Private and Confidential ***For Trade Use Only***

"His Master's Voice"

SERVICE MANUAL

for

FIVE - VALVE

A.C. DUAL-WAVE RECEIVER

CONSOLE MODEL C43B

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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:
58 watts.

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

INTERMEDIATE FREQUENCY:
457.5 Kc/s.

VALVE COMPLEMENT:

6J8GA	Converter
EBF35	I.F. Amp.,-Demod.,-AVC
6U7G	Audio Amplifier
6V6GT	Power Output
5Y3GT	Rectifier.

DIAL AND INDICATOR LAMPS:
6.3 Volt, 0.15 to 0.3 Amp.

LOUDSPEAKER:
Permagnetic Ellipsoid Type 2446OAN
Voice coil impedance, 5 ohms at 400 cycles.

DIMENSIONS:

Width	32 inches
Height	29½ inches
Depth	12 inches

WEIGHT:
Gross ..... 70 lbs. Net ..... 61 lbs.

CIRCUIT DESCRIPTION

This model incorporates a 5-valve A.C. mainsoperated radio receiver. The receiver is a dual-wave superheterodyne 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 the shortwave 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,-DEMOD.,-AVC

The converter valve is transformer coupled to a duo-diode super-control pentode V2. AVC voltage for the pentode section of this valve and the converter is obtained from the diode, which is capacity coupled to the primary of the 2nd I.F. transformer; a fraction of the AVC voltage 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.

AUDIO FREQUENCY AMPLIFIER

The input circuit of this valve may be switched to either the demodulator diode load R9 or to the pick-up terminals. Tone control is effected at this stage by means of the acoustic range selector, which gives bass or treble cut as required by means of appropriate condensers and variable resistors. 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 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 VR3 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 C32 and R24 is connected across the transformer primary. The speaker is connected to the receiver 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, C17 and C20. Both poles of the mains supply are switched by S2.

ACOUSTIC RANGE SELECTOR

This unit combines the bass and treble controls and is connected to the chassis by means of a 3-pin plug. When adjusted correctly it gives suitable variations of tonal balance. Illumination is provided by means of a pilot lamp, which is connected to the chassis by means of a two-pin plug.

CHASSIS DISMANTLING

1. Disconnect power plug from supply mains.
2. Remove the control knobs.
3. Disconnect the acoustic range selector from the chassis.
4. Disconnect the speaker and aerial and earth leads.
5. Remove the two chassis mounting bolts and withdraw chassis.

REMOVAL OF ACOUSTIC RANGE SELECTOR

1. Disconnect leads from chassis.
2. Lift Acoustic Range Selector out of front panel.

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 re-aligned, 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. On 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 the signal generator to the cap of the 6J8GA valve through a 0.1 mF. condenser; do not remove the grid lead of the converter valve.
2. Tune signal generator to exactly 455.5 Kc/s.
3. Adjust the I.F. transformer trimmer screws for maximum reading on the 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 the core into the coil until resonance is obtained.

R.F. ALIGNMENT (BROADCAST)

1. With controls set as for I.F. alignment, connect the signal generator 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 enmeshed 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 pointer on the dial cord.
3. Tune signal generator to 600 Kc/s.
4. Rotate the tuning knob until the pointer is exactly over the 600 Kc/s. calibration point and adjust the oscillator padder screw for maximum response.
5. Tune signal generator to 1500 Kc/s.
6. Rotate the tuning knob until the pointer coincides with the 1500 Kc/s. calibration mark and adjust the oscillator and aerial trimmers for maximum response.
7. Repeat operations 3) to (6) inclusive for proper alignment.

R.F. ALIGNMENT (SHORTWAVE)

1. Set wave-change switch to "Shortwave" (anti-clockwise position). Remove the 200 mmF. condenser from the output lead of the signal generator and replace with a 400 ohm non-inductive resistor and connect to the aerial terminal as before.
2. Rotate tuning knob until the pointer coincides with the 17 metres calibration mark on dial.
3. Tune the signal generator to 17 metres (17.65 Mc/s.).
4. Adjust the shortwave oscillator trimmer for maximum output. Two settings will be found at which the 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 the shortwave 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 the shortwave oscillator trimmer slightly until the dial reads correctly, and repeat operation (5).

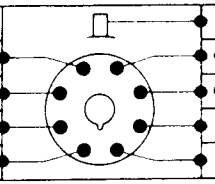
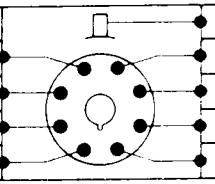
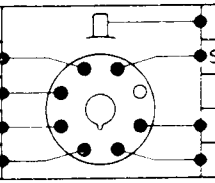
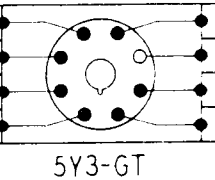
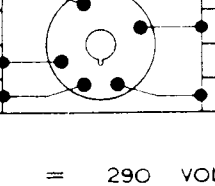
ADDITIONAL DATA

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 —

- 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	290 A.C.	——	1030 Ω
250	2 AMP.A.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	H2X	50,000 ohms ½ watt ± 10%
R2	AJ2X	2,000 ohms ½ watt ± 10%
R3	J2X	100,000 ohms ½ watt ± 10%
R3A	CB1X	30 ohms ¼ watt ± 10%
R4	F2X	10,000 ohms ½ watt ± 10%
R5	V3X	20,000 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	DJ3X	10 megohms 1 watt ± 10%
R12	J2X	100,000 ohms ½ watt ± 10%
R13	H2X	50,000 ohms ½ watt ± 10%
R14	H2X	50,000 ohms ½ watt ± 10%
R15	N3X	2 x 50,000 ohms 1 watt ± 10%
R16	H2X	50,000 ohms ½ watt ± 10%
R17	DH2X	2 megohms ½ watt ± 10%
R18	AL3X	3 megohms 1 watt ± 10%
R19	O3X	500,000 ohms 1 watt ± 10%
R20	H2X	50,000 ohms 1 watt ± 10%
R21	O2X	500,000 ohms ½ watt ± 10%
R22	H2X	50,000 ohms ½ watt ± 10%
R23	ZW3X	250 ohms 1 w. ± 10% BW1
R24	D3X	1,000 ohms 1 watt ± 10%
R25	L2X	200,000 ohms ½ watt ± 10%

MISCELLANEOUS

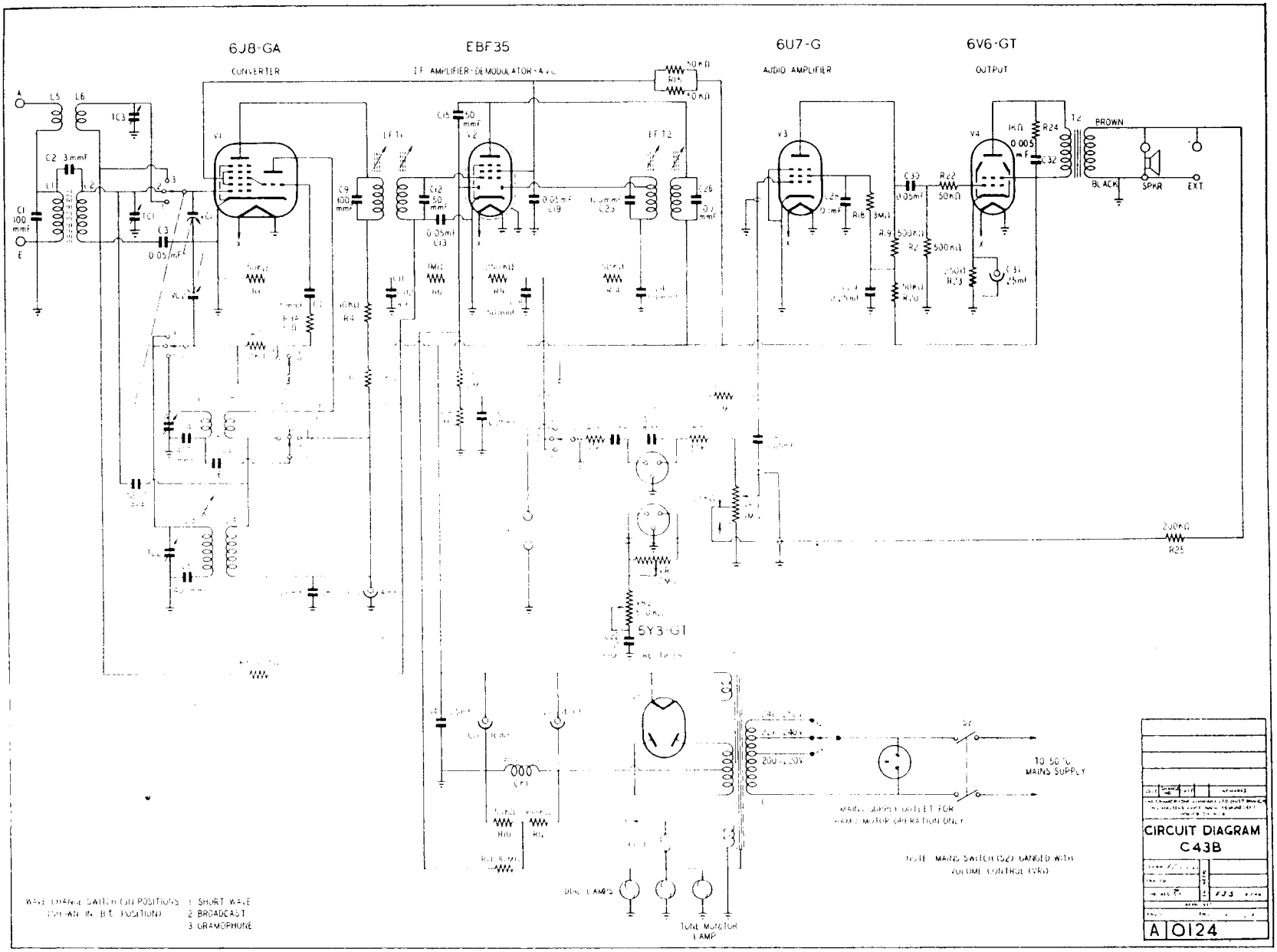
REF.	PART No.	DESCRIPTION
TC1	D2395	Trimmer Condenser 2-28 mmF.
TC2	D2395	Trimmer Condenser 2-28 mmF.
TC3	D2395	Trimmer Condenser 2-28 mmF.
TC4	D2395	Trimmer Condenser 2-28 mmF.

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	C0013S	0.02 mF. 600V. 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	C0013M	0.05 mF. 200V. wkg.
C22	D0243H	0.002 mF. ± 10%
C23	D4405W	100 mmF. ± 5%
C24	D0243P	100 mmF. ± 10%
C25	D0243L	500 mmF. ± 10%
C26	D4405W	100 mmF. ± 5%
C27	C0013M	0.05 mF. 200V. wkg.
C28	C0013E	0.1 mF. 400V. wkg.
C29	C0013C	0.25 mF. 400V. wkg.
C30	C0013G	0.05 mF. 400V. wkg.
C31	C0014CC	25 mF. 40P.V. Electro.
C32	C0013AK	0.005 mF. 600V. wkg.
	D2398	Neutralizing Condenser

MISCELLANEOUS

REF.	PART No.	DESCRIPTION
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
CK1	D2357	H.T. Filter Choke
T1	D2358	Mains Transformer
T2	D2686	Output Transformer
S1	D2346	5-Pole 3-Position Switch
S2-VR3	D2350	1 Megohm Potentiometer tapped at 25,000 ohms. (Incorp. Mains Switch)
VR1	D2754	2 Megohm Potentiometer
VR2	D2753	500,000 ohm Potentiometer
VC1 & VC2	C0159A	2-gang Condenser
IFT.1	D2278	1st I.F. Transformer
IFT.2	D2355	2nd I.F. Transformer
Spkr.	D2765B	Ellipsoidal Speaker, Type 24460AN
		Dial Lamps: 6.3V., 0.25A.
	C0469A	Dial Glass
	D2704	Dial Pointer Assembly
	D9141	Dial Cord
	B0144	Dial Back Plate
	D2534	Dial Pulley
	D2773	Dial Spring
	D2286	P.U. Panel
	D2664	Speaker Grill Mesh. A & E Panel "Carr Fastener" 679-2-2
	D2364	P.U. Plugs
	D2607	Extension Speaker Plug
	D2608	Speaker Sockets
F1		5 Amp. Fuse Wire



CIRCUIT DIAGRAM OF MODEL C43B

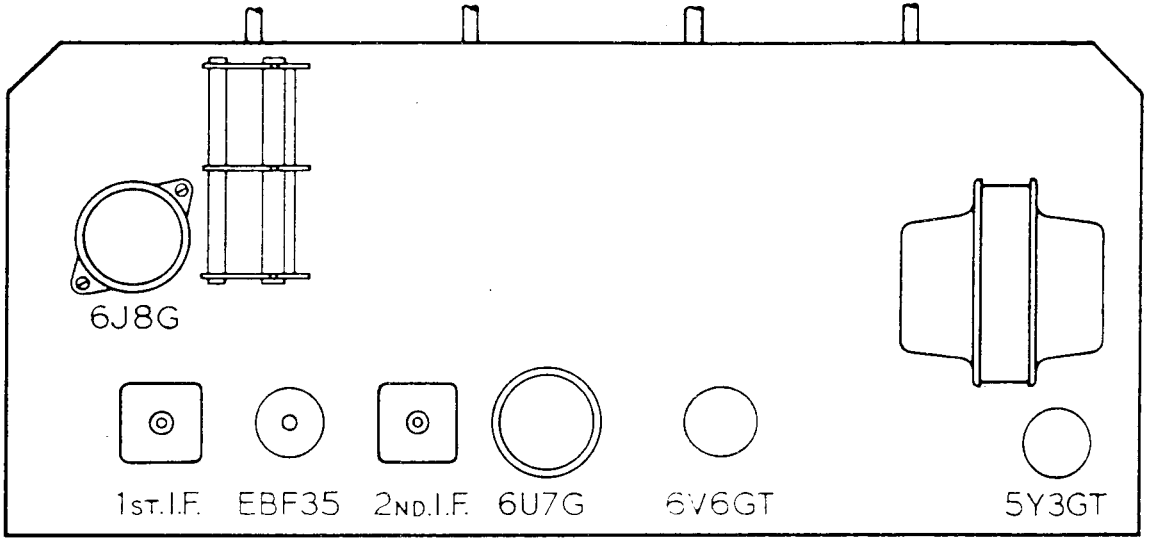
MODEL C43B

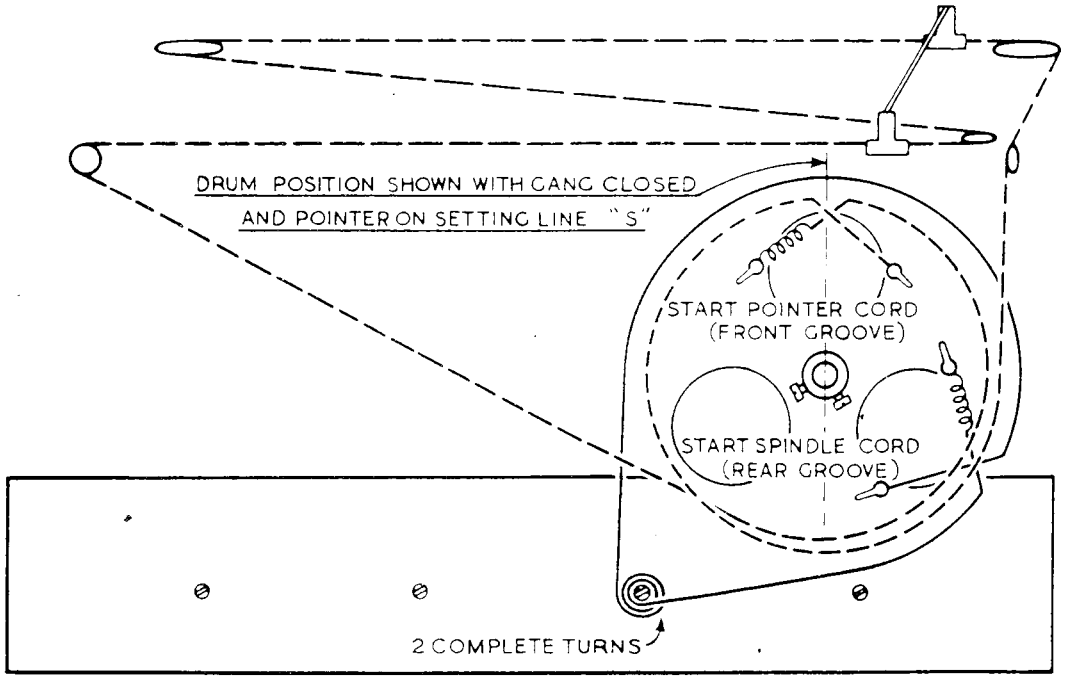
ALIGNMENT

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.





D2730