24YP4
CATHODE-RAY TUBE

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

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

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 Electrodes .............................. 0.5 µf
Grid-No. 1 to All Other Electrodes ............................ 0.6 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 1/2 ± 3/8 Inches
Greatest Bulb Dimensions
  Diagonal ............................................. 24 ± 1/8 Inches
  Width ............................................... 22 3/8 ± 1/8 Inches
  Height ............................................... 18 7/8 ± 1/8 Inches
Minimum Useful Screen Dimensions
  Diagonal ............................................. 22 4/8 Inches
  Width ............................................... 21 1/4 Inches
  Height ............................................... 16 3/4 Inches
Neck Length ............................................. 7 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 ± 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 Voltageπ ............................................. 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 △ ........................................ -28 to -72 Volts DC
Ion-Trap Field Intensity¶, 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.