Electronic TUBES

21MP4

CATHODE-RAY TUBE

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

18⅛ BY 13$\frac{11}{16}$-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 18⅛ by 13$\frac{11}{16}$-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 ±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	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	66	Percent
Specular Reflection of Ambient Light, maximum	1.5	Percent

MECHANICAL

Over-all Length	22⅛ ± ½	Inches
Greatest Bulb Dimensions		
Diagonal	20¾ ± ¼	Inches
Width	19 23/32 ± ⅛	Inches
Height	15 5/16 ± ⅛	Inches
Minimum Useful Screen Dimensions		
Diagonal	19⅛	Inches
Width	18⅛	Inches
Height	13 11/16	Inches
Neck Length	7½	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 Intensityπ, approximate	37	Gausses

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.

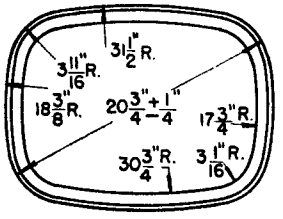
* The maximum ratings provide a ten-percent safety factor in accordance with the standard design-center system of rating cathode-ray tubes. The tube will withstand the combined effects of variations in line voltage and components provided the maximum design-center values are not exceeded by more than 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.

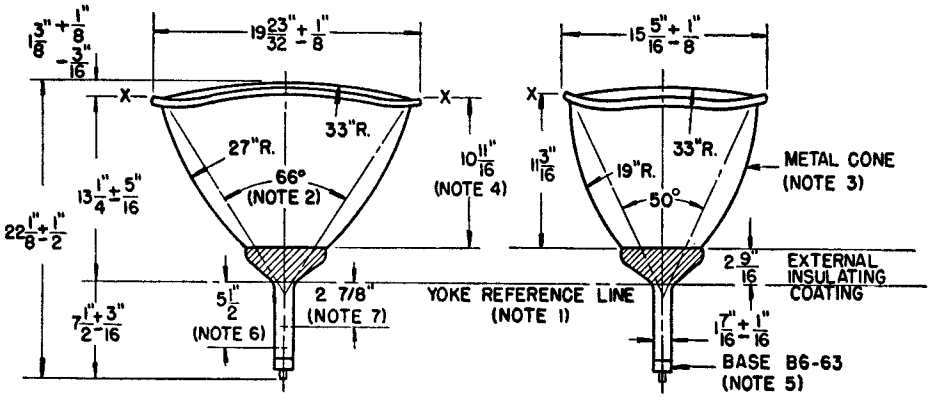
§ For visual extinction of focused raster.

π Single-field ion-trap magnet adjusted to optimum position, equivalent to 37 milliamperes through RETMA ion-trap magnet No. 117.



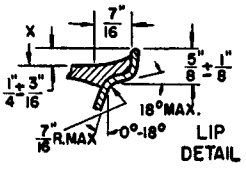
SCREEN DIMENSIONS:

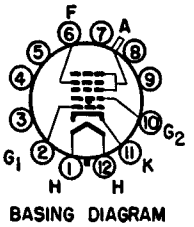
DIAGONAL	19 1/8"
WIDTH	18 1/8"
HEIGHT	13 11/16"



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.





BASING DIAGRAM
12 M