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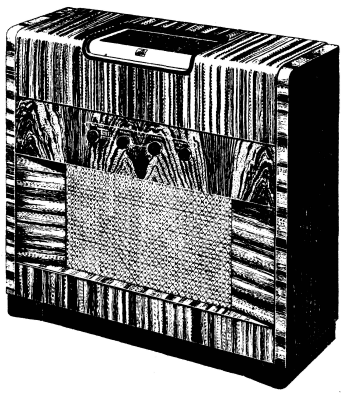
"HIS MASTER'S VOICE"

The Hallmark of Quality



"His Master's Voice"

SERVICE MANUAL

for

FIVE-VALVE

A.C. DUAL-WAVE RECEIVER

CONSOLE MODEL C43D

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THE GRAMOPHONE COMPANY LTD.
(Incorporated in England)
HOMEBUSH - - N.S.W.

TECHNICAL SPECIFICATION

POWER SUPPLY:
200 to 250 volts, 40 to 50 c.p.s.

CONSUMPTION:
50 watts.

FREQUENCY RANGE:
Broadcast: 540 Kc/s — 1600 Kc/s.
Shortwave: 16.5 Metres — 51 Metres.

INTERMEDIATE FREQUENCY:
457.5 Kc/s.

VALVE COMPLEMENT:

6AN7	Frequency Changer
6AR7GT	I.F. Amp.,-Demod.,-A.V.C.
6U7G	Audio Amplifier
6V6GT	Power Output
5Y3GT	Rectifier.

DIAL LAMPS:
6.3 volt, 0.15 to 0.3 Amp.

LOUDSPEAKER:
12-inch Permagnetic.
Voice coil impedance: 2.7 ohms at 400 cycles.

DIMENSIONS:

Width	32 inches
Height	29½ inches
Depth	12 inches

WEIGHT:
Gross ..... 70 lbs. Nett ..... 61 lbs.

CIRCUIT DESCRIPTION

This model incorporates a 5-valve A.C. mains-operated superheterodyne receiver for broadcast and shortwave 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 shortwave reception a shortwave aerial transformer, L5-L6, is switched into circuit.

A triode hexode 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,-DEMODULATOR,-AVC.

The frequency changer valve is transformer coupled to a duo-diode-super-control-pentode, V2. AVC potential for the pentode section of this valve and 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 affected 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 the 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. The speaker is connected to the chassis by means of a 2-pin 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. Both poles of the mains supply are switched by S3, which is incorporated with the volume control.

DISMANTLING

REMOVAL OF CHASSIS

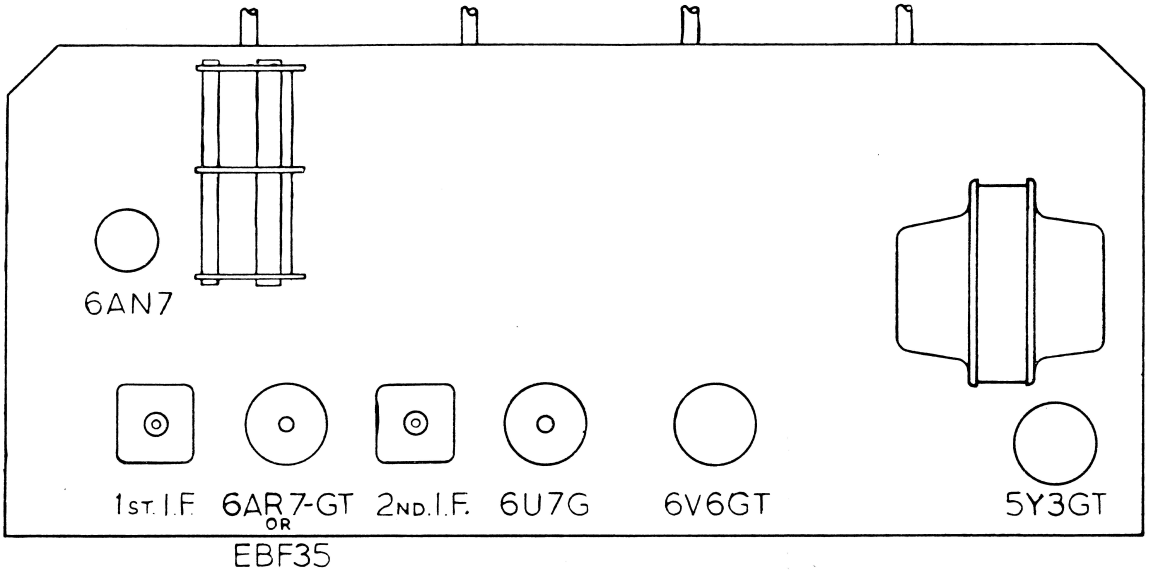
(1) Disconnect power plug from supply mains.
(2) Disconnect aerial and earth wires.
(3) Remove knobs.
(4) Remove two chassis fixing screws at rear of cabinet.
(5) Withdraw chassis from cabinet.

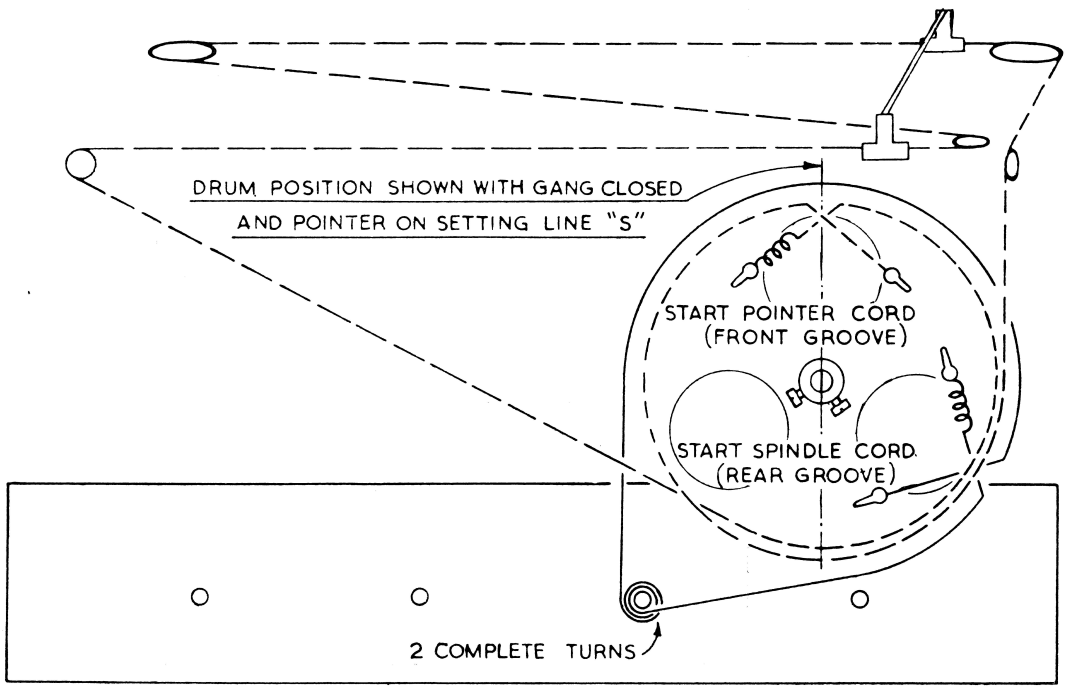
MODEL C43D

ALIGNMENT

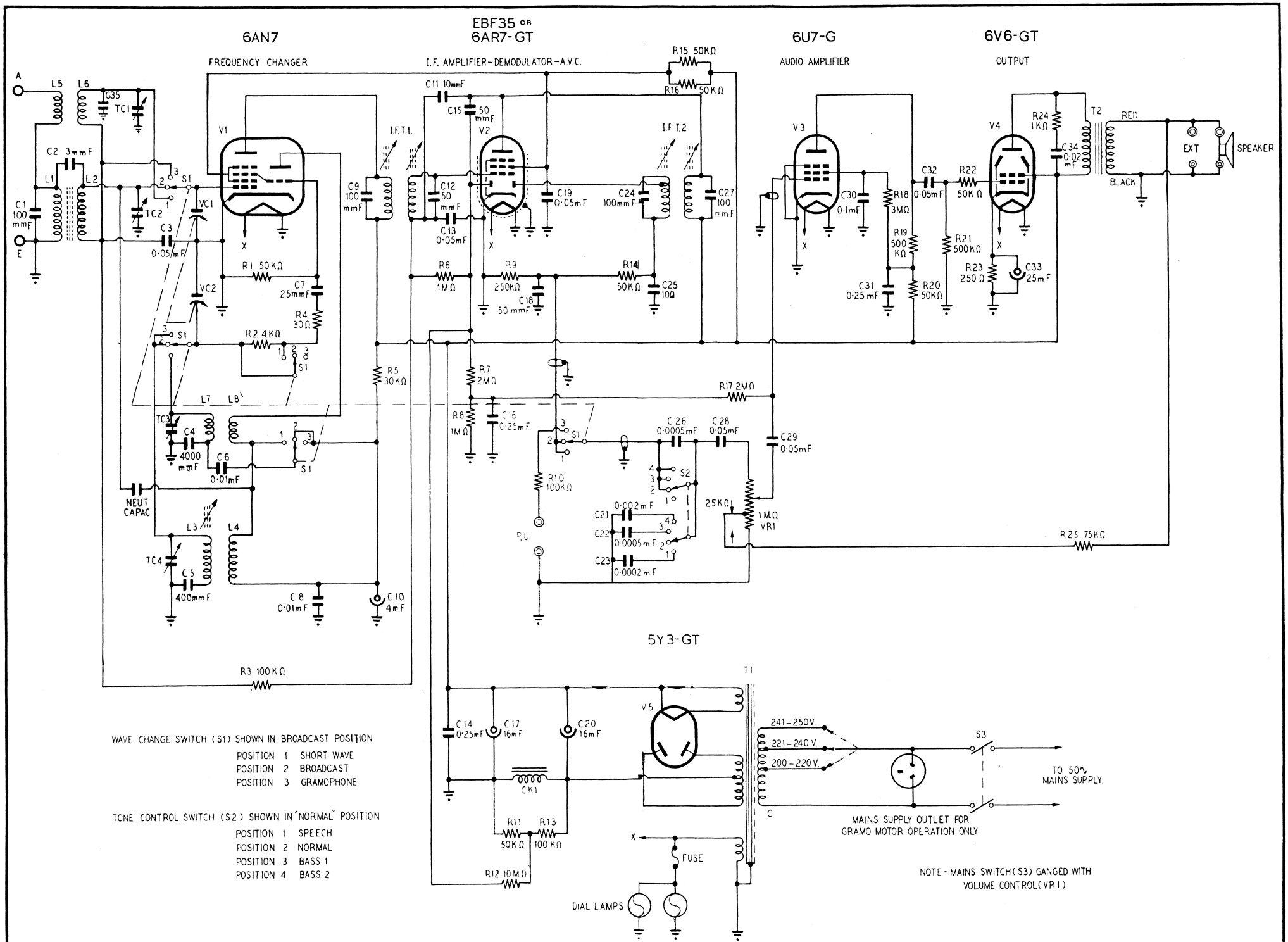
I.F. 457·5 K.C.

B/C { OSC. 600 & 1500 K.C. / AER. ——— 1500 K.C. } S/W { OSC 17·65 M.C. / AER. 17·65 M.C. }





C0614



— CIRCUIT DIAGRAM — MODEL C23B & C43D —

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 control 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 grid of the 6AN7 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 softening the wax securing the drive cord to the pointer carrier.

(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) Tune signal generator to 1500 Kc/s.

(6) 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.

(7) Repeat operations (3) to (6) 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 terminals 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

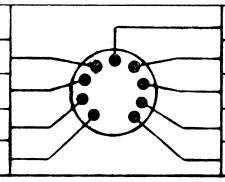
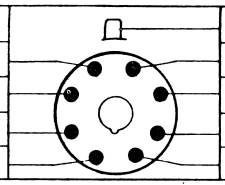
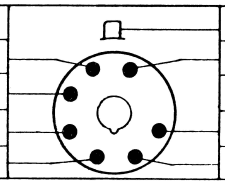
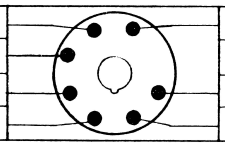
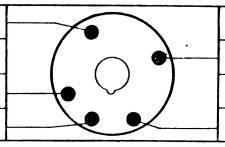
Any further service information desired may be obtained by addressing an enquiry to the "Service Department, The Gramophone Co. Ltd., 2 Parramatta Road, Homebush, N.S.W."

(The Company reserves the right to make any modification without notice).

— VOLTAGE TABLE —

(MODEL C23B & C43D)

- 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 M A	RESISTANCE TO CHASSIS	VALVE ELECTRODE	BOTTOM VIEW OF VALVE SOCKET	VALVE ELECTRODE	VOLTS. TO CHASSIS	CURRENT M A	RESISTANCE TO CHASSIS
			V1	6AN7	FREQUENCY CHANGER			
					HEATER	NIL	———	NIL
6·3 A.C.	230	———	HEATER		INT. CONN.	———	———	———
———	11	NIL	CATHODE		HEX. PLATE	240	3·0	INFIN
———	———	3 MEG Ω	CONTROL GRID		OSC. PLATE	55	6	INFIN
110	3·5	INFIN	SCREEN GRID		OSC. GRID	———	———	50 KΩ
			V2	6AR7-GT OR EBF35	I.F. AMPLIFIER — DEMODULATOR — A.V.C.			
					GRID	———	———	3·3 MEG Ω
84	0·92	INFIN	SCREEN GRID		DIODE N° 2	———	———	300 K Ω
241	4·2	INFIN	PLATE		DIODE N° 1	———	———	2·3 MEG Ω
NIL	———	NIL	METAL SHELL		CATHODE	NIL	5·12	NIL
6 3 A C	300	———	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			
241	3·0	INFIN	SCREEN GRID		GRID	———	———	550 K Ω
222	45	INFIN	PLATE			———	———	500 K Ω
NIL	———	NIL	HEATER		HEATER	6·3 A.C.	450	———
NIL	———	NIL	NO CONN		CATHODE	11	48	250 Ω
			V5	5Y3-GT	RECTIFIER.			
280 A.C.	———	1030 Ω	PLATE N° 1					
					PLATE N° 2	280 A.C.	———	1030 Ω
241	2 AMP. A.C.	INFIN	HEATER					
———	———	———	NO CONN.		HEATER	241	———	INFIN

REMARKS:-

UNFILTERED H.T VOLTAGE = 295 VOLTS
FILTERED H.T VOLTAGE = 241 VOLTS
TOTAL H.T. CURRENT = 67 M.A.
RECTIFIER HEATER VOLTAGE = 5·0 VOLTS

C.0575

PARTS LIST

RESISTORS

REF.	PART No.	DESCRIPTION
R1	H2X	50,000 ohms ½ watt ± 10%
R2	E2XX	4,000 ohms ½ watt ± 10%
R3	J2X	100,000 ohms ½ watt ± 10%
R4	CB1X	30 ohms ¼ watt ± 10%
R5	W3X	30,000 ohms 1 watt ± 10%
R6	P2X	1 megohm ½ watt ± 10%
R7	DH2X	2 megohms ½ watt ± 10%
R8	P2X	1 megohm ½ watt ± 10%
R9	N2X	250,000 ohms ½ watt ± 10%
R10	H2X	50,000 ohms ½ watt ± 10%
R11	AB3X	10 megohms 1 watt ± 10%
R12	J2X	100,000 ohms ½ watt ± 10%
R13	J2X	100,000 ohms ½ watt ± 10%
R14	H2X	50,000 ohms ½ watt ± 10%
R15	H3X	2 x 50,000 ohms 1 watt ± 10%
R16	DH2X	2 megohms ½ watt ± 10%
R17		Not used.
R18	AL3X	3 megohms 1 watt ± 10%
R19	O3X	500,000 ohms 1 watt ± 10%
R20	H2X	50,000 ohms ½ watt ± 10%
R21	O2X	500,000 ohms ½ watt ± 10%
R22	H2X	50,000 ohms ½ watt ± 10%
R23	ZW3X	250 ohms 1 watt ± 10% BWI
R24	D3X	1,000 ohms 1 watt ± 10%
R25	AN2X	75,000 ohms ½ watt ± 10%

MISCELLANEOUS

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

CONDENSERS

REF.	PART No.	DESCRIPTION
C1	D0243P	100 mmF. ± 10%
C2	D0243BU	3 mmF. ± 1 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. Electro.
C18	D0243Q	50 mmF. ± 10%
C19	C0013G	0.05 mF. 400V. wkg.
C20	C0014BZ	16 mF. 525P.V. Electro.
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. Electro.
C34	C0013AK	.002 mF. 600V. wkg.
C35	D0243BJ	10 mmF. ± 10%
	D2398	Neutralizing Capacitor

MISCELLANEOUS

REF.	PART No.	DESCRIPTION
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	D2685	Output Transformer
S1	D2346	5-Pole 3-Position Switch
S2	D2351	2-Pole 4-Position Switch
S3, VR1	D2350	1 Meg. Potentiometer tapped at 25,000 ohms. (Incorp. Mains Switch)
VC1 & VC2	C0159A	2 Gang Condenser
IFT1	D2278	1st I.F. Transformer
IFT2	D2355	2nd I.F. Transformer
V1	6AN7	Valve
V2	EBF35	Valve
V3	6U7G	Valve
V4	6V6GT	Valve
V5	5Y3GT	Valve
		Dial Lamps 6.3V, O.25A
	D3129	12in. Permag. Speaker
	C0559	Dial Glass
	D2704	Dial Pointer
	D0873	Dial Cord Spring
		H238 Lug (Dial Cord)
	D2394	Knob
	F1	5 Amp. Fuse Wire
	B0145	Dial Back Plate Assembly
	D2286	P.U. Panel
		A. & E. Panel "Carr Fastener" 733-2-10
		Dial Cord (white), 11'6"
	D2534	Dial Puley
	D2364	P.U. Plugs
	D2607	Extension Speaker Plug
	D2608	Speaker Socket