**2BPI 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 μμf
- DJ₁ to DJ₂: 2 μμf
- DJ₁ to DJ₃: 2 μμf
- DJ₁ to All Other Electrodes: 11 μμf
- DJ₂ to All Other Electrodes: 8 μμf
- DJ₃ to All Other Electrodes: 7 μμf
- DJ₄ to All Other Electrodes: 8 μμf

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

**Focusing Method:** Electrostatic

**Deflection Method:** Electrostatic

**Overall Length:** 7-5/8" ± 3/16" ± 2" ± 1/16"

**Greatest Diameter of Bulb:** 2" ± 1/16"

**Minimum Useful Screen Diameter:** 1-3/4"

**Mounting Position:** Any

**Base:** Small-Shell Duodecal 12-Pin

**Basing Designation for BOTTOM VIEW:** 12E

**Pin Designation:**
- 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
- Pin 7 – Deflecting Electrode
- Pin 8 – Anode No.2, Grid No.2
- Pin 9 – Deflecting Electrode
- Pin 10 – Deflecting Electrode
- Pin 11 – Internal Connection—Do Not Use
- Pin 12 – Heater

*pDJ₁ 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 4. With DJ₃ positive with respect to DJ₄, the spot is deflected toward pin 1.

The plane through the tube axis and pin "o.4 may vary from the trace produced by DJ₁ and DJ₂ by an angular tolerance (measured about the tube axis) of 10°.

The angle between DJ₁ – DJ₂ trace and DJ₃ – DJ₄ trace is 90° ± 30°.

← Indicates a change.

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Maximum Ratings, Design-Center Values:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANODE-No.2** VOLTAGE</td>
<td>2500 max. volts</td>
</tr>
<tr>
<td>ANODE-No.1 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 ANODE No.2 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>125 max. volts</td>
</tr>
<tr>
<td>Heater positive with respect to cathode.</td>
<td>125 max. volts</td>
</tr>
</tbody>
</table>

Equipment Design Ranges:

- For any anode-No.2 voltage \(E_b_2\) between 500* and 2500 volts:
  
- Anode-No.1 Voltage ... 15% to 28% of \(E_b_2\) ... volts
  
- Max. Grid-No.1 Voltage for Visual Cutoff... 6.75% of \(E_b_2\) ... volts

- Max. Anode-No.1 Current Range... -15 to +10 ... microamperes

Deflection Factors:

- \(D_1\) & \(D_2\) ... 115 to 155 \(\text{v dc/in.} / \text{kv of } E_b_2\)
- \(D_3\) & \(D_4\) ... 74 to 100 \(\text{v dc/in.} / \text{kv of } E_b_2\)

Spot Position...

Examples of Use of Design Ranges:

- For anode-No.2 voltage of 1000 to 2000 volts:
  
- Anode-No.1 Voltage ... 150 - 280 to 300 - 560 ... volts
  
- Max. Grid-No.1 Voltage for Visual Cutoff... -67.5 to -135 ... volts

Deflection Factors:

- \(D_1\) & \(D_2\) ... 115 - 155 to 230 - 310 volts \(\text{dc/in.}\)
- \(D_3\) & \(D_4\) ... 74 - 100 to 148 - 200 volts \(\text{dc/in.}\)

Maximum Circuit Values:

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

* 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 room-light levels.

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

* 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.

* The center of the undeflected, focused spot will fall within a circle having a 5.0-mm radius concentric with the center of the tube face.

Indicates a change.
C1: 0.2 µf
C2: 1.0 µf
C3, C4, C5, C6: 0.05-µf 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 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.

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.
Q of bulb will not deviate more than 2° in any direction from the perpendicular erected at the center of bottom of the base.

92CS-6689
CHARACTERISTICS

$E_F = 6.3$ VOLTS
ANODE-N°1 VOLTS ADJUSTED FOR FOCUS

MAX. ANODE-N°2 CURRENT
FOR ANY TUBE AT ZERO
GRID-N°1 VOLTAGE

ANODE N°2 MILLIAMPERES

ANODE N°2 VOLTS

RELATIVE BRIGHTNESS

CONSTANT LINE WIDTH = 0.004"
AVerAGE CHARACTERISTICS

$E_C = 6.3$ VOLTS
ANODE - N° 2 VOLTS = 1000
ANODE - N° 1 VOLTS ADJUSTED FOR FOCUS

GRID - N° 1 VOLTS
RELATIVE LINE BRIGHTNESS
ANODE N° 2 MILLIAMPERES

AUGUST 14, 1950    TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
The 2BP11 is the same as the 2BP1 except that it has a phosphor of the short-persistence, blue–fluorescence type designated P11. The blue radiation of the P11 screen is highly actinic and has sufficiently short persistence to permit use of the 2BP11 in all moving film photographic applications without blurring except in those where film moves at a high speed. The 2BP11 is also quite satisfactory for visual observation of phenomena because its phosphor has unusually high brightness for a blue screen.

In general, operation of the 2BP11 at an anode–No.2 voltage less than 1000 volts is not recommended.

THE SPECTRAL–ENERGY EMISSION CHARACTERISTIC and the PERSISTENCE CHARACTERISTIC of the P11 Phosphor are shown at the front of this Section.