Private and Confidential

For Trade Use Only

"His Master's Voice"

SERVICE MANUAL

for

FIVE-VALVE A.C. MAINS-OPERATED

MEDIUM-WAVE CHASSIS

TYPE 61

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

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PART No. 6822711

TECHNICAL SPECIFICATION

POWER SUPPLY:
200 to 250 volts, 40 to 50 c.p.s.
(Receiver only).

CONSUMPTION:
36 watts.

FREQUENCY RANGE:
540 Kc/s to 1600 Kc/s.

I.F. FREQUENCY:
457.5 Kc/s.

VALVE COMPLEMENT:

6BE6	.....	Frequency Changer
6BA6	.....	I.F. Amplifier
6AV6	.....	A.V.C.-Demod.-Audio Amp.
6M5	.....	Power
6X4	.....	Rectifier.

DIAL LAMPS:
6.3 volt, 0.3 amp.

CIRCUIT DESCRIPTION

This model incorporates a 5-valve A.C. mains-operated superheterodyne receiver for medium-wave reception.

FREQUENCY CHANGER

The aerial is coupled to the frequency changer valve by means of a high-efficiency iron-dust cored aerial transformer, L1-L2.

With the frequency changer valve, used as a pentagrid converter, a self-excited oscillator circuit is employed incorporating a fixed padding capacity. Variable adjustment is provided by means of an iron dust bolt for tuning the oscillator coil, L3.

I.F. AMPLIFIER

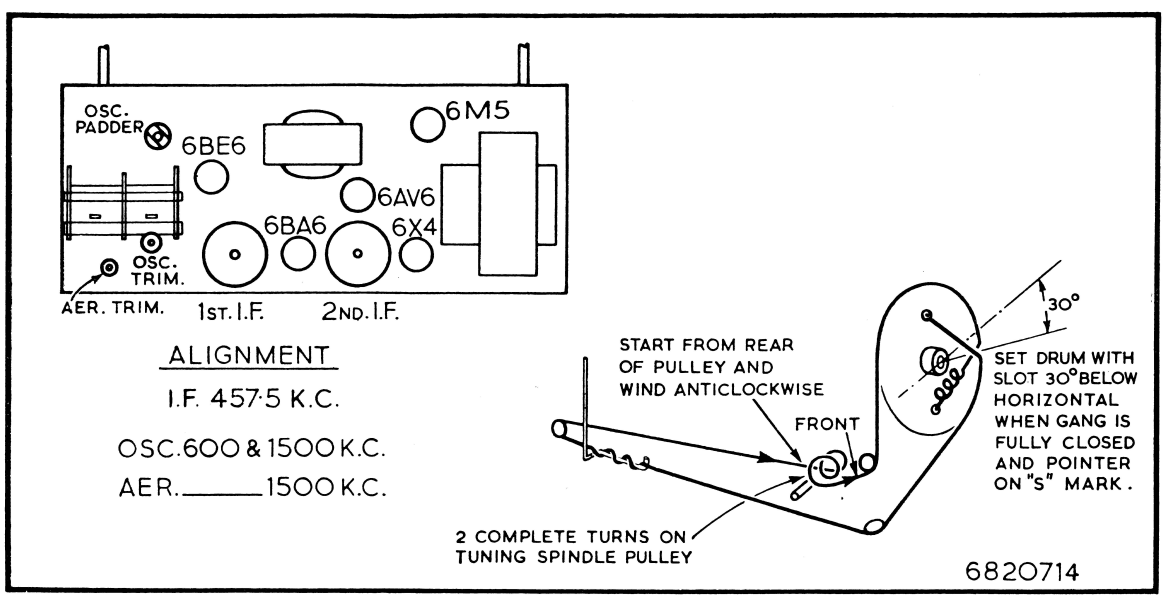
The frequency changer valve is transformer-coupled to a remote cut-off pentode, V2. This valve is, in turn, transformer-coupled to the demodulator diode section of the duo-diode triode valve, V3. Both I.F. transformers have fixed tuning capacitors, and permeability tuning is provided by means of iron-dust tuning bolts.

DEMOD., A.V.C. AND A.F. AMPLIFIER

Simple A.V.C. is used to obtain A.V.C. potentials for the frequency changer and I.F. amplifier.

The demodulated signal across the diode load VR1 is applied to the grid of the triode section of V3.

The audio amplifier is resistance-capacity-coupled to the grid of the beam power output valve, V4.



AUDIO OUTPUT AMPLIFIER

The Beam Power Output valve, V4, is transformer-coupled to the loudspeaker. Inverse feedback is provided by feeding voltage from the voice coil via C22 to the cathodes of the 6M5 output valve.

H.T. SUPPLY

The power supply employs an indirectly-heated-type high-vacuum valve, V5, as a full-wave rectifier. Unfiltered high tension voltage is fed to the power output valve plate circuit, whilst the remaining receiver circuits are supplied with H.T. through a resistance-capacity filter.

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. I.F. alignment should always precede R.F. alignment, 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 be connected across the voice terminals of the speaker to indicate that 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.

Note: Calibration marks are provided on the bottom edge of the dial glass. Beginning at the left, these marks correspond to:

(1) Pointer setting.
(2) 600 Kc/s.
(3) 980 Kc/s.
(4) 1500 Kc/s.

I.F. ALIGNMENT

(1) Rotate the volume control fully clockwise and fully enmesh the tuning condenser vanes. Connect the output leads of a signal generator to the grid of the 6BE6 frequency changer valve through a 0.1 condenser, or the vacant lug on top of tuning condenser.
(2) Tune signal generator to exactly 457.5 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 correct 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

(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 enmeshed, the pointer coincides with the setting line on the extreme left of the dial scale. If necessary, the pointer must be adjusted at the point where the drive cord is attached to the pointer carrier.
(3) Tune signal generator to 600 Kc/s.
(4) Rotate tuning knob until the pointer is exactly over the 600 kc/s calibration mark, and adjust the 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.

Any further service information may be obtained by addressing an enquiry to the "Service Division, E.M.I. (Aust.) Pty. Limited, 575-577 Parramatta Road, Leichhardt." (Telephone LM 1491).

During the course of production of this receiver, the Company reserves the right, without notice, to make any modifications or improvements in design which may be necessary to meet prevailing conditions.

Information concerning changes, which is likely to be of benefit to retailers and servicemen, will be notified as far as possible by issuing a Technical Data Sheet.

PARTS LIST

RESISTORS

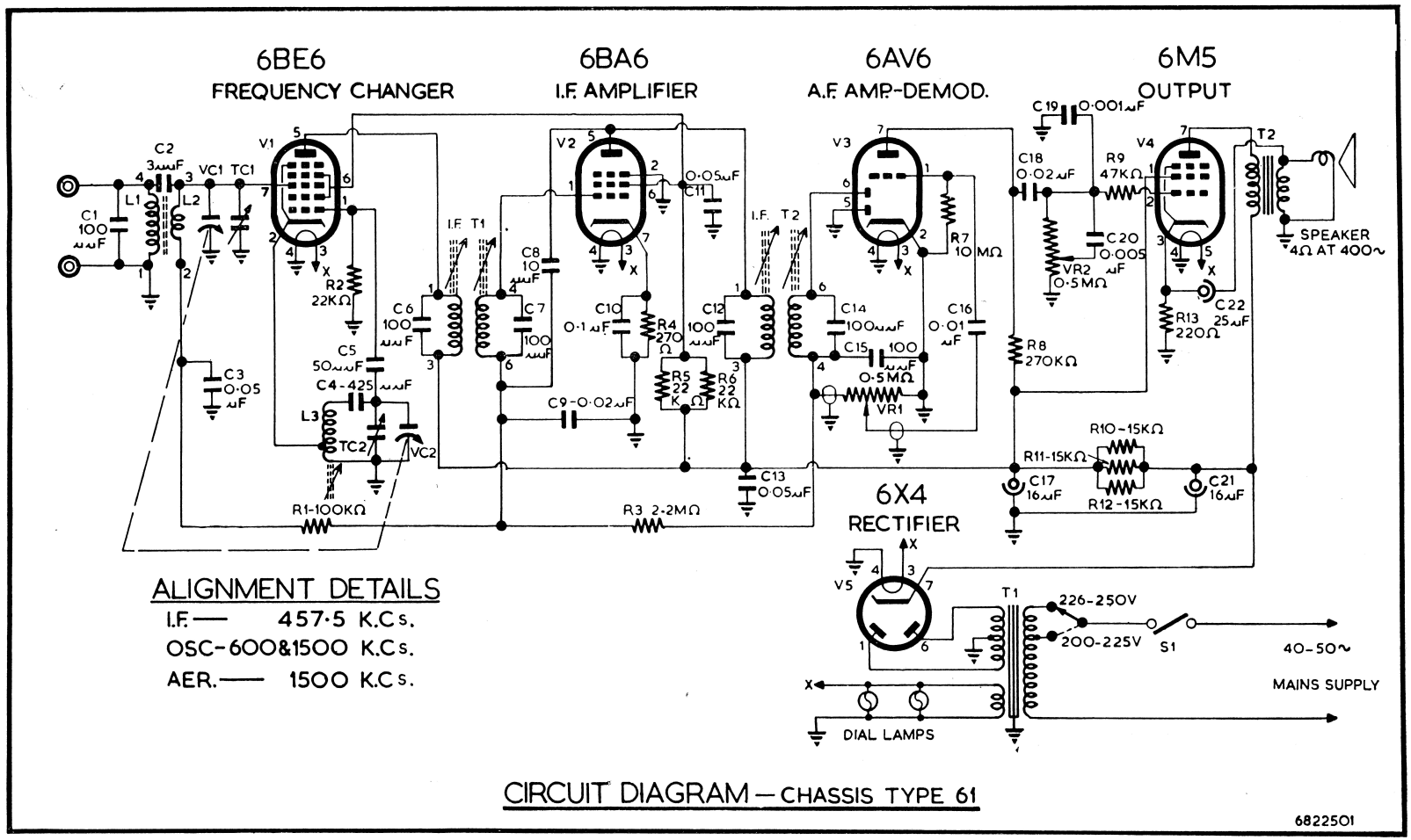
REF.	PART No.	DESCRIPTION	REF	PART No.	DESCRIPTION
R1	7400142	100,000 ohms ± 10% ½ watt	R8	7400172	270,000 ohms ± 10% ½ watt
R2	7400102	22,000 ohms ± 10% ½ watt	R9	7400122	47,000 ohms ± 10% ½ watt
R3	7400202	2.2 megohms ± 10% ½ watt	R10	7420042	15,000 ohms ± 10% 1 watt
R4	7400292	270 ohms ± 10% ½ watt	R11	7420042	15,000 ohms ± 10% 1 watt
R5	7420052	22,000 ohms ± 10% 1 watt	R12	7420042	15,000 ohms ± 10% 1 watt
R6	7420052	22,000 ohms ± 10% 1 watt	R13	7400282	220 ohms ± 10% ½ watt
R7	7420232	10 megohms ± 10% 1 watt			

CAPACITORS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
C1	2730051	100 mmF. ± 10%	C12	2750041	100 mF. ± 5%
C2	2730001	3 mmF. ± 1 mmF.	C13	2790131	.05 mF. ± 20% 400V. wkg.
C3	2790121	.05 mF. ± 20% 200V. wkg.	C14	2750041	100 mmF. ± 5%
C4	2730111	425 pfd. ± 5 pfd.	C15	2730051	100 mmF. ± 10%
C5	2730041	50 mmF. ± 10%	C16	2790071	.01 mF. ± 20% 600V. wkg.
C6	2750041	100 mmF. ± 5%	C17 & C21	2690261	16 mF. + 16 mF. 350 P.V.
C7	2750041	100 mmF. ± 5%	C18	2790101	.02 mF. ± 20% 600V. wkg.
C8	2730011	10 mmF. ± 10%	C19	2730151	1,000 mmF. ± 10%
C9	2790091	.02 mF. ± 20% 400V. wkg.	C20	2790031	.005 mF. ± 20% 600V. wkg.
C10	2790151	.1 mF. ± 20% 200V. wkg.	C22	2690221	25 mF. 40 P.V.
C11	2790131	.05 mF. ± 20% 400V. wkg.			

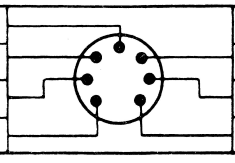
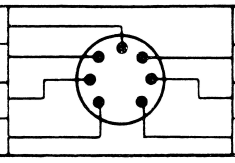
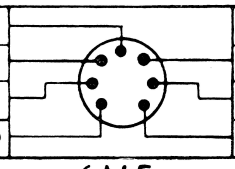
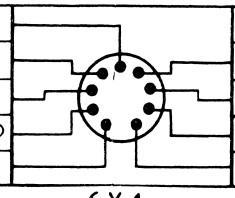
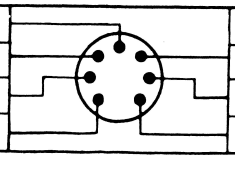
MISCELLANEOUS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
T1	9040004	Transformer, Mains		2970011	Cord, Drive—4' 5" length
T2	9050023	Transformer, Output		8370055	Drive Spindle
VC1-VC2	2810062	Capacitor, 2-Gang		8400111	Spring—Drum
VR1	6770023	Potentiometer, ½ megohm		7940311	Scale—Dial
VR2	6770023	Potentiometer, ½ megohm		9320391	Lamps, 6.3 volt, 0.3 amp., M.E.S.
S1	8550162	Switch, Single Pole		6710271	Pointer Assembly
L1-L2	2530101	Coil, M/W Aerial		9320291	Valve 6M5
L3-L4	2570104	Coil, M/W Oscillator		9320301	Valve 6X4
TC1	2810071	Capacitor—Trimmer Aerial		9320321	Valve 6AV6
TC2	2810031	Capacitor—Trimmer Osc.		9320331	Valve 6BA6
IFT1	9060024	Transformer, 1st I.F.		9320341	Valve 6BE6.
IFT2	9060024	Transformer, 2nd I.F.			
	3810033	Drum			


6BE6
FREQUENCY CHANGER
6BA6
I.F. AMPLIFIER
6AV6
A.F. AMP.-DEMOD.
6M5
OUTPUT
6X4
RECTIFIER
ALIGNMENT DETAILS
I.F.— 457·5 K.Cs.
OSC-600&1500 K.Cs.
AER.— 1500 K.Cs.
SPEAKER 4Ω AT 400~
226-250V
200-225V
S1
40-50~
MAINS SUPPLY
DIAL LAMPS
CIRCUIT DIAGRAM — CHASSIS TYPE 61
6822501

— 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 M.A.	RESISTANCE TO CHASSIS	VALVE ELECTRODE	BOTTOM VIEW OF VALVE SOCKET	VALVE ELECTRODE	VOLTS TO CHASSIS	CURRENT M.A.	RESISTANCE TO CHASSIS
			V1	6BE6	FREQUENCY CHANGER.			
—	—	0	HEATER					
6·3A.C.	300	—	HEATER		PLATE	185	2·0	INFIN
—	11	0·5Ω	CATHODE		SCREEN	95	8·0	INFIN.
—	0·31	20KΩ	OSC.GRID		CONTROL GRID	—	—	2·6MΩ
			V2	6BA6	I.F. AMPLIFIER.			
—	—	0	HEATER					
6·3A.C.	300	—	HEATER		PLATE	185	3·6	INFIN.
—	—	0	SUPPRESSOR		SCREEN	95	2·0	INFIN.
—	—	2·5 MΩ	CONTROL GRID		CATHODE	1·5	5·6	250Ω
			V3	6AV6	AUDIO AMPLIFIER–DEMODULATOR.			
—	—	—	HEATER					
6·3A.C.	300	—	HEATER		DIODE N°2	0	0	0·5MΩ
0	0·4	0	CATHODE		DIODE N°1	—	—	—
0	0	10MΩ	CONTROL GRID		PLATE	70	0·4	INFIN.
			V4	6M5	OUTPUT			
6·3 A.C.	710	—	HEATER					
—	—	—	HEATER		NO CONN.	—	—	—
5V	26	200Ω	CATHODE		PLATE	280	23	INFIN.
0	0	0·5MΩ	CONTROL GRID		NO CONN.	—	—	—
185	3	INFIN.	SCREEN		NO CONN	—	—	—
			V5	6X4	RECTIFIER.			
—	—	—	HEATER					
6·3A.C.	600	—	HEATER		NO CONN.	—	—	—
—	—	—	NO CONN.		PLATE N°2	240A.C.	—	360Ω
240A.C	—	360Ω	PLATE N°1		CATHODE	260	—	INFIN.

REMARKS:- TOTAL H.T. CURRENT 42 M.A.

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