Initial Data

RCA-23EQP4 is a black-and-white pan-o-ply picture tube which eliminates the need for either an integral protective window or a separate safety-glass window and its companion dust seal in the receiver. As a result internal reflections are reduced, and picture contrast is improved. Integral implosion protection in the pan-o-ply picture tube is provided by means of a formed rim band and a welded tension band around the periphery of the tube panel. The 23EQP4 is a rectangular glass picture tube having an aluminized screen with nearly straight sides and slightly rounded corners.

Features of the 23EQP4 include:
- PAN-O-PLY — Integral Implosion Protection
- $114^\circ$ Magnetic Deflection
- Low-Voltage Electrostatic Focus
- Aluminized Screen
- Electron Gun Requiring No Ion-Trap Magnet
- $14.812''$ Max. Overall Length
- $5.125''$ Neck Length
- $15.125'' \times 19.250''$ Screen
- 6.3 Volt/450 Ma Heater
- 23 kv Max. Anode Voltage

GENERAL DATA

Electrical:
Focusing Method .................. Electrostatic
Deflection Method ................ Magnetic
Deflection Angles (Approx.):
  Diagonal ...................... $114^\circ$
  Horizontal .................. $102^\circ$
  Vertical ...................... $85^\circ$
Direct Interelectrode Capacitances:
  Grid No. 1 to all other electrodes 5 pf
  Grid No. 2 to all other electrodes 6 pf
  External conductive coating to anode 2500 max. pf
  1700 min. pf
Heater Current at 6.3 volts ........ 450 $\pm$ 20 ma
Heater Warm-Up Time (Average) ......... 11 seconds
Heater warm-up time is defined as the time required in the test circuit shown in Fig.1 for the voltage (E) across the heater terminals to increase from zero to 0.8 of rated heater voltage.

Electron Gun. Type Requiring No Ion-Trap Magnet

Optical:
Phosphor .................. P4—Sulfide Type, Aluminized
Faceplate .................. Filterglass
Light Transmission at Center (Approx.) .... 42%

Mechanical:
Weight (Approx.) ........................ 28 lbs

Tube Dimensions:
Overall length ................. 14.531'' $\pm$ 0.281''
Neck length ................ 5.125'' $\pm$ 0.125''
Diagonal .................. 23.500'' $\pm$ 0.125''
Greatest width ................ 20.650'' $\pm$ 0.125''
Greatest height .............. 16.650'' $\pm$ 0.125''
Minimum Screen Dimensions (Projected):
  Diagonal .................. 22.312''
  Greatest width ........... 19.250''
  Greatest height .......... 15.125''
Area .................. 282 sq. in.
Bulb Designation .............. J187 L
Cap Designation .............. Recessed Small Cavity
  (JEDEC No. J1-211)
Base Designation .............. Small-Diameter Neomaxitar 7-Pin
  Arrangement 1, (JEDEC No.B7-208)
Basing Designation .............. 8HR

Pin 1: Heater
Pin 2: Grid No. 1
Pin 3: Grid No. 2
Pin 4: Grid No. 4
Pin 5: Grid No. 1
Pin 7: Cathode
Pin 8: Heater
Cap: Anode (Grid No. 3,
  Collector)
C: External Conductive
  Coating

23EQP4 3-64
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Harrison, N. J.
Printed in U.S.A.
### Maximum and Minimum Ratings, Design-Maximum Values

*Unless otherwise specified, voltage values are positive with respect to cathode*

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode Voltage</td>
<td>11,000</td>
<td>23,000</td>
</tr>
<tr>
<td>Grid-No. 4 Voltage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>1100</td>
<td></td>
</tr>
<tr>
<td>Negative value</td>
<td>550</td>
<td></td>
</tr>
<tr>
<td>Grid-No. 2 Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>550</td>
<td></td>
</tr>
<tr>
<td>Negative value</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Grid-No. 1 Voltage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>Negative value</td>
<td>155</td>
<td></td>
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<tr>
<td>Positive bias value</td>
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<td></td>
</tr>
<tr>
<td>Negative bias value</td>
<td>2</td>
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</tr>
<tr>
<td>Heater Voltage</td>
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<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>6.9</td>
<td></td>
</tr>
<tr>
<td>Negative value</td>
<td>5.7</td>
<td></td>
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</tbody>
</table>

**Peak Heater-Cathode Voltage:**

*Heater negative with respect to cathode:*

- During equipment warm-up period not exceeding 15 seconds...
  - 450 max. volts
- After equipment warm-up period...
  - 300 max. volts
- Heater positive with respect to cathode: Combined AC & DC Voltage...
  - 200 max. volts
- DC Component...
  - 100 max. volts

### Typical Operating Conditions for Cathode-Drive Service

*Unless otherwise specified, voltage values are positive with respect to grid No. 1*

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode Voltage</td>
<td>18,000</td>
<td></td>
</tr>
<tr>
<td>Grid-No. 4 Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Negative value</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Cathode Voltage for visual extinction of focused raster (See Fig. 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>28 to 62</td>
<td></td>
</tr>
<tr>
<td>Field Strength of required adjustable Centering Magnet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>0 to 12</td>
<td></td>
</tr>
<tr>
<td>Maximum Circuit Value: Grid-No. 1 Circuit Resistance</td>
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<td></td>
</tr>
<tr>
<td>Positive value</td>
<td>1.5 max.</td>
<td></td>
</tr>
</tbody>
</table>

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**OPERATING CONSIDERATIONS**

**X-Radiation Warning.** When operated at anode voltages up to 16 kilovolts, this picture tube does not produce any harmful X-radiation. However, because the rating of this type permits operation at voltages as high as 23 kilovolts (design-maximum value), shielding of the tube for X-radiation may be needed to prevent against possible injury from prolonged exposure at close range whenever the operating conditions involve voltages in excess of 16 kilovolts.

**TEST CIRCUIT FOR DETERMINING HEATER WARM-UP TIME**

![Diagram](image)

**Equation:**

\[ R = \frac{3E_f}{I_f} \]

**Equation:**

\[ E = 0.8E_f \]

**Equation:**

\[ I_f = \text{RATED HEATER CURRENT OF TUBE UNDER TEST} \]

**Equation:**

\[ \text{RATED HEATER VOLTAGE OF TUBE UNDER TEST} \]

**Fig. 1**

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Planar cutoff chart for cathode-drive service.

**BULB-CONTOUR DIMENSIONS**

**SHORT-SIDE VIEW**

**LONG SIDE VIEW**

**DIAGONAL VIEW**

Planes A through I are normal to the tube axis and at fixed locations from the Y-axis. These coordinates describe the bulb external contour in planes through the tube axis and the respective faceplate axes.
DIMENSIONAL OUTLINE


NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE LINE GAUGE JEDEC NO.6-126 AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

NOTE 3: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. BOTTOM CIRCUMFERENCE OF BASE WAFER WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 1-3/4".

NOTE 4: EXTERNAL CONDUCTIVE COATING AND IMPLSION PROTECTION HARDWARE MUST BE GROUNDED.

NOTE 5: TO CLEAN THIS AREA, WIPE ONLY WITH SOFT DRY LINTLESS CLOTH.

NOTE 6: MEASURED FROM THE TENSION BAND.

NOTE 7: BULGE AT SPLICE-LINE SEAL MAY INCREASE THE INDICATED MAXIMUM VALUE FOR ENVELOPE WIDTH, DIAGONAL, AND HEIGHT BY NOT MORE THAN 1/8".