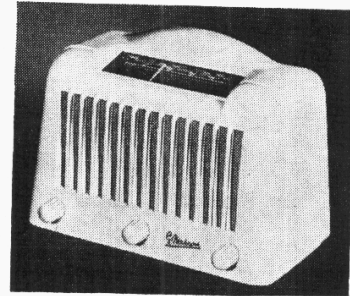


"TRADER" SERVICE SHEET
920

MARCONIPHONE T18DA

"Companion" A.C./D.C. Superhet



The Marconiphone T18DA

ANOTHER member of the "Companion" series, the Marconiphone T18DA is a compact 4-valve (plus rectifier) 2-band table superhet designed to operate from A.C. or D.C. mains of 195-255 V, 25-100 c/s in the case of A.C. The waveband ranges are 197.7-566 m and 895.5-2,000 m.

The 142 range of B8A-based valves introduced in this model includes a single-diode-R.F. pentode, of which two are used.

Release date and original price: April, 1949; £12 19s. 6d. plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by **L1, C28** (M.W.), with the addition of loading coil **L2** on L.W., precedes a triode hexode valve (**V1, Marconi X142**) operating as frequency changer with internal coupling. Provision is made for the connection of an external aerial, which is "bottom" coupled by the capacitive potential divider **C1, C2** to the aerial tuning circuit. Resistors **R1, R2** prevent modulation hum.

Triode oscillator grid coils **L3** (M.W.), **L4** (L.W.) are tuned by **C29**, with parallel trimming by **C30** (M.W.), **C11, C31** (L.W.), and series tracking by **C9** (M.W.), **C10** (L.W.). Reaction coupling by **L5** (M.W.) and **C10** (L.W.).

Second valve (**V2, Marconi WD142**) is a single diode variable-mu R.F. pentode operating as intermediate frequency amplifier and A.G.C. rectifier. The pentode

section of **V2** is tuned-transformer coupled by **C6, L6, L7, C7** and **C14, L8, L9, C15**. Intermediate frequency 465 kc/s.

The diode section of **V2**, fed from **L9** via **C16**, provides D.C. potential which is developed across load resistor **R9** and fed (Continued col. 1 overleaf)

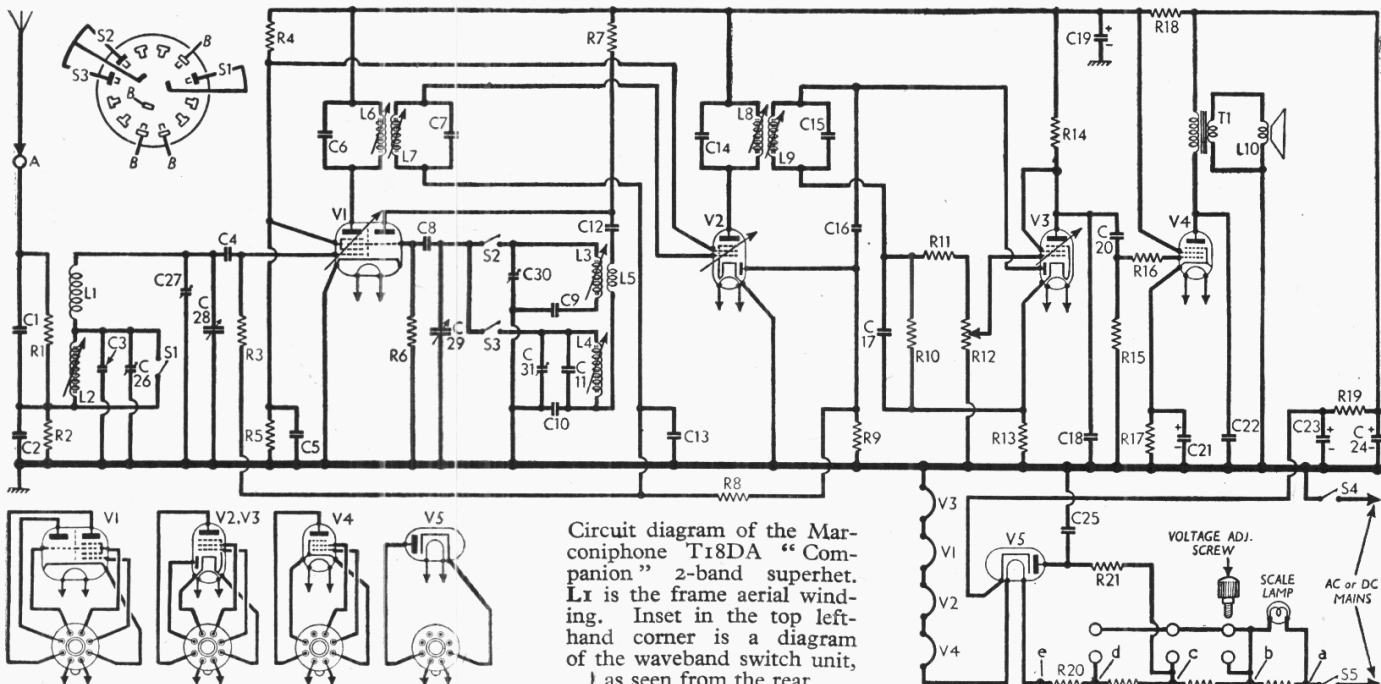
COMPONENTS AND VALUES

CAPACITORS		Values (μF)	Locations
C1	} Aerial coupling ...	0.01	L4
C2		0.005	L3
C3	Aerial L.W. trim ...	0.00015	M4
C4	V1 hex C.G. ...	0.0001	M5
C5	S.G.'s decoupling ...	0.05	L5
C6	} 1st I.F. trans. tun. {	0.0001	B2
C7		0.001	B2
C8	V1 osc. C.G. ...	0.0001	L4
C9	Osc. M.W. tracker	0.00045	L5
C10	Osc. L.W. tracker	0.0002	K4
C11	Osc. L.W. trim ...	0.0001	L3
C12	Osc. anode coup. ...	0.0005	L4
C13	A.G.C. decoup. ...	0.05	K5
C14	} 2nd I.F. trans. tun. {	0.0001	C2
C15		0.00016	C2
C16	A.G.C. coupling ...	0.00005	H5
C17	I.F. by-passes ...	0.0001	H5
C18	I.F. by-passes ...	0.0005	G5
C19*	H.T. smoothing ...	16.0	J4
C20	A.F. coupling ...	0.02	G4
C21*	V4 cath. by-pass ...	25.0	G4
C22	Tone corrector ...	0.02	F5
C23*	J4	16.0	J4
C24*	H.T. smoothing ...	32.0	J3
C25	V5 R.F. by-pass ...	0.01	E4
C26†	Aerial L.W. trim ...	—	L3
C27†	Aerial M.W. trim ...	—	M4
C28†	Aerial tuning ...	—	A1
C29†	Oscillator tuning ...	—	B1
C30†	Osc. M.W. trim ...	—	M4
C31†	Osc. L.W. trim ...	—	K3

RESISTORS		Values (ohms)	Locations
R1	} Aerial coupling ...	1,000,000	L3
R2		22,000	L3
R3	V1 hex C.G. ...	470,000	L5
R4	} S.G.'s H.T. poten- tial divider ... {	22,000	K4
R5		47,000	K5
R6	V1 osc. C.G. ...	33,000	M5
R7	Osc. anode load ...	33,000	L5
R8	A.G.C. decoup. ...	1,500,000	J5
R9	A.G.C. diode load ...	1,500,000	J5
R10	Sig. diode load ...	470,000	H5
R11	I.F. stopper ...	100,000	H5
R12	Volume control ...	2,000,000	E3
R13	V3 G.B. resistor ...	1,000	G5
R14	V3 G.B. resistor ...	100,000	G5
R15	V4 C.G. resistor ...	470,000	F4
R16	V4 C.G. stopper ...	10,000	F5
R17	V4 G.B. resistor ...	220	G4
R18	} H.T. smoothing ... {	3,400†	J4
R19		resistors ...	110‡
R20	Heater ballast ...	1,230*	D1
R21	V5 surge limiter ...	100	G3

* Electrolytic. † Variable. ‡ Pre-set.
§ Two 16μF sections in parallel.

* Tapped at 950Ω + 150Ω + 80Ω + 50Ω from V5 heater. † Two 6,800Ω units in parallel. ‡ Two 220Ω units in parallel.



Circuit diagram of the Marconiphone T18DA "Companion" 2-band superhet. L1 is the frame aerial winding. Inset in the top left-hand corner is a diagram of the waveband switch unit, † as seen from the rear.

Radio

at the four corners of the chassis and lift the chassis and speaker out of the carrying case as a single unit.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the manufacturers, whose receiver was switched to M.W. and was operating from A.C. mains of 230 V. Voltages were measured on appropriate ranges of a 500 ohms-per-volt meter, chassis being the negative connection. The total H.T. current is given as 55 mA.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 X142	153	2.0	67	1.9	—
	Oscillator				
V2 WD142	60	2.8	67	1.0	—
	153	2.5			
V3 WD142	39	1.0	39	0.03	1.1
V4 N142	215	33.0	153	6.0	9.1
V5 U142	225†	—	—	—	225

† A.C.

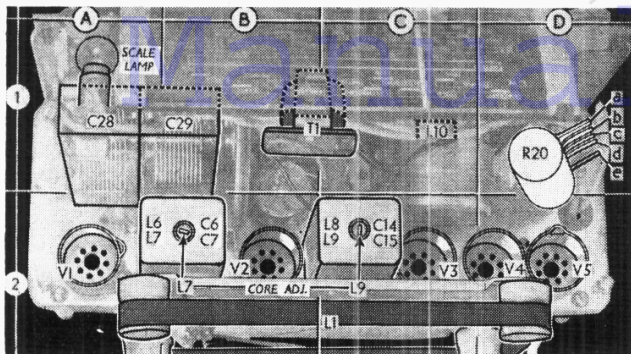
CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator (via an 0.1 μF capacitor in each lead) to control grid (pin 6) of V1 and chassis. Feed in a 465 kc/s (645.16 m) signal, and adjust the cores of L9, L8, L7, and L6 (location references C2, H5, B2, K5) for maximum output. Repeat these operations until no improvement results.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursor should coincide with the high wavelength ends of the two scales. It may be adjusted in position by sliding the cursor carriage along the drive cord, after freeing its clamping tongues. Transfer "live" signal generator lead and series capacitor to A socket, via a suitable dummy aerial.

M.W.—Turn gang to maximum capacitance, switch set to M.W., feed in a 566 m (530 kc/s) signal, and adjust the core of L3 (L4) for maximum output. Turn gang to minimum capacitance, feed in an 895.6 m (335 kc/s) signal, and adjust C30 (M4) for maximum output. Tune to 230 m (spot on scale), feed in a 230 m (1,304 kc/s) signal, and adjust C27 (M4) for maximum output. Repeat these operations until no improvement results.

L.W.—Switch set to L.W., turn gang to maximum capacitance, feed in a 2,000 m (150 kc/s) signal, and adjust the core of L4 (L3) for maximum output. Turn gang to minimum capacitance, feed in an 895.6 m (335 kc/s) signal, and adjust C31 (K8) for maximum output. Tune to 1,875 m (spot on scale), feed in a 1,875 m (160 kc/s) signal, and adjust the core of L2 (L4) for maximum output. Tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust C26 (L3) for maximum output.



Plan view of the chassis, showing the frame aerial winding L1 mounted at the rear. The connecting tags of the ballast resistor R20 are lettered to agree with those in the circuit diagram overleaf.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial ...	2.5	C2
L2	L.W. loading coil ...	11.0	L4
L3	Oscillator tuning coils	2.5	L4
L4		5.0	L4
L5	Osc. react. coil ...	1.0	L4
L6	1st I.F. trans. { Pri. Sec. }	7.0	B2
L7		7.0	B2
L8	2nd I.F. trans. { Pri. Sec. }	7.0	C2
L9		7.0	C2
L10	Speech coil ...	3.2	C1
T1	Speaker trans. { Pri. Sec. }	160.0	B1
S1-S3	W/band switches ...	0.5	L3
S4, S5	Mains sw., g'd R12	—	E3

Circuit Description—continued

back through a decoupling circuit R8, C13 as G.B. to F.C. and I.F. valves, giving automatic gain control.

Diode second detector is part of a second single diode variable-mu pentode valve (V3, Marconi WD142). Audio frequency component in rectified output is developed across load resistor R10 and fed via R11 and manual volume control R12 to control grid of triode-connected pentode section, which operates as A.F. amplifier. I.F. filtering by C17, R11 and C18 in diode and pentode anode circuits respectively.

Resistance-capacitance coupling by R14, C20, R15, via grid stopper R16, between V3 pentode section and pentode output valve (V4, Marconi N142), with fixed tone correction by C22 in V4 anode circuit.

H.T. current is supplied by I.H.C. half-wave rectifying valve (V5, Marconi U142) which, with D.C. mains, behaves as a low resistance. Smoothing by resistors R18, R19 and electrolytic capacitors C19, C23, C24. Valve heaters and ballast resistor R20, a section of which shunts the scale lamp, are connected in series across mains input. R.F. filtering by C25.

GENERAL NOTES

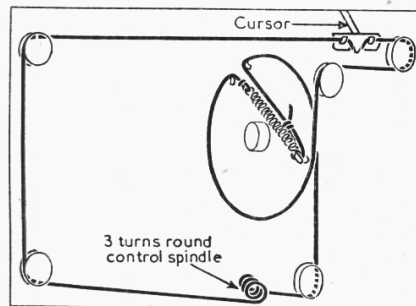
Switches.—S1-S3 are the waveband switches, ganged in a single rotary unit indicated in our under-chassis view and shown in detail in the diagram inset in the top left-hand corner of the circuit diagram overleaf, where it is drawn as seen from the rear of an inverted chassis. S1 and S2 close on M.W. (control knob anti-clockwise); S3 closes on L.W.

S4, S5 are the Q.M.B. mains switches, ganged with the volume control R12.

Scale Lamp.—This has a large clear spherical bulb and an M.E.S. base. It is rated at 6.2 V, 0.22 A, and is shunted by a 50 Ω section of R20.

Drive Cord Replacement.—Something less than four feet of high-grade plaited flax fishing line is required for the drive cord, suitable material

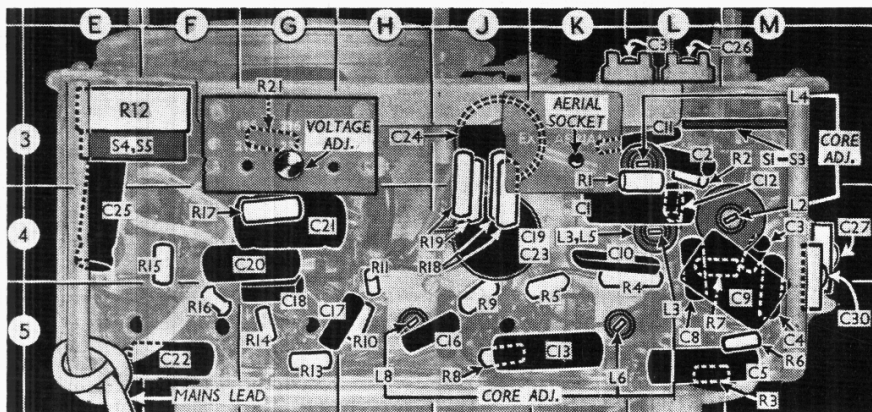
being available from E.M.I. Sales & Service, Ltd., Sheraton Works, Greenford, Middlesex. One end of the cord should be made into a loop, using a non-slip knot. Hook the loop to the anchor tag inside the gang drum as shown in the sketch below, then thread the rest of the cord through the hole in the gang drum groove, run a quarter-turn clockwise, and so on, following the sketch, and finally tie off to one end of the tension spring as short as possible inside the drum. Then engage the cord in the three claws in the cursor carriage, and adjust the latter's position, before hooking the spring to its anchorage.



Sketch of the tuning drive system. The gang drum is at a right-angle to the plane of the cord circuit

DISMANTLING THE SET

Removing Chassis.—Pull off the three control knobs, remove the four cheese-head screws (with washers) securing the fibreboard bottom cover, release the cheese-head captive screws



Under-chassis view. The external aerial socket and mains voltage adjustment are on two panels facing the underside of the cabinet. R18 and R19 each consist of two resistors connected in parallel.