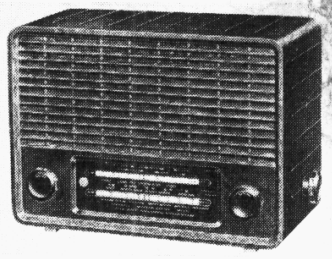
"TRADER" SERVICE SHEET

1012

PYE P43U

Transportable Table Superhet



DESIGNED to operate from A.C. or D.C. mains of 200-250 V, or with a simple modification from mains of 100-125V, the Pye P43U is a 3-valve (plus rectifier) 2-band transportable table superhet. The waveband ranges are 187-560 m and 1,000-2,000 m.

Release date and original price: March 1951; £12 2s 2d, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C28** (M.W.) or **L1, L2, C28** (L.W.), to triode hexode valve **(V1, Mullard UCH42)**, which operates as frequency changer with internal coupling. On L.W. **S2** closes to connect the trimmers **C4, C26.** Provision is made for the connection of an external aerial via the potential divider **C2, C3. R1** and **R2** combine to prevent a static charge from developing on the aerial and to avoid modulation hum.

V1 triode oscillator anode coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C30.** Parallel trimming by **C29** and **C12;** series tracking by **C10** and **C11.** Reaction coupling by grid coil **L3** (M.W.) and by the common impedance of **C11** (L.W.).

Second valve **(V2, Mullard UBF80)** is a variable-mu R.F. pentode with two diodes. The pentode section operates as intermediate frequency amplifier with tuned transformer couplings **C6, L6, L7, C7,** and **C15, L8, L9, C16.**

Intermediate frequency 470 kc/s.

One diode of **V2** operates as signal detector, the audio frequency component in its rectified output being developed across the load resistor **R10** and passed via **C19** and the manual volume control **R12** to the control grid of the pentode output valve **(V3, Mullard UL41).**

D.C. potential developed across **R10** is tapped off and fed back via decoupling circuits to F.C. and I.F. valves, giving automatic gain control. The second diode of **V2** imposes a delay on the A.G.C. by holding the A.G.C. line to chassis potential until the signal attains a predetermined level.

This is achieved by biasing the diode anode positively via the high resistance potential divider **R9, R11, R10** across the H.T. circuit, so that in the absence of a signal it conducts. Upon receipt of a weak signal the diode continues to con-

(Continued col. 1 overleaf)

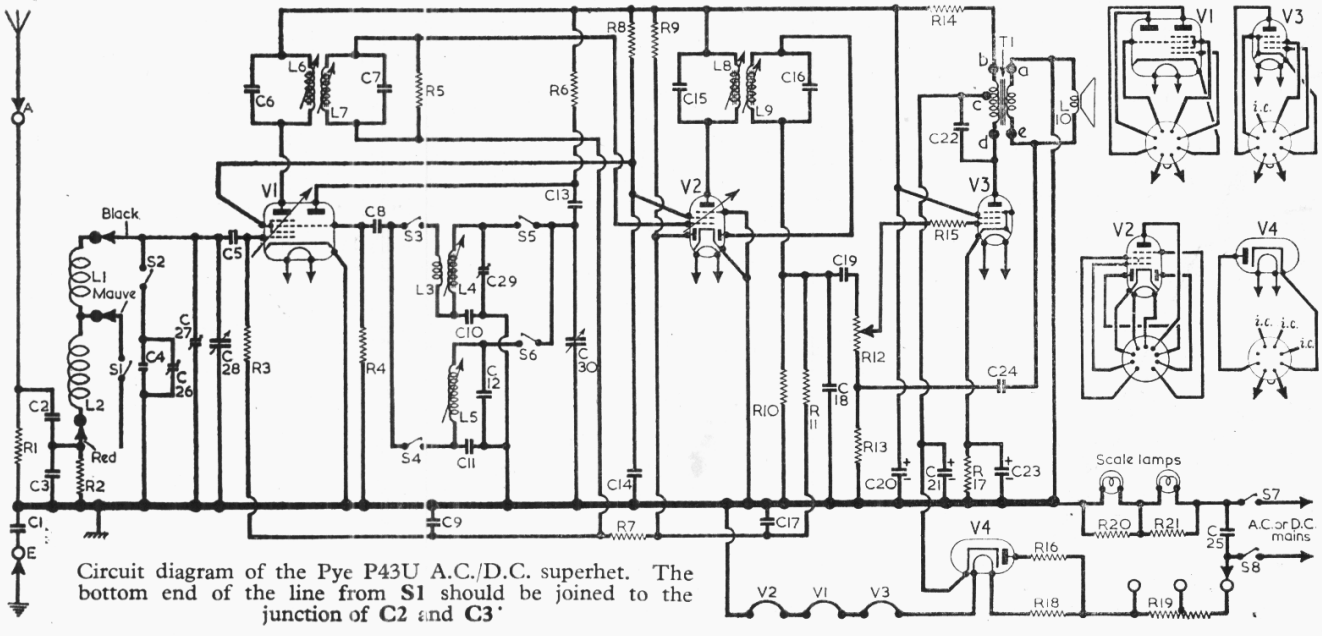
COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	Aerial circuit shunts	470kΩ	G3
R2		22kΩ	G3
R3	V1 C.G.	1MΩ	F3
R4	V1 osc. C.G.	47kΩ	F3
R5	I.F. trans. shunt	1MΩ	F3
R6	Osc. anode feed	10kΩ	F3
R7	A.G.C. decoupling	2·2MΩ	E3
R8	V1, V2 S.G. feed	22kΩ	E2
R9	V2 diode feed	15MΩ	E2
R10	Diode load	470kΩ	E3
R11	A.G.C. decoupling	2·2MΩ	E2
R12	Volume control	800kΩ	D2
R13	F.-B. coupling	2·2kΩ	D2
R14	H.T. smoothing	1·5kΩ	E3
R15	V3 grid stopper	100kΩ	D2
R16	V4 surge limiter	180Ω	D3
R17	V3 G.B.	120Ω	D3
R18	Ballast resistors	1,025Ω	B1
R19†		154Ω	B1
R20	Scale lamp shunts	27Ω	B1
R21		27Ω	B1

† Tapped at 77 Ω

	CAPACITORS	Values	Locations
C1	Chassis isolator	0·01μF	G3
C2	Aerial series	220pF	G3
C3	Aerial coupling	0·0024μF	G3
C4	L.W. aerial trim.	82pF	G3
C5	V1 C.G.	100pF	G3
C6	1st I.F. trans. tuning	100pF	B1
C7		100pF	B1
C8	V1 osc. C.G.	100pF	F3
C9	A.G.C. decoupling	0·02μF	F3
C10	M.W. tracker	360pF	E2
C11	L.W. tracker	180pF	F2
C12	L.W. osc. trim.	200pF	F3
C13	Osc. anode coup.	100pF	F3
C14	V1, V2 S.G. decoup.	0·1μF	E2
C15	2nd I.F. trans. tuning	100pF	C1
C16		100pF	C1
C17	A.G.C. decoupling	0·02μF	E2
C18	I.F. by-pass	470pF	E3
C19	A.F. coupling	0·01μF	E2
C20*	H.T. smoothing	32μF	C1
C21*		32μF	C1
C22	Tone corrector	0·02μF	C1
C23*	V3 cath. by-pass	10μF	D3
C24	Neg. feed-back	0·1μF	C1
C25	Mains R.F. filter	0·01μF	D2
C26‡	L.W. aerial trim.	—	G3
C27‡	M.W. aerial trim.	40pF	G3
C28†	Aerial tuning	528pF	A1
C29‡	M.W. osc. trimmer	40pF	G3
C30†	Oscillator tuning	528pF	A1

* Electrolytic. † Variable. ‡Pre-set.



Circuit diagram of the Pye P43U A.C./D.C. superhet. The bottom end of the line from **S1** should be joined to the junction of **C2** and **C3**.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	M.W. frame aerial		3·4	A1
L2	L.W. frame aerial		21·0	A1
L3	M.W. osc. reaction		0·4	F2
L4	Oscillator tuning coils		2·0	F2
L5			7·4	F3
L6	1st I.F. trans.	Pri. ...	12·2	B1
L7		Sec. ...	12·2	B1
L8	2nd I.F. trans.	Pri. ...	12·2	C1
L9		Sec. ...	12·2	C1
L10	Speech coil	...	2·5	—
T1	O.P. trans.	b-c ...	12·0	
		c-d ...	200·0	C1
		a-e ...	0·4	
S1-S6	Waveband switches		—	G2
S7,S8	Mains sw., g'd R12		—	D2

Circuit Description—*continued*

duct, but the top of **R10** becomes more negative as the signal strength increases, until at length the junction **R9, R11** becomes sufficiently negative to prevent the diode from conducting, when the A.G.C. is free to become increasingly negative according to the strength of the signal.

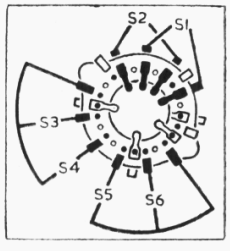


Diagram of the waveband switch unit, viewed in the direction of the arrow in our under-chassis drawing.

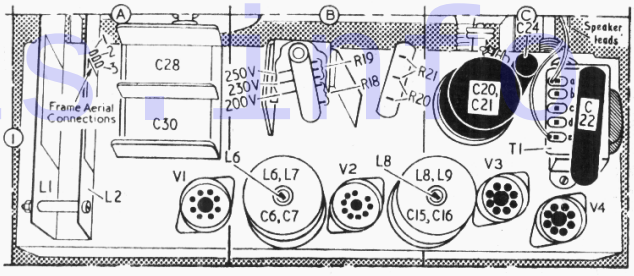
Tone correction is provided in **V3** grid circuit by feeding back to it signals from the speech coil circuit via **C24** and **R13,** and by **C22** in the anode circuit.

H.T. current is supplied by I.H.C. half-wave rectifier **(V4, Mullard UY41)** which on D.C. mains behaves as a low resistance. Smoothing is effected by **R14** and **C20, C21,** residual hum being neutralised by passing the current through a section of the output transformer primary.

Valve heaters, together with scale lamps and ballast resistors **R18, R19,** are connected in series across mains input.

DISMANTLING THE SET

Removing Chassis.—Withdraw cabinet back and base cover (one unit), held by four 6BA cheese-head bolts with washers;



Plan view of the chassis. The connecting tags of the output transformer **T1** are coded to agree with the circuit diagram overleaf.

remove three control knobs (recessed grub screws accessible through base and rear of cabinet);

remove two 4BA cheese-head bolts, securing rear corners of chassis to cabinet;

unsolder black and red leads from speech coil tags on speaker, and withdraw chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are derived from the manufacturers' service information and were measured on a receiver operating from A.C. mains of 207 V, with the voltage adjustment set to the 200-215 V tap. The set was tuned to 200 m on M.W., but there was no signal input.

Voltage readings were measured on the 10 V and 400 V ranges of a Model 7 Avometer, chassis being the negative connection.

Valves	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 UCH42	145	1·8	56	2·4	—
	Oscillator				
	105	3·2			
V2 UBF80	145	4·7	56	1·6	—
V3 UL41	165	48·0	145	9·0	7
V4 UY41	190†	—	—	—	175

† A.C. Voltage.

GENERAL NOTES

Switches.—**S1-S6** are the waveband switches, ganged in a single 2-position unit beneath the chassis. This is indicated in our underside view of the chassis, and shown in detail in the diagram in column 1 on this side of the Sheet, where it is drawn as seen from the far end of an inverted chassis.

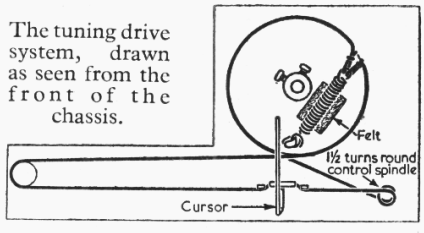
All the odd-numbered switches **S1, S3** and **S5** close on M.W. (control knob turned anti-clockwise) and all the even-numbered ones close on L.W.

S7, S8 are the double-pole Q.M.B. mains switches, ganged with the volume control **R12.**

Scale Lamps.—These are two Mazda lamps, with small clear spherical bulbs and M.E.S. bases, rated at 3.5 V, 0.15 A. They are connected in series and shunted individually by **R20** and **R21.** Replacements may be fitted upon removal of the bottom cover of the cabinet.

Output Transformer T1.—As this has a tapped primary for hum neutralization and the secondary voltages are fed-back to the grid circuit, it is important that the five tags are correctly connected. They are therefore coded **a-e,** these letters being quoted in the plan view and circuit diagram.

Drive Cord Replacement.—About 30 inches of nylon braided glass yarn is required for a new drive cord, which should be run as shown in our sketch below, where it is drawn as it would



The tuning drive system, drawn as seen from the front of the chassis.

be seen from the front of the chassis if the scale backing plate were not there.

It is convenient to make up the cord before fitting by tying a non-slip loop at each end, so that the overall length is 26 inches. The cursor can be slipped on afterwards, and should be adjusted as explained under "Circuit Alignment."

CIRCUIT ALIGNMENT

As the tuning scale is fixed in the cabinet, the following alignment should be carried out with the chassis in the cabinet. All the adjustments are made easily accessible upon the removal of the cabinet back and base cover (one unit).

I.F. Stages.—Connect signal generator, via a 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis. Switch set to M.W., and tune to 560 m. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L9** (location reference E3), **L8** (C1), **L7** (F3) and **L6** (B1) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. effects. Repeat these adjustments.

Oscillator Stage.—Check that with the gang at maximum capacitance the cursor coincides with the dot at the high wavelength end of the L.W. scale. This may be adjusted by slackening the two fixing screws in the drive drum bush and rotating the drum independently of the gang.

M.W.—With the signal generator still connected to control grid of **V1** and the set switched to M.W., tune to 500 m. Feed in a 500 m (600 kc/s) signal and adjust the core of **L4** (F2) for maximum output. Tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C29** (G3) for maximum output.

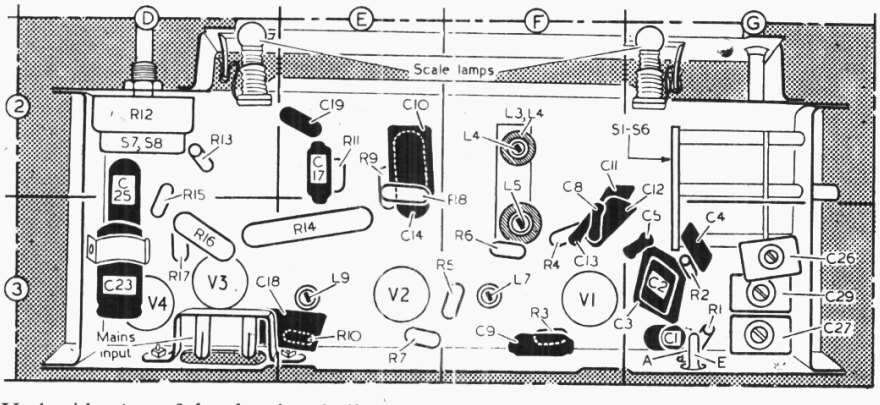
L.W.—Switch set to L.W., tune to 1,400 m, feed in a 200 m (1,500 kc/s) signal and adjust the core of **L5** (F3) for maximum output.

Aerial Stage.—Disconnect the signal generator leads from **V1** and lay them near the frame aerials.

M.W.—Switch set to M.W., tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C27** (G3) for maximum output.

L.W.—Switch set to L.W., tune to 1,400 m, feed in a 1,400 m (214 kc/s) signal and adjust **C26** (G3) for maximum output.

Repeat the above R.F. and oscillator adjustments until calibration is correct.



Underside view of the chassis. A diagram of the waveband switch unit **S1 - S6** in col. 1 shows the unit in detail.

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