

NUMBER 132

'TRADER' SERVICE SHEETS

MARCONIPHONE 345

AND 365 RADIO-GRAMOPHONE

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 C.G. decoupling	100,000
R2	Aerial L.W. circuit stabiliser	100
R3		23,000
R4		23,000
R5	V1, V2 and V3 S.G.'s H.T. potential divider	23,000
R6		7,500
R7		7,500
R8	V1 A.V.C. line decoupling	1,500,000
R9		150
R10	V1 fixed bias resistances	10,000
R11	V1 anode coupling	1,000
R12	V2 hexode C.G. decoupling	100,000
R13	H.F. trans. L.W. sec. stabiliser	100
R14	V2 A.V.C. line decoupling	750,000
R15	V2 fixed bias resistance	150
R16	V2 osc. C.G. resistance	50,000
R17		150
R18	Oscillator anode reaction	500
R19	circuits stabilisers	2,300
R20		15,000
R21	V2 oscillator anode decoupling and H.T. smoothing	35,000
R22		5,000
R23	V3 C.G. decoupling	1,000,000
R24	V3 fixed bias resistance	150
R25	I.F. stopper	50,000
R26	Gram. P.U. series resistance	230,000
R27	Gram. P.U. circuit shunt	50,000
R28	V4 triode C.G. resistance	1,000,000
R29	Manual volume control	250,000
R30	V4 triode anode decoupling	50,000
R31	V4 triode anode load	35,000
R32	V4 bias resistance	1,000
R33	V4 A.V.C. diode load	350,000
R34		230,000
R35	V5 C.G. resistance	230,000
R36	V5 C.G. decoupling	50,000
R37	V5 C.G. I.F. stopper	1,000
R38	V5 bias resistance	100
R39	V5 anode circuit stabiliser	500
R40	Hum neut. coil shunt	0.8

ON the short waves the Marconiphone 345 5-valve (plus rectifier) A.C. all-wave superhet, covers bands of 16.7-51 (S2) and 46-140 (S1) metres. It is for mains of 200-250 V, 50-100 c.p.s., and includes provision for connecting an extension speaker and a gramophone pick-up. A feature of this receiver is the incorporation of two separate tone controls, one for the bass and the other for the treble.

A similar chassis is fitted in the 365 automatic radio-gramophone.

CIRCUIT DESCRIPTION

Aerial input via coupling coils L1 (S.W.2), L3 (S.W.1), L5 (M.W.) and L7 (L.W.) to tuned circuits comprising C45 and coils L2 (S.W.2), L4 (S.W.1), L6 (M.W.) and L8 (L.W.).

First valve (V1, Marconi metallised VMP4G) is an H.F. pentode operating as signal frequency amplifier with tuned-secondary transformer couplings to triode-hexode frequency changer (V2, Marconi metallised X41). Primaries L9 (S.W.2), L11 (S.W.1), L13 (M.W.) and L15 (L.W.); secondaries L10 (S.W.2), L12 (S.W.1), L14 (M.W.), L16 (L.W.) tuned by C50. Oscillator grid coils L17 (S.W.2), L19 (S.W.1), L21 (M.W.), L23 (L.W.) tuned by C51; tracking by C15 (S.W.2), C16 (S.W.1), C17, C55 (M.W.), C57 (L.W.); anode reaction coils L18 (S.W.2), L20 (S.W.1), L22 (M.W.), L24 (L.W.).

Single variable-mu H.F. pentode I.F. amplifier (V3, Marconi metallised VMP4G) operating with tuned-primary tuned-secondary transformer couplings L25, L26 and L27, L28.

Intermediate frequency 460 KC/S.

as G.B. to H.F., F.C. and I.F. valves, giving A.V.C.

Resistance - capacity coupling by R31, C28 (alternatively C29 or C30) and R35 to output pentode (V5, Marconi N41). Coupling capacity is varied by S41 and S42 in order to give control of bass response. Treble tone control is effected in anode circuit by fixed condensers C32, C33, C34, C35 working in conjunction with switches S43, S44, S45 and S46. Provision for connection of low impedance external speaker across secondary of internal speaker transformer TL. H.T. current is supplied by full-wave rectifying valve (V6, Marconi U12). Smoothing by speaker field coil L31 and dry electrolytic condensers C37, C39. Mains H.F. by-passing by C40.

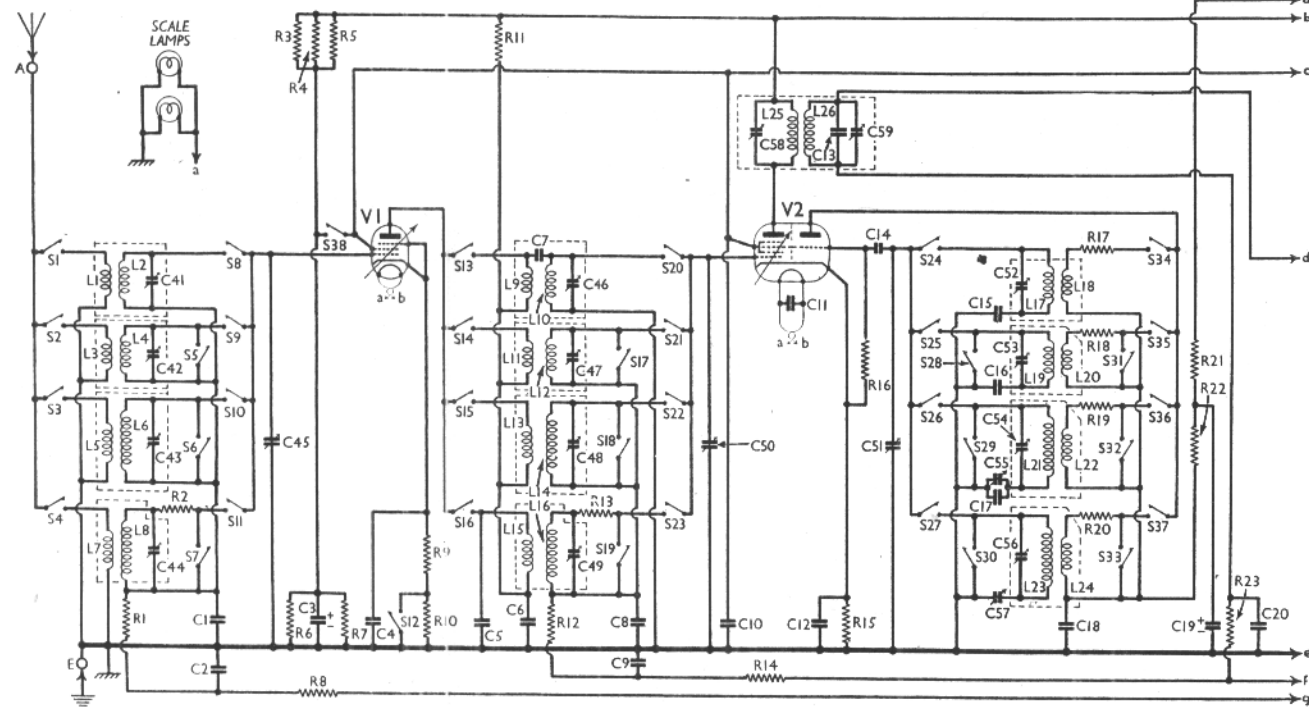
DISMANTLING THE SET

Removing Chassis.—First remove the back (six round-head wood screws) and the six control knobs (recessed self-tapping screws for all except the main tuning knob), taking care not to lose the screws.

Now 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, and the speaker leads from the two cleats.

Next remove the four bolts (with large washers, rubber washers, small washers and distance pieces) holding the chassis to the cabinet bottom, when it can be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

When replacing, do not forget the rubber washers between the chassis and cabinet bottom and see that



Diode second detector forms part of double diode triode valve (V4, Marconi metallised MHD4). Audio-frequency component in rectified output is developed across manual volume control R29 and passed via coupling condenser C23 to C.G. of triode section which operates as L.F. amplifier. Provision for connection of gramophone pick-up by S40; S39 breaks radio circuit, and S38 breaks V1, V2, V3 S.G.'s H.T. supply in order to mute radio on gram.

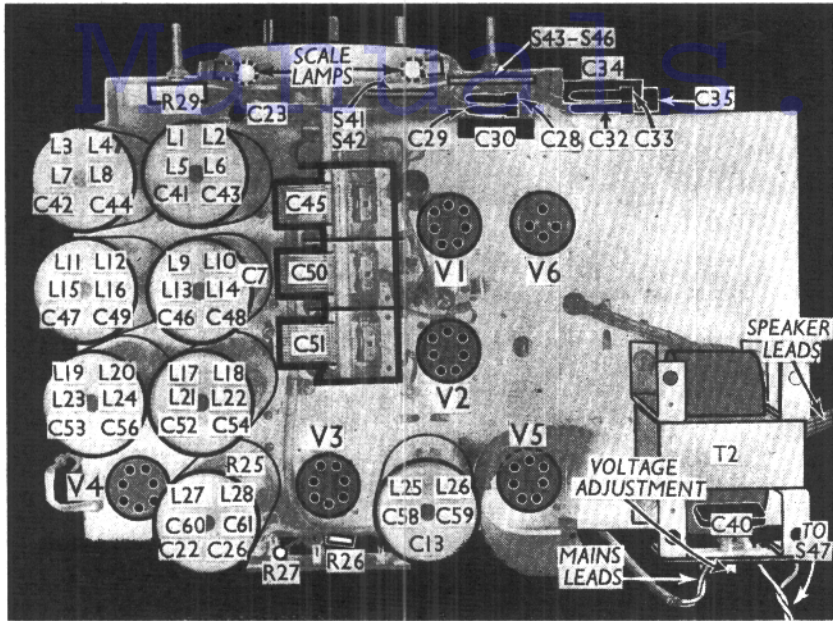
Second diode of V4, fed from V3 anode via C26, provides D.C. potential which is developed across R33, R34 and fed back through decoupling circuits

the tuning dial spindle with the serrated flat is pulled right out before replacing the small tuning knob.

To free the chassis entirely, disconnect the speaker leads (screw terminals) and when replacing, connect as follows—6, blank; 5, red; 4, red/black; 3, red/yellow. The leads to the extension speaker sockets go to terminals 1 and 2.

Removing Speaker.—To remove the speaker from the cabinet, remove the nuts, lock washers and washers from the four bolts holding it to the sub-baffle. When replacing, see that the terminal panel is at the top.

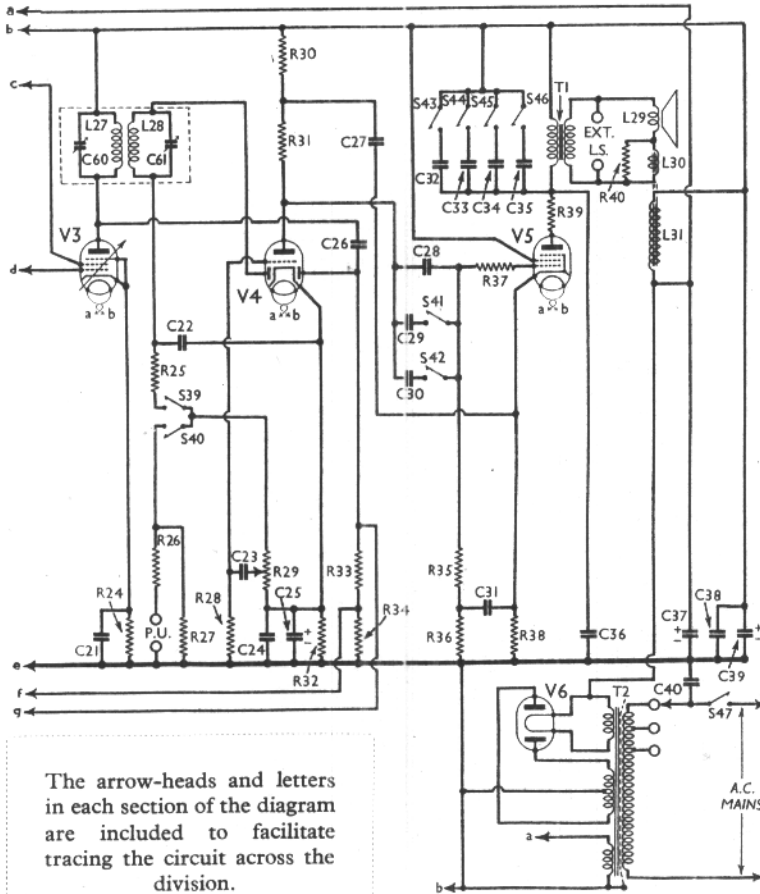
The signal frequency and oscillator circuits of the Marconiphone model 345 all-wave A.C. superhet are shown above, while the remainder of the circuit is on the opposite page.



Plan view of the chassis. Diagrams of switches S41-S46 are given overleaf.

Condensers	Values (μF)
C1	V1 C.G. decoupling .. 0.05
C2	V1 A.V.C. line decoupling .. 0.001
C3*	V1, V2, V3 S.G.'s by-pass .. 4.0
C4	V1 cathode by-pass .. 0.1
C5	H.F. trans. L.W. pri. shunt .. 0.0003

Condensers (continued)	Values (μF)
C6	V1 anode decoupling .. 0.1
C7	H.F. trans. coupling (S.W.2) .. 0.000005
C8	V2 hexode C.G. decoupling .. 0.05
C9	V2 A.V.C. line decoupling .. 0.05
C10	V2 hexode S.G. by-pass .. 0.1



The arrow-heads and letters in each section of the diagram are included to facilitate tracing the circuit across the division.

Condensers (continued)	Values (μF)
C11	V2 heater by-pass .. 0.002
C12	V2 cathode by-pass .. 0.1
C13	1st I.F. trans. sec. tuning, fixed .. 0.0001
C14	V2 osc. C.G. condenser .. 0.00005
C15	Osc. S.W.2. tracker .. 0.00285
C16	Osc. S.W.1. tracker .. 0.00184
C17	Osc. M.W. tracker, fixed .. 0.00035
C18	V2 osc. anode decoupling .. 0.05
C19*	V3 C.G. decoupling .. 4.0
C20	V3 cathode by-pass .. 0.05
C21	I.F. by-pass .. 0.1
C22	L.F. coupling to V4 triode .. 0.00035
C23	V4 cathode by-passes .. 0.05
C24	V4 cathode by-passes .. 0.1
C25*	Coupling to V4 A.V.C. diode .. 4.0
C26	V4 triode anode decoupling .. 0.0001
C27	V4 to V5 L.F. coupling; bass control condensers .. 0.05
C28	V5 C.G. decoupling .. 0.001
C29	V5 C.G. decoupling .. 0.0015
C30	V5 C.G. decoupling .. 0.05
C31	V5 C.G. decoupling .. 0.1
C32	V5 C.G. decoupling .. 0.0023
C33	Treble tone control condensers .. 0.005
C34	Treble tone control condensers .. 0.02
C35	Treble tone control condensers .. 0.05
C36	Fixed tone corrector .. 0.0023
C37*	H.T. smoothing .. 8.0
C38	H.T. smoothing .. 0.25
C39*	H.T. smoothing .. 8.0
C40	Mains H.F. by-pass .. 0.005
C41†	Aerial circuit trimmer (S.W.2) ..
C42†	Aerial circuit trimmer (S.W.1) ..
C43†	Aerial circuit trimmer (M.W.) ..
C44†	Aerial circuit trimmer (L.W.) ..
C45†	Aerial circuit tuning ..
C46†	H.F. trans. trimmer (S.W.2) ..
C47†	H.F. trans. trimmer (S.W.1) ..
C48†	H.F. trans. trimmer (M.W.) ..
C49†	H.F. trans. trimmer (L.W.) ..
C50†	H.F. trans. tuning ..
C51†	Oscillator tuning ..
C52†	Oscillator trimmer (S.W.2) ..
C53†	Oscillator trimmer (S.W.1) ..
C54†	Oscillator trimmer (M.W.) ..
C55†	Oscillator tracker (M.W.) ..
C56†	Oscillator trimmer (L.W.) ..
C57†	Oscillator tracker (L.W.) ..
C58†	1st I.F. trans. pri. tuning ..
C59†	1st I.F. trans. sec. tuning ..
C60†	2nd I.F. trans. pri. tuning ..
C61†	2nd I.F. trans. sec. tuning ..

* Electrolytic. † Variable. ‡ Pre-set.

Other Components	Approx. Values (ohms)
L1	Aerial coupling coil (S.W.2) .. 2.5
L2	Aerial tuning coil (S.W.2) .. 0.1
L3	Aerial coupling coil (S.W.1) .. 16.0
L4	Aerial tuning coil (S.W.1) .. 0.75
L5	Aerial coupling coil (M.W.) .. 46.0
L6	Aerial tuning coil (M.W.) .. 5.5
L7	Aerial coupling coil (L.W.) .. 140.0
L8	Aerial tuning coil (L.W.) .. 30.0
L9	H.F. trans. primary (S.W.2) .. 3.0
L10	H.F. trans. secondary (S.W.2) .. 0.1
L11	H.F. trans. primary (S.W.1) .. 27.0
L12	H.F. trans. secondary (S.W.1) .. 0.75
L13	H.F. trans. primary (M.W.) .. 87.0
L14	H.F. trans. secondary (M.W.) .. 5.5
L15	H.F. trans. primary (L.W.) .. 145.0
L16	H.F. trans. secondary (L.W.) .. 25.0
L17	Osc. tuning coil (S.W.2) .. 0.1
L18	Osc. reaction coil (S.W.2) .. 0.5
L19	Osc. tuning coil (S.W.1) .. 0.5
L20	Osc. reaction coil (S.W.1) .. 0.75
L21	Osc. tuning coil (M.W.) .. 5.0
L22	Osc. reaction coil (M.W.) .. 1.25
L23	Osc. tuning coil (L.W.) .. 10.0
L24	Osc. reaction coil (L.W.) .. 7.0
L25	1st I.F. trans. Pri. .. 12.0
L26	1st I.F. trans. Sec. .. 8.0
L27	2nd I.F. trans. Pri. .. 12.0
L28	2nd I.F. trans. Sec. .. 12.0
L29	Speaker speech coil .. 4.0
L30	Hum neutralising coils .. 0.5
L31	Speaker field coil .. 1,200.0
T1	Speaker input trans. Pri. .. 580.0
	Speaker input trans. Sec. .. 0.5
T2	Mains trans. Pri. total .. 19.5
	Mains trans. Heater sec. .. 0.1
	Mains trans. Rect. fil. sec. .. 0.1
	Mains trans. H.T. sec. total .. 300.0
St-S37	Waveband switches ..
S38	Radio muting switch (gram.) ..
S39, S40	Radio-gram. switches ..
S41, S42	Bass control switches ..
S43, S46	Treble control switches ..
S47	Mains switch ..

(Continued overleaf)

MARCONIPHONE 345 and 365

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

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 VMP4G*	280	0.4	75	0.3
V2 X4r	280	2.9	75	3.1
V3 VMP4G	280	5.2	75	3.9
V4 MHD4	100	2.1	—	—
V5 N4r	230	43.0	280	9.5
V6 Ur2	390†	—	—	—

* Osc. anode 95 V, 7.4 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—There are 37 waveband switches, in six rotary units. The units are numbered in the under-chassis view, and arrows indicate the direction in which they are to be viewed, looking at the underside of the chassis, when referring to the diagrams on this page showing the individual switches. The table (Col. 2) gives the switch positions for the four control settings, O indicating open, and C closed. Note that with the exception of S12, each switch only closes on one of the four wavebands. S12 closes on the Sr and S2 bands.

There are three other switch units, indicated in the chassis views and also shown in diagrams.

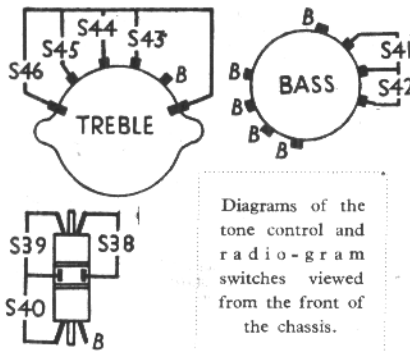
S38-S40 are the Q.M.B. radio-gram switches, and S38 and S39 are closed on radio and open on gram, while S40 is closed on gram, and open on radio.

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. S47 is the Q.M.B. mains switch, mounted at the side of the cabinet.

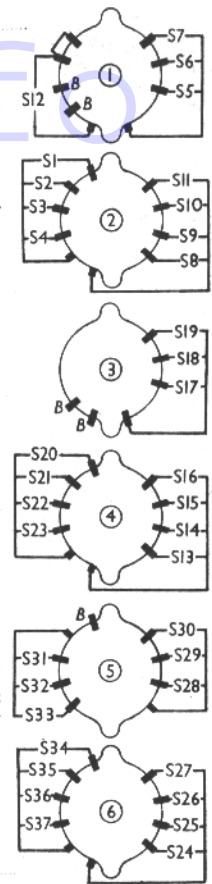
Coils.—These are in eight large screened units on the chassis deck. Each unit contains two trimmers, which are adjusted by slotted screws in the bases of the units, indicated in our under-chassis view. In addition, the L9, L10, L13, L14 unit also contains C7, the first I.F. unit L25, L26 also contains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

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



Diagrams of the tone control and radio-gram switches viewed from the front of the chassis.

These diagrams show the contact arrangements of the six wave-change switch units which are numbered in accordance with the under-chassis illustration below. Each unit is viewed from the rear of the upturned chassis as shown by the arrows. The letters B indicate blank tags or tags used for bearing purposes.



Scale Lamps.—These are two Osram M.E.S. 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 resistance external speaker.

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

Condensers 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 (4μF). The red lead to the rectifier filament is the positive of C37 (8μF) and the other red lead is the positive of C39 (8μF).

Condensers 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.

NOTES ON CIRCUIT ALIGNMENT

See page IV

Under-chassis view. The six wave-change switch units are numbered, and are shown separately in diagrammatic form. All trimmers are clearly marked.

