RCA-23ENP4 PAN-O-PLY PICTURE TUBE

from JEDEC release
#4649, March 30, 1964

INITIAL DATA

RCA-23ENP4 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 23ENP4 is a rectangular glass picture tube having an aluminized screen with nearly straight sides and slightly rounded corners.

FEATURES OF THE 23ENP4 INCLUDE:

- PAN-O-PLY—Integral Implosion Protection
- 92° Magnetic Deflection
- Low-Voltage Electrostatic Focus
- Aluminized Screen
- Electron Gun Requiring No Ion-Trap Magnet
- 18.500" Max. Overall Length
- 5.625" Neck Length
- 15.125" x 19.250" Screen
- 6.3 Volt/600 Ma Heater
- Low Grid-No.2 Voltage
  For Cathode-Drive Service
- 25 kv Max. Anode Voltage

GENERAL DATA

Electrical:
Focusing Method .................................. Electrostatic
Deflection Method .................................. Magnetic
Deflection Angles (Approx.):
  Diagonal .................................. 92°
  Horizontal ................................. 80°
  Vertical .................................. 65°
Direct Inter-electrode Capacitances:
  Cathode to all other electrodes .......................... 5 pf
  Grid No.1 to all other electrodes .......................... 6 pf
  External conductive coating to anode ............... 2500 max. pf
  ........................................ 1700 min. pf
Heater Current at 6.3 volts .................................. 600 + 30 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.) .................................. 29 lbs

Tube Dimensions:
  Overall length .................................. 18.125" ± .375"
  Neck length .................................. 5.625" ± .188"
  Diagonal .................................. 23.500" ± .125"
  Greatest width .................................. 20.650" ± .125"
  Greatest height .................................. 16.650" ± .125"

Minimum Screen Dimensions (Projected):
  Diagonal .................................. 22.312"
  Greatest width .................................. 19.250"
  Greatest height .................................. 15.125"

Area .............................................. 282 sq. in.
Bulb Designation .................................. J187 J
Cap Designation .................................. Recessed Small Cavity
  (JEDEC No.J1-21)
Base Designation ................................ Short Small-Shell Duodecal
Basing Designation ................................ 6-Pin, (JEDEC Group 4, No.B6-203)

Pin 1: Heater
Pin 2: Grid No.1
Pin 6: Grid No.4
Pin 10: Grid No.2
Pin 11: Cathode
Pin 12: Heater
Cap: Anode (Grid No.3,
  Grid No.5, Screen, Collector)
C: External Conductive Coating

BOTTOM VIEW
Maximum and Minimum Ratings, Design-Maximum Values:

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

- **Anode Voltage**: 25,000 max. volts, 11,000 min. volts
- **Grid-No.4 Voltage**:
  - Positive value: 1250 max. volts
  - Negative value: 400 max. volts
- **Grid-No.2 Voltage**:
  - 70 max. volts
  - 40 min. volts
- **Cathode Voltage**:
  - Negative peak value: 2 max. volts
  - Negative bias value: 0 max. volts
  - Positive bias value: 100 max. volts
  - Positive peak value: 150 max. volts
- **Heater Voltage**:
  - 6.9 max. volts
  - 5.7 min. volts

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.

- **Anode Voltage**: 20,000 volts
- **Grid-No.4 Voltage**: 200 volts
- **Grid-No.2 Voltage**: 50 volts
- **Cathode Voltage for visual extinction of focused raster (See Fig.2)**: 36 to 54 volts
- **Field Strength of required adjustable Centering Magnet**: 0 to 12 gauss

Maximum Circuit Value:
- Grid-No.1 Circuit Resistance: 1.5 max. megohms

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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 25 kilovolts (design-maximum value), shielding of the tube for X-radiation may be needed to protect 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](image)

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BULB-CONTOUR DIMENSIONS

PLANE 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 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 WAVER WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 2-3/4".

NOTE 4: EXTERNAL CONDUCTIVE COATING AND IMPLOSION 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".