



21WP4-A

CATHODE-RAY TUBE

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

17 BY 12 $\frac{3}{4}$ -INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
ION-TRAP GUN
ALUMINIZED SCREEN

EXTERNAL CONDUCTIVE COATING

DESCRIPTION AND RATING

The 21WP4-A is a rectangular all-glass picture tube employing magnetic focusing and deflection. It provides a 17 by 12 $\frac{3}{4}$ -inch picture for direct-view television applications. Features of this tube include a high-quality fluorescent screen which is aluminized to increase light output, a gray faceplate to increase picture contrast, an electron gun designed for use with an external single-field ion-trap magnet, and an external conductive coating which serves as a filter capacitor when grounded.

GENERAL

ELECTRICAL

Heater Voltage 6.3 Volts
Heater Current 0.6 $\pm$ 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 μ f

Grid-No. 1 to All Other Electrodes 6 μ f

External Conductive Coating to Anode

Maximum 750 μ f

Minimum 500 μ f

OPTICAL

Phosphor Number—P4, Sulfide Type

Fluorescent Color—White

Phosphorescent Color—White

Persistence—Short

Faceplate—Gray

Light Transmission at Center, approximate 72 Percent

MECHANICAL

Over-all Length $22\frac{7}{16}$ $\pm \frac{3}{8}$ Inches

Greatest Bulb Dimensions

Diagonal $20\frac{3}{8}$ $\pm \frac{1}{8}$ Inches

Width $18\frac{11}{16}$ $\pm \frac{1}{8}$ Inches

Height $14\frac{13}{16}$ $\pm \frac{1}{8}$ Inches

Minimum Useful Screen Dimensions

Diagonal $19\frac{1}{8}$ Inches

Width 17 Inches

Height $12\frac{3}{4}$ Inches

Neck Length $7\frac{1}{2}$ Inches

Bulb Number, ASA Designation—J171F

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 23 Pounds

MAXIMUM RATINGS***DESIGN-CENTER VALUES†**

Anode Voltage‡ 18,000 Max Volts DC

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§ 16,000 Volts DC

Grid-No. 2 Voltage 300 Volts DC

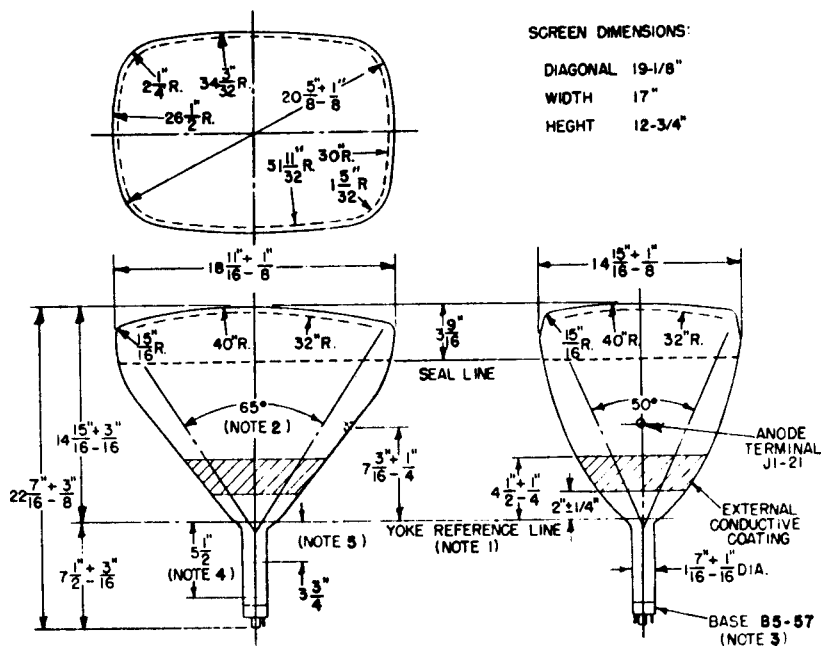
Grid-No. 1 Voltage¶ -28 to -72 Volts DC

Focusing-Coil Current△, approximate 116 Milliampères DC

Ion-Trap Field Intensity♦, approximate 40 Gauss

Grid-No. 1 Circuit Resistance 1.5 Max Megohms

- * All voltages are measured with respect to cathode.
- † 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 voltage 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.
- § 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 RETMA focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3¾-inches.
- ◆ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through RETMA ion-trap magnet No. 117.



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.

