

682-4871

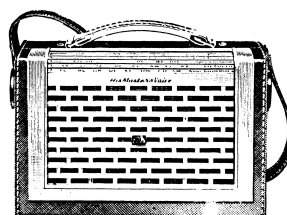


MODEL DATA SHEET

for

"HIS MASTER'S VOICE"

MODEL 14 - 15



This model is a four-valve plus metal rectifier portable receiver of the "handbag" type in a leather case. Operation from either internal batteries or 200 to 255 volt, 40 or 50 c.p.s. mains is possible.

BATTERIES:

- 1 Eveready Type 717 (7.5 volts). Part No. 125-0071.
- 1 Eveready Type 495 (90 volts). Part No. 125-0081.

DIMENSIONS:

	<i>Packed</i>	<i>Unpacked</i>
Width	15 $\frac{3}{4}$ in.	10in.
Height	9 $\frac{3}{4}$ in.	6 $\frac{7}{8}$ in.
Depth	6 $\frac{1}{4}$ in.	4 $\frac{1}{8}$ in.

WEIGHT:

Gross, without batteries	7 $\frac{1}{2}$ lb.
Gross, with batteries	9 lb.
Nett, without batteries	5 $\frac{1}{2}$ lb.
Nett, with batteries	7 lb.

RECEIVER CHASSIS:

For servicing information on chassis, refer to Service Manual for Chassis Type 14, Part No. 682-4881.

SPEAKER:

Rola Model 4-5C, Part No. 831-021. Impedance, 3.5 ohms at 400 c.p.s.

SARE PARTS (Other than those shown in Chassis Manual):

148-1501	Bracket (Battery Retaining)	1
148-1331	Brackets (Chassis Mtg.)	2
148-1351	Bracket O/P Trans.	1
189-0621	Cabinet—Benedictine Tan	1
189-0631	Cabinet—Blue	1
189-0641	Cabinet—Wild Cherry	1
189-0651	Cabinet—Avocado Pear	1
189-0661	Cabinet—Graphite Grey	1
238-0142	Clamp (Strap Fixing)	2
453-0491	Grille	1
517-0611	Knob—Biscuit (For Tan & Green)	2
517-0621	Knob—Grey (For Red & Grey) ...	2
561-0231	Medallion	1
561-0241	Medallion Script	1
664-0871	Plate Speaker Mtg.	1
682-4891	Label—Valve Location	1
794-0563	Scale Dial	1
831-0421	Speaker, 4 x 5C Rola	1
846-0061	Strap—Benedictine Tan	1
846-0081	Strap—Wild Cherry	1
846-0091	Strap—Avocado Pear	1
846-0101	Strap—Graphite Grey	1
849-0121	Stud—Carrying Strap	2
905-0006	Transformer—Output	1

Private and Confidential



For Trade Use Only

"His Master's Voice"

SERVICE MANUAL

for

FOUR - VALVE MEDIUM - WAVE BATTERY/A.C.

MAINS - OPERATED PORTABLE CHASSIS

TYPE 14



THE GRAMOPHONE COMPANY LIMITED

(Incorporated in England)

HOMEBUSH - - - N.S.W.

TECHNICAL SPECIFICATION

POWER SUPPLY:

A.C. Mains—

200-210 volts—40-50 c.p.s.

230-240 volts—40-50 c.p.s.

245-255 volts—40-50 c.p.s.

Battery—

L.T. — 7.5 volts.

H.T. — 90 volts.

CONSUMPTION:

Mains—

10 watts.

Battery—

L.T. — 50 mA.

H.T. — 12 mA.

TUNING RANGE:

535—1600 kc/s.

I.F. FREQUENCY:

457.5 kc/s.

VALVE COMPLEMENT:

1R5—Frequency Changer.

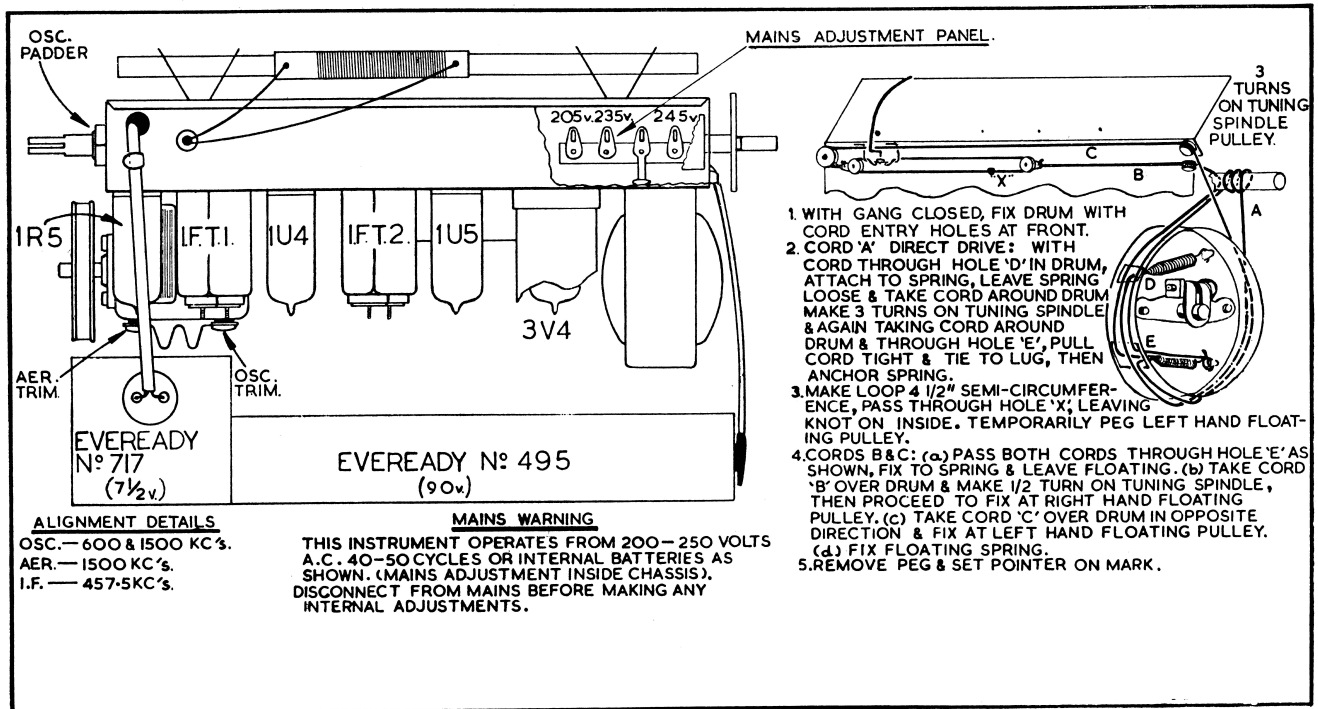
1U4—I.F. Amplifier.

1U5—Demod.-A.V.C.-A.F. Amp.

3V4—Power.

CIRCUIT DESCRIPTION

This chassis is a 4-valve battery/A.C. mains-operated superheterodyne receiver for medium-wave reception.



FREQUENCY CHANGER

A tuned Ferrite rod aerial coil is connected to the signal grid of the frequency changer valve. A fixed padding capacitor is used in the oscillator circuit and padding adjustment is carried out by means of the variable iron-dust core in the oscillator coil L2—L3.

I.F. AMPLIFIER

The output of the frequency changer is transformer coupled to the I.F. Amplifier grid. This stage is neutralised by capacitor C8. The amplifier output is in turn transformer coupled to the diode of the following valve. Both I.F. transformers employ permeability tuning.

DEMOD.—AVC—A.F. AMPLIFIER

The I.F. signal is demodulated in the diode circuit of a diode-pentode valve, the audio signal being developed across the volume control which constitutes the diode load.

A.V.C. voltage is derived from the same source and is applied to the Frequency Changer stage.

The demodulated signal is picked off the volume control and applied to the grid of the A.F. amplifier which is grid-leak biased. The plate circuit is resistance-capacitance coupled to the grid of the output valve.

RECEIVER ALIGNMENT

In any case where a component replacement has been made in either the tuned I.F. or R.F. circuits of the receiver, all circuits should be re-aligned and, even if only one coil has been serviced, the whole of the re-alignment should be undertaken in the order given.

An output meter should always be connected across the speaker voice coil terminals 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 0.5 volt.

Note: Calibration marks are provided on the dial back-plate. Beginning at the left these marks correspond to:

- (1) Pointer setting.
- (2) 600 kc/s.
- (3) 1000 kc/s.
- (4) 1500 kc/s.

I.F. ALIGNMENT

- (1) (a) Set volume control at maximum.

POWER

This stage incorporates a power pentode valve; its grid is biased by the voltage drop across the remaining valve filaments. The output of this stage is transformer coupled to the speaker voice coil.

VALVE FILAMENT CIRCUIT

All valve filaments are connected in series and the voltage drops across them are equalised by shunt resistors. It is important that the tap used on the power transformer should correspond with the value of the supply mains to which the instrument is connected. Attention to this will allow the receiver to accept fluctuations of mains voltage without overloading valve filaments. The mains voltage-tap lugs are located under the chassis as indicated on the valve location diagram.

A.C. POWER SUPPLY

A selenium metal rectifier, MR1, supplies D.C. input to two separate resistance-capacitance filters which feed L.T. and H.T. circuits respectively. Rectifier MR2 functions as a reverse current cut-out to prevent loading on the H.T. battery by the L.T. circuit.

- (b) Fully enmesh tuning capacitor plates.
- (c) Connect output leads of a signal generator through a 0.1 uF capacitor to the stator plates terminal of the front section of the 2-gang capacitor; this point is connected to the frequency changer grid.
- (2) Tune signal generator to 457.5 kc/s.
- (3) Adjust 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 both transformers in turn until no greater output can be obtained.

Note: If trimmer screws are screwed too far in, it may be possible to obtain a false peak. Start alignment of each transformer by first screwing its core well out, and then advancing the core into the coil until resonance is obtained.

R. F. ALIGNMENT

- (1) Check that, when the ganged capacitor is fully closed, the pointer coincides with the setting mark on the dial back plate.
- (2) Set volume control to maximum.
- (3) Inductively couple the signal generator to the receiver by means of a test loop. (The test loop, comprising three turns of 16 B & S insulated wire about 6 inches in diameter, should be connected across the output terminals of the signal generator and placed at right angles to the rod aerial at a distance of about 1 foot).
- (4) Tune signal generator and receiver to 600 kc/s.
- (5) Whilst "rocking" the tuning control, adjust the oscillator tuning core for maximum response.

- (6) Set signal generator and receiver tuning to 1500 kc/s.
- (7) Adjust the oscillator and aerial trimmer capacitors, in that order, for maximum response.
- (8) Repeat operations (4) to (7) inclusive until correct alignment is obtained.

ADDITIONAL DATA

Any further service information may be obtained by addressing any inquiry to the "Service Division, The Gramophone Company Limited, 575-577 Parramatta Road, Leichhardt, N.S.W." (Telephone: LM 1491).

During the course of production of this receiver the Company reserves the right, without notice, to make 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 — CHASSIS TYPE 14

RESISTORS

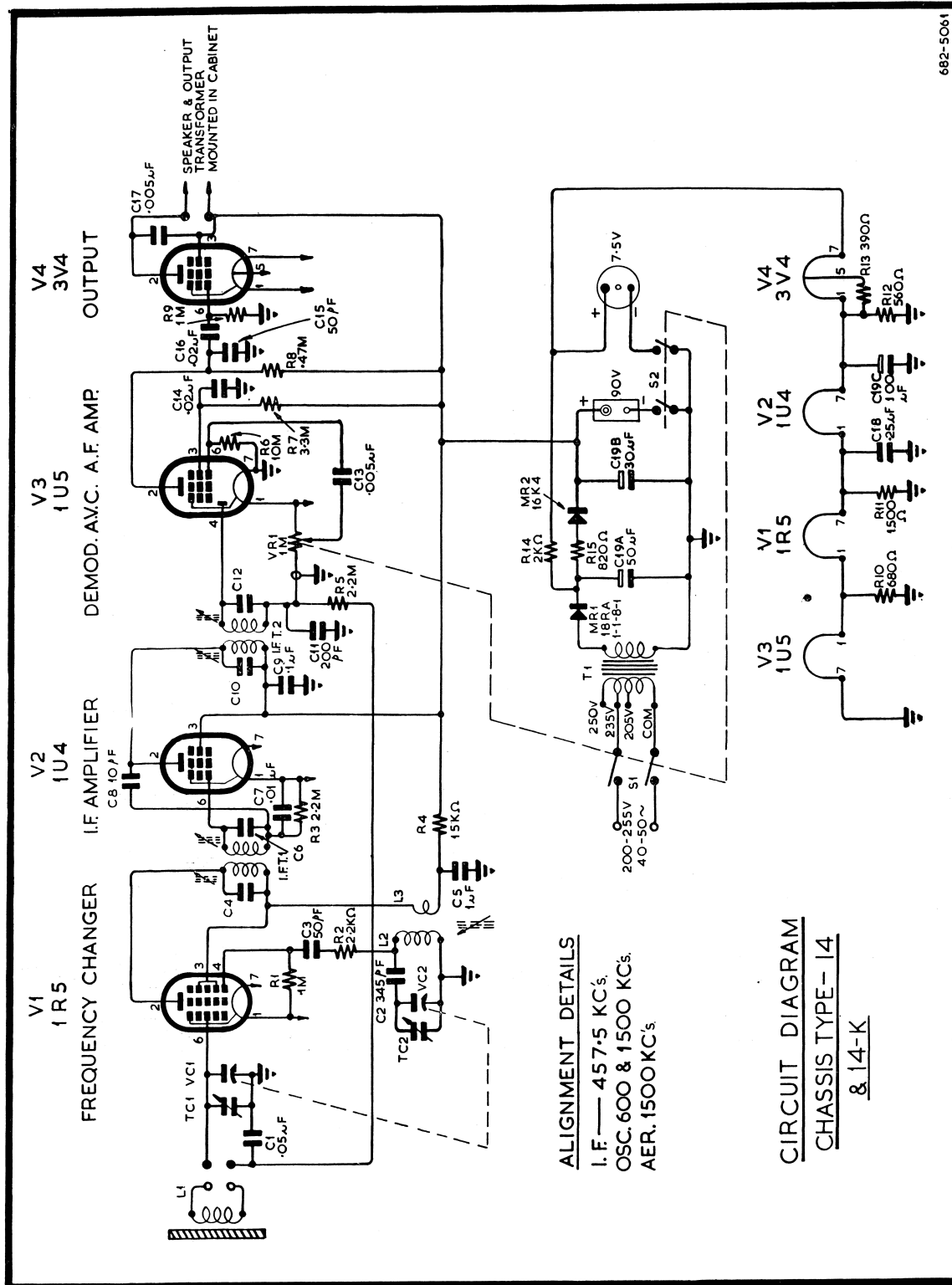
REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
R1	740-0142	100,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt	R9	740-0532	1 megohm $\pm 20\%$ $\frac{1}{2}$ watt
R2	740-0032	2,200 ohms $\pm 10\%$ $\frac{1}{2}$ watt	R10	740-0683	680 ohms $\pm 10\%$ $\frac{1}{2}$ watt
R3	740-0202	2.2 megohms $\pm 10\%$ $\frac{1}{2}$ watt	R11	740-0252	1500 ohms $\pm 10\%$ $\frac{1}{2}$ watt
R4	740-0092	15,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt	R12	740-0263	560 ohms $\pm 10\%$ $\frac{1}{2}$ watt
R5	740-0202	2.2 megohms $\pm 10\%$ $\frac{1}{2}$ watt	R13	740-0003	390 ohms $\pm 10\%$ $\frac{1}{2}$ watt
R6	742-0442	10 megohms $\pm 20\%$ 1 watt	R14	750-0071	2,000 ohms $\pm 5\%$ 5 watt
R7	742-0212	3.3 megohms $\pm 10\%$ 1 watt	R15	742-0542	820 ohms $\pm 10\%$ 1 watt
R8	742-0172	470,000ohms $\pm 10\%$ 1 watt			

CAPACITORS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
C1	279-0121	.05 mF $\pm 20\%$ 200v.	C12	Part of I.F.T.2	
C2	273-0801	345 pF $\pm 1\%$	C13	279-0031	.005 mF $\pm 20\%$ 600v.
C3	273-0041	50 pF $\pm 10\%$	C14	279-0091	.02 mF $\pm 20\%$ 400v.
C4	Part of I.F.T.1		C15	273-0041	50 pF $\pm 10\%$
C5	279-0281	1 mF $\pm 20\%$ 200v.	C16	279-0091	.02 mF $\pm 20\%$ 400v.
C6	Part of I.F.T.1		C17	279-0031	.005 mF $\pm 20\%$ 600v.
C7	279-0071	.01 mF $\pm 20\%$ 600v.	C18	279-0231	.25 mF $\pm 20\%$ 200v.
C8	273-0011	10 pF $\pm 10\%$	C19	269-0411	3 section electrolytic
C9	279-0151	.1 mF $\pm 20\%$ 200v.	C19A	Part of C19	50 mfd 150 W.V.
C10	Part of I.F.T.2		C19B	Part of C19	30 mfd 150 W.V.
C11	273-0071	200 pF $\pm 10\%$	C19C	Part of C19	100 mfd 10 W.V.

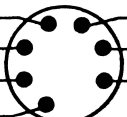
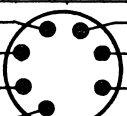
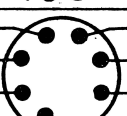
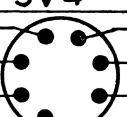
MISCELLANEOUS

REF.	PART No.	DESCRIPTION	REF.	PART No.	DESCRIPTION
L1	253-0161	Rod Aerial	MR2	932-0651	Selenium Rectifier, 16K4
L2-L3	257-0161	Coil, M/W Oscillator	V1	932-0071	Valve 1R5
VC1-VC2	281-0141	Capacitor, 2 gang variable	V2	932-0681	Valve 1U4
TC1-TC2	Part of VC1-2	Capacitor, Aerial and osc. trimming	V3	932-0691	Valve 1U5
IFT1-2	906-0141	Transformer I.F (1st & 2nd)	V4	932-0101	Valve 3V4
T1	904-0131	Transformer, mains		381-0101	Drum, dial
VR1/S1	677-0251	Volume control, 500,000 ohms with D.P.S.T. Switch		671-0451	Pointer assembly
S2	855-0281	D.P. switch wafer (ganged with VR1/S1)		889-0422	Pulley (floating), pointer drive
MR1	932-0641	Selenium Rectifier, 18RA 1-1-8-1		840-0461	Spring
				297-0061	Cord, HEAVY
				297-0071	Cord, LIGHT



VOLTAGE TABLE

- RECEIVER OPERATING ON MAINS POWER SUPPLY & TUNED TO A POINT OF NO RECEPTION.
- READINGS TAKEN WITH MAINS VOLTAGE ADJUSTED TO THE NOMINAL VALUE OF THE TAP USED ON THE TRANSFORMER. BATTERIES DISCONNECTED.
- VOLTAGE READINGS TAKEN WITH METER RESISTANCE OF 1,000 OHMS PER VOLT.

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 1R5 FREQUENCY CHANGER								
—	0.13	100K Ω	OSC. GRID		FILAMENT—	—	—	
51	2.3	*INFIN.	SCREEN		GRID	—	—	3.2M Ω
51		*INFIN.	PLATE		FILAMENT+	2.75	48	—
1.35	48	—	FILAMENT—					
V2 1U4 I.F. AMPLIFIER								
—	—	—	NO CONN.		FILAMENT—	—	—	
90	0.3	*INFIN.	SCREEN		GRID	—	—	2.2M Ω
90	1.1	*INFIN.	PLATE		FILAMENT+	4.1	48	—
2.75	48	—	FILAMENT—					
V3 1U5 AUDIO AMPLIFIER -DEMOD.								
—	—	1M Ω	DIODE		NO CONN.	—	—	
7.5	0.02	*INFIN.	SCREEN		GRID	—	—	10M Ω
16	0.12	*INFIN.	PLATE		FILAMENT+	0	48	—
1.35	48	—	FILAMENT—					
V4 3V4 OUTPUT								
—	—	—	NO CONN.		FILAMENT-CT.	5.1	—	
90	1.4	*INFIN.	SCREEN		GRID	—	—	1M Ω
85	6.4	*INFIN.	PLATE		FILAMENT+	6.75	48	—
4.1	48	—	FILAMENT—					

REMARKS.

H.T. VOLTAGE = 90 VOLTS
H.T. CURRENT = 12 M.A.

AFTER VALVE REPLACEMENT CHECK THAT ALL FILAMENT VOLTAGES ARE BETWEEN THE LIMITS OF 1.2 TO 1.5 VOLTS WITH MAINS VOLTAGE ADJUSTED TO THE NOMINAL VALUE OF THE TAP USED ON THE POWER TRANSFORMER.

- * OBSERVE CORRECT OHMMETER POLARITY WHEN CHECKING THESE POINTS OTHERWISE INCORRECT READINGS WILL RESULT.