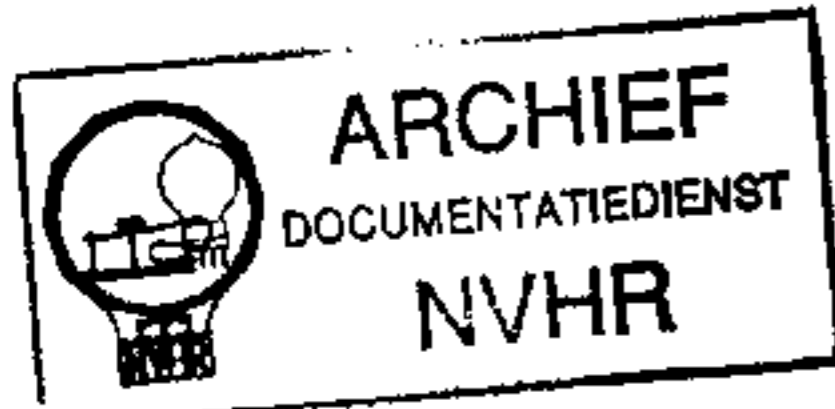
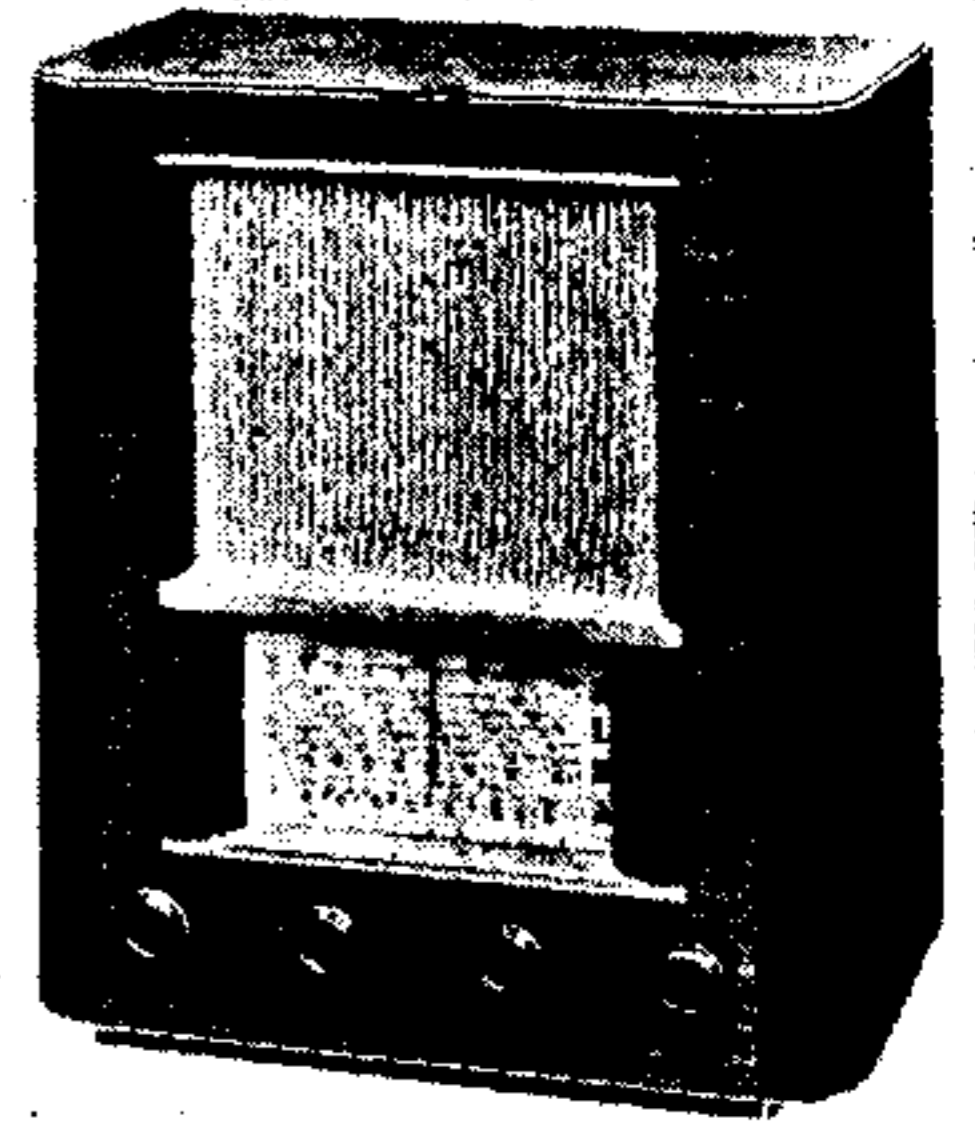


Ned. Ver. v. Historie v/d Radio



# ALBA 461 and 473 A.C. SUPERHETS

H.T. current is supplied by full-wave rectifying valve (V5, Mullard AZ31). Smoothing by resistors R18 and R15 in conjunction with electrolytic capacitors C28, C29 and C25.



**T**HE Alba 461 is a 4-valve (plus rectifier) 3-band superhet designed for A.C. mains of 200-250 V, 40-100 c/s. The 473 employs a similar chassis.  
Release dates and original prices: 461, November, 1945, £16 16s plus £3 12s 3d p.t.; 473, October, 1946, £17 17s plus £3 16s 10d p.t.

## CIRCUIT DESCRIPTION

Aerial input to single-tuned circuits, which precede a triode-hexode valve (V1, Mullard metallized ECH35) operating as frequency changer.

Triode oscillator grid coils L7 (S.W.), L8 (M.W.) and L9 (L.W.) are tuned by C34. Parallel trimming by C35 (S.W.), C36 (M.W.) and C10, C37 (L.W.); series tracking by C11 (S.W.), C12 (M.W.) and C13 (L.W.). Reaction coupling by coils L10 (S.W.), L11 (M.W.) and L12 (L.W.).

Second valve (V1, Mullard metallized EF39) is a variable-mu R.F. pentode operating as intermediate frequency amplifier.

Intermediate frequency 460 kc/s.

Diode second detector is part of double diode triode valve (V3, Mullard metallized EBC33). Audio frequency component in rectified output is developed across load resistor R7 and passed via coupling capacitor C21, switch S13 and manual volume control R9 to control grid of triode section, which operates as A.F. amplifier. I.F. filtering in diode circuit by C17, R6 and C19.

Second diode of V3, fed from L16 via C22, provides D.C. potentials which are developed across load resistor R12 and fed back through decoupling circuits as G.B. to F.C. (except on S.W.) and I.F. valves, giving automatic volume control. Delay voltage, together with fixed G.B. for V1, V2 and V3, is obtained from the drop along R8, which is common to the cathode circuits of these three valves.

Resistance-capacitance coupling by R10, C24 and R13, between V3 triode and pentode output valve (V4, Mullard EL33).

## COMPONENTS AND VALUES

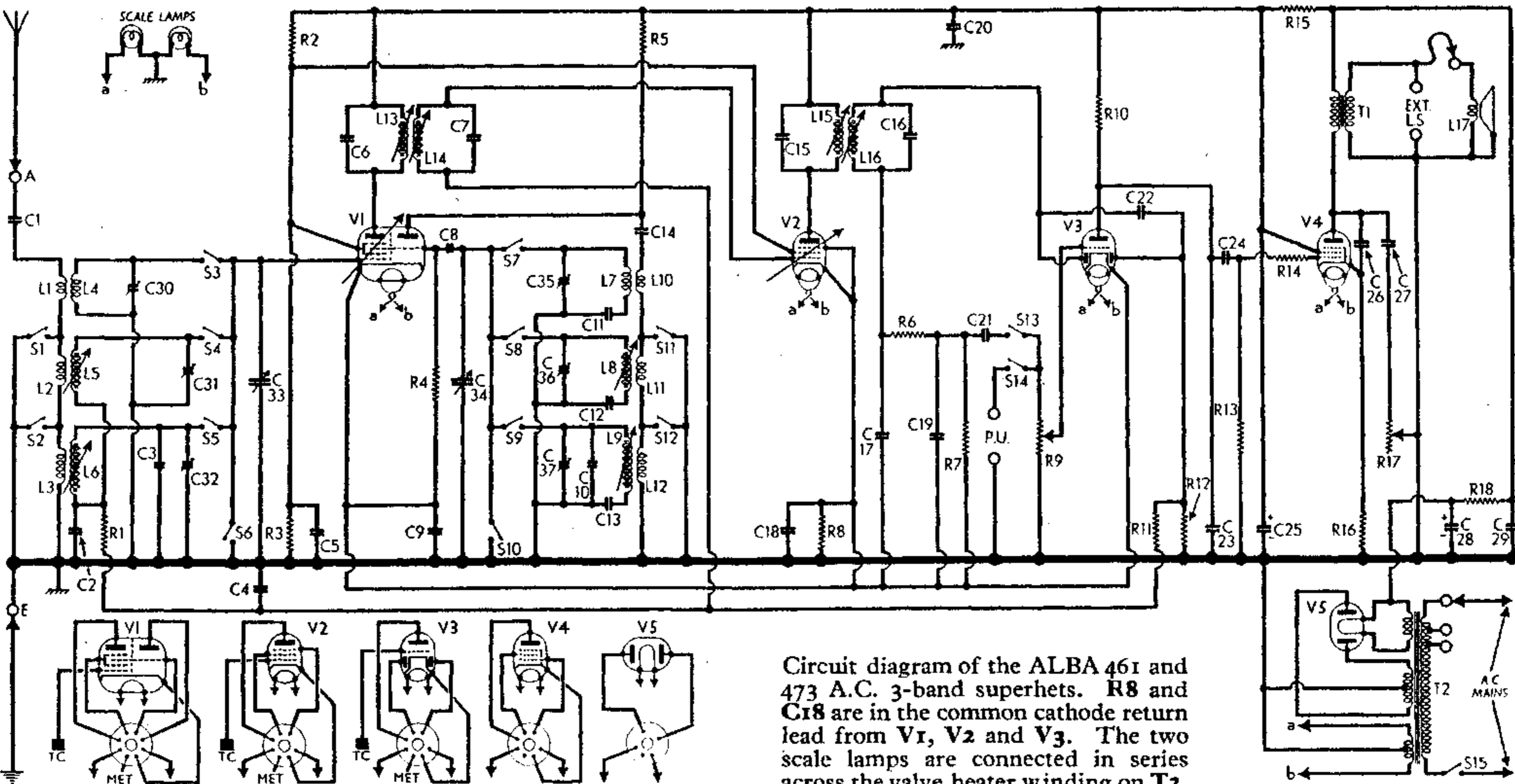
CAPACITORS		Values (µf)
C1	Aerial series capacitor ...	0.0002
C2	V1 hex. C.G. decoupling ...	0.05
C3	Aerial L.W. fixed trimmer	0.000056
C4	A.V.C. line decoupling ...	0.05
C5	V1, V2 S.G.'s decoupling ...	0.1
C6	1st I.F. transformer fixed	0.0001
C7	tuning capacitors ...	0.0001
C8	V1 osc. C.G. capacitor ...	0.000047
C9	V1 cathode by-pass ...	0.1
C10	Osc. L.W. fixed trimmer ...	0.000056
C11	Osc. circ. S.W. tracker ...	0.0016
C12	Osc. circ. M.W. tracker ...	0.000575
C13	Osc. circ. L.W. tracker ...	0.0002
C14	V1 osc. anode coupling ...	0.0001
C15	2nd I.F. transformer fixed	0.0001
C16	tuning capacitors ...	0.0001
C17	I.F. by-pass ...	0.0001
C18	V1, V2, V3 cathode by-pass	0.5
C19	I.F. by-pass ...	0.0001
C20	H.T. circuit R.F. by-pass	0.1
C21	A.F. coupling to V3 C.G. ...	0.005
C22	V3 A.V.C. diode coupling	0.0002
C23	I.F. by-pass ...	0.0002
C24	A.F. coupling to V4 C.G. ...	0.01
C25*	H.T. smoothing capacitor	16.0
C26	Fixed tone corrector ...	0.005
C27	Part variable tone control	0.05
C28*	H.T. smoothing capacitors	8.0
C29*		16.0
C30†	Aerial S.W. trimmer ...	0.00005
C31†	Aerial M.W. trimmer ...	0.00005
C32†	Aerial L.W. trimmer ...	0.00005
C33†	Aerial circuit tuning	0.0005
C34†	Oscillator circuit tuning ...	0.0005
C35†	Osc. circ. S.W. trimmer ...	0.00005
C36†	Osc. circ. M.W. trimmer ...	0.00005
C37†	Osc. circ. L.W. trimmer ...	0.00005

RESISTORS.		Values (ohms)
R1	V1 hex. C.G. decoupling ...	250,000
R2	V1, V2 S.G.'s H.T. feed potential divider ...	22,000
R3		33,000
R4	V1 osc. C.G. resistor ...	47,000
R5	V1 osc. anode H.T. feed ...	22,000
R6	I.F. stopper ...	47,000
R7	V3 signal diode load ...	470,000
R8	V1, V2, V3, fixed G.B. resistor ...	150
R9	Manual volume control ...	1,000,000
R10	V3 triode anode load ...	47,000
R11	A.V.C. line decoupling ...	1,000,000
R12	V3 A.V.C. diode load ...	1,000,000
R13	V4 C.G. resistor ...	50,000
R14	V4 grid stopper ...	47,000
R15	H.T. smoothing resistor ...	2,200
R16	V4 G.B. resistor ...	150
R17	Variable tone control ...	50,000
R18	H.T. smoothing resistor ...	1,000

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial S.W. coupling coil ...	0.2
L2	Aerial M.W. coupling coil ...	0.8
L3	Aerial L.W. coupling coil ...	62.0
L4	Aerial S.W. tuning coil ...	0.1

*Continued overleaf*

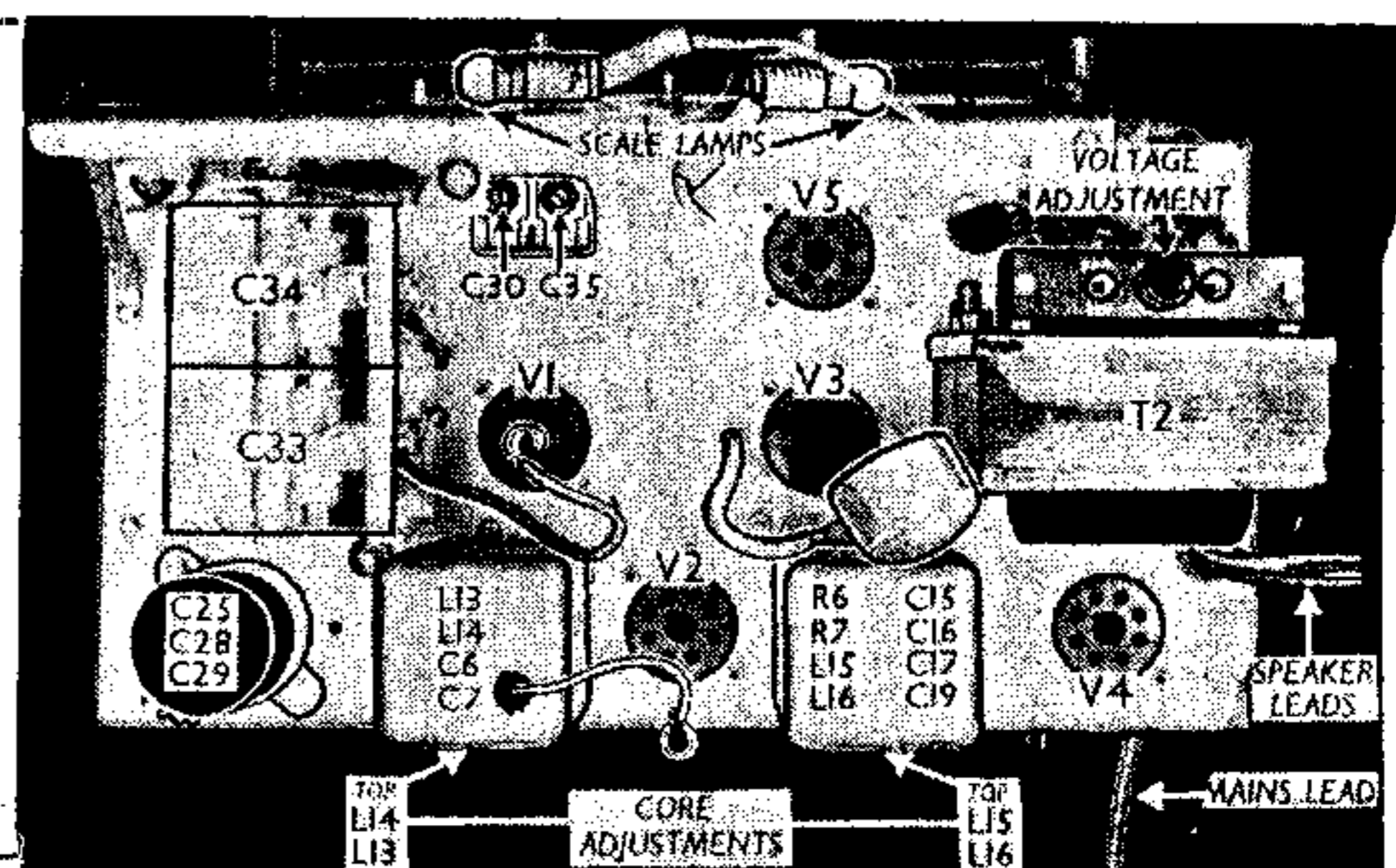
\* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the ALBA 461 and 473 A.C. 3-band superhets. R8 and C18 are in the common cathode return lead from V1, V2 and V3. The two scale lamps are connected in series across the valve heater winding on T2.

OTHER COMPONENTS <i>Continued</i>		Approx. Values (ohms)	
L5	Aerial M.W. tuning coil ...	3.0	
L6	Aerial L.W. tuning coil ...	17.5	
L7	Osc. S.W. tuning coil ...	0.2	
L8	Osc. M.W. tuning coil ...	1.8	
L9	Osc. L.W. tuning coil ...	4.8	
L10	Osc. S.W. reaction coil ...	0.4	
L11	Osc. M.W. reaction coil ...	1.1	
L12	Osc. L.W. reaction coil ...	2.4	
L13	1st I.F. trans. { Pri. ...	7.0	
L14		{ Sec. ...	7.0
L15	2nd I.F. trans. { Pri. ...	9.0	
L16		{ Sec. ...	9.0
L17	Speaker speech coil ...	1.75	
T1	Output trans. { Pri. ...	340.0	
		{ Sec. ...	0.2
		{ Pri., total ...	20.0
T2	Mains trans. { Heater sec. ...	0.1	
		{ Rect. heat. sec. ...	0.2
		{ H.T. sec., total ...	460.0
			—
S1-S14	Waveband switches ...	—	
S15	Mains switch, ganged R17	—	

Plan view of the chassis. The I.F. transformer core adjustments are approximately indicated by arrows.



**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 227 V, using the 230 V tap on the mains transformer. The receiver was tuned to the lowest wavelength on the M.W. band and the volume control was at maximum, but there was no signal input. Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being the negative connection.

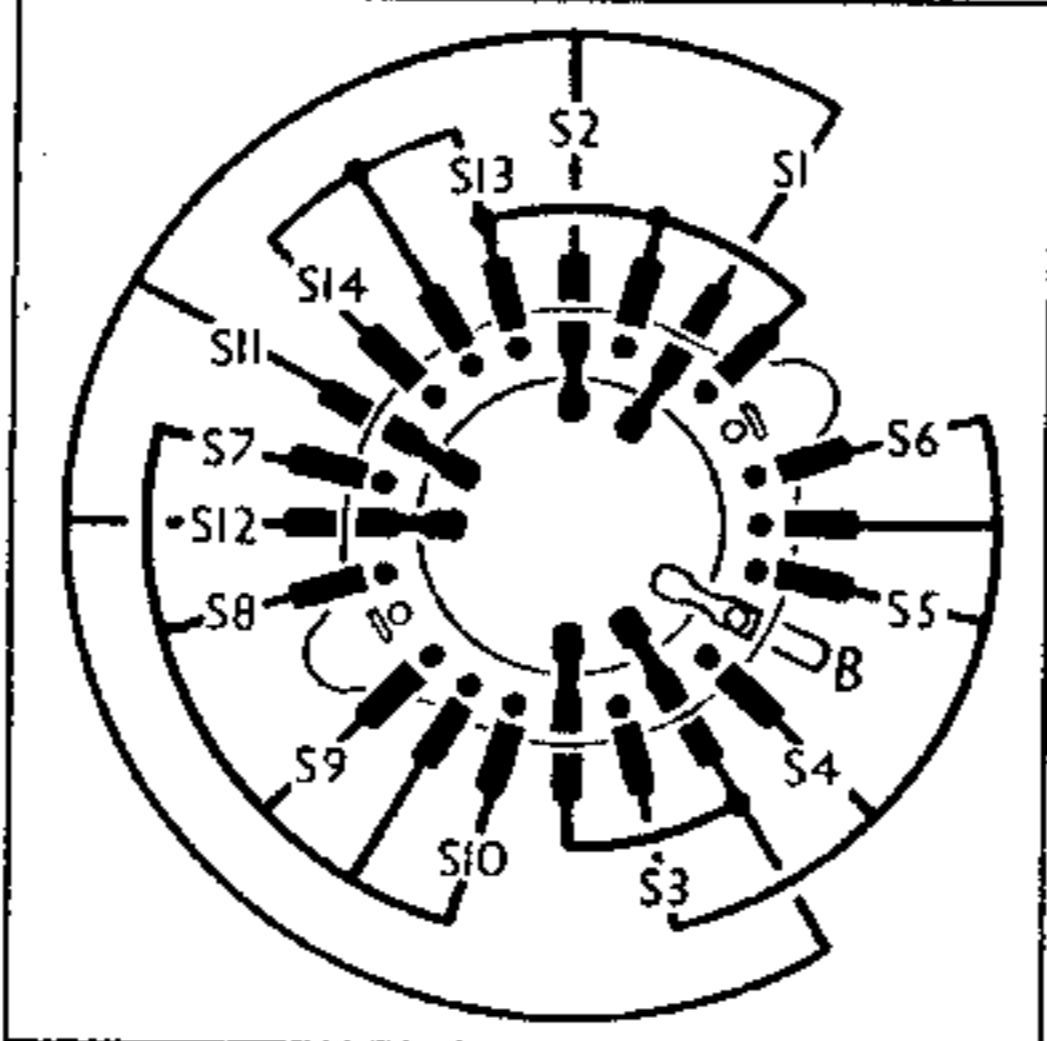
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECH35	216	1.82	94	1.85
	Oscillator	87		
V2 EF39	216	4.4	94	1.22
V3 EBC33	104	2.1	—	—
V4 EL33	260	31.0	216	3.56
V5 AZ31	280†	—	—	—

† Each anode, A.C.

**DISMANTLING THE SET**

**Removing Chassis.**—This is quite straightforward, and needs no description. **When replacing,** connect the speaker leads as follows, numbering the tags on the connecting panel from top to bottom: 1, brown; 2, red; 3, white; 4, blue; 5, yellow. The transformer should be on the right of the speaker, and an earthing lead goes under a speaker fixing nut. **Removing tuning assembly.**—Unsolder from the seven tags on the assembly the leads connecting it to chassis, also the systoflex covered wire going to the right-hand tag on the volume control and the earthing lead which joins a "star" tag to the right of the assembly.

Switch set to S.W. and loosen the grub screw of the waveband indicator operating arm, and slide the arm off the waveband switch spindle; remove four cheese-head screws (with lock washers) securing the tuning assembly to the front chassis member, and lift out the assembly.



The switch unit, seen from the rear.

When replacing, the heads of two trimmers (C30, C35) should project through the hole in the chassis deck. Connect the leads to the tuning assembly as follows, numbering the tags from left to right: 1, to C8 and C34; 2, to C14; 3, screened lead to "live" P.U. socket; 4, screened lead to C21; 5, to C1; 6, to the junction of R1 and C2; 7, to C33. The systoflex covered lead emerging from the front of the assembly goes to the right-hand tag on the volume control, and the braided wire earthing lead should be soldered to the "star" tag to the right of the tuning assembly.

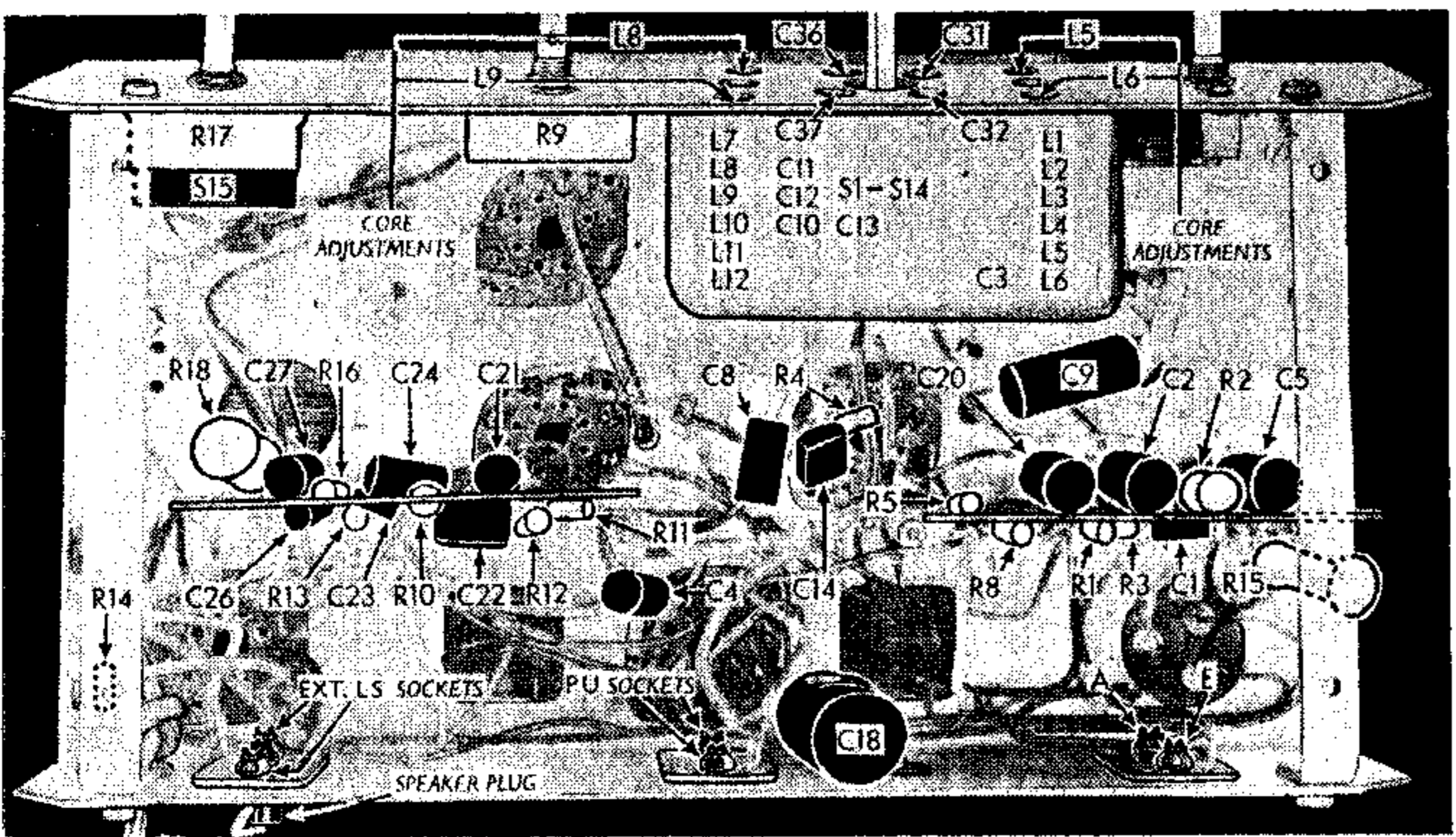
**GENERAL NOTES**

**Tuning Assembly.**—This contains all the R.F. and oscillator coils L1-L12 and associated trimmers and trackers, together with the waveband switch unit S1-S14. Instructions for removing and replacing the assembly are given under "Dismantling the Set." **Switches.**—S1-S14 are the waveband and pick-up switches, ganged in a single rotary unit in the tuning assembly. In the diagram in col. 2, the unit is drawn in detail as seen when the cover is removed from the tuning assembly, and the latter is inverted, as seen in our under-chassis view. The table below gives the switch positions for the four control settings, starting from the anti-clockwise position of the control. A dash indicates open, and C closed. **Scale Lamps.**—These are two Osram M.E.S. type lamps, rated at 3.5 V or 4 V, 0.3 A. **External Speaker.**—Two sockets are provided at the rear of the chassis for a low impedance (2.5Ω) external speaker. A plug and socket device permits the internal speaker to be muted. **Capacitors C25, C28, C29.**—These are three dry electrolytics in a tubular metal container which forms the common negative connection. The two red leads are the positives of C25 and C29 (16μF) and the yellow tag that of C28 (8μF). Our sample was a Dubilier type CT, rated at 400v (120 mA A.C. max.).

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

**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Connect signal generator leads to control grid (top cop) of V1 and chassis, turn the volume control to maximum, feed in a 460 kc/s (652.1m) signal, and adjust the cores of L13, L14, L15 and L16 for maximum output. **R.F. and Oscillator Stages.**—With the gang at maximum, pointer should coincide with the high wavelength ends of the scales. Transfer signal generator leads, via a suitable dummy aerial, to A and E sockets. **M.W.**—Switch set to M.W., tune to 215m on scale, feed in a 215m (1,396 kc/s) signal, and adjust C36, then C31 for maximum output. Tune to 500 m on scale, feed in a 500m (600 kc/s) signal, and adjust the cores of L8 and L7 for maximum output. Check L8 at 350m (857 kc/s) for correct calibration, and repeat the C31, C36 adjustments if necessary. **S.W.**—Switch set to S.W., tune to 18m on scale, feed in an 18m (16.67 Mc/s) signal, and adjust C35, then C30, for maximum output. **L.W.**—Switch set to L.W., tune to 1,000m on scale, feed in a 1,000m (300kc/s) signal, and adjust C37, then C32, for maximum output. Tune to 1,900m on scale, feed in a 1,900m (157.9 kc/s) signal, and adjust the cores of L9 and L6 for maximum output. Check the settings of C32, C37.



Under-chassis view. The large unit at the top is the tuning assembly.