



27EP4 CATHODE-RAY TUBE

27-INCH RECTANGULAR, GLASS
FOCUS—MAGNETIC
DEFLECTION—MAGNETIC
90-DEGREE DEFLECTION ANGLE

24- BY 18½-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
ION-TRAP GUN
ALUMINIZED SCREEN

DESCRIPTION AND RATING

The 27EP4 is a magnetic-focus and deflection, direct-view all-glass picture tube which provides a 24- by 18½-inch picture for television applications. The electron gun 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.

GENERAL

ELECTRICAL

Heater Voltage 6.3 Volts
Heater Current 0.6 ± 10% Amperes

Focusing Method—Magnetic

Deflecting Method—Magnetic

Deflection Angle, approximate

Diagonal 90 Degrees
Horizontal 85 Degrees
Vertical 70 Degrees

Direct Interelectrode Capacitances, approximate

Cathode to All Other Electrodes 5 μμf
Grid-No. 1 to All Other Electrodes 6 μμf

OPTICAL

Phosphor Number—P4, Sulfide Type

Fluorescent Color—White

Phosphorescent Color—White

Persistence—Short

Faceplate—Gray

Light Transmission at Center, approximate 68 Percent



MECHANICAL

Over-all Length $23\frac{1}{16} \pm \frac{3}{8}$ Inches

Greatest Bulb Dimensions

Diagonal $26\frac{13}{16} \pm \frac{1}{8}$ Inches

Width $25\frac{9}{32} \pm \frac{1}{8}$ Inches

Height $20\frac{7}{32} \pm \frac{1}{8}$ Inches

Minimum Useful Screen Dimensions

Diagonal $25\frac{3}{4}$ Inches

Width 24 Inches

Height $18\frac{1}{2}$ Inches

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

Bulb Number, ASA Designation—J214- $\frac{1}{2}$ -A1

Bulb Contact—Recessed Small-cavity Cap, JETEC No. J1-21

Base—Small-shell Duodecal 5-Pin, JETEC No. B5-57

Basing, JETEC Designation—12D

Bulb Contact Alignment

Anode Contact Aligns with Pin No. 6 Position ± 30 Degrees

Mounting Position—Any

Net Weight, approximate 44 Pounds

MAXIMUM RATINGS**DESIGN-CENTER VALUES***

Anode Voltage † $20,000$ 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 Milliampers DC

Ion-Tap Field Intensity ◆, approximate 40 Gauss

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.

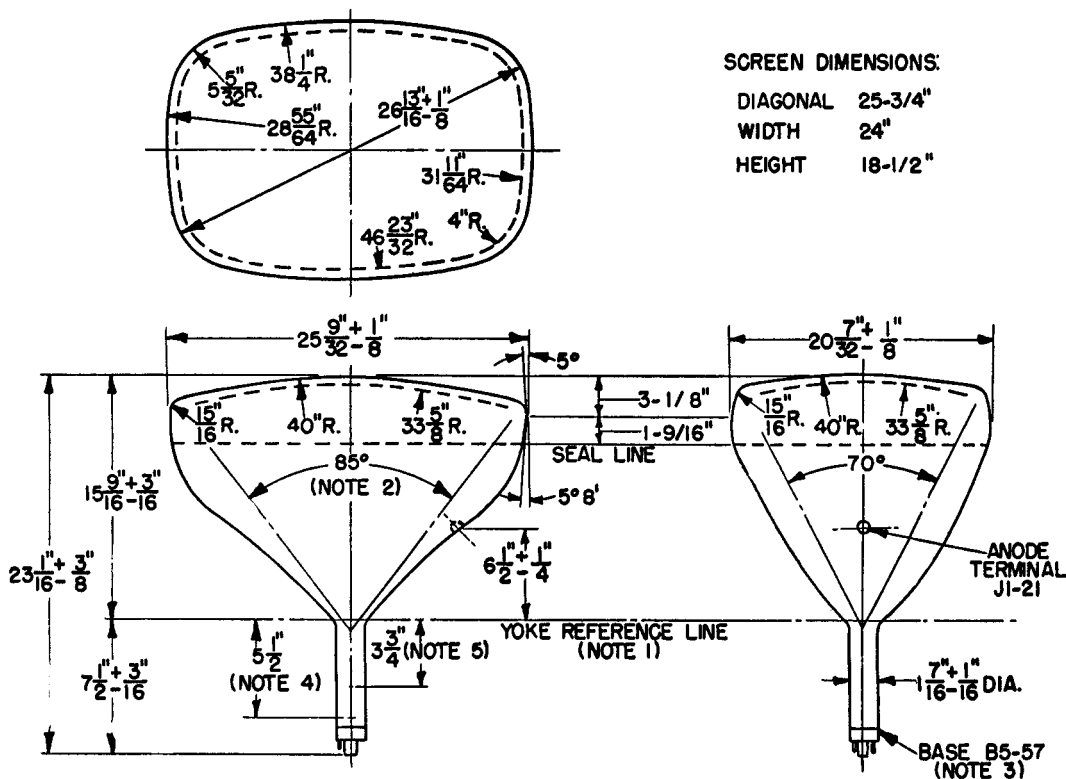
‡Cathode should be returned to one side or to the midtap of the heater transformer winding.

§Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 14,000 volts.

πFor visual extinction of focused raster.

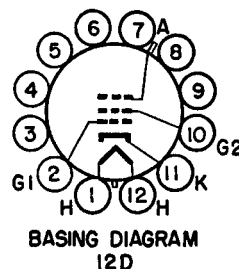
▲For JETEC focusing coil No. 109 with distance from the yoke-reference-line to center-of-air-gap equal to 3¾ inches.

♦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 SHOULDER OF THE REFERENCE-LINE GAGE (RETMA NO. 116) WHEN THE GAGE IS RESTING ON THE CONE.
2. DEFLECTION ANGLE ON DIAGONAL IS 90 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