

"TRADER" SERVICE SHEET
1832

MARCONIPHONE 4142 and Ultra 6146 portable radios are of similar appearance with an identical specification.

An internal ferrite rod aerial is used for m.w. (185-565m), and l.w. (1,120-2,050m) reception, and a telescopic aerial with tuned coupling transformer for s.w. (17.6-51m) reception. Wavering selection is by press-button operated switches.

A socket is provided for the connection of a car type aerial, and a second socket (a normally closed miniature jack), provides muting of the internal 3½in round, 15 ohm loudspeaker on the insertion of a suitable plug connected to either an earphone or tape recorder.

The complementary push-pull power output stage using n.p.n./p.n.p. transistors

Transistor Table

Transistor	Emitter (V)	Base (V)	Collector (V)
TR1 AF116	1.0	1.1	—
TR2 AF117	0.45	0.65	—
TR3 AF117	0.95	1.1	—
TR4 AC155	0.2	0.3	0.7
TR5 AC113	0.55	0.7	4.85
TR6 AC154	—	5.15	9.0
TR7 AC157	—	4.85	0

Total Current

Quiescent	..	..	..	17mA
50mW output	..	..	..	45mA
300mW output	..	..	..	90mA

A.G.C. Characteristic

Signal	..	..	..	A.G.C.
100µV	..	..	..	0.32V
1mV	..	..	..	0.175V
10mV	..	..	..	0.1V

**MARCONIPHONE 4142
ULTRA 6146**

Transistored Portable Radio Receivers



Appearance of Ultra 6146.

in conjunction with a stabilizing diode provide a transformerless power stage giving an audio output of 300mW.

An Ever Ready PP6, or equivalent type battery, provides the operating power.

TRANSISTOR ANALYSIS

Transistor voltages quoted in the table in col. 1 were obtained from information supplied by the manufacturers. They were measured with a 20,000 ohms per volt meter and are negative with respect to the positive line.

With the oscillator functioning normally, the voltage across R3 is 300-500mV peak to peak.

CIRCUIT ALIGNMENT

Equipment Required.—An r.f. signal generator amplitude modulated 30 per cent; an audio output meter with an impedance of 15Ω, or alternatively a model 8 Avometer

(Continued overleaf col. 1)

Resistors

R1	5.6kΩ	C1
R2	27kΩ	C1
R3	1kΩ	C1
R4	100kΩ	C2
R5	100kΩ	C2
R6	680Ω	C2
R7	10kΩ	C2
R8	27kΩ	C2
R9	5.6kΩ	C2
R10	560Ω	B2
R11	4.7kΩ	B2
R12	5kΩ	B1
R13	1kΩ	B1
R14	12kΩ	B2
R15	47kΩ	B2
R16	12kΩ	B1
R17	100Ω	B1
R18	390Ω	B2
R19	680Ω	B2
R20	5.6Ω	B2
R21	2.2Ω	B2
R22	100Ω	B2
R23	2.2Ω	B2
R24	390Ω	C2

Capacitors

C1	20pF	C1
C2	25pF	C2
C3	255pF	C1
C4	60pF	B1
C5	25pF	C1

C6	1,300pF	C1
C7	0.01µF	C2
C8	5,000pF	C2
C9	25pF	C1
C10	2,000pF	C1
C11	25pF	C1
C12	250pF	B1
C13	25pF	C2
C14	230pF	C2
C15	25pF	C2
C16	175pF	C2
C17	75µF	C2
C18	0.02µF	C2
C19	175pF	C2
C20	0.02µF	C2
C21	0.02µF	C2
C22	175pF	B2
C23	0.02µF	B2
C24	0.01µF	B1
C25	0.47µF	B1
C26	25µF	B1
C27	75µF	B2
C28	75µF	B2
C29	75µF	B2
C30	100µF	B2
C31	1,000pF	B2

Coils and Transformers*

L1	—	B1
L2	1Ω	C1
L3	10Ω	A1
L4	—	C1
L5	—	C1

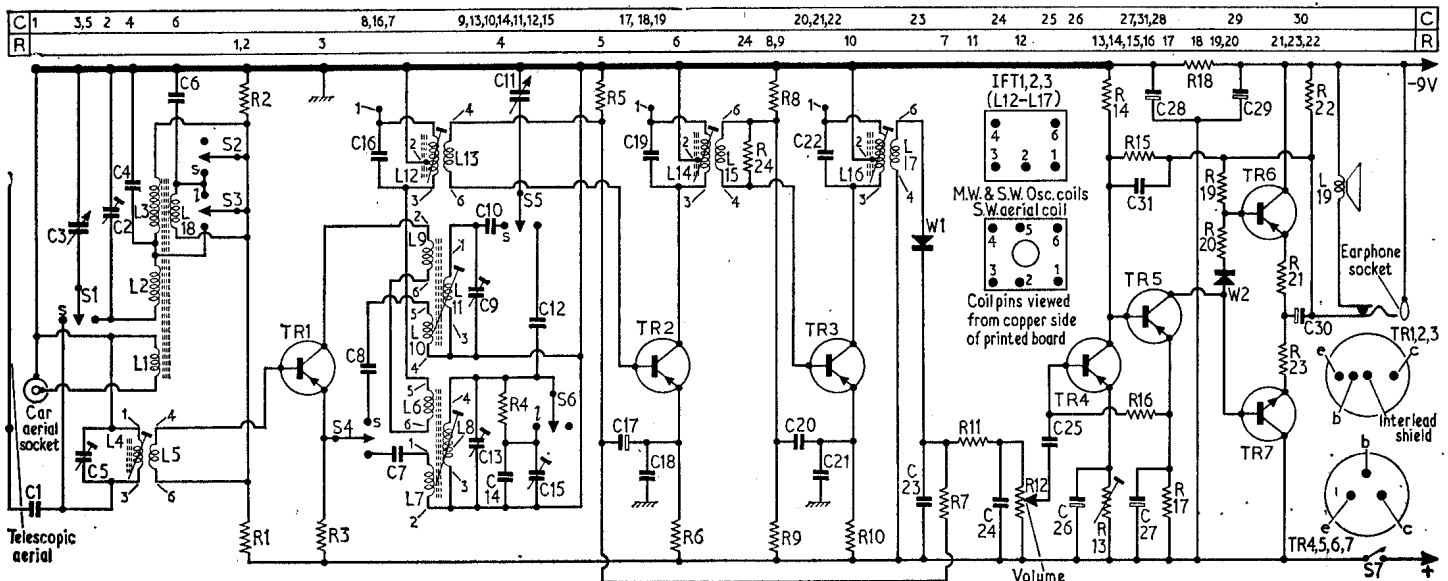
L6	—	C2
L7	—	C2
L8	2.5Ω	C2
L9	—	C1
L10	—	C1
L11	—	C1
L12	10Ω	C2
L13	—	C2
L14	10Ω	C2
L15	—	C2
L16	4.5Ω	B2
L17	—	B2
L18	—	C1
L19	15Ω	†

Miscellaneous

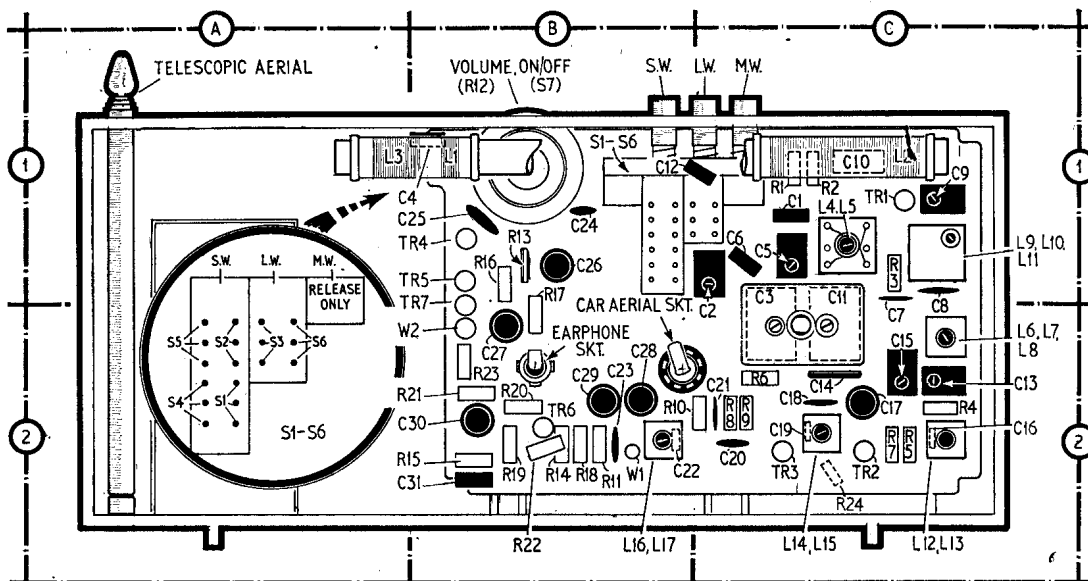
S1-S6	—	A2
S7	—	B1
W1	OA70	B2
W2	AA120	B2

* Appropriate d.c. resistance in ohms.
† Loudspeaker.

Below: Circuit diagram of the Marconiphone 4142 and Ultra 6146



General illustration of receiver with the front cover removed showing component locations. The waveband switches, S1-S6 are shown inset. Note: L18 should be shown on the same former as L2 on the ferrite rod.



Circuit Alignment—continued

set to its 10V a.c. range; a 0.1μF capacitor and an r.f. coupling loop.

Connect the output meter in place of the loudspeaker. Alternatively, connect the Avometer across the speech coil. Turn the volume control to maximum but, during alignment, adjust the signal generator level to maintain the radio output at 50mW. All adjustments are to be made for maximum output.

- 1.—Switch the radio receiver to m.w. and turn the tuning gang to maximum capacitance. Connect the signal generator via the 0.1μF capacitor across C3.
- 2.—Feed in a 475kc/s 30 per cent amplitude modulated signal. Adjust L16, L14 and L12 in that order. Repeat until there is no further improvement.
- 3.—Connect the signal generator to the r.f. coupling loop and loosely couple the loop to the ferrite rod aerial. Set tuning gang to maximum. Feed in a 525kc/s signal. Adjust L8.
- 4.—Feed in a 600kc/s signal and tune receiver to this signal. Adjust L2 by sliding along the ferrite rod.
- 5.—Feed in a 1,500kc/s signal and tune receiver to this signal. Adjust C2.
- 6.—Repeat operations 3-5 until no further improvement results.
- 7.—Switch receiver to l.w. Turn tuning gang to maximum capacitance. Feed in a 148kc/s signal. Adjust C15.
- 8.—Feed in a 220kc/s signal and tune receiver to this signal. Adjust L3 by sliding along the ferrite rod.
- 9.—Switch to s.w. and extend the telescopic aerial. Place the signal generator lead nearby to provide a loose coupling. Turn tuning gang to maximum capacitance. Feed in a 5.9Mc/s signal. Adjust L11.
- 10.—Turn tuning gang to minimum capacitance. Feed in a 17Mc/s signal. Adjust C9.
- 11.—Repeat operations 9 and 10 until no further improvement results.
- 12.—Feed in a 6.77Mc/s signal. Tune receiver to this signal. Adjust L4.
- 13.—Feed in a 15.45Mc/s signal. Tune

receiver to this signal. Adjust C5.
14.—Repeat operations 12 and 13 until no further improvement results.

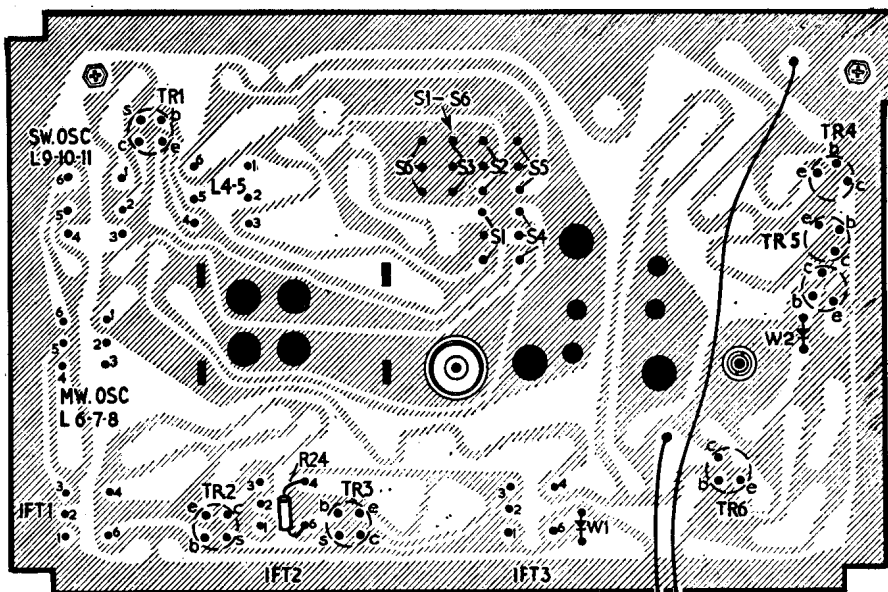
GENERAL NOTES

Dismantling.—In order to open the case, first slide the battery cover downwards to release it and remove the battery. Pull off the tuning knob. Unscrew the handle fixing screws. The front half of the case can now be removed to the extent of the loudspeaker connecting wires.

To gain access to the foil side of the printed panel gently prise up the lower edge of the printed panel, this is clipped into moulded lugs on the case.

Balance Adjustment.—Output transistors TR6 and TR7 are series connected across the 9V battery supply and to ensure a balanced supply voltage to each, an adjustment R13 is incorporated in the emitter circuit of TR4. Adjustment of this resistor sets the emitter potential and hence the collector potential of TR4. This in turn determines the base potential of the directly coupled driver TR5. The base bias of TR5 determines its collector potential which in its turn controls the base voltages of TR6 and TR7.

Correct balance is obtained when the potential of TR6/TR7 emitter junction is 5V with respect to the positive line.



Foil side of printed panel showing the transistor base connections.

