

"TRADER" SERVICE SHEET

650

MARCONIPHONE 234, 257
AND HMV 146, 147

REVISED ISSUE OF
SERVICE SHEET No. 143

A QUIESCENT push-pull output valve is employed in the Marconiphone 234, a 4-valve, 2-band battery superhet.

Excepting mechanical differences, the chassis of the Marconiphone 257 is similar to that of the 234.

The HMV 147 is an equivalent of the Marconiphone 234, while the HMV 146 is an equivalent of the Marconiphone 257.

Release dates and original prices: Marconiphone: 234, 1936, £12 1s. 6d.; 257, 1934, £11 11s. (increased 1935 to £12 12s.); HMV: 147, 1936, £12 1s. 6d.; 146, 1935, £12 12s.

CIRCUIT DESCRIPTION

Two alternative aerial connections (A2 via fixed series condenser C1) to coupling coil L2. Series resistor R1 works in conjunction with switch S1 to give local-distant sensitivity control. Tuned filter L1, C15 across aerial-earth circuit, forms an acceptor trap designed to by-pass interference of similar wavelength to the intermediate frequency. Image suppression by small pre-set condenser C16.

Single tuned circuit L3, L4, C17 precedes first valve, a heptode (V1, Marconi metallised X21) operating as frequency changer with electron coupling. Oscillator grid coils L5, L6 tuned by C19; tracking by shaped plates and condenser C4 (LW); anode reaction coils L7, L8.

Second valve, a variable-mu RF tetrode (V2, Marconi metallised VS24) operates as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings C22, L9, L10, C23 and C25,

L11, L12, C26. Pre-set condenser C24 and small coupling X enable a degree of IF reaction to be applied.

Intermediate frequency 456 kc/s.

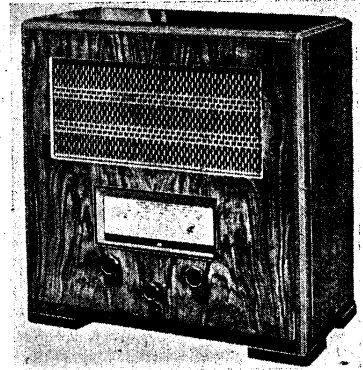
Diode second detector is part of a double diode triode valve (V3, Marconi metallised HD21). Audio-frequency component in rectified output is developed across manual volume control R5 and passed via coupling condenser C8 and IF filter R7, C10 to CG of triode section which operates as AF amplifier. Provision for connection of gramophone pick-up across volume control by switch S5. On gramophone, switch S6 breaks V1 and V2 SG's HT feed circuit, thus muting radio.

Second diode of V3, fed from tapping on primary of second IF transformer, provides DC potential which is developed across R10 and fed back through decoupling circuit as GB to FC and IF valves, giving automatic volume control.

Parallel-fed transformer coupling by R9, C12 and T1 to quiescent push-pull output stage comprising a double pentode valve (V4, Marconi QP21). Resistor R11 prevents parasitic oscillations. Tone correction by fixed condenser C14. Provision for connection of low-impedance external speaker across secondary of internal speaker transformer T2.

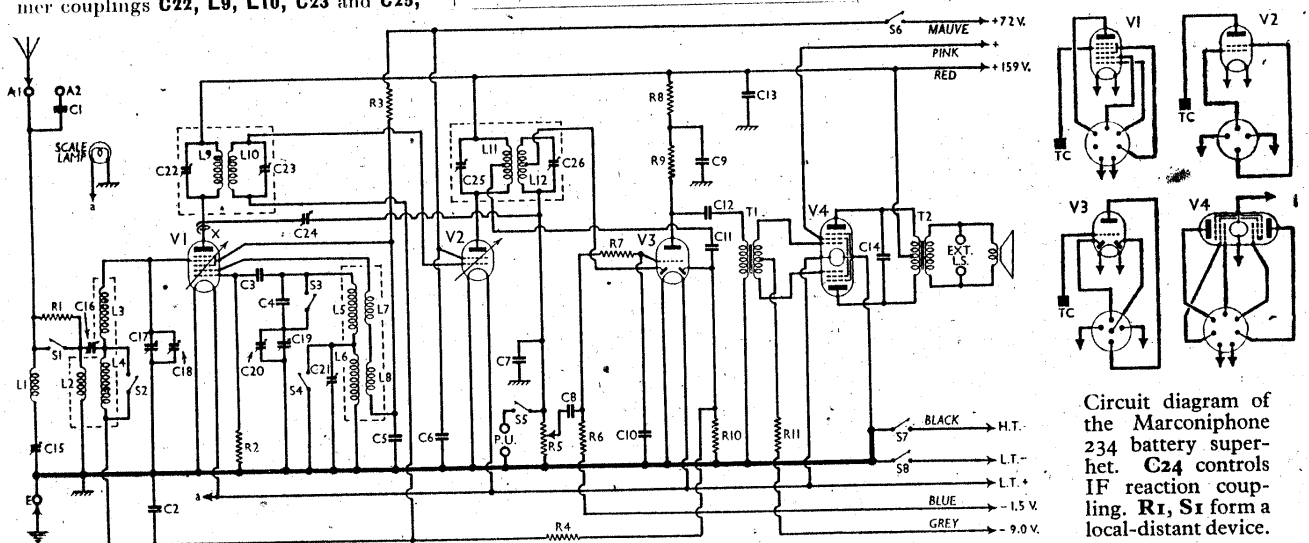
COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	Aerial series resistor	75,000
R2	V1 osc. CG resistor	50,000
R3	V1 HT feed	23,000
R4	AVC line decoupling	500,000
R5	Manual volume control	500,000
R6	V3 triode CG resistor	1,000,000
R7	IF stopper	23,000
R8	V3 triode anode decoupling	7,500
R9	V3 triode anode load	50,000
R10	V3 AVC diode load	500,000
R11	V4 CG's circuit stabiliser	230,000



The Marconiphone 234 receiver

CONDENSERS		Values (µF)
C1	Aerial series condenser	0.0005
C2	AVC line decoupling	0.1
C3	V1 osc. CG condenser	0.00023
C4	Osc. LW tracker	0.0005
C5	V1 HT decoupling	0.1
C6	V2 SG decoupling	0.1
C7	IF by-pass	0.00023
C8	Coupling to V3 triode	0.1
C9	V3 triode anode decoupling	2.0
C10	IF by-pass	0.0001
C11	Coupling to V3 AVC diode	0.00023
C12	AF coupling to T1	0.1
C13	HT circuit RF by-pass	0.1
C14	Tone corrector	0.001
C15†	IF filter tuning	—
C16‡	Image suppressor	—
C17†	Aerial circuit tuning	—
C18†	Aerial circuit trimmer	—
C19†	Oscillator tuning	—
C20†	Oscillator LW trimmer	—
C21†	Oscillator LW trimmer	—
C22†	1st IF trans. pri. tuning	—
C23†	1st IF trans. sec. tuning	—
C24†	IF reaction control	—
C25†	2nd IF trans. pri. tuning	—
C26†	2nd IF trans. sec. tuning	—



Circuit diagram of the Marconiphone 234 battery superhet. C24 controls IF reaction coupling. R1, S1 form a local-distant device.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial IF filter coil ...	47-0
L2	Aerial coupling coil ...	11-5
L3	Aerial tuning coils ...	3-2
L4		18-0
L5	Oscillator tuning coils ...	1-5
L7		3-5
L8	Osc. reaction coils, total...	5-5
L9	1st IF trans. { Pri. ...	4-0
L10		Sec. ... 4-0
L11	2nd IF trans. { Pri. ...	4-0
L12		Sec. ... 4-0
L13	Speaker speech coil ...	4-0
T1	Intervalve { Pri. ...	425-0
	trans. { Sec. total ...	7,500-0
T2	Speaker input { Pri. total ...	800-0
	trans. { Sec. ...	0-8
S1	Local-distant switch ...	—
S2-S4	Waveband switches ...	—
S5	Gram. pick-up switch ...	—
S6	Radio muting switch ...	—
S7	HT circuit switch ...	—
S8	LT circuit switch ...	—
X	IF reaction coupling ...	—

VALVE ANALYSIS

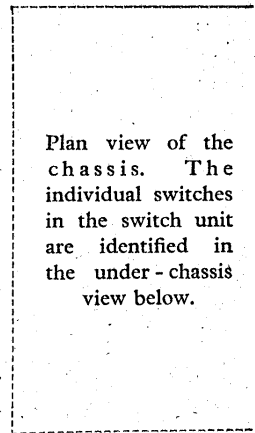
Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new battery reading 175 V. The volume control was at maximum, as was the sensitivity control also, and the receiver was tuned to the lowest wavelength on the medium band. There was no signal input. Voltages were measured on the 1,200 V scale of an Avometer.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X21	{ 165 Oscillator } { 30 0-6 }	0-1	30	0-7
V2 VS24	170	2-8	60	0-9
V3 HD21	88	1-4	—	—
V4 QP21	165†	0-9†	140	0-6

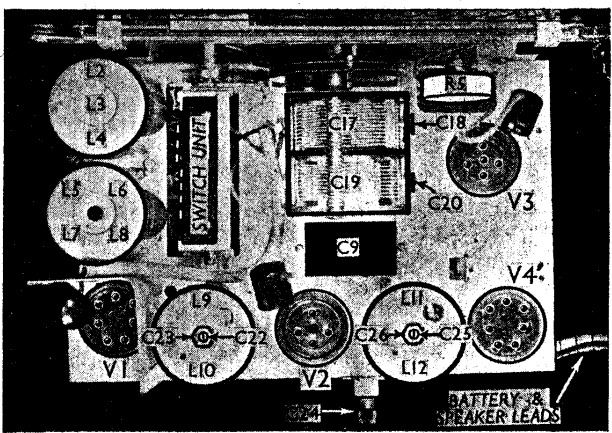
† Each anode.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws) and the switch escutcheon; remove two screws (if fitted) passing through the shelf to hold the scale assembly, and free the leads from their cleat;



Plan view of the chassis. The individual switches in the switch unit are identified in the under-chassis view below.



remove the four bolts (with washers and lock-washers) holding chassis to bottom of cabinet. If the chassis is now tilted up at the rear, it may be withdrawn, left-hand end first, so that the tuning scale clears the bracket bolt at rear of speaker, to the extent of the speaker leads, which is sufficient for normal purposes. To free chassis entirely, free accumulator leads from their cleat at top of cabinet, and speaker leads from one on the sub-baffle; disconnect from screw terminals on speaker the connecting leads, and free the black (earthing) lead from one of the terminal panel fixing screws.

When replacing, connect the leads as follows, numbering the tags as marked on the panel: 3, red/yellow; 4, red; 5, red/yellow. Do not omit to replace the large washers between chassis and bottom of cabinet, and note that the small knob goes on the tuning control spindle.

Removing Speaker.—Remove the two round-head screws holding the clamps at the top of the speaker, and remove the bolt (with nut, lock washer and metal plate) holding the support at the rear of the speaker to the shelf.

GENERAL NOTES

Switches.—S1 is the local-distant switch, of the push-pull type, situated at the front of the chassis. S2-S6 are the waveband, pick-up and muting switches, and S7, S8 are the battery switches, ganged together in a single unit mounted in a gap in the deck of the chassis.

The table below gives the switch positions for the various control settings.

Switch	Off	MW	LW	Gram
S2	○	○	—	○
S3	○	○	—	○
S4	○	○	—	○
S5	—	—	○	○
S6	—	○	○	—
S7	—	○	○	○
S8	—	○	○	○

Coils.—L1 is beneath the chassis. L2-L4 and L5-L8 are in two screened units on the chassis deck. The IF transformers L9, L10 and L11, L12, are in two further screened units.

Scale Lamp.—This is an Osram MES type rated at 2.0 V, 0.1 A.

External Speaker.—Provision is made for the connection of a low impedance speaker to the terminals 1 and 2 on the panel of the internal speaker. The impedance should be about 8Ω.

Condenser C16.—This is a very small air dielectric pre-set type, mounted at the front of the chassis.

Condenser C24.—This is a very small mica dielectric pre-set type for controlling IF reaction. It is mounted at the back of the chassis, and a knob is provided.

Batteries.—LT, Exide CZS3; 2 V 30 AH cell. HT and GB, Marconiphone B552 166 V HT plus 9 V GB.

Battery Leads and Voltages.—Black lead, spade tag, LT negative; black lead, spade tag, with red indicator, LT positive 2 V; black lead and plug, HT negative (and GB positive); red lead and plug, HT positive 166 V; mauve lead and plug, HT positive 72 V; pink lead and plug, HT positive, voltage depending on marking on V4: V, 132 V; W, 140 V; X, 147 V; Y, 155 V; Z, 162 V. Blue lead and plug, GB negative 1.5 V; grey lead and plug, GB negative 9 V.

CIRCUIT ALIGNMENT

IF Stages.—Connect a signal generator to control grid (top cap) of V1 and chassis. Switch set to MW, and turn gang to minimum. Feed in a 456 kc/s (657.9 m) signal, and adjust C22 (screw), C23 (nut), C25 (screw) and C26 (nut) for maximum output. Re-check these settings.

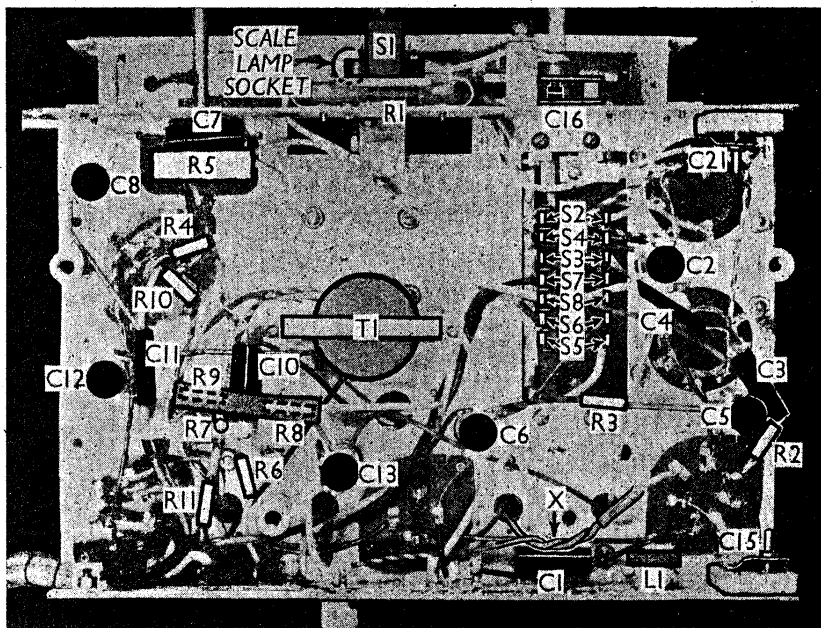
RF and Oscillator Stages.—With the gang at minimum, scale pointer should read 185 m (4in. to left of 200 m mark). Connect an aerial and earth to the set, and loosely couple the signal generator to the aerial lead.

MW.—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust C20 for maximum output. Feed in a 230 m (1,304 kc/s) signal, tune it in, and adjust C18 for maximum output. Check calibration at 550 m (545 kc/s), then on London Regional, and adjust scale if necessary.

LW.—Switch set to LW, tune to 1,500 m on scale, feed in a 1,500 m (200 kc/s) signal, and adjust C21 (hole at front of chassis) for maximum output.

Image Suppressor.—Still switched to LW, feed in a strong signal at the frequency of the most powerful local transmitter between 250 and 285 m. Tune receiver for maximum output, then adjust C16 for minimum output.

IF Filter.—Feed in 456 kc/s signal, connecting signal generator lead to aerial socket of set, and adjust C15 (hole at rear of chassis) for minimum output.



Under-chassis view. X is a twisted-wire IF reaction coupling.