



## 21AVP4-B/21AVP4-A

## CATHODE-RAY TUBE

19 $\frac{1}{8}$  BY 15-INCH PICTURE SIZE

21-INCH, RECTANGULAR, GLASS

FOCUS—ELECTROSTATIC

DEFLECTION—MAGNETIC

72-DEGREE DEFLECTION ANGLE

FACEPLATE—SPHERICAL, GRAY

ION-TRAP GUN

ALUMINIZED SCREEN

EXTERNAL CONDUCTIVE COATING

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DESCRIPTION AND RATING

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The 21AVP4-B/21AVP4-A is an electrostatic-focus and magnetic-deflection, direct-view all-glass picture tube for television applications. It provides the same large 19 $\frac{1}{8}$  by 15-inch picture area as do 21-inch 90-degree deflection tubes. The electron gun has a focusing voltage range of  $-0.4$  to  $+2.2$  percent of the anode voltage and is designed for use 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, a reflective aluminized screen to increase light output, and a space-saving rectangular face shape. An external conductive coating serves as a filter capacitor when grounded.

## GENERAL

## ELECTRICAL

|                      |               |         |
|----------------------|---------------|---------|
| Heater Voltage ..... | 6.3           | Volts   |
| Heater Current ..... | 0.6 $\pm$ 10% | Amperes |

Focusing Method—Electrostatic

Deflecting Method—Magnetic

Deflection Angle, approximate

|                  |    |         |
|------------------|----|---------|
| Diagonal .....   | 72 | Degrees |
| Horizontal ..... | 67 | Degrees |
| Vertical .....   | 53 | Degrees |

Direct Interelectrode Capacitances, approximate

Cathode to All Other Electrodes ..... 5  $\mu$ fGrid-No. 1 to All Other Electrodes ..... 6  $\mu$ f

External Conductive Coating to Anode

Maximum ..... 1500  $\mu$ fMinimum ..... 1200  $\mu$ f

## 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

Supersedes ET-T1199, dated 6-55

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ET-T1199A

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## MECHANICAL

Over-all Length . . . . .  $23\frac{1}{32} \pm \frac{3}{8}$  Inches

### Greatest Bulb Dimensions

Diagonal . . . . .  $21\frac{3}{8} \pm \frac{1}{8}$  Inches

Width . . . . .  $20\frac{1}{4} \pm \frac{1}{8}$  Inches

Height . . . . .  $16\frac{3}{8} \pm \frac{1}{8}$  Inches

### Minimum Useful Screen Dimensions

Diagonal . . . . .  $20\frac{1}{4}$  Inches

Width . . . . .  $19\frac{1}{8}$  Inches

Height . . . . . 15 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 6-pin, JETEC No. B6-63

Basing, JETEC Designation—12L

Bulb Contact Alignment

Anode Contact Aligns with Pin No. 6  $\pm 30$  Degrees

Mounting Position—Any

Net Weight, approximate . . . . . 25 Pounds

## MAXIMUM RATINGS†

### DESIGN-CENTER VALUES\*

Anode Voltage† . . . . . 20,000 Max Volts DC

Focusing-Electrode Voltage . . . . . -500 to +1000 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

Focusing-Electrode Voltage for Focus . . . . . -64 to +352 Volts DC

Focusing-Electrode Current . . . . . -15 to +25 Microamperes DC

Grid-No. 2 Voltage . . . . . 300 Volts DC

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

Ion-Trap Field Intensity $\pi$ , approximate . . . . . 40 Gauss

## CIRCUIT VALUES

|                                             |     |             |
|---------------------------------------------|-----|-------------|
| Grid-No. 1 Circuit Resistance .....         | 1.5 | Max Megohms |
| Grid-No. 2 Circuit Resistance .....         | 0.1 | Min Megohms |
| Focusing-Electrode Circuit Resistance ..... | 0.1 | Min Megohms |

Protective resistance in the grid-No. 2 and focusing-electrode circuits is advisable to prevent damage to the tube. If applicable, one resistor common to both circuits may be used.

♦ 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.

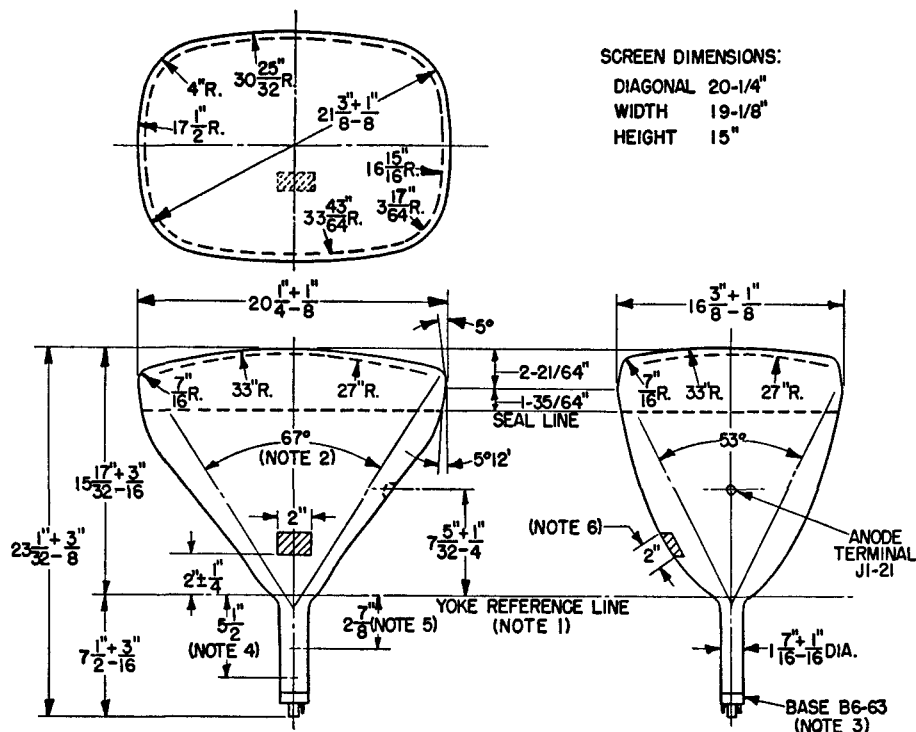
† Anode, grid-No. 3, and grid-No. 5 which are connected together within the tube are referred to herein as anode.

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.

§ For visual extinction of focused raster.

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



## SCREEN DIMENSIONS:

DIAGONAL 20-1/4"

WIDTH 19-1/8"

HEIGHT 15"

## 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 72 DEGREES.
3. ANODE TERMINAL ALIGNS WITH PIN-NO. 6  $\pm$  30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET.
5. APPROXIMATE POSITION OF CENTERING MAGNET, IF USED.
6. EXTERNAL CONDUCTIVE COATING CONTACT AREA.

