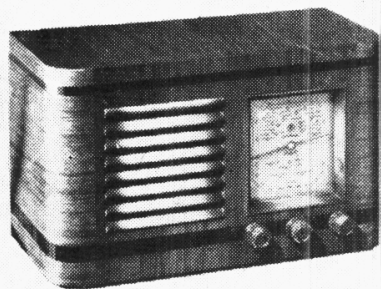


"TRADER" SERVICE SHEET

## 444

# PILOT LITTLE MAESTRO

## AC/DC SUPERHET



One of the three alternative cabinet versions of the Pilot Little Maestro.

THE Pilot Little Maestro is a 4-valve (plus valve rectifier) AC/DC 2-band superhet. It is fitted into several alternative small table cabinets, of which the walnut type is illustrated. An aerial lead is permanently attached, and no earth is used. The receiver is for 200-240 V, AC or DC mains.

Release date: February, 1939.

### CIRCUIT DESCRIPTION

Aerial input via isolating condenser C1 to coupling coil L2 and single tuned circuits L3, C18 (MW) and L4, C18 (LW). On LW, S1 closes to connect C2 across L2 to remove a possible resonance in the band.

L1, C16 across aerial circuit form an IF filter.

First valve (V1, Brimar 6A8G) is a

heptode operating as frequency changer. Oscillator grid coils L5 (MW) and L6 (LW) are tuned by C20; parallel trimming by C21 (MW); series tracking by C22 (LW) and specially shaped C20 plates. Reaction by L7 (MW) and direct coupling via C22 (LW).

Second valve (V2, Brimar 6K7G) is a variable- $\mu$  RF pentode operating as iF amplifier with tuned-primary, tuned-secondary transformer couplings C23, L8, L9, C24 and C25, L10, L11, C26.

Intermediate frequency 451 KC/S.

Diode second detector is part of double diode triode valve (V3, Brimar 6Q7G). Audio frequency component in rectified output is developed across manual volume control R4, which also operates as load resistance, and passed via C8 to CG of triode section.

DC potential across R4 is fed back through decoupling circuit R6, C4 as GB to FC and IF valves, to give AVC. Under no signal conditions, a very small current will flow from the second diode of V3 via R6, R4 and provide a minimum GB potential for the controlled valves.

Resistance-capacity coupling by R7, C10 and R8 between V3 triode and pentode output valve (V4, Brimar 25A6G). Fixed tone correction in anode circuit by C12.

On AC mains, HT is supplied by IHC rectifying valve (V5, Brimar 25Z6G). Smoothing by speaker field L14 and electrolytic condensers C13, C14.

Valve heaters are connected in series, together with tapped line cord ballast resistance R10, across mains input. The pilot lamp is across part of R10.

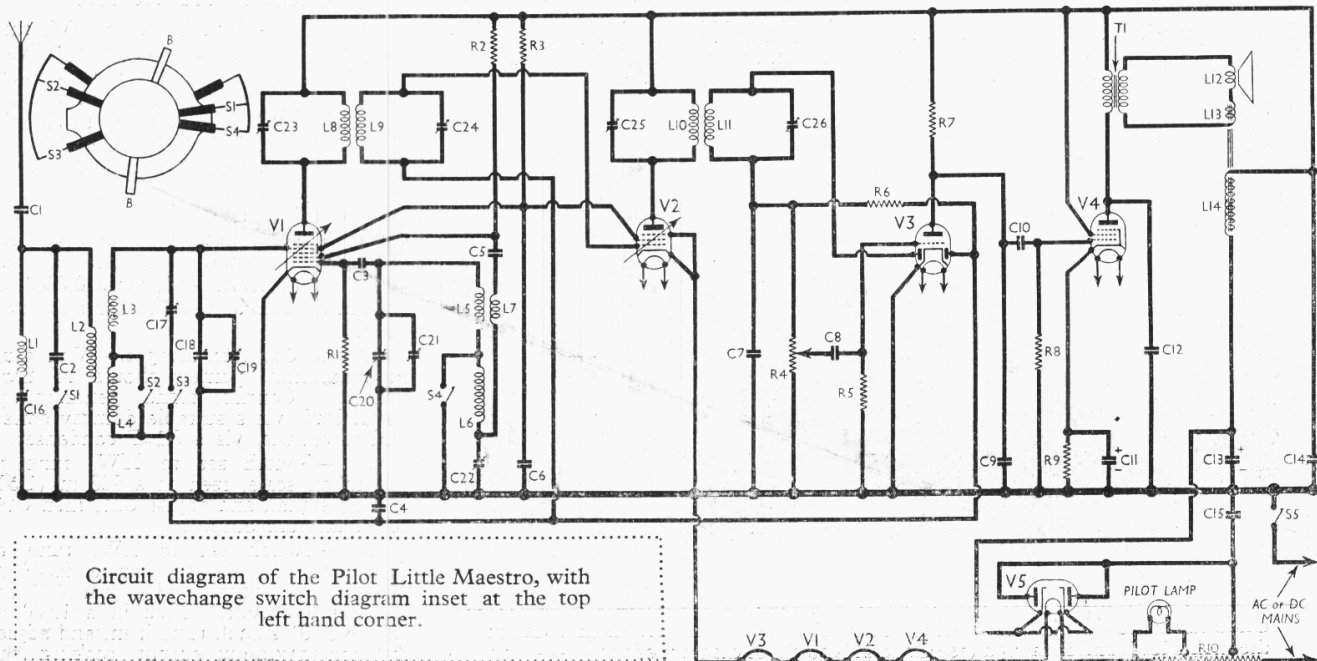
### COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 osc. CG resistances ...	39,000
R2	V1 osc. anode HT feed ...	22,000
R3	V1, V2 SG's HT feed ...	22,000
R4	Manual volume control; V3 signal diode load ...	250,000
R5	V3 triode CG resistance ...	9,500,000
R6	AVC line decoupling ...	1,000,000
R7	V3 triode anode load ...	270,000
R8	V4 CG resistance ...	270,000
R9	V4 GB resistance ...	470
R10	Heater circuit ballast ...	500†

† Tapped at 15 O and 370 O from V5 heater.

CONDENSERS		Values ( $\mu$ F)
C1	Aerial isolating condenser ...	0.001
C2	Anti-resonance condenser ...	0.00015
C3	V1 osc. CG condenser ...	0.00006
C4	AVC line decoupling ...	0.05
C5	V1 anode coupling ...	0.002
C6	V1, V2 SG's decoupling ...	0.05
C7	IF by-pass ...	0.0004
C8	AF coupling to V3 triode ...	0.005
C9	IF by-pass ...	0.0003
C10	V3 triode to V4 AF coupling	0.025
C11*	V4 cathode by-pass ...	10.0
C12	Fixed tone corrector ...	0.02
C13*	HT smoothing condenser ...	20.0
C14*	HT smoothing condenser ...	20.0
C15	V5 anodes RF by-pass ...	0.02
C16‡	Aerial IF filter tuning ...	0.00014
C17‡	Aerial circuit LW trimmer ...	0.00005
C18†	Aerial circuit tuning ...	—
C19‡	Aerial circuit MW trimmer ...	0.00003
C20†	Oscillator circuit tuning ...	—
C21†	Osc. circuit MW trimmer ...	0.00003
C22†	Osc. circuit LW tracker ...	0.00045
C23†	1st IF trans. pri. tuning ...	—
C24†	1st IF trans. sec. tuning ...	—
C25†	2nd IF trans. pri. tuning ...	0.00013
C26†	2nd IF trans. sec. tuning ...	0.00013

\* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Pilot Little Maestro, with the wavechange switch diagram inset at the top left hand corner.



PILOT—Continued

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial IF filter coil	36-0
L2	Aerial coupling coil	13-5
L3		3-4
L4	Aerial circuit tuning coils	16-5
L5	Oscillator circuit tuning coils	3-3
L6		7-5
L7	Oscillator MW reaction	105-0
L8	1st IF Pri.	8-5
L9	trans. Sec.	8-5
L10	2nd IF Pri.	35-0
L11	trans. Sec.	35-0
L12	Speaker speech coil	3-0
L13	Hum neutralising coil	0-15
L14	Speaker field coil	650-0
T1	Speaker Pri. input trans. Sec.	270-0
S1-S4	Waveband switches	0-3
S5	Mains switch, ganged R4	—

DISMANTLING THE SET

**Removing Chassis.**—Remove the three control knobs (pull-off), prise out the staple holding the aerial wire to the bottom of the cabinet, and remove the three self-tapping screws (with washers) holding the chassis to the bottom of the cabinet, when the complete receiver can be withdrawn as a single unit.

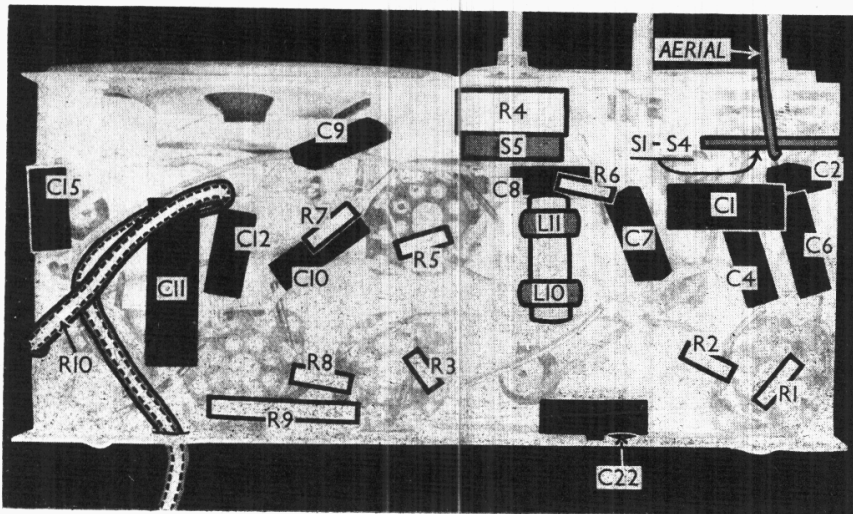
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on

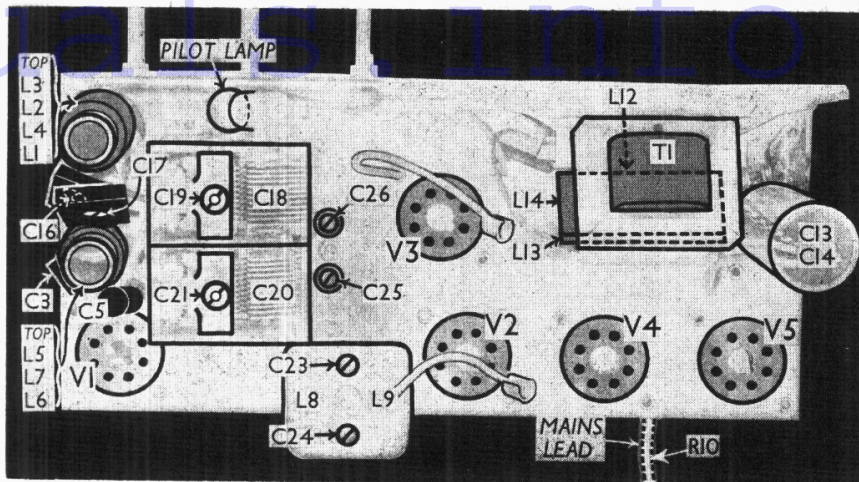
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6A8G	160	3-8	66	2-7
	106	2-2	—	—
V2 6K7G	160	5-6	66	1-4
V3 6Q7G	47	0-4	—	—
V4 25A6G	152	35-0	160	6-0
V5 25Z6G†	—	—	—	—

† Cathode to chassis, 202 V, D.C.

AC mains of 236 V. The receiver was tuned to the lowest wavelength on the MW band, and the volume control was



Underneath view of the chassis of the Pilot Little Maestro. R10 is included in the mains lead, and is tapped (see General Notes). A diagram of the S1-S4 unit is inset in the circuit diagram.



Plan view of the chassis of the Pilot Little Maestro. The adjustments of most of the trimmers in the set (including C16 and C17) can be seen. L12-L14 are parts of the speaker, which is mounted on the chassis.

at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

GENERAL NOTES

**Switches.**—S1-S4 are the waveband switches, in a single rotary unit beneath the chassis. They are shown inset in the circuit diagram, where they are drawn as seen looking from the rear of the underside of the chassis. On MW (knob anti-clockwise), S2 and S4 are closed; on LW (knob clockwise), S1 and S3 are closed.

S5 is the QMB mains switch, ganged with the volume control, R4.

**Coils.**—L1-L4 and L5-L7 are in two unscreened tubular units on the chassis deck. L8, L9 are in a screened unit on the chassis deck. L10, L11 are in an unscreened unit beneath the chassis.

**Pilot Lamp.**—This is an Ever Ready type, with a miniature bayonet cap, and is rated at 7.3 V, 0.25 A.

**Condensers C13, C14.**—These are two 20μF electrolytics in a single metal can, the can being the common negative connection. The tag at the top end is the positive of C14, and the tag beneath the chassis the positive of C13.

**Resistance R10.**—This is incorporated in the mains lead, and is asbestos insulated. At the chassis end of the cable, the asbestos-covered lead is the end of R10 connected to V5; the white lead is the first tapping; the red lead is the second tapping (anodes of V5); and the black lead is one of the mains connections, the other being the far end of R10.

**Chassis Divergencies.**—C9 is not in the makers' diagram. The makers show R8 as 470,000 Ω; C7 as 0.00025μF; C12 as 0.025μF and C15 as 0.025μF.

CIRCUIT ALIGNMENT

**IF Stages.**—Switch set to MW, turn gang to maximum and connect "live" signal generator lead via a 0.1μF condenser to top cap of V2, and earthed lead (via a 0.1μF condenser) to chassis. Feed in a 451 KC/S signal, and adjust C26 and C25 (through chassis deck) for maximum output. Transfer "live" generator lead and its condenser to top cap of V1, and adjust C24 and C23 for maximum output. Transfer signal generator to aerial lead, via a 0.00005μF condenser, and adjust C16 for minimum output.

**RF and Oscillator Stages.**—With gang at maximum, pointer should be horizontal. Connect signal generator to aerial lead, via a suitable dummy aerial, and to chassis, via a 0.1μF condenser.

**MW.**—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust C21, then C19, for maximum output.

**LW.**—Switch set to LW, tune to 2,000 m on scale, feed in a 2,000 m (150 KC/S) signal, and adjust C22 for maximum output. Feed in a 1,000 m (300 KC/S) signal, tune it in, and adjust C17 for maximum output, rocking the gang slightly, if necessary.