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# MARCONIPHONE 375

## 3-BAND BATTERY RECEIVER

A SHORT wave range of 18-50 metres is covered by the Marconiphone 375 3-valve battery operated all-wave receiver.

### CIRCUIT DESCRIPTION

Three alternative aerial input connections. **A1** and **A3** include Droitwich rejector **L1**, **C1**, **C18**; **A3** has series resistance **R1** and is for use in areas close to powerful transmitters; **A2** is directly connected to series condenser **C3**.

On M.W. and L.W. coil **L3** couples aerial to single tuned circuit **L4**, **L5**, **C22**, which precedes variable-mu tetrode H.F. amplifier (**V1**, Marconi metallised **VS24**). Gain control by **R2** which varies G.B. applied and also reduces aerial input.

On S.W., switch **S1** connects **V1** C.G. to **L2** which forms choke input circuit, and the G.B. applied is fixed.

Tuned-anode coupling by **L6**, **C23** (S.W.), **L6**, **L8**, **C23** (M.W.) and **L6**, **L8**, **L9**, **C23** (L.W.) between **V1** and tetrode detector valve (**V2**, Marconi metallised **VS24**) operating on grid leak system.

On M.W. and L.W. reaction is applied from anode by coil **L10** and controlled by pre-set condenser **C27** and pre-set variable resistance **R7**. On S.W. reaction is applied by coil **L7** and controlled by variable condenser **C28**, which forms volume control.

Parallel-fed transformer coupling by **R10**, **C16** and **T1** between **V2** and pentode output valve (**V3**, Marconi **PT2**). Ratio of transformer is increased to 1-7 on S.W. by means of switches **S13**, **S14**, **S15**. Provision for connection of gramophone pick-up across primary of **T1**. Fixed tone correction by condenser **C17** in **V3** anode circuit.

### DISMANTLING THE SET

#### Removing Chassis.—

Remove the five control knobs first, and then the four smaller bolts (with washers and spring washers) holding the chassis to the bottom of the cabinet. The former may, and should, have been removed already, as they are transit bolts.

The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

#### Removing Speaker.—

To remove the speaker from the cabinet, remove the two bolts (with washers) holding the speaker cross bar to the cabinet. When replacing, see that the terminal strip is on the right.

### COMPONENTS AND VALUES

| RESISTANCES |                                     | Values (ohms) |
|-------------|-------------------------------------|---------------|
| R1          | Aerial series resistance            | 10,000        |
| R2          | V1 gain control                     | 100,000       |
| R3          | Gain control fixed min.             | 23,000        |
| R4          | V1 G.B. circuit decoupling          | 1,000         |
| R5          | V1 anode decoupling                 | 10,000        |
| R6          | M.W., L.W., reaction stabiliser     | 500           |
| R7          | M.W., L.W. pre-set reaction control | 3,000         |
| R8          | V2 grid leak                        | 2,300,000     |
| R9          | V2 S.G. H.T. feed                   | 50,000        |
| R10         | V2 anode load                       | 50,000        |
| R11         | V2 anode H.F. stopper               | 10,000        |
| R12         | Gram. P.U. series resistance        | 1,000         |

| CONDENSERS |                                      | Values (μF) |
|------------|--------------------------------------|-------------|
| C1         | Droitwich rejector tuning, fixed     | 0.00035     |
| C2         |                                      | 0.00023     |
| C3         | Aerial series condensers             | 0.0005      |
| C4         | V1 C.G. decoupling (S.W.)            | 0.000075    |
| C5         | V1 C.G. decoupling (M.W., L.W.)      | 0.0005      |
| C6         | V1 G.B. circuit decoupling           | 0.1         |
| C7         | V1 S.G. by-pass                      | 0.1         |
| C8         | H.T. supply by-pass                  | 0.1         |
| C9         | V1 anode decoupling                  | 0.1         |
| C10        | M.W., L.W. series reaction cond.     | 0.0005      |
| C11        | V2 C.G. condenser                    | 0.000075    |
| C12        | V2 S.G. by-pass                      | 0.1         |
| C13        | V2 anode H.F. by-passes              | 0.000035    |
| C14        | L.F. coupling to T1                  | 0.0001      |
| C15        | Tone corrector                       | 0.1         |
| C16        | Droitwich rejector tuning            | 0.001       |
| C17        | Aerial M.W. trimmer                  | —           |
| C18        | Aerial L.W. trimmer                  | —           |
| C19        | Aerial main trimmer                  | —           |
| C20        | Aerial circuit tuning                | —           |
| C21        | V1 anode circuit tuning              | —           |
| C22        | V1 anode S.W. trimmer                | —           |
| C23        | V1 anode M.W. trimmer                | —           |
| C24        | V1 anode L.W. trimmer                | —           |
| C25        | Pre-set reaction control, M.W., L.W. | —           |
| C26        | Reaction control, S.W.               | 0.0003      |
| C27        |                                      | —           |
| C28        |                                      | —           |

† Variable. ‡ Pre-set.

### OTHER COMPONENTS

|        |                                      | Approx. Values (ohms)            |
|--------|--------------------------------------|----------------------------------|
| L1     | Droitwich rejector coil, total.      | 5.0                              |
| L2     | Aerial choke coil, S.W.              | 4.0                              |
| L3     | Aerial M.W., L.W. coupling coil      | 7.0                              |
| L4     |                                      | 2.0                              |
| L5     | Aerial M.W., L.W. tuning coils       | 16.0                             |
| L6     | V1 anode tuning coil, S.W.           | 0.1                              |
| L7     | S.W. reaction coil                   | 0.5                              |
| L8     | V1 anode tuning coils, M.W. and L.W. | 2.0                              |
| L9     |                                      | 16.5                             |
| L10    | M.W., L.W. reaction coil             | 1.5                              |
| L11    | Speaker speech coil                  | 4.0                              |
| T1     | Intervalve trans.                    | Pri. 200.0<br>Sec. total 5,500.0 |
| T2     | Output trans.                        | Pri. 1,000.0<br>Sec. 0.6         |
| S1-12  | Waveband switches                    | —                                |
| S13-15 | T1 ratio change switches             | —                                |
| S16    | H.T. and G.B. circuit switch         | —                                |
| S17    | L.T. circuit switch                  | —                                |

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an H.T. battery reading 175 V overall. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum. There was no signal input.

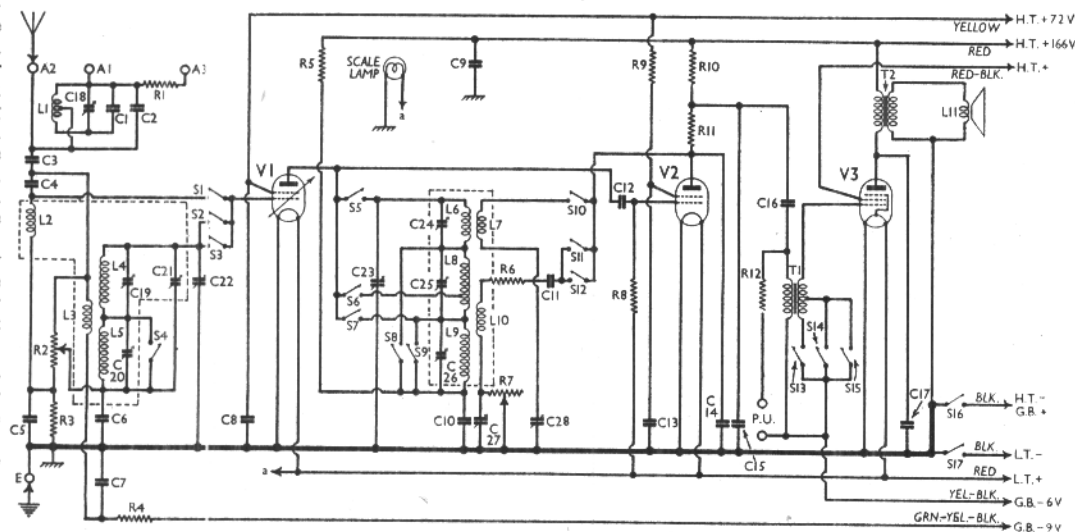
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

| Valve   | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|---------|-------------------|--------------------|--------------------|---------------------|
| V1 VS24 | 140               | 1.6                | 70                 | 0.5                 |
| V2 VS24 | 70                | 1.3                | 40                 | 0.5                 |
| V3 PT2  | 155               | 2.9                | 132*               | 0.5                 |

\* This figure will vary according to the grading of the valve. That in our receiver was an "X" type.

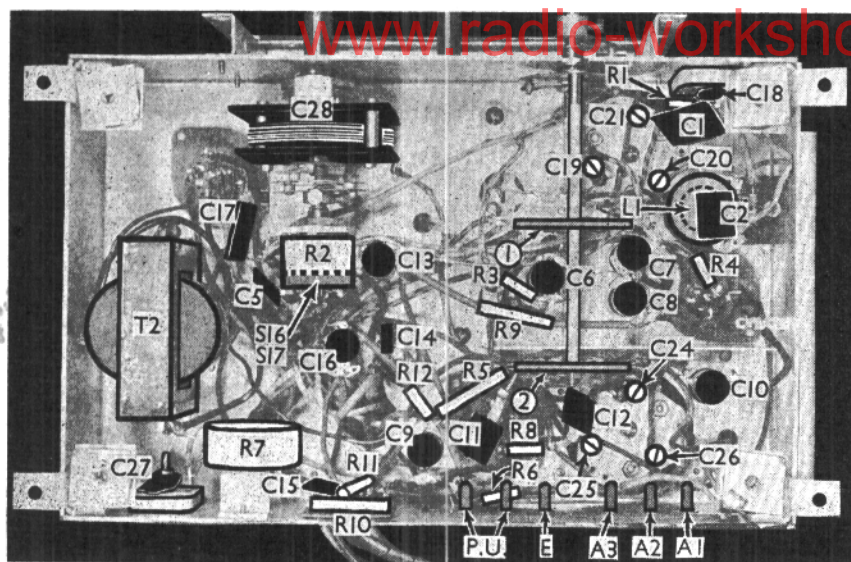
### GENERAL NOTES

Switches.—**S1-S15** are the wavechange, reaction circuit and L.F. transformer switches, in two rotary units ganged



Circuit diagram of the Marconiphone 375 3-band battery receiver.





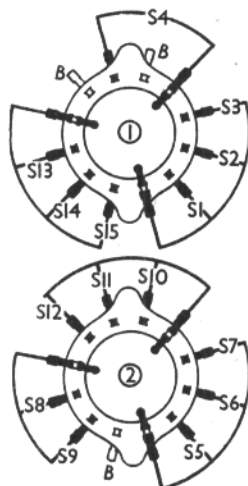
Under-chassis view. Diagrams of the switch units are given below. Note the various trimmer screws.

together beneath the chassis. These are indicated in our under-chassis view by numbers in circles, and the arrows show the directions in which they are viewed in the diagrams on this page.

The table below gives the switch positions for the various control settings, O indicating open, and C closed.

| Switch | S.W. | M.W. | L.W. |
|--------|------|------|------|
| S1     | C    | O    | O    |
| S2     | O    | O    | O    |
| S3     | O    | O    | O    |
| S4     | O    | O    | O    |
| S5     | O    | O    | O    |
| S6     | O    | O    | O    |
| S7     | O    | O    | O    |
| S8     | O    | O    | O    |
| S9     | O    | O    | O    |
| S10    | O    | O    | O    |
| S11    | O    | O    | O    |
| S12    | O    | O    | O    |
| S13    | O    | O    | O    |
| S14    | O    | O    | O    |
| S15    | O    | O    | O    |

S16 and S17 are two Q.M.B. battery switches, ganged with gain control R2.



Switch diagrams, looking from the rear of the underside of the chassis.

The two upper tags are joined together and to chassis. The right-hand bottom tag is the other connection of S16, and the left-hand bottom tag that of S17.

**Coils.**—L1, the Droitwich rejector coil is beneath the chassis in a special bakelite moulding. L2-L5 and L6-L10 are in two screened units on the chassis deck. Note that the first of these also contains the fixed condensers C3, C4. The various trimmers are in the bases of the coils, and are adjustable by screws beneath the chassis.

**Scale Lamp.**—This is an Osram M.E.S. type with a tubular bulb. It is rated at 2.0 V, 0.1 A.

**External Speaker.**—No provision is made for this, but a low resistance (40) type could be connected across the internal speaker speech coil.

**Batteries.**—L.T., Exide D.F.G., 2V 45 AH glass cased cell. H.T. and G.B., Marconiphone 166 V H.T. plus 9 V G.B., Cat. No. 550 A.

**Battery Leads and Voltages.**—Black lead, spade tag, L.T. negative; Red lead, spade tag, L.T. positive 2 V; Black lead and plug, H.T. negative, G.B.

positive; Yellow lead and plug, H.T. positive 72 V; Red/black lead and plug, H.T. positive, voltage to be 15 V below that coinciding with letter marked on V3 (e.g., if V3 is marked "X," voltage should be 132 V); Red lead and plug, H.T. positive 166 V; Yellow/black lead and plug, G.B. negative 6 V; Green/yellow/black lead and plug, G.B. negative 9 V.

### CIRCUIT ALIGNMENT

The pointer should be horizontal at both minimum and maximum of the gang condenser, and the scale should be positioned so that the 800 m. calibration mark is exactly  $\frac{1}{4}$  in. above the pointer with the condenser at minimum.

**M.W.**—Set C27 (rear of chassis) to minimum, R7 (rear of chassis) to mid-position and volume control to maximum. Switch set to M.W., tune to 250 m. on scale and inject a 250 m. signal into A2 and E sockets. Adjust C19 and C25 (beneath chassis) for maximum output. Tune receiver to 200 m. and screw up C27 just short of oscillation, rocking gang between minimum and 250 m. Tune receiver to 350 m. and adjust R7 for maximum output without oscillation. Return to 250 m. on scale, and re-adjust C19 and C25 on a 250 m. input. Check up that receiver does not oscillate at any point on scale.

**L.W.**—Switch set to L.W., tune to 1,500 m. on scale, feed in a 1,500 m. signal and adjust C20 and C26 for maximum output.

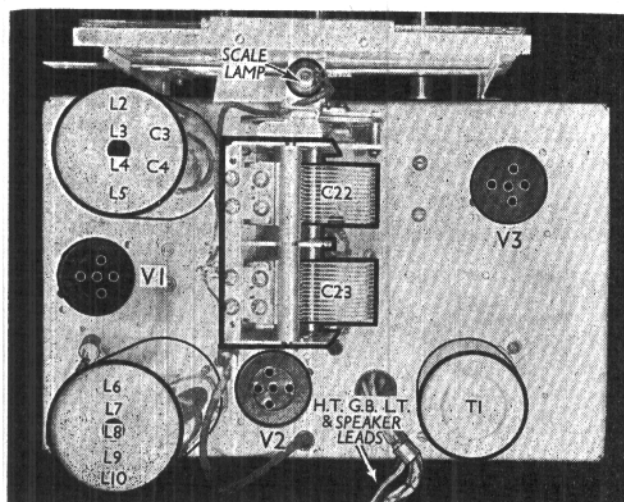
If a peak cannot be obtained when ganging on M.W. or L.W., C21 must be adjusted. If C19 and/or C20 are fully unscrewed and C25 and/or C27 nearly at maximum, unscrew C21, and re-gang throughout. If C19 and/or C20 are near maximum and C25 and/or C26 near minimum, screw up C21, and re-gang.

**Droitwich Rejector.**—Feed a 1,500 m. signal into A1 and E sockets, and adjust C18 (front of chassis) for minimum output.

**S.W.**—Couple oscillator to A2 socket via a 400 O resistance. Tune to 18 m. on scale, feed in an 18 m. signal and adjust C24 for maximum output.

**Pre-set Reaction.**—If it is necessary to adjust the pre-set reaction (without re-ganging) switch set on, turn volume control to maximum and connect the

aerial and earth. Adjust C27 just below oscillation between 200 and 250 m., and adjust R7 similarly on all wavelengths above 250 m., including L.W.



Plan view of the chassis. The L2-L5 coil unit also contains C3 and C4. T1 is the intervalve transformer.