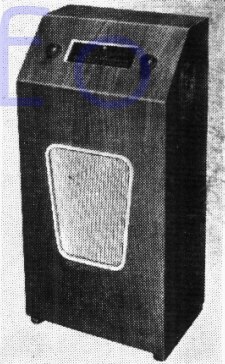


"TRADER" SERVICE SHEET

922

PYE 49 SERIES

Console, Table RG and Auto RG



Console 49C.

THREE Pye Receivers are covered by this Service Sheet: the 49C console, the 49TG table radiogram, and the 49RG autoradiogram, but it was prepared from a model 49C. The differences in the 49TG and 49RG are explained under "Radiogram Modifications" overleaf.

The 49C receiver is a 3-valve (plus rectifier) 2-band superhet designed to operate from A.C. or D.C. mains of 200-250 V, although special models cover low-voltage mains. The wave-band ranges are 187-500 m and 970-2,000 m.

Release date and original prices: April 1949; 49C, £17 17s; 49TG, £26 5s; 49RG, £36 15s. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input, via series capacitor C2, is inductively coupled by L1 (M.W.) or L2 (L.W.) to single-tuned circuits L3, C26 (M.W.) or L4, C26 (L.W.), which precede a triode hexode valve (V1, Mullard UCH42) operating as frequency changer with internal coupling.

Triode oscillator anode coils L6 (M.W.), L7 (L.W.) are tuned by C27, with parallel trimming by C10 (M.W.), C11 (L.W.), and series tracking by C8 (M.W.), C9 (L.W.). Capacitive reaction coupling, due to the common impedance of the trackers in grid and anode circuits, is employed on both bands; with additional inductive coupling by L5 on M.W.

Second valve (V2, Mullard UAF42) is a single diode variable-mu R.F. pentode operating as intermediate frequency amplifier and second detector. The pentode section of V2 is tuned-transformer coupled by C5, L8, L9, C6 and C15, L10, L11, C16 in which the tuning capacitors are fixed and alignment is effected by varying the positions of the iron-dust cores.

Intermediate frequency 465 kc/s.

The audio frequency component in the rectified output of V2 diode section is developed

across load resistor R9, and passed via A.F. coupling capacitor C19, volume control R10, and grid stopper R11, to control grid of pentode output valve (V3, Mullard UL41). I.F. filtering by C18 in diode circuit, and R11 in V3 C.G. circuit, and fixed tone correction in V3 anode circuit by C21.

The D.C. component developed across R9 is tapped off and fed back, through decoupling circuits, as G.B. to P.C. and I.F. valves, giving automatic gain control. Delay is introduced in this circuit by applying a small positive potential to the A.G.C. line, via the potential divider R7, R8, R9, and connecting a diode, formed by the suppressor grid-cathode path of V2, between this point and chassis.

This suppressor-diode conducts, holding the A.G.C. line (at R6, R8) at V2 cathode potential (chassis) until the signal diode current through R9 is great enough to develop across R9 a potential sufficiently large to neutralize the opposing H.T. potential at the suppressor grid. The suppressor grid then ceases to conduct, and the A.G.C. line potential is free to become negative with increasing signal strength.

COMPONENTS AND VALUES

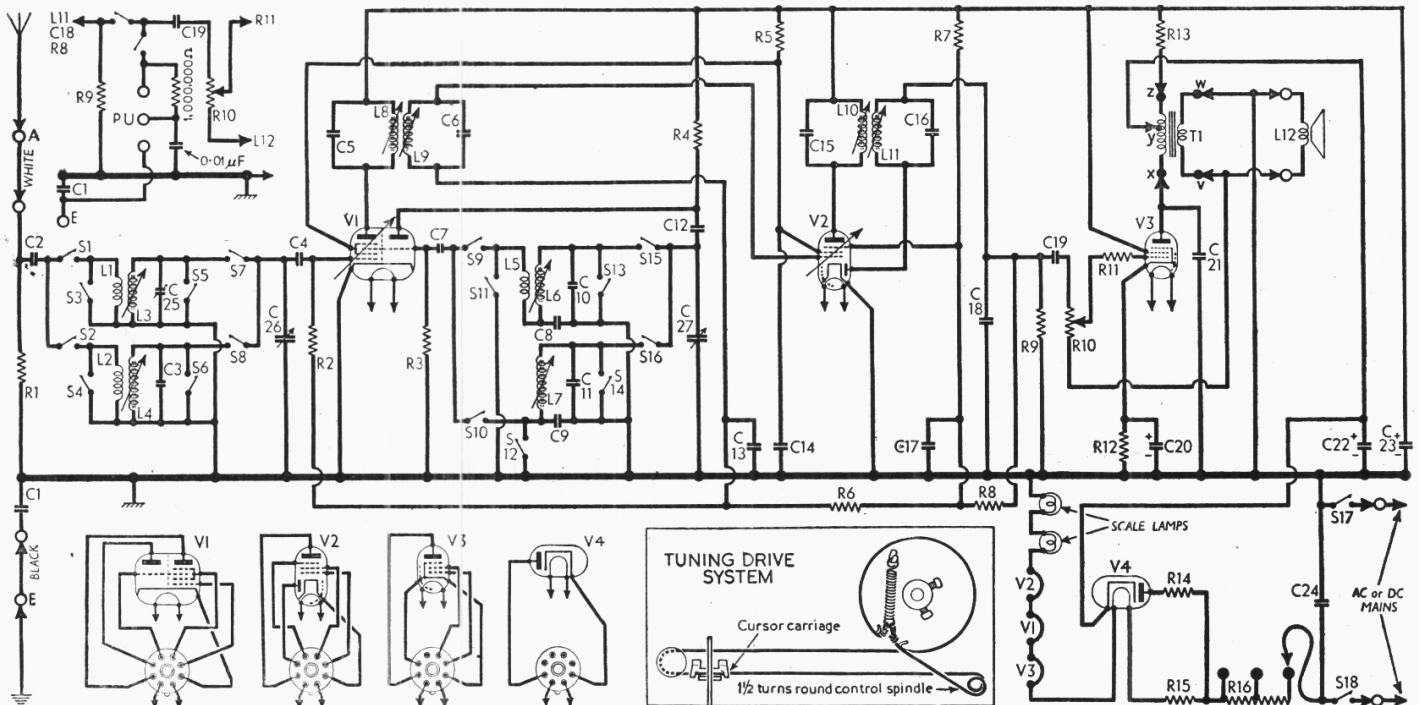
CAPACITORS		Values (μF)	Locations
C1	Earth isolator ...	0-01	A2
C2	Aerial series ...	0-00047	A2
C3	Aerial L.W. trim....	0-00007	J4
C4	V1 hex. C.G. ...	0-0001	H4
C5	} 1st I.F. transformer {	0-0001	B2
C6		tuning ...	0-0001
C7	V1 osc. C.G. ...	0-00005	H4
C8	Osc. M.W. tracker	0-0004	F3
C9	Osc. L.W. tracker	0-00019	H4
C10	Osc. M.W. trim. ...	0-00018	H4
C11	Osc. L.W. trim. ...	0-00014	H3
C12	Osc. anode coup. ...	0-0001	G4
C13	A.G.C. decoup. ...	0-02	G4
C14	S.G.'s H.T. decoup.	0-01	F3
C15	} 2nd I.F. transfor- {	0-0001	C2
C16		mer tuning ...	0-0001
C17	A.G.C. decoup. ...	0-02	F4
C18	I.F. by-pass ...	0-00047	F5
C19	A.F. coupling ...	0-005	E3
C20*	V3 cath. by-pass ...	10-0	D4
C21	Tone corrector ...	0-02	C1
C22*	} H.T. smoothing ... {	32-0	C1
C23*			32-0
C24	Mains R.F. by-pass	0-01	D4
C25†	Aerial M.W. trim.	0-00005	J5
C26†	Aerial tuning ...	—	A1
C27†	Oscillator tuning ...	—	A1

RESISTORS		Values (ohms)	Locations
R1	Aerial shunt ...	470,000	A2
R2	V1 hex. C.G. ...	1,000,000	H5
R3	V1 osc. C.G. ...	47,000	H4
R4	Osc. anode load ...	10,000	G5
R5	S.G.'s H.T. feed ...	22,000	F4
R6	} A.G.C. decoupling {	2,200,000	F4
R7		and delay resis- {	15,000,000
R8	tors ...	2,200,000	F4
R9	Diode load ...	470,000	E5
R10	Volume control ...	800,000	D3
R11	I.F. stopper ...	100,000	D4
R12	V3 G.B. resistor ...	120	D4
R13	H.T. smoothing ...	1,500	E4
R14	V4 surge limiter ...	180	D4
R15	} Heater ballast re- {	1,025	B1
R16		sistors ...	154*

(Continued col. 1 overleaf)

* Electrolytic. † Variable. ‡ Pre-set.

* Tapped at 77Ω.

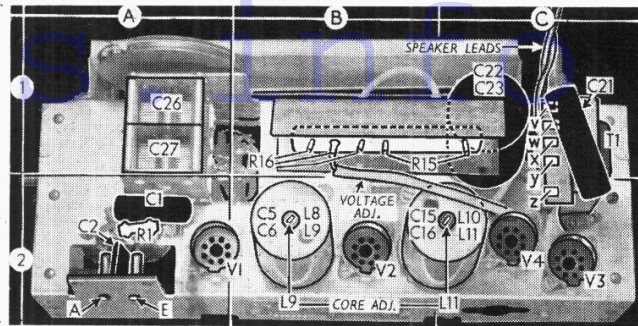


Circuit diagram of the Pye 49C. The tags of the output transformer T1 are letter-coded. Inset at top left corner is a diagram of the pick-up circuit in the 49TG and 49RG. Inset below the circuit is a sketch of the tuning drive cord system, as seen from the front.

Manual

OTHER COMPONENTS		Approx. Values (ohms)	Locations	
L1	Aerial coupling coils	90-0	J4	
L2		300-0	J4	
L3		4-0	J4	
L4		33-5	J4	
L5	Osc. react. coil	0-1	G4	
L6		1-8	G4	
L7	Oscillator tuning coils	4-0	G3	
L8		9-0	B2	
L9	1st I.F. trans.	9-0	B2	
L10		9-0	C2	
L11	2nd I.F. trans.	9-0	C2	
L12		2-5	C2	
T1	Output trans.	205-0	C1	
S1-S16		Waveband switches	—	J4
S17			Mains switches, ganged R10	—
S18	—			D3

Plan view of the chassis. The tags of the output transformer T1 are coded v, w, x, y, z to agree with the circuit diagram overleaf. R15 and R16 are separate sections of the ballast resistors, joined together externally.



GENERAL NOTES

Switches.—S1-S16 are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams below, where they are drawn as seen from the opposite end of an inverted chassis. The table (below) gives the switch positions for the two control settings: M.W. (control knob anti-clockwise), and L.W. A dash indicates open, and C, closed.

Scale Lamps.—These are two M.E.S. type lamps, with small clear spherical bulbs, rated at 2.5 V, 0.15 A.

External Speaker.—No provision is made for

the heater chain and connected in series directly across C24; V2 heater goes straight to chassis.

Drive Cord Replacement.—About 30 inches of nylon braided glass yarn is required for the tuning drive cord. The drive system is shown in the sketch inset beneath the circuit diagram overleaf as it appears when viewed from the front, with the gang at minimum, after removing the scale backing plate (four 6BA bolts).

RADIOGRAM MODIFICATIONS

The 49TG table radiogram and the 49RG auto-radiogram employ a modified 49C chassis. The modification is the same in both models, and concerns only the introduction of pick-up switching, which is inserted in the lead between R9 and C19, and a change in the position of C21, which in the radiograms is connected between tags x and y on the output transformer T1.

The actual circuit is shown inset in the top left-hand corner of the circuit diagram overleaf. The two additional switches are mounted on a third switch unit wafer on the waveband control, which then has three positions.

The 49TG is fitted with a Collaro RP49 rim-drive playing unit with a crystal pick-up, while the 49RG has a Garrard RC70 record changer unit with a crystal pick-up. The radiograms are for use on A.C. mains only.

CIRCUIT ALIGNMENT

These operations may be carried out with the chassis in its normal position if the cabinet is laid, front downward, on a felt pad on the bench. It should be borne in mind that the chassis may be live to the mains.

I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator (via an 0.1 μF capacitor in the "live" lead) to control grid (pin 6) of V1 and the E socket. Feed in a 465 kc/s (645.16 m) signal, and adjust the cores of L11, L10, L9 and L8 (location references C2, E5, B2, G5) for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursor should be vertical and coincident with the 2,000 m calibration mark on the scale. It may be adjusted in position by rotating the drive drum on its spindle after slackening the two boss screws. Transfer "live" signal generator lead to A socket, via a suitable dummy aerial.

M.W.—With set still switched to M.W., tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of L6 (G4) and L3 (J4) for maximum output. Tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust C25 (J5) for maximum output. Repeat these operations until no improvement results.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust the cores of L7 (G3) and L4 (J4) for maximum output.

DISMANTLING THE SET

Removing Chassis.—Lift off the plastic rings and felt washers fitted to the two front panel control knobs; unplug the speaker, aerial and earth leads, and withdraw the mains connector; remove the cup-shaped escutcheon of the waveband switch knob (three wood screws) and pull off the knob; withdraw the cheese-head screw at each end of the chassis rear member, and slide out the chassis.

Removing Speaker.—Unsolder the speaker leads at the speech coil connecting tags, remove the four nuts (with spring washers), and lift out the speaker. When replacing, the speech coil connecting tags should be at the top.

Circuit Description—continued.

A.F. voltages developed across the secondary winding of the output transformer T1 are fed back to V3 C.G. circuit via R10, R11 to improve the quality of reproduction.

When the receiver is operating from A.C. mains H.T. current is supplied by I.H.C. half-wave rectifying valve (V4, Mullard UY41), which with D.C. mains behaves as a low resistance. Smoothing by resistor R13 and electrolytic capacitors C22, C23, residual hum being neutralized by passing the receiver H.T. current through a portion of T1 primary winding.

Valve heaters, together with scale lamps and heater ballast resistors R15, R16, are connected in series across mains input. Mains R.F. filtering by C24, and earth isolation by C1.

VALVE ANALYSIS

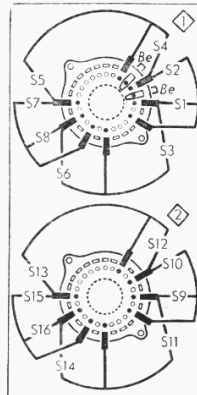
Valve voltages and currents given in the table below are those quoted by the manufacturers. Their receiver was operating from A.C. mains of 207 V, using the 200-215 V tapping on the heater ballast resistor, and was tuned to the lowest wavelength on the M.W. band.

Voltages were measured on the 400 V scale of a model 7 Avometer, except where otherwise indicated, chassis being the negative connection.

Valve	Anode		Screen		Cath. V
	V	mA	V	mA	
V1 UCH42	145	1.8	56	2.4	—
	Oscillator				
	105	3.2			
V2 UAF42	145	3.0	56	1.1	—
V3 UL41	165	48.0	145	9.0	7*
V4 UY41	190†	—	—	—	175

* 10 V meter range. † A.C.

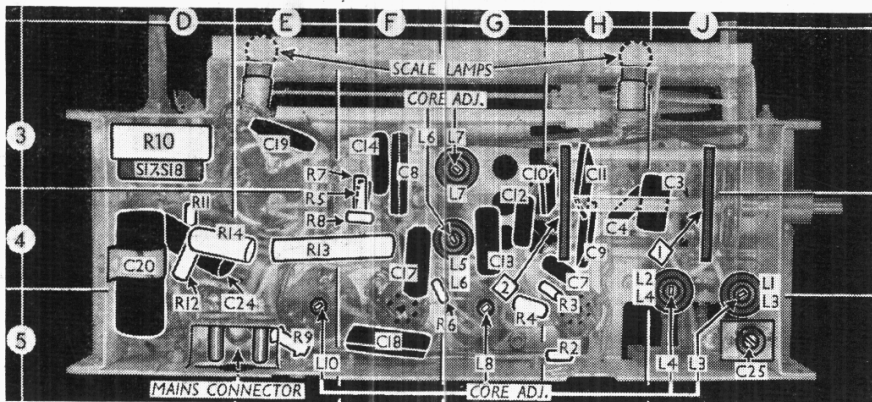
Switch	M.W.	L.W.
S1	C	—
S2	—	C
S3	—	C
S4	C	—
S5	—	C
S6	C	—
S7	C	—
S8	—	C
S9	C	—
S10	—	C
S11	—	C
S12	C	—
S13	—	C
S14	C	—
S15	C	—
S16	—	C



On the right are the waveband switch units. Be indicates a bearer tag. On the left is the associated switch table.

the connection of an external speaker, but one of low impedance (about 3-4 Ω) could be used if it were connected via a double-wound transformer fitted inside the cabinet. The speech coil circuit of the internal speaker is connected directly to one side of the mains.

Low-Voltage Model.—Special models of the 49C are adapted to operate from low-voltage mains only of 100-125V. In these chassis, R14 is deleted and V4 anode goes directly to S18, C24. R15 and the scale lamps are removed from



Under-chassis view. Arrows show the direction in which the waveband switch units 1 and 2 are viewed in the diagrams in col. 2 above.