GENERAL DATA

Electrical:
Heater, for Unipotential Cathode:
  Voltage ............ 6.3 ................ ac or dc volts
  Current ............ 0.6 ................ amp
Direct Interelectrode Capacitances:
  Grid to Plate ....... 1.0 ................ μμf
  Input ................ 3.8 ................ μμf
  Output ............ 0.04 max. ................ μμf
Amplification Factor .... 1650

Mechanical:
Mounting Position .......... Any
Maximum Overall Length .......... 5-1/8"  
Seated Length ............ 4-1/2" ± 1/8"
Maximum Diameter .......... 1-23/32"
Weight (Approx.) .......... 2.7 oz
Bulb .................. T-12
Cap .................. Small (JETEC No.C1-1)
Base ............ Short Jumbo-Shell Octal 6-Pin (JETEC No.B6-73)

VOLTAGE-CONTROL SERVICE

Maximum Ratings, Design-Center Values:
DC PLATE VOLTAGE ............ 27000 max. volts
UNREGULATED DC SUPPLY VOLTAGE .......... 55000 max. volts
GRID VOLTAGE:
  DC value ............ -125 max. volts
  Peak value ............ -550 max. volts
DC PLATE CURRENT .......... 1.5 max. ma
PLATE DISSIPATION .......... 25 max. watts
PEAK HEATER-CATHODE VOLTAGE:
  Heater negative with respect to cathode 180 max. volts
  Heater positive with respect to cathode 180 max. volts

Typical Operation As Shunt Voltage-Regulator Tube
In Accompanying Circuits:
Unregulated Supply:
  DC voltage ............ 29800 36300 volts
  Equivalent resistance .......... 8 8 megalohms

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TENTATIVE DATA
Voltage Divider Values:

\[
\begin{align*}
R_1 \text{ (5 watts)} & \quad 120 \quad 220 \quad \text{megohms} \\
R_2 \text{ (2 watts)} & \quad 1 \quad 1 \quad \text{megohm} \\
R_3 \text{ (1/2 watt)} & \quad 2 \quad 3 \quad \text{megohms}
\end{align*}
\]

Reference Voltage Supply:

\[
\begin{align*}
\text{DC value} & \quad 500 \quad 500 \quad \text{volts} \\
\text{Equivalent resistance} & \quad 1000 \quad 1000 \quad \text{ohms}
\end{align*}
\]

Effective Grid-Plate Transconductance

\[
\begin{align*}
138 \quad 116 \quad \text{μmhos}
\end{align*}
\]

DC Plate Current:

\[
\begin{align*}
\text{For load current of 0 mA} & \quad 1055 \quad 1035 \quad \text{μamp} \\
\text{For load current of 1 mA} & \quad 100 \quad 100 \quad \text{μamp}
\end{align*}
\]

Regulated DC Output Voltage:

\[
\begin{align*}
\text{For load current of 0 mA} & \quad 20000 \quad 27000 \quad \text{volts} \\
\text{For load current of 1 mA} & \quad 19700 \quad 26500 \quad \text{volts}
\end{align*}
\]

Maximum Circuit Values:

Grid-Circuit Resistance:

With unregulated supply having an equivalent resistance of at least 8 megohms . . . . . . . 4 max. megohms

With unregulated supply having an equivalent resistance less than 8 megohms . . . . . . See accompanying curve

**CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN**

<table>
<thead>
<tr>
<th>Note</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Current</td>
<td>1</td>
<td>0.54</td>
</tr>
<tr>
<td>Grid Voltage (1)</td>
<td>1.2</td>
<td>-7</td>
</tr>
<tr>
<td>Grid Voltage (2)</td>
<td>1.3</td>
<td>-</td>
</tr>
<tr>
<td>Grid-Voltage Change</td>
<td>1.4</td>
<td>-</td>
</tr>
</tbody>
</table>

Note 1: With heater voltage of 6.3 volts ac or dc.
Note 2: With dc plate voltage of 30000 volts and dc plate current of 1 ma.
Note 3: With dc plate voltage of 30000 volts and dc plate current of 0.1 ma.
Note 4: Difference between grid voltage (1) and grid voltage (2).

**OPERATING NOTES**

Operation of the 6BD4-A with a plate voltage above approximately 16000 volts (absolute value) results in the production of x-rays which can constitute a health hazard on prolonged exposure at close range unless the tube is adequately shielded. Relatively simple shielding should prove adequate, but the need for this precaution should be considered in equipment design.

JUNE 14, 1954  TUBE DIVISION  TENTATIVE DATA

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Typical performance data for this basic circuit with certain characteristics of the unregulated dc supply and related voltage-divider values are given in the above tabulated data. Other combinations are feasible within the maximum ratings and the maximum circuit values for the 6BD4-A.
AVERAGE TRANSFER CHARACTERISTICS

$E_F = 6.3$ VOLTS

GRID VOLTS

PLATE MILLIAMPERES

-20 -15 -10 -5 0

2.5 2.0 1.5 1.0 0.5

MAR. II, 1954
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