

"TRADER" SERVICE SHEET

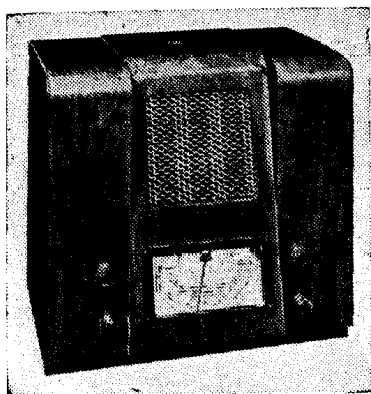
732

REVISED ISSUE OF
SERVICE SHEET No. 334

MARCONIPHONE

857, 857T, 861, 873

HMV 653, 653C, 663, 670, 1101



The appearance of the Marconiphone 857.

A SHORT-WAVE range of 13.5-50 m is covered in the Marconiphone 857. The receiver is a 4-valve (plus rectifier) 3-band superhet designed to operate from AC mains supplies of 195-255 V, 50-100 c/s.

The HMV653 employs an identical chassis, as does also the HMV670 console. The Marconiphone 857T and HMV653C employ the same kind of chassis, but the SW range in these models is modified to 67-200 m, to cover the trawler band.

The Marconiphone 873 and HMV 1101 are table models employing a slightly modified 857 chassis, as explained overleaf.

The Marconiphone 861 and HMV 663 are two radiograms using a modified version of the 857 chassis. The modifications, which are mainly concerned with pick-up switching, are explained overleaf. The radiograms are suitable only for 50 c/s mains.

Release dates and original prices, Marconiphone: 857, March, 1938, £11 0s. 6d.; 857T, August, 1938, £11 11s.; 873, January, 1939, £11 0s. 6d.; 861, May, 1938, £19 19s.

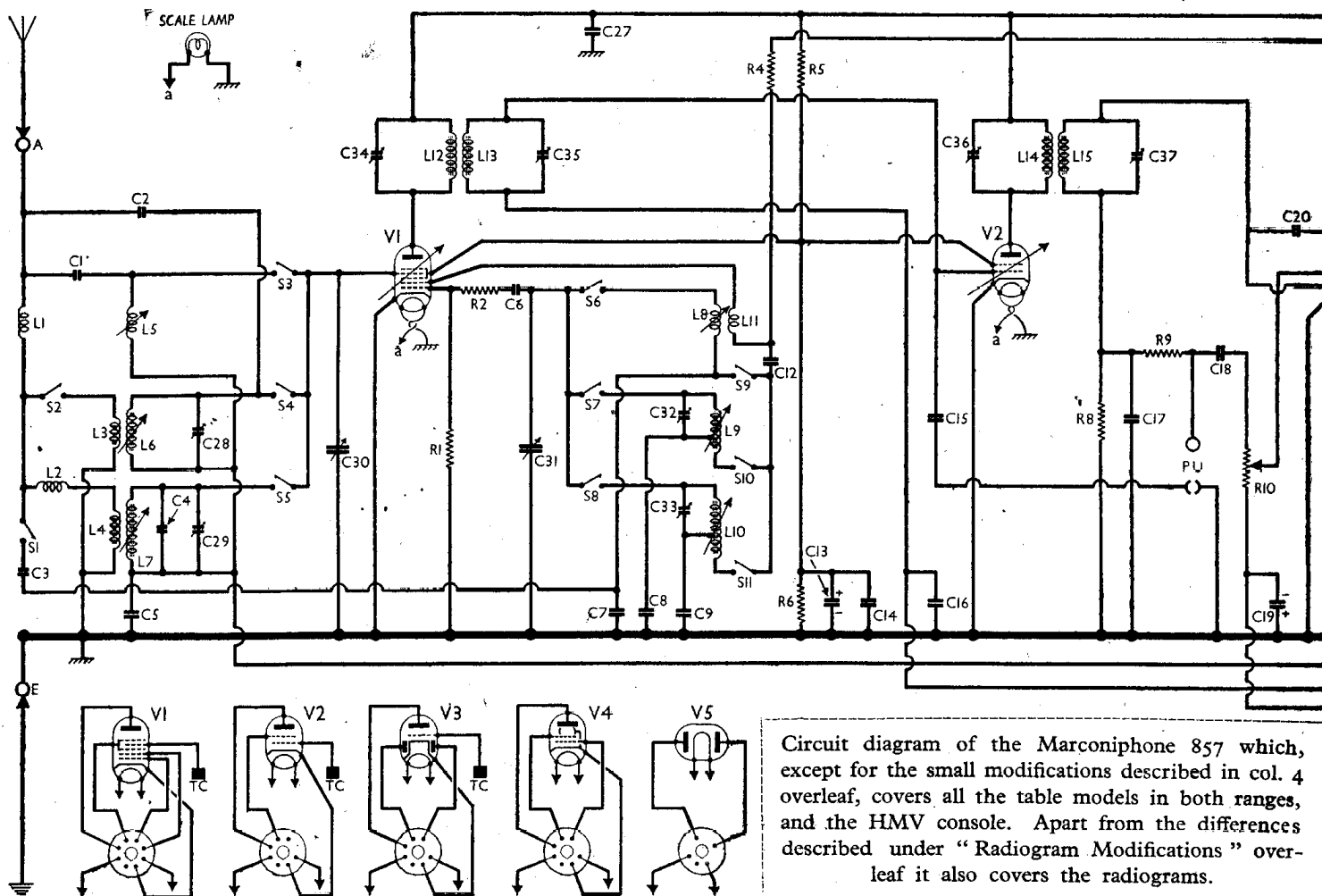
HMV: 653, March, 1938, £11 0s. 6d.; 653C, August, 1938, £11 11s.; 1101, January, 1939, £11 0s. 6d.; 670, September, 1938, £15 15s.; 663, May, 1938, £19 19s.

CIRCUIT DESCRIPTION

Aerial input on MW and LW is via IF and image rejector and aerial matching circuits and high impedance coupling coils L3, L4 to single-tuned circuits L6, C30 (MW) and L7, C30 (LW). L1, C2, C3 and S1 are associated with the image rejector.

On SW, input is via small series coupling capacitor C1 to single-tuned circuit L5, C30.

First valve (V1, Marconi X63) is a



Circuit diagram of the Marconiphone 857 which, except for the small modifications described in col. 4 overleaf, covers all the table models in both ranges, and the HMV console. Apart from the differences described under "Radiogram Modifications" overleaf it also covers the radiograms.

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.

COMPONENTS AND VALUES

CAPACITORS		Values (μF)
C1	Aerial circuit SW coupling	0-000015
C2	Image rejector capacitors	0-0000023
C3		0-00005
C4	Aerial LW fixed trimmer	0-00005
C5	V1 tetrode CG decoupling	0-05
C6	V1 osc. CG capacitor	0-00005
C7	Osc. circuit SW tracker	0-005
C8	Osc. circuit MW tracker	0-00055
C9	Osc. circuit LW tracker	0-0003
C10*	V1 osc. anode HT smoothing capacitors	4-0
C11*		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 shunt	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	AF coupling to V4	0-023
C23	V4 CG decoupling	0-23
C24	Part variable tone control	0-001
C25*	HT smoothing capacitors	16-0
C26*		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.

RESISTORS		Values (ohms)
R1	V1 osc. CG resistor	50,000
R2	V1 osc. CG stabiliser	75
R3	V1 osc. anode smoothing	15,000
R4	V1 osc. anode HT feed	15,000
R5	V1, V2 SG's HT potential divider resistors	23,000
R6		23,000
R7	V1 osc. anode smoothing	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	V3 AVC diode load	1,000,000
R13		500,000
R14	Variable tone control	2,300,000
R15		2,000,000
R16	V4 CG resistor	230,000
R17	Automatic GB and AVC delay potential divider	100,000
R18		100,000
R19		1,000,000
R20		100,000
R21		270

OTHER COMPONENTS		Approx. Values (ohms)
L1	Parts of IF and image rejector circuit	9-5
L2		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. SW tuning coil	Very low
L9	Osc. MW tuning coil, total	2-8
L10	Osc. LW tuning coil, total	3-6
L11	Oscillator SW reaction	1-2
L12	1st IF trans.	Pri. ... 4-5
L13		Sec. ... 4-5
L14	2nd IF trans.	Pri. ... 4-5
L15		Sec. ... 4-5
L16	Speaker speech coil	3-0
L17	Speaker field coil	1,660-0
T1	Output trans.	Pri. ... 280-0
		Sec. ... 0-5
T2	Mains trans.	Pri., total ... 30-0
		Heater sec. ... 0-1
		Rect. heat. sec. ... 0-1
	HT sec., total	690-0
S1-S11	Waveband switches	—
S12	Mains switch, ganged R10	—

DISMANTLING THE SET

Removing Chassis.—Remove the tuning control knob (recessed grub screw) and the three remaining knobs (recessed self-tapping screws); remove the four bolts (with flat washers and spring washers) holding the chassis to the bottom of the cabinet; free the speaker leads from the cleat on the sub-baffle.

The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes, but before access can be gained to the coil and switch compartment beneath the chassis it will be necessary to remove the screening plate (three round-head self-tapping screws).

To free chassis entirely, unsolder from the connecting panel on the speaker the leads connecting it to chassis.

When replacing, connect the speaker leads as follows, using the numbers marked on the connecting panel: 1 and 2 (joined together), black; 3, no external connection; 4, yellow; 6, red/black; 7, red.

See that there is a metal washer on each of the chassis fixing bolts, between the chassis and the bottom of the cabinet. The cap for the valve screen goes on V1.

Removing Speaker.—Unsolder the leads and remove the nuts (with washers) from the three bolts holding the speaker to the sub-baffle.

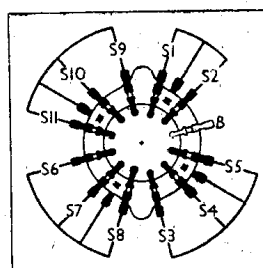


Diagram of the waveband switch unit as seen from the rear of the underside of the chassis.

When replacing, tags 1 and 4 should be at the top, and the leads should be connected as previously indicated.

GENERAL NOTES

Switches.—S1-S11 are the waveband switches, ganged together in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and is shown in detail in the diagram in col. 2, where it is drawn as seen when viewed from the rear of the underside of the chassis, as indicated by the arrow in our under-chassis illustration.

The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control and turning 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 un-screened 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. The coils of these units are iron-cored, but tuning adjustments are effected by pre-set capacitor trimmers which are contained within the cans.

Scale Lamp.—This is an Osram MES type, rated at 6.5 V, 0.3 A, and fitted with a frosted bulb.

External Speaker.—No sockets are provided for this, but a low impedance (5 Ω) type can be connected to tags 1 and 5 on the internal speaker panel.

Internal Speaker.—It will be noted that our diagram shows no hum neutralising coil in series with L16 and T1 secondary. Actually, the speaker in our receiver was fitted with such a coil, connected to tags 3 and 4, but it was short-circuited by a wire between these two tags, and hence is not shown in the diagram. It is understood that in later models the coil is omitted entirely.

Pick-up.—Sockets are provided for this, a Marconi model 25 being recommended. It should have a 7,500 Ω resistor wired in parallel with it.

Note that the lower pick-up socket is split, and when the plug is inserted C15

Switch Table

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

is connected to chassis, and so mutes radio. To revert to radio reception, both pick-up plugs should be removed.

Capacitor Block.—This is in a rectangular metal case, on the chassis deck, with the connecting leads emerging beneath the chassis. It includes the dry electrolytic capacitors **C10**, **C11**, **C13**, **C25** and **C26**. The coding of the leads is: Brown, negative of **C25** (16 μF); red, positive of **C25**; black, negative of all the other capacitors; yellow, positive of **C26** (8 μF); blue, positive of **C13** (4 μF); green lead to junction of **R3**, **R7**, positive of **C10** (4 μF); green lead to junction of **R3**, **R4**, positive of **C11** (4 μF). The unit is a Dubilier type 3231.

Capacitor C19.—Note that the positive of this electrolytic goes to chassis.

Bearer Tag.—One end of **R9** is connected to an insulated bearer tag, which looks like a small moulded condenser, but is not one.

873 and 1101 MODIFICATIONS

The Marconiphone 873 and HMV 1101 are, except for the speaker arrangements, electrically similar to the Marconiphone 857 on which this *Service Sheet* is based, although the cabinets are different.

The 873 and 1101 chassis are fitted with two external speaker sockets and a third socket which, in association with a plug on a flying lead, acts as an internal speaker muting switch, breaking the internal speaker speech coil circuit when the plug is withdrawn from its socket.

The external speaker sockets are connected to either end of **T1** secondary winding, and the internal speaker muting socket is connected to the "upper" or unearthened external speaker socket. The flexible lead from the muting plug goes to the speech coil of the internal speaker.

RADIOGRAM MODIFICATIONS

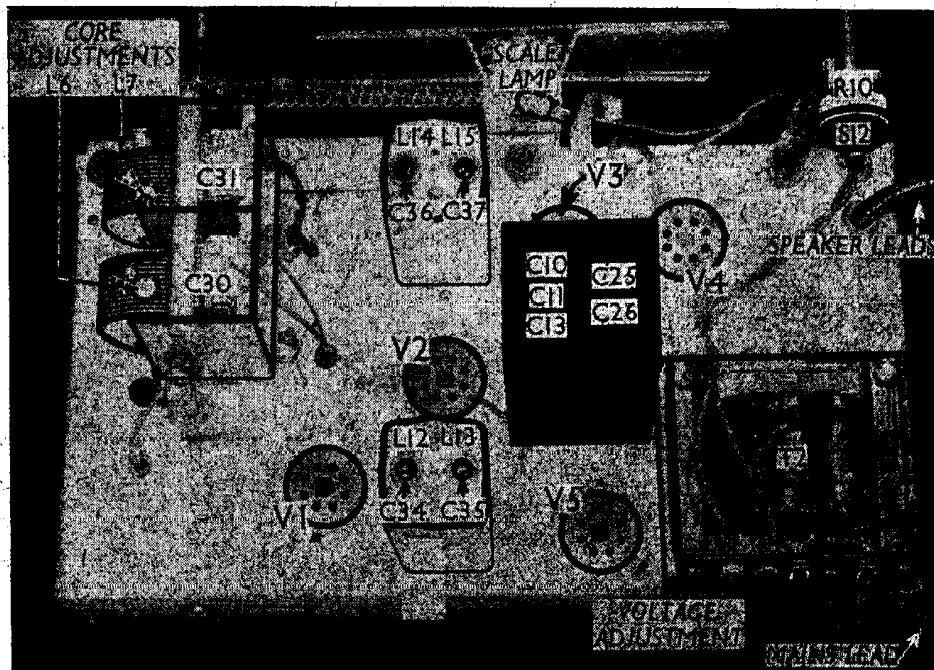
The Marconiphone 861 and HMV 663 radiograms employ a chassis which is basically the same as that in the table models, but the pick-up input circuit is modified by the inclusion of a change-over switch, which consists really of three single-pole shorting switches.

One section of the switch is fitted between the screens of **V1** and **V2** and the junction of **R5**, **R6**. This switch closes on radio, but opens on gram to mute 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 capacitor, 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 0.005 μF capacitor, 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 capacitor and 10,000 Ω resistor in parallel. The pick-up has a DC resistance of 850 Ω .

The radiogram model includes external



Plan view of the chassis. Holes are provided in the deck beside the gang to give access to the core adjustments of **L6** and **L7**. The coding of the leads from the capacitor block is given under "General Notes."

speaker sockets, and a plug and socket arrangement for muting the internal speaker. An induction motor working on the hysteresis principle is fitted, and this limits the mains supply frequency for which the receiver is suitable to 50 c/s only. The speaker is different from that of the table model, and has a speech coil resistance of 4 Ω .

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 capacitor 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 **C82** 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** until no further improvement results.

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. Readjust **C28** at 1,100 m, then tune to 1,400 m on scale, feed in a 1,400 m (214 kc/s) signal, and readjust **C28** 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 **L3** (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 chassis while aligning.