Private and Confidential

For Trade Use Only

"His Master's Voice"

SERVICE MANUAL

•

for

FIVE-VALVE

DUAL-WAVE A.C. RECEIVER

TABLE MODEL 888

CONSOLE MODEL 668

(Incorporating Chassis Type A536DM)

TECHNICAL SPECIFICATION

POWER SUPPLY:
200 to 250 volts. 40 to 50 cycles.

CONSUMPTION:
50 watts.

FREQUENCY RANGE:
Broadcast: 540 Kc/s to 1600 Kc s.
Short-Wave: 16.5 Metres to 51 Metres.

I.F. FREQUENCY:
457.5 Kc/s.

VALVE COMPLEMENT:
6J8GA Converter.
EBF35 I.F. Amplifier, Demod., AVC.
6U7G Audio Amplifier.
6V6GT Power.
5Y3GT Rectifier.

DIAL LAMPS (2):
6.3 volts 0.15 to 0.3 amps.

LOUDSPEAKER:
Model 668: { 6" Permagnetic.
{10" Permagnetic.
Model 888: 6" Permagnetic.
Voice Coil Impedance at 400 c.p.s.
6" Speaker: 3.7 ohm.
10" Speaker: 2.7 ohm.

DIMENSIONS:

	Width	Height	Depth
Model 888	20"	12"	$10\frac{1}{4}$"
Model 668	32"	$29\frac{1}{2}$"	12"

WEIGHT:

	Gross	Net
Model 888	37 lbs.	30 lbs.
Model 668	71 lbs.	61 lbs.

CIRCUIT DESCRIPTION

These models incorporate a 5-valve A.C. mains operated superheterodyne receiver for broadcast and short-wave reception.

FREQUENCY CHANGER

The aerial, on the broadcast band, is coupled to the signal frequency circuit by means of the iron dust core aerial transformer L1-L2. For short-wave reception a short-wave aerial transformer, L5-L6, is switched into circuit.

A triode heptode V1 is employed as frequency changer. Fixed padding capacitors are used on both bands. A variable padding adjustment is provided on the broadcast band by means of an iron dust bolt in the broadcast oscillator coil L3-L4.

I.F. AMPLIFIER, AVC, DEMODULATOR

The converter valve is transformer coupled to a duo-diode super control pentode V2. AVC potential for the pentode section of this valve and the converter is obtained from one of the diodes which is capacity coupled to the primary of the 2nd I.F. transformer; a fraction of the AVC potential is also applied to the audio amplifier valve V3. Standing bias and AVC delay voltage is obtained from a potential dividing network across the high tension filter choke CK1. Demodulation of the I.F. signal is effected by the remaining diode of V2.

A.F. AMPLIFIER

The input circuit of this valve may be switched to either the demodulator diode load R9 or to external pick-up terminals. Tone Control is effected at this stage by means of switch S2 which gives bass or treble cut as required by switching appropriate condensers. The output circuit of this valve is resistance capacity coupled to the grid of the beam power output valve V4.

POWER STAGE

The output of the beam power valve is coupled to the speaker by transformer T2. Negative feedback voltage is taken from the secondary of the transformer and fed into the tap of the volume control VR1 through a resistor. This arrangement provides negative feedback over the whole of the audio frequency system. By advancing the volume control setting for higher gain, the feedback factor is reduced. A phasing network comprising C34, R24, is connected across the transformer primary.

In Model 668, two speakers, each having different characteristics, are connected to appropriate taps on the output transformer secondary. This arrangement ensures that the output valve is working into its correct load and at the same time different proportions of power are fed to each of the speakers.

NOTE: The speakers are connected to the chassis by means of polarised 2-pin plugs; it is important that the large and small speakers be plugged into their correct socket, i.e., "large" and "small" respectively.

When servicing has been carried out on a speaker, it is necessary to make sure that the speaker cones are correctly phased, so that both

cones move in the same direction, otherwise lack of bass response will be experienced. This may be taken care of by ensuring that the voice coil connections of a serviced speaker are correctly reconnected to the polarised plug.

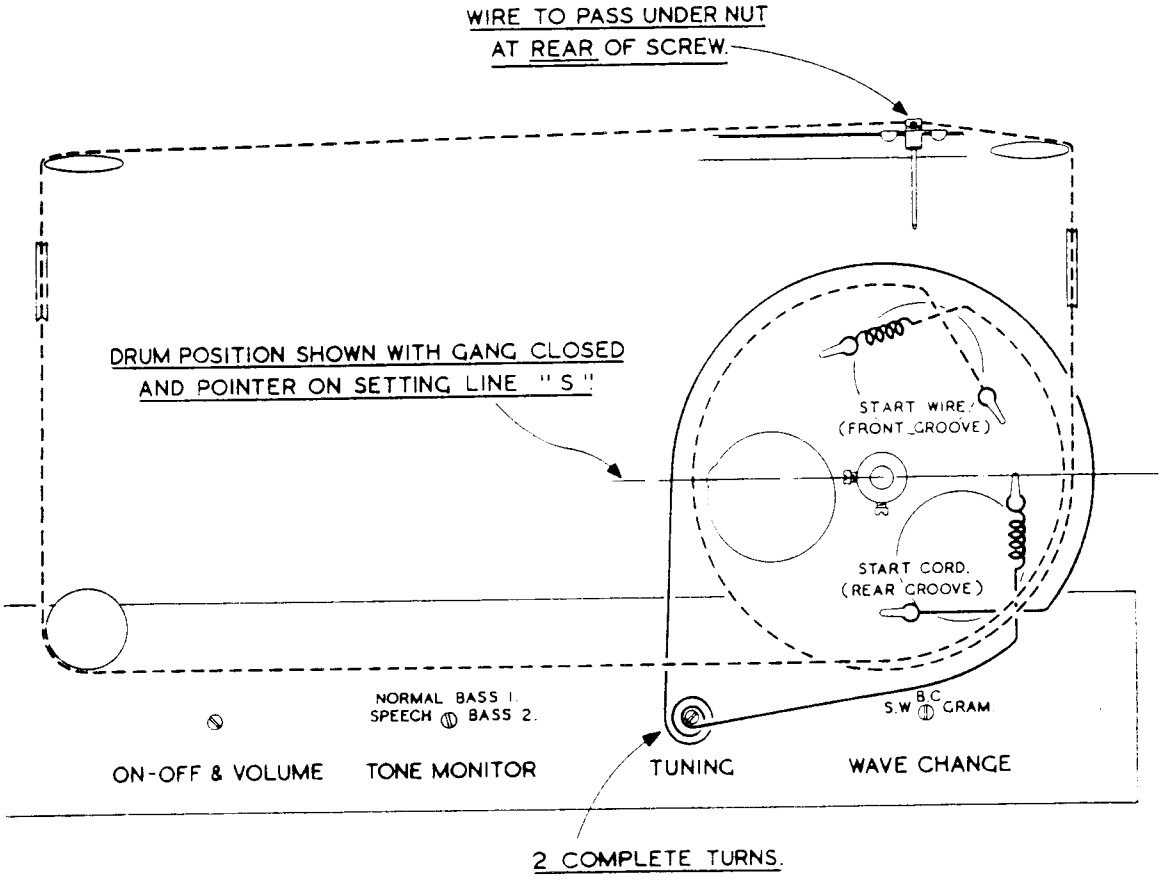
HIGH TENSION SUPPLY

The power supply employs a directly heated type high vacuum rectifier V5. The filter circuit consists of an iron cored choke CK1 and two electrolytic condensers C16 and C17. A mains outlet socket is connected across the mains supply for gramophone motor operation. This outlet should not be used for feeding any other electric appliance. Both poles of the mains supply are switched by S3, which is incorporated with the volume control.

DISMANTLING

REMOVAL OF CHASSIS

1. Disconnect power plug from supply mains.
2. Disconnect aerial and earth wires, also speaker plug/s.
3. Remove knobs.
4. Remove two chassis fixing bolts.
5. Withdraw chassis from cabinet.



— DIAL CORD ARRANGEMENT. —

RECEIVER ALIGNMENT PROCEDURE

In any case where a component replacement has been made in either the tuned I.F. or R.F. circuits of a receiver, all circuits must be realigned, and even if only one coil has been serviced, the whole of the realignment should be done in the order given. An output meter should always be connected across the voice coil terminals of the speaker to indicate when the circuits are tuned to resonance. In carrying out the following operations, it is important that the input to the receiver from the signal generator should be kept low and progressively reduced as the circuits are brought into line, so that the output meter reading does not exceed about 1 volt.

I.F. ALIGNMENT

1. Rotate the volume controll fully clockwise, set the wave change switch to "Broadcast" (centre) position and fully enmesh the tuning condenser vanes. Connect the output leads of signal generator to the cap of the 6J8GA converter valve, through a 0.1 mF. condenser; do not remove grid lead of the converter valve.
2. Tune signal generator to exactly 457.5 Kc/s.
3. Adjust the I.F. transformer trimmer screws for maximum reading on output meter, commencing with the second I.F. transformer and following with the first.
4. Continue this alignment on each transformer in turn until no greater output can be obtained. It is necessary to repeat this procedure twice to ensure good alignment.

NOTE: If trimmer screws are screwed too far in, it may be possible to obtain a false peak due to coupling effects between the iron cores. Start alignment of each individual transformer by first screwing its core well out, and then advancing core into the coil until resonance is obtained.

R.F. ALIGNMENT (BROADCAST)

1. With controls set as for I.F. alignment, connect signal generator output leads in series with a 200 mmF. condenser to the aerial and earth terminals of the receiver.
2. Check that when the gang condenser is fully meshed the pointer coincides with the setting line, marked "S", on the extreme right of the dial scale. If necessary, the pointer may be adjusted to this position by loosening the cord securing screw provided.
3. Tune signal generator to 600 Kc/s.
4. Rotate tuning knob until the pointer is exactly over 600 Kc/s calibration mark and adjust the oscillator padder screw for maximum response.
5. Rotate tuning knob until the pointer coincides with the 1500 Kc/s calibration mark and adjust the oscillator trimmer and aerial trimmer in turn for maximum response.
6. Repeat operations (3) and (5) inclusive for proper alignment.

R.F. ALIGNMENT (SHORT-WAVE)

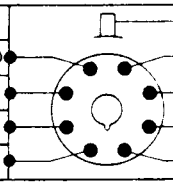
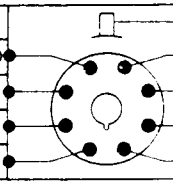
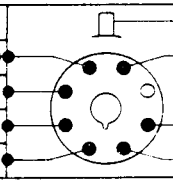
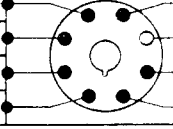
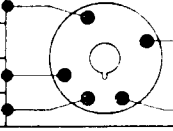
1. Set wave change switch to "Short-Wave" (clockwise) position. Remove the 200 mmF. condenser from the output lead of the signal generator and replace with a 400 ohm non-inductive resistor; connect to the aerial terminal as before.
2. Rotate tuning knob until the pointer coincides with the 17 metres calibration mark.
3. Tune signal generator to 17 metres (17.65 Mc/s.).
4. Adjust S-W oscillator trimmer for maximum output. Two settings will be found at which this trimmer will peak; care must be taken that the setting finally selected is that which gives the lower capacity. Failure to select the correct position of the two will cause serious tracking error and loss of sensitivity.
5. Adjust S-W aerial trimmer for maximum output whilst "rocking" the gang condenser slightly to obtain the true resonance point.
6. Note that the signal is still tuned in correctly on the dial; if not, readjust S-W oscillator trimmer slightly until dial reads correctly, and repeat operation (5).

ADDITIONAL DATA

Any further service information desired may be obtained by addressing an enquiry to the "Service Department, The Gramophone Co. Ltd., 2 Parramatta Road, Homebush, N.S.W."

— VOLTAGE TABLE —

- VOLTAGES AND CURRENTS ARE WITH THE RECEIVER OPERATING ON AVERAGE MAINS VOLTAGE, AND TUNED TO A POINT OF NO RECEPTION ON THE BROADCAST BAND.
- VOLTAGE READINGS TAKEN WITH METER RESISTANCE OF 1,000 OHMS PER VOLT
- VOLTAGE AND CURRENT READINGS WITHIN ± 15 %
- RESISTANCE READINGS ARE APPROXIMATE.

VOLTS TO CHASSIS	CURRENT MA.	RESISTANCE TO CHASSIS	VALVE ELECTRODE	BOTTOM VIEW OF VALVE SOCKET	VALVE ELECTRODE	VOLTS TO CHASSIS	CURRENT MA	RESISTANCE TO CHASSIS
			V1	6J8-GA	CONVERTER			
					GRID	——	——	3 MEG Ω
106	4·3	INFIN.	SCREEN GRID		OSC. GRID	——	——	50 K Ω
225	2·5	INFIN.	PLATE		OSC. PLATE	150	5·0	INFIN.
6·3 A.C.	450	——	HEATER		HEATER	NIL	——	NIL
NIL	——	NIL	NO CONN.		CATHODE	NIL	12·3	NIL
			V2	EBF35	I.F. AMPLIFIER - DEMODULATOR-A.V.C.			
					GRID	——	——	3·3MEG Ω
106	1·3	INFIN.	SCREEN GRID		DIODE # 1	——	——	300 K Ω
250	4·0	INFIN.	PLATE		DIODE # 2	——	——	2·3MEG Ω
NIL	——	NIL	METAL COAT		CATHODE	NIL	5·3	NIL
6·3 A.C.	200	——	HEATER		HEATER	NIL	——	NIL
			V3	6U7-G	AUDIO AMPLIFIER			
					GRID	——	——	3 MEG Ω
10	0·08	INFIN.	SCREEN GRID		SUPPRESSOR	NIL	——	NIL
34	0·34	INFIN.	PLATE					
NIL	——	NIL	HEATER		HEATER	6·3 A.C.	300	——
NIL	——	NIL	NO CONN.		CATHODE	NIL	0·42	NIL
			V4	6V6-GT	OUTPUT			
250	3·0	INFIN.	SCREEN GRID		GRID	——	——	550 K Ω
240	45	INFIN.	PLATE			——	——	500K Ω
NIL	——	NIL	HEATER		HEATER	6·3 A.C.	450	——
NIL	——	NIL	NO CONN.		CATHODE	12	48	250 Ω
			V5	5Y3-GT	RECTIFIER			
290A.C.	——	1030 Ω	PLATE # 1					
					PLATE # 2	290A.C.	——	1030 Ω
250	2 AMPA.C.	INFIN.	HEATER					
——	——	——	NO CONN.		HEATER	250	——	INFIN

REMARKS :-

UNFILTERED H.T. VOLTAGE	=	290 VOLTS
FILTERED H.T. VOLTAGE	=	250 VOLTS
TOTAL H.T. CURRENT	=	63 MA.
RECTIFIER HEATER VOLTAGE	=	5·0 VOLTS

PARTS LIST

RESISTORS

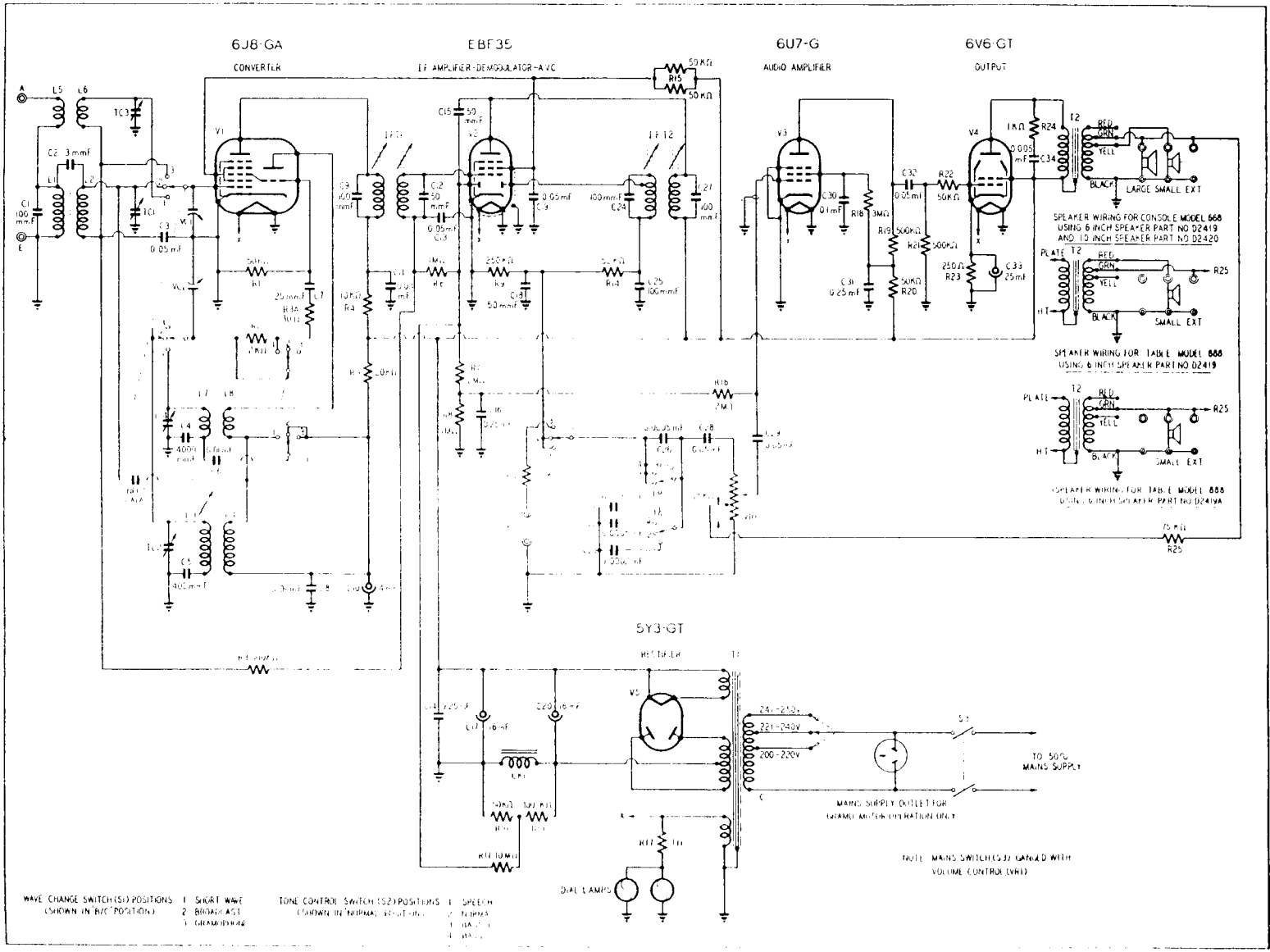
REF.	PART No.	DESCRIPTION
R1	H1X	50,000 ohms $\frac{1}{4}$ watt ± 10%
R2	AJ1X	2,000 ohms $\frac{1}{4}$ watt ± 10%
R3	J1X	100,000 ohms $\frac{1}{4}$ watt ± 10%
R3A	CB1X	30 ohms $\frac{1}{4}$ watt ± 10%
R4	F1X	10,000 ohms $\frac{1}{4}$ watt ± 10%
R5	V3X	20,000 ohms 1 watt ± 10%
R6	P1X	1 megohm $\frac{1}{4}$ watt ± 10%
R7	AA1X	2 megohms $\frac{1}{4}$ watt ± 10%
R8	P1X	1 megohm $\frac{1}{4}$ watt ± 10%
R9	N1X	250,000 ohms $\frac{1}{4}$ watt ± 10%
R10	H1X	50,000 ohms $\frac{1}{4}$ watt ± 10%
R11	AB3X	10 megohms 1 watt ± 10%
R12	J1X	100,000 ohms $\frac{1}{4}$ watt ± 10%
R13	J1X	100,000 ohms $\frac{1}{4}$ watt ± 10%
R14	H1X	50,000 ohms $\frac{1}{4}$ watt ± 10%
R15	H3X	2x50,000 ohms 1 watt ± 10%
R16	AA1X	2 megohms $\frac{1}{4}$ watt ± 10%
R17	DOW2XX	1 ohm $\frac{1}{2}$ watt ± 20% BW-$\frac{1}{2}$
R18	AL3X	3 megohms 1 watt ± 10%
R19	O3X	500,000 ohms 1 watt ± 10%
R20	H1X	50,000 ohms $\frac{1}{4}$ watt ± 10%
R21	O1X	500,000 ohms $\frac{1}{4}$ watt ± 10%
R22	H1X	50,000 ohms $\frac{1}{4}$ watt ± 10%
R23	ZW3X	250 ohms 1 watt ± 10% BW1
R24	D3X	1,000 ohms 1 watt ± 10%
R25	AN1X	75,000 ohms $\frac{1}{4}$ watt ± 10%

CONDENSERS

REF.	PART No.	DESCRIPTION
C1	D0243P	100 mmF. ± 10%
C2	D0243BU	3 mmF. ± 0.5 mmF.
C3	C0013M	0.05 mF. 200V. wkg.
C4	D0243CQ	4,000 mmF. ± 100 mmF.
C5	D0243AM	400 mmF. ± 5 mmF.
C6	C0013N	0.01 mF. 600V. wkg.
C7	D0243BE	25 mmF. ± 10%
C8	C0013N	0.01 mF. 600V. wkg.
C9	D4405W	100 mmF. ± 5%
C10	C0014AT	4 mF. 350P.V. Electro.
C11	C0013I	0.02 mF. 400V. wkg.
C12	D4405X	50 mmF. ± 5%
C13	C0013M	0.05 mF. 200V. wkg.
C14	C0013C	0.25 mF. 400V. wkg.
C15	D0243Q	50 mmF. ± 10%
C16	C0013P	0.25 mF. 200V. wkg.
C17	C0014CB	16 mF. 525P.V. Electrolytic.
C18	D0243Q	50 mmF. ± 10%
C19	C0013G	0.05 mF. 400V. wkg.
C20	C0014BZ	16 mF. 525P.V. Electrolytic.
C21	C0013AO	0.002 mF. ± 10%
C22	D0243L	0.0005 mF. ± 10%
C23	D0243CY	0.0002 mF. ± 10%
C24	D4405W	100 mmF. ± 5%
C25	D0243P	100 mmF. ± 10%
C26	D0243L	0.0005 mF. ± 10%
C27	D4405W	100 mmF. ± 5%
C28	C0013M	0.05 mF. 200V. wkg.
C29	C0013M	0.05 mF. 200V. wkg.
C30	C0013E	0.1 mF. 400V. wkg.
C31	C0013C	0.25 mF. 400V. wkg.
C32	C0013AD	0.05 mF. 600V. wkg.
C33	C0014CC	25 mF. 40P.V. Electrolytic.
C34	C0013AK	0.005 mF. 600V. wkg.
	D2398	Neutralizing Capacitor.

MISCELLANEOUS

REF.	PART No.	DESCRIPTION
TC1	D2395	Trimmer Condenser 2-28 mmF.
TC2	D2395	Trimmer Condenser 2-28 mmF.
TC3	D2395	Trimmer Condenser 2-28 mmF.
TC4	D2395	Trimmer Condenser 2-28 mmF.
L1-2	D1614D/2	B/C Aerial Coil.
L3-4	D2224	B/C Oscillator Coil.
L5-6	D2321/2	S/W Aerial Coil.
L7-8	D2320	S/W Oscillator Coil.
CK.1	D2357	H.T. Choke.
T1	D2358	Mains Transformer.
T2	D2356	Output Transformer.
S1	D2346	5 Pole, 3 Pos. Switch.
S2	D2351	2 Pole, 4 Pos. Switch.
S3, VR1	D2350	1 Megohm Potentiometer tapped at 25,00 ohms (Incorp. Mains Switch).
VC1 & VC2	C0159A	2 Gang Condenser.
IFT.1	D2278	1st I.F. Transformer.
IFT.2	D2355	2nd I.F. Transformer.
V1	6J8GA	Valve.
V2	EBF35	Valve.
V3	6U7G	Valve.
V4	6V6GT	Valve.
V5	5Y3GT	Valve.
		Dial Lamps 6.3V. 0.25A.
Spks.	D2420	10" Speaker Assembly.
	D2419	6" Speaker Assembly.
	C0371	Dial Glass.
	D2335	Dial Pointer.
	D0873	Dial Cord Spring.
		H238 Lug (Dial Cord).
	D2394	Knob.



CIRCUIT DIAGRAM OF MODELS 888 668 INCORPORATING CHASSIS TYPE A536DM.