Technical Data
Hughes Aircraft Company
6498
MEMOTRON*
5-Inch Bright Display Cathode-Ray-Type Storage Tube

GENERAL:

Heaters (two) for Unipotential Cathodes
Voltage
Current (each heater)
Phosphor
Fluorescence and Phosphorescence
Persistence of Phosphorescence
Focusing Method
Deflection Method
Over-all Length
Greatest Diameter of Bulb
Useful Screen Diameter
Mounting Position
Base
Small-Shell Dihedral 14-Pin
Pin 1 Heater (Writing Gun)
Pin 2 First Anode (Writing Gun)
Pin 3 Control Grid (Writing Gun)
Pin 4 Deflecting Electrode D₂
Pin 5 Deflecting Electrode D₁
Pin 6 Deflecting Electrode D₃
Pin 7 Deflecting Electrode D₄
Pin 8 Second Anode (Both Guns)
Pin 9 Cathode (Writing Gun)
Pin 10 Heater (Flood Gun)
Pin 11 Heater, Cathode (Flood Gun)
Pin 12 Control Grid (Flood Gun)
Pin 13 Control Grid (Writing Gun)**
Pin 14 Heater (Writing Gun)

D₁ and D₂ are nearer the base.
D₃ and D₄ are nearer the screen.

Terminals on Bulb
Cap No. 1 Viewing Screen
Cap No. 3 Third Anode
Cap No. ½ Ion Repeller Mesh
Cap No. 5 Collector Mesh
Cap No. 6 Storage Mesh

Cap No. 1 is not recessed.
Caps Nos. 3, 4, 5 and 6 are partially recessed.

6.3 ± 1.0 percent ac or dc volts
0.6 amp

Green Pl
Medium
Electrostatic
Electrostatic
18-3/4" ± 1/2"
5-5/8" Maximum
4" Minimum
Any
(JETEC No. B14-45)

Small Ball Cap (see sketch below)

.113" ± .005 Dia.
5/32" ± 1/64"
.056" R.
.080" Dia.

* Hughes Aircraft Company registered trademark for direct-reading bright display storage tube.

** Use Pin 3 for Control Grid socket connection.

from JETEC release #1426, March 7, 1955
Connection Diagram:

Viewing Screen Terminal
(HV Contact)

BOTTOM VIEW

With $D_1$ positive with respect to $D_2$, the spot is deflected toward Pin 7. With $D_3$ positive with respect to $D_4$, the spot is deflected toward Pin 4.
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Outline Drawing:

Face Flat Within .031"  
5-5/8" Max.  
5" ± 1/8"  
4" Min. Screen Dia.

15/16" ± 3/16"  
1-15/16" ± 3/16"

8 3/4" max.

18-3/4" ± 1/2"

Reference Line  
(Determined by 3" I.D. Cylinder)

2-1/2" Dia. ± 1/8"

2-1/4" ± 3/32" D.

Small-SHELL Dihedral 14-Pin Base (JETEC No. BL4-45)

February 4, 1955
MAXIMUM RATINGS:

- Viewing Screen: 6000 volts
- Ion Repeller Mesh: 350 volts
- Second Anode: 300 volts
- Deflection Plates, Average Potential: 300 volts
- Collector Mesh: 250 volts
- Third Anode: 250 volts
- Storage Mesh: -50 volts
- First Anode: -3300 volts
- Cathode, Writing Gun: -3300 volts

TYPICAL OPERATING VOLTAGES** AND CURRENTS:

- Viewing Screen Voltage: 5000 volts
- Ion Repeller Mesh Voltage: 250 volts
- Second Anode Voltage: 200 volts
- Collector Mesh Voltage, Operating Level***: 150 to 200 volts
- Third Anode Voltage: 150 volts
- Control Grid (Flood Gun) Voltage, Operating Bias****: -50 to -200 volts
- Storage Mesh Voltage: 0 volts
- First Anode (Writing Gun) Voltage for Focus**: 450 to 1050 volts
- Cathode (Writing Gun) Voltage: -3000 volts
- Control Grid (Writing Gun) Voltage** for Visual Extinction of Undeflected Focused Spot: -40 to -80 volts
- Viewing Screen Current: 0 to 300 μA
- Ion Repeller Mesh Current: 0 to 4 mA
- Second Anode Current: 0 to 3 mA
- Collector Mesh Current: -0.5 to +4 mA
- Third Anode Current: -0.5 to +2 mA
- First Anode (Writing Gun) Current: -15 to +15 μA
- Cathode (Writing Gun) Current: 0 to 1000 μA
- Storage Mesh Current: -15 to +15 μA

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* All maximum ratings are given with respect to the flood gun cathode potential and represent the absolute maximum departure from this potential.

** All voltages are given with respect to flood gun cathode potential, except the control grid (writing gun) voltage, and the first anode (writing gun) voltage, which are given with respect to the writing gun cathode potential.

*** The collector mesh operating level, by definition, is 15 volts above the lowest voltage at which written information remains visible indefinitely on all parts of the viewing screen. This latter voltage has been named the retention threshold.

**** Adjust for complete coverage of the viewing screen.
PROTECTIVE CIRCUITRY:

Power supplies should be of the limited-energy type with inherent regulation to limit the continuous short circuit currents to the values tabulated below. If the effective output capacitance is capable of storing more than 10 microcoulombs, a resistance not less than the value given below should be provided between the electrode and the output of the power supply. The 100,000 ohms resistance in series with the storage mesh should be provided regardless of output capacitance.

<table>
<thead>
<tr>
<th>Electrode</th>
<th>Maximum Short Circuit Current</th>
<th>Minimum Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Mesh</td>
<td>3 ma</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>Collector Mesh</td>
<td>6 ma</td>
<td>200 ohms</td>
</tr>
<tr>
<td>Viewing Screen</td>
<td>1 ma</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>Writing Gun Cathode</td>
<td>3 ma</td>
<td>10,000 ohms</td>
</tr>
</tbody>
</table>

PERFORMANCE CHARACTERISTICS: (Average Values)

Writing Speed for a Beam Current of 20 µA and Collector at Operating Level

35,000 in./sec. minimum

In general, writing speed increases with beam current and with collector mesh voltage; therefore, a writing speed considerably greater than the above value is usually possible by raising the collector mesh voltage to the maximum stable voltage and using the maximum beam current consistent with the resolution requirements of the application.

Resolution

50 lines/in. minimum

at 0 volts on the Storage Mesh and 5000 volts on the Viewing Screen

Resolution of the written information is somewhat deteriorated by varying the storage mesh voltage in the negative direction. Resolution increases with viewing screen voltage; however, this effect is slight, above 3000 volts.

Brightness of Written Information

20 foot-lamberts minimum

at 0 volts on the Storage Mesh and 5000 volts on the Viewing Screen
Contrast Ratio
3:1 minimum
at 0 volts on the Storage Mesh
and 5000 volts on the Viewing
Screen

The ratio of brightness of written information to that of the
background can be increased by lowering the storage mesh voltage
below zero volts; however, this improvement is made with some
sacrifice of resolution and brightness of the written informa-
tion. Contrast can be enhanced without sacrifice of brightness
and resolution by applying a positive pulse to both the storage
mesh and collector mesh having a 10 to 30-volt amplitude, 1000-
cycle repetition rate, and 1% duty cycle.

Erase Time
200 milliseconds maximum

Erasure is accomplished by momentarily lowering the collector
mesh voltage below the retention threshold. The most effective
portion of this erasure pulse is the positive slope returning
to operating level. The ideal pulse, therefore, is triangular
with a steep descent, and a slow ascent occupying most of the
total pulse width.

Deflection Factor
D₁ and D₂ 85 to 115 volts/inch
D₃ and D₄ 85 to 115 volts/inch

LSY/z