PHILCO - LANSDALE DIVISION
CATHODE RAY TUBE
DATA SHEET
Tentative

Description

The 19CUP4 is a 19" - 114° direct view rectangular glass picture tube having an aluminized screen, spherical faceplate, non ion trap gun, internal shielding and is designed to operate with electrostatic focus and magnetic deflection.

It is a "HiGm" tube designed to operate in cathode drive service under low G2 voltage conditions. The tube base is short and provides straight through leads oriented by an indexing lug.

Electrical Data

Focusing Method. Electrostatic
Deflection Method. Magnetic
Deflection Angle, approximate
  Horizontal 102 Degrees
  Vertical 85 Degrees
  Diagonal 114 Degrees
Direct Interelectrode Capacitance, approximate
  Cathode to All 4.0uuf
  Grid #1 to All 6.0uuf
  External Coating Capacitance 1300 Min. uuf
                                1700 Max. uuf
Heater Voltage 6.3 Volts
Heater Current at 6.3 Volts 0.45±5% Amperes
Heater Warm-up Time (Note 1) 11 Seconds

Optical Data

Phosphor Number. Aluminized P4
Fluorescent Color. White
Persistence. Medium Short
Faceplate
  Light Transmission at Center, Approximate. 77 Percent

from JEDEC release #4202, April 1, 1963
Continued:

**Mechanical Data**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Length</td>
<td>11 5/8 x 1 1/4 x 3/16 Inches</td>
</tr>
<tr>
<td>Neck Length</td>
<td>4 3/8 x 1/8 x 1/16 Inches</td>
</tr>
<tr>
<td>Greatest Dimensions of Bulb</td>
<td></td>
</tr>
<tr>
<td>Diagonal</td>
<td>10 5/8 x 1 1/8 Inches</td>
</tr>
<tr>
<td>Width</td>
<td>16 13/32 x 1/8 Inches</td>
</tr>
<tr>
<td>Height</td>
<td>13 11/32 x 1/8 Inches</td>
</tr>
<tr>
<td>Minimum Useful Screen Dimensions</td>
<td>172 Sq. Inches</td>
</tr>
<tr>
<td>(maximum assured dimensions)</td>
<td></td>
</tr>
<tr>
<td>Diagonal</td>
<td>17 9/16 Inches</td>
</tr>
<tr>
<td>Width</td>
<td>15 1/8 Inches</td>
</tr>
<tr>
<td>Height</td>
<td>12 Inches</td>
</tr>
<tr>
<td>Bulb</td>
<td>J149A2</td>
</tr>
<tr>
<td>Base</td>
<td>B7-208</td>
</tr>
<tr>
<td>Basing</td>
<td>8HR</td>
</tr>
<tr>
<td>Anode Contact</td>
<td>J1-21</td>
</tr>
<tr>
<td>Anode Contact Aligns with Pin #4 (+30°)</td>
<td></td>
</tr>
</tbody>
</table>

**CATHODE DRIVE SERVICE**

Voltages are positive with respect to Grid #1 unless indicated otherwise.

**Maximum Ratings (Design Maximum Values)**

- **Anode Voltage (Note 2)**: 22,000 Volts DC
- **Grid #4 Voltage**: -550 Min. to +1100 Max. Volts DC
- **Grid #2 Voltage**: 80 Volts DC
- **Cathode Voltage**
  - Positive-Bias Value: 154 Max. Volts DC
  - Positive-Peak Value: 220 Max. Volts
  - Negative-Bias Value: 0 Max. Volts DC
  - Negative-Peak Value: 2 Max. Volts
- **Peak-Heater-Cathode Voltage**
  - Heater Negative with Respect to Cathode
    - During Warm-up Period not to exceed 15 seconds: 450 Max. Volts
    - After Equipment Warm-up Period: 200 Max. Volts
  - Heater Positive with Respect to Cathode: 200 Max. Volts
Typical Operating Conditions

Anode Voltage ........................................ 16,000 Volts DC
Grid #4 Voltage for Focus .......................... -100 Volts to +300 Volts DC
Grid #2 Voltage ........................................ 65 Volts DC
Cathode Voltage (Note 3) ............................ +41 to +56 Volts DC

Maximum Circuit Values

Grid #1 Circuit Resistance ......................... 1.5 Max. Megs.

Notes

1. Heater warm-up time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

2. Anode, Grid #3, and Grid #5 are connected together within the tube and are referred to herein as anode.

3. For visual extinction of the focused raster. For cutoff of undeflected focus spot, the absolute value of the bias between cathode and grid will increase by about 4 volts.

March 1963
MECHANICAL NOTES

1. The reference line is determined by reference line gauge JEDEC #126.
2. The area around the button is covered with an insulating coating.
3. Socket for this base should not be rigidly mounted; it should have flexible leads and be allowed to move freely. The design of the socket should be such that the circuit wiring cannot impress lateral strains through the socket contacts on the base pins. Bottom circumference of the base washer will fall within a circle concentric with bulb axis and having a diameter of 1\(\frac{3}{4}\)".

WARNING

X-ray radiation shielding may be necessary to protect against possible danger of personal injury from prolonged exposure at close range if this tube is operated at anode voltages higher than 10,000 volts.