8NP4

MONITOR KINESCOPE

Low-Voltage Electrostatic Focus
90° Magnetic Deflection

Small, Compact, Rectangular Glass Type

7-3/16" x 5-3/8" Screen
8-1/2" Max. Bulb Diagonal
9-15/16" Max. Overall Length

RCA-8NP4 is a small, compact, rectangular, glass monitor kinescope having an aluminized screen with slightly curved sides and rounded corners, and a minimum projected screen area of 36 square inches.

Features include:

- 9-15/16" maximum overall length
- 5-13/16" neck length
- 90° magnetic deflection
- Electron gun requiring no ion-trap magnet
- Aluminized screen
- Spherical Filterglass faceplate

GENERAL DATA

Electrical:

Focusing Method	Electrostatic
Deflection Method	Magnetic
Deflection Angles (Approx.):	
Diagonal	90°
Horizontal	85°
Vertical	68°
Direct Interelectrode Capacitances:	
Cathode to all other electrodes	5 μμf
Grid No.1 to all other electrodes	6 μμf
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 5 volts.

Electron Gun	Type Requiring No Ion-Trap Magnet

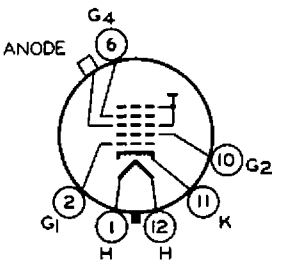
Optical:

Phosphor	P4—Sulfide Type, Aluminized
Faceplate	Filterglass
Light transmission at center (Approx.)	80%

Mechanical:

Weight (Approx.)	2-1/2 lbs
Tube Dimensions:	
Overall length	9-3/4" ± 3/16"
Neck length	5-13/16" ± 1/8"
Diagonal	8-7/16" + 1/16" - 1/32"
Greatest width	7-7/8" + 1/16" - 1/32"
Greatest height	6-1/16" + 1/16" - 1/32"
Minimum Screen Dimensions (Projected):	
Diagonal	7-3/4"
Greatest width	7-3/16"
Greatest height	5-3/8"
Area	36 sq. in.
Bulb Designation	J67-1/2 A1
Cap Designation	Recessed Small Cavity (JEDEC No.J1-21)
Base Designation	Small-Shell Duodecal 6-Pin (JEDEC Group 4, No.B6-63)
Basing Designation	12M

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)



BOTTOM VIEW

Maximum and Minimum Ratings, *Design-Maximum Values:*[a]

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

ANODE VOLTAGE	18000 max.	volts
GRID-No.4 VOLTAGE:		
Positive value	1100 max.	volts
Negative value	550 max.	volts
GRID-No.2 VOLTAGE	550 max. 200 min.	volts volts
GRID-No.1 VOLTAGE:		
Negative peak value	220 max.	volts
Negative bias value	155 max.	volts
Positive bias value	0 max.	volts
Positive peak value	2 max.	volts
HEATER VOLTAGE[b]	6.9 max. 5.7 min.	volts 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	200 max.	volts
Heater positive with respect to cathode:		
Combined AC & DC Voltage	200 max.	volts
DC Component	100 max.	volts

Typical Operating Conditions for Grid-Drive[c] Service:

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

Anode Voltage	16000	volts
Grid-No.4 Voltage[d]	200	volts
Grid-No.2 Voltage	300	volts
Grid-No.1 Voltage for Visual extinction of focused raster (See Fig.2)	-28 to -72	volts
Field strength of required adjustable Centering Magnet[e]	0 to 10	gausses
Maximum Circuit Value:		
Grid-No.1 Circuit Resistance	1.5 max.	megohms

[a] The *maximum ratings* in the tabulated data are established in accordance with the following definition of the *Design-Maximum Rating System* for rating electron tubes.

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, taking responsibility for the effects of changes in operating conditions due to variations in device characteristics.

The equipment manufacturer should design so that initially and throughout life no Design-Maximum value for the intended service is exceeded with a bogey device under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

[b] Measured between the heater terminals.

[c] Grid drive is the operating condition in which the video signal varies the grid-No.1 potential with respect to cathode.

[d] The grid-No.4 voltage required for optimum focus of any individual tube will have a value anywhere between 0 and +400 volts.

[e] Distance from Reference Line for suitable PM centering magnet should not exceed 2-1/4 inches. The specified centering magnet compensates only for the effect which mechanical tube tolerances may have on the location of the undeflected, focused spot with respect to the center of the tube face. Maximum field strength of adjustable centering magnet equals

$$\sqrt{\frac{\text{Anode volts}}{16000 \text{ volts}}} \times 10 \text{ gausses.}$$

The equipment manufacturer must determine and supply additional compensation for the effects of the earth's magnetic field and extraneous fields due to choice of circuitry and components. The additional compensation should preferably be applied as part of the magnetic field of the deflecting yoke.

OPERATING CONSIDERATIONS

X-Radiation Warning. When operated at anode voltages up to 16 kilovolts, this monitor kinescope does not produce any harmful X-radiation. However, because the rating of this type permits operation at voltages as high as 18 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.

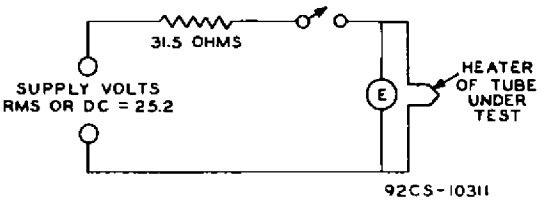


Fig.1 - Test Circuit for Determining Heater Warm-Up Time.

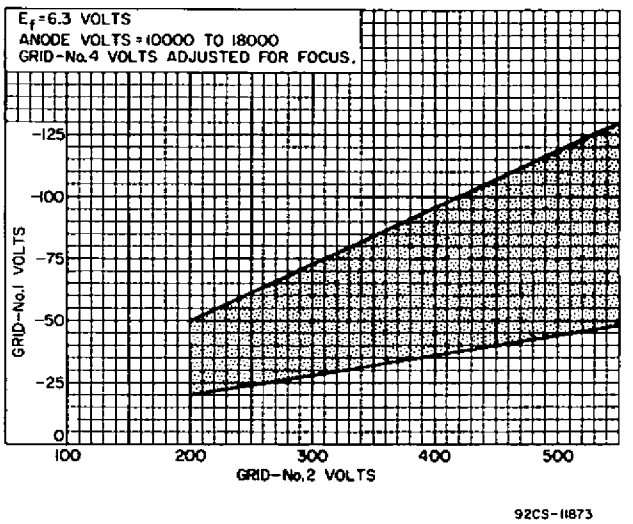
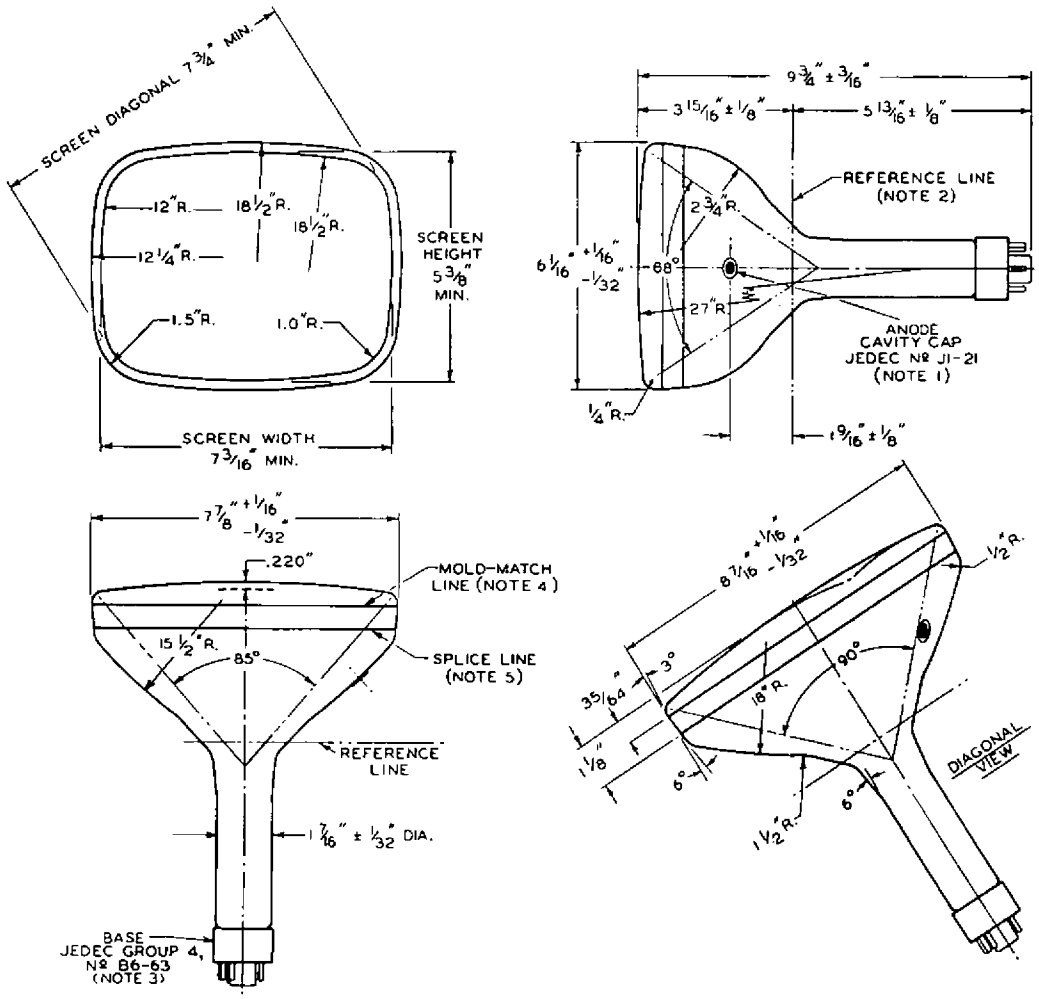


Fig.2 - Raster-Cutoff Range Chart for Type 8NP4.

DIMENSIONAL OUTLINE



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NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN NO.6 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ANODE TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF ± 30°. ANODE TERMINAL IS ON SAME SIDE AS PIN NO.6.

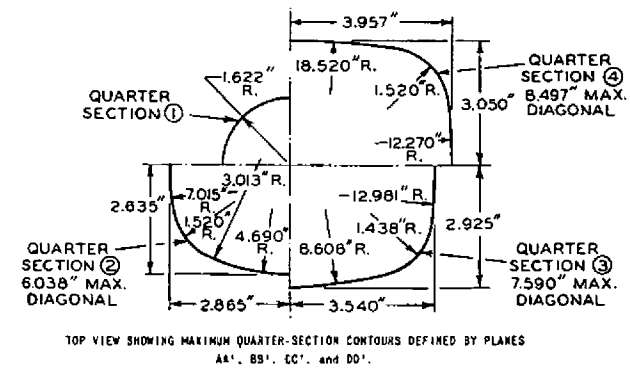
NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE (JEDEC No.G116) AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

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 SHELL WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AT THE REFERENCE LINE AND HAVING A DIAMETER OF 1-5/8 INCHES.

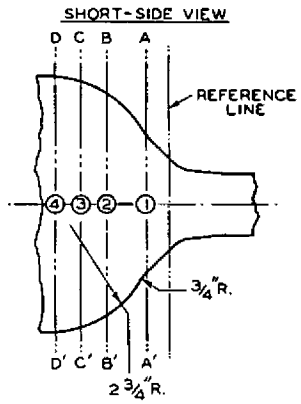
NOTE 4: THE MAXIMUM RADIAL DISPLACEMENT OF THE PERIPHERY OF THE FACE PANEL (JUST ABOVE THE MOLD-MATCH LINE) FROM ITS EXACT CENTERED POSITION ON THE NECK AXIS IS 0.040".

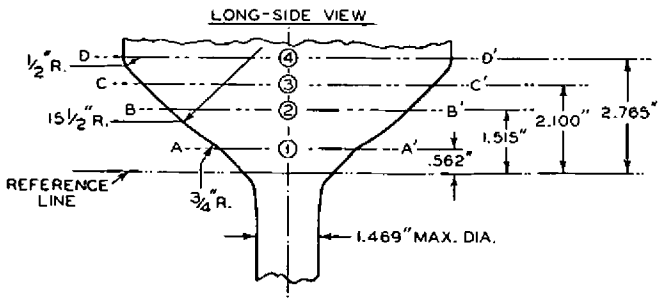
NOTE 5: BULGE AT SPLICE-LINE SEAL WILL NOT PROTRUDE BEYOND THE MAXIMUM ENVELOPE DIMENSIONS AT THE MOLD-MATCH LINE.

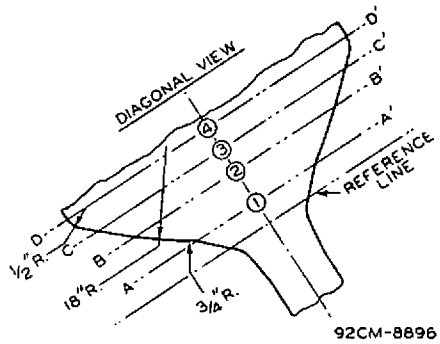
BULB-CONTOUR DIMENSIONS FOR MAXIMUM SPACE REQUIREMENTS



TOP VIEW SHOWING MAXIMUM QUARTER-SECTION CONTOURS DEFINED BY PLANES AA', BB', CC', and DD'.







CONTOURS (1), (2), (3), AND (4) DEFINE MAXIMUM BULB DIMENSIONS IN THE PLANES AA', BB', CC', AND DD'. THE PLANES ARE NORMAL TO THE TUBE AXIS AND AT FIXED LOCATIONS FROM THE REFERENCE LINE. WHEN DIMENSIONED FROM THE FACEPLATE, THE AXIAL POSITIONS OF PLANES AA', BB', CC', AND DD' WILL VARY BY ± 0.125".