

# PILOT - BM109

Valve	Anode		Screen	
	V	mA	V	mA
V1 1R5	85	1.15	58	1.4
V2 1T4	85	1.6	58	0.75
V3 1S5	15	0.09	10	0.04
V4 3V4	82	6.1	85	1.2

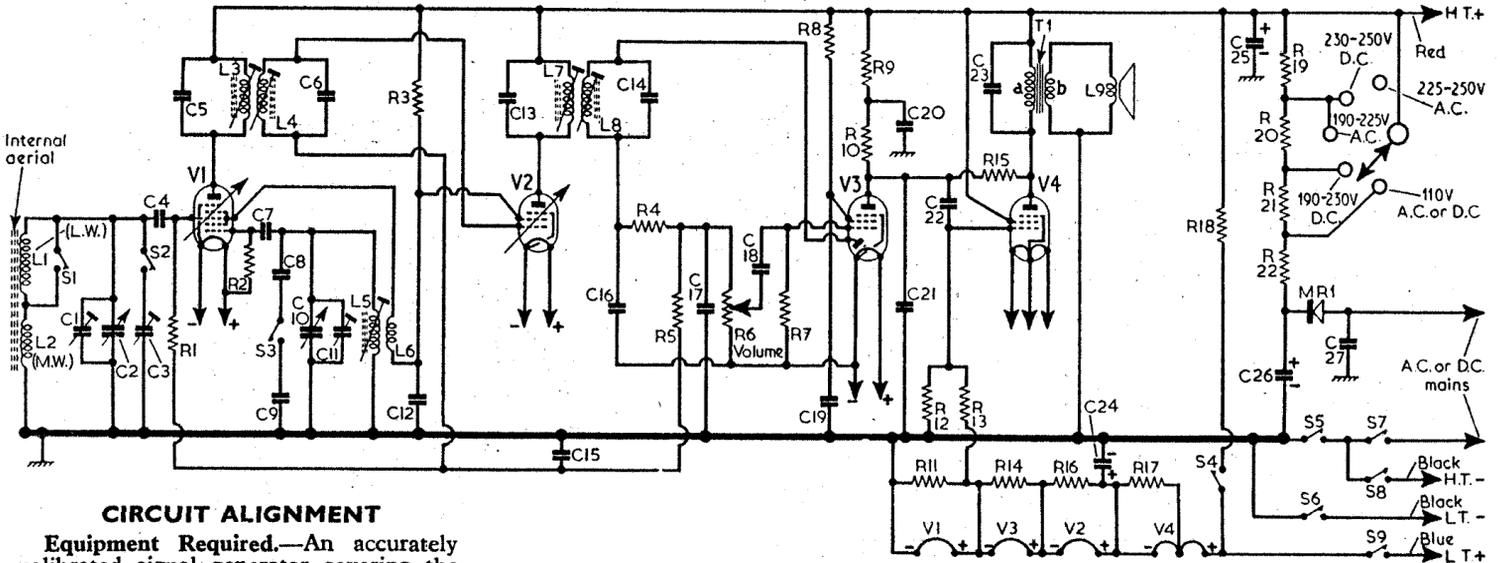
Resistors		
R1	3.3MΩ	F4
R2	100kΩ	F4
R3	4.7kΩ	F3
R4	47kΩ	E4
R5	2.2MΩ	F3
R6	1MΩ	B1
R7	10MΩ	E3
R8	3.3MΩ	F3
R9	220kΩ	F3
R10	1MΩ	E4
R11	180Ω	F4
R12	2.2MΩ	E3
R13	2.2MΩ	E4
R14	220Ω	E4
R15	10MΩ	E4
R16	220Ω	F4
R17	470Ω	E4
R18	1.8kΩ	D4
R19	800Ω	D4
R20	650Ω	D4
R21	1,550Ω	D4
R22	280Ω	D4

Capacitors		
C1	—	F3
C2	—	A1
C3	250pF	B1
C4	100pF	F3
C5	100pF	A2
C6	100pF	A2
C7	100pF	F4
C8	0.1μF	B1
C9	385pF <sup>1</sup>	B2
C10	—	A1
C11	—	F3
C12	0.1μF	F3
C13	100pF	B2
C14	100pF	B2
C15	0.1μF	E4
C16	100pF	E4
C17	100pF	B1
C18	0.01μF	E3
C19	0.01μF	E4
C20	0.1μF	E3
C21	200pF	E4
C22	0.01μF	E4

C23	0.005μF	E4
C24	100μF	F3
C25	32μF	C1
C26	32μF	C1
C27	0.05μF	D3
Coils*		
L1	3.0	A1
L2	—	B1
L3	8.5	A2
L4	8.5	A2
L5	3.0	F3
L6	1.75	F3
L7	8.5	B2
L8	8.5	B2
L9	3.0	—
Other Components*		
T1	440	—
MR1	—	D3
S1-S9	—	B1

<sup>1</sup>Comprises two capacitors in parallel (375pF and 10pF).  
<sup>\*</sup>Westinghouse type 18RA 1-1-16-1.  
<sup>\*</sup>Approximate D.C. resistance in ohms.

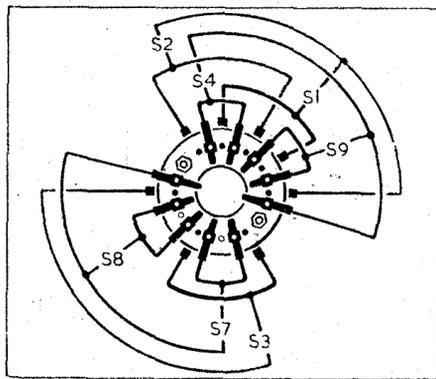
Intermediate frequency 470kc/s.



### CIRCUIT ALIGNMENT

**Equipment Required.**—An accurately calibrated signal generator covering the range 180kc/s-1,500kc/s; a high resistance A.C. voltmeter; a 0.1μF and a 0.05μF capacitor; and a short non-metallic trimming tool. Provided the correct trimming tool is used all alignment adjustments can be carried out with the receiver in its cabinet. Connect the output meter via the 0.1μF capacitor between the (blue lead) tag on the output transformer T1 and chassis, then carry out the following sequence of operations:

- 1.—Connect signal generator via the 0.05μF capacitor to the stator of C2 (A1) and chassis. Feed in a 470kc/s signal and adjust for maximum output on meter the cores of L8 (B2), L7 (B2), L4 (A2) and L3 (A2).
- 2.—Repeat sequence of adjustments in operation 1 for optimum results.
- 3.—Transfer live signal generator lead to suitable coil of wire loosely coupled to ferrite rod aerial. Switch receiver to M.W., turn tuning gang to 200m., feed in a 1,500kc/s signal, and adjust C1 and C11 (F3) for maximum output.



Above: Diagram of the switch unit.  
 Left: Plan view of the chassis. The ferrite aerial is illustrated in location references A1, B1.

- 4.—Turn tuning gang to 500m, feed in a 600kc/s signal and adjust the core of L5 (F3) for maximum output.

- 5.—Switch receiver to L.W. and feed in a 200kc/s signal. Tune receiver to signal generator signal and adjust C3 (B1) for maximum output.

- 6.—Repeat operations 3-5 for optimum results.

**Switches.**—S1-S4 and S7-S9 are the combined waveband and mains/battery switches ganged in a single rotary unit in location reference B1. This unit is indicated in our plan illustration of the chassis and shown in detail in the diagram above where they are drawn as seen from the rear of an upright chassis. S1 closes for M.W., S2, S3 close for L.W., S4, S7 close for mains, and S8, S9 for battery operation. S5 and S6 are the on/off switches for both mains and battery operation.