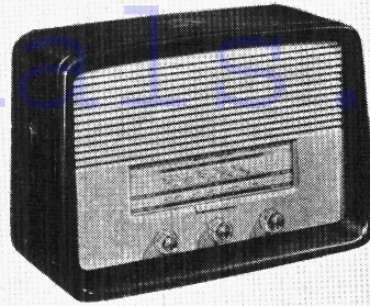


"TRADER" SERVICE SHEET
1194



Appearance of the Sobell 515P.

SOBELL 515 &

Covering Sobell Models 515ACG, 515AG and Banner

THE Sobell 515P is a 4-valve (plus rectifier) table superhet housed in a plastic cabinet and designed to operate from A.C. mains of 200-250V, 50 c/s. The waveband ranges are 16-50m, 200-550m and 1,000-2,000m.

Model 515W employs the same chassis as the 515P but is housed in a wooden cabinet. Models 515STG and 515TAG are 3-speed table radiogram and table auto-radiogram versions respectively of the 515P. Models 515UCG, 515RG, 515ACG and 515AG are 3-speed auto-radiogram versions, housed in different types of cabinet. The 515P chassis is also employed in the combined television ARG model TRG175.

Banner receivers using the same chassis

are models B55, B55TAG, B55RG, B55ACG and B55AG respectively.

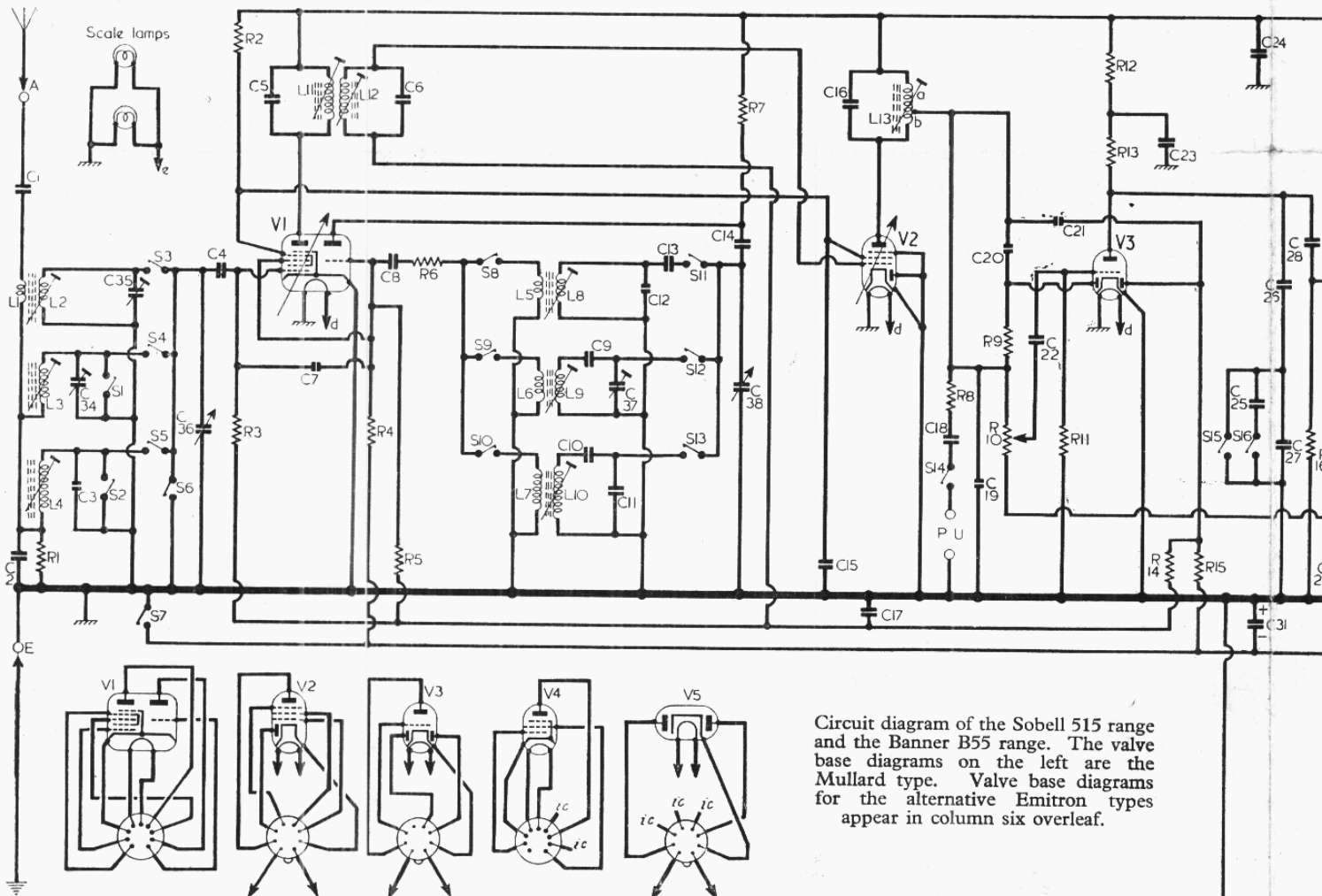
Release date, all models, September 1954. Original prices: 515P, £14 8s 11d; 515W, £17 13s 2d; 515STG, £25 13s 8d; 515TAG, £31 6s; 515UCG, £33 14s 2d; 515RG, £39 6s 6d; 515ACG, £44 18s 11d; 515AG, £63 8s. Banner prices are: B55, £16 17s 2d; B55TAG, £31 6s; B55RG, £41 14s 7d; B55ACG, £55 7s 6d; B55AG, £63 8s. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input via coupling coil **L1** (S.W.) and common impedance coupler **C2** (M.W. and L.W.) to single-tuned circuits **L2, C36** (S.W.), **L3, C36** (M.W.) and **L4, C36** (L.W.) which precede triode heptode valve (**V1, Mullard ECH81**).

Oscillator anode coils **L8, L9, L10** are tuned by **C38**. Parallel trimming by **C12** (S.W.), **C37** (M.W.) and **C11** (L.W.); series tracking by **C13** (S.W.), **C9** (M.W.) and **C10** (L.W.). Inductive reaction coupling from grid by **L5, L6, L7**. Oscillator voltages coupled into the aerial circuit via stray capacitances are neutralized by **C7**.

Second valve (**V2, Mullard EAF42**) is a diode R.F. pentode, its pentode section operating as intermediate frequency



Circuit diagram of the Sobell 515 range and the Banner B55 range. The valve base diagrams on the left are the Mullard type. Valve base diagrams for the alternative Emitron types appear in column six overleaf.

S & BANNER B55 Series

Models 515P, 515W, 515STG, 515TAG, 515UCG, 515RG,
and Banner Models B55, B55TAG, B55RG, B55ACG, B55AG.

amplifier with tuned couplings **C5, L11, L12, C6** and **C16, L13**. Diode section of **V2** is unused and is connected to cathode.

Intermediate frequency 470 kc/s.

Diode signal detector, part of double diode triode valve (**V3, Mullard EBC41**) is fed via **C20** from a tapping on **L13**, and the audio frequency component in the rectified output is developed across **R9** and volume control **R10**, which form the diode load and ensure that a large I.F. signal is applied to the diode to operate it in the linear portion of its curve. A proportion of the A.F. output, that developed across **R10**, is passed via **C22** to grid of triode section, which operates as A.F. amplifier. An earthed strip of metal foil is wound round **C22** to screen it from hum fields.

I.F. filtering by **C19**. Provision is made for the connection of a gramophone pick-

up across the volume control circuit, via tone correction components **R8, C18** and switch **S14**, which closes in the gram position of the waveband control. At the same time **S6** closes to prevent radio break-through, while **S7** in the bias circuit opens muting **V1** oscillator and biasing up **V1** and **V2**.

Second diode of **V3** is fed via **C21** from **V2** anode circuit, and the resulting negative potential developed across diode load **R15** is fed back as bias to **V1** and **V2** giving automatic gain control.

Resistance-capacitance coupling by **R13, C28** and **R16** between **V3** and pen-

tode output valve (**V4, Mullard EL84**). Three-position tone control by **S15, S16** and **C25, C26, C27**. Tone correction by **C32** across **V4**, and by the negative feedback between **T1** secondary winding and **V3** grid circuit via potential divider **C33, R21, R22**.

H.T. current is supplied by I.H.C. full-wave rectifying valve (**V5, Mullard EZ40**). Smoothing by **R19** and electrolytic capacitors **C29, C30**. Residual hum is neutralized by passing H.T. current in anti-phase through section **a** of **T1** primary winding.

An identical circuit and chassis is used in all the models of the 515 and B55 ranges. An alternative range of valves may, however, be used in the 3-speed A.R.G. models. A list of the alternative valves and the receivers in which they may be used are given under "General Notes" overleaf. A separate diagram of the valve base connections for these valves also appears overleaf.

COMPONENT VALUES AND LOCATIONS

CAPACITORS		Values	Locations
C1	Aerial series ...	200pF	G3
C2	Aerial coupling ...	0.003μF	G3
C3	L.W. aerial trim. ...	75pF	A1
C4	V1 C.G. ...	100pF	F2
C5	I.F. trans. tuning	140pF	B1
C6		140pF	B1
C7	Osc. neutralizing	1pF	F3
C8	Osc. C.G.	50pF	F3
C9	M.W. osc. tracker	410pF	G3
C10	L.W. osc. tracker	190pF	G3
C11	L.W. osc. trimmer	140pF	G2
C12	S.W. osc. trimmer	10pF	G3
C13	S.W. osc. tracker	3.900pF	G3
C14	Osc. anode comp.	200pF	G3
C15	S.G. decoupling	0.1μF	F3
C16	I.F. coil tuning	140pF	E3
C17	A.G.C. decoupling	0.05μF	G2
C18	P.U. tone corrector	0.01μF	G2
C19	I.F. by-pass	50pF	E3
C20	Signal diode feed	50pF	E3
C21	A.G.C. diode feed	50pF	E3
C22	A.F. coupling	0.01μF	E2
C23	V3 anode decoupling	0.25μF	D3
C24	H.T. by-pass	0.1μF	F3
C25	Parts tone control	0.005μF	D2
C26		0.01μF	D3
C27		100pF	D3
C28	A.F. coupling	0.01μF	E3
C29*	H.T. smoothing	32μF	B1
C30*		50μF	B1
C31*	Bias decoupling	50μF	B1
C32	Tone corrector	0.005μF	E3
C33	Neg. feed-back	0.25μF	E2
C34†	M.W. aerial trim.	40pF	A1
C35†	S.W. aerial trim.	40pF	A1
C36†	Aerial tuning	528pF	A1
C37†	M.W. osc. trim.	40pF	A1
C38†	Oscillator tuning	528pF	A1

* Electrolytic. † Variable. ‡ Pre-set.

RESISTORS		Values	Locations
R1	Aerial shunt ...	33kΩ	G3
R2	S.G. H.T. feed ...	22kΩ	F2
R3	V1 C.G. ...	1MΩ	F2
R4	V1 osc. C.G. ...	47kΩ	F3
R5	Standing bias feed	10MΩ	G3
R6	Osc. stabilizer ...	150Ω	F3
R7	Osc. anode feed ...	27kΩ†	F3
R8	P.U. tone corrector	100kΩ	E2
R9	Volume control	220kΩ	E2
R10		500kΩ	E2
R11	V3 C.G. ...	10MΩ	D2
R12	H.T. decoupling ...	68kΩ	D3
R13	V3 anode load	150kΩ	D3
R14	A.G.C. decoupling	1.5MΩ	E2
R15	A.G.C. diode load	1MΩ	E3
R16	V4 C.G. ...	680kΩ	E3
R17	Muting bias	220Ω	D3
R18	V4 C.G. stopper	100kΩ	E3
R19	H.T. smoothing	2.4kΩ*	E2
R20	V4 G.B. ...	150Ω‡	E3
R21	Neg. feed-back	3.3kΩ	D2
R22		180Ω§	D3

* Two 1.2kΩ resistors in series.

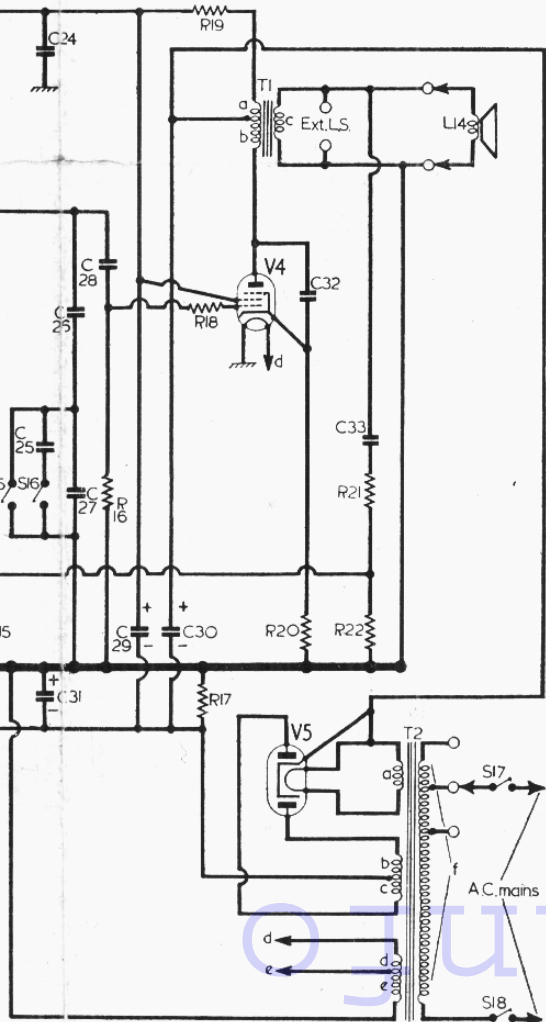
† 22kΩ in Emitron version.

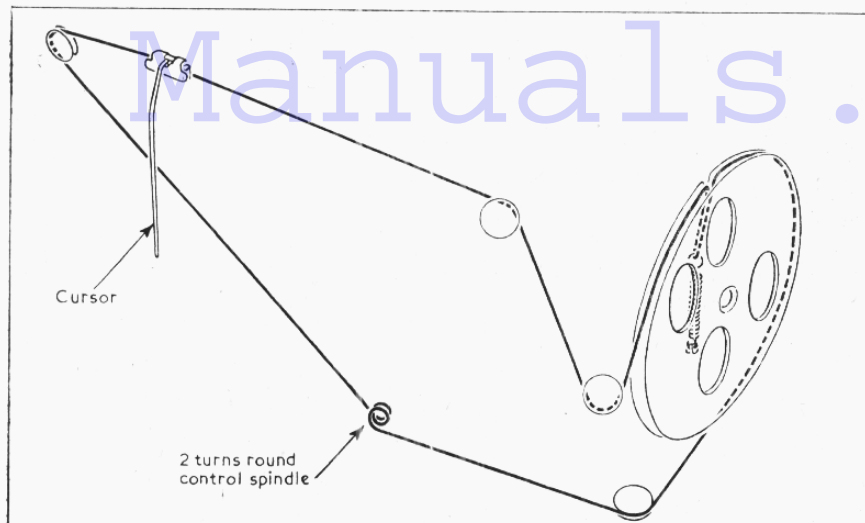
‡ 240Ω in Emitron version.

§ 220Ω in Emitron version.

OTHER COMPONENTS		Approx. Values (ohms)	Locations	
L1	S.W. aerial coup. ...	—	A1	
L2		—	A1	
L3		—	A1	
L4	Aerial tuning coils	3.8	A1	
L5		21.0	A1	
L6	Osc. reaction coils	—	G3	
L7		1.3	G3	
L8		2.0	G3	
L9	Osc. tuning coils	—	G3	
L10		3.3	G3	
L11	I.F. trans. { Pri.	7.6	G3	
L12		Sec. {	6.8	B1
L13	I.F. coil { a	6.8	B1	
L14		b	2.2	E3
L15	Speech coil	2.8	—	
L16		—	—	
T1	O.P. trans { a	13.5	—	
T2		b	420.0	F2
T3		c	0.5	—
T4	Mains trans. { a	0.4	—	
T5		b	290.0	C1
T6		c	290.0	C1
T7		d	—	—
T8		e	—	—
T9	f, tot.	58.0	—	
S1-S14	Waveband switches	—	G2	
S15	Tone switches	—	D2	
S16		—	D2	
S17	Mains sw., g'd R10	—	E2	
S18		—	E2	

Dealers are reminded that if the component numbers given in the circuit and accompanying tables are used when ordering replacement parts, it is advisable to mention the fact on the order, as these numbers may differ from those used in the manufacturers' circuit diagram.





Sketch of the tuning drive cord system, viewed from the front right-hand corner of an upright chassis with the gang at minimum capacitance.



Appearance of the Banner B55TG.

General Notes—continued

ganged in a single 3-position rotary unit beneath the chassis.

S17, S18 are the Q.M.B. mains switches ganged with the volume control **R10**.

Scale Lamps.—These are 6.3 V, 0.3 A lamps with small clear spherical bulbs and M.E.S. bases.

Valves.—In the 3-speed ARG versions, models 515UCG, 515RG, 515ACG, 515AG, B55RG, B55ACG and B55AG, an alternative Emitron range of valves may be used. These valves are: **V1, 7S7; V2, 7B7; V3, 7C6; V4, 7C5; V5, 7Y4.**

Diagrams of the valve base connections for these valves appear on the right in column 6.

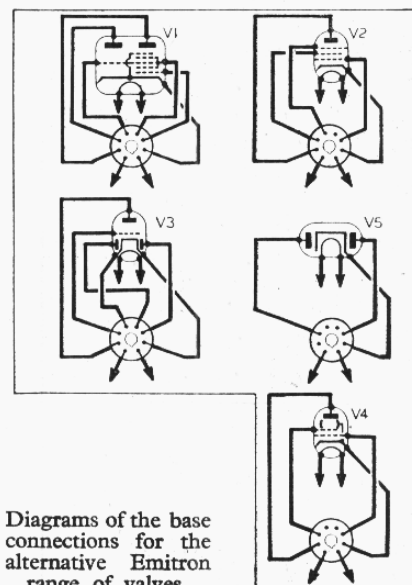
Drive Cord Replacement.—About 48in of nylon-braided glass yarn is required

for a new drive cord, which should be run as shown in the sketch of the tuning drive system above. The gang should be turned to minimum capacitance and the cord run anti-clockwise round the drive drum, pulling against the gang stop. With the drive cord in correct tension, the spring should be extended to about 7in overall.

DISMANTLING

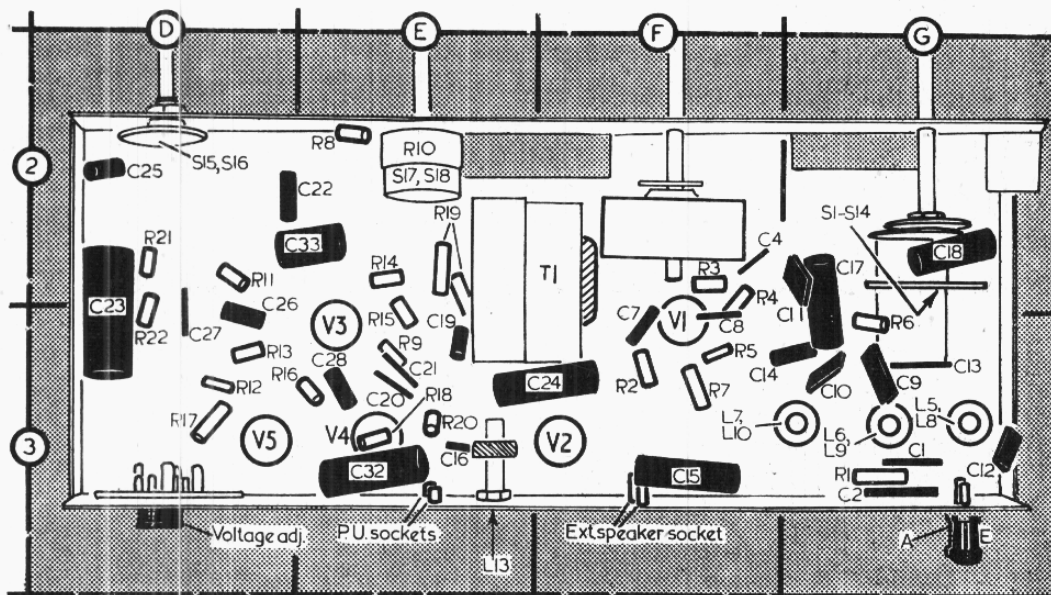
The following instructions apply only to the table receivers 515P, 515W and B55

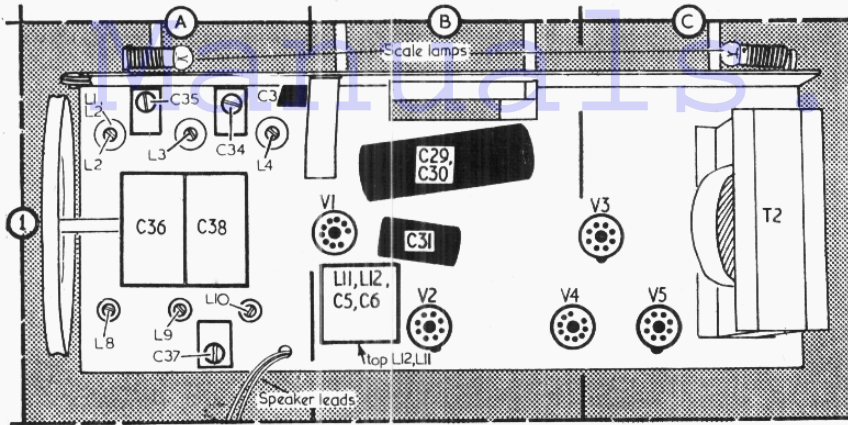
Removing Chassis.—Remove four control knobs (pull off); unsolder leads from speech coil tags on speaker; remove four hexagon-head self-tapping screws securing chassis to cabinet, and withdraw chassis rearwards.



Diagrams of the base connections for the alternative Emitron range of valves.

Underside view of the chassis. The tone control switch in location D2 has three control settings: either of the two switches **S15, S16** closed; and both of them open.





Plan view of the chassis, showing all the aerial and oscillator trimming adjustments in location reference A1.

VALVE ANALYSIS

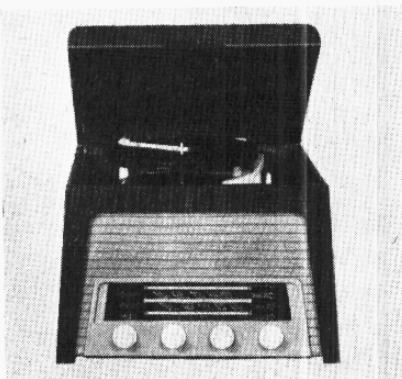
Valve voltages and currents given in the following table are those measured in our receiver when it was operating from 230 V A.C. mains, using the 220-230 V tapping on the mains transformer. The receiver was tuned to the high wavelength end of M.W., but there was no signal input.

Voltage readings were measured with an Avo Electronic Test Meter, which has a high internal resistance, and allowance should be made for the current drawn when using other types of meter. Chassis was the negative connection in every case.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	
V1 ECH81	193.0	1.73	95.0	3.8	—
	Oscillator 107.0 3.8				
V2 EAF42	193.0	4.5	95.0	1.4	—
V3 EBC41	82.0	0.53	—	—	5.6
V4 EL84	222.0	35.0	193.0	3.9	—
V5 EZ40	207.0*	—	—	—	235.0†

* A.C. reading. † Cathode current 54 mA.

Appearance of the Sobell 515TAG. This is a table radiogram with a 3-speed automatic record changer.



CIRCUIT ALIGNMENT

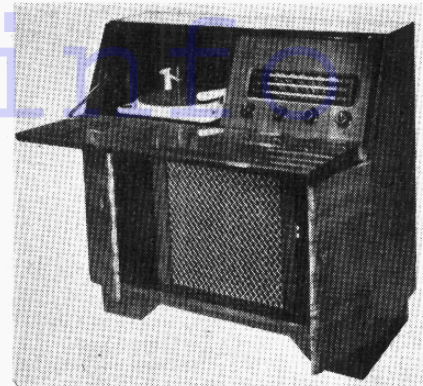
I.F. Stages.—Connect output of signal generator, via an 0.1µF capacitor in the "live" lead, to control grid (pin 6) of V2 and chassis. Feed in a 470 kc/s (638.3m) signal and adjust the core of L13 (location reference E3) for maximum output. Transfer "live" signal generator lead to control grid (pin 2) of V1 (pin 6 in Emitron range of valves). Shunt L11 with a damping unit consisting of a 5kΩ resistor in series with an 0.1µF capacitor, and then, feeding in a 470 kc/s signal, adjust the core of L12 (B1) for maximum output. Transfer damping unit from L11 to L12 and adjust L11 (B1) for maximum output.

R.F. and Oscillator Stages.—No substitute tuning scale is provided on the chassis, and the following alignment adjustments should be carried out with the chassis in its cabinet. Check that with the gang at maximum capacitance, the cursor coincides with the high wavelength ends of the tuning scales. Connect the signal generator leads, via a standard dummy aerial, to A and E sockets. All the following adjustments are in location reference A1.

S.W.—Switch receiver to S.W., tune to calibration mark at 46.16m, feed in a 46.16m (6.5 Mc/s) signal and adjust the core of L8 for maximum output. Tune receiver to 20m, feed in a 20m (15 Mc/s) signal and adjust C35 for maximum output, while rocking the gang for optimum results. Retune receiver to 46.16m, feed in a 46.16m (6.5 Mc/s) signal and adjust the core of L2 for maximum. Repeat the adjustments to C35 and L2 until no further improvement results.

M.W.—Switch receiver to M.W., tune to 214.3m calibration mark, feed in a 214.3m (1,400 kc/s) signal and adjust C37 and C34 for maximum output. Tune receiver to 500m, feed in a 500m (600 kc/s) signal and adjust the cores of L9 and L3 for maximum output.

L.W.—Switch receiver to L.W., tune to 1,765m calibration mark, feed in a 1,765m (170 kc/s) signal and adjust the cores of L10 and L4 for maximum output.



The Banner B55ACG autoradiogram.

GENERAL NOTES

Switches S1—S14 are the waveband switches ganged in a single rotary unit beneath the chassis. This unit is indicated in the under chassis illustration, and shown in detail in the diagram below, as seen from the rear of an inverted chassis. The associated switch table gives the switch operations for the four control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and C, closed.

S15-S16 are the tone control switches,

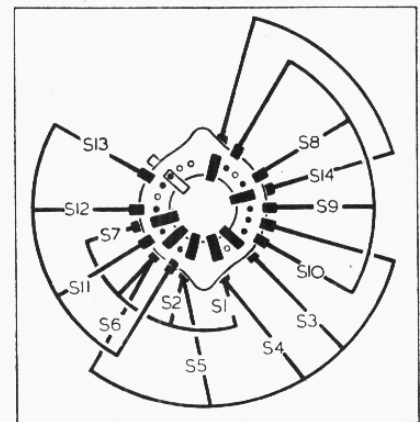


Diagram of the waveband switch unit, drawn as seen from the rear of an inverted chassis. The associated switch table is below.

Switch Table

Switches	Gram.	L.W.	M.W.	S.W.
S1	—	—	—	C
S2	—	—	C	C
S3	—	—	—	C
S4	—	—	C	—
S5	—	C	—	—
S6	C	—	C	—
S7	—	C	—	C
S8	—	—	—	C
S9	—	—	C	—
S10	—	C	—	—
S11	—	—	—	C
S12	—	—	C	—
S13	—	C	—	—
S14	C	—	—	—