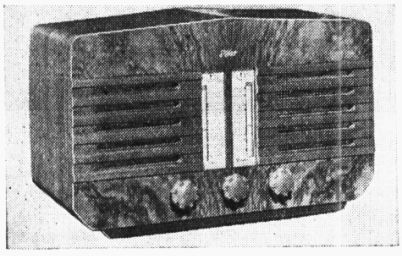
"TRADER" SERVICE SHEET

871

PILOT LITTLE MAESTRO DE LUXE

A.C./D.C. 2-BAND SUPERHET



THE Pilot "Little Maestro" de Luxe is a 4-valve (plus rectifier) 2-band superhet designed to operate from A.C. or D.C. mains of 200-200 V, 40-100 c/s in the case of A.C.

Release date and original price: September, 1947: £13 13*s plus purchase tax.*

CIRCUIT DESCRIPTION

Input from attached aerial is "bottom" coupled, via the capacitative potential divider **C2, C3,** to single-tuned circuits **L1, C17** (M.W.) and **L1, L2, C17** (L.W.) which precede a triode hexode valve **(V1, Brimar 12K8GT)** operating as frequency changer with electron coupling.

Triode oscillator grid coils **L3** (M.W.) and **L3, L4** (L.W.) are tuned by **C18,** with parallel trimming by **C19** (M.W.), and **C20** (L.W.), and series tracking by **C21** (M.W.) and **C22** (L.W.). Reaction coupling from anode is provided by **L5** on both bands.

Second valve **(V2, Brimar 12K7GT)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C23, L6, L7, C24** and **C25, L8, L9, C26.**

Intermediate frequency 451 kc/s.

Diode second detector is part of double diode triode valve **(V3, Brimar 12Q7GT),** in which the diode sections are wired in parallel. Audio frequency component in rectified output is developed across the manual volume control **R5,** which is also the diode load resistor, and passed via A.F. coupling capacitor **C8** and C.G. resistor **R6** to grid of triode section, which operates as A.F. amplifier. I.F. filtering by **C7** in diode circuit and **C9** in triode anode circuit.

The D.C. potential developed across **R5** is tapped off and fed back, via decoupling circuits **R4, C6** and **R2, C3,** as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R7, C10** and **R8,** via grid stopper **R9,** between **V3** triode and beam tetrode output valve **(V4, Brimar 35L6GT).** Fixed tone correction in anode circuit by **C12.**

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, with D.C. mains, behaves as a low resistance. Smoothing by resistor **R11** and electrolytic capacitors **C13, C14,** but the H.T. supply for **V4** anode is obtained direct from the rectifier cathode.

Valve heaters, together with scale lamps (shunted by **R13**) and line cord ballast resistor **R14,** are connected in series across mains input. H.T. R.F. filtering by **C5,** mains R.F. filtering by **C11,** and aerial isolation by **C1.**

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull off); from the underside of the cabinet remove the three long cheese-head screws (with metal washers), securing the chassis to the base of the cabinet, and slide out the chassis and speaker as a single unit.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on A.C. mains of 228V. 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 400V scale of a model 7 Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 12K8GT	88	1·85	88	4·5
	Oscillator			
	88	4·1		
V2 12K7GT	88	8·0	88	2.2
V3 12Q7GT	30	0·18	—	—
V4 35L6GT	190	17·0	88	0·3
V5 35Z4GT	†	—	—	—

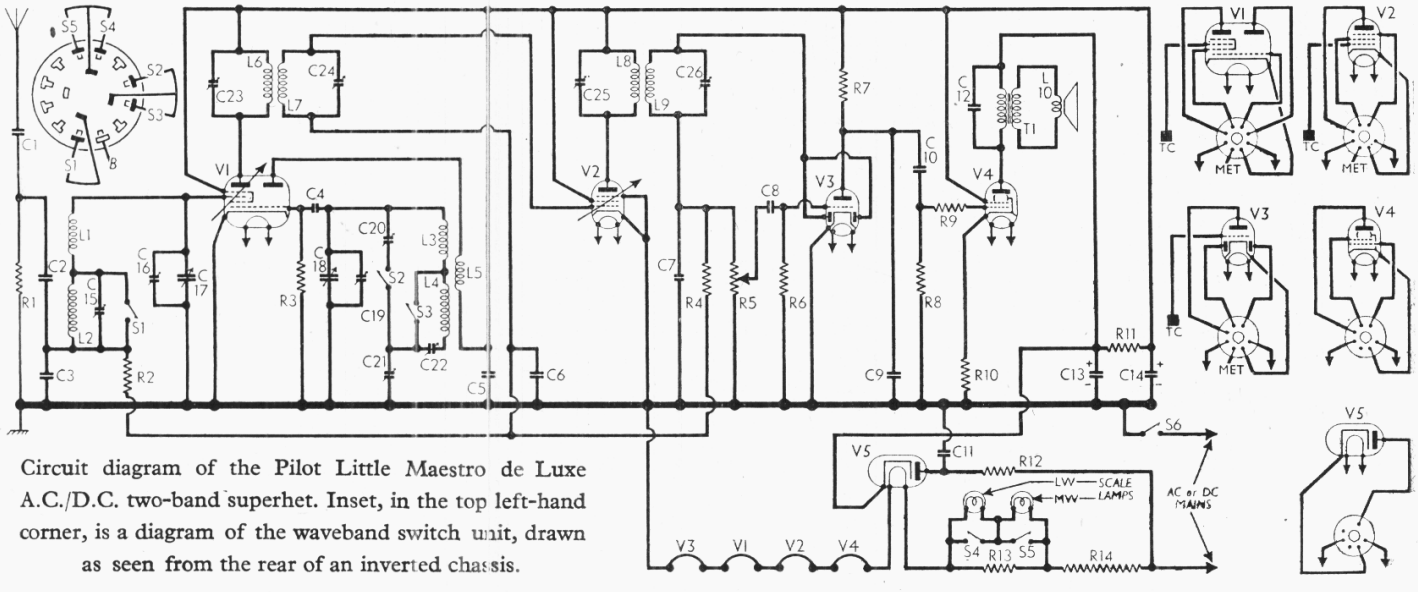
† Cathode to chassis, 199V D.C.

COMPONENTS AND VALUES

If the component numbers given below are used when ordering replacements, dealers should mention the fact, as they may differ from those in the manufacturer's diagram.

	RESISTORS	Values (ohms)	Locations
R1	Aerial shunt ...	3,300	I3
R2	V1 hex. C.G. decoup.	100,000	H3
R3	V1 osc. C.G. ...	33,000	J4
R4	A.V.C. decoupling	1,000,000	H3
R5	Volume control ...	250,000	F3
R6	V3 C.G. resistor ...	10,000,000	H4
R7	V3 triode load ...	270,000	G4
R8	V4 C.G. resistor ...	680,000	F4
R9	V4 C.G. stopper ...	100,000	F4
R10	V4 G.B. resistor ...	470	F3
R11	H.T. smoothing ...	4,700	B4
R12	V5 surge limiter ...	470	E4
R13	Scale lamp shunt	100	E4
R14	Heater ballast† ...	860	E4

† Line cord.



Circuit diagram of the Pilot Little Maestro de Luxe 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.

	CAPACITORS	Values (μF)	Locations
C1	Aerial isolator ...	0·001	J3
C2	Aerial coupling capacitors ...	0·02	I3
C3	Aerial coupling capacitors ...	0·002	H3
C4	V1 osc. C.G. ...	0·00006	J4
C5	H.T. R.F. by-pass	0·1	J4
C6	A.V.C. decoupling	0·1	H4
C7	I.F. by-pass ...	0·00006	G3
C8	A.F. coupling ...	0·01	G4
C9	I.F. by-pass ...	0·0001	G4
C10	A.F. coupling ...	0·01	F4
C11	Mains R.F. by-pass	0·05	E3
C12	Tone corrector ...	0·005	D2
C13*	H.T. smoothing capacitors ...	16·0	D1
C14*	H.T. smoothing capacitors ...	16,0	D1
C15‡	Aerial L.W. trim....	0·0001	A2
C16‡	Aerial M.W. trim.	0·00003	B2
C17†	Aerial tuning ...	0·000483	B2
C18†	Oscillator tuning ...	0·000483	B1
C19‡	Osc. M.W. trim. ...	0·00003	B1
C20‡	Osc. L.W. trim. ...	0·0001	A1
C21‡	Osc. M.W. track ...	0·0003	J4
C22‡	Osc. L.W. track ...	0·0003	I4
C23‡	1st I.F. transformer tuning ...	0·00012	B2
C24‡	1st I.F. transformer tuning ...	0·00012	B2
C25‡	2nd I.F. transformer tuning ...	0·00012	H4
C26‡	2nd I.F. transformer tuning ...	0·00012	G4

* Electrolytic. † Variable. ‡ Pre-set.

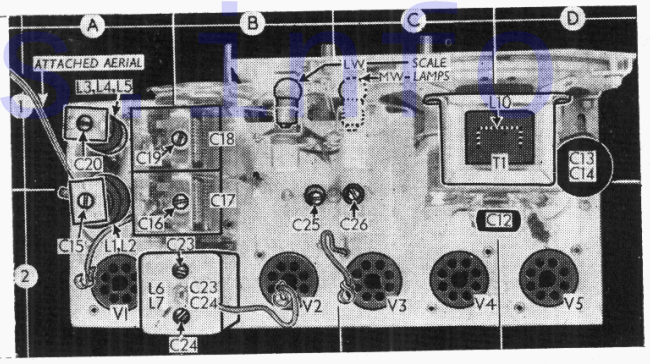
	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Aerial tuning coils	2·8	A2
L2	Aerial tuning coils	12·0	A2
L3	Oscillator tuning coils ...	3·7	A1
L4	Oscillator tuning coils ...	7·0	A1
L5	Osc. react. coil ...	3·3	A1
L6	1st I.F. trans. Pri. ...	10·0	B2
L7	1st I.F. trans. Sec. ...	10·0	B2
L8	2nd I.F. trans. Pri. ...	36·0	H3
L9	2nd I.F. trans. Sec. ...	36·0	G3
L10	Speech coil ...	2·7	D1
T1	Speaker trans. Pri. ...	510·0	D1
	Speaker trans. Sec. ...	0·5	D1
S1-S5	W/band switches...	—	I3
S6	Mains sw., g'd R5...	—	F3

GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, and **S4, S5** are the scale lamp switches, ganged in a single rotary unit beneath the chassis. The unit is 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. **S1, S3** and **S4** close on M.W. (control knob anti-clockwise); **S2** and **S5** close on L.W.

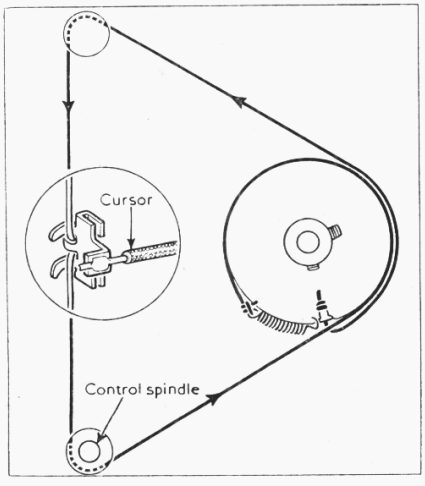
Scale Indicator Lamps.—These are two Osram lamps, rated at 3.5 V, 0.15 A, shunted by **R13.**

Capacitors C13, C14.—These are two dry electrolytics, in a tubular metal container which forms the common negative connection, mounted on the chassis deck, rated at 16μF, 350 V.



Plan view of the chassis. All the pre-set trimmer capacitors involved in circuit alignment (with the exception of trackers **C21, C22,** which are mounted on the rear chassis member), are indicated. **L10** is the speaker speech coil.

Resistors R11, R12, R13.—**R11** and **R12** are both normal carbon types, rated at 2 W each. **R13** is a special resistor, unpainted and unwaxed, rated at ½ W. The makers' part number for it is PLE7.8U.



Sketch showing the drive cord arrangement, seen from the front of the chassis.

Drive Cord Replacement.—Take 2ft of Nylon braided glass cored cord, tie a knot in one end, and thread the free end through the eyelet and the hole in the drum groove. Then, with the gang at minimum, follow the course shown in the sketch in col. 2, looping it through the fingers of the cord grip on the cursor carrier as shown inset. The cord does not make a whole turn round the rubber drive wheel on the control spindle.

Finally, tie on the tension spring so that it opens when hooked to the anchor hole, but before hooking it up, turn gang to maximum and slide pointer along the slack cord until it registers with the two cursor setting marks on the backing plate (see "Circuit Alignment"). It is unnecessary to clamp up the cord grip.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, and 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 kc/s (665.1 m) signal, and adjust **C23, C24, C25** and **C26** (location references B2, C2) for maximum output.

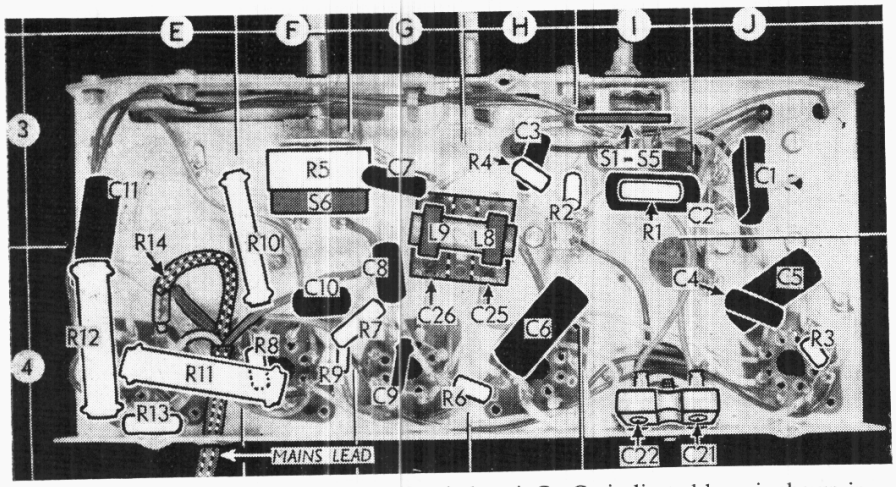
R.F. and Oscillator Stages.—Since the calibrated glass scales are mounted in the cabinet and these adjustments must be carried out with the chassis on the bench, calibration lines are impressed on the scale backing plate. Reading from top to bottom on the left-hand side of the backing plate, the four horizontal lines correspond to : 1, the cursor setting line; 2, 500 m (M.W.); 3, 214.3 m (M.W.); 4, 200 m (M.W.). Similarly, on the right-hand side of the backing plate, the horizontal lines correspond to : 1, the cursor setting line; 2, 2,000 m (L.W.); 3, 1,500 m (L.W.); 4, 1,000 m (L.W.).

With the gang at maximum capacitance the cursor should coincide with the two setting marks, and it may be adjusted in position by rotating the drive drum on the gang spindle after slackening its two grub screws.

Transfer "live" signal generator lead to attached aerial connecting tag on **L1, L2** (A2), via the isolating capacitor and a suitable dummy aerial.

M.W.—With set switched to M.W., tune to the 200 m calibration line, feed in a 200 m (1,500 kc/s) signal, and adjust **C19** (B1) for maximum output. Tune to the 500 m calibration line, feed in a 500 m (600 kc/s) signal, and adjust **C21** (J4) for maximum output. Tune to the 214.3 m calibration line, feed in a 214.3 m (1,400 kc/s) signal, and adjust **C16** (B2) for maximum output. Repeat these adjustments until no improvement results.

L.W.—Switch set to L.W., tune to the 1,000 m calibration line, feed in a 1,000 m (300 kc/s) signal, and adjust **C20** (A1) and **C15** (A2) for maximum output. Tune to the 2,000 m calibration line, feed in a 2,000 m (150 kc/s) signal, and adjust **C22** (I4) for maximum output. Repeat these adjustments until no improvement results.



Under-chassis view. The waveband switch unit **S1-S5** indicated here is shown in detail in the diagram inset in the top left-hand corner of the circuit diagram overleaf.

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