



21MP4

CATHODE-RAY TUBE

21-INCH RECTANGULAR, METAL
FOCUS—ELECTROSTATIC
DEFLECTION—MAGNETIC

18 $\frac{1}{8}$ BY 13 $\frac{1}{16}$ -INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY, FROSTED
ION-TRAP GUN

70-DEGREE DEFLECTION ANGLE

DESCRIPTION AND RATING

The 21MP4 is an electrostatic-focus, magnetic-deflection, direct-view picture tube which provides an 18 $\frac{1}{8}$ by 13 $\frac{1}{16}$ -inch picture for television applications. 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 the 21MP4 include a lightweight metal-cone envelope, a high-quality frosted gray faceplate to prevent specular reflection and increase picture contrast, and a space-saving rectangular face shape.

GENERAL

ELECTRICAL

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

Focusing Method—Electrostatic

Deflecting Method—Magnetic

Deflection Angle, approximate

Diagonal 70 Degrees
Horizontal 66 Degrees
Vertical 50 Degrees

Direct Interelectrode Capacitances, approximate

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

OPTICAL

Phosphor Number—P4, Sulfide Type

Fluorescent Color—White

Phosphorescent Color—White

Persistence—Short

Faceplate—Gray

Light Transmission at Center, approximate 66 Percent
Specular Reflection of Ambient Light, maximum 1.5 Percent

MECHANICAL

Over-all Length $22\frac{1}{8} \pm \frac{1}{2}$ Inches

Greatest Bulb Dimensions

Diagonal $20\frac{3}{4} \pm \frac{1}{4}$ Inches

Width $19\frac{23}{32} \pm \frac{1}{8}$ Inches

Height $15\frac{5}{16} \pm \frac{1}{8}$ Inches

Minimum Useful Screen Dimensions

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

Width $18\frac{1}{8}$ Inches

Height $13\frac{11}{16}$ Inches

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

Bulb Contact—Metal Cone Lip

Base—Small-shell Duodecal 6-pin, JETEC No. B6-63

Basing, JETEC Designation—12M

Base Alignment

Pin-No. 6 Aligns with Horizontal Picture Axis ± 30 Degrees

Mounting Position—Any

Net Weight, approximate 18 Pounds

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

Anode Voltage† 16,000 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† 14,000 Volts DC

Focusing-Electrode Voltage for Focus -56 to $+308$ 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 π , approximate 37 Gauss

CIRCUIT VALUES

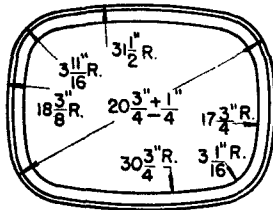
Grid-No. 1 Circuit Resistance 1.5 Max Megohms

Grid-No. 2 Circuit Resistance 0.1 Min Megohms

Focusing-Electrode Circuit Resistance 0.1 Min Megohms

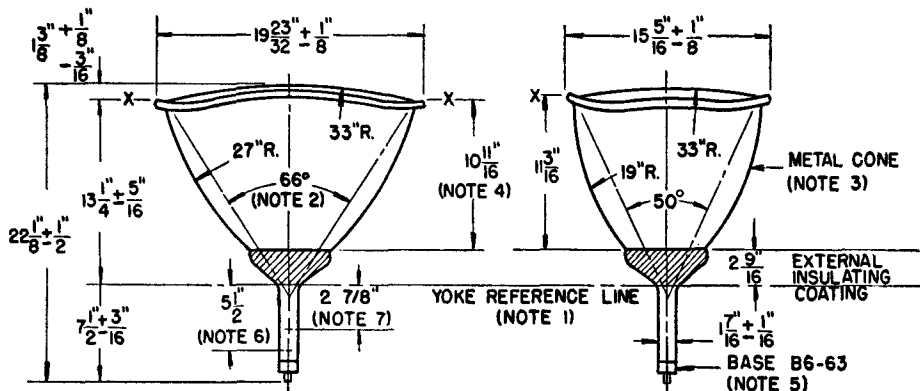
Protective resistance in the grid-No. 2 and focusing-electrode circuits is advisable to prevent damage to the tube. If applicable, one resistor common to both circuits may be used.

- ♦ 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.
- ‡ Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 12,000 volts.
- § For visual extinction of focused raster.
- π Single-field ion-trap magnet adjusted to optimum position, equivalent to 37 milliamperes through RETMA ion-trap magnet No. 117.



SCREEN DIMENSIONS:

DIAGONAL	19 1/8"
WIDTH	18 1/8"
HEIGHT	13 11/16"



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. METAL CONE OPERATES AT HIGH VOLTAGE AND MUST BE INSULATED TO WITHSTAND THE MAXIMUM APPLIED ANODE VOLTAGE.
4. CONE HEIGHT AT DIAGONAL IS 10-9/16\".
5. PIN-NO. 6 POSITION ALIGNS WITH HORIZONTAL PICTURE AXIS ± 30 DEGREES.
6. APPROXIMATE POSITION OF ION-TRAP MAGNET.
7. APPROXIMATE POSITION OF CENTERING MAGNET, IF USED.

