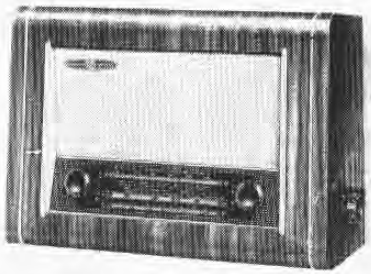
"TRADER" SERVICE SHEET

1135

PYE P75

Transportable A.C. Superhet



THE Pye P75 is a 4-valve (plus rect.) 3-band transportable table receiver housed in a wooden cabinet and designed to operate from A.C. mains of 200-250 V, 40-100 c/s.

The waveband ranges covered are 16.3-51.8 m, 187-567 m and 1,000-2,000 m.

Release date and original price: July, 1953. £15 2s 1d, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input on M.W. by **L1, C28** and on L.W. by **L1, L2, C28.** For S.W. reception an external aerial is necessary and is coupled via **L3** to single-tuned circuit **L4, C28.** Provision is also made for the connection of an external aerial on M.W. and L.W., and when in use it is coupled to the tuned grid circuits by the common impedance of **C2, R1.**

First valve **(V1, Mullard ECH42)** is a triode hexode operating as frequency changer with internal coupling. Oscillator anode coils **L7** (S.W.) and **L8** (M.W. and L.W.) are tuned by **C31.** Parallel trimming by **C29** (S.W.), **C30** (M.W.) and **C10, C30** (L.W.); series tracking by **C8** (S.W.) and **C9** (M.W. and L.W.). Reaction coupling from oscillator grid by **L5** (S.W.) **L6** (M.W. and L.W.) and the common impedances of the trackers. Oscillator stabilization on M.W. by **R4.** On S.W., **S11** closes to short-circuit **R5.**

Second valve **(V2, Mullard EF41)** is a variable mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C4, L9, L10, C5** and **C12, L11, L12, C13.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Mullard EBC41).** Audio frequency component in its rectified output is developed across diode load **R9** and passed via volume control **R10** to grid of triode section, I.F. filtering by **C14** and **R7.**

Second diode of **V3** is fed via **C15** from **V2** anode, and the resulting D.C. potential developed across load resistor **R14** is fed back as bias to **V1** and **V2**, giving automatic gain control.

Resistance-capacitance coupling by **R12, C20** and **R16** between **V3** and pentode output valve **(V4, Mullard EL41).** Variable tone control by **C17, R8** in **V3** grid circuit, and fixed tone correction by **C23** in **V4** anode circuit. A proportion of the speech coil voltage, that developed across **R20** in potential divider **R19, C24, R20,** is fed back to **V3** grid circuit giving a degree of negative feed-back tone correction.

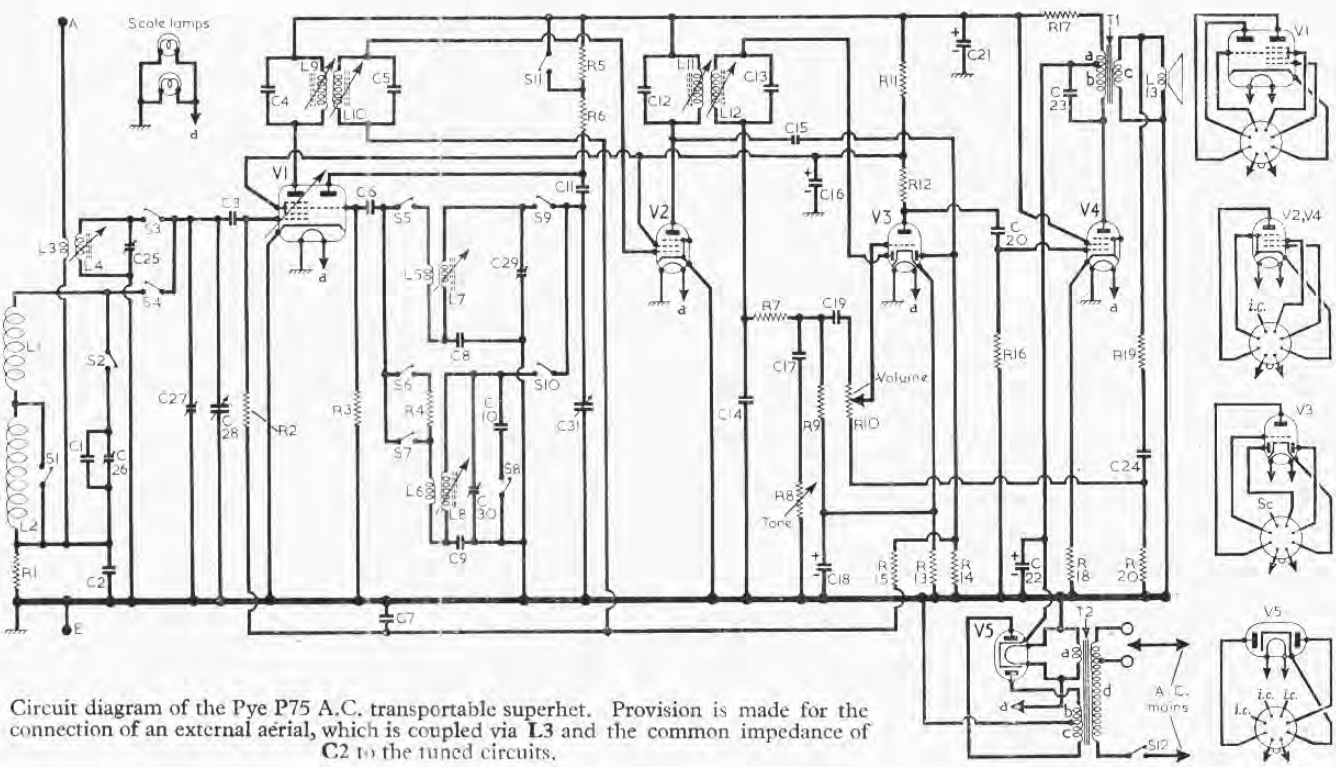
H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Mullard EZ41).** Smoothing by resistor **R17** and electrolytic capacitors **C21, C22.** The heaters of all the valves, including **V5,** are connected across the common heater winding **a** on the mains transformer **T2.**

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	Aerial shunt ...	22kΩ	G3
R2	V1 C.G.	1MΩ	G4
R3	V1 osc. C.G. ...	47kΩ	F4
R4	Osc. stabilizer ...	1·5kΩ	G4
R5	Osc. anode feeds ...	33kΩ	G3
R6		15kΩ	G4
R7	I.F. stopper ...	100kΩ	F4
R8	Tone control ...	1MΩ	D3
R9	Signal diode load ...	470kΩ	F4
R10	Volume control ...	1MΩ	D3
R11	H.T. smoothing ...	47kΩ	E3
R12	V3 anode load ...	220kΩ	E4
R13	V3 G.B.	4·7kΩ	E4
R14	A.G.C. diode load ...	1MΩ	F4
R15	A.G.C. decoupling ...	1MΩ	F4
R16	V4 C.G.	1MΩ	E4
R17	H.T. smoothing ...	1·6kΩ	F4
R18	V4 G.B.	220Ω	E4
R19	Neg. feed-back ...	3·9kΩ	E3
R20		390Ω	E3

	CAPACITORS	Values	Locations
C1	L.W. aerial trim. ...	120pF	G4
C2	Ext. aerial coup. ...	0·0027μF	G3
C3	V1 C.G.	100pF	G4
C4	1st I.F. trans. tuning	100pF	B2
C5		100pF	B2
C6	V1 osc. C.G. ...	100pF	G4
C7	A.G.C. decoupling	0·02μF	F4
C8	Oscillator trackers	0·0047μF	G3
C9		430pF	G4
C10	L.W. osc. trim. ...	430pF	G4
C11	Osc. anode coup. ...	100pF	F4
C12	2nd I.F. trans. tuning	100pF	B2
C13		100pF	B2
C14	I.F. by-pass ...	100pF	E4
C15	A.G.C. coupling ...	15pF	F4
C16*	H.T. smoothing ...	2μF	F4
C17	Part tone control ...	0·002μF	F3
C18*	V3 cath. by-pass ...	25μF	F4
C19	A.F. coupling ...	0·005μF	E3
C20		0·005μF	E4
C21*	H.T. smoothing ...	16μF	E3
C22*		32μF	E3
C23	Tone corrector ...	0·005μF	B1
C24	Neg. feed-back ...	0·1μF	E3
C25‡	S.W. aerial trim. ...	50pF	F3
C26‡	L.W. aerial trim. ...	30pF	G4
C27‡	M.W. aerial trim. ...	50pF	F3
C28†	Aerial tuning ...	§528pF	A1
C29‡	S.W. osc. trim. ...	50pF	F3
C30‡	M.W. osc. trim. ...	50pF	F3
C31†	Oscillator tuning ...	§528pF	A2

* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max.



Circuit diagram of the Pye P75 A.C. transportable superhet. Provision is made for the connection of an external aerial, which is coupled via **L3** and the common impedance of **C2** to the tuned circuits.

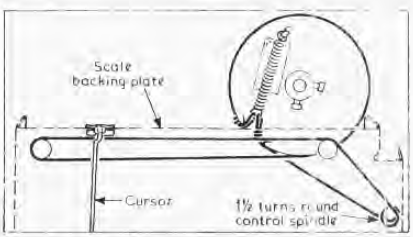
OTHER COMPONENTS			Approx. Values (ohms)	Location
L1	M.W. frame aerial		3·0	A1
L2	L.W. frame aerial		18·5	A1
L3	S.W. aerial coupling		—	G1
L4	S.W. aerial tuning		—	G1
L5	Oscillator reaction coils		43·0	F3
L6			0·5	F4
L7	Oscillator tuning coils		—	F3
L8			2·5	F4
L9	1st I.F. trans.	pri.	11·0	B2
L10		sec.	11·0	B2
L11	2nd I.F. trans.	pri.	11·0	B2
L12		sec.	11·0	B2
L13	Speech coil		2·5	—
T1	O.P. trans.	a	0·0	
		b	500·0	B1
		c	—	
T2	Mains trans.	a	—	
		b	230·0	C2
		c	245·0	
		d, total	700·0	
S1-S11	Waveband s.w.		—	J3
S12	Mains sw., g'd R10		—	D4

GENERAL NOTES

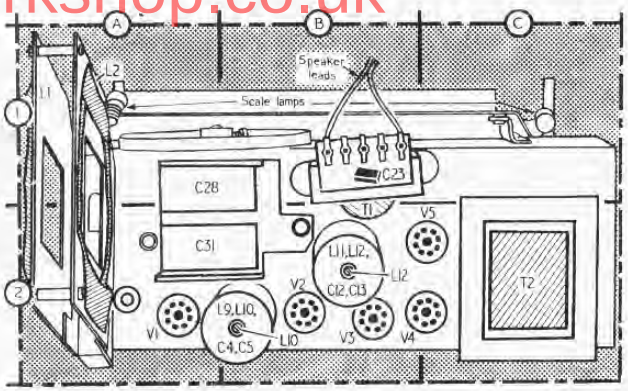
Switches.—**S1-S11** are ganged in a single rotary unit beneath the chassis. This unit is indicated in our under-chassis illustration (location reference G3) and shown in detail in col. 2, where it is drawn as seen from the tone control end of an inverted chassis. The associated switch table appears in col. 2, where a dash indicates open, and **C**, closed.

Drive Cord Replacement.—About three feet of nylon braided glass yarn is required for a new drive cord. It should be knotted into a loop at each end so that the overall length is 29½ inches between the centres of the loops. The drive cord should then be run as shown in the sketch below, starting with the gang at minimum capacitance and running clockwise round the drive drum.

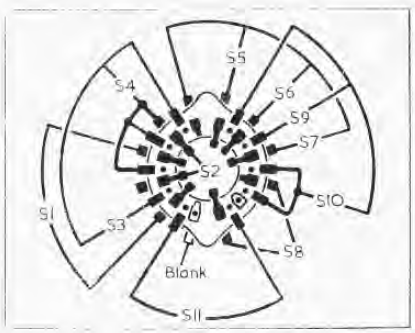
Scale Lamps.—These are two 6.5 V, 0.3 A lamps with small clear spherical bulbs and M.E.S. bases.



Sketch of the drive cord system, drawn as seen from the front with gang at minimum.



Plan view of chassis showing the position of the M.W. and L.W. frame aerials **L1** and **L2**.



Above: Diagram of the waveband switch unit drawn as seen from the tone control end of an inverted chassis.

Below: Associated waveband switch table.

Switch	L.W.	M.W.	S.W.
S1	—	C	—
S2	C	—	—
S3	—	—	C
S4	C	C	—
S5	—	—	C
S6	—	C	—
S7	C	—	—
S8	C	—	—
S9	—	—	C
S10	C	C	—
S11	—	—	C

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturers' information and were measured on a receiver operating from 230 V A.C. mains, the voltage adjustment being set to the 226-250 V tapping. The receiver was switched to M.W. and the gang turned to maximum capacitance, but there was no signal input. Under these conditions the mains consumption was 35 W.

Voltages were measured on the 2.5 V, 10 V and 250 V ranges of a Model 8 Avometer, chassis being the negative connection in every case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECH42	194	1·1	47	2·2	—
	Oscillator 73	2·6			
V2 EF41	194	2·7	47	1·2	—
V3 EBC41	24	0·1	—	—	0·5
V4 EL41	205	23·0	194	3·2	5·7
V5 EZ41	390*	—	—	—	216·0†

* A.C. reading, each anode.
† Cathode current, 36·1 mA.

CIRCUIT ALIGNMENT

The chassis should be removed from its cabinet for the following alignment adjustments.

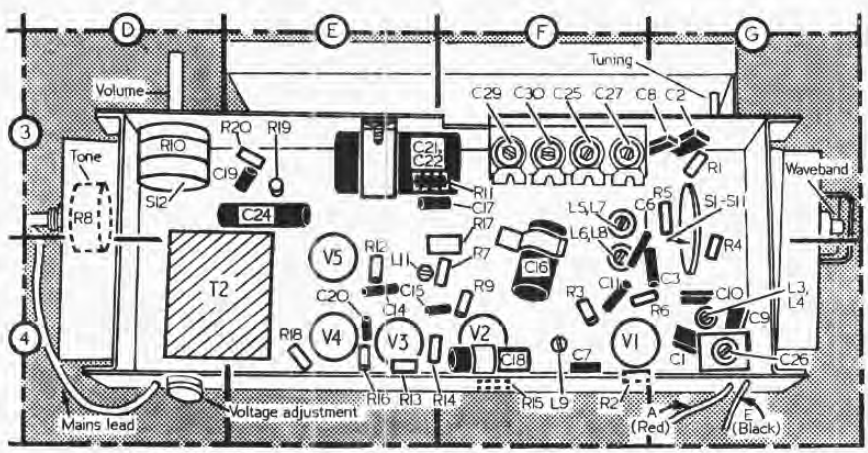
I.F. Stages.—Switch receiver to M.W. and turn gang to maximum capacitance. Connect output of signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L12** (location reference B2), **L11** (E4), **L10** (B2) and **L9** (F4) for maximum output. Repeat these adjustments until no further improvement results.

R.F. and Oscillator Stages.—Check that with the gang at maximum capacitance the cursor coincides with the dots at the high wavelength ends of the S.W. and L.W. tuning scales. The tuning scale is fixed to the cabinet, and in early models where there is no substitute tuning scale on the scale backing plate, the tuning scale must be removed and placed over the volume and tuning control spindles, or a substitute paper tuning scale must be made up to replace it. Transfer signal generator leads to **A** and **E** leads.

M.W.—Switch receiver to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the core of **L8** (F4) for maximum output. Tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C30** (F3) and **C27** (F3) for maximum output. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 1,400 m, feed in a 1,400 m (214 kc/s) signal and adjust **C26** (G4) for maximum output.

S.W.—Switch receiver to S.W., tune to 49.15 m, feed in a 49.15 m (6.1 Mc/s) signal and adjust cores of **L7** (F3) and **L4** (G4) for maximum output. Tune to 16.88 m, feed in a 16.88 m (17.8 Mc/s) signal and adjust **C29** (F3) and **C25** (F3) for maximum output. Repeat these adjustments until no further improvement results.



Underside view of the chassis, showing all the pre-set trimmers

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