Electronic TUBES

20CP4 and 20CP4-A

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	μμf
Grid-No. 1 to All Other Electrodes	6	μμf
20CP4-A		
External Conductive Coating to Anode		
Maximum	750	μμf
Minimum	500	μμf

OPTICAL

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

GENERAL ELECTRIC

Supersedes ETR-138 and ETR-139, dated 4-52

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 ±30 Degrees

Mounting Position—Any

Net Weight, approximate	22½	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 Voltageπ	−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

* 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.

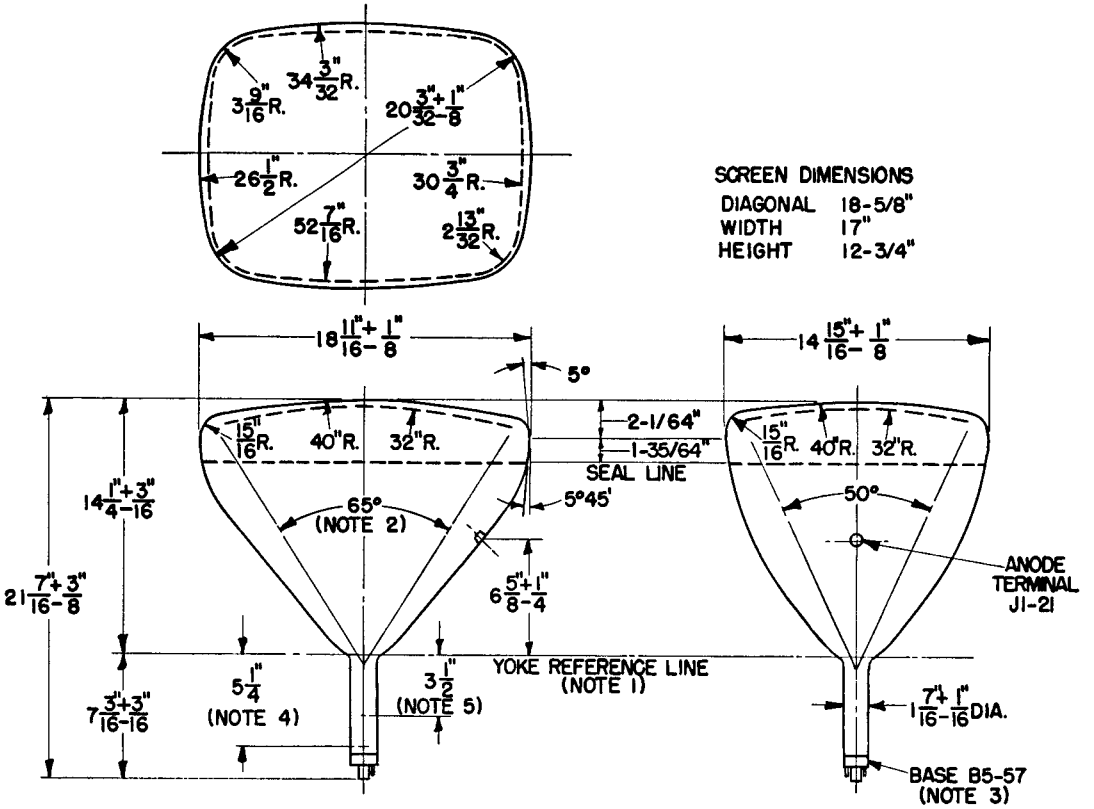
‡ Cathode should be returned to one side or to the midtap of the heater transformer winding.

§ 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.

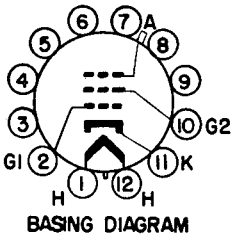
▲ For JETEC focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3½ inches.

♦ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through JETEC ion-trap magnet No. 117.

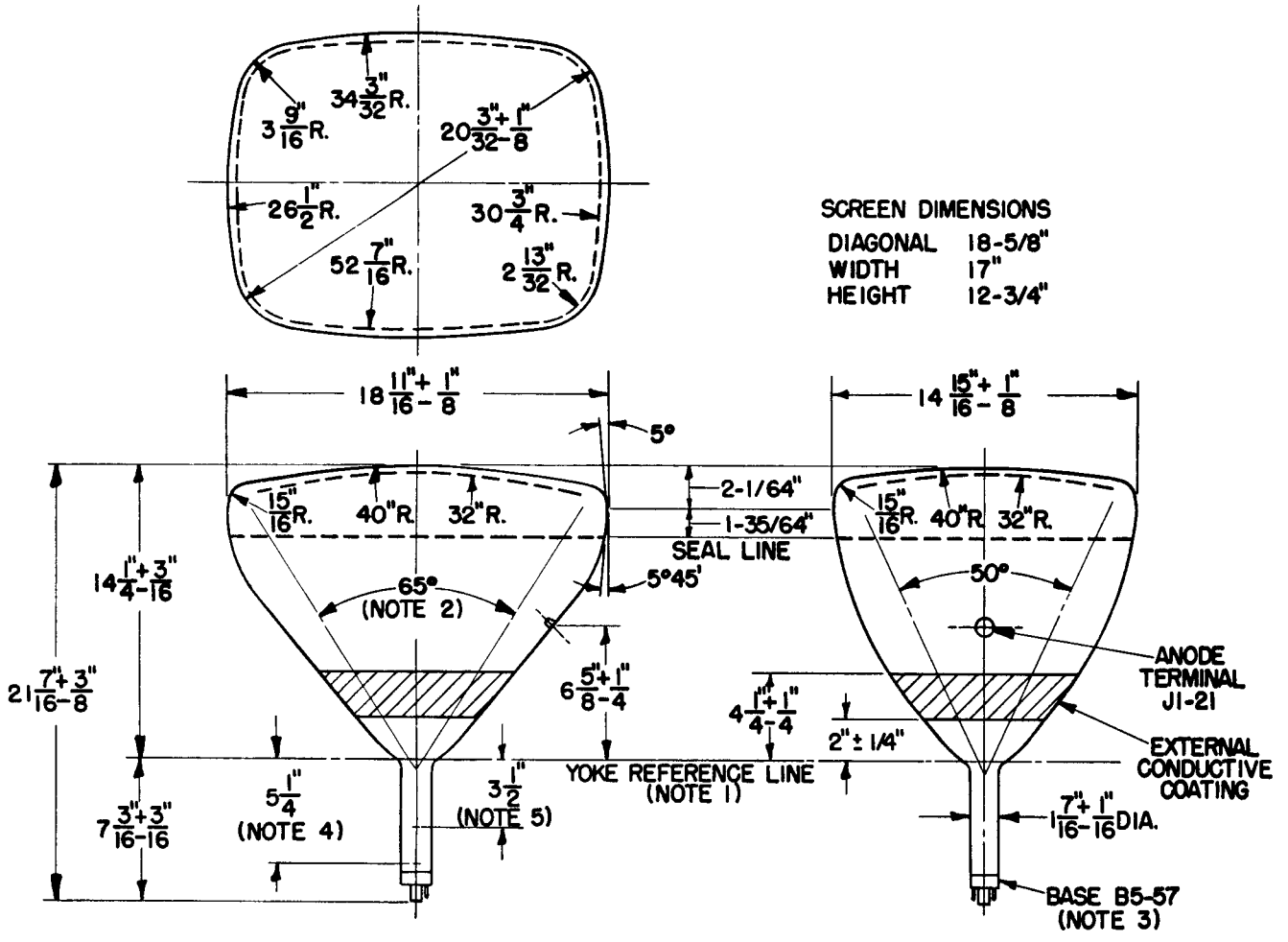


NOTES:

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.



BASING DIAGRAM
12D



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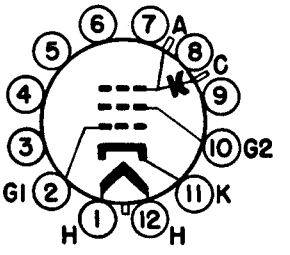

BASING DIAGRAM
12N

N15195AZ

7-7-54

TUBE DEPARTMENT

GENERAL ELECTRIC

Schenectady 5, N. Y.