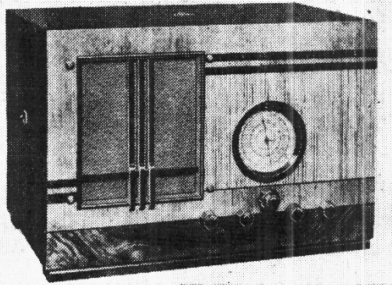


"TRADER" SERVICE SHEET  
**720**

# MARCONIPHONE 345, 365 AND HMV 480, 485

REVISED ISSUE OF  
SERVICE SHEET No. 132



The Marconiphone 345 AC superhet.

**T**WO short wave bands are included in the Marconiphone 345 receiver, marked **S1** (longer SW band) and **S2** (shorter SW band). In this *Service Sheet* they are numbered in the same order, but designated SW1 and SW2. The receiver is a 5-valve (plus rectifier)

and **C57** (LW). Reaction coupling from anode by coils **L18** (SW2), **L20** (SW1), **L22** (MW) and **L24** (LW).

*Release dates and original prices: Marconiphone 345 and HMV 480: January, 1936; £18 7s. 6d. Marconiphone 365 and HMV 485: May, 1936, £37 16s.*

**CIRCUIT DESCRIPTION**

Aerial input via coupling coils **L1** (SW2), **L3** (SW1), **L5** (MW) and **L7** (LW) to single-tuned circuits **L2**, **C45** (SW2), **L4**, **C45** (SW1), **L6**, **C45** (MW) and **L8**, **C45** (LW) which precede a variable-mu RF pentode valve (**V1**, Marconi metallised **VMP4G**) operating as signal frequency amplifier. **S12** closes on both SW bands, reducing the fixed GB to **V1**.

Tuned-secondary RF transformer coupling by **L9**, **L10**, **C50** (SW2), **L11**, **L12**, **C50** (SW1), **L13**, **L14**, **C50** (MW) and **L15**, **L16**, **C50** (LW) between **V1** and triode hexode valve (**V2**, Marconi metallised **X41**) which operates as frequency changer with internal coupling. Triode oscillator grid coils **L17** (SW2), **L19** (SW1), **L21** (MW) and **L23** (LW) are tuned by **C51**. Parallel trimming by **C52** (SW2), **C53** (SW1), **C54** (MW) and **C56** (LW); series tracking by **C15** (SW2), **C16** (SW1), **C17**, **C55** (MW)

and **C57** (LW). Reaction coupling from anode by coils **L18** (SW2), **L20** (SW1), **L22** (MW) and **L24** (LW).

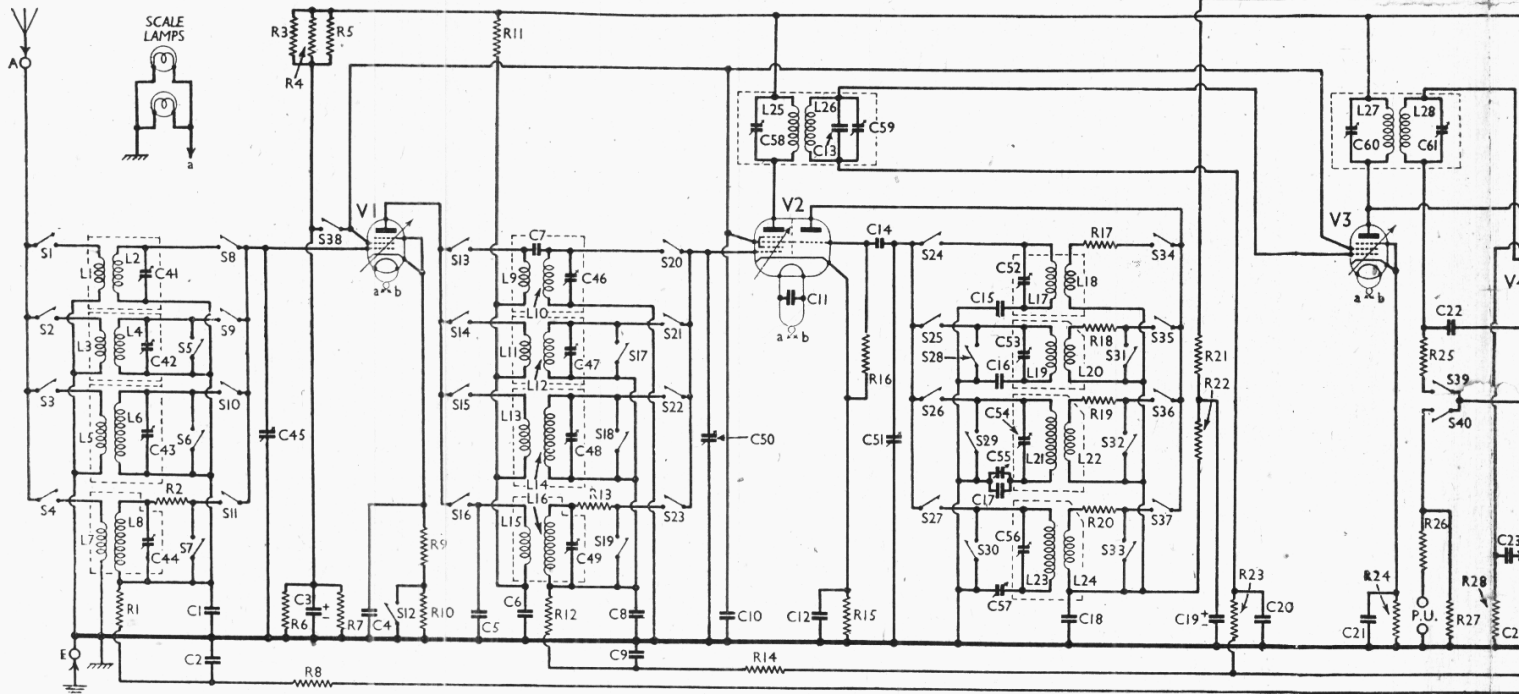
Third valve (**V3**, Marconi metallised **VMP4G**) is a second variable-mu RF pentode, operating this time as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C58**, **L25**, **L26**, **C13**, **C59** and **C60**, **L27**, **L28**, **C61**.

**Intermediate frequency 460 kc/s.**

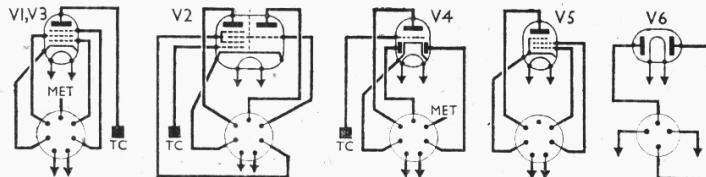
Diode second detector is part of double diode triode valve (**V4**, Marconi metallised **MH4D**). Audio frequency component in rectified output is developed across manual volume control **R29**, which also operates as load resistor, and passed via AF coupling capacitor **C23** to control grid of triode section, which operates as AF amplifier.

IF filtering by **R25** and **C22**. Provision for connection of gramophone pick-up via **S40** across **R29**. When **S40** closes for gramophone operation, **S39** opens to mute radio, as also does **S38**, which controls the HT supply to the screens of **V1**, **V2** and **V3**.

Second diode of **V4**, fed from **V3** anode via **C26**, provides DC potentials which are



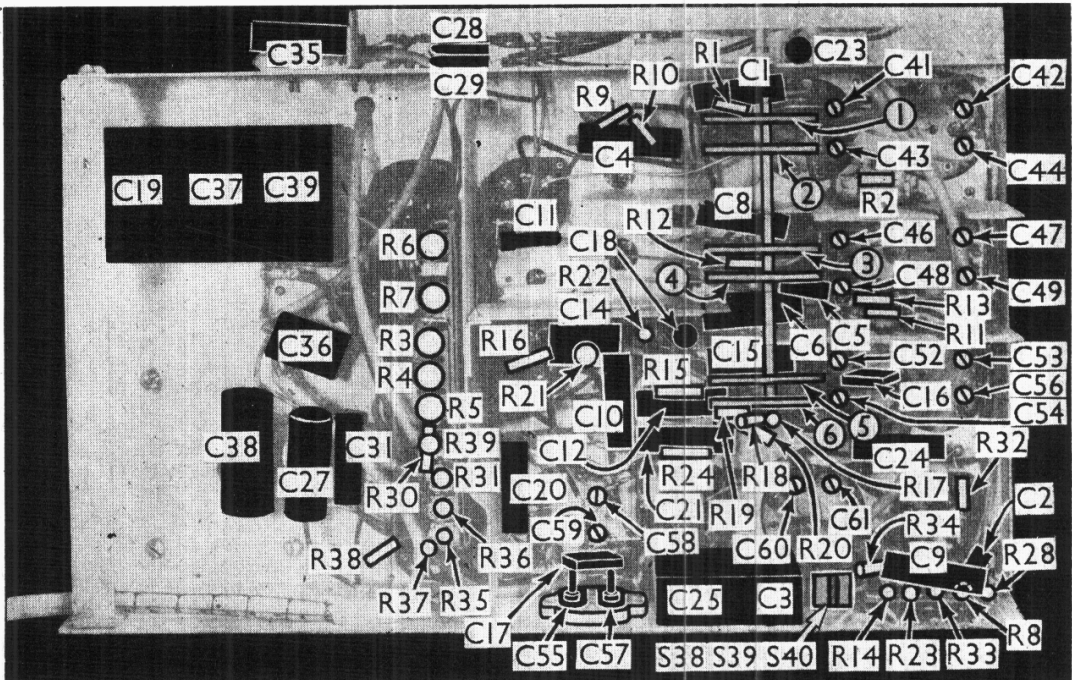
4-band superhet designed to operate from AC mains of 200-250 V, 50-100 c/s. The Marconiphone 365 is a radiogram employing an identical chassis and an automatic record changer, while the HMV 480 (table model) and 485 (autoradiogram) are equivalent types respectively.



Circuit diagram of the M 4-band AC superhet and 365 and S42 are the base control S43-S46 the treble control S feed to the oscillator anode smoothing circuit. This dia to the HMV 480 table and 4



Under - chassis view. The six waveband switch units are indicated here by numbers in circles and arrows. They are shown in detail in the diagrams in col. 1 overleaf. On the right are the RF and oscillator trimmer adjustments mounted in the bases of their respective coil units, and in the foreground are similar IF trimmer adjustments. The two trackers **C55**, **C57** are mounted on the rear member.



developed across load resistors **R33** and **R34** and fed back through decoupling circuits to RF, FC and IF valves, giving automatic volume control. Delay voltage, together with GB for triode section, is obtained from the drop along **R32**.

Resistance-capacitance coupling by **R31**, **C28** and **R35**, via grid stopper **R37**, between **V4** triode and pentode output valve (**V5**, Marconi **N41**). Three-position bass tone control by capacitors **C29**, **C30** and switches **S41**, **S42**, which shunt **C28**. Feed-back by **R38** and **R30** between **V5** cathode and **V4** triode anode circuit. Five-position treble tone control by capacitors **C32**, **C33**, **C34**, **C35** and switches **S43**, **S44**, **S45**, **S46**, which shunt the primary of **T1**. Fixed tone correction by **C36**. Provision for connection of, low impedance external speaker across secondary winding of **T1**.

HT current is supplied by full-wave rectifying valve (**V6**, Marconi **U12/14**). Smoothing by speaker field **L31** and electrolytic capacitors **C37**, **C39** to all HT circuits except the oscillator anode, which is fed separately and smoothed by **R21**, **C19**, **R22**, **C18**. HT circuit RF filtering by **C38**. Mains RF filtering by **C40**.

#### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 211-230 V tapping on the mains transformer. The volume control was at maximum and the receiver was tuned to the lowest wavelength on the medium band, but there was no signal input. Voltages were measured on the

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VMP4G	280	0.4	75	0.3
V2 X41	280	2.9	75	3.1
	95	7.1		
V3 VMP4G	280	5.2	75	3.9
V4 MHD4	100	2.1		
V5 N41	230	43.0	280	9.5
V6 U12/14	390†	—		—

† Each anode, AC.

1,200 V scale of an Avometer, with chassis as negative.

#### DISMANTLING THE SET

**Removing Chassis.**—Remove the back cover (six round-head wood screws); remove the six control knobs (recessed self-tapping screws in all except the main tuning knob); remove the knurled escutcheon from the mains switch on the side of the cabinet, and free the mains lead from the cleat holding it to the bottom of the cabinet; free the speaker leads from two cleats holding them to the cabinet; remove the four bolts (with large metal washers, rubber washers, small washers and distance pieces) holding the chassis to the bottom of the cabinet.

The chassis may now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free chassis entirely, disconnect from the screw terminals on the speaker the leads connecting them to chassis.

When replacing, note that a rubber washer goes on each fixing bolt between the chassis and the bottom of the cabinet;

take care that the tuning scale spindle with the serrated flat is pulled out as far as it will go before replacing the small tuning knob.

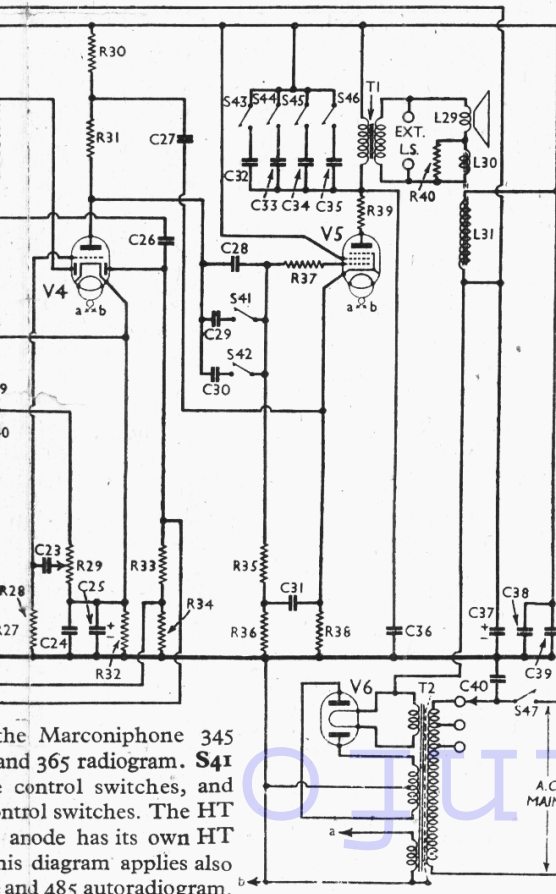
Connect the speaker leads as follows, using the numbers marked on the speaker connecting panel:

6, no external connection; 5, red lead; 4, red/black lead; 3, red/yellow lead.

The leads from the external speaker sockets go to terminals 1 and 2.

**Removing Speaker.**—Remove the nuts, washers and lock-washers from the four bolts holding the speaker to the sub-baffle.

When replacing, the terminal panel should be at the top, and if the leads have been disconnected they should be connected as described previously.



the Marconiphone 345 and 365 radiogram. **S41** control switches, and control switches. The HT anode has its own HT this diagram applies also and 485 autoradiogram.



COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 CG decoupling	100,000
R2	Aerial LW stabiliser	100
R3		23,000
R4		23,000
R5	V1, V2 and V3 SG's HT potential divider	23,000
R6		7,500
R7		7,500
R8	V1 AVC line decoupling	1,500,000
R9		150
R10	V1 fixed GB resistors	10,000
R11	V1 anode decoupling	1,000
R12	V2 hex. CG decoupling	100,000
R13	RF trans. LW stabiliser	100
R14	V2 AVC line decoupling	750,000
R15	V2 fixed GB resistor	150
R16	V2 osc. CG resistor	50,000
R17		150
R18	Oscillator anode reaction circuits stabilisers	500
R19		2,300
R20		15,000
R21	V2 osc. anode HT feed resistors	35,000
R22		5,000
R23	V3 CG decoupling	1,000,000
R24	V3 fixed GB resistor	150
R25	IF stopper	50,000
R26	PU series resistor	230,000
R27	PU circuit shunt resistor	50,000
R28	V4 triode CG resistor	1,000,000
R29	Manual volume control; V4 signal diode load	250,000
R30	V4 triode anode decoupling	50,000
R31	V4 triode anode load	35,000
R32	V4 GB and AVC delay	1,000
R33		350,000
R34	V4 AVC diode load	230,000
R35		230,000
R36	V5 CG resistor	50,000
R37	V5 CG decoupling	50,000
R38	V5 CG IF stopper	1,000
R39	V5 GB resistor	100
R40	V5 anode stopper	500
	Hum neut. coil shunt	0.8

CAPACITORS		Values (µF)
C1	V1 CG decoupling	0.05
C2	AVC line decoupling	0.001
C3*	V1-V3 SG's decoupling	4.0
C4	V1 cathode by-pass	0.1
C5	RF trans. LW shunt	0.0003
C6	V1 anode decoupling	0.1
C7	SW2 RF "top" coupling	0.000005
C8	V2 hex. CG decoupling	0.05
C9	V2 AVC line decoupling	0.05
C10	V2 SG RF decoupling	0.1
C11	V2 heater by-pass	0.002
C12	V2 cathode by-pass	0.1
C13	1st IF trans. trimmer	0.0001
C14	V2 osc. CG capacitor	0.00005
C15	Osc. SW2 tracker	0.00285
C16	Osc. SW1 tracker	0.00184
C17	Osc. MW tracker, fixed	0.00035
C18		0.05
C19*	V2 osc. anode decoupling	4.0
C20	V3 CG decoupling	0.05
C21	V3 cathode by-pass	0.1
C22	IF by-pass	0.00035
C23	AF coupling to V4 triode	0.05
C24		0.1
C25*	V4 cathode by-pass	4.0
C26	Coupling to V4 AVC diode	0.0001
C27	V4 triode anode decoupling	0.5
C28	AF coupling to V5	0.001
C29		0.0015
C30	Bass tone control capacitors	0.05
C31		0.1
C32	V5 CG decoupling	0.0023
C33		0.005
C34	Treble tone control capacitors	0.02
C35		0.05
C36		0.0023
C37*	Fixed tone corrector	8.0
C38		0.25
C39*	HT smoothing capacitors	8.0
C40		0.005
C41†	Mains RF by-pass	—
C42†	Aerial trimmer (SW2)	—
C43†	Aerial trimmer (SW1)	—
C44†	Aerial trimmer (MW)	—
C45†	Aerial trimmer (LW)	—
C46†	Aerial circuit tuning	—
C47†	RF trans. SW2 trimmer	—
C48†	RF trans. SW1 trimmer	—
C49†	RF trans. MW trimmer	—
C50†	RF trans. LW trimmer	—
C51†	RF trans. sec. tuning	—
C52†	Oscillator circuit tuning	—
C53†	Oscillator trimmer (SW2)	—
C54†	Oscillator trimmer (SW1)	—
C55†	Oscillator trimmer (MW)	—
C56†	Oscillator trimmer (LW)	—
C57†	Oscillator tracker (LW)	—
C58†	Oscillator tracker (LW)	—
C59†	1st LF trans. pri. tuning	—
C60†	1st IF trans. sec. tuning	—
C61†	2nd IF trans. pri. tuning	—
	2nd IF trans. sec. tuning	—

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L25	1st IF trans. { Pri. ...	12.0
L26	{ Sec. ...	8.0
L27	2nd IF trans. { Pri. ...	12.0
L28	{ Sec. ...	12.0
L29	Speaker speech coil	4.0
L30	Hum neutralising coil	0.5
L31	Speaker field coil	1,200.0
T1	Speaker input trans. { Pri. ...	580.0
	{ Sec. ...	0.5
T2	Mains { Pri., total ...	19.5
	{ Heater sec. ...	0.1
	{ Rect. fil. sec. ...	0.1
	{ HT sec., total ...	300.0
S1-S37	Waveband switches	—
S38	Radio muting switch (gram.)	—
S39,	Radio-gram switches	—
S40		—
S41,	Bass control switches	—
S42		—
S43-	Treble control switches	—
S46		—
S47	Mains switch	—

GENERAL NOTES

**Switches.**—S1-S37 are the waveband switches, ganged together in an assembly consisting of six rotary units beneath the chassis. These are indicated in our under-chassis view, where the units are identified by numbers in circles and arrows.

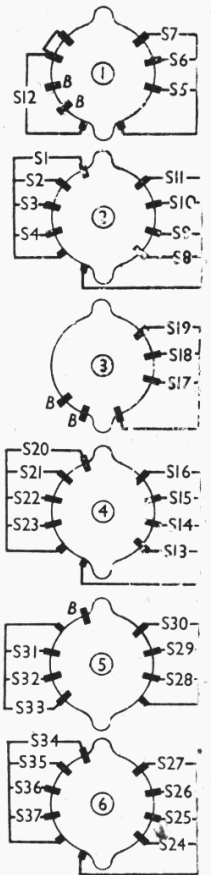
The six units are shown in detail in the diagrams in col. 1, where they are drawn as seen in the direction of the arrows in the under-chassis view and bear the same numbers.

The table below gives the switch positions for the four control settings, a dash indicating open, and C, closed. It will be observed that, whereas all the other switches close only in one control position each, S12 closes on both SW bands.

S38-S40 are the radio/gram change-over switches, in a QMB double-pole two-way unit fitted on the rear chassis member. A diagram of the unit appears in col. 6. S38, S39 close on radio and open on gram; S40 opens on radio and closes on gram.

Switch Table

Switch	S2	S1	MW	LW
S1	C	—	—	—
S2	C	—	—	—
S3	—	—	C	—
S4	—	—	—	C
S5	C	—	—	—
S6	C	C	—	—
S7	—	—	C	—
S8	C	—	—	—
S9	—	C	—	—
S10	—	—	C	—
S11	—	—	—	C
S12	C	C	—	—
S13	C	—	—	—
S14	—	C	—	—
S15	—	—	C	—
S16	—	—	—	C
S17	C	—	—	—
S18	—	C	—	—
S19	—	—	C	—
S20	C	—	—	—
S21	—	C	—	—
S22	—	—	C	—
S23	—	—	—	C
S24	C	—	—	—
S25	—	C	—	—
S26	—	—	C	—
S27	—	—	—	C
S28	C	—	—	—
S29	—	C	—	—
S30	—	—	C	—
S31	C	—	—	—
S32	—	C	—	—
S33	—	—	C	—
S34	C	—	—	—
S35	—	C	—	—
S36	—	—	C	—
S37	—	—	—	C



Diagrams showing in detail the six waveband switch units. They are all drawn as seen when viewed from the rear of the underside of the chassis, and numbered to agree with those indicated in the under-chassis view overleaf. The associated table is in col. 3 on this page. The remaining three switch units are shown in the diagrams in col. 6 opposite.

\* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coil (SW2)	2.5
L2	Aerial tuning coil (SW2)...	0.1
L3	Aerial coupling coil (SW1)	16.0
L4	Aerial tuning coil (SW1)...	0.75
L5	Aerial coupling coil (MW)	46.0
L6	Aerial tuning coil (MW)...	5.5
L7	Aerial coupling coil (LW)	140.0
L8	Aerial tuning coil (LW) ...	30.0
L9	RF trans. pri. (SW2) ...	3.1
L10	RF trans. sec. (SW2) ...	0.1
L11	RF trans. pri. (SW1) ...	27.0
L12	RF trans. sec. (SW1) ...	0.75
L13	RF trans. pri. (MW) ...	87.0
L14	RF trans. sec. (MW) ...	5.5
L15	RF trans. pri. (LW) ...	145.0
L16	RF trans. sec. (LW) ...	25.0
L17	Osc. tuning coil (SW2) ...	0.1
L18	Osc. reaction coil (SW2)...	0.5
L19	Osc. tuning coil (SW1)...	0.5
L20	Osc. reaction coil (SW1)...	0.75
L21	Osc. tuning coil (MW) ...	5.0
L22	Osc. reaction coil (MW) ...	1.25
L23	Osc. tuning coil (LW) ...	10.0
L24	Osc. reaction coil (LW) ...	7.0

(Continued next col.)



**S41** and **S42** are the bass switches, in a single rotary unit at the front of the chassis. In the fully anti-clockwise position, both switches are open. In the next position clockwise, **S41** is closed and **S42** open, and in the clockwise position **S42** is closed and **S41** open.

**S43-S46** are the treble or "brilliance" switches. The control has five positions, and only one switch closes at a time. From the anti-clockwise position, the switches close in the following order: **S46**, **S45**, **S44**, **S43**. In the fifth position, all switches are open.

The tone control units are indicated in our plan view of the chassis, and shown in detail in the diagrams in col. 6.

**S47** is the QMB mains switch, mounted at the side of the cabinet.

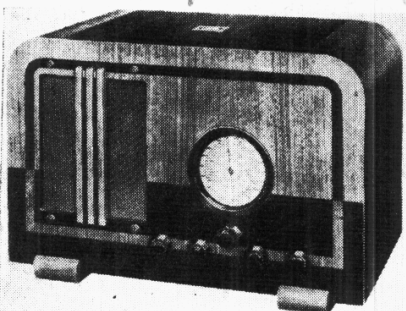
**Coils.**—These are in eight large screened units on the chassis deck. Each unit contains two trimmers, which are adjusted by slotted screws in the bases of the units, indicated in our under-chassis view. In addition, the **L9**, **L10**, **L13**, **L14** unit also contains **C7**, the first IF unit **L25**, **L26** also contains **C13**, while the second IF unit, **L27**, **L28**, contains **R25**, **C22** and **C26**.

**Scale Lamps.**—These are two Osram MES types, rated at 6.5 V, 0.3 A.

**External Speaker.**—Two sockets are provided on a bracket at the rear of the cabinet for a low impedance (about 5Ω) external speaker.

**Resistor R40.**—This is a small coil of resistance wire mounted on the paxolin strip on the speaker chassis.

**Capacitors C19, C37, C39.**—These are three dry electrolytics in a rectangular metal case beneath the chassis. The unit has a common negative (black) lead. The yellow lead is the positive of **C19** (4 μF). The red lead to the rectifier filament is the positive of **C37** (8 μF) and the other red lead is the positive of **C39** (8 μF).

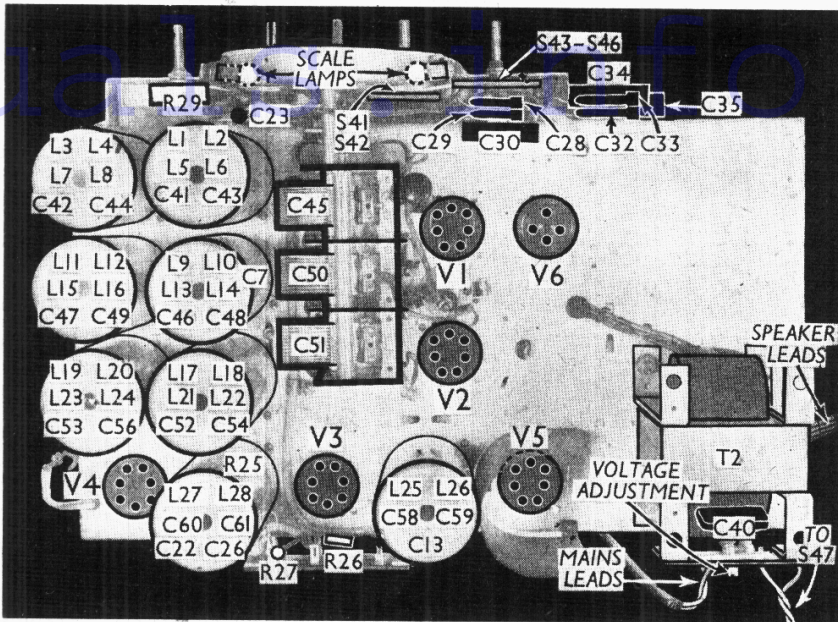


The appearance of the HMV 480 table model, whose chassis is identical with that in the Marconiphone 345.

**Capacitors C3, C25.**—These are 4 μF dry electrolytics in a cardboard case. The black lead is the common negative, the red lead to **S38** is the positive of **C3**, while the other red lead is the positive of **C25**.

**CIRCUIT ALIGNMENT**

**IF Circuits.**—Set bass control to minimum cut, treble control to maximum cut, volume control to maximum, waveband



Plan view of the chassis. The two tone control switch units **S41**, **S42** and **S43-S46** are indicated here. They are seen in detail in the diagrams in col 6 below. All the alignment adjustments are shown in the under-chassis view overleaf.

switch to MW, and turn gang to maximum. See that set is switched to radio. Connect signal generator to fixed vanes of **C50** and chassis, and see that the can is on the IF valve (**V3**). Tune generator to 460 kc/s (652.1 m), and adjust **C58**, **C59**, **C60** and **C61** in that order for maximum output. Re-check for exact resonance on all four trimmers.

**RF and Oscillator Circuits.**—Leave tone and volume controls as above. Connect generator to **A** and **E** sockets. Engage gang plates fully, and see that pointer is exactly over the 0 and 50 marks on vernier scale. Where tuning points for the receiver are given, obtain these, unless otherwise stated, by setting the pointer accurately according to scale, and not by tuning in the generator signal. Use a 400Ω resistor in series with the generator output as a dummy aerial.

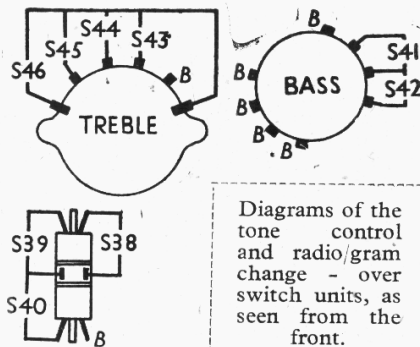
**LW.**—Switch set to LW, tune to 750 m on scale, feed in a 750 m (400 kc/s) signal, and adjust **C56** for maximum output. Set generator to 775 m (387.1 kc/s), tune in the signal, and adjust **C49** and **C44** for maximum output. Set generator to 1,700 m (176.5 kc/s) and tune in signal on receiver. Adjust **C57** for maximum output, irrespective of receiver calibration, rocking gang meanwhile. Repeat these operations. It may be necessary to de-sensitise **V2** by including an additional 2,000Ω resistor in series with the cathode circuit to stabilise the receiver.

**MW.**—Switch set to MW, tune to 185 m on scale, feed in a 185 m (1,622 kc/s) signal, and adjust **C54** for maximum output. Feed in a 205 m (1,463 kc/s) signal, tune it in, and adjust **C48** and **C43** for maximum output. Feed in a 500 m (600 kc/s) signal, tune it in, and adjust

**C55** for maximum output while rocking the gang for optimum results. Repeat these operations.

**SW1.**—Switch set to SW1 band, tune to 46 m on scale, feed in a 46 m (6.52 Mc/s) signal, and adjust **C53** for maximum output. Feed in a 50 m (6 Mc/s) signal, tune it in, and adjust **C47** and **C42** for maximum output while rocking the gang for optimum results. Repeat these adjustments.

**SW2.**—Switch set to SW2 band, tune to 16.7 m on scale, feed in a 16.7 m (17.96 Mc/s) signal, and adjust **C52** for maximum output, selecting the peak involving the lesser trimmer capacitance. Feed in a 17.5 m (17.14 Mc/s) signal, tune it in, and adjust **C46** and **C41** for maximum output while rocking the gang for optimum results. The adjustment of **C46** must be done very carefully, constantly readjusting the gang to obtain the absolute maximum reading. Check the foregoing operations several times.



Diagrams of the tone control and radio/gram change - over switch units, as seen from the front.