Private and Confidential *For Trade Use Only*

"His Master's Voice"

SERVICE MANUAL

for

FIVE-VALVE DUAL-WAVE

VIBRATOR-OPERATED BATTERY RECEIVER

TABLE MODEL 268

CONSOLE MODEL 328

(Incorporating Chassis Type A557DM)

TECHNICAL SPECIFICATION

POWER SUPPLY:

6 volt 130 amp. hour Accumulator.

CONSUMPTION:

1 amp. at 6.0 Volts.

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:

1C7G	Converter
1M5G	1st IF. Amplifier
1K7G	2nd I.F. Amplifier,-Demod.,-AVC
1K7G	A.F. Amplifier
1L5G	Power.

DIAL LAMPS (2):

6.3 volts, 0.15 to 0.3 amp.

LOUDSPEAKERS:

Model 268: 6in. Permagnetic
Model 328: 6in. Permagnetic
10in. Permagnetic
Voice Coil Impedance at 400 c.p.s.
6in. Speaker: 3.7 ohms
10in. Speaker: 2.7 ohms.

DIMENSIONS:	Width	Height	Depth
Model 268:	19in.	11¾in.	10⅛in.
Model 328:	32in.	29½in.	12in.

WEIGHT:	Gross	Net
Model 268	36 lbs.	29 lbs.
Model 328	71 lbs.	61 lbs.
Accumulators	56 lbs.	52 lbs.

CIRCUIT DESCRIPTION

These models incorporate a 5-valve vibrator-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 cored aerial transformer L1-L2. For short-wave reception, the short-wave aerial transformer L5-L6 is switched into circuit.

A pentagrid converter is employed as frequency changer. Fixed padding capacitors are used on both wave 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.

1st I.F. AMPLIFIER

The converter valve is transformer coupled to a super-control pentode, V2, which functions as an I.F. amplifier. This valve is in turn transformer coupled to the 2nd I.F. amplifier valve V3, which is a duo-diode-pentode. The I.F. transformers are of the permeability tuned type with fixed tuning condensers.

2nd I.F. AMPLIFIER,-DEMODULATOR,-AVC

The output of this valve is transformer coupled to the demodulator diode. The remaining diode is capacity coupled to the plate circuit and supplies AVC voltage to the 1st I.F. valve and the broadcast section of the converter. AVC diode delay voltage and also standing bias for this valve is obtained from the voltage drop across the filament of the 1st I.F. valve.

A.F. AMPLIFIER

The input of this valve may be switched to either the demodulator diode load, R12, 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 power pentode valve V5.

POWER STAGE

The output of the 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 volume control tap through a resistor. This arrangement provides negative feedback over the whole of the audio feed system. By advancing the volume control setting for higher gain the feedback factor is reduced. A phasing network comprising C33, R18 is connected across the transformer primary.

In Model 328, 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 speaker.

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 sockets, 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

High tension voltage is obtained by means of a synchronous vibrator and associated transformer and filters, the whole being incorporated on a sub-chassis which is shock-mounted on the main receiver chassis. The vibrator cartridge is readily accessible by removing the rubber-lined metal cover enclosing it. The vibrator input circuit is protected by a 10 amp. fuse in the positive side of the circuit. A double-pole single-throw switch — combined with the Volume Control—controls the vibrator and valve filament circuits.

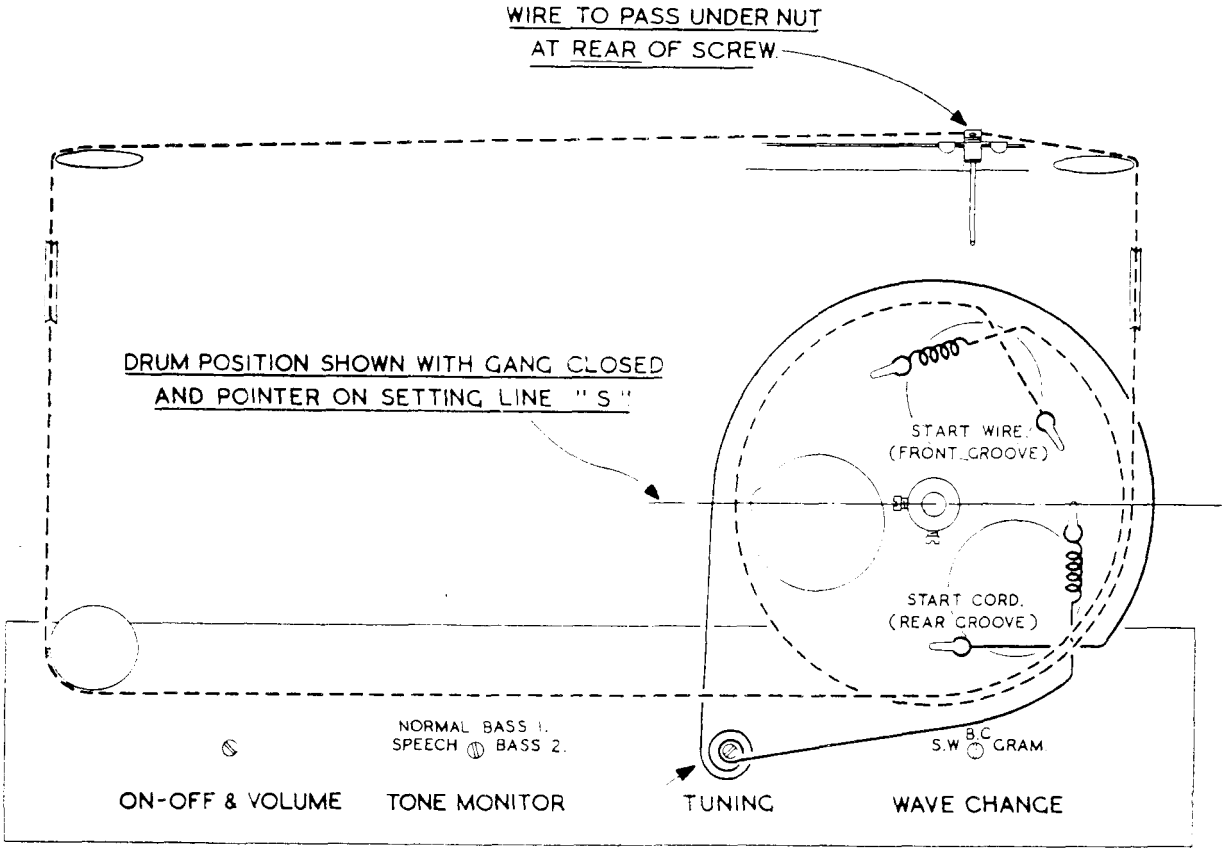
DISMANTLING

MODEL 268

1. Disconnect battery leads.
2. Remove control knobs.
3. Disconnect dial lamp switch plug from chassis.
4. Unscrew two chassis holding screws.
5. Withdraw chassis.

MODEL 328

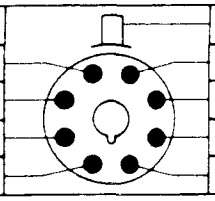
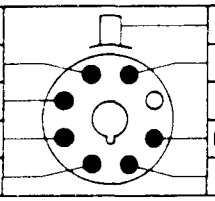
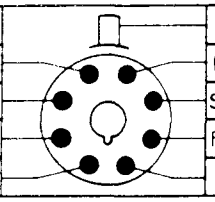
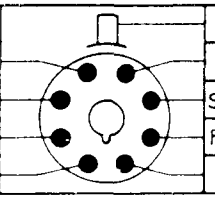
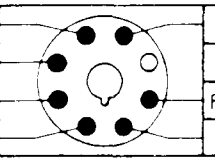
1. Disconnect battery leads.
2. Remove control knobs.
3. Disconnect speaker and dial lamp switch plugs from chassis.
4. Unscrew two chassis fixing nuts and withdraw bolts.
5. Withdraw chassis.



— DIAL CORD ARRANGEMENT —

—VOLTAGE TABLE—

- —— VOLTAGES AND CURRENTS ARE WITH THE RECEIVER OPERATING WITH BATTERY TERMINAL VOLTAGE OF 6·0 VOLTS, 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	1C7-G	CONVERTER			
					GRID	——	——	2·1 MΩ
30	1·5	0·1 MΩ	SCREEN GRID		OSC. GRID	——	——	50 KΩ
130	0·7	INFIN.	PLATE		OSC. ANODE	110	2·0	INFIN.
1·95	120	——	FILAMENT +		FILAMENT −	NIL	——	NIL
			NO CONN.		NO CONN.			
			V2	1M5-G	1ST I.F. AMPLIFIER			
					GRID	——	——	2 MΩ
63	0·78	INFIN.	SCREEN GRID		NO CONN.			
135	2·5	INFIN.	PLATE					
1·95	120	——	FILAMENT +		FILAMENT −	NIL	——	NIL
			NO CONN.		NO CONN.			
			V3	1K7-G	2ND. I.F. AMPLIFIER - DEMODULATOR - A.V.C.			
					GRID	——	——	15 Ω
——	——	1 MΩ	DIODE (A.V.C.)		DIODE (DET.)	——	——	0·3 MΩ
135	0·5	INFIN.	PLATE		SCREEN GRID	63	0·17	INFIN.
3·90	120	——	FILAMENT +		FILAMENT −	——	——	——
			NO CONN.		NO CONN.			
			V4	1K7-G	AUDIO AMPLIFIER			
					GRID	——	——	1 MΩ *
NIL	——	NIL	DIODE		DIODE	NIL	——	NIL
70	0·15	INFIN.	PLATE		SCREEN GRID	15	0·1	INFIN.
3·90	120	——	FILAMENT +		FILAMENT −	——	——	——
			NO CONN.		NO CONN.			
			V5	1L5-G	OUTPUT AMPLIFIER			
135	1·3	INFIN.	SCREEN GRID		GRID	——	——	1 MΩ
132	6·8	INFIN.	PLATE					
5·85	240	——	FILAMENT +		FILAMENT −	——	——	——
			NO CONN.		NO CONN.			

REMARKS :-

H.T. VOLTS = 35·0 VOLTS
H.T. CURRENT = 16·5 MA. (S/W 20·0 MA.)
TOTAL FILAMENT VOLTAGE = 5·85 VOLTS.
TOTAL FILAMENT CURRENT = 0·24 AMP.
TOTAL BATTERY DRAIN = 1·0 AMP.

* VOLUME CONTROL FULLY CLOCKWISE.

PARTS LIST

RESISTORS

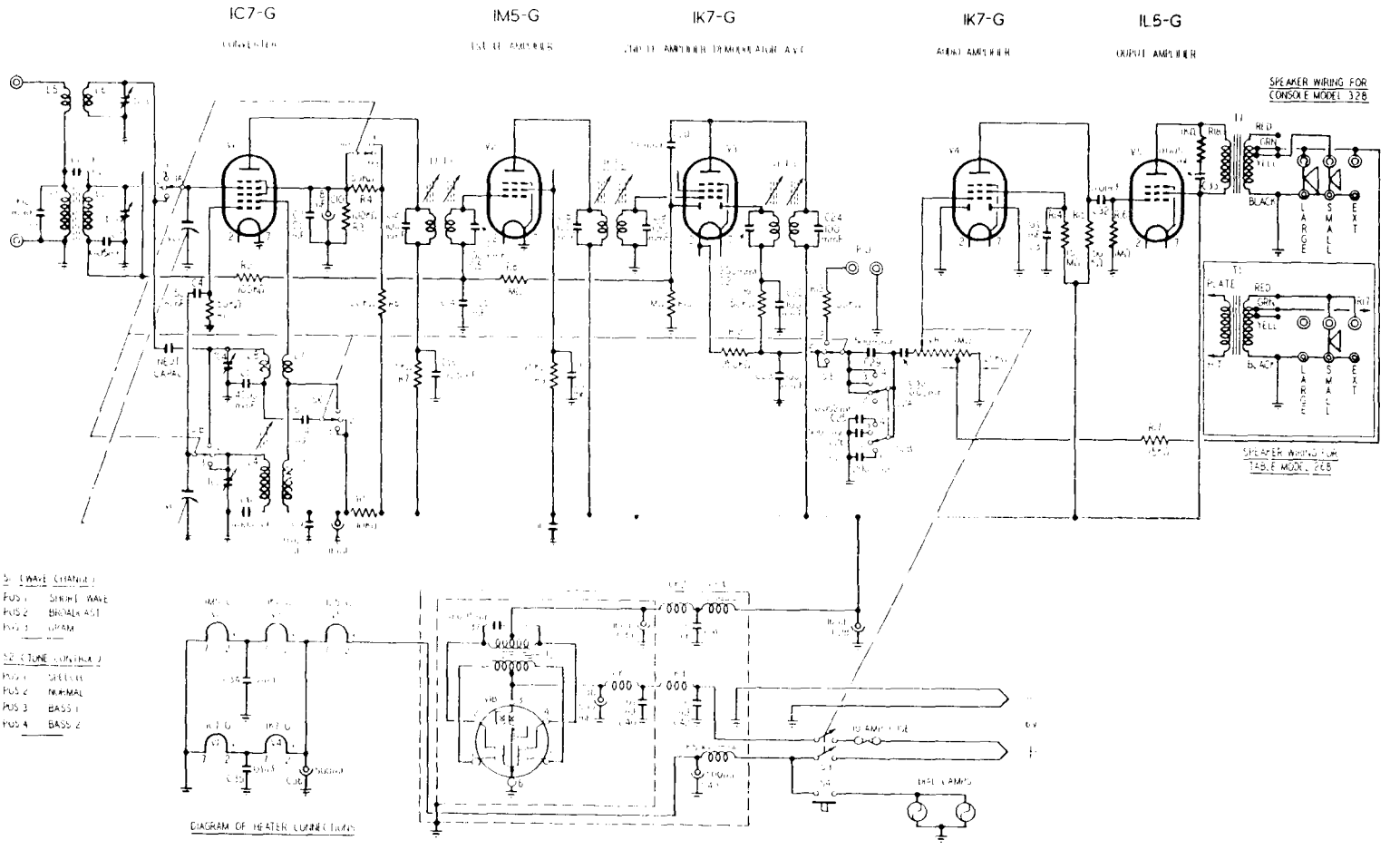
REF.	PART No.	DESCRIPTION
R1	H2X	50,000 ohm ½ watt ± 10%
R2	J2X	100,000 ohm ½ watt ± 10%
R3	J3X	100,000 ohm 1 watt ± 10%
R4	H3X	50,000 ohm 1 watt ± 10%
R5	F3X	10,000 ohm 1 watt ± 10%
R6	V3X	20,000 ohm 1 watt ± 10%
R7	X2X	5,000 ohm ½ watt ± 10%
R8	P2X	1 Megohm ½ watt ± 10%
R9	AN3X	75,000 ohm 1 watt ± 10%
R10	P2X	1 Megohm ½ watt ± 10%
R11	H2X	50,000 ohm ½ watt ± 10%
R12	N2X	250,000 ohm ½ watt ± 10%
R13	J2X	100,000 ohm ½ watt ± 10%
R14	Q3X	1.5 Megohm 1 watt ± 10%
R15	K3X	150,000 ohm 1 watt ± 10%
R16	P2X	1 Megohm ½ watt ± 10%
R17	AN2X	75,000 ohm ½ watt ± 10%
R18	D2X	1,000 ohm ½ watt ± 10%

CONDENSERS

REF.	PART No.	DESCRIPTION
C1	D0243P	100 mmF. ± 10%
C2	D0243BU	3 mmF. ± 1 mmF.
C3	C0013M	0.05 mF. 200V.
C4	D0243Q	50 mmF. ± 10%
C5	D0243CQ	4000 mmF. ± 100 mmF.
C6	D0243AM	400 mmF. ± 5 mmF.
C7	C0013Q	0.1 mF. 200V.
C8	C0013N	0.01 mF. 600V.
C9	C0013I	0.02 mF. 400V.
C10	C0014AZ	8 mF. 350 P.V.
C11	C0014BA	16 mF. 350 P.V.
C12	D4405W	100 mmF. ± 5%
C13	C0013M	0.05 mF. 200V.
C14	C0013M	0.05 mF. 200V.
C15	D4405W	100 mmF. ± 5%
C16	C0013L	0.5 mF. 200V.
C17	C0013Q	0.1 mF. 200V.
C18	D4405W	100 mmF ± 5%
C19	D4405W	100 mmF ± 5%
C20	D0243Q	50 mmF. ± 10%
C21	D4405AC	200 mmF. ± 5%
C22	D0243P	100 mmF. ± 10%
C23	D0243P	100 mmF. ± 10%
C24	D4405W	100 mmF ± 5%
C25	D0243H	0.002 mF. ± 10%
C26	D0243L	500 mmF. ± 10%
C27	D0243CY	200 mmF. ± 10%
C28	C0014AX	16 mF. 350 P.V.
C29	D0243L	500 mmF. ± 10%
C30	C0013M	0.05 mF. 200V.
C31	C0013E	0.1 mF. 400V.
C32	C0013N	0.01 mF. 600V.
C33	C0013AK	0.005 mF. 600V.
C34	C0013Q	0.1 mF. 200V.
C35	C0013Q	0.1 mF. 200V.
C36	C0014AV	500 mF. 12 P.V.
C37	C0013AP	0.005 mF. 2000V. ± 10%
C38	C0014AV	500 mF. 12 P.V.
C39	C0014BA	16 mF. 350 P.V.
C40	C0013Q	0.1 mF. 200V.
C41	C0013E	0.1 mF. 400V.
C42	C0013Q	0.1 mF. 200V.
C43	C0014V	500 mF. 12 P.V.

MISCELLANEOUS

REF.	PART No.	DESCRIPTION
VC1, VC2	C0159A	2 Gang Condenser
VR1, S3	D2350	1 Megohm Potentiometer (Tapped at 25,000 ohm) Incorp. Mains Switch
S1	D2346	6-Pole 3-Position Switch
S2	D2424A	2-Pole 4-Position Switch
S4	D1361B	Push-Button Switch
IFT.1	D2417	1st I.F. Transformer
IFT.2	D2417	2nd I.F. Transformer
IFT.3	D2418	3rd I.F. Transformer
T1	D2423	Output Transformer
T2	D2317	Vibrator Transformer
CK.1	D5624	L.T. R.F. Choke
CK.2	D5623	H.T. R.F. Choke
CK.3	D1438	L.T. R.F. Choke
CK.4	D2228	H.T. Filter Choke
CK.5	D1452	L.T. Filter Choke
L1, L2	D1614D/2	B C Aerial Coil
L3, L4	D2224	B C Osc. Coil
L5, L6	D2321	S/W Aerial oil
L7, L8	D2320	S/W Osc. Coil
TC.1	D2395	Trimmer Condenser
TC.2	D2395	Trimmer Condenser
TC.3	D2395	Trimmer Condenser
TC.4	D2395	Trimmer Condenser
		Dial Lamps, 6.3V. 0.25A. S.C.
VIB.	D2259	Vibrator Cartridge V5124A
	C0371	Dual-Wave Dial Glass
	D2335	Dial Pointer
		Dial Cord, White, No. 1, 2ft. 6ins.
		Dial Wire (Cored and Braided), 6ft. 6ins.
	D0873	Dial Cord Spring
		Dial Cord Lug, H238
	D2394	Control Knob
		5 Amp. Fuse Wire, 38 SWG. T. Cu.
	D2420	10in. Permag. Speaker
	D2419	6in. Permag. Speaker



CIRCUIT DIAGRAM OF MODELS 268 AND 328, INCORPORATING CHASSIS TYPE A557DM.

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 re-alignment 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 0.5 volt.

I.F. ALIGNMENT

1. Rotate the volume control fully clockwise, set Tone Monitor switch to "Normal," and 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 1C7G 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 third I.F. transformer and following with the second and 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) to (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."

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

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