"TRADER" SERVICE SHEET

1172

CHAMPION 820 & 830

3-speed Portable Radiogram and 3-speed Table Autoradiogram

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 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*)

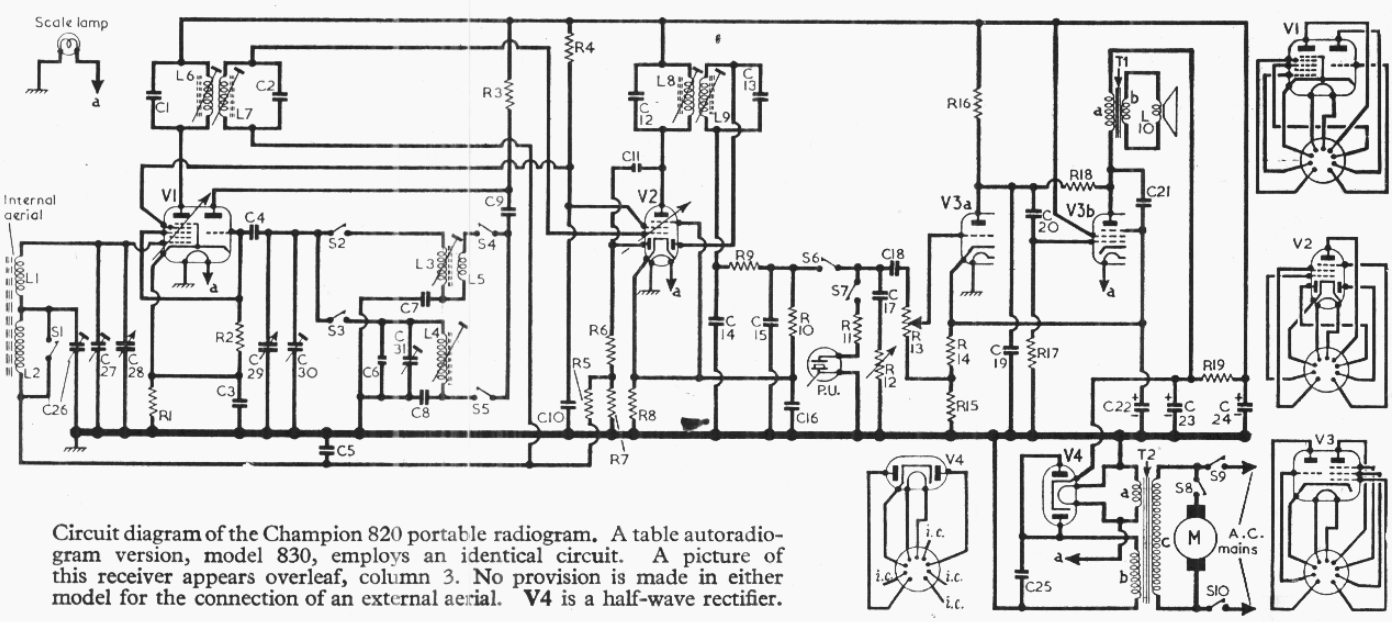
Appearance of the Champion 820.

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

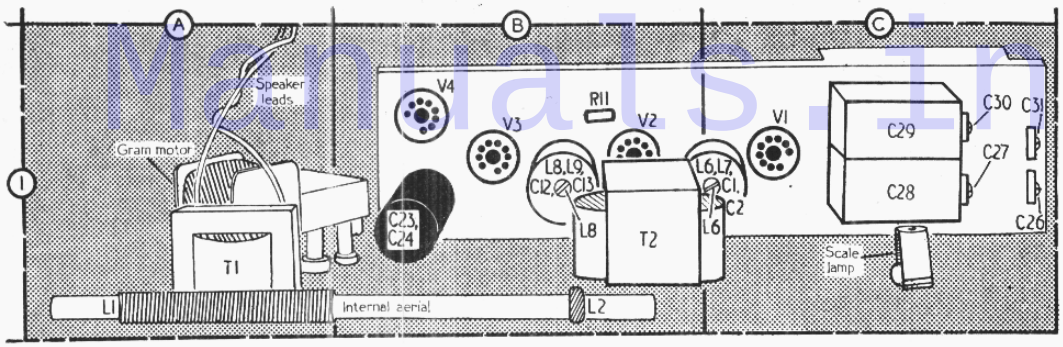
CAPACITORS		Values	Locations
C1	1st I.F. trans. tuning	150pF	B1
C2		150pF	B1
C3	V1 cath. by-pass...	0·1μF	E2
C4	V1 osc. C.G. ...	100pF	E3
C5	A.G.C. decoupling	0·05μF	D2
C6	L.W. osc. trim. ...	50pF	D2
C7	M.W. osc. tracker	550pF	D2
C8	L.W. osc. tracker...	180pF	D2
C9	Osc. anode coup....	100pF	E3
C10	S.G. decoupling ...	0·1μF	E3
C11	A.G.C. coupling ...	50pF	F3
C12	2nd I.F. trans. tuning	150pF	C1
C13		150pF	C1
C14	I.F. by-passes	100pF	G2
C15		100pF	F2
C16	V2 cath. by-pass ...	0·1μF	F2
C17	Part tone control...	0·001μF	E3
C18	A.F. coupling ...	0·01μF	E3
C19	I.F. by-pass ...	100pF	F3
C20	A.F. coupling ...	0·01μF	G3
C21	Tone correction ...	0·002μF	G2
C22*	V3 cath. by-pass ...	500μF	G3
C23*	H.T. smoothing	32μF	B1
C24*		32μF	B1
C25	R.F. by-pass ...	0·01μF	G2
C26‡	L.W. aerial trim....	—	C1
C27‡	M.W. aerial trim....	—	C1
C28†	Aerial tuning ...	—	C1
C29†	Oscillator tuning...	—	C1
C30‡	M.W. osc. trim. ...	—	C1
C31‡	L.W. osc. trim. ...	—	C1

*Electrolytic. †Variable. ‡Pre-set.

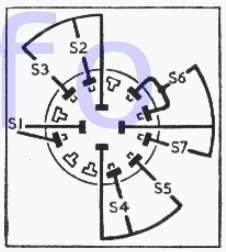
OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Internal aerial coils	0·2	A1
L2		5·5	B1
L3	Oscillator tuning coils	2·8	D2
L4		7·0	D2
L5	M.W. osc. reaction	0·4	D2
L6	1st I.F. trans. Pri.	10·0	B1
L7	1st I.F. trans. Sec.	10·0	B1
L8	2nd I.F. trans. Pri.	10·0	C1
L9	2nd I.F. trans. Sec.	10·0	C1
L10	Speech coil ...	2·8	—
T1	O.P. trans. a ...	400·0	A1
	O.P. trans. b ...	—	
	Mains trans. a ...	—	
T2	Mains trans. b ...	250·0	B1
	Mains trans. c ...	50·0	
S1-S7	Waveband/gram. sw.	—	D3
S8	Gram motor switch	—	—
S9 S10	Mains sw., g'd R13	—	E3



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 results.

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 internal 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.

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	C
S7	C	—	—

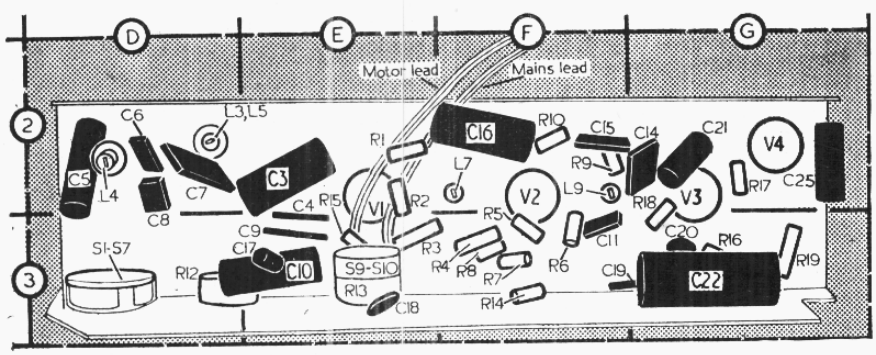
S8 is the gram motor switch and consists of a press-button on/off unit mounted on the motor board beside the pick-up.

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 and an Acos pick-up with a turn-over type crystal cartridge (HGP37).

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.

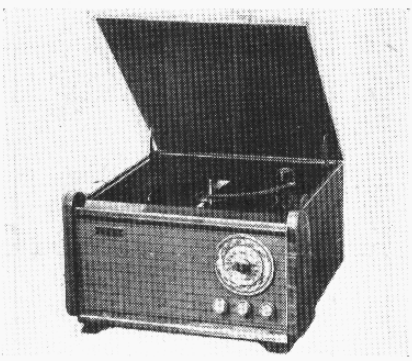


Under-side illustration of the chassis. Mains leads and motor leads are indicated.

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 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.



Appearance of the Champion 830.

Valve	Anode V	Anode mA	Screen V	Screen mA	Cath. V
V1 ECH81	166	1·2	64	3·8	2·0
	Oscillator				
	88	3·4			
V2 EBF80	166	3·0	64	1·0	2·0
V3 ECL80 a	50	0·5	—	—	5·6
V3 ECL80 b	180	15·0	166	2·8	5·6
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.

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