

NUMBER EIGHTY - FOUR

'TRADER' SERVICE SHEETS

COMPONENTS AND VALUES

MARCONIPHONE 279

5-VALVE (Plus Rectifier) A.C. TRANSPORTABLE

ATETRODE frequency changer is used in the Marconiphone 279 5-valve (plus rectifier) A.C. superhet. It is a transportable model with a self-contained frame aerial and is suitable for mains of 200-250 V, 50-100 c.p.s.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, L2, C29** to initial variable-mu tetrode signal frequency amplifier (**V1, Marconi metallised VMS4B**). **C30** is a solid dielectric variable condenser operating as trimmer.

Tuned-secondary transformer coupling by **L3, L4, L5, C32** to tetrode frequency changer (**V2, Marconi MS4B**) operating with reaction coils in cathode circuit.

Oscillator tuning coils **L8, L9** tuned by **C34**; tracking by fixed condenser **C9**; reaction coils **L6, L7**.

One variable-mu tetrode intermediate frequency amplifier (**V3, Marconi metallised VMS4B**) operating with tuned-primary tuned-secondary transformer couplings **L10, L11** and **L12, L13**.

Intermediate frequency 123-127 KC/S. Moving-iron tuning indicator **T.I.** in **V3** anode H.T. feed circuit.

Diode second detector forms part of

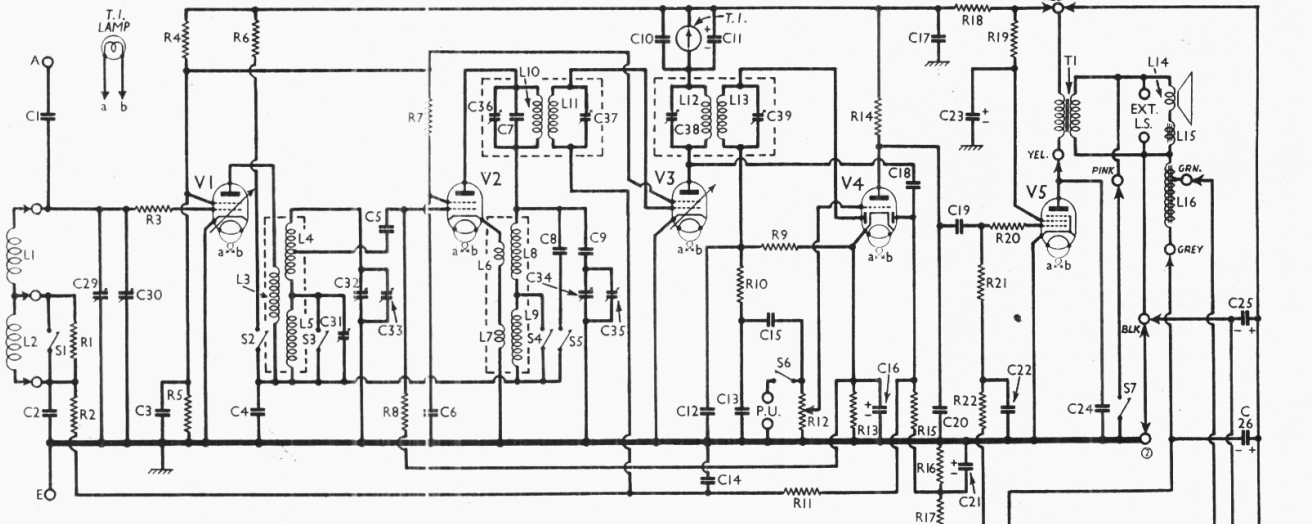
load resistance **R9** and passed via I.F. filter **R10, C12, C13**, coupling condenser **C15**, and manual volume control **R12** to triode section of **V4** which operates as L.F. amplifier. Provision for connection of gramophone pick-up across volume control by switch **S6**. On gram. switch **S2** mutes radio by breaking anode feed circuit of **V1** and **V2**.

Resistance-capacity coupling by **R14, C19** and **R21** between **V4** and output pentode (**V5, Marconi Catkin MPT4**), which obtains its G.B. potential from tapping on speaker field winding **L16**. Tone correction in anode circuit by fixed condenser **C24**. Provision for connection of low-impedance external speaker across secondary of internal speaker transformer **T1**. Switch **S7** short-circuits secondary between positions of wave-change and gram. switches.

H.T. current is supplied by I.H.C. full-wave rectifying valve (**V6, Marconi MU12**). Smoothing by speaker field winding **L16** in H.T. negative line and dry electrolytic condensers **C25, C26**. Hum control by variable potentiometer across heater secondary of mains transformer **T2**. H.F. by-passing in mains input circuit by buffer condensers **C27, C28**.

	Condensers	Values (μF)
C1	External aerial coupling ..	0.0005
C2	V1 cont. grid decoupling ..	0.1
C3	V1 and V3 S.G.'s by-pass ..	0.2
C4	V1 and V2 anodes decoupling ..	0.4
C5	V2 cont. grid condenser ..	0.0001
C6	V2 S.G. by-pass ..	0.2
C7	1st I.F. trans. pri. tuning (part) ..	0.0001
C8	Osc. L.W. trimmer ..	0.00015
C9	Osc. tracker ..	0.0017
C10		0.1
C11*	V3 anode decoupling ..	10.0
C12		0.0002
C13	I.F. by-passes ..	0.0002
C14	A.V.C. line decoupling ..	0.1
C15	L.F. coupling to V4 triode ..	0.1
C16*	V4 cathode by-pass ..	25.0
C17	V1, V2, V3 and V4 H.T. smoothing ..	2.0
C18	Coupling to V4 A.V.C. diode ..	0.0002
C19	L.F. coupling to V5 ..	0.1
C20	V4 anode I.F. by-pass ..	0.001
C21*	A.V.C. delay pot. div. by-pass ..	25.0
C22	V5 cont. grid decoupling ..	0.25
C23*	V5 aux. grid by-pass ..	4.0
C24	Tone corrector ..	0.003
C25*	H.T. smoothing ..	4.0
C26*		8.0
C27	Mains H.F. by-passes ..	0.002
C28		0.002
C29†	Frame aerial tuning ..	—
C30†	Frame aerial trimmer ..	0.0003
C31†	H.F. trans. L.W. trimmer ..	0.00007
C32†	H.F. trans. tuning ..	—
C33†	H.F. trans. main trimmer ..	—
C34†	Oscillator tuning ..	—
C35†	Oscillator main trimmer ..	—
C36†	1st I.F. trans. pri. tuning (part) ..	—
C37†	1st I.F. trans. sec. tuning ..	—
C38†	2nd I.F. trans. pri. tuning ..	—
C39†	2nd I.F. trans. sec. tuning ..	—

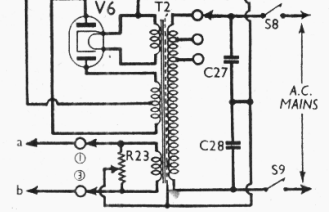
* Electrolytic. † Variable. ‡ Pre-set.



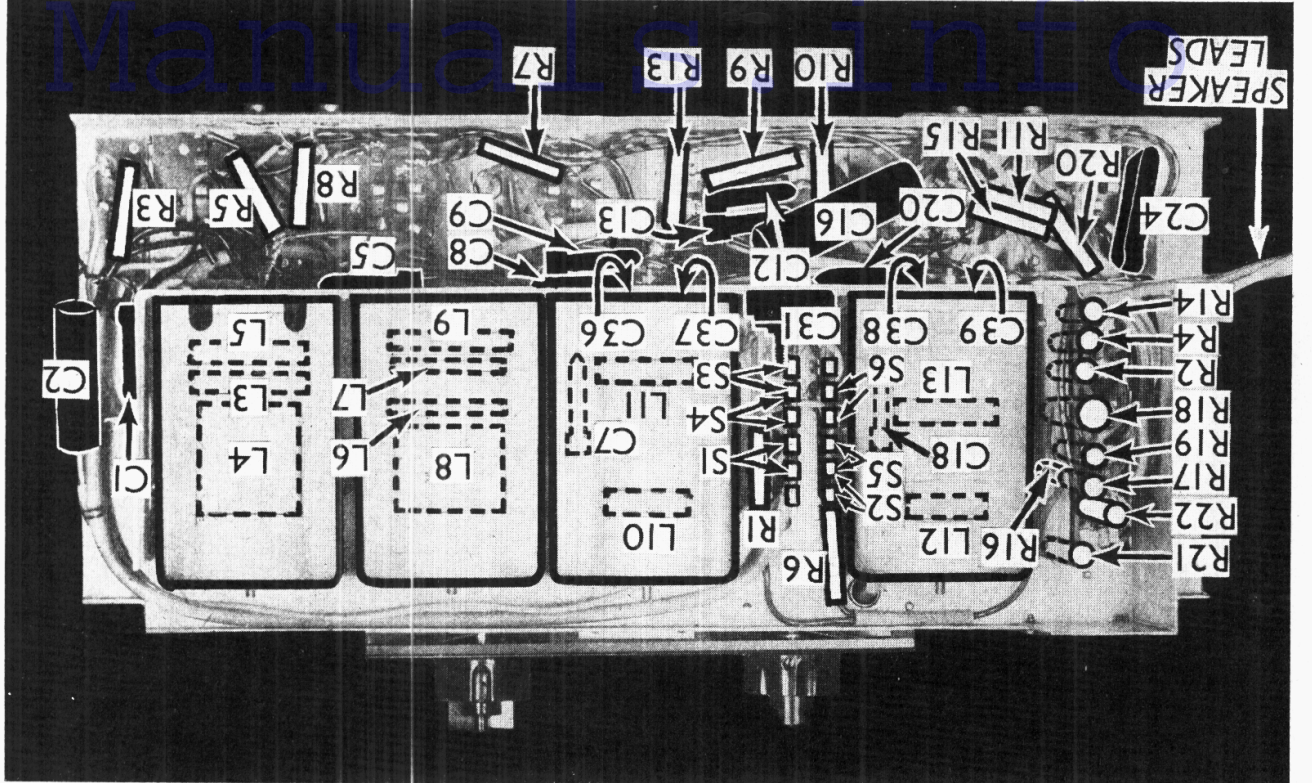
double diode triode (**V4, Marconi metallised MHD4**). Second diode, fed from **V3** anode by condenser **C18**, provides D.C. potential which is developed across load resistance **R15** and fed back through decoupling circuit **R11, C14** as G.B. to H.F. and I.F. valves, giving automatic volume control. Delay voltage is obtained from potential divider **R16, R17** across section of speaker field **L16**.

Audio-frequency component in output from **V4** rectifier diode is developed across

Circuit diagram of the Marconiphone 279 transportable. Note that a tetrode frequency changer is employed. The colour coding for the connections between chassis, speaker and power pack is shown.



Under-chassis view. The screen over the lower portion has been removed. The approximate positions of the coils in the various units are indicated, while the switch contacts are also shown. Note that two of these are blank.



(Continued overleaf)

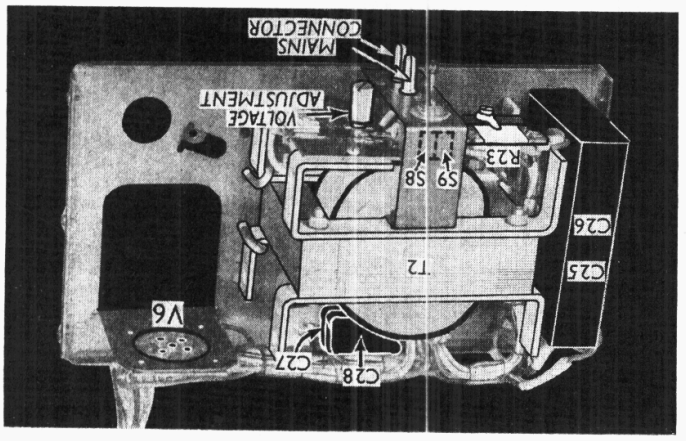
When replacing, note that black lead from chassis should go to middle terminal on strip in centre of chassis, and do not forget to replace metal strips between chassis fixing bolts and fillets. To free the chassis entirely, disconnect the leads from the speaker transformer panel (screw terminals). The panel is coded so that there will be no difficulty in replacing, except that in our chassis green/yellow lead is taken to terminal marked grey and red/yellow lead goes to terminal marked yellow. Remove the four round-head bolts (with washers) holding unit to cabinet bottom, heads underneath cabinet. Remove leads to speaker and chassis terminal strip and free them from cleat on side of cabinet. The unit can now be withdrawn.

Removing Power Unit.—Remove the four round-head bolts (with washers) from terminal strip in centre of chassis. Withdraw the four bolts (with lock washers) holding chassis to fillets at side of cabinet. Chassis can now be withdrawn to extent of speaker leads, which is sufficient for normal purposes.

DISMANTLING THE SET

Other Components (contd.)		Values (ohms)
T2	Mains trans. (Pt. total)	28.0
	Heater sec. sec.	0.1
	H.T. sec.	0.1
S1	Wave-band switches	540.0
S3-S5	Radio muting switches (gram)	—
S6	Gram, pick-up switch	—
S7	Speaker muting switch	—
S8, S9	Mains switches	—

Other Components		Values (ohms)
L1	Frame aerial windings	2.0
L2	H.F. transformer primary coil	20.0
L3	H.F. transformer secondary coils	20.0
L4	H.F. trans. secondary coils	5.0
L5	Oscillator reaction coils total	15.0
L6	Oscillator reaction coils	1.0
L7	Oscillator tuning coils	3.5
L8	1st I.F. trans. (Sec.)	7.0
L9	1st I.F. trans. (Pri.)	65.0
L10	2nd I.F. trans. (Sec.)	95.0
L11	2nd I.F. trans. (Pri.)	95.0
L12	Hum neutralising coil	75.0
L13	Hum neutralising coil	95.0
L14	Speaker speech coil	75.0
L15	Hum neutralising coil	8.0
L16	Speaker field winding, total	2.250
L17	Tuning indicator meter	3,500.0
L18	Speaker input trans. (Sec.)	750.0
L19	Speaker input trans. (Pri.)	2.0



The power pack with its cover removed. R23 is the variable hum control.

Resistances		Values (ohms)
R1	L.W. frame damping	35,000
R2	V1 coil, grid decoupling	1,000,000
R3	V1 coil, grid stabiliser	1,000
R4	V1, V2 and V3 S.G.'s, H.T. potential divider	23,000
R5	V1, V2 and V3 S.G.'s, H.T. potential divider	23,000
R6	V1 and V2 anodes decoupling	1,000
R7	V2 S.G., H.T. feed	100,000
R8	V2 grid resistance	500,000
R9	V4 signal diode load	500,000
R10	V2 grid resistance	500,000
R11	A.V.C. line decoupling	500,000
R12	Manual volume control	250,000
R13	V4 G.B. resistance	1,000
R14	V4 A.V.C. diode load	50,000
R15	V4 A.V.C. diode load	50,000
R16	A.V.C. delay potential divider	100,000
R17	V1, V2, V3 and V4 H.T. smoothing	10,000
R18	V5 aux. grid H.T. feed	5,000
R19	V5 grid I.F. stopper	230,000
R20	V5 grid I.F. stopper	230,000
R21	V5 grid resistance	500,000
R22	V5 coil, grid decoupling	230,000
R23	Hum control	48

MARCONIPHONE 279 (continued)

Removing Speaker.—To remove speaker, first remove chassis and power unit, as described above. Then remove nuts and lock washers from bolts holding speaker to sub-baffle. When replacing, note that there are washers between speaker and sub-baffle.

Removing Frame Aerials.—Each frame aerial is held in place by screws passing through the four brackets on the frame. That in the lid has four screws, nuts and lock washers, while that in the cabinet has four round-head wood screws.

VALVE ANALYSIS

Valve voltages and currents given in the table below were measured with the receiver operating on A.C. mains of 230 V, using the 211-230 V tap. There was no signal input as the frame aerials were disconnected and the three terminals on the chassis strip were shorted together. The volume control was at maximum and the receiver was tuned to the highest wavelength on the M.W. band.

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 VMS4B	160	3.0	70	0.9
V2 MS4B	160	0.6	30	0.3
V3 VMS4B	150	3.2	70	0.7
V4 MHD4	90	1.5	—	—
V5 MPT4	260	37.0	250	7.1
V6 MU12	350*	—	—	—

* Each anode, A.C.

GENERAL NOTES

Switches.—S1-S6 are the waveband and pick-up switches, in a single unit. Its position is indicated by dotted lines in the plan chassis view, while in the under-chassis view the individual switch

tags are shown. Note that the bottom left and top right tags are blank, while certain of the switches have one tag in common. The switch positions for the various settings are given in the table below, O indicating open, and C, closed.

Switch	M.W.	L.W.	Gram.
S1	C	O	O
S2	C	C	O
S3	C	O	C
S4	C	O	C
S5	O	O	C
S6	O	O	C

S7 is the muting switch, which closes momentarily between each position of the main switch unit, but is open in each of these positions.

S8 and S9 are the Q.M.B. mains switches, ganged in a single unit, indicated in the illustration of the power pack.

Coils.—L1 and L2 form the frame aerial, terminals being provided on the chassis for their connection. The remaining coils are in four screened units beneath the chassis. The screens are easily removable by undoing one nut on each. The approximate positions of the various coils are shown by dotted lines in our under-chassis view. Note that the first I.F. transformer, L10, L11, also contains C7, while the second contains C18. The I.F. trimmers are at the base of their respective transformer units, and are adjustable through holes in the vertical partition carrying the coils.

T.I. Lamp.—This is an Osram M.E.S. type, rated at 6.2 V, 0.3 A.

Tuning Indicator.—This is of the moving-iron shutter type, which throws a shadow of varying width on the centre of a double-ended arrow of light.

External Speaker.—This should be of the low resistance (9 O) type, and should be connected to the "Ext. L.S." terminals on the speaker transformer.

Condenser Block C3, C6, C14, C17, C19.—This block, indicated in our plan chassis view, has its leads projecting downwards through a hole in the chassis deck. The leads are colour-coded, and also numbered. Condensers C3, C6, C14 and C17 each have one common connection, marked "E" (black lead). The other connections are: C3, "2" (yellow-red lead); C6, "2" (yellow-red lead); C14, "3" (green lead); C17, "1" (red lead). Note that C3 and C6 have the same coloured leads, which emerge together. C19 has the two leads "4" (yellow) and "5" (white).

Condenser C23.—This is a dry electrolytic, mounted above the condenser block.

Resistances R16, R17.—These form a potential divider, and as indicated in our under-chassis view, R16 is beneath R17.

Power Pack.—This is a separate unit in a metal case which has been removed in our illustration (6 screws at base).

Condensers C25, C26.—These are two dry electrolytics inside the power pack. They have separate sets of positive and negative leads. The upper pair belong to C26 (8μF), and the lower pair to C25 (4μF).

CIRCUIT ALIGNMENT

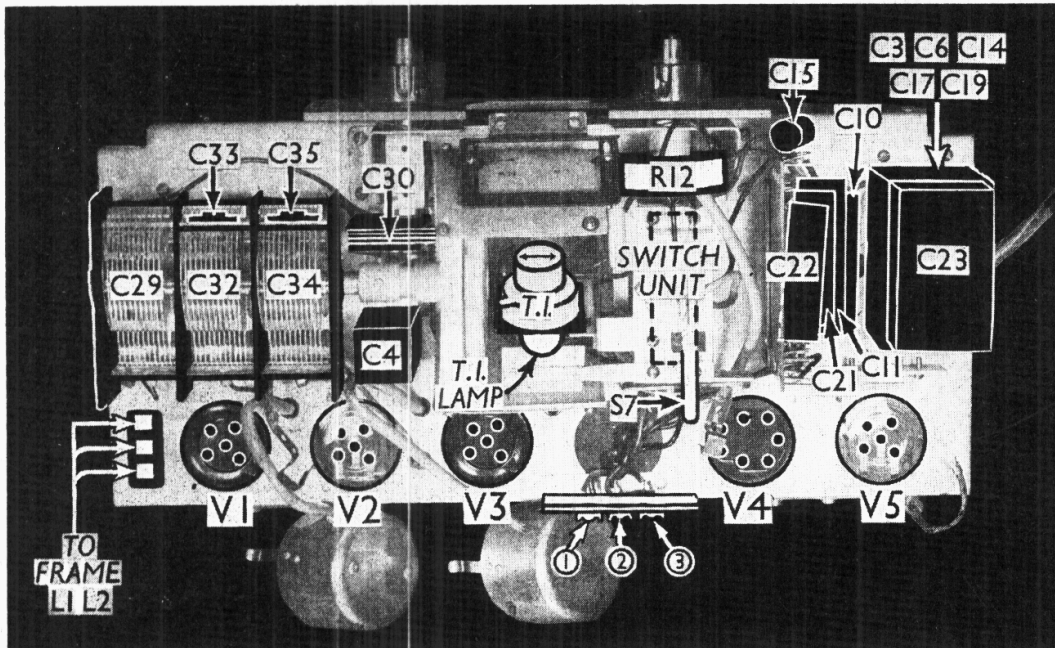
Trimming I.F. Transformers.—Short-circuit outer two frame terminals, and earth cathode of V2 to chassis. Turn gang condenser to minimum and couple their modulated oscillator to V2. The output meter may be a 0-2 A.C. voltmeter across "Ext. L.S." terminals. Do not use tuning indicator of set. Remove plate covering underside of valve-deck.

Trim C39 on 127 KC/S, C38 and C37 on 123 KC/S and C36 on 127 KC/S. Repeat operations in same order. Final resonance curve should now be substantially flat from 123-127 KC/S.

Trimming H.F. and Oscillator Circuits.—Great accuracy must be observed, otherwise instability may occur. Disconnect

frame aerials and couple modulated oscillator to the outer two terminals. Tune receiver and oscillator to 220 m. exactly. Screw up C33 and C35 to maximum. Unscrew C35 for maximum deflection. Two positions for maximum deflection must be found, and that nearest the fully unscrewed position used. Manipulate the gang condenser until this condition is obtained. Slowly unscrew C33 for maximum. Two settings must be found, and that chosen which is nearest the fully screwed-up position. Go over settings of C35 and C33 again.

Now set receiver and oscillator to L.W., and tune both to 1,400 m Adjust C31 for maximum.



Plan view of the chassis. The connections of the condenser block are given in Col. 3. The figures 1, 2 and 3 in circles refer to points similarly marked in the circuit diagram.