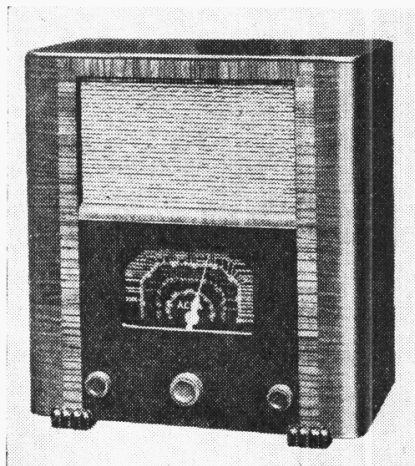


"TRADER" SERVICE SHEET

423

# ALBA 810 (AND 610) AC SUPERHET



The Alba 810 table model AC superhet.

**T**HE 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

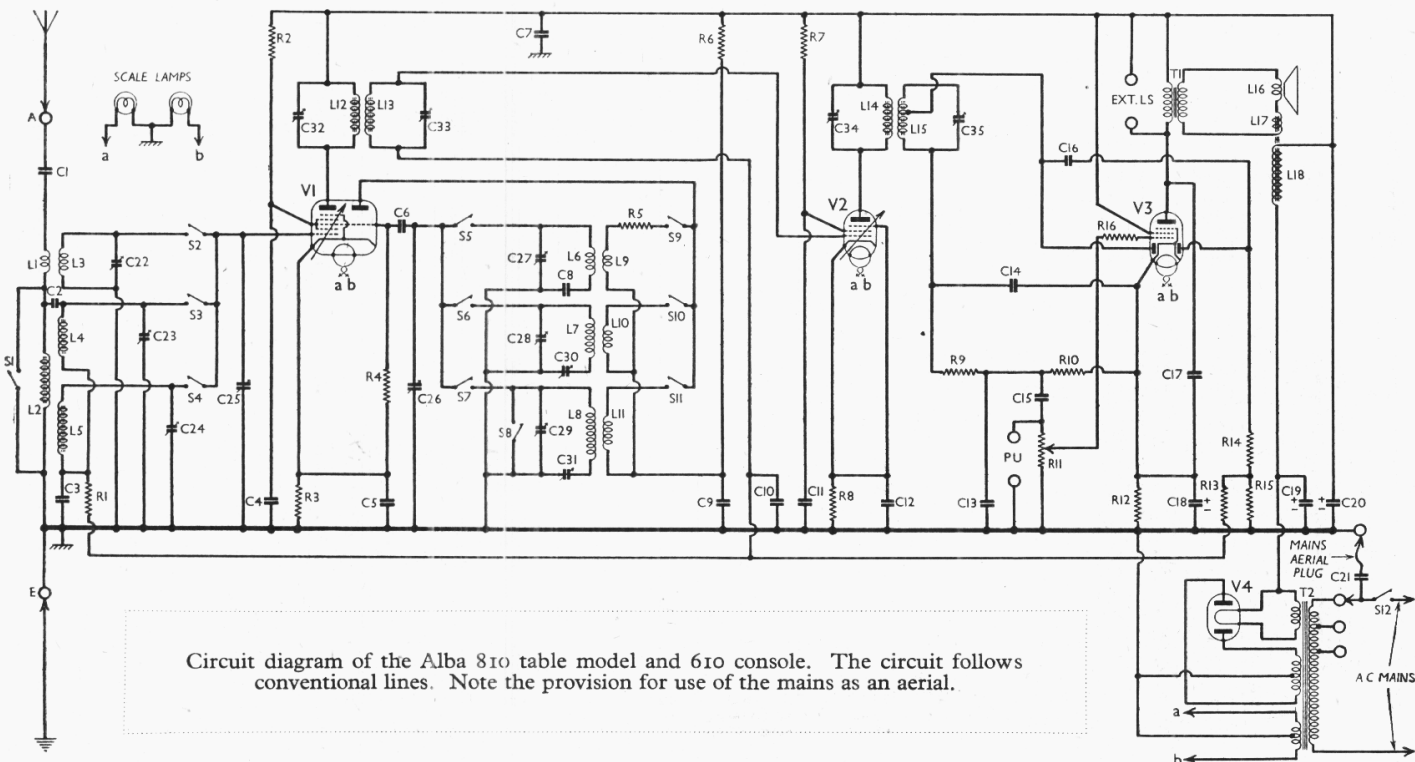
of which is fed directly to the speaker circuit. IF filtering by **C13, R9** and **C14**. Provision for connection of gramophone pick-up across **R11**. Provision for connection of high impedance external speaker across primary of internal speaker input transformer **T1**. Fixed tone correction by **C17** 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.

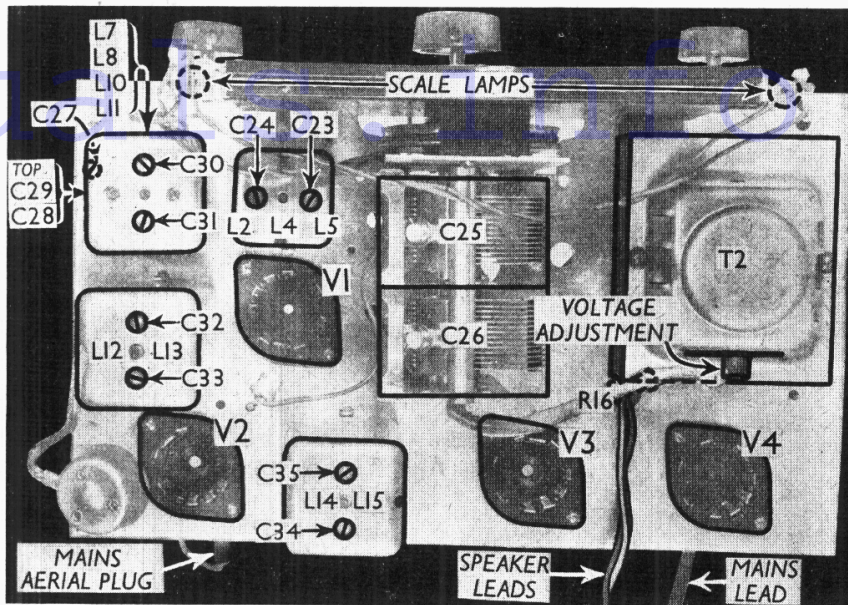


the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis may now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

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 control ..	500,000
R12	V3 GB resistance ..	150
R13	AVC line decoupling ..	250,000
R14	V3 AVC diode load resistances {	500,000
R15		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 ..	0.00025
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		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*		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		Sec. .. 4.0
L14	2nd IF trans. {	Pri. .. 4.0
L15		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
	Sec. .. 0.2	
	Pri., total .. 36.0	
T2	Mains Heater sec. ..	0.1
	trans. Rect. heat. sec. ..	0.15
	HT sec., total ..	500.0
S1-S11	Waveband switches ..	—
S12	Mains switch, ganged Rr1 ..	—

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECh2 ..	{ 282 Oscillator } 2.5	—	68	7.4
V2 EF9 ..	282	5.8	102	2.0
V3 EBL1 ..	263	4.0	282	4.8
V4 AZ1 ..	337†	—	—	—

† Each anode, AC.

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.

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 Ω) 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.



**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.

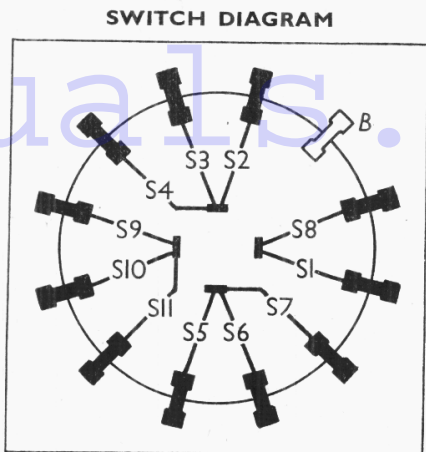
**CIRCUIT ALIGNMENT**

**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	SW	MW	LW
Sr	C	—	—
S2	C	—	—
S3	—	C	—
S4	—	—	C
S5	C	—	—
S6	—	C	—
S7	—	—	C
S8	—	C	—
S9	C	—	—
S10	—	C	—
S11	—	—	C
S12	—	—	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.

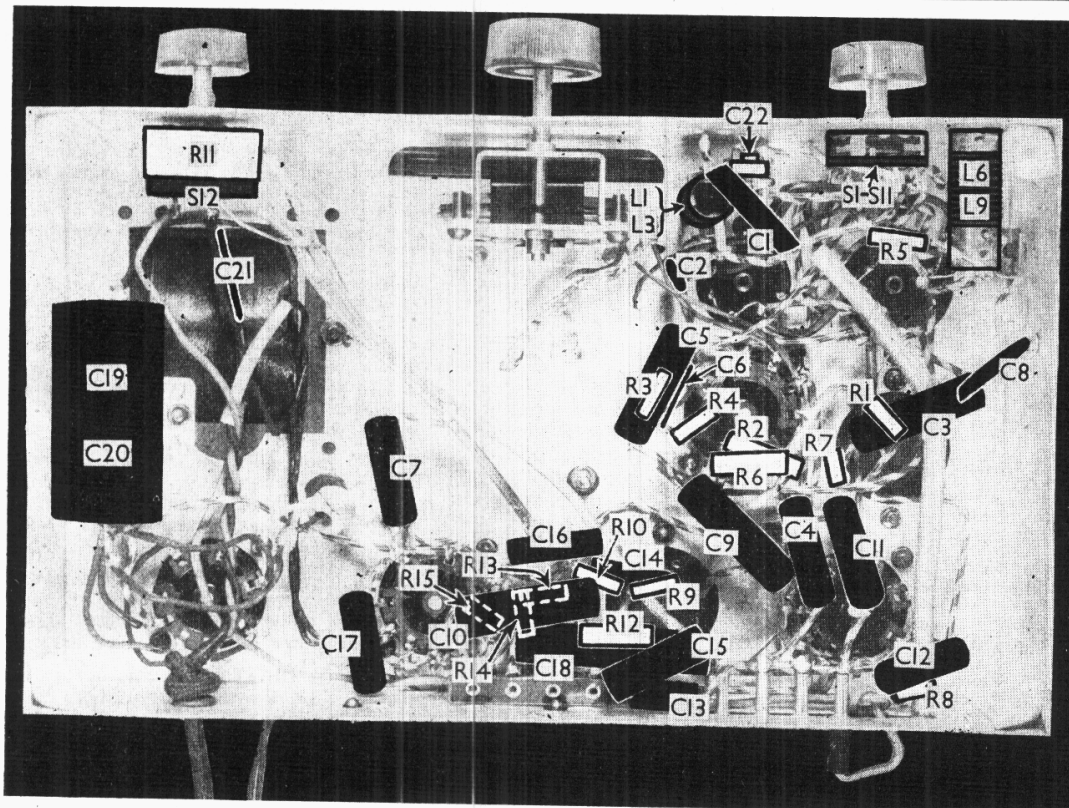
**MAINTENANCE PROBLEMS**

**Notice to Contributors**

A READER who makes considerable use of the maintenance hints and problems published in "The Trader" from time to time has suggested that they would be of even greater help if contributors would include the following details:

1. Make and type number of receiver.
2. Complaint.
3. Associated symptoms and whether affected by controls.
4. Whether set is O.K. from pick-up sockets to speaker, or on certain wavebands only.
5. Routine tests applied.
6. Whether component numbers, if used, refer to "Trader" Service Sheet or manufacturers' information.
7. Actual voltages and currents measured (not merely high or low), compared with the correct values. Also, sensitivity of meter used.

Contributions containing this sort of information are obviously of greater help than those in which important details are omitted, and will therefore receive favourable consideration for publication.



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.