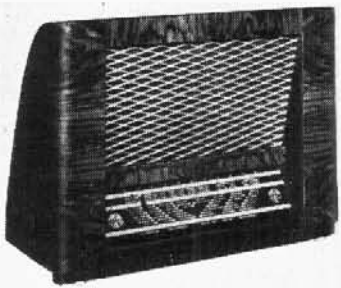


www.radio-workshop.co.uk

"TRADER" SERVICE SHEET
1084

BRISTOL
PILOT 75
Transportable Table Receiver



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)

CAPACITORS		Values	Locations
C1	Aerial coupling ...	0.01 μ F	F3
C2	L.W. aerial	0.001 μ F	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	0.1 μ F	F3
C8	V1 osc. C.G.	100pF	F2
C9	A.G.C. decoupling	0.1 μ F	F2
C10	Osc. tracker	500pF	F3
C11	H.T. decoupling	0.1 μ F	F3
C12	V2 cath. by-pass	0.1 μ F	F3
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	0.002 μ F	E3
C18	I.F. by-pass	100pF	E2
C19	A.F. coupling	0.04 μ F	E3
C20	Part tone control	500pF	D3
C21	Tone corrector	0.001 μ F	E3
C22*	V4 cath. by-pass	50 μ F	E3
C23*		16 μ F	C1
C24*		16 μ F	C1
C25*	H.T. smoothing	16 μ F	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

COMPONENTS AND VALUES

RESISTORS		Values	Locations
R1	V1 C.G. ...	1M Ω	F3
R2	V1 G.B. ...	220 Ω	F3
R3	V1 osc. C.G. ...	47k Ω	F3
R4	Osc. stabilizer	68 Ω	F2
R5	V2 G.B. ...	270 Ω	E3
R6	L.F. stopper	47k Ω	E2
R7	A.G.C. decoupling	1M Ω	F2
R8	Volume control	500k Ω	D2
R9	V3 C.G. ...	10M Ω	E2
R10	H.T. decoupling	4.7k Ω	D2
R11	V3 anode load	270k Ω	E3
R12	Tone control	500k Ω	D3
R13	Part-tone control	470k Ω	D3
R14	V4 C.G. stopper	4.7k Ω	E3
R15	V4 G.B. ...	270 Ω	E3
R16*		1.03k Ω	D3
R17	H.T. smoothing	4.7k Ω	E3

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.

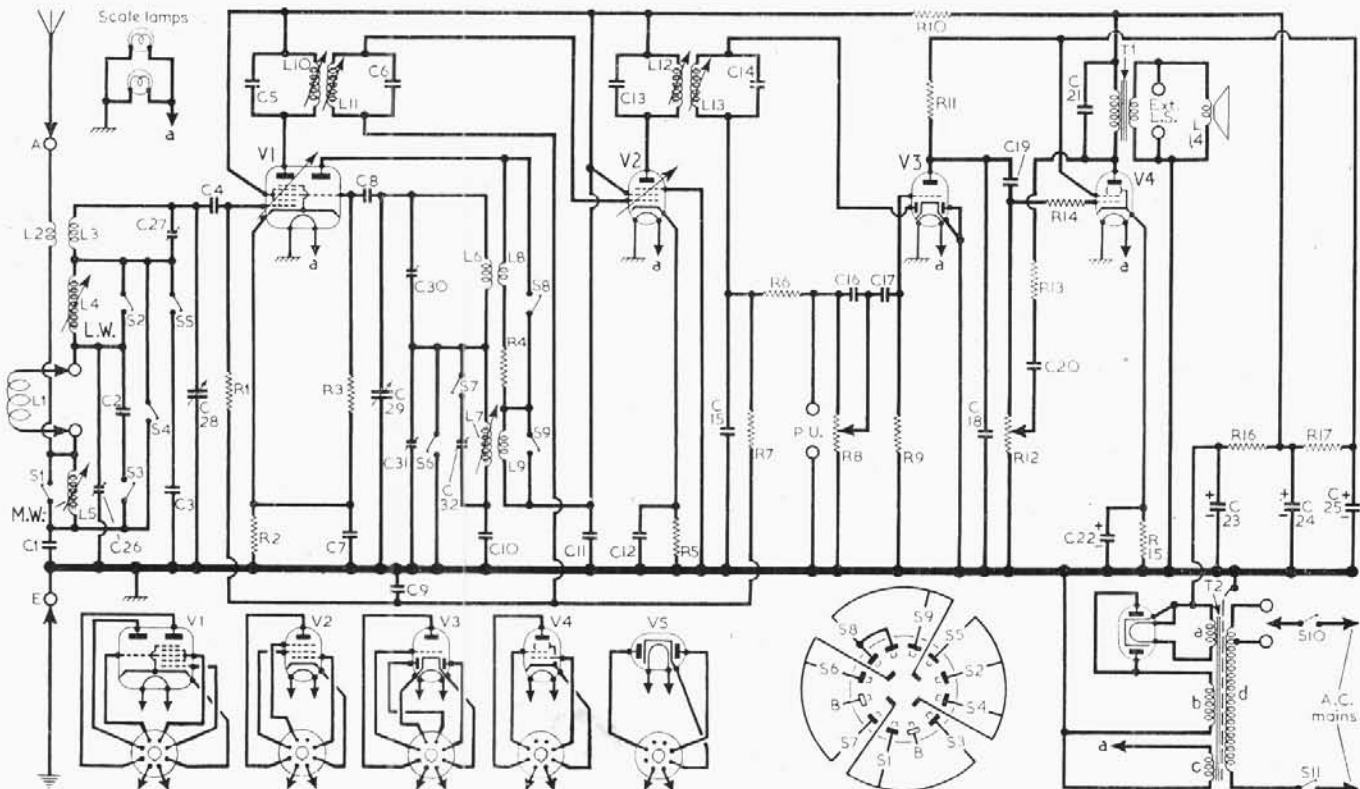
Release date and original price: September 1952, £16 17s 9d plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by L1, loading coil L5 and C28 (M.W.); or L1, loading coils L4, L5

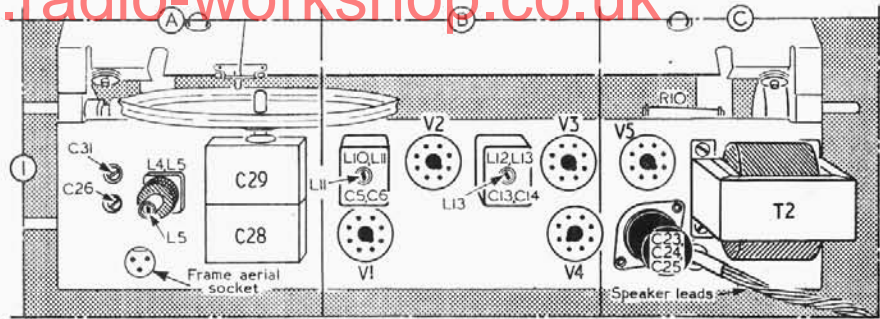
* Two resistors, 1.5k Ω + 3.3k Ω , in parallel.

* 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		---	F2
L8	Oscillator reaction coils	2-0	F2
L9		---	G3
L10	1st I.F. trans. {Pri. {Sec.	7-0	B1
L11		7-0	B1
L12	2nd I.F. trans. {Pri. {Sec.	7-0	B1
L13		7-0	B1
L14	Speech coil	2-8	---
T1	O.P. trans. {Sec.	420-0	---
		0-6	---
T2	Mains trans. {a {b {c {d, total	220-0	C1
		---	---
		---	---
		60-0	G3
S1-S9	Waveband switches	---	---
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 μ F 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,

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

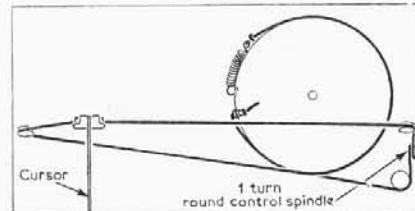
Switches.—S1-S9 are the waveband switches, ganged in a 3-position rotary unit beneath the chassis. This is indicated in our underside view of the chassis, and it is shown in detail in the diagram inset beneath our main circuit diagram, where it is drawn as seen from the remote end of an inverted chassis. 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.

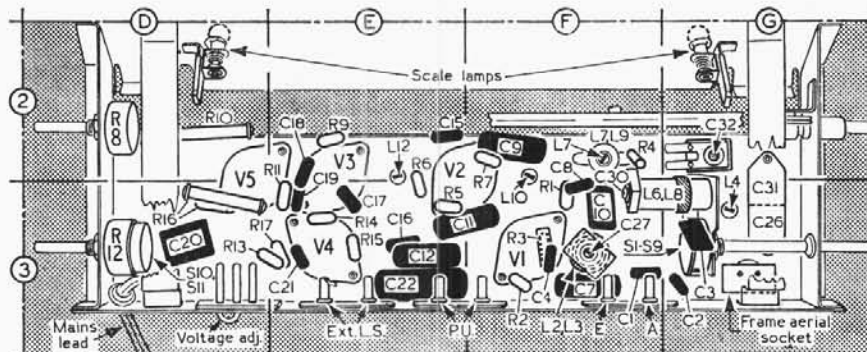
Drive Cord Replacement.—About 60 inches of fine-gauge nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the accompanying sketch. This length includes an ample margin for tying off.



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

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.

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.



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

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	---
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		Screen		Cath.
	V	mA	V	mA	V
V1 7S7	{ 96 96 } Oscillator	{ 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.