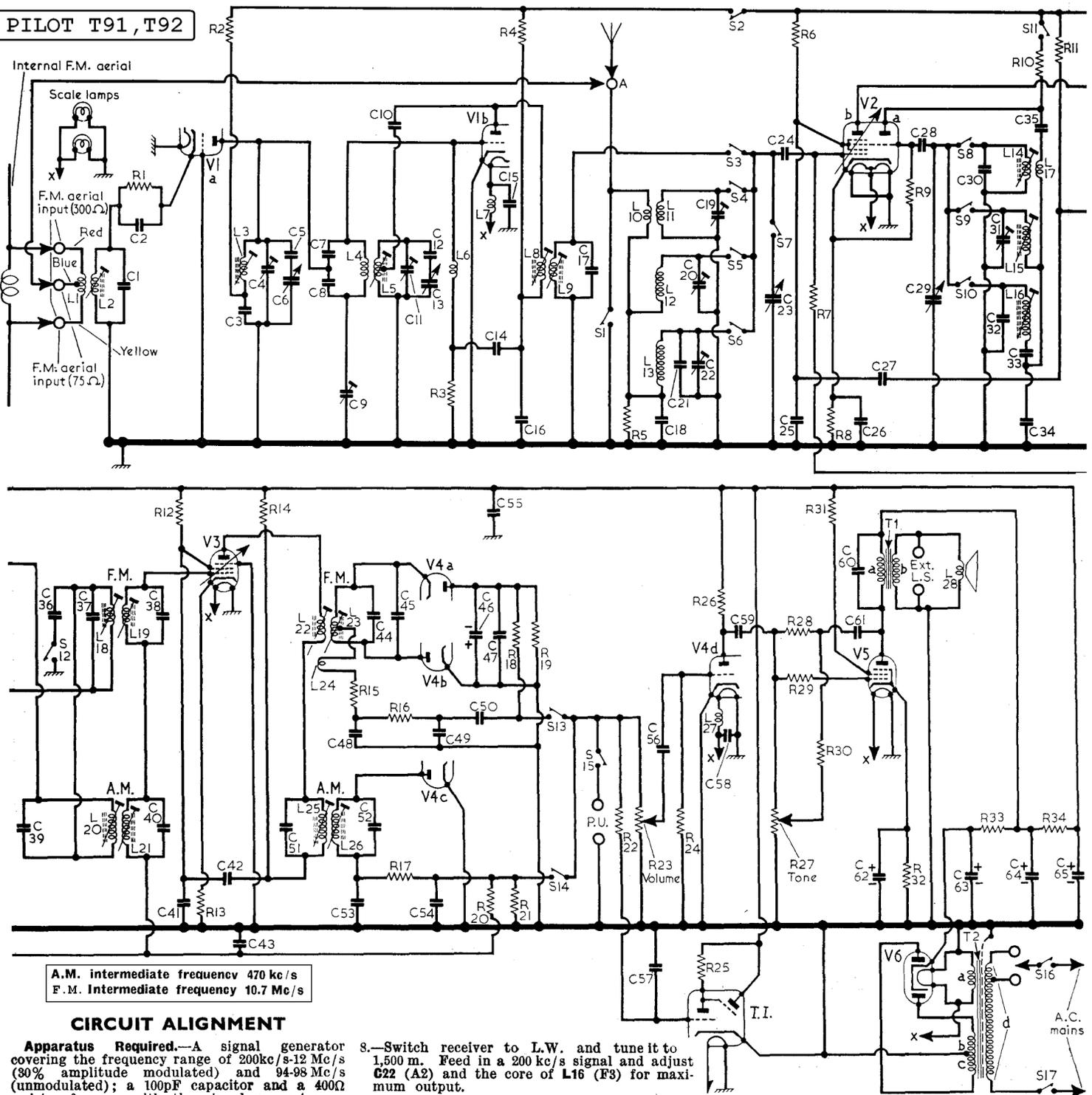


# PILOT T91, T92



A.M. intermediate frequency 470 kc/s  
F.M. Intermediate frequency 10.7 Mc/s

## CIRCUIT ALIGNMENT

**Apparatus Required.**—A signal generator covering the frequency range of 200kc/s-12 Mc/s (30% amplitude modulated) and 94-98 Mc/s (unmodulated); a 100pF capacitor and a 400Ω resistor for use with the signal generator; a valve voltmeter for use during F.M. alignment.

### A.M. I.F. Stages

- 1.—Switch receiver to M.W. and turn gang to maximum. Correct output of signal generator to control grid (pin 2) of V2b.
- 2.—Feed in a 470 kc/s signal and adjust the cores of L26 (location reference C1), L25 (E4), L21 (B2) and L20 (F4) for maximum output, setting each core to the peak nearer the adjusting end of the coil former.

### A.M. R.F. and Oscillator Stages

- 3.—Check that with gang at maximum capacitance, the cursor coincides with the high wavelength ends of the tuning scales.
- 4.—Disconnect signal generator live lead from V2b control grid and re-connect it via the 100pF capacitor to the A.M. aerial terminal.
- 5.—With receiver switched to M.W., tune it to 200 m, feed in a 1,500 kc/s signal and adjust C31 (B1) and C20 (A2) for maximum output.
- 6.—Tune receiver to 500 m, feed in a 600 kc/s signal and adjust the core of L15 (B1) for maximum output.
- 7.—Repeat operations 5 and 6 until no further improvement results.

- 8.—Switch receiver to L.W. and tune it to 1,500 m. Feed in a 200 kc/s signal and adjust C22 (A2) and the core of L16 (F3) for maximum output.
- 9.—Switch receiver to S.W. and tune it to 25 m. Replace 100 pF capacitor in signal generator lead with 400Ω resistor. Feed in a 12 Mc/s signal and adjust C19 (A2) and the core of L14 (B1) for maximum output. (See "General Notes" for S.W. alignment in T92.) Disconnect signal generator.

### F.M. I.F. Stages

- 10.—Switch receiver to F.M. and connect output of signal generator, via a 100 pF capacitor in the live lead, between anode (pin 1) of V1a and chassis.
- 11.—Connect valve voltmeter across R19 (D4), taking the positive meter connection to chassis. Feed in a 10.7 Mc/s unmodulated signal and adjust the cores of L8 (G4), L9 (A2), L18 (F4), L19 (B2) and L22 (C2) for maximum output on valve voltmeter, setting each core to the peak nearer the adjusting end of its coil former.
- 12.—Feed in a 10.7 Mc/s 30% amplitude modulated signal and adjust the core of L23 (B2) for minimum audio output from speaker.
- 13.—Adjust output of signal generator to give a reading of 0.4 V on the valve voltmeter and then repeat operation 12.

### F.M. R.F. and Oscillator Stages

- 14.—Disconnect valve voltmeter and signal generator. Tune receiver to 92 Mc/s and connect valve voltmeter across 300Ω F.M. aerial
- 15.—Adjust C9 (G4) for minimum reading on valve voltmeter. Disconnect valve voltmeter.
- 16.—Connect signal generator output across 75Ω F.M. aerial terminals. Re-connect valve voltmeter across R19.
- 17.—Tune receiver to 98 Mc/s, feed in a 98 Mc/s unmodulated signal and adjust C11 (G4) and C4 (G4) for maximum output on valve voltmeter.
- 18.—Tune receiver to 90 Mc/s, feed in a 90 Mc/s unmodulated signal and adjust the cores of L5 (A2) and L3 (A1) for maximum output on valve voltmeter. Repeat these adjustments, and those in operation 17, until no further improvement results.
- 19.—Tune receiver to 94 Mc/s, feed in a 94 Mc/s unmodulated signal and adjust the core of L2 (A2) for maximum output on valve voltmeter.

**Capacitors**

C1	5pF	G4
C2	0.01μF	G4
C3	470pF	G3
C4	40pF	G3
C5	47pF	G3
C6	—	A1
C7	10pF	G4
C8	10pF	G4
C9	30pF	G4
C10	20pF	G4
C11	30pF	G4
C12	33pF	G4
C13	—	A2
C14	150pF	G4
C15	0.005μF	G4
C16	880pF	G4
C17	5pF	A2
C18	2,850pF	F4
C19	80pF	A2
C20	80pF	A2
C21	150pF	G4
C22	80pF	G4
C23	—	A2
C24	100pF	F4
C25	0.001μF	F4
C26	0.01μF	F4
C27	0.01μF	F4
C28	100pF	F4
C29	—	A1
C30†	33pF	G4
C31	80pF	B1
C32	300pF	F3
C33	400pF	F3
C34	620pF	F3
C35	100pF	F4
C36	0.001μF	F4
C37	5pF	B2
C38	5pF	B2
C39	100pF	F4
C40	100pF	B2
C41	0.005μF	E4
C42	0.01μF	E4
C43	0.1μF	F4
C44	20pF	C2
C45†	5pF	E4
C46	5μF	D4
C47	100pF	D4

C48	200pF	E4
C49	0.001μF	E4
C50	0.05μF	E4
C51	200pF	B2
C52	200pF	B2
C53	100pF	E4
C54	100pF	E4
C55	0.01μF	E4
C56	0.01μF	D4
C57	0.01μF	E4
C58	0.005μF	D4
C59	0.01μF	D4
C60	0.005μF	C2
C61	100pF	D4
C62	25μF	D4
C63	32μF	B1
C64	32μF	B1
C65	8μF	B1

**Resistors**

R1	220Ω	G3
R2	1kΩ	G3
R3	220kΩ	G4
R4	1kΩ	G4
R5	6.8kΩ	F4
R6	33kΩ	F4
R7	1MΩ	F4
R8	220Ω	F4
R9	47kΩ	F4
R10	27kΩ	F4
R11	1kΩ	F4
R12	33kΩ	E4
R13	68Ω	E4
R14	1kΩ	E4
R15	100Ω	E4
R16	33kΩ	E4
R17	47kΩ	E4
R18	470kΩ	E4
R19	68kΩ	E4
R20	1MΩ	F4
R21	270kΩ	E4
R22	2.2MΩ	D3
R23	500kΩ	E3
R24	10MΩ	D4
R25	1MΩ	C1
R26	270kΩ	D4
R27	500kΩ	D3

R28	4.7MΩ	D4
R29	4.7kΩ	D4
R30	220kΩ	D4
R31	100Ω	D4
R32	160Ω	D4
R33	1kΩ	E3
R34	2.2kΩ	E3

**Other Components\***

L1	—	A2
L2	—	A2
L3	—	A1
L4	—	A2
L5	—	A2
L6	—	G4
L7	—	G4
L8	1.0	A2
L9	1.0	A2
L10	—	F4
L11	—	F4
L12	2.5	G4
L13	16.0	G4
L14	—	B1
L15	3.5	B1
L16	10.0	B1
L17	—	B1
L18	1.0	B2
L19	1.0	B2
L20	10.0	B2
L21	10.0	B2
L22	—	C2
L23	—	C2
L24	—	C2
L25	7.5	C2
L26	7.5	C2
L27	—	D4
L28	2.5	—
T1	{ a 500.0 } —	
	{ b — } —	
T2	{ a — } —	
	{ b 200.0 } —	
	{ c 200.0 } —	
	{ d 30.0 } —	
S1-S15	—	F4
S16, S17	—	D3

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECC85	{ a 150 <sup>1</sup>	5.0 <sup>1</sup>	—	—	1.3 <sup>1</sup>
	{ b 145 <sup>1</sup>	4.7 <sup>1</sup>	—	—	—
V2 12AH8	{ a 76	3.5	—	—	1.8
	{ b 169	1.0	76	3.0	1.8
V3 6BA6	165	7.5	90	3.0	0.9
V4 EABC80	{ a-c —	—	—	—	—
	{ d 66	0.5	—	—	—
V5 6L84	205	30.0	170	3.0	5.0
V6 6Z80	230 <sup>2</sup>	—	—	—	270.0 <sup>3</sup>
T.I. 6E5GT	170 <sup>4</sup>	1.5	—	—	—

<sup>1</sup> Receiver switched to F.M.

<sup>2</sup> A.C. reading each anode.

<sup>3</sup> Cathode current 60 mA.

<sup>4</sup> Target anode 20V.

**Drive Cord Replacement.**—About 55in of nylon-braided glass yarn is required for a new drive cord. It should be run as indicated in the sketch of the tuning drive system in the middle of columns 5 and 6, which is drawn as viewed from the rear of an upright chassis with the gang at minimum.

Initially one end of the cord should be tied to the spring-loaded pulley at the right-hand end of the scale backing plate, leaving about three inches of cord loose for final tying off. The cord should then be run down to the gang drive drum, round the tuning spindle, and on up to the top left-hand pulley as shown in the sketch. Finally the end of the cord anchored round the right-hand pulley should be untied and both ends of the cord tied off round a metal eyelet. The final tension on the cord should be enough to compress the pulley spring to  $\frac{1}{2}$  inch.

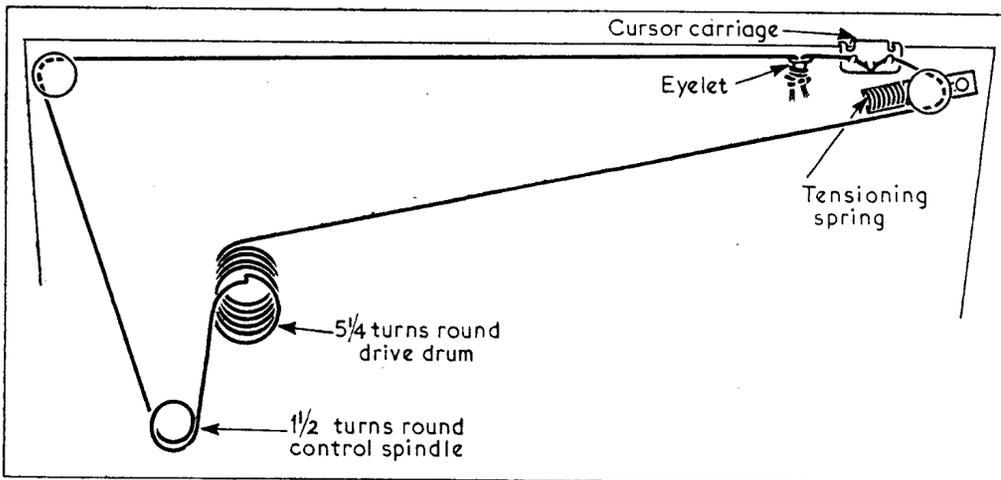
**Switch Table**

Switches	Gram	L.W.	M.W.	S.W.	F.M.
S1	—	—	—	—	—
S2	—	—	—	—	—
S3	—	—	—	—	—
S4	—	—	—	—	—
S5	—	—	—	—	—
S6	—	—	—	—	—
S7	—	—	—	—	—
S8	—	—	—	—	—
S9	—	—	—	—	—
S10	—	—	—	—	—
S11	—	—	—	—	—
S12	—	—	—	—	—
S13	—	—	—	—	—
S14	—	—	—	—	—
S15	—	—	—	—	—

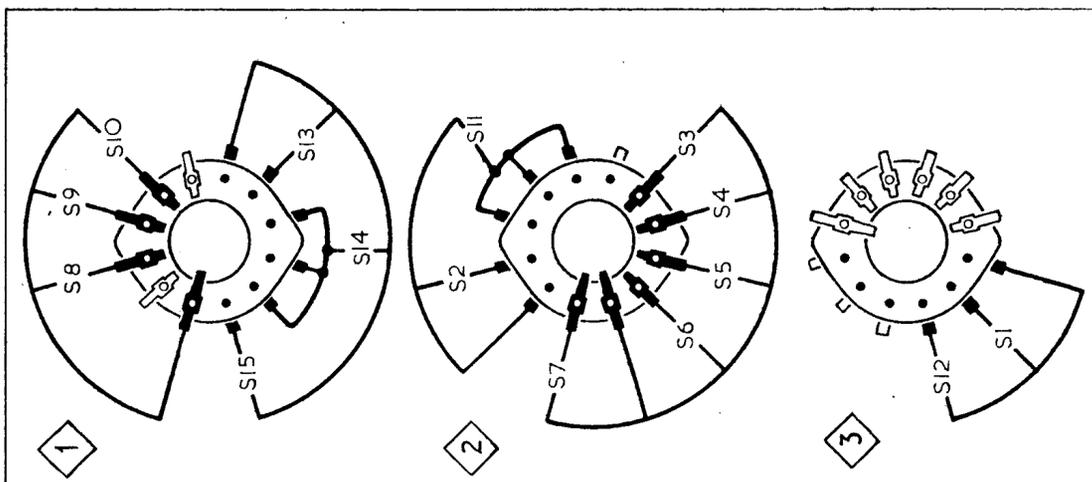
‡Pre-set in model T92.

†May be omitted.

\*Approximate D.C. resistance in ohms.



Sketch of the tuning drive system as seen from the rear of an upright chassis



Diagrams of the band switch units as seen from the rear of an inverted chassis.