**PRODUCT INFORMATION**

**Triode-Pentode**

**FOR TV VERTICAL-DEFLECTION OSCILLATOR AND AMPLIFIER APPLICATIONS**

**6LR8**

**COLOR TV TYPE**

**T-12 ENVELOPE**

**TRIODE-PENTODE**

The 6LR8 is a triode-pentode containing a high-mu triode and a beam pentode. The triode is designed for service as a vertical-deflection oscillator, and the pentode as a vertical-deflection amplifier in television receivers. The 6LR8 utilizes a T-12 bulb and features a 9-pin glass button base with a 0.687-inch pin circle.

### GENERAL

**ELECTRICAL**

- **Cathode** - Coated Unipotential
- **Heater Characteristics and Ratings**
  - **Heater Voltage, AC or DC**: 6.3±0.6 Volts
  - **Heater Current**: 1.5 Amperes
- **Direct Inter-electrode Capacitances**
  - **Pentode Section**
    - Grid to Plate: maximum (Pg1 to Pp): 0.7 pf
    - Input: Pg1 to (h+Pk+Pg2+b.p.): 16 pf
    - Output: Pp to (h+Pk+Pg2+b.p.): 9.0 pf
  - **Triode Section**
    - Grid to Plate: (Tg to Tp): 6.0 pf
    - Input: Tg to (h+Tk): 6.5 pf
    - Output: Tp to (h+Tk): 1.6 pf

**Coupling**

- Pentode Grid-Number 1 to Triode Plate: (Pg1 to Tp) = 0.12 pf
- Pentode Plate to Triode Plate: (Pp to Tp), maximum = 0.32 pf

### MECHANICAL

- **Operating Position** - Any
- **Envelope** - T-12, Glass
- **Base** - E9-88, Button 9-Pin
- **Outline Drawing** - EIA 12-96
  - **Maximum Diameter** = 1.562 inches
  - **Minimum Diameter** = 1.438 inches
  - **Maximum Over-all Length** = 3.125 inches
  - **Maximum Seated Height** = 2.750 inches
  - **Minimum Seated Height** = 2.500 inches

### PHYSICAL DIMENSIONS

- **Maximum**: T12 - 3.125 inches
- **Minimum**: T12 - 2.750 inches
- **Maximum**: 2.500 inches

### TERMINAL CONNECTIONS

- Pin 1 - Triode Cathode
- Pin 2 - Pentode Grid-Number 1
- Pin 3 - Pentode Cathode and Beam Plates
- Pin 4 - Heater
- Pin 5 - Heater
- Pin 6 - Pentode Plate
- Pin 7 - Pentode Grid-Number 2 (Screen)
- Pin 8 - Triode Plate
- Pin 9 - Triode Grid

### BASE DIAGRAM

![Basing Diagram](EIA 9OT)

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**GENERAL ELECTRIC**
### Maximum Ratings

<table>
<thead>
<tr>
<th></th>
<th>Vertical Oscillator Service</th>
<th>Vertical Deflection Amplifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Screen Voltage</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>Peak Positive Pulse Plate Voltage</td>
<td>400</td>
<td>250</td>
</tr>
<tr>
<td>Peak Negative Grid-Number 1 Voltage</td>
<td>2.5</td>
<td>14</td>
</tr>
<tr>
<td>Plate Dissipation §</td>
<td>2.75</td>
<td>-</td>
</tr>
<tr>
<td>Screen Dissipation §</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>Average Cathode Current</td>
<td>30</td>
<td>75 Miampere</td>
</tr>
<tr>
<td>Peak Cathode Current</td>
<td>105</td>
<td>260 Miampere</td>
</tr>
<tr>
<td>Heater-Cathode Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater Positive with Respect to Cathode</td>
<td>100</td>
<td>100 Volt</td>
</tr>
<tr>
<td>DC Component</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total DC and Peak</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Heater Negative with Respect to Cathode</td>
<td>200</td>
<td>200 Volt</td>
</tr>
<tr>
<td>Total DC and Peak</td>
<td>-</td>
<td>2.2</td>
</tr>
<tr>
<td>Grid-Number 1 Circuit Resistance</td>
<td>1.0</td>
<td>2.2 Megohm</td>
</tr>
<tr>
<td>With Fixed Bias</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td>With Cathode Bias</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Bulb Temperature at Hottest Point*</td>
<td>210</td>
<td>°C</td>
</tr>
</tbody>
</table>

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electronic devices in the equipment.

### Characteristics and Typical Operation

<table>
<thead>
<tr>
<th></th>
<th>Triode Section</th>
<th>Pentode Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Voltage</td>
<td>250</td>
<td>45</td>
</tr>
<tr>
<td>Screen Voltage</td>
<td>-4</td>
<td>125</td>
</tr>
<tr>
<td>Grid-Number 1 Voltage</td>
<td>0.0</td>
<td>-10</td>
</tr>
<tr>
<td>Plate Current</td>
<td>2.3</td>
<td>200</td>
</tr>
<tr>
<td>Screen Current</td>
<td>-15</td>
<td>56</td>
</tr>
<tr>
<td>Transconductance</td>
<td>3600</td>
<td>20</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>58</td>
<td>9300</td>
</tr>
<tr>
<td>Plate Resistance, approximate</td>
<td>16000</td>
<td>12000 Ohms</td>
</tr>
<tr>
<td>Grid Voltage, approximate</td>
<td>-6.6</td>
<td>-26 Volt</td>
</tr>
<tr>
<td>Ib = 10 Microamperes</td>
<td>-6.6</td>
<td>-26 Volt</td>
</tr>
<tr>
<td>Grid-Number 1 Voltage, approximate</td>
<td>-26</td>
<td>-30 Volt</td>
</tr>
<tr>
<td>Ib = 1.0 Milliamperes</td>
<td>-26</td>
<td>-30 Volt</td>
</tr>
<tr>
<td>Grid-Number 1 Voltage, approximate</td>
<td>-30</td>
<td>-30 Volt</td>
</tr>
</tbody>
</table>

**Notes**

- The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.
- Heater current of a bogey at Ef = 6.3 volts.
- Without external shield.
- For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.
- § In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.
- † Measured with an infrared thermometer, Ircon Model 700 BC or equivalent, at an ambient temperature of 40° C.
- ▲ Applied for short interval (two seconds maximum) so as not to damage tube.
- † Triode connection (screen tied to plate) with Eb = Ec2 = 120 volts, and Ec1 = -10 volts.