"TRADER" SERVICE SHEET

1032

PYE P43

Transportable Table A.C. Superhet

PROVIDED with a self-contained frame aerial, the Pye P43 is a 3-valve (plus rectifier) 2-band table superhet designed to operate from A.C. mains of 200-250 V, 40-100 c/s. The waveband ranges are 187-560 m and 1,000-2,000 m.

Release date and original price: September, 1951; £12 5s 2d plus purchase tax.

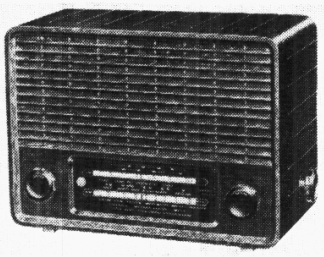
CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C27** (M.W.) or **L1, L2, C27** (L.W.), to triode hexode valve **(V1, Mullard ECH42)**, which operates as frequency changer with internal coupling. On L.W., **S2** closes to connect the trimmers **C3, C25.** Provision is made for the connection of an external aerial and earth via two flexible leads, the aerial being fed via the potential divider **C1, C2.** Modulation hum is suppressed by **R1.**

Triode oscillator anode coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C29.** Parallel trimming by **C28** (M.W.) and **C10** (L.W.); series tracking by **C8** (M.W.) and **C9** (L.W.). Reaction coupling by grid coil **L3** (M.W.) and by the common impedance of **C9** (L.W.).

Second valve **(V2, Mullard EBF80)** is a variable-mu R.F. pentode with two diodes. The pentode section operates as intermediate frequency amplifier with

(Continued in column 3)



The appearance of the receiver. Some models have a silvered finish to the front panel.

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	Aerial shunt ...	22kΩ	G4
R2	V1 C.G.	2·2MΩ	G4
R3	V1 G.B.	220Ω	G4
R4	V1 osc. C.G. ...	47kΩ	G4
R5	Osc. anode load ...	33kΩ	F4
R6	A.G.C. diode load ...	2·2MΩ	F4
R7		1MΩ	E3
R8	S.G. H.T. feed ...	15kΩ	E3
R9	V2 G.B.	470Ω	F4
R10	Signal diode load ...	470kΩ	F4
R11	Volume control ...	800kΩ	D3
R12	H.T. smoothing ...	1·5kΩ	E3
R13	V3 C.G. stopper ...	100kΩ	D3
R14	V3 G.B.	150Ω	E3
R15	Neg. feed-back ...	6·8kΩ	D3

	CAPACITORS	Values	Locations
C1	Aerial coupling ...	470pF	G4
C2		0·0024μF	G3
C3	L.W. trimmer ...	82pF	G3
C4	V1 C.G.	100pF	G4
C5	1st I.F. trans. tuning ...	100pF	A2
C6		100pF	A2
C7	V1 cath. by-pass ...	0·1μF	G4
C8	M.W. osc. tracker...	360pF	G4
C9	L.W. osc. tracker...	200pF	G4
C10	L.W. trimmer ...	180pF	G4
C11	A.G.C. decoupling	0·02μF	F4
C12	Osc. anode coup. ...	100pF	G4
C13	A.G.C. coupling ...	10pF	F4
C14	S.G. decoupling ...	0·1μF	F4
C15	2nd I.F. trans. tuning ...	100pF	B2
C16		100pF	B2
C17	V2 cath. by-pass ...	0·1μF	F4
C18	I.F. by-pass ...	470pF	E4
C19	A.F. coupling ...	0·005μF	E4
C20*	H.T. smoothing ...	16μF	B1
C21*		16μF	B1
C22	V3 cath. by-pass ...	25μF	E3
C23	Tone corrector ...	0·01μF	C1
C24	Neg. feed-back ...	0·1μF	E3
C25‡	L.W. aerial trim. ...	50pF	G3
C26‡	M.W. aerial trim....	50pF	F3
C27†	Aerial tuning ...	§ 528pF	A1
C28‡	M.W. osc. trim. ...	50pF	F4
C29†	Oscillator tuning ...	§ 528pF	A2

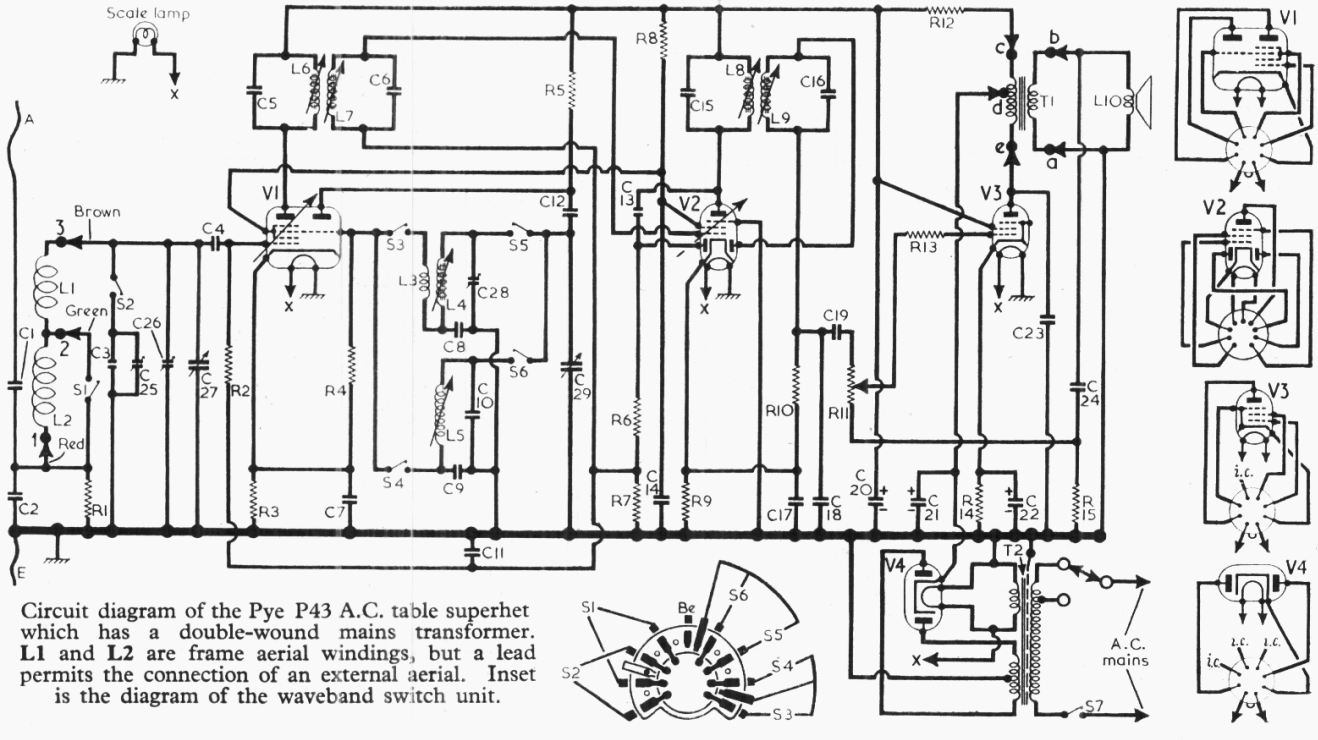
* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max.

tuned transformer couplings **C5, L6, L7, C6** and **C15, L8, L9, C16.**

Intermediate frequency 470 kc/s.

One diode of **V2** operates as signal detector, the audio frequency component

(Continued in column 1 overleaf)



Circuit diagram of the Pye P43 A.C. table superhet which has a double-wound mains transformer. **L1** and **L2** are frame aerial windings, but a lead permits the connection of an external aerial. Inset is the diagram of the waveband switch unit.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	M.W. frame aerial...	3·0	A1
L2	L.W. frame aerial...	21·0	A1
L3	Osc. reaction coil...	—	G4
L4	M.W. osc. tuning...	2·5	G4
L5	L.W. osc. tuning ...	7·5	F4
L6	1st I.F. trans. Pri.	12·2	A2
L7	1st I.F. trans. Sec.	12·2	A2
L8	2nd I.F. trans. Pri.	12·2	B2
L9	2nd I.F. trans. Sec.	12·2	B2
L10	Speech coil ...	2·5	—
T1	O.P. trans. d–c ...	15·0	C1
	O.P. trans. d–e ...	410·0	
	O.P. trans. b–a ...	—	
T2	Primary, total ...	56·0	C2
	H.T. sec., total ...	310·0	
	Heater sec. ...	—	
S1–S6	Waveband switches	—	G3
S7	Mains sw., g'd R11	—	D3

Circuit Description—*continued*

in its rectified output being developed across the load resistor **R10** and passed via **C19** and the manual volume control **R11** to the control grid of the pentode output valve **(V3, Mullard EL41).**

Second diode of **V2** is fed via **C13** from **V2** anode, the resulting D.C. potential developed across **R7** in potential divider **R6, R7** being fed back as bias to F.C. and I.F. stages, giving automatic gain control.

Tone correction is provided in **V3** grid circuit by feeding back to it signals from the speech coil circuit via **C24** and **R15,** and by **C23** in the anode circuit.

H.T. current is supplied by I.H.C. full-wave rectifying valve **(V4, Mullard EZ40).** Smoothing by **R12** and electrolytic capacitors **C20, C21,** residual hum being neutralized by passing the current through a section of the output transformer primary. **V4** is connected to the same heater winding as the other valves.

DISMANTLING THE SET

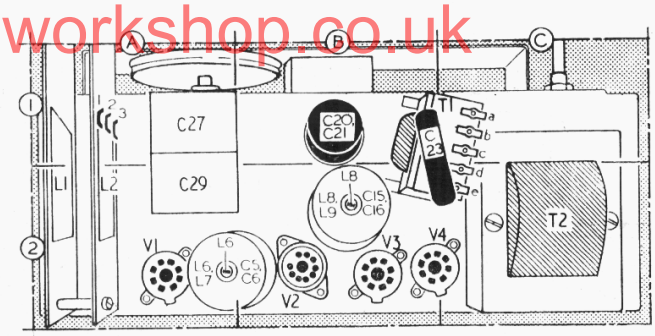
Removing Chassis.—Remove four 6BA screws (with washers) holding back cover to cabinet, remove cover and withdraw base cover, when access can be gained to most parts of the chassis.

Pull off the three control knobs, using a strong piece of cord if they are tight;

remove two 4BA screws at ends of chassis, releasing the vertical bracing strips.

Chassis can now be withdrawn to extent of speaker leads, or freed entirely if these are unsoldered from the speech coil tags on the output transformer **T1.**

When replacing, the speech coil tags on **T1** are identified in our plan view of the chassis.



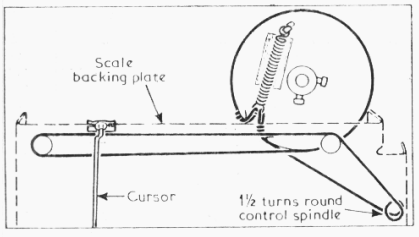
Plan view of the chassis. The frame aerial connections and the tags on the output transformer **T1** are coded to agree with the circuit diagram.

The bracing bars lie vertically over the three screw holes on each side of the cabinet, all six screws going through them.

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 base cover.

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 F4), **L8** (B2), **L7** (F4) and **L6** (A2) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. effects. Repeat these adjustments.



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

Oscillator Stage.—Check that with the gang at maximum capacitance the cursor coincides with the dot at the 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** (G4) for maximum output. Tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C28** (F4) for maximum output.

L.W.—Switch set to L.W., tune to 1,400 m, feed in a 1,400 m (200 kc/s) signal and adjust the core of **L5** (F4) 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 **C26** (F3) 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 **C25** (G3) for maximum output.

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

GENERAL NOTES

Switches.—**S1-S6** are the waveband switches, ganged in a 2-position unit beneath the chassis. This is indicated in our underside drawing of the chassis, and shown in detail in the diagram inset beneath the circuit diagram overleaf, where it is drawn as seen in the direction of the indicating arrow in our chassis illustration.

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

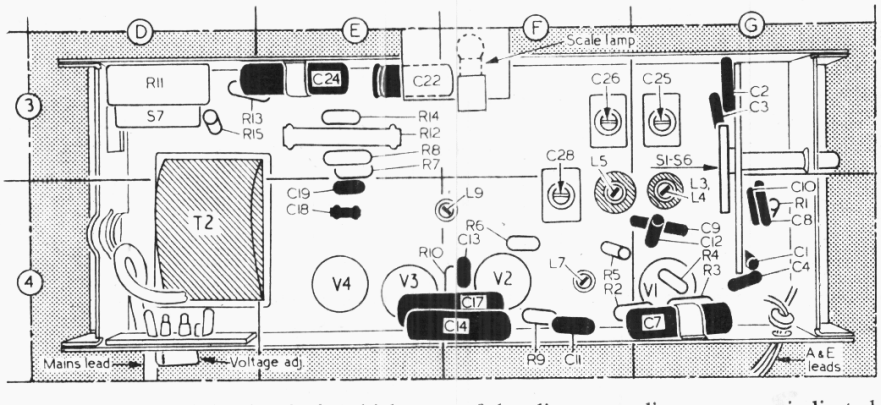
S7 is the Q.M.B. mains switch, ganged with the volume control **R11.**

Scale Lamp.—In our sample this was a Mazda lamp, with a small clear spherical bulb and an M.E.S. base, rated at 6.5 V, 0.3 A. In the makers' manual it was shown as two lamps in series, each rated at 3.5 V, 0.3 A, which is an alternative arrangement.

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

Valve V4.—This was quoted in the makers' manual as an EZ41, so presumably either this or an EZ40 may be used. Our sample used an EZ40.

Drive Cord Replacement.—Three feet of nylon braided glass yarn is required for a new tuning drive cord, this length leaving an ample margin for tying off. It should be run as shown in the sketch in col. 2, where the system is drawn as seen when viewed from the front with the gang at minimum capacitance.



Underside view of the chassis, in which most of the alignment adjustments are indicated. A diagram of the **S1-S6** switch unit is inset beneath the circuit diagram overleaf.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the makers' service manual. Their receiver was operating from A.C. mains of 210 V, using the 200-220 V tapping on the mains transformer. The receiver was tuned to 200 m, but there was no signal input.

Voltages were measured on the 400 V range of a Model 7 Avometer, unless the voltage was lower than 10 V, when it was measured on the 10 V range. The total mains consumption was given as 37 W, and the total H.T. current as 46.8 mA.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECH42...	190 oscillator	2·5	95	4·4	1·9
	90	3·0			
V2 EBF80 ...	190	4·2	95	1·7	2·8
V3 EL41	210	27·5	190	3·5	4·6
V4 EZ40 ...	420†	—	—	—	215·0

† Anode to anode, A.C.

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