

'TRADER' SERVICE SHEET

193

ALBA 870 (A.C.)
AND 970 (A.C.) RADIO-GRAMS

COVERING a short-wave range of 17-50 metres, the Alba 870 (A.C.) receiver is a 4-valve (plus rectifier) A.C. 3-band superhet suitable for mains of 190-250 V, 40-100 C/S.

A similar chassis is fitted in the 970 (A.C.) radio-gramophone and automatic radio-gramophone but as standard they are for mains of 50-60 C/S only. Special models, however, are made for 40-100 C/S.

There are also A.C./D.C. versions of these three models, bearing the same type numbers.

This Service Sheet was prepared on an A.C. table model.

CIRCUIT DESCRIPTION

Aerial input on M.W. and L.W. via coupling coils L1, L2 to inductively coupled band-pass filter. Primary L3, L4 tuned by C21; secondary L9, L10 tuned by C24; coupling coils L5, L6, L7, L8. On S.W. band aerial input is via coupling coil L11 to single tuned circuit L12, C24.

First valve (V1, Mullard metallised TH4) is a triode-hexode operating as frequency changer with internal coupling. Triode oscillator grid coils L13 (S.W.), L15 (M.W.), L17 (L.W.) are tuned by C25; parallel trimming by C26 (S.W.), C27 (M.W.), C28 (L.W.); series tracking by C5 (M.W.) and C29 (L.W.); oscillator anode reaction coils L14 (S.W.), L16 (M.W.), L18 (L.W.).

Single variable-mu R.F. pentode intermediate frequency amplifier (V2, Mullard metallised VP4B) operates with tuned-primary tuned-secondary transformer

R11 and manual volume control R14 to C.G. of pentode output valve (V4, Mullard PenA4). Fixed tone correction in anode circuit by C15. Provision for connection of external high-impedance speaker across primary of T1.

Second diode of V3, fed via C11, provides D.C. potential which is developed across R12, R13 and fed back as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage is obtained from drop along V4 cathode resistance R15.

When the receiver is switched for gramophone operation, the I.F. valve V2 operates as an A.F. amplifier with R8 as anode load and C14 as coupling to the output valve.

H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Mullard IW4/350). Smoothing by speaker field coil L25 and dry electrolytic condensers C17, C18. Mains aerial coupling by C19.

COMPONENTS AND VALUES

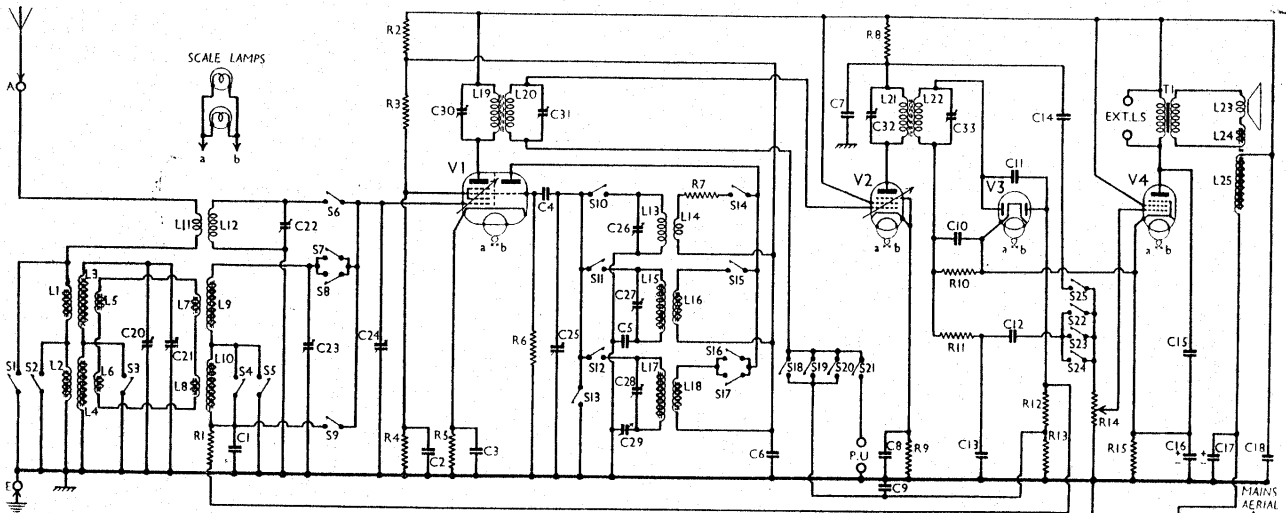
RESISTANCES		Values (ohms)
R1	V1 hexode C.G. decoupling	1,000,000
R2	V1 S.G.'s and osc. anode	13,000
R3	H.T. potential divider	10,000
R4		25,000
R5	V1 fixed G.B. resistance	200
R6	V1 osc. C.G. resistance	25,000
R7	V1 osc. anode S.W. stabiliser	100
R8	V2 anode decoupling	5,000
R9	V2 fixed G.B. resistance	150
R10	V3 signal diode load	500,000
R11	I.F. stopper	50,000
R12	V3 A.V.C. diode load	500,000
R13	Manual volume control	500,000
R14		500,000
R15	V4 G.B. resistance	150*

* May be 100 O.

CONDENSERS		Values (uF)
C1	V1 hexode C.G. decoupling	0.1
C2	V1 hexode S.G.'s by-pass	0.1
C3	V1 cathode by-pass	0.1
C4	V1 osc. C.G. condenser	0.0001
C5	V1 osc. M.W. tracker	0.002
C6	V1 osc. anode decoupling	0.1
C7	V2 anode decoupling	0.002
C8	V2 cathode by-pass	0.1
C9	V2 C.G. decoupling	0.1
C10	I.F. by-pass	0.00025
C11	V3 A.V.C. diode feed	0.00025
C12	Radio A.F. coupling to V4	0.005
C13	I.F. by-pass	0.00025
C14	Gram. A.F. coupling to V4	0.005
C15	Fixed tone corrector	0.005
C16*	V4 cathode by-pass	25.0
C17*		8.0
C18*	H.T. smoothing	12.0
C19	Mains aerial coupling	0.00025
C20†	Band-pass pri. trimmer	0.0001
C21†	Band-pass pri. tuning	0.0001
C22†	Aerial S.W. trimmer	0.00003
C23†	Band-pass sec. trimming	0.00003
C24†	Band-pass sec. and S.W. tuning	0.00003
C25†	Osc. tuning	0.00003
C26†	Osc. S.W. trimmer	0.00003
C27†	Osc. M.W. trimmer	0.00003
C28†	Osc. L.W. trimmer	0.00003
C29†	Osc. L.W. tracker	0.0007
C30†	1st I.F. trans. pri. tuning	—
C31†	1st I.F. trans. sec. tuning	—
C32†	2nd I.F. trans. pri. tuning	—
C33†	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial M.W. and L.W. coupling coils	70.0
L2		6.75
L3	Band-pass primary coils	1.6
L4		14.0
L5	Band-pass coupling coils	22.0
L6		22.0
L7	Band-pass coupling coils	22.0
L8		1.6
L9	Band-pass secondary coils	15.0
L10		15.0

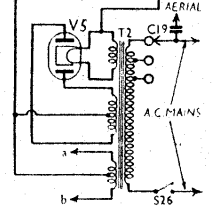


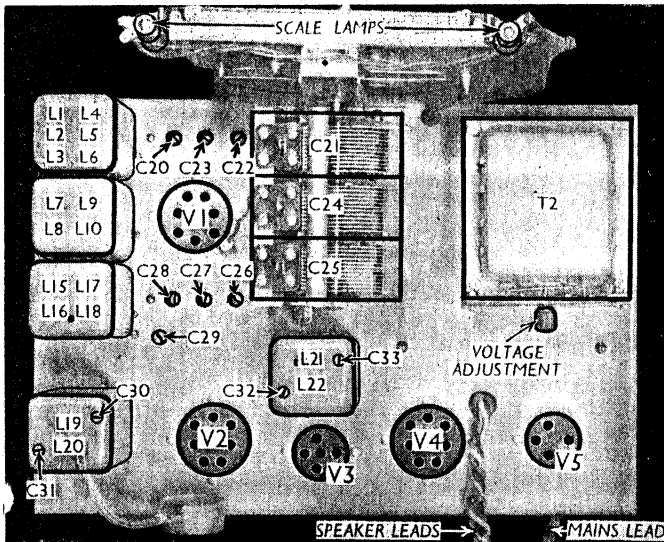
couplings C30, L19, L20, C31 and C32, L21, L22, C33.

Intermediate frequency 117.5 KC/S.

Diode second detector is part of separate double diode valve (V3, Mullard metallised 2D4A). Audio-frequency component in rectified output is developed across R10 and passed via I.F. stopper

Circuit diagram of the Alba 870 (A.C.) 3-band superhet. When using a pick-up the I.F. valve becomes an A.F. amplifier.





Plan view of the chassis. Note that the signal frequency and oscillator trimmers are adjustable through holes in the chassis deck.

Switch	S.W.	M.W.	L.W.	Gram.
S1	C	O	O	O
S2	O	C	O	C
S3	O	C	O	O
S4	O	C	O	O
S5	O	O	C	O
S6	C	O	O	C
S7	O	C	O	O
S8	O	C	O	O
S9	O	C	O	C
S10	O	C	O	O
S11	O	C	O	O
S12	O	O	C	O
S13	O	O	C	C
S14	C	O	O	O
S15	O	C	O	O
S16	O	O	C	O
S17	O	O	O	C
S18	C	O	O	O
S19	O	C	O	O
S20	O	O	C	O
S21	O	O	O	C
S22	C	O	O	O
S23	O	C	O	O
S24	O	O	C	O
S25	O	O	O	C

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L11	Aerial S.W. coupling coil	0.1
L12	Aerial S.W. tuning coil	Very low
L13	Osc. S.W. tuning coil	Very low
L14	Osc. S.W. reaction coil	3.5
L15	Osc. M.W. tuning coil	1.6
L16	Osc. M.W. reaction coil	50.0
L17	Osc. L.W. tuning coil	10.0
L18	Osc. L.W. reaction coil	2.5
L19	1st I.F. trans. Primary	50.0
L20	1st I.F. trans. Secondary	50.0
L21	2nd I.F. trans. Primary	50.0
L22	2nd I.F. trans. Secondary	50.0
L23	Speaker speech coil	1.9
L24	Hum neutralising coil	0.1
L25	Speaker field coil	2,000.0
T1	Speaker input trans. Pri.	500.0
	Sec.	0.3
T2	Mains trans. Pri. total	50.0
	Heater sec.	0.05
	Rect. heat. sec.	0.1
	H.T. sec. total	600.0
S1-17	Waveband and muting switches	---
S18-25	Radio-gram. change switches	---
S26	Mains switch, ganged R14	---

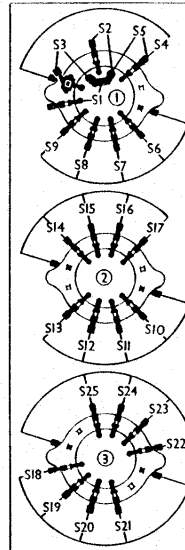
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH4*	260	2.1	55	3.1
V2 VP4B	175	15.0	260	5.4
V3 2D4A	---	---	---	---
V4 PenA4	240	38.0	260	4.8
V5 1W4/350	385†	---	---	---

* Oscillator anode, 110 V, 5.0 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—S1-S25 are the waveband and gramophone switches, in three ganged rotary units beneath the chassis. The three units are indicated in the under-chassis illustration, the arrows indicating the directions in which they are viewed in the diagrams on the right. The table (col. 3) gives the switch positions for



the four control settings, starting from the fully anti-clockwise position, O indicating open, and C closed.

S26 is the Q.M.B. mains switch, ganged with the volume control R14.

Continued overleaf

Switch diagrams, looking at the underside of the chassis in the directions of the arrows in the illustration below.

DISMANTLING THE SET

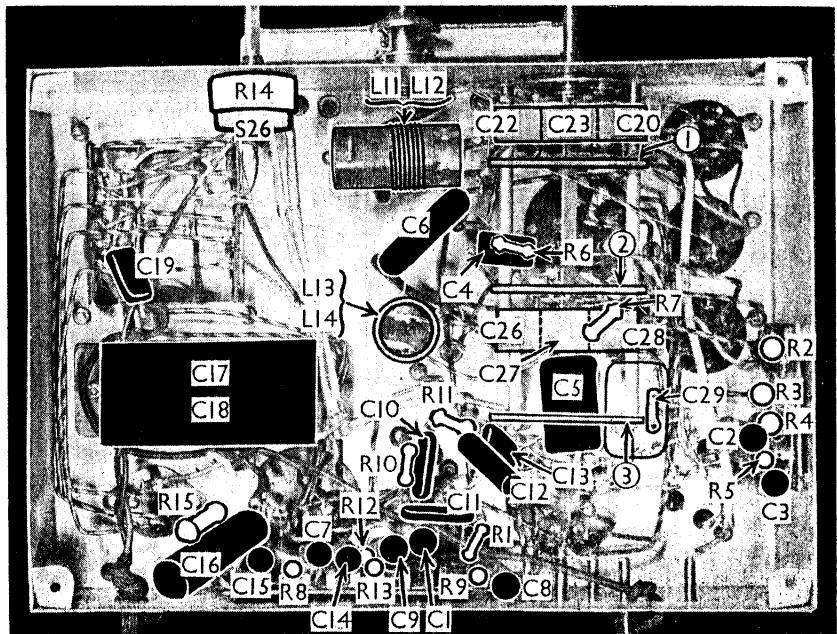
Removing Chassis.—First remove the four control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unsolder the speaker leads and when replacing, connect them as follows:—F and 3 joined together, red; 1, black; F, blue. The white lead goes to the tag on the bottom right-hand speaker fixing screw.

Removing Speaker.—Remove the nuts from the four screws holding it to the sub-baffle. When replacing, see that the transformer is on the right and do not forget to fix the tag for the earthing lead on the bottom right-hand screw.

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 2) are those measured in our receiver when it was operating on mains of 230 V, using the 220 V tapping on the mains transformer. The set was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.



Under-chassis view. The seven trimmers are adjusted through holes in the chassis deck.