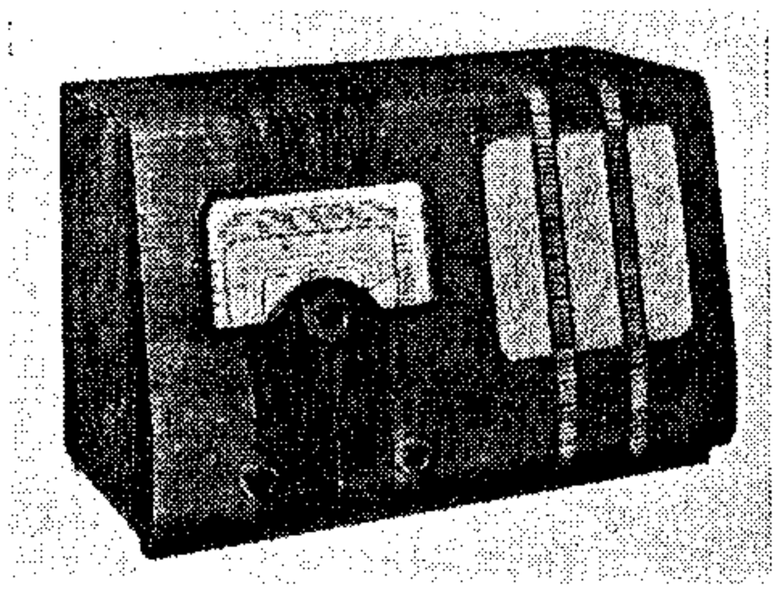
# ALBA 330

## 4-BAND BATTERY SUPERHET



COVERING short-wave ranges of 19·5-50 m (referred to below as SW1) and 65 to 200 m (SW2), the Alba 330 is a 4-valve battery 4-band superhet with an octode frequency changer, a variable-mu hexode IF amplifier, a double-diode triode and an output pentode.

### CIRCUIT DESCRIPTION

Aerial input on MW and LW via SW1 and SW2 coupling coils **L11** and **L12** respectively, and MW and LW coupling coils **L1** and **L2** respectively, to inductively coupled band-pass filter. Primary coils **L3, L4** are tuned by **C18**; secondaries **L9, L10** by **C21.** Coupling by coils **L5, L6, L7, L8.** On SW, input is via **L11** (SW1) and **L12** (SW2) to single tuned circuits **L13, C21** (SW1) and **L14, C21** (SW2).

First valve (**V1, Mullard metallised FC2A**) is an octode operating as frequency changer with electron coupling. Oscillator grid coils **L15** (SW1), **L16** (SW2), **L17** (MW) and **L18** (LW) are tuned by **C22**; parallel trimming by **C24** (SW1), **C25** SW2), **C26** (MW) and **C27** (LW); series tracking by **C4** (MW) and **C23** (LW). Reaction by coils **L19** (SW1), **L20** (SW2), **L21** (MW) and **L22** (LW).

Second valve (**V2, Mullard metallised VP2B**) is a variable-mu RF hexode with second and third grids strapped to operate as a pentode intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C28, L23, L24, C29** and **C30, L25, L26, C31.**

**Intermediate frequency 117·5 KC/S.**

Diode second detector is part of double-diode triode valve (**V3, Mullard metallised TDD2A**). Audio frequency component in rectified output is developed across load resistance **R9** and passed via AF coupling condenser **C11** and CG resistance **R11** to CG of triode section which operates as AF amplifier. IF filtering in anode circuit by **C12** and in diode circuit by **C9, R8, R10,** and **C10.**

Second diode of **V3,** fed from **V2** anode via **C8,** provides DC potentials which are developed across load resistance **R13** and fed back through decoupling circuits as GB to FC (except on SW bands) and IF valves, giving automatic volume control.

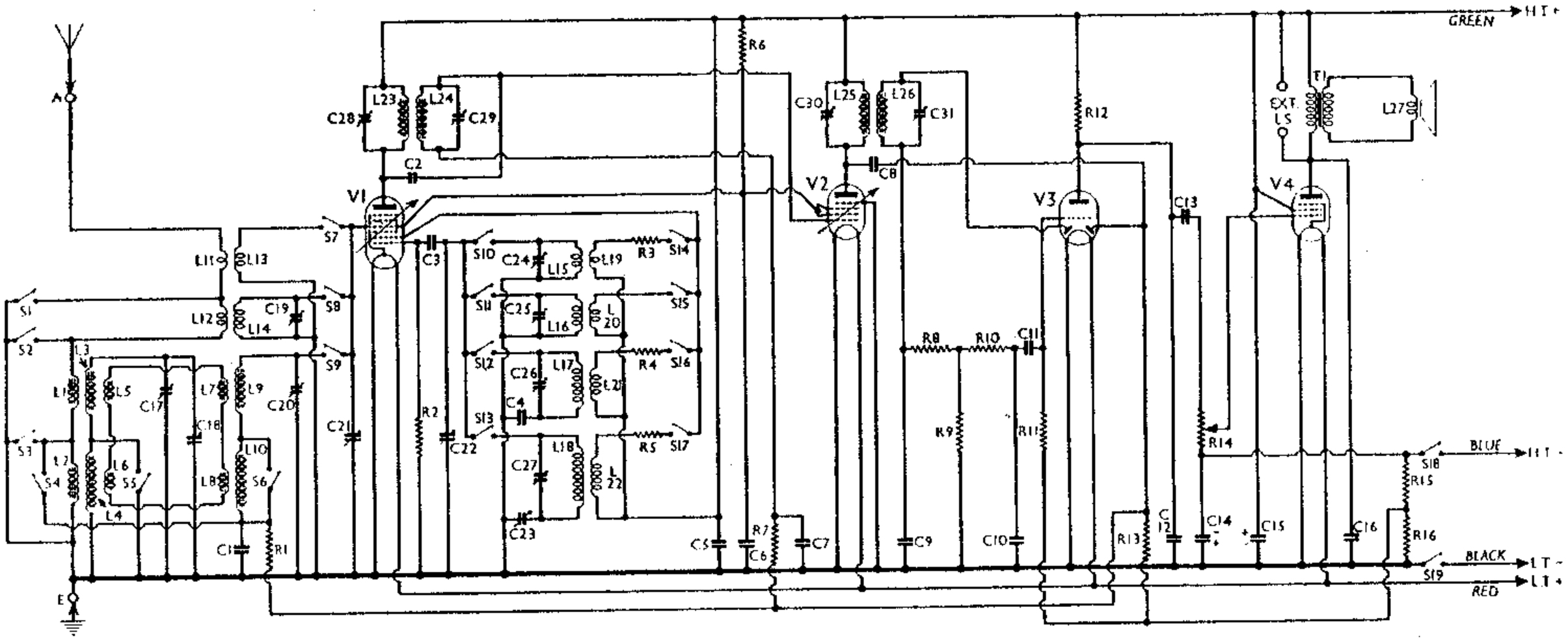
Resistance-capacity coupling by **R12, C13** and manual volume control **R14** between **V3** triode and pentode output valve (**V4, Mullard PM22D**). Fixed tone correction by **C16** in anode circuit. Provision for connection of high impedance external speaker across primary of internal speaker input transformer **T1.**

Potentials for **V4** GB, **V3** triode GB, **V2** fixed GB, **V1** fixed GB (on MW and LW only) and AVC delay are obtained automatically from drop across resistances **R15, R16,** forming a potential divider in the HT negative lead to chassis.

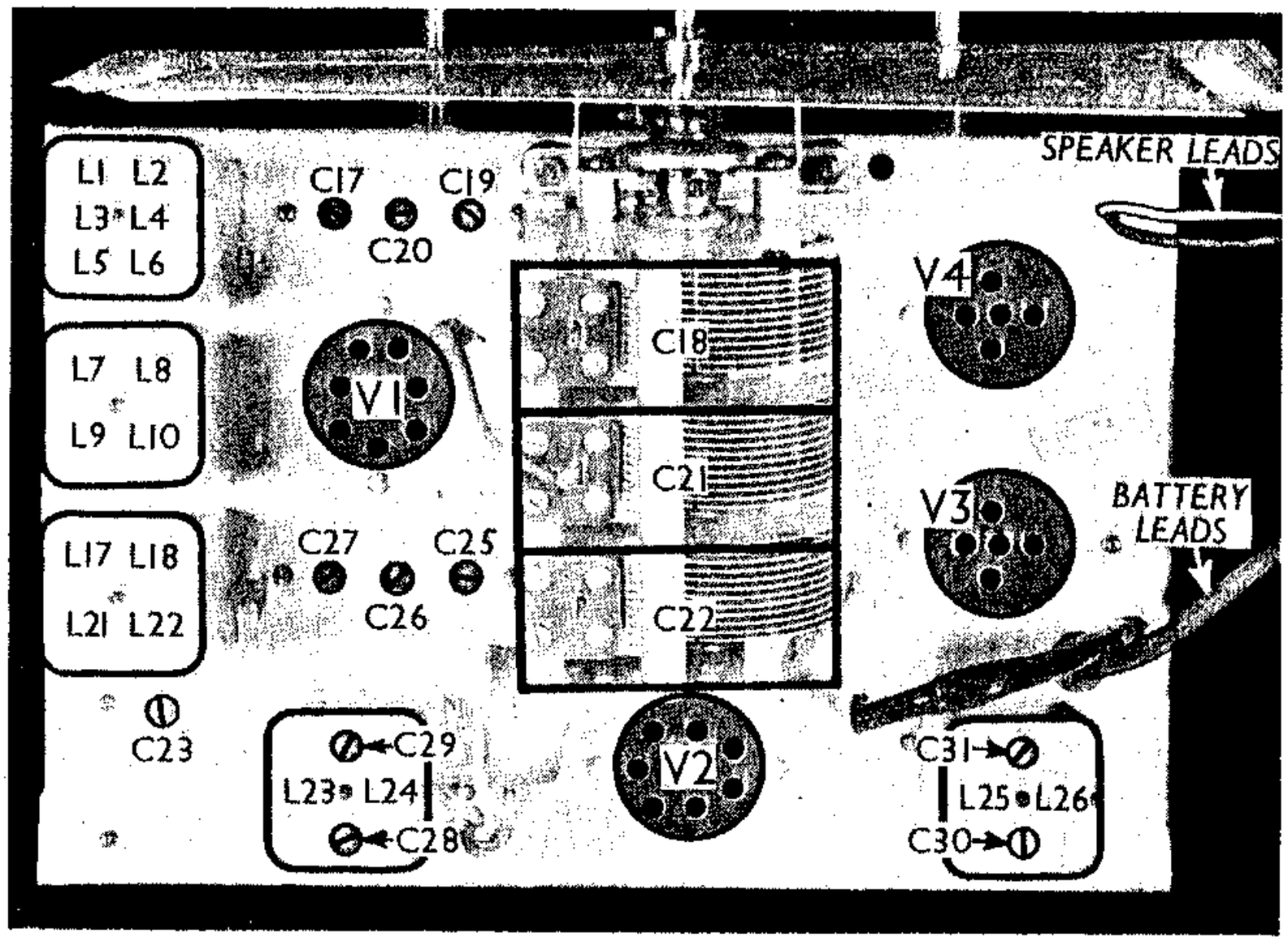
### COMPONENTS AND VALUES

| | RESISTANCES | Values (ohms) |
|---|---|---|
| R1 | V1 pentode CG decoupling .. | 1,000,000 |
| R2 | V1 osc. CG resistance .. | 50,000 |
| R3 | Osc. SW1 reaction stabiliser .. | 16 |
| R4 | Osc. MW reaction stabiliser .. | 2,000 |
| R5 | Osc. LW reaction stabiliser .. | 5,000 |
| R6 | V1, V2 SG's HT feed .. | 50,000 |
| R7 | V2 CG decoupling .. .. | 250,000 |
| R8 | IF stopper .. .. .. | 250,000 |
| R9 | V3 signal diode load .. .. | 250,000 |
| R10 | IF stopper .. .. .. | 50,000 |
| R11 | V3 triode CG resistance .. | 500,000 |
| R12 | V3 triode anode load .. .. | 20,000 |
| R13 | V3 AVC diode load .. .. | 500,000 |
| R14 | Manual volume control .. | 500,000 |
| R15, R16 | Auto GB potential divider resistances .. .. | 80, 100 |

| | CONDENSERS | Values (μF) |
|---|---|---|
| C1 | V1 pentode CG decoupling .. | 0·1 |
| C2 | 1st IF trans. "Top" coupling | 0·000025 |
| C3 | V1 osc. CG condenser .. | 0·0001 |
| C4 | Osc. circuit MW tracker .. | 0·002 |
| C5 | HT circuit RF by-pass .. | 0·1 |
| C6 | V1, V2 SG's decoupling .. | 0·1 |
| C7 | V2 CG decoupling .. .. | 0·1 |
| C8 | Coupling to V3 AVC diode .. | 0·0001 |
| C9, C10 | IF by-pass condensers | 0·0002, 0·0002 |
| C11 | AF coupling to V3 triode .. | 0·001 |
| C12 | IF by-pass .. .. .. | 0·0001 |
| C13 | V3 triode to V4 AF coupling .. | 0·002 |
| C14* | V4 CG decoupling .. .. | 50·0 |
| C15* | HT reservoir condenser .. | 8·0 |
| C16 | Fixed tone corrector .. .. | 0·002 |
| C17‡ | Band-pass pri. MW trimmer .. | 0·00003 |
| C18† | Band-pass primary tuning .. | — |
| C19‡ | Aerial SW2 trimmer .. .. | 0·00003 |
| C20‡ | Band-pass sec. MW trimmer .. | 0·00003 |
| C21† | SW1, SW2 aerial and band-pass sec. tuning .. .. .. | — |
| C22† | Oscillator circuit tuning .. | — |
| C23‡ | Osc. circuit LW tracker .. | 0·0007 |
| C24‡ | Osc. circuit SW1 trimmer .. | 0·00003 |




Circuit diagram of the Alba 330 4-band battery superhet. Some models may show slight divergencies, which are explained in General Notes.




Plan view of the chassis. Note the seven trimmers adjustable through holes in the chassis deck.

| CONDENSERS (*Continued*) | | Values (μF) |
|---|---|---|
| C25‡ | Osc. circuit SW2 trimmer .. | 0·00003 |
| C26‡ | Osc. circuit MW trimmer .. | 0·00003 |
| C27‡ | Osc. circuit LW trimmer .. | 0·00003 |
| C28‡ | 1st IF trans. pri. tuning .. | — |
| C29‡ | 1st IF trans. sec. tuning .. | — |
| C30‡ | 2nd IF trans. pri. tuning .. | — |
| C31‡ | 2nd IF trans. sec. tuning .. | — |

* Electrolytic. † Variable. ‡ Pre-set.

| OTHER COMPONENTS | | Approx. Values (ohms) |
|---|---|---|
| L1 | Aerial MW and LW coupling coils .. .. .. | 55·0 |
| L2 | | 10·0 |
| L3 | Band-pass primary tuning coils .. .. .. | 1·6 |
| L4 | | 18·5 |
| L5 | Band-pass primary coupling coils .. .. .. | 49·0 |
| L6 | | |
| L7 | Band-pass secondary coupling coils .. .. .. | 49·0 |
| L8 | | |
| L9 | Band-pass secondary tuning coils .. .. .. | 1·8 |
| L10 | | 23·0 |
| L11 | Aerial SW1 coupling coil .. | 0·85 |
| L12 | Aerial SW2 coupling coil .. | 2·5 |
| L13 | Aerial SW1 tuning coil .. | 0·1 |
| L14 | Aerial SW2 tuning coil .. | 0·5 |
| L15 | Osc. circuit SW1 tuning coil | 0·05 |
| L16 | Osc. circuit SW2 tuning coil | 0·4 |
| L17 | Osc. circuit MW tuning coil .. | 3·9 |
| L18 | Osc. circuit LW tuning coil .. | 13·0 |
| L19 | Oscillator SW1 reaction coil .. | 1·25 |
| L20 | Oscillator SW2 reaction coil .. | 60·0 |
| L21 | Oscillator MW reaction coil .. | 87·5 |
| L22 | Oscillator LW reaction coil .. | 130·0 |
| L23 | 1st IF trans. Pri. .. .. | 3·5 |
| L24 | 1st IF trans. Sec. .. .. | 3·5 |
| L25 | 2nd IF trans. Pri. .. .. | 3·5 |
| L26 | 2nd IF trans. Sec. .. .. | 3·5 |
| L27 | Speaker speech coil .. .. | 2·6 |
| T1 | Speaker input trans. Pri. .. | 800·0 |
| | Sec. .. | 0·3 |
| S1-S17 | Waveband switches .. .. | — — |
| S18 | HT circuit switch ganged | — — |
| S19 | LT circuit switch R14 | — — |

## DISMANTLING THE SET

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

*When replacing*, see that there are two rubber washers on each of the front fixing bolts and a single washer on each of the back bolts, between the chassis and the bottom of the cabinet.

To free the chassis entirely, unsolder the speaker leads.

**Removing Speaker.**—To remove the speaker from the cabinet, remove the nuts and washers from the four screws holding it to the sub-baffle. Alternatively, remove the nuts from the four ornamentally headed screws and remove the two round-head wood screws holding the sub-baffle to the front of the cabinet, and then remove the nuts and washers from the four screws holding the speaker to the sub-baffle. *When replacing*, see that the transformer is pointing to the top right-hand corner of the cabinet.

## VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an HT battery reading 135 V, on load. 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.

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

| Valve | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|---|---|---|---|---|
| V1 FC2A | 135 Oscillator 126 | 0·5 2·8 | 52 | 0·9 |
| V2 VP2B | 135 | 1·5 | 52 | 0·4 |
| V3 TDD2A | 105 | 1·1 | — | — |
| V4 PM22D | 131 | 4·9 | 135 | 0·8 |

## GENERAL NOTES

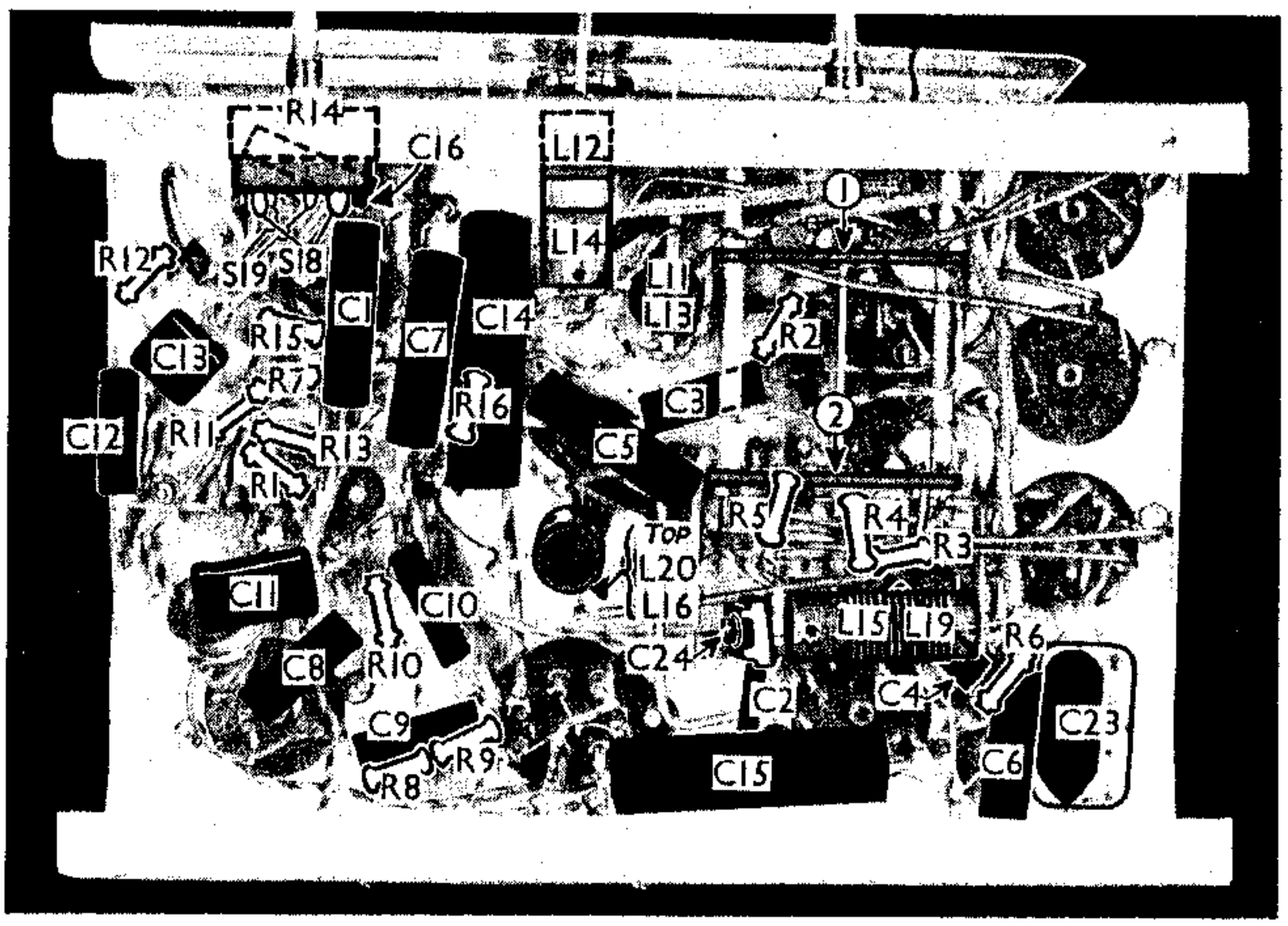
**Switches.—S1-S17** are the waveband switches, in two rotary units beneath the chassis. These are indicated in our under-chassis view, and are shown in detail in the diagrams on page VIII, where they are as seen when looking from the front of the underside of the chassis.

The table (page VIII) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and **C,** closed.

**S18, S19** are the QMB battery circuit switches, ganged with the manual volume control **R14.** Their tags are indicated in our under-chassis view.

**Coils.—L1-L6; L7-L10; L17, L18,**

*Continued overleaf*




Under-chassis view. The tags of the battery circuit switches are indicated, and the wave-change switch units are shown in detail overleaf.

**ALBA 330**—*Continued*

**L21, L22**; and the IF transformers **L23, L24** and **L25, L26** are in five screened units on the chassis deck, the latter including their associated trimmers.

**L11, L13**; **L12, L14**; **L15, L19** and **L16, L20** are in four unscreened tubular units beneath the chassis, indicated in our under-chassis view.

**External Speaker.**—Two terminals are provided on a panel on the internal speaker for a high impedance (15,000 to 20,000 Ω) external speaker.

**Resistance R3.**—This is a 50 Ω resistor on which is wound a length of resistance wire, connected in parallel, to bring the total resistance down to 16 Ω. The value of the wire winding is about 24 Ω.

**Chassis Divergencies.** — Our chassis differed in a number of points, compared with the makers' diagram.

In the first place, they show a 1 MΩ resistor in series with the lead to the control grid of **V4** which is missing in our chassis, while a 0·1 μF condenser from the junction of **R15** and **R16** to chassis is also missing.

**R3, R4** and **R5** are not shown on the makers' diagram.

The makers show **V1** control grid returned to the junction of **R15, R16** on the SW1 and SW2 bands, but in our case the bottoms of **L13** and **L14** are returned to chassis.

Our **S4** is not shown by the makers, while the values of certain resistors are different. The values shown are those in our chassis.

**Batteries.**—LT, 2 V 45 AH multi-plate cell. HT, 135 V dry battery. GB is automatic.

**Battery Leads and Voltages.**—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; blue lead, black plug, HT negative; green lead, red plug, HT positive, +135 V.

## CIRCUIT ALIGNMENT

**IF Stages.**—Feed in a 117·5 KC/S signal between the top cap of **V1** and chassis, with set switched to MW.

Adjust **C31, C30, C28** and **C29** for maximum output, in that order, reducing input progressively as the circuits come into alignment.

**RF and Oscillator Stages.**—See that the scale pointer is horizontal at maximum position of gang condenser. If not, adjust by means of the pointer clip on the drive spindle.

Feed a 250 m (1,200 KC/S) signal into **A** and **E** sockets, switch set to MW, tune to 250 m on the scale, and adjust **C26,** then **C20** and **C17** for maximum output.

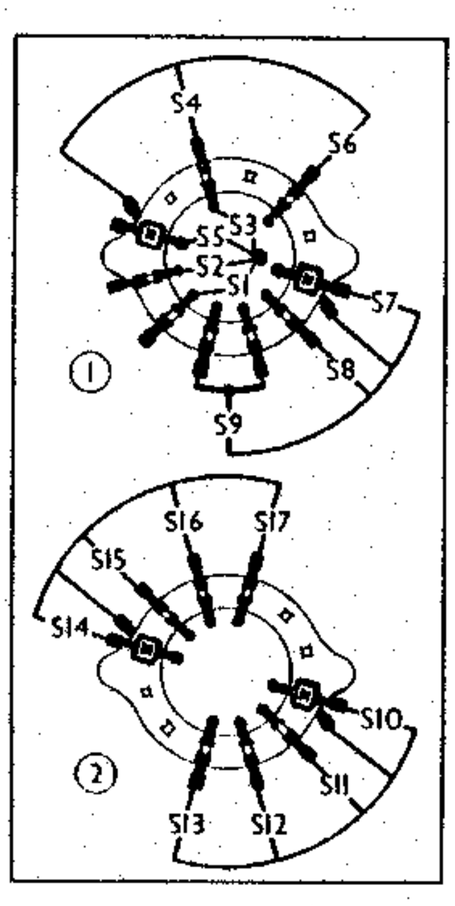
Switch set to LW, feed in a 1,200 m (250 KC/S) signal, tune to 1,200 m on the scale, and adjust **C27** for maximum output, rocking the gang slightly for optimum results, since there are no separate LW band-pass trimmers. Feed in a 1,000 m (158 KC/S) signal, tune it in, and adjust **C23** for maximum output, rocking the gang meanwhile.

Switch set to SW2, feed in a 120 m (2,500 KC/S) signal, tune to 120 m on scale, and adjust **C25,** then **C19,** for maximum output.

Switch set to SW1, feed in a 31 m (9·65 MC/S) signal, tune to 31 m on the scale, and adjust **C24** for maximum output. If **C24** gives two peaks, choose that obtained with it nearest its minimum position.

## SWITCH TABLE AND DIAGRAMS

| Switch | SW1 | SW2 | MW | LW |
|---|---|---|---|---|
| S1 | C | | | |
| S2 | | C | | |
| S3 | | | C | |
| S4 | C | | | |
| S5 | C | | C | |
| S6 | | | C | |
| S7 | C | | | |
| S8 | | C | | |
| S9 | | | C | C |
| S10 | C | | | |
| S11 | | C | | |
| S12 | | | C | |
| S13 | | | | C |
| S14 | C | | | |
| S15 | | C | | |
| S16 | | | C | |
| S17 | | | | C |




Switch diagrams, as seen from the front of the underside of the chassis.

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