**Five & Ten Metre Converter**

As described in the constructional article in the No. 5 Eddystone Short Wave Manual

If your receiver covers the recommended I.F. of 1'6 mc/s (187.5 metres) the Converter will allow efficient reception of

**FIVE & TEN METRE AMATEURS AND TELEVISION SOUND**

Uses modern V.H.F. Valves EF50, EF54 and EC52.

On five metres, tests have shown results equal to specialised high-frequency receivers. Actual frequency coverage of converter is 51'4 to 60'5 mc/s and 26'4 to 33'4 mc/s by plug-in coils. Simplicity of coil design makes other interesting H.F. ranges available by experiment.

**AVAILABLE EX-STOCK**

The necessary power supply of 6.3v. 1 amp. and 250v. H.T. can usually be supplied from your receiver. If this is inconvenient use WEBB'S Power Pack "230/30," size 6" x 6" x 4". Price £4.10.0

---

**EDDYSTONE**

**"640"**

now £39 10s. 0d. and NO Purchase Tax...


**AVAILABLE FROM STOCK**

I4 SOHO STREET, OXFORD STREET, LONDON, W.1

Telephone: GERRARD 2089. Shop Hours: 9 a.m.—5.15 p.m. Sats. 9 a.m.—1 p.m.
CLYDESDALE
The Radioman's Shop
For Bargains in Ex-Services Electronic Equipment

Ex-U.S. A.A.F.
BC348 RECEIVER

For A.C. mains 200/250v., operation with internal power pack.
A communications receiver, covering 1.5-180 mcs., and 200-500 kcs., with 9 valves, built-in A.C. power pack, high imp. phone, and 2-3 ohm L.S. Outputs, Vernier tuning control, crystal filter, noise limiter, A.V.C., M.V.C. and B.F.O. controls, in black crackle case, 18" x 10" x 8", complete with circuit.

CLYDESDALE'S PRICE ONLY £27.10 Carriage and packing paid
Circuit available at 1/3d. Post free.
Price of unmodified BC348 on application.

DIPOLE AERIAL
Half-wave dipole aerial 9' 3", with reflector 9' 7", and crossarm 4' 11" plus 39' co-axial cable and co-axial plug for approx. 6 metres, either vertical or horizontal mounting to existing mast or wall bracket. Robust construction.
CLYDESDALE'S 21/- each Carriage or packed in a stout wood case, non-returnable, 28/6
PRICE ONLY

CO-AXIAL CABLE
Coil (12 yds.) first-class co-axial cable, approx. 80 ohms. At special price
7/6 per coil Post free

REPEAT OFFER—FURTHER SUPPLY
A1134 BATTERY AMPLIFIER WITH JUNCTION PANEL
2-Valve, 2-stage pre-amp. intercom. unit, with OP21 and 210LF trans., condensers, switches, 10- and 4-pin plugs, etc., in metal cabinet 7" x 5" x 4¾", with circuit plus junction panel, containing 10 and 4-way sockets. Six 2-way and two 3-way terminal blocks, switches, etc., on board. 6" x 4½".
CLYDESDALE'S PRICE ONLY 19/6 each Post paid
EX-R.A.F.

THE WELL

KNOWN R1155 RECEIVER

A communications receiver for 180-7.5 mcs., 7.5-3 mcs., 1,500-600 kcs., 500-200 kcs., 200-75 kcs., 5 wavebands with 10 valves, S.M. tuning, calibrated dial, etc., complete receiver unit in metal case 16⅛" x 9" x 9". Power supply required 210v. 60 ma. Smoothed D.C. 6-3v. 3.5a. A.C. Tested in operation before despatch.

CLYDESDALE'S Carriage and Packing paid £12.12

Circuit available at 1/3 post free. Circuit for an A.C. mains and output unit at 6d. for an A.C. mains and output unit at 6d.

BRAND NEW EX-R.A.F.

TI154 TRANSMITTER

Complete Tx with "Ham" band coverage, for "Fone" C.W. and M.C.W. with valves ML6 (VT105) Hartley M.O. 2/PT15's (VT104), parallel P.A. ML6, mod. and side tone, suppressor grid modulation, simplified tuning, etc., etc., with circuits less power pack, in metal cabinet, with cooling louvres.

CLYDESDALE'S Carriage and Packing paid £10.10


BRAND NEW EX-R.A.F.

SLOW MOTION DRIVE

Muirhead 48-1 ratio, 3" dia. for standard spindle, milled edge on main drive, four drilled holes allow for fitting an escutcheon. A metal tongue is provided to lock the drive to the panel. Clydesdale's price only 7/6 each Post paid 2 for 13/6

---

### CONDENSERS

All tested before despatch

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8 mfd.</td>
<td>750</td>
<td>4⅛&quot; x ⅞&quot; x 1⅛&quot;</td>
<td>Upright</td>
<td>6/6</td>
</tr>
<tr>
<td>8 mfd.</td>
<td>500</td>
<td>4⅛&quot; x ⅞&quot; x 1⅛&quot;</td>
<td>Upright</td>
<td>5/6</td>
</tr>
<tr>
<td>4 mfd.</td>
<td>250</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>1/9</td>
</tr>
<tr>
<td>2 mfd.</td>
<td>600</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>1/9</td>
</tr>
<tr>
<td>1 mfd.</td>
<td>400</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>1/3</td>
</tr>
<tr>
<td>1 mfd.</td>
<td>2,000</td>
<td>4⅛&quot; x 2⅜&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>3/6</td>
</tr>
<tr>
<td>0-3 mfd.</td>
<td>750</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>1/6</td>
</tr>
<tr>
<td>0-3 mfd.</td>
<td>1,500</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>1/6</td>
</tr>
<tr>
<td>0-25 mfd.</td>
<td>2,000</td>
<td>2⅜&quot; x ⅞&quot; x ⅜&quot;</td>
<td>Upright</td>
<td>2/6</td>
</tr>
</tbody>
</table>

### U.S.A. METAL CASED, OIL FILLED

Ceramic S.O. Insulators

| 4 mfd. | 350 | 3⅜" x 3⅜" x 3⅜" | Upright | 3/6 | 22/6 |
| 1 mfd. | 600 | 2⅜" x 2⅞" x 2⅞" | Upright | 1/6 | 13/6 |

### CERAMIC HIGH VOLTAGE TRANSMITTING

Lab. built, on D.LH insulation, brass vanes, caps. 3/50 pf. or 2/100 pf. or 4/200 pf. as connected. Size 2⅛" x 2⅛" x 1½".

CLYDESDALE'S Carriage only 4/11 Post paid

### VARIABLE AIR SPACED CONDENSER (STRATTON 339)

Lab. built, on D.LH insulation, brass vanes, caps. 3/50 pf. on 3/100 pf. on 4/200 pf. as connected. Size 2⅛" x 3" x 2".

CLYDESDALE'S Carriage only 7/6 Post paid
The Radioman's Shop

METERS—All Moving Coil
Brand new in Maker's Boxes

<table>
<thead>
<tr>
<th>Range</th>
<th>Resistance</th>
<th>White scale Mounting</th>
<th>Price each Post paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro Ampmeters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/500</td>
<td>75</td>
<td>2½'' round</td>
<td>25/-</td>
</tr>
<tr>
<td>0/500</td>
<td>500</td>
<td>2'' round, piece cut off top flange</td>
<td>8/6</td>
</tr>
<tr>
<td>500-500</td>
<td>500</td>
<td>2½'' round, plug-in</td>
<td>12/6</td>
</tr>
<tr>
<td>Milliammeters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>6</td>
<td>2½'' round</td>
<td>10/-</td>
</tr>
<tr>
<td>0/5</td>
<td>10</td>
<td>2'' square, marked battery lines</td>
<td>5/6</td>
</tr>
<tr>
<td>0/10</td>
<td>5</td>
<td>2'' square, internal shunt to 100 ma, marked &quot;MagFeed&quot;</td>
<td>5/6</td>
</tr>
<tr>
<td>0/40</td>
<td>0-75</td>
<td>2'' square, two readings</td>
<td>12/6</td>
</tr>
<tr>
<td>0/120</td>
<td>0-42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/500</td>
<td>2</td>
<td>2'' round...</td>
<td>9/-</td>
</tr>
<tr>
<td>Thermo-coupled Ammeter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/0-5</td>
<td>0-7</td>
<td>2'' square...</td>
<td>7/6</td>
</tr>
</tbody>
</table>

Volt Meters

<table>
<thead>
<tr>
<th>Range</th>
<th>Resistance</th>
<th>White scale Mounting</th>
<th>Price each Post paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/30</td>
<td>6000</td>
<td>2'' square</td>
<td>5/6</td>
</tr>
<tr>
<td>0/40</td>
<td>8000</td>
<td>2'' square</td>
<td>5/6</td>
</tr>
<tr>
<td>0/40</td>
<td>8000</td>
<td>2'' square, black face</td>
<td>5/6</td>
</tr>
</tbody>
</table>

DST 100 MK III
CLYDESDALE'S PRICE ONLY £37.10 Carriage and packing paid

BRAND NEW
REMOTE CONTACTOR No. 4
Relay switching unit, comprising 24-volt relay, drive mechanism, on/off switch, resistance, etc., in round 4'' dia. metal case with plastic top, perspex window.
CLYDESDALE'S Price only 3/11 Post paid

EX-ARMY RECEPTION SET, R109
For H.T. and C.W.
A receiver, covering 1-9-8-5 mcs. in 2 switched bands, with 9 valves. S.M. tuning, crush limiter, for phone and speaker operation. L.S. fitted. In metal case 15'' x 11'' x 10''. Input 6 V.D.C.
CLYDESDALE'S PRICE ONLY £6.9.6 Carriage paid

BRAND NEW MICROPHONE AND HEADPHONE ASSEMBLY
Consisting of a carbon hand power microphone (Tannoy) in diecast case with press switch.
Moving coil headphones, 40 ohms coil, sealed and moisture proof, fitted with rubber earpieces. Connecting cable terminating in a 5-point plug.
CLYDESDALE'S PRICE ONLY 15/6 EACH Post paid

CES ELECTRONIC EQUIPMENT
WHEATSTONE BRIDGE
Resistance and continuity test set. 20-0-20. M.C. galvanometer, range 1/210 ohms, can be extended, circuits supplied, with decade switches, precision resistors, in hard wood carrying case, 16" x 7" x 6".

CLYDESDALE'S PRICE ONLY 50/-
Carriage paid. Packed in wood box

BRAND NEW
RI481 RECEIVER
A V.H.F. receiver unit for 65-86 mcs. with 10 valves plus stabilizer, screened R.F. unit, S.M. tuning dial calibrated 0-180, "S" meter, B.F.O. Attenuator, etc., rack mtd. enclosed chassis, dark grey, 19" x 101/2" x 11", with circuit, tested in operation before despatch. Power supply required 210v. ma., smoothed D.C. 6.3v. 3.5a. A.C.

CLYDESDALE'S PRICE ONLY £7.19.6
Carriage and packing paid

EX-U.S. NAVY
I.F.F. RECEIVER/TRANSmitter
Types ABK (43AAK) 12v. and ABKI (43AAAY) 24v. for 158-186 mcs., with 10 valves, Pioneer dynamotor, etc., in metal case 12" x 12" x 8", used, good condition.

CLYDESDALE'S PRICE ONLY 33/6 eachCarriage and packing paid
Circuit available at 1/9 post free

Send now for New Illustrated Lists. Please print Name and Address
CLYDESDALE SUPPLY • 2 BRIDGE ST., CO LTD GLASGOW - C.5
VISIT OUR BRANCHES IN SCOTLAND, ENGLAND AND NORTHERN IRELAND
"AVO"

ELECTRONIC TEST METER

D.C. Volts: 2.5mV. to 10,000v.—Maximum input Resistance 111.1 MΩ.
D.C. Current: 0.25 µA to 1 amp.—150 mV. drop on all ranges.
A.C. Volts: 0.1v. to 2,500v. R.M.S. up to 1.5 Mc/s. With external diode probe 0.1v. to 250v. and up to 200 Mc/s.
A.C. Output Power: 5mW. to 5 watts in 6 different load resistances from 5 to 5,000 ohms.
Decibels: —10db. to +20db. Zero level 50mW.
Capacitance: 0.0001 µF to 50µF.
Resistance: 0.2 ohms to 10 MΩ.
Insulation: 0.1 MΩ to 1,000 MΩ.

This figure represents the ratio of measurement that can be made on the principal ranges of this versatile instrument. These measurements can be made with the simplicity of an ordinary multi-range test meter. In addition, the "AVO" Electronic Testmeter offers you the facilities of a laboratory valve voltmeter for use on frequencies from D.C. up to 200 Mc/s.
ALEC DAVIS SUPPLIES LTD

18 TOTTENHAM COURT RD., LONDON, W.1
Tel.: MUSEUM 4539

STOCK LINES

ATKINS DUST-CORED COILS. Single "Spire-Nut" fixing. Size 1½ in. long by ½ in. dia.
Range 1. 800/2000 metres, Tracking freqs. 150, 200, 250 kc/s. Padder 200 pF, Trimmer 0 pF.
Range 2. 200/450 metres, Tracking freqs. 605, 1025, 1350 kc/s. Padder 450 pF. Trimmer 75 pF.
Range 3. 16/47 metres, Tracking freqs. 7-04, 12-57, 16-8 kc/s. Padder 5000 pF, Trimmer 50 pF. In three types Aerial, H.F. or Csc. All at 3/- each.

ATKINS STANDARD 465 kc/s I.F.'s for use with the above or similar coils. End or side permeability tuning. Per pair 16/6.

WRIGHT & WEARE P COILS, all ranges, all types, 3/-/.

J.B. SQUAREPLANE DRIVE. Oblong clock-face type drive, ratio 8-1. Scale 4½ in. by 3¼ in.

GOODMAN celebrated twin cone 12 in. P.M. Speaker for high quality reproduction. 15 ohm speech-coil. Price £8 8s.

CELESTION 5 in. speaker. Weight 1 lb. 3 oz. speech-coil. Price £1 3s. 6d.

CELESTION 3¼ in. speaker. Weight ½ lb. 3 oz. speech-coil. Price £1 9s. 6d.

SANTON 30 amp. rotary double pole on/off switch—new and boxed. Price 19/6 (Post 1/-).

SURPLUS EQUIPMENT AT SURPLUS PRICES — STOCKISTS OF VALVES, BATTERIES, COMPONENTS AND TEST EQUIPMENT. Business Hours — 9 a.m. - 5.30 p.m. Mon./Fri., 9 a.m. - 1 p.m. Sat.

A UNIQUE INSTRUMENT
90 RANGES & 20,000 OHMS PER VOLT ON A.C. & D.C.

MODEL 85A
PRICE £19-19-0

H.P. TERMS: £1-19-0 deposit and 11 monthly payments of £1-18-2

IMMEDIATE DELIVERY

TAYLOR ELECTRICAL INSTRUMENTS LTD
419- 421 MONTRASE AVENUE, SLough, Bucks, England

Telephone: SLough 2281 (2 lines)
Grims & Cable • TAYLOR • SLough
Ahead of all others!

The S. G. Brown Type “K” Moving Coil headphones with the following outstanding characteristics, supply that High Fidelity Reproduction demanded for DX work, monitoring and laboratory purposes, etc.

NOTE THESE CHARACTERISTICS

D.C. RESISTANCE, 47 Ohms.
IMPEDANCE, 52 Ohms at 1,000 c.p.s.
SENSITIVITY, $1.2 \times 10^{-11}$ watts at 1 kc. = $0.0002$ Dyne/cm$^2$.

Descriptive Literature on request

Price **£5 : 5 : 0** Per Pair
Supplies now available.
Order from your local dealer.

HEADPHONES WHICH UPHOLD BRITISH PRESTIGE

S.G.Brown Ltd.

VICTORIA RD., NORTH ACTON, LONDON, W.3. Phone: ACOrn 5021

ODEON RADIO

Everything for the Amateur

G4HV, G6FQ, G50H

NEW VALVES AT LOW PRICES

5U4G 10/-, KT66 11/-. GU50 17/-, RK39/807 15/-. TZ40 35/.
All these valves are packed in makers’ original cartons, and are guaranteed perfect in every respect.

LABGEAR TRANSMITTING COIL TURRETS

A bandswitching coil turret which will handle up to 150 watts RF, with silver-plated inductances for 3'5, 7'0, 14'0, 21'0 and 28'0 Mc. bands. **£5/12/-**

MODULATION TRANSFORMERS

WODEN multi-ratio, will match any modulator to any RF load. UM1, 30W, 54/-. UM2, 60W, 72/6. UM3, 125W, 90/-. We also carry a complete range of WODEN Transformers and Chokes.

Appointed distributors of EDDYSTONE, RAYMART, DENC0, and LABGEAR PRODUCTS.

We manufacture Transmitters and other Amateur Equipment.

ODEON RADIO, 56 College Road, Harrow, Middx. Telephone: HARrow 5778
**SHORT WAVE MAGAZINE**  
**APRIL 1948**

**VALVES, TRANS.**  
3ST, 45/-; 811, 45/-; 813, 70/-; 87127A, 60/-; 100TH, 60/-.

**VALVES, RX.**  
617, 6K7, 6AC7, 6Q7, 12SA7, 12SK7, 12KB, 12A6, 126R7, 7/6, 6 x 5, 7/6, 6V6G, 8/6, 6L6 Met., 12/6. 6N7, 10/-.

**TUBES, TUBES.** Immediate delivery, 25/6.

**WESTERN ELECTRIC.**  
RU19RX, 6 valves, 9 coils HRO type. £7/10/- less power pack.

**METERS.**  

**U.S.A. TEST METERS.**  
M/c 1,000 ohms per volt. D.C., 0-30v, 0-300v, 0-1,500v, 0-150 mills. A.C., 0-15v, 0-150v, ohms 0.3,000, 0.300,000. BY6-way rotary switch. Complete with test prods by Triumph, Chicago, £6.

**BLEEDERS.**  
10,000 ohm 120w, 15,000 40w. at 1/- each.

**S. G. BROWNS.** Low impedance Phones, 5/6.

**VALVE HOLDERS.** Ceramic, octal 1/-, 1octal 6d. Spring loading.

**CON. VAR.** Trans., 1,000v, cer. ins. 100pf, 2/6; 100+100. Split stator 5/-; 50+50 1,500v 8/6.

**CON. VAR. RX.** 50pf 1/9, 75+75 3/6. 3 Gang, -0003, 7/6. All cer. ins. 1155. Slow motion drive, 200-1, 4/6.

**TCC.** By-pass, mica 1,000v, -0047, 3/6 doz. -001 By-pass, mica, 2,700v w.kg., 1/6.

**CO-AX.** 7/229, 80 ohm, 1kW, 1/- yd.

**SMOOTHING CON.** Bi 800v test, 400v w. Metal can paper, 4½ x 1½ x 1", 4/6 doz. 1-5 M, 4,000v, D.C. wkg., 6/6.

**SMOOTHING CHOKE.** Swinging trop. 200 mill. 4 hry., ex-A.M., 7/6.

**THE Q FIVER (see QST Jan.).**  
BC453B. Brand new with 6 valves. Will improve even an AR88. Band width 6-5kc at 1,000 times down, £3.

**RECTIFIERS.**  
5R4Gy. 950-0-950, 175 mills. Full wave, a gift, 7/6 each.

**EVERY ITEM OFFERED BRAND NEW IN ORIGINAL PACKING POST PAID BY RETURN**

**H. WHITAKER G3SJ**  
10 YORKSHIRE STREET, BURNLEY  
Phone : 4924

---

**Q5R9 ROTARY BEAMS FOR AMATEURS**

We are the leading specialists for beams, and our range includes all metal heads for 2½, 5, 6, 10, 15 and 20 metres, plus all the associated equipment, masts, bearings, motor rotators, direction indicators, chimney brackets, pulley units, etc. This equipment is engineered for high performance and strength, and low weight and windage; our experience in this field is your guide, e.g. 20 m. head, 3 elements each, 5 tapering sections, wt. 26 lbs., gain 7 d.b.

Spring is here; now is the time to commence your aerial programme.

**Q5R9 INSTRUMENTS & COMPONENTS**

Matchmeter, for directly measuring standing waves. All purpose aerial coupling unit, 5 bands. U.H.F. converter for 2½, 5, 6 and 10 metres. Microphone floor stand, adjustable 2½-5 ft. Absorption wavemeter and phone monitor. Strip supported polythene moulded tx. coil. -0001 Variables, 1/6 gap. Ex-Govt. Clydons 5/-.

Send S.A.E. and 5d. for Spring Lists.

**E.M.D.O. LTD.,**  
ACE WORKS, MOOR LANE, STAINES.

---

**G2AK**

Offers the following snips:

- Genuine RCA AR88 Speakers in black crackle and chrome finish.
- Complete sets of spare tubes for AR88, 14 per set, in sealed carton.
- Few only available.
  - Speakers £3/15/- each
  - Tubes £6/- per set
- One of each only per customer. First come, first served, C.W.O. or C.O.D.

For the 450 mc. Enthusiast

Limited number of 420/520 mc. 12-valve double superhets. Line up: 446a (lighthouse) RF, 955 mixer, 955 osc., 6AC7, 6AC7 (55 mc. IF's), 6AC7 mixer, 6JS osc., 6AC7, 6AC7 (15 mc. IF's), 6H6 3rd Det., 6AC7, 6AC7 cathode coupled audio stages.

Beautifully made, easy to get at, tubes alone are worth £7 at surplus prices. You will be sorry if you miss one of these, because at £6/10/- each we are giving these away.

450 mc. 2 Element beams, complete with 33ft. of heavy VHF Co-Ax Cable. Only 7/6 each.

Write, Ring or Telegraph your requirements to

**CHAS. H. YOUNG, G2AK,**  
880 Washwood Heath Road, Birmingham.

STECFORD 2809
**G.S.V. CO.,**
**MARINE and COMMERCIAL COMMUNICATION ENGINEERS . . .**

Offer for sale the following items:
- NC.156 Receiver. 500 Kt/30 Mc. E40
- AR.77E Receiver E35
- BC.342 S Meter, Noise Limiter E25
- BC.348 Converted A.C. Operation E23
- HT.7 Hallicrafters Crystal Calibrator E12/10
- Dummy Aerials (4 lamps), 3/6. Muirhead Drives, 7/6

Transmitters, V.F.O.'s, Converters, Modulators and Power Packs in stock, and constructed to individual requirements.

Trade enquiries invited

**G.S.V. CO.,**
**142 WESTMOUNT RD., S.E.9**
ELT. 6050

---

**MORSE CODE Training**

There are Candler Morse Code Courses for

**BEGINNERS AND OPERATORS**

Send for this free "BOOK OF FACTS"

It gives full details concerning all Courses.

**JUNIOR Scientific Code Course**
Teaches all the necessary code fundamentals scientifically.

**ADVANCED High-speed Telegraphing**
For operators who want to increase their w.p.m. speed and improve their technique.

**TELEGRAPH Touch Typewriting**
For those who wish to become expert in the use of the typewriter for recording messages and for general commercial uses.

Code Courses on Cash or Monthly Payment Terms.

**IRREFUTABLE EVIDENCE**
of the value of the Candler System of Morse Code Training is given in the "Extracts from students' letters," included with every "Book of Facts." Send for a copy now.

**THE CANDLER SYSTEM CO.**
(655.W.) 121 Kingsway, London, W.C.2

---

**Lyons Radio**

**Wavemeter, Type W191**
A very high grade frequency meter in brand new condition. 100 kc. to 20 mc. continuous (8 bands). Accuracy 0-1%. Fitted with attenuator and fully screened oscillator enabling them to be used as a first-class signal generator. Complete with crystal, 4 valves, calibration chart and instructions. Supplied in strong wooden transit cases with a full set of 4 spare valves. Operates from battery supply of 2v. L.T. and 60v. H.T. Exceptionally useful instrument for a variety of purposes.

£11/10/- (carriage 7/6)

**Wave Form Generators, Type 26**
Useful units containing 13 valves (6-VR65, 1-VR116, 2-VR54, 4-VR56). Components include over 80 resistances, 35 condensers, relays, transformers, etc. In metal cases, approx. 11½" x 7½" x 10". Practically new. 36/- each (carriage 4/-)

**R.A.F. Valve Tester, Type 2**
A comprehensive self-contained instrument for testing a full range of British battery valves. As new and in perfect working order. Fitted with 3" dia. 0-100 grade 1, moving-coil micro-ammeter. Can be readily adapted for other types of valves. Suitable for use without any modifications as a multi-range D.C. meter with the following ranges:
- 0/2, 0/10, 0/100, 0/200 volts
- 0/100 micro-amps, 0/1, 0/2, 0/5, 0/10, 0/50 milli-amps. Instructions included. In well-made metal boxes, 14½" x 6" x 10" deep, with hinged lid and leather carrying strap. £3/12/6 (carriage 4/-)

**Power Unit, Type 3**
High grade mains power unit for rack or bench mounting.
- Input 200-250v. A.C. (adjustable by switch on front panel)
- Output: 220 v. at 70 ma. (D.C.) and 6.3 v. at 4-5 amps (A.C.). Panel size 19" x 7". Depth over dust cover, 10". Fitted with pilot light, mains switch, 0/300 voltmeter and 0/150 milli-ammeter to read output volts and current. Fuses in input and output circuits. Two-section filter giving particularly good smoothing. Actually made for use with R1132A and RI481, but suitable for many types of receivers including R1155. A versatile and efficient power unit of smart appearance. Includes VU39 rectifier valve. As brand new in transit cases. £4/0/0 (carriage 6/-) Also as above but in used condition. Good working order. Less transit cases. £2/19/6 (carriage 11/-, with 5/- returnable on packing case)

**Converter Unit**
Input 24 v. D.C. Output 230 v. A.G. (50 cycles), 100 watts. Comprises rotary converter in metal case with on/off switch and input and output sockets. Connectors with plugs are included. Good condition. Size 12" x 12" x 8". £3/15/- (carriage 6/-)

**New Publications for your Book List**
- "Communications Receivers Manual."
- "Sound Equipment Manual."
- "Handbook of Radio Circuits, No. 2."
- "Radio Repairs Manual."
- "Amateur Transmitters Construction Manual."

2/8 each, post free
Ensuring Instruments by Pullin

For every need of consistently accurate electrical measurement, there is a Pullin Instrument.
- Miniature
- Industrial
- Portable
- Laboratory Pattern
- Single or Multi-range

Send your instrumentation problems to us.

MEASURING INSTRUMENTS (PULLIN) LTD
Address all enquiries to Dept. T, Electrin Works, Winchester Street, Acton, W.3. Telephone: Acorn 4651/4

WODEN TRANSFORMER CO. LTD
DE LUXE AND POTTED TYPE TRANSFORMERS

MAINS TRANSFORMERS
D.T.M.11. 250-0-250 60 m/a
D.T.M.12. 275-0-275 120 m/a
D.T.M.13. 350-0-350 120 m/a
D.T.M.14. 425-0-425 150 m/a
D.T.M.15. 500-0-500 150 m/a
D.T.M.16. 650-0-650 200 m/a
D.T.M.17. 750-0-750 250 m/a

Also available in larger sizes

MAINS TRANSFORMERS
P.T.M.11. 250-0-250 60 m/a
P.T.M.12. 270-0-275 120 m/a
P.T.M.13. 350-0-350 120 m/a
P.T.M.14. 425-0-425 150 m/a
P.T.M.15. 500-0-500 150 m/a
All above available in 4 v or 6 v filament windings.
P.T.M.16. 650-0-650 200 m/a

We welcome your enquiries for all types of Transformers

WODEN TRANSFORMER CO. LTD.
MOXLEY ROAD, BILSTON
STAFFSHIRE
TELEPHONE: BILSTON 41959/0
Good Lines from Vallance's

ABK1 U.S. NAVY AIRCRAFT I.F.F. RECEIVERS

10 Valves U.H.F. with 24-volt D.C. dynamotor power supply and carbon pile voltage regulator. Constructed on two separate chassis, size \(12\frac{1}{4} \times 8\times 2\frac{3}{4}\). Valves are 6 of 6SH7, 2 of 6H6, and 2 of 7193. U.H.F. transmitting triodes with top cap grid and anode 3-5 watts; all have 6-3-volts heaters.

The units include valuable V.H.F. components, relays, bathtub oil-filled condensers, resistors, etc. A small quantity only offered, at the very low price of 37/6, plus 7/6 carriage. Brand-new but less covering cases.

WEARITE CERAMIC SWITCHES

We have now in stock a ceramic switch chest and can supply up to 4-bank, SP 12-way, 2p 6-way, and 4p 3-way. The index spindle is supplied with a 6" spindle which may be cut to the required length, the side rods being available in three standard sizes (2½, 3¾ and 6¼). Price of Parts:—Spindle and index, 4/-; Ceramic wafer, 7/-; types SP 12-way, 2p 6-way and 4p 3-way. Side rods 2½", 3¾", 4d.; 3¼", 6d.; 4¾", 8d.; 6", 10d.

Moulded straps, 8d. Nuts, 3d. dozen.

B2 TRANSMITTING COILS

We have available a limited quantity o sets of 4 coils at 7/6 per set.

HIGH-QUALITY COMPONENTS FOR SHORT-WAVE TRANSMITTERS MANUFACTURED BY LABGEAR

Radio Frequency Chokes. 1-0 and 3-0m.h. types, 350mA. D.C. rating available with mounting brackets. 1-0m.h., 6/-; 3-0m.h., 7/6.

Coil Turret. Four-band coil turret for 150-watt transmitters. The latest for high-efficiency band-switched transmitters. Complete with coils to cover 10, 20, 40 and 80 metres. £5/12/-. 150-Watt Swinging Link P.A. Coils. The ultimate in high-efficiency plug-in coils, giving very fine control of loading: available only for 7 meg at present, 25/-.

Transmitting Condensers. 1,500v peak rating, single-ended type, 100PF., 16/6. Micalex insulated silver-plated vases.

Midget Absorption Wattmeters. Direct frequency, easy reading calibration, and M.E.S. 6-3V -15 amp. indicator projects through front panel. Size 3" x 2" x 3", in black wrinkle panel assembly.

WF25D 24-WATT C.W. TRANSMITTERS

The WF25D is efficient, dependable and ready for immediate use. Specification:

- Power Input, 25 watts, C.W.
- Valves:—6L6XTL. Oscillator 807. P.A. with 5U4G in Power supply (internal).
- Metering:—Grid and Anode of 807. Separate meters.
- Controls:—Mains switch with pilot lamp, stand-by transit switch with indicator lamps. P.A. tuning control, Jacks for keying C.O. or 807 stage. Osc. tuning control.

Complete in cabinet finished in grey cellulose, with chromium carrying handles, and could be used as driver for a high-power P.A. Supplied complete with 7-meg crystal and coils. Price £29/10/-. Railing charge, 10/-. Case charge £2 (returnable).

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

Vallance & Davison Ltd
144 BRIGGATE, LEEDS I Phone: 29428/9

Staff call signs:—G2HHV, G8SX, G3ABD, G3AHV
Enthusiastic Reception!

AND NO WONDER FOR AT £22/10/- IT'S THE BEST "BUY" in the country to-day. There is no other Receiver at anything like the price which will compare in performance.

Read what Mr. John Russell, of Sandymount, Dublin, has to say about the Hambander:
"During the past week I have tested the Hambander on all amateur bands from 10-160 metres and on the 13, 16, 19 and 31 metre broadcast bands. Its performance is excellent throughout its complete tuning range, and is equal to that of American receivers at double the price. It is a remarkable set, and I am completely satisfied with it."

Our thanks to you, John Russell, and to all the many Hambander enthusiasts who have sent us similar letters.

Don't Delay. Write now for Illustrated Brochure.

H.P. Facilities
RADIOVISION (Leicester) LTD., 58/60 Rutland St., Leicester.

A fine reputation for efficiency was acquired by the famous 30 Coil-Pack long ago, therefore it became the inevitable choice when the Model 30 Tuning Heart was designed. If you are discriminating in the quality of performance and reproduction of the sets you build... if you are truly critical of the sensitivity on short waves of your DX receiver, then read what others say about this new Model 30 Tuning Heart.

**MODEL 30 TUNING HEART**

**Specification.** This unit incorporates the 30 Coil-Pack and covers 16-50, 200-550, 800-2,000 metres. 465 kcs I.F. Permeability tuned. Iron-cored coils ensure high sensitivity on all wavebands, and adequate rejection of image responses on short waves. Uses valves 6K8G, 6K7G, 6Q7G. Audio output suitable for use with any amplifier. Delayed AVC. Requires 250 volts at 30mA, and 6.3 volts at 1.2 amp. Unit fully aligned and tested for gain.

**Price £9.9.0**

LONDON TELEVISION COMPANY LTD.
694 Lea Bridge Road, London, E10. Phone: Leytonstone 4380
This unit uses the well-known Q.C.C. Power type crystal, which is undoubtedly the most rugged and active crystal cut available for amateur use. The crystal is mounted in our type U dust-proof holder, with standard 3/8 in. pin spacing, as illustrated above. The P5 unit has a temperature co-efficient of 20 cycles per megacycle per degree Centigrade temperature change. Used with a 6V6 or 6L6 type beam tetrode, it will give up to 5 watts r.f. output on the fundamental frequency and approximately 3 watts on the second harmonic in the Tritet circuit.

Available with fundamental frequencies in the 1.7, 3.5 and 7 Mc. bands for fundamental operation or frequency multiplying to any higher frequency band.

An official certificate of calibration is sent with each P5 unit, giving the frequency under stated operating conditions to an accuracy of ±0.025%.

PRICES: Ground to your specified frequency in the above bands... £1/17/6
Or ground to a frequency not specified by you but taken from our stock... £1/12/6

Please note that all the leading dealers in amateur equipment now carry stocks of the P5 crystal unit.

THE QUARTZ CRYSTAL CO., LTD. (Directors: E. A. Dedman, G2NH., N. H. R. Munday, G5MA., W. J. Thompson, G2MR), 63/71 Kingston Road, NEW MALDEN, SURREY.

Phone: MALden 0334

OPPORTUNITIES IN RADIO

Get this FREE Book!

"ENGINEERING OPPORTUNITIES" reveals how you can become technically qualified at home for a highly paid key appointment in the vast Radio and Television industry. In 108 pages of intensely interesting matter it includes full details of our up-to-the-minute home-study courses in all branches of RADIO AND TELEVISION, A.M.Brit.I.R.E., A.M.I.E.E., City and Guilds, Special Television, Servicing, Sound-film Projection, Short Wave, High Frequency and General Wireless courses.

We definitely guarantee

"NO PASS—NO FEE"

If you're earning less than £10 a week this enlightening book is for you. Write for your copy today. It will be sent FREE and without obligation.

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY
149 Shakespeare House,
17-19 Stratford Place, London, W.1
RADIO CLEARANCE LTD.
27 TOTTENHAM COURT ROAD, W.I.

SPECIAL PURCHASE, LIMITED NUMBER
BRAND NEW B.C.348 RECEIVERS

8-valve Superhet Receivers, 6 Wave Bands, 200-500 kc/s, 1-5-18-0 Mc/s. 2 R.F. Stages, Crystal Filter, B.F.O., 100/1 Tuning and other refinements. At present uses 28v Dynamotor, but can easily be modified for P.P. We offer these receivers, while they last, at £16/10s., carriage and packing, 10/.

SPECIAL BARGAIN OFFER
A new delivery of 100 RI481 Receivers, bought at a reduced price, enables us to offer these excellent sets at an amazing figure. These are as our previous lot, all brand new and in wooden transit cases. Frequency range, 65-86 Mc/s, 10 Valves (Standard 6-3v). Sequence, R.F., OSC, Mixer, 3 I.F., diode doubler (DET and A.V.C.), AF, output. B.F.O. 1 VR65, 3 VR63, 3 VR53, 1 VR45, 1 VR57, and stabiliser on OSC V57. I.F. 12 Mc/s, built-in tuning meter, etc. Requires power (250v 50mA, 6-3v 4a). These receivers lend themselves readily to modification (plug-in coils, etc.). Supplied complete with all valves and circuit diagram. The price, £17/19/6.

Power Packs for above sets, 19" Rack Mounting, available only with sets, at £2/19/6.

Moving Coil Milliammeters,
- 0-10mA, 2" square, flush mounting, 8/-. 0-1mA, 2" square, flush mounting, 7/-.
- 0-500 microamp, 2" circular, flush mounting, 19/6.

Speakers; P.M., 5", less trans., 16/11.

Plug and Sockets:
- 8-way Jones, 1/6 per pair.
- 5-pin, with locating peg, 1/6 per pair.

R.F. Units, Type 25, 5 switched frequencies, approx. 35-45 Mc/s. 3 Valves (VR65's), R.F., Osc., Mixer, I.F., 7-3 Mc/s, 30k ceramic 5W. Complete with valves 16/6.

Mansbridge Condensers, 1mF, 1,000v, 1/-; 2mF, 300v, 10d.; 4mF, 600v, 4/-; 5mF, 1,000v, 4/-; 10mF, 500v, 5/6; 1mF, 5,000v (size 2x1x11/2), 5/6; all wkg, v.

Vibrator Packs. 24v input, 120v stabilised output, 21/.

Wire-Wound V.C., 3-watt Type, 100, 500, 2000, 4000, 5000, 6800, 2K, 4K, 6K, 7K, 8K, 10K, 20K, 50K, 75K, 100K, 2/6.

Wire-Wound V.C. 15w, 500, 5000, 4/6.

Smoothing Chokes, 5H, 200mA, 8/-. Smaller type, Res. 1600, 5/6.


Selenium Rectifiers. 250v, 40mA, H.W., 4/6; 250v, 60mA, H.W., 5/-.

W.D. SALES

3 ELECTRON HOUSE, WINDMILL HILL, RUISLIP, MIDDLESEX

RECEIVERS—ALL ARE REMARKABLE OFFERS BUT ONE IS EXTRA SPECIAL, DUE TO LAST MONTH'S MINISTRY SALE

B.208 PERCISION RECEIVER: the frequency coverage is from 10-60 Mc/s, e.g., 5-30 metres. The receiver with power supply for working off mains or 6v battery and 6" loud-speaker is built on a steel chassis and housed in a steel cabinet. The chassis slides into the front of the cabinet and has handles for withdrawal. The circuit is—Stage of R.F., combined frequency changer and mixer, two stages of I.F., detector, A.V.O. and first A.F., and 616 output. The range 10-60 Mc/s is covered by a three-position wave -change switch.

Other controls include Muting, Phone jacks, Battery mains on/off switch, A.F. gain, R.F. gain and B.F.O. The set will work with open circuit, but full performance is obtained with 500 ohms. Other controls include Muting, Phone jacks, Battery mains on/off switch, A.F. gain, R.F. gain and B.F.O. The set will work with open circuit, but full performance is obtained with 500 ohms.

We offer a limited number of these £100 class communications receivers at 48/-10s. Carriage 10/.- Packing case 7/8. ORDER BY RETURN.

INTERCOM. All 744 complete with valves 15/.-. Or if you want to build a loud -speaking intercom, we can supply a complete kit comprising two loud -speakers in veneered cabinets, the amplifier 1114 and diagram with full instructions. PRIORитет post paid.

RI156. We can supply this famous receiver which is doing good service over the World with complete sets with ten valves and in tip-top condition, tested before despatch. PRIORитет 4/6, plus 4/- carriage, 10/- of which we will refund if you return the transit case.

DATA BOOKS. Copied from official publications, giving circuit diagrams, component values and useful notes:
- BC.348 — BC.348
- BC.332 — BC.221 — R.308 — R.102A
- "Debomed" Valves, 2/6.

WINTER LIST free on application with stamp. 200 BARGAINS.
COMMUNICATIONS RECEIVER R.I224A. The ex-R.A.F. 5-valve battery superhet covering 1-0-10-0 mcs. in 3 switchable bands. Power supply 2v LT, 9v GB, 120v HT. Has Muirhead precision slow-motion dial, aerial trimmer, sensitivity control, etc., etc. Circuit employs RF stage. Supplied with valves as follows: 2-type VP 23, and 1 each FC2A, HL2, PM22A. Cabinet size 15" x 9½" x 8½". A battery superhet of the highest order. ALL BRAND NEW IN ORIGINAL PACKING AND WITH CIRCUIT DIAGRAM. ONLY 99/6 (carriage, etc., 7/6).

COMMUNICATIONS RECEIVER R.I155. This famous 10-valve receiver is known too well for us to repeat all its outstanding features. Covers 7.5 mcs-75 kcs in 5 switchable bands. Slow and fast ratio tuning with Magic Eye. Complete with 10 valves and BOOKLET GIVING CIRCUIT DIAGRAMS, ETC., AND FULL MODIFICATION DETAILS. All sets have been used, but ARE IN SUPERB ORDER, and only require power pack. “Not to be confused with the badly worn and questionable sets of this type that are on the market.” ONLY £12/10/- (carriage, etc., 15/-).

INDICATOR UNITS. A large selection of ex-R.A.F. CR Units which are suitable for conversion to oscilloscopes or television work, etc. The main items are listed below, but every unit contains a host of components in addition. UNIT TYPE 48A contains 2 tubes VCR 138 (4") and 2 valves SP 41. ONLY 50/-. UNIT TYPE 184 A contains 1 tube VCR 517 (6") and 1 3" tube, 5 valves EF 50, 3 type EB 34, 3 type SP 41 and 5 diodes. ONLY 85/-. UNIT TYPE 182 contains 1 tube VCR 517, 3 valves EF 50, 4 type SP 61, and 1 type U 52. ONLY 85/-. UNIT TYPE 162 B contains 1 tube VCR 517, 1 tube VCR 139 (3"), 3 valves SP 41 (6 volt), 1 VR 17, 1 CV 67, and 12 v cooling blower. ONLY 100/-. TEST SET TYPE 43 contains VCR 138, 4 valves 6J7, 3 type EB 34, 1 type 5Z4G, 1 type SU 2150 A. Battery input. ONLY £7/10/-.

TEST SET TYPE 74 contains VCR 139, 1 valve SU 2150 A, 1 type 6Q7, 1 type 6J5G, 3 type SP 41 (6 v), 1 type E 1148, 1 type 5Z4. Internal power pack for normal AC mains input. ONLY £7/10/- Please note that either of these test sets require little modification for use as a normal oscilloscope. Customers are requested to call if possible for these CR Units, owing to risk of damage in transit, but if unable to do so please add 10/- for packing and carriage on No. 48 unit and 20/- on all others.

C.W.O. please. S.A.E. for lists

U.E.I. CORP,

(Open until 1 p.m. Saturdays. We are 2 mins. from High Holborn, 5 mins. from King’s Cross.)

4 VALVE SUPERHET

HERE IS A SUPERHET which will bring you dozens of short wave stations just as soon as batteries and phones are connected. 6 to 9 MC/S—4 2-volt valves—slow motion drive—size only 6" x 5" x 9½"—complete as illustrated 29/6

Correctly matched headphones fitted with plug-in jack, 9/- post free.

Other interesting BARGAINS
12 assorted Magnetic Relays. Price 11/-, post free.
Thermo-Couple H.F. Meter. Price 4/6, post free.
Nuts, Bolts and Washers, small sizes for model making. Three gross assorted. Price 7/6, post free.
PHOTO-ELECTRIC CELL. Unlimited applications. Price 19/6, post free.

Write for detailed list of Bargains to Dept. "MP"

INSTRUMENT CO.
244, HARROW ROAD, LONDON, W.2.
Telephone: Cunningham 0508
... but there's nothing more attractive than

"TICONAL" PERMANENT
REGD. TRADE MARK
MAGNETS MADE BY Mullard

THE MULLARD WIRELESS SERVICE COMPANY LIMITED, MAGNET DIVISION, CENTURY HOUSE, SHAFTESBURY AVENUE, LONDON, W.C.2.
## INDEX TO ADVERTISERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.C.S. Radio</td>
<td>137</td>
</tr>
<tr>
<td>Amateur Radio Service</td>
<td>138</td>
</tr>
<tr>
<td>Automatic Coil Winder</td>
<td>73</td>
</tr>
<tr>
<td>B.I.E.T.</td>
<td>81</td>
</tr>
<tr>
<td>Barnes Radio</td>
<td>142</td>
</tr>
<tr>
<td>Belling &amp; Lee</td>
<td>133</td>
</tr>
<tr>
<td>Berry's Ltd.</td>
<td>Cover viii</td>
</tr>
<tr>
<td>Brighton Trade Services</td>
<td>143</td>
</tr>
<tr>
<td>Britain (Radio) Ltd.</td>
<td>143</td>
</tr>
<tr>
<td>Brookes Crystals Ltd.</td>
<td>137</td>
</tr>
<tr>
<td>Brown, S. G.</td>
<td>75</td>
</tr>
<tr>
<td>Bulls, J.</td>
<td>144</td>
</tr>
<tr>
<td>Candler System</td>
<td>77</td>
</tr>
<tr>
<td>Celecton</td>
<td>135</td>
</tr>
<tr>
<td>Clydesdale Supply Co. Ltd.</td>
<td>iii, iv, v, vi</td>
</tr>
<tr>
<td>Cover viii</td>
<td></td>
</tr>
<tr>
<td>Cover vii</td>
<td></td>
</tr>
<tr>
<td>Denco</td>
<td>136</td>
</tr>
<tr>
<td>Davis, Alec, Ltd.</td>
<td>74</td>
</tr>
<tr>
<td>Emdo</td>
<td>76</td>
</tr>
<tr>
<td>Gamages</td>
<td>139</td>
</tr>
<tr>
<td>General Sound &amp; Vision Co.</td>
<td>77</td>
</tr>
<tr>
<td>H.A.C. Short-Wave Products</td>
<td>142</td>
</tr>
<tr>
<td>H.P. Radio Services Ltd.</td>
<td>140</td>
</tr>
<tr>
<td>Henbest Bros. Ltd.</td>
<td>139</td>
</tr>
<tr>
<td>Henleys</td>
<td>134</td>
</tr>
<tr>
<td>Instrument Co.</td>
<td>83</td>
</tr>
<tr>
<td>Johnsons</td>
<td>141</td>
</tr>
<tr>
<td>Labage</td>
<td>87</td>
</tr>
<tr>
<td>Lasky's Radio</td>
<td>135</td>
</tr>
<tr>
<td>London Television Co.</td>
<td>80</td>
</tr>
<tr>
<td>Lyons Radio</td>
<td>77</td>
</tr>
<tr>
<td>M.O.S.</td>
<td>Cover vii</td>
</tr>
<tr>
<td>Merribull Products</td>
<td>144</td>
</tr>
<tr>
<td>Mullard</td>
<td>84</td>
</tr>
<tr>
<td>Odeon Radio</td>
<td>75</td>
</tr>
<tr>
<td>Pearson, M. &amp; J.</td>
<td>81</td>
</tr>
<tr>
<td>Premier Radio</td>
<td>86</td>
</tr>
<tr>
<td>Pullin (M. &amp; L.)</td>
<td>78</td>
</tr>
<tr>
<td>Quartz Crystals</td>
<td>81</td>
</tr>
<tr>
<td>Radford, Arthur H.</td>
<td>136</td>
</tr>
<tr>
<td>Radio Clearance</td>
<td>82</td>
</tr>
<tr>
<td>Radiocraft Ltd.</td>
<td>133</td>
</tr>
<tr>
<td>Radiolvision (Leicester) Ltd.</td>
<td>80</td>
</tr>
<tr>
<td>Rogers Development</td>
<td>144</td>
</tr>
<tr>
<td>Samsons Surplus Stores</td>
<td>140</td>
</tr>
<tr>
<td>Short Wave (Hull) Radio</td>
<td>141</td>
</tr>
<tr>
<td>Small Advertisements</td>
<td>139, 144</td>
</tr>
<tr>
<td>Taylor Electrical</td>
<td>74</td>
</tr>
<tr>
<td>Tce, Herbert</td>
<td>139</td>
</tr>
<tr>
<td>Tele-Radio (G434) Ltd.</td>
<td>134</td>
</tr>
<tr>
<td>Trading Post</td>
<td>136</td>
</tr>
<tr>
<td>U.E.I. Corp.</td>
<td>83</td>
</tr>
<tr>
<td>University Radio</td>
<td>143</td>
</tr>
<tr>
<td>Valance &amp; Davison Ltd.</td>
<td>79</td>
</tr>
<tr>
<td>W.D. Sales</td>
<td>82</td>
</tr>
<tr>
<td>Webb's Radio</td>
<td>Cover ii</td>
</tr>
<tr>
<td>Whitaker, H.</td>
<td>76</td>
</tr>
<tr>
<td>Woden Transformers</td>
<td>78</td>
</tr>
<tr>
<td>Young, C. H.</td>
<td>76</td>
</tr>
</tbody>
</table>

## SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

**Vol. VI APRIL 1948 No. 57**

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editorial</td>
<td>87</td>
</tr>
<tr>
<td>Wide-Band RF Pre-Amplifier by G. A. Hume (G5UX)</td>
<td>88</td>
</tr>
<tr>
<td>Crystal-Checked VFO Drive by R. J. Donald (G3DJD)</td>
<td>91</td>
</tr>
<tr>
<td>Simple CW Monitor by J. Hum (G5UM)</td>
<td>94</td>
</tr>
<tr>
<td>The Type 145 Oscillator by N. P. Spooner (G2NS)</td>
<td>97</td>
</tr>
<tr>
<td>Twin Three-Element Beam System by C. G. Allen (G8IG)</td>
<td>102</td>
</tr>
<tr>
<td>DX Commentary by L. H. Thomas, M.B.E. (G6QB)</td>
<td>104</td>
</tr>
<tr>
<td>British Old-Timers' Club</td>
<td>110</td>
</tr>
<tr>
<td>Twenty-Metre DX Forecast by I. D. McDermid, A.R.T.C. (GM3ANV)</td>
<td>111</td>
</tr>
<tr>
<td>Round Europe on QRP ! by W. Oliver (G3XT)</td>
<td>112</td>
</tr>
<tr>
<td>Indoor Aerials by L. A. Kippin (G6PL)</td>
<td>112</td>
</tr>
<tr>
<td>The VHF Bands by E. J. Williams, B.Sc. (G2XC)</td>
<td>114</td>
</tr>
<tr>
<td>Approach to 144 mc by W. J. Crawley (G2IQ)</td>
<td>121</td>
</tr>
<tr>
<td>Valve Delay Circuit by D. B. Appleby</td>
<td>124</td>
</tr>
<tr>
<td>Here and There</td>
<td>125</td>
</tr>
<tr>
<td>New QTH's</td>
<td>126</td>
</tr>
<tr>
<td>Other Man's Station—G2AMJ</td>
<td>128</td>
</tr>
<tr>
<td>Month with the Clubs...From Reports 129</td>
<td></td>
</tr>
</tbody>
</table>

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

**Advertisement Manager:** P. H. FALKNER

**Assistant Editor:** L. H. THOMAS, M.B.E. (G6QB)

Published the first Wednesday each month at 49 Victoria Street, London, S.W.1. Telephone: Abbey 2384. Annual Subscription: Inland 20s. Abroad 22s. post paid.

Copyright Reserved throughout the World

**AUTHORS' MSS.**

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

**THE SHORT WAVE LISTENER ASSOCIATED WITH THIS MAGAZINE IS SPECIALLY FOR THE RECEIVING ENTHUSIAST**
OUR NEW LIST IS NOW AVAILABLE. All enquiries must be accompanied by a 2/1d. stamp.

SPECIAL OFFERS. 807 (Ceramic base Tubes). 10/- each.


TEST UNIT APS374 consists of a Test Unit for a U.H.F. Tx., incorporates a 230 v. 50 c/s Power Pack, with a smoothed output of 240 v. up to 50 m/a and 6 3 a. 2 a, 2 EF50, 1 EC52, 1 EA50, 1 5Z4G, 1 Y63 Magic Eye, and a large quantity of condensers, resistors and tuning gear. Complete in an attractive steel case. Size 19 x 8 x 8 in. Price 45/-. Carriage and packing, 5/-.

TEST UNIT TYPE 73, consists of a special purpose Oscilloscope that requires only rewiring and the addition of a few condensers and resistors to convert into a standard oscilloscope, input 230 v. 50 c/s. A 3 3 in. C.R. Tube and 1 SU22OA, 1 EB14, 1 5Z4, 2 SP41, 1 5Z4G, 1 Y63 Magic Eye, and a large quantity of condensers, resistors and tuning gear. Complete in an attractive steel case. Size 101 x 9 x 8 in. Price 45/-.

REMY UNIT TYPE 9, consists of a 24 v. operated relay unit incorporating 3 KT13C valves, a telephone line (Uniselectro) switch with 6 poles, 26 contacts, 5 P.O. type relays, 2 high-speed relays, and a quantity of other material. Contained in an attractive relay rack type metal case 19 x 19 x 9 in. deep. Price 60/- or without valves, 30/-.

PREMIER COIL PACK consists of a wired and aligned Coil Pack of the most Modern Type incorporating such features as Permeability Tuned I.F. Transformers with Litz windings on Polystyrene formers (7KC Bandwidth) Air Dielectric Trimmers, Litz wound medium wave coils, Tuned R/F stage, covers 13-40, 40-120, 200-557 metres. Dimensions of Pack, 6 in. x 44 in. x 2 in. Pair I.F. Transformers, 3-Gang Condenser, Slow-motion Drive and Dial are supplied loose. Complete circuit is supplied. Price complete £3/17/6.

OSCILLOGRAPH POWER UNITS. Input 230 v. 50 c/s. include transformer, metal rectifiers, voltage doubling and smoothing condensers. Type 409, output 900 v. 25/-. Type 410, output 1,800 v. 35/-. Carriage and packing, 15/-. Price complete £3/17/6.

SPECIAL HEADPHONE OFFER. High-grade Double Headphones, using balanced armature units. D.C. Res. 60 ohms, 3/6 per pair. Matching Transformer if required, 2/6 each.


MAINS TRANSFORMERS. Military surplus. All 230 v. 50 cycles input.

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Output</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>500-0-500 v. 150 m/a, 4 v. 2 1/2 a.</td>
<td>35/-</td>
</tr>
<tr>
<td>4</td>
<td>865-0-865 v. 500 m/a. Tapped at 690 v. and 760 v.</td>
<td>75/-</td>
</tr>
<tr>
<td>5</td>
<td>450-0-450 v. 150 m/a. Tapped 300 v.</td>
<td>40/-</td>
</tr>
<tr>
<td>35</td>
<td>300-0-300 v. 250 m/a, 4 v. 3-5 a.</td>
<td>30/-</td>
</tr>
<tr>
<td>36</td>
<td>6-3 v. 1-2 a.</td>
<td>25/-</td>
</tr>
<tr>
<td>30</td>
<td>Output 30 v. 4 a.</td>
<td>20/-</td>
</tr>
<tr>
<td>31</td>
<td>Output 40 v. 3 a. and 104 v. 1 1/4 a. (auto wound)</td>
<td>21/-</td>
</tr>
<tr>
<td>32</td>
<td>Output 700-700 v. 150 m/a, 1,000 v. 30 a.</td>
<td>40/-</td>
</tr>
<tr>
<td>33</td>
<td>Output 38 v. at 2 a.</td>
<td>21/-</td>
</tr>
</tbody>
</table>

C.R. TUBES. We have available a large quantity of E.M.I.4/1 Cathode Ray Tubes, 31 in. diameter, Green Screen, short persistence, 4 v. 1-3 A. Heater. 800 v. H.T. Complete with socket. 17/6 each.

Huge new purchase of Government surplus METERS. All flush mounting. All new—in original makers' cartons.

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>24 in.</td>
</tr>
<tr>
<td>500 microamps. 2 1/2 in.</td>
<td>5/-</td>
</tr>
<tr>
<td>20 v.</td>
<td>2 1/2 in.</td>
</tr>
<tr>
<td>2 1/2 a. 2 1/4 in.</td>
<td>5/-</td>
</tr>
<tr>
<td>5 ma. 23 in.</td>
<td>5/-</td>
</tr>
<tr>
<td>150 ma. 21 in.</td>
<td>6/-</td>
</tr>
<tr>
<td>1 ma. 33 in.</td>
<td>15/11</td>
</tr>
<tr>
<td>500 microamps 3 1/4 in.</td>
<td>19/6</td>
</tr>
<tr>
<td>15 v. 3 1/2 in.</td>
<td>7/6</td>
</tr>
<tr>
<td>5 K Electrostatic</td>
<td>50/-</td>
</tr>
</tbody>
</table>
EDITORIAL

Portable

With the prospect of long summer days, many operators will have ideas about the possibility of a little practical work under outdoor conditions—not only organised field days and VHF outings, but more regular activity with portable equipment.

Under present conditions, transport is of course the biggest problem; certainly, the gear, including accessories, can all be accommodated in a couple of small carrying cases, but the prospect of pursuing one's researches by the use of "public transport" alone is enough to daunt all but the most enthusiastic and determined of operators.

However, there seems to be a prospect of some slight amelioration of the situation in regard to "basic," and apart from that, amateurs have always found some way of overcoming difficulties which at first glance appear almost insuperable.

The GPO will issue on request, at a nominal fee, a /P amendment to the normal station licence, which will allow operation under portable conditions anywhere within ten miles radius of a point designated by the licensee. This is a very valuable concession and a facility of which much good use can be made.

The design and construction of compact and efficient portable apparatus calls for a high degree of technical skill, and the achievement of good results with inputs of a few watts to such apparatus can be a very satisfying reward. For those hemmed in by bricks and mortar, there is also a lot of interesting and instructive work to be done with different types of aerial, which can usually be prepared beforehand and slung up quickly at the site.

We would suggest that amateurs generally give much more attention to the practical problems of operation under portable conditions—there is much valuable experience to be gained and huge enjoyment to be derived from a day spent at a /P location.

Anon 1957/58.
Wide-Band RF Pre-Amplifier

British Version of the "R9'er"

By G. A. HUME (G5UX)

(It is widely known that a good RF pre-selector will improve almost any communications receiver, especially at the upper end of the tuning range. The "R9'er" has been well spoken of in the States for the past year. It is a broad-band fix-tuned RF amplifier and is claimed to give high gain on 28 mc. Here are the details of a unit on the principle of the "R9'er" and designed for 10 metres.—Ed.)

As a result of numerous contacts with American stations, the writer became interested in an RF amplifier known in the States as the "R9'er." Every station using this amplifier was very impressed with the gain, performance and particularly with the fact that the unit was small, could be built into existing receivers and required little or no tuning. A few enquiries round the local stations revealed a growing interest in this amplifier although information regarding mechanical layout and design was extremely sketchy and components were apparently difficult to come by.

With the assistance of several W's, particularly W6LRU, mechanical details and photographs of the original design were obtained and it was decided to build the unit using components which could be bought fairly easily in this country.

This article has been written at the request of numerous stations operating on the 10-metre band who had obtained some information and circuit arrangements from the States but who had had little success with the completed job. No originality is claimed for the amplifier, which was devised and built by the G.E. Co. of America and originally published by them in December 1946—but a great deal of spadework has been done in getting the unit working with British components.

The writer's prime interest was to obtain maximum performance on 28 mc, particularly as the majority of modern communication receivers tend to fall off when approaching this frequency; hence, the unit has been built for that band only, although in the original design a system of plug-in coils enabled it to be used on 14, 28 and 56 mc. After several months of experimenting a design was evolved which gives considerable gain and has an excellent signal-to-noise ratio.

Performance Characteristics

The unit to be described is an electronic impedance matching device and a broadband amplifier giving maximum performance on 28 mc. The gain achieved depends to a certain extent on how well the receiver is matched to the receiving aerial, but the minimum gain which may be expected is from 25 to 30dB. This is actual measured gain and was checked and rechecked using several communication receivers, including the National HRO and NC100XA.

The gain is obtained in two ways—first by careful input and output matching. In the normal amateur station the aerial-to-receiver matching is given very little consideration, although considerable time is usually spent in matching the radiating system to the transmitter. In these days of multi-element aerials on the higher frequencies, increased power and generally higher efficiency, it is the writer's belief that the limiting factor in any amateur station is the receiver. In broad terms, almost irrespective of power it is possible to work practically anything that can be received.

The majority of communication receivers have, according to the manufacturers, a nominal input impedance of 250 to 500 ohms. This may be perfectly true for the lower frequencies, but tests have revealed that the input is nearer 2,000 ohms at 28 mc. This discrepancy is bad enough, but usually a 72-ohm line links the receiver to the aerial, and so the loss in gain due to the mismatch is considerable.

A series of tests was carried out using several aerials with different receivers and it was found that by careful attention to this matter of matching the aerial into the receiver gains varying between 5 and 20 dB could be obtained.

Apart from the increase possible by careful input and output matching, the
General layout in G5UX's version of the "R9'er."

American 6AK5 miniature valve acting as a broad-band amplifier will give an additional gain of up to 25dB. At the writer's station 'phone carriers which could only be detected by using the BFO were resolved into quite intelligible and workable speech by use of the unit to be described.

Circuit

Referring to Fig. 1, the circuit arrangement consists of a broad-tuned grid, a broad-tuned plate, a standard cathode circuit and an adjustable screen supply. The by-pass condenser C5 is used in order that the variable C7 may be operated with the stator grounded. Co-ax cable or twin transmission line may be used for both the input and output sides, and in the case of single-wire feed it should be connected to the junction of C1 and C2.

Condensers C1, C2, C6 and C7 form the impedance matching input and output circuits, and with the constants shown the unit will match any input or output impedance from 40 to 2,700 ohms.

It is very important that the other circuit values should be strictly adhered to—even in the case of by-pass condensers—otherwise the band-width is upset. The measured band-width of the unit is approximately 1 mc at 28 mc, and over this range the unit will give reasonably uniform gain. The general construction and layout is important, the 6AK5 being mounted horizontally with the grid-pin projecting on one side of the screen. The actual positioning of components is not too critical and providing reasonable care is taken no trouble should be experienced. Inadequate shielding may lead to instability and will prevent the unit from functioning properly.

Constructional Details

The unit is built in a 3 in. x 4 in. x 5 in. aluminium box and all components are mounted on the front panel. The dividing screen between grid and plate circuits is made of 3 in. x 4 in. x ½ in. aluminium and it is essential that this be a good fit and securely bolted to the front panel.

Three plugs are provided as follows: at the top for the output, the middle for power supply and the lower plug is the input. Two further screens are mounted on the main screen, the upper one carrying the change-over switch and the lower one the screen potentiometer. A further small
screen shields the input and the valve itself is also screened.

The coils are mounted on either side of the main screen, the adjustment of the coverage being through clearance holes in the front panel, and the screen carrying the switch is built across the valve holder so that the grid is entirely screened.

Little difficulty should be experienced with the actual construction as in the writer’s case the unit was built entirely from photographs. The original coil formers were made of ceramic with a brass slug (Millen type), but these are of course unobtainable in this country. It was, however, found that amongst the surplus RAF material at present on the market were some 12 mc IF transformers. These formers have an adjustable dust-iron core and seemed to be suitable for the job. Numerous checks were made and it was found that by modifying the number of turns the coils proved to be just as good as the original ceramics, although a compromise had to be struck on the question of band-width. The band-width with the original ceramic formers with brass slug, together with the 7,000-ohm damping resistor, was approximately 2 mc, whereas with the dust-iron core no better than 1 mc could be obtained. The 1 mc band-width at 28 mc was considered satisfactory, especially as the normal operating band for G stations appears to be about 1 mc, i.e. mostly between 28 and 29 mc.

The gain of the unit is almost entirely dependent on the construction of coils, and it is stressed that the wire gauge must be right and the coils wound in one layer so as to obtain maximum Q. Enamelled wire may be used providing there is no sign of the enamel being cracked or chipped.

The matter of stressing maximum Q may at first seem a little strange when the coils are heavily damped with the 7,000-ohm resistor; but a little consideration will show that unless maximum Q is obtained in the undamped state the band-width will be materially altered when the damping resistor is added. The band-width should depend entirely on the resistor and the distributed capacities across the circuit.

With the unit as finally constructed the band-width can be roughly checked by setting the frequency to 28.5 mc and then carefully tuning over the band 28-29 mc. The background noise should be fairly constant over this range, falling off slightly at the ends. If it is found that the band-width is greater than 1 mc and it is impossible to obtain greater coil efficiency, the 7,000-ohm damping resistor should be gradually increased until the band-width is approximately correct.

**Operation**

With the input and output connections made to the aerial and to the receiver, the switch S should be set so that the amplifier is cut out and the receiver tuned to a signal in approximately the centre of the band. The amplifier should then be switched in, the screen control set to approximately half-way position and the condenser C2 tuned, together with L1, until the signal is heard. The signal should then be adjusted to maximum by tuning L1, adjusting C2, retuning L1, readjusting C2, and so on. This process should then be repeated with the plate circuit C7 and L2. If C1 is found to be at maximum capacity the length of the aerial must be altered. Conversely, the length of the line between the receiver and the amplifier must be altered if C7 does not tune near its middle capacity setting. To correct this, add a quarter wave and prune, until the condenser peaks the signal at approximately centre scale.

With the unit finally peaked, the screen

---

**Table of Values**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C6</td>
<td>5 µµF ceramic</td>
</tr>
<tr>
<td>C2, C7</td>
<td>100 µµF</td>
</tr>
<tr>
<td>C3, C4, C5, C8</td>
<td>0.0005 µF mica</td>
</tr>
<tr>
<td>R1, R5</td>
<td>7,000 ohms, 1-watt</td>
</tr>
<tr>
<td>R2</td>
<td>200 ohms, 1-watt</td>
</tr>
<tr>
<td>R3</td>
<td>15,000 ohms, 1-watt</td>
</tr>
<tr>
<td>R4</td>
<td>25,000 ohms, heavy-duty potentiometer</td>
</tr>
<tr>
<td>R6</td>
<td>10,000 ohms, 1-watt</td>
</tr>
<tr>
<td>L1, L3</td>
<td>13 turns 28 SWG on slug-tuned former</td>
</tr>
</tbody>
</table>

---

**Circuit of G5UX’s version of the American “R9’er.”**
potentiometer should be adjusted for maximum output consistent with minimum screen volts. Once these adjustments have been made the unit may be forgotten as far as the operator is concerned, for it will give maximum output over the entire band without any additional tuning.

The unit as described will give excellent pre-amplification gain over the 10-metre band, and stations have been worked that were inaudible on the original receiver. When the receiver is required to operate on other bands the amplifier is switched out by means of switch S1/S2.

It is hoped that in a further article it will be possible to give details of a system of plug-in coils for use on 5, 10 and 20 metres. The writer is indebted to the G.E. Co. for the original data on what they have called the "R9'er."

---

Crystal-Checked VFO Drive

Economical Method of Calibration

By R. J. DONALD (G3DJD)

EVERYONE agrees that a good VFO has certain definite advantages over the crystal oscillator in the exciter stage of an amateur transmitter—but it also has certain definite disadvantages, not least of which is the necessity for some form of frequency measuring gear. The GPO rightly insist on equipment of very high accuracy in this respect, and the regulations lay down that it must be used whenever the frequency of the transmitter is changed.

Crystal wavemeters as such have two disadvantages; first, they can be expensive even when bought on the surplus market, and secondly, they require a good deal of attention on the part of the operator when in use. The writer recently found himself faced with the preliminaries to getting on the air for the first time and therefore set to work to produce something which would (a) satisfy the GPO, (b) not involve too much expense, and (c) allow foolproof one-hand operation without sacrificing accuracy.

The notes below explain how this was achieved.

The Principle

The usual method of frequency measurement is to compare the VFO fundamental with the harmonics of a crystal standard such as a 100 kc bar, but equally accurate frequency measurement can be carried out by comparing the harmonics of the VFO with the harmonic of a suitable standard such as a 1 mc crystal oscillator. In the latter case, of course, the beats will not be equally spaced, nor will they be of equal strength, but that does not matter.

In practice a triode valve such as the triode section of a 6K8 frequency changer can be operated as a reference standard with a 1 mc crystal in its grid circuit and its tank tuned to give steady oscillation. With about 100 volts of stabilised HT, it will generate a long line of harmonics extending into the very high frequencies. If a signal from the VFO (which of course also contains a harmonic content) is fed into the mixer grid of the 6K8, beat notes will appear in the anode circuit of the valve. Whenever the sum or difference between a harmonic of the VFO and a harmonic of the crystal falls within the tuning range, a beat note will appear. A stage of resistance-coupled AF amplification will increase the strength of these beats, with headphones as an indicating device in the anode circuit. Fig. 1 shows the circuit.

Construction

It is not proposed to go into great detail regarding the construction of the unit, since anyone who decides to use the system will have their own ideas on the subject. Harmonics from the crystal up to the 46th at least are required, and therefore suitable care must be taken with the choice of components. The valveholder for the 6K8 should be ceramic and the

---

This article describes how a 1 mc crystal oscillator can be employed to provide calibration check points for a VFO. Though applied to a Type 145 driver unit, the system is adaptable to any VFO, using crystals of different frequencies and known calibration.—Ed.
short wave magazine
April 1948

G3DJD’s circuit for applying a 1 mc crystal calibrator, with AF amplifier, to the Type 145 Oscillator. The method of taking out check points is described in the text.

condensers C1 and C2 should be silvered mica type. If the unit is to be built into a low-power VFO unit, care must be taken to keep the VFO oscillator and the crystal oscillator well apart to prevent RF from the crystal side getting into the drive circuit. Coupling to the mixer valve should be from the last buffer, and the unit must be carefully shielded.

The writer was fortunate enough to obtain an Oscillator Type 145. This is an excellent unit containing an 807 as drive oscillator, and covers from 1.8 to 8.0 mc in two bands, with a dial that can be read to very high accuracy. In its Service use it is operated with about 500 volts HT, and it contains four neon regulators to stabilise this voltage.

First, one of these was removed so as to use it on just under 400 volts, and the screen voltage reduced somewhat so that the anode current fell to about 15mA. Some other unwanted parts were also removed and room was thus made for the 6K8, crystal and oscillator tank coil contained in a small can, on the top deck of the 145 chassis and to the rear, with their associated parts grouped around the valve holder below the chassis.

A 6C5 audio stage was fitted in the mounting previously accommodating the stabiliser, and a 'phone jack was mounted on the front panel. This jack was arranged so that removing the plug disconnected the HT from the crystal oscillator anode as well as from the AF amplifier, so as to prevent stray pick up of 1 mc harmonics in the receiver.

<table>
<thead>
<tr>
<th>Table of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 1. Crystal Checker for the VFO</td>
</tr>
<tr>
<td>C1 = 0.00001 µF</td>
</tr>
<tr>
<td>C2 = 0.002 µF</td>
</tr>
<tr>
<td>C3, C4 = 0.5 µF</td>
</tr>
<tr>
<td>C6 = 0.05 µF</td>
</tr>
<tr>
<td>C7 = 25 µF, 25 volt DC</td>
</tr>
<tr>
<td>V1 = 6K8</td>
</tr>
<tr>
<td>V2 = 6K5 or similar</td>
</tr>
<tr>
<td>R1, R6 = 1 megohm</td>
</tr>
<tr>
<td>R2 = 68,000 ohms, 2 watt</td>
</tr>
<tr>
<td>R3 = 100,000 ohms, 1 watt</td>
</tr>
<tr>
<td>R4 = 30,000 ohms</td>
</tr>
<tr>
<td>R5 = 300 ohms</td>
</tr>
<tr>
<td>R7 = 500,000 ohms</td>
</tr>
<tr>
<td>R8 = 1,000 ohms</td>
</tr>
<tr>
<td>L1/C5 = 1 mc</td>
</tr>
<tr>
<td>Xtau = 1 mc</td>
</tr>
</tbody>
</table>

(Broadcast aerial coil with coupling winding removed and compression type -0.01 µF trimmer.)

Xtal = 1 mc

(Should a high tension supply of 400 volts not be available, a lower voltage might be used, R2 and R3 being reduced in value to suit. R2 could be omitted and R3 replaced by a small choke such as may be salvaged from a dismantled battery eliminator.)

Calibration

It will be clear that a very large number of beat notes will be audible and the first job is to sort them out—but this is not nearly as difficult as might be expected. By a little simple arithmetic the points on the VFO range which will result in beat notes can be worked out beforehand! To do this first write down a list of crystal harmonics and divide each by whole numbers thus:

6000 ÷ 2 = 3000 |
7000 ÷ 2 = 3500 |
8000 ÷ 2 = 4000 |
9000 ÷ 3 = 3000 |
10000 ÷ 3 = 3333.3 |
11000 ÷ 3 = 3666.6 |
12000 ÷ 3 = 4000 |
13000 ÷ 4 = 3250 |
14000 ÷ 4 = 3500 |
15000 ÷ 4 = 3750 |
16000 ÷ 4 = 4000 |
17000 ÷ 5 = 3400 |
18000 ÷ 5 = 3600 |
19000 ÷ 5 = 3800 |

When the quotient expressed in kc falls within the normal tuning range of the VFO a beat will be heard in the 'phones when it is tuned through that frequency. For example, when the VFO is tuned to exactly 3666.6 kc its third harmonic will be on 11 mc and will be at zero beat with the 11th harmonic of the crystal oscillator.

For the benefit of anyone who might care to use the system with a VFO covering 3-5-3-8 mc, a list of check points used at G3DJD is given in a separate table.

When worked out and identified on a calibrated receiver the check points should be plotted on a large-scale graph.

Operation

If the audio output is wired into the headphone circuit of the receiver, operation becomes simple, quick and completely legal. One cannot shift frequency more than a few kc without passing a beat note,
Beat-notes and Harmonic Relationship in the 3.5-4.0 mc Range with a 1 mc Crystal

<table>
<thead>
<tr>
<th>f(V2O Freq. (fundamental)</th>
<th>Order of Harmonic</th>
<th>-1 mc Xtal Harmonic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>to nearest kc</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>3.500</td>
<td>2</td>
<td>47</td>
</tr>
<tr>
<td>3.538</td>
<td>7</td>
<td>46</td>
</tr>
<tr>
<td>3.545</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>3.571</td>
<td>12</td>
<td>39</td>
</tr>
<tr>
<td>3.583</td>
<td>5</td>
<td>32</td>
</tr>
<tr>
<td>3.600</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td>3.625</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>3.656</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>3.700</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>3.714</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>3.727</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>3.750</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>3.778</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>3.800</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>3.900</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>4.000</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

and a rapid glance at the graph will satisfy the operator as to his frequency.

Before making the final calibration chart, it is desirable to make sure that the crystal really is what it purports to be. In the case of 1 mc crystals this can be done easily by checking the second harmonic against the standard frequency transmission from GMT on 2 mc (this is radiated daily from 10.00 to 10.15 hrs on weekdays)—or on the various frequencies of WWV.

Correct operation of the following stages of the transmitter should be carried out by means of an absorption type wavemeter, as in the case of crystal control.

Conclusion

Of course, there is no special reason for using a 1 mc crystal; any crystal of known and checked calibration accuracy could be employed. One ground for 500 kc, or for a frequency in the 1.7 band would be quite suitable, except that there is the added complication in the initial working out of where the beats should appear.

When applying for his licence the writer explained the apparatus described here and also said that he was not in possession of a crystal wavemeter as such. The licence was duly granted, so that it may safely be assumed that the system meets with official approval.

UNLICENSED GERMAN STATIONS

Once again—all calls other than those prefixed D2, D4 and D5 are pirates operating in defiance of their respective Zone authorities. It does not make the task of our own people in Germany any easier if the DA’s are encouraged in their unlawful activities by finding that G’s are prepared to work them. We know that the DA’s now have what amounts to an “underground” organisation, which has divided the country into “call areas” for the purpose of “issuing 2 licences.” We know that they operate a QSL-Bureau, and are ready to exchange cards for all contacts made. But we also know that such activities can only delay in the long run the issue of licences to those German nationals who are not breaking the law, and that the DA’s caught are not just getting off with a fine and a reprimand—they are “going inside” for six months.

We agree that all this is very hard on the keen German amateur who just wants to be on the air like the rest of us, with no fell intent or evil purpose. But the thing to remember is that if the outcome of the war had been the other way, the penalty for defying the occupying authority in this manner would have been the bullet, with no time wasted. The Nazis would not for a moment have tolerated anything in the nature of amateur operation, which even in their own country was very tightly controlled before the war—on much the same lines, incidentally, as it is in Russia to-day.

Our suggestion is that all G’s should reflect on these facts before calling or working a known pirate in the Occupied Zones of Germany.
Simple CW Monitor

Design, Construction and Operation

By J. HUM (G5UM)

In recent months several descriptions have been published of 'phone monitors, but few if any of CW monitors—suggesting almost that 'phone is more important than CW! Though telephony stations may make their presence on the amateur bands more obvious than CW stations it is probably true that the latter outnumber them several fold; it is felt that the design of a good and reliable—but ultra-simple—CW monitor will have a considerable appeal. Particularly for the new "G3-plus-three's" coming on in large numbers at the present time, such a piece of equipment will be found most useful, because in the early, ab initio days of halting Morse sending (ex-Service operators excluded!) some means of checking the character of the transmitted telegraphy is practically indispensable.

In the writer's description of the "No Cost Five" in the September Short Wave Magazine the suggestion was made that monitoring of the transmitter in question could easily be effected by means of a simple 1-valve reacting detector housed in a screened box. It is now proposed to describe this useful piece of equipment in more detail.

Battery or Mains?

Tradition has it that a CW monitor should be a completely self-contained battery-driven device capable of being carried round the room if desired, completely independent of the main transmitter. While designs of that type have their attractions they suffer, in the writer's estimation, from a quite unnecessary "messiness." The batteries must be contained within the case, in which position all too frequently they set up corrosion—yes, even when they are of the "all-dry" type. Moreover, in battery-operated monitors it is necessary to employ types of valves which are probably not used in any other equipment in the station, thus complicating the spares problem; on the other hand, those ancient 2-volt battery valves can often be used up in such equipment, if one is prepared to accept their associated batteries, and the fact that they have poor performance at the higher frequencies.

Discarding the traditional form of battery-driven CW monitor, the writer sought to design a more up-to-date mains operated type which would meet all the requirements demanded by present-day conditions. Its specification was set down as follows:

1. It should be compact, and take up the minimum possible space on the operating desk.
2. It should employ only one reacting detector valve.
3. It should tune to all amateur bands from 160 metres to 10 metres, using switchable coils for quick band-changing.
4. It should have one-knob control, and no fiddling adjustment of regeneration should be necessary.

The circuit of the monitor is shown in Fig. 1. It meets the requirements mentioned in the following respects:

1. It is compact, and is housed in an aluminium case measuring 8 ins. tall by 5½ in. wide by 6 in. deep. Any metal case would do, of course, provided it were equally economical of bench space. Small biscuit tins, or even those cylindrical jobs beloved of manufacturers of milk foods would do—do very well, in fact.
2. Its single valve is the ubiquitous—one might almost say inevitable—EF50, triode-connected for maximum donibility as in the original "All EF50 TRF Receiver."
3. Three sets of coils are provided which cover the five major amateur bands. Since switchable coils are used no attempt has been made to add the 5-metre band to this monitor, though the more ambitious constructor should not find this a very difficult proposition.

As is customary at G5UM, the monitor was made up from parts which happened to be lying unused in the junk box. Among those parts was a Polar "Ideal" condenser, which is—literally—ideal for a job of this nature. It employs a built-in slow-motion movement which is absolutely silent in operation even at 10 metres, and it has two concentric knobs giving direct or slow-motion drive. These are marked in degrees, which is perfectly adequate for use in a monitor, where precise scale calibration is unnecessary. Its capacity of 250 μF enables it to tune to two amateur bands with any one coil. If this type is not available any well-built variable condenser of the same capacity will serve.
Fig. 1. Circuit diagram of the band-switched monitor.

### Table of Values

**Fig. 1. Simple CW Monitor**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>250 µµF, with slow-motion drive</td>
</tr>
<tr>
<td>C2 grid condenser</td>
<td>100 µµF</td>
</tr>
<tr>
<td>C3 pre-set reaction</td>
<td>100 µµF</td>
</tr>
<tr>
<td>C4 audio coupling</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>C5 hum-bucking</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>R1 grid leak</td>
<td>2 megohm</td>
</tr>
<tr>
<td>R2 anode load</td>
<td>30,000 ohms</td>
</tr>
</tbody>
</table>

**Coils:**

- 160/80: 60 turns grid, 15 turns reaction, 36 SWG
- 40/20: 15 turns grid, 8 turns reaction, 24 SWG
- 20/10: 4 turns grid, 2 turns reaction, 24 SWG

All on 1-inch diameter bakelite formers, close-wound. Slight variations in number of turns may be needed to take up variations in individual circuit layouts.

RFC1, RFC2 = Ordinary broadcast type chokes.

### Adjusting the Coils

As the diagram shows, a multi-contact wavechange switch is employed. Three of its contacts bring in the grid coils. Three others bring in the reaction coils. In point of fact, there is no need to switch the reaction coils, because they do no work when their respective grid coils are out of operation, but for maximum circuit isolation the constructor may prefer the slight additional complication of the extra switching. Incidentally, a single-wafer Yaxley with two sets of three contacts each is all that is needed for the wavechange switch.

Because a monitor of this type should for preference employ one knob control, no variable reaction condenser is provided on the control panel. Indeed, a slot-adjusted variable air condenser is mounted on the chassis deck, pre-set once and for all. This necessitates a certain amount of juggling with the position of each reaction coil in relation to its grid coil to ensure that steady oscillation is obtained on each band, but the exercise of a little patience in this respect is well repaid. Of course it is possible to take the easy way out and mount the reaction condenser on the front panel so that it can be adjusted for oscillation on each band, but that rather defeats the object of making the monitor one-knob control.

Unless the constructor is very lucky it is unlikely that he will obtain oscillation on all bands at exactly the same point on C3. This does not matter at all, because no attempt need be made to have the EF50 just on the verge of oscillation —its most sensitive state—since it will not be required to pick up weak signals. All it is called upon to do, in fact, is to pick up a strong signal from the station transmitter, and "verge of oscillation" working is not needed for that. If oscillation cannot be obtained the reaction windings should be reversed. If still "no joy" add more reaction turns—but cut them down later to the minimum needed to sustain oscillation.

When steady oscillation has been obtained on each band, the reaction coils should be fixed permanently in position with Chatterton's Compound. The "20/10" coil will probably be the most difficult to adjust to ensure that the monitor oscillates smoothly and steadily on 20 metres with the tuning condenser almost full in but does not go into violent squeging on 10 metres when the tuning condenser is almost full out.

### Other Features

Some simplification of the output circuit may be achieved by eliminating R2 and inserting the headphones in its place (eliminating C4 as well, of course).
If then the headphone jack were not made self-closing the monitor HT would be switched off when the headphones were withdrawn. Personally, the writer prefers the arrangement as shown, with a separate on-off switch to remove the monitor signal from the receiver. The choke RFC1 may not be necessary. If the monitor works satisfactorily without it then eliminate it! The choke RFC2 is intended to isolate the HT input lead to prevent too much RF being picked up from outside.

**Power Supply**

The monitor requires the usual 6.3 volts for its heater, and a low value of HT for its anode, both of which may be obtained from any external power pack feeding other equipment and capable of sparing another 5 or 6 mA.

An HT voltage of 50 should be quite adequate. It may even be found too high. The compromise at which to aim is steady oscillation on all bands without paralysis of the detector on any of them. The detector will almost certainly be paralysed by a strong local signal if too high an HT voltage is applied to it.

**Operation**

Before putting the monitor into operation it should be roughly calibrated by beating it against a transmitted signal and noting the scale reading at which each band appears. The coils have been proportioned so that they cover one amateur band at the top end of the condenser travel and another at the bottom end. Minor adjustments should be made to the coils to achieve this coverage.

While the monitor is being calibrated the constructor should observe whether it is receiving a clean, pure note from the transmitter or whether it is "killed" by the transmitted signal. As has been said, too much HT voltage may cause this effect. On the other hand, more adequate screening of the monitor might cure it. If the signal picked up should be too weak a short "aerial" consisting of six inches of covered wire can be soldered at point X in Fig. 1 and carried through a hole in the side of the cabinet. Unless the monitor produces a pure, clean beat-note from a local signal it is worse than useless.

The monitor, will, of course, pick up harmonics from the transmitter. These should never be used; they do not give an accurate picture of the transmitted signal. Only by listening on the fundamental can an operator determine exactly the quality of his telegraphy. Whether for instance, it is emitting "whiskers" on either side of the fundamental, or whether his VFO is as chirpy as some of those we hear.

To employ the headphones at will with either the monitor or the receiver a switching arrangement should be employed. A double-pole change-over toggle switch mounted on a small panel is connected so that the headphones may be thrown over to either piece of equipment.

Fig. 2. Suggested mechanical layout for construction of the monitor.
The Type 145 Oscillator

Design Details—Circuit Arrangement—Operation as VFO

by N. P. SPOONER (G2NS)

WHILE more and more Government surplus equipment becomes available, the flow of authentic information concerning much of it appears to be meagre in comparison. The Type 145 oscillator is no exception, and although a considerable number are now in amateur use, there are many interesting points about the equipment still not generally realised.

An Air Ministry publication records the coverage of the war-time ground station transmitters of American make (officially labelled as the ET4332 and the ET4336) as being from 2 to 20 mc, with the CO operating on its fundamental frequency. Apparatus Kit Type 74/74A was then designed to provide for these transmitters additional MO control by means of the Type 145 oscillator and the Type 392 power pack, both of which would bolt to the side of the main transmitter cabinet. These two units were common to both kits, but the 74 included a Type 38 aerial coupler that would fit into the top of a transmitter. Since their post-war release for sale it is to the Type 145 oscillator that amateurs have been attracted.

Power Pack

Commencing with the 392 power pack, this consists below chassis of three 4 μF 1,000-volt working condensers and one 10H 70 mA LF choke. Above chassis is an AC mains transformer tapped for 200 to 245 volts input and giving outputs of 700-0-700 volts at 70 mA, 4 volts at 2-5 amps for two CV54 or VU133 rectifiers, and 12.5 volts at 1 amp for the heater of the 807 valve (CV124 or VT60A). This 12-5-volt supply was to be barrettered down to 6-3 volts to maintain a steady heater current under mobile operating conditions. The top-deck components are the two rectifiers and a 20,000-ohm, 45-watt voltage-dropping series resistor. While it is generally accepted that a "nominal 600 volts" should be supplied to the unit it will be found that the four CV45 neon stabilisers will fail to strike with too low a voltage, while with too high a one they will over-work themselves without properly stabilising the supply. About 120 volts are dropped across each of the neons, rated as having a "maximum striking voltage of 180 and a normal stabilised voltage of 130." It therefore amply repays one to experiment with the HT voltage until the happy medium is found where a meter in the HT supply line to the unit shows practically the same steady reading of round about 50 mA or so whether the key is open or closed.

Under Service conditions the 807 was rated as having a plate dissipation of 25 watts with 300 volts on the screen and 600 volts on the plate. Keying is in the...
Circuit of the 145, less crystal switchins. The unit is neon-stabilised and will give an excellent drive output on 3.5 and 7 mc.

Table of Values

<table>
<thead>
<tr>
<th>Type 145 Oscillator</th>
<th>C1, C2 = 560 µF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C3 = 240 µF</td>
</tr>
<tr>
<td></td>
<td>C4, C11, C12, C15, C16 = 0.01 µF</td>
</tr>
<tr>
<td></td>
<td>C5 = 47 µF</td>
</tr>
<tr>
<td></td>
<td>C8 = 200 µF</td>
</tr>
<tr>
<td></td>
<td>C9 = 0.1 µF</td>
</tr>
<tr>
<td></td>
<td>C10 = 50 µF</td>
</tr>
<tr>
<td></td>
<td>C13 = 100 µF</td>
</tr>
<tr>
<td></td>
<td>C14 = 40 µF</td>
</tr>
<tr>
<td>R1, R2, R3, R4</td>
<td>1,000-ohm, ½-watt</td>
</tr>
<tr>
<td>R6</td>
<td>4,700-ohm, 1 watt</td>
</tr>
<tr>
<td>R7</td>
<td>33,000-ohm, 1 watt</td>
</tr>
<tr>
<td>R9</td>
<td>20,000-ohm, ½-watt</td>
</tr>
<tr>
<td>R10</td>
<td>1,000-ohm, 1 watt</td>
</tr>
<tr>
<td>R11</td>
<td>150-ohm, ½-watt</td>
</tr>
<tr>
<td>R12</td>
<td>100,000-ohm, ½-watt</td>
</tr>
<tr>
<td>V1, V2, V3, V4</td>
<td>CV45 neon stabilisers</td>
</tr>
<tr>
<td>V5</td>
<td>807 (CV124 or VT60A)</td>
</tr>
<tr>
<td>V6</td>
<td>Burrettor</td>
</tr>
<tr>
<td>L1</td>
<td>Grid Coil</td>
</tr>
<tr>
<td>L2</td>
<td>Feed back</td>
</tr>
<tr>
<td>L3</td>
<td>Plate Coil</td>
</tr>
<tr>
<td>RFC</td>
<td>1.5 mH RF choke</td>
</tr>
<tr>
<td>A1</td>
<td>Keying relay</td>
</tr>
</tbody>
</table>

Each component is numbered for identification and reference, some having also a stores reference number. A condenser and resistor mounting-board below chassis reading from front panel towards rear of unit holds R1 to R4, R6, R7, C7, C6, R10, C9, RFC, R14, R13. Viewed from underneath, the valve-holder panel holds R12 and C13 above L2, C15 with C11 and C12 below L2 and to the right of L2 is R9 and C5. A 100,000-ohm resistor R12 and a 0.01 µF condenser C15 form an effective key-click filter. The 807 plate lead includes a 150-ohm parasitic suppressor R11 and the cathode is given a small positive bias by voltage drop across 1000-ohm R10.

The front-panel main tuning dial by means of gear-drive simultaneously adjusts the grid coil L1 and the plate coil L3, and the number of whole turns in circuit in both coils appears in the calibration window, while the fractions of a turn can be taken from the dial circumference, readable to one tenth of a degree. This is accurate and extremely useful when re-setting to a desired frequency. As the main tuning dial is operated a contact wheel travels along the windings of each coil and it pays to keep condenser spindles, coil spring leaves, coil windings and contact wheels free from dirt and dust by occasional brushing with “Thawpit,”...
commercial alcohol or carbon tetrachloride in order to avoid a poor wheel-contact, producing an annoying row of "whiskers" on the signal. These will be heard and quickly found in a monitor or when beating against a received signal. Likewise, if the locking knob of the main tuning dial is screwed home too tightly these whiskers may again reappear.

The front-panel fine tuning dial is used to rotate a cam and rock a bar that will move the coil driving shaft through one division for slight QSY after the locking knob on the main tuning dial has been screwed home. With the locking knob unscrewed the fine tuning dial becomes inoperative.

Condensers C1 and C2 have a fixed plate mounted on zero temperature-coefficient metal and a moving plate mounted on brass rods. Expansion and contraction of these rods varies the compensating plate-gap and stabilises the oscillator frequency with changes of temperature. Three sockets on the front panel accommodate any one crystal-holder having either British or American pin-spacing. The front panel dial marked "Anode Trimmer" adjusts the 50 µµF condenser C10 for maximum output. Greater output as indicated by bulb or neon strike from the plate or top end of the plate coil L3 can also be had if the number of turns in the plate circuit is altered by lifting the contact wheel from its normal position on the winding and replacing it elsewhere.

Switching

Front-panel switch S1 has four wafers operated by shaft-drive below chassis and two wafers above chassis operated by gear-drive. In position 1 the switch gives crystal operation over 2 to 4 mc and in position 2 from 4 to 7.5 mc. In position 3 master oscillator (or VFO) operation is obtained for 2-4 mc and 4-7.5 mc in position 4. For VFO operation, therefore, only positions 3 and 4 are of interest and in these circumstances the 807 cathode, grid and screen form a Colpitts type of oscillator. The tuned circuit L1/C1/C2 is between grid and earth, but the screen (oscillator plate) is held at earth potential by condenser C13 and the cathode is returned to the mid point of condensers C1 and C2. Electron coupling takes place and the plate circuit is at twice the grid frequency in switch position 3 (2-4 mc). In position 4 (4-7.5 mc) the plate circuit is set at three times the fundamental frequency. The figures stamped on the switch dial therefore refer to the output frequency and not to the fundamental of grid circuit L1/C1/C2, which is always one half or one third the frequency of the plate circuit when operating as a master oscillator.

Above 7.5 mc further frequency multiplication must take place in the transmitter itself. In position 3 (2-4 mc) condenser C8 reduces the frequency by means of switch section S1b, and likewise condenser C3 across the grid coil by means of section S1f. A higher plate voltage is required for MO (VFO) operation than for crystal; to maintain an equal output under all conditions switch section S1a connects the plate direct to HT in positions 3 and 4, and thus eliminates the extra drop of about 120 volts across neon VI, which remains in circuit in positions 1 and 2.

Resistances R6, R7 and R10 form a
potentiometer for tapping off the required voltages for the 807 screen (oscillator plate) which, when doubling in position 3, is connected by $S_{1c}$ to the junction of $R_{6}$ and $R_{7}$. Higher voltage is required when trebling in position 4 and $S_{1c}$ therefore goes to the top of $R_{6}$.

Output Coupling

A 2-ft. length of Uniradio 43 was meant to couple the output of the Type 145 to existing transmitters if the following modifications were effected in the transmitter CO stage: (1) Removal of the feed-back condenser between CO plate and grid. (2) Removal of crystal-holder from crystal sockets, together with removal of lead from socket to earth. Crystal position taken by a 2.2 $\mu F$ fixed condenser. (3) The insertion of a 150-ohm half-watt stopper in the grid of the CO, and (4) Insertion of a 68,000-ohm 2-watt resistor between screen and earth, to discharge the screen by-pass condenser in the key open position.

When the first stage of the transmitter was to act as a buffer, the RF output connector from the Type 145 was to be plugged into the originally earthed side of the transmitter crystal socket, so that the additional 2.2 $\mu F$ condenser coming into series with the 145 RF output condenser $C_{14}$ reduced the coupling between driver and transmitter. When, however, the first stage of the transmitter was to frequency multiply, the RF connector was to be plugged into the grid side of the crystal socket in order to leave the 2.2 $\mu F$ condenser out of circuit.

The Type 145 unit is supplied with two barretters, one of which is a spare; if these are removed with their holders, and also the bracket supporting the RF output socket and the keying relay connection panel, then a very useful space will have been cleared into which can be built another 807 buffer, doubler or final stage. An upright metal shield can be placed close up to the oscillator 807 and the plate coil $L_{3}$, with the second 807 mounted horizontally behind it, so that its grid is close to the oscillator output condenser $C_{14}$. The cabinet side-panel with the ventilation louvres can be removed (5 screws) and its place taken by a new piece of metal having the top right-hand corner cut out through which opening the new 807 stage can be tuned and coil-changed.

Applications as Driver

Several methods of coupling to the transmitter are possible. Although not tested by the writer in such a manner there appears no reason why the unit should not be used as a single valve QRP ECO Tx for 3.5 and 7 mc by linking the aerial coupling coil to the cold or nearest chassis end of plate coil $L_{3}$.

The other methods actually tested have been as follows: With the oscillator on 3.5 or 7 mc straight into the grid of the suggested new 807 stage alongside. This can in turn pass on 3.5, 7 or 14 mc RF to the aerial coupling coil via link—or if a 14 mc doublet is in use, straight out to the aerial by one or two turns. Alternatively, the oscillator output on 3.5 or 7 mc can go straight into the transmitter crystal stage grid via co-axial. Again, if the transmitter happens to be CO, buffer or doubler and final the oscillator can drive the new 807 stage for doubling to 7 or 14 mc. This can skip the transmitter CO grid and be linked instead to the CO plate coil, which then acts as a tuned input circuit to the trans-

General arrangement of the parts in the Type 145 Oscillator. The keying relay is on the upper deck between the 807 (right-hand valve) and one of the four voltage stabilisers.
mitter buffer-doubler. This stage then doubles again for driving the final on 14 or 28 mc. This latter method may sound complicated, but it boils down to MO-Doubler-Doubler-Final and it works very well indeed on 28 mc.

The stability and clickless keying of the oscillator can be checked by switching to 3.5 or 7 mc VFO operation and listening to the 28 mc harmonic.

**Calibration**

The oscillator dial readings may be directly translated into kilocycles if a frequency sub-standard and the receiver are used to draw a graph. Alternatively, the frequency sub-standard (by which is meant a 1000 or 100 kc crystal and not "any old rock" used in the transmitter) can be switched on at the beginning of each session for checking the calibration of the receiver. Only if this is of the calibrated-dial communications type will such a check be accepted by the GPO for use with a VFO, the frequency of each and every transmission being logged in kc directly from the receiver dial readings.

In conclusion, the only possible way in which to use the 145 AS A VFO is to abhor padded shoulders and scything across the bands with all spiv-guns blazing. A separate on-off toggle brought out to a convenient position will switch the oscillator HT independently of everything else in the station. After a signal has been tuned in on the receiver the oscillator alone can be switched on and its tuning dial rotated until the oscillator is heard some 3 to 5 kc away from the received signal. The oscillator is switched off and no one outside your station is even aware of what you propose to do! When the received station signs over all stages of the transmitter will follow the oscillator in calling up.

After contact has been established, the distant station can invite single-channel working. After the contact has terminated set your oscillator dial elsewhere if you are going to call CQ in order to leave the last station's frequency clear for others to work on it.

**XTAL XCHANGE**

Only a few in the market this month —please set out your own request in the form below, headed "Xtal Xchange Free Insertion" on a separate slip. All negotiations should be conducted direct.

G2AO, Branksome, Worcester Road, Malvern, Worcs.
Has 7170 kc crystal, mounted. Wants frequency between 1800 and 1900 kc.

G3CIM, 35 Melford Avenue, Barking, Essex.
Has 1,000 kc crystal, new, heldered, 2-in. pin spacing. Wants similar 3550-3575 or around 7100 kc, or offers.

G8UA, 406 Higher Brunshaw, Burnley, Lncs.
Has 1850 kc crystal, mounted. Wants frequency between 7100 and 7200 kc.

SWL, 4 Phipps Terrace, North Road, Selsey, Sussex.
Has 1,000 kc, 4570 and 6735 kc crystals. Wants one in 7 mc 'phone band.

**EDDYSTONE "640" ESSAY COMPETITION**

The winner of the recent Essay Competition for the Eddystone 640 Receiver is R. C. Jennison, 28 Park Drive, Grimsby, Lncs. He is an undergraduate of the University of Manchester, and chose as his subject "The Application of Microwaves in Amateur Radio."

The judges specially commended four other entries : D. H. Johnson, West Byfleet, Surrey ("Relative Merits of British and American Communications Equipment") ; K. Parvin, London, W.1 ("Band Planning") ; H. Turner, G8VN, Rugby, Warks. ("Band Planning") ; W. D. Old, Redruth, Cornwall ("Application of Microwaves"). Messrs. Stratton & Co. have generously decided to present suitable consolation prizes to these four entrants in special recognition of their work.

The winning article, which is a valuable contribution in the Amateur field to the literature on the subject, will appear exclusively in the next (May) issue of the Short Wave Magazine.

For the Best Information on the Latest News, read the Short Wave Magazine
Twin Three-Element Beam System

General Description of the 14/28 mc Array at G8IG, Bromley, Kent

by C. G. ALLEN

The wooden lattice tower is 31 ft. high with a base dimension of 4 ft. The main supports are bolted to channel iron sections, which are sunk in concrete blocks and hold the whole structure very rigid.

The lower beam is a 3-element close spaced 14 mc array, using a folded dipole as a radiator. The 3 elements and their supports are made from duralumin tube; each element is formed of three sections of telescopic tube. The centre section is 1/4-in. dia. and the end sections are a telescopic fit, suitably clamped to ensure good contact. The thinner element of the radiator is also in three sections with the centre section 1/4-in dia.

The main boom is duralumin and all the elements are supported on and insulated from it by blocks made of gear fibre. Gear fibre blocks are also used for the minor horizontal tubes supporting the director and reflector. These minor tubes are 8 ft. long by 1/8-in. dia. Similar supports are used for the radiator spacers, but the end blocks are of duralumin.

All cables including the feeders are carried neatly to the eaves of the house on a steel stretch wire. The 2-element vertical beam on the side of the tower is a television receiving aerial.

Dimensions—14 mc

The element lengths are as follows:—

Director—32 ft. 1 in.
Radiator—35 ft.
Reflector—36 ft.

The spacing between the director and radiator is 10 ft. and between the radiator and director, 7 ft. The elements of the radiator are spaced 6 in. from centres. The aerial is 33 ft. above ground. The whole 14 mc array weighs only 28 lb.

The smaller element of the radiator is fed direct with 45-ohm coaxial line and gives almost a perfect match with the above measurements on 14,200 kc. The measured standing wave ratio at this frequency is 1.4 to 1.

Standing wave ratios for other frequencies are:—

14,000 kc—4.2/1
14,100 kc—3.2/1
14,300 kc—2.5/1
14,400 kc—4.3/1

Ten-Metre Beam

The 28 mc array is mounted 8 ft. above the 14 mc beam and is a half-size replica of it; it is also fed with 45-ohm coaxial line. It has almost identical characteristics and weighs only 7 lb.

Careful checks were made to ascertain if the mounting of the beams parallel to each other adversely affected them but no apparent effect was noticeable.

The driving shaft up through the centre of the tower is 2-in. water pipe and stands on a ball race. Half-way up the tower, the tube passes through a steadying bearing.

Constructional Points

The boom of the 14 mc beam is clamped in a steel cradle, with the cradle fitted to a steel tube 1-1/2-in dia. and 8 ft. long. This tube is passed through a ball race sunk into the top platform of the tower; a heavy bolt through the driving shaft and this tube securely anchors it for rotation. A steel collar is fitted to the shaft and rests on the ball race in the top platform to stop it dropping through when the lower bolt is removed.

The 28 mc array is clamped to an 8-ft. length of 1-in. dia. duralumin rod which slips into a socket welded to the cradle supporting the 14 mc beam, and is held by three heavy grub screws tapped through the socket.

A ½-h.p. reversible motor connected through suitable gearing housed at the base of the tower provides for rotation at a speed of one revolution per 56 seconds. Continuous rotation is not possible due to the method of feed, but this has not been found a disadvantage. The feeders are wound around the driving shaft three times, so that the arrays may be rotated continuously for six complete turns, if necessary, before reversing.

Indicator Unit

The beam indicator unit is perhaps worth mentioning. A great circle map of the world was photographed down to 10-in. dia. and printed off on thin paper, suitably coloured to make the various
countries stand out. The print was then mounted on a 12-in. circle of aluminium in which holes had been drilled every 10 degrees and slots cut with a fret-saw from the drilled holes to within ⅜ in. of the centre.

Behind every other hole are mounted small 6v bulbs which are wired through a 6v mains transformer to a suitable multi-connector fitted to the case in which the assembly is housed. An 18-point stud switch is fitted to the centre of the tower and the main driving shaft passes through it. On the main shaft is fitted a wiper arm, with the blade just wide enough to touch two of the studs at a time.

The studs are connected to the indicator in the station via a multicore cable. When two lights show on the indicator, the beam is between them, so that indication of the beam is obtained every 10 degrees. The lights also illuminate the slots and show the path of the beam over the great circle route.

**General view of the 14/28 me twin-beam array at G8IG, Bromley, Kent.**

---

**THE SHORT WAVE LISTENER**

A series now running in our companion *Short Wave Listener* covers a set of answers to the last Radio Amateurs' Examination; when all the questions have been dealt with, a new series will be started covering the preparatory work for those hoping to take the next R.A.E.

A regular VHF feature—the first in any periodical in the world devoted wholly to SWL's interested in VHF listening—has been successfully launched, and for the summer months some space will be devoted to portable operation on all bands. Regular features like "Have You Heard?" (the Amateur Band Commentary), Calls Heard, and "DX Broadcast" (for the SWL interested in S/W BC reception) enjoy wide support and have a very large following; it can fairly be claimed that for the short wave listener these monthly features are the most up-to-date, comprehensive and informative of their kind appearing in print to-day.

The *Short Wave Listener* is of 32 pp. with colour cover, published on the third Thursday of each month, price 1s. 3d., or by post 1s. 4d. The direct subscription rate is 16s. for twelve issues, post free. Write the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.

---

**ATLANTIC CITY REPORT**

A remarkable publication is the Final Report on the International Telecommunication and Radio Conferences at Atlantic City last year; printed page for page in English and French, it sets out in detail the decisions of the meetings on every conceivable point connected with the general use of the ether and proves—if proof were needed—the immensity of the task facing those responsible for reaching agreement on what in many cases were most conflicting needs or aspirations.

Among interesting points is the adoption of abbreviations like "NW" and "OK" as traffic signals, and a table of words to identify the letters of the alphabet. These are nearly all place-names, nicely blended to give equal prominence to all countries. The ones we don't like are "C for Casablanca," "U for Upsala" and—believe it or not—"X for Xantippe"! (What's Xantippe, anyway?)

---

**LITTLE ERROR CREEP IN**

In that diagram Fig. 2 on p. 44 of the March issue, the RF current paths should be shown dotted for the whole run, as it was not the intention to indicate a wire short across the RF chokes!
February and March have been disappointing months, if we compare results with the corresponding months of last year; but by any other standard they have been pretty good. Readers will probably know by now, however, that the sunspot cycle has not been going according to plan; in fact we have seen it stated that this year's numbers have been 40 per cent. down on expectations. So, to those of you who were expecting the peak period this spring, we can literally say "You've had it!" It was probably last spring.

But what is a mere packet of sunspots where the DX fraternity are concerned? There will always be someone to dive under the surface and emerge with some choice pieces, and if it can't be done on 28 and 14 mc, they will migrate to 7 and 3.5 mc and do it there. You just can't keep a good man out of the QRM.

And is it our imagination, or has there been a little less spivvery going on lately? Time and time again we have heard nice DX stations calling CQ, and waited on their frequency for the avalanche—but it has not arrived. The "pouncers" seem to have acquired enough common sense and operating ability to spread out a little. It's an amazing thing, but chaps like CR6AI seem to call CQ nowadays without making their part of the band curdle; perhaps everyone has worked them?

What—No Heat?

Another remarkable fact is that, in spite of yet another record load of mail, no one has got really hot under the collar. There are mild grouses, it is true, but more in sorrow than in anger. Our objectionable friend the Concrete-Mixer, who causes a broad hash on 7030, 14060 and 28120 kc, has come in for his share of comment. One reader calls him a "resonant sink"—but we don't imagine he minds that. If only someone could give us his full QTH, and someone else present us with a teeny-weeny atom-bomb...

G8UA (Burnley) is mildly indignant on the subject of QSL's from the various USSR countries, and asks us to issue a GMTTCSU Certificate ("Got-more-than-two-cards-from-Soviet-Union")! On the other hand G8KP (Wakefield) has worked 15 of their countries and received 14 QSL's; while G2WW (Penzance) has cards from 15 of them! He says they seem to come if you don't mind waiting. (Ours don't!) And G3CVG (Wakefield) has sent them 50 cards and not received a single one in return. Better get the secret from G8KP...

Competitive Dept.

With a hot blush of shame, your commentator puts his own call at the head of the 1948 list this time. But he is rather cut up about it, because he knows several people with higher scores who have not sent them in. There it is, though—36 Zones have poured down the funnel so far, and if anyone in Zones 19, 23, 26 and 39 would like to communicate, we should be pleased to co-operate.

Most of the regular DX types are climbing steadily up the ladder but are not, we hope, bursting any blood-vessels in the process. Somehow the DX seems to come for you at its own speed, and any attempt to hurry it up produces a nervous wreck and nothing more!

DX of the Month

Starting on the 3.5 mc band, we find the stalwarts still bringing in the W's in considerable quantities during the mornings; even more since the clock is now one hour kinder to us. G2BY (Cheltenham) reports working plenty of them, plus ZL2IC, ZL4IE and OX3MG. Proceeding to 7 mc, we find our old friend G2PL (Wallington) working VR6AA for his first European QSO—nice work for Pete! G2PL also raised FQ3AT/FE on the same band, and tells us that his WAZ Certificate has come through. He is therefore the first G to collect a post-war WAZ; and he also has the first all-'phone DXCC outside USA. A very nice Double-First indeed, and congratulations from us all, G2PL.
VOLUME VI
SHORT WAVE MAGAZINE

G8HX (Mansfield) read some queries about the credentials of D4AWK/6; but he assures us that the station is genuine, as he has had some very fine QSO’s with him, including a most unusual one of which we can’t say more at present. On the other hand, G8HX asserts that HE1EC was a phoney, as he had his card returned. G3HK (Maryport) has worked 19 Zones (post-war) on 7 mc only, including KL7, VE8, CM, HH, KP4, VP2, VP5, NY4, PY, VS2, ZS and lots of others. But he wishes some of the local boys would take the trouble to listen, especially in the mornings, before they blot out the DX with their chatter. Most of 'HK’s DX has been worked with a single 807.

G3PZ (Gloucester) knocked up the very fine score of 19,312 points in the ARRL DX Contest, using 7 mc mainly, but adding a bit of activity on 3.5 mc. G2WW (Penzance) has also been on 7 mc quite a lot, and collected ZS2EC (a YL), ZS2DR, TF3EA, OX3MG, and UA1KEC (Franz Josef Land). On 14 mc ‘WW pulled out a brand-new country in the shape of MP2BH, in the independent Sheikdom of Qatar (Persian Gulf). This has not been universally confirmed as a new country, but sounds good enough for us. ‘WW has acquired an aerial pole at last, and now uses a 137-foot Zepp, 40 feet high, for all bands.

14 mc DX

Now here’s a fine thing! That hardened, dyed-in-the-wool 7 mc addict, G5FA (London, N.11) has migrated to 14 mc at last. In his first four weeks on the band he worked 49 countries in 19 Zones. On 7 mc only, however, he has 65C and 20Z to his credit, and he agrees with C5WC’s dictum that anyone working 20 on that band is pretty tough.

Nice new ones from G6ZO (Totteridge) include ZD8B, who is ex-G5BO on Ascension Island and perfectly genuine (QTH in list), and CT3AB (Madeira), who is the old pre-war 3AB. CT3’s have just been given licences again. ‘ZO also worked VP7NG in the Bahamas, and found our old friend and predecessor in this space, Ham Whyte (VE3BWY), who
is on the air and looking for G's during weekday evenings on 14012 kc. Finally, G6ZO would like to know whether anyone has worked a genuine FB8 station since the war. The FB3AC who was on some time back has proved to be a phoney.

G3CSE (Hull) has been badly bitten by the DX bug, having opened up on 14 mc with 8 watts and found that he can raise a W9! He agrees with all we say about local 'phone on a DX band. G3DCC (London, N.8)—it is he who complains about the gurglings of the resonant sink—is still working some nice DX with his "doubled doublet," which is a 14 mc aerial folded into 17 feet. He is now going to try another at right angles to it. Looks as though he may eventually have something very interesting to those who are short of space.

G3UA (Stockport) breaks into the Marathon List, and complains of a particularly spivvish piece of work. When a DX station comes back to him, he says, but calling "G3U?, QRZ G3U?", why do G5's, G6's and W2's all go back? Obviously it's at least a G3 that's wanted. G6PJ (Sheffield) is one of the lucky few who raised VP7NG and he has found things very good for VK/ZL contacts in the mornings, too. G2HPF (Great Baddow) has discovered to his sorrow that CR6KW, worked a year ago, was a phoney. He has just worked CT1OR, who denied ever having operated the said station.

G3BI (Seer Green), who has become one of the high scorers this year, sends some useful QTH's which indicate that he has been getting around: YV1, C7, PZ1, FQ3AT/FE, CR9, OA, C9, VK9, HL1—not too bad? G3TK (Leigh) says that when he comes on the band is either just folding up or else it's full of howling ECO's, lids, T3 notes and the gentry who screw their keys down and squirt parasitics in all directions. (Life is like that, TK, unless you sleep by day and get on the air at 4 a.m.) Nevertheless 'TK has added VP5MU, YV1AZ, C700, CR6AN and 6AU, among many others.

Down Bournemouth way, G3AAE has been working some nice steady 14 mc
DX, including VS9ET and PK4VD, both of whom we should appreciate very much. He comments on the new AP prefix for Pakistan, which will, of course, be stale news by the time you read this. G8KP (Wakefield) has collected practically everything going—and that includes YA3B, VR5PL and 5IP, CT3AB, VS9ET, all on 14 mc CW. He has broken out with some 28 mc 'phone as well.

News from Overseas

Before we pass from 14 mc to 28 mc we had better let the overseas types break through, because we welcome a lot of them this month, all with very newsy letters. Ex-MD5LR writes from Bath to say that there will no longer be an MD5GM connected with the old 5LR station, as the second op. is also awaiting release.

Ex-G3BFV is now on the air as ZS1GV; he has been hearing G’s on 7 mc, but calls to them produce no effect. (QTH in list.) Gossip from Athens includes a nice high score from SVIRX; he says he had decided not to continue the Great Country-Chasing-Racket, in fact it was one of his New Year Resolutions not to do so. But when he found that he had worked 24 Zones in January, including 10 of them on the first day, he thought he’d better go on. (Funny how it gets you—just look at us!)

MD1D is no more—Dan Lockyer pulled the switch and is going on to Transjordan, where he intends to come on the air in spite of all difficulties. He says he has QSL’d 100 per cent., but if anyone has not had his card from LI2CL or MD1D, drop a line. We shall be keeping in touch.

ST2FU (Wadi Haifa) wants more precise information in these columns about whether the choice bits have been worked on 'phone or CW. When correspondents tell us clearly, we pass on the information, but they often leave it vague themselves. We’ll try to make it even clearer in future.

ST2FU is ex-MD2C, runs 10 watts of 'phone with occasional excursions into CW, and works mostly on 28 mc. He says that MD2B, MD2D and MD2G (ex-TINS) are still active in Tripoli.

Maurice Selby of J4AAK is home again, and hopes to be back on the air as G4LV when his next location is settled—possibly from GM. Ham Whyte (VE3BWY), who was, of course, G6WY, tells us that he has bought a “beautiful 500-watt Tx” with which to rend the ether; we’ll all be looking for you, Ham.

Two very interesting letters from G3CNM (s.s. Athenic). He left England way back in December, and found his first real treat was listening to the 7 mc band in mid-Atlantic! No QRM whatever at mid-day—in fact no signals at all! Lovely! A bit later you find HI, HH, TI and so on blowing your cans off with S9 'phone. And so through the Panama Canal and away to Pitcairn, of all places. On arrival, 'CNM had an hour’s chat with VR6AA and also met VR6AY, who is still trying to find out why the New Zealand authorities will not renew his old licence. He says they don’t even answer his letters. His second letter comes from “G3CNM at Wellington, N.Z.,” and includes the photographs from Pitcairn, shown here. He hoped to do some intensive listening while in port, but they took the ship’s aerial down to leave room to swing derricks for unloading, and that was that.

ST2FU (Wadi Halfa) wants more precise information in these columns about whether the choice bits have been worked on 'phone or CW. When correspondents tell us clearly, we pass on the information, but they often leave it vague themselves. We’ll try to make it even clearer in future.

ST2FU is ex-MD2C, runs 10 watts of 'phone with occasional excursions into CW, and works mostly on 28 mc. He says that MD2B, MD2D and MD2G (ex-TINS) are still active in Tripoli.

Maurice Selby of J4AAK is home again, and hopes to be back on the air as G4LV when his next location is settled—possibly from GM. Ham Whyte (VE3BWY), who was, of course, G6WY, tells us that he has bought a “beautiful 500-watt Tx” with which to rend the ether; we’ll all be looking for you, Ham.

Two very interesting letters from G3CNM (s.s. Athenic). He left England way back in December, and found his first real treat was listening to the 7 mc band in mid-Atlantic! No QRM whatever at mid-day—in fact no signals at all! Lovely! A bit later you find HI, HH, TI and so on blowing your cans off with S9 'phone. And so through the Panama Canal and away to Pitcairn, of all places. On arrival, 'CNM had an hour’s chat with VR6AA and also met VR6AY, who is still trying to find out why the New Zealand authorities will not renew his old licence. He says they don’t even answer his letters. His second letter comes from “G3CNM at Wellington, N.Z.,” and includes the photographs from Pitcairn, shown here. He hoped to do some intensive listening while in port, but they took the ship’s aerial down to leave room to swing derricks for unloading, and that was that.

G3ATL (home QTH Rochdale) is now licensed as ZL2AFP (Portable), for use on board the ship in which he is Senior Signals Officer. He asks for reports and QSO’s, and all cards should go to his home address.

HA8S (Budapest) wants to know why
it is that his QSO's at the LF end of 14 mc, on CW, can be ruined by G stations coming on 'phone. HI looked on G stations as exemplary operators and was very surprised to find this going on.

Hans Juergen Franz (Heidenheim), whose SWL card bears the legend "DE-Expectant-1-A," writes about the position in Germany. Briefly, what he says is that the D's and DE's have been given back their old DE numbers, and that several

<table>
<thead>
<tr>
<th>DX QTH's</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CE5CU</td>
<td>Box 3971, Santiago de Chile.</td>
</tr>
<tr>
<td>CR9AM</td>
<td>Box 504, Macao.</td>
</tr>
<tr>
<td>EK1GW</td>
<td>c/o Mackay Radio, Tangier.</td>
</tr>
<tr>
<td>ET3AE</td>
<td>Box 145, Addis Ababa.</td>
</tr>
<tr>
<td>ET3AF</td>
<td>Box 855, Addis Ababa.</td>
</tr>
<tr>
<td>HI2S</td>
<td>Box 103, Port-au-Prince, Dominican Republic.</td>
</tr>
<tr>
<td>HLIAR</td>
<td>APO 901, c/o Postmaster, San Francisco, California.</td>
</tr>
<tr>
<td>J4AAK/G4LV</td>
<td>Cpl. B. M. Selby, c/o Well Hill, Hemingford Road, North Cheam, Surrey.</td>
</tr>
<tr>
<td>KP4EZ</td>
<td>APO 851, c/o Postmaster, Miami, Fla.</td>
</tr>
<tr>
<td>MT3BC</td>
<td>QSL via A.R.I. (Station in Etretad).</td>
</tr>
<tr>
<td>O4AQ</td>
<td>Box 538, Lima, Peru.</td>
</tr>
<tr>
<td>O0Q5AS</td>
<td>Box 9, Usumbura, Urundi, Belgian Congo.</td>
</tr>
<tr>
<td>OX3GF</td>
<td>APO 858, c/o Postmaster, New York.</td>
</tr>
<tr>
<td>VI0GW</td>
<td>c/o O.V.C., Port Moresby, New Guinea.</td>
</tr>
<tr>
<td>V84TT</td>
<td>Walter Field, Trinidad, B.W.I.</td>
</tr>
<tr>
<td>V85AL</td>
<td>Government Airport, Kingston, Jamaica.</td>
</tr>
<tr>
<td>V87NG</td>
<td>Box 2003, Arlington, Virginia, U.S.A., (Station in Bahamas).</td>
</tr>
<tr>
<td>V84NH</td>
<td>Box 571, Nairobi, Kenya.</td>
</tr>
<tr>
<td>V85ELD</td>
<td>L. H. Durham, Post Office, Kampala, Uganda.</td>
</tr>
<tr>
<td>V87AC</td>
<td>P/O Clee, Naval HQ, Trincomalee, Ceylon.</td>
</tr>
<tr>
<td>V87LA</td>
<td>c/o RAF, Koggala, Ceylon.</td>
</tr>
<tr>
<td>V87WN</td>
<td>A. J. Benn, Admiralty W/T Station, Narahenpitiya, Colombo, Ceylon.</td>
</tr>
<tr>
<td>W1DTS/CT2</td>
<td>Bill Gibbs, 24 Fletcher Avenue, Lawrence, Mass.</td>
</tr>
<tr>
<td>ZB1AO</td>
<td>Capt. Gatehouse, HQ Royal Artillery, Tigne, Malta.</td>
</tr>
<tr>
<td>ZC6NO</td>
<td>c/o X Branch HQ, Palestine.</td>
</tr>
<tr>
<td>ZD8B</td>
<td>A. Boa, Cables and Wireless Ltd., Ascension Island.</td>
</tr>
<tr>
<td>ZS1IV</td>
<td>A. J. Marsh (ex-G3BFV), Port Radio Office, HM Dockyard, Simonstown, South Africa.</td>
</tr>
<tr>
<td>ZS3F</td>
<td>Box 297, Windhock, S.W. Africa.</td>
</tr>
</tbody>
</table>

Radio Clubs are officially licensed—but for receiving only. All the strange D and DA calls are worked under cover; a bogus D4AVL was recently rounded up, and for the next six months he will be in a very quiet place, as far as radio is concerned.

Ex-G3HS is now AP5B (Lahore) and says he is being worked to death giving a new country to the DX boys! Pakistan prefixes are expected to be: AP2, Sind Province; AP3, North West Frontier Province; AP5, West Punjab. AP5B asks us to give this note some space to save long explanations in QSO!

28 mc DX

And now back home again to some of the DX types. G5XS, an OT at Ashton-under-Lyne, referring to 28 mc, asks whether some of the DX kings have to call a rare station like FQ3AT/FE every time they hear him, even if they have worked him before? They might remember the queue! But then to continue with a 25-minute ragchew in fifth-form French is a little too much. XS also records a case of a G station calling an XZ2 for about twenty minutes, with occasional five-second pauses; during the whole of this time the XZ was in QSO with someone else. Of course, anyone doing that
sort of thing just wants dumping on a lonely island somewhere without a transmitter.

GM3CSM (Glasgow) also has some complaints about the 28 mc CW band, including the accusation of bad notes. He has placed himself nicely on the list this month, though.

Piracy Department

G5QI (Henley) puts out a CQ and hears lots of stations coming back, but not to the right G5QI! His own outfit usually runs 1 watt to a CO, and the pirate has an FCO, which gives him an unfair advantage. G2FXA (Stockton-on-Tees) says that anyone working a "G2FXA" on 3.5 mc 'phone will be in QSO with a pirate—he keeps getting cards for non-existent contacts.

VK1AA, however, is not a pirate! There are no normal VK1 calls, but G6YQ (Liverpool) tells us that VK1AA is a Royal Australian Navy Ship, H.M.A.S. Wyatt Earp, on an Antarctic Expedition. This news came to 'YQ via VK3YP.

Shorts

Our first contribution from the Outer Hebrides comes from GM3BST on Benbecula, whence he works plenty of DX on 7 mc. He gets Aurora conditions up there and finds the band going silent after dark, and generally playing tricks. His main trouble is aerial supports—it would be on a treeless island where the gales howl frequently. Flimsy things just blow down. 'BST has worked on 7 mc (and had a card from) VS9ET.

G2CDT (Sheffield) worked M1MB (San Marino) on 'phone recently and wonders whether it counts as a country. We say it does—but so far as we know MIA was the only genuine amateur there. Anyone who worked W1DTS/CT2, or CN8EE, and did not get a card for the QSO, should get in touch with W1DTS at his home QTH—in list. (This from G2ZC.). G3CO (London, S.E.18) and several others continue the UC2/UP2 story; thanks, chaps, but this correspondence is now closed—it wasn’t getting anywhere. 'CO very much wants to see some band-planning, especially on 3.5 mc—don’t we all?

G3BIX, aboard the M.V. British Character, sends a list of Calls Heard from the Eastern Med., but unfortunately doesn’t mention the band. We hope to hear from him again, though. G3CHN is an operator in the Merchant Navy and will be en route to the States via Suez Canal and Far East. He remarks that several ten-metre “beams” at home must be rather indifferent performers, because when the proud owners shine them on the USA, they still put S9 signals into Portuguese East Africa! Anyone who would like G3CHN to listen for them on his next trip should drop a line to him at Broadley Farm, Sway, Hants.

G2AO (Malvern) still works 7 and 14 mc; he recently put the rig on 14 mc 'phone for the first time, called CQ and back came KW6AI.... 'AO says it was like working his first VK all over again! G8QX (also Malvern) remarks on the “GDX” possibilities of 30 mc late in the evenings. He recently had some 100-mile contacts at S9 plus.

G3DEU (Hove) runs DC mains and a 6-volt car battery for heaters, and is also restricted to an indoor folded dipole. This sounds like a really tough situation for DX! Keep plugging, 'DEU—you’ll get there eventually. G8PL (London,
N.W.3) also uses an indoor aerial, but is better placed for power. He sends some very useful QTH's which appear in the list.

G8OJ (Manchester) has been working 7 mc only, but has collected ZC6NN, 6NR, 6WF, MD2G, EK1AA, OX3ME and PK3JM (the last two on 'phone). G8JC (Droitwich) suggests that PX1C is one of the engineers of Radio Andorra working under cover—hence the picture postcards of that station which sometimes come back. But as long as his cards contain no details of a QSO they are useless as confirmations.

G3CDR (H.M.S. London) writes from Singapore with a short list of Calls Heard on 7 mc. Best time for it there, he says, is about 2130 GMT—early in the morning. He hears VK's working around the world are particularly asked at the other end. He hears VK's working is about 2130 GMT—early in the morning.

Incidentally, those readers who get around the world are particularly asked to send us comprehensive lists of G Calls Heard—which are always appreciated.

There is, of course, no point in covering the 14 and 28 mc bands, but 7 mc Calls Heard from long distances, and 3·5 and 1·7 mc lists for medium distances will be very welcome and are sure of appearance in the appropriate space.

**Last-minute Note**

At the time of writing (late March) conditions are definitely changing for the better; after one or two almost complete black-outs, the 28 mc band is once again very lively from early in the morning; and 14 mc is yielding signals like KH6, KG6, VR2 and VR5, instead of the more usual crowd of VK's and ZL's. It looks as though April might be a really fine month, as it usually is.

So write and tell us all about it—and the deadline is April 15, first post. Marathon and WAZ claims on post-cards, please, and send them, together with all news, to “DX Commentary,”*Short Wave Magazine,* 49 Victoria Street, London, S.W.1. Good luck, Good DX—and BCNU.

---

**British Old-Timers’ Club**

**Membership Hits the Century!**

This, the third Membership List, contains 32 names and brings the total membership to 100 exactly. Here, in order of “radio seniority,” are this month’s additions:

- H W. Pope (G3HT), PZX in 1911;
- D. F. Owen (G2BC), OEX in 1912;
- J. Partridge (G2CSF), M4X in 1912;
- R. F. J. Maidment (G2LAM), VXE in 1913;
- A. G. Davies (G2PC), 1920;
- F. S. Adams (G2YN), 1921;
- R. W. Bailey (G2QG), 1922;
- K. Graham Styles (G2SK), 1922;
- A. N. J. Levy (G5DM), 1922;
- A. T. Wallace (G5KP), 1922;
- L. H. Lee (G5PII), 1923;
- A. D. Gay (G5NFS), 1923;
- F. Cropper (G6XKS), 6XY in 1923;
- J. M. Drudge-Coates (G2DC)
- Y-DCK in 1924;
- W. Stockburn (G2TG), 1924;
- G. McLean Wilford (G2WD), 1924;
- E. J. Reid (G5QO), 1924;
- T. A. St. Johnston (G6UT), 1924;
- J. Banner, M.B.E. (GWS3V), 1925;
- H. E. James (G5IM), 6KA in 1925;
- R. Carlisle (G6WG), 1925;
- C. H. Young (G2AK), 1926;
- A. A. Barrett (G5UF), 1926;
- D. B. Fry (G3UY), 1926;
- J. I. G. Taylor (G6XK), 1926;
- F. W. Garnett (G6XL), 1926;
- C. J. Reid (G2IP), 1927;
- J. W. Wroth (G2WT), 1927;
- R. S. Holdan (G5HU), 1927;
- H. A. Bartlett (G5QA), 1927;
- H. A. M. Whyte (VE3BWW), G6WY in 1927;
- A. G. Chambers (G5NO/ZBSAB), VE3BP in 1928.

It has been decided to hold the Old Timers’ Dinner in London in the early autumn, probably about September next, depending upon when and where accommodation will be available for what we expect to be a party of about 150—and what a night it will be!

Eligibility for attending the Dinner will be either (a) inclusion in the B.O.T.C. membership lists as published from time to time in the *Short Wave Magazine*, or (b) the holding of a radiating licence issued by any British authority at a date not later than June 30, 1928, with possession of a transmitting permit (but not necessarily issued by the same authority) current on June 30, 1948.

At the request of the RSGB, and in deference to the fact that the first Old Timers’ function was organised by the Society some years before the war, this year’s event will be a joint affair. Hence, it has been agreed that either membership of the B.O.T.C. or eligibility under clause (b) above will qualify for attendance at the gathering next September.

The cost will not be more than one guinea per head (exclusive of wines) and since nothing can be done till we have some idea of numbers, all who are eligible and would like to attend are asked to notify either the RSGB or the *Short Wave Magazine* by June 30 next; it would be a convenience if B.O.T.C. members would write us, and that others not yet (or not intending to become) B.O.T.C. members would inform the RSGB.
Twenty-Metre DX Forecast
Predictions for April

by I. D. McDermid, A.R.T.C. (GM3ANV)

Most areas show either a decrease in maximum and minimum field strength or a decrease in period of activity. Thus, VK does not now reach its peak field intensity until about two hours later than last month, the same applying to VS1, and the more northerly areas of Asia, as exemplified by J, show a maximum field strength only 75 per cent. that of last month. The more northerly of the American areas also indicate drastic reductions in field strength, with a pronounced maximum at 0400 GMT. Hence, it may be anticipated that the chances of evening contacts with KL7, VE7 and W6 areas are now almost nil, and will remain negligible until next autumn. With reference to the Australasian curves, VK2 and ZL now show two well-defined periods of activity on the east and west vortex of signals from these areas. The maximum strength of signals from these zones, as well as from VK6, remains at the same level, but in the case of VK6, for a shorter period of time. The same applies to the Oceanic signal from FO8. Although it will be seen that the geographic area enclosed by VK2, VK6, VS1, J and KA, all show a pronounced peak between 1900 and 2100 GMT, the local time factor must be considered, since all good amateurs are asleep during the night—or are they?
Round Europe on QRP!

Five-Watt Week-End Tour

By W. OLIVER (G3XT)

"YOU seem to have been all round Europe on QRP!" That was the comment of a certain G3 operator when I told him about my 5-watt adventures during a recent week-end. Between Friday and Tuesday I contacted 39 different stations in 15 European countries. Apart from England itself (which accounted for 13 of the contacts), the countries worked were: Scotland, Wales, Northern Ireland, Eire, Holland, Belgium, France, Germany, Switzerland, Czecho-Slovakia, Italy, Denmark, Norway and Sweden. A "QRZ?" reply was also received from Finland, but no QSO established; evidently the QRM made it impossible to read my call-sign.

The best DX contacts included Czesky-Brod and Miava in Czecho-Slovakia; Lake Como in Italy; and Halden near Oslo Fiord in Norway. British Isles contacts ranged from Cupar in the north to Bromley in the south, and from Great Yarmouth in the east to Waterford in the west.

The transmitter I used was a tritet CO, with a 25A6 pentode as the oscillator, working off AC mains. The aerial was a Windom, with a 66-ft. top running NW/SE, a 33-ft. feeder tapped on to the top at a point 22 ft. from the end nearer the house, and a simple aerial tuning circuit with link coupling from the oscillator tank coil.

Solid QSO's Obtained

The outstanding features of this week-end test were the high readability of the contacts; nearly all of them were 100 per cent. "solid" both ways, despite the week-end pandemonium of QRM from stations using a hundred watts or more against my five: The uniform signal-strength in all directions with the same aerial; most of the stations concerned reported my signals RST-569, 579 or 589. Only a very few found the readability below R5, and fewer still gave me reports of S5 or less.

Three frequencies were available; 7022, 3520 and (doubled in the tritet circuit) 7040, but nearly all the best work was done on the 7 mc frequencies. Only one DX contact—Denmark—took place on the 3-5 mc band. Searching for replies was entirely on a QLM basis, so all the contacts were made in the overcrowded lower half of the bands.

These facts seem to deny the notion that successful QRP work can only be done at picked times on specially selected frequencies, and should be an encouragement to anyone who is contemplating trying out a low-power transmitter.

Indoor Aerials

14 mc Transmitting System for DX Operation

by L. A. KIPPIN (G8PL)

THOUGH much useful information appears from time to time in the Short Wave Magazine on the subject of aerials generally, mention has not yet been made of the operator who has to work with a bit of wire strung up indoors.

All sorts of expedients are open to those who have just a little space out-of-doors, however small it may be. But when the transmitting aerial has to be inside the house one is pretty much up against realities. At G8PL, the entire aerial system has to be in a first-floor room, hence these comments.
The details of the arrangement will be clear from the sketch. It is basically a small end-fire array, and is also bi-directional. Being cut into four sections, the system can be made to give maximum radiation either east-west or north-south by adjustment of the wire links and feeders. The aerial is hung from the picture-rail and, being completely indoors, is impervious to weather conditions. Adjustments are easy, too; one can get round the whole system by standing on a chair!

**Results**

Running 100-140 watts, 68 countries in 20 zones have been worked, and on 14 mc reports of S6/7 have been received from VK and ZL. Recent DX includes CR6, MD3, PY, VK4, VK5, VQ4, VS9, and ZL—so the system really does work.

It is not suggested that an indoor transmitting aerial of any type is ideal (in fact, anyone who can borrow a wire clothes-line in a back garden is probably better off), but it is a practical solution to the problem of getting on the air when no outside space is available.

**Cards in the Box**

If your callsign is in the list below, it is because we are holding cards for you, but have not got your address on file. Please send a stamped addressed envelope, about the size of this page, with your name and callsign, to BCM/QSL, London, W.C.1. The cards will be forwarded on the next G clearance. Should you wish your callsign and address to appear in “New QTH’s,” please mention it at the same time.

G2ADL, 2ALB, 2AMA, 2AOF, 2BFB, 2BIP, 2BMW, 2BTU, 2BWL, 2CKF, 2CJ, 2CQ, 2CVA, 2DGF, 2DKV, 2DTG, 2FCV, 2FIG, 2FSO, 2HAI, 2HAY, 2HZF, 2ZL, 3ACP, 3ADB, 3AGU, 3AIO, 3AKJ, 3AM, 3AMW, 3ANF, 3ANX, 3APD, 3ARG, 3ART, 3ASX, 3ATZ, 3AUP, 3AVY, 3AXT, 3AXV, 3AXW, 3AYS, 3BCH, 3BCQ, 3BDI, 3BGN, 3BH4W, 3BIK, 3BJ, 3BJU, 3BKH, 3BLR, 3BMV, 3BMY, 3BMZ, 3B6Q, 3BOS, 3BPJ, 3BRE, 3BRK, 3BUD, 3BVA, 3CAI, 3CBA, 3CCI, 3CCS, 3CDQ, 3CEV, 3CIW, 3CLB, 3CLD, 3CJN, 3CNO, 3COI, 3CPB, 3CPR, 3CSW, 3CTT, 3CUM, 3CVB, 3CWH, 3CXN, 3DCD, 3DCN, 3DDM, 3DEQ, 3DFL, 3DLN, 3FW, 3JG, 3MM, 3OD, 3TP, 3ZC, 4DH, 4KM, 4NQ, 4PV, 4RJ, 4YN, 5BC, 5BW, 5CH, 5DZ, 5WL, 6GA, 6KL, 60Y, 6PW, 6BP, 6VY, 8AU, 8AV, 8DG, 8FC, 8FR, 8HG, 8KX, 8KY, 8PT, 8TB, GM2FTN, 3BDA, 3BTX, 3BUX, 3CXE, 4AA, GW3AUI, 3BRI, 3CA.

Use the QSL Bureau
THE VHF BANDS

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

The past month has seen periods of outstanding GDX conditions on five metres. So far as is known no new inter-G record has been set up, but there is a fairly widely expressed opinion that the evening of March 8 produced the best post-war tropospheric conditions experienced on the band. From quite early in the evening until well after midnight, contacts over distances between 100 and 200 miles were being made with little or no fading and very high signal strength. The explanation seems to lie in the existence of a large temperature inversion and steep humidity gradient. At 2100 GMT the inversion was 8 deg. F. between 1,000 and 2,000 ft. a.s.l. It is not known if anyone was active the following morning, but it is worth recording that the inversion between ground and 1,000 ft. was as great as 19 deg. F. at 0900 on March 9, while the humidity dropped from 83 per cent. to 43 per cent. just above the inversion.

Other good dates were February 28 and 29, March 9 and March 13, but some GDX was audible on most evenings, the Devonshire stations being received very consistently in south-east England.

Activity Week-End

The first M.A.W.E. resulted in a fairly high level of activity—not up to contest pitch, but decidedly above average. The fine weather was a counter-attraction outdoors, but with the exception of the afternoon period there was always someone on the band during the week-end. The peak of conditions appeared to be during Saturday afternoon and evening, particularly the period 1500-1700, when we made some good solid GDX contacts north and south-west. On the Sunday conditions deteriorated appreciably, although the London signals were good in Portsmouth all day.

One of the most notable features of this first M.A.W.E. was the large amount of activity above 59 mc! On Sunday morning there was QRM between 59 and 59.3 mc, while 58.5 to 58.6 was void of signals! Lists of calls heard and worked are given elsewhere in this article.

The next M.A.W.E. will be April 10-11, beginning at 1500 BST on the Saturday; we hope to have a QSO with you—and don't forget to let us have a short report on what you hear and work, however little it may be.

Six Metres

This month the 50 mc first-contact position is brought up to date. The table has been compiled from information supplied by G5BD, G5BM, G5BY and G6DH. If there are any prior claims, please let us have them in time for next month, when a revised final list will appear, to stand as a monument to the skill and perseverance of the operators concerned.

So far as we know there has been no 6-metre DX worked from G since December 18,* when G5BY was across to the States. G6XM was hearing harmonics up to 46 mc on March 10 and 11. G6DH says "the sun seems to have been shining on everything except the ionosphere lately!" On the other hand, we understand that the South Americans have had a good patch on 50 mc; on March 6, CE1AH, PY2QK, LU9AM and CX1AQ had a 4-way on 6 metres, surely a remarkable achievement.

Though we have had the assurance of more than one eminent British scientist that amateur VHF work is of considerable value, several readers have suggested that it is being somewhat exaggerated. It was with great interest, therefore, that we saw the opinion of the Central Radio Propagation Laboratory of the American National Bureau of Standards, in a letter to G5BY commenting on his 50 mc observations. To quote from this letter: “Heretofore,

* (But see late news note.—Ed.)
The outfit at G5PY, Clapham Park, London, an active 5-metre station. The Rx side comprises an S27 for general VHF listening, with an EF54-EF50-EC52 converter into an SX28 at 8-5 mc for 50 and 58 mc reception. The transmitter, power supply and modulator complete are carried in the rack assembly, the 58 mc PA being an 807 FD; this is shortly to be replaced by a pair of RK34’s to “reach 144 and 420 mc.” G5PY’s aerial is a 3-element rotary beam, controllable from the operating position.

reliable checks on frequencies above about 30 mc have been extremely scarce. It was with great pleasure, therefore, that Mr. Ferrell’s comprehensive report, including your own observations, was received. I sincerely hope this important work will be continued.”

While on the subject of “firsts”, GI6YW points out that apropos the note on p. 745 of the February issue, the first two-way ‘phone working record in GI was on June 29, 1932, when GI6YW worked G15HV—sorry, but at the time we were thinking of post-war results; however, we are glad to put the record straight.

Individual Reports

G5GX (Hull), whom we worked on February 29 for the first over 200-mile GDX from G2XC, is using 20 watts to an 832 and a 4-element w.s. beam. He remarks that in spite of the stations listed last month, Yorkshire activity remains very low.

G8JV having moved to Matlock, the long-maintained schedule with G5BD (Mablethorpe) has at last been broken after a continuous run of no less than 530 contacts! G8JV’s new QTH is badly screened to the south. G5BD heard F8NW and worked G3AAT/A (Fareham) recently. A welcome newcomer is G5BJ (Birmingham), using NBFM ‘phone, with a 6SL7 as CO on 1-8 mc, and phase modulation. The final is an 829B and deviation 15 kc.

G2RI (Leicester), in common with several others, comments on the increasing number of operators who seem unable to use or read CW on five metres. He asks us to correct the impression that CW is used only by stations unable to operate telephony! This is not so. Many of us enjoy CW operation and it has undoubted advantages in GDX work. Both ‘phone and CW have their place in Amateur Radio, whether on 58 mc or any other band.

G2ADZ (with whom we have a schedule at 1900 BST daily) continues to keep Shropshire on the map, assisted by G4LU.

FLASH - 50 mc OPENS

On March 27, 1400-1527 BST, the MUF went high enough to open 50 mc for a good CW and ‘phone contact G5BY/ZS1T. ZB2A and ZS1T also heard one another, but no QSO resulted.

During the good spell on March 8, G2ADZ beamed north for two hours, but his best was G2AOA (Preston). G4LU missed the March 8 opening as he had his 5-metre power pack hooked up to a new 420 mc superhet on test.

G6MN/A (Worksop) has been hearing GW5UO, but no QSO as yet. G8KL (Wolverhampton) worked G2XC for his third QSO with a new 3-element beam,
G8UR will shortly be active from the same town.

G3ABA (Coventry) draws attention to the numerous BBC and other harmonics in the Midlands, some GDX often being lost under them. He wonders what is going to happen when the Midland TV service starts up amongst all these odd radiations.

The South

During the past month a number of new callsigns from south-G have appeared in our log. G6NK (Weybridge), who started on the last day of the Short Wave Magazine Contest, has a rotary dipole in use. Across the street from G6VX in Hayes, Kent, is G3BOB, who has been doing some good work, including a contact with G3BD up in Mablethorpe. G2HY (Roehampton) has nearly made the first rung of Counties Worked with 13C, using a fixed folded dipole in the attic, while G4RO (Welwyn Garden City) is pushing out a useful signal for Herts; he now has a 3-element rotary going.

In the Portsmouth area G8LO has made one or two appearances on the band, but suffers from an extremely noisy QTH.

G2AJ/P on Dunstable Downs

Special mention must be made of G2AJ’s gallant effort in going portable in Bedfordshire on February 28 and 29. He has, of course, given us a lot to do as the whole Counties Worked panel has had to be revised as a result! However, as G2XC was one of the lucky 75, we have done the job cheerfully. G2AJ wants to acknowledge his indebtedness to G2AHC and G6SB for their valuable co-operation. They provided the transport and were able to co-ordinate some tests of their own during the expedition. G5GX (Hull) was the most outstanding GDX signal heard on the Dunstable Downs, while G3APY was one of the most consistent. G2IN (Southport) and G5BD were audible all day on February 29, and G2AJ/P achieved contacts with four Lancashire stations, though G3DA in Cheshire could not be found. In all, the very satisfactory total of 23 counties was worked; but G2AJ, never satisfied, grumbles that he did not QSO Denbigh, Caernarvon, Northumberland or Durham! And, says he, there was activity up there! QSU’s have been sent to all 75 stations worked. So far nine have replied. What will the final number be? Anyone who has not got his card from G2AJ/P can have another by sending his own to G2AJ with the necessary request!

More Reports

G5RP (Abingdon) has been getting excellent results with a new 4-element wide-spaced beam, working 20 counties during the February 28/29 week-end.

G6XM (Farnborough) who worked G3ZK (Halifax) on March 8, makes an interesting point, with which we think most south-east G’s will agree, namely, the great consistency of the Devonshire stations in the London and south-east area, compared with that of stations at similar distances to the north. G2BMZ and G3AUS have been putting over remarkable signals day after day at distances up to 200 miles when little or nothing has come through from the north. We can only offer two suggestions. First, these Devonshire boys take their beams seriously and have built really good arrays, and secondly, the intervening stretch of sea may set up much better humidity gradients than on the path to the north. Any other suggestions?

G3BLP (Selsdon) was another who worked G3ZK on that night of nights,

---

**SIX METRES**  
**LIST OF FIRST CONTACTS**

<table>
<thead>
<tr>
<th>Country</th>
<th>Callsign</th>
<th>Frequency</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>G5BD/VE1QZ</td>
<td>1620</td>
<td>Nov. 5, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/VE2KH</td>
<td>1323</td>
<td>Nov. 20, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/VE3ANY</td>
<td>1544</td>
<td>Nov. 20, 1947</td>
</tr>
<tr>
<td>Canal Zone</td>
<td>G6DH/MD5KW</td>
<td>0855</td>
<td>Nov. 10, 1947</td>
</tr>
<tr>
<td>Egypt</td>
<td>G5BM/SU1HF</td>
<td>0900</td>
<td>Nov. 16, 1947</td>
</tr>
<tr>
<td>France</td>
<td>G6DH/F8ZF</td>
<td>2035</td>
<td>Dec. 10, 1947</td>
</tr>
<tr>
<td>Netherlands</td>
<td>G6DH/PAØUN</td>
<td>0750</td>
<td>Mar. 10, 1948</td>
</tr>
<tr>
<td>South Africa</td>
<td>G5BY/ZS1P</td>
<td>1230</td>
<td>Nov., 1947</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>G6DH/W1HDQ</td>
<td>1302</td>
<td>Nov. 5, 1947</td>
</tr>
<tr>
<td></td>
<td>G6DH/W2AMJ</td>
<td>1345</td>
<td>Nov. 5, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/W3OR</td>
<td>1325</td>
<td>Nov. 22, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/W5LY</td>
<td>1550</td>
<td>Nov. 16, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/W9ZHL</td>
<td>1555</td>
<td>Nov. 22, 1947</td>
</tr>
<tr>
<td></td>
<td>G5BY/WØIFB</td>
<td>1632</td>
<td>Nov. 22, 1947</td>
</tr>
</tbody>
</table>

**Note:** No claim received for first G/W4 contact two claims for first G/W8 under investigation.
W3OR, Essington, Penna., was well heard over here on 6 metres during the November 50 mc break. He has a very fine composite beam array for 28, 50 and 144 mc; the polarisation of the 2-metre beam is adjustable to either plane. The 6-metre Tx runs 600 watts input. (Acknowledgment "CQ").

March 8. He has also worked much other GDX, including G5MQ and G5BD at S9 'phone. G5MR (Bognor Regis) has raised his beam from 15 to 21 ft. and says it seems to have made a great improvement.

Activity continues in and around Cambridge. G6UW (with G3COJ as operator) enters the Counties Worked list by rolling in 14C in 16 days. They went portable as G2FJD/P on one occasion, working G2XV, G3BK and G5BD from the Gog Magog Hills. One visitor wanted to know what they used for an induction coil. During vacation, G3COJ (Hull) will be active, i.e., for four weeks from March 20. GSIG heard F8GH at 1900 on March 11, but could not raise him.

Others who have reported active include G2CIW (Brentwood), G2HLF (Heathfield), G2JU (Harrow), G3VH (Bristol), G5LO (Chiswick), G5MP (Hythe), G5PY (Clapham Park), G5FO (N. Bucks), G6UH (Hayes, Middx.), G6VX (Hayes, Kent), G8SM (Molesey) and G8KZ (Kensington). Many thanks to all of them.

In addition, a large mail has come in from VHF listeners; it is much to be regretted that Magazine space is too tight for them to be covered in detail here, although all have been read with interest. However, these very useful reports are being handed over to A. A. Mawse, who conducts the VHF column in our Short Wave Listener for the special interest of SWL's; material from these letters will be appearing in his column in the May issue.

Contest Point

Our thanks also to those who were kind enough to comment on the rapid appearance of the results of the recent Contest. Well, the dates were chosen so as to make it possible and everybody responded by producing their entries by the time they were wanted.

Others have pointed out some errors regarding the counties in which certain
FIVE-METRE ACTIVITY LIST
G4, G5, G6, and G8 Calls
List of stations known to have been active during the Short Wave Magazine Contest period. A supplementary list of stations since reported active will be given next month.

<table>
<thead>
<tr>
<th>Calls</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4AC</td>
<td>Chelmsford, Essex.</td>
</tr>
<tr>
<td>G4AP</td>
<td>Swindon, Wilts.</td>
</tr>
<tr>
<td>G4GG</td>
<td>Wimborne, Dorset.</td>
</tr>
<tr>
<td>G4CI</td>
<td>New Malden, Surrey.</td>
</tr>
<tr>
<td>G4G</td>
<td>Beckenham, Kent.</td>
</tr>
<tr>
<td>G4JO</td>
<td>Torquay, Devon.</td>
</tr>
<tr>
<td>G4V</td>
<td>Letchworth, Herts.</td>
</tr>
<tr>
<td>G4KD</td>
<td>Edgware, Mddx.</td>
</tr>
<tr>
<td>G4MR</td>
<td>Slough, Bucks.</td>
</tr>
<tr>
<td>G4NT/A</td>
<td>Downley, Bucks.</td>
</tr>
<tr>
<td>G4OF</td>
<td>Gainford, Lincs.</td>
</tr>
<tr>
<td>G4OT</td>
<td>Woodham, Essex.</td>
</tr>
<tr>
<td>G4QA</td>
<td>Newcastle, N’land.</td>
</tr>
<tr>
<td>G5S</td>
<td>Kingston, Surrey.</td>
</tr>
<tr>
<td>G5D</td>
<td>Mablethorpe, Lincs.</td>
</tr>
<tr>
<td>G5B</td>
<td>Cheltenham, Glos.</td>
</tr>
<tr>
<td>G5M</td>
<td>Cheltenham, Glos.</td>
</tr>
<tr>
<td>G5C</td>
<td>Hendon, Mddx.</td>
</tr>
<tr>
<td>G5P</td>
<td>Sale, Cheshire.</td>
</tr>
<tr>
<td>G5X</td>
<td>Hull, Yorks.</td>
</tr>
<tr>
<td>G5N</td>
<td>Reading, Berks.</td>
</tr>
<tr>
<td>G5G</td>
<td>Cambridge.</td>
</tr>
<tr>
<td>G5J</td>
<td>Birmingham, Warks.</td>
</tr>
<tr>
<td>G5L</td>
<td>Newcastle.</td>
</tr>
<tr>
<td>G5O</td>
<td>Oxford.</td>
</tr>
</tbody>
</table>


80 stations.  Total 156.

London stations are located. Here, we relied upon entrants knowing if they were in the L.C.C. area! G8KZ has kindly sent in a complete list of districts in the County of London—a total of 81! So if you are in doubt, let us know and we will check against the list for you.

Our attention is also drawn to the fact that an elastic ruler would make distances shorter and not longer! In self-defence, let it be said straightaway that we did have to increase quite a number of mileages, and several scores given in the Table of Results are actually higher than those originally claimed! So we are not apologetic!

Fiveband Club
It was a great disappointment to your conductor not to be able to get to the Fiveband Dinner in London on February 21—but it was the weather that intervened. Those who faced the blizzards had a very enjoyable time, even if they did...
have to trudge home through the snow.
Among the interesting suggestions made at the dinner was one for a Fiveband Club, and the Short Wave Magazine is very happy to be able to support the idea. Club membership will be open to all genuinely interested in 5-metre work and who are regularly active. The object of the Club will be to encourage activity on 58 mc, and with this in view members will be expected to support events organised for that purpose (e.g., the M.A.W.E.). A special membership certificate will be provided by the Magazine.

Members of the Fiveband Club will be eligible for membership of the more exclusive VHF Century Club on production of 100 post-war QSL's confirming two-way contacts on 50 and 60 mc bands. The main intention of this verification is to encourage the practice of QSL'ing. The Magazine will also provide a certificate for the VHF Century Club.

It is hoped to organise social gatherings, similar to the recent meeting in London, at various places from time to time. Applications for membership of the Fiveband and VHF Century Clubs should be sent to us at Magazine Headquarters as soon as possible, and in the case of the Fiveband Club should contain a statement that the applicant is regularly active on five metres and will support events designed to encourage five-metre activity to the best of his or her ability.

No subscriptions, entrance fees or other dues are called for, since it is the intention that both these ventures shall be supported by the Short Wave Magazine, through this feature, in which the membership lists will appear.

Whither 144 mc?

We note that it is being suggested in some quarters that at least part of the 144 mc band be used for "'cross town" communication, employing self-excited oscillators and super-regenerative receivers. Readers will no doubt react violently to any such suggestion and in the general interest we feel we must comment on one or two factors in the argument.

It is alleged that it is the expense and complexity of 60 mc gear which has kept so many G's off the band. What nonsense! If expense is a serious consideration one can get to five metres in two stages—a quadrupling 'tritet and a power

---

**FIVE METRES COUNTIES WORKED LIST**

Starting Figure, 14

<table>
<thead>
<tr>
<th>Worked</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>G3BXE (121), G5BY</td>
</tr>
<tr>
<td>29</td>
<td>G5BD, G6XM (197)</td>
</tr>
<tr>
<td>28</td>
<td>G2MR, G2XC (238), G5MA, G5MQ, G6LK (225)</td>
</tr>
<tr>
<td>27</td>
<td>G2ADZ, G3BLP (144), G5BM, G5PY (199)</td>
</tr>
<tr>
<td>26</td>
<td>G2AJ (179), G2NH (170), G4LU, G5RP, G6MN/A, G6VX, G8UZ</td>
</tr>
<tr>
<td>25</td>
<td>G2CIW (118), G2RL, G8SM</td>
</tr>
<tr>
<td>23</td>
<td>G1ABA, G3MY, G3PZ, G4IG (163), G6OH (129)</td>
</tr>
<tr>
<td>22</td>
<td>G2ATK, G5IG, G6YU</td>
</tr>
<tr>
<td>21</td>
<td>G3IS, G4AP, G6KB, G6VX</td>
</tr>
<tr>
<td>20</td>
<td>G2YL, G5JU</td>
</tr>
<tr>
<td>19</td>
<td>G2NM</td>
</tr>
<tr>
<td>18</td>
<td>G3BK, G5GX</td>
</tr>
<tr>
<td>17</td>
<td>G2KF, G6CW, G6LX, G8QM/A</td>
</tr>
<tr>
<td>16</td>
<td>G3AK, G5LQ, G6KL</td>
</tr>
<tr>
<td>15</td>
<td>G4AJ</td>
</tr>
<tr>
<td>14</td>
<td>G5BJ, G6UW</td>
</tr>
</tbody>
</table>

*Note: Figures in brackets after call are total of different stations worked: starting figure 100.*
doubler. This will give ample RF for cross-town working, and an O-V-1 was used by G2ADZ for his 16 Zone F contacts in the Magazine Contest. No, it is the striking absence of consistent DX which keeps most people off five metres! And the same will apply to 144 mc, however simple we make the gear!

Apart from this, adequate frequency checking apparatus will be a necessity. That is why we do not want them and while building the preliminary RF stage, with its proper screening, why not use the two valves, with their bits and pieces, to make a first-screening, why not use the two valves, with their bits and pieces, to make a first-

**FIVE-METRE CALLS HEARD**

**G3CWV, 11 Cheyne Walk, Hendon Central, London, N.W.4.**

**Worked:** G2AJ, 2FKZ, 2FPP, 2FZB, 2FWA, 2KF, 2XC, 4CG, 4KD, 5PY, 6HD, 6NA, 6NK, 8KZ.

**Heard:** G2ADZ, 3ABA, 3APY, 4LU, 2COP, 5GX. (March 13, 1900-2300; all over 100 miles.)

**G6UW, Cambridge University Wireless Society, Downing College, Cambridge.**

**Worked:** G2AJ/P, 2BB, 2CWW, 2FKZ, 2NH, 201, 3ABA, 3CO3, 3CWW, 3VB, 4KD, 5US, 6F0, 6GR, 6H, 6KB, 6LC, 6LQ, 6RP, 6ZQ.

**Heard:** G2ATK, 4AP, 6GM, 6HF, 6UK, 8KZ.

**G5LQ, 12 Cambridge Road, Chiswick, W.4.**

**Worked:** G2XC, 3BXE, 3CWW, 3HT, 3SU, 5RP, 60S, 6UH, 6ZQ.

**Heard:** G2ADZ, 2AUA, 2ATK, 2NH, 201, 3ABA, 3CO3, 3CWW, 3VB, 4KD, 5US, 6F0, 6GR, 6H, 6KB, 6LC, 6LQ, 6RP, 6ZQ. (February 28-29, using 6m, beam.)

**G5MR, South Lawn, Admiralty Road, Felpham, Bognor Regis, Sussex.**

**Worked:** G2HLF, 2XC, 3BLP, 4IG, 5CM, 5LQ, 5RP, 5ZT, 6NA, 6UH, 8KZ.

**Heard:** G2BB, 2KF, 2NH, 3AUA, 3CWW, 3VB, 4KD, 5US, 6F0, 6OH, 6VX, 6XM. (During M.A.W.E.)

**G2ADZ, Llloft Wen, Ardmillan Lane, Oswestry, Shrops.**

**Worked:** G2BB, 2NH, 201, 2XC, 5US, 6VX, 6XM, 8SM.

**Heard:** G2AJ, 2COP, 2HLF, 2MV, 3BLP, 5PP, 6F0, 6ZQ. (During M.A.W.E.)

**G5BM, Barrville, Arle Drive, Cheltenham, Glos.**

**Worked:** G2ADZ, 2AJ/P, 2AOK/A, 2ATK, 2BF, 2RI, 3AUA, 3APY, 3BLP, 3CWW, 3VD, 3SU, 5MA, 5PP, 60S, 6ZQ.

**Heard:** G2ATK, 2NM, 3APA, 4LU, 5RP, 60S, 6UH, 6ZQ. (February 14 to March 14.)

**G2ADZ, Dunstable Downs, Bedfordshire.**

**Heard or Worked:** G2ADZ, 2AOK/A, 2AUA, 2BMZ, 2CWW, 2DHJ, 2JHD, 2NJ, 2QK, 2R1, 2RM, 2NH, 2RI, 2XC, 2XY, 2YI, 2ZV, 3ABA, 3AEZ, 3APY, 3AUS, 3BGW, 3BK, 3BLP, 3BOB, 3SU, 3SU, 5MA, 5PP, 5RP, 6F0, 6GR, 6MN/A, 6NB, 6OS, 6UH, 8NR, 8RS, 8VW.

**G2AJ/P, Dunstable Downs, Bedfordshire.**

**Heard or Worked:** G2ADZ, 2AOX, 2AUA, 2BMZ, 2CWW, 2DHJ, 2JHD, 3ABA, 3AEZ, 3APY, 3AUS, 3BGW, 3BK, 3BLP, 3BOB, 4B, 3SU, 3SU, 5MA, 5PP, 5RP, 5SR, 60S, 6UH, 6VX, 6XM. (During M.A.W.E.)

**G2HLF, 9 Theobalds Green, Heathfield, Sussex.**

**Worked:** G2AJ, 2BB, 2BMZ, 2CWL, 2FFY, 2FKZ, 2FPP, 3F, 2FK, 2KL, 2MR, 2NH, 2NM, 20V, 2UJ, 2XC, 2YI, 3AAT/A, 3AUS, 3BLP, 3BOB, 3BYY, 3HT, 3IB, 3IG, 3MR, 4RO, 5BY, 5IG, 5LA, 5MR, 5PY, 5RP, 5US, 5GH, 5UW, 6VX, 6XM, 8RS, 8SM, 8TS.

**Heard:** G5BJ, 44 Sunnymead Road, Birmingham, 26.

**G5BJ, 94 Sunnymead Road, Birmingham, 26.**

**Worked:** G2AK, 2AKT, 2COP, 2RI, 2XC, 3ABA, 3APY, 3BLP, 3FD, 3IS, 3JK, 5BD, 5GH, 5LJ, 5RP, 6GR, 6VX, 6XM, 6UL, 8KZ, 6VX.

**Heard:** G5PM, (March 2-9, on RF 26 converter into HRO.)

**G2CIW, 23 Tower Hill, Brentwood, Essex.**

**Heard:** G2ATK, 2COP, 2NM, 3RP, 5BY, 5GH, 5PP, 60S, 8VZ.

**Worked:** G2ADZ, 2AUA, 2BMZ, 2RI, 2XC, 3ABA, 3BD, 5MR, 5RP, 8PS, 8TS, 8VW.

**G4LU, Avalon, Pant, Shropshire.**

**Worked:** G2AJ/P, 2BB, 2MR, 2XC, 2XY, 5MA, 6F0, 6MN/A, 8UZ.

**Heard:** G2AJ/P, 2BB, 2US, 5MA, 6F0, 6MN/A, 8UZ.

**Worked:** G2AK, 2AOK/A, 2ATK, 2COP, 2RI, 3ABA, 3APY, 3BLP, 3BRU/A, 3BY, 3IS, 3IS, 5RP, 3ZT, 5LQ, 5MA, 5PP, 5RP, 6F0, 6G, 6J, 6K, 6LC, 6MN/A, 6NB, 6NK, 6OH, 6OS, 6UH, 6VX, 6XM, 6ZQ, 8IV, 8KZ, 8MP, 8PS, 8RS, 8SM, 8UZ, 8VW. (February 25-29.)

**G6MN/A, 70 Bridge Street, Workop, Notts.**

**Worked:** G2MR, 2NH, 2RI, 2XC, 3ABA, 3BLP, 5PZ, 5BJ, 5MA, 5MQ, GW5UO.

**Heard:** G8KL, 3 Brome Road, Wolverhampton, Staffs.

**Worked:** G2ADZ, 2AK, 2AOK/A, 2ATK, 2BB, 2XC, 3ABA, 4LU, 5BJ, 5LJ, 5MQ, 5MA, 5PP, 50F, 6F0, 6VX, 6XM, 8SM.
rate superhet convertor? It's not so much more complicated!

Several items of 144 mc interest are to hand and will be covered in next month's story.

420 mc

Two readers, I. M. Gaye (Haslemere) and A. A. Brown (Epsom) have written to draw attention to a piece of ex-U.S. Navy radar equipment which is easily converted for use as a receiver on 420 mc. This is the receiver Type ASB-7, designed to operate on 515 mc, and is a double superhet, the first IF being 55 mc and the second 16 mc; there is a "lighthouse" RF stage and the output of the Rx is designed to feed into a CRT indicator unit. A conversion of the receiver for amateur operation on 420 mc was given in the American Radio News for July, 1947. This includes the introduction of a noise silencer, S-meter and a 6V6 output stage.

The Type ASB-7 equipment has been available quite cheaply in this country, and if readers are interested we shall be glad to give further details of the circuit on request.

At a recent meeting of the South London UHF Group, the 420 and 2300 mc bands were discussed. This group suggest that, for a start, vertical polarisation be used, and that operation be in the band 430-440, to avoid tuning of too large a frequency area. Selective IF stages are contemplated in the receivers, and so stable transmissions are advised. A valve list for both bands is being produced, while information on frequency measurement on 2300 mc is being sought. We shall be pleased to have readers' comments on these points, and in particular notes from anyone operating on 2300 mc.

In Conclusion

Having again exceeded our allowance of words we must now conclude—but please don't forget to send in your reports for next month by April 17 latest. And just a final reminder: M.A.W.E. No. 2 is April 10-11. Write E. J. Williams (G2XC), Short Wave Magazine, 49 Victoria Street, London, S.W.1.

Approach to 144 mc

Some Suggestions for Rx and Tx

By W. J. CRAWLEY (G2IQ)

(Always full of ideas, our contributor has turned his attention—as have many other VHF operators—to the intensely interesting problems which are presented by the projected 144 mc band. Here are some sound practical suggestions which will be found helpful in getting ready for it. There is as yet no definite news as to when we can expect this band which, nominally at least, is still in full occupation by other interests.—Ed.)

The proposed allocation of the 144-146 mc band for future amateur use is a prospect that makes the VHF man's mouth water. Here is a new field for experiment and exploration. New problems both in reception and transmission confront us and the scope for exercising that ingenuity for which the amateur is justly famous (and can justly be proud) is greatly extended.

If you are the type that buys a beautiful shining transmitter thing ready to go on the air at the flick of a switch, plugs in a microphone and just talks about handles and QSL cards, don't read any farther: this article will not interest you! The other day a friend, a licensed amateur, said to the writer "These experiments of yours are all very well, but you're only finding out things that electronic engineers have known for years." We agree, but we do enjoy our hobby and, furthermore, we try to apply our experiments to the specialised field of Amateur Radio, in which there are particular problems of no interest to the professional.

Receiver for 144 mc

The writer has, in the past, eulogised the EF54 as the RF amplifier par excellence for 50-60 mc, mainly because of its low equivalent noise resistance and high input...
Fig. 1. Conventional GGT circuit, suitable for 144 mc operation.

Table of Values

**Fig. 1. Conventional GGT Circuit**

| Component | Value
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C3, C4</td>
<td>0.001 µF, mica</td>
</tr>
<tr>
<td>R1</td>
<td>150 ohms</td>
</tr>
</tbody>
</table>

impedance. At 144 mc, however, the use of a pentode in the first stage of a receiver is not recommended. At this frequency the EF54 shows a noise factor of 9 dB, which compares unfavourably with the earthed-grid triode with a noise factor of about 4 dB. In addition, the input impedance of the EF54 enters the region where it will have appreciable effect upon the first tuned circuit; at this frequency it is little more than 1,000 ohms, which is about one-tenth of the value at 60 mc.

Triode RF amplifiers are indicated, then, in our 144 mc receivers. Two methods are available and in each the obstacle of positive feedback through the grid-anode capacity is successfully overcome—in one by earthing the control grid and in the other by neutralisation.

Circuits for both types are in Figs. 1 and 2, and from the amateur point of view there appears to be little to choose between them on the scores of gain and noise. Fig. 3 is an interesting arrangement popular in America, using a 6J6 double-triode, and known as a cathode-coupled amplifier. The input is fed into the grid of the first triode and the output from the first anode is coupled to the second triode, which is connected as an earthed-grid amplifier, through the common inductance in the cathode. The gain with this combination is said to be equal to a high-gain pentode, but the signal-noise ratio is superior owing to the triode's lower noise-factor and higher input impedance.

The Mixer

Here again, screen noise is responsible for more than 50 per cent. of mixer noise and the use of a triode for this stage is again advocated. Very good results have been obtained by the writer with the American double-triode type 6J6 (Fig. 4). The use of grid-leak bias on the mixer makes the arrangement particularly tolerant as to oscillator voltage, and the two valves in one envelope conveniently combine the functions of mixer/oscillator. Sufficient injection is obtained through the capacity between the valve pins for satisfactory operation and no external coupling is required.

The IF Amplifier

The choice of intermediate frequency is not likely to present much difficulty. It must be sufficiently high to prevent interaction between mixer and oscillator, but it should be remembered that the higher the frequency the poorer the selectivity. Whilst for some time, at least, 144 mc is not expected to rival 7 mc on a Sunday morning, the overall noise of the receiver will increase as the selectivity is decreased. Therefore, an IF of between 7 and 10 mc is suggested. Three stages of IF amplification using high-gain valves such as the EF50 or SP61 will be sufficient for amateur needs.
Ignition Noise

Contrary to the opinion expressed by some hopefuls ignition noise is still a factor to be considered at 144 mc; indeed, it seems almost as bad as at 60 mc. The inclusion of one’s own pet limiter circuit is therefore strongly recommended.

The Transmitter

On 60 mc many amateurs obtained quite good results by pressing into service valves on hand, such as the 807, designed for lower frequency work. They cannot hope to repeat their experience at 144 mc and the choice of valve types must be confined to the few specially designed for VHF service. Types 832 or 829 seem to be the obvious choice for the final amplifier. Tests with each of these types indicate that with careful layout and sufficient excitation, efficiencies of the order of at least 60 per cent. may be achieved.

Although the manufacturers state that neutralisation is not normally required at 144 mc, it has been found preferable to employ home-made neutralising condensers consisting of small lengths of 18 SWG wire from each grid, which are laid parallel to the opposite plate in the push-pull stage. These valves will work satisfactorily with full input up to 250 mc and with excellent efficiency at 144 mc, require very little drive and may be used with either coils or resonant lines.

The choice of valves for the frequency multiplying stages, of which there must be quite a few, is rather limited. The Osram TT11 (VT51) used by the writer in this application is quite suitable. Rated at 300 volts anode and about 7.5 watts dissipation at 70 mc, the efficiency is about 50 per cent. at that frequency. The writer’s experimental rig for 144 mc has a conventional tritet employing a 6 mc crystal and 12 mc output, an EF50 doubling to 24 mc, a TT11 tripling to 72 mc and a Hytron 2E30 doubling to 144 mc. There is just sufficient output from this line-up to drive the 829B to full grid current. The EF50 doubler could be dispensed with and an 8 mc crystal used, taking the 24 mc harmonic from the tritet, but even short experience with this higher frequency work has taught that one cannot be niggardly with valves; as conventional types may be used in the first two or three stages there is no point in trying to economise.

There appears to be no limit to the variety of compact multi-element arrays that may be tried on 144 mc, but the writer, who does not know much about aerials anyway, is going to leave this to the experts.

---

**Table of Values**

**Fig. 3. Cathode-coupled 6J6 RF stage.**

| CI, C2, C3 | 0.01 μF, mica |
| RI, R3 | 3.300 ohms |
| R2 | 50 ohms |

**Fig. 4. Using the 6J6 as a combined mixer-oscillator.**

**Table of Values**

**Fig. 4. 6J6 Mixer-Oscillator**

| C1 | 0.01 μF, mica |
| C2, C3 | 50 μμF, ceramic |
| C4 | 0.001 μF, mica |
| R1 | 4.7 megohm |
| R2 | 3,200 ohms |
| R3 | 27,000 ohms |
| R4 | 5,600 ohms |
| V | 6J6 |
Valve Delay Circuit

Arrangement derived from the Miller Time Base

By D. B. APPLEBY

This circuit, by means of a valve, provides an adjustable delay from milliseconds to seconds, depending upon the time constants used.

Basically, the circuit consists of a standard Miller time base with the addition of a relay in the anode circuit, and hand-switched bias on the suppressor taking the place of the synchronising pulse and DC restorer. The grid is returned to earth instead of HT, as we do not require a very linear fall of anode voltage.

Operation

With S1 open, the suppressor is very heavily biased negative and results in the anode current being at zero and the anode voltage at maximum. The screen takes heavy current and the voltage is therefore low; cathode and grid are at earth potential. The relay is de-energised and the contacts are open.

When S1 is closed, the suppressor is earthed, removing the bias and anode current starts to flow. The anode voltage falls and transfers the drop via C1 to the grid. This slides the grid back along the grid base and so reduces the anode and screen currents. The charge on C1 starts to leak away and allows the anode current to start increasing again. The anode voltage drops once more; the action is cumulative until the anode voltage falls to a low level and the valve takes full current. This is the normal Miller action. During this time the relay is steadily energised until it closes at a current depending upon the type of relay used. The time that the valve takes to assume full anode current depends upon the time constant of C1R1 and altering these values will alter the delay time.

Practical Circuit

The values shown were found to be suitable for the EF50 and result in a delay of about 40 seconds. Other valves may be employed providing the anode current is sufficient to close the relay used. The anode load and bias will have to be altered to obtain correct operation. The bias value need not always be as high as shown, but it must be sufficient to cut the anode current off. The relay in the writer's circuit is an ex-GPO Type 3000 with a pair of heavy duty contacts added. The DC resistance is 1,650 ohms and it closes at just over 6.0 mA, with a hold-on current of 1.5 mA.

Application

This circuit is employed by the writer in a power pack feeding a universal supply panel. Its use is to delay the HT supply until heaters are warmed up. Overload contacts could be inserted in series with S1 to cut HT if a fault developed and so safeguard the power supply. If S1 is tripped either accidentally or on purpose, the full delay time is effected and so the HT would flick on and off if the overload persisted.

No originality is claimed for this circuit, which is an adaptation not generally known of a standard arrangement.

Table of Values

Valve Delay Circuit

| R1   | 500.000 ohms |
| R2   | 1,000 ohms  |
| R3   | 27.000 ohms |
| R4   | 6.800 ohms  |
| R5   | 470.000 ohms|
| R6   | 100.000 ohms|
| R7   | 100.000 ohms|
| S1   | S.P.S.T. Toggle switch |
| C1   | 1.0 µF   |
| Relay| Ex-GPO Type 3000, resistance 1,650 ohms |
| V1   | Mullard EF50 |
The AT Code

Opinion on the practicability of the proposed new amateur procedure code—see Short Wave Magazine, February, pp. 730-731—is about equally divided between those who favour its use and those who consider the existing Q Code fulfils all normal needs.

The interesting thing is that, almost without exception, those who are “for” the AT Code are operators licensed since the war. Those against its adoption are mainly holders of pre-war callsigns, who regard it as an unnecessary complication.

Though several hundred opinions have been received, we do not consider that there is yet sufficient backing for the ATC to justify further action for its general adoption. It would be helpful if many more readers would state their views—have another look at the original article and send in a card saying “Yea” or “Nay.”

Photographs, Please

We are always glad to see photographs of Amateur Radio interest—whether of stations or equipment, home or overseas. If you have good, clear prints (any size) please send them in. All those used will be paid for, and if required they can be returned; the block-making process involves no damage or marking of the original.

Band Planning

We have received from the RSGB their band-planning proposals, which have been circulated to all amateur organisations and a number of radio periodicals. We are reluctant, in the RSGB’s own interests, to criticise what are obviously compromise suggestions of no great merit, put forward without full and proper consultation with other interested parties.

But in broad terms it seems to us that the CW bands are too narrow; that the proposed allocation of frequency areas to CW and ‘phone stations together is unworkable, in that these areas will become virtually ‘phone bands; and that the plan as a whole is unrealistic since it does not take the American allocations fully into account.

However, that a proposal has emerged at all is obviously a step in the right direction, particularly as the observance of any finally agreed plan is to be made compulsory.

It is understood that the whole question of Band Planning is to be referred to an IARU conference—which may well be the first and last test of the IARU organisation. Though sound enough in its general conception, as a working body the IARU is vague and nebulous in the extreme; activities are directed from ARRL headquarters at West Hartford, and it is inescapable that American opinion will be the deciding factor on such an issue as Band Planning—unless the European societies are strong enough to assert themselves.

Mail Order Supply Co.

They have opened a new mail order (only) office at 3 Robert Street, Hampstead Road, London, N.W.1, to which post orders should be sent. All other enquiries should go to 24 New Road, London, E., as before. An M.O.S. innovation is a monthly general-interest news sheet, the first issue of which is expected shortly.

“50 Watts With DC Mains”

Further to this article which appeared in our February issue, ZBIAB informs us that the general performance of the transmitter can be improved by using battery instead of auto bias, which reduces the standing PA plate current and increases output. Resistors R7 and R8 in the original diagram should be removed or shorted, and -50 volts battery bias applied in series with R12.

Net Working

The establishment of regular nets on the LF bands is a very good way of maintaining contact among local stations. Though we know that several Club nets are in operation on 1.7 and 3.5 mc, there is room for many more. The successful operation of a net calls for single-channel working with a control operator (who does not talk the whole time!) to bring stations in, and snappy transmissions by all others in the net—which can give itself a name, like “The Lincolnshire Poachers” or “The Lancashire Late-Nighters.”
NEW QTH's

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

EJ7T W. T. MacMahon, 92 Homefarm Road, Drumcondra, Dublin.
G2BOC D. H. H. Clarke, 15 Corporation Street, Lincoln.
G2BTY L. J. T. Lewis, Kandersteg, Pond Head Lane, Earley, Reading, Berkshire.
G2CMR A. M. Boyce, 34 Carr Avenue, Prestwich, Manchester.
G2FMR F. W. Broomfield, 44 Derwent Avenue, Headington, Oxford.
G2FUP S. Bransby, 96 Woodmore Avenue, Shirley, Crowdon, Surrey.
G3AMH H. Green, Barugh Coke Ovens, Gawber, Barnsley, Yorks.
G3BBW G. F. Tuck, 36 Redhall Avenue, Longstone, Edinburgh 11.
G3BIS P. V. Edwards, 62 Thompson Street West, Darlington, Durham.
G3BUY J. T. Dent, 25 Kingston Drive, Flixtone, Manchester.
G3BZL E. Boire, 27 Fountain Street, Leek, Staffs.
G3CAA J. R. Simpson, 22 Hollow Road, Anstey, Leics.
G3CAG R. H. Pearson, 14 The Grove, Bletchley, Bucks.
G3CBG W. A. S. Murray, Redknoiter, South Petherton, Som.
G3CBG/A W. A. S. Murray, 114 Cedon Road, Halton, Cheshier.
G3CHO H. Phra pb, Colwyn, Hard Lane, St. Helens, Lanes.
G3CHP I. J. Wood, Reydon, Coldharbour Lane, Bushey, Watford, Herts.
G3CKX/A S/L S. F. Sharpe, R.A.F., Danesfield Court, Medmenham, Marlow, Bucks.
G3CMOE J. N. Piper, Freeiland, Gateside, Fife.
G3CRL W. Newsham, 12 Roberts Road, Boscombe East, Bournemouth.
G3CRV L. F. Cole, 100 Birch Tree Avenue, West Wickham, Kent.
G3CUL F. R. Ellory, 153 Windsor Avenue, Hillingdon, Middlesex.
G3DAA E. Cockayne, Brindle Croft, Clay Mills, Burton-on-Trent, Staffs.
G3DAP A. W. Adam, 30 Oronsay Crescent, Kesington, Bearsden, Dumbartonshire.
G3DBT R. A. Whitehead, Medford House, Bemham Road, Alverstoke, Gosport, Hants.
G3DBU Cpl. W. Bevan, Royal Signals, 1 "F" Block, Old Ward Barracks, Balfour Camp, Wilts.
G3DBW H. J. Pitt, Flat No. 1, Tower Hill Works, Witney, Oxon.
G3DCJ J. E. Wootton, Junior Grammar School, Compton Road, Wolverhampton, Staffs.
G3DCV A. R. Watson, 75 Elwyn Road, March, Cambs.
G3DDR F. E. Bennett, 26 Swann Waye, Hayes, Middx.
G3DEF B. J. Gealer, 6 Ferndale Road, Swindon, Wilts.
G3DEK J. E. James, 4 Victoria Street, Cinderford, Glos.
G3DEX F. N. Howard, The Nook, Drayton, Norwich.
G3DFC R. A. F. Amateur Radio Society, Danesfield Court, Medmenham, Marlow, Bucks.
G3DFD M. C. Farley, 55 Westminster, Caterham, Surr.
G3DFE/A O. S.ouldwell, 80 Alexandra Road, Newland, Hull.
G3dff R. J. Barrett, 69 Shrewsbury Road, Carlshaton, Surr.
G3DGH D. G. Hardcastle, 3 Shrubbery Road, Kidderminster, Worcs.
G3DIV P. J. Pollard, 6 Annnington Road, Eastbourne, Sussex.
GW3DIX G. Moorfield, Siabod, Capel Curig, Caernarvonshire.
G3JD J. R. Donald, 2 Canfield Road, Brighton, Sussex.
G3DG C. Oakes-Jones, 78 Turref Avenue, Donnington, Wellington, Salop.
GSKG/A F/L G. W. Siack, Officers' Mess, RAF, Danesfield Court, Medmenham, Marlow, Bucks.
G5WW/A P. Carment, Officers' Mess, RAF Danesfield Court, Medmenham, Marlow, Bucks.

G6BD R. A. Farmer (ex-D2AV), 12 Carisbrooke Road, St. Leonards-on-Sea, Sussex.

G6QF W. K. Miller, 94 Hilton Lane, Little Hulton, Bolton, Lancs.


G8OZ R. A. French, 24 Sudbury Crescent, Bromley, Kent.

G8WI/A C. R. Thompson, Officers' Mess, RAF, Danesfield Court, Medmenham, Marlow, Bucks.

CHANGE OF ADDRESS

EI4G G. H. O'Donnell, 61 Stiles Road, Clontarf, Dublin.


G2COU C. Page, 18 Highfield Road, Luton, Beds.

G2DHV/A G. V. Haylock, c/o 28 Longlands Road, Sidcup, Kent.

CONTRIBUTORS NOTE

We are always glad to see articles dealing with any aspect of Amateur Radio, and we give quick appearance to important material of immediate value and interest. Besides which, in the Amateur Radio field we still pay the highest rates in the world.

If you have ideas for an article, let us see your suggestions, with a short outline of the proposed range it is to cover.

NEW QTH'S

The loading has once again run ahead of the available space, so that it is taking up to two months for callsigns to appear. We are sorry about this, and as soon as we see a chance we will take some more space to get up to date again. All concerned will probably agree that one page is a fair average allocation for this feature, though for our part we should like to be able to print the lot every month.

Sir Robert Watson-Watt (speaking) was one of the chief guests at the Belling-Lee Jubilee Celebration Dinner; Mr. Edgar Lee was in the chair and Capt. Mullard is on the right of the photograph. The progressive success of the firm of Belling-Lee, well known in radio for over twenty years, is an outstanding example of the initiative and resource which have built up the British radio industry.
The other man's station

G2AMJ

A photograph of the beam aerial system at G2AMJ—G. Raahague, A.M.I.E.E., 87 Wolfreton Lane, Willerby, East Yorks. —appeared on p. 609 of our December issue. Here is a view, and some details, of the station itself.

G2AMJ uses two HRO's, one for the signal on tune, and the other as a monitor for comparative strengths—and also to find a frequency clear of QRM should the station being worked get buried. These receivers are carefully calibrated by means of the BC-221 on the right of the receiver position, and dial readings are indicated on both receivers. Also available is an S27 for NBFM or FM reception.

The transmitter is a Collins 30J, using a pair of HF100's in the final, modified for 150-watt operation. Crystal control is employed on three frequencies in the 28 mc band, and the Tx can also be VFO-controlled by the Type 145 Oscillator, visible to the left of the HRO's; again, frequency is checked by the BC-221 frequency meter.

Modulation check is by means of a Mullard 4-in oscilloscope. The monitor above the 145 is used for aural check on phone quality, and is also adapted for field strength measurement work. The station is relay-operated and arranged for “push-to-talk” control; pilot lights are incorporated to indicate when circuits are “live.”

G2AMJ is a “10-metre only” station, and on this band good and consistent reports are received from VK and W6.

CORRESPONDENCE

We are anxious to make-space (somehow) for two regular pages of reader correspondence, of which we receive a large bundle every month, full of useful and interesting points. It is neither neglect, indolence nor lack of material which prevents it happening—but until we can see a way of getting a couple of pages, it is considered better in the interests of all concerned to use the available space for practical general-interest articles.
THE MONTH WITH THE CLUBS
FROM REPORTS

Activity continues to be at a high level, and we publish this month the reports from 36 Clubs, including some very welcome newcomers. For this reason, we keep the preamble short, merely stating that the deadline for next month's reports is first post on April 15. Please address them to the Club Secretary, Short Wave Magazine, 49 Victoria Street, London, S.W.1.

Wanstead and Woodford Radio Society.—An Extraordinary General Meeting was held during March at which members agreed to annul the office of President, after the resignation of Mr. E. D. Ostermeyer, G5AR. Rules were also policed up and will be circulated in due course. A news-sheet is now published, in which details of forthcoming meetings are given.

South-West Essex Radio and Scientific Society.—Newcomers, they formed in January, and now meet every Wednesday, 7 p.m., at Valence House, Becontree Avenue, Dagenham (Room 9, 1st Floor). Talks have been arranged on Superhet Theory, Basic Radio for the Beginner, Television Receivers, and regular Morse classes, junk sales and raffles are also held. Secretary's name in panel.

Burnham and Highbridge Amateur Radio Society.—This Club was inaugurated in February, and is now in full swing. Future meetings are to be held at the Ring-o'-Bells Hotel, Burnham-on-Sea, on the first and third Mondays of each month; they will include Morse classes, and lectures covering the RAЕ syllabus. Slow Morse transmissions on 3.5 mc are also being started shortly.

Stourbridge & District Amateur Radio Society.—The A.G.M. was held at King Edward VI School, and a good attendance were recorded. The new committee and officers were elected, and the President (G601) referred to the happy atmosphere prevailing in the Society and hoped that further activities would be undertaken soon. During the coming year, it was decided, a Social Evening will be held.

Basingstoke & District Amateur Radio Society.—At the March meeting D. R. Willis demonstrated Marconi instruments, including a transmitter, Output and Frequency Meter, Modulation Meters and so on. This Club has been given some useful publicity in one of the local papers, and membership now stands at 32.

South Shields Amateur Radio Club.—They have now acquired a new call (G3DDI) and a new address (Trinity House, Laygate, South Shields). The Club transmitter will soon be on the air, and a course of lectures and demonstrations has been arranged for the forthcoming months.

Cannock Chase Radio Society.—Cannock Chase meets on the second and fourth Tuesdays, 7.30 p.m., at the Unicorn Inn, Church Street, Cannock, and new members will be heartily welcomed if they will just turn up. The future programme includes a course in Radio Fundamentals, visits to places of radio interest, and participation in N.P.D.

Weston-super-Mare Radio Society.—The first report received from this Club informs us that meetings are being held on the first Friday in every month, 7.30 p.m., at the Y.M.C.A., Weston. Secretary's QTH in panel.

Wirral Amateur Radio Society.—A demonstration on VHF aerials was recently given by Mr. Arthur Bell, of the Mersesyside Radio Society; signal generator, transmitting and receiving aerials were set up on the club room table and many effects were demonstrated. A proposal on compulsory band-planning was carried by 24 votes to 3. April meetings are booked for the 7th and 21st—both 7.30 p.m. at the Y.M.C.A.

Smethwick & District Wireless Society.—Recent meetings have included demonstrations of the AR88, the Eddystone 640, and three sound-films on Radar. The club transmitter, G2GX/A, is operated from the club-room on 7 and 14 mc 'phone.

Bradford Amateur Radio Society.—Membership is increasing and meetings are well supported. A forthcoming lecture is on "Radio Signals from Outer Space," by G2FJD. Members of the "Worked All Planets" Club are expected to turn up in numbers.

Doncaster & District Amateur Radio Society.—The A.G.M. was held on March 3, at which the Officers and Committee were duly elected. Meetings are held every Wednesday, 7.30 p.m., at 73 Hexthorpe Road, with Morse classes, and a series of lectures. From April onwards, however, the Club will meet on Tuesdays as well.

Rae & Farnborough District Amateur Radio Society.—This Club, now in its second year, holds very successful meetings every other Monday at 7.15 p.m. The Secretary will be pleased to hear from any potential members and also, in particular, from anyone prepared to lecture on Radio and Electronics subjects. On April 12 there is a Brains Trust, and on April 26 a Mazda lecture on "Valve Technique."

Midland Amateur Radio Society.—A recent lecture on "Design of UHF Generators" (with a demonstration on
450 mc) was attended by 89 members and visitors. The lecturer was G2RQ and the demonstrator G3BJ. All meetings are on the third Tuesday, 6.30 p.m., in the Imperial Hotel, Birmingham.

Bovingdon Airport Club.—This Club's licence has come through with the call G3DGS, several members are licensed to operate, and the first QSO has already been made with a 6-watt transmitter. Skeds are being arranged with stations in surrounding districts. Members recently visited Bovingdon Airport Control and were shown over all the equipment used in a modern civil airport. The Hon. Sec. requests that correspondence should be addressed to him at the QTH given, and not at the Airport.

Reading & District Amateur Radio Society.—Another new idea for Clubs, as tried out by this Club in February, “Mystery Parcel Exchange,” in which all participants (if they were lucky) may well have obtained that very piece of gear they have been looking for! A rather unusual lecture was also given by the President, with Dr. Lemon, the title being “Very Low Frequency Oscillations.” Effects of AC were demonstrated by mechanical methods at frequencies between 0.5 and 2 cycles per second. Meetings are at Palmer Hall, 6.30 p.m., on the second and last Saturdays of the month.

Southend & District Radio Society.—During March the Club was given a talk on Gramophone Recording by Mr. R. V. Ripley, A.M.I.E.E., of E. K. Cole, Ltd. At the April meeting, on the 9th, there will be a Murphy lecture on Television. April 23 is set aside for informal “rag-chewing.” All meetings are now preceded by a Morse class at 7.15 p.m.

Grafton Radio Society.—All North London amateurs and enthusiasts will be welcomed at this Club, which must be one of the very few in the country which meet three times a week—Mondays, Wednesdays and Fridays, 7.30 p.m., will find Grafton in session at the Grafton School, Ebourne Road, Holloway, London, N.7 (one minute’s walk from the “Nag’s Head.”)

Medway Amateur Receiving & Transmitting Society.—Still expanding, they now have a membership near the 70 mark. Recent lectures have covered such subjects as “The Electronic Test Meter,” “Antenna Coupling Arrangements” and “Transmitting Procedure and Intelligent Reporting.” Work on the Club station is going ahead, alternate nights being devoted to constructional work.

Tees-Side Amateur Radio Society.—First report from this Club, which has been running for over a year. There are now 40 names on the register, including 13 “ticket-holders.” A Club transmitter

Following are the names and addresses of the Secretaries of Clubs whose reports appear in this issue. They will be pleased to give full details and every assistance to prospective members.

BASINGSTOKE. L. S. Adams, 16 Brambley Drive, Basingstoke, Hants.

BOVINGDON AIRPORT (G3DGS). J. D. Lord, Police Station, Bovingdon, Hemel Hempstead, Herts.

BRADFORD. W. S. Sykes, G2DJS, 287 Poltar Grove, Great Horton, Bradford

BURNHAM AND HIGHBRIDGE. T. N. Carter, G3BPV, P.O. Radio Station, Highbridge, Som.

CANNICK CHASE. D. M. Whitehouse, 69 Church Street, Cannock, Staffs.

CHIPPENHAM. W. A. Henson, G3DDG, 12 Filton Way, Chipping Barnet, Wilts.

COVENTRY (G2ASP). J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.

DONCASTER. J. D. Gillies, GM2FZT, 3 Berridale Avenue, Doncaster.

EAST SURREY. L. Knight, G5LK, Radiohome, Madeira Walk, Reigate.

EDGEWATER (G3ASR). R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.


HARROW. J. D. Lord, Police Station, Bovingdon, Hemel Hempstead, Herts.

KINGSTON. A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.

MEDWAY. S. A. Howell, G5FH, 39 Broadway, Gillingham, Kent.

MERSIDE. C. M. Johnstone, 6 Flawn Road, West Derby, Liverpool.

MEDWAY. W. J. Vincent, G4OL, 342 Warwick Road, Solihull, Birmingham.

READING. Port. C. J. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading.

RETFORD. H. White, G3BTV, 39 Trent Street, Retford.

SLADE. C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23.

SMETHWICK (G2G/A). Maj. G. A. Swinnerton, G6AS, 23 Hawthorn Croft, Quinton, Birmingham, 32.

SOUTHEND (G6QK). J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.

SOUTH-WEST ESSEX. P. F. T. Redman, 108 St. Andrew's Avenue, Elm Park, Romford, Essex.

SOUTH SHIELDS. W. Dennell, G3ATA, 12 South Frederick Street, South Shields.

STOKE-ON-TRENT. D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent.

STOURBRIDGE. W. A. Higgins, G3GF, 35 John Street, Brierley Hill, Staffs.

SURREY. L. C. Blanchard, 122 St. Andrew's Road, Coulsdon, Surrey.

STOKE-ON-TRENT. D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent.

STOURBRIDGE. W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.

SOUTH-WEST ESSEX. P. F. T. Redman, 108 St. Andrew's Avenue, Elm Park, Romford, Essex.

SOUTH SHIELDS. W. Dennell, G3ATA, 12 South Frederick Street, South Shields.

STOKE-ON-TRENT. D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent.

STOURBRIDGE. W. A. Higgins, G3GF, 35 John Street, Brierley Hill, Staffs.

SURREY. L. C. Blanchard, 122 St. Andrew's Avenue, Coulsdon, Surrey.

TEES-SIDE. H. Walker, G3CBW, 9 Chester Street, Middlesbrough.

THAMES VALLEY. D. R. Searing, G3GQ, 99 High Street, Esher, Surrey.

WANSTEAD (G3BRX). R. J. Broad, G3AAJ, 24 St. Margaret's Road, Wanstead Park, London, E.12.

WESTON-SUPER-MARE. W. O. Morton, G3U, 22 Locking Road, Weston-super-Mare.

WOLVERHAMPTON. H. Porter, G2YM, 221 Park Lane, Wolverhampton.

WORCESTER. J. Morris Casey, G8JC, Brookhill Farm, Ladywood, Droitwich, Worcestershire.

WORTHING. G. W. Morton, 42 South Farm Road, Worthing, Sussex.
Impressive array of equipment built by Reading members for their Constructors' Competition.

is under construction, permanent premises have been obtained, and everyone is very busy with Morse classes and all the other activities. Next meeting is on April 12 at 7.30 p.m. Secretary's QTH in panel.

Radio Society of Harrow.—The last meeting included a discussion on equipment, site and personnel for the forthcoming NFD event. Equipment will be made by Club members. Future events include a talk, by G2AI, on Aerial Systems. This will be on April 20.

Merseyside Radio Society.—At the March meeting there was a talk on Single-Side-Band working by G3BNO, and a new Hon. Sec. was elected (QTH in panel). At the April meeting (before publication) there is to be a talk on arials. The Club publishes a very interesting bulletin called “Merseyside Amateur Radio Review,” giving a very full account of the Club’s activities, social, technical, constructional and projected! It also covers the work of the Liverpool and District Short Wave Club.

Slade Radio Society.—The next two meetings after publication are on the 16th (Ceramics) and the 30th (High-Fidelity Reproduction). All meetings are held at the Parochial Hall, Broomfield Road, Slade Road, Erdington, at 8 p.m.

Worcester & District Amateur Radio Club.—At the last meeting another “pre-exam” lecture was given, and the President gave a brief description of his 50-cm oscillator, which was passed round for inspection. In future an informal meeting will be held on the third Tuesday of each month, the regular monthly meetings continuing on the first Thursday.

Coventry Amateur Radio Society.—The Club’s transmitter, G2ASF, has now made its debut on 3.5 mc, and will be heard on most Mondays. The last meeting comprised a demonstration of various types of oscillator; on April 26 Mr. T. R. Theakston, well known for his Maths. lectures, will talk. The Club carried off the Desmond Trophy by winning the MARS/CARS Team Contest—good show for Coventry!

Edgware & District Radio Society.—During March members heard Dr. Bloomfield (G2NR) on the subject of the newer low-loss insulating materials, and on March 21 the first of the year’s outdoor events (a 1.7 mc DF Contest) was held. Motive power was, of course, limited to bicycles! Membership increases weekly, and a sixpenny raffle is held each week to pay the rent.

Stoke-on-Trent Amateur Radio Society.—This Club held a very successful Exhibition in Hanley at the beginning of March. The idea was to show the public the amateur’s contribution to the art of radio, and the exhibits took the form of a pageant of “Radio Through the Ages.” On the modern side, the Police and Territorials co-operated with some of their equipment—the
former demonstrated the ease and quickness with which a police car can be contacted. G3ALP and G3UD were on the air from the Exhibition. Normal meetings are held every Thursday at 7.30 p.m., and comprise lectures, demonstrations, junk sales or just "someone's idea."

Thames Valley Amateur Radio Transmitters' Society.—A lecture on "An Introduction to the Electronic Valve" was recently given, illustrated by a Mullard film. This was the first of a series of six similar lectures. A panoramic short-wave receiver built by a member was also described. At the April meeting there will be a talk on VHF work.

Retford & District Amateur Radio Club.—After only six weeks' existence this Club has a membership of 17, including two YL's! Permanent premises have been obtained; Morse and radio classes are held every Monday pending the "move-in." Secretary's QTH, as usual, in panel.

Kingston & District Amateur Radio Society.—Lectures during March were on "Crystals" and "RAF Communications Equipment and its Modification for Amateur Use." Forthcoming events were also discussed, and these include a Field Day in May, and a display of technical films. April meetings, on the 8th and 22nd, are both lectures—"Underwater Communication" and "The Decca Navigator."

Surrey Radio Contact Club.—The March junk sale was very successful, and was visited by G8IG and G6VX, the latter contributing some valves and components. Next meeting is at the Blacksmith's Arms, 7.30 p.m. on April 13, and will be the A.G.M.

East Surrey Radio Club.—A lecture on "Frequency Measurement," as required at amateur stations, was recently given by G2MV, deputising for G5OH. Meetings are held on the last Thursday, at Toc H Rooms, Redhill.

R-H-O Club, Giffnock.—This Club records a 100 per cent. attendance nearly every time—a healthy sign, if ever there was one. Two main subjects of discussion are Rotary Beams and F-M Equipment. There is also a "VVHF" group working on 2,300 mc; several contacts have been made and the experts are preparing to go mobile for some longer-distance work.

Worthing Radio Group.—The March meeting was well attended, and Mr. Crowley gave a talk on the design and applications of the CRO. At the April meeting (before publication) the first of the Mullard valve films is to be shown.

Wolverhampton Amateur Radio Society.—Great activity is taking place in connection with the Borough's Centenary Celebrations. Recent activities have included a lecture on transformers, a junk sale, and a demonstration of the CRO by Mr. F. T. Smith, the Club's Chairman.

EDDYSTONE RELEASES

In addition to their Speed Key, mentioned in our last issue, Stratton & Co. offer two other very useful and interesting new items—the Eddystone Signal Strength Meter, and the Eddystone Modulation Level Indicator.

The S-meter has been designed primarily for use with the 640 Receiver, into which it plugs without any alteration or fiddling; the meter is 0-200 microamp at full-scale deflection and is calibrated in S units and dB above S9; the standard is a 4 dB change in carrier-level for each S point.

In the Modulation Level Indicator, two crystal rectifiers are employed, with a meter calibrated to give direct percentage-modulation readings when the RF pick-up is correctly adjusted. The various bands are covered by plug-in coils, and the calibration holds good on all frequencies up to 28 mc. This particular instrument can also be used as a 'phone monitor and field strength meter, and thus combines a number of useful applications.

Other new releases include the Eddystone Beam Aerial Kit—a complete assembly as far as the supporting tube for a 3-element array adjustable to any frequency between 50 and 100 mc—and the Crystal Calibrator. The latter is a self-contained unit providing high harmonic output from 100/1,000 kc bars on frequencies up to 60 mc.

SMALL POINT

If you are busy on frequencies from 28 mc up, and the layout of the gear will allow it, try inductive in preference to link coupling. There is nothing new about this—except the large increase in transfer efficiency by the use of inductive coupling as the frequency goes up. In a particular piece of equipment, link coupling gave a maximum of 18 mA of drive at 50 mc; the link was four inches long, of the best material, and carefully adjusted at each end. By arranging for variable inductive coupling this became 30 mA at the optimum settings.
THE IDEAL TRANSMITTING AND RECEIVING AERIAL FOR THE AMATEUR

This very practical kit consists of a "T" strain insulator, 80 ft. of cadmium copper wire and 80 ft. of L336 balanced twin feeder with plug and socket to suit (see illustration below) and two glass end insulators. The "T" insulator in the illustration on which sensible terminals and "cable grips" are provided, has been designed to take the feed from the centre of a half-wave di-pole.

For receiving purposes, the length per half-section is not critical to within a few inches, but for transmission the lengths given are approximate only and must be slightly re-adjusted to the correct length from the formula:

\[
\text{Length of half-section in feet} = \frac{224}{\text{Frequency in Mc/s}}
\]

Cadmium copper is supplied as this will not stretch—a most important matter if the aerial is being used for transmission. Suitable for 200 watts RF up to 28 mc/s.


<table>
<thead>
<tr>
<th>Frequency in Mc/s</th>
<th>Length in feet</th>
<th>Frequency in Mc/s</th>
<th>Length in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-0</td>
<td>32-75</td>
<td>6-0</td>
<td>40</td>
</tr>
<tr>
<td>14-0</td>
<td>16-5</td>
<td>9-0</td>
<td>27</td>
</tr>
<tr>
<td>28-0</td>
<td>8-0</td>
<td>12-0</td>
<td>20</td>
</tr>
<tr>
<td>56-5</td>
<td>4-0</td>
<td>15-0</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18-0</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21-0</td>
<td>11</td>
</tr>
</tbody>
</table>

Length given is per half-section

Short Wave Amateur Band | Short Wave Broadcast Band

Construction of Equipment

Our department dealing with the above is always ready to discuss, and, we hope, solve the various problems the average constructor meets when building that new equipment.

We also provide quotations for building equipment to order, as well as for the modification of existing gear, to say nothing of the re-alignment and adjustment of receivers, transmitters, etc.

This branch of the Radiocraft Service is proving increasingly popular—our charges are reasonable and the workmanship good.

STANDARD EQUIPMENT. Our new lists give details of the range of equipment designed for Amateur application. Transmitters, V.H.F. Converters, Field Strength Meters, Power Packs, Modulators, Transformers, are all listed, together with prices.

We will willingly add your name to our mailing list.

We have a good stock of high wattage resistors, both fixed and adjustable, and a range of valves such as PT 15, 807, RG250/3000 (866), 4356A, 4061A (RK20A), 2V400A, etc., etc.

SPECIAL OFFER. Mains transformers of excellent and robust construction.

Primary 200 to 250 volts
Secondary 500-0-500 volts at 200 M.A.
5 volts, 3 amps; 6'3 volts, 4 amps.

£4.3.6

Radiocraft Ltd
11 CHURCH ROAD • UPPER NORWOOD
LONDON • S.E.19  Phone: LIVINGstone 4787
**TELE-RADIO (1943) LTD.**

177 EDGWARE ROAD, LONDON, W.6

Phone: AMB. 5393. PAD. 6116/5606

**OFFER THE FOLLOWING AMERICAN TYPE NEW VALVES**

<table>
<thead>
<tr>
<th>1-4 Volt Range</th>
<th>ALL IN STOCK</th>
<th>VOLTAGE</th>
<th>TUNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>6B8</td>
<td>16/7</td>
<td>6V6</td>
<td>13/11</td>
</tr>
<tr>
<td>6C5</td>
<td>10/-</td>
<td>6X5</td>
<td>12/-</td>
</tr>
<tr>
<td>6C6</td>
<td>20/7</td>
<td>624/8</td>
<td>12/-</td>
</tr>
<tr>
<td>6C8</td>
<td>19/11</td>
<td>627G</td>
<td>19/11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7 Volt Range</th>
<th>REGULATORS</th>
<th>INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7A8</td>
<td>15/3</td>
<td>785</td>
</tr>
<tr>
<td>7B6</td>
<td>12/7</td>
<td>786</td>
</tr>
<tr>
<td>7B8</td>
<td>12/3</td>
<td>788</td>
</tr>
</tbody>
</table>

**TUNING INDICATORS**

| VR75/30       | 12/6       |
| VR90/30       | 12/6       |
| VR150/30      | 12/6       |

| 8B4           | 18/-       |
| 8B5           | 18/-       |

**SUNDRIES**

| 25A6          | 13/11      |
| 25Y5          | 12/-       |
| 25Z4          | 12/-       |
| 25Z6          | 12/-       |
| 35A5          | 12/-       |
| 35A6          | 12/-       |
| 35K6          | 12/-       |
| 6AC7          | 27/10 pr.  |

**5 Volt Range**

<table>
<thead>
<tr>
<th>$5/10/-</th>
<th>6.3 Volt Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>6L7</td>
<td>13/11</td>
</tr>
<tr>
<td>6L8</td>
<td>19/5</td>
</tr>
<tr>
<td>6L9</td>
<td>12/7</td>
</tr>
<tr>
<td>6L2</td>
<td>15/3</td>
</tr>
<tr>
<td>6L3</td>
<td>15/3</td>
</tr>
<tr>
<td>6L4</td>
<td>13/11</td>
</tr>
<tr>
<td>6L5</td>
<td>13/11</td>
</tr>
</tbody>
</table>

**MATCHED VALVES IN PRS. Tungsram**

<table>
<thead>
<tr>
<th>P27/500/Px25</th>
<th>each valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>6AB7</td>
<td>19/11</td>
</tr>
<tr>
<td>6AC7</td>
<td>19/11</td>
</tr>
<tr>
<td>6AG7</td>
<td>13/11</td>
</tr>
</tbody>
</table>

**NEW FOLDER**

... tells you all about the complete range of Henley SOLON Electric Soldering Irons, for the standard voltage ranges of 200/220 and 230/250: 65 watt and 125 watt models fitted with oval-tapered bits or pencil bits and 240 watt models fitted with oval-tapered bits are available.

Write to-day for the new folder ref. Y.10 describing W. T. HENLEY'S TELEGRAPH WORKS CO. LTD. (Engineering Dept.) 51-53 Hatton Garden, London, E.C.1
CELESTION

The quality of reproduction secured from Celestion Speakers greatly increases the pleasure of radio in the home.

The model illustrated has an attractively designed Cabinet with a special mahogany finish, it employs an 8” speaker of high sensitivity and excellent response. It is fitted with a volume control and is one of the finest 8” extension speakers available.

All interested in other Celestion Cabinet and Chassis models should write for Illustrated Brochure “S.W.”

WHERE TO BUY CELESTION SPEAKERS

The Public are requested to order from their local Radio Dealer

Wholesalers are supplied by the Sole Distributors:
CYRIL FRENCH LTD., High St., Hampton Wick, Middx, Phone: KINGston 2240

Manufacturers should please communicate direct with:
CELESTION LTD., KINGSTON-ON-THAMES, SURREY Phone: KINGston 5656, 7, 8 and 9

STANDARD 8 CABINET MODEL

Mahogany finish
Size: Height 17” Width 12” Depth 5½” PRICE £3:18:0

Price with Universal Transformer £4:14:0

Technical Details of Chassis Model for use with your own cabinet. Dia. 8”, Paffle opening 7½”. Voice coil impedance at 400 cps, 2½ ohms. Pole dia. 1”. Flux density gauss, 8,000. Total gap flux, 3,000. Peak power capacity 4 watts

Price less transformer (Suitable for outputs 1-5 ohms) £1:17:6

Price with Universal transformer (Suitable for all Receivers) £2:3:6

LASKY’S RADIO

THIS MONTH’S SPECIAL OFFER

2-volt Vibrator Power Units, as used with the Canadian 58 Sets (Walkie-Talkie). Output: 1-5 volts L.T., 90 and 180 volts at 35 m/a H.T., completely smoothed (synchronous vibrator).

In grey metal case, size 8”x3½”x4½”. Included are two fine 2-volt, 20 a.h. accumulators, spare vibrator and fuses, with all plugs and connectors. The whole unit, with accumulators and spares, etc., is totally enclosed in metal carrying case. Finished in olive green crackle. Size 14”x11”x5”. Weight 30 lb. approx. When the accumulators are charged the unit is ready for use.

ABSOLUTELY BRAND NEW AND UNUSED.

DO NOT MISS THIS BARGAIN.

LASKY’S PRICE 69/6 Carriage 4/- extra, England and Wales.

SPECIAL VALVE BARGAINS, Brand New ex-Government. Miniature 1¼ volt button base. 155 at 9/6, 174 at 9/6, 153 at 11/6, 1-4 volt local transmitting tetrode 1299A at 7/6 each. 807 at 12/6, 5Z3 at 12/6, ECC31 at 12/6, 6317, glass or metal, at 7/6, 6K7, glass or metal, at 8/-, 6K5GT at 10/6, CV6 and E1138 at 5/-, 955 acorn at 12/6, EF50 at 7/6, CO66 at 10/6, 6H6 or EB34 at 5/-, EA50 at 7/6, 6A7 at 18/-.

A REAL MINIATURE 3-GANG TUNING CONDENSER. .0005 mfd. Ceramic insulation. Fixing feet. Size 2½” long by 2” deep by 1½” wide, ½” spindle, ⅞” long. Price 17/6 each.

32 MFD CONDENSERS, 350 volt Working. By well-known manufacturers. Tubular metal cans. Size 1½ dia., 2½” long. Price 4½/- each, 46/- per doz. As above, miniature size 1” dia., 1½” long. Price 5½/- each, 87/6 per doz.

SEND 1d. FOR OUR CURRENT LIST OF RADIO COMPONENTS. ALSO OUR SPECIAL BULLETIN OF EX-GOVERNMENT BARGAINS. IT WILL PAY YOU TO PAY US A VISIT.

LASKY’S RADIO

370 HARROW ROAD, PADDINGTON, LONDON, W.9
Telephone: CUNningham 1979
Opposite Paddington Hospital
Hours: Monday to Saturday 9.30 a.m. to 6 p.m. Thursdays half-day
THE TRADING POST — G8YQ

AERIALS. Dipole, cut to approx. 30 metres, complete with insulators and 30 yards of twisted feeder. This feeder is similar to that sold for vacuum cleaners.

1S/6
AERIALS. Dipole, tubular, adjustable. Ideal for 5-metre rigs, or could be adapted for lower frequencies.

£1.0/0
Ex-R.A.F. 27 ft. sectional steel masts. These are cigar-shaped masts of exceptional strength, being approx. 3" at top and bottom and 5" in the centre. Rope guys are included, and the mast packs into approx. 9 ft. for transport. Ideal for rotary arrays.

£3.0/0

A number of IFF sets still available at £1/12/- ea.

Wireless Remote Control Units (Canadian).

We have a very good line in partly stripped power unit cases, which still contain the following useful articles:—13 fixed resistors, 1 variable resistor, 14 condensers including 3 high voltage, 3 L.F. chokes, 8 valveholders, all mounted on a very accessible chassis, and the whole sliding into a well made, and well ventilated cover. This bargain cannot be repeated when stocks are exhausted.

This unit measures 12" x 8" x 7".

A gift at 7/-6, plus 2/-6 postage.

MOTORS. 12-volt, easily adapted to work off either A.C. or D.C. mains.

£1/18/-

MOTORS. 24-volt fractional H.P. A.C. or D.C., needs addition of line cord only to work off mains.

£15/-

Please send S.A.E. for lists

Beat the Budget, by beating up to

THE TRADING POST

at

40 SOUTH EALING ROAD, W.5

Phone: EAL 5903

G6YA WESTERN GATEWAY HEADQUARTERS G2BAR

For Radio Equipment and Components

GENUINE R.C.A. EQUIPMENT

Plate Transformer. 1-75 kVA. Input 190/250v. 50 cps. Sec. 2,300-1,750-0-1,750-2,300v. (for nominal outputs of 2,000 and 1,500v. at 800 m/a). Weight 97 lbs. net. Size 9" x 9" x 7 1/2". £6/10/- each.

Modulation Transformer

Primary 10,400 ohms (suitable P.P. 810, 805, TZ40, 813, etc.). Sec. 4,300 ohms, suit any P.A. up to 1 kW. Weight 67 lbs. net, size 9" x 9" x 7 1/2". £6/10/- each.

Modulator Unit

Comprises mod. trans. as above, driver trans., filament trans., valveholders and balancing controls for PP805 valves on chassis. Wired ready for use. Input 190/250v. 50 cps. £9/0/0.

Speech Amplifier. Input 190/250v. 50 cps. Valve line up 4-6J7's, 2-6L6's, I-5U4G. Resistance coupled P.P. 25 watts output. Standard input and output impedances. Will feed modulator unit above. In brown crackle case with valves, £13/10/-.

All above new in sealed case. Carriage paid rail.

IN22 Sylvania Crystal Diodes

2/-6 each, 10 for £1, ideal for field strength meters, monitors, etc., using up to 1 m/a movements. Post free.

ARTHUR H. RADFORD

A.M.I.E.E. (G6YA) A.M.(BRIT.) I.R.E.

28 Bedminster Parade, Bristol, 3

Telephone: 64314

This gives details of our latest products including:—

CT.6. A new coil turret for superhets, with no RF stage (replacing CT.1 and 2), several additional features: 5 bands covering completely 0-175 to 30 Mc (except 465 kc1F) ; large calibrated vertical reading dial. Complete with dial and drive mechanism ... ... £4/10/-

CT.3. The well-known 6-band turret with RF stage, complete with dial, drive, etc. ... ... ... ... ... ... ... ... £6/10/-

IFT.8. Maxi-Q IF Transformer, 465 kc or 1-6 Mc ... ... 9/-

TW.1. Tuning wand: a boon in receiver alignment ... ... ... ... ... 3/6

RFC.9. Transmitting type R.F. Choke, 2-6 mH. 250 Ma....... 3/6

DENCO (CLACTON) LTD., OLD ROAD, CLACTON, ESSEX

Ask your stockist for our new catalogue (9d.)
COMPLETE EQUIPMENT
This fine transmitter affords every convenience in amateur operation and is so far in advance of contemporary design that it will not be outdated for many years. Supplied complete, rack mounted, with all connecting cables.

PRICE COMPLETE, READY TO GO ON THE AIR. £175
or as INDIVIDUAL UNITS

SPECIAL INSTALLATION SERVICE available on request at a modest charge

Labgear LTD

Labgear 150 WATT 'phone/C.W. TRANSMITTER

Noteworthy features include:
PRECISION ANTI-DRIFT V.F.O. CONTROLLED;
BUILT-IN CRYSTAL HETERODYNE WAVE-METER;
WIDE BAND MULTIPLIERS—NO TUNING; 813 P.A.;
HIGH LEVEL MODULATOR; BAND SWITCHED THROUGHOUT; FULLY METERED; STABILISED POWER; UNIVERSAL ANTENNA COUPLER.

INDIVIDUAL UNITS
R.F. EXCITER UNIT (with valves) ... ... £40
P.A. UNIT (with 813) ... ... ... ... £30
UNIVERSAL ANTENNA TUNING UNIT (as illustrated) ... ... ... ... £12
SPEECH AMPLIFIER and MODULATOR (with valves)... ... ... ... ... £25
POWER UNIT for AUDIO equip't. and BIAS (with valves) ... ... ... ... £25
POWER UNIT for all R.F. equip't. including 1,000v D.C. for P.A. (with valves) ... ... £30

A.C.S. RADIO

WE OFFER THE FOLLOWING SELECTION OF ITEMS FROM OUR LARGE STOCK OF COMPONENTS

Indicator Lampholders, panel mounting type, bakelite, with screw-in bulb holder, 9d. each.
Vitreous Resistors, 10,000w. 10 watt, 1/6 each.
Co-axis Cable, 80 ohms, 5/16" diam., polythene insulation, 1/3 yd.
Condensers, paper, in metal cans, 2 mfd. 600 v. wkg., 2/6 each.
Ceramic Coil Formers, with mounting strips, 2" x 1/8" diam., 5/- per dozen.
Neon Lamps, Osram 1-watt, B.C., 3/6 each.
Smoothing Chokes, 10H 150 mA 200 ohms, 15/-.
Polystyrene Coil Formers, with dust iron cores, 1" long x 7/16" diam., adjustable cores, 6d. each.

RECEIVERS

The Eddystone 640 at the new list price of £39/10/- is to-day's best buy in new Communications Receivers. No purchase tax on this set. Eddystone "S" Meter Units for the 640 receiver, £5/5/-.

VALVES

We hold large stocks of receiving and transmitting valves of all types at controlled prices; let us know your requirements.
A.C.S. Noise Suppressor Unit for H.R.O. and similar receivers. Send for illustrated leaflet.
Wearite "P" Coils, all types, 3/- each.

YES, HE WILL SEE HIM AGAIN—AND ON EXACTLY THE SAME SPOT—IF HE IS USING A BROOKES CRYSTAL

UNFAILING IN ACTIVITY AND STABILITY

51/53 GREENWICH CHURCH ST., GRE. 1828 LONDON, S.E.10
IT'S A SUCCESS!
THE 10 METRE "TEE-BEAM"

DURALUMIN ADJUSTABLE ELEMENTS, 9 ft. DURALUMIN BOOM, CAST ALUMIN HEAD, ADJUSTABLE "TEE-MATCH," SOLID COPPER FITTINGS

READ WHAT OTHERS SAY—(Unsolicited)
"The Beam is going F.B., plenty of DX."
"A definite increase in signal strength and it makes DX contacts a surety."
"The construction and finish of the Beam is excellent."
"Tee-Beam is going fine, giving a definite gain over other antennas I have."
"Very pleased with results, element lengths not critical, and back to front ratio is 36 db."

ORDER NOW

Wide spaced elements supported on thick "Perspex" panels makes tuning easy.
Increased power, and where you want it. Reduces Q.R.M.
Adjustable "Tee-Match" for co-axial or open line feeders.
Easily assembled, easily erected, fits any 2" mast-top. Only weighs 9 lbs.
Smart finish, all Duralum sprayed aluminium. Looks fine!

ORDER NOW
Carriage paid
£5/17/6 Passenger Train
AS SUPPLIED CROYDON AIRPORT.
(Complete with full instructions)
QUICK DELIVERY
EXPORT ENQUIRIES INVITED.

HERBERT TEE (G8DC) 469 HIGHER BRUNSHAW, BURNLEY, LANCS.
(Owing to pressure of business, no callers at present, please. All Mail Orders.)

THE MAIN AMATEUR SERVICE OF THE NORTH

CRYSTAL MICROPHONE. Chromium-plated in chrome table stand and heavy crackle base. Screened covered lead and screened plug and socket supplied with each. Response flat 30-8,000 cycles. List price less stand is £3/8/-.
Only £5 complete.
T1115. Master Oscillator or Crystal-F.D. or B.A. and P.A. Tuning 142 kc/s to 20 Mc/s. CW or phone. Size 10 x 12 x 15". Completely enclosed with modulator valve. Oscillator drives a PX25 into a TZOS-20. All connections marked. Ready to connect to 6v and 600v supplies. Meters, S.M. Dials, etc. Crystal not supplied.
Only £10 Complete
NOTE.—Most of the above have complete sets of coils, some have one or two coils missing.
BLEEDERS. Vitreous heavy duty.
130 watt, 20,000 and 50,000. 180 watt, 12,000 and 100,000. Only 5/- each
TELESCOPIC AERIAL, copper plated steel, 7 ft. to 34 ft. £2 10s.
TRANSFORMERS. Fully clamped with cast end plates. 4v 6A or 7.5v 6A. Both CT. 25/- each. Two transformers giving 1,250v at 400 Mas or 2,500 and 1,250 v at 200 Mas.
£4
CONDENSERS. 4 Mfd 1,000v, 7/6 ; 10 Mfd 1,000v, 15/- ; 4-4 Mfd 3,000v, 35/-.
BC348 COMMUNICATION RECEIVERS £19
Converted for Mains use £24.
The above are extracts from our new comprehensive list SWM. Please ask for a copy to be sent.
Amateur Radio Service G6HP, Canning Street, Burnley. Telephone 2999
We specialise in supplying complete kits and individual component parts for all circuits described in this journal.

WEARITE CERAMIC SWITCHES. We can supply individual parts or kits of parts to make 1 pole 12-way, 2 pole 6-way, 4 pole 3-way, from 1 to 6 bank.

SHORT WAVE COILS, 4-pin, set of 3, covers 12 to 80-metres. Complete with circuit, 9/6.

WEARITE "P" Coils. Full range in stock as shown in our catalogue. 3/- each.

SPECIAL OFFER. 2½" dia. SPEAKERS, Speech Coil impedance, 3 ohm. Brand New, 17/6. Also 5", same price.

H.B.L. 2-VALVE S.W. KIT. A simple to build and efficient battery 2-valve short-wave receiver, covering 12 to 80 metres. Complete kit of components, chassis, coils, valves and full instructions. £3 14/6

Send 2/6d. stamp for our Brochure of Kits, Peto-Scott Bros., 31 Woodbridge Road, Guilford.

HENBEST BROS., LTD.
Dept. S.M.
26 Green Lanes, London, N.13
Telephone : BOWES PARK 6289

GAMAGES
BARGAIN OFFER OF BRAND NEW EX-ADMIRALTY
EXTENSION SPEAKERS
AT A FRACTION OF ORIGINAL COST!

PRECISION BUILT to exacting Admiralty specification, these magnificent speakers give the clearest reproduction. Not too large for use in the home. Complete with Matching Transformer, Volume Control. Moving Coil-Speaker.

49/6

GAMAGES, HOLBORN, LONDON, E.C.1

SMALL ADVERTISEMENTS

TRADE ADVERTISEMENTS

9d, per word, minimum charge 12/-, 10/- series discount; all charges payable with order. Insertions of radio interest only accepted. Add 25% for Foreign readers (Heavy Type). Calendar terms: May issue, April 16. No responsibility accepted for errors.

NATIONAL HRO coils, LF ranges, £2/10/- each. Marconl CR100, good, £37/10/-, RCA-AR77E, new condition, £38/15/-, RCA-AR77E, working condition, £25/10/-, £35, excellent, £40/14/-, £5/15.

New 813 valves, £3/10/- each, 211 valves with bases, £2 each. Agents for Denco, Labgear, Q-Max, etc. Telegraphs : Elektron, Peterborough. (I2CGC-G3BHD) Electroonic Supplies Ltd., 9 Lincoln Road, Peterborough. Phone 42 0.


QLS CARDS AND LOG BOOKS. APPROVED G.P.O. SAMPLES FREE. ATKINSON BROS., PRINCES AVE., ELLAND.

COMPLETE Correspondence Course covering Amateur and C & G.I. Exams consisting of 12 lessons. Send for particulars.—Everyman's Correspondence College, 72, W. Stephenson's House, West End, S.W. 1.


AR88 USERS SEE SPECIAL OFFER ON PAGE 76. FEW ONLY AVAILABLE.—G2AK.

A MATOURS only. New type coil-winding giving improved performance. Signal and IF coils wound to your requirements. Quotations on request.—H. H. Sharratt, 49 Harold View, Leeds, 6.

DESIGN, DEVELOPMENT AND CONSTRUCTION OF APPARATUS OF ALL TYPES; CALIBRATION SERVICE; HIGHEST QUALITY WORKMANSHIP; REASONABLE CHARGES; SATISFACTION GUARANTEED.—S. G. BUTTON (G5JV), 91 WOODBRIDGE ROAD, GUILDFORD, SURREY.

A MATOUR selling out. 80 valves, including 807's, A6L6's, T20, lot £25. Type 37 oscillator/transmitter, 20 mc to 80 mc, £4 12. Emdo converter, with 2, 5, 6 and 10-metre coils, £8. Sig. Gen., 17 mc to 95 kc, 100/250 AC, £9. Crystal calibrator, 100/1000 kc, with 10 kc multimeter and internal mod., £4. Phone : Wallington 3528.

STUCK'S Radio, G3AMR, North Street, Sudbury, Suffolk.—Eddyson 640's, £39/10/-; Bugs, 77/6. Full range Eddystone and other amateur components, ex stock. Lists.

ALUMINIUM chassis and panels, any size, plain or polished to your requirements, from 3/9.—E.A.D., 15 Bence Lane, Darton, Barnsley.

BRAND, spanking, new National HRO Senior receivers. Signal-meter, X-tal, nine coils, AC power pack. It's worth a few extra pounds to have a receiver which has not been "frigged about," £62/10/-.—Power's Radio (G3ASC), Oswestry.

EF54, 5/6; 807's, 12/6. R3002 radar receivers, complete with 4 SP41, 2 RK34, 1 EF50, 3 DI, rotary transformer, 12 volts, input 480v 40 mA output, 22-85 mc, 45/- carriage paid. Brown's Type "P" headphones, 4000 ohms, 10/- pair. List ld.—Norris, ERFJ, 8 Kinghill Crescent, St. Albans.

B2 Mk. III Power Packs, 230v AC and 6v, 70/-.

B2 Transmitters, complete with coils, 45/6. Type 17 Osn, complete with AC power packs, £5. Type 145 power packs, 750v and Ms, 80/-. R22 Transceiver, complete, £6. Sleevings, all colours, 7/- per 100 yds. Valves : 7R7, 7Q7, 807, etc. Send for list.—Radio Components Unlimited, 31a Dunstable Road, Luton, Beds.
SMALL ADVERTISEMENTS:

TRADE—continued.

DURAL MASTS, IDEAL FOR THE BARNS, THREE TUBULAR SECTIONS, COMPLETE WITH GUYS, EASILY ERECTED AND TAKES LITTLE GROUND SPACE, WITH STAND CONVERTIBLE. EXPOSED LENGTH ONLY 2.5 FT., AS PERSONALLY USED, VERY STRONG, AMAZINGLY LIGHT, LIMITED NUMBER, ONLY 70/- CARRIED.

PAID, HERBERT TEE (G.D.C.), 469 HIGHER BRUNSHINE, NEAKING, S.5CHESTER.

BARTONS.—BC348's, 342's and 312's, from £18.


NEW and unused ex-Gov't. valves at 8/9 each. 6K8, 6K7, 6J7, 607V, 6L6, 5Z4, 5U4, MU14, EF50, EL22, 2S6. Aerialox Condensers, 600v DC 1 mfd, 2/6, 2 mfd, 3/3 each. Condensers, choke mounting, 25 350 dc, 0-1 2000v D.C. at 4/- doz. 0.25 1000v DC, 4/6 doz. 250 mfd 12v, 2/- each. C.W.O. only.—A.G. Supplies (Mail Order), 90 Melrose Avenue, Mitcham, Surry.

G6VS FOR REWINDS AND SPECIALS. TRANSFORMERS, CHOKE'S, ETC., REWOUND AND MANUFACTURED TO SPECIFICATION.

EXHAUSTIONS FREE. 125 mA, 100 LF CHOKE'S, 2/6; 10 Hz, 100 mA LF CHOKE'S, 10/6. TRADE ENQUIRIES INVITED. CARLTON COIL-WINDING CO., CARCO WORKS, 8 CHURCH ROAD, EIRKENHEAD.

SPECIAL sale of precision Test Meters (canceled export order) : Ranges, AC—0—10, 100, 5000v; DC—0—1v, 10, 100, 500, 1000v; DC current, 0-5, 10, 50, 100 500 ma.; resistance, 0-2000, 20000, 2 meg, 20 mezhos; capacity, 0-0.1, 1 mfd; watts, 0-4; all guaranteed. Usual price £16/16/-; To Hams and experimenters, special price £10/10/-; plus 1/3 postage. Limited quantity.—GM3PB, 44 Banner Road, Glasgow, W.3.

TELEVISION receiver at low cost (approximately £10). Tested circuit and instructions for converting easily obtainable ex-Government surplus radar receiver and indicator units into a highly satisfactory television receiver (sound and vision). Receiver IF's require no alteration. Full description of conversion approximately 12 hours. Circuit and instructions, 5/-.—B. W. Stevens, 122 Bath Road, Hounslow, Middx.

ATTENTION: DENC0 COMMUNICATIONS RECEIVERS SHORTLY AVAILABLE. A REAL STEP FORWARD IN SHORT-WAVE TECHNIQUE. YOU SIMPLY MUST HAVE THE DATA SHEET OF THIS FINE INSTRUMENT. DENO COMPONENTS ALWAYS AVAILABLE, ILLUSTRATED CATALOGUE, PRICE 9d. S.A.E. NOW TO MASONS (S.W.), WIVENOHE, NR. COLCHESTER, ESSEX.

LARGE Marconi DF receiver, A.W., for sale. Some external damage, but contains a wealth of material. £10, excluding carriage. Telephone Tudor 5277, or write BM/RXBF, London, W.C.1.

MASONS.—A few first-class aerial masts, new, unused and crated, A.M. Type 23, are offered at 17 guineas each, carriage paid nearest station in Great Britain. 78-11, high when erected. Telephone Tudor 5277 or write BM/RXBF, London, W.C.1.

HAM Gear? Don't seek far. See 4PF at WB9 Radio, 45 Priory Road, Anfield, Liverpool, BC3-48R, £20. Aerial Tuning Units, 17/6; 1-5 ma m.c., 5/-; 6ma m.c., £1/1/-; telephone 648, IBR, Liverpool. 

COOLHam Gear? Don't seek far. See 4PF at WB9 Radio, 45 Priory Road, Anfield, Liverpool, BC3-48R, £20. Aerial Tuning Units, 17/6; 1-5 ma m.c., 5/-; 6ma m.c., £1/1/-; telephone 648, IBR, Liverpool.

COOLHam Gear? Don't seek far. See 4PF at WB9 Radio, 45 Priory Road, Anfield, Liverpool, BC3-48R, £20. Aerial Tuning Units, 17/6; 1-5 ma m.c., 5/-; 6ma m.c., £1/1/-; telephone 648, IBR, Liverpool.

WALLCRAFTERS SX16 Communications Receptor, fine condition, complete with Hallcrafters speaker to match. Forty-six Pounds. G2IN, 116 Cambridge Road, Southport.
SMALL ADVERTISEMENTS

TRADE—continued.

FOR the High Stability VFO Driver Short Wave Magazine, March. 6AC7 RCA, new, boxed 7/6. 50 PF 3.5 V Trimmable Cer. 1/3, 7 my Cx 10uf. yr. choice of freq. 12/6, -5 mF Sprague 1/-. Resistors 6/- Doz. For Miniature Tx: RCA, 6N7, 10/-, 6X5 7/6, new, boxed. "01 Sprague 8d. Twin Cer. Trimmers, 2-40, Dublifier, 1/6. See also displayed Ad. G3SJ, 10 Yorkshire Street, Burnley.

QSI's and LOGS by MINERVA. Always new and attractive designs. Samples from Minerva Press, Elm Park, Essex.

READERS' ADVERTISEMENTS

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

SALE. Universal Avo Minor, £6. 2 PT15's, 10/- each. 2 pairs 465 kc Midget IF Transformers, new, 15/- pair. J2/CIL Cheddar, Somerset.

R3077/FF Trans./Rec., 12 valves—2 EF50, 16 SP41, 3 D1, 1 EL148. Complete, power supply 12v DC input, frequency 58-210 mc (2 bands), nearest £6.—Brunner, 6 Station Road, Solihull, Birmingham.

BRAND new B2 Transmitter/Receiver, power supply, all coils, unused, £12 complete, or exchange for twin class valve amplifier. General Radio (U.S.A.) amateur band precision absorption frequency-meter, Model 358, in case with charts, 3-5 to 60 mc, £4 10/- General Radio (U.S.A.) general-covereage absorption frequency-meter, Model 358, in case with charts, 1-5 to 22 mc, visible RF indication, £4. Large Cyldon transmitting meter, Model 358, in case with charts, 1.5 to 22 mc, £4'10;—Brand new E.D.C. Rotary Converter, input 12v DC, output 600v 250 mA, £2. Bound volumes R5GB Bulletin, 1933/34, 1934/35, 1935/36, 1936/37, 1937/38, 8/6 each. Loose issues, 1938/45, 7/6 per doz.—GW6AA, G.P.O. Box 4, Colwyn Bay, N. Wales.

WANTED. Hallicrafters SX24, if possible with spare converter, also power supply for same. Offers to GMT, Rederoft, Eldin Avenue, Cheltenham, Glos.

SHORT WAVE (HULL) RADIO

30/32 Prince's Avenue, HULL
Telephone 7168

NATIONAL SENIOR "HRO"

Completely with 9 Coil Units, 50 K/c to 30M cs, choice of 110 v, or 110 230 v A.C., or 6 v. D.C. Power Packs—all brand new National items. Also superb Brand New AR88's—110-240v, A.C. built-in power supply.

★ SHORT-WAVE LISTENERS, AMATEURS, ENTHUSIASTS!

2nd, stamp brings our Special Monthly Bulletin. A host of up-to-date lines at keen prices.


JOHNSONS

TELEPHONE 4080

RADIO SPECIALISTS

MACCLESFIELD, CHES.
BARNES RAD.-ELEC. & WHOLESALE CO.
2 Elmdale Rd. (Mount Rd.), Penn, Wolverhampton
If you are after a fine communications and broadcast receiver for ALL BANDS (to 15 m). We are specialists in R1166A Double-Superhet 8 valves (new and re-built), R1155X, X2200, X1115, in fine condition, 2v and 120v supply, £10 delivered, plus 30/- deposit returnable case. All data, circuits, spares, available.
We believe we are the only firm with stocks; order now.
Send for special leaflet and/or latest catalogue (21d.).
12 Coils in fitted case for T1115 Tx. (also fine for high or low power transmitters), 30/- delivered.
Fully smoothed power units in neat case, stabiliser valve, choke, relay, etc.:—200v, 50 ma, D.C. and 13v output: 24v input. Bargain at 27/6. complete. Control panels with 2-m/c meters (5 ma), switches, etc., new, 25/-.

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 Valve 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 a special offer:—
"H.A.C." SHORT-WAVE PRODUCTS
(Dept. VIC.) 66 New Bond St., London, W.1

More Useful Bargains!
TRANSFORMERS. Auto type, 230/110 volts 85 watts, 25/-, 150 watts, 35/-, 200 watts, 40/-, 300 watts, 65/-, 1000 watts, £7/10/-.
Transformers, double wound, B.T.H. 200/230/250 volts 50 cy., 20/22/24 volts, 20 amp, 75 volts 6 amp, E4/10/-.

SMALL CHARGERS FOR ACUMULATORS. 230 volts, 10 amp, D.C. output, 23/-.
METAL RECTIFIERS. 75 watts 6 volts, £4/10/-.
BUZZERS. Test buzzers, double contact blade for distant signals or converting to vibrator, 8/6. Morse practice buzzer, high tunable note, 7/6. The high-note Tiny Townsend Buzzer for the experimenter, platinum contacts, 5/-.

QAXLON FORMERS.
4", long, 3" O.D., 1/6.
3" x 3/4" dia., 1/-.
LOW VOLTAGE CONDENSERS.
High voltage oil filled, 1uF and 2uF in steel cases, 5/- each, postage 1/6 extra.
SWITCHES. Dewar key panel type, 7- pole C.O. flush fitting, 5/-, Yaxley 3- way, 3/4, 4- pole 1- way, 3/-, D.P.C.O. toggle switch 250 volts 1 amp, flush panel, 3/3, 8-way Lucas switchbox, 3/6, 6-way, 3/-.
MAGNETS. Large stock of horseshoe magnets. Send for our special Magnet Leaflet, "S.W."

Please include postage for mail orders.

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

SMALL ADVERTISEMENTS
READERS—continued.

FIRSt letter secures AR88-LF. Fair condition, cabinet scratched. Without tools, speaker, £40. Buyer collects.—G2ZS, 7 Foxholes Road, Southborough, Kent.
MIDGET DC Test Meter, 12 ranges, new, £3. Two Ferranti Multi-Meters, 30/- each. 832, 30/4, Valves, Books, cheap. S.A.E. List.—22 Highfield Drive, Whickham, Kent.
WANTED. R1155 tuning gang condenser. Good condition. Would consider damaged R1155 receiver if gang intact.—34 Pound Avenue, Stevenage, Herts.
H. T. B. MEDIUM COMPT. Pro Xtal model, coils all Ham bands, £20 or near, plus carriage, or exchange for 50/60 watt Modulator.—40 Dale Lane, Heckmondwike, Yorks.
NATIONAL HHO communications receiver, crystal, 5-meter, 10/550 metres, complete with speaker. Would exchange wire recorder.—Box 244.
RAC TESTER, communications receiver, crystal, 5-meter, 10/550 metres, noise limitier, 14 valves, service manual. Offers Box 245.

HRO—5 watt amplifier, Rx and Tx valves, and accessories, please offer.—Box 246.
TAMMARTUND Pro Xtal model, with valves and Xtal, works well, but front panel rough, £5. Cossor double-beam 'scope, perfect. Offers £15.—Box 247.

WANTED HHO Bandspread Coils, also any condition Senior HRO, or components for same.—375 Harrowstone Road, Mapperley, Nottingham, Notts.

WANTED HHO Bandspread Coils, also any condition Senior HRO, or components for same.—375 Harrowstone Road, Mapperley, Nottingham, Notts.

WANTED HHO Bandspread Coils, also any condition Senior HRO, or components for same.—375 Harrowstone Road, Mapperley, Nottingham, Notts.

HRO SENIOR, special grey enamel, fitted into enclosed professional rack, sloping front, with loudspeaker above and unused Tx control panel below, 230v pack, 4 spare valves, 30/-, 600 volts 150 mA, £5. Cossor double-beam 'scope, perfect. Offers £35.—G5IY, 17 Knottsall Lane, Penmaenmawr, North Wales.

SALE 1155, modified 6F6 output ; 200-240 volts input, £6. Ditto, Generator, 12v input, 600v output, 15/-, 12v vibrator pack, 250v output, 25/-. Transformers: input 200-240, output 250-250 60 mA, 5v 2a 6v 3v 2a, 10/-, Ditto, 4v LT (Varley), 12/-, 350-350 60 mA, 6v 3v 3a 5v 12a, 12/-, Ditto, 4v LT, 12/-, 6v, HR 'phones, 3/-, 4G5C, 7 Rutburywyke Close, Ewel, Surrey, Ewel, 4182. Callers preferred.
SALE 1155, modified 6F6 output ; 200, 80, 40, 20, 10, 5w, BC221, scratch on phone jack, 8-in. energized speaker, separate power pack, £25 or offer. Tx : 6L6 Trit, meters in screen and anode, coils 40, 20, 10, Xtal, valued £15. Offers for BC221 Set, £5.—G5IX, Sunny Cottage, Donnington Wood, Wellington, Shropshire.

S-METERS. 2-ln. bakelite, flush mounting, 0-250 microamperemont. Scale marked "S", Meter, graduated 0-9 and backward reading, 17/6 each.—G3BK, 28 Regent Avenue, March, Cambs.

APRIL 1948 SHORT WAVE MAGAZINE
SMALL ADVERTISEMENTS

READERS—continued.

G3ATU GUARANTEES the following: Finest oil-filled condensers, 4 mfd, 2000v wkg. 10 3; 4 mfd, 1000v wkg., 5/-; 2 mfd, 500v wkg., 2/-; 810’s (4), £2/15/-; 872a’s, 30/-; Precision Meters by Simpson, Chicago, 3 in. square, DC 0-1000 m.a, 39/-; 0-250 m.a, 30/-, AC 0-150v, 25/-; RF 0-10 amps, 40/-; Transmitting Variables, 500 30mfd 600v wkg. 10/-; 200 mmf 4000v, 15/-; 300 mmf 6000v, 25/-; Rokker House, Roker, Sunderland.

G5CP DOPPERS unused. C.A. S4R4Y full-wave rectifiers, 950v 175mA, 12/each. American multi-ratio modulation transformers, 200 watt, 25/-. ratio of windings supplied. Mansfield Paper Condensers, 1000v 2 mfd, 3/-; 1500v wkg., 1 mfd, 2/6; 35k 60-watt wire-resistances, 1/6; Black crackle totally enclosed and ventilated slide-in chassis, 20 in. x 5 in. x 8 in., 7/6.—G5CP, 33 Manley Road, Sale, Manchester.

AR.77E 10v communication Rx, 31-0 55 mc, celluloid banded spread on 10, 20, 40 and 80 metres, var. selectivity, Xtal filter, noise limiter, S-meter. In FB condition, £37. Demonstration, and buyer to collect.—Bexleyheath 754.

HALLICRAFTERS HT11, with 12v rotary power unit and belt, ready for operation, what offers? BC348-0, brand new, converted 230v AC, offers over £20. R.1155 with power pack and speaker, £3. In oscilloscope, Puckle time-base, two amplifiers, offers £100. 1000v power pack, £6. Ham built receiver, 2RF, 2IF, BFO, Eddypond parts. £10.—G3LZ, 3 Derwent, Damhead Hall, Warrington, Lancs.

GERMAN 7-valve Rx, 2 5 mc-26 mc, continuous banded spread, as new, £10. New B.P.L. Signal Generator, £10. Heavy Rice-Kellog B.T.H. speaker, 1250-clm field coil, £10/-; 10 volumes Wireless World, £5.—Box 254.

FOR sale, 12 6N7’s, 6/- each; 8 6SN7GT’s, 6/- each; 4 PXA4’s, 5/- each. All in perfect condition, almost new.—Box 250.

RADIONE. German Comm. Rx, 110-220 AC, 24v DC, 2-25-55 mc. Cont. 3 wavebands, BFO, built-in and standalone, offers £25. New, pair 406A’s, 3 Elmae 15E’s, 6 RCA 1625’s, sell or swap. Wanted VHF Converter.—G8WMO, 53 Little Water Street, Cramlington.

REASONABLE offers for HRO Senior, 4 coils.—Taylor, 2 Southfields Avenue, Gt. Sankey, Warrington, Lancs.

COMPLETE 82 Tx/Rx, with power pack, all coils, accessories, two crystals, perfect, £14. S.A.E. list gear.—GBUA, 406 Higher Brunshaw, Burnley.

FOR sale, R1155, fully modified, power pack, 6/6 output, £20. BRAS15, 35/-—Manor Road, Preston, Poulton, Devon.

WANTED—Radio News for October and November, 1946. Also CQ for May, 1946. Purchase or loan.—Box 249.

BC221 Frequency Meter for sale, brand new: includes three spare valves and American lightweight head. £15. Wanted: Hallicrafters Skyrider Marine, good condition, or would exchange.—Stephenson, 16 The Ridgeway, St. Albans, Herts.

WANTED—£1 offered Bandspread Dial for Hallicrafter SX24. Urgently needed for replacement.—Box 252.

BC312N Receiver, perfect, as new, £14. If new, use as dynamotor, ready for power pack, £13.—G5SBM, Berriwelle, Arle Drive, Cheltenham, Glos.

SALE. Complete Tx, including 1,500v power supply, SA and MOD, T240’s and UM4, 1V power supplies for SA, EXO and BLB; exciter 6L6-807, Buffer T240, PA357’s, Aerial Tuning Unit, 30 8D2’s, 7” Weston m.a meters, 2 ditto voltmeters, 0-2,000 m/c and 0-5000 m/c. Nearest offer to £120.—Further details, CHB1, 315 Stafford Road, Wolverhampton, Staffs.

THE following valves for sale, new and unused: 4 T240’s at £1 each, 4 829’s at £1 each, 4 826’s at £1 each, 2 352’s at £1 each, 2 805’s at £1/6/-; 1-7, 3-5, 7 m.c Xtal, methylated, 12/6 each. 4 mfd 500v 200w, new, £3. 1N27 R.C.A. Xtal diode rectifiers, 3/- each. Wee Megger, new, £4. 6 807 R.C.A.’s, new, at 15/- each.—Box 261.

VOLUME VI

SHORT WAVE MAGAZINE

143

EDDYSTONE

‘504,’ ‘640,’ ‘680,’ and Full range of S.W. components

Also

Valves, condensers, transformers, resistances, etc.

All C.O.D. orders promptly executed.

52-page catalogue 1/- post free.

B.T.S.

THE Radio Firm of the South.

63, London Road, Brighton 1, Sussex.

Phone: Brighton 1555.

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.

CHARLES BRITAIN (RADIO) LTD.

R.F. Units, Type 24 and 25, contain 3, 5P6i, 3-way 3-bank ceramic Yaxley switch, 7 Mc/s, I.F., output. Tuning Ranges, Type 24, 26 to 30 Mc/s. Type 25, 40 to 50 Mc/s. Very suitable for U.S.W. converters. Price £16/-, post free.

British IFF Unit. Contains 10 valves, motor generator, etc., a really amazing bargain. Price 25/-, plus 7/6 carriage.

Receiver R1124. Suitable for conversion to the television sound channel. Frequency range 30-5 to 40-5 Mc/s switched by Yaxley switch, 6-bank 6-way, complete with 6 BD2 valves, with screening cans, 30 condensers, 30 resistors and 3 potmeters. The whole is enclosed in a strong metal case, size 16” x 10” x 16”. Price 27/6, plus 5/- carriage and packing.

Test Set 74. This consists of a special purpose scope working from 230 v. 50 c.p.s. A.C. mains. It contains 11 valves, 5 HP21, 1 CV6, 1 SQ7, 615, 1 EASO, 1 UV2A, 1 UVR2A, and 1” 3" type tube VCR139A. Controls are: focus, brilliance, sender and receiver tuning, receiver gain, and recurrence. The Y terminal is brought out separately. This consists of a special purpose scope working from 230 v. 50 c.p.s. A.C. mains. It contains 11 valves, 5 HP21, 1 CV6, 1 SQ7, 615, 1 EASO, 1 UV2A, 1 UVR2A, and 1” 3" type tube VCR139A. Controls are: focus, brilliance, sender and receiver tuning, receiver gain, and recurrence. The Y terminal is brought out separately. It is housed in a handsome case, size 18” x 12” x 9”. This unit can be very easily converted into an oscilloscope. Price £5/19/6, plus 15/- packing and carriage. £1 deposit on crate, refundable on return.

Send your orders and requests for List “S.W.” to CHARLES BRITAIN (RADIO) LTD.

Radio House, 2 Wilson Street, London, E.C.2

Phone: Bishphage 2966.
**SMALL ADVERTISEMENTS**

**READERS'—continued.**

**SYLVANIA VR91 (EF50), VR137 (EF54), VR135 (DET 20), KT6W1, 6D6, 6C5, 6J5, 6SN7, 6SL7, 6TC, 6H4, 45, 5/- each. 6J5, GL63, 4/-, 6H6GT, VR92, Hickok holder, 2/6 each. Diode holders, 3 for 1/-; 12A6, 12SK7, 6SS7, 6SA7, 6S07, 6E6 each. 5U4G, 6S17, 6AC7, 8/6 each. 323’s, 35/-, 808’s, 30/-, 805’s, 40/-, KT606’s, 15/-, 0-350 mA, 0-1 amp thermocouple. More than 6/- each. WANTED. Bulbs about 9 ft. dia. and kite aerial wire, also 7-pin valve holders to fit 832 or 829.—G200, A. Holle, Well Street, Lymington.

**WODEN transformers, Modulation type UM3, £3; UM1, £1/10/-;**—Malns type, DTM17, 750-750v at 250 mA, £3; swinging choke, 5/25 H at 250 mA, £1/10/-.

**All as new. Valves—R.C.A. CR Tubes, Type 913 (6), at 15/- each; Type 3S (8), at 45/- per pair, all boxed, unused. One pair 809, £1, slightly used. Communication receiver, 13 valves, crystal standard, noise limiter, etc., complete, £16/10/-.

Full technical details on request.—17 New Drive, High Wycombe, Bucks.

**T**

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**FOR Sale.** Eddystone 640 Rx with "G" Meter. Eddystone Manual No. 5 2/3v preselector. Manual No. 6, 0-4v-1. 50 watt Tx: 6L6 CO, 807 PA, 6S7, 6JS, 6L6’s P/P modulator, with power packs; Coils 40, 20, 10, Xtal 7005 kc, Rotherham D104 Xtal mike. Short Wave News (August 1946). Phone Monitor-Absorption Wave Meter. Must Sell. All letters answered. G. Bird, 118 Woodpecker Road, New Cross, E.14.

**WANTED URGENTLY**—Purchase, Hire or borrow handbook or circuit of Hallicrafter S27. G3AOK, 64 St. Bernards Road, East Ham, London, E.6.
This month we proudly offer the R.3170A RADAR RECEIVER (Anti-Jamming)

A brand new R.A.F. equipment in its original transit case, untouched since manufacture. Complete with 15 new valves of the most useful types: 8 EF50, 2 RL37, 1 RL16, 1 HVR2, 1 R3, 1 EA50 and 1 CV188. As illustrated—ideal for conversion to television use.

100 WATT DC TO AC ROTARY CONVERTER. A brand new portable equipment. 24v 9 amp DC input. 230v 50 c/s. 435 amp output. 3,000 R.P.M. Ideal for field units. 3-Pin output socket. £5/- (£ carriage and packing 10/-).

BENDIX RADIO COMPASS UNIT, BC 519. As used in the American Signal Corps complete with 15 metal valves: 5 each 5Z4, 6N7, 6SC7, 6L7, 6JS; 2 each 6EB, 6F6 and 2051; and 4 6K7. Only £7/10/- (carriage and packing 10/-).

B.C.348 COMMUNICATIONS RECEIVERS. 203 to 500 kcs, 1.5 to 18 mcs. As new, with 28v power supply incorporated. £18/13/0 (£ carriage and packing 10/-).


METERS. The following meters are now added to our comprehensive range (all brand new and unused):—

- 0-500 microamp moving coil DC ¾" square flush mounting. £5/-.
- 0-300v moving iron, 2½" flush mounting. Round. 10/-.
- 0-5 m/a 2½" flush mounting calibrated 1" Battery-Lines. 5/-.
- 0-40 amp 2½" proj. round moving iron, AC. 10/-.
- 0-10 m/a 2½" proj. round moving iron, DC. 9/-.
- 0 to 2 amp R.F. Thermo-coupled 2½" proj. rd. 6.6.

This month ONLY we offer SPRAGUE and MICAMOLD tubular aluminium can condensers:—

- Sprague -01 mfd 1,000v working, 36 for 12/-, or 5d. each.
- Micamold -01 mfd 350v working, 36 for 15/-, or 5d. each.
- Micamold -025 mfd 350v working, 12 for 6/-, or 7d. each.
- Micamold -025 mfd 500v working, 12 for 7/-, or 8d. each.

To our regular customers we can offer a very special buy! Only a very few available, so order now:

(a) HALLICRAFTERS S38 COMMUNICATIONS RECEIVERS. Brand new in original carton. 540 Kc-32-4 mcs in four bands. B.F.O., A.N.L., built-in speaker and power supply. 6 Valves. Weight only 11 lbs. Only £28.


N.B.—A BURGOYNE Aerial Co-axial connector is presented free to all purchasers of these HalliRAFTERS Receivers.

U.H.F. TRANSMITTER. 300 to 450 mcs. Complete with R.L. 18 valve. Only 32/6 (carriage and packing 3/6),

SMOOTHING CHOKE. Heavy duty tropically impregnated 10 Henry 250 m/a LF choke. New and unused for 15/- (carriage and packing 1/-).

R1359 U.H.F. COMMUNICATIONS RECEIVERS. Only a few left now! A superheterodyne receiver covering 130-520 mcs. Crystal detector, I.F. 13-5 mcs B.F.O. Operates from 20w-250v AC, using external power supply or from vibrator pack. Valve line-up 4 EF50, 2 SP41, 1 E.B.34, E.1231. Only £13/13/- (carriage and packing 1/-).

MAIL ORDER SUPPLY COMPANY
Dept. SWM, 24 New Road, London, E.I.
Stepney Green ZF60-3906
POST ORDERS to 3 Robert St., Hampstead Rd., N.W.1
BUILT UP TO A HIGH STANDARD, NOT DOWN TO A PRICE
EVERY ONE HAND MADE

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 ins. by 10 ins. by 9½ ins.

NOTHING EXTERNAL EXCEPT MICROPHONE AND KEY

PRICE

£75

NEW HIGH "Q" CIRCUITS
NOW READY

8 VALVE SEMI-COMMUNICATION. 4 Wave Bands, 13-557 m. 1 R.F., 2 I.F., B.F.O., "S" meter. Circuit 8/-


5 VALVE AMPLIFIER. 10-12 watts output. 6SN7, 6J5, 2 6F6, 5Z4. Negative feedback. Circuit 3/6

Full details on request of these and other circuits to any requirement

SEND 3d. FOR OUR
NEW 1948 ILLUSTRATED CATALOGUE

R.T.S. PRECISION TRANSFORMERS

A very high grade range of transformers, tropically impregnated with guaranteed tolerance of ±1% of rated values. The following are a few examples:

- **FHE0695 350-0-350 100mA 350-0-350 100mA 5v 2A, 5v 2A, 6-3v 2A, 6-3v 2A, 6-3v 4A** … 4 2 6
- **FHE696 750-650-550-0-550-750 at 150mA 0-2 5-4.5v 5A** … … … … 4 0 10
- **FHE0699 1,000-850-0-850-1,000 at 120mA 0-2-5v 5A 0-2-4v 6A** … … … … 4 0 10
- **FHE0697 550-450-0-450-550v 230mA 0-2-5v 4A 6-3v 4A** … … … … 4 2 6
- **ATQ9007 1,750-1,500-1,250-0-1,250-1,500 1,750v 200mA 0-2-5v 5A 0-2-4v 4A...** … … … … 6 7 0
- **ATW1295 0-1,000-1,500-0-1,500 2,000v SmA 4v 1-5A 2v 1-5A 4v 2A...** … … … … 3 12 6
- **FHE0714 0-2,000-3,000-4,000v SMA, 2v 2A, 4v 2A, 4v 2A...** … … … … 4 7 6
- **DTW1046 Multi Ratio Output, 15 watts. All rating for push-pull...** … … … … 2 15 0

BERRY'S (SHORTWAVE) LTD

25 HIGH HOLBORN • LONDON • W.C.1

(OPPOSITE CHANCERY LANE). TELEPHONE: HOLBORN 6231