General:

Heater, for Unipotential Cathode:
- Voltage: $2.5 \pm 10\%$ ac or dc volts
- Current: 2.1 amp.

Direct Interelectrode Capacitances (Approx.):
- Grid No. 1 to All Other Electrodes: 9.0 $\mu$F
- DJ1 to All Other Electrodes: 8.5 $\mu$F
- DJ3 to All Other Electrodes: 6.5 $\mu$F

Phosphor (For Curves, see front of this Section): No. 5

Fluorescence: Blue
Persistene: Very Short
Focusing Method: Electrostatic
Deflection Method: Electrostatic
Overall Length: 11-1/2" $\pm$ 3/8"
Greatest Diameter of Bulb: 3" $\pm$ 1/16"
Minimum Useful Screen Diameter: 2-3/4"
Mounting Position: Any
Base: Medium 7-Pin
Basing Designation for Bottom View: 7CE

Pin 1 - Heater
Pin 2 - Grid No. 1
Pin 3 - Deflecting Electrode DJ3
Pin 4 - Anode No. 1
Pin 5 - Deflecting Electrode DJ1
Pin 6 - Grid No. 2, Anode No. 2
Pin 7 - Heater, Cathode

DJ1 and DJ2 are nearer the screen
DJ3 and DJ4 are nearer the base

With DJ2 positive with respect to DJ1, the spot is deflected toward pin 1. With DJ4 positive with respect to DJ3, the spot is deflected toward pin 6.

The angle between the trace produced by DJ3 and DJ4 and its intersection with the plane through the tube axis and pin 6 does not exceed 100.

The angle between the trace produced by DJ3 and DJ4 and the trace produced by DJ1 and DJ2 is 900 $\pm$ 30.

Maximum Ratings, Design-Center Values:

- ANODE-No. 2 & GRID No. 2 VOLTAGE: 1500 max. volts
- ANODE-No. 1 VOLTAGE: 1000 max. volts
- GRID-No. 1 (CONTROL ELECTRODE) VOLTAGE:
  - Negative Value: 125 max. volts
  - Positive Value: 0 max. volts
- PEAK VOLTAGE BETWEEN ANODE No. 2 AND DEFLECTING ELECTRODE DJ1 OR DJ3: 500 max. volts
## OSCILLOGRAPH TUBE

(continued from preceding page)

### Typical Operation:

<table>
<thead>
<tr>
<th>Anode No.2 &amp; Grid No.2 Voltage*</th>
<th>1000</th>
<th>1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode No.1 Voltage for Focus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 75% of Grid-No.1 Voltage for Cutoff*</td>
<td>287</td>
<td>430</td>
</tr>
<tr>
<td>Grid-No.1 Volt. for Visual Cutoff#</td>
<td>-33</td>
<td>-50</td>
</tr>
<tr>
<td>Max. Anode-No.1 Current Range†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between -50 and +10 μamp.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Deflection Sensitivity:

- DJ1 and DJ2: 0.334 0.223 mm/v dc
- DJ3 and DJ4: 0.348 0.233 mm/v dc

### Deflection Factor: **

- DJ1 and DJ2: 76 114 v dc/in.
- DJ3 and DJ4: 73 109 v dc/in.

* Brilliance and definition decrease with decreasing anode-No.2 voltage.
  In general, anode-No.2 voltage should not be less than 1000 volts.
* Individual tubes may require between +29% and -44% of the values shown with grid-No.1 voltages between zero and cutoff.
# Visual extinction of stationary focused spot. Supply should be adjustable to ± 50% of these values.
† See curve for average values.
** Individual tubes may vary from these values by ± 20%.

### Spot Position:

The undeflected focused spot will fall within a 15-mm square centered at the geometric center of the tube face and having one side parallel to the trace produced by DJ1 and DJ2. Suitable test conditions are: anode-No.2 voltage, 1500 volts; anode-No.1 voltage, adjusted for focus; deflecting-electrode resistors, 1 megohm each for DJ1 and DJ3, connected to anode No.2; the tube shielded from all extraneous fields. To avoid damage to the tube, grid-No.1 voltage should be near cutoff before application of anode voltages.

### Maximum Circuit Values:

<table>
<thead>
<tr>
<th>Grid-No.1 Circuit Resistance</th>
<th>1.5 max. megohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance of Any Deflecting-Electrode Circuit at Heater-Supply Frequency</td>
<td>1.0 max. megohms</td>
</tr>
<tr>
<td>Resistance in Any Deflecting-Electrode Circuit**</td>
<td>5.0 max. megohms</td>
</tr>
</tbody>
</table>

** It is recommended that both deflecting-electrode-circuit resistances be approximately equal.
TYPICAL OSCILLOGRAPH CIRCUIT

HIGH-VOLTAGE AC SUPPLY

100V. DC

C1: 0.1 µf
C2: 1.0 µf
C3 C4 C5 C6: 0.05-µf Blocking Capacitors
R1 R2: 1.5 Megohms
R3: 4 Megohms

1500 V. DC

R4
R5
R6
R7
R8
R9
R10

ANODE N2
ANODE N21

R4: 2-Megohm Potentiometer
R5: 1.0 Megohm
R6: 0.5-Megohm Potentiometer
R7 R8: Dual 3-Megohm Potentiometer
R9 R10: 2-Megohms

CATHODE

VOLTAGE INPUT TO DEFLECTING ELECTRODES

GRID N21

BOTTOM VIEW

HEATER SUPPLY

92CS-4300R4

*When cathode is grounded, capacitors should have high voltage rating; when anode No.2 is grounded, they may have low voltage rating. For dc amplifier service, deflecting electrodes should be connected directly to amplifier output. In this service, it is preferable usually to remove deflecting-electrode resistors to minimize loading effect on amplifier. In order to minimize spot defocusing, it is essential that anode No.2 be returned to a point in the amplifier system which will give the lowest possible potential difference between anode No.2 and the deflecting electrodes.

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligations.

JUNE 20, 1946
OSCILLOGRAPH TUBE

\[3'' \pm \frac{1}{16}''\]

SCREEN RADIUS
\[1\frac{3}{8}''\] MIN.

\[\frac{1}{4}''R.\]

\[8''R.\]

\[19^\circ 55'\]

\[5\frac{1}{8}''\]

\[1\frac{1}{2}''\]
\[\pm \frac{3}{8}''\]

\[10\frac{7}{8}''\]
\[\pm \frac{3}{8}''\]

\[1\frac{3}{8}''\]
\[\pm \frac{1}{16}''\]

\(\Phi\) OF BULB WILL NOT DEViate MORE THAN 2\(^\circ\)
IN ANY DIRECTION FROM PERPENDICULAR
ERECTED AT CENTER OF BOTTOM OF BASE

JUNE 20, 1946

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
AVERAGE CHARACTERISTICS

$E_t = 6.3$ VOLTS - ANODE NO. 1 VOLTS ADJUSTED TO GIVE FOCUS

<table>
<thead>
<tr>
<th>CURVE</th>
<th>ELECTRODE CURRENT</th>
<th>ANODE NO. 2 &amp; GRID NO. 2 VOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ANODE NO. 1</td>
<td>1500</td>
</tr>
<tr>
<td>B</td>
<td>ANODE NO. 1</td>
<td>1000</td>
</tr>
<tr>
<td>C</td>
<td>ANODE NO. 2 &amp; GRID NO. 2</td>
<td>1500</td>
</tr>
<tr>
<td>D</td>
<td>ANODE NO. 2 &amp; GRID NO. 2</td>
<td>1000</td>
</tr>
</tbody>
</table>

GRID NO. 1 VOLTS

ANODE NO. 1 MICROAMPERES

ANODE NO. 2 & GRID NO. 2 MICROAMPERES

GRID NO. 1 VOLTS

APR. 18, 1945

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-5415R5