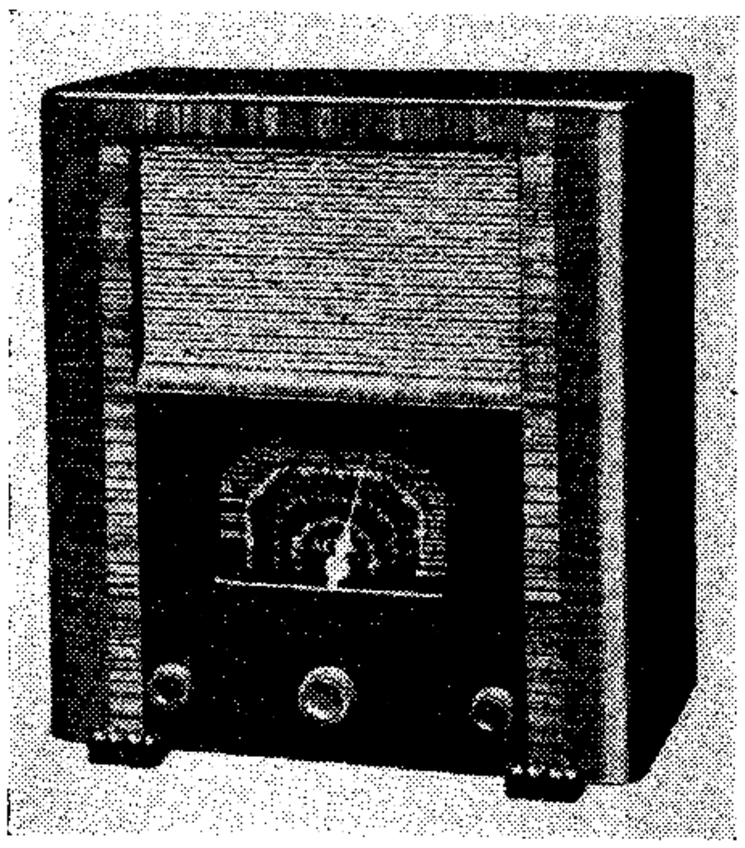
Supplement to The Wireless & Electrical Trader, August 26, 1939

ALBA 810
(AND 610) AC SUPERHET



The Alba 810 table model AC superhet.

THE Alba 810 is a 3-valve (plus rectifier) 3-band AC table superhet for use on mains of 190-250 V, 40-100 C/S. The SW range is 16·5-51 m. Provision is made for the use of a pick-up and a high impedance external speaker, while a mains aerial device is fitted.

Model 610 is a console version of the receiver, having an identical chassis.

Release dates, both models : April, 1939.

CIRCUIT DESCRIPTION

Aerial input is via series condenser **C1** and coupling coils **L1** (SW) and **L2** (MW and LW) to single-tuned circuits **L3, C25** (SW), **L4, C25** (MW) and **L5, C25** (LW). Small coupling condenser **C2** modifies the coupling efficiency on MW band.

First valve (**V1, Mullard ECH2**) is a triode pentode operating as frequency changer with internal coupling. Triode oscillator grid coils **L6** (SW), **L7** (MW) and **L8** (LW) are tuned by **C26 ;** parallel trimming by **C27** (SW), **C28** (MW) and **C29** (LW) ; series tracking by **C8** (SW), **C30** (MW) and **C31** (LW). Reaction by anode coils **L9** (via damping resistance **R5,** SW), **L10** (MW) and **L11** (LW).

Second valve (**V2, Mullard EF9**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C32, L12, L13, C33** and **C34, L14, L15, C35.** The transformer coils have iron-dust cores, but tuning adjustments are effected by pre-set condensers.

Intermediate frequency 470 KC/S.

Diode second detector is part of double diode output pentode valve (**V3, Mullard EBL1**). Audio frequency component in rectified output is developed across load resistance **R10** and passed via AF coupling condenser **C15** and manual volume control **R11** to CG of pentode section, the output of which is fed directly to the speaker circuit. IF filtering by **C13, R9** and **C14.** Provision for connection of gramophone pick-up across **R11.** Provision for connection of high impedance external speaker across primary of internal speaker input transformer **T1.** Fixed tone correction by **C17** between anode and cathode of **V3.**

Second diode of **V3,** fed from tapping on **L15** via **C16,** provides DC potentials which are developed across load resistances **R14** and **R15 ;** that across **R15** is fed back through decoupling circuits as GB to FC (except on SW band) and IF valves, giving automatic volume control . Delay voltage, together with GB for pentode section, is obtained from drop along resistance **R12** in cathode lead to chassis.

HT current is supplied by full-wave rectifying valve (**V4, Mullard AZ1**). Smoothing is effected by speaker field **L18** and dry electrolytic condensers **C19** and **C20.** HT circuit RF filtering by **C7.** Provision for mains aerial coupling via **C21** whose plug, when not required in the aerial socket, is inserted in a second earthed socket, so that **C21** then operates as a mains RF by-pass.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (with felt washers) from the front of the cabinet, and withdraw

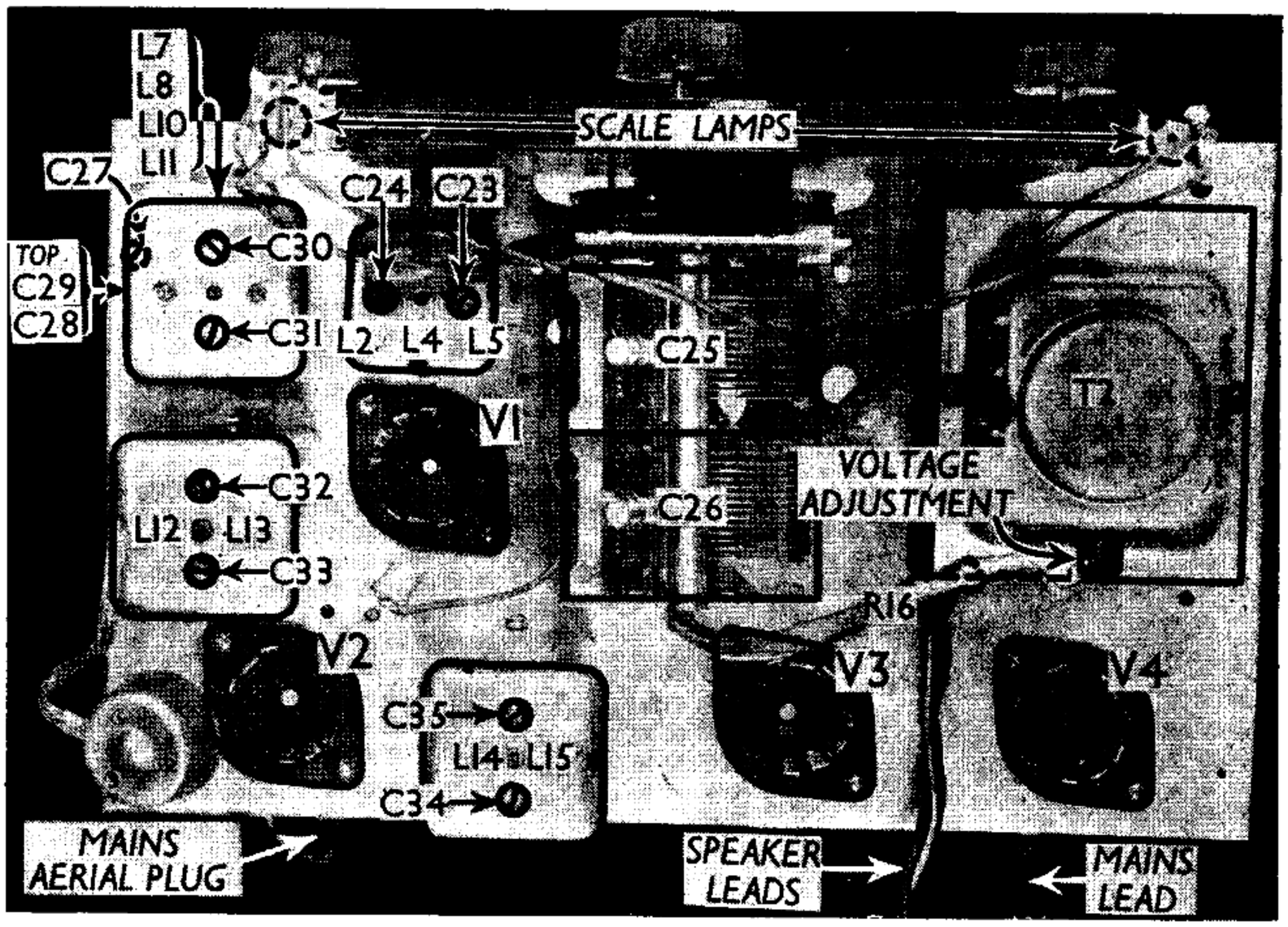
Circuit diagram of the Alba 810 table model and 610 console. The circuit follows conventional lines. Note the provision for use of the mains as an aerial.

the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis may now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

When replacing, note that the knob bearing the three coloured waveband indicator lines goes on the right-hand spindle, and that the large knob is fitted to the tuning condenser spindle.

To free the chassis entirely, unsolder the speaker leads, and *when replacing*, connect them as follows, numbering the tags from bottom to top:—1 and 2, joined together, red; 3, no connection; 4, white; 5, blue.

Removing Speaker.—The speaker can be removed by unsoldering the leads and removing the nuts (with two rubber washers and one metal washer each) holding it to the sub-baffle. *When replacing*, see that each fixing bolt is fitted with a rubber washer on either side of the speaker rim, and that a metal washer is fitted directly under each fixing nut. The transformer should be on the right, and the leads connected to it as indicated above.



Plan view of the chassis. **C27**, the oscillator SW trimmer, is adjusted through a hole in the chassis deck, while **C28** and **C29** are reached through holes in the side of the **L7, L8, L10, L11** coil unit.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 pentode CG decoupling	250,000
R2	V1 SG HT feed	25,000
R3	V1 fixed GB resistance	100
R4	V1 osc. CG resistance	50,000
R5	Oscillator SW reaction damping	200
R6	V1 osc. anode HT feed	25,000
R7	V2 SG HT feed	90,000
R8	V2 fixed GB resistance	300
R9	IF stopper	50,000
R10	V3 signal diode load	500,000
R11	Manual volume tontrol	500,000
R12	V3 GB resistance	150
R13	AVC line decoupling	250,000
R14	V3 AVC diode load resistances	500,000
R15	V3 AVC diode load resistances	500,000
R16	V3 grid stopper	50,000

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·0002
C2	MW aerial coupling condenser	0·000005
C3	V1 pentode CG decoupling	0·05
C4	V1 SG decoupling	0·1
C5	V1 cathode by-pass	0·1
C6	V1 osc. CG condenser	0·0001
C7	HT circuit RF by-pass	0·1
C8	Osc. circuit SW tracker	0·0025
C9	V1 osc. anode RF by-pass	0·1
C10	V2 CG decoupling	0·05
C11	V2 SG decoupling	0·1
C12	V2 cathode by-pass	0·1
C13	IF by-pass condensers	0·0001
C14	IF by-pass condensers	0·0001
C15	AF coupling to V3 pentode	0·005
C16	Coupling to V3 AVC diode	0·00005
C17	Fixed tone corrector	0·005
C18*	V3 cathode by-pass	25·0
C19*	HT smoothing condensers	8·0
C20*	HT smoothing condensers	8·0
C21	Mains aerial coupling	0·0001
C22‡	Aerial circuit SW trimmer	0·00003
C23‡	Aerial circuit MW trimmer	0·00003
C24‡	Aerial circuit LW trimmer	0·00003
C25†	Aerial circuit tuning	—
C26†	Oscillator circuit tuning	—
C27‡	Osc. circuit SW trimmer	0·00003
C28‡	Osc. circuit MW trimmer	0·00003
C29‡	Osc. circuit LW trimmer	0·00003
C30‡	Osc. circuit MW tracker	0·0006
C31‡	Osc. circuit LW tracker	0·00025
C32‡	1st IF trans. pri. tuning	0·00003
C33‡	1st IF trans. sec. tuning	0·00003
C34‡	2nd IF trans. pri. tuning	0·00003
C35‡	2nd IF trans. sec. tuning	0·00003

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil		0·8
L2	Aerial MW and LW coupling coil		40·0
L3	Aerial SW tuning coil		Very low
L4	Aerial MW tuning coil		1·4
L5	Aerial LW tuning coil		16·0
L6	Osc. circuit SW tuning coil		Very low
L7	Osc. circuit MW tuning coil		3·2
L8	Osc. circuit LW tuning coil		9·5
L9	Oscillator SW reaction		19·0
L10	Oscillator MW reaction		32·0
L11	Oscillator LW reaction		52·0
L12	1st IF trans.	Pri.	4·0
L13	1st IF trans.	Sec.	4·0
L14	2nd IF trans.	Pri.	4·0
L15	2nd IF trans.	Sec., total	4·0
L16	Speaker speech coil		1·6
L17	Hum neutralising coil		0·3
L18	Speaker field coil		1,000·0
T1	Speaker input trans.	Pri.	440·0
T1	Speaker input trans.	Sec.	0·2
T2	Mains trans.	Pri., total	36·0
T2	Mains trans.	Heater sec.	0·1
T2	Mains trans.	Rect. heat. sec.	0·15
T2	Mains trans.	HT sec., total	500·0
S1-S11	Waveband switches		—
S12	Mains switch, ganged R11		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 235 V, using the 230 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECH2	282	2·5	68	7·4
	Oscillator			
	97	5·8		
V2 EF9	282	6·8	102	2·0
V3 EBL1	263	40	282	4·8
V4 AZ1	337†	—	—	—

† Each anode, AC.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

GENERAL NOTES

Switches.—**S1-S11** are the waveband switches, in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view and shown in detail in the diagram in col. 2 overleaf as it is seen from the rear of the chassis. The table (col. 2 overleaf) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates *open*, and **C** *closed*.

S12 is the QMB mains switch, ganged with the volume control **R11.**

Coils.—The aerial SW coils **L1, L3** and the oscillator SW coils **L6, L9** are in two unscreened tubular units beneath the chassis. **L2, L4, L5**; **L7, L8, L10, L11**; and the IF transformers **L12, L13** and **L14, L15** are in four screened units on the chassis deck with their associated trimmers and trackers.

Scale Lamps.—These are two Osram MES types rated at 4·5 V, 0·3 A. They are connected in series across the heater winding of **T2,** and the junction between them is connected to chassis.

External Speaker.—Two screw-type terminals are provided on the output transformer connecting panel for a high impedance (7,000 O) external speaker.

Condensers C19, C20.—These are two 8 μF (500 V DC working) dry electrolytics in a metal container. The tag connected to **V3** valveholder is the positive of **C20,** and the other the positive of **C19.** The case forms the common negative connection.

Supplement to The Wireless & Electrical Trader, August 26, 1939.

Resistance R16.—This is located in the top cap lead to **V3.**

Chassis Divergencies.—The pick-up and external speaker connections were not shown in the makers' diagram, but were fitted in our chassis. Similarly the mains aerial connection (with **C20**), the condenser **C7** and resistance **R16** were not shown. Switch **S12** may be found connected in the opposite side of the mains in some chassis.

In the makers' plan view, the position of **C30** and **C31** are transposed as compared with our chassis, so that care should be exercised, when making alignment adjustments, that the correct tracker is being used.

CIRCUIT ALIGNMENT

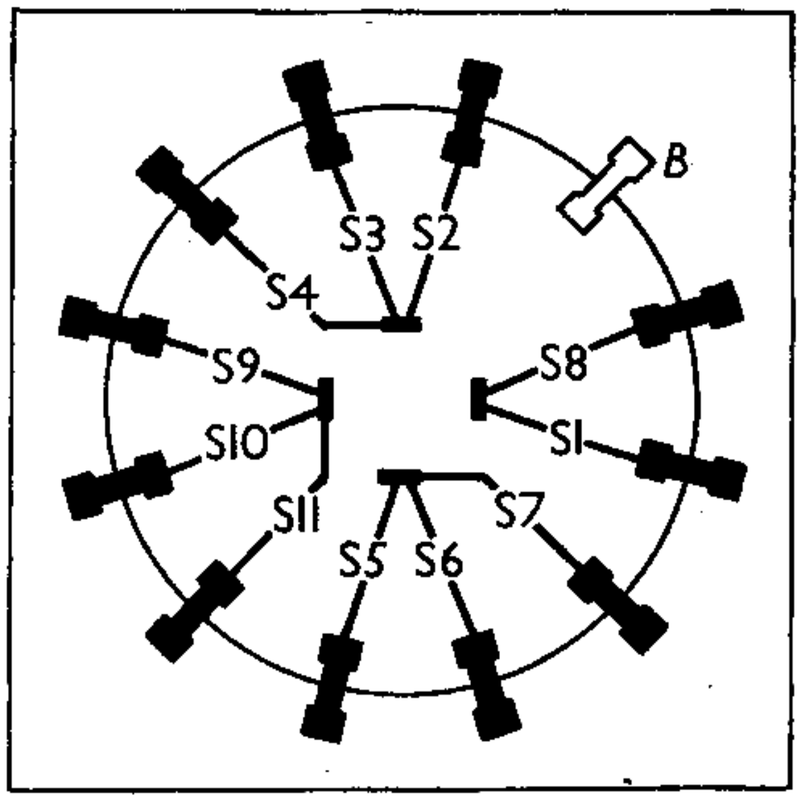
IF Stages.—Switch set to MW or LW, turn volume control to maximum. Connect signal generator to control grid (top cap) of **V1** and chassis. Feed in a 470 KC/S signal and adjust **C34** and **C35,** then **C32** and **C33** for maximum output.

RF and Oscillator Stages.—With the gang at maximum, the pointer should coincide with the high-wavelength ends of the three scales.

Connect signal generator via a standard dummy aerial to **A** and **E** sockets, and keep volume control at maximum.

MW.—Switch set to MW, tune to 250 m on scale, feed in a 250 m (1,200 KC/S) signal, and adjust **C28,** then **C23,** for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C30** for maximum output, while rocking the gang for optimum results. Re-check at 250 m.

SWITCH DIAGRAM

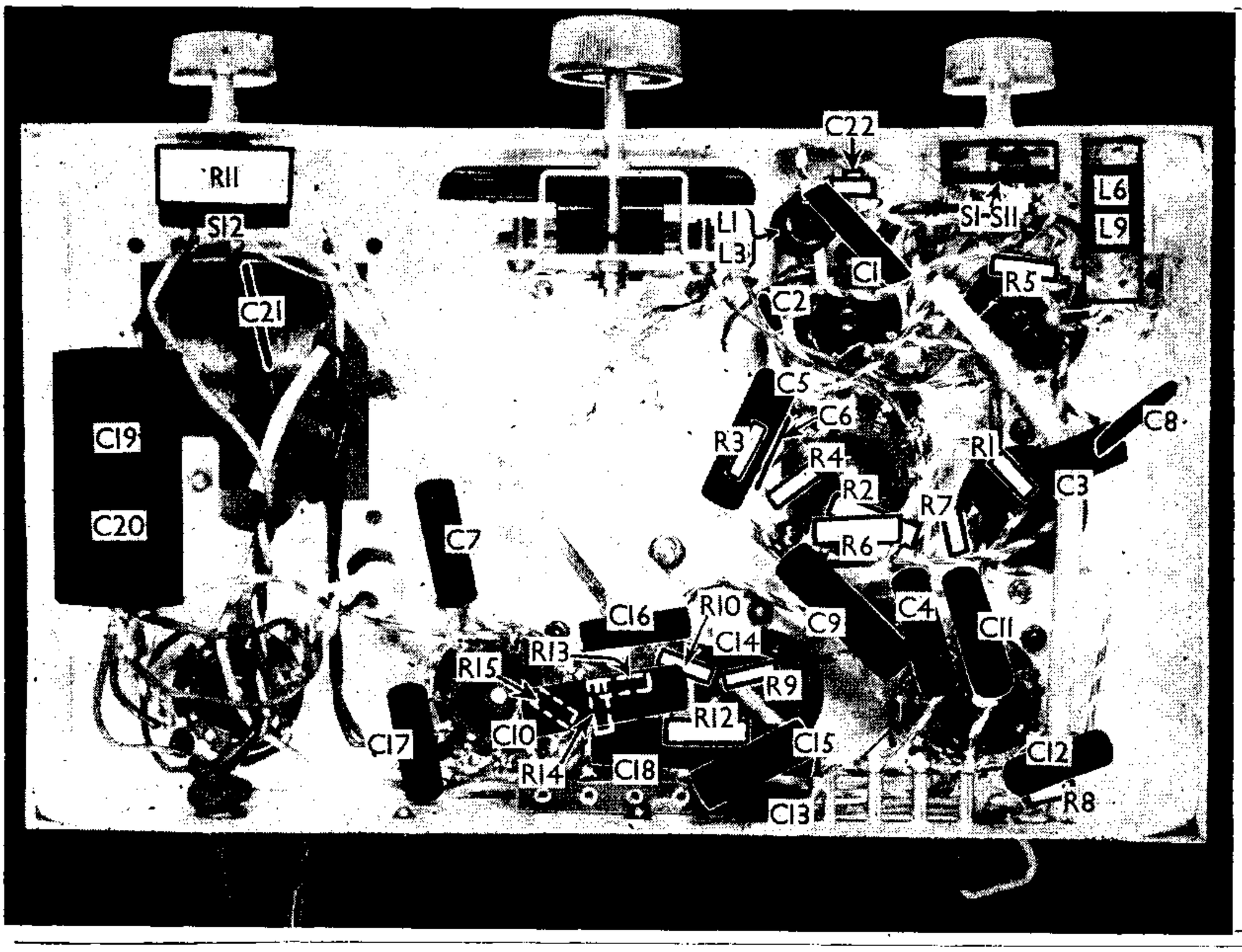


Switch	SW	MW	LW
S1	C	—	—
S2	C	—	—
S3	—	C	—
S4	—	—	C
S5	C	—	—
S6	—	C	—
S7	—	—	C
S8	—	C	—
S9	C	—	—
S10	—	C	—
S11	—	—	C

The switch diagram at the top of the column is drawn as seen looking from the rear of the underside of the chassis. Below it is the switch table.

LW.—Switch set to LW, tune to 1,300 m on scale, feed in a 1,300 m (231 KC/S) signal, and adjust **C29,** then **C24,** for maximum output. Feed in a 1,900 (158 KC/S) signal, tune it in, and adjust **C31** for maximum output, while rocking the gang for optimum results. Re-check at 1,300 m.

SW.—Switch set to SW, tune to 19 m on scale, feed in a 19 m (15·8 MC/S) signal, and adjust **C27,** then **C22,** for maximum output.



Under - chassis view. Note the **S1-S11** switch unit, which is shown in detail at the top of col. 2. All the trimmers except **C22** are adjusted from the top of the chassis. **L1, L3** and **L6, L9** are the coil units for the SW band.

Printed in Great Britain by Sanders Phillips & Co., Ltd., The Baynard Press, Chryssell Road, London, S.W.9.