RCA-23NP4 is a directly viewed, rectangular glass picture tube having an aluminized screen 19-1/4" x 15-1/8" with nearly straight sides and slightly rounded corners, and a minimum projected screen area of 282 square inches. Maximum overall length is 14-11/16".

The 23NP4 features an envelope having a relatively flat, compound radius faceplate and special internal contouring in the deflecting yoke region to obtain 114° deflection with 110° deflecting components.

The 23NP4 has an electron gun that has improved cathode-drive sensitivity; that requires no ion-trap magnet; and that minimizes deflection distortion.

Other design features of the 23NP4 include a neck diameter of 1-1/6"; an external conductive bulb coating; and a "neonlighter" 7-pin base of the integral glass-button type having straight leads fitted with an indexing plug.
CATHODE-DRIVE SERVICE

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

Maximum and Minimum Ratings, Design-Maximum Values:

ULTOR-TO-GRID-No. 1 VOLTAGE... (2) 2000 max. volts
GRID-No. 4-TO-GRID-No. 1 VOLTAGE:
Positive value... 1100 max. volts
Negative value... 500 max. volts
GRID-No. 2-TO-GRID-No. 1 VOLTAGE...
Positive value... 700 max. volts
Negative value... 400 max. volts
CATHODE-TO-GRID-No. 1 VOLTAGE:
Positive peak value...
Negative peak value...
HEATER VOLTAGE... (1) 6.9 max. volts
(1) 5.7 min. volts
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode:
During equipment warm-up period not exceeding 15 seconds...
After equipment warm-up period...
Heater positive with respect to cathode...

Equipment Design Ranges:
With any utor-to-grid-No. 1 voltage (E_{Rg1}) between 1100 and 2800 volts and grid-No. 2-to-grid-No. 1 voltage (E_{Rg2}) between 44 and 70 volts:
Grid-No. 4-TO-GRID-No. 1 Voltage
For focus:
Cathode-to-GRID-No. 1 Voltage (E_{kg}) for visual extinction of focused raster...
Cathode-to-GRID-No. 1 Video Drive from Raster Cutoff [Black level]:
White-level value (Peak negative)...

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

The device manufacturer chooses these values to provide acceptable serviceability of the device under the intended service. Design-Maximum value as applied to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

The utor in a cathode-ray tube is the electrode to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection. In the 23NP4, the utor function is performed by grid No. 5. Since grids No. 5, grid No. 3, and collector are connected together within the 23NP4, they are collectively referred to simply as "UTOR" for convenience in presenting data and curves.

The cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No. 1 and the other electrodes.

Individual tubes will have satisfactory focus at some value of grid-No. 4-to-grid-No. 1 voltage between 0 and 440 volts with the combined bias voltage and video-signal voltage adjusted to give an utor current of 2 microamperes.

Distance from reference line for suitable PM centering magnets should not exceed 0.12 inches. Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having a 1/2-inch radius concentric with the center of the tube face. It is to be noted that the earth's magnetic field can cause as much as 1/2-inch deflection of the spot from the center of the tube face.

OPERATING CONSIDERATIONS

X-Ray Warning: When operated at utor voltages up to 16 kilovolts, the 23NP4 does not produce any harmful X-ray radiation. However, the rating of this type permits operation at voltages as high as 22 kilovolts (design-maximum value), shielded of the 23NP4 for X-ray 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.

Shatter-Proof Cover Over the Tube Face: Following conventional picture-tube practice, it is recommended that the cabinet be provided with a shatter-proof, glass cover over the face of the 23NP4 to protect it from being struck accidentally and to protect it against possible damage resulting from tube implosion under some abnormal condition. This safety cover can also provide X-ray protection when required.
Fig. 1 - Test Circuit for Determining Heater Warm-Up Time.

Fig. 2 - Raster-Cutoff-Range Chart for Type 29RP4.
Fig. 3 — Cathode-Drive Characteristics of Type 23NP4.

Fig. 4 — Cathode Drive Characteristics of Type 23NP4.
DIMENSIONAL OUTLINE

SCREEN DIAGONAL 22 7/8"

SCREEN WIDTH 19 13/16" MIN.

SCREEN HEIGHT 15 15/16" MIN.

2" R.

48" R.

63 1/4 R.

15" R.

60° R.

62 3/4 R.

4 9/16

4 11/16

4 1/16

2 1/2" 1/8

1/2" 1/8

1/4" 1/16

16 1/2"

103/8"

6 1/16

64"

4 1/4 ± 1/16

4 1/4 ± 1/16

1 7/8 ± 1/16

5" ± 1/16

5 1/16 ± 1/16

2 1/16 ± 1/16

4 1/4 ± 1/16

1 1/8 ± 1/16

1/4 ± 1/16

2 1/2" R.

1/2"

20 1/4 1/16

46" R.

30° R.

-24" R.

12"

-250"

3 105/16"

1.125" + 0.031" - 0.023"

REFERENCE LINE (NOTE 2)

TRANSPARENT PROTECTIVE COATING

2.16"

MOLD-MATCH LINE

SEAL BULGE (NOTE 6)

SPICE LINE

3.375"

2.250"

-0.010" - 0.015"

DETAIL OF PANEL
NOTE: PLANES A THRU G 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
THE TUBE AXIS AND THE RESPECTIVE FACEPLATE AXES.
NOTES FOR DIMENSIONAL OUTLINE


NOTE 3: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. THE DESIGN OF THE SOCKET SHOULD BE SUCH THAT THE CIRCUITRY CANNOT IMPRESS LATERAL STRAINS THROUGH THE SOCKET CONTACTS ON THE BASE PINS. 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 MUST BE GROUNDED.

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

NOTE 6: MEASURED AT THE MOLD-MATCH LINE.

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", BUT AT ANY POINT AROUND THE SEAL, THE BULGE WILL NOT PROTRUDE MORE THAN 1/16" BEYOND THE ENVELOPE SURFACE AT THE LOCATION SPECIFIED FOR DIMENSIONING THE ENVELOPE WIDTH, DIAGONAL, AND HEIGHT.

NOTE 8: AREA BETWEEN MOLD-MATCH LINE AND SEAL BULGE IS 1/2" MINIMUM. THIS SHOULD BE THE MAXIMUM WIDTH OF TUBE SUPPORT BAND. SUPPORTS MUST BE SPACED FROM THE TUBE BY THE USE OF CUSHIONING PADS MADE OF ASPHALT, IMPREGNATED FELT OR EQUIVALENT.

SOCKET CONNECTIONS

Bottom View

PIN 1: HEATER
PIN 2: GRID NO. 1
PIN 3: GRID NO. 2
PIN 4: GRID NO. 4
PIN 6: GRID NO. 1
PIN 7: CATHODE
PIN 8: HEATER
CAP: ULTOR (Grid No. 3, Grid No. 5, Collector)
C: EXTERNAL CONDUCTIVE COATING

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