IEPI
OSCILLOGRAPH TUBE
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 (Approx.):
  Grid No.1 to all other electrodes .......... 6.5 μf
  Deflecting electrode DJ₁ to  
    deflecting electrode DJ₂ .......... 1.7 μf
  Deflecting electrode DJ₃ to  
    deflecting electrode DJ₄ .......... 0.6 μf
  DJ₁ to all other electrodes .......... 5 μf
  DJ₂ to all other electrodes .......... 5 μf
  DJ₃ to all other electrodes .......... 3.8 μf
  DJ₄ to all other electrodes .......... 3.8 μf

Faceplate, Flat .................. Clear Glass

Phosphor (For Curves, see front of this Section). .......... Pt
  Fluorescence. .......... Green
  Phosphorescence .......... Green
  Persistence ............. Medium

Focusing Method .......... Electrostatic
Deflection Method .......... Electrostatic

Maximum Overall Length .......... 4-1/16"
Maximum Diameter .......... 1-1/4" ± 1/16"

Minimum Useful Screen Diameter .......... Any

Mounting Position .......... Any
Weight (Approx.) .......... 2 oz

Bulb .......... T-10

Base. .......... Small-Button Unidekar 11-Pin (JETEC No.E11-22)

Basing Designation for BOTTOM VIEW .......... 11V

Pin 1—Heater  
Pin 2—Heater  
Pin 3—Grid No.1  
Pin 4—Cathode  
Pin 5—Grid No.3  
Pin 6—Deflecting Electrode DJ₄
Pin 7—Deflecting Electrode DJ₃

Pin 8—Ultor  
Pin 9—Deflecting Electrode DJ₂
Pin 10—Deflecting Electrode DJ₁
Pin 11—Internal Connection—Do Not Use

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 the midpoint between pins 6 and 7. With DJ3 positive with respect to DJ4, the spot is deflected toward the midpoint between pins 9 and 10.

The angle between the trace produced by DJ3 and DJ4 and its intersection with the plane through the tube axis and the midpoint between pins 9 and 10 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, Design-Center Values:**

- ULTROR VOLTAGE ........................................ 1500 max. volts
- GRID-No.3 VOLTAGE ...................................... 1200 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 ULTOR 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 ultror voltage (E<sub>c4</sub>) between recommended minimum* and 1500 volts

- Grid-No.3 Voltage for Focus .......................... 10% to 30% of E<sub>c4</sub> volts
- Grid-No.1 Voltage for Visual Extinction of Undeflected Focused Spot .............................. -1.4% to -4.2% of E<sub>c4</sub> volts
- Grid-No.3 Current for Any Operating Condition .......................................................... -15 to +10 μamp

**Deflection Factors:**

- DJ1 & DJ2 ........................................ 210 to 310 vdc/in./kv of E<sub>c4</sub>
- DJ3 & DJ4 ........................................ 240 to 350 vdc/in./kv of E<sub>c4</sub>

**Spot Position:**

**Examples of Use of Design Ranges:**

For ultror voltage of 500 1000 volts

- Grid-No.3 Voltage for Focus .......................... 50 to 150 100 to 300 volts

* Brilliance and definition decrease with decreasing ultror voltage. Recommended minimum for the IEP1 in general service is 500 volts, but a value as low as 300 volts may be used under conditions of low-velocity deflection and low ambient light levels. For operation between 500 and 1000 volts, it is essential that the ultror voltage be applied before beam-current flow. Otherwise, a screen charge may develop to block off or distort the scanning pattern.

**#: See next page.**

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6-56  TUBE DIVISION  TENTATIVE DATA 1

RADIO CORPORATION OF AMERICA, HARLESON, NEW JERSEY
For ultimate voltage of 500 1000 volts

Grid-No.1 Voltage for Visual Extinction of Undecfected Focused Spot ....... -7 to -21 -14 to -42 volts

Deflection Factors:
DJ₁ & DJ₂ ....... 105 to 155 210 to 310 volts dc/in.
DJ₃ & DJ₄ ....... 120 to 175 240 to 350 volts dc/in.

Maximum Circuit Values:
Grid-No.1-Circuit Resistance ..... 1.5 max. megohms Resistance in Any Deflecting-Electrode Circuit ..... 2.0 max. megohms

[#] The center of the undecfected focused spot will fall within a circle having 2.5-mm radius concentric with the center of the tube face.

[Ⅲ] It is recommended that the deflecting-electrode-circuit resistances be approximately equal.

1½" MIN.
SCREEN DIA.

1¾" ± ¼"

3½" ± ¼"

4½" MAX.

92CS-8924

SMALL-BUTTON UNIDEKAR 11-PIN BASE JETEC #EI1-22

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
TYPICAL OSCILLOGRAPH CIRCUIT

C1: 0.5 μf, 2000 volts
C2: 1 μf, 200 volts
C3: 1 μf, 200 volts
C4: 0.05 μf, 1600 volts
C5 C6 C7 C8: 0.05 μf, 600 volts
R1 R2: 510,000 ohms, 1/2 watt
R3 R4: 300,000 ohms, 1 watt
R5: 250,000-ohms, 2-watt potentiometer
R6: 51,000 ohms, 1/2 watt
R7: 100,000-ohms, 1/2-watt potentiometer
R8: 510,000 ohms, 1/2 watt

R9: 5 megohms, 1/2 watt
R10 R11: Dual 1-megohm potentiometer
R12 R13: Dual 1-megohm potentiometer
R14 R15 R16 R17: 1.5 megohms, 1/2 watt
T1: Transformer, 6.3 volts at 1 ampere, insulated for 2000 volts, such as Thordarson T21F08
F1: 1-ampere fuse

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.
E_T = 6.3 VOLTS
GRID-N°3 VOLTS ADJUSTED FOR FOCUS

<table>
<thead>
<tr>
<th>CURVE</th>
<th>ULTOR VOLTS</th>
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<tbody>
<tr>
<td>A</td>
<td>1000</td>
</tr>
<tr>
<td>B</td>
<td>1000</td>
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<tr>
<td>C</td>
<td>500</td>
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<td>D</td>
<td>500</td>
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RELATIVE LINE BRIGHTNESS
ULTOR MICROAMPERES
MAXIMUM ULTOR-CURRENT REQUIREMENTS
FROM POWER SUPPLY

$E_b = 6.3$ VOLTS
GRID-N$^9$3 VOLTS ADJUSTED FOR FOCUS

MAX. ULTOR CURRENT
FOR ANY TUBE AT ZERO
GRID-N$^9$1 VOLTAGE

ULTOR MICROAMPERES

ULTOR VOLTS

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-8939
AVERAGE CHARACTERISTICS

E_{f} = 6.3 VOLTS
GRID-NA3 VOLTS ADJUSTED FOR SHARP FOCUS AT CENTER OF RASTER.
GRID-NA1 VOLTS ADJUSTED TO GIVE INDICATED BRIGHTNESS VALUE ON A 2 CM x 2 CM, 25-LINE RASTER.
* LINE WIDTH MEASURED BETWEEN POINTS WHERE BRIGHTNESS WAS APPROX. 1/2 THAT AT CENTER OF LINE.
The 1EP2 is the same as the 1EP1 except for the following items:

**General:**
Phosphor (For Curves, see front of this Section). . . . . P2
Fluorescence . . . . . . . . . . . . Greenish-Yellow
Phosphorescence . . . . . . . . . . Greenish-Yellow
Persistence . . . . . . . . . . . . Long

In general, operation of the 1EP2 at an ultraviolet voltage less than 750 volts is not recommended.

**AVERAGE CHARACTERISTICS**

\[ Ef = 6.3 \text{ VOLTS} \]
GRID-N3 VOLTS ADJUSTED FOR SHARP FOCUS
AT CENTER OF RASTER,
GRID-N1 VOLTS ADJUSTED TO GIVE INDICATED
BRIGHTNESS VALUE ON A 2 CM x 2 CM, 25-LINE RASTER.
*LINE WIDTH MEASURED BETWEEN POINTS WHERE
BRIGHTNESS WAS APPROX. 1/2 THAT AT CENTER OF LINE.*
AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
ULTOR VOLTS = 1000
GRID-Nè 3 VOLTS ADJUSTED FOR FOCUS.
The 1EP11 is the same as the 1EP1 except for the following items:

General:
Phosphor (For Curves, see front of this Section) ........ P11
   Fluorescence ........................................... Blue
   Phosphorescence ........................................ Blue
   Persistence ............................................. Short

In general, operation of the 1EP11 at an ultravoltage less than 750 volts is not recommended.

AVERAGE CHARACTERISTICS

E_f = 6.3 VOLTS
GRID-N03 VOLTS ADJUSTED FOR SHARP FOCUS
   AT CENTER OF RASTER.
GRID-N01 VOLTS ADJUSTED TO GIVE INDICATED
   BRIGHTNESS VALUE ON A 2 CM x 2 CM, 25-LINE RASTER.
* LINE WIDTH MEASURED BETWEEN POINTS WHERE
   BRIGHTNESS WAS APPROX. 1/2 THAT AT CENTER OF LINE.
$E_F = 6.3$ VOLTS
ULTOR VOLTS = 1000
GRID-N=3 VOLTS ADJUSTED FOR FOCUS.