

# MARCONIPHONE 851 THREE-BAND SIX

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**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

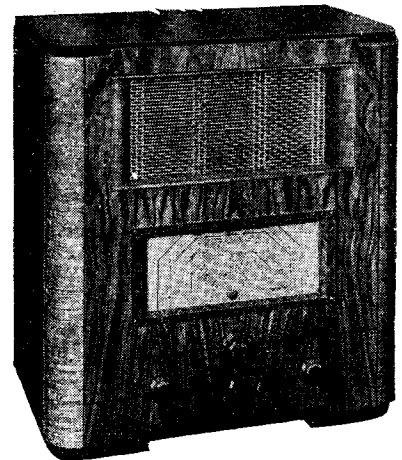
secured by three brackets. Removal of this enables the underside of the chassis to be inspected.

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.

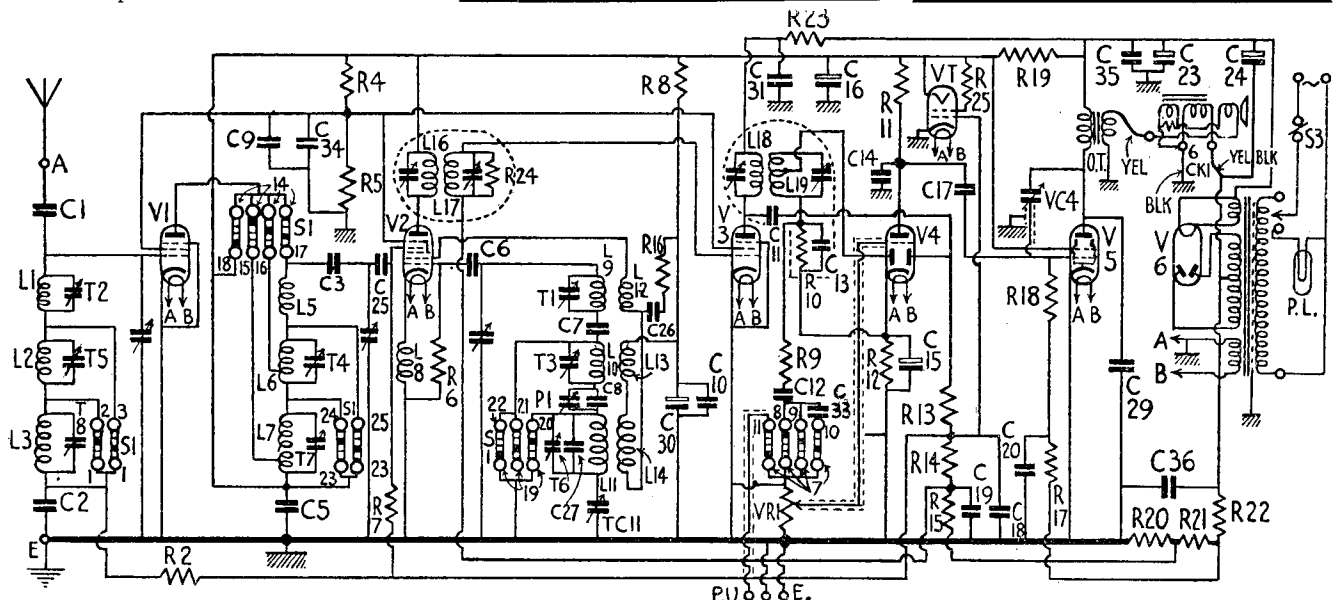
## VALVE READINGS

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	V5 bias potr. (part) ..	1,000
21	V5 bias potr. (part) ..	7,500
22	V5 bias potr. (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, 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

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## Marconi 851 on Test

**MODEL 851.**—Standard model for 255 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

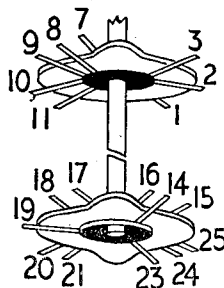
Ample volume for a large room without overloading. Excellent frequency response, crisp, clean attack and good low-note radiation very free from resonances. Speech balance on all orchestral music particularly pleasing and above average.

### Replacement Condensers

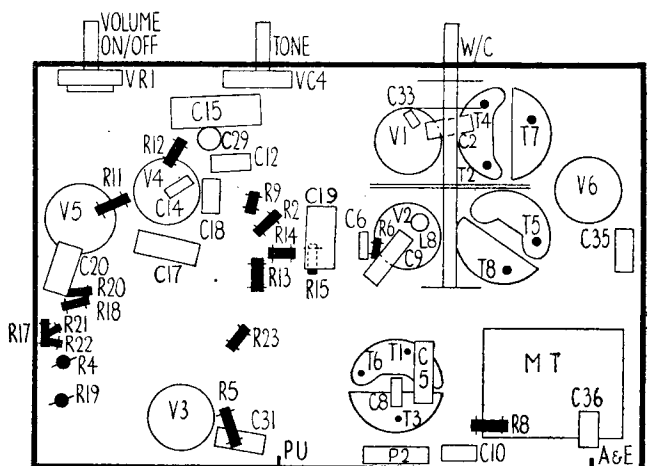
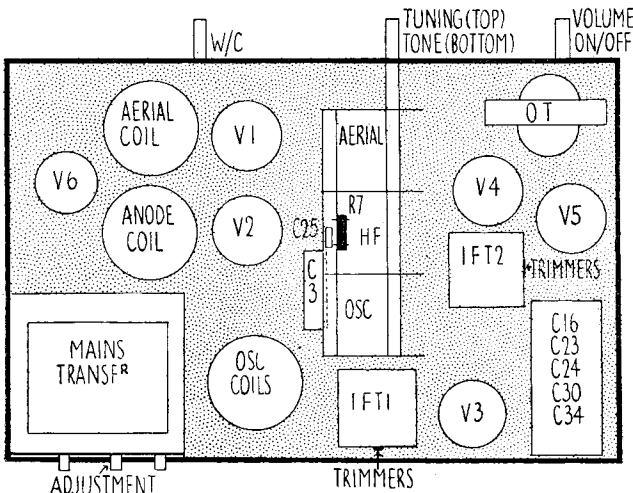
**EXACT** replacement condensers for the 851 are available from A. H. Hunt, Ltd. For the block containing Cs. 24, 10, 23, 30 and 34, there is unit 3543, 7s. 6d.; for C15, there is unit 2984, 1s. 6d.

### 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 .. .	.07
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.



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.

## DECCA MODEL PT ML PRESTOMATIC

(Continued from page 41.)

Although T1 and T3, the medium- and long-wave oscillator trimmers, are shown for the sake of clarity directly across the oscillator coils in the circuit, they are actually on the trimmer assembly strip.

### Alignment Notes

Alignment operations should be carried out with the chassis in the cabinet where access may be obtained to all trimmers.

**I.F. Circuits.**—Connect an output meter across the primary of the speaker transformer. Turn gang to maximum capacity and press the medium-wave manual knob fully in. Turn volume control to maximum and tone control to high position. Connect a service oscillator between the top grid cap of V1 and chassis.

Tune the service oscillator to 456 kcs. and adjust first the trimmers of I.F.T.2 and then I.F.T.1 for maximum, reducing the input from the oscillator as the circuits come into line. This must be done to prevent the A.V.C. action giving misleading results.

**Signal Circuits.**—Connect the service oscillator to the A and E sockets via a dummy aerial. Only feed sufficient input to obtain reliable peaks in the output meter, and reduce the input as the circuits come into line.

**Medium Waves.**—Press medium-wave manual button fully in. Tune set and oscillator to 200 metres (1,500 kc.) and adjust T1 and then T2 for maximum.

The padding is fixed, but check at 550 metres.

**Long Waves.**—Press long-wave manual button fully in. Tune set and oscillator to 1,000 metres (300 kc.), and adjust T3 and then T4 for maximum.

The long-wave padding is fixed, but check at 2,000 metres.

### Press-button Alignment

Remove service oscillator and output meter, and connect an external aerial and earth, placing the cabinet on its side so as to obtain access to the trimmer panel through the false bottom.

Each button should be calibrated on the station it is to receive. For example, press the button inscribed London Regional, adjust the oscillator trimmer

(see sketch) to bring in the station, and then adjust the aerial trimmer to obtain maximum volume.

If desired, the station may be tuned in with the oscillator trimmer, the aerial and earth system removed, and a service oscillator, tuned to the frequency of the station concerned, connected in its place, and the aerial trimmer adjusted to give maximum volume. This prevents operation of the A.V.C. if the input is kept down. However, for all practical purposes, it will be found satisfactory to adjust the trimmers on the stations themselves.

## ULTRA MODEL 202

(Continued from page 39.)

Tune service oscillator to 470 kc. and adjust the trimmers of I.F.T.2 and then I.F.T.1 for maximum response, reducing the input from the oscillator as the circuits come into line to keep the A.V.C. inoperative.

**Signal Circuits.**—Adjust the tuning pointer to lay between the two cream horizontal dial lines when the gang is fully closed.

Connect the service oscillator to the A and E sockets via a dummy aerial. To prevent operation of the A.V.C., only feed sufficient input to obtain reliable peaks in the output meter.

**Medium Waves.**—Tune set and oscillator to 200 metres (1,500 kc.), and adjust T1 and then T2 for maximum.

Tune set and oscillator to 500 metres (600 kc.), and adjust P1 for maximum, at the same time rocking the gang.

Repeat both operations until no further improvement results.

**Long Waves.**—Tune set and oscillator to 1,300 metres (230 kc.), and adjust T3 and then T4 for maximum response.

Tune set and oscillator to 1,700 metres (176.5 kc.), and adjust P2 for maximum simultaneously rocking the gang.

Repeat both operations until no further improvement results.

**Short Waves.**—Tune set and oscillator to 17 metres, screw T5 right up, unscrew until the second peak is heard, then adjust T6 for maximum response.

The short-wave padding is fixed, but check calibration at 50 and 51 metres.

**I.F. Wavetrap.**—Inject a strong signal of 470 kc., tune set to 950 metres and adjust W.T. trimmer for minimum response in the output meter.

Tune service oscillator to 464 kcs., and adjust the trimmers of I.F.T.2 and then I.F.T.1 for maximum, reducing the input from the service oscillator as the circuits come into line to keep below the point at which the A.V.C. begins to operate.

**Signal Circuits.**—The wavelength pointer should coincide with the right-hand vertical line on the dial when the gang is fully closed.

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.

**Medium Waves.**—Tune set and oscillator to 214 metres (1,400 kcs.), this is marked with a small dot on the M.W. scale, and adjust T1 and then T2 for maximum response.

Tune set and oscillator to 500 metres

## Marconiphone 851

(Continued from page 35.)

be found running across the coil former, and this loop must be bent up or down until maximum output is obtained.

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 T5. **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.

### 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.

## KOLSTER-BRANDES 652

(Continued from page 45.)

cuit on the medium- and short-wave bands.

As the chassis is of the universal type, under certain conditions the chassis is "live" and should not be connected to earth.

### Alignment Notes

**I.F. Circuits.**—Connect an output meter across the primary of the output transformer, taking the precaution of inserting a 2-mfd. condenser in series with one of the meter leads. Switch set to M.W. band, turn gang to maximum and volume to maximum. Connect a service oscillator between the top grid cap of V1 and chassis, leaving set connection made.

(600 kcs.) and adjust P1 for maximum, simultaneously rocking the gang. P1 is the nut of the double padding condenser.

Repeat both operations until no further improvement results.

**Long Waves.**—Tune set and oscillator to 1,200 metres (250 kcs.) and adjust T3 and then T4 for maximum.

Tune set and oscillator to 1,714 metres (175 kcs.), also marked with a dot, and adjust P2 for maximum, simultaneously rocking the gang.

Repeat both operations.

**Short Waves.**—Tune set and oscillator to 17.6 metres (17 mcs.) and adjust T5 and T6 for maximum response.

The short-wave padding is fixed, but check at 50 metres (6 mcs.), and if any appreciable error is found then compensate with T5 to halve the error.