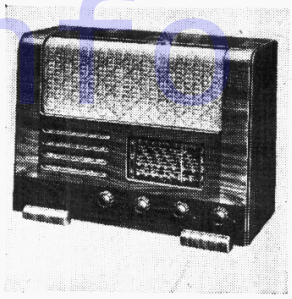
"TRADER" SERVICE SHEET

854

ALBA 471

FOUR-BAND BATTERY SUPERHET



TWO valves are used in a Q.P.P. output circuit in the Alba 471, a 5-valve 3-band battery superhet, whose S.W. range is 19-50 m. Provision is made for a pick-up and an external speaker.

Release date and original price: May, 1947; £16 16s.

CIRCUIT DESCRIPTION

Aerial input via series capacitor **C1** and coupling coils **L1** (S.W.), **L2** (M.W.) and **L3** (L.W.) to single-tuned circuits **L4, C25** (S.W.), **L5, C25** (M.W.) and **L6, C25** (L.W.), which precede octode valve **(V1, Mullard metallized KK32)** operating as frequency changer with electron coupling.

Oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C26**. Parallel trimming by **C27** (S.W.), **C28** (M.W.) and **C6, C29** (L.W.); series tracking by **C7** (S.W.), **C8** (M.W.) and **C9** (L.W.) Reaction coupling by anode coils **L10** (S.W.), **L11** (M.W.) and **L12** (L.W.).

Second valve **(V2, Mullard metallized KF35)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings.

Intermediate frequency 455 kc/s.

Diode second detector is part of double diode triode valve **(V3, Mullard metallized KBC32).** Audio frequency component in rectified output is developed across load resistor **R6** and passed via A.F. coupling capacitor **C16**, switch **S13**, and manual volume control **R7** to control grid of triode section, which operates as A.F. amplifier.

Second diode of **V3**, fed from **V2** anode via **C15**, provides D.C. potential which is developed across **R9** and fed back, via decoupling circuits, as G.B. to F.C. (except on S.W.) and I.F. valves, giving A.V.C.

Parallel-fed transformer coupling, by **C17** and **T1**, between **V3** triode and quiescent push-pull output stage comprising two pentodes **(V4, V5, Mullard KL35's).**

Fixed G.B. for all valves, and A.V.C. delay voltage, is obtained from the drop across **R11, R12** in series with the negative H.T. lead to chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver, using an H.T. battery measuring 115 V on load.

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 KK32	107	0·22	47	1·4
	Oscillator			
	107	3·5		
V2 KF35	107	1·2	47	0·28
V3 KBC32	55	0·22	—	—
V4 KL35	106	2·2	107	0·35
V5 KL35	106	2·2	107	0·35

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Location
R1	V1 pent. C.G. decoup.	250,000	F5
R2	V1 osc. C.G. ...	47,000	E5
R3	S.G.'s H.T. feed ...	33,000	F5
R4	I.F. stopper ...	47,000	B2
R5	A.V.C. decoupling	1,200,000	D5
R6	Sig. diode load ...	470,000	B2
R7	Volume control ...	1,000,000	D3
R8	V3 triode load ...	150,000	C5
R9	A.V.C. diode load...	1,200,000	D5
R10	Tone control ...	50,000	C3
R11	Fixed G.B. and	100	C5
R12	A.V.C. delay ...	*500	C5
R13	T1 sec. artificial	560,000	C5
R14	centre tap ...	560,000	C6
R15	V4 G.B. decoup. ...	47,000	C5

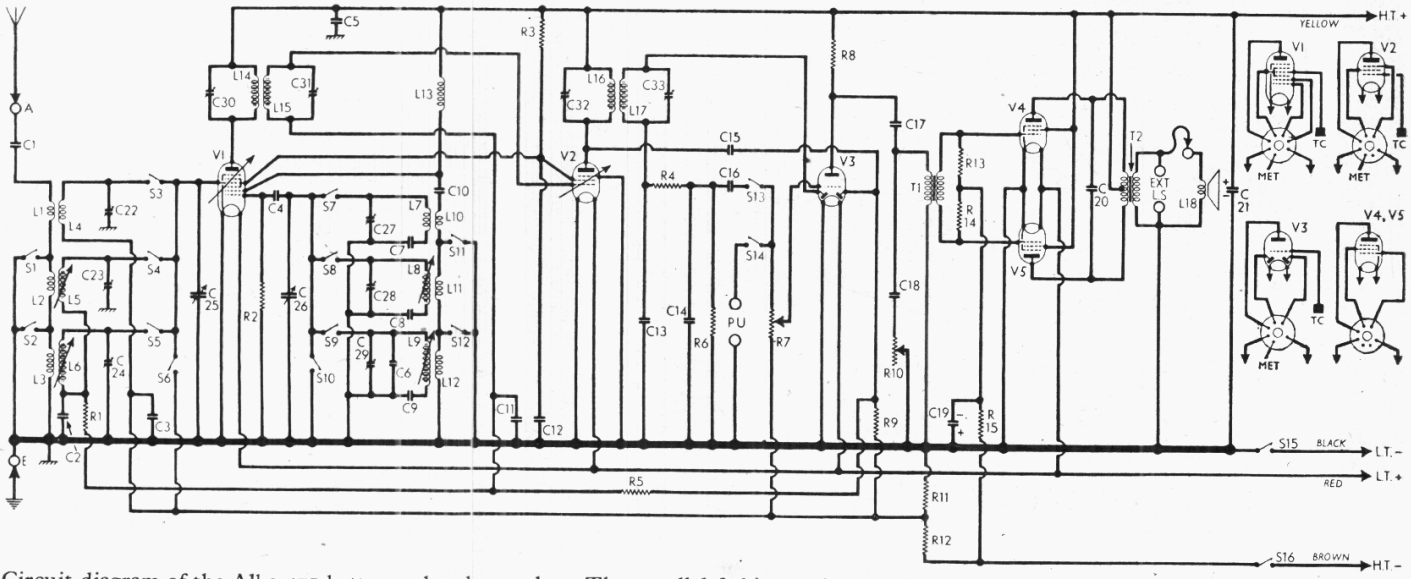
* Made up of 200 Ω + 300 Ω in series.

	CAPACITORS	Values (μF)	Location
C1	Aerial series ...	0·0002	F5
C2	V1 pent C.G. de-	0·05	F5
C3	coupling... ...	0·1	D4
C4	V1 osc. C.G. ...	0·0001	E5
C5	H.T. R.F. by-pass	0·1	F5
C6	L.W. fixed trim. ...	0·000056	E3
C7	Osc. S.W. tracker...	0·0056	E3
C8	Osc. M.W. tracker	0·000575	E3
C9	Osc. L.W. tracker...	0·0002	E3
C10	Osc. anode coup. ...	0·0001	E4
C11	V2 C.G. decoup. ...	0·05	D6
C12	S.G.'s decoup. ...	0·1	F5
C13	I.F. by-passes ...	0·0001	B2
C14		0·0001	B2
C15	A.V.C. coupling ...	0·0002	D6
C16	A.F. coupling cap-	0·005	C5
C17	acitors	0·1	C5
C18	Part tone control...	0·01	C4
C19*	V4 G.B. by-pass ...	50·0	C4
C20	Tone corrector ...	0·0005	B1
C21*	H.T. reservoir ...	8·0	E6
C22‡	Aerial S.W. trim. ...	0·00005	A1
C23‡	Aerial M.W. trim....	0·00005	E3
C24‡	Aerial L.W. trim. ...	0·00005	E3
C25†	Aerial tuning ...	0·0005	A2
C26†	Oscillator tuning ...	0·0005	A1
C27‡	Osc. S.W. trim. ...	0·00005	A1
C28‡	Osc. M.W. trim. ...	0·00005	E3
C29‡	Osc. L.W. trim. ...	0·00005	E3
C30‡	1st I.F. transformer	0·0002	A2
C31‡	tuning	0·0002	A2
C32‡	2nd I.F. transfor-	0·0002	B2
C33‡	mer tuning ...	0·0002	B2

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)	Location
L1	Aerial coupling	0·2	F3
L2	coils	0·6	F3
L3		80·0	F3

(Continued overleaf)



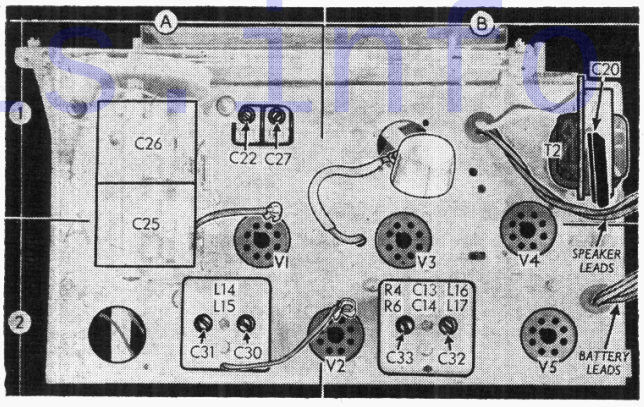
Circuit diagram of the Alba 471 battery 3-band superhet. The parallel-fed intervalve transformer **T1** is artificially centre-tapped by **R13-R14.**

OTHER COMPONENTS (*continued*)		Approx. Values (ohms)	Location
L4	Aerial tuning coils	Very low	F3
L5		2·2	F3
L6		19·5	F3
L7	Oscillator tuning coils	Very low	F3
L8		1·8	F3
L9		5·0	F3
L10	Oscillator reaction coils	0·3	F3
L11		1·5	F3
L12		2·0	F3
L13	Osc. R.F. choke	215·0	E6
L14	1st I.F. trans. Pri.	6·5	A2
L15	1st I.F. trans. Sec.	6·5	A2
L16	2nd I.F. trans. Pri.	6·5	B2
L17	2nd I.F. trans. Sec.	6·5	B2
L18	Speech coil	2·0	—
T1	Intervalve trans. Pri.	1,400·0	D4
	Intervalve trans. Sec.	3,500·0	D4
T2	Output trans. Pri., total	1,400·0	B1
	Output trans. Sec.	0·3	B1
S1-S14	Waveband switches	—	E3
S15, S16	Battery switches, g'd R10	—	C3

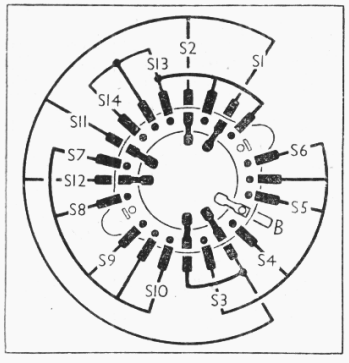
DISMANTLING THE SET

Removing Chassis.—Remove the four control knobs (recessed grub screws) from the front of the cabinet;
from the underside of the cabinet remove the four round-head screws (with washers) securing the chassis to the base of the cabinet, and slide out chassis to the extent of the speaker leads.

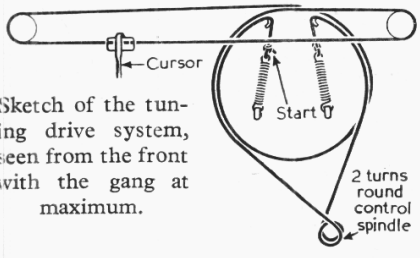
Removing tuning assembly.—Unsolder from the seven tags on the assembly the leads connecting it to the chassis; also the mauve lead which emerges from the assembly close to the tag strip, the yellow lead to the volume control, and the earth braid which joins a chassis tag to the right of the assembly.
Switch set to S.W., loosen the grub screw of the waveband indicator operating arm and slide the arm off the spindle;
remove four cheese-head screws (with lock washers) securing the assembly to the front chassis member, and lift it out.
When replacing, the heads of two trimmers (**C22, C27**) should project through the hole in the chassis deck.
Connect the leads to the tuning assembly as follows, numbering the tags from left to right: 1, to **C4** and **C26**; 2, to **C10**; 3, screened lead to "live" P.U. socket; 4, screened lead to **C16**; 5, to **C1**; 6, to junction of **R1, C2**; 7, to **C25**. The mauve lead goes to **C3**, the yellow lead emerging from the front of the assembly goes to the righthand tag on **R7**, and the braided earth lead should be resoldered to the chassis tag on the right of the assembly.



Plan view of the chassis. The I.F. transformer tuning capacitor adjustments are indicated, as also are the S.W. aerial (**C22**) and oscillator (**C27**) trimmers.



The switch unit, seen from rear.



Sketch of the tuning drive system, seen from the front with the gang at maximum.

GENERAL NOTES

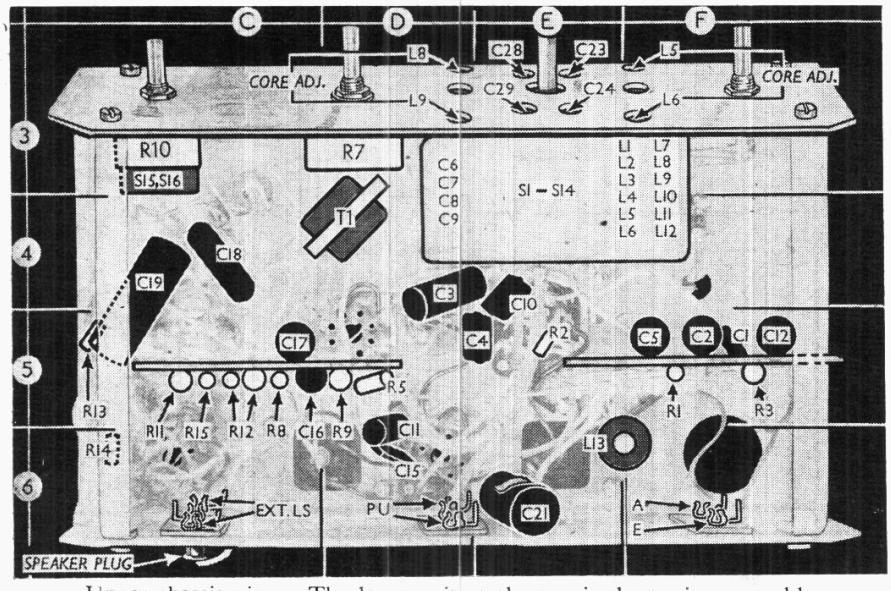
Tuning Assembly.—This contains all the R.F. and oscillator coils **L1-L12** and associated trimmers and trackers, together with the waveband switch unit **S1-S14.** Instructions for removing and replacing the assembly are given under "Dismantling the Set."

Switches.—S1-S14 are the waveband and pick-up switches, ganged in a single rotary unit in the tuning assembly. In the diagram in col. 2, the unit is drawn in detail as seen when the cover is removed from the tuning assembly, and the latter is inverted, as seen in our under-chassis view. The table below gives the switch positions for the four control settings, starting from the anti-clockwise position of the control. A dash indicates open, and **C** closed.

Drive Cord Replacement.—The sketch (col. 2) shows the course taken by the nylon-braided glass cord, and is self-explanatory. Fifty-four ins. of cord provides an ample length and allows a margin for tieing off.

Switch Table

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



Under-chassis view. The large unit at the top is the tuning assembly.

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator, via an 0.1 μF capacitor in the "live" lead, to control grid (top cap) of **V1** and the **E** socket. Turn the volume control to maximum, feed in a 455 kc/s (659.3m) signal, and adjust **C30, C31, C32** and **C33** (location references A2, B2) for maximum output, keeping the input low to avoid A.V.C. action.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursor should coincide with the high wavelength ends of the three scales. Transfer "live" signal generator lead, via a suitable dummy aerial, to **A** socket.

M.W.—Switch set to M.W., tune to 215 m on scale, feed in a 215 m (1,396 kc/s) signal, and adjust **C28** and **C23** (E3) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of **L8** (D3) **L5** (F3) for maximum output. Check setting of **L8** at 350 m (857 kc/s) for correct calibration, and repeat the **C28, C23** adjustments if necessary.

S.W.—Switch set to S.W., tune to 19 m on scale, feed in a 19 m (15.79 mc/s) signal, and adjust **C27** and **C22** (A1) for maximum output.

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C29** and **C24** (E3) for maximum output. Tune to 1,900 m on scale, feed in a 1,900 m (157.9 kc/s) signal, and adjust the cores of **L9** (D3) and **L6** (F3) for maximum output. Finally, check the settings of **C29** and **C24.**

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