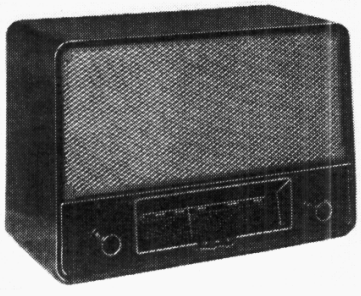
"TRADER" SERVICE SHEET

1016

SOBELL 511 Series



The appearance of the 511P.

COVERING three wavebands, the Sobell 511 Series comprises four models: the 511P, with a plastic cabinet, which we illustrate in our heading; the 511W, which is the same receiver in a walnut cabinet; the 511TAG which is a table autoradiogram employing a slightly modified 511 chassis, and the 511AG which is a console version of the 511TAG. The differences are explained overleaf.

The basic chassis is a 4-valve (plus metal rectifier) 3-band superhet designed to operate from A.C. mains of 200-250 V, 50-100 c/s, without voltage adjustment, although with the radiograms the motor restricts the frequency to 50 c/s. The waveband ranges are 16.2-51 m, 185-580 m and 1,000-2,000 m.

Release dates and original prices (second price in parentheses is the current price; there are several intermediate price changes, including those at 1951 *Budget): 511P, September* 1950, £13 16s 9d (£15 8s 11d); *511W, June* 1950, £17 5s 11d (£19 2s 6d); *511TAG, June* 1950, £28 13s 7d (£34 11s 5d); *511AG, September* 1950, £52 19s (£61 15s 6d). *Purchase tax extra.*

CIRCUIT DESCRIPTION

Aerial input via **L1** (S.W.) and the common impedance of **C2** (M.W. and L.W.) to single tuned circuits **L2, C29** (S.W.), **L3, C29** (M.W.) and **L4, C29** (L.W.) which precede triode heptode valve **(V1, Brimar 7S7)** operating as frequency changer with internal coupling.

Oscillator anode coils **L8** (S.W.), **L9** (M.W.) and **L10** (L.W.) are tuned by **C31.** Parallel trimming by **C30** (M.W.) and **C12** (L.W.); series tracking by **C9** (S.W.), **C10** (M.W.) and **C11** (L.W.). Inductive reaction coupling from grid by **L5** (S.W.), **L6** (M.W.) and **L7** (L.W.).

Second valve **(V2, Brimar 7H7)** is an R.F. pentode operating as intermediate frequency amplifier with tuned couplings.

Output from **V2** is fed from a tap on **L13** via **C17** to diode signal detector, part of double diode triode valve **(V3, Brimar 7C6** or **7B6).** A.F. component in rectified output is developed across volume control **R11,** which acts as diode load, and passed via **C19** to C.G. of triode section.

D.C. potential developed across **R11** is fed back as bias to F.C. and I.F. stages giving automatic gain control. D.C. potential developed across **R4** in oscillator grid circuit is fed via **R3** to A.G.C. line providing a degree of standing bias to **V1** and **V2.**

Resistance-capacitance coupling by **R13, C22** and **R15** between **V3** triode anode and control grid of beam tetrode output valve **(V4, Brimar 6V6G).** I.F. filtering by **R10, C18** and **C21.** Tone correction by **C25** in anode circuit of **V4** and by negative feed-back developed across **R17.**

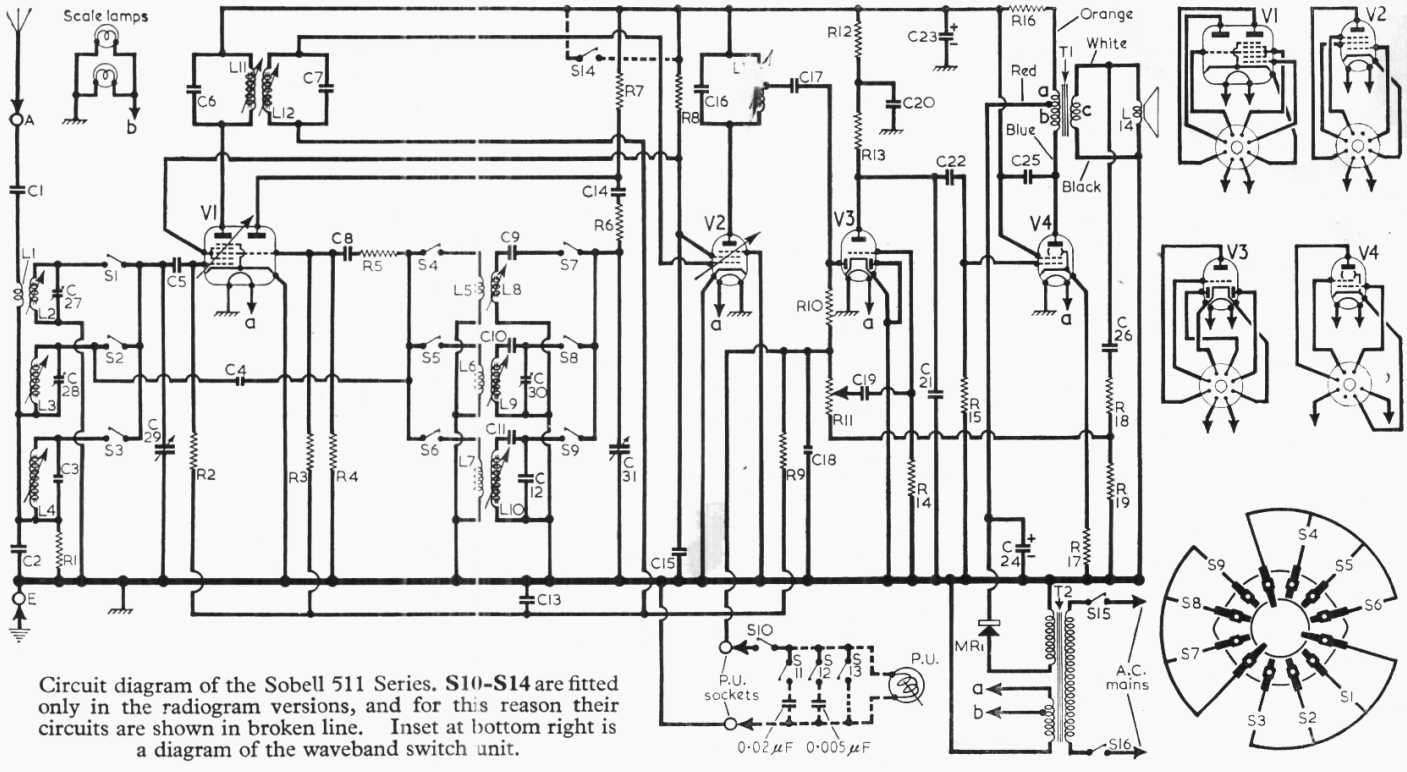
(*Continued col.* 1 *overleaf*)

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	Mod. hum shunt ...	33kΩ	G3
R2	V1 C.G.	1MΩ	G4
R3	V1 osc. C.G. decoup.	10MΩ	F4
R4	V1 osc. C.G.	47kΩ	G4
R5	Osc. stabilizers ...	68Ω	G3
R6		100Ω	F3
R7	Osc. anode feed ...	22kΩ	G4
R8	V1, V2 S.G. feed ...	18kΩ	F4
R9	A.G.C. decoupling	1·5MΩ	F4
R10	I.F. stopper ...	150kΩ	D3
R11	Volume control ...	500kΩ	D3
R12	V3 anode feed ...	100kΩ	E4
R13	V3 anode load ...	150kΩ	E3
R14	V3 C.G.	10MΩ	E3
R15	V4 C.G.	680kΩ	E4
R16	H.T. smoothing ...	1·5kΩ	E4
R17	V4 G.B.	240Ω	E4
R18	Neg. feed-back ...	3·3kΩ	D3
R19		560Ω	D3

	CAPACITORS	Values	Locations
C1	Aerial coupling ...	200pF	G4
C2		0·003μF	G4
C3	L.W. fixed trim. ...	75pF	G3
C4	Neutralising ...	2pF	G3
C5	V1 C.G.	100pF	G4
C6	I.F. trans. tuning	200pF	A2
C7		200pF	A2
C8	V1 osc. C.G. ...	100pF	G4
C9	S.W. osc. tracker ...	0·0039μF	F3
C10	M.W. osc. tracker...	400pF	G3
C11	L.W. osc. tracker...	190pF	F3
C12	L.W. fixed trim. ...	140pF	F3
C13	A.G.C. decoupling	0·05μF	F4
C14	Osc. anode coup. ...	200pF	F4
C15	S.G. decoup. ...	0·1μF	F4
C16	I.F. tuning ...	200pF	E4
C17	Diode feed ...	100pF	E4
C18	I.F. by-pass ...	50pF	D3
C19	A.F. coupling ...	0·01μF	D3
C20	V3 anode decoup....	0·25μF	D4
C21	I.F. by-pass ...	100pF	E3
C22	A.F. coupling ...	0·01μF	E4
C23*	H.T. smoothing ...	32μF	E3
C24*		32μF	E3
C25	Tone corrector ...	0·005μF	E4
C26	Neg. feed-back ...	0·25μF	D3
C27‡	S.W. aerial trim. ...	40pF	A1
C28‡	M.W. aerial trim.	40pF	A1
C29†	Aerial tuning ...	528pF	A2
C30‡	M.W. osc. trimmer	40pF	G3
C31†	Oscillator tuning ...	528pF	A2

*Electrolytic. †Variable. ‡Pre-set.



Circuit diagram of the Sobell 511 Series. **S10-S14** are fitted only in the radiogram versions, and for this reason their circuits are shown in broken line. Inset at bottom right is a diagram of the waveband switch unit.

	OTHER COMPONENTS		Approx. Values (ohms)	Location
L1	S.W. coupling ...		—	A1
L2	Aerial tuning coils		—	A1
L3			3·5	A1
L4			21·0	B1
L5	Oscillator reaction coils		0·5	F3
L6			1·5	G3
L7			2·5	F3
L8	Oscillator tuning coils		—	F3
L9			3·5	G3
L10			7·5	F3
L11	1st I.F. trans.	Pri.	7·5	A2
L12		Sec.	7·5	A2
L13	I.F. coil		7·5*	E4
L14	Speech coil ...		2·5	—
T1	O.P. Trans.	a	5·0	
		b	210·0	F3
		c	0·5	
T2	Mains Trans.	Primary	110·0	
		H.T. sec.	145·0	C2
		Chassis–a	0·5	
		Chassis–b	0·4	
S1-S9	Waveband switches		—	G3
S10-S14	Radio/gram sw., ...		—	—
S15, S16	Mains sw. g'd R11		—	D3
MR1	H.T. rectifier ...		—	E3

* 5Ω from tap to H.T. Positive line.

Circuit Description—*(continued)*

Speech coil voltage developed across **R19** in frequency selective potential divider **C26, R18, R19** is fed back to the bottom of **R11** giving a further degree of tone correction. Provision is made for the connection of a gramophone pick-up across **R11, R19.**

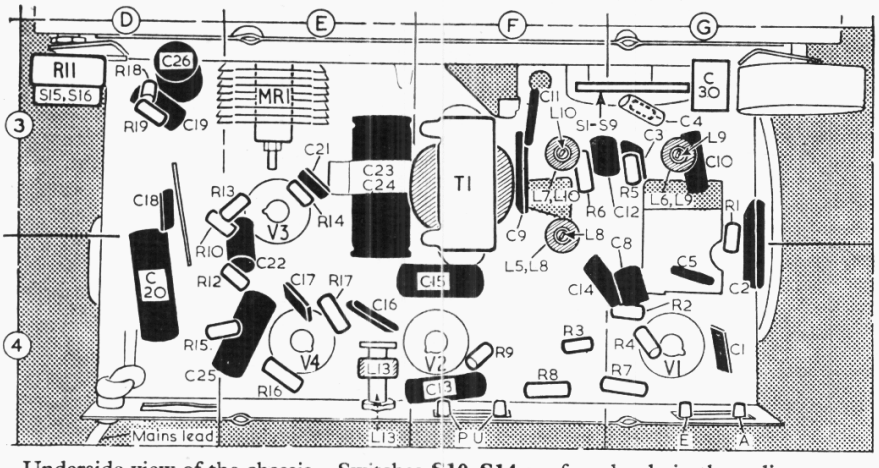
H.T. current is supplied by half-wave metal rectifier **(MR1, Westinghouse 15B)** from H.T. secondary winding on mains transformer **T2.** A second winding, which supplies the valve heaters, is tapped to feed the scale lamps from a lower voltage. H.T. smoothing by **R16** and electrolytic capacitors **C23** and **C24,** residual hum being neutralized by feeding the H.T. current through section **a** of output transformer **T1** primary.

VALVE ANALYSIS

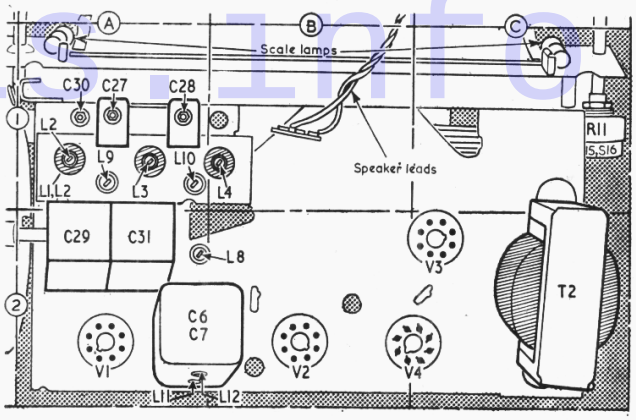
Valve voltages and currents given in the table below are those derived from the manufacturers' service information. They were measured on a receiver operating from A.C. mains of 232 V.

Voltages were measured on the 10 and 400 V ranges of a Model 7 Avometer, chassis being the negative connection.

Valves	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 7S7	157	2·5	85	2·8	—
	Oscillator				
	100	2·5			
V2 7H7	157	4·0	85	1·4	—
V3 7C6	75	0·25	—	—	—
V4 6V6	172	30·0	157	1·6	7·5



Underside view of the chassis. Switches **S10-S14** are found only in the radiograms.

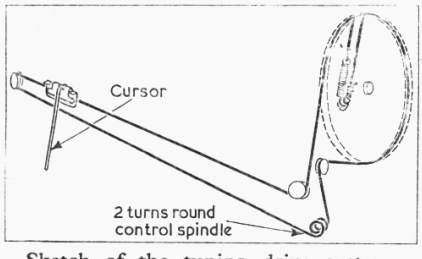


Plan view of the chassis in which most of the alignment adjustments are indicated.

GENERAL NOTES

Switches.—**S1-S9** are the waveband switches, ganged in a single 3-position rotary unit beneath the chassis. This is indicated in our under-chassis drawing, and shown in detail in the diagram inset in the bottom right-hand corner of the circuit diagram overleaf, where it is viewed from the rear of an inverted chassis. On S.W. (control lever pushed to left), **S1, S4, S7** close. In the next position (M.W.) **S2, S5, S8** close. In the third position (L.W.) **S3, S6, S9** close.

S10-S14 are used in the autoradiograms only.



Sketch of the tuning drive system.

S15, S16 are the Q.M.B. mains switches, ganged with the volume control **R11.**

Scale Lamps.—These are two Osram M.E.S. types, with small clear spherical bulbs, rated at 6.5 V, 0.3 A.

Drive Cord Replacement.—About 4 feet of high-grade flax fishing line, plaited and waxed, is required for a new drive cord, which should be run as shown in our sketch, where the system is drawn as seen from the front right-hand corner of the chassis, when the gang is at minimum capacitance.

Radiogram Models.—Models 511AG and 511TAG are respectively console and table auto-radiograms employing a slightly modified 511 radio chassis. They are fitted with a three-position radio/gram change-over switch unit comprising five switches which are numbered **S10-S14** in our circuit diagram.

In the first position of the control, **S13, S14** are closed, and the other three switches are open for radio operation. In position two, **S10, S11** close for gram operation, and **S13, S14** open. In the third position, conditions are still the same as in position two except that **S11** opens and **S12** closes to modify the tonal reproduction on gram.

The leads from the gramophone pick-up go directly to the switch unit, whose output leads are plugged into the pick-up sockets of the receiver chassis, which thus requires no modification for this purpose. The small modification referred to is the insertion of **S14** in the H.T. feed lead to **R8** and the screen grids of **V1** and **V2** for radio muting.

CIRCUIT ALIGNMENT

Remove chassis from cabinet and stand on its mains transformer end on the bench. A damping unit consisting of a 5 kΩ resistor is required when adjusting the I.F. transformer.

I.F. Stages.—Connect output of signal generator to control grid (pin 6) of **V2** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the core of **L13** (location reference E4) for maximum output. Transfer signal generator leads, via 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis. Connect damping unit across **L12** and, feeding in 470 kc/s, adjust the core of **L11** (A2) for maximum output. Connect damping unit across **L11** and adjust the core of **L12** (A2) for maximum output. Remove damping unit.

R.F. and Oscillator Stages.—Check that with the gang at maximum capacitance, the cursor coincides with the high wavelength ends of the scale lines. Connect the output of the signal generator via a dummy aerial to **A** and **E** sockets.

S.W.—Switch set to S.W., tune to 20 m, feed in a 20 m (15 Mc/s) signal and adjust **C27** (A1) for maximum output while rocking the gang for optimum results. Tune set to 46.16 m, feed in a 46.16 m (6.5 Mc/s) signal and adjust the cores of **L8** (F3) and **L2** (A1) for maximum output. Repeat these adjustments.

M.W.—Switch set to M.W., tune to 214.3 m, feed in a 214.3 m (1,400 kc/s) signal and adjust **C30** (A1) and **C28** (A1) for maximum output. Tune set to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of **L9** (G3) and **L3** (A1) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 1,765 m, feed in a 1,765 m (170 kc/s) signal and adjust the cores of **L10** (F3) and **L4** (B1) for maximum output.

Sensitivity Figures

The following figures show the 30% modulated input signal required to produce a 50 mW output across **T1** secondary.

I.F. Stages.—2.5 mV at 470 kc/s to control grid of **V2.** 35 μV at 576.9 m (520 kc/s) to control grid of **V1.**

R.F. and Oscillator Stages.—Output of signal generator connected direct to **A** and **E** sockets. **S.W.**—50 μV at 30 m (10 Mc/s). **M.W.**—30 μV at 333.4 m (900 kc/s). **L.W.**—60μ V at 1,364 m (220 kc/s).

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