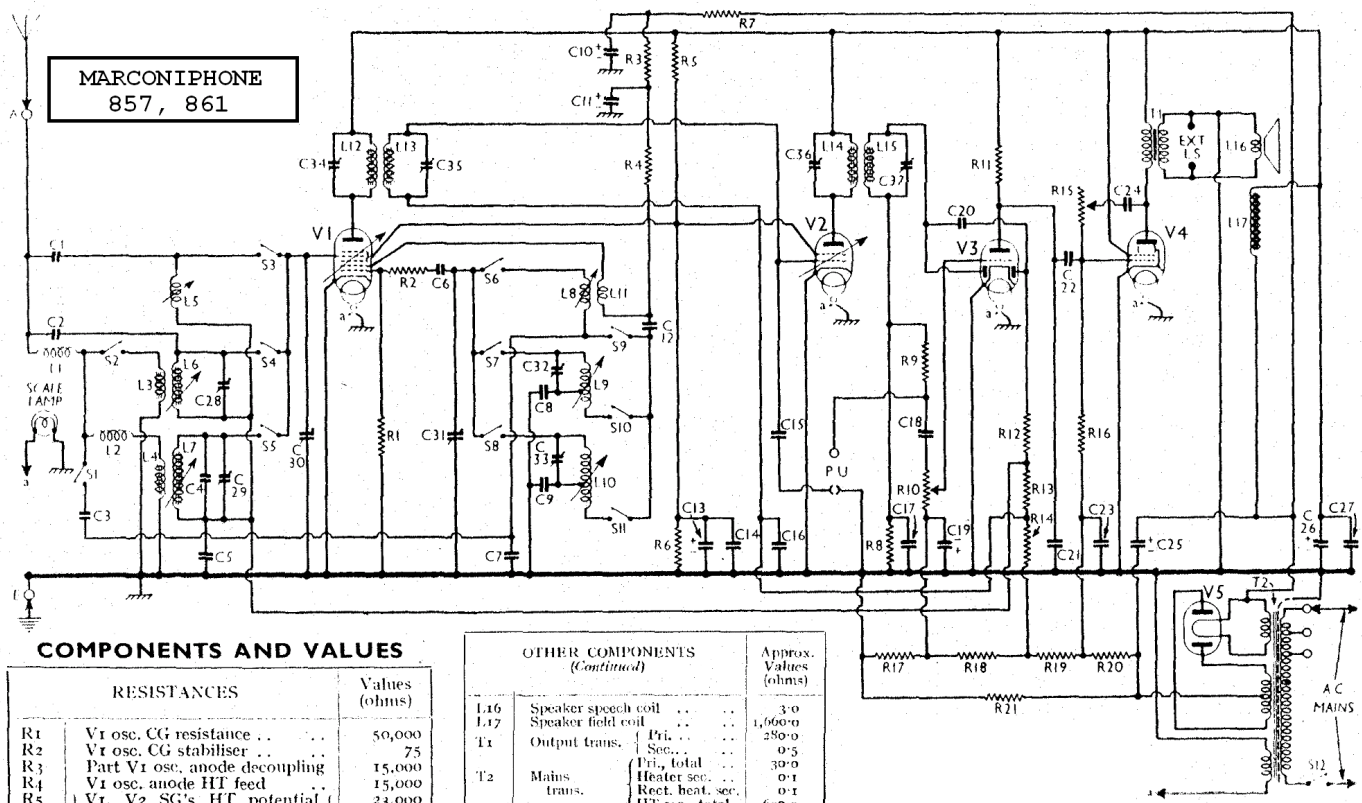


COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 osc. CG resistance	50,000
R2	V1 osc. CG stabiliser	75
R3	Part V1 osc. anode decoupling	15,000
R4	V1 osc. anode HT feed ..	15,000
R5, R6	V1, V2 SG's HT potential divider resistances ..	23,000
R7	Part V1 osc. anode decoupling	5,000
R8	V3 signal diode load	500,000
R9	IF stopper	230,000
R10	Manual volume control ..	2,000,000
R11	V3 triode anode load	75,000
R12, R13, R14	V3 AVC diode load resistances	1,000,000 500,000 2,300,000
R15	Variable tone control ..	2,000,000
R16	V4 CG resistance	230,000
R17, R18, R19, R20	Automatic bias potential divider for V1, V2 fixed GB; V3 triode, V4 GB; AVC delay	100,000 100,000 1,000,000 100,000
R21		270

	CONDENSERS	Values (μF)
C1	Aerial circuit SW coupling ..	0·000015
C2, C3	Image rejector condensers	0·000002 0·00005
C4	Aerial LW fixed trimmer ..	0·00005
C5	V1 tetrode CG decoupling ..	0·05
C6	V1 osc. CG condenser ..	0·00005
C7	Osc. circuit SW tracker ..	0·005
C8	Osc. circuit MW tracker ..	0·00055
C9	Osc. circuit LW tracker ..	0·0003
C10*, C11*	V1 osc. anode decoupling	4·0 4·0
C12	V1 osc. anode coupling ..	0·005
C13*	V1, V2 SG's decoupling ..	4·0
C14	V1, V2 SG's RF by-pass ..	0·05
C15	Radio muting condenser ..	0·0001
C16	V2 CG decoupling	0·05
C17	IF by-pass	0·0001
C18	AF coupling to V3 triode ..	0·001
C19*	V3 triode CG decoupling ..	50·0
C20	Coupling to V3 AVC diode ..	0·000075
C21	IF by-pass	0·00035
C22	V3 triode to V4 AF coupling	0·023
C23	V4 CG decoupling	0·23
C24	Part of variable tone control	0·001
C25*, C26*	HT smoothing ..	16·0 8·0
C27	HT circuit RF by-pass ..	0·1
C28‡	Aerial circuit MW trimmer	—
C29‡	Aerial circuit LW trimmer ..	—
C30†	Aerial circuit tuning ..	—
C31†	Oscillator circuit tuning ..	—
C32‡	Osc. circuit MW trimmer ..	—
C33‡	Osc. circuit LW trimmer ..	—
C34‡	1st IF trans. pri. tuning ..	—
C35‡	1st IF trans. sec. tuning ..	—
C36‡	2nd IF trans. pri. tuning ..	—
C37‡	2nd IF trans. sec. tuning ..	—

* Electrolytic. † Variable. ‡ Pre-set

	OTHER COMPONENTS	Approx. Values (ohms)
L1, L2	Parts of IF and image rejector circuit	9·5 33·0
L3	Aerial MW coupling coil ..	0·4
L4	Aerial LW coupling coil ..	1·6
L5	Aerial SW tuning coil.. ..	Very low
L6	Aerial MW tuning coil ..	2·0
L7	Aerial LW tuning coil ..	9·0
L8	Osc. circuit SW tuning coil ..	Very low
L9	Osc. circuit MW coil, total ..	2·8
L10	Osc. circuit LW coil, total ..	3·6
L11	Oscillator SW reaction ..	1·2
L12	1st IF trans. Pri... ..	4·5
L13	1st IF trans. Sec... ..	4·5
L14	2nd IF trans. Pri... ..	4·5
L15	2nd IF trans. Sec... ..	4·5

	OTHER COMPONENTS (*Continued*)	Approx. Values (ohms)
L16	Speaker speech coil	3·0
L17	Speaker field coil	1,660·0
T1	Output trans. Pri.	280·0
	Output trans. Sec... ..	0·5
T2	Mains trans. Pri., total ..	30·0
	Mains trans. Heater sec. ..	0·1
	Mains trans. Rect. heat. sec.	0·1
	Mains trans. HT sec., total	600·0
S1-S11	Waveband switches	—
S12	Mains switch, ganged R10 ..	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 228 V, using the 224-255 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X63	238 (Oscillator)	1·9	76	2·8
	185	4·0		
V2 KTW63	238	5·3	76	1·0
V3 DH63	120	1·2	—	—
V4 KT63	227	34·0	238	5·3
V5 U50	335†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S11 are the waveband switches, in a single rotary unit beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagram on page VIII. The table (p. VIII) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

S12 is the QMB mains switch, ganged with the volume control **R10.**

Coils.—L1, L2; L3, L6; L4, L7; L5; L8, L11; L9; and **L10** are in seven unscreened units beneath the chassis. **L3, L6** and **L4, L7** are iron-cored, the cores of **L6** and **L7** being adjustable. The inductances of **L5** and **L8** are adjustable by wire loops inside the coil formers. **L9** and **L10** are also adjustable in inductance by metal "spade" trimmers, whose positions are varied by means of screw adjusters, indicated in our under-chassis view.

L12, L13 and **L14, L15** are the IF transformers, in two screened units on the chassis deck, with their associated trimmers.

Scale Lamp.—This is an Osram MES type, rated at 6·5 V, 0·3 A, and fitted with a frosted bulb.

RADIOGRAM MODIFICATIONS

The radiogram model 861 employs a similar circuit, but with the following modifications. A radio-gram switch is fitted, which really consists of three single pole shorting switches. One section of the switch is fitted between the screens of **V1** and **V2** and the junction of **R5, R6,** and this switch closes on radio and opens on gram., thus muting radio. **C15** and the split pick-up socket is therefore not used.

The top of **R10** is disconnected from **C18** and another section of the switch inserted between them, while the top of **R10** also goes to the third section of the switch, the other side of which goes, via a 0·005 μF condenser, to one of the pick-up sockets. On radio, **C18** and **R10** are joined, as in our diagram, while on gram. **C18** is disconnected, and the pick-up, via the extra condenser, is connected to the top of **R10.**

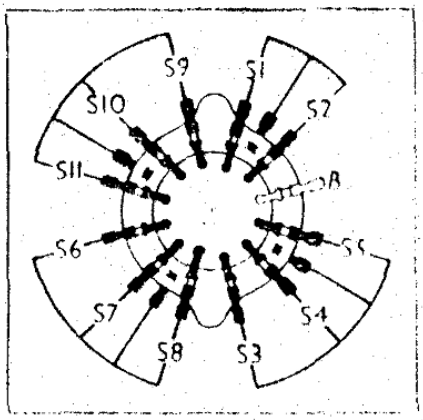
There are three pick-up sockets altogether, that mentioned above, and two which go to chassis. One of these is for earthing the pick-up casing. Across the pick-up are connected a 0·015 μF condenser and 10,000 Ω resistance in parallel. The pick-up has a DC resistance of 850 Ω.

The radiogram model includes external speaker sockets, and a plug and socket arrangement for muting the internal speaker. An induction motor working on the hysteresis principle is fitted. The speaker is different from that of the table model, and has a speech coil resistance of 4 Ω.

TABLE AND DIAGRAM

Switch	SW	MW	LW
S1	—	—	C
S2		C	
S3	C		
S4		C	
S5			C
S6	C		
S7		C	
S8			C
S9	C		
S10		C	
S11	—	—	C

Switch diagram, looking from the rear of the underside of the chassis.



CIRCUIT ALIGNMENT

IF Stages.—Switch set to LW, turn gang to maximum, volume control to maximum and tone control fully anti-clockwise. Connect signal generator via a 0·1 μF condenser to fixed vane tag of **C30** and chassis, leaving top cap connection of **V1** in place. Feed in a 465 KC/S signal, and adjust **C34, C35, C36** and **C37** in that order for maximum output. Check these adjustments.

RF and Oscillator Stages.—The scale must be positioned so that the pointer spindle hole is exactly concentric with the spindle, and the scale is square in its frame. With gang at maximum, pointer must coincide exactly with the small black spot at the top right-hand corner of the scale.

Turn volume control to maximum, and tone control fully anti-clockwise, and connect signal generator to **A** and **E** sockets.

MW.—Switch set to MW, and tune to 225 m on scale (black spot). Feed in a 225 m (1,333 KC/S) signal and adjust **C32** for maximum output. Tune to 530 m on scale (black spot) and feed in a 530 m (566 KC/S) signal. Adjust inductance ("spade" trimmer) of **L9** (screw on paxolin coil mounting strip) for maximum output. Repeat these operations until no further improvement results. Return to 225 m, and adjust **C28** for maximum output.

Return to 530 m, and rotate upper core of **L6** for maximum output. This is reached through a hole in the chassis deck by means of a special tool (EMI Service, Part No. 20730A) which consists of a pointed rod of insulating material with a rubber bush. It should be inserted through the hole in the chassis, the point located in the hole in the paxolin coil mounting strip, and the rubber bush bearing on the core. The core may now be rotated by turning the tool.

Repeat the adjustments of **C28** and **L6**.

LW.—Switch set to LW, tune to 1,100 m on scale, and feed in a 1,100 m (272·7 KC/S) signal. Adjust **C33** for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (158 KC/S) signal, and adjust inductance ("spade" trimmer) of **L10** (screw on paxolin coil mounting strip) for maximum output. Repeat these adjustments.

Return to 1,100 m and adjust **C29** for maximum output. Return to 1,900 m and adjust hexagonal-headed screw core of **L7** (through hole in chassis deck) for maximum output. Re-adjust **C29** at 1,100 m, then tune to 1,400 m on scale, feed in a 1,400 m (214 KC/S) signal, and re-adjust **C29** if necessary.

SW.—Switch set to SW, tune to 50 m on scale, feed in a 50 m (6 MC/S) signal and adjust loop of **L8** (inside its coil former) for maximum output. This can be reached through a hole in the shield. A strip of insulating material with a slot in it should be used to move the wire up or down. Then adjust loop of **L5** (through hole in chassis deck) for maximum output in the same way.

Do not alter the position of the pointer, after ganging, or rock the gang while aligning.