



24YP4

CATHODE-RAY TUBE

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

21¼ BY 16¾-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
ION-TRAP GUN
ALUMINIZED SCREEN

EXTERNAL CONDUCTIVE COATING

DESCRIPTION AND RATING

The 24YP4 is an electrostatic-focus and magnetic-deflection, direct-view all-glass picture tube which provides a 21¼ by 16¾-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 was designed for use with an external single-field ion-trap magnet. Other features of the 24YP4 include a high-quality gray faceplate to increase picture contrast and detail under high ambient light conditions, a space-saving rectangular face shape, and a fluorescent screen which is aluminized to increase light output. A high-capacitance external conductive coating serves as a filter capacitor when grounded.

GENERAL

ELECTRICAL

Heater Voltage	6.3	Volts
Heater Current	0.6 ± 10%	Amperes
Focusing Method—Electrostatic		
Deflecting Method—Magnetic		
Deflection Angle, approximate		
Diagonal	90	Degrees
Horizontal	85	Degrees
Vertical	70	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes5	μf
Grid-No. 1 to All Other Electrodes6	μf
External Conductive Coating to Anode		
Maximum	1500	μf
Minimum	1200	μf

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	21 $\frac{1}{8}$ \pm $\frac{3}{8}$	Inches
Greatest Bulb Dimensions		
Diagonal	24 \pm $\frac{1}{8}$	Inches
Width	22 $\frac{43}{64}$ \pm $\frac{1}{8}$	Inches
Height	18 $\frac{7}{16}$ \pm $\frac{1}{8}$	Inches
Minimum Useful Screen Dimensions		
Diagonal	22 $\frac{9}{16}$	Inches
Width	21 $\frac{1}{4}$	Inches
Height	16 $\frac{3}{4}$	Inches
Neck Length	7 $\frac{1}{2}$	Inches
Bulb Number, ASA Designation—J192A		
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	32	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 π	16000	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 Δ	-28 to -72	Volts DC
Ion-Trap Field Intensity ϕ , approximate	40	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.

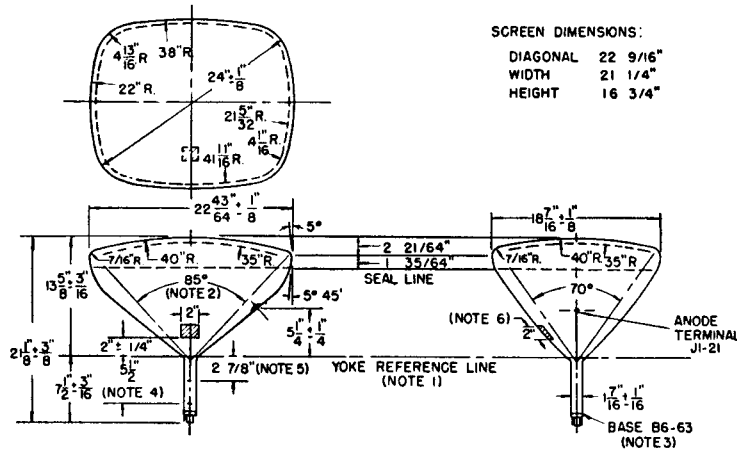
‡ Anode, grid-No. 3, and grid-No. 5 which are connected together within the tube are referred to herein as anode. If this tube is operated at voltages in excess of 16,000 volts, x-ray radiation shielding may be necessary to avert possible danger of personal injury from prolonged exposure at close range. 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.

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

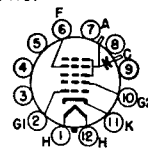
△ For visual extinction of focused raster.

♦ Single-field ion-trap magnet adjusted to optimum position, equivalent to 40 milliamperes through RETMA 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 ± 30 DEGREES.
4. APPROXIMATE POSITION OF ION-TRAP MAGNET
5. APPROXIMATE POSITION OF CENTERING MAGNET, IF USED.
6. EXTERNAL CONDUCTIVE COATING CONTACT AREA.



BASING DIAGRAM
 12L

OUTLINE
 24YP4, 24DP4-A