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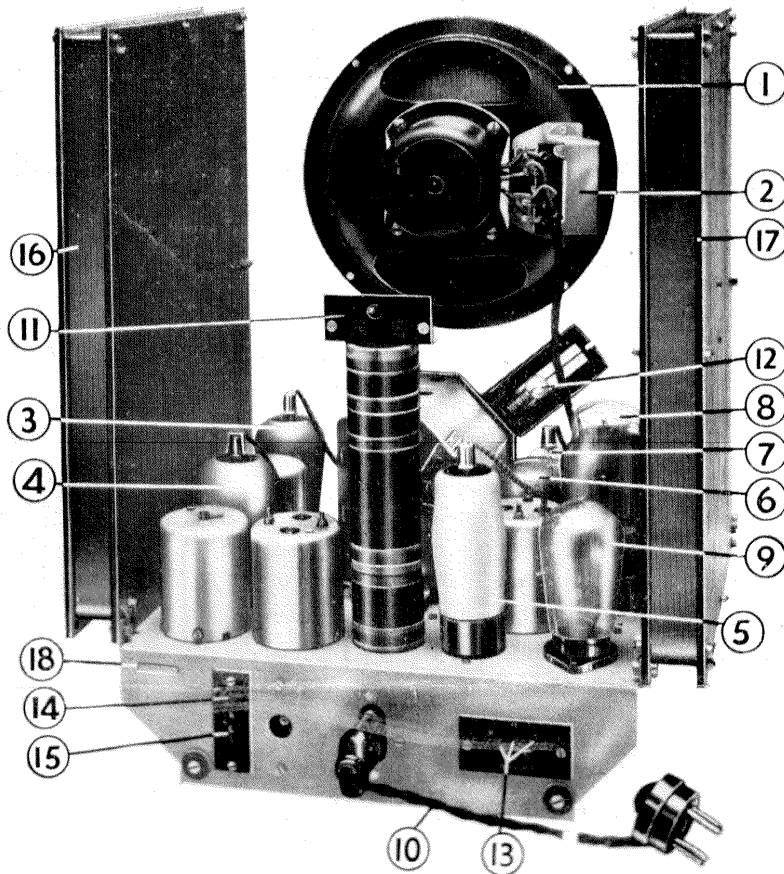
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SERVICE INFORMATION

Ekco

Model ADT95

TRANSPORTABLE RECEIVER



ADT95 Chassis

*Universal model for A.C. or D.C. mains,
200-250 volts.*

1. Speaker mounted in cabinet.
2. Output Transformer.
3. H.F. amplifier valve.
4. Detector-oscillator valve.
5. I.F. amplifier valve.
6. 2nd Detector and AVC valve.
7. L.F. amplifier valve.
8. Output pentode valve.
9. Rectifier valve.
10. Mains lead and plug.
11. Mains voltage adjustment panel.
12. Pilot lamp.
13. Tone control sockets.
14. Aerial socket.
15. Earth socket.
16. Medium wave frame aerial.
17. Long wave frame aerial.
18. Serial number.

WARNING

As the chassis is alive, great care must be taken in handling when back is off, or when chassis is removed from cabinet for test purposes. This particularly applies to sets working on A.C. mains or, in the case of D.C. mains, where the positive main is earthed.

When working on A.C., it is necessary as an extra precaution, to insert the plug in the mains socket so that the chassis is at earth potential. Test by connecting a condenser of about .25 mfd. in series with the earth lead and touch chassis with bare end of wire. If a flash occurs, reverse the mains plug.

IMPORTANT: *This test must NOT be carried out unless condenser is fixed as above, otherwise should polarity of mains be such that chassis is alive, one of the filter coils will be burned out on touching chassis with earth wire as described.*

Do not forget (a) to replace back, (b) fill grub screw holes on control knobs with wax after refitting.

DESCRIPTION OF CIRCUIT

Mains Consumption :

A.C. 230 volts input (plug in 220-230 volt tap) 300-340 m/a.
D.C. 230 volts input (plug in 220-230 volt tap) 300 m/a.

VALVES

1. High Frequency Amplifier.

This valve is an H.F. pentode and functions as a straight H.F. amplifier, the approved type being a Mullard VP13A. A universal base is fitted, the control grid being brought to a terminal on top of valve.

2. Frequency Changer.

This valve is an octode, the approved type being a Mullard FC13, combining the function of first detector and local oscillator. The valve may be considered as a triode oscillator, the electron stream of which acts as cathode for the H.F. pentode. A universal base is fitted and the control grid is brought to a terminal on top of valve.

3. I.F. Amplifier.

This valve is a variable-mu H.F. Pentode, the approved type being a Mazda VP1321. It is fitted with a seven pin base, the anode being connected to a terminal on top of valve.

4. Demodulator.

This valve is a double diode, the approved type being a Mazda DD/620, fitted with a five pin base. One diode acts as demodulator, the other supplying automatic volume control.

5. L.F. Amplifier.

This valve is a standard triode, the approved type being a Mazda HL1320. It is fitted with a seven pin base the grid being brought to a terminal on top of valve.

6. Output Valve.

This is an L.F. Pentode, the approved type being a Mazda Pen35/20, fitted with a seven pin base.

7. Rectifier.

This is either a Mullard UR2 fitted with a universal base (the two anodes being joined together and the valve thus used as a half wave rectifier), or a Brimar ID5 half wave rectifier fitted with a standard five pin base.

SIGNAL FREQUENCY CIRCUIT

This consists of two frame aeriels, one for medium waves and the other for long waves, together with the necessary switching. These aeriels are mounted on each side of chassis; the long wave aerial on left (facing front) and medium wave aerial on right. Incoming signals are passed via a .0001 mfd. condenser to the grid of the H.F. valve, amplified and transferred to the first detector by means of transformer coupling.

Provision is made for connecting an outside aerial and earth. When in use, the former is connected through a .001 mfd. condenser to a tapping point on the medium wave frame, or through this condenser and the choke L3 to a tapping point on the long wave frame, depending upon the setting of the wave change switch. The function of the choke is to prevent medium wave break-through on the long wave band. The frame aeriels act as the first tuned circuit.

The H.F. transformer is mounted in a screened can between the H.F. and octode valves.

OSCILLATOR CIRCUIT

This consists of a tuned grid circuit coupled to a coil in the anode circuit of the triode section of the octode valve.

The oscillator coils are mounted in a screened can on chassis behind octode valve.

INTERMEDIATE FREQUENCY STAGES

The coupling between V2 and V3, and between V3 and V4, is by means of I.F. transformers. These transformers, with the necessary trimmers, are mounted in screening cans on the chassis. The first I.F. transformer is mounted next to the oscillator coil, the second being mounted between the I.F. amplifier and double diode valves.

Trimming condensers are adjusted with a box spanner through holes in top of screening cans.

L.F. STAGE

Resistance capacity coupled to preceding stage.

OUTPUT STAGE

Resistance capacity coupled to preceding stage.

MAINS FILTER

This consists of two Leeson wound coils (L16 and L17) and two condensers (C33 and C34).

POWER SUPPLY

As previously explained, either a full wave rectifying valve is used with the anodes in parallel to give half wave rectification, or a half wave valve may be used on A.C.

When used on D.C., the rectifying valve is actually unnecessary, but, as it passes current continuously so long as the anode is maintained at a positive potential, it is left in circuit to avoid switching complications. It must not be short circuited on D.C., as the polarity of the electrolytic condensers is not reversible.

All valve heaters are connected in series, the mains voltage being reduced by resistance R23.

AUTOMATIC VOLUME CONTROL AND STATIC SUPPRESSION SWITCH

The demodulator diode of the double diode valve V4 is fed from the secondary (L15) of the second I.F. transformer, the load consisting of resistances R7, R8, R10 and R11.

When the static suppression switch (S7) is closed and no signal is applied, the I.F. valve (V3) has a cathode current of about 5 m/a., a potential of $1\frac{1}{2}$ volts being developed across R7. As this bias voltage is applied to the demodulator diode, the valve will fail to rectify. Thus a certain degree of static suppression is continuously applied, but if the switch S7 is opened, thus placing R8 in circuit, the bias will be increased to approximately six volts, and consequently no noise will be heard between stations. When a carrier wave is tuned in, an A.V.C. potential is fed back to the I.F. valve, thus reducing its cathode current, releasing bias on demodulator diode, and the signal becomes audible.

The A.V.C. diode or the double diode valve is supplied with signal voltage in the usual way, the load being made up of resistances R12 and R21, controlling bias being taken from the junction of these two resistances. The A.V.C. potential is supplied to the valves as follows :—

- (a) H.F. Valve.
Through grid leak R2 and resistance R9.
- (b) Octode.
Through the low potential end of its grid coil circuit and the resistance R9. The effect on these two valves is similar, each being biassed more negatively by an incoming carrier wave.
- (c) I.F. Valve.
The low potential end of the grid circuit is returned to centre of A.V.C. diode load.

VOLUME CONTROL

250,000 ohm resistance in grid circuit of L.F. amplifying valve.

tone control

Resistance R17 and condenser C28 can be plugged in across the anode circuit of the output pentode valve.

TO REMOVE CHASSIS FROM CABINET

(In this model the tuning scale and loudspeaker are fixed to the cabinet)

1. Detach back by removing seven special screws.
2. Remove control knobs by slackening grub screws.
3. Remove three screws under large knob.
4. Unplug loudspeaker leads.
5. Remove two screws in brackets holding frame aerials to speaker baffle board.
6. Remove nut from mains switch and push switch in to clear cabinet.
7. Remove four screws sunk in underside of cabinet when chassis can then be withdrawn.

RE-ALIGNMENT AND GANGING

RE-ALIGNMENT

To re-align model ADT95, connect output meter from anode of output valve to chassis. If the meter used does not contain a condenser, isolate from the H.T. supply by means of a condenser of about 2 mfd. Then proceed as follows :—

1. Set wave change switch to long wave position.
2. Set tuning condenser to maximum position.
3. Apply 110 KC output of oscillator to A. and E. sockets.
4. Adjust I.F. trimmers in the following order :—
 - (a) 1st. I.F. Primary.
 - (b) 2nd I.F. Primary.
 - (c) 1st. I.F. Secondary.
 - (d) 2nd I.F. Secondary.

Adjustments (a), (c) and (d) should be for maximum reading on meter, and (b) for minimum reading.

GANGING

1. Set input oscillator at 200 metres.
2. Set wave change switch to medium waves.
3. Swing tuning condenser to 200 metre mark on dial.
4. Adjust oscillator trimmer (front) on ganged condenser for maximum signals.
5. Set input oscillator at 250 metres.
6. Swing tuning condenser to 250 metre mark on dial.
7. Adjust band-pass trimmers for maximum signals.
8. Check calibration on other wavelength.
9. Set wave change switch to long waves.
10. Check calibration on 1600 metres. If out to any extent, adjust by padding condenser at rear of chassis to maximum output, meanwhile rocking tuning condenser slightly.

POSSIBLE FAULTS

1. Crackle.

Cause :

- | | |
|--|--|
| <ul style="list-style-type: none"> (a) Loose pilot light. (b) Noisy valve. (c) Loose connection or valve loose in socket. (d) Internal intermittent short circuit, in fixed condenser. | <ul style="list-style-type: none"> (e) Bad joint. (f) Outside interference. (g) Loose loudspeaker plugs. (h) Loose screening foil on long wave frame aerial. |
|--|--|

2. Hum.

Cause : Suspect HL1320 or pentode output valve.
Poor earth on volume control to chassis.

3. Low Output.

Suspect VP1321, VP13A or HL1320. Also check rectifying valve.

4. No Signals.

- (1) Screened lead of HL1320 triode grid short-circuiting through screen.
- (2) Component short-circuiting to chassis.

VOLTAGES AND RESISTANCE READINGS

(All voltages measured by means of voltmeter with resistance of 1000 ohms per volt.)

Volume Control Resistance ...	...	...	...	250,000 ohms.
Long wave frame aerial ...	...	...	24 ohms. tap to earth	3.5 ohms
Medium wave frame aerial ...	...	...	1.6 ohms. tap to earth	.3 ohms
H.F. Transformer Primary ...	...	...	4.5 ohms, anode to H.T	
H.F. Transformer Secondary Longwave ...	...	...	...	26 ohms
H.F. Transformer Secondary Medium Wave ...	...	...	...	2.3-2.7 ohms

H.F. VALVE VP13A

Anode ...	...	...	...	165-175 volts
Screen ...	...	...	...	80- 85 volts
Bias ...	...	...	...	... 2 volts

DETECTOR OSCILLATOR FC13

Oscillator Anode...	...	...	...	80-85 volts
Modulator Anode ...	...	...	...	150-180 volts
Screen ...	...	...	...	80-85 volts

I.F. VALVE VP1321

Anode ...	...	...	...	165-175 volts
Screen ...	...	...	...	165-175 volts
Bias ...	...	...	...	... 3 volts

L.F. AMPLIFIER DL1320

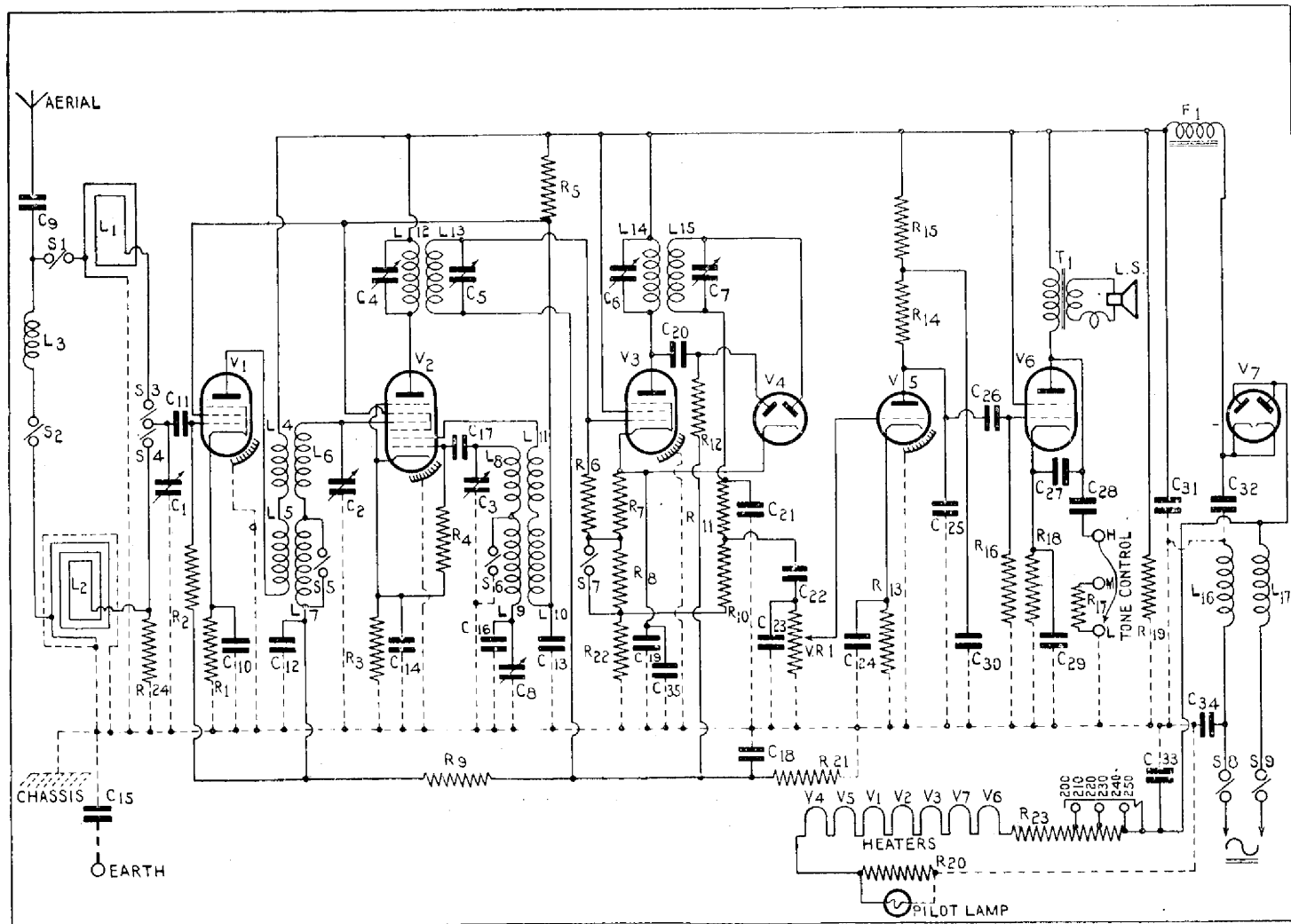
Anode ...	...	...	...	95-100 volts
Bias ...	...	...	...	1.5-2 volts

OUTPUT PENTODE PEN 3520

Anode ...	...	...	...	130-158 volts
Screen ...	...	...	...	165-175 volts
Bias ...	...	...	...	... 6 volts

MODEL ADT95

CIRCUIT DIAGRAM and VALUES



Circuit Diagram ADT95

Ref.	Description	Part No.	Ref.	Description	Part No.	Ref.	Description	Part No.
L1	M.W. Frame Aerial	DP542	C14	Fixed Cond. .1 mfd.	A3844	R9	Fixed Resis. .5meg	A3263
L2	L.W. Frame Aerial	DP543	C15	Fixed Cond. .1 mfd.	A3844	R10	Fixed Resis. 100,000 ohms	A3263
L3	H.F. Choke	DP475	C16	Fixed Cond. .0009 mfd	A3839	R11	Fixed Resis. 100,000 ohms	A3263
L4	H.F. Transformer	S.A.54	C17	Fixed Cond. .001 mfd	A3841	R12	Fixed Resis. .25meg	A3263
L5			C18	Fixed Cond. .01 mfd	A3846	R13	Fixed Resistance 1,000 ohms	A3263
L6			C19	Fixed Cond. .1 mfd	A3844	R14	Fixed Resistance 25,000 ohms	A3263
L7			C20	Fixed Cond. .0001 mfd	A3842	R15	Fixed Resistance 9,000 ohms	A3263
L8			C21	Fixed Cond. .0003 mfd	A3842	R16	Fixed Resistance .25meg	A3263
L9	Oscillator Coil	S.A.60	C22	Fixed Cond. .01 mfd	A3846	R17	Fixed Resistance 9,000 ohms	A3263
L10			C23	Fixed Cond. .0005 mfd	A3842	R18	Fixed Resistance 165 ohms	DP478
L11	1st. I.F. Coil	S.A.61	C24	Electrolytic Cond. 25mfd	A3265	R19	Fixed Resistance 5,000 ohms	A3263
L12			C25	Fixed Cond. .002 mfd	A4109	R20	Fixed Resistance 100 ohms	D.P.437
L13			C26	Fixed Cond. .1 mfd	A3844	R21	Fixed Resistance .25meg	A3263
L14	2nd. I.F. Coil	S.A.62	C27	Fixed Cond. .0025 mfd	A3844	R22	Fixed Resistance 300 ohms	DP441
L15			C28	Fixed Cond. .01 mfd	A3847	R23	Fixed Resistance 460 ohms	DP489
L16	Filter Coil	S.A.64	C29	Electrolytic Cond. 25 mfd	A3265	R24	Fixed Resistance 80,000 ohms	A3263
L17			C30	Elect. Cond. 2 mfd	B4123	V.R.1	Variable Resis. .25meg	B4635
C1			Gang Cond. .0005 mfd.	C4483		C31	Elect. Cond. 24 mfd	T1	Output Transformer	D.P.61
C2	Gang Cond. .0005 mfd.	C32	Elect. Cond. 8 mfd			F1	L.S. Field Coil	
C3	Gang Cond. .0004 mfd.	C33	Fixed Cond. .1 mfd		S1-S6	Wave Change Switch	B4541	
C4	Pre-Set Cond.	S.A.61	C34	Fixed Cond. .0003 mfd	A3842	S7	Noise-Suppression Switch	A4580
C5	Pre-Set Cond.	S.A.62	C35	Elect. Cond. 25 mfd	A3265	S8-S9	On-Off Switch	A4167
C6	Pre-Set Cond.		R1	Fixed Resistance 300 ohms.	D.P.441	V1	H.F. Pentode Valve. V.P.13A	
C7	Pre-Set Cond.		R2	Fixed Resis. .5meg	A3263	V2	Octode Valve F.C.13	
C8	Pre-Set Cond.	D.P.494	R3	Fixed Resis. 300 ohms	D.P.441	V3	I.F. Amplifier Valve. V.P.1321	
C9	Fixed Cond. .001 mfd.	A3842	R4	Fixed Resis. 50,000 ohms	A3263	V4	Double Diode Valve. D.D.620	
C10	Fixed Cond. .1 mfd.	A3844	R5	Fixed Resis. 10,000 ohms	A3263	V5	Triode Valve. H.L.1320	
C11	Fixed Cond. .0001 mfd.	A3842	R6	Fixed Resis. .25meg	A3263	V6	Pentode Output Valve Pen3520	
C12	Fixed Cond. .1 mfd.	A3844	R7	Fixed Resis. 300 ohms	D.P.441	V7	Rectifier Valve U.R.2 or I.D.5	
C13	Fixed Cond. .1 mfd.	A3844	R8	Fixed Resis. 2,000 ohms	A3263			

PRICE LIST OF SPARE PARTS FOR ADT95

Ref. No.	Part No.	Description	List Price	Ref. No.	Part No.	Description	List Price
CABINETS				CONDENSERS			
	DP523	Cabinet (Walnut)	£1.15.0	C1/2/3	C4483	Variable Condenser	18/6d.
	DP524	Cabinet (Black)	£2.2.6	C30/31/32	B4123	24+8+2 Electrolytic Condenser	7/6d.
KNOBBS				C24/29/35	A3265	25 mfd. Electrolytic Condenser	3/6d.
	C3660	Tuning Knob (Walnut)	1/6d.	C9/17	A3842	Condenser .001 mfd.	9d.
	DP143	Tuning Knob (Black)	2/-	C11/20	A3842	Condenser .0001 ,,	9d.
	C3838	Knob (Walnut) Volume Control	9d.	C10/12/13/14			
	DP142	Knob (Black) Volume Control	1/-	15/19/26/33	A3844	Condenser .1 mfd.	9d.
	B4211	Knob (Walnut) Wavechange	9d.	C16	A3839	Condenser .0009 mfd.	9d.
	B4211	Knob (Black) Wavechange	1/-	C18/22/28	A3846	Condenser .01 mfd.	9d.
	B4579	Knob (Walnut) Static Suppressor	9d.	C21/34	A3842	Condenser .0003 mfd.	9d.
	B4579	Knob (Black) Static Suppressor	1/-	C23	A3842	Condenser .0005 mfd.	9d.
				C25	A4109	Condenser .002 mfd.	9d.
				C27	A3684	Condenser .0025 mfd.	9d.
				C28	A3847	Condenser .01 mfd.	9d.
SCALES Etc.				RESISTANCES			
	C4551	Scale	2/-	R20	DP437	Fixed Resistance 100 ohms	1/-
	B4542	Scale Centre Bar	1/6d.	R18	DP478	Fixed Resistance 165 ohms	9d.
	B4505	Scale Clamp	2d.	R1/3/7/22	DP441	Fixed Resistance 300 ohms	1/-
	B4503	Scale Mounting	2/-	R2/9	A3263	Resistance .5 meg.	9d.
LOUDSPEAKER				R4	A3263	Resistance 50,000 ohms	9d.
	D3662/2	M/C Loudspeaker (without trans.)	25/-	R5	A3263	Resistance 10,000 ohms	9d.
	DP61	Output Transformer	10/6d.	R6/12/16/21	A3263	Resistance .25 megs.	9d.
	DP324	Loud Speaker lead	1/-	R8	A3263	Resistance 2000 ohms	9d.
	B3336	Loud Speaker plug mounting	3d.	R10/11	A3263	Resistance 100,000 ohms	9d.
	A3337	Plug for B3336	1d.	R13	A3263	Resistance 1,000 ohms	9d.
COILS				R14	A3263	Resistance 25,000 ohms	9d.
	SA61	1st. I.F. Coil Assembly	5/6d.	R15/17	A3263	Resistance 9,000 ohms	9d.
	SA62	2nd. I.F. Coil Assembly	5/6d.	R19	A3263	Resistance 5,000 ohms	9d.
	SA54	H.F. Transformer Assembly	5/6d.	R24	A3263	Resistance 80,000 ohms	9d.
	SA60	Oscillator Coil Assembly	6/6d.	VR1	B4635	Volume Control	6/-
	SA64	Filter Assembly	3/-	R23	DP489	Mains Resistance Assembly	4/6d.
	L1	Medium Wave Frame Aerial	10/-	VALVES			
	L2	Long Wave Frame Aerial	12/6d.	V1		H.F. Pentode Valve Mullard VP13A	17/6
MISCELLANEOUS				V2		Octode Valve Mullard FC13	20/-
	DP558	Valve Top Screen	6d.	V3		Variable Mu H.F. Pentode Mullard VP1321	17/6
	A4071	Valve Top Clip	1d.	V4		Double Diode Valve Mazda DD/620	5/6
	A1531	Insulated Screw (Mains adjustment)	3d.	V5		Triode Valve Mazda HL1320	13/6
	DP140	Mains Plug	6d.	V6		1.F. Pentode Mazda Pen3520	18/6
	P2445	Pilot Lamp	9d.	V7		Rectifier Mullard UR2 or Brimar I.D.S. (Valves not interchangeable unless valve holder is changed).	15/-
	DP196	Mains Lead	3/-				
	A3654	Plug (Black or Red)	2d.				
L3	DP475	H.F. Choke	1/-				
S7	A4580	Noise Suppression Switch	2/6d.				
S1 to 6	B4541	Wave Change Switch	2/6d.				
S8/9	A4167	On-Off Switch	2/-				
	DP516	Base Plate & Turntable Assembly	6/6d.				
	DP532	Back Cover and Cowl Assembly	4/6d.				

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