

16AYP4  
16BDP4

This bulletin also applies to RCA-16BDP4 which is identical with RCA-16AYP4 except for its heater current rating of 600 ± 30 ma.

16BDP4



# 16AYP4

## PICTURE TUBE

Low-Voltage Electro-  
static Focus  
114° Magnetic Deflection

Aluminized Screen  
Initial Data

12.938" x 10.250" Screen  
15.74" Max. Bulb Diagonal  
10.50" Max. Overall Length

RCA-16AYP4 is a rectangular glass picture tube having an aluminized screen with nearly straight sides and slightly rounded corners.

Features include:

- 114° magnetic deflection
- Aluminized screen
- Very short electron gun which minimizes deflection distortion
- Electron gun requiring no ion-trap magnet
- 1-1/8-inch diameter neck
- Projected screen area of 125 square inches minimum
- External conductive coating

Neck length . . . . .	4.12" ± 0.12"
Diagonal . . . . .	15.62" ± 0.12"
Greatest width . . . . .	13.70" ± 0.12"
Greatest height . . . . .	11.10" ± 0.12"
Minimum Screen Dimensions (Projected):	
Diagonal . . . . .	14.875"
Greatest width . . . . .	12.938"
Greatest height . . . . .	10.250"
Area . . . . .	125 sq. in.
Bulb Designation . . . . .	Not Assigned
Cap Designation . . . . .	Recessed Small Cavity (JEDEC No. J1-21)
Base Designation . . . . .	Small-Button Neoeightar 7-Pin, Arrangement 1, (JEDEC No. B7-208)
Basing Designation . . . . .	BHR

### GENERAL DATA

**Electrical:**

Focusing Method . . . . .	Electrostatic
Deflection Method . . . . .	Magnetic
Deflection Angles (Approx.):	
Diagonal . . . . .	114°
Horizontal . . . . .	102°
Vertical . . . . .	85°

Direct Interelectrode Capacitances:

Cathode to all other electrodes . . . . .	5	pf
Grid No.1 to all other electrodes . . . . .	6	pf
External conductive coating to anode . . . . .	1300 max. 800 min.	pf

Heater Current at 6.3 volts . . . . .	450 ± 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 5 volts.

Electron Gun . . . . . Type Requiring No Ion-Trap Magnet

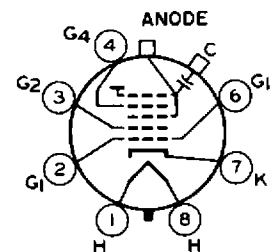
**Optical:**

Phosphor . . . . . P4-Sulfide Type, Aluminized  
Faceplate . . . . . Filterglass  
Light Transmission at Center (Approx.) . . . . . 78%

**Mechanical:**

Weight (Approx.) . . . . . 8-1/2 lbs  
Tube Dimensions:  
Overall length . . . . . 10.25" ± 0.25"

- 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: Anode (Grid No.3, Grid No.5, Screen, Collector)
- C: External Conductive Coating



**BOTTOM VIEW**

**Maximum and Minimum Ratings, Design-Maximum Values:<sup>a</sup>**

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

ANODE VOLTAGE . . . . .	20000 max. volts 12000 min. volts
GRID-NO.4 VOLTAGE:	
Positive value . . . . .	1100 max. volts
Negative value . . . . .	550 max. volts
GRID-NO.2 VOLTAGE . . . . .	550 max. volts 200 min. volts
CATHODE VOLTAGE:	
Negative peak value . . . . .	2 max. volts
Negative bias value . . . . .	0 max. volts
Positive bias value . . . . .	155 max. volts
Positive peak value . . . . .	220 max. volts
HEATER VOLTAGE <sup>b</sup> . . . . .	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<sup>C</sup> Service:**

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

Anode Voltage . . . . .	16000	volts
Grid-No.4 Voltage <sup>d</sup> . . . . .	100	volts
Grid-No.2 Voltage . . . . .	300	volts
Grid No.1 Voltage for visual extinction of focused raster (See Fig.2) . . . . .	28 to 60	volts
Field Strength of required adjustable Centering Magnet <sup>e</sup> . . . . .	0 to 8	gausses

**Maximum Circuit Value:**

Grid-No.1 Circuit Resistance . . . . .	1.5 max.	megohms
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<sup>a</sup> 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.

- <sup>b</sup> Measured between the heater terminals.
- <sup>c</sup> 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.
- <sup>d</sup> The grid-No.4 voltage required for optimum focus of any individual tube will have a value anywhere between -100 and +300 volts.
- <sup>e</sup> 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

$$\sqrt{\frac{\text{Anode volts}}{16000 \text{ volts}}} \times 8 \text{ gaussess.}$$

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 picture tube does not produce any harmful X-radiation. However, because the rating of this type permits operation at voltages as high as 20 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.

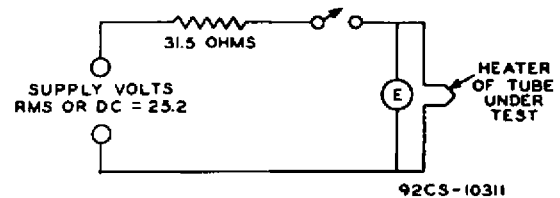


Fig. 1 - Test Circuit for Determining Heater Warm-up Time.

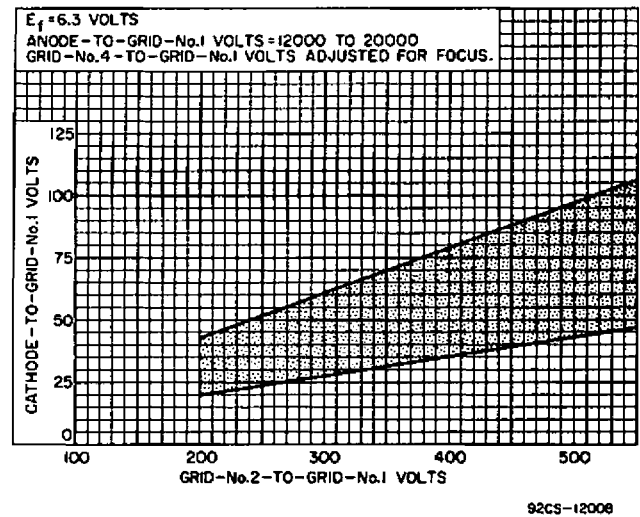
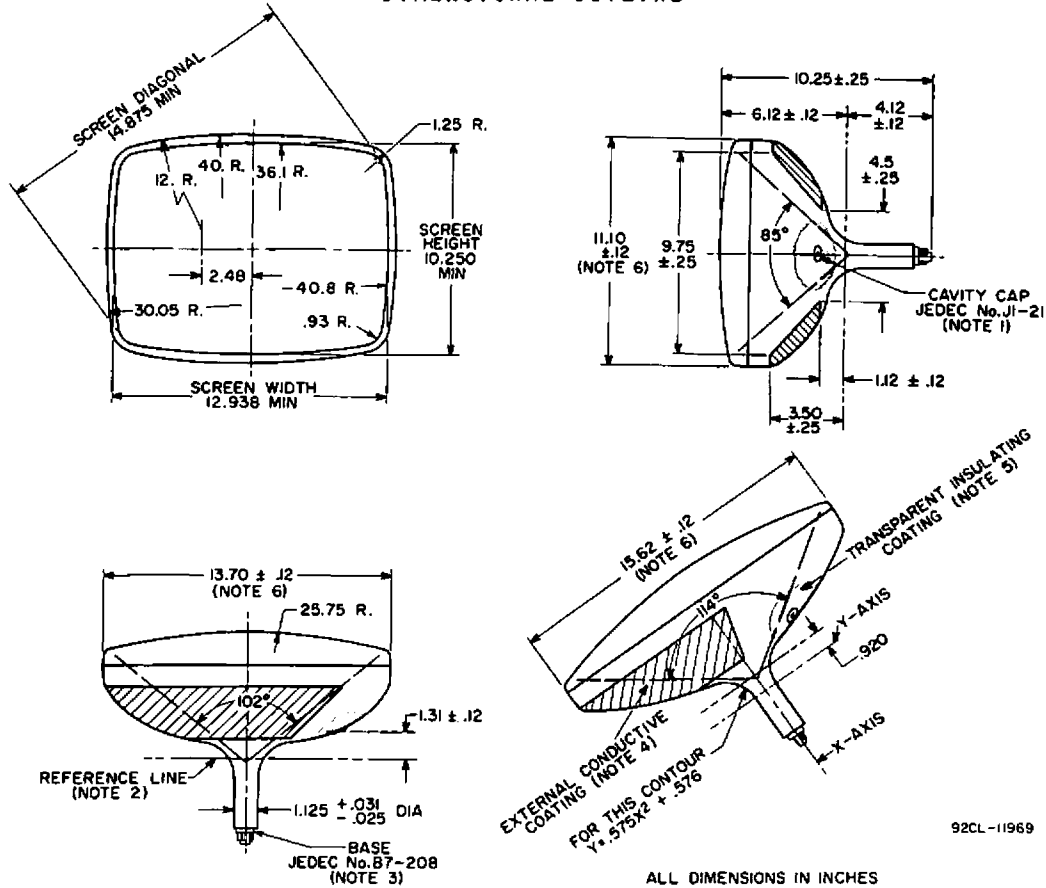


Fig. 2 - Raster-Cutoff-Range Chart for Type 16AYP4 in Cathode-Drive Service.

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DIMENSIONAL OUTLINE



92CL-11969

ALL DIMENSIONS IN INCHES

**NOTE 1:** THE PLANE THROUGH THE TUBE AXIS AND PIN NO.4 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ANODE TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF  $\pm 30^\circ$ . ANODE TERMINAL IS ON SAME SIDE AS PIN NO.4.

**NOTE 2:** WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JEDEC NO. G-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".

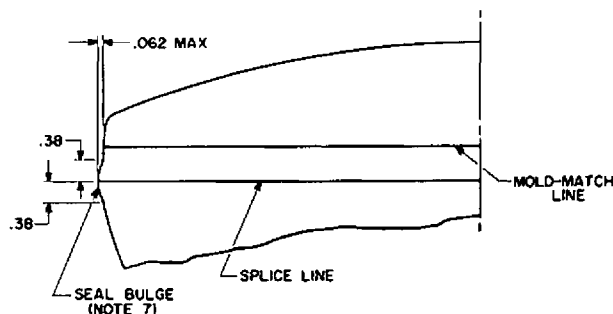
**NOTE 4:** EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

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

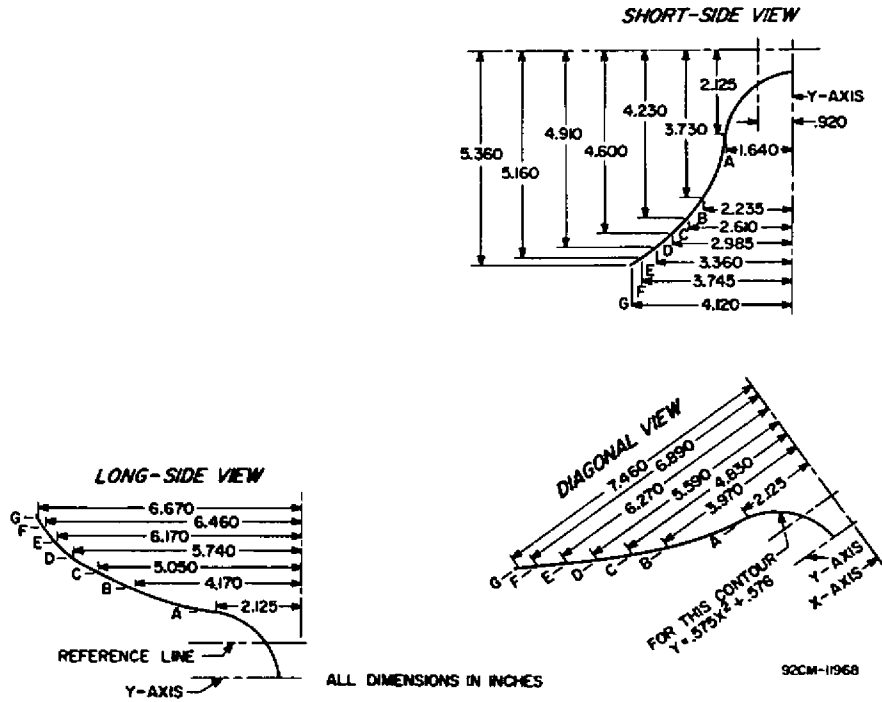
**NOTE 6:** MEASURED AT THE MOLD-MATCH LINE.

**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.

Detail of Panel



BULB-CONTOUR DIMENSIONS



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 TUBE AXIS AND THE RESPECTIVE FACEPLATE AXES.