**SADPI**

**OSCILLOGRAPH TUBE**

**POST-DEFLECTION ACCELERATOR**

**ELECTROSTATIC FOCUS**

**ELECTROSTATIC DEFLECTION**

**DATA**

**General:**
- Heater, for Unipotential Cathode:
  - Voltage: 6.3 ac or dc volts
  - Current: 0.6 ± 10% amp
- Direct Interelectrode Capacitances:
  - Grid No.1 to all other electrodes: 4.2 to 7.9 μf
  - Cathode to all other electrodes: 3.1 to 5.8 μf
  - Deflecting electrode DJ₁ to deflecting electrode DJ₂: 1.7 to 3.1 μf
  - Deflecting electrode DJ₃ to deflecting electrode DJ₄: 0.7 to 1.3 μf
  - DJ₁ to all other electrodes: 4.4 to 9.2 μf
  - DJ₂ to all other electrodes: 4.4 to 9.2 μf
  - DJ₃ to all other electrodes: 2.8 to 5.3 μf
  - DJ₄ to all other electrodes: 2.8 to 6.3 μf
- Faceplate, Flat: Clear Glass
- Phosphor (For Curves, see front of this Section): P₁
  - Fluorescence: Green
  - Phosphorescence: Green
  - Persistence: Medium
- Focusing Method: Electrostatic
- Deflection Method: Electrostatic
- Deflecting-electrode arrangement: See Dimensional Outline
- Overall Length: 16-3/4" ± 3/16"
- Greatest Diameter of Bulb: 5-1/4" ± 3/32"
- Minimum Useful Screen Diameter: 4-1/2"
- Weight (Approx.): 2-1/2 lbs
- Mounting Position: Any
- Cap: Recessed Small Ball (JETEC No.J1-22)
- Bulb: J42
- Base: Medium-Shell Diheptal 12-Pin (JETEC No.B12-37)

**Basing Designation for BOTTOM VIEW:** 14J

**Diagram:**

- Pin 1-Heater (Grid No.2, Grid No.4)
- Pin 2-Cathode
- Pin 3-Grid No.1
- Pin 4-No Connection-Do Not Use
- Pin 5-Grid No.3
- Pin 7-Deflecting Electrode DJ₃
- Pin 8-Deflecting Electrode DJ₄
- Pin 9-Ultor
- Pin 10-Deflecting Electrode DJ₂
- Pin 11-Deflecting Electrode DJ₁
- Pin 12-No Connection
- Pin 14-Heater Cap-Post-Ultor (Grid No.5, Collector)

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*Tube Division*  
Radio Corporation of America, Harrison, New Jersey  
Tentative Data 1
**Maximum Ratings, Design-Center Values:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST-ULTOR VOLTAGE</td>
<td>6000 max. volts</td>
</tr>
<tr>
<td>ULTOR VOLTAGE</td>
<td>2600 max. volts</td>
</tr>
<tr>
<td>RATIO OF POST-ULTOR VOLTAGE TO ULTOR VOLTAGE</td>
<td>2.3:1 max.</td>
</tr>
<tr>
<td>GRID-No.3 VOLTAGE</td>
<td>1000 max. volts</td>
</tr>
<tr>
<td>GRID-No.1 VOLTAGE:</td>
<td></td>
</tr>
<tr>
<td>Negative bias value</td>
<td>200 max. volts</td>
</tr>
<tr>
<td>Positive bias value</td>
<td>0 max. volts</td>
</tr>
<tr>
<td>Positive peak value</td>
<td>2 max. volts</td>
</tr>
<tr>
<td>PEAK VOLTAGE BETWEEN ULTOR AND ANY DEFLECTING ELECTRODE</td>
<td>500 max. volts</td>
</tr>
<tr>
<td>PEAK HEATER-CATHODE VOLTAGE:</td>
<td></td>
</tr>
<tr>
<td>Heater negative with respect to cathode</td>
<td>180 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode</td>
<td>180 max. volts</td>
</tr>
</tbody>
</table>

**Equipment Design Ranges:**

With any post-ультor voltage ($E_c$) between 2000* and 6000 volts and any ультor voltage ($E_{c4}$) between 1500** and 2600 volts.

| Grid-No.3 Voltage for Focus                  | 20% to 34.5% of $E_{c4}$ volts |
| Grid-No.1 Voltage for Visual Extinction of Undelected Focused Spot | -2.25% to -3.75% of $E_{c4}$ volts |
| Grid-No.3 Current for Any Operating Condition | -15 to +10 μamp |

**Deflection Factors:**

When $E_c = 2 \times E_{c4}$:
- $D_{11} \& D_{12}$: 26.7 to 33.3 v dc/in./kv of $E_{c4}$
- $D_{31} \& D_{34}$: 20.3 to 25 v dc/in./kv of $E_{c4}$

When $E_c = E_{c4}$:
- $D_{11} \& D_{12}$: 21.5 to 26.5 v dc/in./kv of $E_{c4}$
- $D_{31} \& D_{34}$: 16 to 20 v dc/in./kv of $E_{c4}$

* At or near this rating, the effective resistance of the ультor supply should be adequate to limit the ультor input power to 6 watts.

** It is recommended that the post-ультor voltage be not less than 3000 volts for high-speed scanning.

** Recommended minimum value of ультor voltage.

## With heater voltage of 6.3 volts, post-ультor voltage of 4000 volts, ультor voltage of 2000 volts, grid-No.3 voltage adjusted to give focus, grid-No.1 voltage adjusted to give spot that is just visible, each deflecting electrode connected through a 1-megohm resistor to ультor, and the tube shielded from all extraneous fields, the center of the undeflected, focused spot will fall within a circle having an 8-mm radius concentric with the center of the tube face.

# See next page.
Examples of Use of Design Ranges:

<table>
<thead>
<tr>
<th>With post-ulator voltage of</th>
<th>2000</th>
<th>3000</th>
<th>4000</th>
<th>volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>and ulator voltage of</td>
<td>2000</td>
<td>1500</td>
<td>2000</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage for Focus</td>
<td>400 to 690</td>
<td>300 to 515</td>
<td>400 to 690</td>
<td>volts</td>
</tr>
<tr>
<td>Grid-No.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage for Visual Ex-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>traction of Undeflected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused Spot</td>
<td>-45 to -75</td>
<td>-34 to -56</td>
<td>-45 to -75</td>
<td>volts</td>
</tr>
<tr>
<td>Deflection Factors: #</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DJ₁ &amp; DJ₂</td>
<td>43 to 53</td>
<td>40 to 50</td>
<td>53.4 to 66.6 v dc/in.</td>
<td></td>
</tr>
<tr>
<td>DJ₃ &amp; DJ₄</td>
<td>32 to 40</td>
<td>30.5 to 37.5</td>
<td>40.6 to 50 v dc/in.</td>
<td></td>
</tr>
</tbody>
</table>

Maximum Circuit Values:

| Grid-No.1-Circuit Resistance | 1.5 max. meohms |
| Resistence in Any Deflecting- | 5.0 max. meohms |
| Electrode Circuit            |      |

SPECIAL PERFORMANCE DATA

| With post-ulator voltage of | 3000 volts |
| and ulator voltage of       | 1500 volts |
| Line Width                   | 0.030 max. inch |
| Peak Grid-No.1 Drive from    |      |
| Spot Cutoff                 | 45 max. volts |
| Raster Shape                |      |

# The deflecting electrodes in the 5ADPI are designed to have extra-high deflection sensitivity and consequently produce less than full-screen deflection. With post-deflection acceleration, the length of deflection in either horizontal or vertical direction may be limited to 4-1/4 inches; without post-dejection acceleration, deflection to full screen diameter will ordinarily be obtained.

# It is recommended that the deflecting-electrode-circuit resistances be approximately equal.

Under the following conditions: heater voltage of 6.3 volts, brightness of 15 foot-lamberts measured on a 2° x 2°, 49-line raster with high-frequency scanning applied to deflecting electrodes DJ₁ and DJ₄, for line-width measurement, the high-frequency scanning is adjusted to give a raster width of 0.7 cm with the grid-No.3 voltage adjusted to give sharpest focus at center of tube face. Raster height is contracted until individual scanning lines are just barely distinguishable. Line width is expressed as the quotient of the contracted raster height measured at the center line of the tube face divided by the number of scanning lines (49).

§ Under the following conditions: heater voltage of 6.3 volts, grid-No.3 voltage adjusted for focus, and grid-No.1 voltage adjusted to give visible raster, with 49-line raster, the size of which is adjusted so that the widest points on the raster just touch the sides of a square 3.075° on a side, no point on the raster sides will lie within an inscribed square 2.925° on a side having its sides parallel to the sides of the 3.075° square and its center at the center of the 3.075° square.
POST-ULTOR
RECESSD
SMALL BALL
CAP
JETEC NO. JI-22

SCREEN DIA.
4 1/2" MIN.

1/4 R.

8.75"

6 1/8"

± 1/4"

27 13/16 R.

2" ± 1/16"

16 3/4"

± 3/16"

10 9/32 MAX.

MEDIUM-SHELL
DINEPTAL
12-PIN
BASE
JETEC NO. BI2-37

92CM-9098

△ OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE.


DJ₁ AND DJ₂ ARE NEARER THE SCREEN. DJ₃ AND DJ₄ ARE NEARER THE BASE. WITH DJ₁ POSITIVE WITH RESPECT TO DJ₂, THE SPOT WILL BE DEFLECTED TOWARD PIN 5; LIABLE, WITH DJ₃ POSITIVE WITH RESPECT TO DJ₄, THE SPOT WILL BE DEFLECTED TOWARD PIN 2.
### Average Characteristics

- **E_C = 6.3 Volts**
- **Grid-No3 Volts Adjusted for Focus.**

<table>
<thead>
<tr>
<th>Curve</th>
<th>Electrode Current</th>
<th>Ultor Volts</th>
<th>Post-Ultron Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ultron</td>
<td>2000</td>
<td>4000</td>
</tr>
<tr>
<td>B</td>
<td>Ultron</td>
<td>1500</td>
<td>3000</td>
</tr>
<tr>
<td>C</td>
<td>Post-Ultron</td>
<td>2000</td>
<td>4000</td>
</tr>
<tr>
<td>D</td>
<td>Post-Ultron</td>
<td>1500</td>
<td>3000</td>
</tr>
</tbody>
</table>

- **Grid-No1 Volts**

- **Post-Ultron (Grid No5 & Collector) Microamperes**

- **Ultron (Grids No2 & 4) Microamperes**

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*Tube Division*

*Radio Corporation of America, Harrison, New Jersey*
E r = 8.3 VOLTS
GRID-N03 VOLTS ADJUSTED FOR FOCUS.
POST-ULTOR (GRID N0 5 & COLLECTOR) VOLTS
GREATER THAN ULTOR (GRIDS N0 2 & N0 4)
VOLTS.
GRID-N01 VOLTS = 0

- MAX. TOTAL CURRENT FOR ANY TUBE.
- TYPICAL FLUORESCENT-SCREEN (POST-ULTOR) CURRENT.
TYPICAL CHARACTERISTICS

$E_p = 6.3$ VOLTS
GRID-$N=3$ VOLTS ADJUSTED FOR FOCUS
POST-ULTOR VOLTS=2×ULTOR VOLTS

RELATIVE LINE BRIGHTNESS

ULTOR VOLTS

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6820R1