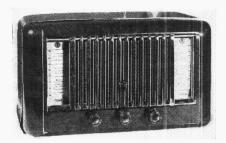
"TRADER" SERVICE SHEET
913

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



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.

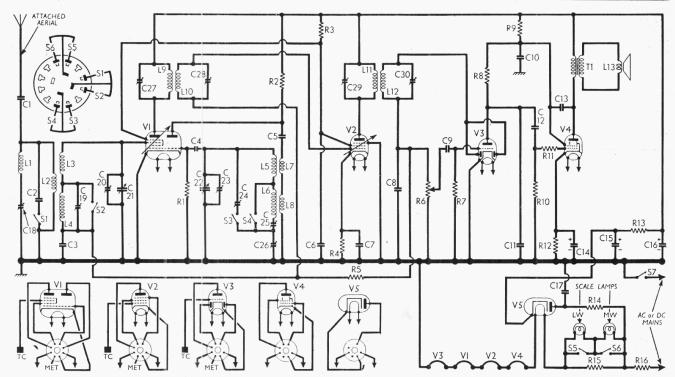
Release date and original price: April 1949; £10 13s. 6d. plus purchase tax. Coloured finishes 4s. 7d extra.

COMPONENTS AND VALUES

	CAPACITORS	Values (uF)	Loca- tions
C1	Aerial series	0.0003	A1
C2	Aerial L.W. shunt	0.0003	J3
C3	A.G.C. decoup	0.1	H4
C4	V1 osc. C.G	0.00006	A2
C5	Osc. anode coup	0.0001	A2
C6	S.G.'s decoupling	0.1	J4
C7	V2 cath. by-pass	0.05	F_5
C8	I.F. by-pass	0.0003	G3
C9	A.F. coupling	0.002	G3
C10	H.T. feed decoup.	0.25	H4
C11	I.F. by-pass	0.0003	F4
C12	A.F. coupling	0.01	F4
C13	Tone corrector	0.01	F4
C14*	V4 cath. by-pass	50·0	E4
C15*	TT gmoothing	16.0	E4
C16*	H.T. smoothing {	16.0	D1
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‡	1 1st I.F. transformer		B2
C28‡	f tuning \	-	B2
C29‡	2nd I.F. trans-		G4
C30‡	former tuning	mercan .	G4

	RESISTORS	Values (ohms)	Loca tion
R1	V1 osc. C.G	33,000	J5.
R2	Osc. Anode load	22,000	J5
R3	S.G.'s H.T. feed	33,000	G5
R4	V2 fixed G.B	100	F_5
R5	A.G.C. decoup	1,000,000	H4
R6	Volume control	250,000	F3
R7	V3 C.G. resistor	10,000,000	F4
R8	V3 triode load	270,000	F4
R9	H.T. feed decoup.	22,000	F5
R10	V4 C.G. resistor	270,000	F5
R11	V4 C.G. stopper	4,700	F5
R12	V4 G.B. resistor	270	F5
R13	H.T. smoothing	1,500	E5
R14	V5 surge limiter	100	E5
R15	Scale lamps shunt	100	J3
R16	Heater ballast	830	B2

OT	HER COMPONENTS	Approx. Values (ohms)	Loca- tions
L1 L2 L3 L4 L5 L6 L7 L8	I.F. filter coil Aerial coup. coil Aerial tuning coils Oscillator tuning { coils Oscillator reaction coils, total (Cont. col. 1 overleaf)	22·0 14·0 2·5 16·5 3·0 6·5	A1 A1 A1 A1 A2 A2 A2



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.

ОТ	HER COMPONENTS (continued)	Approx. Values (ohms)	Loca- tions
L9 L10 L11 L12 L13 T1 S1-S6 S7	} 1st I.F. trans. { Pri. Sec. Pri. Sec. Speech coil Pri. Sec. W/band switches Mains sw., g'd R6	10·0 10·0 34·0 34·0 2·5 480·0 0·6	B2 B2 G4 G4 C1 H3 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.).

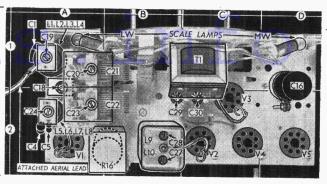
Second valve (V2, Brimar 12K7GT) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C27, L9, L10, C28 and C29, L11, L12, C30.

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

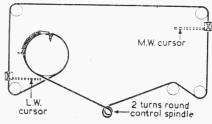
Plan view of the chassis, indicating the positions of all adjustments involved in circuit alignment, with the exception of those for trackers C25, C26, which are mounted on the rear chassis member. The attached aerial connecting connecting tag is also identified.



(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.

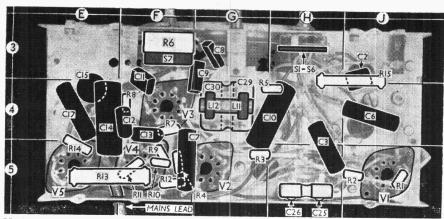


Sketch showing the course of the tuning drive cord, seen from the rear of the chassis with the gang at maximum capacitance

GENERAL NOTES

Switches .- The waveband switch unit S1-S7 is Switches.—The waveband switch unit \$1.87 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. \$2, \$4, \$5 close on M.W. (control knob anti-clockwise); \$1, \$3, \$6 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.

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 $0.000474\mu F$ 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.
varve	(V)	(mA)	(V)	(mA)	(V)
V1 12K8GT V2 12K7GT V3 12Q7GT V4 35L6GT V5 35Z4GT	$ \begin{cases} 170 \\ Oscill 100 \\ 170 \\ 38 \\ 152 \\ 220 \\ \end{cases} $	$ \left.\begin{array}{c} 1 \cdot 2 \\ 1 \text{ other} \\ 3 \cdot 3 \\ 4 \cdot 7 \\ 0 \cdot 3 \\ 35 \cdot 0 \\ \hline $	63 63 122	2·5 1·1 1·9	0·6§

† 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.

insulating compound.

CIRCUIT ALIGNMENT

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1.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator (via an 0.1.µF isolating capacitor in each lead) to control grid (top cap) of V1 and chassis, feed in a 451 ke/s (665.1 m) signal, and adjust C20, 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 ke/s) signal, and adjust C23 (A2) and C20 (A1) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 ke/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 ke/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 ke/s) signal, and adjust C25 (H5) for maximum output. Repeat these operations until no improvement results.

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