

MARCONIPHONE 851 THREE-BAND SIX

CIRCUIT.—The aerial input to the grid of V1, an H.F. pentode operating as an amplifier, is via a series aerial condenser to single tuned circuits on all bands.

V1 is tuned anode coupled to the signal grid of V2, a heptode frequency changer. A cathode choke, L8, ensures stability of the oscillator section, and the oscillator anode is provided with an extra coupling channel for the short wave band.

An I.F. transformer, tuned to 465 kc., effects the coupling between V2 and V3, an H.F. pentode operating as the I.F. amplifier. A resistance is connected across the secondary of the transformer. V3, V2 and V1 are all A.V.C. controlled.

Another transformer effects the coupling between V3 and the demodulating diode of V4, a double diode triode. The other diode provides the impulse operating the A.V.C. network.

Coupling arrangements to the grid of the triode section of V4 include a manual volume control and connections for a pick-up. On short waves an additional coupling condenser, C33, cuts down the bass response.

V4 is resistance capacity coupled to V5, an output tetrode. A condenser between anode and cathode effects a fixed modification of tone and a negative feedback variable condenser between anode and grid enables tone to be adjusted. Bias for this valve is obtained by means of a potentiometer between H.T. negative and chassis earth line.

Mains equipment consists of a mains transformer, a full wave rectifying valve, V6, electrolytic smoothing condensers and smoothing choke (the field coil). The smoothing choke is connected in the negative side of the circuit.

Chassis Removal.—The base of the cabinet is provided with a false bottom

secured by three brackets. Removal of this enables the underside of the chassis to be inspected.

Remove the four control knobs (grub-screw fixing) from the front of the cabinet. The double-tuning knob is rotated until the grub screw coincides with the withdrawal slot, when the grub screw can be loosened. Remove the chassis-securing bolts from the base.

Uncleat the speaker cable from the baffle. The chassis may then be removed to the extent of the speaker cable.

The speaker, secured by four wood screws, may be removed if desired, or, alternatively, the leads to the panel may be unsoldered. When replacing, connect yellow lead to No. 2, black lead to No. 5, and yellow-black to No. 7.

Special Notes.—The adjustment device on the mains transformer takes the form of a flying lead adapted to be secured to one of two terminals.



Five valves and a rectifier are employed in the Marconiphone 851.

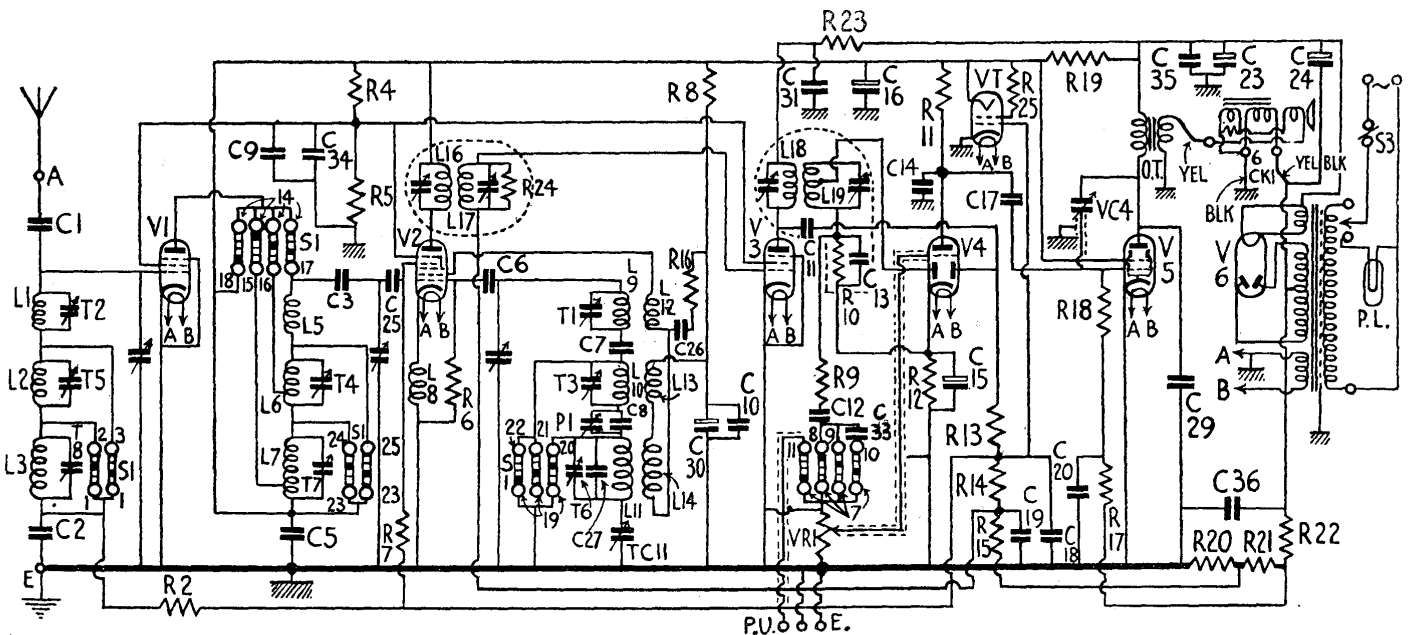
VALVE READINGS

No signal. Volume maximum. M.W. min. cap. 225 volts. A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	(All Marconi) W63 or KTW63	Anode ..	250	5.2
		Screen ..	80	1.1
2	X63	Anode ..	250	2.4
		Screen ..	80	3
		Osc.anode	150	4
3	W63 or KTW63	Anode ..	220	5.2
		Screen ..	80	1
4	DH63	Anode ..	135	1.6
5	KT63	Anode ..	260	32
		Screen ..	250	4.8
6	U50	Heater ..	370	—

RESISTANCES

R.	Purpose.	Ohms.
2	V1 A.V.C. decoupling ..	75,000
4	V1, V2 and V3 screens decoupling (part) ..	23,000
5	V1, V2 and V3 screens decoupling (part) ..	35,000
6	Osc. grid leak ..	50,000
7	V2, A.V.C. feed ..	500,000
8	Osc. anode decoupling ..	23,000
9	H.F. stopper ..	100,000
10	Demodulating diode load ..	500,000
11	V4 anode load ..	50,000
12	V4 cathode bias ..	750
13	A.V.C. diode load (part) ..	500,000
14	A.V.C. diode load (part) ..	500,000
15	A.V.C. diode load (part) ..	500,000
16	Regeneration modifier S.W. ..	100
17	V5 grid decoupling ..	100,000
18	V5 grid leak ..	150,000
19	H.T. line decoupling ..	1,000
20	V6 bias pot. (part) ..	1,000
21	V5 bias pot. (part) ..	7,500
22	V5 bias pot. (part) ..	50,000
23	V3 anode decoupling ..	10,000
24	I.F.T.1 sec. shunt ..	1 meg.
VR1	Volume control ..	2 meg.



An amplifier before the frequency changer is a feature of the three-band 851. The visual indicator (VT) and R25 are fitted only to the model 852 radiogram version. Switch positions, top to bottom, are ; LW, MW, SW. Gram.

The single dial light is rated at 230 volts 15 watts and located in a bayonet-type holder behind the dial.

Pick-up sockets are provided at the rear of the chassis. A pick-up having a D.C. resistance of more than 1,000 ohms should be used. Marconiphone Model 25 pick-up should have a 7,500 ohms resistance connected in shunt. The pick-up may be left permanently connected.

An extension speaker should have a speech coil impedance of approximately 5 ohms and be wired to tags 2 and 3 on the speaker panel.

R24 is contained in I.F.T.1, C11, C13 and R10 in I.F.T.2, C1 in the aerial coils can, and C7, C26, C27 and R16 in the oscillator coils can.

The wiring colour code consists of red for H.T. positive, red-yellow for anodes of valves not directly connected to H.T. positive, red-black for screens not directly connected to H.T. positive, green for grid circuits, red-brown for mains, with heat-

ers, filaments and cathodes brown, earth black, and yellow for general purposes.

Yellow is also used for leads not falling in the general code and when stocks of any colour are temporarily exhausted in the factory.

The visual tuning indicator, R25, and a pick-up with shunt resistance are fitted to Model 852.

Circuit Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer. Switch receiver to L.W. band, set gang to maximum capacity, volume control to maximum and tone control fully anti-clockwise.

Connect a service oscillator to top grid cap of V2 via a 0.1 mfd. condenser (leaving grid connection made) and chassis.

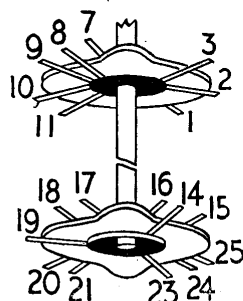
Tune service oscillator to 465 kc. and adjust the trimmers of IFT2 and then IFT1 for maximum response, reducing the input from the oscillator as the circuits come into line to render the A.V.C. inoperative.

Signal Circuits.—Connect the service oscillator to the A and E sockets via a dummy aerial, only feeding sufficient input to obtain reliable peaks in the output meter.

Short Waves.—Tune set and oscillator to 18 metres (16.67 mc.) and adjust T1 and then T2 for maximum, simultaneously rocking the gang.

If the inductance unit L1, L2 and L3 has been replaced, and not otherwise, tune oscillator to 50 metres (6 mc.) and tune in on receiver. A loop of wire will
(Continued on page iv.)

CONDENSERS		
C.	Purpose.	Mfds.
1	Series aerial . . . . .	.0000075
2	V1 A.V.C. decoupling . . . . .	.05
3	Gang isolator . . . . .	.1
5	H.T. line shunt . . . . .	.1
6	Osc. grid . . . . .	.00005
7	S.W. osc. fixed padder . . . . .	.0035
8	M.W. osc. fixed padder . . . . .	.00035
9	V1, V2 and V3 screens decoupling (part) . . . . .	.1
10	Osc. anode decoupling (part) . . . . .	.005
11	A.V.C. diode coupling . . . . .	.000075
12	L.F. coupling . . . . .	.01
13	H.F. by-pass . . . . .	.0001
14	V4 anode shunt . . . . .	.00035
15	V4 cathode bias shunt . . . . .	.25
16	H.T. line decoupling . . . . .	.4
17	L.F. coupling . . . . .	.05
18	T.I. grid decoupling . . . . .	.05
19	V3 A.V.C. decoupling . . . . .	.23
20	V5 grid bias decoupling . . . . .	.23
23	H.T. smoothing . . . . .	.4
24	H.T. smoothing . . . . .	.8
25	V2 grid isolator . . . . .	.000035
26	Regeneration modifier . . . . .	.00015
27	L.W. osc. fixed trimmer . . . . .	.000023
29	Tone modifier . . . . .	.0023
30	Osc. anode decoupling (part) . . . . .	.4
31	V3 anode decoupling . . . . .	.05
33	S.W. bass limiting condenser . . . . .	.001
34	V1, V2 and V3 screens decoupling (part) . . . . .	.4
35	H.T. line by-pass . . . . .	.015
36	Bias potr. (shunt) . . . . .	.05



Left, the two switch banks in the same relative positions shown in the under chassis layout diagram given below.

Marconi 851 on Test

MODEL 851.—Standard model for A.C. mains operation, 195-255 volts, 50-100 cycles. Price 12½ gns.

DESCRIPTION.—Five-valve, plus rectifier, three-band superhet table model.

FEATURES.—Full-vision scale calibrated in metres and station names. Two-speed tuning, combined volume control and master switch, negative feed-back tone control, wave selection knob operating rotary disc inscribed with wavebands. Elliptical speaker. Sockets for pick-up and external loudspeaker.

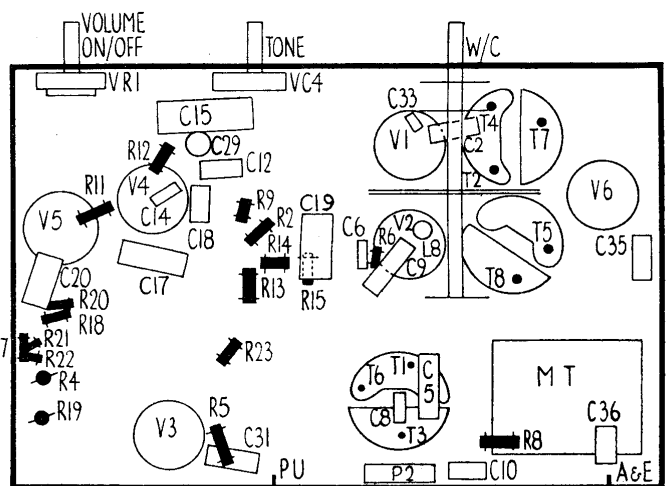
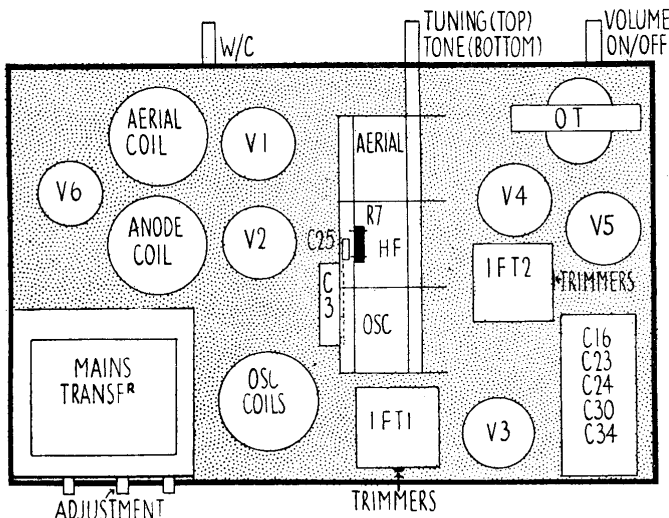
LOADING.—71 watts.

Sensitivity and Selectivity
SHORT WAVES (16.5-52 metres).—Excellent gain and selectivity, well maintained over entire band, easy handling and no drift.
MEDIUM WAVES (195-580 metres).—Very good gain and selectivity, with local stations spreading on adjacent channels only. Good background, free from whistles.
LONG WAVES (725-2,000 metres).—Similar performance to medium waves, with excellent selectivity. Deutschlandsender received with very little side splash.

Acoustic Output
 Ample volume for a large room without overloading. Excellent frequency response, crisp, clean attack and good low-note radiation very free from resonances. Speech balance on all orchestral music particularly pleasing and above average.

Replacement Condensers

EXACT replacement condensers for the 851 are available from A. H. Hunt, Ltd. For the block containing Cs. 24, 16, 23, 30 and 34, there is unit 3543, 7s. 6d.; for C15, there is unit 2984, 1s. 6d.



All the component parts of the 851 can be identified by means of these diagrams of (left) the top of the chassis and (right) the underside.

Marconiphone 851

(Continued from previous page.)

be found running across the coil former, and this loop must be bent up or down until maximum output is obtained using a strip of insulating material with a suitable "nick."

It may be necessary to remove the coil can to identify the loop, but final adjustments must be made with the can in position and properly secured. Then recheck at 18 metres.

Medium Waves.—Tune oscillator to 195 metres (1,538.5 kc.), set gang to minimum capacity and adjust T3 for maximum response.

Tune service oscillator to 225 metres (1,333 kc.), tune in on receiver and adjust T4 and then T5 for maximum.

Tune service oscillator to 530 metres (566 kc.) and adjust P1 for maximum, at the same time rocking the gang.

Return to 195 metres and check setting of T3.

Long Waves.—Tune oscillator to 725 metres (413.8 kc.), set gang to minimum and adjust T6 for maximum.

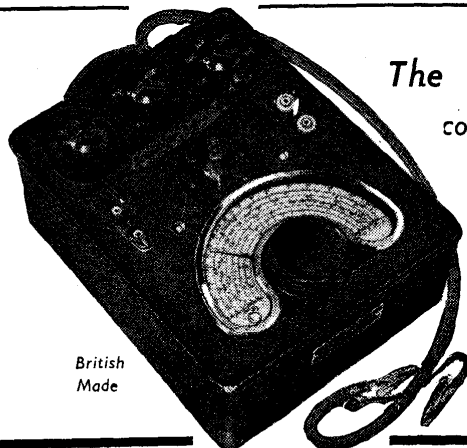
Tune oscillator to 800 metres (375 kc.), tune in on receiver and adjust T7 and T8 for maximum.

Tune oscillator to 1,900 metres (158 kc.), tune in on receiver and adjust P2 for maximum, simultaneously rocking the gang.

Check setting to T6 at 725 metres and then return to medium waves and go through entire M.W. and L.W. alignment

again. After ganging it is recommended to check the calibration of the scale at all ranges and set the pointer to give the best possible compromise.

WINDINGS (D.C. Resistances)			
Windings.	Ohms.	Range.	Measured between.
L1 .. ..	.1	SW	Top grid V1 and tag 1 S1.
L1+L2 ..	6	MW	Top grid V1 and tag 1 S1.
L1+L2+L3	20	LW	Top grid V1 and tag 1 S1.
L5 .. ..	.1	SW	Anode V1 and tag 23 S1.
L6	5.5	MW	Tag 25 and tag 23 S1.
L7	14	LW	Tag 23 and tag 24 S1.
L8 .. ..	.1	—	Cathode V1 and chassis.
L9 .. ..	.1	—	Across T1.
L10	5.5	—	Across T3.
L11	4.2	—	Across T6.
L12+L13+L14	6	—	Osc. anode V2 and R8.
L16	5	—	Anode V2 and screen V5.
L17 R24 ..	5	—	Top grid V3 and yellow / black lead IFT1.
L18	5	—	Anode V3 and red lead IFT2
L19 R10 ..	500,000	—	Diode and cathode V4.
CK1	1,600	—	Tags 5 and 6 L.S.
O.T. prim.	400	—	Red and yellow leads from transformer.
M.T. prim.	26	—	Terminals M and 195/223 volts.
Total HT sec.	630	—	Anode pins V6.



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The ALL-WAVE AVO-OSCILLATOR

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covers CONTINUOUS fundamental frequency band from 95 Kc. to 40 Mc.

Self-contained.
Complete with
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AN accurate modulated oscillator covering a complete band from 95 Kc. to 40 Mc. by six fundamental ranges. Extended to 8 Mc. by harmonic calibration. Dial directly calibrated throughout—accuracy within 1%. Externally modulated, internally modulated, or R.F. Signal obtained at will. Internal modulation is 30% at 400 cycles, the L.F. Signal available for external use. Double attenuation enables signals to be varied from a few microvolts to 50 millivolts, with a force output of 1 volt. A simple barreter is incorporated which increases L.T. Battery life. Calibration errors due to change in battery L.T. volts almost eliminated.