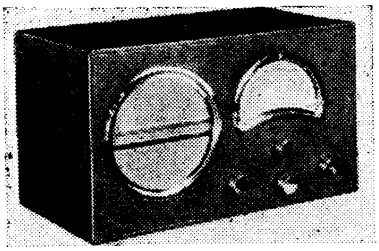
"TRADER" SERVICE SHEET

687

REVISED ISSUE OF SERVICE SHEET No. 51

MARCONIPHONE 235, 237, 238, 240, 245 HMV 360, 370; COLUMBIA 359

AND "A" MODELS WITH DROITWICH REJECTOR



The Marconiphone 235 receiver

THREE valves (plus the rectifier) are employed in the Marconiphone 235, a 2-band TRF receiver designed to operate from AC mains of 200-250 V, 50 c/s.

The Marconiphone 240 console, HMV 360 table and Columbia 359 table employ an identical chassis, while the differences in the radiograms 245 (Marconiphone) and 370 (HMV) are explained under "Radiogram Modifications."

The Marconiphone 237 and 238 (tables), and all the models previously mentioned but bearing the suffix letter "A" (referred to throughout as "A" models), employ a modified chassis, including a Droitwich rejector. The differences in these models are explained under "Droitwich Models."

Release dates and original prices: August, 1935 *(all models) unless otherwise stated. Marconiphone:* 235, £8 18*s.* 6*d. (reduced Jan.*, 1936, *to* £6 16*s.* 6*d.*); 237, 238, *Feb.*, 1936, £8 8*s.*; 240, £13 2*s.* 6*d. (reduced Jan.*, 1936, *to* £9 9*s.*); 245, *Nov.*, 1935, £16 16*s. (reduced Jan.*, 1936, *to* £12 12*s.*); 245A, *Feb.*, 1936, £16 16*s.*

HMV: 360, £9 9*s. (reduced Jan.*, 1936, *to* £7 7*s.*; 360A, *Jan.*, 1936, £8 8*s.*; 370, £16 16*s. (reduced Jan.*, 1936, *to* £12 12*s.*); 370A, *Jan.*, 1936, £17 6*s.* 6*d.*

Columbia: 359, £9 9*s.*

CIRCUIT DESCRIPTION

Two alternative aerial input sockets: **A1** direct, and **A2** via series resistor **R1,** to coupling coil **L1** and single-tuned circuit **L2, C15** (MW), plus **L3** (LW), which precedes first valve **(V1, Marconi metallised VMS4B),** an RF tetrode operating as signal frequency amplifier. Gain control by variable resistor **R5,** which forms part of an HT potential divider **R2, R3, R5** and varies applied GB.

Tuned-anode coupling by **L4, L5, C18** to triode detector valve **(V2, Marconi MH41)** operating on grid leak system with **C6** and **R8.** Reaction applied to anode coils by coils **L6, L7,** and controlled by variable condenser **C20.** Fixed condenser **C4** prevents damage to **V1** anode tuning coils in the event of a short-circuit occurring in **C18** or **C19.** RF filtering in detector anode circuit by choke **L8** and condensers **C8, C9.**

Resistance-capacity coupling by **R10, C10** and **R11,** via grid stopper **R12,** between **V2** and pentode output valve **(V3, Marconi N41).** Fixed tone correction by **C12** in anode circuit. Provision for connection of low-impedance external speaker across speech coil **L9** of internal speaker.

HT current is supplied by full-wave rectifying valve **(V4, Marconi U12).** Smoothing by speaker field **L11** and dry electrolytic condensers **C13, C14.** Hum control by pre-set variable potentiometer across heater secondary of mains transformer **T2.**

COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	V1 cathode by-pass ...	0·1
C2	V1 SG decoupling ...	0·5
C3*	V1 anode decoupling ...	2·0
C4	Blocking condenser ...	0·05
C5	V1 anode decoupling ...	0·1
C6	V2 CG condenser... ...	0·000075
C7*	V2 anode decoupling ...	1·0
C8	RF by-pass condensers ...	0·00075
C9		0·00075
C10	AF coupling to V3 ...	0·1
C11*	V3 cathode by-pass ...	25·0
C12	Fixed tone corrector ...	0·002
C13*	HT smoothing condensers	8·0
C14*		8·0
C15†	Aerial circuit tuning ...	—
C16‡	Aerial MW trimmer ...	—
C17‡	Aerial LW trimmer ...	—
C18†	V1 anode tuning	—
C19‡	V1 anode MW trimmer ...	—
C20†	Reaction condenser ...	0·0·008

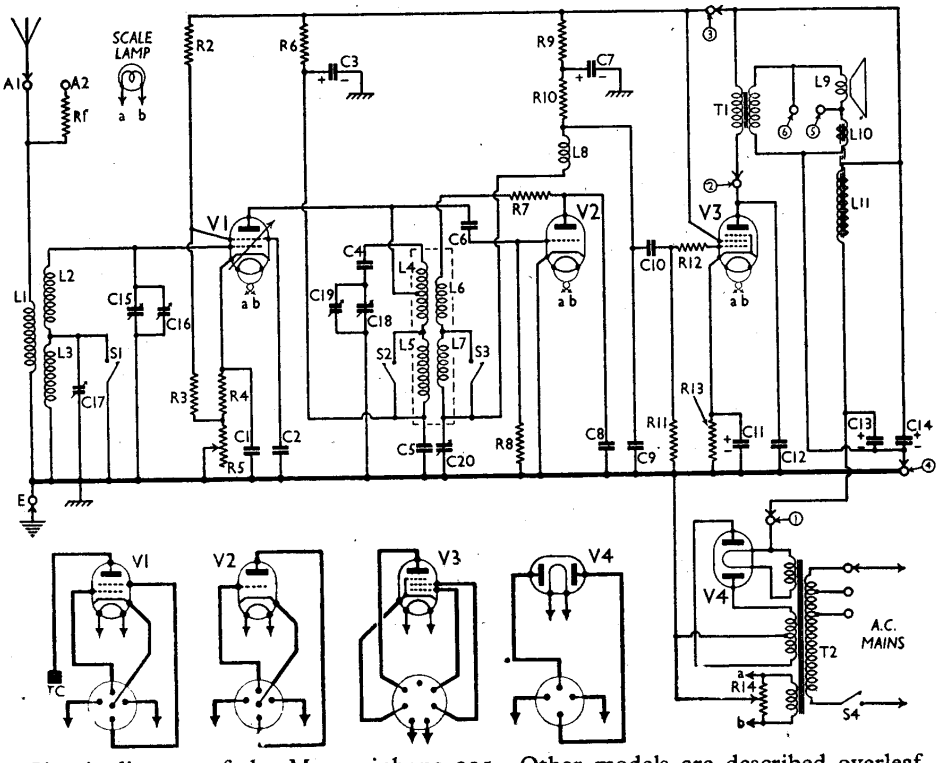
* Electrolytic. † Variable. ‡ Pre-set.

	RESISTORS	Values (ohms)
R1	Aerial series resistor ...	23,000
R2	V1 SG pot. divider ...	35,000
R3		23,000
R4	V1 fixed GB resistor ...	230
R5	V1 gain control	14,000
R6	V1 anode decoupling ...	5,000
R7	Reaction stabiliser ...	100
R8	V2 grid leak	2,300,000
R9	V2 anode decoupling ...	100,000
R10	V2 anode load	50,000
R11	V3 CG resistor	230,000
R12	V3 grid stopper	100,000
R13	V3 GB resistor	50
R14	Hum control	48·5

	OTHER COMPONENTS	Values (ohms)
L1	Aerial coupling coil ...	12·0
L2	Aerial tuning coils... ...	3·0
L3		24·0
L4	V1 anode tuning coils ...	3·0
L5		24·0
L6	Reaction Coils	0·75
L7		2·0
L8	V2 anode RF choke ...	90·0
L9	Speaker speech coil ...	1·75
L10	Hum neutralising coils ...	0·5
L11	Speaker field winding ...	2,000·0
T1	Speaker input trans. Pri. ...	750·0
	Sec. ...	0·2
T2	Mains trans. Pri., total ...	29·0
	Heater sec. ...	0·1
	Rect. fil. sec.	0·1
	H.T. sec., total	680·0
S1-S3	Waveband switches ...	—
S4	Mains switch	—

VALVE ANALYSIS

The voltage and current readings in the table overleaf are those quoted by the makers for



Circuit diagram of the Marconiphone 235. Other models are described overleaf.

an average chassis working with no aerial or earth connections. The volume control was set at maximum and reaction was at minimum. All voltages were measured with a low consumption meter, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VMS4B	170	4·0	70	0·6
V2 MH41	65	1·0	—	—
V3 N41 ...	170	42·0	200	10·0
V4 U12	330*	—	—	—

* Each anode, AC.

DISMANTLING THE SET

Removing Chassis.—Remove the control knobs (self-tapping screws);
unsolder from the connecting panel, at the rear right-hand corner of the chassis deck, the four leads connecting it to the speaker;
disconnect the two mains switch leads from their screw terminals on the mains transformer;
free the mains lead from its clip on the side of the cabinet;
remove the four hexagon bolts holding the chassis to the base of the cabinet.

When replacing, connect the speaker leads as follows, numbering the tags on the chassis as shown in our plan view: 1, red; 2, red/yellow; 3, red/black; 4, black.

Removing Speaker.—Remove the four bolts holding the speaker mount to the base of the cabinet, disconnecting the leads if desired.

When replacing, press the speaker close to the front of the cabinet as the fixing bolts are tightened.

If the leads have been unsoldered they should be connected at the chassis end as previously described, and at the speaker end to the corresponding tags as numbered on the connecting panel.

GENERAL NOTES

Switches.—S1-S3 are the waveband switches, ganged in two rotary units beneath the chassis deck. These are indicated in our under-chassis view, where the tags are identified. All the switches close on MW and open on LW.

S4 is the QMB mains switch fitted at the right-hand side of the cabinet. The leads from it are clamped under the two connectors marked "Switch" on the insulated panel above the mains transformer.

Coils.—These are in two screened units on top of the chassis. On removing the screens, which are held to the chassis by two brackets each, and to the coil unit by a radial bolt and nut in each case, the coils will be seen wound on a tubular former. The order of the coils from top to bottom is, in the first unit, **L2, L1, L3,** and in the second unit, **L4, L6, L5, L7. L8** is seen in the under-chassis view.

Scale Lamp.—This is an Osram MES type, rated at 6.2 V, 0.3 A, and having a frosted bulb.

External Speaker.—This may be connected to the tags numbered 5 and 6 on the speaker chassis terminal panel. It should be of the low-impedance type, with a coil resistance of about 2 Ω.

Condensers C13, C14.—These are two electrolytics mounted on the platform of the speaker chassis. In our case they are two separate units of the tubular type, but in other chassis they may be in a single 8 + 8 μF pack, with a common negative lead. In this case the yellow lead is the positive of **C13** and the red lead the positive of **C14.**

Hum Coils.—There are two of these connected in series. They are shown as one coil, **L10,** in the circuit diagram. Part is wound over the field coil, **L11,** while the remainder is round one arm of the magnet. In addition, a small external resistor is connected across **L10,** but is not shown in the circuit diagram. It is actually a small length of resistance wire, inside empire sleeving, connected between tags 4 and 5 on the speaker chassis terminal panel. The resistance value was about 1 ohm in our chassis.

CIRCUIT ALIGNMENT

MW.—Connect signal generator leads, via a 0.0002 μF condenser, to **A1** and **E** sockets. Connect the output meter, which may be a 0-2 V AC voltmeter, to tags 4 and 6 on the speaker chassis terminal panel.

Unscrew **C16** and **C19** to minimum. Insert chassis into cabinet, and tune condenser to exactly 200 m on the scale. Carefully remove chassis without disturbing condenser. Feed in a 200 m (1,500 kc/s) signal, set receiver volume control **R5** to maximum, and reaction control **C20** just short of oscillation. Adjust **C19** for maximum output, reducing signal generator output progressively so that the reading on output meter is below 0.5 V. Similarly adjust **C16.** Readjust **C19,** then **C16** again if necessary.

LW.—Place chassis in cabinet, tune to 1,400 m on scale. Remove chassis carefully. Set wavechange switch to LW and feed in a 1,400 m (214 kc/s) signal. Set reaction control just short of oscillation, and adjust **C17** for maximum output.

MODIFICATIONS

Droitwich Models

Marconiphone 237 and 238, and the remaining "A" models in Marconiphone (240A, 245A), HMV (360A, 370A) and Columbia (359A) ranges, employ a modified circuit as compared with the 235.

The primary difference is in the substitution of a Droitwich rejector in place of the **A2** socket resistor **R1,** but several other differences occur as well. **V1** anode is connected via two switches (MW or LW) to tappings on **L4** or **L5,** with a 0.000023 μF condenser shunted across **L5.**

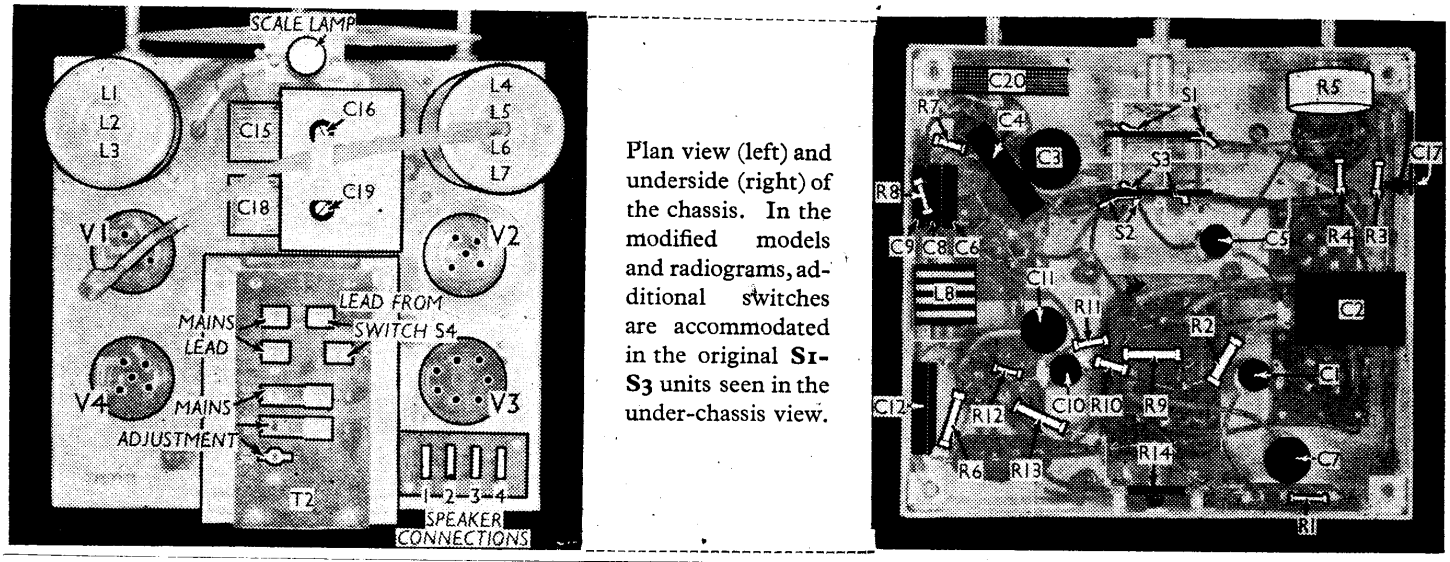
The reaction circuit is changed considerably. **C20** becomes a pre-set condenser, fitted on the rear chassis member, and it is shunted by a 3,000 Ω variable potentiometer which acts as the reaction control. Switch **S3** is omitted, and **R7** is replaced by an RF choke and a 0.0005 μF isolating condenser, connected in series. The bottom of **L8** is connected directly to **V2** anode instead of to **L7. R9** becomes 50,000 Ω, and **R13** becomes 100 Ω.

The controls are rearranged, **S4** taking the place of **C20,** and the reaction control potentiometer spindle projecting from the rear of the chassis, just beside **C20** adjustment. All the "A" models have a screened mains transformer, and some of them have a 0.0023 μF RF by-pass condenser between one side of the mains and chassis. The 237 is housed in a leatherette cabinet, like the 235; all the other models have walnut cabinets.

Radiogram Modifications

The Marconiphone 245, 245A and HMV 370, 370A are radiograms, with the following modifications as compared with the table models.

A radio muting switch is introduced between **C10** and **R11,** opening on gram. The pick-up is connected across a 500,000 Ω potentiometer, one side of which goes to chassis, and the slider goes via a second switch to the top of **R11.** The potentiometer is ganged with **R5.** In the "A" models, a third switch connects **V1** anode directly to the HT circuit, short-circuiting **V1** output on gram. In addition, a 0.05 μF condenser is connected across the speaker field (tags 1 and 3 on connecting panel).



Plan view (left) and underside (right) of the chassis. In the modified models and radiograms, additional switches are accommodated in the original **S1-S3** units seen in the under-chassis view.

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