

"TRADER" SERVICE SHEET

577

REVISED ISSUE OF SERVICE SHEET No. 39

THESE receivers comprise the "Jubilee" range. The Marconiphone 264 is a 4-valve (plus rectifier) 2-band table receiver. The 297 is a console, and the 287 a radiogram, employing the same chassis. The HMV 441 (table), 444 (console) and 541 (radiogram) also employ an identical chassis.

Release date, all models: 1935.

CIRCUIT DESCRIPTION

Aerial input via S2, series condenser C1 and image suppressor circuit L1, L2, C2 (MW), and via filter coil L3 (LW), to inductively coupled band-pass filter. Primary coils L4, L5 are tuned by C24; secondaries L6, L7 by C26.

First valve (V1, Marconi MX40) is a heptode operating as frequency changer with electron coupling. Oscillator grid coils L8 (MW) and L9 (LW) are tuned by C28. Parallel trimming by C29 (MW) and C30 (LW); tracking by shaped vanes of C28. Reaction by coils L10, L11.

Second valve (V2, Marconi metallised VMS4) is a variable-mu BF tetrode operating as IF amplifier with tuned-primary, tuned-secondary transformer couplings.

Intermediate frequency 125 KC/S.

Diode second detector is part of double diode triode valve (V3, Marconi metallised MHD4). Audio frequency component in rectified output is developed across load resistance R11 and passed via manual volume control R16 (which is isolated from cathode by C12), variable tone control R19, C14 and grid stopper R20 to CG of triode section, which operates as AF amplifier. IF filtering by R10, C10. Provision for connection of gramophone pick-up across R16.

MARCONIPHONE 264, 297, 287 AND HMV 441, 444, 541

Resistance-capacity coupling by R18, C16 and R23 between V3 triode and pentode output valve (V4, Marconi MPT4). Provision for connection of low impedance external speaker.

HT current is supplied by full-wave rectifying valve (V5, Marconi MU12). Smoothing by speaker field L20 (in negative HT lead) and condensers C21, C22.

AVC Circuit.—Delayed amplified AVC is employed. V3 cathode is returned via R22, R26 to the bottom of R27, R28, which is negative with respect to chassis, but as the GB for V3 triode is obtained from the DC potential developed across R11, the actual cathode potential with respect to chassis will vary according to the current flowing through R22, R26, which will vary with the signal strength, but in opposite phase.

The second diode of V3 provides a DC potential, which is developed across the load resistance R21, only when the cathode falls below chassis potential due to a strong signal, and the resulting voltage is fed back to V1 and, via S6, to V2 as AVC.

A "Quiet Tuning" static suppressor is fitted, however, to suppress signals below a predetermined strength. It is brought into action by switches S6, S7, when contacts 4, 5 and 1, 2 respectively close. The degree of suppression is pre-set by the adjustment of R6, which is included in V2 cathode circuit and biases up the valve to the required degree. AVC to V2 is then obtained from the signal diode via L16, R9.

DISMANTLING THE SET

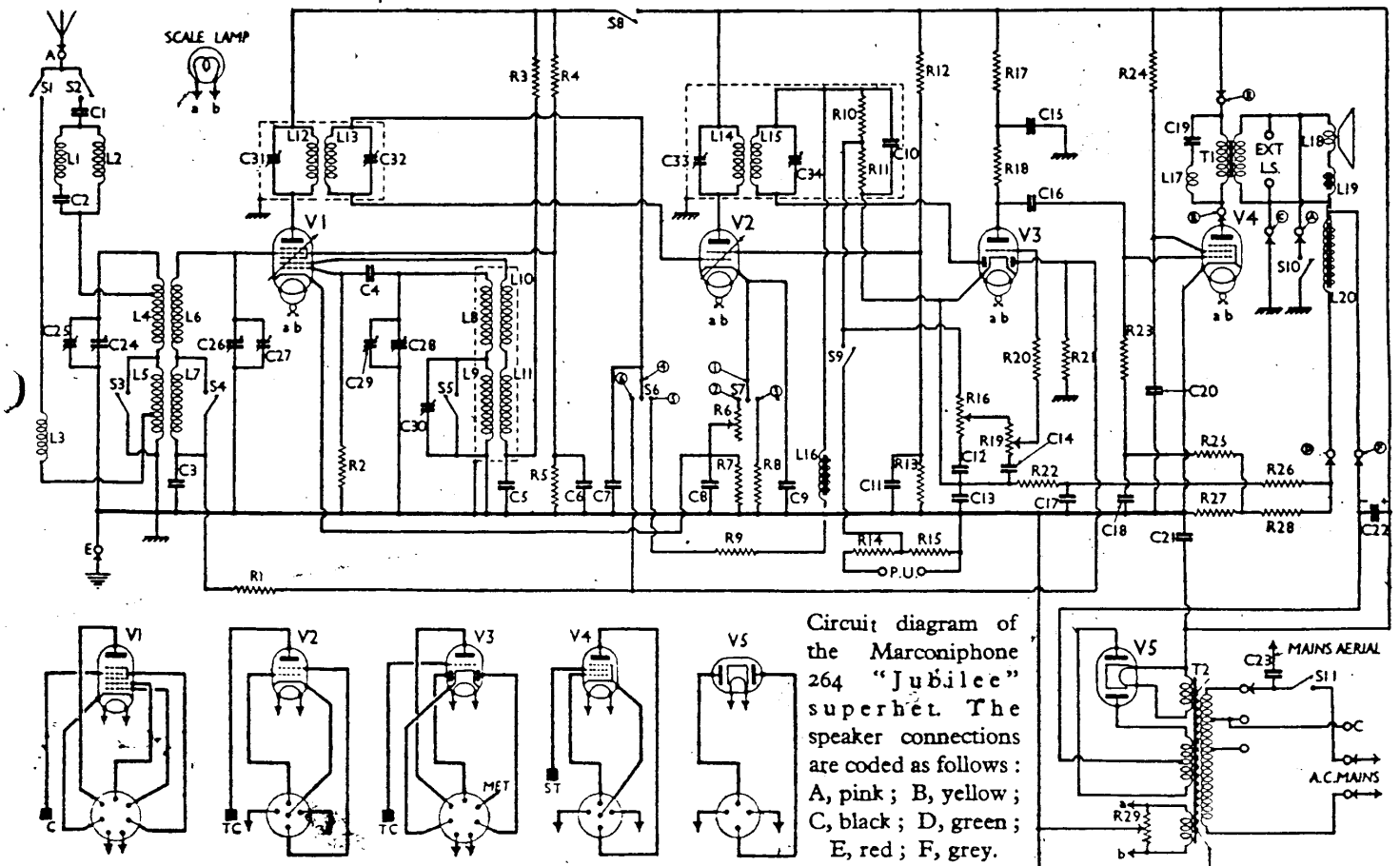
Removing Chassis.—Remove the control knobs and backing boards from cabinet; free speaker leads from clip on cabinet; remove the four hexagonal fixing screws (with spring washers and metal clips).

Chassis can now be withdrawn, but to free it entirely, disconnect the six speaker leads. When replacing, connect the leads as follows: Pink to terminal marked "LS"; green to "Tap"; red and yellow to "OP Trans. OP"; black to "LS F+"; grey to "LS F."

COMPONENTS AND VALUES

CONDENSERS		Value (μF)
C1	Aerial series condenser...	0-0005
C2	Part image suppressor	0-002
C3	V1 pent. CG decoupling	1-0
C4	V1 osc. CG condenser ...	0-0001
C5	V1 osc. anode decoupling	0-5
C6	V1 SG decoupling	1-0
C7	V2 CG decoupling	0-035
C8	V1 cathode by-pass	0-5
C9	V2 cathode by-pass	0-25
C10	IF by-pass	0-0001
C11	V2 SG decoupling	3-0
C12	Isolating condenser	0-1
C13	V3 cathode by-pass	1-0
C14	Part variable tone control	—
C15	V3 triode anode decoupling	0-0005
C16	V3 triode to V4 coupling	1-0
C17	AVC bias decoupling	2-0
C18	V4 CG decoupling	1-0
C19	Part fixed tone corrector	0-0005
C20	V4 SG decoupling	1-0
C21	HT smoothing condensers	4-0
C22		8-0
C23	Mains aerial coupling	0-00035
C24	Band-pass pri. tuning	—
C25	B-P pri. MW trimmer	0-00007
C26	Band-pass sec. tuning	—
C27	B-P sec. MW trimmer	—
C28	Oscillator circuit tuning	—
C29	Osc. circ. LW trimmer	—
C30	Osc. circ. MW trimmer	0-00014
C31	1st IF trans. pri. tuning	0-00014
C32	1st IF trans. sec. tuning	0-00014
C33	2nd IF trans. pri. tuning	0-00014
C34	2nd IF trans. sec. tuning	0-00014

* Electrolytic. † Variable. ‡ Pre-set. § In condenser block.



Circuit diagram of the Marconiphone 264 "Jubilee" superhet. The speaker connections are coded as follows: A, pink; B, yellow; C, black; D, green; E, red; F, grey.

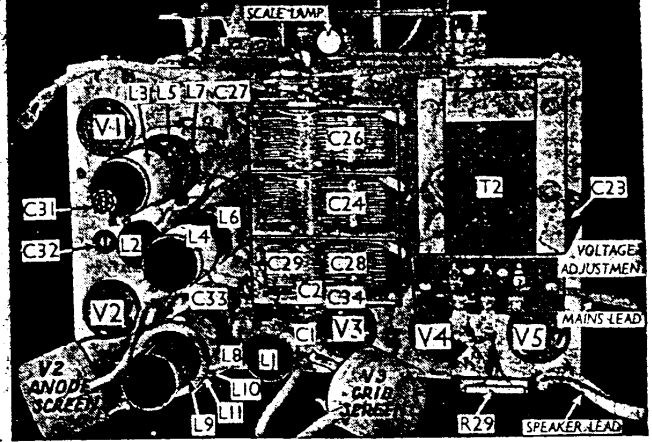
RESISTANCES		Values (ohms)
R1	V1 pent. CG decoupling ...	500,000
R2	V1 osc. CG resistance ...	50,000
R3	V1 osc. anode HT feed ...	50,000
R4	V1 SG HT feed potential divider ...	23,000
R5	Static suppressor control	14,000
R7	V1 fixed GB resistance ...	500
R8	V2 fixed GB resistance ...	100
R9	V2 CG decoupling ...	50,000
R10	IF stopper ...	50,000
R11	V3 signal diode load ...	230,000
R12	V3 SG HT feed potential divider ...	35,000
R13	Pick-up input potential divider ...	23,000
R14	Manual volume control ...	600,000
R17	V3 triode anode decoupling ...	23,000
R18	V3 triode anode load ...	50,000
R19	Variable tone control ...	500,000
R20	V3 triode grid stopper ...	230,000
R21	V3 AVC diode load ...	500,000
R22	Part V3 cathode resistance	35,000
R23	V4 CG resistance ...	230,000
R24	V4 SG HT feed ...	10,000
R25	V4 CG decoupling ...	150,000
R26	Part V3 cathode resistance	23,000
R27	V4 GB and AVC circuit bias resistances ...	250
R28	Heater circuit pot. ...	750
R29	Heater circuit pot. ...	48.5

OTHER COMPONENTS		Approx. Values (ohms)
L1	Image suppressor coils ...	0.4
L2		0.6
L3	Aerial LW filter coil ...	75.0
L4	Band-pass primary coils	2.7
L5		12.5
L6	Band-pass secondary coils	2.7
L7		12.5
L8	Osc. circ. MW tuning coil	3.25
L9	Osc. circ. LW tuning coil	7.0
L10	Oscillator reaction coils ...	3.75
L11		2.2
L12	1st IF trans. { Pri. ...	95.0
L13		Sec. ...
L14	2nd IF trans. { Pri. ...	95.0
L15		Sec. ...
L16	Q AVC circuit choke ...	3,000.0
L17	Fixed tone corrector choke ...	400.0
L18	Speaker speech coil ...	8.0
L19	Hum neutralising coil ...	2.4
L20	Speaker field coil ...	2,000.0
T1	Speaker input { Pri. ...	750.0
	trans. { Sec. ...	2.0
	trans. { Heater sec. ...	20.0
	trans. { Rect. heat. sec. ...	0.1
	trans. { HT sec., total ...	0.15
T2	Mains switch ...	400.0
S1-S5	Waveband switches ...	—
S6, S7	Static suppressor switches ...	—
S8	Radio muting switch ...	—
S9	Gram pick-up switch ...	—
S10	Speaker muting switch ...	—
S11	Mains switch ...	—

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 2) are those to be expected in an

Plan view of the chassis. The screw-on screening can has been removed from the oscillator coil unit L8-L11 to expose the coils. L1, L2 are the image suppressor coils, L2 being the adjustable coil.



average receiver when the "Q" switch is depressed, the volume control is at maximum, and there is no signal input. Voltages were measured with a high resistance voltmeter, whose negative lead was connected to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MX40	{ 220 120	{ 3.3 1.5	80	1.9
V2 VMS4	220	3.0	75	1.7
V3 MHD4	100	1.5	—	—
V4 MPT4	215	25.0	170	5.5
V5 MU12	340†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, S8, S9 the pick-up and radio muting switches, and S10 the speaker muting switch, in a single rotary leaf-spring unit beneath the chassis, indicated in our under-chassis view where the switches are identified. S10 is open in all settings, and closes only while the control is being operated. The remaining switch positions are given in the table below. A dash indicates open, and C, closed.

Switch Table

Switch	MW	LW	Gram
S1	—	o	—
S2	o	—	—
S3	o	—	—
S4	o	—	—
S5	o	—	—
S8	—	—	—
S9	—	—	—

S6, S7 are the QAVC switches, whose contacts are numbered 1-6 in the diagram and the under-chassis view. They are operated by a push-pull action of the volume control knob. In the normal position (knob depressed), contacts 4, 6 and 1, 3 are closed; in the "quiet"

position (knob out), contacts 4, 5 and 1, 2 are closed.

Condenser Block.—Eleven fixed condensers are contained in a single unit beneath the chassis. Its position is indicated in our under-chassis view by a black outline, but the unit cannot be seen as it is hidden by a large assembly of resistances. The diagram below shows the internal connections.

Scale Lamp.—This is an Osram MES type, rated at 6.2v. 0.3a.

External Speaker.—Two terminals marked "EXT" and "LS" are provided on the speaker assembly for the connection of a low impedance (6-12 O) external speaker.

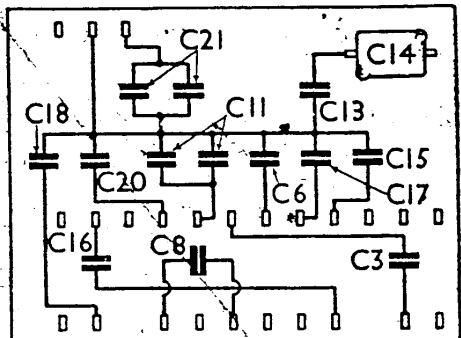


Diagram of the condenser block, as seen from the rear of the underside of the chassis.

CIRCUIT ALIGNMENT

Connect one signal generator lead to chassis, and couple the other by twisting an insulated lead round V1 top cap, and turn the volume control to maximum. Feed in a 125 KC/S (2,400 m) signal, and adjust C33, C34 and C31, C32, in that order, for maximum output. Repeat the adjustments in the following order: C31, C32, C33, C34.

RF and Oscillator Stages.—Connect signal generator via a suitable dummy aerial to A and E sockets. With the gang set so that the bottom edge of the vanes is 3/8 in. from the frame, the pointer should register with the 200 m mark on the scale.

MW.—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust C29 for maximum output, selecting the peak involving the lesser trimmer capacity if two peaks are found. Feed in a 250 m (1,200 KC/S) signal, tune it in, and adjust C27 for maximum output, while rocking the gang for optimum results. Now adjust C25 for maximum output.

LW.—Switch set to LW, tune to 1,000 m on scale, feed in a 1,000 m (300 KC/S) signal, and check setting on scale. Now tune in the signal accurately, and adjust C30 for maximum output while rocking the gang for optimum results.

Image Suppressor.—If an image of a strong local station is evident, it will be found at a frequency 250 KC/S (twice the IF) below that of the offending transmitter. That of a 342 m signal would be 877-250 KC/S or 627 KC/S, which = 480 m.

To adjust the suppressor, feed in a strong signal of the transmitter's frequency, and tune in the image. Slacken L2 bracket fixing screws, and adjust the position of the coil until the image is at minimum, and tighten the screws.

Under-chassis view. The switches are individually indicated here. The black line enclosing the resistance assembly on the left indicates the position of the condenser block. The diagram (col. 3) shows the connections of the block when viewed from the same direction.

