

LISSEN

SERVICE MANUAL FOR BATTERY 3-BAND SUPERHET RECEIVER MODEL 8304.

TECHNICAL SPECIFICATION

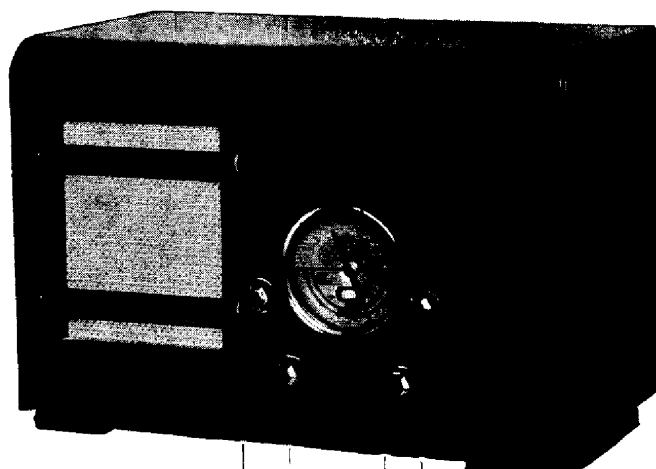
The Model 8304 is a three-band superhet receiver for battery operation. Valves are as follows:—

- Frequency changer Osram X22 (Heptode).
- I.F. Amplifier,
Ever Ready K50N (Variable-mu pentode).
- Detector A.V.C. and L.F. Amplifier,
Ever Ready K23B (Duo-diode-triode).
- L.F. Amplifier (Class "B" driver),
Ever Ready K301E (Triode).
- Output Valve (Class "B"),
Ever Ready K33B (Double-triode).

An inductively coupled band-pass filter precedes the frequency changer on long and medium waves; on short waves the aerial is coupled direct to the aerial coil through a condenser.

The grid coils in the oscillator circuits are tuned, and the oscillator frequency is higher than the signal frequency on medium and long waves, and lower on short waves.

The primary of the first I.F. transformer forms the anode load of the frequency changer, and this



VOLUME CONTROL
AND ON OFF SWITCH.

TONE CONTROL.

TUNING CONTROL

SELECTOR SWITCH.

winding, in common with the other I.F. coils, is tuned to 455 Kc/s. The anode circuit of the I.F. amplifier includes the primary of the second I.F. transformer, the secondary of which is connected direct to the signal diode, and through a small condenser to the A.V.C. diode. The latter applies the A.V.C. potential via decoupled circuits to the grids of the frequency changer and I.F. amplifier valves. L.F. coupling between the triode amplifier in the duo-diode-triode valve, and the Class "B" driver, is by a resistance-capacitance combination, and the driver is coupled to the double-triode output valve by a special Class "B" transformer. Tone control is effected by varying a condenser-resistance combination across the anodes of the output valve.

The grid bias section of the H.T. battery is discharged at a suitable rate whilst the receiver is switched on.

Wavelengths covered by the 8304 are as follows:—

Long waves	850-1,920 metres.
Medium waves	198- 580 ,,
Short waves	19- 50 ,,

The wavechange switches are in position "A" on short waves, "B" on medium waves, and "C" on long waves.

**OPERATING CONDITIONS OF VALVES
IN TYPE A4 RECEIVER.**

Valve	Electrode	Voltage	Current
Frequency Changer	Anode ..	130-135	0.8- 1.2 mA.
Osram X22 .. (Heptode) ..	Screen .. Oscillator Anode ..	50- 55 50- 60	0.8- 1.2 mA. 0.8- 1.2 mA.
I.F. Amplifier ..	Anode ..	130-135	1.75-2.15 mA.
Ever Ready K50N (H.F. Pentode) ..	Screen ..	35- 45	0.75- 1.0 mA.
Detector A.V.C. and L.F. Amplifier, E.R.K23B ..	Anode ..	85- 95	0.5- 1.0 mA.
(Duo-diode-triode)	Grid* ..	-1.5	—
Class "B" Driver	Anode ..	125-133	1.5- 2.0 mA.
E.R. K30E (Triode)	Grid ..	-4.5	—
Class "B" Output Valve E.R. K33B (Double- triode) ..	Each anode Grids ..	127-135 -3.8- -4.2	0.9-1.75 mA. —
Total H.T. current on M.W. with no — signal ..	—	—	9.0-12.0 mA.

* With volume control at minimum.

All voltage measurements made with a Universal Avometer (on 1,200-volt range for all voltages above 50 volts) are to CHASSIS.

Switch in M.W. position for all measurements.

INDUCTANCES.

Code	Description	Part No.	Values
L1	M. and L.W. Primary Coil	78,505	Signal Frequency Coil
L2	M.W. B.P.1 Coil ..		
L3	L.W. B.P.1 Coil ..		
L4	S.W. Signal Frequency Coil		
L5	M.W. B.P.2 Coil ..		
L6	L.W. B.P.2 Coil ..		
L7	S.W. Grid Coil ..		
L8	M.W. Grid Coil ..		
L9	L.W. Grid Coil ..		
L10	S.W. Tickler Coil ..		
L11	M.W. Tickler Coil ..	78,508	Oscillator Frequency Coil
L12	L.W. Tickler Coil ..		
L13	1st I.F. Primary Coil ..		
L14	1st I.F. Secondary Coil ..		
L15	2nd I.F. Primary Coil ..		
L16	2nd I.F. Secondary Coil ..		
T1	Inter-valve Class "B" Driver Transformer ..	77,501	1st I.F. Transformer
T2	Output Class "B" Transformer ..	77,503	2nd I.F. Transformer
		77,502	
		77,504	

SWITCHES.

Code	Description	Part No.	
S1 } S2 } S3 } S4 }	Wave Range Switch ..	83,502	—
S5 }			
S6 }			

VALVES.

Code	Description	Part No.	
V1	Frequency Changer ..	86,500	Osram X22
V2	I.F. Amplifier ..	4,091	Ever Ready K50N
V3	Double Diode Triode ..	4,048	Ever Ready K23B
V4	Driver ..	4,055	Ever Ready K30E
V5	Class "B" Output ..	4,081	Ever Ready K33B

RESISTANCES.

Code	Description	Part No.	Values
R1	A.V.C. Decoupling ..	71,962	110,000 ohm, 1/2 watt
R2	A.V.C. Decoupling ..	71,962	110,000 ohm, 1/2 watt
R3	Oscillator Grid Leak ..	71,962	110,000 ohm, 1/2 watt
R4	M. and L.W. Oscillator Anode Feed ..	71,968	51,000 ohm, 1/2 watt
R5	S.W. Oscillator Anode Feed ..	71,966	16,000 ohm, 1/2 watt
R6	I.F. Valve Screen Feed ..	71,962	110,000 ohm, 1/2 watt
R7	Signal Diode Load ..	71,944	510,000 ohm, 1/2 watt
R8	I.F. Stopper ..	71,968	51,000 ohm, 1/2 watt
R9	Volume Control Potentiometer ..	81,501	500,000 ohm
R10	A.V.C. Decoupling ..	71,962	110,000 ohm, 1/2 watt
R11	1st L.F. Valve Anode Load ..	71,968	51,000 ohm, 1/2 watt
R12	A.V.C. Diode Load ..	71,944	510,000 ohm, 1/2 watt
R13	A.V.C. Diode Load ..	71,945	260,000 ohm, 1/2 watt
R14	A.V.C. Decoupling ..	71,944	510,000 ohm, 1/2 watt
R15	Driver Valve Grid Leak	71,944	510,000 ohm, 1/2 watt
R16	Output Valve Grid Stabiliser ..	71,963	11,000 ohm, 1/2 watt
R17	Output Valve Grid Stabiliser ..	71,963	11,000 ohm, 1/2 watt
R18	Tone Control Potentiometer ..	81,500	50,000 ohm
R19	Bias Discharge ..	71,992	430 ohm, 1/2 watt
R20	A2 Potentiometer ..	71,962	110,000 ohm, 1/2 watt
R21	A2 Potentiometer ..	71,963	11,000 ohm, 1/2 watt

CONDENSERS.

Code	Description	Part No.	Values
C1	L.W. B.P.1 Trimmer ..	82,501	40/100 mmfd.
C2	M.W. B.P.1 Trimmer ..	82,500	5/40 mmfd.
C3	L.W. B.P.2 Trimmer ..	82,501	40/100 mmfd.
C4	M.W. B.P.2 Trimmer ..	82,500	5/40 mmfd.
C5	Signal Circuit S.W. Trimmer	82,500	5/40 mmfd.
C6	Oscillator Circuit S.W. Trimmer	82,500	5/40 mmfd.
C7	Oscillator Circuit M.W. Trimmer	82,500	5/40 mmfd.
C8	Oscillator Circuit L.W. Trimmer	82,501	40/100 mmfd.
C9	M.W. Oscillator Circuit Padder	82,502	300/600 mmfd. 300/600 mmfd.
C10	L.W. Oscillator Circuit Padder		
C11	Triple Gang ..	80,502	540 mmfd. Max.
C12			
C13			
C14	S.W. Aerial Coupling ..	71,262	10 mmfd.
C15	S.W. Tracking ..	68,005	.01 mfd.
C16	A.V.C. Decoupling ..	68,020	.1 mfd.
C17	Frequency Changer Screen Bypass ..	68,020	.1 mfd.
C18	Oscillator Grid Condenser ..	66,035	.0001 mfd.
C19	Oscillator Anode Bypass ..	68,020	.1 mfd.
C20	Oscillator Anode Bypass ..	68,020	.1 mfd.
C21	A.V.C. Decoupling ..	68,020	.1 mfd.
C22	I.F. Trimmers on I.F.T. Assembly	—	—
C23			
C24			
C25			
C26			
C27	I.F. Screen Bypass ..	68,020	.1 mfd.
C28	L.F. Coupling Condenser ..	68,014	.05 mfd.
C29	Signal Diode Load Bypass ..	66,038	.0002 mfd.
C30	A.V.C. Coupling Condenser ..	71,262	10 mmfd.
C31	L.F. Coupling Condenser ..	68,014	.05 mfd.
C32	H.T. Reservoir Condenser ..	13,511	2 mfd.
C33	Tone Control Condenser ..	68,014	.05 mfd.
	Tone Correction ..	66,035	.0001 mfd.

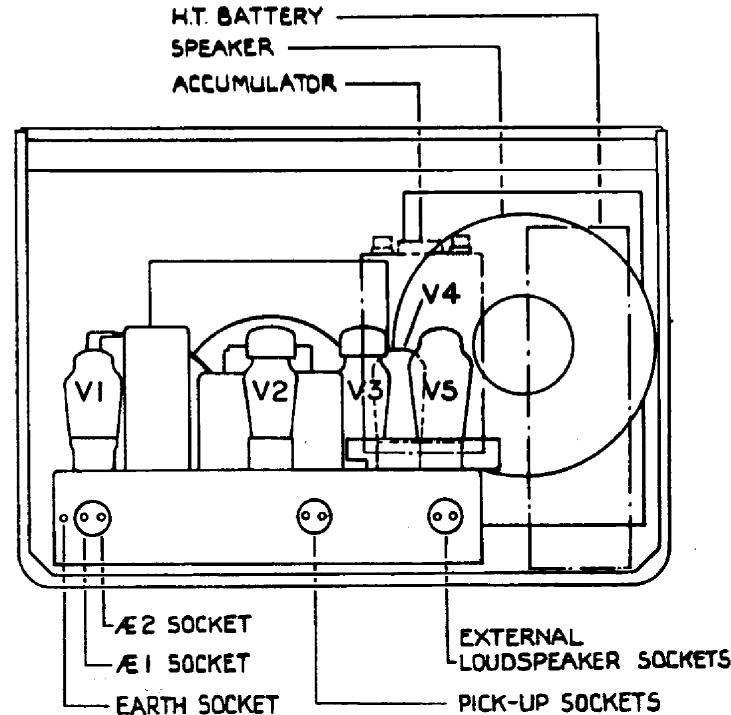
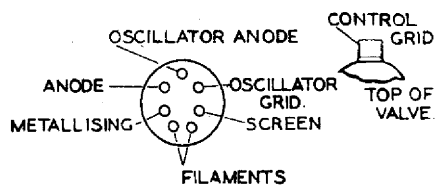
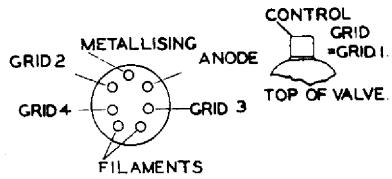


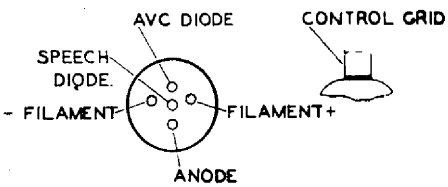
Fig. 5.



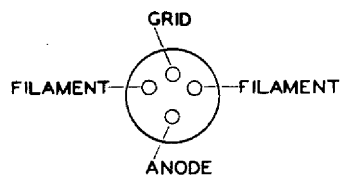
UNDERSIDE OF HOLDER
FOR X22 VALVE.



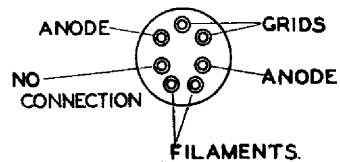
UNDERSIDE OF HOLDER
FOR K.50.N VALVE



UNDERSIDE OF HOLDER
FOR K.23.B VALVE.



UNDERSIDE OF HOLDER
FOR K.30.E VALVE.



UNDERSIDE OF HOLDER
FOR K.33.B VALVE.

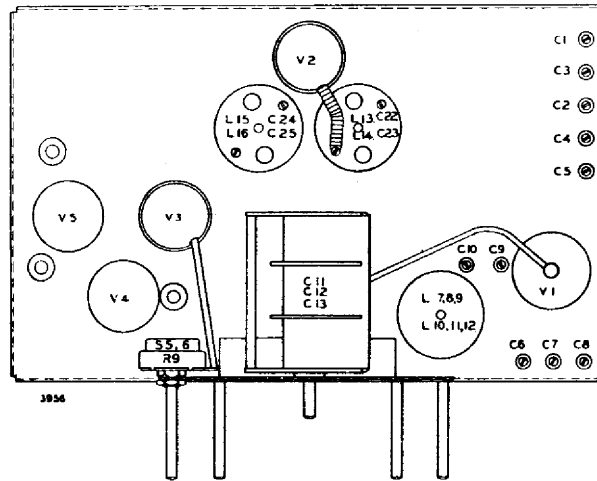


Fig. 2

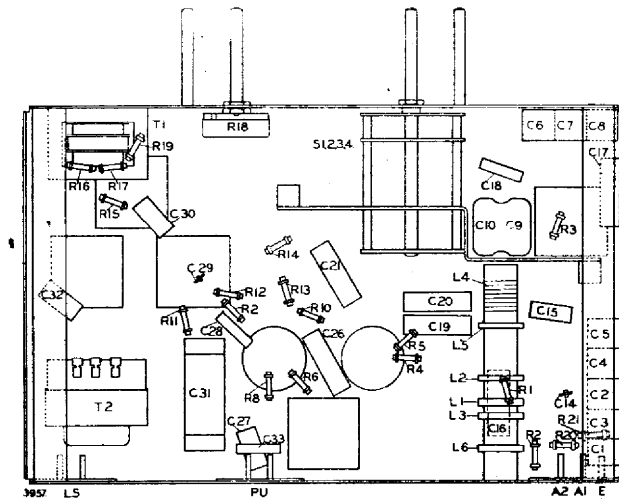
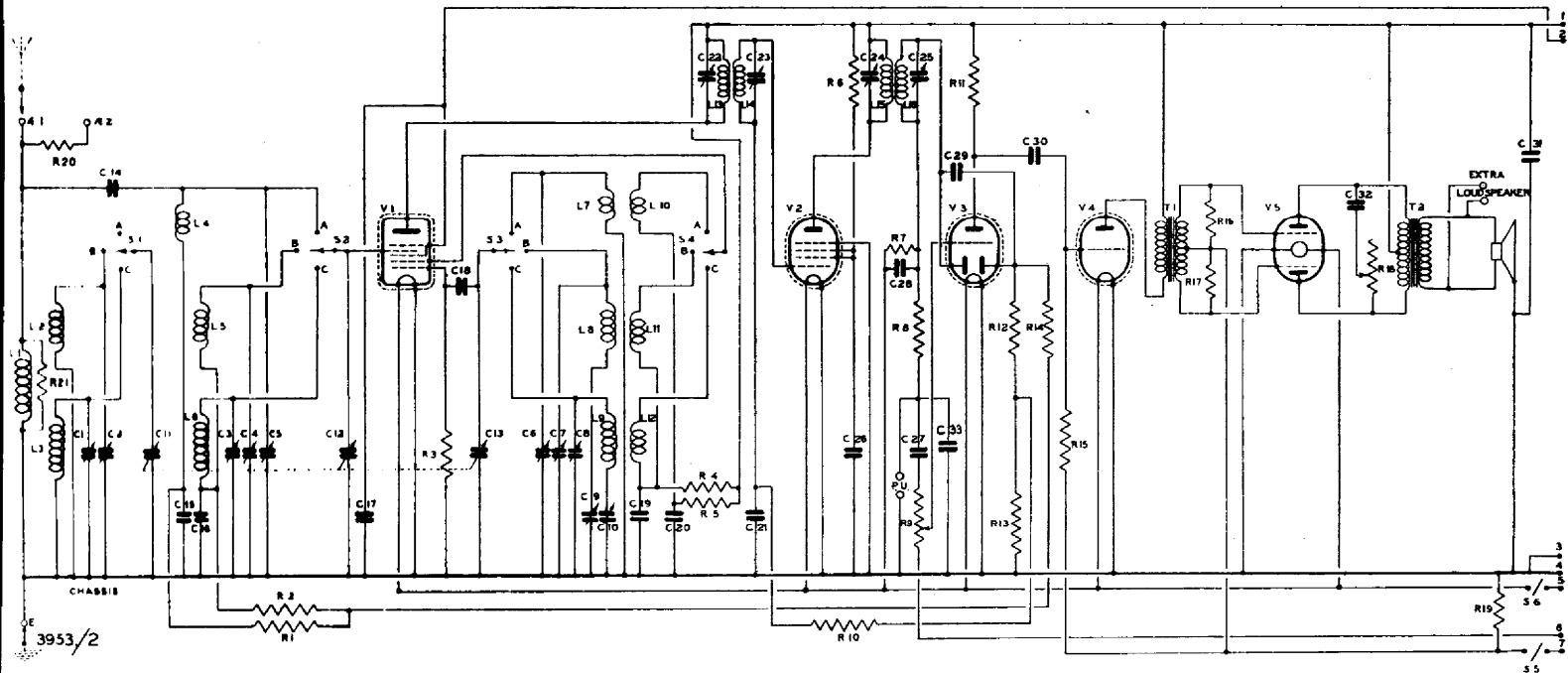


Fig. 3



CIRCUIT DIAGRAM.

Fig. 4

- 1. H.T.+ 136.5V RED
- 2. H.T.+ 525V BLUE
- 3. H.T.+ 45V BROWN
- 4. L.T.- BLACK
- 5. L.T.- RED
- 6. H.T.+ 3V. YELLOW
- 7. H.T.- BLACK