

TRADER'S SERVICE SHEET

# 240

# MARCONIPHONE

## 382, 392 AND 395

**T**HE Marconiphone 382 receiver is a 4-valve (plus rectifier) A.C./D.C. 3-band superhet having a short-wave range of 16.5-50 metres.

A similar chassis is incorporated in the 392 radio-gramophone and the 395 automatic radio-gramophone, the differences being explained in "General Notes." This Service Sheet was prepared on a 382.

### CIRCUIT DESCRIPTION

Aerial input on M.W. and L.W. via socket **A**, tapping on S.W. coupling coil **L4**, mains isolating condenser **C3** and coupling coil **L1** to capacity coupled band-pass filter. Primary coils **L2, L3** are tuned by **C34**; secondaries **L6, L7** are tuned by **C38**. The coupling coil **L1** is tuned by fixed condenser **C1** and forms an I.F. filter. **L8**, connected in series with the band-pass common coupling condenser **C5**, acts as an image rejector on M.W. On S.W. aerial input is via socket **A**, or via sockets **A** and **A1** when a di-pole aerial is used, to coupling coil **L4** and single-tuned circuit **L5, C38**.

First valve (**V1, Marconi metallised X31**) is a triode-hexode operating as frequency changer with internal coupling. Oscillator grid coils **L9 (S.W.), L10 (M.W.)** and **L11 (L.W.)** are tuned by **C39**; parallel trimming by **C40 (S.W.)** and **C42 (L.W.)**; series tracking by **C9 (S.W.), C10, C41 (M.W.)** and **C43 (L.W.)**. Anode reaction coils **L12 (S.W.), L13 (M.W.)** and **L14 (L.W.)**.

Single variable-mu R.F. pentode intermediate frequency amplifier (**V2, Marconi metallised W31**) operates with tuned-primary tuned-secondary transformer couplings **C44, L15, L16, C45** and **C46, L17, L18, C47**.

Intermediate frequency 465 KC/S.

Diode second detector is part of separate

double diode valve (**V3, Marconi metallised D41**). Audio-frequency component in rectified output is developed across load resistance **R9** and passed via coupling condenser **C20**, manual volume control **R12** and I.F. stopper **R13** to C.G. of pentode output valve (**V4, Marconi X31**). Fixed tone correction in anode circuit by **C23**; variable tone control by switches **S8, S9** and condensers **C25** and **C26**. I.F. filtering by chokes **L19, L20**, condensers **C18, C19** and resistance **R18**.

Second diode of **V3**, fed from **L18** via **C21**, provides D.C. potential which is developed across load resistance **R11** and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage is obtained from drop across G.B. resistance **R15** in the cathode circuit of **V4**.

When the receiver is used with A.C. mains H.T. current is supplied by rectifying valve (**V5, Marconi U30**) with both anodes and both cathodes strapped to operate as half-wave rectifier, which, with D.C. supplies, behaves as a low resistance. Smoothing is effected by iron-cored choke **L22** and large capacity dry electrolytic condensers **C27** and **C28**. R.F. filtering by **C29**.

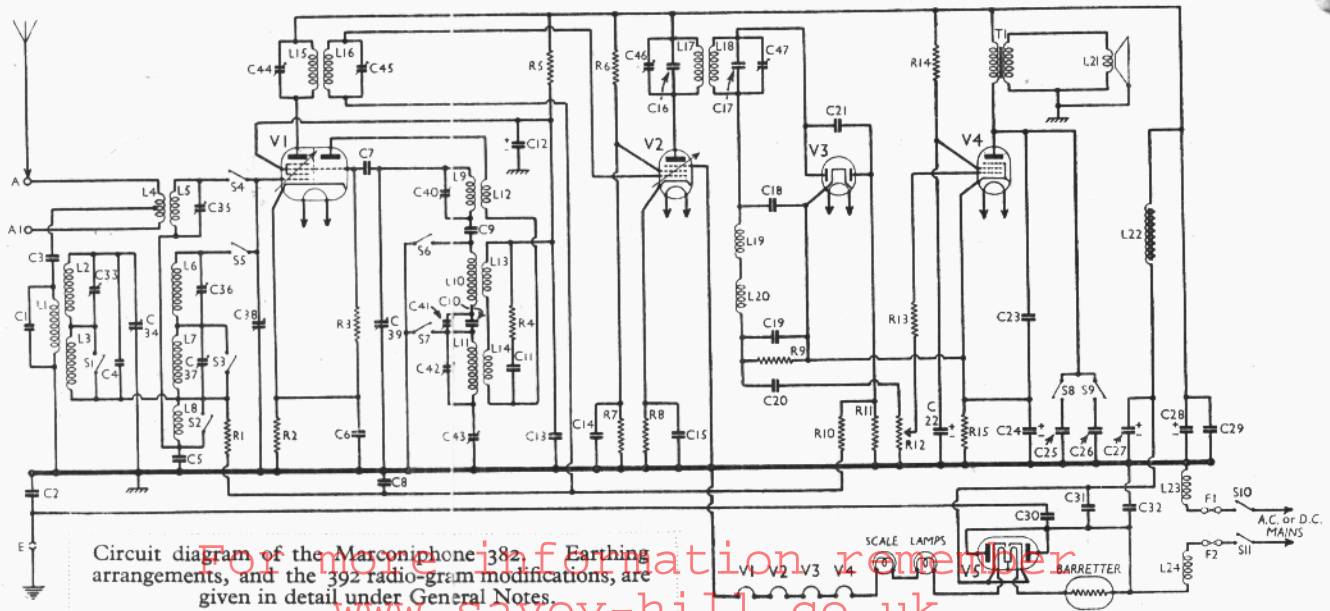
Valve heaters are connected in series together with current regulating barretter (**Marconi 304**) and scale lamps across mains input. Filter comprising chokes **L23, L24** and condensers **C30, C31** and **C32** suppresses mains-borne interference.

The plate on which the mains switches are mounted and the metal grille covering the speaker aperture are, as a safety measure, connected to the true earth side of the split earth socket, which consists of two separate sections which are only connected upon insertion of the earth lead plug.

### COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial I.F. filter fixed tuning	0.00005
C2	Mains isolating condensers	0.005
C3		0.001
C4	Band-pass primary fixed trimmer	0.000023
C5	Band-pass common coupling	0.015
C6	V1 cathode by-pass	0.1
C7	V1 osc. C.G. condenser	0.0001
C8	A.V.C. line decoupling	0.1
C9	Osc. circuit S.W. tracker	0.005
C10	Osc. circuit M.W. fixed tracker	0.00035
C11	Part of V1 osc. anode circuit stabiliser	0.00015
C12*	V1 osc. anode and S.G. decoupling	4.0
C13	V1 osc. anode and S.G. R.F. by-pass	0.01
C14	V2 S.G. decoupling	0.5
C15	V2 cathode by-pass	0.1
C16	2nd I.F. trans. pri. fixed trimmer	0.0001
C17	2nd I.F. trans. sec. fixed trimmer	0.0001
C18	I.F. by-passes	0.0001
C19		0.0001
C20	A.F. coupling to V4	0.1
C21	V3 A.V.C. diode coupling	0.0001
C22*	V4 S.G. decoupling	2.0
C23	V4 anode fixed tone corrector	0.0023
C24*	V4 cathode by-pass	50.0
C25	Variable tone filter condensers	0.005
C26		0.025
C27*	H.T. smoothing	12.0
C28*		12.0
C29	H.T. circuit R.F. by-pass	0.1
C30	Mains R.F. filter condenser	0.005
C31	V5 anode-cathode by-pass	0.0005
C32	Mains R.F. filter condenser	0.01
C33†	Band-pass pri. M.W. trimmer	—
C34†	Band-pass primary tuning	—
C35†	Aerial circuit S.W. trimmer	—
C36†	Band-pass sec. M.W. trimmer	—
C37†	Band-pass sec. L.W. trimmer	—
C38†	Aerial S.W. and band-pass sec. tuning	—
C39†	Oscillator circuit tuning	—
C40†	Osc. circuit S.W. trimmer	—
C41†	Osc. circuit M.W. tracker	—
C42†	Osc. circuit L.W. trimmer	—
C43†	Osc. circuit L.W. tracker	—
C44†	1st I.F. trans. pri. tuning	—
C45†	1st I.F. trans. sec. tuning	—
C46†	2nd I.F. trans. pri. tuning	—
C47†	2nd I.F. trans. sec. tuning	—

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



RESISTANCES		Values (ohms)
R1	V1 hexode C.G. decoupling	100,000
R2	V1 fixed G.B.	230
R3	V1 osc. C.G. resistance	50,000
R4	Part of V1 osc. anode circuit stabiliser	100
R5	V1 osc. anode and S.G. H.T. feed	35,000
R6	V2 S.G. H.T. potentiometer	15,000
R7	V2 fixed G.B.	23,000
R8	V3 signal diode load	230
R9	A.V.C. line decoupling	230,000
R10	V3 A.V.C. diode load	500,000
R11	Manual volume control	500,000
R12	V4 C.G. I.F. stopper	500,000
R13	V4 S.G. H.T. feed	50,000
R14	V3, V4 G.B. resistance, A.V.C. delay	5,000
R15		100

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial M.W. and L.W. coupling; I.F. filter coil	8.5
L2	Band-pass primary coils	2.5
L3		21.5
L4	Aerial S.W. coupling coil	0.7
L5	Aerial circuit S.W. tuning coil	0.1
L6	Band-pass secondary coils	2.5
L7		16.5
L8	M.W. image rejector	0.3
L9	Oscillator S.W. tuning coil	0.1
L10	Oscillator M.W. tuning coil	5.8
L11	Oscillator L.W. tuning coil	4.5
L12	Oscillator anode S.W. reaction	1.0
L13	Oscillator anode M.W. reaction	2.0
L14	Oscillator anode L.W. reaction	3.0
L15	1st I.F. trans. { Pri. . . . .	5.25
L16	{ Sec. . . . .	5.25
L17	2nd I.F. trans. { Pri. . . . .	3.25
L18	{ Sec. . . . .	3.5
L19	I.F. filter chokes	130.0
L20		130.0
L21	Speaker speech coil	4.0
L22	H.T. smoothing choke	240.0
L23	Mains filter chokes	3.5
L24		3.5
T1	Output trans. { Pri. . . . .	450.0
	{ Sec. . . . .	0.7
S1-S7	Waveband switches	—
S8, S9	Tone control switches	—
S10	Mains switches, gauged	—
S11		—
F1, F2	Mains fuses	—

**DISMANTLING THE SET**

**Removing Chassis.**—To remove the chassis from the cabinet, remove the

wax covering the heads of the recessed grub screws in the two small knobs, slacken the screws and remove the knobs. Remove the two larger knobs (pull off).

Now remove the earthing lead from the chassis to the bracket on the side of the cabinet (screw terminal) and remove the mains switch from the side of the cabinet (lock nut). Next remove the four bolts (with washers and spring washers) holding the chassis to the chassis platform, when the chassis can be withdrawn to the extent of the speaker leads, which should be just sufficient for normal purposes.

When replacing, do not forget the two wooden blocks at the back of the chassis, between the chassis and the platform, and cover the heads of the screws in the two small knobs with wax.

To free the chassis entirely, unsolder the speaker leads from the panel at the back of the chassis and remove the earthing lead from the mains switch to the bracket on the side of the cabinet (screw terminal).

**Removing Speaker.**—If it is desired to remove the speaker, remove the four round-head screws (with lock washers) holding it to the sub-baffle. When replacing, see that the terminal panel is at the bottom, and do not forget to replace the tag for the speaker earthing lead on the bottom right-hand screw.

**VALVE ANALYSIS**

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X31*	230	1.6	60	2.4
V2 W31	230	6.8	100	4.3
V3 D4†	—	—	—	—
V4 N3†	210	39.0	185	9.0
V5 U30†	—	—	—	—

\* Oscillator anode 60 V, 2.3 mA.  
† Cathode to chassis 250 V D.C.

Valve voltages and currents given in the table above are those measured in

our receiver when it was operating on A.C. mains of 230 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

**GENERAL NOTES**

**Switches.**—S1-S7 are the waveband switches, in a single rotary unit, mounted parallel to the chassis deck, and beneath it. The unit is shown in our under-chassis view, the individual switches being clearly indicated. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise (lever control to the left). A dash indicates open, and C, closed.

Switch	S.W.	M.W.	L.W.
S1	—	C	—
S2	C	—	C
S3	—	C	—
S4	C	—	—
S5	—	C	C
S6	C	—	—
S7	—	C	—

S8 and S9 are the tone control switches, in a single rotary unit above the chassis deck, operated by a knob concentric with that of R12. In the fully anti-clockwise position of the control S9 is closed, and S8 open; in the middle position S8 is closed and S9 open; while in the third (clockwise) position, both switches are open.

S10 and S11 are the Q.M.B. mains switches, gauged in a single unit which fits on the left-hand side of the cabinet.

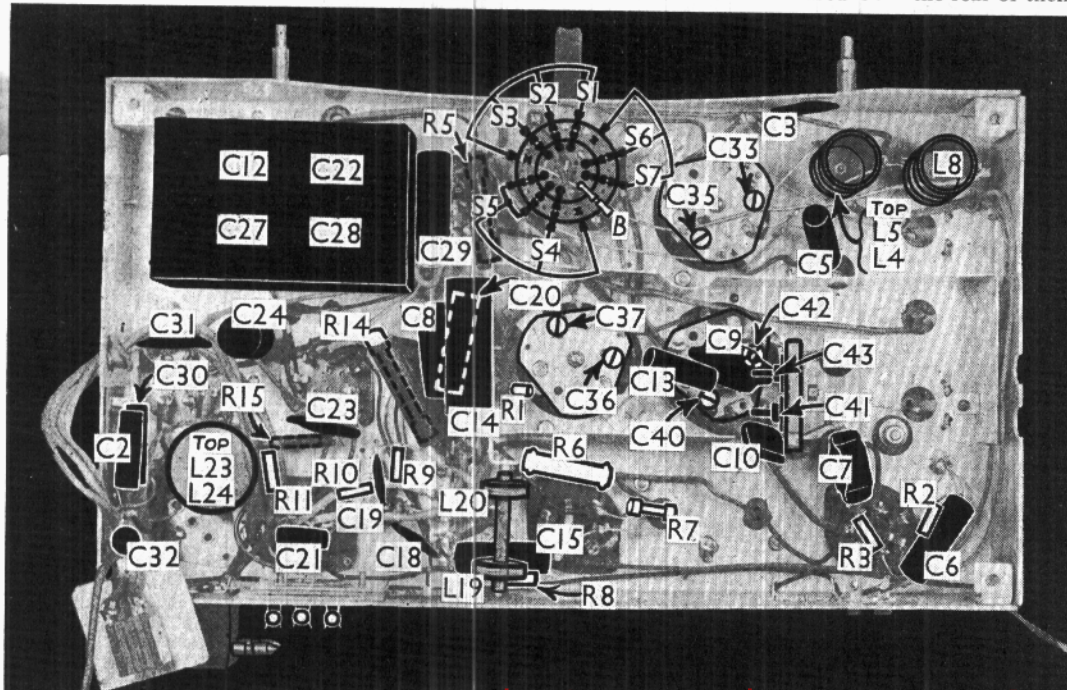
**Coils.**—L1-L3; L6, L7; L9-L14 and the I.F. transformers L15, L16 and L17, L18 are in five screened units on the chassis deck. Some of these units contain extra components, which are indicated in our plan chassis view. The I.F. trimmers are reached through holes at the rear of their respective cans.

L4, L5 is on an unscreened tubular unit beneath the chassis, L5 being the thick wire winding. L8 is on a separate tubular former, also beneath the chassis, as are the I.F. chokes L19, L20 and the filter chokes L23, L24. L22 is on the chassis deck.

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

**Fuses.**—There are three of these, mounted in clips at the rear of the

*Continued overleaf*



Under-chassis view. Note the single switch unit, with the individual switches identified.

**MARCONIPHONE 382—Continued**

chassis, one being a spare. They are glass tubular types, 1½ in. long, rated at 1.25 A and coded with a yellow spot (E.M.I. Part No. 19850A).

**External Speaker.**—No provision is made for this. It should be noted that the output transformer secondary is connected to chassis, which may be live, so that it is not safe to connect a low resistance external speaker.

**Earthing Arrangements.**—These have been somewhat simplified in our circuit diagram, but the full arrangements are as follows. The earth socket is split, and one side of it goes to the junction of C2 and C30, so that when the earth plug is inserted, the chassis is earthed for R.F. via the blocking condenser C2.

To the other side of the split earth socket is connected a lead which emerges from the left-hand rear corner of the chassis, and goes to a small bracket on the inside of the cabinet. To this is also connected a lead from the metal speaker grille and another one from the metal plate carrying the mains switches.

Thus when the earth plug is inserted, the speaker grille and knob and escutcheon of the mains switch go to true earth.

The speaker frame, on the other hand, is connected to one side of the speech coil, which is connected to chassis because one side of T1 secondary is connected thereto.

**Condensers C12, C22, C27, C28.**—These are four dry electrolytics in a single unit beneath the chassis. The black lead is the common negative of C12, C22 and C28, while the brown lead is the negative of C27. The positive leads are: blue, C22 (2µF); green, C12 (4 µF); yellow, C28 (12µF); red, C27 (12 µF).

**Trimmers.**—All except the I.F. trimmers are adjustable from beneath the chassis, the positions of the adjusting screws beneath the coil units being indicated in our under-chassis view. C41 and C43 are mounted on a unit at right angles to the chassis deck.

**Resistance R13.**—Note that this is in series with the lead to the top cap of V4, and is fitted close up to the connector.

**Chassis Divergencies.**—R2 and R8 in our chassis are 230 O, not 150 O, as shown by the makers. In some chassis C31 may not be included. C13 in our chassis is 0.01 µF, not 0.1 µF as shown by the makers. In connection with L1, the resistance value is 8.5 O, not 14 O as shown in the makers' manual.

**Radiogram Modifications.**—The model 392 and 395 radiograms have a similar chassis, but with some additions.

The pick-up is of the low resistance type (25 O) and is fed to the input of V4 via a step-up iron cored transformer located beneath the chassis, at the rear. This has a primary of 30 O and a secondary of 1,750 O. Across the secondary is a 0.0005 µF fixed condenser. One side of the secondary goes to chassis, and the other to one of the outer contacts of a Q.M.B. single-pole changeover radiogram switch. The junction between C20 and the top of R12 is broken, and the top of R12 is taken to the centre contact of this switch, the other outer contact going to the free end of C20. The pick-up lead screening goes to chassis.

External speaker sockets are provided, with a 50 O resistance across them. The external speaker should have an impedance of 5 O. A 3-point switch is fitted to enable internal, external or both speakers to be used. Incidentally, the internal speaker speech coil and frame does not go to chassis, as in the table model, but to true earth.

The gramophone motor is designed for 35 V, and a dropping resistance of 1,320 O, shunted by a 0.5 µF condenser, is in series with it. There are also two chokes (on a single former) in series with the leads from the motor, the dropping resistance and the automatic brake-switch to the supply, which is picked up between chassis and the junction of L24 and C32. The motor frame and brake-switch casing go to earth.

**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Switch set to M.W., turn tone control fully anti-clockwise, advance volume control fully, and turn gang condenser to minimum. Connect signal generator to top cap of V1 via a 0.1 µF condenser, and chassis. If generator is earthed, include a 0.1 µF condenser also in series with the lead to chassis.

Feed in a 465 KC/S signal, and adjust C44, C45, C46 and C47, in that order, for maximum output. Repeat this.

**R.F. and Oscillator Stages.**—M.W.—Connect signal generator to A and E sockets, via a dummy aerial, feed in a 200 m. signal, and tune the set to it. Adjust C36, then C33 for maximum output. Feed in a 550 m. signal, tune to 550 m. on scale, and adjust C41, rocking the gang for optimum results. Repeat these operations. Feed in a 350 m. signal, tune it in, and set the pointer to indicate 350 m. accurately.

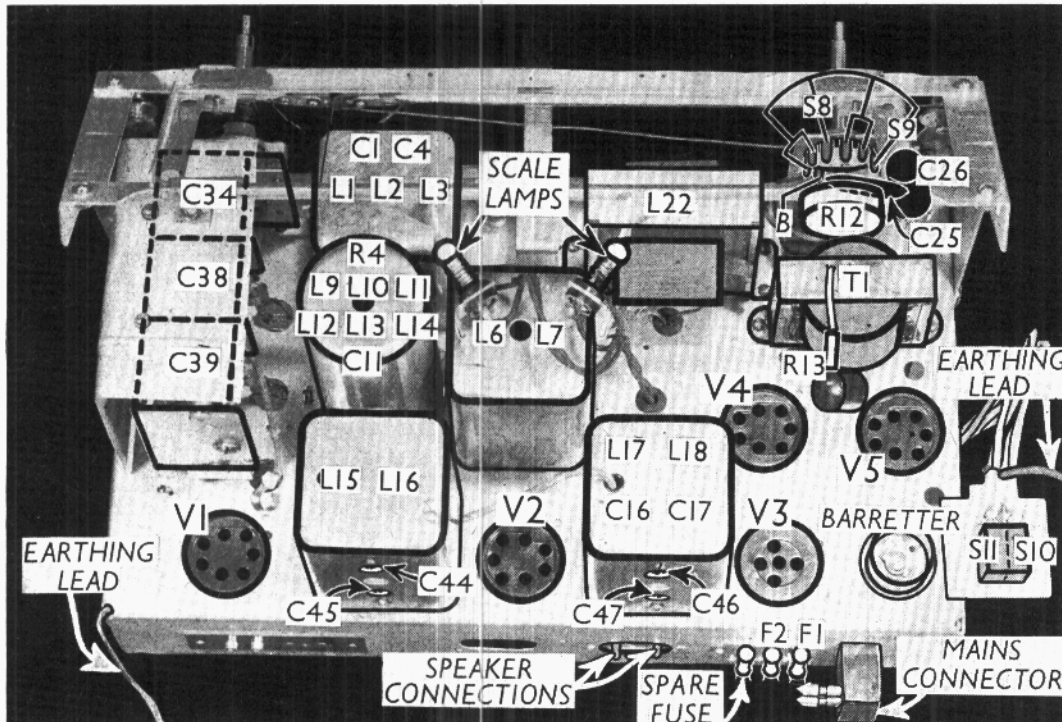
**L.W.**—Switch set to L.W., feed in a 800 m. signal, tune to 800 m. on scale, and adjust C42 and C37 for maximum output. Feed in a 1,950 m. signal, tune to 1,950 m. on scale, and adjust C43 for maximum output, rocking the gang for optimum results. Repeat these operations.

**S.W.**—Switch set to S.W., connect signal generator to A and E sockets, using a 400 O resistance in series with the aerial connection.

Feed in a 16.8 m. signal, tune to 16.8 m. on scale and adjust C40 for maximum output.

Feed in a 20 m. signal, tune it in, and adjust C35 for maximum output, rocking the gang for optimum results.

Feed in a 50 m. signal, tune it in, and adjust the inductance of L5 for maximum output by moving the loop of wire inside the L4, L5 coil former towards or away from the chassis. Repeat these operations.



Plan view of the chassis. The tone control switches, S8, S9 are indicated. Note R13 in series with the V4 top cap connector.

For more information remember