

**Private and Confidential**



**For Trade Use Only**

**"His Master's Voice"**

**SERVICE MANUAL**

*for*

**7 VALVE**

**A.C. MAINS - OPERATED MEDIUM - WAVE AND**

**BANDSPREAD SHORT - WAVE CHASSIS**

**TYPE 82**

•

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

**PART No. 682-4501**

## TECHNICAL SPECIFICATION

### POWER SUPPLY:

200 to 250 volts at 40 to 50 c.p.s.

### CONSUMPTION:

54 watts.

### TUNING RANGE:

S.W. 1: 18.40—14.20 Mc/s.  
(16.30—21.13 metres)

S.W. 2: 12.10—9.40 Mc/s.  
(24.79—31.92 metres)

S.W. 3: 7.50—5.90 Mc/s.  
(40.00—50.85 metres)

M.W.: 1600—540 Kc/s.

### INTERMEDIATE FREQUENCY:

457.5 Kc/s.

### VALVE COMPLEMENT:

6AN7 ..... Frequency Changer  
6N8 ..... I.F. Amp.—Demod.—A.V.C.  
12AX7 ..... 1st A.F. Amp.—Tone Control  
12AX7 ..... 2nd A.F. Amp.—Phase Splitter  
6M5 ..... Power  
6M5 ..... Power  
6V4 ..... Rectifier.

### DIAL AND PILOT LAMPS:

6.3 volt, 0.3 amp. (Miniature screw-cap base).

### LOUDSPEAKER:

12-inch Permagnetic.  
Voice coil impedance, 2 ohms at 400 c.p.s.

### tone CONTROLS:

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

## CIRCUIT DESCRIPTION

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

### FREQUENCY CHANGER

A triode-hexode, V1, is employed as the frequency changer.

On the medium-wave band the aerial is coupled through a high-gain transformer, L2-L3, to the hexode grid. An acceptor circuit, tuned to the intermediate frequency, is connected across the aerial and earth terminals. The triode section of V1 on the medium-wave band is used as a shunted plate-tuned oscillator; tracking is obtained by means of a fixed padding capacitor in conjunction with an adjustable iron-dust tuning bolt in oscillator coil L7-L8. With the wave-change switch set to "Gram." position, the hexode signal grid is grounded to chassis, at R.F. potentials, through capacitor C4.

On the short-wave bands, a transformer, L4-L5, having a tapped secondary, is used to couple the aerial to the frequency changer grid. The signal-frequency section of the variable ganged-capacitor, VC1, is padded on all short-wave bands by means of capacitors C5, C6 and C7 to obtain bandspread tuning. Circuit trimming adjustments are carried out by means of the iron-dust tuning bolts in L4-L5 and trimmer capacitor TC2.

The short-wave oscillator employs a tapped coil, L6, in a Colpitt's arrangement; bandspread tuning is obtained on all short-wave bands by the use of padding capacitors C12, C13 and C14, in

conjunction with the oscillator section, VC2, of the variable ganged capacitor. Circuit trimming adjustments are made by means of the iron-dust tuning bolt in L6 and trimmer capacitor TC4. The oscillator circuit tracks on the high frequency side of the signal-frequency.

### I.F. AMP.—DEMOD.—A.V.C.

The frequency changer is transformer-coupled to a duo-diode-pentode valve, V2, the output of which is coupled by means of a second transformer to the demodulator diode, where the signal is demodulated and appears across resistor R8.

The I.F. transformers employed have fixed tuning capacitors and are permeability tuned.

Neutralisation of this stage is effected by capacitor C20. The plate circuit of this amplifier is capacity-coupled to the remaining diode to provide AVC. Full AVC voltage is applied to the frequency changer and I.F. amplifier; standing bias for these stages and AVC diode delay voltage is supplied from the back-bias resistor, R26, in the high tension negative circuit.

### A.F. AMPLIFIER

The demodulated signal or pick-up input is coupled to the volume control in the grid circuit of the first triode of the twin triode V3. The output is resistance-capacitance coupled to the remaining triode V3, which functions as a cathode follower. Then follows the tone control network,

which gives treble and bass boost or cut, and its output is applied to the grid of the 2nd I.F. Amplifier, V4. This valve, in turn, is resistance-capacitance coupled to the remaining triode of the twin triode V4, which functions as a phase-splitter.

#### POWER AMPLIFIER

The output of the phase-splitter, taken across R25 and R32, is then applied to the signal grids of the push-pull Power Amplifier valves, V5 and V6. 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, first half V4 to provide negative feedback.

#### HIGH TENSION SUPPLY

The power supply employs an indirectly-heated full-wave rectifier, V7. 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. Voltage drop across the back-bias Resistor, R26, in the high tension negative circuit supplies standing grid bias to the frequency changer, V1, and the I.F. Amplifier, V2.

### 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 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: Normal.

Wave-Change: Medium-Wave.

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 cores for maximum reading on the output meter, commencing with the 2nd 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 cores are screwed too far in, it may be possible to obtain a false peak due to coupling effects between them. 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 (Medium-Wave)

- (1) With the controls sets 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 below 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 5DR).
- (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.

## R.F. ALIGNMENT (Short-Wave)

- (1) Set the wave-change switch to SW.2. Replace the 200 pF. capacitor between the signal generator and receiver with a 400 ohm non-inductive resistor.
- (2) Tune the signal generator to 10 Mc/s.
- (3) Adjust receiver tuning control so that the pointer coincides with 10 Mc/s. calibration.
- (4) Adjust S.W. oscillator and aerial tuning bolts in that order for maximum output.
- (5) Tune the signal generator to 12 Mc/s.
- (6) Adjust tuning control so that the pointer coincides with 12 Mc/s calibration.
- (7) Adjust S.W. oscillator and aerial trimmer capacitors in that order for maximum output.
- (8) Repeat operations (2) to (7) inclusive, until correct calibration is achieved at both 10 Mc/s. and 12 Mc/s. points.
- (9) Set the wave-change switch to S.W.1.
- (10) Tune signal generator and receiver to 15 Mc/s.
- (11) Adjust the inductance of the S.W. aerial circuit for resonance.

In this operation, the tuning bolt in the coil should not be touched. The adjustment is made by altering the position of the wire connected to the

first tap (nearest the coil base) of the S.W. aerial coil. A convenient method of doing this is to take a  $\frac{1}{4}$ -in. diameter plastic rod and file a small slot across one end; engage the wire in the slotted rod, and alter its position relative to the coil winding; a position will be found where resonance is obtained as indicated by maximum deflection on the output meter.

This completes the short-wave alignment for all bands.

## CAUTION

When refitting the chassis into a cabinet, care should be taken not to disturb the wiring of the short-wave circuits; otherwise, they will be thrown out of alignment.

## ADDITIONAL DATA

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" (phone LM1491).

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.

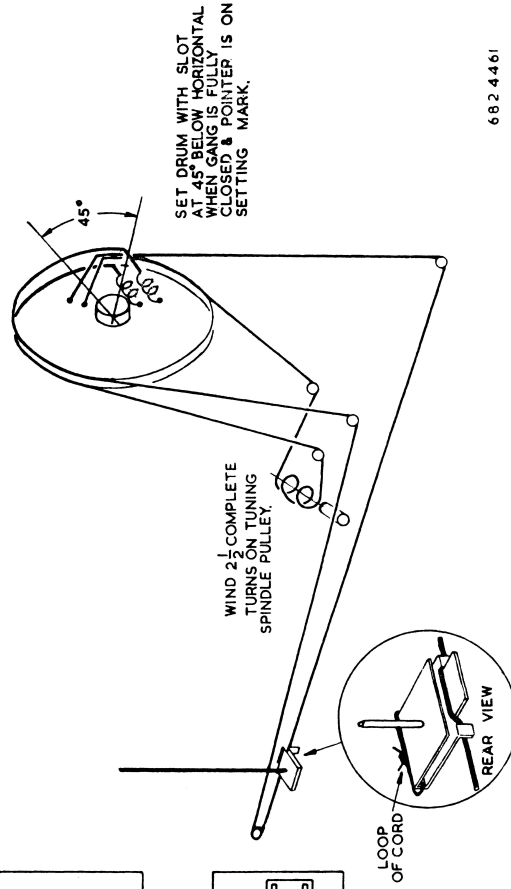
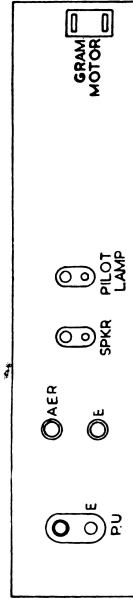
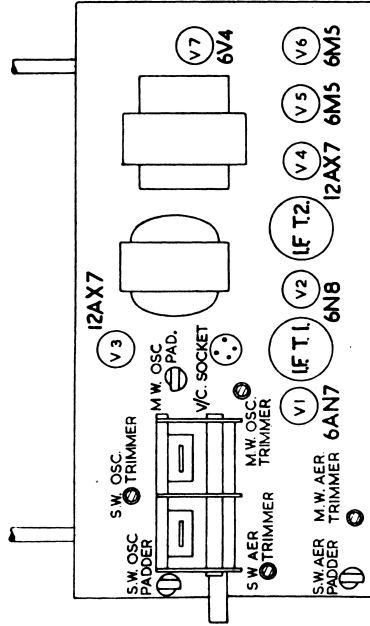
Information concerning changes, which is likely to be of benefit to retailers and servicemen, will be notified as far as possible by the issue of a Technical Data Sheet.



# ALIGNMENT DETAILS

I.F. — 457.5 KC/s

|                      | M W       | S W BAND 2 |
|----------------------|-----------|------------|
| OSC. PADDER          | 600 KC/s  | 10 MC/s    |
| OSC. TRIMMER         | 1500 KC/s | 12 MC/s    |
| AER. PADDER          |           | 10 MC/s    |
| AER. TRIMMER         | 1500 KC/s | 12 MC/s    |
| REFER SERVICE MANUAL |           | 15 MC/s    |



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## PARTS LIST — CHASSIS TYPE 82

### RESISTORS

| REF. | PART No. | DESCRIPTION                                  | REF. | PART No. | DESCRIPTION                                |
|------|----------|--|------|----------|--|
| R1   | 740-0142 | 100,000 ohms $\pm 10\%$ , $\frac{1}{2}$ watt | R20  | 740-0382 | 6,800 ohms $\pm 10\%$ , $\frac{1}{2}$ watt |
| R2   | 740-0232 | 39,000 ohms $\pm 10\%$ , $\frac{1}{2}$ watt  | R21  | 740-0052 | 3,300 ohms $\pm 10\%$ , watt               |
| R3   | 742-0052 | 22,000 ohms $\pm 10\%$ , 1 watt              | R22  | 740-0232 | 39,000 ohms $\pm 10\%$ , watt              |
| R4   | 740-0122 | 47,000 ohms $\pm 10\%$ , $\frac{1}{2}$ watt  | R23  | 740-0192 | 220,000 ohms $\pm 10\%$ , watt             |
| R5   | 742-0062 | 27,000 ohms $\pm 10\%$ , 1 watt              | R24  | 740-0182 | 470,000 ohms $\pm 10\%$ , watt             |
| R6   | 740-0232 | 39,000 ohms $\pm 10\%$ , $\frac{1}{2}$ watt  | R25  | 740-0122 | 47,000 ohms $\pm 10\%$ , watt              |
| R7   | 740-0202 | 2.2 megohms $\pm 10\%$ , $\frac{1}{2}$ watt  | R26  | 746-0011 | 30 ohms $\pm 10\%$ , watt                  |
| R8   | 742-0142 | 270,000 ohms $\pm 10\%$ , 1 watt             | R27  | 740-0302 | 1,800 ohms $\pm 10\%$ , watt               |
| R9   | 740-0192 | 1 megohm $\pm 10\%$ , $\frac{1}{2}$ watt     | R28  | 742-0272 | 8,200 ohms $\pm 10\%$ , 1 watt             |
| R10  | 740-0112 | 27,000 ohms $\pm 10\%$ , watt                | R29  | 742-0272 | 8,200 ohms $\pm 10\%$ , 1 watt             |
| R11  | 740-0062 | 3,900 ohms $\pm 10\%$ , watt                 | R30  | 742-0272 | 8,200 ohms $\pm 10\%$ , 1 watt             |
| R12  | 740-0192 | 220,000 ohms $\pm 10\%$ , watt               | R31  | 742-0052 | 22,000 ohms $\pm 10\%$ , 1 watt            |
| R13  | 740-0202 | 2.2 megohms $\pm 10\%$ , watt                | R32  | 742-0282 | 47,000 ohms $\pm 5\%$ , 1 watt             |
| R14  | 740-0032 | 2,200 ohms $\pm 10\%$ , watt                 | R33  | 740-0192 | 220,000 ohms $\pm 10\%$ , watt             |
| R15  | 740-0242 | 33,000 ohms $\pm 10\%$ , watt                | R34  | 740-0192 | 220,000 ohms $\pm 10\%$ , watt             |
| R16  | 740-0232 | 39,000 ohms $\pm 10\%$ , watt                | R35  | 740-0082 | 10,000 ohms $\pm 10\%$ , watt              |
| R17  | 740-0122 | 47,000 ohms $\pm 10\%$ , watt                | R36  | 746-0041 | 100 ohms $\pm 10\%$ , watt                 |
| R18  | 740-0122 | 47,000 ohms $\pm 10\%$ , watt                | R37  | 740-0082 | 10,000 ohms $\pm 10\%$ , watt              |
| R19  | 742-0022 | 4,700 ohms $\pm 10\%$ , 1 watt               | R38  | 740-0082 | 10,000 ohms $\pm 10\%$ , watt              |

### CAPACITORS

| REF. | PART No. | DESCRIPTION               | REF. | PART No. | DESCRIPTION               |
|------|----------|---------------------------|------|----------|---------------------------|
| C1   | 275-0041 | 100 pF $\pm 5\%$          | C21  | 273-0041 | 50 pF $\pm 10\%$          |
| C2   | 273-0051 | 100 pF $\pm 10\%$         | C22  | 275-0041 | 100 pF $\pm 5\%$          |
| C3   | 273-0001 | 3 pF $\pm 1$ pF           | C23  | 273-0071 | 200 pF $\pm 10\%$         |
| C4   | 279-0121 | .05 mF $\pm 20\%$ , 200V. | C24  | 275-0041 | 100 pF $\pm 5\%$          |
| C5   | 273-0271 | 250 pF $\pm 1\%$          | C25  | 273-0141 | .01 mF $\pm 20\%$ , 600V. |
| C6   | 273-0281 | 300 pF $\pm 1\%$          | C26  | 273-0141 | .01 mF $\pm 20\%$ , 600V. |
| C7   | 273-0261 | 70 pF $\pm 5\%$           | C27  | 279-0121 | .05 mF $\pm 20\%$ , 200V. |
| C8   | 279-0131 | .05 mF $\pm 20\%$ , 400V. | C28  | 273-0141 | .01 mF $\pm 20\%$ , 600V. |
| C9   | 273-0041 | 50 pF $\pm 10\%$          | C29  | 269-0211 | 8 mF 350 P.V.             |
| C10  | 273-0061 | 150 pF $\pm 10\%$         | C30  | 279-0121 | .05 mF $\pm 20\%$ , 200V. |
| C11  | 273-0091 | 400 pF $\pm 1\%$          | C31  | 273-0051 | 100 pF $\pm 10\%$         |
| C12  | 273-0271 | 250 pF $\pm 1\%$          | C32  | 279-0131 | .05 mF $\pm 20\%$ , 400V. |
| C13  | 273-0271 | 250 pF $\pm 1\%$          | C33  | 269-0111 | 24 mF 350 P.V.            |
| C14  | 273-0261 | 70 pF $\pm 5\%$           | C34  | 269-0111 | 24 mF 350 P.V.            |
| C15  | 279-0161 | .1 mF $\pm 20\%$ , 400V.  | C35  | 279-0131 | .05 mF $\pm 20\%$ , 400V. |
| C16  | 275-0041 | 100 pF $\pm 5\%$          | C36  | 279-0131 | .05 mF $\pm 20\%$ , 400V. |
| C17  | 275-0041 | 100 pF $\pm 5\%$          | C37  | 275-0241 | .5 mF $\pm 20\%$ , 400V.  |
| C18  | 279-0101 | .02 mF $\pm 20\%$ , 600V. | C38  | 269-0171 | 50 mF $\pm 40$ P.V.       |
| C19  | 279-0131 | .05 mF $\pm 20\%$ , 400V. | C39  | 273-0231 | 5000 pF $\pm 10\%$        |
| C20  | 273-0011 | 10 pF $\pm 10\%$          |      |          |                           |

### MISCELLANEOUS

| REF.      | PART No.   | DESCRIPTION  | REF.                      | PART No. | DESCRIPTION                              |
|-----------|------------|--|---------------------------|----------|--|
| L1        | 259-0003   | Coil, I.F. Filter  | S1A, 1B, }<br>2A, 2B, 3 } | 855-0003 | Switch, Wave-Change                      |
| L2-L3     | 253-0101   | Coil, M/W Aerial   | V1                        | 932-0151 | Valve, 6AN7                              |
| L4-L5     | 253-0112   | Coil, S/W Aerial   | V2                        | 932-0201 | Valve, 6N8                               |
| L6        | 257-0092   | Coil, S/W Oscillator                                       | V3-4                      | 932-0401 | Valve, 12AX7                             |
| L7-L8     | 257-0085   | Coil, M/W Oscillator                                       | V5-6                      | 932-0291 | Valve, 6M5                               |
| VC1-VC2   | 281-0021   | Capacitor, 2-gang, Variable                                | V7                        | 932-0351 | Valve, 6V4                               |
| TC1-2-3-4 | 281-0051   | Capacitor, Trimmer   |                           | 932-0391 | Lamp, 6.3 volt, 0.3 to 0.32 amp., M.E.S. |
| IFT1-IFT2 | 906-0024   | Transformer, I.F. (1st & 2nd)                              |                           | 794-0531 | Scale, Dial                              |
| T1        | 905-0091   | Transformer, Output  |                           | 297-0011 | Cord, Dial Drive (5ft. 10in.)            |
| T2        | { 904-0051 | Transformer, Mains   |                           | 381-0073 | Drum, Dial                               |
| VR1       | { 904-0041 | Alt. Transformer, Mains                                    |                           | 671-0341 | Pointer, Assembly                        |
|           | 677-0221   | Volume Control, .5 megohms, logarithmic taper              |                           | 840-0191 | Spring, Drum Drive                       |
| VR2       | 677-0191   | Treble Tone Control, 50,000 ohms linear taper, with switch |                           | 840-0261 | Spring, Pointer Drive                    |
| VR3       | 677-0201   | Bass Tone Control, 50,000 ohms, linear taper               |                           |          |  |



# VOLTAGE - TABLE

- VOLTAGES AND CURRENTS ARE WITH THE RECEIVER OPERATING ON AVERAGE MAINS VOLTAGE AND TUNED TO A POINT OF NO RECEPTION ON THE MEDIUM WAVE BAND
- VOLTAGE READINGS TAKEN WITH METER RESISTANCE OF 1000 OHMS PER VOLT.
- VOLTAGE AND CURRENT READINGS WITHIN  $\pm 15\%$ .
- RESISTANCE READINGS ARE APPROXIMATE

| VOLTS<br>TO<br>CHASSIS  | CURRENT<br>—m A | RESISTANCE<br>TO CHASSIS<br>—OHMS | VALVE<br>ELECTRODE     | BOTTOM<br>VIEW<br>OF<br>VALVE<br>SOCKET | VALVE<br>ELECTRODE     | VOLTS<br>TO<br>CHASSIS | CURRENT<br>—m A | RESISTANCE<br>TO CHASSIS<br>—OHMS |
|---|-----------------|-----------------------------------|------------------------|---|------------------------|------------------------|-----------------|-----------------------------------|
| V1 6AN7 FREQUENCY CHANGER.  |                 |                                   |                        |   |                        |                        |                 |                                   |
| —   | —               | —                                 | HEATER.                |   | HEATER.                | 6.3 A.C.               | 300 A.C.        | —                                 |
| 0   | 9.2             | 0                                 | CATHODE.               |   | INTERNAL CON.          | —                      | —               | —                                 |
| —   | —               | 33M                               | GRID.                  |   | PLATE.                 | 195                    | 2.5             | 61 K                              |
| 81  | 3.3             | 39K                               | SCREEN GRID.           |   | OSC. PLATE.            | 80                     | 3.4             | 88 K                              |
| —   | —               | —                                 | —                      |   | OSC. GRID.             | —                      | —               | 47K                               |
| V2 6N8 I.F. AMPLIFIER—DEMODULATOR—AVC.                                      |                 |                                   |                        |   |                        |                        |                 |                                   |
| —   | —               | —                                 | HEATER.                |   | HEATER.                | 6.3 A.C.               | 300 A.C.        | —                                 |
| 0   | 8.4             | 0                                 | CATHODE.               |   | PLATE.                 | 195                    | 6.2             | 61K                               |
| —   | —               | 32 M                              | GRID                   |   | AVC. DIODE.            | —                      | —               | 1.0M                              |
| 95  | 2.2             | 100K                              | SCREEN GRID.           |   | DEM. DIODE             | —                      | —               | 242 K                             |
| —   | —               | —                                 | —                      |   | SUPP. GRID.            | —                      | —               | 0                                 |
| T <sub>2</sub> 1st. A.F. AMPLIFIER V3 12AX7 T <sub>1</sub> TONE CONTROL.    |                 |                                   |                        |   |                        |                        |                 |                                   |
| —   | —               | —                                 | HEATER.                |   | HEATER.                | —                      | —               | —                                 |
| 1.5   | 0.4             | 3.9K                              | CATHODE—T <sub>2</sub> |   | PLATE—T <sub>1</sub>   | 18.6                   | 0.7             | 66K                               |
| —   | —               | —                                 | GRID —T <sub>2</sub>   |   | GRID —T <sub>1</sub>   | —                      | —               | 2.2M                              |
| 74  | 0.4             | 285K                              | PLATE —T <sub>2</sub>  |   | CATHODE—T <sub>1</sub> | 22                     | 0.7             | 35.2K                             |
| —   | —               | —                                 | —                      |   | HEATER—C.T.            | 6.3 A.C.               | 300 A.C.        | —                                 |
| T <sub>2</sub> PHASE SPLITTER. V4 12AX7 T <sub>1</sub> 2nd. A.F. AMPLIFIER. |                 |                                   |                        |   |                        |                        |                 |                                   |
| 6.3 AC  | 300 A.C.        | —                                 | HEATER.                |   | HEATER.                | 6.3 A.C.               | 300 A.C.        | —                                 |
| 23  | 0.7             | 48.8 K                            | CATHODE—T <sub>2</sub> |   | PLATE—T <sub>1</sub>   | 74                     | 0.25            | 303K                              |
| —   | —               | 517 K                             | GRID —T <sub>2</sub>   |   | GRID —T <sub>1</sub>   | —                      | —               | 6.8K—56.8K                        |
| 128   | 0.7             | 130K                              | PLATE —T <sub>2</sub>  |   | CATHODE—T <sub>1</sub> | 0.6                    | 0.25            | 3.3K                              |
| —   | —               | —                                 | —                      |   | HEATER—C.T.            | —                      | —               | —                                 |
| V5 6M5 POWER AMPLIFIER.   |                 |                                   |                        |   |                        |                        |                 |                                   |
| 6.3 AC  | 710 AC.         | —                                 | HEATER.                |   | HEATER.                | —                      | —               | —                                 |
| 5.6   | 28              | 100                               | CATHODE.               |   | PLATE.                 | 260                    | 24              | 64K                               |
| —   | —               | 230K                              | GRID.                  |   | —                      | —                      | —               | —                                 |
| 195   | 4               | 61 K                              | SCREEN GRID.           |   | —                      | —                      | —               | —                                 |
| —   | —               | —                                 | —                      |   | —                      | —                      | —               | —                                 |
| V6 6M5 POWER AMPLIFIER  |                 |                                   |                        |   |                        |                        |                 |                                   |
| 6.3 AC  | 710 AC.         | —                                 | HEATER.                |   | HEATER.                | —                      | —               | —                                 |
| 5.6   | 28              | 100                               | CATHODE.               |   | PLATE.                 | 260                    | 24              | 64K.                              |
| —   | —               | 230 K                             | GRID.                  |   | —                      | —                      | —               | —                                 |
| 195   | 4               | 61 K                              | SCREEN GRID.           |   | —                      | —                      | —               | —                                 |
| —   | —               | —                                 | —                      |   | —                      | —                      | —               | —                                 |
| V7 6V4 RECTIFIER.   |                 |                                   |                        |   |                        |                        |                 |                                   |
| —   | —               | —                                 | HEATER                 |   | NO CONNECTION          | —                      | —               | —                                 |
| 6.3AC   | 600AC           | —                                 | HEATER                 |   | PLATE No.2             | 250 AC                 | —               | 345                               |
| 260   | 73              | —                                 | CATHODE                |   | NO CONNECTION          | —                      | —               | —                                 |
| —   | —               | —                                 | NO CONNECTION          |   | NO CONNECTION          | —                      | —               | —                                 |
| 250 AC  | —               | 315                               | PLATE No.1             |   | —                      | —                      | —               | —                                 |

BIAS VOLTAGE CONVERTER/IF AMP — 2.2 VOLTS

|                   |          |          |
|-------------------|----------|----------|
| 19.6.56.          | APPROVED | ENC      |
| DRAWN             | CHECKED  | PROD.    |
| DATE              | SIC      | REMARKS. |
| TABLE - VOLTAGE - | 682-4561 |          |
| 32 C-455/5        |          |          |