

# DESCRIPTION AND RATING

## CATHODE-RAY TUBE 21ARP4

19-1/8 by 14-3/16-INCH PICTURE SIZE

21-INCH RECTANGULAR, GLASS	FACEPLATE - SPHERICAL, GRAY
BUILT-IN FOCUSING UNIT	BUILT-IN ION-TRAP MAGNET
DEFLECTION - MAGNETIC	EXTERNAL CONDUCTIVE COATING
70-DEGREE DEFLECTION ANGLE	OPERATING RANGE - 14 to 18 KILOVOLTS

The 21ARP4 is a magnetic-focus and magnetic-deflection, direct-view all-glass picture tube which provides a 19-1/8 by 14-3/16-inch picture for television applications. In this tube, an ion-trap magnet and a magnetic focusing unit are integral parts of the electron gun. The ion-trap magnet assures proper alignment of the electron beam and eliminates the adjustable external magnet usually required. The focusing unit permits a sharp over-all focus adjustable through a wide range of anode voltage by a magnetic shunt sleeve around the tube neck. Other features of this tube include a high-quality gray faceplate which increases picture contrast and detail under high ambient light conditions, and a space-saving rectangular face shape. An external conductive coating serves as a filter capacitor when grounded.

### TECHNICAL INFORMATION

#### GENERAL

##### Electrical

Heater Voltage	6.3	Volts
Heater Current	0.6 ± 10%	Amperes
Focusing Method - Magnetic		
Deflecting Method - Magnetic		
Deflection Angle, approximate		
Diagonal	70	Degrees
Horizontal	65	Degrees
Vertical	50	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes	5	uuf
Grid-No. 1 to All Other Electrodes	6	uuf
External Conductive Coating to Anode		
Maximum	750	uuf
Minimum	500	uuf

##### Optical

Phosphor Number - P4, Sulfide Type		
Fluorescent Color - White		
Phosphorescent Color - White		
Persistence - Short		
Faceplate - Gray		
Light Transmission at Center, approximate	71	Percent

**GENERAL  ELECTRIC**

## GENERAL (CONT'D)

## Mechanical

Over-all Length	23-1/32 ± 3/8	Inches
Greatest Bulb Dimensions		
Diagonal	21-7/32 ± 1/8	Inches
Width	20-1/4 ± 1/8	Inches
Height	15-9/16 ± 1/8	Inches
Minimum Useful Screen Dimensions		
Diagonal	20-1/8	Inches
Width	19-1/8	Inches
Height	14-3/16	Inches
Neck Length	7-1/2	Inches
Bulb Number, ASA Designation - C170 Exp. 13		
Bulb Contact - Recessed Small-Cavity Cap, JETEC No. J1-21		
Base - Small-Shell Duodecal 5-Pin, JETEC No. B5-57		
Basing, JETEC Designation - 12N		
Bulb Contact Alignment		
Anode Contact Aligns with Pin No. 6 Position ± 30 Degrees		
Mounting Position - Any		
Net Weight, approximate	25	Pounds

## MAXIMUM RATINGS \* Design-Center Values

Anode Voltage †	20,000 Max	Volts DC
Anode Input ‡	6 Max	Watts
Grid-No. 2 Voltage	500 Max	Volts DC
Grid-No. 1 Voltage		
Negative-Bias Value	125 Max	Volts DC
Positive-Bias Value	0 Max	Volts DC
Positive-Peak Value	2 Max	Volts
Peak Heater-Cathode Voltage §		
Heater Negative with Respect to Cathode		
During Warm-up Period not to Exceed 15 Seconds	410 Max	Volts
After Equipment Warm-up Period	180 Max	Volts
Heater Positive with Respect to Cathode	180 Max	Volts

## Typical Operating Conditions

Anode Voltage Δ	16,000 ± 2000	Volts DC
Grid-No. 2 Voltage	300	Volts DC
Grid-No. 1 Voltage π	-28 to -72	Volts DC

## Maximum Circuit Values

Grid-No. 1-Circuit Resistance	1.5 Max	Megohms
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\* The maximum ratings provide a ten-percent safety factor in accordance with the standard design-center system of rating cathode-ray tubes. The tube will withstand the combined effects of variations in line voltages and components provided the maximum design-center values are not exceeded by more than ten percent.

† Anode and grid-No. 3 which are connected together within the tube are referred to herein as anode.

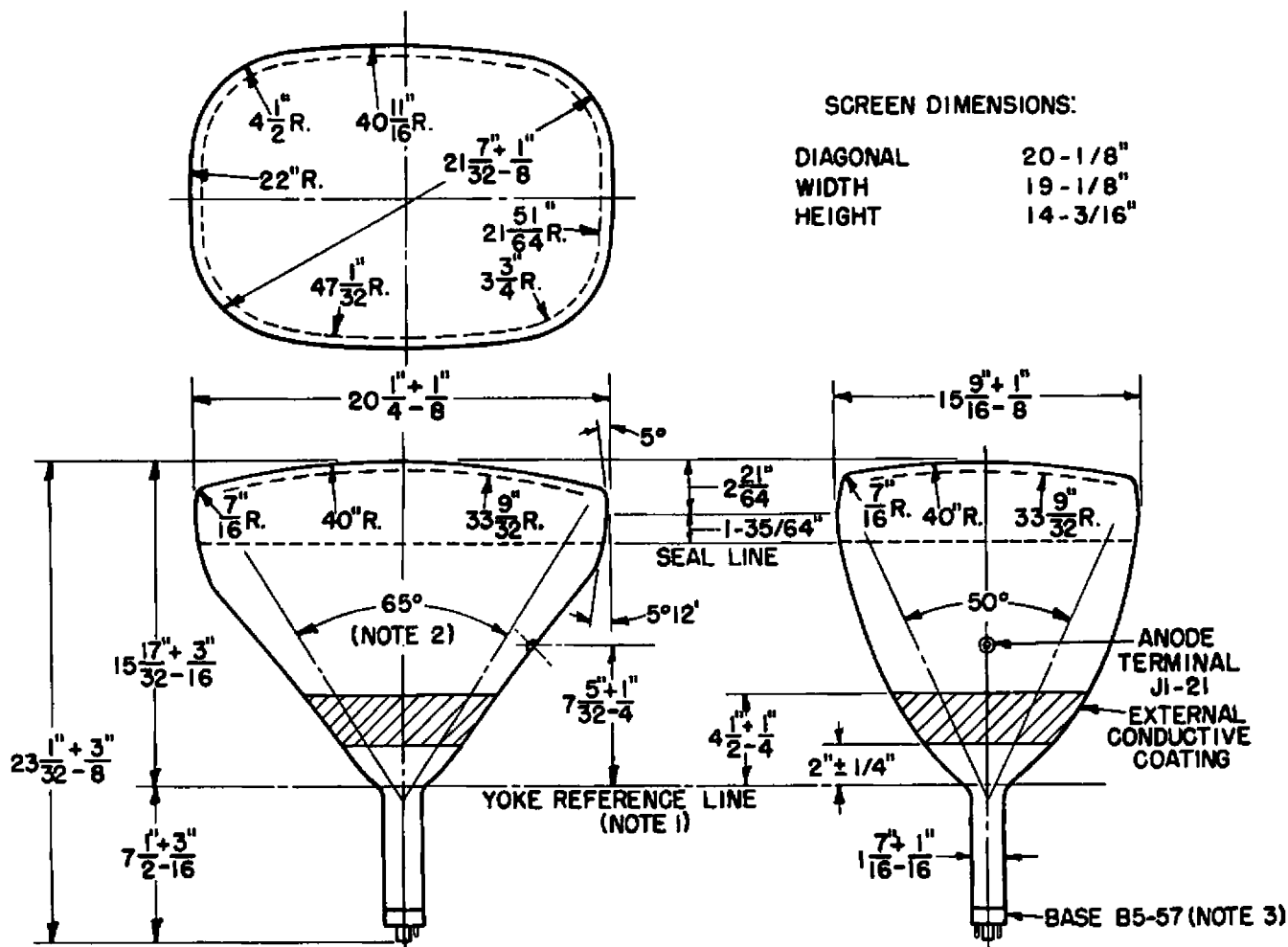
If this tube is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert possible danger of personal injury from prolonged exposure at close range. The protective face-viewing window of apparatus using tubes of this type may provide such a safeguard. If the radiation measured in contact with this window does not exceed 6.25 milliroentgens per hour, the window will normally provide adequate protection.

# Anode input equals the product of anode voltage and anode current, the latter being measured at the anode contact with a direct-current ammeter.

§ Cathode should be returned to one side or to the midtap of the heater transformer winding.

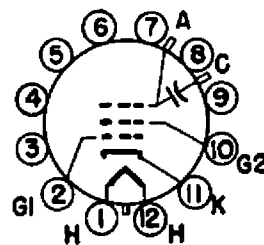
Δ Optimum focusing conditions require that the tube be operated within the specified voltage range. The tube, however, will safely withstand the rated maximum anode voltage.

π For visual extinction of focused raster.



NOTES:

1. REFERENCE LINE IS DETERMINED BY THE PLANE OF THE UPPER EDGE OF THE REFERENCE-LINE GAGE (RETMA NO. 110) WHEN THE GAGE IS RESTING ON THE CONE.
2. DEFLECTION ANGLE ON DIAGONAL IS 70 DEGREES.
3. ANODE TERMINAL ALIGNS WITH PIN-NO. 6 POSITION  $\pm 30$  DEGREES.



BASING DIAGRAM  
12N

K69087-72A632

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Outline  
21ARP4

TUBE DEPARTMENT  
**GENERAL ELECTRIC**  
Schenectady 5, N. Y.