited. To avoid this
an RF choke is connected across the
crystal. The value of this choke is not at
all critical.

There is another objection to the circuit
as it stands. This is due to the capacity of
the quartz holder, which may permit
sufficient feedback, at frequencies remote
from the crystal resonance, to start self-
oscillation. This defect is avoided by the
use of a neutralising circuit, shown in
Fig. 2. In this, the main tuned circuit LC
is the same as in Fig. 1, the values being
selected to cover the desired range of
frequency. The coupling coil is centre-
tapped, and a neutralising condenser,
equal in maximum capacity to that of the
holder, is joined between one free
end and earth. The other end of the
coupling coil is connected to the quartz
as before, the RF choke serves
merely as a DC path for the valve anode
current. A tetrode is shown, in the anode
circuit of which is a second tuned circuit
set to the fundamental, or preferably to
some harmonic frequency.

Values and Tuning Procedure
In setting up an oscillator of this type,
the first step is to choose a coil which will
tune, with the main variable condenser,
over the desired range. Each half of the
coupled winding should include about
one-fifth of the number of turns used on
the main coil and should be well insulated
from it. The neutralising condenser
should normally be an air trimmer
covering estimate 3-30 µuF.

To adjust the oscillator, first short-
circuit the anode coil, and with a meter
in the HT lead, set the neutralising
condenser about half-scale and tune the
main variable condenser slowly through
its range. A pronounced dip will be
observed when the setting is correct. Note
this reading, then search for spurious
responses at other settings. These can be
eliminated by trial adjustments of the
neutralising condenser. If the tuned
circuit covers an exceptionally wide range,
it is possible that a harmonic response of
the crystal will be excited. This must not
be confused with some undesired feed-
back instability. Having adjusted the
crystal circuit, remove the short-circuit on
the anode coil and tune this circuit to
resonance. Practically any tetrode valve
and any type of crystal from 50 kc to
10 mc can be used in the circuit. With
reasonable HT voltages, crystal current is
low and the output and efficiency are both
high. Grid leak and condenser values are
normal, e.g., 30,000 ohms and 100 µuF.

Multi-Crystal Operation
A remarkable property of the circuit is
that a number of crystals can be employed
simultaneously, all joined in parallel,
without any form of switching. The
desired frequency is selected merely by
tuning the main condenser and watching
for the separate dips in anode current.
Naturally, the anode circuit will need
re-tuning to each new frequency. Multi-
crystal operation requires only an increase
in the setting of the neutralising condenser
to allow for the increased total holder
capacity. The crystal frequencies must not
be very closely adjacent, or there will be
some interaction. In any of the circuits
described, VFO operation is secured by
connecting a short-circuiting switch across
the crystal, or bank of crystals. It is well
to remember that VF oscillators of high
stability should be operated with a large
fixed padding capacity and a variable
portion just large enough to sweep over
the desired frequency range.

As a refinement, voltage-stabilised
supplies can be used, but this is not
normally required.

Frequency Measuring Applications
The form of oscillator described has its
principal use as a driving source for an
RF amplifier. In addition, it can be used
in a signal generator or in a heterodyne
frequency meter. For these applications,
the tuned harmonic selection feature is not
required, and a simple triode oscillator
can be used. The possibility of working
on one of a number of spot frequencies,
with an easy change to variable-frequency
control by the use of a single switch,
makes the circuit extremely convenient in
operation.

GERMAN LICENCES

Latest official information from
Germany, dated September 20, is that no
amateur licences have yet been issued to
German nationals. The reason is that the
German Economic Council has not yet
presented to the Military Government the
ordinance they were instructed to issue by
September 1. Hence, there will be a
further delay in licensing amateurs, and
any German nationals to be heard on our
bands are still pirates—more's the pity.
Compact Transmitting Aerial

The Beehive Twenty

By S. C. CLARK (G2FC)

POST-WAR Amateur Radio has found many operators using indoor aerial systems, possibly through the sheer necessity of living space. A dipole folded into a rectangle or square is sometimes employed, of which a good example was recently published in the Short Wave Magazine ("Indoor Aerials," p.112, April 1948).

Accordingly, experiments were carried out with an indoor half-wave aerial folded into a rectangle. It was then thought that a useful radiator could be designed by using only this portion and coiling the ends in such a way that the inductance and capacity would be sufficiently well distributed.

Practical Design

In practice a radiator 5 ft long was used, and the ends were coiled up in the form of a beehive with the last few inches left projecting horizontally (Fig. 1). Dural or aluminium tubing may be employed for the radiating portion and 12 or 14 SWG enamelled wire for the coils. The ideal conductor would be a thin hollow tube increasing in diameter towards the centre and tapering to a fine point at each end with a very low RF resistance. However, in practice the arrangement described seems to work quite well.

Resonating the System

It will be understood that it is not easy to calculate the length of wire required for a given frequency. As a start the same length can be used as is normally required for a straight-wire aerial. A short stub may be temporarily connected to the centre, and a thermo-couple shorted across different points for highest current will show whether more turns are needed on the coils. It was found that 15 ft of wire coiled in about 11 turns of ever decreasing diameter gave best results over the whole of the 14 mc band. The diameter of the first turn was 8 inches, making the total length of the aerial 35 ft.

Matching

It will be found that it is not possible to feed the centre of the aerial with low impedance lines since owing to the short physical length of the radiator and the inductance and capacity distribution, quite a high RF voltage appears at the centre as well as high current values. Consequently, the end impedance is apparently much higher than the normal half-wave straight wire.

The simplest way of matching was found to be a single wire feed tapped at one end on the PA coil, the other tapped on to one of the "beehives." The tapping at the aerial end is very critical and a thermo-couple should be connected in the centre to show maximum current. A more balanced (and safer) system may be the usual twin-wire spaced 2 or 3 in. apart feeding the centre, with a 3-turn coil coupled to the PA anode coil midway between the current and high voltage positions.

If it is essential to current feed, then the artificial tank circuit can be used (Fig. 2), though with some additional losses. It must be stressed that however the system is fed, an ammeter must be used to check the current actually obtained at the centre.

Matching Circuit

The problem of how to get out when facilities exist for an indoor aerial only bothers many operators, and deters some from coming on the air at all. That satisfactory results on our communication bands are possible with inside aerial systems has often been proved. Here is another suggestion in the same strain.—Ed.
When a loose-coupled coil is employed, parallel or series tuning may be required depending on the length of feeder. The matching data given refer to relatively short feeder lengths, since the aerial was being used indoors near the transmitter.

**Mechanical Mounting**

The system was made entirely self-supporting as shown in Fig. 1. Two 4-ft poles (broom handles from the local ironmonger) were screwed together, T-fashion, the radiator proper being mounted on strips of ebonite—alternatively, fairly long stand-off insulators may be used. The "beehive" coils are also clamped between two strips of insulating material and mounted at the ends of the T-piece. High grade insulation must be used owing to the high RF voltage that appears over the whole system.

**Results**

Under average Class-C amplifier conditions, the centre current will run .75 to 1.75 amps, for powers of 100 to 150 watts. There is considerable variation of current due to nearby capacity effects when the system is used indoors; and when set up in a very confined space, with the aerial turned to alter the directivity, retuning of the PA is necessary.

The aerial was tested out under very adverse conditions, being used in a small room and standing 4 ft from the floor near the operator, in a first-floor flat 22 ft above the ground and severely screened in all but one particular direction. Numerous 'phone and CW QSO's have been obtained under short- and medium-skip conditions; it is unfortunate that this aerial would give a good account of itself when erected under conditions similar to the more conventional types.

**Further Experiments**

It is not possible to use parasitic reflectors or directors, though two or more driven radiators may be used to obtain greater directivity, in and out of phase and in all the usual close-spaced driven element arrangements. Also, one or more elements may be used vertically where reasonable height can be obtained.

There is a great field for experiment with compact-aerials on other frequencies. It is thought that a 30 mc system might be scaled down even further. It is not intended to make any exaggerated claims for the arrangement described, but simply to suggest a system which may help those who have to operate in confined spaces for aerial erection.

---

Fig. 2. Methods of feeding the "Beehive Twenty." If used with high power in the near vicinity of the operating position, G2FC remarks that RF burns are a danger.
Neutralising Tetrode Amplifiers

Cleaning Up the "Squiggers" in an RF Stage

By J. N. WALKER (G5JU)

The subject of instability in beam tetrode RF power amplifiers has been ventilated to such an extent that one would think no more need be said about it. But one has only to listen on the amateur bands to realise that the importance of the point is not yet fully appreciated by many amateurs, who still unwittingly emit signals other than (and in addition to) the fundamental.

It is not the intention here to discuss parasitic oscillation of the VHF and low radio-frequency types. Suffice it to say that tests should always be made, when setting up a new transmitter, to ascertain if such parasitics are present and if any signs of them are found, steps be taken to eliminate them, using methods which are common knowledge.

Cause...

To make our present point, let us assume a transmitter with a PA stage using an un-neutralised beam tetrode (or perhaps two in parallel or push-pull) of the 813, 807 or KT8 variety, with bias partly or wholly fixed so that, when not under drive, the anode current is zero.

Switch on the transmitter and adjust for normal excitation and load. Now, in all probability, a study of the emitted unmodulated signal on one's own receiver (with the RF gain backed off) and on the receivers of neighbouring stations, will indicate a single carrier, with clean edges and no spurious "squiggers." On the strength of this, the owner of the signal will probably be convinced (and not without reason) that he has succeeded in obtaining high stability and that, as the manufacturers usually state, "there is no necessity for neutralisation." All well and good. Or is it?

To make quite sure, try this test: Without touching any tuning controls cut off the drive completely but leave normal voltages applied to the electrodes of the PA valve. Or rather, if high voltages are in use, it may be wiser to reduce at least the anode voltage to something like 60 per cent. of normal.

Next, gradually reduce the bias voltage. Soon after a standing anode current is registered on the anode current meter, it is only too likely that the current will jump suddenly to a comparatively high value and grid current will also be indicated. The stage has, in fact, gone into self-oscillation.

Again look for the signal on your receiver. The books will tell you that, because of the altered operating conditions (particularly as regards phase) the tuned-plate tuned-grid circuit we are now considering will oscillate at a slightly different frequency when self-excited than when it is driven. Your receiver will confirm this fact. On the 14 mc band, for example, the difference may amount to 500 kc or even more, and the new frequency may lie outside the amateur band.

... and Effect

Now to the point. If the feedback is sufficient to allow self-oscillation to occur, the transmitter may be operating under what amounts to a "locked" condition. For a fraction of a second when the drive is applied, the PA self-oscillates but very rapidly comes into lock with the drive frequency.

There are two important effects when this happens. One is the interference caused by the actual sweep of 500 kc or so across the band (keeping to the 14 mc example). The other is that a transient of this nature in itself creates sub-harmonics over a wide frequency range and interference can be caused to receivers working on frequencies well removed from the transmitter fundamental—and that over a wide area if considerable power is employed.

Obviously, this effect will occur every time the key is pressed by a CW operator. Not so obviously, it will also occur if the carrier is heavily modulated, through the valve being inept in converting minute fractions of a second at negative peaks. So when you hear "funny noises" at one part of a band and find a local (or perhaps not so local) transmitter putting out a signal in another part of the band—or even another band—you will appreciate what is happening. It is then up to you to see that he knows about it—and also up to you to...
make quite sure that your own transmitter is not "playing up" in the same way.

If, when carrying out the foregoing test, self-oscillation does not take place before the anode current reaches a value such that the rated dissipation is not exceeded, do not be satisfied. Try rotating the anode and grid tuning condensers (the latter may, of course, be the anode tuning condenser of the preceding stage) to ensure that the stability is high irrespective of the settings of the tuning condensers. If self-oscillation is experienced, it will be just as necessary to eradicate it.

The Cure

The cure, obviously, is proper neutralisation, so that the stability is actually as well as apparently high.

Neutralisation is carried out exactly as with a triode amplifier, but by reason of the very much smaller capacity which has to be balanced out, the application is not so easy. A popular method with twin tetrode valves (of the QVO4/20 or 829 types) is to run well-insulated wires from the grids and permit them to lie near the opposing anodes, varying length and distance until neutralisation is correct. The writer approves (and uses) this method on the VHF's as it is desirable to keep the physical mass of metal to a minimum. At the same time, it must be admitted that it is something of a hit-or-miss arrangement and becomes more difficult to apply and adjust with valves of physically greater sizes.

Some means of making a definite adjustment is desirable and the writer has found the answer in the use of a modified Eddystone Cat. No. 481 neutralising condenser (two in a push-pull stage). The modification consists of the removal of the larger of the two cups and the reversal of the metal part which holds the screw plunger so that a wider-than-normal gap results.

The condenser must be mounted in such a way that the two connecting wires are screened from each other—otherwise the capacity between the wires is liable to be greater than that of the condenser! It is also desirable to keep the connecting wires short, particularly at the higher frequencies. There will usually be a metal screen separating the input and output circuits and it should not be difficult to fit the condenser in a position on this screen such that it is readily accessible for adjustment and fulfils the other conditions. The fixing screw should be of the countersunk type, when the possibility of flash-over is remote, even with a well-modulated 813. The circuit will take the normal form, with a split-stator tuning condenser in the anode circuit. The neutralising condenser should be adjusted in the direction which indicates a reduction of grid current under self-oscillatory conditions, and a quite definite setting will be found at which self-oscillation will not occur at any positions of the grid and anode tuning condensers.

On returning to the normal driven condition, with grid bias increased to its full value, it will probably be noticed that the grid current is a little less than it was in the unneutralised condition, which is accounted for by the removal of the positive feedback.

Another BC-453 Conversion Operation with BC-348 or Eddystone 640

By L. A. LEAR

In the September issue of the Short Wave Magazine, conversion of the BC-453 for use as a "Q5'er" was described in conjunction with a receiver having an IF within the range 190-550 kc. The purpose of these notes is to show how the BC-453 can be quite easily adapted for use with receivers such as the BC-348 or Eddystone 640, having IF's of 915 kc and 1600 kc respectively.

The Q5'er is first converted exactly as detailed by G2AO, and can be checked by tuning to 200 kc, the frequency of the Light Programme.

Now remove the screws at each end of the RF coil unit and pull the coil box off complete. The coils are of the plug-in type, each in a small aluminium can.

Commencing with the oscillator coil, marked with a blue spot, remove the four red-painted screws and withdraw the coil. Unsolder the outer end of the larger coil and carefully remove the requisite number of turns, as shown in Table 1 or 2 herewith.

The mixer coil, marked with a yellow spot, is treated in the same way, the turns being removed from the lower coil. The coupling coil is left as before.
In the case of the aerial coil, the tap at 75 turns is unsoldered during the unwinding, and after the necessary number of turns has been removed, the outer end of the coil is resoldered to both pins.

Next, take out the small moulded condenser C39 connected between pin 8 of V3 and the $3 \times .05 \mu F$ condenser on the side of the chassis.

**Adjustment**

Remove the outer top cover, after taking out all the plated screws on each side of the chassis, in order to obtain access to the trimmers. Connect HT and LT supplies and tune the set to an injected signal at the required IF. Next, peak the mixer by adjusting the trimmer nearest the aerial terminal. The aerial coil is peaked by means of the panel control marked "align input." If a signal generator is not available it is quite easy to align the unit on broadcast signals.

### Table 1

**APPROXIMATE FREQUENCY COVERAGE**

<table>
<thead>
<tr>
<th>Coil</th>
<th>Number of turns removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oscillator</td>
<td>120</td>
</tr>
<tr>
<td>Mixer</td>
<td>145</td>
</tr>
<tr>
<td>Aerial</td>
<td>155</td>
</tr>
</tbody>
</table>

### Table 2

**APPROXIMATE FREQUENCY COVERAGE**

<table>
<thead>
<tr>
<th>Coil</th>
<th>Number of turns removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oscillator</td>
<td>165</td>
</tr>
<tr>
<td>Mixer</td>
<td>193</td>
</tr>
<tr>
<td>Aerial</td>
<td>205</td>
</tr>
</tbody>
</table>

## Band-spreading the Clapp

### High-Stability Oscillator Modified

**By R. T. REED (G2RX)**

The Clapp oscillator circuit described in *QST* for May, 1948, is quite outstanding for stability but rather unsuitable for band-spreading. Although it is suggested that this may be obtained by shunting a further capacity across the tuning condenser this will defeat the attempt to keep the tuning capacity small; it also upsets the stability and is difficult to adjust. However, with the modification shown herewith it is possible to arrange to spread the band as much as may be desired.

C1, the main tuning condenser, is about $0.001 \mu F$; C2, the band-set condenser, is $100 \mu F$ and C3 about $50 \mu F$, so that the circuit does not cease to oscillate when C2 is reduced to a low value. For the oscillator to function at 1.7 mc, L1 should be about 50 turns of 20-gauge wire spaced its own diameter on a 2-in. former of good quality. The tap for the tuning capacity C1 is about 15 turns from the ground end and may easily be adjusted to give the amount of band-spread required.

### Table of Values

**Modified Clapp Oscillator**

- C4, C5 = $100 \mu F$, silver mica
- C6 = $0.001 \mu F$, mica
- C7 = $0.01 \mu F$, mica
- R1 = 100,000 ohms
- L2 = RFC
- V1 = 6C5 or 6J5

Circuit devised by G2RX to obtain wider frequency coverage with the Clapp oscillator, which has exceptionally stable characteristics as a VFO driver.
Inexpensive Driver Unit

T9 VFO for the 25-Watter

By G. MOORFIELD (GW3DIX)

HAVING taken stock of the situation on initial licensing in February this year, it was found—in common with a large number of fellow amateurs—that although enthusiasm was available without limit, space and the "wherewithal" were not so plentiful! A definite plan of attack had therefore to be formulated, and as far as a transmitter was concerned, a most satisfactory compromise was obtained in the construction and operation of the 25-watt rig described in the Short Wave Magazine for January 1947.

This transmitter achieved all that its designer claimed, besides being inexpensive and compact. But after an initial period during which as much as possible was done to attain a reasonable amount of practical experience in operation, a desire was felt for the ability to make use of those tantalizing "quiet spots" in the bands, which never seem to appear on the frequencies for which one's crystals are ground. Work was accordingly started on an 80-metre VFO unit in keeping with the requirements of the station, with the accent on economy, simplicity, and, most of all, stability and quality of note.

The result was the simple Hartley-connected VFO, the circuit of which appears in Fig. 1. Its operation is so conventional as not to require further description. It might be noted, however, that the "high-C" tuned circuit does a very great deal towards producing a high quality note; indeed, in two months of constant operation on the 80-, 40-, and 20-metre bands, only two reports of T8 have been received, both on 20 metres from W's on nights when extremely bad conditions prevailed. All other reports have been consistently T9, including one very recently from a VK7.

Construction

One or two constructional details may be worth noting, and many will view with satisfaction the fact that one side of the tuned circuit is solidly earthed, thus making for ease of construction. But too much stress cannot be laid on the importance of taking all sub-chassis earth leads to one single earth tag, and attention to correct wiring layout and screening is essential. The only chassis deck components should be the valve, coil, and tuning condenser (which must have a good slow-motion drive) and a screening box should be constructed around these as well. The cathode tap should be taken to a spare pin on the former, which is as standard 4-pin plug-in type.

The capacity Cx consists of a silver mica condenser soldered across the pins of the coil holder; the value of this condenser will vary from rig to rig. Its function is to determine the limits of the band in which the VFO tunes, and in the prototype, with this capacity at 150 \( \mu \)F, the unit tuned smoothly and accurately between 3·0 mc and 4·0 mc. Trial and error may be found necessary, however, before satisfactory coverage is obtained, but no undue difficulty should be experienced.

Keying

With the VFO driving the transmitter, keying may be arranged in any of the usual ways, but as the writer's particular interests devolve around break-in working, the oscillator itself is keyed, with eminently successful results. To do this, a separate and stabilised source of HT is necessary for the VFO, and the circuit employed is shown at Fig. 2. It should be noted that the value of R1 is very critical, and that shown has proved to give the best results. The voltage regulators S.130 (Cossor) have also been chosen as giving the most satisfactory regulation, and the key-up/ key-down currents are identical when the component types and values are as shown. The keying method at present in use is that commonly known as grid-blocking, by means of an old HT battery, but the solution to this problem is purely a matter of personal preference.

With the VFO in operation as described above, no drift, chirp, or ripple has ever been experienced on any of the bands, and ample drive is available at all times for the succeeding stages when the unit is substituted for the crystal oscillator circuit of the transmitter. An absorption wavemeter
Fig. 1. The oscillator circuit for a VFO driver to work with the Magazine All-Band 25-Watt Transmitter. This oscillator design is by GW3DIX, who has been operating very successfully with the transmitter originally described by GW3ALE in our issue for January, 1947.

Table of Values

**Fig. 1. Oscillator-Driver for 25-watt Transmitter**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>100 μF</td>
</tr>
<tr>
<td>C2, C5</td>
<td>100 μF, silver mica</td>
</tr>
<tr>
<td>C3</td>
<td>0.1 μF, mica</td>
</tr>
<tr>
<td>C4</td>
<td>-0.01 μF, mica</td>
</tr>
<tr>
<td>Cx</td>
<td>See text</td>
</tr>
<tr>
<td>R1</td>
<td>35,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>10,000 ohms</td>
</tr>
<tr>
<td>L1</td>
<td>16 turns 18 SWG enam., on standard 4-pin former: cathode tap 5 turns from earthy end</td>
</tr>
<tr>
<td>RFC</td>
<td>Transmitting type RF choke</td>
</tr>
<tr>
<td>V1</td>
<td>6V6GT</td>
</tr>
</tbody>
</table>

is of course an essential requirement, to ensure selection of the correct harmonic when tuning up.

The flexibility of operation possible with this unit makes its construction very much worth while, and other operators who have tried the circuit all agree that in practice it compares most favourably with that of some more complicated and expensive oscillators.

The writer would be interested to hear from anybody who is sufficiently interested to try out this VFO, and reports on resultant success (or otherwise) will be welcomed.

**CALL BOOK—SUMMER EDITION**

This is another “monster production” of some 320 pages. The G’s now listed total about 4,300 and include all those appearing in our “New QTH’s” up to and including the June issue of the Magazine. This figure compares with 3,700 G’s shown in the Summer 1939 edition: of the latter total, however, about 1,000 were AA calls, i.e. holders of what were known before the war as non-radiating permits. On this basis, the increase in fully-licensed G’s listed is about 1,600. But the Call Book is still over 2,000 behind with the British permits actually in issue at the present time. The Radio Amateur Call Book is obtainable on annual subscription only (four quarterly issues) through Dale International Publications, Ltd., 105 Bolsover Street, London, W.1, of whom all enquiries should be made.

**TABLE OF VALUES**

**Fig. 2. Stabilised Power Unit**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>8 μF, 600 v. wkng.</td>
</tr>
<tr>
<td>C2</td>
<td>16 μF, 600 v. wkng.</td>
</tr>
<tr>
<td>R1</td>
<td>3,000 ohms, 50-watt</td>
</tr>
<tr>
<td>Ch</td>
<td>10-henry 120 mA choke</td>
</tr>
<tr>
<td>T1</td>
<td>Transformer 350-0-350 volts, 80 mA, 5v. and 6-3 v. c.t.</td>
</tr>
<tr>
<td>S1</td>
<td>Mains switch</td>
</tr>
<tr>
<td>S2</td>
<td>VFO on-off, HT</td>
</tr>
<tr>
<td>V1</td>
<td>U52</td>
</tr>
<tr>
<td>V2, V3</td>
<td>Cossor S130 voltage stabilizers</td>
</tr>
</tbody>
</table>

...COLLECT YOUR CARDS!

Your call is here because we do not know your address for sending on the card(s). Please let us have a large stamped addressed envelope, with name and callsign; send to BCM/QSL, London, W.C.1.; the cards will be forwarded on the next G clearance. And if you would like your address and call to appear in our "New QTH" section, please mention that at the same time.

G2BPF, 2CNX, 2COC, 2COH, 2FWM, 2HKR, 3AMG, 3AOJ, 3ASX, 3AZW, 3BMD, 3CLT, 3CWB, 3CZB, 3DBG, 3DEQ, 3DFE, 3DLF, 3DMM, 3DPE, 3DSZ, 3DTQ, 3DZR, 3EFR, 3EiJ, 3FZ, 3OD, 4HM, 6AI, 6NJ, 8AU, 8BJ, 8DL, GC3EBU, GI2HUL, 3BAH, GM3ASY, 3COQ, 3DPL, 3DRX, GW2BLW, 3BJZ, 3CDP.
It seems that the DX season is wide open once again, and all our DX bands are bearing a heavy load. Early Transatlantic contacts on 3.5 mc have already been made; 7 mc sees almost daily QSO's with W and VK; 14 mc covers the world, as usual; and as we write there are more ZL 'phones coming through on 28 mc than we have ever heard before. So take your choice—or for preference use all four of them.

With a view to awakening a little interest in this laudable object, the new DX table is being called "The Four-Band DX Club." Last month claims were requested of countries worked on the various bands, and quite a number of them have come in, as you will see. We propose to juggle with this little table each month; this month the contestants are listed merely in order of call-signs, but in future one of the bands, or the total, will be used to give the order of merit—and we shall not say which one.

Those of you who still show a "Zero" in one column had better hurry up and work something on this missing band, or you will no longer qualify for the "Four-Band DX Club."

No Grief, No Grievance

We really haven't the heart to expound any "Hot-Under-Collar" stuff this month, after reading a letter from G3AAE (Bournemouth). He writes "DX Commentary last month looked like war. Nothing but moans, groans, nasty remarks, distrust, envy and so on. If that is the 1948 spirit of Amateur Radio, I'll take it up philately." Now, considering that the letters coming in for this feature are nearly always quite tolerant and friendly in tone, we have come to the conclusion that we must be the disillusioned and disgruntled ones. So we are going on a Course; we are going to forget DX-chasing and just take what comes. We shall be pleasantly occupied by listening to the Parade of the Little Spivs every now and then, but we refuse to fight for our honour any longer. The 28 mc band is quite a pleasant spot to work in, even now, and we will make full use of it and leave 14 mc to the more aggressive types. And we will not make things sound any worse than they are.

"More Detail, Less Blarney."

One of the regular correspondents weighs in with a remark containing a good deal of sense. He says, in effect, that he is no longer interested in reading that G9BF has worked KH6IJ KL7LE, ZD9AA and ZD2RGY. It merely makes him say "So what?" What he would like to know is when he worked them and on what frequency, so that he can get in there and work them himself. It is not proposed, on the strength of this one letter, to cut out all the gossipy stuff about what people have worked, but we would be glad if you would give more detail about times and frequencies. Neither is it intended that this Commentary shall gradually turn into a list of times and frequencies for catching DX stations, but those that are at all unusual will be welcomed and reproduced.

News From Overseas

ON4JW (Brussels) is awaiting his WAZ certificate, having worked his 40Z and 172C, of which 140 are confirmed—very nice work, too. He, with many others, has winkled out VU4AC (Laccadive Islands), of whom more details later.
G4HC, Colchester, runs a 25-watt outfit, CO 6V6-807, with an HRO receiver and 6J7-6C5-P/P 6L6 modulator; the aerial is as described in our issue for February, 1939. G4HC is unusual in that AC is obtained from a 400-watt rotary converter run off the DC supply.

ON4JW adds that there are now about 210 ON's "officially" on the air.

G3CHN writes from Curacao to report on conditions in the Gulf of Mexico and the West Indies. On 7 mc, the only signal from Europe has been the BBC Overseas Service, but on 14 it is a full time job to keep track of all the CW. Regarding British 'phone, CHN comments on the "superlative" transmissions from G6BY and GM8MN; there are dozens more which can be recognised as English voices, but those two, he says, are always terrific. The 28 mc band has opened up since he wrote, so his comments on that are hardly worth quoting. CHN is bound for the U.K. and promises to listen on the LF bands from Bermuda onwards, so we may expect some interesting Calls Heard shortly.

ZC1CL (Amman) is increasing his score nicely and says that two more stations are now operating in T-J. They are ZC1FW and W2TEA/ZC1. CL says that he called "CQ Pacific" several times and had replies from all over the place, so he called "CQ Mars" and was pleased to get three replies. The Martian call-signs, he tells us, are allotted on a similar system to those on Earth, as G3xxx, UA3xx and I1xx came back!

G3BRJ, formerly of Bath, has moved over to Singapore and hopes to be on the air from there shortly. His address is 120 Kings Avenue, H.M. Naval Base.

G2CUR, in Kenya, has now officially collected the call VQ4CUR and operates nearly every day on 14, 28 and 58 mc, 'phone and CW.

ZB1AI went QRT some little time back and is now in the U.K. awaiting a G call-sign. QTH is Sedbergh, Yorks. EP3H likewise went QRT for good on August 20, and hopes to be on again shortly "with an even more exotic call"—but he keeps the location dark. VS9AL (QTH given last month) is on the air but asks people please to refrain from calling him when he is in QSO with someone else (he adds that G's are pretty well behaved in this respect).

We recently mentioned the call-signs MD7QRQ, 7QRL and 7QRP and asked "could anyone allot worse calls?" In reference to this, a letter has arrived from the Middle East Services Radio Association, pointing out that such calls were not allotted, the stations quoted are operating illegally, and steps have been taken to trace them, close them down and confiscate their equipment. (So there should be some nice BC-610's going before long).
The MD2 series of call-signs has now gone into two letters—quite a long way in, in fact, as we have heard direct from MD2BU. He is not on the air yet, but asks us to advertise the call-sign and its legality.

ON4FT (Brussels) has had a letter from AR8AB, now on leave in France, saying that he has of course received heaps of QSL’s for AC4AE, AC4AA and the other AC4 ‘phoneys who said “QSL via AR8AB”. They are ‘phoneys, and no return QSL will be forthcoming. But AR8AB is hanging on to the cards in case one of the said ‘phoneys might possibly return QSL will be forthcoming.

AC4 ‘phoneys AC4AE, AC4AA and the other MD2 series of call-signs has now gone into two letters—quite a long way in, the time in the future.

AR8AB is hanging on to the cards in case one of the said ‘phoneys might possibly turn up to collect them !

G6NJ is now QRT in this country and will be on the air with a VQ4 call some time in the future.

VS1CR (Singapore) works under difficulties, having to pack his rig away every morning and bring it out again at night. The aerial, fortunately, remains up ! He says conditions have been very poor there, with static hitting the high spots.

VS2CJ (Johore) has been operating for nearly two months, and says that 14 mc now produces an S9 from the U.K. at about 2030 GMT. He runs 25 watts to an 807 and is looking for more G contacts in spite of QRM from J2, J9, HL, KG6 and so on. VS2CJ’s father is G6BW, who has a paragraph to himself further on.

By a queer coincidence the next letter is from G3DBJ at Aden. His father is G6FS! ’DBJ sends quite a nice list of G’s heard, but in view of the fact that they are on 14 and 28 mc we are not reprinting them. (Any heard on 7 or 3·5 however, would be more than welcome.)

D2KW (Berlin) is now restricted in power, but is working regularly on 3·5, 7 and 14 mc with QRP. Since he wrote official notification has been received of the licensing of the German (national) amateurs with the prefix DL ; the power limitations are 50 and 25 watts and the licence conditions are based on our own. At the same time, we hear a rumour that the Russians are letting loose some stations in their Sector with the call-signs “US1, 2, 3” and so on, using unlimited power. Holders of the licences are said to be former members of the German Communist Party. Not having heard any of these US affairs up to the present, we refrain from comment.

Under-Cover de Luxe!

Direct from Germany comes information that the under-cover station DA7AA, which came on the air on October 24, 1947, has since achieved the following results: WAZ, WAS, WAC 90 times, and 132 Countries! WAC was scored on 28, 14 and 7 mc, and very nearly on 3·5 as well. Once more, no comment.

Zonal Ambiguity

Last month we remarked that UA0PA was at Ulan, which, on our map, is in Zone 23. Since then we have been shown several of his QSL’s, all clearly marked “Zone 18.” This is bad news for G2VD (Watford) who was hoping that he might claim his 40th. ’VD, however, has been doing very well on 14 mc with F18ZZ (1710), ZD9AA (2130). TG9JK (0550), EA8AO (2355) and many others. He also worked I1PL/M1, who was genuinely a portable in San Marino and does QSL—his card is on our wall, and it is worded “Hello G6QB You have got a new country on 21/8/48 . . . .”

G2VD was not lucky with VU4AC but listened to several QSO’s. QTH was given as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would give as Minikoi, Laccadive Islands, and VU4AC said he was unlicensed but would
The late Colonel Clair Foster, of Carmel, California, was one of America's most famous amateurs. Here is a view of his station 6HM in 1925 (no official international prefix in those days!) with the 200-watt 45-metre transmitter often heard over here on an 0-V-1. The whole station was home-built, and batteries and heavy voltage regulators are much in evidence.

on by 'phones, who don't seem to think 95 per cent. of a band is sufficient for them. Why?

G3ATU (Sunderland) has been doing well, his high spot being the collection of

1948 MARATHON
(Starting Figure: 25 Z)

<table>
<thead>
<tr>
<th>Station</th>
<th>Z.</th>
<th>C.</th>
<th>Station</th>
<th>Z.</th>
<th>C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Phone and CW</td>
<td></td>
<td></td>
<td>'Phone and CW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2EC</td>
<td>40</td>
<td>152</td>
<td>G2DFR</td>
<td>30</td>
<td>61</td>
</tr>
<tr>
<td>G3AAE</td>
<td>40</td>
<td>108</td>
<td>G5MR</td>
<td>30</td>
<td>43</td>
</tr>
<tr>
<td>G5KP</td>
<td>39</td>
<td>131</td>
<td>G2BJY</td>
<td>29</td>
<td>89</td>
</tr>
<tr>
<td>G4CP</td>
<td>39</td>
<td>136</td>
<td>G2AO</td>
<td>29</td>
<td>80</td>
</tr>
<tr>
<td>G5KP</td>
<td>39</td>
<td>131</td>
<td>G8LO</td>
<td>29</td>
<td>73</td>
</tr>
<tr>
<td>G3DO</td>
<td>39</td>
<td>118</td>
<td>GM3CMS</td>
<td>28</td>
<td>69</td>
</tr>
<tr>
<td>G2AVP</td>
<td>39</td>
<td>108</td>
<td>G3BNE</td>
<td>28</td>
<td>69</td>
</tr>
<tr>
<td>G3BI</td>
<td>39</td>
<td>108</td>
<td>G2BXP</td>
<td>28</td>
<td>66</td>
</tr>
<tr>
<td>G3ATU</td>
<td>38</td>
<td>114</td>
<td>G6XX</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>G2AJ</td>
<td>38</td>
<td>110</td>
<td>G5HH</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>G8IP</td>
<td>38</td>
<td>90</td>
<td>G3ACC</td>
<td>25</td>
<td>53</td>
</tr>
<tr>
<td>G2VD</td>
<td>37</td>
<td>123</td>
<td>GC1C</td>
<td>36</td>
<td>109</td>
</tr>
<tr>
<td>G3AAG</td>
<td>36</td>
<td>103</td>
<td>G3DO</td>
<td>35</td>
<td>98</td>
</tr>
<tr>
<td>G2FW</td>
<td>35</td>
<td>112</td>
<td>G3ZI</td>
<td>32</td>
<td>81</td>
</tr>
<tr>
<td>G5FA</td>
<td>35</td>
<td>107</td>
<td>G3DAH</td>
<td>31</td>
<td>86</td>
</tr>
<tr>
<td>G2DC</td>
<td>35</td>
<td>92</td>
<td>G2BXP</td>
<td>28</td>
<td>65</td>
</tr>
<tr>
<td>G8KU</td>
<td>34</td>
<td>95</td>
<td>G2VJ</td>
<td>27</td>
<td>64</td>
</tr>
<tr>
<td>G8PL</td>
<td>34</td>
<td>95</td>
<td>G6CB</td>
<td>25</td>
<td>54</td>
</tr>
<tr>
<td>G3DAH</td>
<td>33</td>
<td>102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4AR</td>
<td>31</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

both VR5PL and VR2BD one morning. The latter, in particular, has been very consistent throughout the month—best time, 0800 GMT, frequency about 14050. Others from 'ATU were VP8AI (midnight, 14080) and XZ2TT (14100).

A 'Phone Record?

We have for a long time known that G2ZB (Boscombe) was doing great things on 28 mc 'phone, but we had not realised until his own note arrived that he only wants a UAØ in Zone 19 for WAZ ! On 28 mc 'phone G2ZB has worked 39Z and 144C (125 confirmed). He says this has been done without calling CQ DX on any occasion. Very fine work, we should say.

G3DAH (Herne Bay) was recently been on a trip which took in ZB1, ZB2, VS9, ZE2, VO4, MD4, MD7, VU7 ST2, MD5 and SU ! He promises to let us hear more of this. (Has anyone "Visited All Zones" yet ?)

G5FA (London, N.11) has a hunch that he will be back on 7 mc ere long, judging by the state of the DX up there. All the same, he has acquired some nice new ones on 14. G3DO (Sutton Coldfield) now works with a 3-element rotary on 28 mc and a 2-element on 14. His grand total is up to 159 countries, and he reports that the QSL from ZC6LA (Israel) has arrived, also three cards from UAØKGA (all for the same contact !)

G2DFR (Newbury) breaks into the
WAZ Lists and is probably unique in one respect. He works one band with one crystal only! He sits permanently on 14090 with a full-wave aerial 33 feet high, and works the odd DX like KL7KV, KH6ES, UA0VB, YN1MH, CM2WD, ZD2RGY and PK4VD with 24 watts to an 807. Spivs, take note.

G3AKU (St. Ives) says he is sitting on 14050 waiting for VU4AC. He has collected ZP3AW and HP1BR, among others, with his 807 and 30 watts. 'AKU tells us that MP4BAB is VS9GT with his new call.

G3DCQ (London, E.4) describes himself as “one of those who plod quietly along and never do anything sensational. If DX comes my way I take it, but the aim of this station is to make every QSO 100 per cent. of intelligent conversation.” (We can think of many worse aims than that.)

Funny one from G8OJ (Manchester) is EY1A, QTY given as “Malo.” Other 14 mc DX included VS6AE, VS6BD, HL1BA, VS9AL, UN1AB and VR2BD.

Top Band DX?

G2YS (Coventry), sending in his score for the Four-Band DX Club, asks “Why
'AGQ suggests that when 21 mc is opened up and the inevitable marathon starts, 14 mc may become more matey again. We still think the only way is to use 'em all and take what comes. As regards the Competitive Stuff, it is intended to continue the WAZ Listing and the Four-Band DX Club, which we should like to see on the increase. After that, anyone can invent competitions, but we don't propose to join in. (We await, with interest, a competition for the First YL to WAZ on 1.7 mc.) From G8PL (London, N.W.3) comes the remark that a very pleasant feature of early-morning DX on 14 mc has been the relative absence of W's. We have noticed that, too. One morning there was literally nothing on the band but VR2BD, VR5PL, and a few KL7's—but that was when "Aurora conditions" were in evidence. KH6IJ comes up every morning at about 0800 with a crash, and about one morning in two the VK's and ZL's are good. But W's (even 6's and 7's) are rare. Now and then, as PL says, TI, OA, and CM make a surprise appearance, as does the odd VE8.

G3BDQ (St. Leonards) is on the air with a 2-element fixed beam "in the backyard," the reflector-director ending just inside the shack with a shorting link to change its properties. On this strange array he has collected VP5AS, ZD1LQ/EL, EK1FP, PJ8XP, AP4A and other DX—so it does work—but in what direction? Very small Hot-Under-Collar comment from G3AAG (Richmond). He had just suffered from 49 minutes of "tuning-up" on his frequency by an unidentified station, and was waiting to see if a call-sign emerged, when he wrote his letter. At the time his temperature was such that if the station was within reasonable distance of London he was assured of a personal QSO at very short notice. 'AAG was attempting to work FY8AD and FM8AD at the time this particular pest started up, and consequently his remarks about people who (a) tune-up on the air with DX coming in and (b) don't give a call-sign, and (c) don't listen on the frequency are somewhat pointed. And quite right, too. Anyone like that should be deprived of his ticket for a year, if not for good.

QRP Achievements
G6NB (Chertsey) went on holiday with a portable rig. The PA was an EF50 with less than 5 watts input, but it worked CN, EP, LU, KP4, CP, VE3, W2, W8 and VK. Some of them were on 'phone with cathode modulation! ZS1T was worked on 28 mc 'phone, and the total bag was 36 countries in a week. 'NB is back home with 150 watts, but is quite certain that he won't do any better.

G5WC (London, S.E.19) asks what we are to do about Zone 26 "now that there are no XZ's on the air." Funnily enough, we worked XZ2EM on the day his letter arrived. And XZ2TT's QTH appears in the list. G5WC would very much like to know the whereabouts of Ken Vickery, ex-VS1AE—can anyone help?

Another Good Man Gone...
Ben Wallich of G6BW (Churchill, Som.) is on his way to New Zealand, and will be on the air with a ZL call as soon as he can, manage it. We hope to hear of his doings very soon. One of his last jobs was the removal of 8,300 QSL cards from the walls and ceiling of the shack! But he will soon be putting some new ones up.

Pirates' Corner
G2FST (Oldham) is receiving cards for 7 and 14 mc 'phone, which he does not use. . . . G2FKS (London, S.E.6) is also getting them for 14 mc contacts, and he is not at present on the band. . . . Both suggest that the persons concerned might choose different calls or, better still, get some of their own.

G3AKO (Tiverton) makes an excellent...
suggestion—a weekend of operating minus CQ calls. He reminds us that ex-marine operators well know the value of the International Three Minute Silence every half-hour, which used to show up the astounding DX possibilities of 600 metres. The CQ-less weekend might be very difficult to arrange but if we could guarantee, for instance, that everyone reading this Commentary would co-operate that would be quite something.

G2FTK (Coventry) is still working the DX on 7 mc and says that most of the trouble on the band lies with the operators. (Isn’t that true of all the others too?) ‘FTK has worked EK, OX, PY, ZL, SU, and many others to give a total of 37 countries on 7 mc.

CQ DX Contest

Copies of the rules for this Contest are now available from us. If you intend to enter, send a stamped addressed envelope right away to 49 Victoria Street, London, S.W.1, with a card marked “CQ Contest Forms” and please keep the application quite separate from any other correspondence. The dates are October 30, 0200 GMT to November 1, 0200 GMT for the ‘Phone Contest, and November 6, 0200 GMT to November 8, 0200 GMT for the CW Contest. Note that CQ’S own schedule erroneously refers to November 1 and November 8 as Sundays, but they are, of course, the two Mondays on which the Contest ceases at two in the morning!

Quickies

A listener in Durham reports an interesting phenomenon on 28 mc, whereby two G stations, one with a punk receiver and the other with a punk transmitter, assist one another to work DX.... G6BB (Streatham) worked VK3NC, who was using 6 watts to a rhombic and was the loudest VK on the band.... G3DER (Compton Bassett) has winkled out RY5R1, UA1KEC (Franz Josef Land), OY3IGO, LX1FR and YU7RR—not DX, as he says, but all nice ones....

If you hear or work ZL1GW, Arapui, New Zealand, this is a view of the station and its operator. He is a 28 mc man with a 3-element beam and a 3-stage 100-watt transmitter using an IIS4 final; the Rx is a 361A.

G3DCC (London, N.8) now uses a folded dipole with a 17-foot top and the rest hanging down, and has worked quite a good lot of DX on it.... G6QB (Bexhill) raised F08A (T8, chirpy, 14100) at 0830 on the day of writing this. He sounded extremely phoney, but we worked ZL2BD just afterwards and he said the FO was perfectly genuine—he has his QSL. But why did no one else call the FO? QTH in panel.... “KC5I” is YR5I; “KD4AW” is D4AWK. But who, or what is YQ5E?

Deadline for next month’s reports is first post, October 13, at Short Wave Magazine, 49 Victoria Street, London, S.W.1. Look at that Four-Band DX Club Table, and if you’re not already in it, there’s a vacancy for you next month. If everybody tries to use four bands there may be more room on all of them at any given time! (That’s not logical, but we don’t mind). 73, BCNU, and Good Hunting.

ZD4AM is again en route for the Gold Coast....

GET IT REGULARLY!

And on time! We can mail you your copy of the Short Wave Magazine direct by post on publication day—the first Wednesday of the month—for 20s. a year of twelve issues, post free. And for 22s. we can send it to any address overseas for twelve months. Write the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1. A direct subscription saves time, money and trouble.
More on the "AT" Code

A Reply to Criticisms

By W. OLIVER (G3XT)

AT long last, a worthwhile criticism on the AT Code! As you may have seen on p. 327 of the July issue of the Short Wave Magazine, it comes from G3ANQ. He is the first operator, among all those who have commented on the AT Code, to put forward an argument against it that will even bear consideration.

The questions involved go deeper than a mere discussion on the pros and cons of two different procedure codes; they involve points which are of importance to the continuance of amateur operating under the present-day conditions of ever-increasing interference. That is why I feel justified in prolonging the discussion!

Moreover, G3ANQ's comments have brought to light several grounds for possible misunderstanding, which may have deterred other operators also from using the new AT Code. So I will start by clearing these up.

Using Both Codes

G3ANQ, in common with some other operators, seems to have missed the point of the AT Code. It was never designed to be a complete substitute for the Q Code; I never claimed that the meanings of all the AT signs were entirely new, original or not covered by any other code. Nor did I ever suggest that any operator had got to make a choice between total use of the AT Code and total use of the Q Code.

My intention was that both codes should be used side-by-side where necessary, but that the AT Code, being designed expressly for the needs of amateurs, gradually supersede the Q Code for purposes where the Q Code is more cumbersome, less effective, harder to remember, liable to misuse, less explicit and altogether less convenient than the short and snappy AT Code.

G3ANQ says "there is no need to create a fresh code for this purpose, of which 13 items are direct duplicates of existing Q signals." But he overlooks the fact that the AT abbreviations are shorter and quicker to send in Morse than the corresponding Q code signs, thus eliminating superfluous signalling and consequent interference; and, unlike the Q abbreviations, the ATC meanings are "self-evident."

To draw a parallel in the newspaper world, I agree that the headline "Canine Quadruped Suffering from Hydrophobia bites Harrovian" means much the same as "Mad Dog Bites Harrow Boy"—but I should like to hear what an Editor would say to a reporter who handed in the former mouthful! When one remembers that space on the amateur bands nowadays is almost as precious as space in rationed newsprint, one realises the advantage of a short concise code.

Misusing the Q Code

G3ANQ freely admits that modern amateurs "know little of the symbols or application of the Q Code." That is true. For every amateur who uses the Q Code properly, there are scores who misuse it. Take but one example: the sign "QRT" in its proper sense is a peremptory order to stop transmitting. One hears it used on the shipping bands when distress traffic is being passed and some operator, not realising that an SOS has gone out, unwittingly comes on and causes interference. A coastal station will tell him in effect, to "Shut up" by sending the sign "QRT SOS."

But the vast majority of amateur stations send QRT as an indication that they are about to close down. I have heard several first-class operators misusing it in this way. The AT Code was not drawn up hurriedly or thoughtlessly. The idea was first conceived before the war, and the final form of the new code, published in the February 1948 issue of the Short Wave Magazine, was a carefully thought-out system for conveying, as concisely and clearly as possible, the whole of the information contained in normal amateur routine messages. To make the code so short and simple that every operator, including absolute beginners, could memorise it quickly and easily, I restricted myself to 26 abbreviations—one for each...
letter of the alphabet and made them all self-evident.

Advantages of AT Code

I claim—and no one has yet been able to disprove it—that the AT Code, intelligently used, meets ordinary amateur needs for routine messages and normal procedure. I claim also that no other code has yet been devised which does this with such ease, speed and simplicity. Moreover, I claim that the whole of the AT Code can be learnt as easily, and perhaps remembered more easily, than the 24 miscellaneous abbreviations in the list appended to G3ANQ’s comment.

G3ANQ includes in his list a number of Q abbreviations which are hardly ever heard on the amateur bands, and when I have tried using any of them myself, I have immediately found that they have caused confusion, mainly due to the fact that so few amateurs know them.

“999” Redundant?

A number of competent commercial operators have suggested to me that the complete and proper use of the Q Code by amateurs would fulfil all needs and render the AT Code redundant. To this I would reply that the complete and proper observance of the law by everyone in the country would render the police force redundant! So if one disregards counsels of perfection and comes down to earth with a grasp of present reality—taking things as they are and not as they might be—it is perfectly evident that existing amateur procedure, including the use and misuse of the cumbersome Q Code (designed for cleared commercial channels and not on our overcrowded bands) leaves much to be desired.

As for the shortened (two-letter) Q Code advocated by G3ANQ, this would probably cause even greater confusion. The shortened form of QGE, for instance, could be mistaken for the amateur abbreviation “GE” (“Good evening!”): that of QTU could be mistaken for “Thank you” and so on. Moreover, some of the miscellaneous two-letter abbreviations appended in G3ANQ’s list are identical with the shortened Q Code ones, but totally different in meaning—for example, TR and QTR. What a muddle!

G3ANQ claims that the versatile use of these abbreviations is one of the fine arts of operating. I would say that carrying six or eight men, standing on each other’s shoulders, on one motor-cycle is one of the fine arts of travel, and is practised successfully by highly-trained despatch riders in the arena at a military tournament. But as a versatile accomplishment for the ordinary motorist who wants to take the XYL and small chirps out on the public roads, it is best left alone.

Another criticism of the AT Code put forward by G3ANQ is that it perpetuates the “oddities” which have become a tradition of Amateur Radio. For instance, he claims that “R” (“Received”) is an exact equivalent of ATP. Oh, no! it isn’t—not by a long way! The commercial operator is probably only concerned with whether his message has been received complete at the other end. He is not particularly interested in whether the receiving operator was able to copy it with perfect ease, or whether he had to stop the clock, hold his breath and kick the cat to prevent it purring while he was straining his ears to hear the signals.

“R” simply means that the message has been received intact and that no repetition is required. But “ATP” means that perfect copy has been obtained with ease. It is equivalent to “R OK SOLID FB” and much briefer!

No Valid Criticisms

In drawing up the AT Code, I tried to think of every possible drawback, difficulty and criticism that might arise. So far, the criticisms have been negligible—and the really valid ones practically nil. Despite this, the fact remains that the AT Code has not yet proved popular with the majority of amateurs. About fifty per cent. seem to be against its adoption. If they can find no valid points of criticism, why won’t they use it?

I think the main reasons are apathy and long-standing habit which makes them stick to the Q Code; and a shyness about trying anything “different” or unorthodox. I still believe that the vast majority who are not in favour of the code have rejected it without a fair trial, and possibly without any trial at all. Why not learn it, try it out on the air, and then form a sound practical judgment on whether to use it in future?

TAYLOR SECTOR INSTRUMENTS

Their new sector-shape instruments achieve small size with a long, clear scale; modern in design and in attractive moulded cases, they are well suited to set off any equipment for which good appearance is a factor. A wide choice in moving-coil, moving-iron and thermocouple types, in all ranges, is being made available in the new shape.
Not All Fun
Avoid That Nervous Breakdown!

By N. F. JOLY (G3FNJ)
(ex-SVIRX)

On many occasions during the last twelve years when I have operated a station from Greece—still a relatively "rare" country—I have had the fellow at the other end telling me something like this: "How lucky you are to have a rare call and just sit back and listen to the whole band calling you."

Many operators who have had the experience will agree that this is a very rash and thoughtless statement, and will nod their heads in sympathy with me. One or two examples will serve to illustrate my point, but before giving them I should like to say that I doubt whether G6QB, in his June "DX Commentary," knew how near he was to the truth when he said: "Watch the others collecting their nervous breakdowns and duodenal ulcers, but take it easy yourself."

I have not had a nervous breakdown but I have certainly developed a duodenal ulcer during the last six months which has been caused, I am sure (and so is my doctor), by high nervous tension arising from chasing DX, especially during meals frequently consisting of a hasty snack swallowed at the operating position with one hand on the key—and long sleepless nights after a full day's hard work at the office. And of course my "luck" in being a "rare DX station."

"It's nice to get up in the morning, but it's nicer to stay in bed," wrote a realistic song-writer many years ago. Yet the indescribable urge to work early-morning DX has often given me the energy and determination to throw off the bed-clothes, put my head under the cold water tap and then totter sleepily on to the air. Through the cobwebs of lingering sleep I listen on the band and hear some of that weak and watery stuff. For a moment I waver, playing with the idea of crawling back into my still warm bed. But there may be something interesting coming through, so I take another listen over the band.
Suddenly I am wide awake! There, as large as life, is VR6AA coming through at R9 plus (well, S6 on the meter). He's working W1FH so it's no good waiting to get a word in edgeways. Extreme long skip seems to be prevailing, and hush, there is no European QRM. The time in Athens is 04.45 (02.45 GMT) so who could be mad enough to be up at this unearthly hour? I have the band to myself! A few precious minutes are lost while I listen for some faint CQ which will make the blood in my veins QRQ. But I don't hear it, and as the Europeans can't hear me (or so I think) I start a two-minute CQ DX at about 8 w.p.m. signing my "rare" call frequently. The least I can hope for is to hook a VR5 or even a ZK1. Yes, two faint signals are there, calling SV1RX slowly-intolerably slowly. How stupid they are, why don't they sign before something happens and I am unable to get their call. I keep dodging from one to the other, while my hair turns visibly grey, wondering who will sign first. Fortunately one is sending a little faster than the other, so just as I hear him starting my call for what seems like the hundredth time, I listen to the slow one who signs after two minutes—G3 blank blank *blank. By a miracle I do not burst a blood vessel but tune hurriedly to my last hope, the fast one. He is already in the middle of his call and I listen with bated breath for him to repeat it so that I should get the prefix. Yes, you're right, it is an OK1.

Keeping Calm

But I must not lose my temper. Good amateurs don't lose their temper (?). I try another method. I QSY to a quiet spot on the band (ha! ha!) and put out a snappy CQ DX on the bug at 20 w.p.m. concluding, not with my call, but with the very clear and definite request: "Not European stations pse DX only pse K," and land another G3-plus-three who thinks he's starting the day well by snagging his first SV while all the other G's are still in bed. And so it goes on. Right through the night, during the eight months of the year when they come through on 14 mc, the W's have frequently driven me crackers.

If I heard a station that several dozen W's were not calling smack on his frequency, and gave him a shout, the moment I went over to listen, they would start calling me on the DX station's frequency, without at least giving me the satisfaction of knowing that he did come back to me, even if they wouldn't let me work him. Yes, it's not all fun, I assure you.

---

**XTAL XCHANGE**

Following are this month's offerings. Negotiations should be conducted direct. Insertions for this space, which are free in respect of exchanges of crystals only, should be sent in on a separate slip set out as below, and headed "XTAL XCHANGE—Free Insertion."

**G2DDM, 34 Birch Avenue, Romiley, Cheshire.**
Has QCC Type P crystal, 7070 kc, mounted. Wants similar 3750 kc, or near.

**G2DUZ, 1 Munster Avenue, Bispham, Blackpool, Lancs.**
Has 1892 kc Edison crystal in low-loss holder. Wants 7050-7150 kc crystal in holder.

**G13BB, Cosy Lodge, Culmore Road, Londonderry, N.I.**
Has 500 kc crystal, holdered. Wants similar 100 kc bar.

**G3DJQ, 131 Church Lane, Birmingham, 20.**
Has 1736, 3580, 7024 and 7059 kc crystals, all mounted, ¼-in. pin spacing. Wants any frequencies 3500-3535 or 7312-7500 kc.

**G3DKR, 2 Chestnut Close, Southgate, London, N.14.**
Has QCC 3594 kc crystal, mounted. Wants any frequency in 1.7 mc band.

**GW3DOF, 29 Victoria Street, Cwmbran, Mon., S. Wales.**
Has dual frequency 7275-7290 kc crystal unit, thermostatic 6-3v. heater, octal base fitting. Wants two crystals, ½-in. pin spacing, in CW area 7 mc band.

**GW3ECH, 28 Rectory Road, Trecwn, Pembs., W. Wales.**
Has 7280, 7310, 7360, 8360, 8410 and 8610 kc crystals, ½-in. pin spacing: 1000 kc, ¼-in.: and 1000 kc, octal mounting. Wants any frequency in 1·7 mc band, 3500-3530 kc, and near 7010 kc.

**G8GG, 25 Abbey Road, Blackpool S.S., Lancs.**
Has 7040 kc crystal, mounted. Wants similar crystal 1750-1800 or 1860-1930 kc.
Crystallizing the Type 27 Converter

Obtaining High Stability and Improving Bandspread

By I. PAUL (G3CYY)

HAVING used a Type 27 converter on five metres for several months the writer came to the conclusion that it was a very sensitive receiver that suffered from drift and lack of band spread.

By using a high stability fixed oscillator and tuning the intermediate frequency (the main receiver) these disadvantages are overcome. There are, however, a few snags which these notes may help prospective constructors to avoid.

General Design

The big difficulty was the necessity to screen the main receiver (a BC-348) from direct pick up on the intermediate frequency. To overcome this it may be necessary in some receivers to insert RF chokes and by-pass condensers in the power supply leads if an external power pack is used, or in the mains lead if the pack is internal.

It is strongly advised that the oscillator unit be constructed on a separate completely screened chassis, since the writer's first unit (which was squeezed into the back of the Type 27) resulted in all harmonics of the crystal frequency being injected into the frequency changer, thus causing signals to be heard which were neither in the 58.5 mc band nor on the intermediate frequency! The IF coil in the RF unit appears to have a bandwidth of about 2 mc and in the writer's version the centre of the band was on 7 mc. It was therefore decided to make 7 mc the IF for a signal on 59 mc. This indicated an oscillator frequency of 59 mc ± 7 mc and since it was desired to make the HF end of the scale on the BC-348 the HF end of the 58.5 mc band the 52 mc frequency was chosen. If it is required to cover a wider range than 2 mc the IF coil should be replaced by a standard short wave choke.

The crystal frequency should of course be chosen so that none of its own harmonics fall in the 58.5-60 mc region.

The Circuit

EF50's were the obvious choice for oscillator and frequency multiplier stages because of their efficiency and economy in HT current. Two of these valves are - used in a trebling-tritet-into-trebler combination. All parts are standard receiving types, the tuning condensers being type ASP 30 [LIS air dielectric trimmers. All coils are wound on 1/2-in. diameter formers and the whole unit is constructed on a chassis measuring 3½ in. x 5 in. x 2 in. To ensure complete isolation of the 52 mc frequency from the other harmonics two tuned circuits are used, one inside the oscillator box and the other in the converter. These circuits are link coupled by means of light flexible co-axial cable, and a single turn loop around the earthy ends of both coils. The heater choke may be unnecessary in some cases, but was found to be an advantage in suppressing beat notes in the receiver: it is made of about 30 turns of 20 SWG wound round an iron-dust core. The supply and output leads from the oscillator were formed into a cable and connected to a four-pin valve base which plugs into the back of the Type 27.

Modifications to the Type 27

A 1½ in. diameter hole was cut in the back of the converter to take the holder
Fig. 1. G3YYY's circuit for a 52 mc local oscillator unit for the Type 27 converter. Such a unit can be used with any other kind of VHF converter with a 7 mc IF, or the IF of the converter itself can be changed.

for the four-pin base. Wires were run from this holder to the HT and heater connections on the back of the Jones plug and a thick earth wire to one of the bolts securing the metal screen above the chassis. The link circuit was extended from the four-pin valve holder through one of the holes in the chassis to the oscillator coil. If the coils have not been modified they should be rewound to the usual 6½ turns on the oscillator and 7½ turns on the RF and FC coils.

The 20 µF oscillator grid condenser and the connection from the bottom of the oscillator coil to the tuning condenser were removed. This latter coil ending was then connected to the earth tag beside the sub-chassis 4-21 µF trimmer. This left the oscillator coil tuned by this trimmer with one end earthed and the other connected to the FC grid via the 21.4 F injection condenser. A one-turn link was then wound around the earthy end of the coil, and connected one side to earth and the other to the centre of the oscillator input cable.

Lining Up

The first step is to make sure that the crystal is oscillating; this can be done by tuning to the fundamental on the station receiver and listening for the beat note. Should there be no oscillation when the crystal is known to be in working order it is probable that the cathode circuit is tuned to a frequency lower than that of the crystal. This can be remedied by either reducing C3 or taking a few turns off the coil.

The anode circuits can be lined up by two methods:

(a) By loosely coupling the coils L1 and L2 in turn to a receiver tuned to the

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C6, C8, C9</td>
<td>500 µF</td>
</tr>
<tr>
<td>C2</td>
<td>2 µF (existing FC grid condenser)</td>
</tr>
<tr>
<td>C3</td>
<td>100 µF</td>
</tr>
<tr>
<td>C4, C11</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>C5, C12</td>
<td>30 µF</td>
</tr>
<tr>
<td>C7</td>
<td>50 µF</td>
</tr>
<tr>
<td>C10</td>
<td>200 µF</td>
</tr>
<tr>
<td>C13</td>
<td>4-21 µF (existing osc. trimmer)</td>
</tr>
<tr>
<td>R1, R3</td>
<td>100,000 ohms ½ watt</td>
</tr>
<tr>
<td>R2</td>
<td>25,000 ohms ¼ watt</td>
</tr>
<tr>
<td>R4</td>
<td>500 ohms ¼ watt</td>
</tr>
<tr>
<td>R5</td>
<td>50,000 ohms ¼ watt</td>
</tr>
<tr>
<td>RFC1</td>
<td>Standard short wave choke</td>
</tr>
<tr>
<td>RFC2</td>
<td>VHF choke</td>
</tr>
<tr>
<td>RFC3</td>
<td>see text</td>
</tr>
<tr>
<td>L1</td>
<td>26 turns 24g. enam. close wound</td>
</tr>
<tr>
<td>L2</td>
<td>20 turns 22g. enam. close wound</td>
</tr>
<tr>
<td>L3</td>
<td>6 turns 22 g. enam. spaced 1 wire dia.</td>
</tr>
<tr>
<td>L4</td>
<td>see text</td>
</tr>
</tbody>
</table>

(Note.—Coils L1, L2, L3 wound on ½-in. dia. formers.)

V1, V2 = EF50's
desired harmonic and adjusting the condensers until the output peaks, or

(b) By inserting a milliammeter in the anode circuit of each valve in turn and tuning for a minimum current, checking the frequency by means of an absorption wavemeter.

Next the oscillator circuit (L4-C13) in the converter must be tuned to approximately 52 mc; this can be done by setting C13 to the position indicated in Fig. 2. Should the RF and FC circuits have been previously aligned for the 58 mc band it is but necessary to set the Type 27 dial to this band, couple the converter to the main receiver tuned to the correct IF, adjust condensers C12 and C3 for maximum noise output and you are ready to go.

If, however, the 27 has not been lined up for 58 mc the following procedure should be adopted: Set the dial to 60 deg and the RF and FC sub-chassis trimmers to half-mesh and adjust the screen mounted trimmers to obtain maximum noise level. The two 52 mc circuit should then be readjusted to maximum noise level and the converter is ready.

Results

The converter has proved very satisfactory, stability and bandspread being so good that it is possible to hear a signal one night and return the next to find it in exactly the same spot—indeed, the writer's method of calling G4LX is to set the dial to his frequency, call him, then sit back and wait! During the initial try-out a rock-steady 20 cps beat note was maintained with G4LX for half an hour. The sensitivity is every bit as good as that of a normal Type 27 and the signal-to-noise ratio seems slightly better. With 240 volts HT the oscillator draws 8.2 mA, which should impose a negligible extra drain on the Rx power supply.

FURTHER NOTE BY G4LX

The writer having tested the crystal-controlled oscillator and modified Type 27 converter built by G3CYY, and being very enthusiastic about its performance, decided to adapt a Type 25 converter. A brief description of the necessary changes follows.

Alterations to the Type 25

Remove the local oscillator section completely, including the cathode injection circuit into the mixer stage. Remove also the five-position wave change switch, four of the five trimmers from the RF section,

Fig. 3. G4LX applied the CO unit designed by G3CYY for the Type 27 to a Type 25, as described in the text. The suggested conversion of the Type 25 for CO injection is very easily done.
and four of the five trimmers from the mixer section. Remove one turn from the RF tuned inductance at the “hot” end, and move the grid tap to 2½ turns from the “hot” end.

Rewind the mixer inductance to five turns and tap the grid lead at its centre. The trimmer is then wired across the whole of the inductance, one end being earthed and the other floating.

Wire the injection from the RF stage on to the centre tap of the mixer inductance.

Fit a five-turn coil and trimming condenser in the old oscillator section of the chassis in corresponding positions to those in the RF and mixer sections. Couple the “hot” end of this circuit through a very small capacity of about 2 μF to the grid of the mixer. Link couple this tuned circuit to the output of the crystal-controlled local oscillator.

Cut a hole in the back of the converter case and fit a suitable socket. Wire up this socket as in the modified Type 27 converter.

Operation

The alignment procedure and the method of operation are exactly the same as that described by G3CYY in his article on the modified Type 27 Converter. On test, the writer found the equipment every bit as efficient as the Type 27 and would not hesitate to recommend it to anybody wishing to explore the VHF bands for the first time.

In the accompanying circuit diagram, no values have been given as all components are as in the original Type 25 converter. The circuit shows the final changes adopted.

DENCO CATALOGUE

In the trade for the supply of Amateur Radio equipment before the war, Denco became large manufacturers of RF components for the Services during the 1939-45 period. They are now in a position to supply a wide range of necessary parts, and have developed various specialities—notably the products branded “Maxi-Q,” covering coils, formers and IF transformers. Other items in the Denco range include coil turrets, variable condensers, RF chokes and stand-off and feed-through insulators.

Also available, at 3s., is a roneoed technical bulletin describing applications of Denco’s Maxi-Q coils, with design and constructional data for a superhet receiver and VHF converter. Messrs. Denco (Clacton), Ltd., 355-9 Old Road, Clacton-on-Sea, Essex.

TVI IN AMERICA

In a very interesting letter, Peter Lovelock (ex-G2AIS of Loudwater, Bucks.) comments on the current situation in regard to television interference in New York and its vicinity. There are three separate TV stations serving this area, operating every day, with evening (and sometimes afternoon) programme periods lasting till 10 p.m. The New York rooftops are becoming a forest of TV receiving aerials, and due to the steel-frame buildings, reflected waves is a great problem, requiring the use of much more elaborate arrays than the ordinary two-element type seen in this country.

To a number of W2’s in this congested area TVI has become a very real problem of the greatest magnitude, and one particular difficulty is the allocation, to WCBS-TV in New York, of a channel in harmonic relation with the 14 and 28 mc amateur bands! Another difficulty is the fact that American television operates on the single-carrier system, with the video amplitude modulated and the sound frequency modulated, suitable separating circuits being used in the receiver. Hence, the band-width is considerable and the interference problem correspondingly more serious.

On the other hand, as ex-G2AIS says, TVI as a problem as yet exists only in a very restricted area compared with the country as a whole—but many American amateurs see it as a potential threat to the very existence of Amateur Radio.
THE VHF BANDS

By E. J. Williams, B.Sc. (G2XC)

WHO made the first 145 mc contact on September 1 will probably never be known. Truth to tell, the honour was shared by a large number of VHF operators and we are not going to attempt to list them here, if only because there would be further calls to add to the list next month!

Following the initial contacts came a lull, with complaints of inactivity, but this was in part due to the troposphere letting us down; the one or two days when the weather has been favourable proved that stations are there. In fact, keeping pace with the 2-metre DX record has been a hectic business.

On September 1 we think G2BMZ/G6LK had it; on September 5 it went to G5MQ/G2AJ/P; then G2BMZ/G8GX seized it on September 9, and on September 14 it passed to G5BY/G5MQ. But within less than 45 minutes G3APY had worked G5BY to increase the distance by a few more miles, and since then G2IQ and G6OS have worked G5BY at still greater distances.

G5BY/G6OS (2103 on September 17) is 287 miles and that was certainly the 2-metre GDX record at the time of writing this.

That such distances should have been covered within three weeks only of the release of the band for amateur operation reflects the greatest credit on all concerned and the congratulations of all VHF operators will go to those who have held the record, even if only for a few minutes!

We must also mention the first G/PA contact, G6DH having worked PAØPN at about 120 miles on September 14; PAØPN was on 144-7 mc. ON4FG is active on 144-1 and IIAS is on 144 exactly.

As spor-E is an unlikely means of contact on the 146 mc band, any European QSO's made will almost certainly be by tropospheric propagation and it is therefore considered that the 2-metre DX record listing should be a general one in the sense that contacts with Continental stations will count provided the exact QTH of the station is beyond dispute. This will tend to make geographical location of less importance in the establishing of records. If other means of propagation occur, the DX distance listings will be divided into appropriate sections.

So far, our own impression of the 2-metre band agrees fairly well with the forecasts. The normal ground-wave range is somewhat less than on 5 metres, while signals at horizon distance are of comparable strength. When tropospheric bending occurs the signals from 60 miles and beyond rise to strengths which may be as good as on 5 metres. Fading has, however, been very prevalent, though that may be because up to the present, no really settled period of "VHF weather" has been experienced.

It is good to be able to report that those pessimists who anticipated an outbreak of self-excited oscillators and generally unstable transmissions on the new band have been well astray in their forecasts and almost all the signals heard have been T9. Again, CW has presented no great difficulties on the reception side and converters working into the usual selective communication receivers have proved entirely satisfactory. Although some stations are using crystal-controlled converters, our own experience with the normal SE oscillator in the converter has shown that the CC job is a luxury rather than a necessity on the Rx side.

Activity and achievement summaries are given elsewhere in these pages and it is obvious from these that once activity rises to a high level some really big logs of calls...
heard and worked will be forthcoming. The best dates so far (i.e., up to mid-September) have been September 5, 9, 14 and 16.

Individual "Two" Reports

G2BMZ (Torquay) using an 8-element beam (4 directors and 3 reflectors), and Rx consisting of push-pull 6AG5's, push-push 6J6 mixer, 6J6 osc. (72 mc and doubling) has had some good DX contacts. He finds most 145 mc signal reports, both in and out, about 2 S-points down compared with 5 metres. G5US (Camberley) has erected an 8-element beam at 40 ft, and has had good results. The Tx uses 815 final, while the Rx is only temporary. G2BMZ and G5US hope to resume on the 2-metre band the nightly schedule previously maintained on 5 metres.

G5BY (Bolt Tail, Devon), who shares the 2-metre DX title with G6OS, has a 5-element beam about 40 ft. up, while the Rx uses two 954 RF stages, 954 mixer, and 955 osc. on 73.3 mc with 6C4 doubler, to feed into the 1-6 mc range of the main Rx. His Tx is surplus Admiralty gear. In all, G5BY has worked 6 stations at over 200 miles, which is a clear indication of what can be done. G5MQ (Woolton, Lancs), who has held the DX title more than once so far, thinks he probably reached his practical limit when he worked G5BY; but with Continental activity this may not be so. G5MQ has an SCR-522 which he has noticeably improved by adding an RF choke in the plate feed to the 832 tripler. The Rx is 4 stages of wideband 954 RF, 954 mixer, 955 osc., with output on 30 to 32 mc into an AR88. A 4-element c.s. beam is 6-ins. above the 5-metre beam.

We need say little here of the Tx at G6VX (Hayes, Kent) for readers have had the opportunity of seeing a description of his f.i.e. two-metre gear in the Magazine during the past few months. G6VX’s receiver employs 6AK5’s in a CC converter; the beam is a 4-element w.s. G6LK (Cranleigh) is using a 5-element w.s. beam and a 4-acorn converter; the Tx ends in P/P VT62’s. He suspects there are some very poor receivers about and appeals for an increase in activity. Well, these are still early days and although one or two who had promised to be on the band have not yet put in an appearance, compared with the first few months of 5-metre working in the post-war period, 145 mc has made a pretty auspicious start—and G6LK, himself, has worked 9 counties.

G2AJ (Hendon) provided some of the northern stations with their first DX by working them from the top of Dunstable Down while P in early September. From the home QTH, some good contacts have been obtained after initial troubles with the Rx. A 5-element beam is in use, and the EC91-6J6 converter feeds into an SX28. G8GX (Northwood Hills) has an 832 PA running at 15 watts with a 3-above-3 w.s. beam in the loft. His Rx has IF of 29-30 mc and is tuned. Occasional break-through is experienced from the 10-metre band, and on one occasion a weak two-metre CW signal was QRM’d by a W6 on ten!

G2IQ (Sheffield) has spent much time on Rx design and emphasises the superiority of triodes on 145 mc for RF and mixer positions. His latest circuit includes two GGT stages; he notices a pronounced build-up in 145 mc conditions around midnight. G3APY (Kirkby, Notts) has a 4-element beam mounted above his 3-element 5-metre beam in the roof-space. The Rx consists of CV66 RF, EF54 (triode connected) as mixer, and 9002 osc., with IF on 13 mc to AR88. G6OS (Hull) is surprised at the strength of signals from
THE SHORT WAVE MAGAZINE

VHF Contest

RULES

(1) The periods of the Contest will be Friday, November 12, 1800-2359, clock time; Saturday, November 13, 1200-2359; Sunday, November 14, 0900-2359.

(2) Points will be claimed for inter-British Isles working only from the home location, using the 58-5-60 mc and 145-146 mc bands.

(3) Exchange of RST, reference number and QTH will constitute a contact.

(4) Contacts may be made on either 'phone or CW, but no extra points will be allowed for 'phone QSO's as distinct from CW contacts.

(5) Every contestant will allot himself or herself a three-figure reference number, different for each band, which will remain unchanged for that band during the period of the Contest. This reference number will be sent before the RST or QS report in the following manner: 342RST569, or 342QSS7 in the case of a 'phone report. The reference number must be given with the report outwards in every counting QSO.

(6) Scoring will be on the following basis:—
   (a) For contacts with stations up to 25 miles (Zone A), one point.
       25-50 miles (Zone B), two points.
       50-75 miles (Zone C), three points.
       75-100 miles (Zone D), five points.
       100-150 miles (Zone E), eight points.
       150-200 miles (Zone F), twelve points.
       200 miles and over (Zone G), twenty points,
       plus five points for each additional ten miles of distance; proportions of these additional 10-mile distances will not count for points in proportion.
   (b) Stations in all Zones may be contacted once on each band for points.
   (c) For each station in Zones A, B, C and D which is worked on both bands, five bonus points will be scored. For each station in Zones E, F and G which is worked on both bands, ten bonus points will be scored.
   (d) No bonus or multiplier points will be scored on a county basis.

(7) Point-to-point distances will be taken from the Ordnance Survey "Ten-Mile" Map of Great Britain, or calculated from the National Grid References when these are known.

(8) No Contest QSO may be prearranged, nor may contacts be passed on from one station to another. These practices will be grounds for disqualification.

(9) The exchange of reference numbers prior to the Contest is forbidden, and will be reason for disqualification.

(10) Results should reach us, addressed E. J. Williams, G2XC, The Short Wave Magazine, 49 Victoria Street, London, S.W.1, by November 22, 1948, latest, set out as follows:—
   (a) Separate running logs for each band covering the period of the Contest, showing only contacts claimed to count, with time of working, reference number in, RST in, RST out, QTH of station worked, distance, zone and points claimed. The contestant's own reference number for the band used should be clearly marked at the top of each log sheet, and the total score for the band at the end of each log.
   (b) A list of stations worked on both 5 and 2 metres, with claim for bonus points.
   (c) The final combined total of points claimed.
   (d) National grid reference of contestant's station, if known.
   (e) A short description of equipment used and notes on impressions and experiences of the Contest.

Results of the Contest in full will be reported in the January, 1949, issue of the Short Wave Magazine with a preliminary comment in the December issue.
G2IQ and G3APY at about 60 miles; both as good as on 5 m. G6OS is active daily on 145.5 from 2100 to 2200 BST. G3MY (Sheffield) is afrother with a CC converter. He has CV66 RF, and 6AK5 triode-connected mixer. His Tx runs a 829B final and he hopes to be /P in Derbyshire soon. A 16-element array is being planned.

In the Midlands G2ATK (Birmingham) has an 18-valve Rx, including 5 RF stages (two CV66 and three EF54). The first three stages are built as a separate pre-selector; series tuning enables coils of up to 7 turns to be used. A 5-element c.s. beam (directors 37½ ins. reflector 30½ ins. driven element 38 ins.) is soon going up to 35 ft.; this beam is very narrow in its angle of coverage and careful searching is necessary. G4LU (Oswestry) has heard G2AK and asks for CW signing after 'phone QSO's to enable identification of weak carriers—the old trouble again. His Rx is CV66, EF54, RL16, with osc. from 16.75/17 mc through doubler stages, and is very stable.

G3DCV/A (March) has 522 Tx and 6AK5, 6AK5, 6AK5, 9002 converter. He asks for information on modifying the 522 receiver side .... G2OI (Eccles), on 145-35, wants schedules .... G3ABA (Coventry) has 22 watts to an 832 and a 4-element beam with an acorn converter for Rx.

In Scotland, GM3EDQ made his Amateur Radio debut by coming on 145 mc at zero hour on September 1! Others active up there are GM2DI, GM5VG and GM6KH. Some queer beam directions, possibly due to reflections from nearby objects, have been encountered. GM2DI has a modified T1131 to an 8-element beam and an S27 Rx with GG pre-amp. GM3EDQ has the 522 Tx and Rx, to 3-element beam. GM6KH also has a 522 Tx and 3-element beam. GM2DI (Wishaw) is operating the following schedule (beam direction as shown): 

<table>
<thead>
<tr>
<th>Day</th>
<th>Beam Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon. and Tues.</td>
<td>2100 E, 2115 S, 2130 N, 2145 W.</td>
</tr>
<tr>
<td>Wed.</td>
<td>2200 S, 2230 W.</td>
</tr>
<tr>
<td>Thurs.</td>
<td>2130 E, 2145 S, 2200 N.</td>
</tr>
<tr>
<td>Fri.</td>
<td>On 3-5 mc 2200 to discuss 145 mc.</td>
</tr>
<tr>
<td>Sat.</td>
<td>2100 to 2300.</td>
</tr>
<tr>
<td>Sun.</td>
<td>2030 onwards.</td>
</tr>
</tbody>
</table>

He calls for 5 minutes and listens for 10.

In Northern Ireland GI2HML has worked cross-band with other GI's on five metres. A 6-element w.s. beam is in use with a converted 522.

Five Metres

It is hoped that those who have remained faithful to five metres will forgive us for having used so much space this month for two-metre news. Five-metre activity appears to have been at a low ebb, except for the September 4/5 week-end. There have, however, been one or two spells of
fairly good conditions. GC5OU (Jersey) and G3TN (Portland) were in QSO for the first Jersey /G contact on September 19; GC2AWT (Jersey) also heard G3TN and was received by G3HW/A. GC5OU is on every Sunday at 1030-1100, for schedules. All this follows on the news of the first G/Guernsey contact between G2AVF and GC8OK.

Among the station reports is a welcome one from G8IC (Doncaster), who has just completed a new PA using LS50. He enters the Counties and Countries tables. G5GX (Hull) claims the first G/OE on five, with OE1CD at 1703 on July 2—somewhat earlier than G3KX/A, to whom we incorrectly awarded the honour last month. G6SM (Sanderstead) resumed 5-metre activity, after a 10-year break, on July 21, using 14 watts to an 807 PA and a Type 26 converter for Rx. G3BUR (Birmingham) is now active from his home QTH, in a poor location, although results appear to be fairly good. He thinks he may be working DX by landline as some telephone wires pass just a foot over his beam! G3WW (Wimblington) has erected a 51-foot tower made from scrap metal and has his 5-metre beam on top of it. G3EEZ (Wolverhampton) is a newcomer to the band. G5QA (Exeter), to quote his own words, “a very old ham, but a newcomer to 58 mc,” heard some of the Aurora DX and being active at week-ends (1800 to 2300), appeals for some DX calls from the old stagers. G2KI (Walton-on-Thames) has worked F8GH and has climbed up the tables with some excellent GDX. G3ABA (Coventry) brought in G3CXD in Newcastle to help him up the list, while

<table>
<thead>
<tr>
<th>Worked</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>G3APY (210)</td>
</tr>
<tr>
<td>41</td>
<td>G3BLP (245), G3WP</td>
</tr>
<tr>
<td>40</td>
<td>G6CW</td>
</tr>
<tr>
<td>39</td>
<td>G2AJ (317), G2ADZ, G2O1 (186), G5BD (225)</td>
</tr>
<tr>
<td>38</td>
<td>G3ABA (170)</td>
</tr>
<tr>
<td>37</td>
<td>G3DCV (140), G5MA</td>
</tr>
<tr>
<td>36</td>
<td>G8UZ</td>
</tr>
<tr>
<td>35</td>
<td>G2CW (214), G2MR, G5YV (179)</td>
</tr>
<tr>
<td>34</td>
<td>G2RI (150), G5VB, G5BM, G5LK, G6OS (176), G5VX</td>
</tr>
<tr>
<td>33</td>
<td>G5BY, G5GX (47), G6MN (147), G8XM</td>
</tr>
<tr>
<td>32</td>
<td>G2XC (320), G3IS (141), G4LU, G5BF (114), G6OH</td>
</tr>
<tr>
<td>31</td>
<td>G3BXE (126), G5PP, G5RP, G5KL (145)</td>
</tr>
<tr>
<td>30</td>
<td>G2NH (251), G3WW (113), G5PY (241)</td>
</tr>
<tr>
<td>29</td>
<td>G2KI (165), G2IO, G4AP, G5JU (144), G5WV</td>
</tr>
<tr>
<td>28</td>
<td>G3PP, G5MO</td>
</tr>
<tr>
<td>27</td>
<td>G3BB8 (127), G4IG</td>
</tr>
<tr>
<td>26</td>
<td>G3KX/A, G6HD (157), G6NF (170), G6YU (126), G85M (157)</td>
</tr>
<tr>
<td>25</td>
<td>G2AOK/A, G4RX, G5LC (111), G8UR</td>
</tr>
<tr>
<td>24</td>
<td>G4RO, G5VC (137), G9GX</td>
</tr>
<tr>
<td>23</td>
<td>G3BB0, G3DA (104), G5LQ (190)</td>
</tr>
<tr>
<td>22</td>
<td>G2ATK, G2HFL (134), G3CGQ, G5IG</td>
</tr>
<tr>
<td>21</td>
<td>G2KF (121), G2QY (124), G6KB (152), G8KZ, G8WC</td>
</tr>
<tr>
<td>20</td>
<td>G2BMZ, G2YL, G3BW, G3CW (168), G5CP, G5LC, G6SM (104), G6TF, G8AL, G8PX, G8VN</td>
</tr>
<tr>
<td>19</td>
<td>G2NM, G2QZ, G6LY</td>
</tr>
<tr>
<td>18</td>
<td>G2ADR, G2AUA, G3BK, G2HDY (135), G5HN, G5MR, G6UW</td>
</tr>
<tr>
<td>17</td>
<td>G2HDI, G3WS, G5UM (127)</td>
</tr>
<tr>
<td>16</td>
<td>G2LC (123), G3COJ</td>
</tr>
<tr>
<td>15</td>
<td>G3AEZ, G6CB, G6VD, G8TS (170)</td>
</tr>
<tr>
<td>14</td>
<td>G6IC, G8JO</td>
</tr>
</tbody>
</table>

Note: Figures in brackets after call are number of different stations worked. Starting figure, 100.
G3XX/A (Banwell) found August 28 and September 5 outstanding days. G2LC (S. Ruislip) obtains contacts much more easily now he has his rotary beam up. G2AJ/P (Dunstable) had over 150 five-metre O.SO's during his recent portable session there. G3HW/P (Teignmouth) has been operating at 800 ft. a.s.l. ; a w.s. 4-element has been used, fed from an 832 at 15 watts input. The Rx is a much modified R.1481 with 2-stage pre-selector (EF54's). He has a Saturday midnight schedule with G8UR (Wolverhampton) and is active daily, 0730 to 1000. On August 30 he worked G8OK and on September 14, G5BD—both excellent contacts. Ex-D4ATO reports a whole flock of G's heard in Konstanz, S. Germany, on July 4 under sp-r-E conditions.

420 mc

The influx of 145 mc news this month prevents discussion of the possibilities of 420 mc working, but with the release of that band from October 1 we anticipate having a new set of DX records to publish next month! As it is unlikely that G2XC will be able to get on 420 mc for some time yet, we must rely on your reports, so please send along the fullest details possible in good time. Amongst those preparing for the new band are G2HDJ (Thrapston) who hopes to have P/P 15E’s as Tx.

New 2350 mc Record!

Just as this was being closed for press, news came in of a new record on our 13-centimetre band. On September 19, G3CBN and G8IH journeyed down to Brighton with their gear (see Short Wave Magazine, p. 335, July) and set up a fixed station at High Salvington. This worked to a mobile rig first at Lancng (5 miles) and then at Race Hill, Brighton (about 13 miles); good two-way communication was obtained, in the presence of some 16 members of the Brighton & Hove Group, though an attempt to increase the distance to 20 miles (High Salvington-Newhaven)

**TWO-METRE ACTIVITY REPORT**

<table>
<thead>
<tr>
<th>Call</th>
<th>Town</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G2AJ</td>
<td>Hendon, Middlesex.</td>
<td>Heard: G2AX, 2AH, 2CFL, 2MR, 2HDY, 2XG, 2MF, 3BPMA, 3CQ, 4CG, 4DD, 5BY (184), 5IB, 5KH, 5MQ, 5PY, 5TP, 5US, 5XQ, 6CB, 6LK, 6PG, 6VV, 8DV, 8GZ, 8SK, 85K.</td>
</tr>
<tr>
<td>G2AW</td>
<td>Torquay, Devon.</td>
<td>Works: G2X (110), 5BY, 5US (136), 6LK (141), 6VV (167), 8DM (113), 8DV (129), 8QG (156).</td>
</tr>
<tr>
<td>G2O1</td>
<td>Eccles, Lancs.</td>
<td>Works: G1AAB, 3BY, 3DA, 5BY (244), 5CP, 5MQ, 6DP.</td>
</tr>
<tr>
<td>G2OY</td>
<td>Portmouth, Notts</td>
<td>Heard: G5BY, 5MQ, 6ON.</td>
</tr>
<tr>
<td>G3AP</td>
<td>Kirkby-in-Ashfield, Nottingham.</td>
<td>Works: G2IQ, 3MY, 4DS, 5BY (220), 6OS, 6VV (133).</td>
</tr>
<tr>
<td>G3AQ</td>
<td>Teignmouth, Devon.</td>
<td>Works: G2AJ, 2BMZ (110), 2MR, 5RP, 5TZ, 5US, 6DH (116), 6LK, 6PG, 6VV, 8DM, 8GZ.</td>
</tr>
<tr>
<td>G3CA</td>
<td>Havering-atte-Bower, Essex.</td>
<td>Works: G2AX, 2BRH, 5AA, 5IB, 6PG, 8GQ, 8TL.</td>
</tr>
<tr>
<td>G2A2</td>
<td>2MR, 2WS, 3BPMA, 4CG, 5VS, 6KV, 6VV.</td>
<td></td>
</tr>
<tr>
<td>G5CP</td>
<td>Sale, Lancs.</td>
<td>Works: G2O1, 3DA, 3BY, 5MQ, 6DP.</td>
</tr>
<tr>
<td>G5BY</td>
<td>Bolt Tall, Devon (N.G.R. 20/688388).</td>
<td>Works: G2AJ (184), 2IQ (226), 20I (241), 3APY (241), 3BY (218), 5MQ (221), 6LK (159), 6OS (287), 6VV (186), 8DM (185), 8DV (148).</td>
</tr>
<tr>
<td>G5GK</td>
<td>Hull, Yorkshire.</td>
<td>Heared: G2GCL, 2JO, 3ALD, 3APY, 6BX, 6DF.</td>
</tr>
<tr>
<td>G5MQ</td>
<td>Woolton, Liverpool, Lancs.</td>
<td>Works: G2AJ/P (144), 2T, 20I, 3BY, 3DA, 3AB, 5BY (221), 5CP, 6DP, 6LK (186), 6VV (186).</td>
</tr>
<tr>
<td>G5RP</td>
<td>Abingdon, Berks.</td>
<td>Works: G2GC, 4AP, 5TP, 5US, 6LK, 6VV, 8DM, 8DV.</td>
</tr>
<tr>
<td>G5US</td>
<td>Camberley, Surrey.</td>
<td>Works: G2AJ/P, 2BMZ, 2XG, 3CP, 5BY (125), 5RP, 5LK, 8GQ, 8DV.</td>
</tr>
<tr>
<td>G6L</td>
<td>Hove, Kent.</td>
<td>Heared: G2GCL, 2JO, 3ALD, 3APY, 6BX, 6DF.</td>
</tr>
<tr>
<td>G6LX</td>
<td>Farnham, Surrey.</td>
<td>Works: G2AJ, 2BMZ (129), 2MF, 2XG, 3BY (148), 5RP, 5TP, 6LK, 6VV, 8DM, 8GZ.</td>
</tr>
<tr>
<td>G6TV</td>
<td>Northwood Hills, Middlesex.</td>
<td>Works: G2AJ/P, 2AM, 4AP, 5TP, 5US.</td>
</tr>
<tr>
<td>G6VY</td>
<td>Farnham, Surrey.</td>
<td>Works: G2AJ, 2BMZ (129), 2MF, 2XG, 3BY (148), 5RP, 5TP, 6LK, 6VV, 8DM, 8GZ.</td>
</tr>
<tr>
<td>G6VM</td>
<td>Camberley, Surrey.</td>
<td>Works: G2AJ/P, 2BMZ, 2XG, 3CP, 5BY (125), 5RP, 5LK, 8GQ, 8DV.</td>
</tr>
<tr>
<td>G6VX</td>
<td>Hove, Kent.</td>
<td>Heared: G2GCL, 2JO, 3ALD, 3APY, 6BX, 6DF.</td>
</tr>
<tr>
<td>G6LX</td>
<td>Farnham, Surrey.</td>
<td>Works: G2AJ, 2BMZ (129), 2MF, 2XG, 3BY (148), 5RP, 5TP, 6LK, 6VV, 8DM, 8GZ.</td>
</tr>
<tr>
<td>G6VP</td>
<td>Camberley, Surrey.</td>
<td>Works: G2AJ/P, 2BMZ, 2XG, 3CP, 5BY (125), 5RP, 5LK, 8GQ, 8DV.</td>
</tr>
</tbody>
</table>
was unsuccessful. Anyway, it is another milestone passed, and a noteworthy contribution to progress on our highest-frequency band. We hope to hear of more results on 2350 mc.

The Clubs
A second circular will be sent to all members shortly, but we would like to record here that G3APY, G5RP and G5YV have been appointed members of the Fiveband Club Advisory Committee. A London area member will be named shortly. Members writing to these area representatives should enclose S.A.E. if a reply is desired.
The Fiveband Club Contest was won by G3BLP (most stations worked) and G2ADZ (highest score). Full details will be given in the next circular.

We should like to remind those interested that the VHF Century Club is open only to members of the Fiveband Club. Certificates for both clubs are now in hand and will be issued shortly.

In Conclusion
Once again thanks for the big mail. Several last-minute arrivals have had, unfortunately, to be held over. Please try to send your reports in good time, otherwise the tables become a mass of alterations, which is a sore point with the Editor, who then has to pacify the printers.

Latest date this coming month is October 14, and the address is E. J. Williams, G2XC, Short Wave Magazine, 49 Victoria Street, London, S.W.1. Really important late news—such as new 145 or 420 mc DX records—can be taken by ‘phone (Abbey 2384) or telegram up to October 20. But all routine items by the 14th, please. CU on November 3.

Transmitter for 420 mc
Adapting the Unit Type 105
Notes by G4LU

It seems from published information that the 420 mc transmitter may have to employ a self-oscillating circuit until such time as amplifying valves, with power and voltage ratings suitable for amateur purposes, become available. Although the self-oscillator is to be deplored there is no easy alternative at the moment and good frequency stability therefore becomes a matter of using high Q-factor circuits and a rigid mechanical construction.
The first of these requirements is met by employing concentric-line circuits which have zero radiation loss and also heavy silver plating on all conductors carrying RF currents to reduce ohmic losses. For those who do not feel inclined to carry out the necessary constructional work there are suitable British and American war surplus equipments which can be easily adapted for amateur purposes. These equipments were used either in altimeters or IFF gear and generated output powers between one and five watts. Some form of mechanically-operated device was usually employed for sweeping a band of frequencies periodically and this can in most cases be modified to form the tuning control of the transmitter.

Type 105 Design
The R.A.F. RF Unit Type 105 is just such a piece of equipment. The unit consists of a silver-plated box, which contains the valve and the main portion of the concentric line tank circuit, and from which an extensible portion of the line protrudes. The line works in a half-wave mode, but is shorter than a physical half-wavelength because of the effect of the valve capacity at one end and the tuning capacity at the other. The latter capacity consists of an earthed flexible metal vane housed in a small compartment mounted on the end of the extensible portion of the line; the separation between the vane and the centre conductor can be varied by applying pressure to an insulated rod working in a bush fitted to the front face of the compartment.

It was evidently intended that the rod should be operated by a cam device but for amateur use a screw working in a saddle bracket mounted round the front
Table of Values

Fig. 1. The 420 mc Transmitter
C1, C2, C3, C4 = By-pass condensers. See text.
C5 = Vane tuning condenser, see text.
C6 = Blocking condenser, 1 µF, 400 volt working.
C7 = Audio tuning condenser, 1 µF, 200 volt working.
C8 = Decoupling condenser, 20 µF, 12 volt working.
C9 = Cathode by-pass condenser, 5 µF, 12 volt working.
R1 = Grid leak, 1500 ohms, 1/2 watt.
R2, R3, R4 = Filament dropping resistors, 10 ohms, 1/2 watt.
R5 = Feedback resistor, 68,000 ohms, 2 watt.
R6, R7 = Modulator Cathode resistors, 200 ohms, 1/2 watt.
L1 = Cathode choke, 2 turns 1/2 in. dia., 1/2 in. long.
L2 = Heater choke, 4 turns 1/2 in. dia., 1/2 in. long.
L3 = Anode choke, 2 turns 1/2 in. dia., 1/2 in. long.
L4 = Anode choke, 9 turns 1/2 in. dia., 1/2 in. long.
T1 = Microphone transformer.
V1 = CV82
V2 = 6V6

G4LU's circuit for speech-tone modulation, as applied to the Type 105 Oscillator adapted for 420 mc operation. If a carbon microphone is used, it can be energised by bleeding off a proportion of the modulator cathode current.

Grid leak bias is employed on the oscillator and the grid is maintained at zero RF potential with a by-pass condenser formed by the disc seal, as one plate, separated from the box partition by a mica sheet.

Modification for 420 mc

To get the unit working through the band 420-460 mc all that is required is to extend the line as far as possible and to insert a sheet of mica between the tuning vane and the centre conductor of the line. The mica sheet as well as increasing the tuning capacity also prevents a short circuit of the anode supply when the vane is in its extreme low frequency position.

The circuit of the unit, with the modulator applied by the writer, is shown in Fig. 1. The tuning condenser is designated C5 and the grid by-pass condenser C2. The by-pass condensers C1, C3, C4 consist of small washers separated from the case by discs of mica or polystyrene. Although the valve is a grounded-grid triode, oscillation is possible because the CV82 is designed with a much larger anode-cathode capacity than a similar type of valve used in amplifying applications. Feed-back coupling between the anode and cathode circuits is obtained by this
capacity, the excitation voltage being maintained in the cathode circuit by the impedance of the chokes L1 and L2. The constants of the CV82 are listed in Table 1.

Power Supply and Operation

For convenience, the oscillator and modulator are run from a common 6.3 volt filament supply, the voltage being dropped to 4 volts by R2, R3, R4 in parallel. The modulator is quite conventional, choke coupling to the oscillator in the familiar Heising circuit being employed, although transformer coupling would give a more exact load resistance to the 6V6 valve. Self-bias is provided by resistors R6, R7, and a portion of the voltage is tapped off to provide excitation for a carbon microphone. The transmitter can be tone-modulated by converting the modulator valve into an audio oscillator. This is arranged for by throwing the SPDT switch which automatically connects the feed-back circuit and tuning condenser to the primary winding of the microphone transformer, T1. The note frequency will depend on the constants of the transformer and the value of the parallel condenser C7. (The secondary winding of the transformer must of course be connected right the way to obtain audio oscillation.) The purity of the tone will depend on the quality of the transformer and the amount of feed-back employed, which can be varied by using different values for resistor, R5, but too much attention need not be paid to this since a modulated oscillator is not capable of good quality reproduction unless the percentage modulation is kept very low.

The provision of tone modulation should prove to be an advantage during initial testing on the new band, enabling a lower frequency QSO to be kept going while the distant station is tuning and searching for the VHF signal. It is a great help, too, in the local testing of receivers since this work can then be carried out by one operator. On the latter grounds alone the cost of the few extra components is justified.

Table 1

<table>
<thead>
<tr>
<th>OPERATING DATA FOR CV82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, 4V.</td>
</tr>
<tr>
<td>Filament Current, 0.7A.</td>
</tr>
<tr>
<td>Amplification Factor, 35</td>
</tr>
<tr>
<td>Mutual Conductance, 6 mA/V.</td>
</tr>
<tr>
<td>Capacities: Cag 1.4μF, Cac 0.4μF, Cgc 4.2μF.</td>
</tr>
<tr>
<td>Maximum Anode Voltage, 350V.</td>
</tr>
<tr>
<td>Maximum Anode Current, 38 mA.</td>
</tr>
<tr>
<td>Maximum Anode Dissipation, 6W.</td>
</tr>
<tr>
<td>Maximum Grid Dissipation, 0.5W.</td>
</tr>
</tbody>
</table>

Efficiency at 450 mc, 30 per cent. Spade terminal on filament lead is common with cathode and painted red.

Operation

In operation the unit is adjusted in the usual fashion of self oscillators, all the necessary precautions being observed. The frequency is set up initially using a wavemeter or Lecher wires. The coupling to the aerial can then be increased until a reasonable output consistent with good frequency stability and freedom from frequency jumping is obtained. The frequency can then be checked again so that any change due to the load circuit can be remedied. It should be remembered that the aerial is in effect part of the oscillating circuit and, to reduce the possibility of frequency instability, it should be constructed very rigidly.

With a 350-volt anode supply the unit delivers a power output of between two and three watts which, in conjunction with an aerial system of good gain (such as a dipole in a corner reflector) will provide an ample signal for local working up to a distance of about 10 miles over suitable terrain.
Q-Max B4/40
Self-Contained Transmitter for Five Bands

Magazine Test Report

FOR some time we have had in operation a Q-Max B4/40, which is essentially a five-band self-contained band-switching CW/Phone transmitter, running inputs of up to 40 watts CW and 30-35 watts on telephony.

The RF section consists of a three-stage TT11-EL32-KT8c arrangement, direct-coupled throughout, but with link-coupled output on the RF side. The KT8c PA is modulated by a pair of 6L6's, and the speech amplifier is designed for crystal microphone input. The power pack provides HT for all stages, RF and modulator, and by means of a metal rectifier tapped off the main power transformer also a stabilised bias supply for the BA/Doubler and PA valves.

Switching
The mode of operation (any band 3.5-28 mc, CW or 'phone) can be quickly selected from the front panel, which carries all tuning controls and the band-selector switch. This operates both a Q-Max four-band coil turret and also on the coil assembly in the BA/Dblr plate, thus giving output on any desired band literally by "the flick of a switch".

Metering is provided in all essential stages—PA grid, FD plate, PA plate and modulator plate—by suitable selector switching.

Frequency Control
Primary frequency control can be either crystal or VFO—in the latter case the drive is applied direct to the grid side of the second (EL32) stage through a loop link coupling on the oscillator plate coil. A modified Pierce crystal oscillator circuit is employed and is "sure-fire" with all crystals having any life in them at all.

Keying is provided in the cathode of the first (CO-TT11) stage and under key-up conditions the static bias cuts off plate current to the succeeding stages.
Modulation

With any standard type of crystal microphone, the speech amplifier-modulator section gives ample control of the carrier with the PA loaded for optimum RF output on any band. Indeed, the degree of modulation obtainable and the general performance of the transmitter on 'phone is one of its outstanding characteristics.

The RF output can be taken off directly to a dipole fed through low-impedance line or, preferably, into a separate external link-coupled aerial tuning unit if an "all-band" type of radiating system is used—as should be so with a transmitter having the wide frequency coverage of the B4/40. Two feed-through insulators on the front panel serve to couple in the RF load.

General Construction

The B4/40 is very well built, and designed to fit compactly into an attractive crackle-finished steel cabinet, suitable for table mounting; dimensions are 19 in. × 10 in. × 10 in., the front panel size being 19 in. × 9½ in.

Electrically, the design is excellent and the layout and inter-stage screening such as to ensure stable operation. First quality components are used throughout and dissection of the transmitter into its various units showed that nothing has been skimmed.

The Tx tends to run rather warm under full-load conditions with the modulator in operation, and though louvre ventilation is provided, it is advisable to keep the
cabinet lid open during sustained periods on the air.

Operation
With either VFO or crystal control, operation is quite simple and rapid band-change is an easy matter. It is not the intention here to describe the tuning procedure in detail since a well-produced and fully illustrated instruction manual accompanying the set gives the user all the information he could possibly require on the setting up and operation of the transmitter.

Suffice it to say that working from crystals only we were able to calibrate our model for all bands in less than half-an-hour, the dial settings then being noted as a guide for operation with a VFO.

Results
The B4/40 was tested from a good country location under practical conditions on all bands covered (except 21 mc) and gave an extremely satisfactory account of itself on CW and 'phone—though one criticism might be that when using CW with CO drive, the note may tend to be chirpy unless the FD tuning is very carefully adjusted. This effect is inherent in the CO circuit used, but need not be serious.

A catalogue of DX worked would be quite meaningless, since so much depends upon operator ability, location and conditions. But using CW both on the DX and domestic communication bands the transmitter did all that could possibly be expected for the power available, and on telephony all reports received were uniformly good both as regards quality and depth of control.

To put it into operation, the B4/40 requires only a 200-250 volt AC supply, a key, microphone and aerial tuning panel—or just a dipole feeder line for one-band operation. All in all, it is a good example of well designed commercial low-power transmitting equipment and can be recommended for amateur-band operation under what in these days are "medium-power" conditions.

Bringing in the DX
Points on Operating Procedure
By S. A. HERBERT (G3ATU)

Of all aspects of Amateur Radio, working DX (or trying to work it) commands increasing attention. More and more stations are after that elusive Zone or new country, with the result that the DX bands are rapidly becoming areas of terrific activity, colossal QRM and keen, sometimes too keen, competition.

The newcomer hearing G6—working everything going, plunges eagerly into the fray, and often becomes a sad but not much wiser man.

Some stations, seemingly, work DX without effort—indeed, some work nothing else. Others, with the band wide open, can’t work a thing. Why? Is it power, or lack of it? Is it location, luck, or just experience plus good operating?

In normal conditions, the man who knows what he is doing and how to do it must have more success than a beginner, and while experience itself is the best teacher, there are one or two points which, if followed, should make DX seeking more profitable.

Listening
We all have a receiver, yet how many of us bother to use it properly? Remember the old adage (and the terms of your licence) and listen before you transmit. You’ll find out what’s cooking that way, and you won’t make yourself popular calling CQ DX slap on top of AC4YN.

The next thing is to decide what you want in the way of DX. There is usually plenty of “ordinary” DX coming through at a comfortable S6, but have you ever really listened, picked out that watery little signal about “so high”? Weak, may be, but it is surprising how many satisfying QSO’s can be had even when the local boys come on for their QRO cross-town chats.

A so-called “dead band” can often provide some really worthwhile signals.
Strange countries have a habit of popping up, and there they are, all on their own, calling “CQ Europe,” unaware that Europe and his XYL are QRT and have gone to the pictures.

Broadly speaking, with the exception of the 28 mc ‘phone band (which now seems to embrace the entire band width), it is very little use answering a station more than a few kc away from one’s own frequency, unless that station is using band search procedure. It is an unfortunate fact, in these days of VFO’s, that very few stations do use QLM, so it’s too bad for the one-rock man and good hunting to the VFO, in whoever’s hands it be.

When replying to a station using band search procedure, notice should be taken both of the frequency difference between the two stations and the amount of activity on the band. Obviously with activity at a high level, it will take longer to tune a given range than when few stations are on.

Break-In

Perhaps the best and most efficient of all methods is to use break-in procedure, coupled with QLM, and remember, even if you are not equipped for break-in, you can still “BK” the other station and save time, as well as reducing interference.

Several simple and effective methods of achieving break-in have appeared in the Short Wave Magazine. As regards the transmitting side, two points seem to stand out. If you are a CW man, and you send good CW with a good note, you’ll get more QSO’s than John Q. Kilowatt with his shaky 30 w.p.m., and a note like a buzz-saw.

It doesn’t matter whether you send at 12 w.p.m. or 25—as long as you are sending nice, rhythmic, 100 per cent copy. Once you over-run your capabilities and send too fast, anything may happen. Then, too, you may get a reply, and ten to one it will be faster than your call! “Sri om, heavy local QRM, pse QRS”! A good operator, too, will always suit his speed to the fellow at the other end. It may sound fine to hear your own bug doing thirty, but poor old G9XX at the other end doesn’t think so—good job you don’t know just what he is thinking!

There are one or two operating practices which never fail to cause loud applause and shouts of joy from all concerned. Perhaps the number one favourite is the clot who calls CQ for minutes at a time punctuated by short bursts of diddly dits, long dahs and VE’s, plus an occasional “test.” He then signs and waits virtuously for a call. What a hope!

The same type has been known to repeat the performance except that he eventually closes down without giving his call at all. The real joke is, of course, that someone always listens to the bitter end. In fascinated horror, presumably.

The sign SK is being used rather loosely on occasion. A station may sign with a definite SK, and continue chatting for another hour, leaving perhaps several stations calling him and/or gnashing their teeth.

Likewise, the practice of “going QRT” and then carrying on another QSO. Very funny, unless you have been lying in wait for an hour or so, then, having heard “QRT,” you switch off the Tx just in time to hear your DX busily chatting with your hated rival!

Finally a word to the “CQ’ers” and “non-CQ’ers.” Some stations rarely, if ever, send CQ. They just wait, listen and work the DX. As has been said before, calling CQ DX is no way to achieve DXCC, but it is still fun and you never know. Besides if you QLH, you may gladden the heart and raise the blood pressure of some rock-bound “W” with his first DX.

FOR SWL READERS

Do you know the Short Wave Listener, our companion publication, which covers all SWL interests? Of 32 pp. with colour cover, the regular features are “Have You Heard?”, a monthly commentary on SWL amateur band activities, and “DX Broadcast,” covering the reception of S/W BC stations throughout the world. Both these are the most informative and up-to-date news articles of their kind appearing in print to-day. The Short Wave Listener also caters for SWL’s graduating to the full permit, and always contains authoritative material of direct interest to the listener. Publication day is the third Thursday in the month, price per single copy is 1s. 3d. (1s. 4d. post free), and the subscription rate is 16s. for a year of twelve issues. Write the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.
NEW QTH's

This space is available for the publication of the addresses of all holders of new callings, or changes of address of transmitters already licensed. All addresses published here are automatically included in the quarterly issue of the Call Book in preparation. QTH's are inserted as they are received, up to the limit of the space allowance. Please write clearly and address on a separate slip to QTH Section.


G2UX/A G. Edwards, Wymondham Secondary School, Norwich Road, Wymondham, Norfolk.

G3ACP A. F. Padfield, 24 Church Rise, Chessington, Surrey.

G3ALQ G. A. Woodhouse, 14 Wentworth Way, Sanderstead, South Croydon, Surrey.

G3AMX A. J. White, Little Pleasance, Western Road, Ashburton, Devon.

G3AXP R. C. Farrary, 29 Willow Grove, Beeston, Nottingham.

G3BCC J. J. Jardine, 80 Roundwood Road, Northend, Manchester, Lancs.

G3BCC A. Martin, 21 Clifton Gardens, Goole, Yorkshire.

G3BEC R. W. Westmorland, 36 Godfrey Street, Chelsea, London.


G3DDB W. A. Sansom, Wines Farm, Plumpton, Lewes, Sussex.

G3CBG A. Leach, 29 Russell Avenue, Kingswood, Bristol.

G3CQX H. E. Pointer, 39 Blundell Road, Bedworth, Warwick.

G3CRL H. E. Pointer, 39 Blundell Road, Bedworth, Warwick.

G3CRB B. S. Smart, 1 Waterbeach Road, Cambridge.

G3CWS/G A. D. A. Brown, 19 Haig Avenue, Kirkcaldy, Fife, Scotland.

G3DJE N. Vaus, Station House, New Milton, Hampshire.

G3DKN J. B. M. Stewart, 37 Dillichip Terrace, Horfield, Bristol.


G3DVT E. W. King, Broom Hill, Landford, near Salisbury, Wilts.

G3DU J. B. Leach, 25 Clevedon Road, Gloucester.


G3EAB J. C. Rigby, 50 West Drive, Timmington, Hadfield, Manchester.

G3EBH G. C. Newby, 35 Chaucer Drive, St. Giles, Lincoln.

G3EBN L. Clift, 4 Crompton Avenue, Blackpool, S.S., Lancs.

G3EDC J. J. Jardine, 80 Roundwood Road, Northend, Manchester, Lancs.

G3EDC A. Martin, 21 Clifton Gardens, Goole, Yorkshire.

G3EZH R. J. Price (ex-SU V1), 28 Rectory Road, Trecwn, Pembrokeeshire, W. Wales.

G3ECM P. W. Bowles, 47 Braemore Road, Hove, 3, Sussex.

G3ECU W. W. King, Broom Hill, Landford, near Salisbury, Wiltshire.

G3ECX A. P. Newport, 71 Micheldever Road, Lee, London, S.E.12.

G3ECZ K. Robinson, 20 Church Avenue, West Somerton, Choppington, Northumberland.

G3EDG W. G. Piffield, 4 Devonshire Street, Brighton, 7, Sussex.

G3EDU J. F. M. Stewart, 37 Dillichip Terrace, Bonhill, Alexandria, Dunbartonshire.

G3EHH J. G. Watkinson, Church Lane, Hedon, Hull, Yorkshire.


G4WS W. Stanworth, 4 Tewkesbury Avenue, Harrow, Middlesex.

G4ZU Capt. G. A. Bird, 94 Shirley Street, Croydon, Surrey.

G5VCA N. Vaus, Station House, New Milton, Hampshire.

G5MA J. Hearn, Rose Cottage, Bank Park Crescent, Tranent, East Lothian, Scotland.

G8UG J. K. Coomber, 22 Russell Road, Mitcham, Surrey.

CHANGE OF ADDRESS

G2CQK Major R. S. Trevelyan, 91 St. Georges Road, Cheltenham, Gloucestershire.

G2HXX C. L. R. Bullock, 52 Bunbury Road, Northfield, Birmingham, 31.

G2KU R. M. Herbert, 9 Baldwin Avenue, Eastbourne, Sussex.

G3AKH D. G. Lucas, 66 Whiteley Road, Whitley Bay, Northumberland.

G3BQ W. H. Tanser, 29 Wheatfield Road, Old Bilton, near Rugby, Warwick.


G3CLM Dr. B. G. Wells, Little Orchard, Lee-on-the-Solent, Hants.

G3CXW R. F. Hall, 88 Woodbank Road, Downham, Kent.

G3NA E. H. D. Coates, 21 White Horse Square, Hereford.

G4V G. A. Woodhouse, 14 Wentworth Way, Sanderstead, South Croydon, Surrey.

G5UGA J. Hearn, Rose Cottage, Bank Park Crescent, Tranent, East Lothian, Scotland.

G8UG J. K. Coomber, 22 Russell Road, Mitcham, Surrey.

CORRECTION

G3BIU J. Dunn, Care View, Sennen Cove, Land's End, Cornwall.
Small Mistake

Reference Part II of G6HL’s article on Aerial Design, Fig. 10 on p. 479 and its accompanying paragraph in the text should have made the vertical spacing half-wave, and not as shown. It was that little chap with the black pencil who dunnit!

Amateur Radio Exhibition

We shall again be on Stand 5 at the RSGB’s Second Annual Amateur Radio Exhibition, opening on November 17 at the Royal Hotel, Woburn Place, W.C.1, and continuing till Saturday the 20th. The stand will be manned by various members of our staff throughout the period of the Exhibition, which is being supported by 26 firms operating in the Amateur Radio field. Come and see what promises to be an excellent show—and say hello to us.

Struck, Another Blow for “Freedom”

From Hungary comes official notification that all amateur activities have been co-ordinated under the M.R.R.E., or “Hungarian Shortwave Radioamateur League,” with address Postbox 185, Budapest 4, which is also that of the HA QSL Bureau. This is of course on the Box 88, Moscow, theme and there is an illuminating remark in the notice to the effect that “Bureaux publicated in different papers and magazines have been in private hands and exist no longer.” In other words, toe the line or be liquidated. But it is only fair to add that the M.R.R.E. circular concludes with the hope (which we echo) that “international amateurism hand-in-hand will serve the matter of peace.”

G2NM—Yachtsman

This has practically nothing to do with Amateur Radio in the strictest sense, but many of our readers fond of the sea or yachtsmen themselves will be very interested to hear that Gerald Marcuse, G2NM, of Bosham, Sussex, has gained another distinction. With his cruiser Eirene II he won the Motor Boat Challenge Cup, open to all comers, in the International Cruise Pavillon d’Or 1948. Nearly 100 yachts were entered for this event, a cruise to Holland, and judging was on the basis of the owner producing the best log. G2NM was accompanied by G5MR as crew, and for two radio amateurs to win this cherished trophy of the yachting world is a great achievement.

Eirene II is fitted with radio for operation on non-amateur frequencies, those assigned being 1650 kc (emergency), 2012 kc (ship-to-shore schedules), and 2135 or 2225 kc for inter-ship contacts. During the cruise, lasting some nine weeks, GNF North Foreland, was one of the land stations worked and the operators on watch enquired if the Grand Old Man of Amateur Radio was afloat again. He was—well done, Gerry!

R.A.E. Results

Consolidated results of the Radio Amateurs’ Examination held in May last show that the total number of candidates, home and overseas, was exactly 700. Of these, 528 passed, giving a failure figure of about 24 per cent.—still too high, in our estimation, but a great improvement on the 1947 R.A.E., when 37 per cent. of the 326 candidates were failed.

The Paper (which appears in full in the October issue of our Short Wave Listener) was again fair and reasonable, and this time the Examiner’s Report to the Department of Technology, City & Guilds of London Institute, remarks as follows: “Candidates’ work as compared with previous examinations was generally of a much higher standard both technically and the manner in which the questions were answered. It was apparent that more adequate preparation had been made for this year’s examination. . . .”

Obituary

Mrs. C. H. Myler, G3GH, Knowle, Braunton, was well known on the air in pre-war days, though she had not resumed amateur activity when licences were re-issued. Known to many of us as “Gran’ma,” and a great friend to all interested in Amateur Radio in North Devon, she was of the finest type of amateur. A cultured woman with a wide knowledge of the arts, in her earlier days she had been a concert violinist of distinction. Her passing at the end of August will be mourned by all who knew her—Valet.
The
other
man's
station
G3BDS

Station G3BDS is owned and operated by K. T. Whithorn at 34 Tybridge Street, Worcester. Situated in a small spare room (lucky chap!), complete with work-bench, G3BDS is another outfit completely home-built except for the Eddystone 640 receiver and bug key.

Above the operating table is a standby 9-valve superhet, with speaker. The VFO/Frequency Meter is built into a TU6B unit, alongside which is its power pack and the modulation meter. To the left on the table is a switch panel which gives complete control of the station through relays. An oscilloscope, with a separate power unit, is also provided.

The QRO transmitter is 6V6-807-807-813 running 150 watts, built in separate units and housed in a 6-ft. rack, with the heavy power supplies in the two bottom positions. Next comes the modulator, using EF36-EF36-P/P 6L6's triode connected-P/P 807's as triodes, and arranged to plate-screen modulate the 813. Above the modulator panel is the CO-FD-FD section; then the PA as one unit; and finally the aerial tuning panel.

Aerials in use are 66-ft. with 600-ohm feeders, a 66-ft. dipole, and a 14-mc dipole running E-W. The aerials are brought in to a switch panel on the wall, for quick selection.

A small stand-by Tx is also available for 7 mc working, running 15 watts. To date, operation has been mainly with CW on 7, 14 and 28 mc, 'phone being used on 1-7 mc only. It is the intention to commence 'phone working on 14 and 28 mc, with the equipment as described above.

G3BDS is a good example of neat and compact station design, with everything in its place and to hand, making for easy and efficient operation.

Have You Seen the DX Operating Manual?
THE MONTH WITH THE CLUBS

FROM REPORTS

The opening-up of the winter season is heralded by a great burst of activity among the Clubs, and reflected in the fact that we have received 37 reports for inclusion this month. The tale is the same everywhere—of interest on the increase, on more of better attendances, and of winter programmes full of promise.

By the time this is published, Club Secretaries who have reported to us during the last six months should have received the rules for the forthcoming Magazine 1.7 mc Club Contest (December 4-12), for which we hope to see a record entry. We are assured of hot competition from among last year’s high scorers, but a little new blood will make things all the more interesting. Will secretaries please note that though MCC entries will be accepted up till December 3, we want to be able to print a full list of entrants in our December issue, for which the closing date will be November 12. Those Clubs that may get their entries in before October 15 will also be listed in the November Magazine.

Deadline for next month’s reports is first post on October 15. Please address them, as usual, to Club Secretary, Short Wave Magazine, 49 Victoria Street, S.W.1.

South Manchester Radio Club.—Welcome to this newcomer, which had its first gathering on August 20, at the Northenden Church School Rooms. Meetings will be held there at 7.30 on October 15 and 29, November 12 and 26, and December 10. A full programme of events has been organised, with Morse classes, talks on Transmitter Technique and visits to places of interest. There are two licensed transmitters among the membership and several more “hopefuls.”

Tees-side Amateur Radio Society.—Permanent headquarters are now at 400 Linthorpe Road, Middlesbrough, and consist of a club room, transmitting room and a workshop. A visit was recently paid to the local police station (officially, of course!) and the radio gear was inspected. Morse classes and a course in radio are about to open.

Catterick Amateur Radio Club.—This club is now meeting every Tuesday evening. Major Ken Ellis of MDSK5W is back in Catterick, and ex-MD5JH is also there. Lectures during the past month have been on the TU5B Conversion and on the Principles of Frequency Measurement. Visitors or “transients” will be welcome “in the shade of that 72-ft. stick.”

West Kent Radio Society.—Activities continue at a high level with a much-increased membership. Lectures, demonstrations, films and visits have all taken place recently, and new members from Sevenoaks, Tunbridge Wells, Tonbridge, Southborough and outlying districts will be welcomed.

Malvern and District Radio Society.—Twenty-six members attended the Junk Sale in September, and an informal discussion followed the main business. On October 6 G2AO is to talk on The Atlantic City Conference.

Warrington and District Radio Society.—Meets on alternate Mondays, 7.30, in the Sea Cadet Headquarters. Recent meetings have included a talk on High-Fidelity Reproduction, a film show, and a talk on VHF and Television Aerials. On October 16 a visit is being paid to the Port of Liverpool Radar Station.

Worthing and District Amateur Radio Club.—The former Worthing Group has reorganised under this new title, in order to widen the scope of the club and to admit more members. Meetings are on the first Thursday, 7.30, at Oliver’s Cafe, Southfarm Road. New secretary’s QTH in panel.

Wirral Amateur Radio Society.—Lectures were recently heard on radar (CR Tubes and Time-Bases), from Mr. D. H. McClelland. October meetings are arranged for the 6th and 20th, both 7.30, at YMCA, Whetstone Lane, Birkenhead.

Hi-Q Club, Giffnock.—Discussion during the past month has centred on 145 mc gear. The DX section are testing 21 mc equipment in readiness for the new band. GM3AEC, the original chairman, has changed his QTH and becomes an Honorary Founder Member. GM2KP, 3AKK and 4JO were recently present at a private showing in the university of “Atom-Splitting” with 30 million volts. (We gather that all returned safely.)

Reading Radio Society.—At a recent meeting members who had expected to remain mute in the audience were privily called on to the floor, without warning, to give brief descriptions of their stations and the gear used. The instructor of the local Technical College class on Radio for the Amateur also gave an interesting talk on modulation systems. In September a 3-metre DF contest was held, but results are not yet to hand.

Stourbridge and District Amateur Radio Society.—Members who attended the September meeting enjoyed a talk by G3CLG on Communications Receivers. The lecturer has been building them for nearly 20 years and knows his subject! In Octo-
Slade Radio Society.—October 1-8 represents Slade’s 21st Birthday Week, and a special programme has been arranged. October 1—Lecture on the Cavity Magnetron ; October 2—Visit to Droitwich ; October 6—Demonstration of communication on 3.5 mc ; October 8—21st Birthday Dinner. On October 15 there is to be a lecture on Photo-Electric Cells in Industry, by Mr. K. H. Varney, a member.

Kirkcaldy Amateur Radio Society.—A hearty welcome to an newcomer to these columns. The club meets on the first Tuesday and third Wednesday of each month in the Station Grill, Kirkcaldy, at 7.30. Morse instruction is given regularly, followed by talks and discussions ; a visit to the BBC relay station at Falkirk is planned, among other trips. Membership stands at 40, and prospective members should contact GM3DVW, the Hon. Sec. (QTH in panel).

Sutton and Cheam Radio Society.—They have just suffered a sad loss by the death of the late Secretary, Mr. B. J. Blount. The office has been taken over by Mr. L. Seaton.

Herewith are the names and addresses of the Hon. Secs. of Clubs reporting this month. They will be pleased to give every assistance to prospective members:

BLACKPOOL.  H. D. Ashworth, G4PY, 5 Albion Avenue, Blackpool.
BRADFORD.  W. S. Sykes, G2DJS, 287 Poplar Grove, Great Horton, Bradford.
BRIGHTON.  R. H. Newland, G3VW, 12 Park Street, Brighton.
CARLISLE.  J. Ostle, 2 Outgang, Aspatria, Carlisle.
COVENTRY.  J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.
DARLINGTON.  G. Walker, G2AWR, 7 Geneva Crescent, Darlington.
EDGWARE.  R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.
EDGWARE.  R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.
GEC.  C. Edington Sutton, G3ANQ, Osmar Valve Department, Magnet House, Kingsway, London, S.W.C.2.
GLASGOW.  J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4.
GRAFTON.  W. C.2. E. Cross, Dalvington Priory Road, Malvern.
HARROW.  J. R. Pikett, 93 Whitmore Road, Harrow, Middx.
KIRKCALDY.  J. Gray, GM3DVW, 19 Haig Avenue, Kirkcaldy.
LIVERPOOL.  W. G. Andrews, G3DVW, 17 Lindigfield Road, Liverpool, 14.
MALVERN.  E. Cross, Dalvington, Priory Road, Malvern.
MANSFIELD.  T. S. White, G4DS, Lyndene, Fern Street, Sutton-in-Ashfield, Notts.
NORTH-WEST IRELAND.  D. R. J. Adair, G13BVB, Cosby Lodge, Culmore Road, Londonderry.
READING.  L. Watts, G6WO, 817 Oxford Road, Reading.
SALTERS.  G.2FZT, 3 Berridale Avenue, Glasgow, S.4.
SOUTHEND.  J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.
SLADE.  C. N. Smart, 110 Wootonmore Road, Erdington, Birmingham 23.
SOLIHULL.  H. C. Holloway, 20 Danford Lane, Solihull.
SOUTHEND.  J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.
SPEN VALLEY.  J. Ackroyd, 125 Westgate, Clockheaton, Yorks.
STOURBRIDGE.  W. A. Higgins, G8OF, 35 John Street, Brierley Hill, Staffs.
SUTTON AND CHEAM.  L. Seaton, 125 Oxford Road, Sutton, Surrey.
TECHNICONS.  G. Walker, G3CBW, 2 Chester Road, Middlebrough.
WARRINGTON.  W. R. Murray, G3CUB, 36 Crow Wood Lane, Widnes.
WARRINGTON.  W. R. Murray, G3CUB, 36 Crow Wood Lane, Widnes.
WEST KENT.  R. L. Pluck, G4AY, 9 Prospect Road, Southborough, Kent.
WIRRAL.  B. O’Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Cheshire.
WISCHAW.  A. R. T. Williamson, 14 Coronation Road, New Stevenston, Motherwell, Lanarks.
WORTHING.  F. T. Tooley, 62 Becket Road, Worthins.
YORK.  G. W. Kelley, G5KC, 123 Kingsway West, Acomb, York.

Mansfield District Radio Society.—This club, formed on May 1, meets monthly at the Swan Hotel, Mansfield. In September members visited Messrs. Whiteley’s radio factory, and on October 10 a discussion on Band Planning will be held at 3 p.m. New members will be heartily welcomed to this meeting. Secretary’s QTH in panel.

GEC Model Engineering and Electronics Society.—This society has a strong Amateur Transmitting Group, among whom are several licensed members and some eligible ex-Service types. The club hopes to put in an entry for the MCC in December, several of the members being anxious to try their hands on 1.7 mc.
A full programme of lectures and demonstrations has been arranged for the coming season. Several members with full licences have acquired 1746 kc crystals and "net" on this frequency soon after 10.30 p.m. Other clubs might well copy this scheme, but please note that "netting" does mean using one spot-on frequency and not spreading all over the band, as some have been known to do!

Coventry Amateur Radio Society.—At a recent meeting a talk on home-made television gear was followed by a display of members’ own home-made apparatus of all kinds, from superheats to an automatic sender. Autumn lectures will cover subjects from Interference Suppression to Induction Heating. G3BJC, from Penzance, is among a number of new members.

North-West of Ireland Amateur Radio Society.—The club station, GI3CFH, is now licensed for 150 watts 'Phone and CW, and the 150-watt PA and Modulator are well in hand with their working parties. A BC348 receiver was also acquired recently. Membership is on the increase and several of the clan are well on the way towards their call-signs. There is a certain amount of interest in 5-metre work.

Liverpool and District Short Wave Club.—Attendance at recent meetings has been good; recent lectures have been on Radio Telephony, by the Chairman, G6KS; and on the Edystone 640 and the BC221 by Mr. W. Lawson, G4PF. The club wishes to express its appreciation of the regular attendances by the Treasurer, G8JU, in spite of his very arduous duties at Speke Airport.

West Cornwall Radio Club.—This club has now come out with its own publication, called The Radio Link. We have seen the first copy with interest, and learn from it that a Special General Meeting is being held shortly to discuss the future of the club, one of whose problems is the large but sparsely populated area (from the amateur point of view) with which it has to cope. Prospective members, whether from Falmouth, Truro, Redruth, St. Ives or Penzance districts will be equally welcomed by the Hon. Sec.

Brighton and Hove Group.—Big things were planned for September 19, with an afternoon attempt on the 2350 me record (between High Salvington and Lancing). This was to be followed by a Social. Unfortunately it will, of course, be past history as you read these notes, though an account of the 13 cm test may appear elsewhere in this issue. During October a Junk Sale is being arranged; meetings are held on alternate Mondays at the Golden Cross Hotel, Western Road, Brighton.

Wishaw and District Radio Club.—This club has started the new season with a full programme. Meetings are held at the Marshall Street Institute, Wishaw (Friday at 7.30), but a search is being made for more suitable premises. The Secretary (QTH in panel) will be pleased to welcome newcomers.

Kingston and District Amateur Radio Society.—Fortnightly meetings at the Kingston Hotel have been resumed. An instructive lecture on Electrolytic Condensers was given by Mr. H. C. Daly at the last meeting, and a comprehensive programme of coming events has been arranged. Next meetings, October 7 and 21 at 7.30.

Darlington and District Amateur Radio Society.—Welcome to yet another addition to the ranks this month. They meet on alternate Thursday evenings, 7.30, at the Temperance Institute, Gladstone Street, but are hoping to acquire a suitable room where a more permanent HQ can be established.

Edgware and District Radio Society.—Membership is now over 70, and this club must surely hold the record for overseas visitors, who have included VK3TZ, VK2XM, ST2MP, VE3BK0, ZS6GH, VE7VO, SM5ZN, F9BS, VK2JR, VQ4AWH and W4JBI. Weather rather spoilt the DF contest in September, but spirits were undamped and the transmitter was located. The Mullard series of
film strip lectures on The Radio Valve will be given as a monthly feature, beginning on October 13.

Grafton Radio Society.—This club meets every Monday, Wednesday and Friday at 7.30, and Morse instruction is given at every meeting. Lectures covering the RAE syllabus commence shortly, and a large stock of gear is in hand for the season’s constructional programme. New officers were elected at the third AGM in September—the president for this session is GW3ALE. New members welcomed.

Blackpool and Fylde Amateur Club.—The meeting room has now been found at the Chamber of Trade Hall, 53 Queen Street, and meeting nights has been altered to the third Tuesday in the month. It is hoped that members who have not been regular attendees will now return and give the club their full support.

Worcester and District Amateur Radio Club.—The film lecture on The Radio Valve was given at the September meeting, and it is hoped to give the complete series later on. For the November meeting it is hoped that a discussion on The Multi-Range Electronic Test-meter can be arranged with the co-operation of The Automatic Coil Winder Co. Ltd. and the British I.R.E.

Southend and District Radio Society.—Next meetings are to be on October 15 and 29 at the Municipal College, Southend, 7.45. Radio activity in the district has increased enormously and there are now 43 licensed amateurs in the vicinity!

Warstead and Woodford Radio Society.—The Woodford Fete went off with a swing, three transmitters being on the air. The Television Group is also under way, and the Transmitter Group is building a new transmitter for the MCC. Please note Secretary’s change of address (in panel).

Hounslow and District Radio Society.—The autumn session opened on September 8 with a very successful meeting, during which three short talks were given: Neon Stabilisers for the BC-221, Frequency meters and Electronic Transmission of Movement. The club is having an evening “up west” on December 18.

Carlisle Amateur Radio Society.—As from October 1 meetings will be held on the first and third Fridays at the Trades Hall, Scotch Street, Carlisle. The first lecture, by Mr. J. Ostle, will be on Receiver Principles and Fault Finding. On October 15 there will be a Quiz, the questions for which will be sent in by members.

POINT ON THE 145

The Type 145 oscillator is very prone to frequency jumping and whisker effects due to the varying contact resistance of the runners on the variable inductances. This can be overcome by the modification described below.

First, saw through the arm connecting the vernier adjusting knob with the main dial; detach the vernier knob, remove the spindle with the sawn-through arm, and in the mounting hole remaining on the panel fit a small 100 μμF variable condenser, and wire it up to the grid coil.

Then, fit pigtail leads to each end of the grid and anode rods, allowing enough slack for the rotation of the rod—the pigtail lead is taken to the tag wiring on its respective coil unit; this modification is to short out any possible bad connection which might be present in the bush end of the rod.

To set up the VFO, tune to the required band, lock the main dial and then adjust for frequency on the parallel variable condenser, which will give a frequency swing of about 130 kc on the 3.5 mc band.

From G6FU, 51 Victoria Road, Surbiton, Surrey.

RECEIVING LICENCE

Possession of a transmitting licence does not now, as it used to, mean that you are exempt from taking out a general receiving licence. Are your tickets in order and available for immediate GPO inspection should the question be asked?
Hams should know!

An unsuppressed motor car can seriously interfere with Ultra short-wave and Television reception

Many large concerns have suppressed "fleets" of vehicles which show that the campaign, for the voluntary suppression of car interference, is proving a success.

One Televiewer, who, disgusted with seeing his picture spoilt by car interference, bought fifty suppressors and gave them gratis to his neighbours, tradesmen, etc., and owners of vehicles frequently passing his house. He now considers his total expenditure well worth while, but is fortunate in not living on a main road.

Everybody cannot do this, but everybody can suppress their own cars, and encourage their friends to do so, at a reasonable cost.

Distributor suppressors cost 1/6 each, are easily fitted and do not affect engine performance.

The "Belling-Lee" suppressor L630 screws into specified makes of distributor caps after removal of the H.T. lead terminal, which is then screwed into the top of the suppressor.

The following Celestion P.M. Speakers cover a wide range of frequencies at an even response. They are greatly favoured for use in domestic receivers.

The complete Celestion range available to readers of the Short Wave Magazine includes models with chassis diameters of 2½", 3½", 5", 6½", 8", 10", 12" and 18". Peak handling power capacities of ¼, 1, 2, 3, 4, 6, 12 and 40 watts.

<table>
<thead>
<tr>
<th>CHASSIS DIAMETER</th>
<th>MODEL</th>
<th>VOICE COIL IMPEDANCE (OHMS)</th>
<th>POLE DIAMETER</th>
<th>FLUX DENSITY (GAUSS)</th>
<th>TOTAL GAP FLUX (MAXWELLS)</th>
<th>PEAK POWER HANDLING CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>PBD</td>
<td>2-3</td>
<td>1&quot;</td>
<td>6,200</td>
<td>24,000</td>
<td>4W</td>
</tr>
<tr>
<td>8&quot;</td>
<td>PBM</td>
<td>2-3</td>
<td>1&quot;</td>
<td>8,000</td>
<td>31,000</td>
<td>4W</td>
</tr>
<tr>
<td>8&quot;</td>
<td>PBG</td>
<td>2-3</td>
<td>1&quot;</td>
<td>10,000</td>
<td>39,000</td>
<td>4W</td>
</tr>
</tbody>
</table>

The Public are requested to order from their local Radio Dealer. Wholesalers are supplied by the sole Distributors: CYRIL FRENCH, LTD., High Street, Hampton Wick, Middlesex. Phone: KIngston 2240. Manufacturers should please communicate direct with

CELESTION LTD., SUMMER ROAD, THAMES DITTON, SURREY

Telephone: Emberbrook 3402-5
**Premier Radio**

**Morris and Co. (Radio) Ltd.**

All Post Orders To: Jubilee Works, 167 Lower Clapton Rd.

_London, E.S._

(AMhurst 4723)

Callers To: 169 Fleet Street, E.C.4 (Central 2833)

---

**Premier MAINS TRANSFORMERS.** All primaries are tapped for 200-230-250v, mains 40-100 cycles.

<table>
<thead>
<tr>
<th>List No.</th>
<th>Output</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP. 175A</td>
<td>175-0-175v.</td>
<td>50 m/a.</td>
</tr>
<tr>
<td>SP. 175B</td>
<td>175-0-175v.</td>
<td>50 m/a.</td>
</tr>
<tr>
<td>SP. 250A</td>
<td>250-0-250v.</td>
<td>60 m/a.</td>
</tr>
<tr>
<td>SP. 250B</td>
<td>250-0-250v.</td>
<td>60 m/a.</td>
</tr>
<tr>
<td>SP. 300</td>
<td>300-0-300v.</td>
<td>60 m/a.</td>
</tr>
<tr>
<td>SP. 300B</td>
<td>300-0-300v.</td>
<td>60 m/a.</td>
</tr>
<tr>
<td>SP. 301A</td>
<td>301-0-300v.</td>
<td>120 m/a.</td>
</tr>
<tr>
<td>SP. 301B</td>
<td>301-0-300v.</td>
<td>120 m/a.</td>
</tr>
<tr>
<td>SP. 350A</td>
<td>350-0-350v.</td>
<td>100 m/a.</td>
</tr>
<tr>
<td>SP. 350B</td>
<td>350-0-350v.</td>
<td>100 m/a.</td>
</tr>
<tr>
<td>SP. 351A</td>
<td>351-0-350v.</td>
<td>150 m/a.</td>
</tr>
<tr>
<td>SP. 351B</td>
<td>351-0-350v.</td>
<td>150 m/a.</td>
</tr>
<tr>
<td>SP. 352</td>
<td>352-0-350v.</td>
<td>150 m/a.</td>
</tr>
<tr>
<td>SP. 375A</td>
<td>375-0-375v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 375B</td>
<td>375-0-375v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 425A</td>
<td>425-0-425v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 425B</td>
<td>425-0-425v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 501</td>
<td>501-0-500v.</td>
<td>150 m/a.</td>
</tr>
<tr>
<td>SP. 501A</td>
<td>501-0-500v.</td>
<td>150 m/a.</td>
</tr>
<tr>
<td>SP. 503</td>
<td>503-0-500v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 504</td>
<td>504-0-500v.</td>
<td>350 m/a.</td>
</tr>
<tr>
<td>SP. 750</td>
<td>750-0-750v.</td>
<td>250 m/a.</td>
</tr>
<tr>
<td>SP. 1000</td>
<td>1000-0-1000v.</td>
<td>200 m/a.</td>
</tr>
</tbody>
</table>

---

**Sectional Whip Aerials.** Seven sections which plug into each other making an Aerial 14 ft. long, a steel wire runs through the centre to stiffen. Thinnest section $\frac{1}{8}$ in diameter, thickest section $\frac{1}{2}$ in diameter.

- **Weatherproof Green Enamel**
- **Insulated Bases**
- **3/6 each**

**Premier Coil Pack 4-Band.** Consist of a fully-wired and calibrated coil pack of the latest type; 5-Position switch includes a gain position. Each coil has litz wound over 13-6-52 metres (8 m/s), 51-200 metres (5-9-15 m/s), 200-550 metres and 900-2,100 metres. Air dielectric trimmers on all short wave coils. Unit consists of 3 screened sections, aerial, R.F. and oscillator.

Dimensions of pack, 6" x 4½" x 2½". Also included pair 1.F. transformers with permeability tuned litz windings of high "Q." A 3-gang condenser, drive spindle, drive wheel. Price with circuit diagram, 85/-, or complete with coloured glass dial, backplate, pointer, dial light brackets and drilled 7½ valve chassis, with blue prints, £8/10/-.


**The Famous R.1155 Receiver.** These are all Brand New and Unused. Frequency range 19 m/s. 25 kc wavebands. Complete with 10 valves (including Magic Eye). Completely enclosed in black crinkled metal case, 16" x 9" x 9".

- **Brand New**
- **Price**
- **Used models**
- **Price**

---

**Oscillograph Power Units.** Input 230v. Consist of Kit of parts incorporating Mains Transformer, metal rectifier, voltage doubling condensers.

<table>
<thead>
<tr>
<th>Type</th>
<th>Output</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 408</td>
<td>800v.</td>
<td>25/-</td>
</tr>
<tr>
<td>Type 409</td>
<td>1,000v.</td>
<td>30/-</td>
</tr>
<tr>
<td>Type 25</td>
<td>2,500v.</td>
<td>4v, 2 A.C.T.</td>
</tr>
<tr>
<td>Type 25</td>
<td>3,000v.</td>
<td>4v, 2 A.C.T.</td>
</tr>
<tr>
<td>Type 35</td>
<td>5,300v.</td>
<td>4v, 2 A.C.T.</td>
</tr>
<tr>
<td>Type 55</td>
<td>8,200v.</td>
<td>4v, 2 A.C.T.</td>
</tr>
</tbody>
</table>

**E.H.T. Transformers.** Have a single primary suitable for 200-250v. Mains 40-100 cycles. The output voltages are with an input of 230v.

<table>
<thead>
<tr>
<th>Type</th>
<th>Output 800v.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type E.H.T. 1</td>
<td>800v.</td>
<td>15/-</td>
</tr>
<tr>
<td>Type E.H.T. 2</td>
<td>800v.</td>
<td>4v, 2 A.C.T.</td>
</tr>
</tbody>
</table>

**Metal Rectifiers (Selenium Type).**

<table>
<thead>
<tr>
<th>Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 A.C.T. 5V.</td>
<td>25/-</td>
</tr>
<tr>
<td>4V, 2 A.C.T.</td>
<td>35/-</td>
</tr>
</tbody>
</table>

- The I.T.'s are centre-tapped so that C.R. Tubes with 2-v. heaters may be used. Each of these Transformers may be used in voltage doubling circuits to obtain approx. double the stated H.T. voltages.

---


---

**Our New Enlarged Catalogue is Now Ready. Please send stamp for copy.**
MAXIMUM RADIATION

Most amateurs spend a considerable proportion of their radio time in obtaining the maximum efficiency from the aerial systems in use at their stations. The Radiocraft Field Strength Meter is a valuable item of equipment in this connection as it will give indication of radiation under various conditions, thus providing a ready means of comparison.

It is supplied in a die-cast aluminium box with a sensitive moving coil meter, and incorporates facilities for monitoring 'phone transmissions. It may also be utilised as an Absorption Type Wave meter, neutralising device, etc., etc.

Supplied with coils to cover all bands, 1-760 mc.

Price £3.9.0

This and many other items of interest are detailed in our current lists, which are available upon demand.

CONSTRUCTIONAL AND MAINTENANCE

If you require an existing piece of equipment modified or overhauled, or gear constructed to your requirements, Radiocraft C & M Service will provide a quotation for the job.

Messrs. Johnson's (Radio) of Macclesfield, Cheshire, will provide any information on Radiocraft Equipment, as will Messrs. A.C.S. Radio, of Bromley, Kent.

Radiocraft Ltd

11 CHURCH ROAD • UPPER NORWOOD
LONDON • S.E.19 'Phone : Ll.4vingstone 4787

LASKY'S RADIO

The Famous No. 19 Set

ARMY TANK TRANSMITTER/RECEIVER

Receiver and "B" set utilizes 12 valves : 6K7, 2 6K8, 2 6V6, 2 688, 1 EL148/CV6, 4-gang tuning condenser, B.F.O., relays, etc.

Receiver frequency 2-8 mc/s continuous in two bands: "B" set frequency 235 mc/s. Transmitter utilizes 3 valves : 1 6N6, 1 807, 1 EP50. Also single gang tuning condenser, 0-5 m/a moving coil meter for tuning and voltage checking. Transmitter frequency 2-8 mc/s continuous in two bands. The set is enclosed in strong metal case. Front panel grey, all controls clearly marked. Size : 10" x 17" x 8". Weight 35 lbs. Made by leading U.S. manufacturers, R.C.A., Philco, Zenith, etc.

LASKY'S PRICES:

Complete with all valves, £7.10/-, plus 7/6 extra carriage.

Less valves, £3.15/-, plus 7/6 extra carriage.

Less valves and meter, £1.15/-, plus 7/6 extra carriage.

12/24 volt power packs for the 19 set, 45/-, plus 5/- extra carriage.

Valves sold separately for the above Set

6K7 at 7/6 each; 6V6 at 7/6 each; 807 at 10/- each; 6K8 at 10/- each; 688 at 7/6 each; 688 at 12/10 each; CV6 at 5/- each; EP50 at 6/- each.

All these valves are brand new and unused.

MODULATOR UNIT TYPE 64

Containing 7 valves : 2 EP50 (CV91); 2 CV54 (high voltage rectifier); 1 807 (VT60A); 1 CV73; 1 CV85 (special type). Dozens of various components, oil-filled condensers, resistances, pot meters, switches, metal rectifiers, etc. Weight, 50 lbs.

LASKY'S PRICE, 22/6, carriage 5/- extra.

EX-A.M. ROTARY CONVERTERS


A BARGAIN NOT TO BE MISSED.

LASKY'S PRICE, 59/6, carriage 5/- extra.

EX-A.M. INDICATOR UNITS IN STOCK

TYPE 62. Containing 20 valves : 16 CV118, 2 VR54, 2 E50, 1 crystal, etc., also VCR 97 cathode ray tube. Numerous other components. PRICE 9/-, plus 7/6 carriage.

TYPE 182. Containing 8 valves : 3 EP50, 4 SP61, 1 5U4G, 1 VCR97 cathode ray tube. Dozens of pot/meters, condenser, resistance, etc. PRICE 33/6, carriage 6/6 extra.

TYPE 184. Containing 15 valves : 5 EP50, 3 VR65, 4 EA50, 2 cathode ray tubes—6" VCR 517 B and 2½" VCR 139 A. Hosts of other useful components, resistances, condensers, etc. PRICE 59/-, carriage 7/6 extra.

TYPE 6. Containing 7 valves : 4 EP50, 3 EB34, 6" cathode ray tube VCR97. Resistances, etc. Ideal for vision receiver. PRICE 69/-, carriage 7/6 extra.

We publish regularly a detailed bulletin of our ex-Government radio and electrical gear. If you drop us a line with your name and address printed in block letters and enclose a stamp we will send you a copy as they are published.

We also stock a large and varied assortment of small components—pot/meters, condensers, transformers, chokes and valves, British, U.S.A., Continental, etc. If you are in need of some let us have your order. "Satisfaction or Money Refunded" is our motto.

LASKY'S RADIO

370 Harrow Road, Paddington, London, W.9 (opposite Paddington Hospital)

Phone : CUNningham 1979 Closed 1 p.m. Thursday
INDICATING UNIT 230. This unit works from AC mains 230v 50cps. Contains mains transformer giving 350-0-350 100 M/a, 3 1/2 volt, 1 2v 1 amp winding, and the following valves: 1 SZ4, 1 Y63, 1 EA50, 4 EF50. Brand new in metal case, made by G.E.C. Price £1 2/- 6d. Callers only this item.

INDICATOR UNIT 176. This also works direct from mains. Contains mains transformer giving 350-0-350 120 M/a, 2 5v 2 amp windings, 1 6 3v 2 amp, 1 2v 1 amp winding, and the following valves—2 5Z4, 1 Y63, 1 EF50, 1 EA50. Brand new in grey metal case, size 18" x 12" x 8", complete with all cables and connectors. Price £2 15/- 6d. Callers only this item.

INDICATOR UNIT 184. Contains: 1, 6" C.R.T. tube VCR517; 1, 3" C.R.T. CVR139A; 6, EA50; 5, EF50; 3, SP61; 3, EB34; 4, Selenium rectifiers; 14, pot-meters. Many 1 watt resistors, condensers, etc. Size of case, 9" x 12" x 18". Very special price £2 19/- 6d. Callers only. Note: All tubes are demonstrated to callers.

INDICATOR UNIT Type ID6 APN4 (American). Contains 26 valves of the following types: 3, SL7, GT; 14, SN7 GT; 8, 6H6 GT; 1, 617 GT; 1, 5 C.R.T. Type SCPI and 100 K/c crystal. Price £1 19/- 6d. Callers only.

RECEIVER Type 3170A. Complete with 15 new valves: 8, EF50; 2, RL7; 1, RL16; 1, HVR2; 1, K3; 1, EA50; 1, CV188—all brand new. This receiver converges well to a good vision. It is very good and is excellent for use in conjunction with the above British indicator units. Price £4 2/- 6d. Carriage and packing 7/-.

RECEIVER Type 3170B. Complete with 18 new valves: 8, EF50; 2, RL7; 1, RL16; 1, HVR2; 1, K3; 1, EA50; 1, CV188—all brand new. This receiver converges well to a good vision, and it is very good and is excellent for use in conjunction with the above British indicator units. Price £4 2/- 6d. Carriage and packing 7/-.

TYPE 26 R.F. UNITS. Tuned 5 meter converters. Brand new in maker's cartons, price 27/- 6d post free. MAKING Type 26 R.F. See page 74. This is the ideal unit for this purpose. It works straight off the mains. We can supply detailed instructions for making up one. Details: Size of unit, 18" x 12" x 9", 1, GOF; 1, 6J5; 1, EA50; 1, SZ4; 1, CV6; 5, SP61; 1, HVR2A; 3" tube VCR139A. Complete with the necessary mains supply and smoothing, etc. All instruments tested before despatch. Price with full instructions, £6 10/- or less instructions £5 10/-, plus 15/- carriage.

R1724 RECEIVER. Range 30-40 Mc/s, contains six new valves: 3, 9D2; 1, 8D2; 1, 13D2 (frequency changer); 1, 4D1; 24 ceramic trimmers; 6, ceramic valveholders; 6, valve screening cans; 30, resistors; 3, pot-meters; mica and tubular condensers; ceramic coil formers; 5-way 4-bank switch with long spindle and IF transformers, etc. A real buy at only 19/- 6d carriage and packing.

SELECT from our very special bargains. I.F. Transformers and coil formers; iron cores, very high gain. In case, size 3¼" x 1¼" x ¾", 5/- per pr. Brand new 5" speakers, less transformers, 10/- 6d each. Brand new 8" speakers, less transformer, 17/- 6d each. Accumulators, unspillable, 20 amp per hour, brand new, size 6½" x 3½" x 2½", 6/- 6d each.

SPECIAL VALVE OFFER. 5U4G, 7/- 6d ea.; VU133 (Mazda V960), 7/- 6d ea.; VU143, 5/- ea.; VU146, 7/- 6d ea.; VU147, 5/- 6d ea.; EF54, 7/- 6d ea.; EA50, 3/- ea.; VR99A, 6/- 6d ea.; VR99, 6/- ea.; VR99A, 6/- ea. All valves are guaranteed, many are brand new.

This month's Super Bargain. It is doubtful if you will ever be able again. For 7/- 6d you will receive spares which must cost at least £10 if bought separately, and it's all useful stuff too—here is a list:

- 3 2-metre coils.
- 3 Tuning Condensers, split stator type.
- 3-4 watt Carbon Resistors, all useful values.
- 1 Tapped 20-watt Resistor, vitreous 20- and 17-ohm sections.
- 2-2 watt carbon resistors, useful values.
- 6, 1,000 ohm Paper Condensers.
- 1 Heavy metal chassis, size 12" x 7" x 4".
- 1 Louvred Casing size 12" x 7" x 4". Finished grey cellulose.
- 2 Insulated Output Sockets.
- 8 Condenser Clips, assorted sizes.
- 3 Diode DI Valve Holders.
- 24 Rubber Grommets, assorted sizes.
- 5, 001 Mica Condensers, Bakelite enclosed.
- 1-01 3,000v Paper Condenser.
- 24 Rubber Grommets, assorted sizes.
- 6 1-watt Resistors, all useful values.
- 6 4-watt Resistors, all useful values.
- 40 6-watt Resistors, all useful values.
- 40 Silver Mica Condensers, assorted values, including 10, 15, 20, 40, 50, 150, 300 and 500 M.M.F. types.
- 4 English Octal Valve Holders.
- 2-5-pin Valve Holders.
- 1-9-pin Valve Holders.
- 3 Diode D1 Valve Holders.
- 8 Condenser Clips, assorted sizes.
- 2 Insulated Output Sockets.

Assorted Nuts, Bolts and P.K. Self-threading Screws. Miscellaneous bits and pieces including four Tag Boards, Grid Caps, screened and otherwise, Levers, Rollers, Connecting Rods, Rubber Retains, etc., etc. This is undoubtedly a bargain which you should not miss. Price is 7/- 6d plus 1/6 post and packing. Order item No. 264.

DATA BOOKS. Copied from official publications, giving circuit diagrams, component values and useful notes: TR1196, BC342, BC348, BC312, BC221, R208, R103A, R107, M.C.R.I, R1155, W/S.22, RT.18, W/S.19, R116a, all at 2/3/- each, also Walkie-Talkie 58, 3/-, "Demobbed" valves, 2/6. "£15 Television Receiver," 7/- 6d. List free on application with stamp. 200 bargains described.

165 TELEVISION RECEIVER. We invite you to call on Saturdays before 5 p.m., during Television transmitting time, to see this excellent little receiver working. If you can't call send without delay for the constructional data. Price 7/- 6d. The longer you leave it before ordering the longer you will be without the excellent entertaining that television offers.

W. D. SALES

3 Electron House, Windmill Hill, Ruislip Manor, Mdx.

TUBS—We still have a few of these left—unused, complete with data, 25/- post free.
OUTSTANDING BARGAINS

METER MOVEMENTS D.C. moving coil highly sensitive 100 microamp movement only, with pointer 6/6 or two in one case 10/6.

CONDENSERS, ELECTROLYTIC 64 mfd 150v highly sensitive 100 microamp movement only, with pointer 6/6 or two in one case 10/6.

CONDENSERS 64 mfd 150v 1/3 each or 10/- dozen.

BATTERY CHARGER KIT. Keep your test accumulator in good condition from 230v A.C. mains; double wound transformer, metal rectifier, ballast resistance, terminals and base plate, 2v 1/2 amp, 21/2, 6v 1/2 amp, 35/- with connection diagram.

TRANSFORMERS AUTO 230/110v 85 watts 25/-, 150 watts 35/-. B.T.H. TRANSFORMERS 200/230/250v 50 cycles input 2v 20 amps and 75v 6 amps with 15 taps 70/- carriage paid England and Wales.

METAL RECTIFIER 75v 6 amp £4. SOLENOIDS. Powerful Electro-magnetic D.C. ironclad solenoid 12" screw-in core, weight 1 lb 10 oz. 6/25v lift 7/28 lbs; No. 1 4/-, No. 2 with 3 separate windings 4/6. Wound solenoid coil only 27 gauge enamelled wire, excellent as H.F. smoothing filter chokes 2/-.

DIMMER RESISTANCES. Totally enclosed 100 ohms 1 amp, 2/6, 50 ohms 2 amp, 2/6, open panel type 10 ohms 1 amp, porcelain former, wire wound, 2/6.

THE DEM. CONTINUITY-TESTER. A self-contained portable circuit-tester for all electrical circuits. Almost pocket size, 6½ in. x 3½ in. x 2½ in. A beautifully-made Govt. instrument; new, totally enclosed, polished wood case with carrying strap and contact switch. The experimenter's best friend. Worth 42/-. A limited number are offered at 12/6 post free.

Please include postage for mail orders.

ELECTRADIX RADIOS
214, Queenstown Road, London, S.W.8
Telephone: MACaulay 2159.

TYPE B.C.
DUAL FREQ. UNIT GIVING 100 kcs ZERO TEMP. CO/EFF. OR 1000 kcs LOW TEMP. CO/EFF. PRICE £3.0.0

TYPE S
FOR ALL AMATEUR RANGES LOW TEMP. CO/EFF. CUTS PRICE £1.12.6 7½ extra for specified freq.

BROOKES CRYSTALS LTD.
10 STOCKWELL ST., LONDON, S.E.10
GRE 0410.

42-ft. Steel Aerial Masts
Known in the R.A.F. as aerial masts type 50, these are made up as complete kits of 9 tubular sections each 2" dia. with base plate, full set of upper and lower guys, set of steel pickets, picket marker, insulators, head section with pulley, 60-ft. lanyard and all fittings. Nothing else required for this really super mast. Easily erected. Brand new in canvas bag with leather handles. £3/12/6 (carriage 7/6).

American IFF. Receiver, Type BC966
A useful piece of equipment fitted with 12v input motor generator (output 450v at 60ma—these are easily convertible into efficient AC/DC fractional H.P. motors). Contain 12 valves (7 6SH7, 2 6H6, 3 7193) and numerous other components. In metal cases approx. 12" x 12" x 8". 27/6 (carriage 5/-).

H.P. Electric Motors (Repulsion Start-Induction)
110 or 220/230v 50-cycle single-phase. 1,460 r.p.m. American made (Century Electric Co.). In perfect order. £6/10/- (carriage 6/-).

Indicator Unit, Type 157
These units are fitted with the now well-known cathode ray tube type VCR97 (6" short persistence) employed in several television designs. Contain also 20 valves (mostly 5P61's), Muirhead slow-motion drive, and very many useful components. Good condition. £4/-/- (carriage £2/6 with 5/- refundable on return of packing case).

R.F. Units, Type 25
Brand new. A few only still available. With valves. 16/6 (postage 1/6).

Battery Amplifier A1134
Fitted with QP21 and 210LF valves. Includes mic. input and output transformers, etc. Good used condition. 10/6 (postage 1/6).

American Metal 6L6 Valves
Brand new and fully guaranteed. 13/-, post paid.

Contactor Relays
12 and 24v coils, 12 amp. contacts. All brand new. 5/6 each, post paid.
CLYDESDALE
For Bargains in Ex-Services Electronic Equipment

Ex-R.A.F. BRAND NEW AIRCRAFT XMTR-RCVR. UNITS

T 1154
TRANSMITTER
For "Fone", C.W. and M.C.W. complete with Valves, Circuit and plugs, etc., in metal case 14" x 16½" x 8½" less power pack.
Clydesdale’s Price only £10 10s.
Each
Carriage and packing paid.
Full details on request.

POWERS UNITS FOR T 1154
High Voltage H.T.
Output: 1200v 200 mA.
Types 32 or 32A.
Input: 12v 32 amps.
Types 33 or 33A.
Input: 24v 16 amps.
All at:
Clydesdale’s Price only 26/11 each
Carriage paid.

R 1155
RECEIVER
A 10-Valve Communication and D.F. Receiver for 18-3 mcs., 1500-600 kcs. 500-75 kcs. in 5 W.B. complete with valves, Circuit and plugs, etc., in metal case 16½" x 9" x 9" less power pack. "Airtested before" despatch.
Clydesdale’s Price only £12 12s.
Each
Carriage and packing paid.
Full details on request.

POWERS UNITS FOR R 1155
L.T./H.T.
Outputs: L.T. 7-2v 13 amps.
H.T. 225v 110 mc.
Types 34 or 34A.
Input: 9-3v 23 amps.
Types 35 or 35A.
Input: 18v 12 amps.
All at:
Clydesdale’s Price only 26/11 each
Carriage paid.

BRAND NEW IN MAKER’S ORIGINAL PACKING
Ex-U.S.A.A.F.
PANORAMIC GUNNERY TRAINER, MARK 1
Comprising:
35 mm. Sound Film Projector, soundhead photoelectric cell. CE-2, etc.
Sound Amplifier, 4 valves, 52A, 6J7G, 6F6, etc.
Control Amplifier, 4 valves, VR150/30, 6XS, 6517, 2051, etc. Two photoelectric cells CX-25, etc. etc.,
In wood cabinet 46½" x 19½" x 10½", operating voltage 115v 60 c/s., consumption 405 watts.
Operating Manual, plus a reel safety Film Spares kit, with 6 each lamps, 3 photo-cells, 12 valves, etc., etc.
Clydesdale’s Price only £35 each. Carriage paid
Packed in a wood case.

Send now for New Illustrated Lists. Please print Name and Address

CLYDESDALE SUPPLY CO LTD
2 BRIDGE STREET, GLASGOW - C.5
Phone: SOUTH 2706/9
VISIT OUR BRANCHES IN ENGLAND, SCOTLAND AND NORTHERN IRELAND
WELWYN high stability cracked carbon resistors from stock

The following values are 5 per cent. tolerance and therefore eminently suitable for use in receivers and radio instruments where stability is of great importance.

Other features of high-stability cracked carbon resistances are low temperature coefficient, tropicalised finish and very low noise level.

1-WATT SIZE. Type No. 3622

| Value (Ohms) | Type No. 3623 | ±1-WATT
|--------------|---------------|----------
| 32 ohms      | 470 ohms      | 7.5K ohms |
| 50 ohms      | 560 ohms      | 100K ohms |
| 56 ohms      | 680 ohms      | 15K ohms  |
| 68 ohms      | 820 ohms      | 220K ohms |
| 91 ohms      | 1K ohms       | 22K ohms  |
| 100 ohms     | 1.5K ohms     | 25K ohms  |
| 130 ohms     | 2.2K ohms     | 370K ohms |
| 180 ohms     | 2.7K ohms     | 330K ohms |
| 220 ohms     | 3.3K ohms     | 470K ohms |
| 270 ohms     | 4.7K ohms     | 500K ohms |
| 330 ohms     | 5.6K ohms     | 1 Meg.    |
| 390 ohms     | 6.8K ohms     | ALL 8d. EACH |

1-WATT SIZE. Type No. 3634

| Value (Ohms) | Type No. 3635 | ±1-WATT
|--------------|---------------|----------
| 100 ohms     | 2.0K ohms     | 100K ohms |
| 150 ohms     | 2.5K ohms     | 50K ohms  |
| 250 ohms     | 5.0K ohms     | 75K ohms  |
| 500 ohms     | 7.5K ohms     | 1 Meg.    |
| 750 ohms     | 10K ohms      | 2 Meg.    |
| 1K ohms      | 15K ohms      | 3 Meg.    |
| 1.5K ohms    | 20K ohms      | 5 Meg.    |
|              | 25K ohms      | ALL 8d. EACH |

We will also have available shortly a full range of Welwyn high-stability cracked carbon resistances plus or minus 1 per cent. tolerance.

1/2-WATT SIZE.

<table>
<thead>
<tr>
<th>Value (Ohms)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 ohms</td>
<td>9d.</td>
</tr>
<tr>
<td>750K ohms</td>
<td>9d.</td>
</tr>
<tr>
<td>1 Meg.</td>
<td>5d.</td>
</tr>
<tr>
<td>2.5 Meg.</td>
<td>6d.</td>
</tr>
<tr>
<td>3 Meg.</td>
<td>7d.</td>
</tr>
</tbody>
</table>

ALL 8d. EACH

Please include sufficient for Postage and Packing

Shop Hours: 9 a.m. to 5.30 p.m. (including Saturdays). 9 a.m. to 1 p.m. Thursday
500-0-500V 200mA
350-0-350V 150mA
325-0-325V 150mA
250-0-250V 80mA

STEWART (All primaries except where otherwise stated, 210-230V, Auto transformer.
EP56.-500-0-500V 200mA
EP54.-500-0-500V 180mA
EP57.-375-0-375V 150mA; 2-0-2V 2.5A; 2-0-2V 2A.
EP75.-350-0-350V 120mA
EP51.-350-0-350V 85mA
EP50.-350-0-350V 85mA
EP70.-250-0-250V 70mA; 0-4-6.3V 3A; 0-4-5V 2A

VARLEY (All primaries 15-0-200-230 volts, 50 c.p.s.)
Eddystone, Raymart.

EP76.-375-0-375V 150mA; 2-0-2V 5-5A; 2-0-2V 2A.
EP74.-500-0-500V 180mA; 0-4-3V 4A; 0-4-5V 2A. Size 3 x 4 x 3 in. Unshrouded.
EP53.-350-0-350V 120mA; 0-4-6-3V 4A; 0-4-5V 2A. Size 3 x 4 x 3 in. Shrouded.
EP78.-Auto transformer, 100-110V 120VA. Size 5 x 3 x 4 in. Fully shrouded.

Eddystone, Raymart.

STEWART (All primaries except where otherwise stated, 210-230V, 20 c.p.s.)
250-0-250V 80mA; 6-3V 3A; 0-4-5V 2A. Size 3 x 3 x 4 in. Fully shrouded.
250-0-250V 150mA; 4V 1A; 4V 1A; 6-3V 2-5A; 5V 3A. Size 3 x 4 x 3 in. Unshrouded.
350-0-350V 150mA; 0-4-5V 2A; 0-4-6-3V 2A. Size 3 x 4 x 3 in. Unshrouded.
350-0-350V 220mA; 6-3V 6A; 4-8A; 0-6-6-3V 2A. Size 4 x 4 x 3 in. Enshrouded.
350-0-350V 220mA; 6-3V 6A; 4-8A; 0-6-6-3V 2A. Size 4 x 4 x 3 in. Enshrouded.
500-0-500V 200mA; 6-3V 4A; 5V 2A. Size 4 x 4 x 3 in. Unshrouded.

M. WATTS
38 CHAPEL AVENUE, ADDLESTONE, SURRY
Telephone: Weybridge 2542
STEEL MASTS. Sectional, 27’ high, 4” in diameter. Guys supplied. Ideal for rotary arrays. £50 each. Carriage paid.

CONVERTERS. 12v input, 100vA with 0-300v. A.C. Meter and voltage regulator resistor. Output 230v, 50 cycles. £4/10 each.

RECEIVERS. Type 159. 4-Band, auto-switching, less valves. £12/6 each.

TRANSFORMERS. 6.V.6. output. Ratio 20:1. Suitable for 3 to 4 ohm speakers, 7/6 each. £10/- each.


HEATER TRANSFORMERS. 230v 50 cycles. Primary 4v, 1.5A or 3.5A. £10/- each.

RECTIFIERS. Selenium. Type 280/L.U. 187.B. 1 Wave. Input 30v at 10A. £12/6 each.

CONDENSERS. 25Mfd, 25v working, £6d each. I Mfd, 600v DC working B.I. at 9d each.

POWER PACKS. Special for R.1155 Receivers. 200-230v 50 cycles with 6.V.6 output stage built in. £20/£6 each.

RECEIVERS: SX 28 E35. HRO Senior with coils and power pack £36.

SHORT WAVE (HULL) RADIO
30/32 Prince’s Avenue, Hull
Telephone: 7168

SHORT WAVE (Hull) Radio
GSGX
145 MC/S
Having been on this band for a month we still think a beam is very necessary, why not make up your own?—we can supply all the parts:

(a) Distrene dipole centres to take ½” rod elements. Waterproof, low loss and self-supporting, e.g., five required for five element beam. Price 6/6 each

(b) ½” rod elements, specially made to fit the above and long enough for you to prune your beam to any frequency in 144-146 band. Price, per pair, 5/-

Sectional Metal Aerial Masts, 33’, as per our August advertisement. Price £3/10/-

Beam Indicators (see June “Short Wave Magazine”).
2” dial, now 10/6
3” dial now 12/6. Packing, etc., 1/-. Receivers: SX 28 £35. HRO Senior with coils and power pack £46.

THE MAIN AMATEUR SERVICE OF THE NORTH

HK3BI - G6HP MULTI-BAND DX ANTENNA
Amazing DX Reports (see May issue)
REDUCED BCI,
NO FONE INSTABILITY OR FEEDBACK.
3-BAND OPERATION.
(All Bands with the longer top.)
BETTER THAN A BEAM.
EQUALY GOOD FOR TX OR RX.

Listen to HK3BI on 28 and 14 Mcs (and on 3-5 Mcs). Supplied ready to erect, no complications, with full data and instructions.

In use by many leading DX Stations.

A REVELATION FOR THE DX ENTHUSIAST
ONLY £3 Cash with order.

Why waste time erecting a beam for ONE BAND when our MULTI-BAND aerial gives you BETTER RESULTS on 3 bands? (All bands with the longer top.)
33 or 66 ft. top, with 30 ft. ribbon. Extra ribbon charged at 9d. per yard, any length supplied, please specify.

TRANSMISSION
"The Tx likes this aerial. It loads better than any aerial I have tried, and even though I have 20 ft. of ribbon in the shack I get none of the bad feedback effects on fone."—GW6GW.

"The 3-element beam which I have now discarded never did this for me."—G2AAW.

RECEPTION
"It was most surprising to note such a vast difference (in signals) from all the other measured aerials I have tried out on my AR77, even though the top is much lower in height."—GW5CBX.

Satisfaction guaranteed or money refunded. A fairer offer could not be made. Please mention if you would also like a copy of our latest lists. Available only direct from:—

AMATEUR RADIO SERVICE G6HP • CANNING ST., BURNLEY • Tel.: 2999
BC458B. 40 watt Modulator Unit contains 1625 (same as an 807 with 12v heater), 12J3 Triode and VT150. Neon stabiliser. 3 Supersensitive relays. Modulation Transformer, Driver Transformer. Output Transformer. Precision Resistors, Condensers, etc. Brand New in original cartons. £8 3s. 6d. carriage paid.

immediate safe delivery and satisfaction guaranteed

H.P. Radio Services Ltd.,
Britain's Leading Radio Mail Order House
55 County Road, Walton, Liverpool, 4
Est. 1935
Tel. : Aintree 1445
Staff Call Signs : G3DLV, G3DGL

BC453, THE Q5'er, 190/550 kc/s. These sets are now well known for their use with communication receivers to give improved selectivity, attenuating unwanted signals by at least 30 db., making single signal reception easily obtainable, and improving even the H.R.O.

Full details of the easy conversion were contained in the S.W.M. for September, and we also supply full information.

We guarantee them to be brand new in the makers' SEALED packing, unused and in perfect condition, they are offered at the lowest price yet for new sets, 42/- post free. Most firms are offering used ones, but ours are absolutely brand new and perfect. Furthermore, with every set we send one pair of HIGH RESISTANCE headphones, free of charge. It's the best buy yet.

Why not write for our new catalogue? Many more bargains offered. It's entirely free of charge: send a postcard now.

TORBAY ELECTRIC
Fairhaven, 43 Colley End Park, Paignton, S. Devon
SMALL ADVERTISEMENTS

TRADE—continued.

TRANSMITTERS, RECEIVERS, RECEIVING ANTENNAS, MOSFET DEVELOPMENTS. AFC & FRC (Australia), 201 Bank St., North Melbourne, Vic. 3051.

WRITE TODAY FOR DESCRIPTIVE DATA Enclose a 2/6 stamp, a copy of our current lists—and see "CQ"—genuine USA 50 mmfd 6 kv Vacuum Capacitors, 10/- ea. Post paid.

PASLODE, 25, 40, 60, 75, 90 Mc. Receipts and orders. 10/- (10).—Please send for a list. T. G. 

LENS—National Optics, 33 High St., Loughton, Essex. 

MOSFET DEVELOPMENTS. AFC & FRC. 201 Bank St., North Melbourne, Vic. 3051. 


PRE-SELECTOR/CONVERTER

FOR AMATEURS WHO WANT RESULTS! Pull in that weak DX! Let this new Labgear Pre-Selector/Converter add punch to your RF gain! Also converts for 5, 10, 15 and 20-metre bands—ideal for BSB and R1115 enthusiasts and similar RX limited to 18 Mc/s. Comes to you complete with built-in AC 250v power unit.

Delivery from stock, price £25, tax free, carr. paid.

READERS’ ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Box numbers 1/6 extra.

APPLICATIONS

AMATEUR Equipment Designed and Built to Specification. Transmitters, Modulators, Power Packs, etc. 144 mc Transmitters to order; G3WAX, Thomas, Kittle, Bishopston, Swansea.

G2000’s guaranteed valve sets, all new, unused. £10.00. 7SG7, 25 Sa. G2000, 25K2, 6SH7, 6SY7, CV18 (RK34), 125G7, 12A6, 12CS7, 1287F, 6SLG, 2X2A, 1287K, 9006, & 6/each. KT61, 6DV6, VR65A (SF41), VR137 (RL16), 41MPT, and 12-4 pin vibrators, e.g. 6SJ7, 6SK5, 6SLF, 6SY7, 657F, 657N, 657L, 2050 gas tetrode, 6XS5T, 6AB7, 6SO7, 6G6G 6FB, 9/6 each. 2C26, VR150/30, VR105/30, 6J6 6AG5, 6C4, 1T4, 6AG7, PT11, 12J6 each, 832, 35T-35T each. 805’s, 40/-, 4-pin jacks plus socket, 1/6 each I-Octal valve boxes. 4/6 dozen.

NEW PANELS. £4.- G3VB, 20 West Street, Haslemere.

TERMS: C.W.O. Remittances payable to E. & G. Distributing Corporation, Ltd.\

M.O.S. MAIL ORDER SUPPLY CO., Dept. SWM, 3 Robert St., Hampstead Rd., London, N.W.1

WRITE TODAY FOR DESCRIPTIVE DATA

Enclose a 2/6 stamp, a copy of our current lists will also be sent—many useful and topical lines.

NOTE: The Short Wave Magazine cannot be held responsible for the fulfillment of the above advertised items. If you are in doubt about the authenticity of any of the offers or claims made, write for more details to the advertiser. An application for inclusion in Short Wave Magazine will not of itself involve an obligation on the part of the publisher to accept the advertisement.
“You’ll probably get it at . . . .

**SMITH’S of Edgware Road**

The fact that this remark is often heard today is the result of twenty years of specialising in **WIRELESS COMPONENTS**. We know your needs and do our best to meet them (taking advantage of 'disposal stocks to keep costs as low as possible). You won’t see many sets here, but you will see an amazing variety of components, materials, valves, speakers, test gear, cabinets, technical literature, etc.

H. L. SMITH & CO. LTD.

287-9 Edgware Road, London, W.2

Near Edgware Road Met. & Bakerloo.

'Phone PAD 5891. Hours 9-6 (Thurs. 1 o’clock')

---

**SMALL ADVERTISEMENTS**

**READERS’ continued.**

**BARGAIN.** Radiogram, 3 bands, good condition. £30. Includes records—G3COG, 22 Claremont Road, St. Margarets, M.E.15.


**HALLCRAFTERS Super-Skyrider SX17, as new, realigned, all new valves, 4-500 metres, excellent results at £75.—E. N. L. Mason, 65 Lonsworthy, 67 Corrance Road, Brixton, London, S.W.2.

1155—Send-receive switch, separate RF gain, KT63 output, and power pack, excellent condition, with speaker, also RCCX transmitter with certificates 3525 and 7040 kc. £17 the lot, or offers—G3COI, 59 Darlingston Street, Wolverhampton.


**FOR SALE.**—Brand new DC/AC Vibrator Converter for radio, radio, etc. Never used. Listed £9. Genuine offer, £7.—Box 378.

R1155 4-valve Super receiver packed, £20.64 switch, 6V6 output, perfect, £12/10/-; 700v power pack type 392, £4. Steel case. Details from G3BMG, 36 Claude Road, Rye Lane, London. £1.5.

BC342 3-modified, bandspread, etc., buyer collects, £30 or offer?—O-Max cabinet, £2/10/-; O-Max full vision dial, £2. PT15, 10/-.—G2BGZ, 6 Wakefield Road, London, N.15.

WANTED. 1 set of B2 TX coils and B2 power pack, exchange 500v AC power pack 6V.5 rec.—Godwin, P.O.D.E., H.P.O., Jersey, C.I.

**BRAND NEW R107.** 'Scope-aligned, BFO/AVC, excellent condition, little used, Genuine reasons, Best offer. —Brown, No. 2 Site, Waltham, Lincs.

1500 volt 0.1 µf tubular condensers. They are unused 1940-45. £3/6 dozen, post 6d. 800v test, 400 volt working 2 µF paper condensers, nearest 1/-, post 6d. Unused 1939-45. £35.—F. W. Whitworth, 17 Hillview Road, Hatch End. ‘Phone 1879, SKY TRUIMPH, March 1949. Unused 1940-45. Re-valved, realigned, nearest £20. Buyer collects.—J. Lambert, 327 Parkway, Iver Heath, Bucks (near Uxbridge).

**HAMBANDER bargain.** For quick sale. Perfect condition, as new. Nearest offer £18/10/-—G3DG, 40 Edgware Road, Middlesbrough.

V55R Communication receiver, in first-class order, Edgburdse preselector, speaker and 'Phone, £12/10/-, can be seen and tested evenings. —Patterson, 32 Hall Road, Chester-le-Street.

**AMERICAN** 150-watt transmitter, complete! Coverage from 3-0 to 18-1 mc. Complete with LT transformers but no HT supply. Can be driven up to 240 watts. In new condition. BC221 new. Offers wanted, or exchange considered.— Box 390.

V55r Brand new, best offer or part exchange—Box 386, buyer collects. Also 90-watt rotary converter.—Hogue, 27 Shrubland Road, London, E.8. SCR522 TX column, RP 522 Drift, £5, 1967 for £15.—Box 379.

**COMMUNICATIONS** battery receiver, 5 valves super, complete with valves, 24 accumulators and batteries. Smart enclosed black chassis, £18, nearest £10 or nearest. R116A 8-valve battery double-super, less valves. Circuit diagrams, £3. Both carriage paid.—Box 379.

150 watt TX—813 PA-VFO-MOD, power pack, complete in Edgburder rack, £125. Details from G3COG, 22 Claremont Road, St. Margarets, M.E.15.

**TU5B** 3-5/7 Mc, with 6G6G, 6V6G, VR150/30, £4. Class- D Waveform, £4. Eddystone AW2 Receiver complete (factory made), £4. 830’s, £1.5.—G3BCO, Ardwyn, Border Road, Haswall, Cheshire.
SMALL ADVERTISEMENTS

G8KD offers new BC-1031A panoramic adaptor, 450/475 kc IF, £2.5. VCR97 Cathode Ray tube, £8. Used but in good condition. DC to AC Converters, Admiralty pattern, 24V to 230V, 50 cycles, £10, AM pattern, 110V to 230V, 50 cycles, 100 watts, £1. Many new valves as USA 807, 866A, etc., or call by appointment. -Newfield, Dore Moor, Sheffield.

R115S Receiver, good condition, unmodified, working and working, £9.20 Clifton Avenue, London, E.17.

AR40 and BC342 Receivers, £25. Power Unit PE103, input 6 or 12v, output 500v, 0-16 amps, £3.10. Power Unit PE-55, input 12v, output 500v, 0-2 or 2 amps, £5. Case containing 118 crystals (5 in. 2-pin fitting), frequency range in 25 kc steps from 5675 to 6550 kc £6. Valves: New, boxed, types 801 and 46, 5/- each. Microphones and headsets £1 each. Roslea Road, Birkenhead.

High Street, Cinderford, Glos.

1000 kc, 15/-.

Output, 90 watts, £8. Buyer collects. Xtal 1876 kc, £1. Carriage 1/-.

Avo Model 7 for sale. Perfect condition, £12/10/-.

Brookes crystals, with calibration certs., 7017 and 7018, £25. Q-Max S-meter for AR88, unused, 30/-.

G3WS Receiver, fully modified, new S-meter, £40.-Collin, 32 High Street, Wickford, Essex.

SALE.—BC-342 Receiver, fully modified, noise limiter, separate RF and AF gains, provision for S-meter, £25. Q-Max S-meter for AR88, unused, 30/-.


G8KD Receiver, modified, receiver only, £10. Carriage £1.8.4.

AR77 reconditioned, re-valved, new S-meter, £10.-Collin, 32 High Street, Wickford, Essex.

Other stets available.

There are Candler Code Courses for BEGINNERS AND OPERATORS

Send for the Candler "BOOK OF FACTS," it gives details of all the Courses, which are supplied on Cash or Monthly payment terms.


Candler System Co., Denver, Colorado, U.S.A.

RADIO G300

Vibrator Supply Unit No. 4. 12v, input, about 300v. H.T. Ideal for car radio; only 19/-, and full of F.B. components; or the same job converted to work on 230v. A.C. mains instead of 12v. D.C., to give about 300v, at 100 ma, together with 4-5-6-12-18-24v. L.T. for hétérs. A bargain at 45/-.

Rotary Transformer. 11-5v, input, 250v at 125mA out. Just the thing for car receivers where space is restricted. £2 10/6.

Altimeter Unit.—ARNL. 4 Acorns, 9 Metal Ocatic Tubes and VR150/30, working on about 420 Mc. Absolutely brand new in maker's sealed carton, straight from U.S.A. Full of useful gear for 145 Mc etc. Price 70/- only.

For this month's valves, see page 595.

A. C. HOILE

LOOSE VILLAGE, MAIDSTONE, KENT

LOSE 83579

EDDYSTONE

640 ....... £17 10s. 0d.

H. P. Terms available.

Full range of components.

All C.O.D. orders promptly executed.

Send for Catalogue, 1/ post free.

SPECIAL OFFER

P. M. Speakers

5 inch ..... 13/- 6 inch ..... 14/- including packing and postage.

B.T.S.

THE Radio Firm of the South.

63, London Road, Brighton I, Sussex.

Phone: Brighton 1555.
BENDIX COMMAND RECEIVERS.—Valves, 12SK7 (3), 12KB (1), 12SRY (7), 12A6 (1). BC 453, 190-550 kc, 85 kc 1/4 fc, “Q fires.” BC 454, 3-6 megs, 1,415 kc 1/4 fc. BC 455, 6-6.1 megs, 2,830 kc 1/4 fc. All sets in sealed marker cartons. Any set 35/- each, post 1/6 extra.

FEW ONLY BENDIX 455 (MODIFIED).—28-41 megs, 2,830 1/4 fc. Ideal for television sound. 50/- each, post 1/6.

BENDIX RADIO COMPASS.—Type MN 26Y. Range : 150-325 kcs, 325-695 kcs, 3-4-7 megs. Twelve valves: 6N7 (2), 6K7 (5), 688 (1), 6F6 (1), 6J5 (2) and 6L7 (1). Brand New with 28v Generator. £5, plus 10/- carriage and packing.

WESTCOTERS.—W.X.6 and W.112, 6/- per dozen, post 4d.

“DECO” HAND GENERATORS. 6v -amps handspeed 110 r.p.m. Brand New with sparse brushes, 17/6 each.

CONTACTOR TIME SWITCHES by Venners or handspeed 110 r.p.m. Brand New with spare brushes, “DELCO” HAND GENERATORS. 6v -amps, £12.50 each, post 4d. Contact in first instance, W. A. Sparks, 38 Lovely Lane, Worthington, Lancs.

SOUTHERN RADIO SUPPLY LIMITED
46 LISLE STREET, LONDON, W.C.2.

CLASSIC ELECTRICAL
364 LOWER ADDISCOMBE ROAD
CROYDON, SURREY
Telephone—ADDIScombe 4023

“THE TELEVISION SPECIALISTS”
South London’s Leading Agents for all Television Components.
Scanning coils, Focus coils, Transformers, Chokes, etc., all available from stock.
Big supplies of Ex Gov, surplus radio equipment including R,3132, receivers and 6a. Indicators.

ALL COMPONENTS FOR THE ELECTRONICS TELEVISOR AS SPECIFIED.

H.A.C.
Short-Wave Equipment
Noted for over 15 years for Short-Wave Receivers and Kits of quality

One Valve Kit, Model “C” Price 20/-
Two Valves Kit, Model “E” 43/-

These kits are complete with all components, accessories, and full instructions. Before ordering send stamped addressed envelope for descriptive catalogue.

Note new sole address

H.A.C. SHORT-WAVE PRODUCTS
(Dept. VIC.) 66 New Bond St., London, W.1

SMALL ADVERTISEMENTS
READERS’—continued.


—Olley, 56 Hampton Road, E.7.

TRIPLETT Multi-Range Test Meter, brand new worth £20, for £14 : National HRO, brand new-valves 480 kc to 30 mc, with power unit, £42 : BC221: brand new, spare valves and handbook, £12 : approximately 40 valves, including new 807’s, 6L6’s, EFS0’s, 5ST4’s, 6N7’s, etc., £15. Eddystone parts, coils, bases and tuning condensers, all new and worth £2/10/- 30/- the lot. Stripped T.U. units, including all parts, 3 to 15/-. Mains transformers : 400-0-400, 350-0-350, 250-0-250. 4 for £3. BC348 mains transformer, 28 fl, brand new, 30/-. Contact in first instance, W. A. Sparks, 38 Lovely Lane, Worthington, Lancs.

AR88 excellent condition, with S-meter, B2 RXT with coils, both £52 or offer.—Peck, Whatton, Park Avenue, Carlton, Nottingham.

Gloet Tubular sectional steel concentric mast, 10 ft, £25 or offer; 80 ft with base, 810, 813 : all new. Offers ?—Box No. 382, London area.

BC348R perfect mains, ‘phones, converters, nearest £20—also BC221, valves, meters, etc.—S.A.E. to G3DCT, 38 Constad Manor Road, Edinburgh, Esse.

HAMMARLUND Comet Pro, crystal model, 8 to 2510 metres, 115/230 volt AC, condition as new, complete with circuit diagram and technical literature, £12/10/-.—Biltcliffe, 1 South Street, Watchfield, Swindon, Wilts.

AR88D. Rack mounting, in really first-class condition, £45. Transformer 1000-0-1000 at 300 mA, 85/-. Pair TZ40, unused, 30/- each. Complete 120-watt modulator and driver with 1000v supply. 250. Complete 200-watt ‘phone Tx for 90, 20, 15 and 10 : switched, slug-tuned exiter, fully metered and relay operated, 813 final, Mod. TZ40’s. Offers over £50.—112 Commercial Road, Bournemouth. ’Phone 5051.

BC342N New, 6-band, 1-5 to 18 mc, X10, HFA £16/10/-: Carriage paid.—Taylor, 75 Edgehill Road, Winton, Bournemouth.

BC348 Receiver, modified heaters for 6v, £14. Phillips PCR1, new, £14. SP41’s, 4/- each.—Haskell, 57 Seymour Avenue, Lipson, Plymouth.

BC88D as new, £35. SCR522, brand new, £7. TI113 power packs, RF, £6 : Modulator, £7. BC639 100-150 mc, 1 RF, 3 IF’s, midget valves in RF circuits, air tested on 144 mc, £12. Must be collected. Old stock, £3 each.—Write, G3DCT, 75 Elwyn Road, March, Cambs.

WILL swap Walkie Talkie, 58 Mark 1, complete with power pack and accumulators, for complete B2. —J. K. Bond, 23 Harding Street, LONDONderry, N.I.

SUPER Marconi CR100, laboratory modified by expert, using two EF54’s in RF stages, EF52 oscillator, SI30 stabiliser on oscillator, S-meter fitted, crystal filter, band-pass filter, black crackle cabinet, chrome handles : comparison test better than HRO, or 88, A gift at £45. Buyer collects, or carriage extra.—Box 384.

MARCONI Comm./Rx, 1 RF, 2 IF, 550 kc-25mc, A-Broad, Fine DX’er, 7 mc WAC, wanted power Pack, £13. Also Woden UM2, unused, £3/5/-.—Write, Fuller, 85 High Street, Chelmsford.

H AM selling up. Rack Tx CW/‘phone 50 10/80 m. three power packs, separate 5v VFO with supply, meters in all stages, 25w mod., aerial tuner, £50. R107, perfect, book, £13. T1154, complete, £4. Ttx 45w CW phone 40/160mc CO/VFO, with valves, £10. Transformers, 500-0-500v, 250 ma 2 x 63v 5a, 5v 3a £2/10/- : 300-0-300v, 200 ma, 6-3v 5a, 5v 3a, £1/10/- Hand 41/2w, 125a, 30v, 40 mA, PT15’s, 10/- : £50 : SP41, 5/-: Other from 3/-. S.A.E. for details or list. Offers ?—Box No. 385.
SMALL ADVERTISEMENTS

READING—continued

VOLUME VI
SHORT WAVE MAGAZINE
599

VALVES, brand new and boxed, 32/6 each, post
Thornton Heath, Surrey.

An -watt Modulator and Speech Amplifier, complete with power packs, two standard panels
used by G3RK. £35, or exchange for good Rx.
Spashett's, Bungay, Suffolk.

EDDYSTONE 640. S-meter, speaker, £20:
50 -watt Tx, 6L6, CO, 807 PA, Modulator, Power Packs,
£25 or near offers. -Bird, 118 Woodpecker Road, New
Cross, S.E.14.

SMALL ADVERTISEMENTS
READERS’—continued

A MARK III Suitcase Set wanted
Condition and
Price to S. Read, Ranselhill Training College, Ranselhill, Retford, Notts.

FOR SALE.—Two new 35T transmitting valves, 25/-
each.—Tomlinson, 18 Torquay Avenue, Shirley, Southhampton.

HAM gear for disposal. Valves, condensers, speakers, Transformers, communication receiver, etc. Send
S.A.E. for list to G3BNP, Roseneile, Roath Road, Portishead.

SALE.—Class D wavemeter, good condition, £6. Or
exchange for small AC Power Pack, suitable BC221.
-G3CPM, 49 Lime Tree Avenue, Broadway, Worcestershire.

with tuning eye. Both fine condition, £17. Exch-
changes.—45 Sipson Way, West Drayton, Middlesex.

R.1155, new and modified, would exchange for
BC221. Wanted UM2, exchange for new
G3BOI, 1 Raleigh Avenue, Hayes, Middlesex.

TWO serviceable T1154’s for sale, complete valves,
no power supplies. Going QRT. London.

OFFERS over £5 each. Sold singly.—Box No. 383.

EX RAF TR9, 20/80 meters Transmitter/Receiver
battery operated, working order, £4, carriage paid.
—J. Thewlis, 14 Silverdale Avenue, Denton, Manchester

AR88LF, as new, £35. Hallicrafters S20 Sky-
Champion, £15. RME DM36 conv-
ertor, 5-10 metre. £10. Speech amplifier and class B
modulator, 50 watt, with 50 volt pack, £10. TU5B,
12/6. Eddystone 640, £22/10/,-: also 504, £30.
Both as new. SCR-522 in condition, best offer G3M0L,
Weedland, Plesance Avenue, Dumfries.

BRAND new unused BC 348, modified for 220v DC
mains, perfect condition, £20 or nearest. Class D
Wavemeter, with spares.—Offers Box No. 386.

813 VALVES, brand new and boxed, 32/6 each, post free.—A Redwood, 30 Norich Road, Thornton Heath, Surrey.

100 -watt Modulator and Speech Amplifier, com-
plete with power packs, two standard panels and
chassis, 750v and 300v supplies, UM3 trans., as
used by G3RK, £35, or exchange for good Rx.
—Spashett's, Bungay, Suffolk.

EDDYSTONE 640, S-meter, speaker, £20 : 50-watt
Tx, 6L6, CO, 807 PA, Modulator, Power Packs,
£25 or near offers.—Bird, 118 Woodpecker Road, New
Cross, S.E.14.

G3AA8 HAS THE FOLLOWING FIRST
GRADE EQUIPMENT, SURPLUS
TO REQUIREMENTS, FOR DISPOSAL : HALLI-
CRAFTER MODEL AR85 28-145 MC, S-
METER, NOISE LIMITER, BFO, ETC., 14 VALVE
RECEIVER. £15.
—AR88D, CABINET MODEL.
GOOD CONDITION, £40.
—BENDIX BC640A10 -VALVE RECEIVER, 100-155 MC, S-
METER, BFO, AVC, ETC., £12/10/,-. BRO SENIOR, NEW,
5 COILS TO 28 MC, AND POWER PACK, £40.
—DUMONT MODEL 224A OSCILLOSCOPE, WIDE
BAND AMPLIFIER, PROBE, ETC., SPECIALLY
DESIGNED FOR TELEVISION AND FM SER-
VICING. NEW, £22/10/-, LISTED AT £70.
—COSSOR MODEL 339 DOUBLE -BEAM OSCILLOSCOPE,
BLUE TRACE, £35. COSSOR MODEL 343 GANGING
OSCILLATOR (WORBLATOR) FM AND
AM, £30. MODEL TS/275U MODULATED, CRYSTAL
CONTROLLED, TEMPERATURE COM-
PENSATED, HETERODYNE FREQUENCYMETER
SIMILAR TO 11C221, FREQUENCY COVERAGE
85-1000 MC WITH ACCURACY OF ±005 PER
CENT., NEW, WITH SPARE VALVES, £18/10/,-.
—RCA JUNIOR "VOLT-OHMIST" VALVE-VOLT-
METER, NEW, £16. S.A.E. MUST ACCOMPANY
ALL ENQUIRIES. WANTED, WIRE RECORDER.
G3AA8. 144 PARK ROAD, GREAT SANKEY.
WARRINGTON, LANCS.

TU5B

BULLS

You can make a Super V.F.O from the instructions which the A.R.R.L. League has given permission to reprint from Q.S.T. with the U.S. Signal Corps TU5B Tuning Unit. Price Complete with instructions

BULLS (w) 22/6

246 HIGH STREET, HARLESDEN, N.W.10 + 3/6 carriage

COULPHONE RADIO

58 DERBY ST., ORMSKIRK, LANC.S.

BRIGHT ALI CHASSIS. 16 s.w.g. 3"deep ;
8” x 8”, 8½; 12” x 9”, 10/6; 15” x 9”, 11/6;
16” x 8”, 11/6; 20” x 8”, 12/6.

ROTARY CONVERTORS. 6v D.C. in.
200v 50mA out. 15/,-.

3-VALVE R.C. AMPS., with three IT4 valves
in ceramic holders, 22/6.

EDDYSTONE 640 now £27.10.0, carriage paid.

LINE CORD. -3 amp, 60/70 ohms per foot—
2 way, 1/3 per yd. 3 way, 1/6 per yd.
Send 2/6d. stamp for catalogue.

HALLICRAFTERS S27

Ultra HF, 27-8 to 148 Mc/s, 3 Wavebands,
230 or 110v AC. £22.

Similar S27 C, 120 to 230 Mc/s.

BRAND NEW

1154 TRANSMITTER
POWER PACKS

230v AC, 1,200v at 200 mA, 220v 110 mA
6-3v 13 amps rectified, fully smoothed,
£10.

All the above tested and fully guaranteed.
Carriage paid U.K. Money back if not
to your expectations.

FIELD’S

435-437 STRATFORD ROAD
BIRMINGHAM 11
SMALL ADVERTISEMENTS
READERS—continued.

PE-110
Power Units, 500v at 400 mA, L.T's, 5 rectifiers, 50c. A super heavy duty U.S. Army job, brand new in crate, £8/10/-.—Taylor, 75 Edgehill Road, Winton, Bourne- mouth.

AR77E
For sale, £30. New valves: BEF11, EF11 (2), EL11: what offers ? 'Phone New Cross 4094 (after 6.0 p.m.) or write G3ACC, 59 Upholden Road, S.E.22.

G200' s announcements now appear in the Trade Small Advertisement column and on Page 595.

SALE.—Hallcrafters Sky Buddy, 550 kc-18 mc, recently overhauled, good condition, £10/10/-.—J. F. Acquiter, Hillcroft, Station Road, Eynsford, Kent.

TROPHY
For sale, including speaker and phones, good condition, S-meter, AVC, 7 to 350 metres, £18.—42 Kings Road, New Haw, Weybridge, Surrey.


R1155
as new, 6V6 output, power pack and 10-in. speaker, £12, T1154H, 20, 40, 80 metres, complete with valves and all components for power pack. £6.—Denol, 14 Lipson Hill, Lipson, Plymouth.

EDDYSTONE tropical battery “All World Eight” Receiver, 9-2000 metres, 7 coil units, highly efficient, cost over £30, as new, £16 or near offer.—Box 389

CRYSTALS, QCC in holders with certs, 1838, 7048, 7187 kc, 20- each : 1190TR, with 9 valves, £2:- new 3 cm. complete magnetron and klystron assembly with magnetron, 2 klystrons, 2 IN23 xtal, 2 6AC7, etc., £2 : Radio-Aid Bug, £1 : Labgear 4-band 150w coil-switch assembly, less coils, 12/6: BC343 Radio Compass, less valves, 30/-: Valves: CV63's, 5/-: RK715B, 60w RF tetrode, 10/-: VT62's (854), 25/-: AC/SC/PA filter unit, £10/-. All guaranteed good or new, carriage paid.—G3UL, 30 Rugby Gardens, Ovenden, Halifax, Yorks.

A MOST new Tx by G6US. Self-contained VFO, switched 80, 40, 20 metres-807 BA/DBLR-PP513 (75-300 watts), Class B TZA40's, 3 power packs, band-switching (except PA) relay controlled by remote switch, £90. Worth Double. One of best HRO’s in “G”. Band spread coils (not war-time model) power switching (except PA) relay controlled by remote switch, £90. Worth Double.

BRAND new Avo Oscillator for sale, £11/10/-:-Taylor, 75 Edgehill Road, Winton, Bournemouth.

SMITH for all Radio Components

SMITH
98 West End Road, Morecambe, Lancs.
Telephone: Morecambe 436.

SLOUGH, BUCKS
We are pleased to announce our appointment as “Eddystone” Stockists. Model 640 Receiver available for immediate delivery.
All the usual and unusual short wave and television equipment in stock.
Our business is run by HAMS for HAMS. Why not drop in and see us ?

THIS MONTH’S BARGAINS

FOH RADIO CO. (G3XC)
7 STATION APPROACH

WE OFFER
A large range of used and new Test Equipment, Converters, Recorders, Amplifiers, Motors, Transformers, etc. All guaranteed and at very attractive prices.

We buy good modern used equipment of all types for spot cash.

UNIVERSITY RADIO LTD.
22 LISLE STREET, LONDON, W.C.2.
Tel.: GER 4447 and GER 8582.

SMITH for all Radio Components

REGISTERED EDDYSTONE DEALER

Also Raymart, Wearite, etc. Send stamp for list of “ Q ” Coils, Coil Packs, Valves, Chokes, etc. New Goods, also Surplus Stock.

Quick Service.

* C.W.O. or C.O.D.

Any Radio goods supplied
UNIVERSAL ELECTRIC MOTORS
A brand new fractional horse-power motor (½ h.p.) available for use on any mains voltage A.C. or D.C. Speed approx. 5,000 r.p.m. Very suitable for use with grindstone, polishing mop, drilling chuck, etc. Every home workshop needs one—especially at the price offered, which represents one of our finest bargains. 22/6 POST FREE.

12v. AC/DC ELECTRIC MOTORS
Made by Berkshire. Embodies 5:1 Reduction gearing. Speed at motor armature 5,000 r.p.m.—final speed 1,000 r.p.m. Size 4½" x 4½" x 3½". Totally enclosed. BRAND NEW, 25/- (post and pkg. 1/4).

HEAVY DUTY SMOOTHING CHOKE
Oil-filled choke to carry 800 mA D.C. Brand new, 12v. AC/DC ELECTRIC MOTORS, 25/- (carr. and pkg. 3/-).

POWER UNITS TYPE 234A
A brand new A.C. power pack in transit case. Ideal for use with R1355, R1481, R132A, etc. Input 200-250v. A.C. Outputs 220v. 80 m/a D.C.; 6-3v. 4-5 amps A.C. Meter incorporated for measuring input and output H.T. voltages. Fully smoothed and of the latest A.M. design. ONLY £4 (carr. and pkg. 10/-).

TU8B, TU9B, TU10B and TU26B
These Transmitter Tuning Units suitable for V.F.O. conversion still available at 15/- (carr. and pkg. 2/6). See Aug. issue for frequency coverage.

BENDIX RA-10DB RECEIVERS
A 7-valve receiver unit similar to the BC433G Radio compass with frequency coverage 30-300, 270-2,000 metres. Complete with crystal and 28v. input Dynamotor power supply. In excellent condition with loop relay unit. Valve line-up: 1 6K6GT, 3 6SK5, 1 6R7, 1 6C5, 1 6K8. £4 (CARRIAGE PAID).

SCR 625 MINE DETECTORS
Brand new equipment in original packing. This famous U.S. Army detector now offered absolutely unused and complete. An invaluable aid to the location of metals underground or water by visual and audible means. The U.S. Forestry Service has recommended procedure for using this equipment to find concealed metal in tree logs and other timber products.

TOOLBOXES
As designed for radio mechanics. An ingenious American toolbox with an inner tray that raises itself completely out of the toolbox when the lid is raised. Overall size 16" x 7" x 7". Complete with hasps, carrying handle, etc. The inner compartment has seven differently sized divisions. ONLY 25/-, POST FREE.

SUBSCRIPTION FORMS FOR OUR AMAZING NEWSLETTER STILL AVAILABLE.
HAVE YOU HAD ISSUE No. 3? No. 4 TO FOLLOW SHORTLY.

Terms: C.W.O. Remittances payable to E. & G. Distributing Corporation, Ltd.
THE "Q-MAX" B4/40 TRANSMITTER
A complete 40 watt—Four Band Transmitter for Phone or C.W.
- Four Bands 80-40-20-10 metres at the turn of a single switch.
- Two Tuning Controls only.
- 40 watts C.W., 35 watts Phone to KT8C Final
- Built-in Modulator and Power Pack.
- High efficiency Four band Tank Coil Turret.
- All essential circuits metered.
- Provision for Low impedance input from a V.F.O.
- Instant Crystal changing from front of panel.
- The whole completely housed in attractive black crackle finished steel cabinet, 19 in. by 10 in. by 9½ in.

COMBINED ABSORPTION WAVEMETER AND PHONE MONITOR
An Absorption Wave-meter for checking harmonics and parasitics; and oscillators, doublers and power amplifiers for correct frequencies.

- All amateur bands are covered by means of plug-in inductances.
- Complete with one inductance covering any specified band ........... 35 -
- Extra Inductances each 3 9

Coverage: (1) 1-8 Mc/s.
(2) 3-5 Mc/s.
(3) 7 Mc/s.
(4) 14 Mc/s.
(5) 28 Mc/s.

A complete P.A. Tank Coil and Condenser assembly for maximum efficiency on all bands with powers up to 150 watts and 2,000 volts High Tension.

- The unit consists of a 60 pf., 60 pf. Split-Stator condenser of 0.02" spacing, with built-in 350mA R.F. Choke and SKY By-pass condenser; Tank Coil and Swinging Link mounts both of which take plug-in tank and link coils giving the most efficient combination for any band.
- This unit can be fitted with either one or two neutralizing condensers for single end or push-pull operation.
- Complete Unit as illustrated ....... ....... ....... £6 13 0

"POLYMAX"—THE UNBREAKABLE INSULATOR
Stand-offs ½" 6d., 1½" 9d., 1½" 1¼
Beehive Insulators ..... 1¼", 2½-
Feed-Through ..... ..... 1½, 1/3

"Q-MAX" CHASSIS CUTTERS
1½-in. or ½-in. (Key 9d.) ..... 9½
1½-in. or 1½-in. (Key 1½) (Key 1½) 12½
2½-in. (Key 1½) ..... ..... 2½

ILLUSTRATED CATALOGUE, 3½d., POST FREE

BERRY'S (SHORTWAVE) LTD
25 HIGH HOLBORN · LONDON · W.C.1
(OPPOSITE CHANCERY LANE) TELEPHONE: HOLBORN 6231