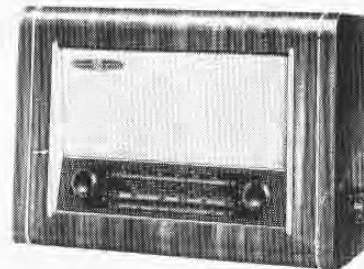




PYE P75

Transportable A.C. Superhet



THE Pye P75 is a 4-valve (plus rect.) 4-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 16.3-18 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 on the mains transformer **T2**.

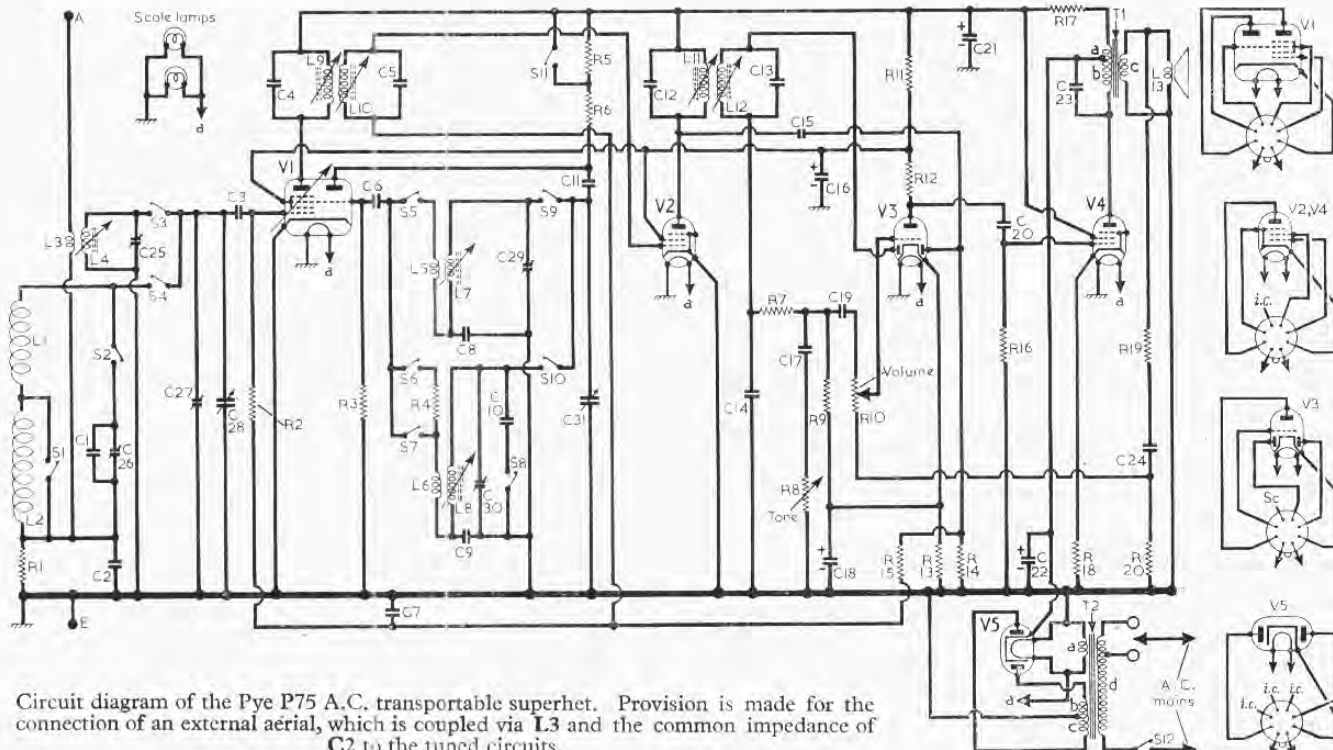
COMPONENTS AND VALUES

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	1.0kΩ	F4
R18	V4 G.B.	220Ω	E4
R19	} Neg. feed-back	3.9kΩ	E3
R20		390Ω	F3

CAPACITORS

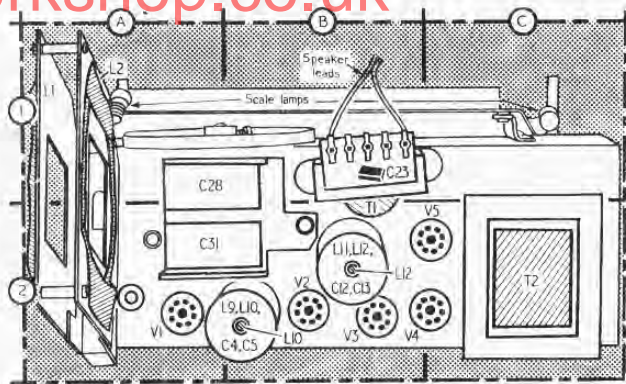
	Values	Locations
C1	I.W. aerial trim...	120pF G4
C2	Ext. aerial coup. ...	0.0027μF G3
C3	V1 C.G. ...	100pF G4
C4	} 1st I.F. trans. tuning	100pF B2
C5		100pF B2
C6	V1 osc. C.G. ...	100pF G4
C7	A.G.C. decoupling	0.02μF F4
C8	} Oscillator trackers	0.0047μF G3
C9		430pF G4
C10	L.W. osc. trim. ...	430pF G4
C11	Osc. anode coup. ...	100pF F4
C12	} 2nd I.F. trans. tuning	100pF B2
C13		100pF B2
C14	I.F. by-pass ...	100pF B4
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 B4
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)	Locations
L1	M.W. frame aerial	3.0	A1
L2	L.W. frame aerial	18.5	A1
L3	S.W. aerial coupling	—	G4
L4	S.W. aerial tuning	—	G4
L5	Oscillator reaction coils	43.0	F3
L6	Oscillator tuning coils	0.5	F3
L7	Oscillator tuning coils	2.5	F4
L8	1st I.F. trans. { pri. sec.	11.0 11.0	B2 B2
L9	2nd I.F. trans. { pri. sec.	11.0 11.0	B2 B2
L10	Speech coil	2.5	—
L11	O.P. trans. { a b c	500.0	B1
L12	Mains trans. { a b c	230.0 245.0 70.0	C2
S1-S11	Waveband sw.	—	D3
S12	Mains sw., g'd R10	—	D4



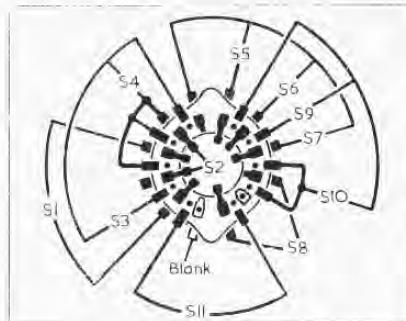
Plan view of chassis showing the position of the M.W. and L.W. frame aerials L1 and L2.

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 29 1/2 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 0.5 V, 0.3 A lamps with small clear spherical bulbs and M.E.S. bases.



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 230-250 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 73	1.1 2.6	47	2.2	—
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*	—	—	—	210.0†

* 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.

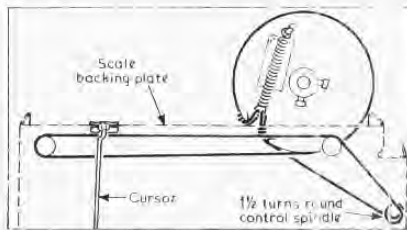
I.F. Stages.—Switch receiver to M.W. and turn gang to maximum capacitance. Connect output of signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of V1 and chassis. Feed in a 470 kc/s (688.3 m) signal and adjust the cores of L12 (location reference B2), L11 (E4), L10 (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.

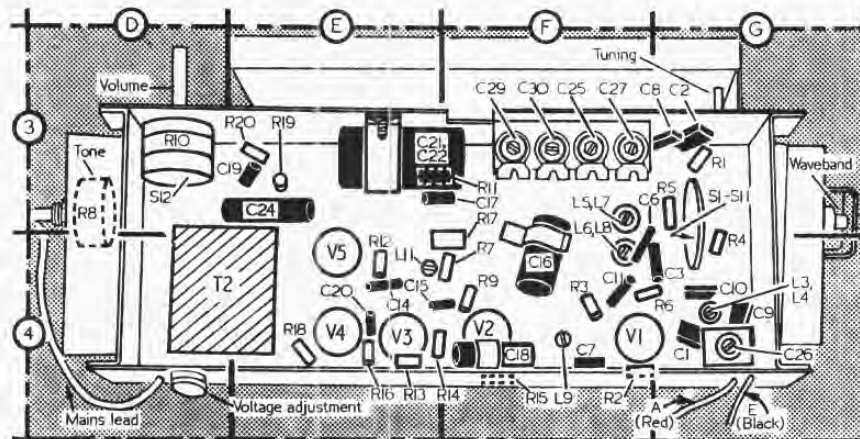
M.W.—Switch receiver to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the core of L8 (F4) for maximum output. Tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C30 (F3) and C27 (F3) for maximum output. Repeat these adjustments until no further improvement results.

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.



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



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