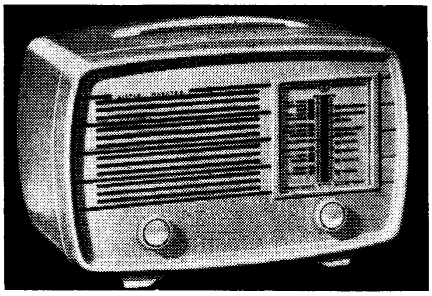
"TRADER" SERVICE SHEET

1034

PILOT Little Maestro

A.C. and A.C./D.C. Models of the 1952 Versions



TWO new "Little Maestro" receivers are covered together here, the A.C. and A.C./D.C. versions. They can be distinguished from earlier models of the same designation by the type Nos. T66 and T65 respectively, in very small print, in the bottom right-hand corner of the paper label on the rear chassis member. If this is missing, our photograph will provide identification.

The receivers are 4-valve (plus rectifier) 2-band superhets, and both operate from mains of 200-250 V. The A.C./D.C. model can be adjusted also for 110 V. The waveband ranges are 190-550 m and 1,100-2,000 m.

Release date and original price, both models: September 1951; £11 15s, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C22** and loading coil **L3** (M.W.) or **L1, C22** and loading coil **L2** (L.W.) to heptode valve **(V1, Brimar 6BE6** (A.C. model) or **12BE6** (A.C./D.C. model)) which operates as frequency changer with electron coupling. On S.W. **S2** closes to connect fixed trimmer **C3**. Provision is made for the connection of an external aerial via **C1**.

In the alternative aerial circuit shown to the left of our main diagram, aerial input on L.W. is via **S7** and the bottom coupling capacitor to the L.W. tuning coil, which is shunted by the 100 pF capacitor. On M.W., the L.W. coil provides coupling to the M.W. coil, **S6** being closed, and **S7** open. There is a plate aerial, but no frame aerial.

Single oscillator grid coil **L4** is tuned by **C24**. Parallel trimming by **C7, C25** (M.W.) and **C7, C25** and **C26** (L.W.); series tracking by **C8** (M.W. and L.W.). Reaction coupling by cathode coil **L5**.

Second valve **(V2, Brimar 6BA6** (A.C. model) or **12BA6** (A.C./D.C. model)) is a variable-mu R.F. pentode, operating as intermediate fre-

(*Continued col. 1 overleaf*)

COMPONENTS AND VALUES

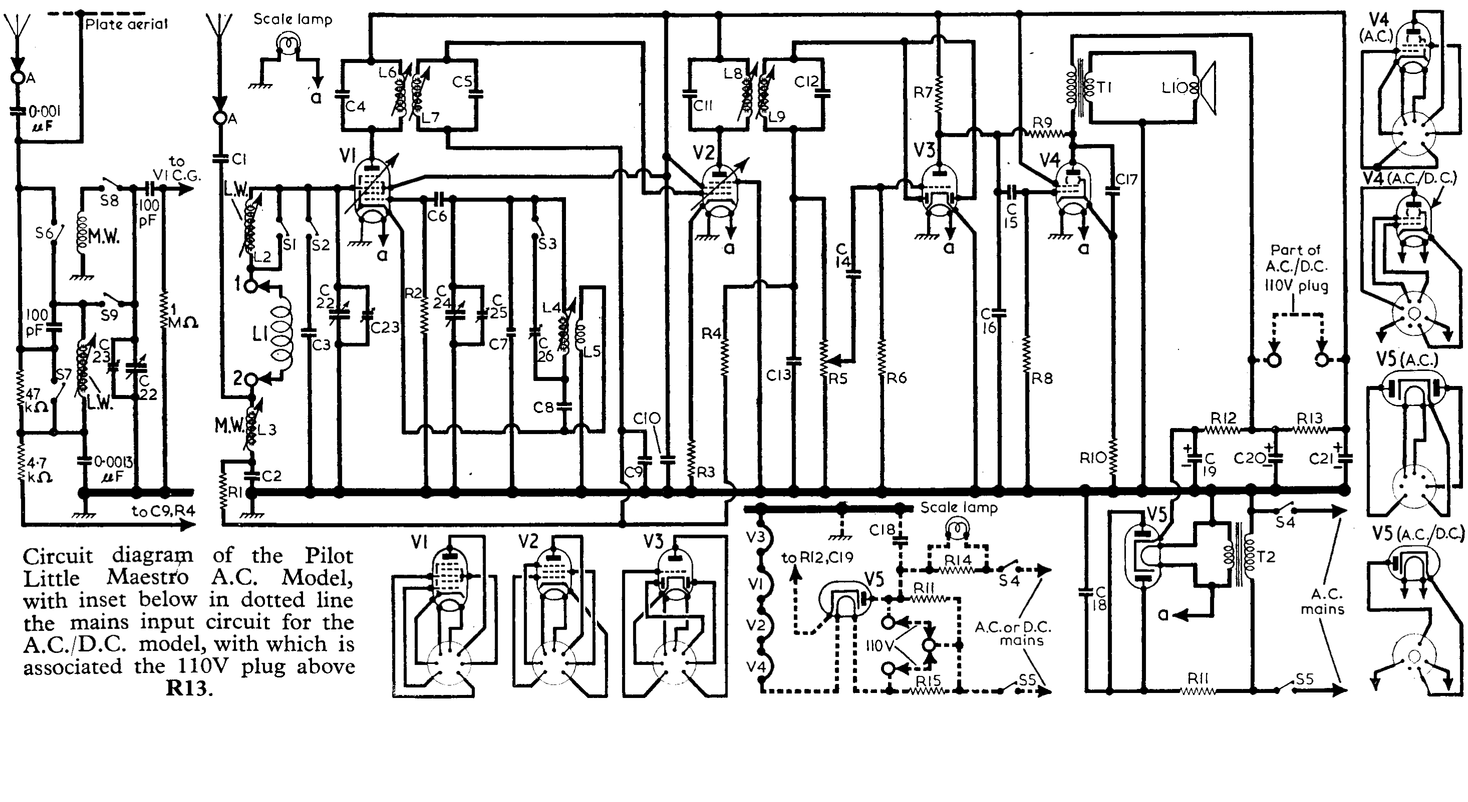
CAPACITORS		Values	Locations
C1	Aerial series	300pF	G4
C2	A.G.C. decoupling	0·1μF	F3
C3	L.W. trimmer	180pF	F4
C4	1st I.F. trans. tuning	100pF	A2
C5	1st I.F. trans. tuning	100pF	A2
C6	V1 osc. C.G.	100pF	G4
C7	Osc. trimmer	§20pF	A1
C8	Osc. tracker	530pF	G4
C9	A.G.C. decoupling	0·1μF	F3
C10	H.T. decoupling	0·1μF	F4
C11	2nd I.F. trans. tuning	100pF	B2
C12	2nd I.F. trans. tuning	100pF	B2
C13	I.F. by-pass	100pF	E3
C14	A.F. coupling	0·001μF	E3
C15	A.F. coupling	0·01μF	E4
C16	Tone correctors	0·001μF	E4
C17	Tone correctors	0·001μF	E4
C18	Mains R.F. filter	0·01μF	D3
C19*	H.T. smoothing	16μF	C1
C20*	H.T. smoothing	16μF	C1
C21*	H.T. smoothing	8μF	D4
C22†	Aerial tuning	—	A2
C23‡	M.W. aerial trim.	—	A2
C24†	Oscillator tuning	—	A1
C25‡	M.W. osc. trim.	—	A1
C26‡	L.W. osc. trim.	700pF	A1

* Electrolytic. † Variable. ‡ Pre-set.
§ Two capacitors, 10pF + 10pF, in parallel.

RESISTORS		Values	Locations
R1	A.G.C. decoupling	220kΩ	F3
R2	V1 osc. C.G.	22kΩ	G4
R3	V2 G.B.	68Ω	F4
R4	A.G.C. decoupling	1MΩ	F4
R5	Volume control	250kΩ	D3
R6	V3 C.G.	10MΩ	E4
R7	V3 anode load	470kΩ	E4
R8	V4 C.G.	1MΩ	E4
R9	Neg. feed-back	1MΩ	E4
R10	V4 G.B.	†270Ω	E4
R11	Surge limiter	100Ω	D3
R12	H.T. smoothing	1kΩ	D3
R13	H.T. smoothing	2·2kΩ	E4
R14*	Scale lamp shunt	22Ω	E3
R15*	Ballast resistor	830Ω	C2

* A.C./D.C. *model only.*
† 220Ω in A.C./D.C. model.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial	1·0	—
L2	L.W. loading coil	8·0	A1
L3	M.W. loading coil	1·4	A1
L4	Osc. tuning coil	2·0	G4
L5	Osc. reaction coil	0·4	G4
L6	1st I.F. trans. Pri.	7·0	A2
L7	1st I.F. trans. Sec.	7·0	A2
L8	2nd I.F. trans. Pri.	7·0	B2
L9	2nd I.F. trans. Sec.	7·0	B2
L10	Speech coil	2·5	B1
T1	O.P. trans. Pri.	450·0	B1
	O.P. trans. Sec.	0·4	
T2	Heater trans. Pri.	155·0	C2
	Heater trans. Sec.	0·4	
S1-S3	Waveband switches	—	G4
S4, S5	Mains sw., g'd R5	—	D3



Circuit diagram of the Pilot Little Maestro A.C. Model, with inset below in dotted line the mains input circuit for the A.C./D.C. model, with which is associated the 110V plug above R13.

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Circuit Description—*continued*

quency amplifier with tuned transformer couplings **C4, L6, L7, C5** and **C11, L8, L9, C12.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Brimar 6AT6** (A.C. model) or **12AT6** (A.C./D.C. model)**).** Audio frequency component in rectified output is developed across volume control **R5,** which acts as diode load, and is passed via **C14** to control grid of triode section. I.F. filtering by **C13.**

D.C. potential developed across **R5** is fed back as bias via decoupling circuit **R4, C9, R1, C2** to F.C. and I.F. stages, giving automatic gain control.

Resistance-capacitance coupling, via **R7. C15** and **R8,** between **V3** anode and output tetrode valve **(V4, Brimar 6AQ5** (A.C. model) or **35L6GT** (A.C./D.C. model)**).** Tone correction by **C16** in **V3** anode circuit, **C17** in **V4** anode circuit and by negative feedback via **R9** between **V4** and **V3** anodes.

In the A.C. model, H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Brimar 6X4)** whose anodes are connected together to form a half-wave rectifier. Smoothing by **R12, R13** and electrolytic capacitors **C19, C20** and **C21. R11** protects **V5** from current surges. Transformer **T2** has only one secondary winding and feeds the heaters of all the valves including **V5.** Mains R.F. filtering by **C18.**

In the A.C./D.C. model, H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Brimar 35Z4GT).** Smoothing is as before, but the valve heaters, together with ballast resistor **R15,** scale lamp and **R14** are connected in series across the mains input. **R14** protects the scale lamp from current surges. For 110 V operation **R11, R13** and **R15** are short-circuited.

GENERAL NOTES

Switches.—**S1-S3** are the waveband switches, ganged in a single rotary unit beneath the chassis and mounted concentrically with the tuning control spindle which, if the knob is depressed and turned, engages with the switch for waveband changing. In the M.W. position (knob anti-clockwise) **S1** closes only. On L.W., **S2, S3** close.

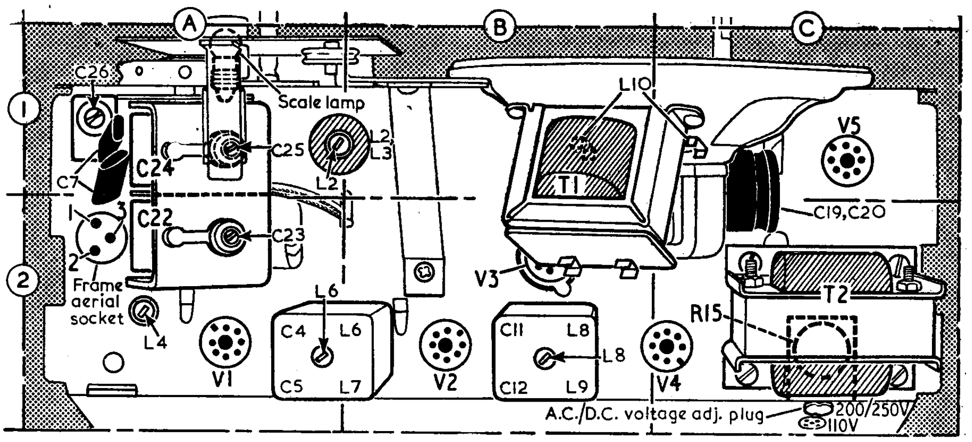
In the earlier version there were two more switches. Then, **S6** and **S8** (in diagram on left of main circuit diagram overleaf) closed on M.W., and **S7, S9** closed for L.W.

Scale Lamps.—These are M.E.S. type lamps, with small clear spherical bulbs. They are rated **at** 6.5 V, 0.3 A (A.C. model) or 3.5 V, 0.15 A (A.C./D.C. model).

A.C. and A.C./D.C. Models.—The only differences between the two models lie in the mains input circuits. The main circuit diagram is that of the A.C. model. The differences in the A.C./D.C. model are shown in the dotted diagram inset beneath the main diagram, which replaces the A.C. mains input circuit, with one exception: the 110 V adjustment plug shown above **R13** appears only in the A.C./D.C. model.

Modifications.—Earlier versions than our sample receiver had the alternative aerial circuit shown on the left of our main diagram overleaf. This included a plate aerial, but no frame aerial, and it applied to both A.C. and A.C./D.C. models. **C7** was omitted in these models, and **C8** was 470 pF.

Drive Cord Replacement.—2 feet of fine-gauge nylon braided glass yarn is required for a new tuning drive cord, which should be run as shown in the sketch below, where the chassis is viewed from the front with the gang at minimum capacitance.



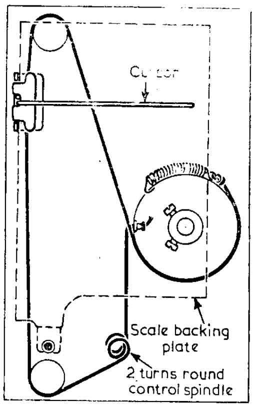
Plan view of the A.C. chassis. **R15** and the voltage adjustment appear only in the A.C./D.C. model.

CIRCUIT ALIGNMENT

In order to make the under-chassis I.F. core adjustments accessible the chassis should be removed from its cabinet.

I.F. Stages.—Connect output of signal generator, via a 0.1 μF capacitor in the " live " lead, to control grid (pin 7) of **V1** and chassis. Switch set to M.W., tune to 500 m, feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L9** (location reference E4), **L8** (B2), **L7** (F4) and **L6** (A2) for maximum output. Repeat.

Sketch of the tuning drive system, drawn as seen from the front, looking " through " the scale backing plate, when the gang is at minimum capacitance.



R.F. and Oscillator Stages.—As the tuning scale is fixed to the cabinet, and no calibration marks are provided on the scale backing plate, it is advisable to carry out the following adjustments, where possible, with the chassis in the cabinet. With some earlier models however, the gang capacitor was mounted in such a position that it was not possible to adjust **C23** or **C25** without withdrawing the chassis.

If the chassis has to be withdrawn, a substitute paper tuning scale should be made, and can be calibrated by holding it up against the tuning scale and marking off on it the 214.3 m, 500 m, and 1,304 m alignment points, and the lower edge of the clear centre portion of the scale. The substitute scale should then be fastened by tape to the front of the scale backing plate so that its lower mark coincides with the engraved line at the bottom right-hand corner of the backing plate.

With the gang at maximum capacitance the cursor should coincide with the lower edge of the clear centre section of the scale or with the mark on the scale backing plate. Adjustments can be made by sliding the cursor carriage along the drive cord. Transfer signal generator leads, via a suitable dummy aerial to **A** socket and chassis. As one side of the mains is connected to chassis care should be taken to see that the signal generator is not earthed.

M.W.—Switch set to M.W., tune to **214.3 m,** feed in a 214.3 m (1,400 kc/s) signal and adjust **C25** (A1) and **C23** (A2) for maximum output. Tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of **L4** (A2) and **L3** (F3) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to **1,304 m,** feed in a 1,304 m (230 kc/s) signal and adjust **C26** (A1) and the core of **L2** (A1) for maximum output. Repeat these adjustments.

VALVE ANALYSIS

Valve voltages and currents given below were measured on our receivers when they were operating from A.C. mains of 230 V. The receivers were tuned to the highest wavelength end of M.W. with the volume controls turned to maximum, but there was no signal input.

Voltage readings were measured on an Avo Electronic TestMeter, which draws no appreciable current, and allowance should be made for the current drawn when using other types of meter. Chassis was the negative connection in every case.

A.C. Model

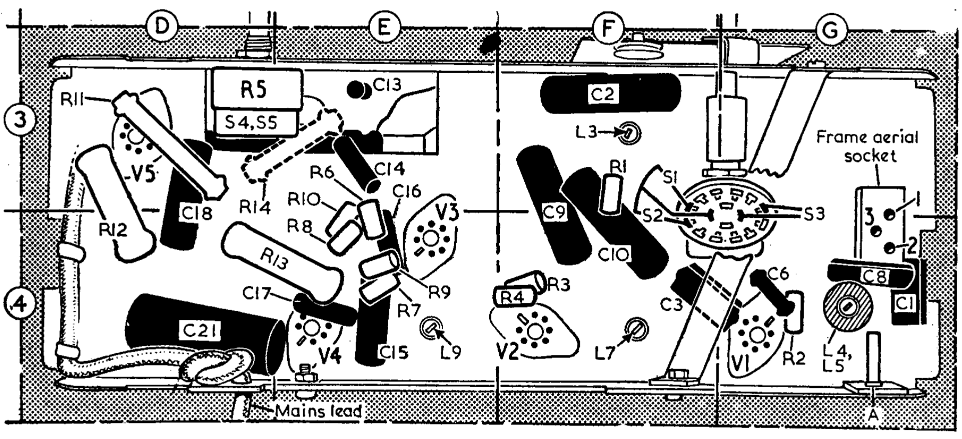
Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 6BE6 ...	120	3·3	120	8·2	—
V2 6BA6 ...	120	10·5	120	4·7	1·0
V3 6AT6 ...	78	1·2	—	—	—
V4 6AQ5 ...	175	18·0	120	2·5	5·4
V5 6X4 ...	215†	—	—	—	240·0

† A.C. voltage reading.

A.C./D.C. Model

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 12BE6 ...	100	3·0	100	7·0	—
V2 12BA6 ...	100	7·7	100	3·4	0·7
V3 12AT6 ...	50	1·0	—	—	—
V4 35L6GT ...	135	34·0	100	5·0	7·5
V5 35Z4GT ...	210†	—	—	—	210·0

† A.C. voltage reading.



Underside view of the chassis. The detail of the waveband switch unit is shown.

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