"TRADER" SERVICE SHEET

1366

MARCONIPHONE P60B

Covering also H.M.V. Models 1410B and 1410G

THE Marconiphone P60B is a 2-band battery-operated portable superhet receiver housed in a grey or cream plastics case and employing a ferrite rod aerial, a printed circuit, three valves and two P-N-P transistors. The waveband ranges are 200-550m and 1,000-2,000m.

H.M.V. receivers using the same chassis are Models 1410B and 1410G and are housed in a blue and grey plastics case respectively.

Release date and original price, all models: June 1957, £9 16s 5d. Purchase tax and batteries extra.

CIRCUIT DESCRIPTION

Tuned ferrite rod aerial input by **L1, C2, C3** (M.W.) and by **L2, C1, C2** and **C3** (L.W.) precede heptode frequency changer valve **V1.**

Oscillator grid coil **L5** is tuned by **C8, C9** (M.W.) and in addition by **L7** (L.W.). Reaction coupling by **L6.**

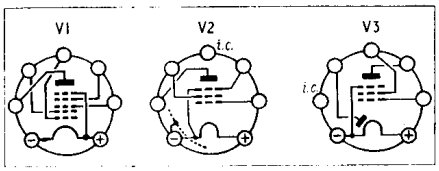
Variable-mu R.F. pentode **V2** operates as intermediate frequency amplifier with tuned transformer couplings **L3, C4, L4, C5; L7, C12, L8, C13.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of a diode-pentode valve **V3.** Audio-frequency component in its rectified output is developed across volume control **R8,** which also operates as diode load, and is passed via **C17** to the control grid of **V3** pentode section, which operates as A.F. driver. I.F. filtering by **C15, R7, C16.** The D.C. potential developed across **R7, R8** is fed back as bias via decoupling circuit **R6, C14** to **V1, giving** automatic gain control.

A.F. output of **V3** is coupled via interstage phase-splitter transformer **T1** to the P-N-P transistors **TR1, TR2** which operate in a grounded emitter class B push-pull output stage. Base bias for **TR1** and **TR2** is provided by common emitter resistor **R13** and by the voltage drop across bias control resistor **R12.**

Output of **TR1** and **TR2** is coupled to the speaker via output transformer **T2.** H.T. decoupling by **C21.**



CIRCUIT ALIGNMENT

Equipment Required.—An accurately calibrated signal generator; an audio output meter; a non-metallic trimming tool.

L1 and **L2** are ferrite rod tuned and should be adjusted for maximum output by sliding their formers along the ferrite rod and securing them to the rod with an adhesive.

1.—Switch the receiver to M.W. and turn the tuning gang to minimum and the volume control to maximum. Connect the audio output meter across **T2** secondary winding. Connect signal generator between the control grid (pin 6) of **V1** and chassis.

2.—Feed in a 470 kc/s signal and adjust the cores of **L8** (B2), **L7** (D3), **L4** (A2) and **L3** (E3) in that order for maximum output.

3.—Connect a few turns of wire to the signal generator output and inductively couple the turns to the ferrite rod aerial coils **L1** and **L2.** Switch the receiver to M.W. and turn the gang to maximum. Feed in a 522 kc/s signal and adjust the core of **L5** (A1) for maximum output.

4.—Turn the gang to minimum. Feed in a 1,602 kc/s signal and adjust **C9** (E3) for maximum output.

5.—Repeat operations 3 and 4.

6.—Feed in a 588 kc/s signal, tune it in on the receiver and adjust **L1** (A2) for maximum output.

7.—Feed in a 1,427 kc/s signal, tune it in on the receiver and adjust **C2** (E3) for maximum output.

8.—Repeat operations 6 and 7.

9.—Switch the receiver to L.W. Feed in a

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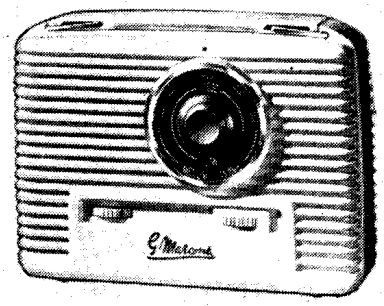
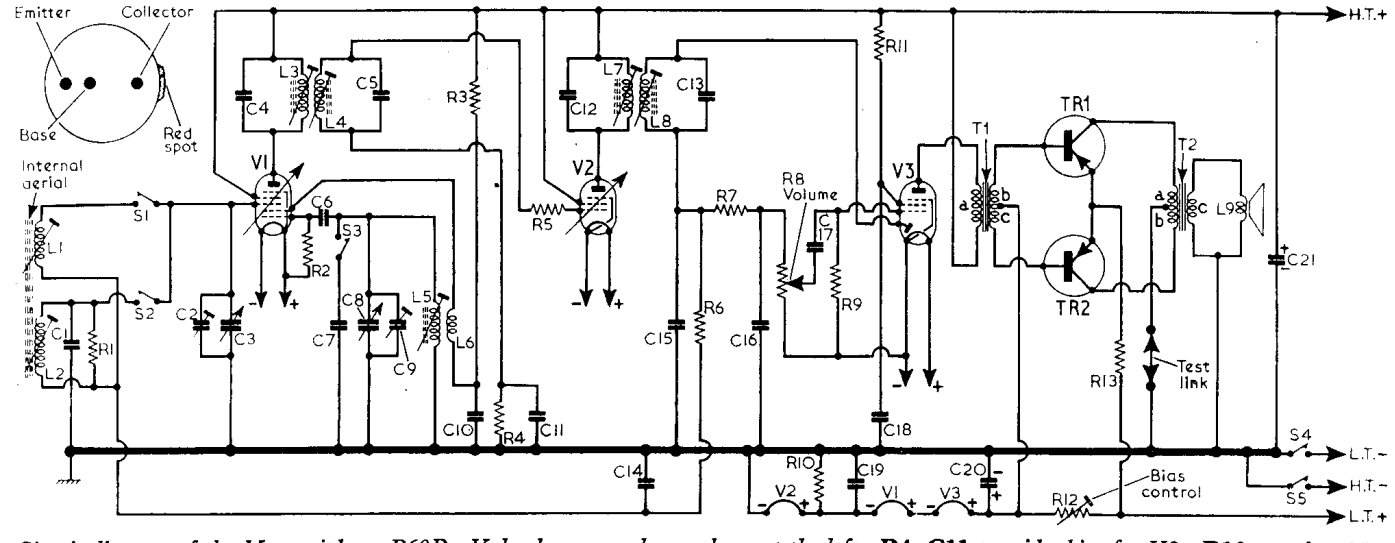


Resistors		
R1	100kΩ	B2
R2	27kΩ	A1
R3	18kΩ	A1
R4	10MΩ	A2
R5	15kΩ	A2
R6	4.7MΩ	B2
R7	100kΩ	C2
R8	1MΩ	C1
R9	10MΩ	B1
R10	470Ω	A2
R11	270kΩ	B1
R12	15Ω	C1
R13	3.9Ω	C1
Capacitors		
C1	120pF	A1
C2	—	E3
C3	—	B1
C4	100pF	A2
C5	100pF	A2
C6	100pF	A1
C7	330pF	A1
C8	—	B2
C9	—	E3
C10	0·01μF	A1
C11	0·01μF	A2
C12	100pF	B2
C13	100pF	B2
C14	0·03μF	B1
C15	100pF	B2
C16	100pF	C1
C17	0·01μF	B1
C18	0·01μF	C1
C19	0·03μF	A2
C20	50μF	D3
C21	8μF	E3
Coils*		
L1	1·0	A2
L2	7·0	C2
L3	10·0	A2
L4	10.0	A2
L5	5·0	A1
L6	5·0	A1
L7	10·0	B2
L8	10·0	B2
L9	3·0	—
Miscellaneous*		
T1 a	7,000·0	C2
T1 b	5,000·0	
T1 c	5,000·0	
T2 a	4·0	C1
T2 b	4·0	
T2 c	—	
S1-S3	—	A1
S4, S5	—	C1

**Approximate D.C. resistance in ohms. Read "Warning" under "General Notes" before making measurements.*



Circuit diagram of the Marconiphone P60B. Valve bases are shown above at the left. **R4, C11** *provides bias for V2.* **R12** *may be 12Ω.*

Circuit Alignment—*continued*

162 kc/s signal, tune it in on the receiver and adjust **L2** (C2) for maximum output.

VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturers' information. Voltages were measured on a 20,000Ω/V meter, chassis being the negative connection in every case. The receiver was operating from a set of new batteries, but there was no signal input.

The total H.T. current was 4.5mA and total L.T. current was 40mA.

Valve		Anode	Screen
V1 DK96	mixer	67V	67.5V
	osc.	30V	—
V2 DF96		67V	67.5V
V3 DAF96		65V	50.0V

GENERAL NOTES

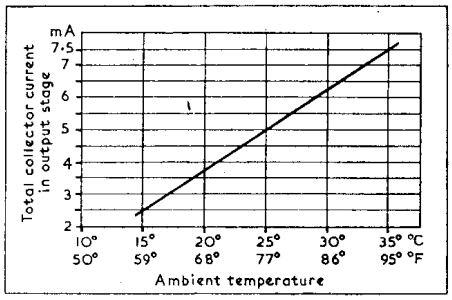
Switches.—S1-S3 are the waveband switches ganged in a sliding unit in location reference A1. Above the switch unit a detailed diagram of the contacts is drawn as seen from the front of an inverted chassis. **S1** is closed on M.W., **S2, S3** are closed on L.W. **S4** and **S5** are the battery on/off switches and are shown in location C1.

Batteries.—The batteries recommended by the manufacturers are as follows: H.T., Ever-Ready B139 rated at 67.5V; L.T., three Ever-Ready U11's rated at 1.5V each.

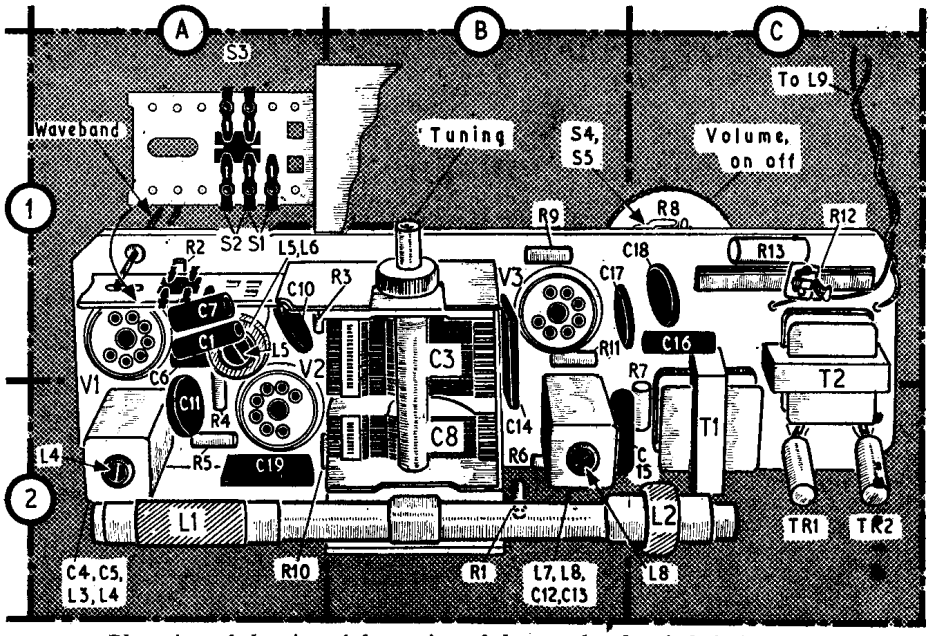
Transistors.—TR1, TR2 are a matched pair of Mullard OC72 transistors. No voltage readings are given for them, but these are obvious from the circuit diagram.

Pre-set bias control R12.—This control is adjusted at the factory and should not normally require re-adjustment, unless the transistors **TR1** and **TR2** are replaced. To adjust **R12,** proceed as follows.

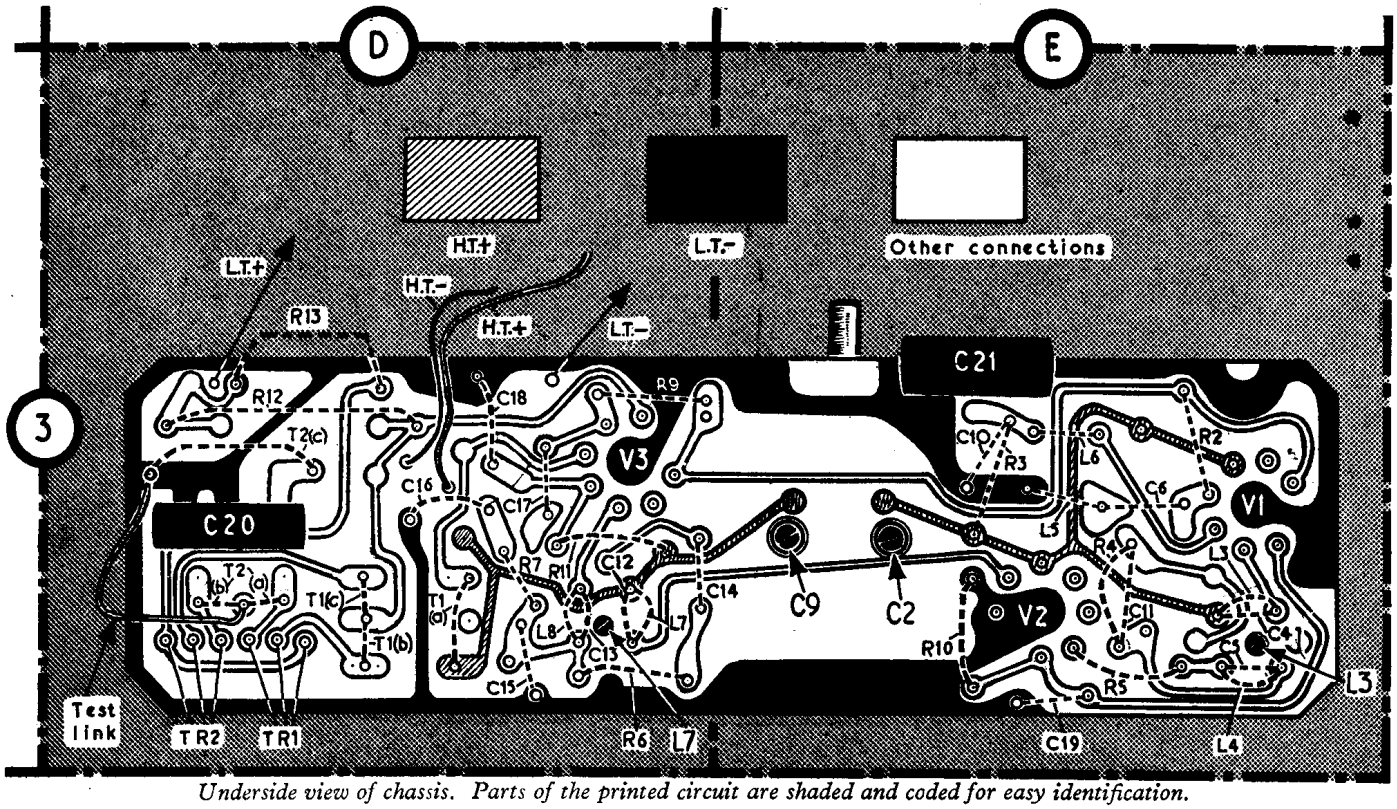
Unsolder one side of the "test link" (location reference D3) and insert a 0-10mA meter. Switch the receiver on and tune it for no signal. Turn the volume control to minimum. Measure the ambient temperature and adjust **R12** (C1) for a current reading corresponding to the ambient temperature as shown on the transistor bias chart below, e.g., if the ambient temperature is 20° centigrade the corresponding current reading for correct quiescent bias is 3.75mA.



Warning.—Transistors may be permanently damaged if their base connections are accidentally short-circuited to chassis, or if continuity measurements are made with the transistors in circuit. If a transistor has to be removed or replaced, the soldering or unsoldering operation should be completed as quickly as possible, and a heat shunt such as a pair of pliers should be clamped across the transistor lead between the transistor and the soldering iron during the soldering or unsoldering of its leads.



Plan view of chassis. A front view of the waveband switch is included.



Underside view of chassis. Parts of the printed circuit are shaded and coded for easy identification.

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