OSCILLOGRAPH TUBE

ELECTROSTATIC FOCUS ELECTROSTATIC DEFLECTION

DATA

General:
Heater, for Unipotential Cathode:
  Voltage: 6.3 ac or dc volts
  Current: 0.6 amp

Direct Interelectrode Capacitances (Approx.):
  Grid No.1 to All Other Electrodes: 8 \(\mu\)f
  \(DJ_1\) to \(DJ_2\): 2 \(\mu\)f
  \(DJ_3\) to \(DJ_4\): 2 \(\mu\)f
  \(DJ_1\) to All Other Electrodes: 11 \(\mu\)f
  \(DJ_2\) to All Other Electrodes: 8 \(\mu\)f
  \(DJ_3\) to All Other Electrodes: 7 \(\mu\)f
  \(DJ_4\) to All Other Electrodes: 8 \(\mu\)f

Phosphor (For Curves, see front of this Section): No.1
  Fluorescence: Green
  Persistence: Medium

Focusing Method: Electrostatic
Deflection Method: Electrostatic
Overall Length: 9–1/8" ± 1/4"
Greatest Diameter of Bulb: 3" ± 1/16"
Minimum Useful Screen Diameter: 2–3/4"
Mounting Position: Any

Base: Small-Shell Duodecal 12-Pin
Basing Designation for BOTTOM VIEW: 12E

Pin 1-Heater
Pin 2-Grid No.1
Pin 3-Cathode
Pin 4-Anode No.1
Pin 5-Internal Connection—Do Not Use
Pin 6-Deflecting Electrode \(DJ_3\)
Pin 7-Deflecting Electrode \(DJ_4\)
Pin 8-Anode No.2, Grid No.2
Pin 9-Deflecting Electrode \(DJ_2\)
Pin 10-Deflecting Electrode \(DJ_1\)
Pin 11-Internal Connection—Do Not Use
Pin 12-Heater

\(DJ_1\) and \(DJ_2\) are nearer the screen
\(DJ_3\) and \(DJ_4\) are nearer the base

With \(DJ_1\) positive with respect to \(DJ_2\), the spot is deflected toward pin 4. With \(DJ_3\) positive with respect to \(DJ_4\), the spot is deflected toward pin 1.

The angle between the trace produced by \(DJ_3\) and \(DJ_4\) and its intersection with the plane through the tube axis and pin No.1 does not exceed 10°.

The angle between \(DJ_1\) – \(DJ_2\) trace and \(DJ_3\) – \(DJ_4\) trace is 90° ± 3°.
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Maximum Ratings, Design-Center Values:

- ANODE-No.2 • VOLTAGE# ........................................ 2500 max. volts
- ANODE-No.1 VOLTAGE ........................................... 1000 max. volts
- GRID-No.1 VOLTAGE:* Negative bias value .................... 200 max. volts
- Positive bias value ............................................... 0 max. volts
- Positive peak value ............................................. 2 max. volts

PEAK VOLTAGE BETWEEN ANODE No.2 AND ANY DEFLECTING ELECTRODE .................................... 500 max. volts

PEAK HEATER-CATHODE VOLTAGE:
- Heater negative with respect to cathode .................... 125 max. volts
- Heater positive with respect to cathode ...................... 125 max. volts

Equipment Design Ranges:

For any anode-No.2 voltage \( (E_{b2}) \) between 500* and 2500 volts

- Anode-No.1 Voltage .............................................. 16.5% to 31% of \( E_{b2} \) ...................... volts
- Maximum Grid-No.1 Voltage for Visual Cutoff .................. 6.75% of \( E_{b2} \) ...................... volts
- Anode-No.1 Cur. for any Operating Condition .................. -15 to +10 microamperes
- Deflection Factors:
  - \( DJ_1 \) & \( DJ_2 \) ........................................ 73 to 99 v dc/in./kv of \( E_{b2} \)
  - \( DJ_3 \) & \( DJ_4 \) ........................................ 52 to 70 v dc/in./kv of \( E_{b2} \)
- Spot Position ........................................

Examples of Use of Design Ranges:

For anode-No.2 voltage of 1000 2000 volts

- Anode-No.1 Voltage .............................................. 165 - 310 330 - 620 volts
- Maximum Grid-No.1 Voltage for Visual Cutoff .................. -67.5 -135 volts
- Deflection Factors:
  - \( DJ_1 \) & \( DJ_2 \) ........................................ 73 - 99 146 - 198 volts dc/in.
  - \( DJ_3 \) & \( DJ_4 \) ........................................ 52 - 70 104 - 140 volts dc/in.

Maximum Circuit Values:

- Grid-No.1-Circuit Resistance .................................. 1.5 max. megohms
- Resistance in Any Deflecting-Electrode Circuit** ............ 5.0 max. megohms

- Anode No.2 and grid No.2 which are connected together within tube, are referred to herein as anode No.2.
- # The product of anode-No.2 voltage and average anode-No.2 current should be limited to 6 watts.
- * Brilliance and definition decrease with decreasing anode-No.2 voltage. A value as low as 500 volts is recommended only for low-velocity deflection and low ambient light levels.
- ▲ The center of the undeflected, focused spot will fall within a circle having 7.5-mm radius concentric with the center of the tube face.
- ** It is recommended that the deflecting-electrode-circuit resistances be approximately equal.

MAY 20, 1949 TUBE DEPARTMENT RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY TENTATIVE DATA
OSCILLOGRAPH TUBE

TYPICAL OSCILLOGRAPH CIRCUIT

C1: 0.2 \mu F
C2: 1.0 \mu F
C3 C4 C5 C6: 0.05-\mu F Blocking Capacitors
R1 R2: 2.5 Megohms, 0.5 Watt
R3: 2.5 Megohms, 1 Watt
R4: 1.0-Megohm Potentiometer
R5: 0.5 Megohm, 0.5 Watt
R6: 0.35 Megohm, 0.5 Watt
R7 R8: Dual 5-Megohm Potentiometer
R9 R10: Dual 5-Megohm Potentiometer
R11 R12 R13 R14: 2 Megohms, 0.5 watt

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 point in the amplifier system which will give the lowest possible potential difference between anode No. 2 and the deflecting electrodes.

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.
© OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM PERPENDICULAR ERECTED AT CENTER OF BOTTOM OF BASE.

92CM-7119
CHARACTERISTICS

$E_f = 6.3$ VOLTS
ANODE-NO.1 VOLTS ADJUSTED FOR FOCUS.

RECOMMENDED
MAX. ANODE-NO.2
current

MAX. ANODE-NO.2
CURREN FOR ANY
TUBE AT ZERO
GRID-NO.1 VOLTAGE

CONSTANT LINE-MODULATION 100 PER CENT

CONSTANT LINE-MODULATION 50 PER CENT

ANODE-NO.2 MILLIAMPERES

ANODE-NO.2 VOLTS

RELATIVE BRIGHTNESS

DEC. 10, 1948
TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7143
$E_f = 6.3\ \text{VOLTS}$
$\text{ANODE-N\#2 VOLTS}=1000$
$\text{ANODE-N\#1 VOLTS ADJUSTED FOR FOCUS}$

**Diagram:**
- **Axes:**
  - **X-axis:** Grid-NS1 Volts
  - **Y-axis:** Relative Line Brightness
  - **Y-axis (Right):** Anode-N\#2 Current
  - **Y-axis (Right):** Anode-N\#2 Milliamperes

- **Graph:**
  - A curve indicating the relationship between Grid-NS1 Volts and Relative Line Brightness, with Anode-N\#2 Current and Milliamperes as additional data points.

**Date:**
DEC.9,1948

**Department:**
TUBE DEPARTMENT

**Company:**
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
The 3RP1 is the same as the 3RP1-A except for the following items:

General:
Faceplate.......................... Spherical Clear Glass
Bulb................................. J-24P1
Weight (Approx.).................... 7 oz

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