



Note the automatic bias arrangements in this circuit diagram of the Pilot B43 3-band battery superhet, the potential divider **R14, R15** in the HT negative lead providing grid bias for all four valves and also delay voltage for the AVC system.

### COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 osc. CG resistance	50,000
R2	Osc. reaction SW stabiliser	30
R3	V1 osc. anode MW and LW HT feed	20,000
R4	V1 osc. anode SW HT feed	6,000
R5	V1, V2 SG's HT feed	30,000
R6	V3 signal diode load resistances	50,000
R7	Manual volume control	500,000
R8	V3 triode CG decoupling	750,000
R9	V3 triode anode load	50,000
R10	V3 triode anode load	100,000
R11	AVC line decoupling	1,000,000
R12	V4 CG resistance	500,000
R13	V3 AVC diode load	1,000,000
R14	V1, V2, V3 and V4 auto GB.	190
R15	and AVC delay voltage resistances	140

CONDENSERS		Values (μF)
C1	AVC line decoupling	0.05
C2	V1 osc. CG condenser	0.0004
C3	Osc. circuit SW tracker	0.006
C4	V1 osc. anode coupling	0.00015
C5	V1, V2 SG's decoupling	0.1
C6	Coupling to V3 AVC diode	0.00015
C7	IF by-pass	0.00015
C8	AF coupling to V3 triode	0.01
C9*	V3 CG decoupling	10.0
C10	V3 triode anode IF by-pass	0.0004
C11	V3 triode to V4 IF coupling	0.01
C12	Fixed tone corrector	0.002
C13*	HT circuit reservoir	8.0
C14†	Aerial circuit SW trimmer	—
C15†	Aerial circuit MW trimmer	—
C16†	Aerial circuit LW trimmer	—
C17†	Aerial circuit tuning	—
C18†	Osc. circuit MW tracker	0.0006
C19†	Osc. circuit LW tracker	0.0002
C20†	Osc. circuit SW trimmer	—
C21†	Osc. circuit MW trimmer	—
C22†	Osc. circuit LW trimmer	—
C23†	Oscillator circuit tuning	—
C24†	1st IF trans. pri. tuning	—
C25†	1st IF trans. sec. tuning	—
C26†	2nd IF trans. pri. tuning	—
C27†	2nd IF trans. sec. tuning	—

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

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	0.5
L2	Aerial MW coupling coil	18.0
L3	Aerial LW coupling coil	100.0
L4	Aerial SW tuning coil	0.05
L5	Aerial MW tuning coil	2.0
L6	Aerial LW tuning coil	20.0
L7	Oscillator SW reaction	0.2
L8	Oscillator MW reaction	1.2
L9	Oscillator LW reaction	3.6
L10	Osc. circuit SW tuning coil	0.05
L11	Osc. circuit MW tuning coil	3.0
L12	Osc. circuit LW tuning coil	16.0
L13	1st IF trans. Pri.	4.0
L14	1st IF trans. Sec.	4.0
L15	2nd IF trans. Pri.	12.0
L16	2nd IF trans. Sec.	12.0
L17	Speaker speech coil	1.6
T1	Speaker input trans. Pri.	530.0
	Speaker input trans. Sec.	0.15
S1-S17	Waveband switches	—
S18	Speaker switch	—
S19	HT circuit switch	—
S20	LT circuit switch	—

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new HT battery reading 122 V on load. 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, **V1** should become unstable when its anode current is being measured, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TP23	{ 117 62 } Oscillator	{ 0.6 1.8 }	62	1.2
V2 VP22	117	1.2	62	0.6
V3 L22DD	70	0.3	—	—
V4 Pen24	114	4.7	117	0.9

### GENERAL NOTES

**Switches.**—**S1-S17** are the waveband switches, in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams on page iv. The table (page iv) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

**S18** is the internal speaker switch, associated with the external speaker sockets. When the special plug is inserted and rotated anti-clockwise, **S18** opens and mutes the internal speaker.

**S19** and **S20** are the HT and LT circuit switches, ganged with the manual volume control **R8**. The blue and the black braided leads go to **S19**, and the black rubber and tinned copper leads go to **S20**.

**Coils.**—**L1-L6**; **L7-L12** and the IF transformers **L13, L14** and **L15, L16**, are in four screened units on the chassis deck. These units contain also the associated trimmers.

**Trackers.**—The variable trackers **C18, C19** are adjusted through holes in the chassis deck.

**Pilot Lamp.**—This is an Ever Ready type, fitted with a miniature bayonet cap, and rated at 2 V, 0.06 A. Its bulb is coloured red.

**External Speaker.**—Special sockets are provided at the rear of the chassis for a high impedance (16,000 Ω) external speaker. A 2-pin plug is provided and the rotation of this permits both internal and external, or only the external speaker, to be in circuit, **S18** opening in the latter case.

**Valve Bases.**—**V2, V3** and **V4** have Mazda octal bases, whereas **V1** has the ordinary British 7-pin base. The octal base connections, looking at the underside of the base, and numbering the pins anti-clockwise from the key (when the key is at the bottom of the central spigot) are as follows:—

**V2.**—1, filament; 2, no pin; 3, anode; 4, G2; 5, G3; 6, metallising; 7, no pin; 8, filament; top cap, G1.

**V3.**—1, filament; 2, blank; 3, anode; 4, blank; 5, D1; 6, metallising; 7, D2; 8, filament; top cap, G1.

**V4.**—1, filament; 2, no pin; 3, anode; 4, G2; 5, G1; 6, blank; 7, no pin; 8, filament.

**Batteries.**—LT, 2V 45 AH accumulator cell. HT, 120 V dry HT battery. GB is automatic.

**Battery Leads and Voltages.**—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; blue lead, black plug, HT negative; red/white lead, red plug, HT positive 120 V.

### CIRCUIT ALIGNMENT

**IF Stages.**—Switch set to MW and turn gang to maximum. Connect signal generator to control grid (top cap) of **V2**, via a 0.1 μF condenser, and chassis. Feed in a 451 KC/S signal, and adjust **C26** and **C27** for maximum output. Transfer signal generator to control grid (top cap) of **V1**, and adjust **C24** and **C25** for maximum output. Check the adjustments of **C26** and **C27**.

**RF and Oscillator Stages.**—With gang at maximum, pointer should register with "set line" at the top right hand corner of the scale. Connect signal generator to A socket (via a 0.0002 μF condenser) and to E socket.

**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 **C15**, for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C18** for maximum output, while rocking the gang for optimum results. Now check the 200 m adjustments again.

**LW.**—Switch set to LW, and follow the same procedure, adjusting **C22** and **C16** at 800 m (375 KC/S) and **C19** at 2,000 m (150 KC/S).

**SW.**—Switch set to SW, feed in a 17 m (17.65 MC/S) signal, tune to 17 m on scale, and adjust **C20** and **C14** for maximum output, rocking the gang very slightly, if necessary, for optimum results. No variable tracker is fitted on this band.

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

