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SPECIFICATION

* Measurements identified by an asterisk are taken in accordance with the new IHF A-202 amplifier measurement standard.

Power Amplifier Section

* Continuous average power output at 8 ohms 20–20K Hz both channel driven
  30W
  < 0.09%
  +1.2dB
  +60W
  50W
  60W
  +2.2dB
  50W
  60W
  70W
  +1.7dB
  < 1μsec.
  > 50
  15V/μsec.

* Reactive load rating

* Transient Overload Recovery Time

* Slew Factor

  Slew Rate
  Damping factor at 50 Hz (Ref. 8 ohms)
  T.H.D. 20–20K Hz From 250 mW to 30 W
  S.M.P.T.E. 1.M.D. (60 Hz + 7kHz, 4:1) From 250mW to 30W
  I.H.F. 1.M.D. (19kHz + 20kHz) at 30W
  T.I.M. (15kHz Sine + 3.18kHz Square Wave) at 30W
  Frequency Response, 20–20K Hz
  Frequency Response Range ± 3dB

  5–45 KHz

Preampifier Section

* Input Impedance Resistance/Capacitance
  47KΩ/47PF
  0.5mV
  2.5mV
  190mV
  19mV
  1.9 V
  < 0.09%
  < 0.09%
  < 0.09%
  < 0.09%
  ± 0.3dB

  Input Sensitivity (1KHz) * For 1 watt out
  30 Watt out
  Ref 10mV
  Ref 5mV
  Ref 10mV

  Input Overload at
  1KHz
  20 Hz
  20 kHz
  THD (20–20K Hz) and IMD at + 30dB input level
  RIAA Response Accuracy
  Signal to Noise Ratio A–weighted
  (a) with phono cartridge connected
  (b) with short-circuit input

  High level input

  * Input impedance Resistance/Capacitance
  Input sensitivity * For 1 watt out
  For 30 watt out
  Ref 1 watt out
  Ref 30 watt out
  Ref 1 watt out

  Signal to Noise Ratio, A–Weighted
  (a) with mute off
  (b) with mute on

  * Maximum input signal
  Frequency Response, 20–20K Hz

  Controls

  Bass control, range at 50 Hz
  Treble control, range at 10 KHz
  Infrasonic filter Turn over frequency
  Slope (dB/ octave)
  High filter Turn over frequency
  Slope (dB/ octave)
  Mate

  Net weight

  Shipping weight

  Power Consumption at 1 watt out

  15.4 x 5.5 x 12
  39 x 14 x 30.5
  20 lbs/9 kg
  22 lbs/10 kg
  30VAC
  200VAC
1. **IDLE CURRENT ALIGNMENT**

1. 5 Minutes minimum pre-heating is necessary for idle current alignment.
2. Set the volume control at minimum position.
3. Speaker switch should be set at off position.
4. Connect DC voltmeter across R637 for right channel and across R638 for left channel. (see fig. 1)
5. Record the reading of DC voltmeter and refer to the following chart to find the appropriate value resistor to connect in parallel with R625 (right channel), or R626 (left channel) on the bottom side (pattern side) of PCB.
6. Read the DC voltage across to R637 (right channel) and R638 (left channel) again.
7. If the DC voltage were between 10 mV and 20 mV, then the alignment is completed.
8. If the DC voltage were less than 10 mV, the value of parallel resistor should be increased until the DC voltage is between 10 mV and 20 mV.
9. If the DC voltage were more than 20 mV, the value of parallel resistor should be reduced until the DC voltage is between 10 mV and 20 mV.

<table>
<thead>
<tr>
<th>Reading of DC Voltmeter</th>
<th>Parallel Resistor</th>
<th>Reading of DC Voltmeter</th>
<th>Parallel Resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 to 0.8 mV</td>
<td>1k ohm</td>
<td>3.1 to 4.0 mV</td>
<td>2k2 ohm</td>
</tr>
<tr>
<td>0.9 to 1.2 mV</td>
<td>1k2 ohm</td>
<td>4.1 to 5.0 mV</td>
<td>2k7 ohm</td>
</tr>
<tr>
<td>1.3 to 2.0 mV</td>
<td>1k5 ohm</td>
<td>5.1 to 6.0 mV</td>
<td>3k3 ohm</td>
</tr>
<tr>
<td>2.1 to 2.4 mV</td>
<td>1k8 ohm</td>
<td>6.1 to 7.0 mV</td>
<td>3k9 ohm</td>
</tr>
<tr>
<td>2.5 to 3.0 mV</td>
<td>2k ohm</td>
<td>7.1 to 10 mV</td>
<td>4k7 ohm</td>
</tr>
</tbody>
</table>

* Important notice: The power switch must be in the off position when soldering is done.

2. **POWER METER ALIGNMENT**

1. Feed a 1KHz sine wave approx 150mV RMS to both channel’s Aux inputs.
2. Connect an 8 ohm (+20%) dummy load and an AC voltmeter and oscilloscope to the “main speaker” terminals on the rear panel.
3. Set the volume control at maximum position and other controls are set at their normal positions.
4. Set the speaker switch to “main” position.
5. Adjust the input signal level till the output voltage is 15.5 V making sure that no clipping of the waveform is occurring.
6. Adjust VR 1 (for right channel) and VR 2 (for left channel) for a meter indication of 30 W, (or 0 dB). (sec. fig. 3)

* In cases of poor mains regulation it is possible that slight clipping occurs at 15.5 V when both channels are driven simultaneously. If this is the case, do the calibration one channel at a time.
ALIGNMENT

3 DC OFFSET ALIGNMENT

1. 5 minutes minimum pre-heating is necessary for DC offset adjustment.
2. Set the volume control at minimum position.
3. Speaker switch should be set to "main" position.
4. Connect a DC milli-voltmeter to the "main speaker" terminals of each channel. The meter sensitivity should be set for 100-300mV full scale deflection. The positive input of the meter should be connected to the red (+) speaker terminal.
5. If the readings are within ±50mV, then no adjustment is necessary.
6. If the reading is more than ±50mV then refer to Table I to find the appropriate value resistor to connect from point A (right) to C (right) on the bottom side (pattern side) of PCB. (see fig. 1 )
   B (left) to D (left)
7. If the reading is less than -50mV then also refer to Table I to find the appropriate value resistor to connect from point A (left) to E (left) on the bottom side (pattern side) of PCB. (see fig. 1 )
   B (right) to F (right)
8. Use a piece of insulating sleeve on the resistor legs to avoid shorting to PC board tracks, and make sure the resistor is not pressed against a sharp cut edge of a component leg.
* Important notice: The power button must be in the off position when soldering is done.

Table I

<table>
<thead>
<tr>
<th>Reading of DC Milli Voltmeter</th>
<th>*Resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 60 mV</td>
<td>100k ohm OR 330k ohm</td>
</tr>
<tr>
<td>60 to 75 mV</td>
<td>82k ohm OR 270k ohm</td>
</tr>
<tr>
<td>75 to 90 mV</td>
<td>68k ohm OR 220k ohm</td>
</tr>
<tr>
<td>90 to 110 mV</td>
<td>56k ohm OR 180k ohm</td>
</tr>
<tr>
<td>110 to 135 mV</td>
<td>47k ohm OR 150k ohm</td>
</tr>
<tr>
<td>135 to 165 mV</td>
<td>39k ohm OR 120k ohm</td>
</tr>
<tr>
<td>165 to 200 mV</td>
<td>33k ohm OR 100k ohm</td>
</tr>
<tr>
<td>to mV</td>
<td>ohm OR ohm</td>
</tr>
</tbody>
</table>

9. After having soldered in the resistor, repeat steps 1 through 5.

* If the feedback resistors of power amplifier (R 613, R614) are 10 kohm then select from column A if 33 kohm then select from column B.