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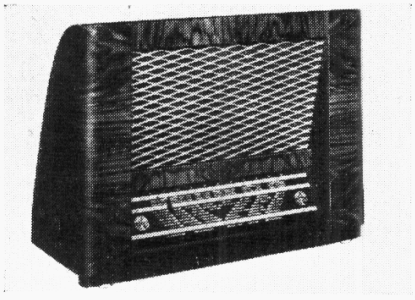
"TRADER" SERVICE SHEET

1084

PILOT 75

Transportable Table Receiver



PROVIDED with a frame aerial winding for use in areas of high signal strength, the Pilot 75 is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. mains only of 200-250 V, 40-100 c/s. Although a half-wave rectifier is used, the mains transformer is double-wound, and the chassis is isolated from the mains. The waveband ranges are 16.5-50 m, 185-550 m and 1,200-2,000 m.

Release date and original price: September 1952, £16 17s 9d plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by **L1**, loading coil **L5** and **C28** (M.W.); or **L1**, loading coils **L4**, **L5** and **C28** (L.W.). The frame aerial is not in operation on S.W., provision being made for the connection of an external aerial which is coupled via **L2** to single tuned circuit **L3**, **C28**. An external aerial can also be used on M.W. and L.W. and is then tapped into the tuning coil circuit.

First valve **(V1, Brimar 7S7)** is a triode heptode operating as frequency changer with internal coupling. Oscillator grid coils **L6** (S.W.)

(Continued col. 1 overleaf)

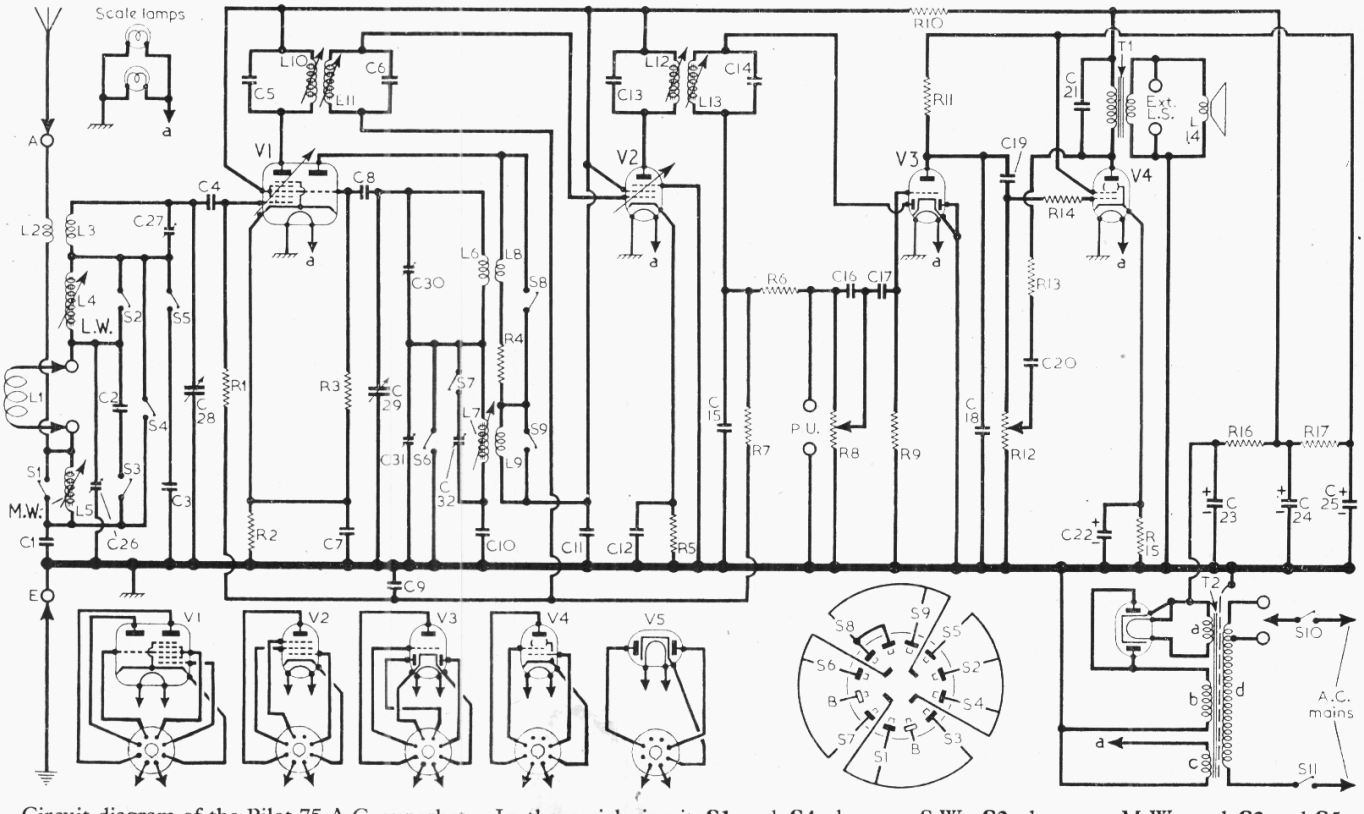
COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 C.G.	1MΩ	F3
R2	V1 G.B.	220Ω	F3
R3	V1 osc. C.G. ...	47kΩ	F3
R4	Osc. stabilizer ...	68Ω	F2
R5	V2 G.B.	270Ω	E3
R6	I.F. stopper ...	47kΩ	E2
R7	A.G.C. decoupling	1MΩ	F2
R8	Volume control ...	500kΩ	D2
R9	V3 C.G.	10MΩ	E2
R10	H.T. decoupling	4·7kΩ	D2
R11	V3 anode load ...	270kΩ	E3
R12	Tone control ...	500kΩ	D3
R13	Part tone control...	470kΩ	D3
R14	V4 C.G. stopper ...	4·7kΩ	E3
R15	V4 G.B.	270Ω	E3
R16*	H.T. smoothing ...	1·03kΩ	D3
R17		4·7kΩ	E3

* Two resistors, 1·5kΩ + 3·3kΩ, in parallel.

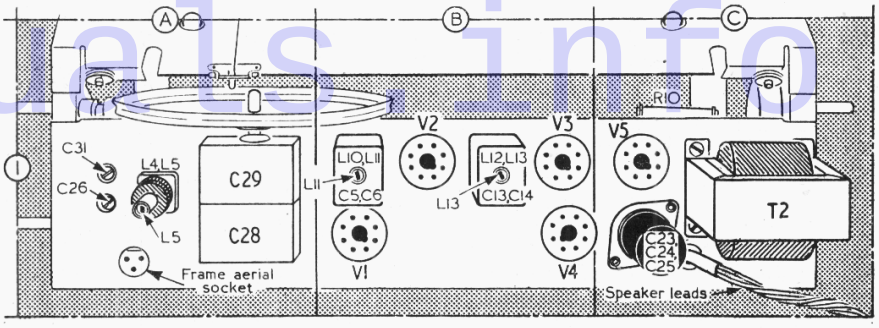
	CAPACITORS	Values	Locations
C1	Aerial coupling ...	0·01μF	F3
C2	L.W. aerial	0·001μF	G3
C3	trimmers	180pF	G3
C4	V1 C.G.	100pF	F3
C5	1st I.F. trans.	100pF	B1
C6	tuning	100pF	B1
C7	V1 cath. by-pass	0·1μF	F3
C8	V1 osc. C.G. ...	100pF	F2
C9	A.G.C. decoupling	0·1μF	F2
C10	Osc. tracker ...	500pF	F3
C11	H.T. decoupling ...	0·1μF	F3
C12	V2 cath. by-pass	0·1μF	E3
C13	2nd I.F. trans.	100pF	B1
C14	tuning	100pF	B1
C15	I.F. by-pass ...	100pF	E2
C16	Tone compensator	100pF	E3
C17	A.F. coupling ...	0·002μF	E3
C18	I.F. by-pass ...	100pF	E2
C19	A.F. coupling ...	0·04μF	E3
C20	Part tone control	500pF	D3
C21	Tone corrector ...	0·001μF	E3
C22*	V4 cath. by-pass	50μF	E3
C23*	H.T. smoothing ...	16μF	C1
C24*		16μF	C1
C25*		16μF	C1
C26‡	M.W. aerial trim.	65pF	G3
C27‡	S.W. aerial trim.	50pF	F3
C28†	Aerial tuning ...	—	A1
C29†	Oscillator tuning	—	A1
C30‡	S.W. osc. trim. ...	50pF	F3
C31‡	M.W. osc. trim. ...	65pF	G3
C32‡	L.W. osc. trim. ...	700pF	G2

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Pilot 75 A.C. superhet. In the aerial circuit **S1** and **S4** close on S.W., **S2** closes on M.W., and **S3** and **S5** close on L.W. **L1** is the frame aerial winding. In the oscillator circuit, **L7** acts as M.W. and L.W. tuning coil, **C32** being shunted across it for L.W. operation.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial ...	2·0	—
L2	S.W. aerial coup.	0·3	F3
L3	S.W. aerial tuning	—	F3
L4	L.W. loading coil	9·5	A1
L5	M.W. loading coil	1·7	A1
L6	Oscillator tuning coils	—	G3
L7		2·0	F2
L8	Oscillator reaction coils	—	G3
L9		1·0	F2
L10	1st I.F. trans. Pri.	7·0	B1
L11	1st I.F. trans. Sec.	7·0	B1
L12	2nd I.F. trans. Pri.	7·0	B1
L13	2nd I.F. trans. Sec.	7·0	B1
L14	Speech coil ...	2·8	—
T1	O.P. trans. Pri.	420·0	—
	O.P. trans. Sec.	0·6	
T2	Mains trans. a ...	—	
	Mains trans. b ...	220·0	C1
	Mains trans. c ...	—	
	Mains trans. d, total	60·0	
S1-S9	Waveband switches	—	G3
S10, S11	Mains sw., g'd R12	—	D3



Plan view of the chassis. The tuning drive system is shown in the drawing below.

Circuit Description—*continued*

and **L7** (M.W.) are tuned by **C29**. **L7** is also used for L.W. operation, when it is shunted by **C32**. Parallel trimming by **C30** (S.W.), **C31** (M.W.) and **C31, C32** (L.W.); series tracking by **C10** (M.W. and L.W.). Inductive reaction coupling from anode by **L8** (S.W.) and **L9** (M.W. and L.W.). Stabilization by **R4**.

Second valve **(V2, Brimar 7B7)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C5, L10, L11, C6** and **C13, L12, L13, C14**.

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Brimar 7C6)**. Audio frequency component in rectified output is developed across volume control **R8**, which acts as diode load, and is passed via **C17** to grid of triode section. **C16** provides some high-note boost at low settings of the volume control.

Provision is made for the connection of a gramophone pick-up across **R8**. I.F. filtering by **C15, R6** and the capacitance of the screened lead to the volume control. D.C. potential developed across **R6, R8** is fed back as bias to **V1** and **V2**, giving automatic gain control.

Resistance-capacitance coupling by **R11, C19** and **R12** between **V3** triode and beam pentode output valve **(V4, Brimar 7C5)**. Fixed tone correction by **C21** in anode circuit. Variable tone control by **R12** in negative feed-back circuit **R13, C20** and **R12**, between **V4** anode and control grid circuits. Provision is made for the connection of a low impedance external speaker across **T1** secondary winding.

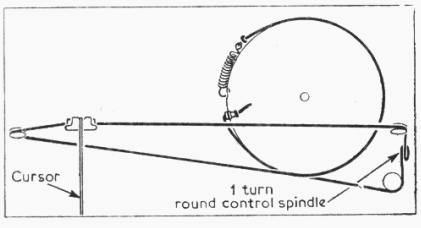
H.T. current is supplied by I.H.C. rectifying valve **(V5, Brimar 7Y4)** whose anodes are connected together for half wave operation. Smoothing by **R16, R17** and electrolytic capacitors **C23, C24** and **C25.**

CIRCUIT ALIGNMENT

I.F. Stages.—Remove cabinet base cover and stand receiver on its side, so that top and underside of chassis are accessible. Connect output of signal generator, via an 0.1 μF capacitor in "live" lead, to control grid (pin 6) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L13** (location reference B1), **L12** (E2), **L11** (B1) and **L10** (F2) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. action. Repeat these adjustments until no further improvement results.

R.F. and Oscillator Stages.—As the tuning scale is fixed to the cabinet, and a substitute tuning scale is not provided, the following adjustments must be carried out with the chassis in its cabinet. Transfer signal generator leads to **A** and **E** sockets.

S.W.—Switch receiver to S.W., tune to 16.5 m, feed in a 16.5 m (18.2 Mc/s) signal and adjust **C30** (F3) and **C27** (F3) for maximum output. If two peaks are obtained when adjusting **C30**, it should be set to the one involving the higher capacitance. Repeat these adjustments until no further improvement results.



Sketch showing the tuning drive system, as seen from the front with the gang at minimum capacitance.

M.W.—Switch receiver to M.W., tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C31** (A1) and **C26** (A1) for maximum output. Tune receiver to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of **L7** (F2) and **L5** (A1) for maximum output. When adjusting **L7** core it should be set to the peak which occurs with the core in the windings of both **L7** and **L9**. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 1,300 m, feed in a 1,300 m (230 kc/s) signal and adjust **C32** (G2) for maximum output. If any further M.W. adjustments are made, they must be followed by L.W. re-alignment.

GENERAL NOTES

Switches.—**S1-S9** are the waveband switches, ganged in a 3-position rotary unit beneath the chassis. This is indicated in our underside view of the chassis, and it is shown in detail in the diagram inset beneath our main circuit diagram, where it is drawn as seen from the remote end of an inverted chassis. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and **C**, closed.

S10, S11 are the Q.M.B. mains switches, ganged with the variable tone control **R12.**

Scale Lamps.—These are two Osram lamps, with small clear spherical bulbs and M.E.S. bases, rated at 6.5 V, 0.3 A.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 4 Ω) external speaker.

Drive Cord Replacement.—About 60 inches of fine-gauge nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the accompanying sketch. This length includes an ample margin for tying off.

Waveband Switch Table

Switch	S.W.	M.W.	L.W.
S1 ...	C	—	—
S2 ...	—	C	—
S3 ...	—	—	C
S4 ...	C	—	—
S5 ...	—	—	C
S6 ...	C	—	—
S7 ...	—	—	C
S8 ...	—	C	C
S9 ...	C	—	—

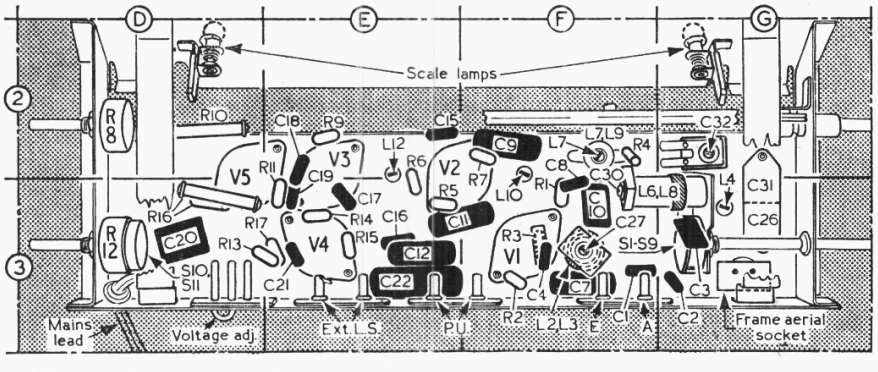
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from 230 V A.C. mains. The receiver was tuned to the highest wavelength end of M.W., and the volume control was at maximum, but there was no signal input.

Voltage readings were taken with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for the current drawn when using other types of meter. Chassis was the negative connection in every case. The voltage measured across **C24** was 172 V.

Valves	Anode V	Anode mA	Screen V	Screen mA	Cath. V
V1 7S7	96 Oscillator 96	2·5 2·8	96	2·6	1·7
V2 7B7 ...	96	7·5	96	2·0	2·5
V3 7C6 ...	92	2·6	—	—	—
V4 7C5 ...	161	25·0	159	3·0	6·8
V5 7Y4 ...	195*	—	—	—	216·0†

* A.C. reading. † Cathode current 47mA.



Underside view of the chassis. The **S1-S9** diagram is inset in the circuit overleaf.

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