Electronic TUBES

24DP4-A

CATHODE-RAY TUBE

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

21¼- BY 16¾-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
EXTERNAL CONDUCTIVE COATING
ALUMINIZED SCREEN

DESCRIPTION AND RATING

The 24DP4-A 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 24DP4-A 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. An 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	5	μμf
Grid-No. 1 to All Other Electrodes	6	μμf
External Conductive Coating to Anode		
Maximum	750	μμf
Minimum	500	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	$21\frac{1}{8} \pm \frac{3}{8}$	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 ± 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§	16,000	Volts DC
Focusing-Electrode Voltage for Focusπ	−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

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 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.

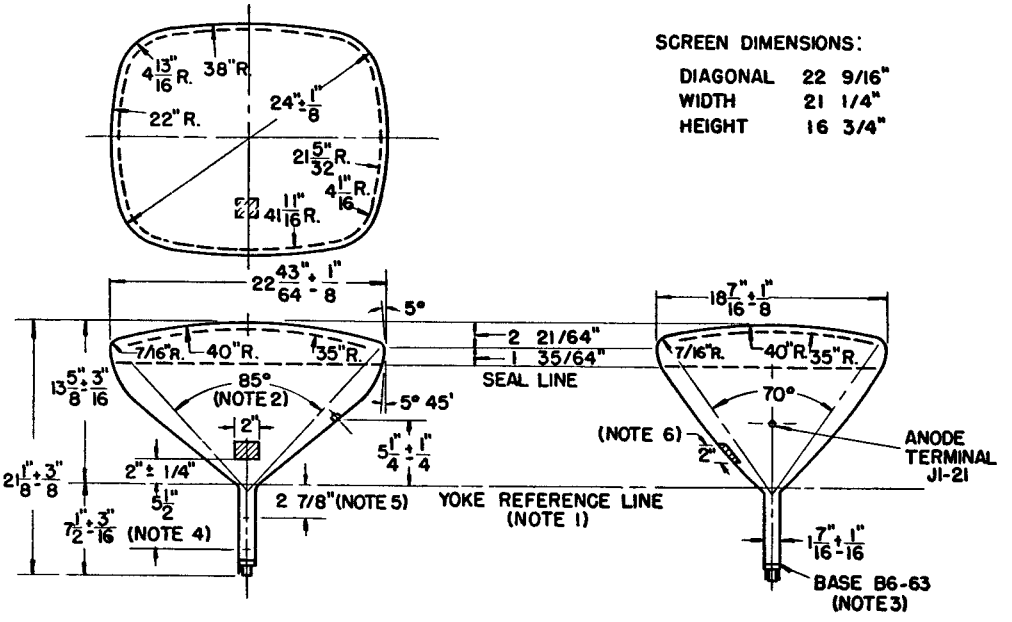
‡Cathode should be returned to one side or to the midtap of the heater transformer winding.

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

πThe focusing electrode may be modulated within the stipulated maximum range without damage to the tube.

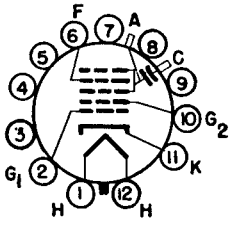
△For visual extinction of focused raster.

♦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