**GENERAL DATA**

**Electrical:**
- Heater, for Unipotential Cathode:
  - Voltage: $6.3 \pm 5\%$ ac or dc volts
  - Current: 0.150 amp
- Direct interelectrode Capacitances:
  - With External Shield: Grid No.1 to Plate: 0.015 max., Input: 4.2 μf, Output: 3.4 μf
  - Without External Shield: Grid No.1 to Plate: 0.03 max., Input: 4.0 μf, Output: 1.9 μf

* Having inside diameter of 0.005" and connected to cathode.

**Characteristics, Class A Amplifier:**
- Plate Supply Voltage: 100 volts
- Grid-No.2 Supply Voltage: 100 volts
- Cathode Resistor: 150 ohms
- Plate Resistance: 260000 ohms
- Transconductance: 5000 μmhos
- Plate Current: 7.5 ma
- Grid-No.2 Current: 2.4 ma
- Grid-No.1 Volts (Approx.) for plate current of 10 μamp: -9 volts

**Mechanical:**
- Operating Position: Any
- Maximum Bulb Length: 1-3/8"
- Length from Button Seal to Bulb Top (Excluding tip): 1.075" ± 0.060"
- Diameter: 0.383" ± 0.017"
- Bulb: T-3
- Leads, Flexible: 8
- Length: 1-1/2" to 1-3/4"
- Orientation and Diameter: See Dimensional Outline in General Section

**AMPLIFIER - Class A**

**Maximum Ratings, Absolute Values:**
- DC Plate Voltage: 165 max. volts
- GRID-No.2 (SCREEN) Voltage: 155 max. volts

JUNE 1, 1953
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TENTATIVE DATA 1
SHARP-CUTOFF PENTODE

GRID-No.1 (CONTROL-GRID) VOLTAGE:
- Negative bias value ................. 55 max. volts
- PLATE DISSIPATION .................. 1.1 max. watts
- GRID-No.2 INPUT ................... 0.55 max. watt
- DC CATHODE CURRENT .............. 16.5 max. ma

PEAK HEATER-CATHODE VOLTAGE:
- Heater negative with respect to cathode ........... 200 max. volts
- Heater positive with respect to cathode ........... 200 max. volts

BULB TEMPERATURE (At hottest point on bulb surface) ........ 250 max. °C

Typical Operation as Resistance-Coupled Amplifier:

See RESISTANCE-COUPLED AMPLIFIER CHART at end of tabulated data for this type

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
- For cathode-bias operation .......... 1.2 max. megohms
- For fixed-bias operation .......... Not recommended

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Note</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td>1</td>
<td>0.138</td>
<td>0.162</td>
</tr>
<tr>
<td>Grid-No.1-to-Plate</td>
<td>2</td>
<td>-</td>
<td>0.015</td>
</tr>
<tr>
<td>Capacitance</td>
<td>2</td>
<td>3.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>2</td>
<td>2.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Output Capacitance</td>
<td>1.3</td>
<td>5.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Plate Current</td>
<td>1.4</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>Transconductance</td>
<td>1.3</td>
<td>4100</td>
<td>5900</td>
</tr>
<tr>
<td>Transconductance</td>
<td>5.3</td>
<td>3750</td>
<td>-</td>
</tr>
<tr>
<td>Grid-No.1 Current</td>
<td>1.6</td>
<td>-</td>
<td>±0.3</td>
</tr>
<tr>
<td>Grid-No.2 Current</td>
<td>1.3</td>
<td>0.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Plate Resistance</td>
<td>1.7</td>
<td>0.175</td>
<td>-</td>
</tr>
</tbody>
</table>

Heater-Cathode Leakage Current:
- Heater negative with respect to cathode ........ 1.8 - 7.0 µµamp
- Heater positive with respect to cathode ........ 1.8 - 7.0 µµamp

Leakage Resistance:
- Between Grid No.1 and All Other Electrodes Tied Together ........ 1.9 100 - megohms
- Between Plate and All Other Electrodes Tied Together ........ 1.10 100 - megohms

* See next page.

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TENTATIVE DATA
Note 1: With 6.3 volts ac or dc on heater.
Note 2: With external shield having inside diameter of 0.405" and connected to cathode.
Note 3: With plate supply voltage of 100 volts, grid-no.2 supply voltage of 100 volts, cathode resistor of 150 ohms, and cathode bypass capacitor of 1000 microfarads.
Note 4: With dc plate voltage of 100 volts, dc grid-no.2 voltage of 100 volts, and dc grid-no.1 voltage of -9 volts.
Note 5: With 5.7 volts ac or dc on heater.
Note 6: With plate supply voltage of 100 volts, grid-no.2 supply voltage of 100 volts, cathode resistor of 150 ohms, cathode bypass capacitor of 1000 microfarads, and grid-no.1 resistor of 0.1 megohm.
Note 7: With plate supply voltage of 100 volts, grid-no.2 supply voltage of 100 volts, cathode resistor of 150 ohms bypassed by capacitor having a maximum reactance of 3 ohms.
Note 8: With 100 volts dc between heater and cathode.
Note 9: With grid no.1 100 volts negative with respect to all other electrodes tied together.
Note 10: With plate 300 volts negative with respect to all other electrodes tied together.

* Each tube is stabilized before characteristics testing by continuous operation for at least 48 hours at room temperature and with dissipation values equivalent to life test conditions.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:
Impact Acceleration . . . . . . . . 450 max. g
Tubes are held rigid in three different positions in a Navy Type, High Impact (flyweight) Shock Machine and are subjected to 450 g impact acceleration.

Fatigue Rating:
Vibrational Acceleration . . . . . . 2.5 max. g
Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 25 cycles per second for 32 hours.

Uniform Acceleration Rating . . . . . 1000 max. g
Tubes are subjected in each of three positions to a gradually applied uniform acceleration up to 1000 g.

Low-Frequency Vibration Performance:
RMS Output Voltage . . . . . . . . 60 max. mv
Under the following conditions: A 100-volt plate and grid-No.2 voltage supply having an impedance not exceeding that of a 40-µf capacitor, plate load resistance of 10000 ohms, grid-No.1 resistor of 0.1 megohm, cathode resistor of 150 ohms, cathode bypass capacitor of 1000 µf, and vibrational acceleration of 15 g at 40 cps.
Heater-Cycling Life Performance:

Cycles of Intermittent Operation . . 2500 min. cycles
Under the following conditions: With heater voltage of
7.0 volts cycled 1 minute on and 4 minutes off, heater-
cathode voltage of 140 volts (rms), and plate, grid-No.2,
and grid-No.1 voltage = 0 volts.

Average Life Performance:

The average life performance based on a 500-hour test at
175°C ambient temperature is not less than 450 hours. This
life test is made on sample lot of tubes with heater voltage
of 6.3 volts; plate supply voltage of 100 volts; grid-No.2
supply voltage of 100 volts; dc heater-cathode voltage
(heater positive with respect to cathode) of 200 volts;
cathode resistor of 150 ohms; and grid-No.1 resistor of 1
megohm.

The 500-hour end-point limits for the 5840 with heater
voltage of 6.3 volts, plate supply voltage of 100 volts,
grid-No.2 supply voltage of 100 volts, cathode resistor of
150 ohms bypassed by capacitor having a maximum reactance
of 3 ohms, and dc heater-cathode voltage of 100 volts with
heater either positive or negative with respect to cathode
are: transconductance, 3250 micromhos minimum; heater-
cathode leakage current, 20 microamperes maximum; and
grid-No.1 current, +0.9 microampere maximum or –0.9 micro-
ampere maximum.
## SHARP-CUTOFF PENTODE

### OPERATING CONDITIONS AS RESISTANCE-COUpled AMPLIFIER

<table>
<thead>
<tr>
<th></th>
<th>Plate-Supply Voltage</th>
<th>100</th>
<th>150</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>volts</td>
<td>volts</td>
<td>ohms</td>
<td>ohms</td>
</tr>
<tr>
<td><strong>Plate Load Resistor</strong></td>
<td>0.10 0.10</td>
<td>0.27 0.27</td>
<td>0.47 0.47</td>
<td>meg</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Grid-No.2 Resistor</strong></td>
<td>0.22 0.22</td>
<td>0.68 0.68</td>
<td>1.2 1.2</td>
<td>meg</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Grid-No.1 Resistor</strong></td>
<td>0.27 0.47</td>
<td>0.47 1.0</td>
<td>0.47 1.0</td>
<td>meg</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Cathode Resistor</strong></td>
<td>820 820</td>
<td>2200 2200</td>
<td>3300 3300</td>
<td>ohms</td>
<td>ohms</td>
</tr>
<tr>
<td><strong>Sig. Input Volt. (rms)</strong></td>
<td>0.1 0.1</td>
<td>0.1 0.1</td>
<td>0.1 0.1</td>
<td>volt</td>
<td>volt</td>
</tr>
<tr>
<td><strong>Output Voltage (rms)</strong></td>
<td>8.2 9.0</td>
<td>9.5 11.8</td>
<td>9.2 11.7</td>
<td>volts</td>
<td>volts</td>
</tr>
<tr>
<td><strong>Voltage Gain</strong></td>
<td>82 90</td>
<td>95 118</td>
<td>92 117</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Distortion</strong></td>
<td>2.8 3.8</td>
<td>2.5 3.0</td>
<td>3.1 2.3</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Sig. Input Volt. (rms)</strong></td>
<td>0.23 0.22</td>
<td>0.15 0.16</td>
<td>0.12 0.14</td>
<td>volt</td>
<td>volt</td>
</tr>
<tr>
<td><strong>Output Voltage (rms)</strong></td>
<td>17.7 18.6</td>
<td>13.6 17</td>
<td>11 16</td>
<td>volts</td>
<td>volts</td>
</tr>
<tr>
<td><strong>Voltage Gain</strong></td>
<td>77 85</td>
<td>91 106</td>
<td>92 114</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Distortion</strong></td>
<td>4.9 4.8</td>
<td>4.7 4.4</td>
<td>4.8 5.0</td>
<td>%</td>
<td>%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Plate-Supply Voltage</th>
<th>150</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>volts</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td><strong>Plate Load Resistor</strong></td>
<td>0.10 0.10</td>
<td>0.27 0.27</td>
<td>0.47 0.47</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Grid-No.2 Resistor</strong></td>
<td>0.27 0.27</td>
<td>0.82 0.82</td>
<td>1.5 1.5</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Grid-No.1 Resistor</strong></td>
<td>0.27 0.47</td>
<td>0.47 1.0</td>
<td>0.47 1.0</td>
<td>meg</td>
</tr>
<tr>
<td><strong>Cathode Resistor</strong></td>
<td>560 560</td>
<td>1500 1500</td>
<td>2200 2200</td>
<td>ohms</td>
</tr>
<tr>
<td><strong>Sig. Input Volts. (rms)</strong></td>
<td>0.1 0.1</td>
<td>0.1 0.1</td>
<td>0.1 0.1</td>
<td>volt</td>
</tr>
<tr>
<td><strong>Output Voltage (rms)</strong></td>
<td>11.5 12.5</td>
<td>13.2 15.5</td>
<td>13 16.7</td>
<td>volts</td>
</tr>
<tr>
<td><strong>Voltage Gain</strong></td>
<td>115 125</td>
<td>132 155</td>
<td>130 167</td>
<td>%</td>
</tr>
<tr>
<td><strong>Distortion</strong></td>
<td>1.5 2.2</td>
<td>2.4 2.4</td>
<td>3.7 3.0</td>
<td>%</td>
</tr>
<tr>
<td><strong>Sig. Input Volts. (rms)</strong></td>
<td>0.20 0.18</td>
<td>0.16 0.16</td>
<td>0.11 0.14</td>
<td>volt</td>
</tr>
<tr>
<td><strong>Output Voltage (rms)</strong></td>
<td>21.7 21.7</td>
<td>20.5 24</td>
<td>14 22.2</td>
<td>volts</td>
</tr>
<tr>
<td><strong>Voltage Gain</strong></td>
<td>109 120</td>
<td>128 150</td>
<td>127 159</td>
<td>%</td>
</tr>
<tr>
<td><strong>Distortion</strong></td>
<td>4.8 5.0</td>
<td>4.9 4.8</td>
<td>4.2 4.8</td>
<td>%</td>
</tr>
</tbody>
</table>

0 of following stage.

^ Ratio of signal output to signal input.

*: Maximum value to swing the grid of resistance-coupled amplifier tube to the point where its grid No.1 starts to draw current.

Note: Coupling capacitors should be selected to give desired frequency reponse. Cathode resistors should be adequately bypassed.
AVERAGE PLATE CHARACTERISTICS

$E_C = 6.3$ VOLTS
GRID-N° 2 VOLTS = 100

PLATE ($I_B$) OR GRID-N° 2 ($I_C$) MILLIAMPERES

JAN. 8, 1953
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7893
AVerage Characteristics

$E_C = 6.3 \text{ VOLTS}$

$\text{PLATE VOLTS} = 100$

$\text{GRID-N\&2 VOLTS} = 100$

TRANSCONDUCTANCE ($g_m$) - MICROMYOS

PLATE ($I_L$), OR GRID-N\&2 ($I_C$) MILLIAMPERES

GRID-N\&1 VOLTS

PLATE RESISTANCE ($r_p$) - MEGOHMS

JAN. 8, 1953

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