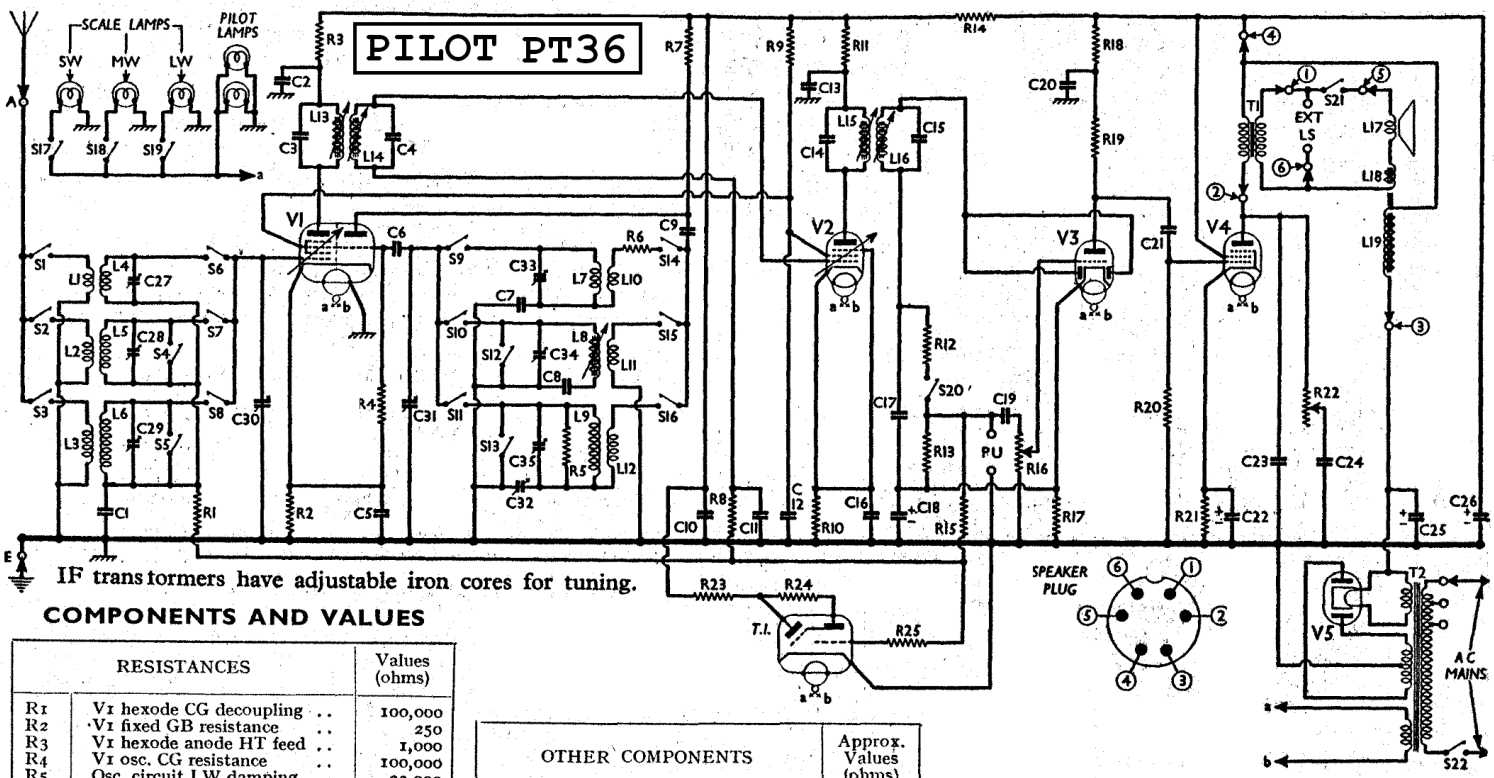


IF transformers have adjustable iron cores for tuning.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 hexode CG decoupling	100,000
R2	V1 fixed GB resistance	250
R3	V1 hexode anode HT feed	1,000
R4	V1 osc. CG resistance	100,000
R5	Osc. circuit LW damping	33,000
R6	Osc. SW reaction damping	60
R7	V1 osc. anode HT feed	30,000
R8	V2 CG decoupling	100,000
R9	V1, V2 SG's HT feed	20,000
R10	V2 fixed GB resistance	390
R11	V2 anode HT feed	1,000
R12, R13	V3 signal diode load resistances	47,000
R14	V1, V2 and T.I. HT feed	470,000
R15	AVC line decoupling	1,000
R16	Manual volume control	1,000,000
R17	V3 GB resistance	1,000,000
R18	V3 triode anode decoupling	4,000
R19	V3 triode anode load	100,000
R20	V4 CG resistance	250,000
R21	V4 GB resistance	470,000
R22	Variable tone control	440
R23, R24	T.I. anode HT feed resistances	100,000
R25	T.I. CG decoupling	22,000
		1,000,000
		1,000,000

	CONDENSERS	Values (μF)
C1	V1 hexode CG decoupling	0·01
C2	V1 hexode anode decoupling	0·01
C3, C4	1st IF transformer fixed tuning condensers	0·00011
C5	V1 cathode by-pass	0·00011
C6	V1 osc. CG condenser	0·1
C7	Osc. circuit SW tracker	0·0001
C8	Osc. circuit MW tracker	0·00325
C9	V1 osc. anode coupling	0·00045
C10	HT circuit RF by-pass	0·002
C11	V2 CG decoupling	0·1
C12	V1, V2 SG's decoupling	0·01
C13	V2 anode decoupling	0·1
C14, C15	2nd IF transformer fixed tuning condensers	0·01
C16	V2 cathode by-pass	0·00011
C17	IF by-pass	0·00011
C18*	V3 cathode by-pass	0·1
C19	AF coupling to V3 triode	0·00025
C20	V3 triode anode decoupling	10·0
C21	V3 triode to V4 AF coupling	0·01
C22*	V4 cathode by-pass	0·1
C23	Fixed tone corrector	10·0
C24	Part of variable tone control	0·003
C25*, C26*	HT smoothing condensers	0·03
C27‡	Aerial circuit SW trimmer	16·0
C28‡	Aerial circuit MW trimmer	8·0
C29‡	Aerial circuit LW trimmer	0·00003
C30†	Aerial circuit tuning	0·00003
C31†	Oscillator circuit tuning	0·00003
C32‡	Osc. circuit LW tracker	—
C33‡	Osc. circuit SW trimmer	0·00016
C34‡	Osc. circuit MW trimmer	0·00003
C35‡	Osc. circuit LW trimmer	0·00003
		0·00008

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW coupling	1·2
L2	Aerial MW coupling	19·0
L3	Aerial LW coupling	120·0
L4	Aerial SW tuning coil	0·05
L5	Aerial MW tuning coil	2·8
L6	Aerial LW tuning coil	17·0
L7	Osc. circuit SW tuning coil	0·05
L8	Osc. circuit MW tuning coil	4·0
L9	Osc. circuit LW tuning coil	9·5
L10	Oscillator SW reaction coil	0·13
L11	Oscillator MW reaction coil	0·8
L12	Oscillator LW reaction coil	0·3
L13, L14	1st IF trans. Pri.	4·5
	1st IF trans. Sec.	4·5
L15, L16	2nd IF trans. Pri.	4·5
	2nd IF trans. Sec.	4·5
L17	Speaker speech coil	3·0
L18	Hum neutralising coil	0·2
L19	Speaker field	1,400·0
T1	Speaker input trans. Pri.	700·0
	Speaker input trans. Sec.	0·4
T2	Mains trans. Pri., total	22·0
	Mains trans. Heater sec.	0·1
	Mains trans. Rect. heat. sec.	0·1
	Mains trans. HT sec., total	300·0
S1-S16	Waveband switches	—
S17-19	Scale lamps switches	—
S20	Radio muting switch	—
S21	Speaker switch	—
S22	Mains switch, ganged R22	—

VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X65	248	1·6	98	5·3
	Oscillator			
	106	4·4		
V2 6U7G	244	7·4	98	2·0
V3 6Q7G	85	0·5	—	—
V4 6F6G	246	35·0	274	7·3
V5 5Z4G	333†	—	—	—
T.I. 6G5	48	0·2	—	—
	Target			
	192	2·0		

† Each anode, A.C

Valve voltages and currents given in the table above are those measured in our receiver when it was operating on mains of 225 V, using the 225 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium 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 Universal Avometer, chassis being negative.

If, as in our case, **V2** should become unstable when its anode and screen currents are being measured, it can be stabilised by connecting a non-inductive condenser of about 0·1 μF from the electrode concerned to chassis.

GENERAL NOTES

Switches.—S1-S16 are the waveband switches, and **S17-S19** the scale lamp switches, in two rotary units beneath the chassis. These are indicated in the underchassis view, and shown in detail in the diagrams overleaf, where they are as seen looking from the rear of the underside of the chassis. The table overleaf gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

S20 is the radio muting switch, of the rotary type, associated with the pick-up sockets at the rear of the chassis. **S20** is normally closed, but when the 2-pin pick-up plug is inserted and rotated anti-clockwise, it opens **S20** and so mutes radio by breaking the input to the grid circuit of **V3.** When the pick-up plug is rotated clockwise, however, **S20** closes for radio operation.

S21 is a similar switch associated with the external speaker sockets, also at the rear of the chassis. When an external speaker is plugged in, and the 2-pin plug is rotated anti-clockwise, **S21** opens and mutes the internal speaker by disconnecting its speech coil circuit. In the clockwise position, however, **S21** is closed, and both speakers are in operation.

S22 is the QMB mains switch, ganged with the tone control **R22.**

Coils.—L1-L6, and the IF transformers **L13, L14** and **L15, L16,** are in three screened units on the chassis deck. Note that the trimmers **C27-C29** are reached through three holes in the front of the **L1-L6** can. The core adjustments of the IF transformers are at the rear of their cans, and are indicated in the plan chassis view.

L7, L10; L8, L11 and **L9, L12** are in three unscreened tubular units beneath the chassis. **L8** has a variable iron core for tracking, the screw adjustment being indicated in the under-chassis view.

Scale and Pilot Lamps.—There are three scale lamps, switched by **S17-S19,** and two pilot lamps which light whenever the set is " on." They are all Ever Ready miniature bayonet cap types, rated at 7·3 V, 0·25 A.

TABLE AND DIAGRAMS

Switch	SW	MW	LW
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	C	—	—
S5	C	C	—
S6	C	—	—
S7	—	C	—
S8	—	—	C
S9	C	—	—
S10	—	C	—
S11	—	—	C
S12	C	—	—
S13	C	C	—
S14	C	—	—
S15	—	C	—
S16	—	—	C
S17	C	—	—
S18	—	C	—
S19	—	—	C

1, red/white; 2, blue; 3, red; 4, yellow; 5, white; 6, white/red.

At their opposite ends the coloured leads are connected to the speaker transformer terminal strip. The connections here are given under " Removing Speaker."

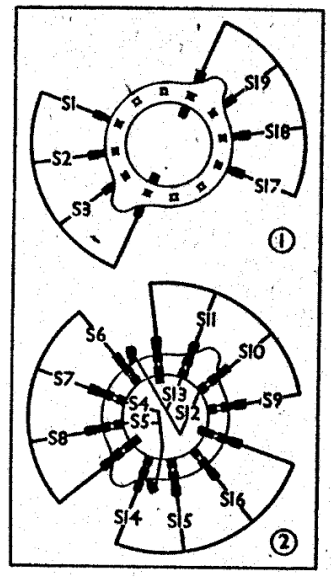
Trimmer C34.—This is of the cylindrical interleaving type, the variable electrode screwing in or out of the fixed one.

CIRCUIT ALIGNMENT

IF Stages.—Switch set to MW, and turn gang condenser to maximum. Connect signal generator via a 0·1 μF condenser to control grid (top cap) of **V2,** and chassis.

Feed in a 451 KC/S signal, and adjust the core of **L15,** then **L16,** for maximum output. Transfer signal generator to control grid (top cap) of **V1,** and adjust the core of **L13,** then **L14,** for maximum output. Re-check all settings with the signal generator connected to **V1.**

RF and Oscillator Stages.—With gang condenser at maximum, pointer should cover the arrow heads at the high wavelength ends of the three scales. Connect signal generator to **A** and **E** leads via a 0·0002 μF condenser.



Diagrams of the two switch units, as seen looking from the rear of the underside of the chassis.

MW.—Switch set to MW, and tune to 200 m on scale. Feed in a 200 m (1,500 KC/S) signal, and adjust **C34,** then **C28,** for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust the core of **L8** for maximum output, while rocking the gang for optimum results. Repeat the 200 m adjustments.

LW.—Switch set to LW, and tune to 1,100 m on scale. Feed in a 1,100 m (272·5 KC/S) signal, and adjust **C35,** then **C29,** for maximum output. Feed in a 1,900 m (158 KC/S) signal, tune it in, and adjust **C32** for maximum output, while rocking the gang for optimum results. Repeat the 1,100 m adjustments.

SW.—Switch set to SW, and tune to 17 m on scale. Feed in a 17 m (17·65 MC/S) signal, and adjust **C33,** then **C27,** for maximum output. Repeat these adjustments very accurately. There is no variable SW tracker to be adjusted.

AUTOMATIC TUNING

A mechanical " piano-key " system is used, in which plungers operated by the keys cause a rotary motion of a spindle which is linked up to the gang spindle by bell-cranks and a system of gearing. The drum-type scale is operated in the same way from the spindle of the automatic tuner.

The manual tuning knob, when depressed, releases any piano key which is down, and at the same time links the manual tuning spindle via a worm wheel to a sector gear attached to the spindle of the auto unit. Manual tuning can then be carried out. When any piano-key is depressed, the manual tuning spindle is disconnected from the drive.

To change a station, the auto-system is unlocked by rotating the locking control (the knob in the centre above the row of four) anti-clockwise for several turns. The appropriate key is then fully depressed, and keeping it depressed the manual tuning drive is engaged, and the receiver tuned to the desired station. The locking control is then fully tightened up (clockwise). If desired, all keys can be re-set whilst the locking control is unscrewed.