HIGH-VACUUM CATHODE-RAY TUBE

Supersedes Type 4BP1

General:

Heater, for Unipotential Cathode:

Voltage, 6.3 ± 10% ac or dc volts
Current, 0.6 amp.

Direct Interelectrode Capacitances (Approx.):

Grid No. 1 to All Other Electrodes, 8.5 μf
Cathode to All Other Electrodes, 8.0 μf
DJ1 to DJ2, 2.0 μf
DJ3 to DJ4, 2.0 μf
DJ1 to All Other Electrodes, 8.0 μf
DJ3 to All Other Electrodes, 6.0 μf
DJ1 to All Other Electrodes except DJ2, 6.0 μf
DJ2 to All Other Electrodes except DJ1, 5.0 μf
DJ3 to All Other Electrodes except DJ4, 4.0 μf
DJ4 to All Other Electrodes except DJ3, 6.0 μf

Phosphor (For Curves, see front of this Section), No. 1
Fluorescence, Green
Persistence, Medium
Focusing Method, Electrostatic
Deflection Method, Electrostatic
Overall Length, 10" ± 1/4"
Greatest Diameter of Bulb, 3" ± 1/16"
Minimum Useful Screen Diameter, 2-3/4"
Mounting Position, Any

Base, Medium Shell Diheptal 12-Pin

Basing Designation for BOTTOM VIEW, 14G

Pin 1—Heater
Pin 2—Cathode
Pin 3—Grid No. 1
Pin 4—Internal Con.
Do Not Use
Pin 5—Anode No. 1
Pin 7—Deflecting Electrode DJ3
Pin 8—Deflecting Electrode DJ4
Pin 9—Anode No. 2, Grid No. 2
Pin 10—Deflecting Electrode DJ2
Pin 11—Deflecting Electrode DJ1
Pin 12—No Conn.
Pin 14—Heater

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

With DJ1 positive with respect to DJ2, the spot is deflected toward pin 5. With DJ3 positive with respect to DJ4 the spot is deflected toward pin 2.

The angle between the trace produced by DJ1 and DJ2 and its intersection with the plane through the tube axis and pin 5 does not exceed 10°.

The angle between the trace produced by DJ3 and DJ4 and the trace produced by DJ1 and DJ2 is 90° ± 30°.

Maximum Ratings, Absolute Values:

ANODE-No. 2 & GRID-No. 2 VOLTAGE, 2200 max. volts
ANODE-No. 1 VOLTAGE, 1100 max. volts

JULY 1, 1945
RCA VICTOR DIVISION
DATA 1
HIGH-VACUUM CATHODE-RAY TUBE

GRID-No. 1 (CONTROL ELECTRODE) VOLTAGE:

Negative Value .................. 200 max. volts
Positive Value ................... 0 max. volts

PEAK VOLTAGE BETWEEN ANODE No.2 AND
ANY DEFLECTING ELECTRODE 550 max. volts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode 125 max. volts
Heater positive with respect to cathode 10 max. volts

Typical Operation:

Anode-No.2 & Grid-No.2 Voltage* 1500 2000 ...... volts
Anode No.1 Voltage for Focus at 75% of Grid-No.1 Volt-
age for Cutoff* 430 575 ...... volts
Grid-No.1 Volt. for Visual Cutoff# -45 -60 ...... volts
Max. Anode-No.1 Current Range▲ Between -50 and +10 μamp.

Deflection Sensitivity:

DJ1 and DJ2 .................. 0.169 0.127 .. mm/v dc
DJ3 and DJ4 .................. 0.229 0.172 .. mm/v dc

Deflection Factor:***

DJ1 and DJ2 .................. 150 200 .. v dc/in.
DJ3 and DJ4 .................. 11 148 .. v dc/in.

* Brilliance and definition decrease with decreasing anode-No.2 voltage.
  In general, anode-No.2 voltage should not be less than 1500 volts.
* Individual tubes may require between +20% and -30% of the values shown
  with grid-No.1 voltages between zero and cutoff.
# Visual extinction of stationary focused spot. Supply should be adjust-
  able 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. Suit-
able test conditions are: anode-No.2 voltage, 1500 volts;
anode-No.1 voltage, adjusted for focus; deflecting-electrode
resistors, 1 megohm each, 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 applica-
tion of anode voltages.

Maximum Circuit Values:

Grid-No.1-Circuit Resistance ........ 1.5 max. megohms
Impedance of Any Deflecting-Electrode
  Circuit at Heater-Supply Frequency 1.0 max. megohm
Resistance in Any Deflecting-
  Electrode Circuit** 5.0 max. megohms

** It is recommended that all deflecting-electrode-circuit resistances
be approximately equal.

JULY 1, 1945
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RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
HIGH-VACUUM CATHODE-RAY TUBE

TYPICAL OSCILLOGRAPH CIRCUIT

C1: 0.1 µf
C2: 1.0 µf
C3 C4 C5 C6: 0.05-µf Blocking Capacitors*
R1 R2: 2 Megohms
R3: 5.5 Megohms
R4: 2-Megohm Potentiometer
R5: 1.5 Megohms
R6: 0.5-Megohm Potentiometer
R7 R8: Dual 5-Megohm Potentiometer
R9 R10: Dual 5-Megohm Potentiometer
R11 R12 R13 R14: 2 Megohms

*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 direct 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.
$\frac{1}{4}$ R.

12 $\frac{3}{16}$ R.

3 $\pm \frac{1}{16}$

SCREEN RADIUS

1 $\frac{3}{8}$ MIN.

.350"

MEDIUM SHELL DIHEPTAL 12-PIN BASE

9 $\frac{1}{4}$

$\pm \frac{1}{4}$

2 $\pm \frac{1}{16}$

$\frac{2}{3}$ R.

© OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE
### Average Characteristics

**$E_f = 6.3$ 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>2000</td>
</tr>
<tr>
<td>B</td>
<td>Anode No. 1</td>
<td>1500</td>
</tr>
<tr>
<td>C</td>
<td>Anode No. 2 &amp; Grid No. 2</td>
<td>2000</td>
</tr>
<tr>
<td>D</td>
<td>Anode No. 2 &amp; Grid No. 2</td>
<td>1500</td>
</tr>
</tbody>
</table>

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**Grid No. 1 Volts**

-60  -40  -20  0  10  20  30  40  50

**Anode No. 2 & Grid No. 2 Microamperes**

-60  -40  -20  0  20  40  60  80  100  120  140  160

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**Grid No. 1 Volts**

-60  -40  -20  0  20  40  60  80  100  120  140  160

**Anode No. 2 & Grid No. 2 Microamperes**

-60  -40  -20  0  20  40  60  80  100  120  140  160

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APR. 18, 1945

RCA Victor Division

Radio Corporation of America, Harrison, New Jersey

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