

"TRADER" SERVICE SHEET

1172

CHAMPION 820 & 830

3-speed Portable Radiogram and 3-speed Table Autoradiogram

of a length of ferrite rod to form the internal aerial, and are tuned by C28.

Triode heptode valve (V1, Mullard ECH81) operates as frequency changer with external coupling between oscillator grid and injector grid. Oscillator grid coils L3 (M.W.) and L4 (L.W.) are tuned by C29. Parallel trimming by C30 (M.W.) and C30, C31 (L.W.); series tracking by C7 (M.W.) and C8 (L.W.).

Second valve (V2, Mullard EBF80) is a double diode variable-mu R.F. pentode, its pentode section operating as intermedi-

(Continued col. 1 overleaf)



Appearance of the Champion 820.

HOUSED in a two-tone leatherette finish carrying case, the champion 820 "Radio Revler," is 4-valve 2-band portable 3-speed table radiogram, designed to operate from A.C. mains of 220-240 V, 50 c/s. The waveband ranges are 200-550 m and 800-2,000 m.

Model 830 is a walnut-veneered 3-speed table autoradiogram version of the 820. Details of this model are given in "General Notes."

Release dates and original prices: Model 820, May 1954, £21 1s 3d; Model 830, August 1954, £26 4s 8d. Purchase tax extra.

CIRCUIT DESCRIPTION

The internal aerial coils L1 (M.W.) and L2 (L.W.) are mounted on opposite ends

CAPACITORS

Location	Value	Location
B1	150pF	C1
B1	150pF	C2
E2	0.1µF	C3
E3	100pF	C4
D2	0.05µF	C5
D2	50pF	C6
D2	550pF	C7
D2	180pF	C8
E3	100pF	C9
E3	0.1µF	C10
F3	50pF	C11
C1	150pF	C12
C1	150pF	C13
G2	100pF	C14
F2	100pF	C15
F2	0.1µF	C16
E3	0.001µF	C17
E3	0.01µF	C18
F3	100pF	C19
G3	0.01µF	C20
G2	0.002µF	C21
G3	500µF	C22*
B1	32µF	C23*
B1	32µF	C24*
G2	0.01µF	C25
C1	—	C26†
C1	—	C27†
C1	—	C28†
C1	—	C29†
C1	—	C30†
C1	—	C31†

Values

Locations

OTHER COMPONENTS

Component	Approx. Values (ohms)	Locations
L1	0.2	A1
L2	5.5	B1
L3	2.8	D2
L4	7.0	D2
L5	0.4	D2
L6	10.0	B1
L7	10.0	B1
L8	10.0	C1
L9	10.0	C1
L10	2.8	—
T1	400.0	A1
T2	250.0	B1
S1-S7	50.0	—
S8	—	D3
S9	—	—
S10	—	E3

Approx. Values (ohms)

Locations

RESISTORS

Values

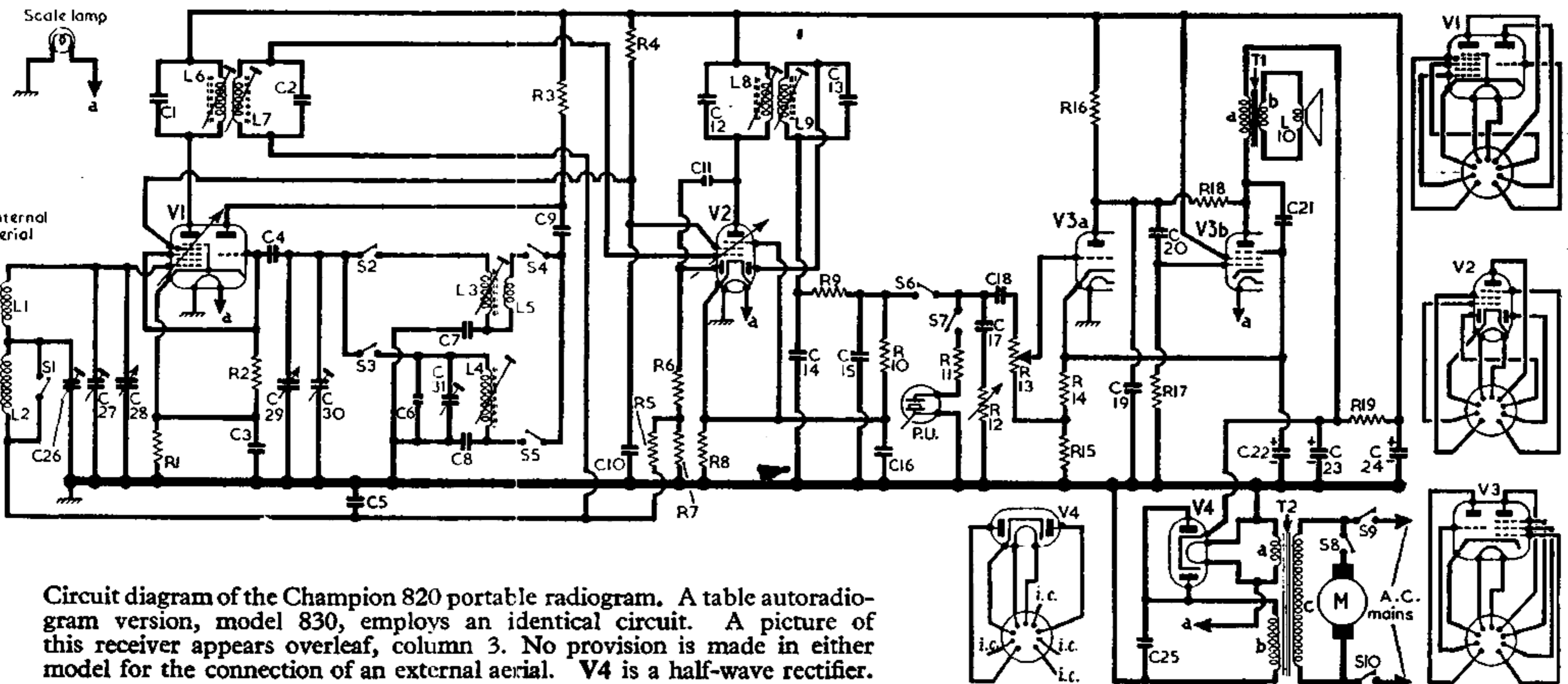
Locations

R1	V1 G.B.	220Ω	E2
R2	V1 osc. C.G.	47kΩ	E2
R3	Osc. anode feed	22kΩ	E3
R4	S.G. H.T. feed	15kΩ	F3
R5	A.G.C. decoupling	1MΩ	F3
R6	A.G.C. pot. divider	1MΩ	F3
R7		470kΩ	F3
R8	V2 G.B.	470Ω	F3
R9	I.F. stopper	100kΩ	F2
R10	Signal diode load	470kΩ	F2
R11	P.U. tone corrector	470kΩ	B1
R12	Tone control	1MΩ	D3
R13	Volume control	1MΩ	E3
R14	V3 G.B.	150Ω	F3
R15		150Ω	E3
R16	V3a anode load	220kΩ	G3
R17	V3b C.G.	680kΩ	G2
R18	Neg. feed-back	3.3MΩ	G2
R19	H.T. smoothing	1.5kΩ	G3

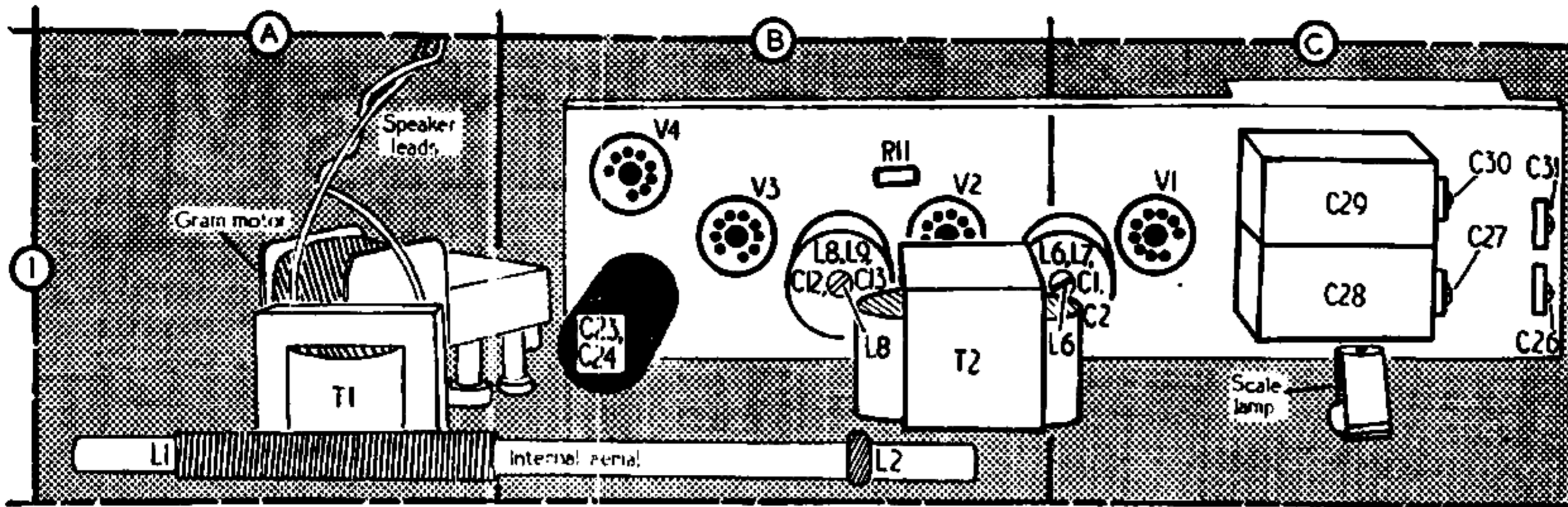
*Electrolytic.

†Variable.

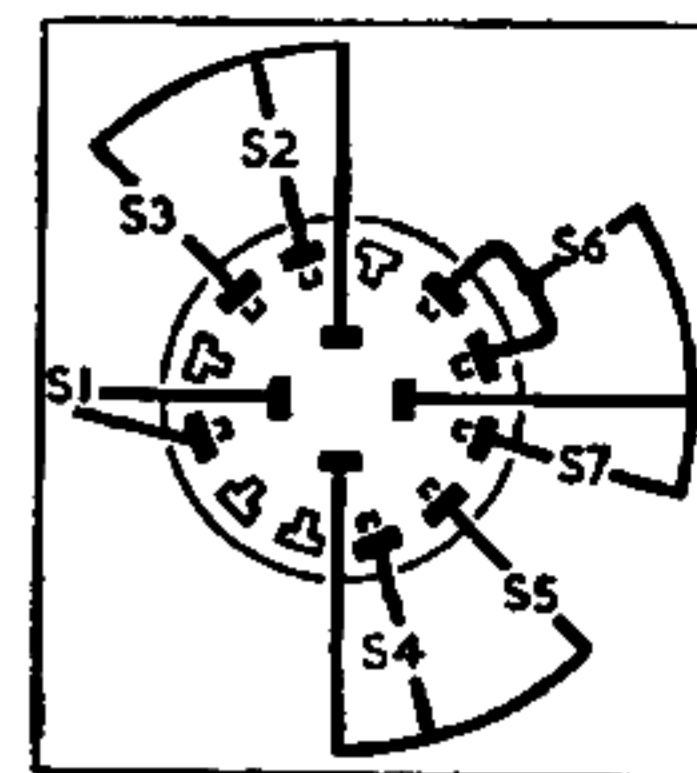
‡Pre-set.



Circuit diagram of the Champion 820 portable radiogram. A table autoradiogram version, model 830, employs an identical circuit. A picture of this receiver appears overleaf, column 3. No provision is made in either model for the connection of an external aerial. V4 is a half-wave rectifier.



Plan view of chassis. The ferrite rod aerial is indicated with L1 and L2.



Above: Diagram of the switch unit.

Circuit Description—continued

ate frequency amplifier with tuned transformer couplings C1, L6, L7, C2 and C12, L8, L9, C13.

Intermediate frequency 465 kc/s

One diode of V2 operates as signal detector. Audio frequency component in its rectified output is developed across R10, and passed via C18 and volume control R13 to grid of V3a (triode section of V3, Mullard ECL80). Variable tone control by C17 and R12 in V3a grid circuit. With the waveband switch control set in the gram position, the crystal pick-up is connected via S7 across the volume control circuit. S6 opens in this position to prevent radio break-through.

Resistance-capacitance coupling by R16, C20 and R17 between V3a and pentode output valve V3b. Tone correction by C21 in anode circuit, and by negative feedback between the anodes of V3b and V3a via R18.

H.T. current is supplied by I.H.C. rectifying valve (V4 Mullard EZ80). H.T. smoothing by R19 and electrolytic capacitors C23, C24. Mains R.F. filtering by C25.

CIRCUIT ALIGNMENT

Withdraw top panel of receiver, complete with chassis, as described under "Dismantling."

I.F. Stages.—Switch receiver to M.W. and tune to a point at the high-wavelength end of the band where there is no signal pick-up. Connect output of signal generator, via a 0.1µF capacitor in the "live" lead, to control grid (pin 2) of V1 and chassis. Feed in a 465 kc/s (645.16m) signal and adjust the cores of L9 (location reference F2), L8 (B1), L7 (F2) and L6 (C1) for maximum output. Repeat these adjustments until no further improvement result.

R.F. and Oscillator Stages.—Transfer signal generator leads to a dummy loop aerial which

should be placed about a foot away from the ferrite rod aerial.

M.W.—Switch receiver to M.W., tune to 550m, feed in a 550m (545.4 kc/s) signal and adjust the core of L3 (D2) for maximum output. Tune receiver to 200m, feed in a 1,500 kc/s signal, and adjust C30 and C27 (C1) for maximum output. Repeat these adjustments until no further improvement results.

L.W.—Switch receiver to L.W., tune to 2,000m, feed in a 2,000m (150 kc/s) signal and adjust the core of L4 (D2) for maximum output. Tune receiver to 1,000m, feed in a 1,000m (300 kc/s) signal and adjust C31 and C26 (C1) for maximum output. Repeat these adjustments until no further improvement results.

and an Acos pick-up with a turn-over type crystal cartridge (HQP37).

Model 830 employs an identical chassis to the 820, but is fitted with a Collaro RC54 3-speed automatic record changer and a Collaro crystal pick-up with turn-over type cartridge.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured on our receiver when it was operating from A.C. mains of 230 V. The

GENERAL NOTES

Switches.—S1-S7 are the waveband and radio/gram change-over switches ganged in a single rotary unit beneath the chassis. This unit is indicated in our under-chassis illustration, and shown in detail in the diagram in column 3. The associated switch table below shows the switch operations for the three control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and C, closed.

Switch Table

Switches	Gram.	M.W.	L.W.
S1	---	C	---
S2	---	C	---
S3	---	C	---
S4	---	C	---
S5	---	C	---
S6	---	C	---
S7	C	---	---

S8 is the gram motor switch and consists of a press-button on/off unit mounted on the motor board beside the pick-up.

S9, S10 are the Q.M.B. mains switches ganged with the volume control R13.

Scale lamp.—This is a 6.5 V, 0.3 A lamp with a clear spherical bulb and an M.E.S. base.

Model 820, on which this service sheet was based employs a Champion 3-speed gram motor



Appearance of the Champion 830.

receiver was switched to M.W. and tuned to a point at the high-wavelength end of the band where there was no signal pick-up.

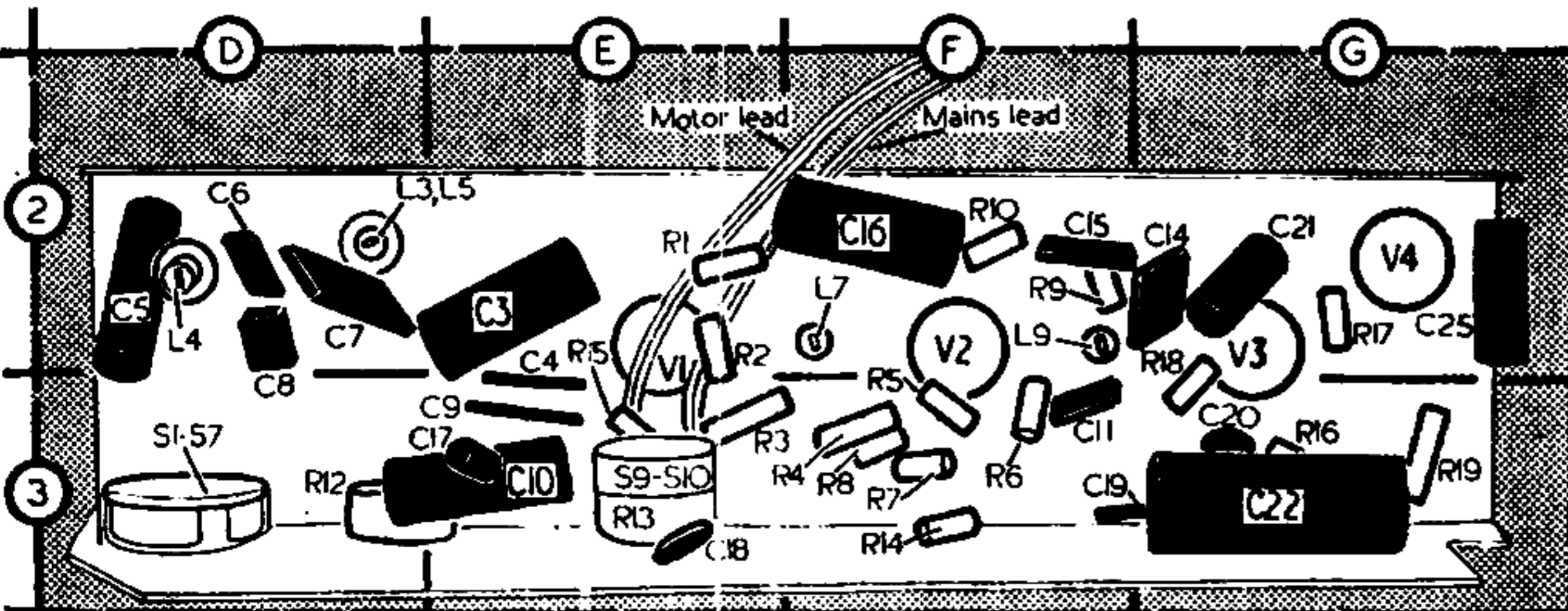
Voltages were measured with an Avo Electronic Test Meter, and as this instrument has a high internal resistance allowance must be made for the current drawn by other types of meter. Chassis was the negative connection in each case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECH81	160†	1.2	64	3.8	2.0
	Oscillator	3.4			
V2 EBF80	166	3.0	64	1.0	2.0
V3 ECL80	50	0.5	—	—	6.6
	180	15.0	166	2.8	
V4 EZ80	162*	—	—	—	188.0†

* A.C. reading, each anode. † Cathode current 31 mA.

DISMANTLING

Removing Chassis.—Remove two wood screws from front edge and two from rear edge of receiver top panel; remove four Philips-head wood screws securing lower ends of lid stays to carrying case; pull-off motor turntable, and gripping the cut-away section of the panel now exposed, lift out the panel complete with motor and chassis; unsolder leads from speech coil tags on speaker. When replacing, the two long panel screws secure the rear edge of the panel.



Under-side illustration of the chassis. Mains leads and motor leads are indicated.