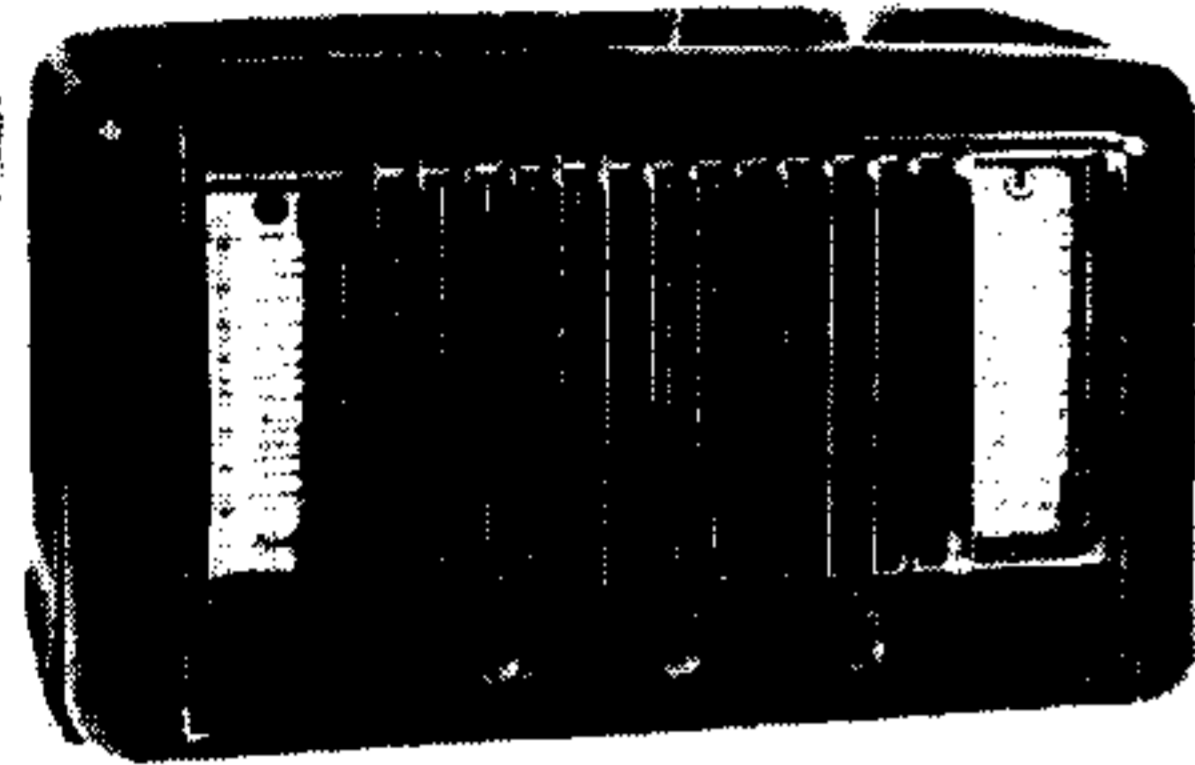


"TRADER" SERVICE SHEET
913

PILOT LITTLE MAESTRO MODEL 10 A.C./D.C.

COMPONENTS AND VALUES



THERE are two Pilot model 10 "Little Maestro" receivers: an A.C. version and an A.C./D.C. version. This *Service Sheet* covers the A.C./D.C. version only; the A.C. version is covered separately in *Service Sheet* 912.

The receiver is a 4-valve (plus rectifier) 2-band superhet designed to operate from A.C. or D.C. mains of 200-250 V without voltage adjustment. The waveband ranges are 200-550 m and 1,000-2,000 m. The plastic cabinet may be in walnut or coloured finishes.

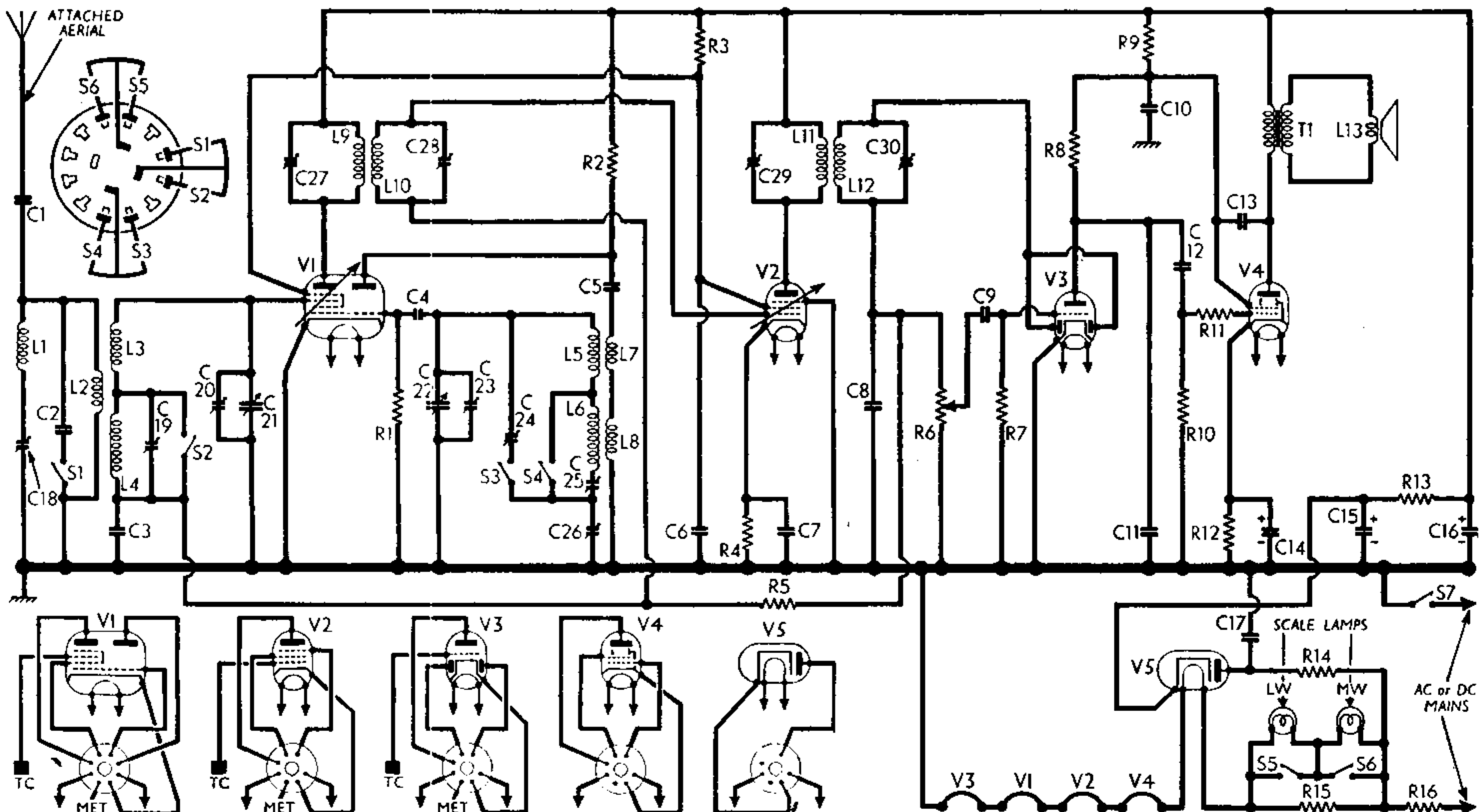
Release date and original price: April 1949; £10 13s. 6d. plus purchase tax. Coloured finishes 4s. 7d extra.

CAPACITORS			RESISTORS			
		Values (uF)	Locations		Values (ohms)	Locations
C1	Aerial series ...	0-0003	A1	R1	V1 osc. C.G. ...	33,000 J5
C2	Aerial L.W. shunt ...	0-0003	J3	R2	Osc. Anode load ...	22,000 J5
C3	A.G.C. decoup. ...	0-1	H4	R3	S.G.'s H.T. feed ...	33,000 G5
C4	V1 osc. C.G. ...	0-00006	A2	R4	V2 fixed G.B. ...	100 F5
C5	Osc. anode coup. ...	0-0001	A2	R5	A.G.C. decoup. ...	1,000,000 H4
C6	S.G.'s decoupling ...	0-1	J4	R6	Volume control ...	250,000 F3
C7	V2 cath. by-pass ...	0-05	F5	R7	V3 C.G. resistor ...	10,000,000 F4
C8	I.F. by-pass ...	0-0003	G3	R8	V3 triode load ...	270,000 F4
C9	A.F. coupling ...	0-002	G8	R9	H.T. feed decoup. ...	22,000 F5
C10	H.T. feed decoup. ...	0-25	H4	R10	V4 C.G. resistor ...	270,000 F5
C11	I.F. by-pass ...	0-0003	F4	R11	V4 C.G. stopper ...	4,700 F5
C12	A.F. coupling ...	0-01	F4	R12	V4 G.B. resistor ...	270 F5
C13	Tone corrector ...	0-01	F4	R13	H.T. smoothing ...	1,500 E5
C14*	V4 cath. by-pass ...	50-0	E4	R14	V5 surge limiter ...	100 E5
C15*	H.T. smoothing ...	18-0	E4	R15	Scale lamps shunt ...	100 J3
C16*		18-0	D1	R16	Heater ballast ...	830 B2
C17	Mains R.F. by-pass ...	0-05	E4			
C18†	I.F. filter tune ...	0-0001	A1			
C19†	Aerial L.W. trim ...	0-0001	A1			
C20†	Aerial M.W. trim ...	—	A1			
C21†	Aerial tuning ...	0-000483	A1			
C22†	Oscillator tuning ...	0-000483	A2			
C23†	Osc. M.W. trim ...	—	A2			
C24†	Osc. L.W. trim ...	0-0001	A2			
C25†	Osc. L.W. tracker ...	0-0003	H5			
C26†	Osc. M.W. tracker ...	0-0007	H5			
C27†	1st I.F. transformer ...	—	B2			
C28†		tuning ...	—	B2		
C29†	2nd I.F. trans- former tuning ...	—	G4			
C30†		—	G4			

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS			
		Approx. Values (ohms)	Locations
L1	I.F. filter coil ...	22-0	A1
L2	Aerial coup. coil ...	14-0	A1
L3	Aerial tuning coils ...	2-5	A1
L4		16-5	A1
L5	Oscillator tuning coils ...	3-0	A2
L6		6-5	A2
L7	Oscillator reaction coils, total ...	—	—
L8		3-0	A2

(Cont. col. 1 overleaf)



Circuit diagram of the Pilot Little Maestro Model 10 A.C./D.C. two-band superhet. Inset, in the top left-hand corner, is a diagram of the waveband switch unit, drawn as seen from the rear of an inverted chassis.

OTHER COMPONENTS (continued)	Approx. Values (ohms)	Locations	
L9 } 1st I.F. trans. { Pri.	10.0	B2	
L10 } { Sec.	10.0	B2	
L11 } 2nd I.F. trans. { Pri.	34.0	G4	
L12 } { Sec.	34.0	G4	
L13	Speech coil	2.5	
T1	Speaker trans. { Pri.	480.0	C1
	{ Sec.	0.6	
S1-S6	W band switches...	H3	
S7	Mains sw., g'd R6...	F3	

CIRCUIT DESCRIPTION

Input from attached aerial via series capacitor C1, is inductively coupled by L2 to single-tuned circuits L3, C21 (M.W.) and L3, L4, C21 (L.W.) which precede a triode hexode valve (V1, Brimar 12K8GT) operating as frequency changer with electron coupling. A filter circuit L1, C18 removes interfering signals at the intermediate frequency, and a fixed capacitor C2 is shunted across L2 on L.W. to prevent M.W. breakthrough.

Triode oscillator grid coils L5 (M.W.), L5, L6 (L.W.) are tuned by C22, with parallel trimming by C23 (M.W.), C24 (L.W.), and series tracking by C26 (M.W.) and C25, C26 (L.W.). Inductive reaction coupling from anode, via C5, by coils L7 (M.W.) and L7, L8 (L.W.).

Second valve (V2, Brimar 12K7GT) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C27, L9, L10, C28 and C29, L11, L12, C30.

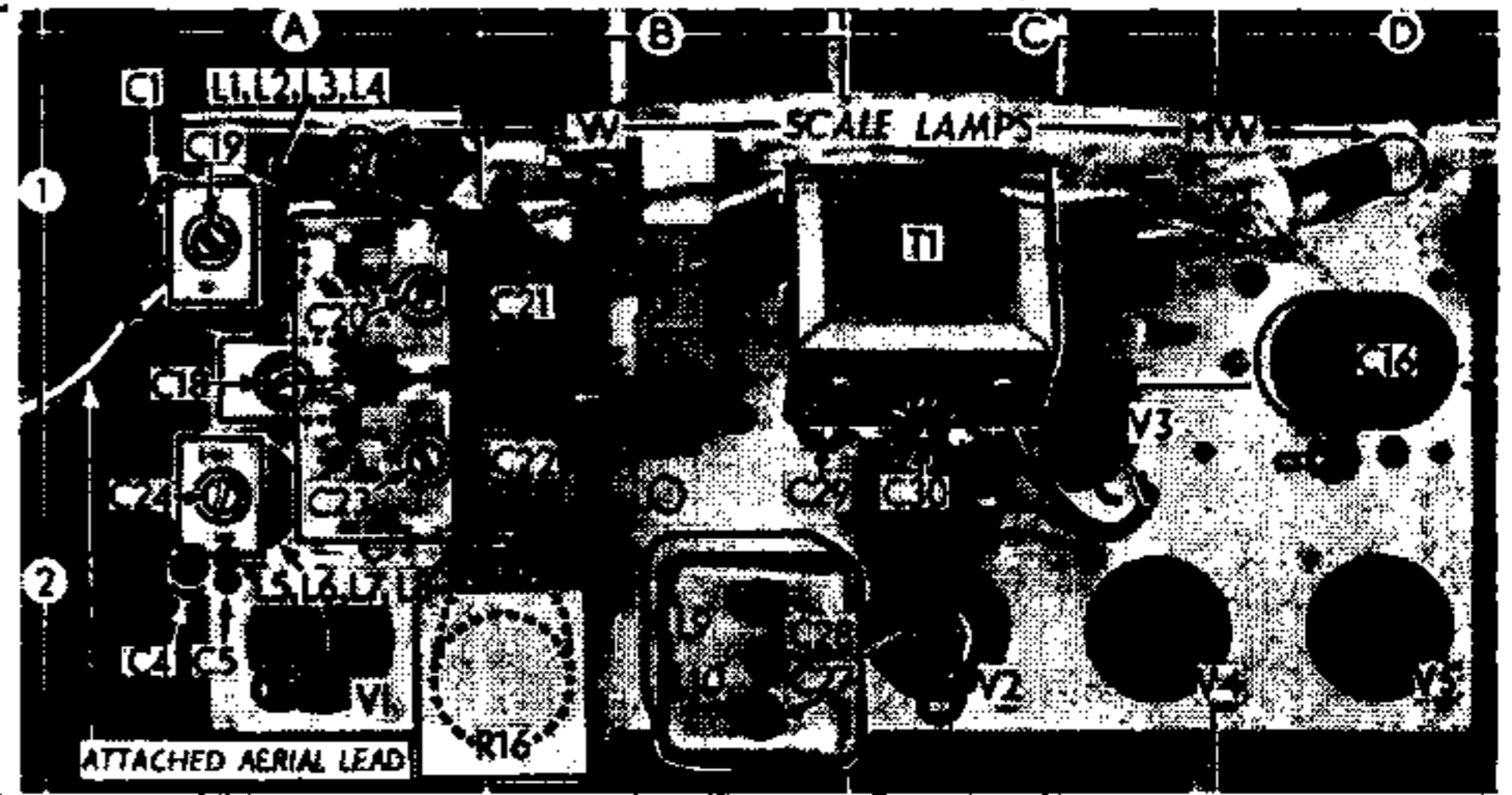
Intermediate frequency 451 kc/s.

Diode second detector is part of double diode triode valve (V3, Brimar 12Q7GT), the diode sections of which are wired in parallel. Audio frequency component in rectified output is developed across volume control R6, which is also the load resistor, and passed, via A.F. coupling capacitor C9 and C.G. resistor R7, to grid of triode section, which operates as A.F. amplifier. I.F. filtering by C8 and C11 in diode and triode anode circuits respectively.

The D.C. component developed across R6 is tapped off and fed back through a decoupling circuit R5, C3 as G.B. to F.C. and I.F. valves giving automatic gain control.

Resistance-capacitance coupling by R8, C12, R10, via grid stopper R11, between V3 triode and beam tetrode output valve

Plan view of the chassis, indicating the positions of all adjustments involved in circuit alignment, with the exception of those for trackers C25, C26, which are mounted on the rear chassis member. The attached aerial connecting tag is also identified.



(V4, Brimar 35L6GT), with fixed tone correction in tetrode anode circuit by C13.

When the receiver is operated from A.C. mains H.T. current is supplied by I.H.C. half-wave rectifying valve (V5, Brimar 35Z4GT), which behaves as a low resistance with D.C. mains. Smoothing by resistor R13 and electrolytic capacitors C15, C16. Mains R.F. filtering by C17.

Valve heaters, together with scale lamps and ballast resistor R16, are connected in series across mains input.

Drive Cord Replacement.—Forty inches of Nylon braided glass yarn is required for the tuning drive cord, which is run as shown in the sketch in col 2, where it is drawn as seen from the rear, neglecting obstructions, when the gang is at maximum capacitance.

Capacitors C21, C22.—These may have alternative values of 0.000474µF each, in some sets.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 225 V. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a Model 7 Avometer, except where otherwise indicated, chassis being the negative connection.

Valve	Anode		Screen		Cath.
	(V)	(mA)	(V)	(mA)	
V1 12K8GT	170	1.2	63	2.5	—
	Oscillator				
V2 12K7GT	100	3.3	63	1.1	0.08
	170	4.7			
V3 12Q7GT	38	0.3	—	—	—
V4 35L6GT	152	35.0	122	1.9	9.18
V5 35Z4GT	220†	—	—	—	240

† A.C. § 10 V meter range.

DISMANTLING THE SET

Removing Chassis.—Pull off the three control knobs, withdraw the four 4BA cheese-head chassis retaining screws from the underside of the cabinet, and slide out the chassis and speaker as a single unit.

When replacing, do not omit to cover the heads of the chassis retaining screws with a suitable insulating compound.

CIRCUIT ALIGNMENT

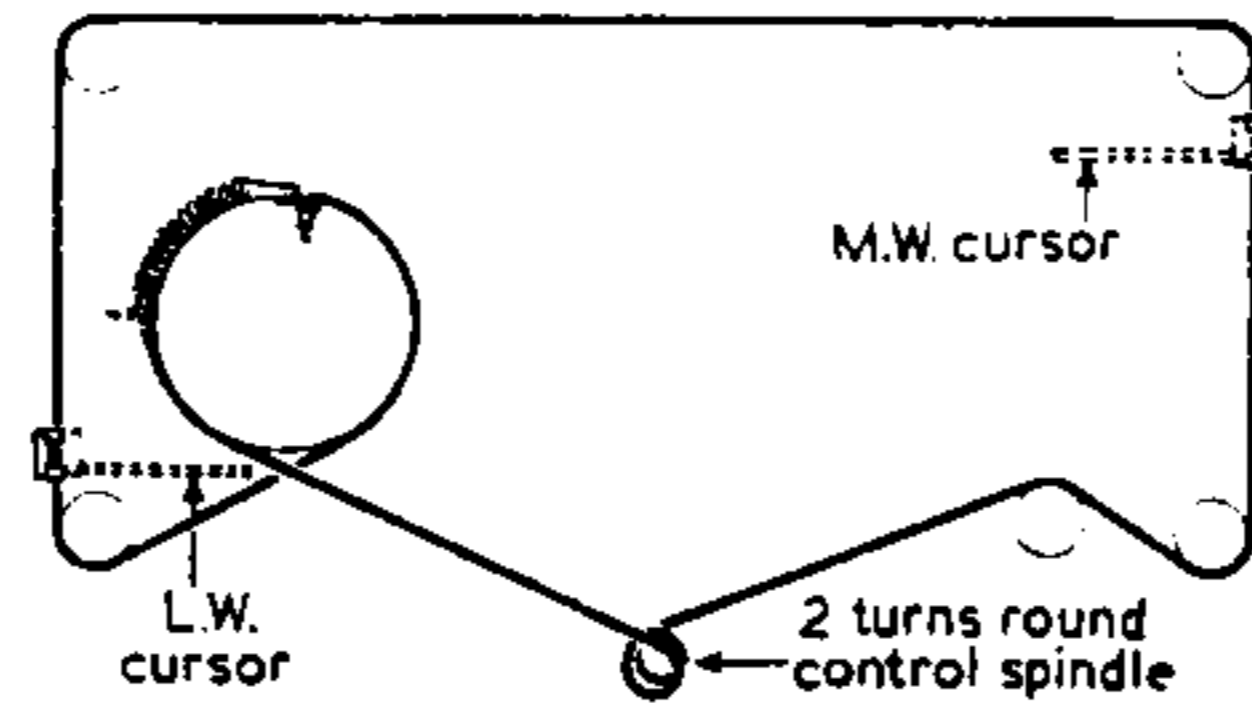
I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator (via an 0.1µF isolating capacitor in each lead) to control grid (top cap) of V1 and chassis, feed in a 451 kc/s (665.1 m) signal, and adjust C30, C29, C28, C27 (location references C2, B2) for maximum output, progressively attenuating the signal generator output as the circuits are aligned, to avoid A.G.C. action.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursors should coincide with the two black lines printed at the high-wavelength end of each scale. They may be adjusted in position by sliding the cursor carriages along the drive cord. Transfer "live" signal generator lead, with series capacitor, to attached aerial connecting tag on L1-L4 (A1).

M.W.—With set still switched to M.W., tune to 214.3 m on scale, feed in a 214.3 m (1,400 kc/s) signal, and adjust C23 (A2) and C20 (A1) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust C26 (H5) for maximum output. Repeat these operations until no improvement results.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust C24 (A2) and C19 (A1) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal, and adjust C25 (H5) for maximum output. Repeat these operations until no improvement results.

I.F. Filter.—Switch set to M.W., tune to 500 m on scale, feed in a strong 451 kc/s signal, and adjust C18 (A1) for maximum output.

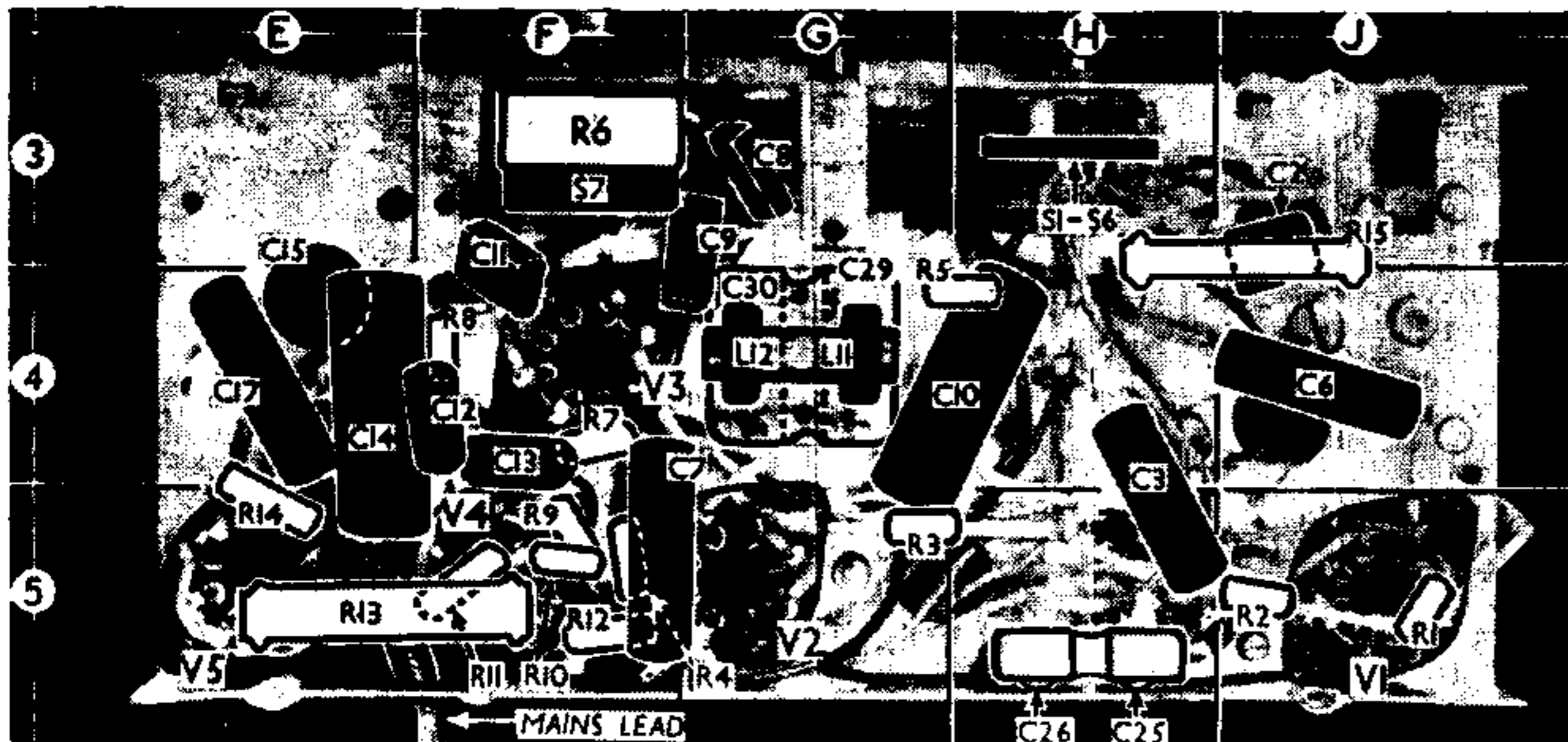


Sketch showing the course of the tuning drive cord, seen from the rear of the chassis with the gang at maximum capacitance

GENERAL NOTES

Switches.—The waveband switch unit S1-S7 is indicated in our under-chassis illustration by an arrow which shows the direction in which it is viewed in the diagram inset in the top left-hand corner of the circuit diagram overleaf, where it is shown in detail. S2, S4, S5 close on M.W. (control knob anti-clockwise); S1, S3, S6 close on L.W.

Scale Lamps.—These are two Osram M.E.S. types rated at 3.5 V, 0.15 A. They have small clear spherical bulbs.



Under-chassis view. Details of the waveband switch unit S1-S6, indicated here, are shown in the diagram inset in the top left-hand corner of the circuit diagram overleaf.