

209

# ALBA 310

## 3-BAND BATTERY RECEIVER

A SHORT-WAVE range of 16.5-50 metres is covered by the Alba 310 3-band battery receiver. It has a 3-valve chassis with two alternative aerial sockets (one bringing a Droitwich rejector into circuit), and provision for a gramophone pick-up and an extension speaker.

### CIRCUIT DESCRIPTION

Two alternative aerial inputs, **A1** (direct) and **A2** (via Droitwich rejector **L1**, **C11**), to coupling coils **L8** (S.W.), **L2** (M.W.) and **L3** (L.W.). On S.W., single-tuned circuit **L9**, **C14** precedes first valve; on M.W. and L.W., input is via band-pass filter. Primary **L4**, **L5**, tuned by **C12**; secondary **L6**, **L7**, tuned by **C14**; bottom coupling by **C1**.

First valve (**V1**, Mullard metallised **VP2**) is a variable-mu R.F. pentode signal frequency amplifier. Gain control by variable potentiometer **R2** which varies G.B. applied.

Tuned anode coupling by **L13** (S.W.), **L14** (M.W.), **L15** (L.W.), **C20**, to triode detector valve (**V2**, Mullard metallised **PM2HL**) operating on leaky grid system with **C5**, **R5**, **R6**. Reaction is applied from anode of **V2** by **L10** (S.W.), **L11** (M.W.), **L12** (L.W.). **L14** and **L15** are short-circuited when not in use. R.F. filtering in anode circuit of **V2**, by **L16**, **C6**; also by **C4** on M.W. and L.W. Provision for connection of gramophone pick-up between **V2** C.G. and chassis.

Parallel fed auto-transformer coupling by **R7**, **C7**, **T1** between **V2** and pentode output valve (**V3**, Mullard **PM22D**) via R.F. grid stopper **R8**. Tone correction

in anode circuit by fixed condenser **C8**. G.B. for **V3**, and fixed bias for **V1** is obtained by potentiometer **R9**, **R10** in H.T. negative line.

Provision for high resistance external speaker across primary of **T2**.

### COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 C.G. decoupling ..	50,000
R2	V1 gain control ..	25,000
R3	V1 S.G. and anode H.T. feed	2,000
R4	V1 anode tuning M.W. shunt	250,000
R5	V2 grid leak and filament pot.	2,000,000
R6		2,000,000
R7	V2 anode load ..	30,000
R8	V3 C.G. R.F. stopper ..	100,000
R9	V1, V3 fixed G.B. resistances	1,500
R10		200

CONDENSERS		Values (μF)
C1	Band-pass bottom coupling ..	0.02
C2*	V1 anode and S.G. decoupling	8.0
C3	V1 anode and S.G. R.F. by-pass	0.01
C4	V2 anode by-pass (M.W. and L.W.)	0.0002
C5	V2 C.G. condenser ..	0.0001
C6	V2 anode by-pass ..	0.000005
C7	A.F. coupling to T1 ..	0.1
C8	V3 tone corrector ..	0.005
C9*	G.B. potentiometer by-pass	25.0
C10*	H.T. supply reservoir ..	2.0
C11†	Droitwich rejector tuning	—
C12†	Band-pass pri. tuning ..	—
C13†	Band-pass pri. trimmer ..	—
C14†	Band-pass sec. and S.W. aerial tuning	—
C15†	Band-pass sec. trimmer ..	—
C16†	Reaction control ..	—
C17†	V1 anode S.W. trimmer ..	—
C18†	V1 anode L.W. trimmer ..	—
C19†	V1 anode M.W. trimmer ..	—
C20†	V1 anode tuning ..	—

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

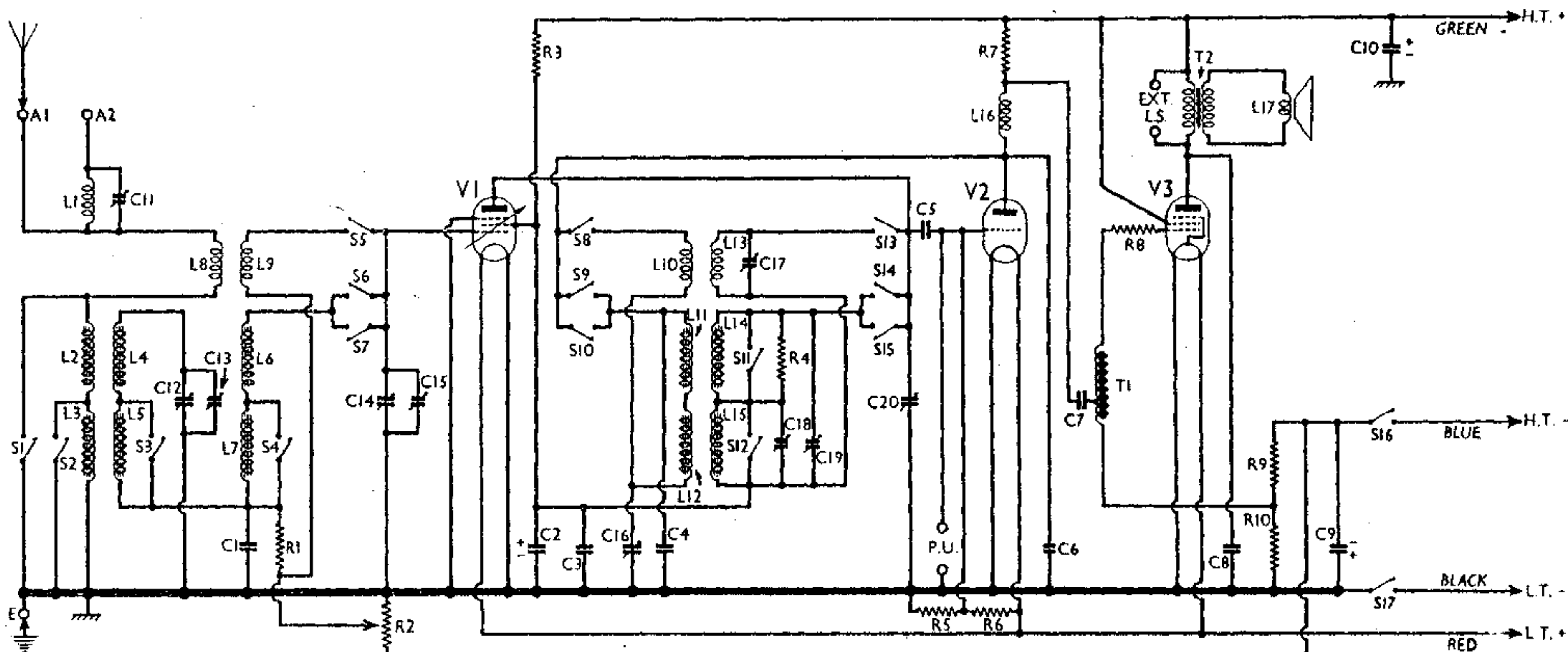
OTHER COMPONENTS		Approx. Values (ohms)
L1	Droitwich rejector coil ..	19.0
L2	Aerial coupling coil (M.W.) ..	38.0
L3	Aerial coupling coil (L.W.) ..	6.0
L4	Band-pass primary (M.W.) ..	1.75
L5	Band-pass primary (L.W.) ..	18.0
L6	Band-pass secondary (M.W.) ..	1.75
L7	Band-pass secondary (L.W.) ..	18.0
L8	Aerial coupling coil (S.W.) ..	0.25
L9	Aerial tuning coil (S.W.) ..	0.05
L10	Reaction coil (S.W.) ..	30.0
L11	Reaction coil (M.W.) ..	1.5
L12	Reaction coil (L.W.) ..	4.5
L13	V1 anode tuning (S.W.) ..	0.05
L14	V1 anode tuning (M.W.) ..	1.75
L15	V1 anode tuning (L.W.) ..	18.0
L16	V2 anode R.F. choke ..	11.0
L17	Speaker speech coil ..	2.5
T1	Intervalve auto-trans. (total)	2,000.0
T2	Speaker input trans. { Pri. ...	650.0
	{ Sec. ...	0.5
Sr-15	Waveband switches ..	—
Sr6	H.T. circuit switch ..	—
Sr7	L.T. circuit switch ..	—

### DISMANTLING THE SET

**Removing Chassis.**—If it is desired to remove the chassis from the cabinet, first remove the four control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the bottom of the cabinet, when it can be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

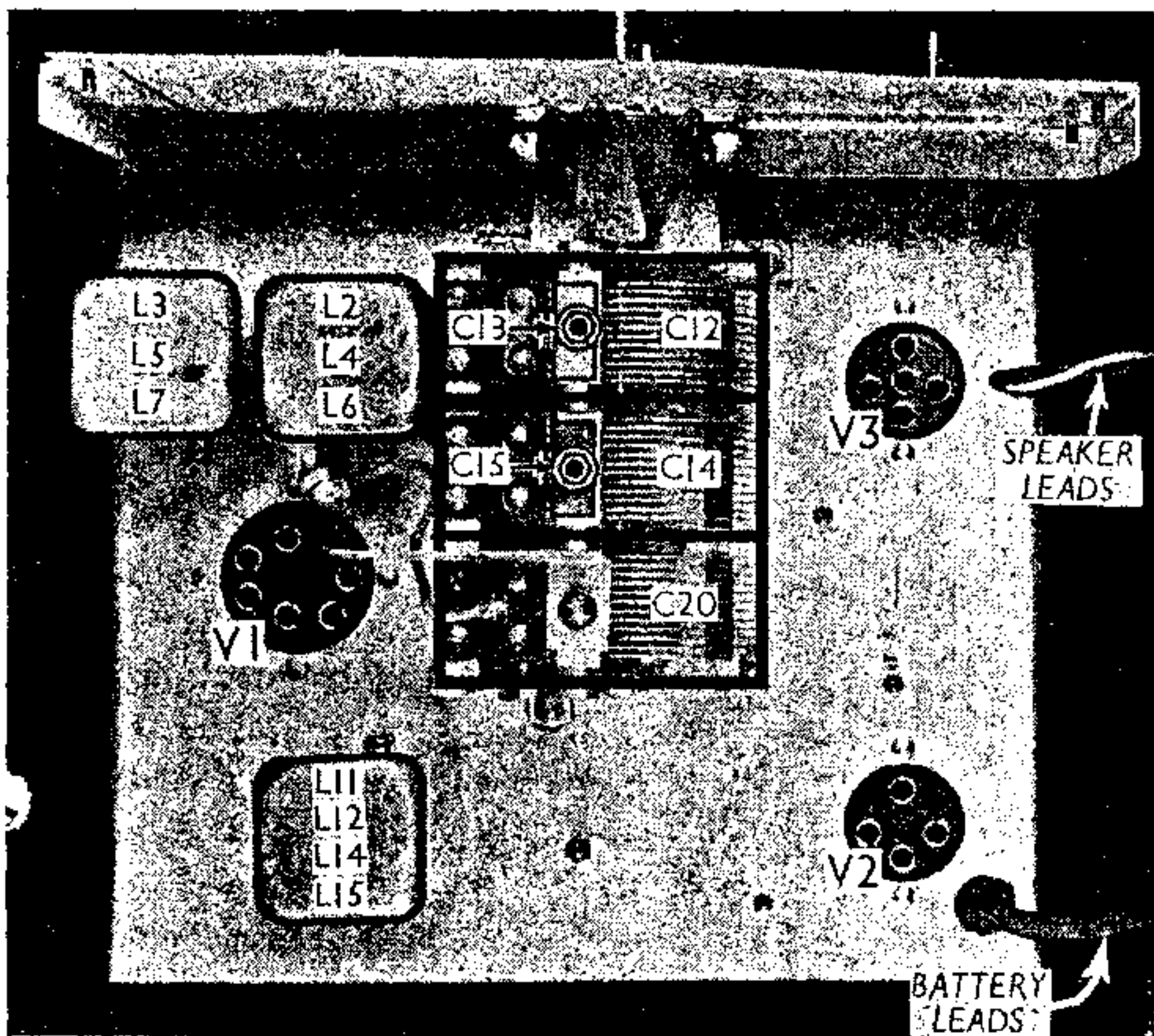
To gain access to the switch unit nearer the front of the chassis it will be necessary to remove the large horizontal screen which covers it (four round-head screws).

To free the chassis entirely, unsolder the speaker leads and when replacing, connect the white lead to tag 3 (which is also connected to tag F) and the black



Circuit diagram of the Alba 310 3-band battery receiver. **L1** and **C11** form a Droitwich rejector. **R2** is the gain control, adjusting the bias on **V1**.





Plan view of the chassis.

lead to tag 1 (which is connected to the other tag F).

**Removing Speaker.**—The speaker can be removed from the cabinet by removing the nuts from the four bolts holding it to the sub-baffle, or alternatively the speaker and sub-baffle may be removed together by removing the three ornamentally-headed screws and one round-head wood screw holding the sub-baffle to the cabinet front. When replacing, see that the transformer is at the bottom.

**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an H.T. battery reading 120 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

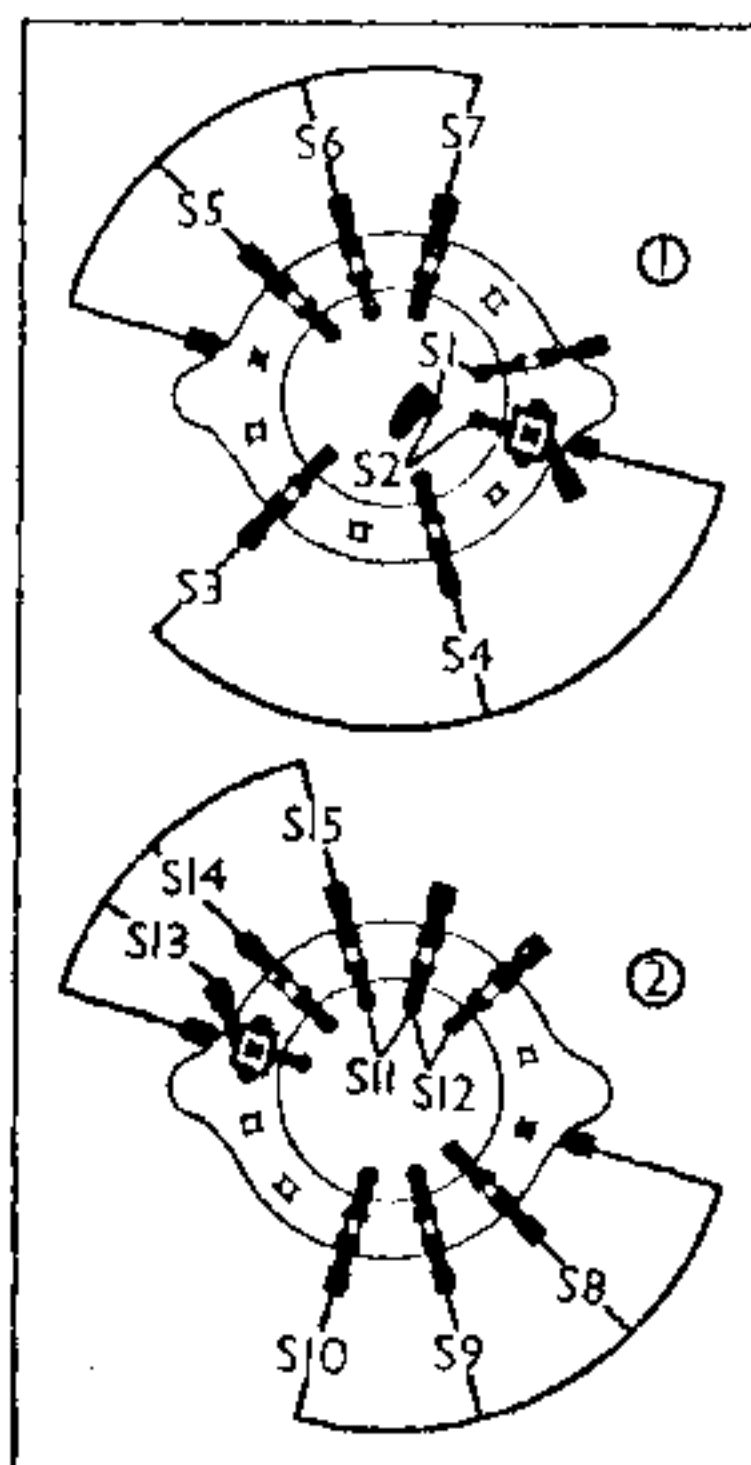
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	100	1.6	100	0.5
V2 PM2HL	62	1.4	—	—
V3 PM22D	103	4.4	108	0.7

**GENERAL NOTES**

**Switches.**—S1-S15 are the waveband switches, in two rotary ganged units beneath the chassis. The units are indicated in our under-chassis view, and the switches are shown in detail in the diagrams on this page, where they are as seen looking at the underside of the chassis, from the front. The table (col. 3) gives the switch positions for the three control settings, starting from the fully anti-clockwise position. O indicates open, and C, closed.

S16 and S17 are the H.T. and I.T. circuit switches, of the Q.M.B. type, ganged with the gain control R2. Looking from the underside of the chassis, the upper two tags belong to S16 and the lower two to S17.



Switch diagrams, looking at the underside of the chassis, from the front.

**SWITCH TABLE**

Switch	S.W.	M.W.	L.W.
S1	C	O	O
S2	O	C	O
S3	O	C	O
S4	O	C	O
S5	C	O	O
S6	O	C	O
S7	O	C	O
S8	C	O	O
S9	O	C	O
S10	O	C	O
S11	C	O	O
S12	O	C	O
S13	C	O	O
S14	O	C	O
S15	O	O	C

**Batteries.**—The recommended batteries are: L.T., 2 V 45 AH accumulator cell; H.T., 120 V dry battery. Grid bias is automatic.

**Battery Leads and Voltages.**—Black lead, spade tag, L.T. negative; Red lead, spade tag, L.T. positive 2 V; Blue lead, black plug, H.T. negative; Green lead, red plug, H.T. positive 120 V.

**CIRCUIT ALIGNMENT**

Connect signal generator to A1 and E sockets, switch set to M.W., feed in a 200 m. signal, and tune to 200 m. on scale. Adjust C13, C15 and C19 for maximum output.

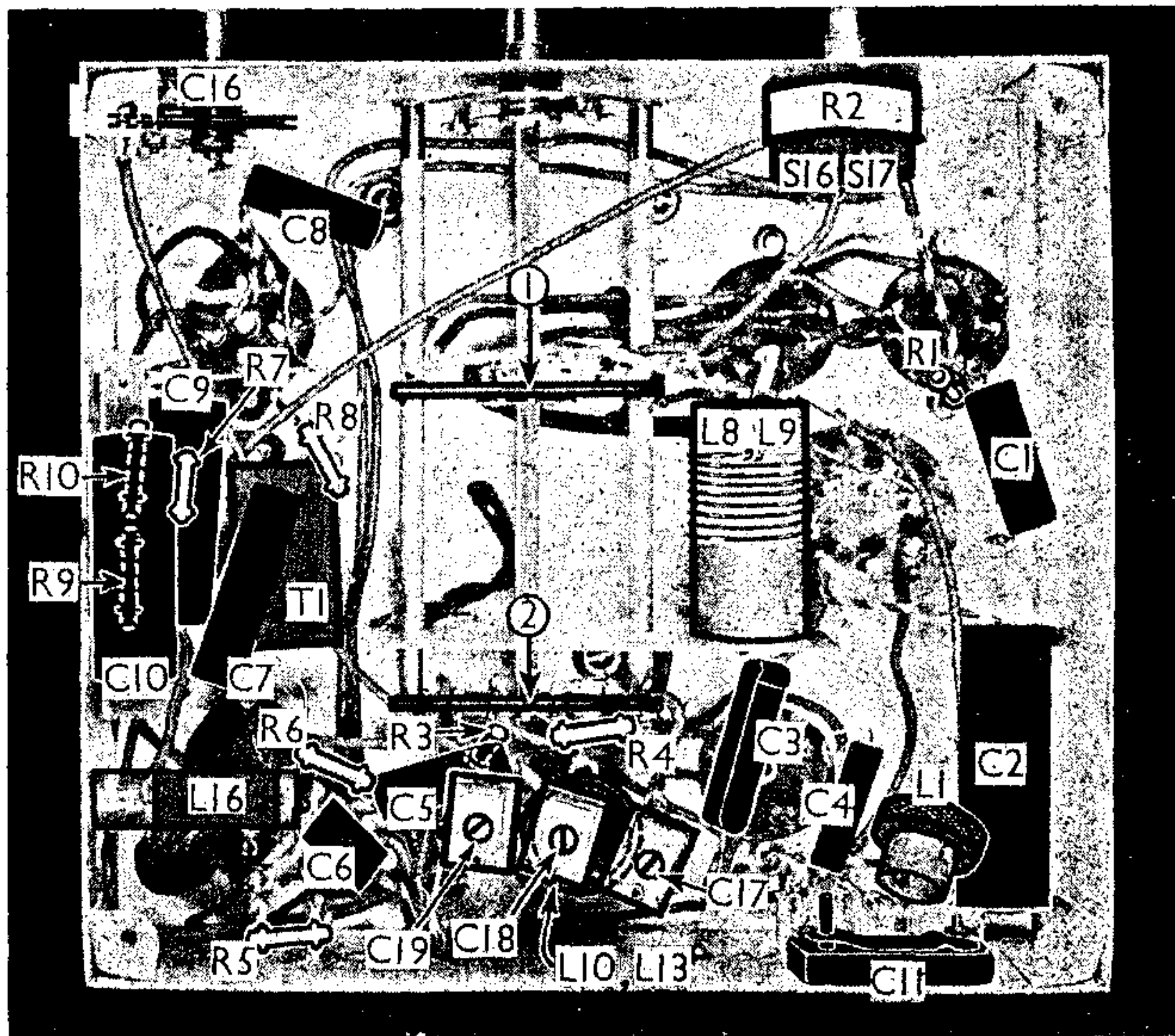
Switch set to L.W., feed in a 1,000 m. signal, tune to 1,000 m. on scale, and adjust C18 for maximum output, rocking the gang slightly for optimum results.

Switch set to S.W., feed in a 20 m. signal, tune to 20 m. on scale, adjust C17 for maximum output, rocking the gang slightly for optimum results.

To adjust Droitwich rejector, connect signal generator to A2 socket and feed in a 1,500 m. signal. Tune it in on receiver, then adjust C11 (rear of chassis) for minimum output.

**Coils.**—L2, L4, L6; L3, L5, L7 and L11, L12, L14, L15 are in three screened units on the chassis deck, and are iron dust cored. L1 is the Droitwich rejector coil, beneath the chassis, while the S.W. coils, L8, L9 and L10, L13 are on two unscreened tubular formers, also beneath the chassis. The thick bare wire windings are L9 and L13 respectively. L16 is a single layer R.F. choke, beneath the chassis.

**External Speaker.**—Two terminals are provided on the connector panel of the internal speaker transformer, T2, for a high resistance external speaker.



Under-chassis view. The two switch units are indicated by numbers in circles, and arrows. L10, L13 are on a tubular former beneath C18.