

SERVICE ENGINEER

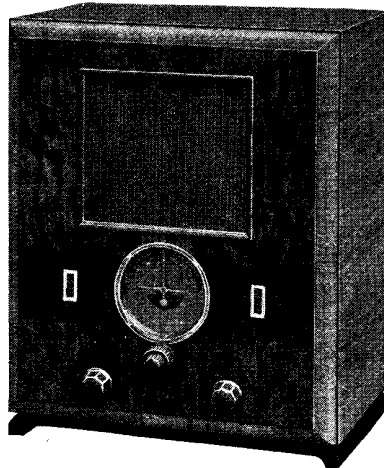
ALBA MODEL 880 ALL-WAVE A.C. SUPERHET

CIRCUIT.—An A.C. mains superhet receiver for operation on three wavebands—short, medium and long.

The coupling between the aerial and V1, the frequency changer, is through a band-pass filter on medium and long waves and tuned grid with aperiodic coupling on short waves.

The signal passes to V2, an H.F. pentode, through an iron-cored I.F. transformer tuned to 117.5 kc., and to V3, an H.F. pentode, and V4, a double diode, through two further I.F. transformers. One diode of V4 supplies A.V.C. bias to the preceding valves in the orthodox manner.

The L.F. output of V4 is fed to the output pentode valve V5 through a resistance and capacity network, and after amplification, to the speaker through a matching transformer.



The Alba 880 receiver is made by A. J. Balcombe, Ltd., and is a five-valve plus rectifier superhet which covers a short-wave range as well as the two normal wavebands.

Layout diagrams giving details of the chassis are given on the facing page.

Mains equipment consists of transformer, full-wave rectifier, electrolytic condensers, and the speaker field.

Special Notes.—The external speaker is connected on the high resistance side of the output transformer and should have its own matching transformer.

The position of the plug in its socket determines whether the internal speaker is disconnected or not.

The pilot lamps are rated at 6.2 v. .3 amp. The holders of all but the tuning indicator lamp are fixed by spring clips.

Removing Chassis.—Remove four knobs (Continued on opposite page.)

RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling ...	100,000
2	V1 A.V.C. decoupling ...	1 meg.
3	V1 screen decoupling potr. ...	25,000
4	V1 cathode bias ...	250
5	V1 osc. grid leak ...	50,000
6	V1 osc. anode decoupling ...	75,000
7	V2 A.V.C. decoupling ...	.5 meg.
8	V2 cathode bias ...	400
9	V3 A.V.C. decoupling ...	.5 meg.
10	V3 cathode bias ...	250
11	V3 screen decoupling ...	10,000
12	V3 anode load ...	5,000
13	H.F. filter ...	50,000
14	V4 demodulator diode load ...	1 meg.
15	Part V4 A.V.C. diode load potr. ...	.25 meg.
16	Part V4 A.V.C. diode load potr. ...	.25 meg.
17	Volume control ...	.5 meg.
18	V5 cathode bias ...	150
19	Part V4 A.V.C. diode load potr. ...	.5 meg.
20	V1 screen decoupling potr. ...	50,000
21	V1 A.V.C. decoupling ...	.1 meg.
22	Grid stopper ...	.1 meg.

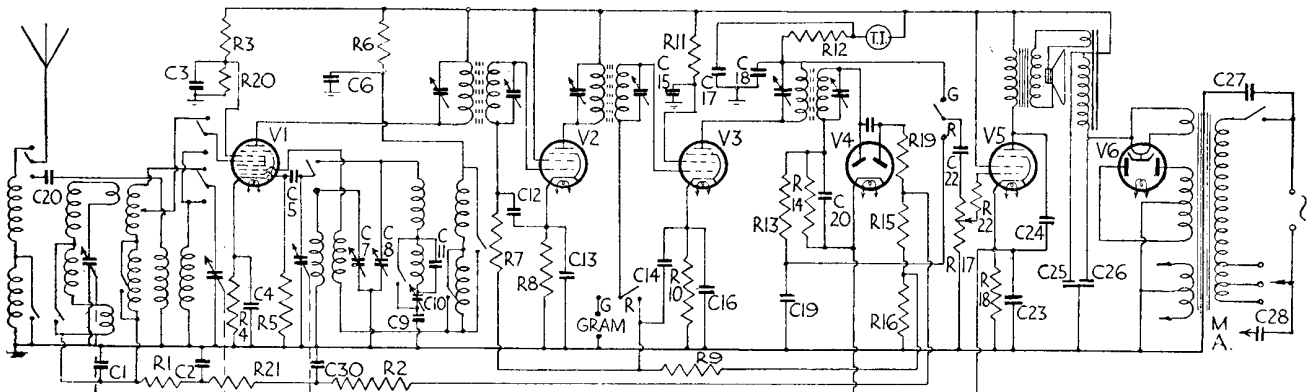
CONDENSERS

C.	Purpose.	Mfd.
1	V1 A.V.C. decoupling ...	.1
2	V1 A.V.C. decoupling ...	.1
3	V1 screen decoupling ...	.1
4	V1 cathode bias shunt ...	.1
5	V1 oscillator grid ...	.000025
6	V1 osc. anode decoupling ...	.1
9	Long and medium-wave padding	.0032
10	Long and medium-wave trimmer	.0007
11	Medium-wave padding ...	.000025
12	V2 A.V.C. decoupling ...	.02
13	V2 cathode bias shunt ...	.1
14	V3 A.V.C. decoupling ...	.02
15	V3 screen decoupling ...	.1
16	V3 cathode bias shunt ...	.25
17	Tuning indicator shunt ...	2
18	H.F. by-pass ...	.002
19	H.F. by-pass ...	.0001
20	H.F. by-pass ...	.0002
21	A.V.C. diode coupling ...	.0002
22	I.F. coupling ...	.005
23	V5 cathode bias shunt ...	.25
24	Pentode compensating ...	.005
25	H.T. smoothing ...	8
26	H.T. smoothing ...	12
27	Suppression condenser ...	.01
28	Mains aerial ...	.0001
29	Series aerial ...	.000075
30	V1 A.V.C. decoupling ...	.1

QUICK TESTS

Quick tests are available on this model on the terminal strip on the speaker transformer. Volts measured between this and the chassis should be:—

- Yellow, earth link to chassis.
- Blue, 400 v., unsmoothed H.T.
- White, 245 v., smoothed H.T.
- Black, 230 v., V5 anode volts.
- Red, 245 v., smoothed H.T.



The use of two intermediate frequency amplifying stages is an original feature in the Alba 880. As a whole the circuit follows typical modern practice.

ALBA 880 ALL-WAVE SUPERHET (Continued)

from the front of the cabinet (two tuning knobs), which are secured by grub screws, and four bolts from underneath.

The chassis will then slide out of the cabinet far enough without disconnecting the speaker leads.

ALIGNMENT NOTES

I.F. Circuits.—The intermediate frequency is 117.5 kc., and for correct alignment the transformers should be adjusted with the aid of an oscilloscope. The manufacturers state that should the I.F. transformers need adjustment the receiver should be returned to the factory.

Medium Wave Band.—(1) Close the tuning condenser and check that the pointer is on the 550 metres index mark.

(2) Connect a modulated oscillator to the aerial and earth terminals and an output meter across the external speaker terminals, taking care to keep the output from the oscillator below A.V.C. level.

(3) Tune oscillator and receiver to 500 metres and adjust T1 and T2 for maximum reading on output meter.

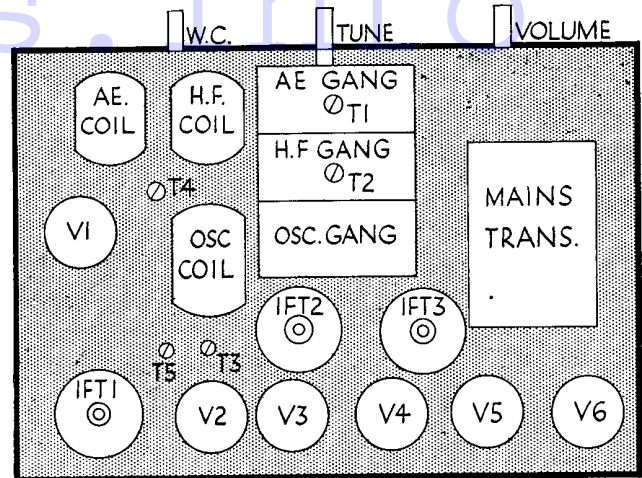
(4) Tune oscillator and receiver to 220 metres and adjust T3 for maximum on output meter.

(5) Repeat 3 and 4 for check.

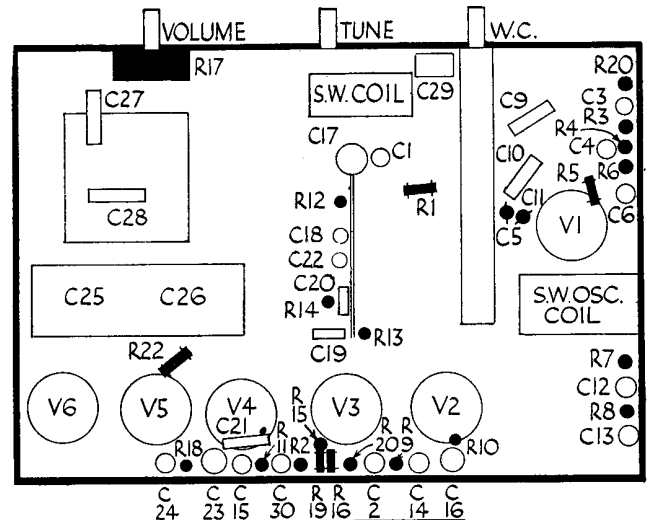
Long Wave Band.—Tune oscillator and receiver to 1,600 metres and adjust T4 for maximum reading on output meter.

Short Wave Band.—Adjust oscillator to 20 metres and tune in the signal. Check that the pointer is on the correct index mark; if not, adjust until correct. Then trim T5 for maximum reading on output meter.

The diagram on the right gives a plan view of the Alba 880 chassis and indicates the positions of the valves and other components which are visible from above.



This illustration gives the location of the components underneath the Alba chassis. Resistors are shown in solid black and condensers in outline.



VALVE READINGS				
No signal. Volume maximum. 200 v. A.C. mains.				
V.	Type.	Electrode.	Volts.	Ma.
1	F.C.4 Met.(7)	anode ...	245	1.5
		aux. grid ...	85	5
		osc. anode...	75	2
2	VP4B Met.(7)	anode ...	245	9.2
		aux. grid ...	245	3
3	VP4B Met.(7)	anode ...	165	8.1
		aux. grid ...	175	2.9
4	2D4A Met. (5)	diode ...	—	—
		anode ...	230	32
5	Pen.4VB (7)	anode ...	245	3.4
		aux. grid ...	400	—
6	IW3 (4) ...	filament ...	—	—
(All Mullard)				

USUALLY an excellent indication as to whether a receiver has developed a complete or partial short circuit can be obtained by measuring its resistance between H.T. + and chassis — when, of course, the set is “off.”

First, remembering that all resistance paths between H.T.+ and “earth” are in parallel, the total resistance can be calculated. If the measured resistance is different a little thought will usually suggest the whereabouts of the fault.

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ALBA 880, 890, 990 AC

Five valve, plus rectifier, three waveband superhet with bandpass input circuit and two IF stages. A tuning indicator is incorporated and sockets for a high impedance pick-up are provided. Suitable for operation from standard AC mains. Marketed by A. J. Balcombe, Ltd., 52-58, Tabernacle Street, London, E.C.2.

ON MW and LW signals are coupled by L1 and L2 to the primaries L3 and L4 of a bandpass filter unit, in which L8 and L7 are the secondary windings. The primary and secondary windings are tuned by VC1 and VC2 sections of the triple ganged condenser and coupling between the windings is effected by coils L5 and L6.

On SW signals are fed via C1 to the coupling coil L9 and thence to the short wave grid coil L10. Signals from the tuned circuits are fed direct to the grid of the octode frequency-changer V1, which is cathode biased by R4, decoupled by C5, and is also connected to the AVC line. The screening grid is fed from the junction of the HT potential divider R6, R7 with decoupling effected by C6.

The oscillator section employs tuned grid circuits across VC3 section of the ganged condenser. The coils are in pairs, L11, L12 (SW), L13, L15 (MW) and L14, L16 (LW), the second coil in each group

being the anode feedback winding. R5 and C7 are the gridleak and condenser.

The IF signals from V1 are coupled by the first transformer L17, L18 to the grid of the amplifying valve V2 which is cathode biased by R10, decoupled by C12, while AVC is fed to the grid circuit.

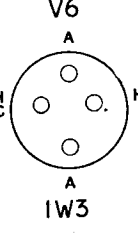
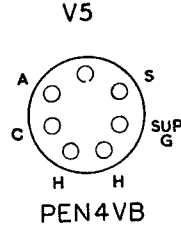
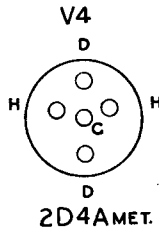
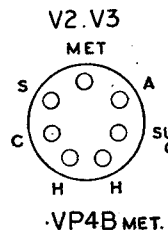
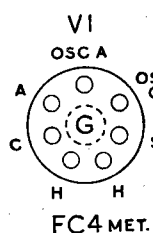
A second IF transformer L19, L20 transfers the signals to the grid of a second IF amplifying valve V3, which is also connected to the AVC line and is cathode biased by R11 decoupled by C14.

On gram the output from the pickup is fed into the grid circuit and V3 then operates as an LF amplifier with R14 as the coupling resistance.

A tuning indicator of the moving-iron type is

RESISTANCES

R	Ohms	R	Ohms
1	1 meg	12	500,000
2	100,000	13	10,000
3	1 meg	14	5,000
4	250	15	1 meg
5	50,000	16	50,000
6	50,000	17	500,000
7	25,000	18	250,000
8	75,000	19	250,000
9	500,000	20	500,000
10	400	21	100,000
11	250	22	150



also in the anode circuit of V3 and is operated by the change of anode current brought about by changes of grid bias caused by variation of signal strength.

A third IF transformer L21, L22 passes on the signal to the signal diode of the double diode V4. The load resistance is R15 filtered by C18 and LF signals are fed via decoupling components R16, C19 and the radiogram switch to the coupling condenser C21 and thence to the volume control R20.

CONDENSERS

C	Mfd	C	Mfd
1	75 mmfd	15	.1
2	.1	16	2
3	.1	17	.002
4	.1	18	.0002
5	.1	19	.0001
6	.1	20	.0002
7	25 mmfd	21	.005
8	.1	22	25
9	.0032	23	.005
10	25 mmfd	24	12
11	.02	25	8
12	.1	26	.01
13	.02	27	.0001
14	.14		

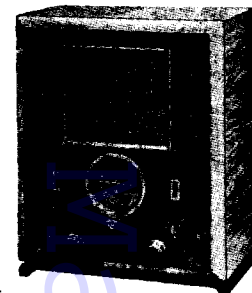
On gram the radiogram switch connects the coupling condenser C21 to the LF coupling resistance R14.

AVC is derived from L22, which feeds a signal to the diode of V4 via C20, the load resistances being R17, R18 and R19. Full control voltage is

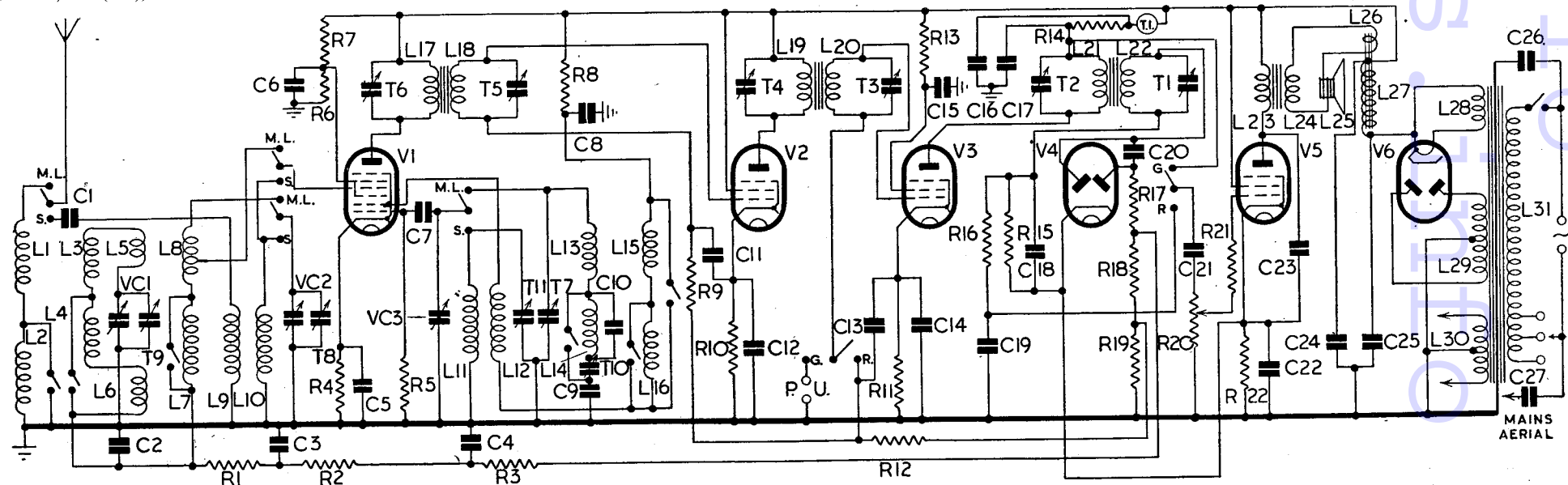
Continued overleaf.

WINDINGS

L	Ohms	L	Ohms
1	9	17	50
2	100	18	50
3	3.5	19	50
4	12	20	50
5	.1	21	50
6	1.75	22	50
7	12	23	350
8	3.5	24	low
9	.1	25	1.75
10	very low	26	low
11	very low	27	2,000
12	25	28	.1
13	4.5	29	300 + 300
14	6.5	30	very low
15	200	31	38 + 6 + 6
16	300		



The Alba 880, by A. J. Balcombe, is unusual in having two intermediate frequency stages and no pre-selector stage.



Three wavebands are covered with bandpass input on M and LW only. The three IF transformers are iron-dust cored. Third IF valve is used as LF amplifier on pickup.

For more information remember www.savoy-hill1.co.uk

ALBA 880, 890 990 AC—Continued

Components both below and above the Alba chassis are identified by these two diagrams. Trimmers are accessible from above.

applied to the grid circuit of V1 via decoupling components R1, R2, R3, C2, C3 and C4, while a smaller voltage is applied to the grid circuits of V2 and V3 via decoupling components R9, R12 and C11.

Delay volts are obtained by connecting V4 cathode to R22.

LF signals from the volume control R20 are fed via the grid stopper R21 to the grid of the output pentode V5 which is cathode biased by R22 de-coupled by C22. The output transformer L23, L24 couples the output valve to the energised moving coil loudspeaker in which L25 is the speech coil, L26 the hum bucking coil and L27 the field winding.

HT is derived from a full-wave rectifier V6 with smoothing effected by the field winding L27 and condenser C24, C25. Mains filtering is by C26 and a mains aerial device comprises a lead connected to C27, which transfers HF energy from the mains supply wiring.

GANGING

IF circuits—The manufacturers state that the IF circuits should be treated as bandpass couplings and should be lined up with the aid of an oscillograph at 117.5 kcs. Satisfactory results should be obtainable by injecting a signal of this frequency into the control grid of V1 and adjusting the trimmers T1—T6 for maximum output at this frequency with the receiver tuned to LW.

If instability occurs, or if the quality of reproduction is unacceptable, the primary or secondary windings may be slightly off-set so that the output meter needle remains constant at maximum reading, while the service oscillator tuning control is swung slowly over the intermediate frequency.

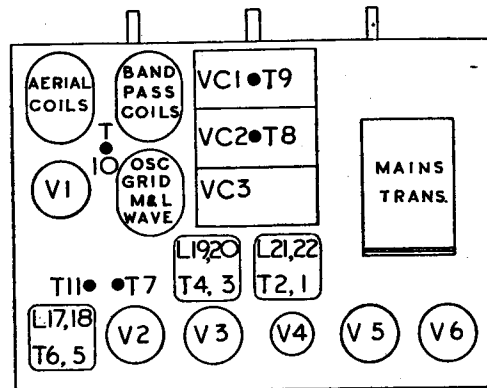
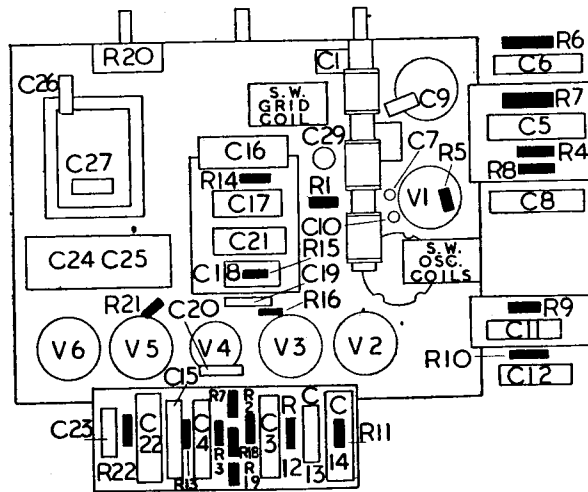
MW band—Switch receiver to MW and inject a signal of 200m into the aerial and earth sockets via a suitable dummy aerial. Adjust T7, T8 and T9 for maximum output.

LW band—Adjust receiver to LW and inject a signal of 1,000m into the aerial and earth sockets.

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	FC4 (Met)	Anode ..	240	2
		Osc Anode ..	74	2.1
		Screen ..	86	4.9
2	VP4B (Met)	Anode ..	240	9.5
		Screen ..	240	3.1
3	VP4B (Met)	Anode ..	168	8
		Screen ..	176	2.8
4	2D4A (Met)	—	—	—
5	PEN 4VB	Anode ..	228	32
		Screen ..	240	3.6
6	1W3	Cathode ..	375 (approx.)	—

Pilot Lamps 6.2v .3 amps.



Tune receiver to 1,000m and adjust T10 for maximum output while rocking gang.

SW band—Inject and tune in a signal of 20m and adjust T11 for maximum output.

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The receiver was returned to the service department for test and functioned perfectly. We sent out another well tried model. When this was installed the same results took place.

The engineer then thought that the iron frame of the building might be affecting the circuits of the set, especially as the IF coils are unshielded, and he tried roughly to retune the set as it stood. This certainly brought up the volume and, as a matter of interest, we took it back to the workshop where it proved hopelessly weak and out of tune.

Finally it was returned to the owner and returned on his premises with satisfactory results.—F. DAY-LEWIS.

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