"TRADER" SERVICE SHEET

809

PILOT LITTLE MAESTRO

Post-War A.C. Version

THIS version of the Pilot Little Maestro series is a post-war production operating on A.C. mains only, and is quite distinct from either of the A.C./D.C. versions. It is a 4-valve (plus rectifier) 2-band superhet for use on A.C. mains of 200-250 V, 40-100 c/s. Its H.T. circuit is not isolated from the mains.

Release date: November, 1945. *Original prices:* £11 17*s* 6*d plus* £2 11*s* 1*d p.t.* (*plastic cabinet*); £12 10*s plus* £2 13*s* 9*d p.t.* (*wooden cabinet*).

CIRCUIT DESCRIPTION

Aerial input via isolating capacitor **C1** and coupling coil **L2** to single-tuned circuits **L3, C19** (M.W.) and **L4, C19** (L.W.). On L.W., **S1** connects **C2** across **L2** to remove a possible resonance in the band. **L1, C17** in series across aerial circuit form an I.F. filter.

First valve **(V1, Brimar 6K8G)** is a triode hexode operating as frequency-changer with electron coupling. Oscillator grid coils **L5** (M.W.) and **L6** (L.W.) are tuned by **C20.** Parallel trimming by **C21** (M.W.) and **C22** (L.W.); series tracking by **C24** (M.W.) and **C23** (L.W.). Reaction coupling by **L7, L8,** from anode, via **C6.**

Second valve **(V2, Brimar 6K7G)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C25, L9, L10, C26** and **C27, L11, L12, C28.**

Intermediate frequency 451 kc/s.

Diode second detector is part of double diode triode valve **(V3, Brimar 6Q7G),** the diode sections of which are strapped in parallel. Audio frequency component in rectified output is developed across manual volume control **R5,** which also acts as diode load resistor, and passed via A.F. coupling capacitor **C9** to C.G. of triode section, which operates as A.F. amplifier. I.F. filtering by **C8** in diode circuit and **C11** in triode anode circuit.

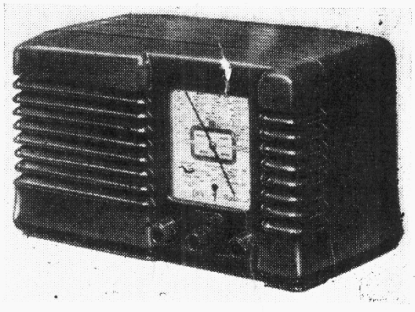
D.C. potential developed across **R5** is tapped off and fed back via decoupling circuit as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacitance coupling by **R7, C12, R8** between **V3** triode and beam tetrode output valve **(V4, Brimar 6V6GT).** Fixed tone correction in anode circuit by **C13.**

H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Brimar 6X5GT)** whose anodes are strapped together and fed directly from the mains, via surge limiter **R11.** All heaters, together with the scale lamp, are fed from a single winding on the heater transformer **T2.**

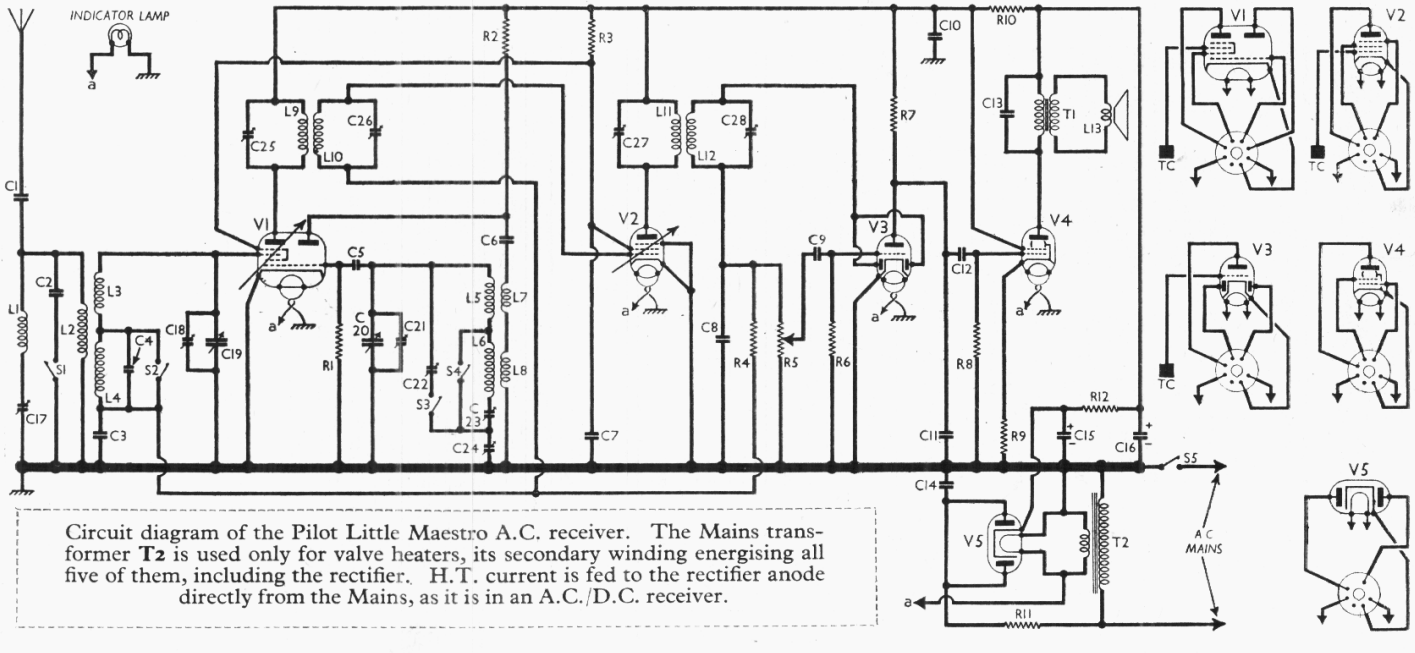
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)
R1	V1 osc. C.G. resistor ...	33,000
R2	V1 osc. anode H.T. feed...	22,000
R3	V1, V2 S.G.'s H.T. feed...	22,000
R4	A.V.C. line decoupling ...	1,000,000
R5	Manual volume control ...	250,000
R6	V3 triode C.G. resistor ...	10,000,000
R7	V3 triode anode load ...	270,000
R8	V4 C.G. resistor	1,000,000
R9	V4 G.B. resistor	270
R10	H.T. line decoupling ...	4,700
R11	V5 anode surge limiter ...	100
R12	H.T. smoothing resistor...	1,000



	CAPACITORS	Values (μF)
C1	Aerial isolator	0·0003
C2	Aerial L.W. shunt	0·0003
C3	A.V.C. line decoupling ...	0·1
C4	Aerial L.W. fixed trimmer	0·00006
C5	V1 osc. C.G. capacitor ...	0·00006
C6	V1 osc. anode coupling ...	0·0001
C7	V1, V2 S.G.'s decoupling	0·1
C8	I.F. by-pass capacitor ...	0·0003
C9	A.F. coupling to V3 C.G.	0·002
C10	H.T. line decoupling ...	0·1
C11	I.F. by-pass capacitor ...	0·0003
C12	A.F. coupling to V4 C.G.	0·01
C13	Fixed tone corrector ...	0·01
C14	Mains R.F. by-pass ...	0·05
C15*	H.T. smoothing capacitors	16·0
C16*	H.T. smoothing capacitors	16·0
C17‡	Aerial I.F. filter tuning...	0·0001
C18‡	Aerial circuit M.W. trimmer	0·00003
C19†	Aerial circuit tuning ...	0·000483
C20†	Oscillator circuit tuning...	0·000483
C21‡	Osc. circ. M.W. trimmer...	0·00003
C22‡	Osc. circ. L.W. trimmer..	0·0001
C23‡	Osc. circ. L.W. tracker ...	0·0003
C24‡	Osc. circ. M.W. tracker...	0·0007
C25‡	1st I.F. trans. pri. tuning	—
C26‡	1st I.F. trans. sec. tuning	—
C27‡	2nd I.F. trans. pri. tuning	—
C28‡	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Pilot Little Maestro A.C. receiver. The Mains transformer **T2** is used only for valve heaters, its secondary winding energising all five of them, including the rectifier. H.T. current is fed to the rectifier anode directly from the Mains, as it is in an A.C./D.C. receiver.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial I.F. filter coil ...		24·0
L2	Aerial coupling coil ...		15·0
L3	Aerial circuit tuning coils ...		2·8
L4	Aerial circuit tuning coils ...		17·2
L5	Oscillator circuit tuning coils		4·0
L6	Oscillator circuit tuning coils		6·8
L7	Oscillator circuit reaction coils, total		3·5
L8	Oscillator circuit reaction coils, total		3·5
L9	1st I.F. trans.	Pri. ...	10·0
L10	1st I.F. trans.	Sec. ...	10·0
L11	2nd I.F. trans.	Pri. ...	34·0
L12	2nd I.F. trans.	Sec. ...	34·0
L13	Speaker speech coil ...		2·8
T1	Output trans.	Pri.	480·0
	Output trans.	Sec.	0·5
T2	Mains trans.	Pri.	136·0
	Mains trans.	Heater sec. ...	0·2
S1-S4	Waveband switches ...		—
S5	Mains switch, ganged R5 ...		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 217 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, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6K8G	137 Oscillator 82	1·07 3·0	69	3·0
V2 6K7G	137	5·5	69	1·5
V3 6Q7G	45	0·3	—	—
V4 6V6GT	195	21·0	137	1·5
V5 6X5GT†	—	—	—	—

† Cathode to chassis 242 V, D.C.

GENERAL NOTES

Switches.—S1-S4 are the waveband switches, ganged in a two-position rotary unit beneath the chassis. A diagram of the unit drawn as seen from the rear of an inverted chassis is given below in this column. On M.W. (knob anti-clockwise) **S2** and **S4** are closed; on L.W., **S2, S4** open, and **S1, S3** close.

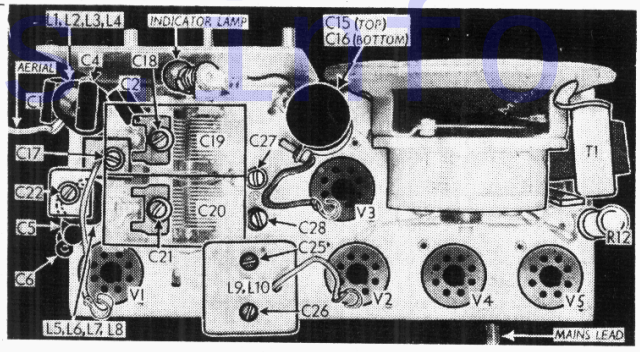
S5 is the Q.M.B. mains switch, ganged with the volume control **R5.**

Coils.—L1-L4 and **L5-L8** are in two unscreened units on the chassis deck. **L9, L10** are in a screened unit on the chassis deck, while the other I.F. transformer **L11, L12** is in an unscreened unit beneath the deck.

Indicator Lamp.—This is an Osram lamp, with a small spherical bulb and an M.E.S. base, rated at 6.5 V 0.3 A.

Capacitors C15, C16.—These are two 16 μF dry electrolytics in a double-ended container mounted vertically on the chassis deck. The end tags are the positive connections, and the case forms the common negative connection. The unit is a Dubilier "Drilitic" rated at 350 V D.C. working, 130 mA A.C. max.

Plan view of the chassis. All the pre-set trimmers are indicated here, but the two trackers are beneath the chassis. **C15, C16** is a double-ended electrolytic unit.



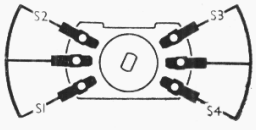


Diagram of the Waveband switch unit **S1-S4** as seen from the rear of an inverted chassis.

Chassis Divergencies. — According to availability at the time of manufacture, the speaker used may have a permanent magnet, as did our sample, or an energized magnet. Where the latter is fitted, the field winding replaces **R12** in the circuit diagram, its resistance being 1,000 Ω. The value of **R10** is then changed to 6,800 Ω, and **V4** screen is transferred to the other end of it. This will raise the screen voltage and increase the anode current.

In some chassis, the dual tracker unit may be reversed, transposing **C23** and **C24** on the chassis. Also, **C1** may be 0.0001 instead of 0.0003 μF.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull-off), and the three countersunk-head screws securing the chassis to the bottom of the cabinet, when the chassis and speaker may be removed as a complete unit.

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

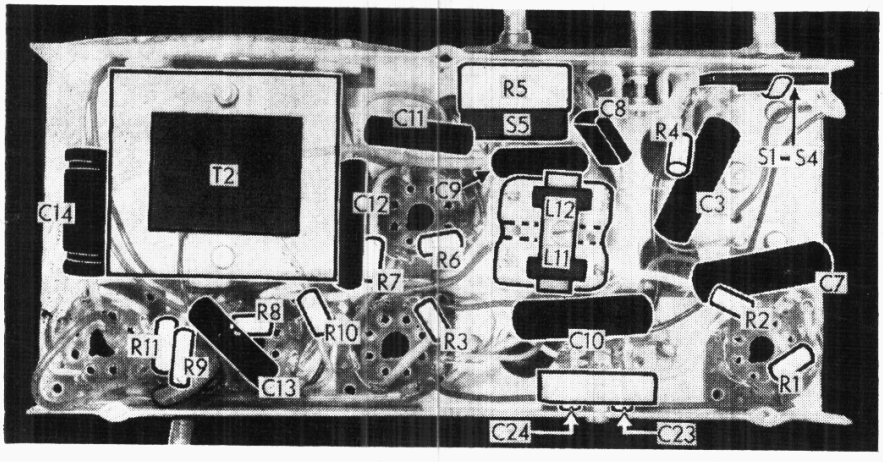
CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang to maximum, and connect signal generator leads via 0.1 μF capacitors to control grid (top cap) of **V1** and chassis. Feed in a 451 kc/s (665.1 m) signal, and adjust **C28** and **C27** (through chassis deck) then **C26** and **C25** for maximum output. Transfer signal generator leads to the aerial connection, via a 0.00005 μF capacitor, and chassis, feed in a strong 451 kc/s signal, and adjust **C17** for minimum output.

R.F. and Oscillator Stages.—With the gang at maximum, the pointer should be horizontal. Replace the capacitor with a standard dummy aerial, retaining the 0.1 μF isolator in the chassis lead.

M.W.—Switch set to M.W., tune to 214 m on scale, feed in a 214 m (1,400 kc/s) signal, and adjust **C21** and **C18** for maximum output. Feed in a 500 m (600 kc/s) signal, tune it in, and adjust **C24** for maximum output while rocking the gang for optimum 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 **C22** for maximum output. Feed in a 1,596 m (188 kc/s) signal, tune it in, and adjust **C23** for maximum output while rocking the gang for optimum results.



Under-chassis view. The waveband switch unit **S1-S4** indicated here is shown in detail in the diagram in col. 2 above. The two trackers **C23, C24,** seen mounted on the rear chassis member, may be transposed in some cases.

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