



# 20CP4 and 20CP4-A

**20CP4**  
**20CP4-A**  
 ET-T1073  
 Page 1  
 5-54

## CATHODE-RAY TUBE

**20-INCH RECTANGULAR, GLASS**  
**FOCUS—MAGNETIC**  
**DEFLECTION—MAGNETIC**  
**70-DEGREE DEFLECTION ANGLE**

**17- BY 12¾-INCH PICTURE SIZE**  
**FACEPLATE—SPHERICAL, GRAY**  
**ION-TRAP GUN**  
**20CP4-A—EXTERNAL CONDUCTIVE COATING**

### DESCRIPTION AND RATING

The 20CP4 is a magnetic-focus and deflection, direct-view all-glass picture tube which provides a 17- by 12¾-inch picture for television applications. The electron gun is used with an external single-field ion-trap magnet. 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.

The 20CP4-A has the additional feature of an external conductive coating which serves as a filter capacitor when grounded.

### 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		
20CP4 and 20CP4-A		
Cathode to All Other Electrodes . . . . .	5	μmf
Grid-No. 1 to All Other Electrodes . . . . .	6	μmf
20CP4-A		
External Conductive Coating to Anode		
Maximum . . . . .	750	μmf
Minimum . . . . .	500	μmf

#### OPTICAL

Phosphor Number—P4, Sulfide Type	
Fluorescent Color—White	
Phosphorescent Color—White	
Persistence—Short	
Faceplate—Gray	
Light Transmission at Center, approximate . . . . .	66 Percent



**MECHANICAL**

Over-all Length . . . . .	21 $\frac{7}{16} \pm \frac{3}{8}$	Inches
Greatest Bulb Dimensions		
Diagonal . . . . .	20 $\frac{3}{32} \pm \frac{1}{8}$	Inches
Width . . . . .	18 $\frac{11}{16} \pm \frac{1}{8}$	Inches
Height . . . . .	14 $\frac{15}{16} \pm \frac{1}{8}$	Inches
Minimum Useful Screen Dimensions		
Diagonal . . . . .	18 $\frac{5}{8}$	Inches
Width . . . . .	.17	Inches
Height . . . . .	12 $\frac{3}{4}$	Inches
Neck Length . . . . .	.7 $\frac{3}{16}$	Inches
Bulb Number, ASA Designation—J161-C1		
Bulb Contact—Recessed Small-cavity Cap, JETEC, No. J1-21		
Base—Small-shell Duodecal 5-Pin, JETEC No. B5-57		
Basing, JETEC Designation		
20CP4—12D		
20CP4-A—12N		
Bulb Contact Alignment		
Anode Contact Aligns with Pin-No. 6 Position $\pm 30$ Degrees		
Mounting Position—Any		
Net Weight, approximate . . . . .	22 $\frac{1}{2}$	Pounds

**MAXIMUM RATINGS**

**DESIGN-CENTER VALUES\***

Anode Voltage† . . . . .	18,000 Max	Volts DC
Grid-No. 2 Voltage . . . . .	410 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 . . . . .	150 Max	Volts
Heater Positive with Respect to Cathode . . . . .	150 Max	Volts

**TYPICAL OPERATING CONDITIONS**

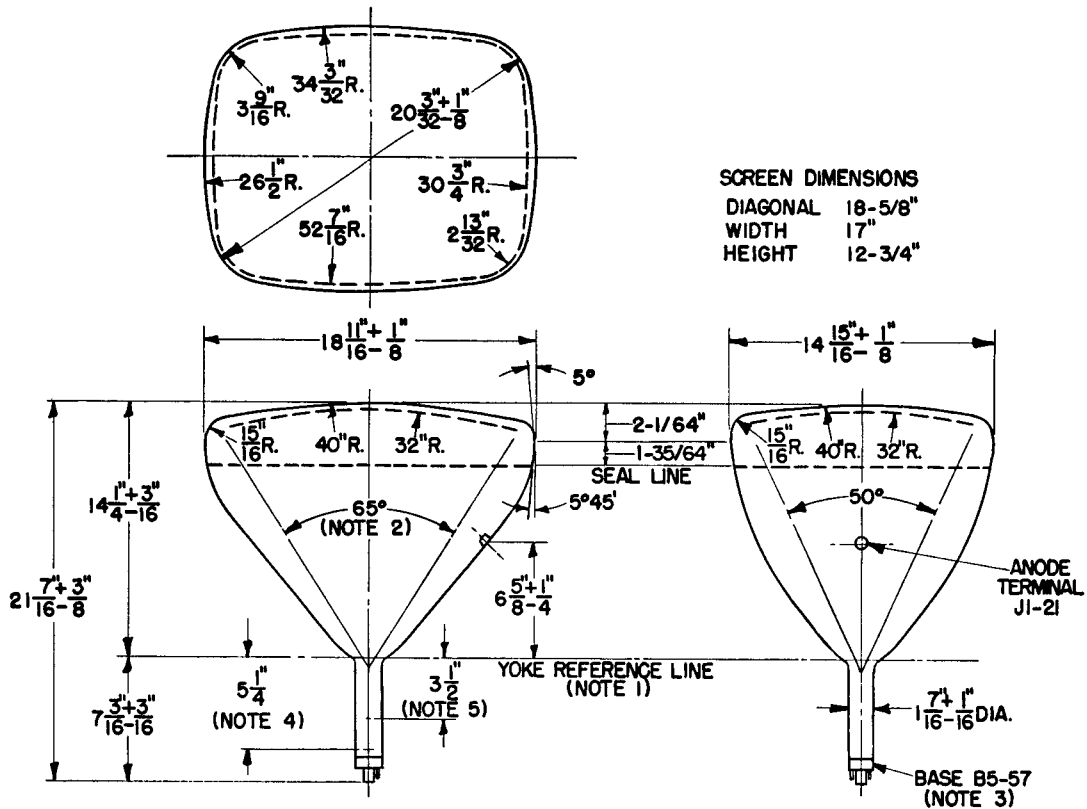
Anode Voltage§ . . . . .	16,000	Volts DC
Grid-No. 2 Voltage . . . . .	300	Volts DC
Grid-No. 1 Voltage¶ . . . . .	—28 to —72	Volts DC
Focusing-Coil Current▲, approximate . . . . .	106	Milliamperes DC
Ion-Trap Field Intensity◆, approximate . . . . .	40	Gausses

**MAXIMUM CIRCUIT VALUES**

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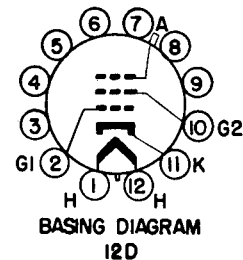
\* The maximum ratings provide a ten-percent safety factor in accordance with the standard design-center system of rating cathode-ray tubes. The tube will withstand the combined effects of variations in line voltages and components provided the maximum design-center values are not exceeded by more than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

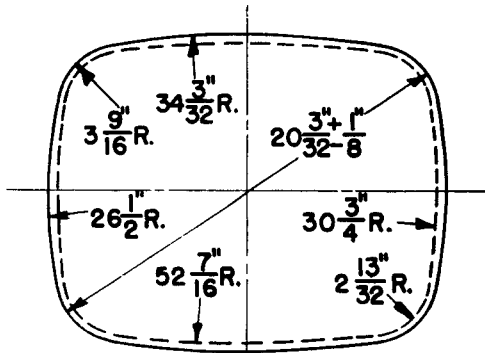
- † Anode and grid-No. 3 which are connected together within the tube are referred to herein as anode.  
 If this tube is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert possible danger of personal injury from prolonged exposure at close range. The 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.
- ‡ Cathode should be returned to one side or to the midtap of the heater transformer winding.
- § Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 14,000 volts.
- π For visual extinction of focused raster.
- ▲ For JETEC focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3½ inches.
- ◆ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through JETEC ion-trap magnet No. 117.



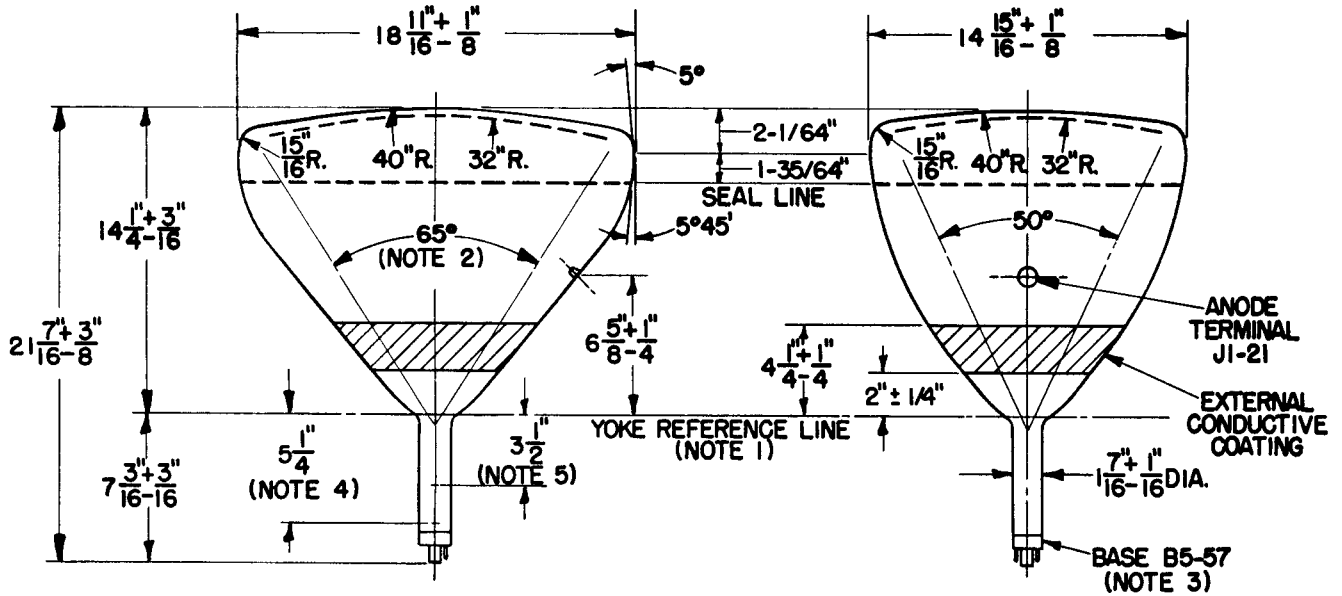
**NOTES:**

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 ± 30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET.
5. RECOMMENDED POSITION FOR CENTER OF FOCUSING FIELD.





SCREEN DIMENSIONS	
DIAGONAL	18-5/8"
WIDTH	17"
HEIGHT	12-3/4"



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