

NUMBER THIRTY-NINE
(VOLUME TWO)

'TRADER' SERVICE SHEETS

MARCONIPHONE MODEL 264

THE Marconiphone "Jubilee" table receiver, model 264, is a 4-valve (plus valve rectifier) A.C. superhet, with numerous refinements, which is also available in radio-gramophone form, when it is known as model 287.

CIRCUIT DESCRIPTION

Aerial input on L.W. by way of switch S1 and filter coil L3, and on M.W. by way of switch S2, series condenser C1, and image suppression circuit L1, L2, C2, to tapings on primary of inductively coupled band-pass filter. Primary L4, L5 tuned by C24; secondary L6, L7 tuned by C26.

First valve (V1, Marconi MX40) is a heptode operating as frequency-changer with electron coupling. Oscillator grid coils L8, L9 tuned by C28; anode coils L10, L11.

Second valve, a variable-mu tetrode (V2, Marconi metallised VMS4), functions as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings L12, L13 and L14, L15.

Intermediate frequency 125 KC/S.

Diode second detector is part of double diode triode (V3, Marconi metallised MHD4) which also provides a form of amplified delayed automatic volume control and L.F. amplification. Audio-frequency component in output is de-

veloped across load resistance R11 and passed by way of manual volume control R16 and variable tone control R19, C14 to grid of triode section. G.B. for radio amplification is obtained from the steady potential present across R11 by reason of the carrier wave of a transmitter. Resistances R22, R26 in V3 cathode circuit, and R27, R28 in H.T. negative line, provide the high cathode to earth potential

required for amplified delayed A.V.C. in conjunction with second diode of V3 and its load resistance R21. A.V.C. is applied to frequency-changer and I.F. valves. Static and interstation noise suppression is effected by switches S6 and S7, which form a double-pole change-over switch operated by a push-pull action of the manual volume control spindle. When in the "quiet" position, S7 switches preset variable resistance R6 into cathode circuits of V1 and V2, thus increasing fixed G.B. applied, while S6 changes the A.V.C. applied to V2 from amplified to normal. The degree of suppression is adjusted by means of R6.

Resistance-capacity coupling between V3 and output pentode (V4, Marconi MPT4), which has a choke-capacity tone compensating filter L17, C19, in its anode circuit. G.B. is obtained from voltage drop along R27. Provision for connection of low-resistance external speaker across secondary of speaker input transformer. S10 is speaker muting switch.

H.T. current is supplied by full-wave rectifying valve (V5, Marconi MU12). Smoothing by speaker field L20 in H.T. negative line, and condensers C21, C22. Hum control by preset variable potentiometer across heater secondary of mains transformer T2.

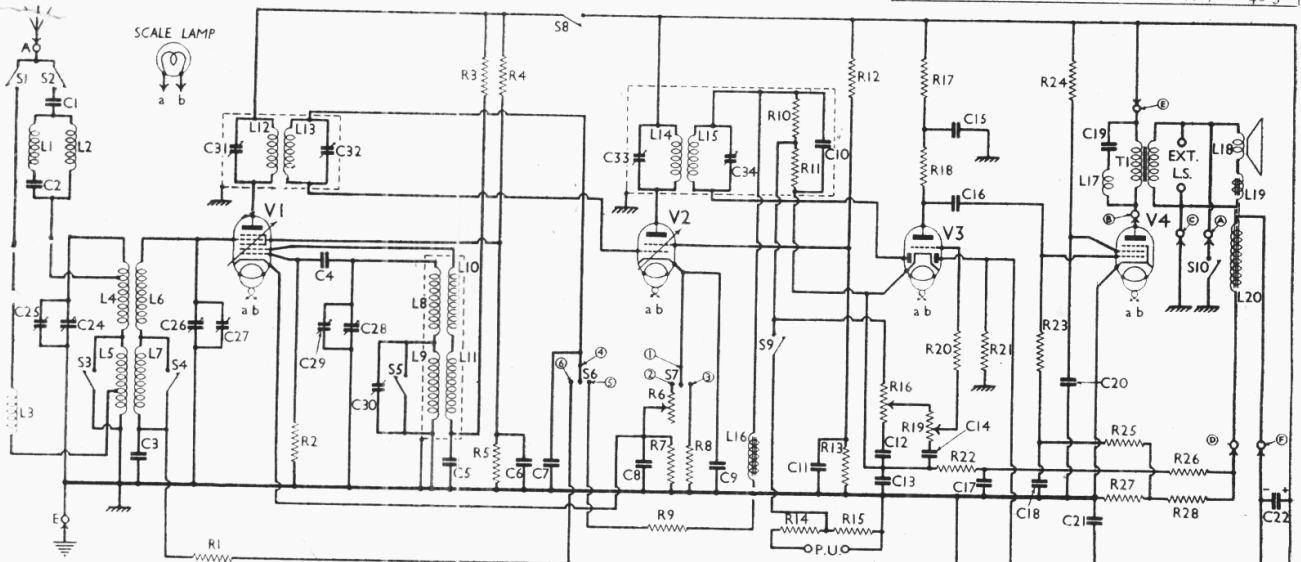
bolts from the underside of cabinet, and with them the spring washers and the metal strips. This releases the chassis.

To remove chassis entirely, disconnect the 6-way speaker cable from the panel on the speaker transformer. Note that the wires are colour coded.

Removing Speaker.—The speaker, with its associated components, is held to the sub-baffle by four large hexagonal nuts.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 cont. grid decoupling	500,000
R2	V1 osc. grid resistance	50,000
R3	V1 osc. anode decoupling	50,000
R4	V1 S.G.'s pot. divider	23,000
R5	Silent tuning control	23,000
R6	V1 fixed G.B. resistance	14,000
R7	V2 fixed G.B. resistance	500
R8	V2 cont. grid decoupling	100
R9	I.F. stopper	50,000
R10	V3 rectifier diode load	50,000
R11	V2 S.G. pot. divider	230,000
R12	Pot. divider across pick-up	35,000
R13		23,000
R14	Manual volume control	23,000
R15	V3 anode decoupling	500,000
R16	V3 anode resistance	23,000
R17	V3 anode resistance	50,000
R18	Variable tone control	500,000
R19	V3 grid I.F. stopper	230,000
R20	V3 A.V.C. diode load	230,000
R21	V3 cathode resistance	500,000
R22	V4 grid resistance	35,000
R23	V4 aux. grid H.T. feed	230,000
R24	V4 grid decoupling	10,000
R25	V4 cathode resistance	150,000
R26	V4 G.B. and A.V.C. circuit	23,000
R27	voltage-dropping resistances	250
R28		750
R29	Hum control	48.5

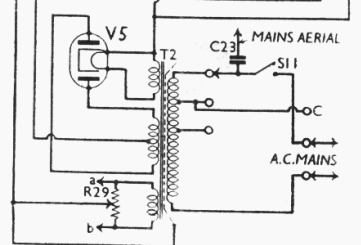


The circuit diagram. The contacts of S6 and S7 are numbered as in the diagram on p. (iv), and the letters in circles indicate the L.S. leads (see General Notes). The bottom of L16 connects to R9 only, and not to chassis.

veloped across load resistance R11 and passed by way of manual volume control R16 and variable tone control R19, C14 to grid of triode section. G.B. for radio amplification is obtained from the steady potential present across R11 by reason of the carrier wave of a transmitter. Resistances R22, R26 in V3 cathode circuit, and R27, R28 in H.T. negative line, provide the high cathode to earth potential

DISMANTLING THE SET

Removing Chassis.—Remove back of receiver (3 screws). Remove knob of preset silent tuning control (R6) at rear by unscrewing the axial slotted screw. Remove wooden back-board at bottom of rear of cabinet (2 screws). Unclip speaker cable from clips at the side and top of the cabinet. Remove knobs (grub screws). Now remove the four hexagonal headed



Condensers		Values (μF)
C1	Aerial series condenser (M.W.)	0.0005
C2	Part of image suppressor circuit	0.002
C3*	V1 cont. grid decoupling	1.0
C4	V1 osc. grid decoupling	0.0001
C5	V1 osc. anode decoupling	0.5
C6*	V1 S.G.'s by-pass	1.0
C7	V2 cont. grid decoupling	0.035
C8*	V1 cathode by-pass	0.5
C9	V2 cathode by-pass	0.25
C10	I.F. by-pass	0.0001
C11*	V2 S.G. by-pass	3.0
C12	Blocking condenser	0.1
C13*	V3 cathode by-pass	1.0
C14	Tone control by-pass	0.0005
C15*	V3 anode decoupling	1.0
C16*	L.F. coupling to V4	2.0
C17*	Part of amplified A.V.C. circuit	0.1
C18*	V4 grid decoupling	0.0005
C19	Part of tone comp. circuit	1.0
C20*	V4 aux. grid by-pass	1.0
C21*	H.T. smoothing	4.0
C22	H.T. smoothing, electrolytic	8.0
C23	Mains aerial condenser	0.00035
C24	Band-pass primary tuning	—
C25	Band-pass primary trimmer	0.00007
C26	Band-pass secondary tuning	—
C27	Band-pass secondary trimmer	—
C28	Oscillator tuning	—
C29	Oscillator M.W. trimmer	—
C30	Oscillator L.W. trimmer	—
C31	1st I.F. trans. pri. tuning	0.00014
C32	1st I.F. trans. sec. tuning	0.00014
C33	2nd I.F. trans. pri. tuning	0.00014
C34	2nd I.F. trans. sec. tuning	0.00014

* In condenser block.

Other Components		Values (ohms)
L1	Suppressor coil	0.4
L2	Image suppressor coil	0.6
L3	Aerial filter coil	75.0
L4	Band-pass primary coils	2.7
L5	Band-pass secondary coils	12.5
L6	Band-pass secondary coils	2.7
L7	Band-pass secondary coils	12.5
L8	Osc. grid tuning coils	3.25
L9	Osc. grid tuning coils	7.0
L10	Osc. anode coils	3.75
L11	Osc. anode coils	2.2
L12	1st I.F. trans. Pri.	95.0
L13	1st I.F. trans. Sec.	95.0
L14	2nd I.F. trans. Pri.	95.0
L15	2nd I.F. trans. Sec.	95.0
L16	Part of Q.A.V.C. circuit	3,000
L17	Part of tone comp. filter	400
L18	Speaker speech coil	8.0
L19	Hum neutralising coils	2.4
L20	Speaker field winding	2,000
T1	Speaker input trans. Pri.	750
	Speaker input trans. Sec.	2.0
	Mains trans. Pri. total	20.0
	Mains trans. Heater sec.	0.1
	Mains trans. H.T. sec.	0.15
	Mains trans. H.T. sec.	400.0
S1-S5	Waveband switches—ganged	—
S6,S7	Silent tuning switches	—
S8,S9	Radio-gramophone switches	—
S10	Speaker muting switch	—
S11	Mains switch	—

VALVE ANALYSIS

The voltage readings in the table (col. 3) were obtained with a high resistance voltmeter, connected between the anodes or screens of the valves and chassis. Readings are average ones for the chassis with the "Q" switch pushed in (maximum

sensitivity) and with no aerial or earth connected, i.e., no signal input.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 MX40*	220	3.3	80	1.9
V2 VMS4	220	3.0	75	1.7
V3 MHD4	100	1.5	—	—
V4 MPT4	215	2.5	170	5.5
V5 MU12	340†	—	—	—

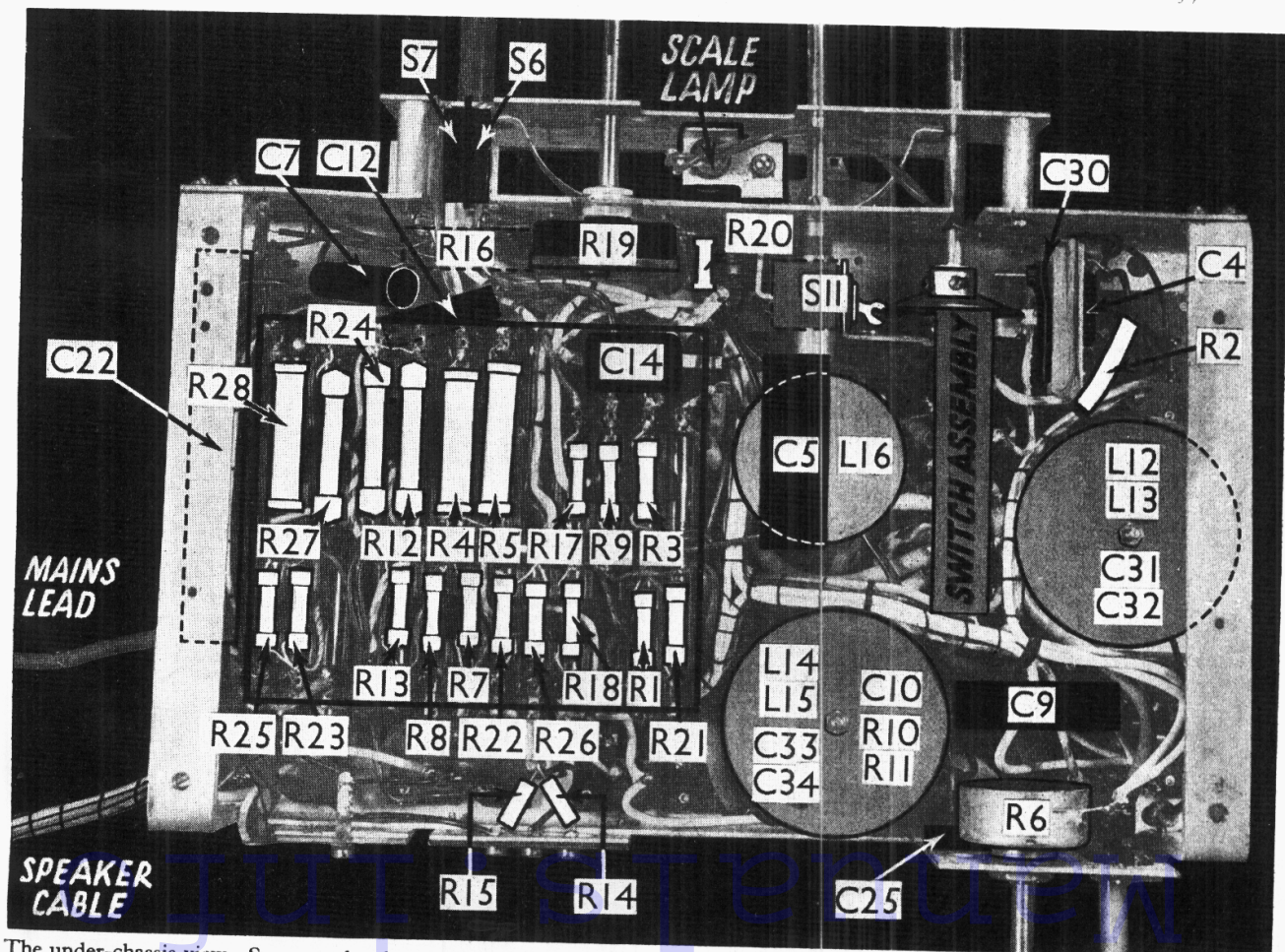
* Oscillator anode 120 V 1.5 mA. † A.C., each anode.

GENERAL NOTES

Switches.—S1-S5 and S8-S10 are all contained in the switch assembly indicated in our under-chassis view, and shown separately in a diagram. With this assembly is ganged S11, the Q.M.B. mains switch, operated by a cam plate on the switch assembly spindle. The remaining switches, S6 and S7, are two Q.M.B. single-pole changeover types, mounted in one unit, and operated by the push-pull action of the volume control knob. These switches are also indicated in the under-chassis view, and are shown in a separate diagram. The contacts are numbered to correspond with the numbers in the circuit diagram.

The table overleaf gives the switch positions for various settings of the main switch assembly. S1-S5 are wavechange switches, S8 and S9 are for pick-up switching, and S10 is for speaker muting.

(Continued overleaf)



The under-chassis view. Separate sketches overleaf show the condenser block (outlined above), the main switch assembly, and S6, S7.

MARCONIPHONE MODEL 264
(continued)

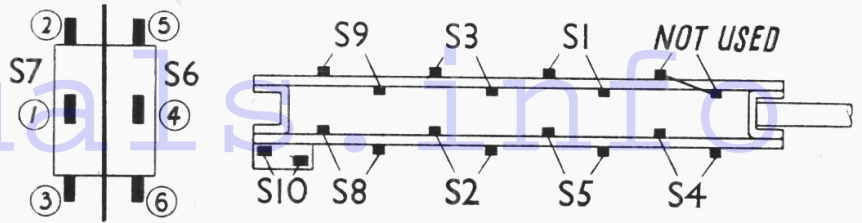
Switch	M.W.	L.W.	Gram.
S1	O	C	O
S2	C	O	O
S3	C	O	O
S4	C	O	C
S5	C	O	O
S8	C	C	O
S0	O	O	C

S10, the muting switch, closes between each of the above positions, but opens again when each position is reached. The speaker is therefore silent whilst the main switching takes place.

With regard to **S6** and **S7**, the table below shows which of the numbered contacts are closed in the "Normal" and "Quiet" positions. The former is with the volume control knob pushed in, and the latter with it pulled out.

Switch	Normal	Quiet
S6	4 — 6	4 — 5
S7	1 — 3	1 — 2

Coils.—The suppressor coils **L1** and **L2** are wound on small flat formers mounted on top of the chassis as shown in our plan view. The band-pass coils **L4-L7**, and the filter coil **L3** are wound on two unshielded tubular formers on top of the chassis, **L3, L5** and **L7** being on one former and **L4** and **L6** on the other. The positions of the coils are indicated in our plan chassis view. The oscillator coil



Diagrams of the switches. The contacts of **S6** and **S7** are numbered as in the circuit diagram.

is screened by a screw-on cover, which has been removed in our illustration. It includes coils **L8-L11**. Starting from the top, **L9** is the first coil. Next to this is a ring of insulating material, and below it is coil **L11**. Next is a single layer coil covered with Empire cloth, which is **L10**, while at the bottom is a large single layer coil, **L8**, of which the last few turns are separated from the main winding. It is rather difficult to see all these coils in our illustration, **L11** being entirely hidden.

The I.F. coils, **L12, L13** and **L14, L15**, are in two screening cans beneath the chassis, seen in our under-chassis view. These cans are easily removable, being held by a central nut and washer in each case. Besides the coils, the cans contain the associated trimming condensers **C31, C32, and C33, C34**. In addition, the second unit contains also **C10, R10** and **R11**.

Condenser Block.—Most of the condensers are contained in a large block which is mounted beneath a moulded panel carrying the resistors. This block is outlined in black in our under-chassis view,

and a diagram of the internal connections is given on this page. The tags indicated project through the moulded panel and can be identified by their positions. **C14**

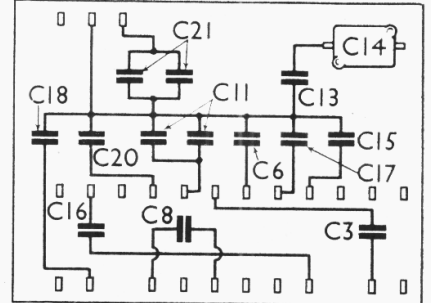


Diagram of the condenser block. Note that **C11** and **C21** each comprise two units in parallel.

is mounted on top of the moulded panel. Note that in the case of **C11** and **C21**, two condensers are connected in parallel to give the correct capacity.

Scale Lamp.—This is an Osram M.E.S. type, 6.2 V, 0.3 A.

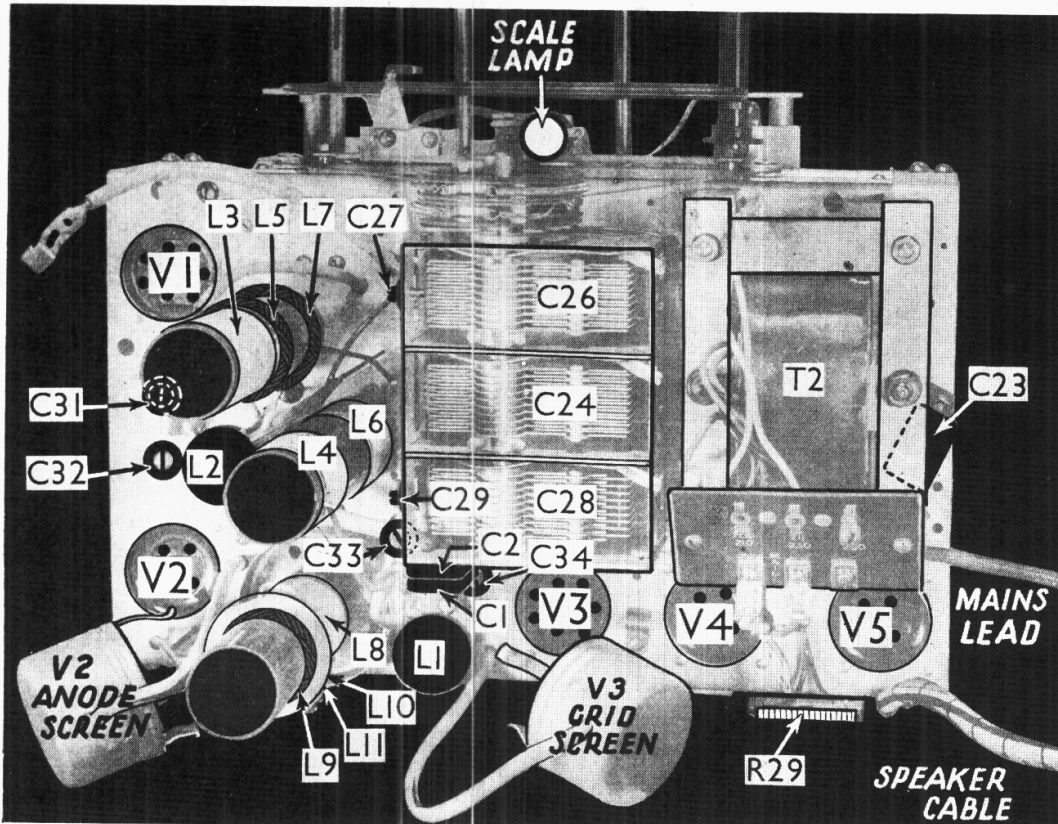
External Speakers.

—If connected to the terminals marked EXT. L.S. on the internal speaker transformer, these must be of the low resistance type. High resistance speakers must be connected in parallel with the primary of **T1**, i.e., to the terminals to which the red and yellow leads are already connected.

Loud-speaker Unit.

—Note that this contains **L18**, the speech coil; **L19**, the split hum coil, partly wound round the magnet and partly round the field coil; **L20**, the field coil; **T1**, the input transformer; and in addition, the tone compensation components **L17** and **C19**.

The six colour-coded tags for the wires from the chassis are indicated on the circuit diagram by letters as follows: A, Pink; B, Yellow; C, Black; D, Green; E, Red; F, Grey.



Plan view of the chassis. The coil positions are explained in detail above under "Coils."