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For Trade Use Only

"HIS MASTER'S VOICE"
RADIO SERVICE MANUAL

for

SIX - VALVE
A.C. MAINS - OPERATED MEDIUM - WAVE CHASSIS
TYPE K1

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

PART No. 682-6821

TECHNICAL SPECIFICATION

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

CONSUMPTION
51 watts.

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

INTERMEDIATE FREQUENCY:
457.5 Kc/s.

TONE CONTROLS:
1: Bass boost or cut.
2: Treble boost or cut.

VALVE COMPLEMENT:

6BE6	Frequency Changer.
6BA6	I.F. Amplifier.
6AV6	A.F. Amp. — Demod. — A.V.C.
6BM8	2nd A.F. Amp. — Power.
6BM8	Phase Splitter — Power.
6V4	Rectifier.

DIAL AND PILOT LAMPS
6.3 volt, 0.3 amp. (Miniature screw-cap base).

OUTPUT IMPEDANCE:
15 ohms at 400 c.p.s.

CIRCUIT DESCRIPTION

This chassis type is a six-valve A.C. mains-operated medium-wave superheterodyne receiver, in which provision for the attachment of record playing equipment has been made.

FREQUENCY CHANGER

The aerial is coupled to the signal frequency circuit by means of the iron-dust cored aerial transformer, L1-L2.

The frequency changer valve is used as a pentagrid converter with a self-excited oscillator circuit.

A fixed padding capacitor is provided in the oscillator circuit with variable padding provided by an iron-dust bolt in coil L3.

A push-pull Radio-Gramophone switch incorporated with the volume control is used to switch from radio to gramophone operation.

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.—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 or pick-up input is coupled to the volume control in the grid circuit of the triode. section of V3. The output is resistance-capacitance coupled to the tone control network, which gives treble and bass boost or cut, and its output is applied to the grid of the 2nd A.F. Amplifier, V4A. This valve, in turn, is resistance-capacitance coupled to the grid of the triode V5A, which functions as a phase-splitter.

POWER AMPLIFIER

The output of the phase-splitter, taken across R19 and R20 is then applied to the signal grids of the push-pull Power Amplifier valves, V4B and V5B. The Power Valves are then transformer-coupled to the loudspeaker. Portion of the voltage appearing across the secondary of the output transformer is applied to the cathode of the A.F. Amplifier, V4A, to provide negative feedback.

HIGH TENSION SUPPLY

The power supply employs an indirectly-heated full - wave rectifier, V6. Unfiltered high tension voltage from the cathode of the rectifier supplies the plate circuits of the power amplifier; the remaining HT circuits of the receiver are fed through a resistance-capacitance filter.

A push-pull mains switch incorporated with the Bass Tone Control is used to connect the mains supply to the receiver and mains outlet socket.

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 A.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 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

Set receiver controls as follows:

Volume Control: Maximum.
Tone Controls: Both normal.
Tuning Control: Capacitor plates fully enmeshed.

(1) Connect the output of the signal generator through a 0.1 mF. capacitor to the stator plates of the front section of the ganged capacitor.

(2) Tune the 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 the 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

(1) With the controls set as for I.F. alignment, connect the signal generator output leads in series with a 200 pF. capacitor to the aerial and earth terminals of the receiver.

(2) Check that, when the ganged capacitor is fully closed, the pointer coincides with the setting marks at the extreme left-hand side of the dial scale.

(3) Tune the signal generator and receiver to 600 kc/s. (The 600 kc/s calibration mark will be found above 7ZL on the dial scale).

(4) Whilst "rocking" the tuning control, adjust the medium - wave oscillator tuning bolt for maximum response.

(5) Tune the signal generator to 1500 kc/s.

(6) Adjust the tuning control until the pointer coincides with the 1500 kc/s calibration mark (below 3AK).

(7) Adjust the oscillator and aerial trimmer capacitors in that order for maximum response.

(8) Repeat operations (3) to (7) inclusive until correct alignment is obtained.

ADDITIONAL DATA

Any further service information may be obtained by addressing an enquiry to the "Service Division, E.M.I. (Australia) Limited, 575-577 Parramatta Road, Leichhardt" (phone LM0291).

During the course of production of this chassis 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 the issue of a Technical Data Sheet.

PARTS LIST

RESISTORS

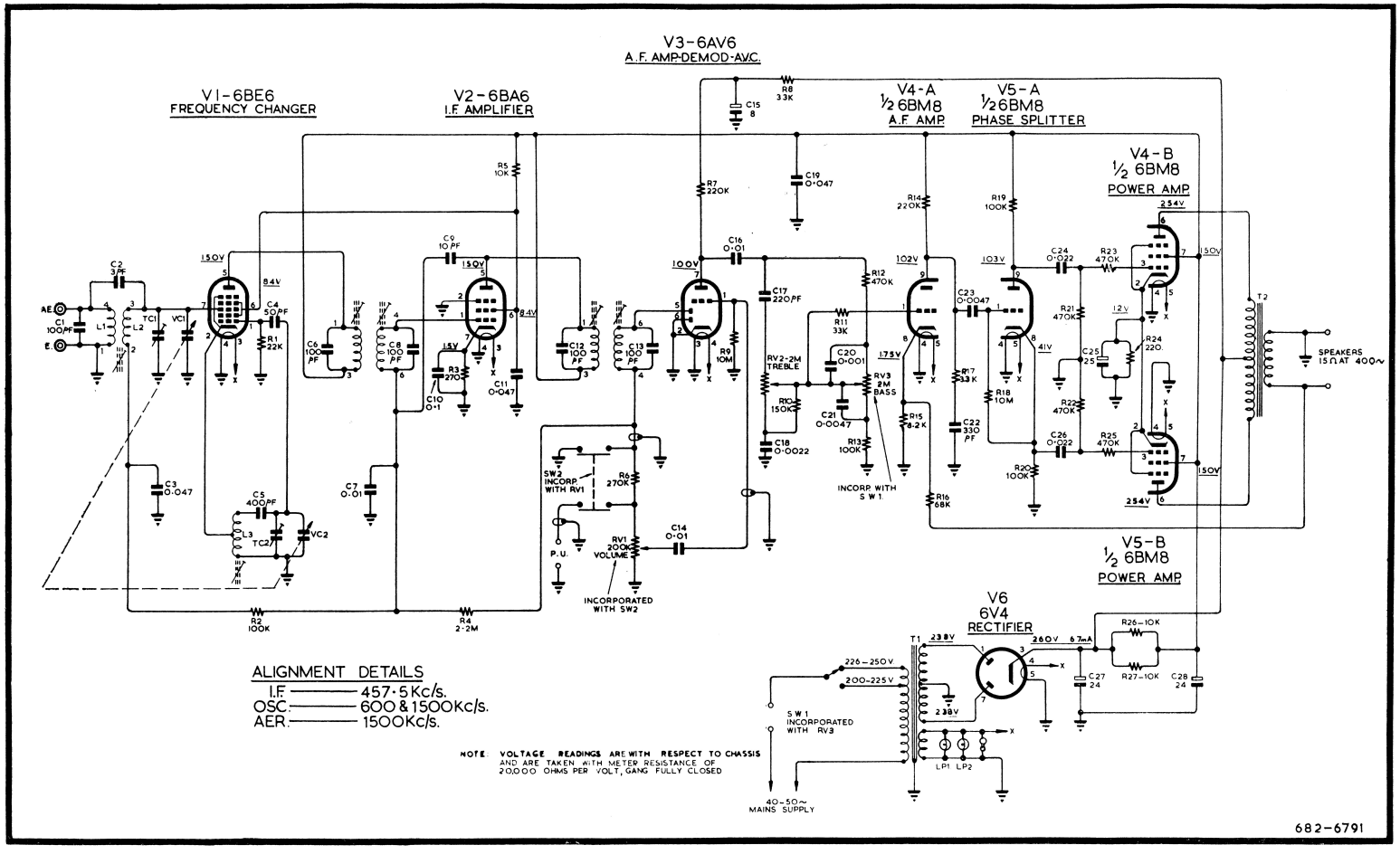
REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
R1	740-0102	22,000 ohms ± 10% ½ watt	R14	742-0132	220,000 ohms ± 10% 1 watt
R2	740-0142	100,000 ohms ± 10% ½ watt	R15	740-0792	8,200 ohms ± 10% ½ watt
R3	740-0292	270 ohms ± 10% ½ watt	R16	740-0752	68,000 ohms ± 10% ½ watt
R4	740-0202	2.2 megohms ± 10% ½ watt	R17	740-0242	33,000 ohms ± 10% ½ watt
R5	742-0031	10,000 ohms ± 10% 1 watt	R18	742-0232	10 megohms ± 10% 1 watt
R6	740-0172	270,000 ohms ± 10% ½ watt	R19	742-0922	100,000 ohms ± 5% 1 watt
R7	742-0132	220,000 ohms ± 10% 1 watt	R20	742-0922	100,000 ohms ± 5% 1 watt
R8	740-0242	33,000 ohms ± 10% ½ watt	R21	740-0182	470,000 ohms ± 10% ½ watt
R9	742-0232	10 megohms ± 10% 1 watt	R22	740-0182	470,000 ohms ± 10% ½ watt
R10	740-0152	150,000 ohms ± 10% ½ watt	R23	740-0182	470,000 ohms ± 10% ½ watt
R11	740-0242	33,000 ohms ± 10% ½ watt	R24	742-0782	220 ohms ± 10% 1 watt
R12	740-0182	470,000 ohms ± 10% ½ watt	R25	740-0182	470,000 ohms ± 10% ½ watt
R13	740-0142	100,000 ohms ± 10% ½ watt	R26	742-0031	10,000 ohms ± 10% 1 watt
			R27	742-0031	10,000 ohms ± 10% 1 watt

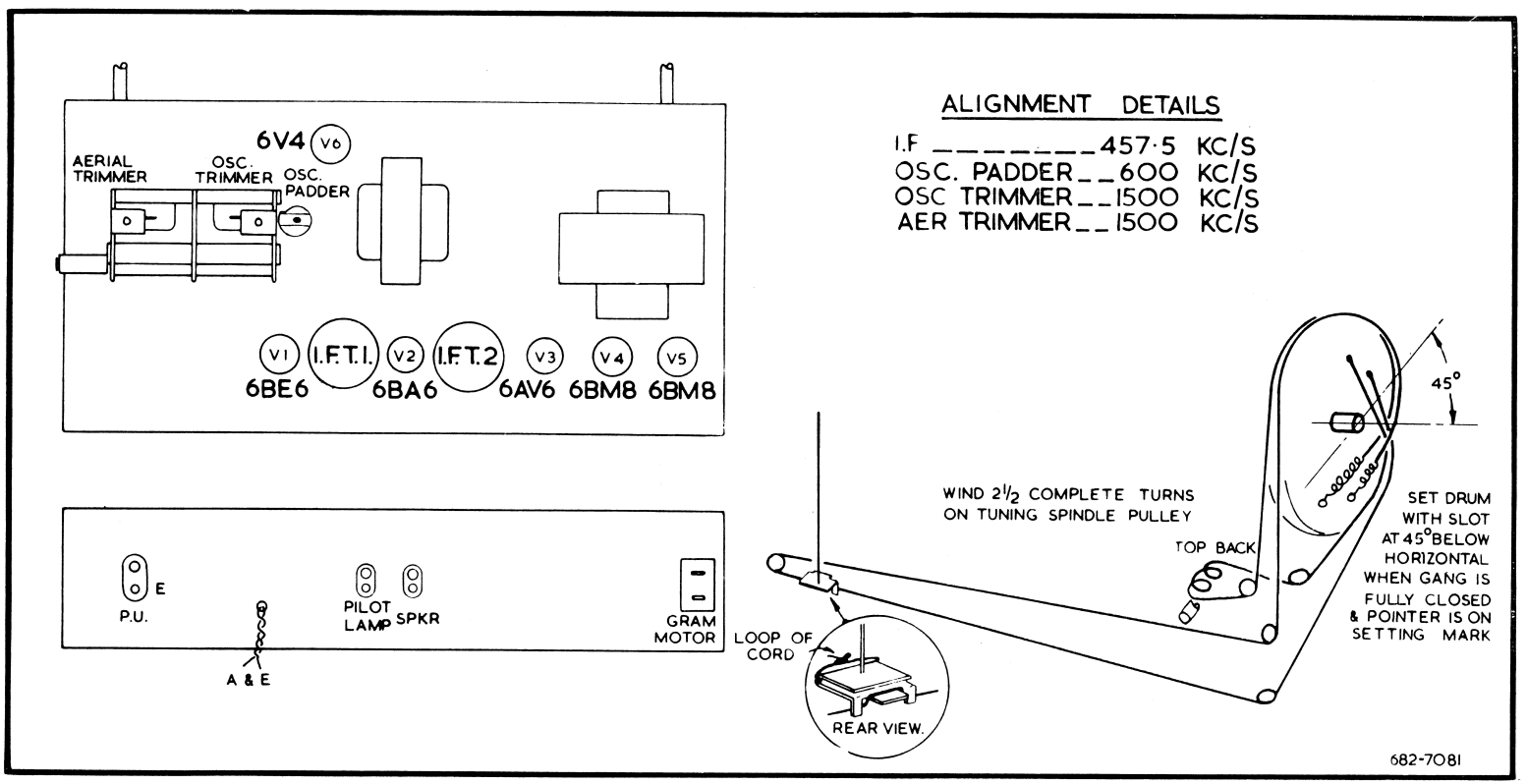
CAPACITORS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
C1	273-0051	100 pF ± 10%	C15	269-0211	8 mF 350 P.V.
C2	526-1233	Lead—Capacitor 3 pF ± 10%	C16	279-1371	0.01 mF ± 20% 400V.
C3	279-1081	0.047 mF ± 20% 200V.	C17	273-0691	220 pF ± 10%
C4	273-0041	50 pF ± 10%	C18	280-0291	0.0022 mF ± 10% 200V.
C5	273-0091	400 pF ± 1%	C19	279-1701	0.047 mF ± 20% 400V.
C6	275-0041	100 pF ± 5%	C20	280-0251	0.001 mF ± 10% 200V.
C7	279-1001	0.01 mF ± 20% 200V.	C21	280-0331	0.0047 mF ± 10% 200V.
C8	275-0041	100 pF ± 5%	C22	273-0631	330 pF ± 10%
C9	273-0011	10 pF ± 10%	C23	280-1331	0.0047 mF ± 20% 400V.
C10	279-1121	0.1 mF ± 20% 200V.	C24	279-1411	0.022 mF ± 20% 400V.
C11	279-1701	0.047 mF ± 20% 400V.	C25	269-0221	25 mF 40 P.V.
C12	275-0041	100 pF ± 5%	C26	279-1411	0.022 mF ± 20% 400V.
C13	275-0041	100 pF ± 5%	C27 } C28 }	269-0271	24 mF + 24 mF 350 P.V.
C14	279-1371	0.01 mF ± 20% 400V.			

MISCELLANEOUS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
L1, L2	253-0103	Coil, M/W aerial	V1	932-0341	Valve 6BE6
L3	257-0106	Coil, M/W oscillator	V2	932-0031	Valve 6BA6
VC1 } VC2 }	281-0022	Capacitor, 2-gang, variable	V3	932-0321	Valve 6AV6
TC1-2	281-0111	Capacitor Trimmer	V4-V5	932-0511	Valve 6BM8
IFT1 } IFT2 }	906-0062	Transformer, I.F. (1st and 2nd)	V6	932-0351	Valve 6V4
T1	904-0221	Transformer, Mains		932-0391	Lamp, 6.3 volt, 0.25 amp., M.E.S.
T2	905-0251	Transformer, Output		794-0791	Scale, Dial (H.M.V.)
RV1-SW2 }	677-0482	Volume control 0.2M ohms with switch		794-0801	Scale, Dial (K.)
RV2	677-0492	Treble control		279-0011	Cord, Dial Drive (5ft. 10in.)
RV3-SW1 }	677-0502	Bass control with switch		381-0073	Drum
				671-0341	Pointer Assembly
				840-0251	Spring, Drive Drum
				840-0181	Spring, Drive Pointer


V1-6BE6
FREQUENCY CHANGER
V2-6BA6
I.F. AMPLIFIER
V3-6AV6
A.F. AMP-DEMOD-AVC.
V4-A
½ 6BM8
A.F. AMP.
V5-A
½ 6BM8
PHASE SPLITTER
V4-B
½ 6BM8
POWER AMP
V5-B
½ 6BM8
POWER AMP
V6
6V4
RECTIFIER
AE
E.
C1 100PF
C2 3PF
C3 0·047
C4 50PF
C5 400PF
C6 100 PF
C7 0·01
C8 100 PF
C9 10PF
C10 0·1
C11 0·047
C12 100 PF
C13 100 PF
C14 0·01
C15 8
C16 0·01
C17 220PF
C18 0·0022
C19 0·047
C20 0·001
C21 0·0047
C22 330 PF
C23 0·0047
C24 0·022
C25 25
C26 0·022
C27 24
C28 24
R1 22K
R2 100K
R3 270
R4 2·2M
R5 10K
R6 270K
R7 220K
R8 33K
R9 10M
R10 150K
R11 33K
R12 470K
R13 100K
R14 220K
R15 6·2K
R16 68K
R17 33K
R18 10M
R19 100K
R20 100K
R21 470K
R22 470K
R23 470K
R24 220
R25 470K
R26-10K
R27-10K
RV1 200K VOLUME
RV2-2M TREBLE
RV3 2M BASS
INCORP. WITH S.W.1.
INCORPORATED WITH SW2
SW2 INCORP. WITH RV1
P.U.
TC1
TC2
VC1
VC2
L1
L2
L3
T1
T2
SPEAKERS 15Ω AT 400~
226-250V
200-225V
S.W.1 INCORPORATED WITH RV3
40-50~ MAINS SUPPLY
LP1
LP2
NOTE: VOLTAGE READINGS ARE WITH RESPECT TO CHASSIS AND ARE TAKEN WITH METER RESISTANCE OF 20,000 OHMS PER VOLT, GANG FULLY CLOSED
ALIGNMENT DETAILS
I.F. 457·5 Kc/s.
OSC. 600 & 1500Kc/s.
AER. 1500Kc/s.
682-6791


ALIGNMENT DETAILS
I.F _____ 457·5 KC/S
OSC. PADDER __ 600 KC/S
OSC TRIMMER __ 1500 KC/S
AER TRIMMER __ 1500 KC/S
6V4 V6
AERIAL TRIMMER
OSC. TRIMMER
OSC. PADDER
V1 I.F.T.1. V2 I.F.T.2 V3 V4 V5
6BE6 6BA6 6AV6 6BM8 6BM8
E
P.U.
PILOT LAMP
SPKR
GRAM MOTOR
A & E
LOOP OF CORD
REAR VIEW.
WIND 2½ COMPLETE TURNS ON TUNING SPINDLE PULLEY
TOP BACK
45°
SET DRUM WITH SLOT AT 45° BELOW HORIZONTAL WHEN GANG IS FULLY CLOSED & POINTER IS ON SETTING MARK
682-7081

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

H. CLARK PTY. LTD.
Printers
CAMPERDOWN — N.S.W