



21BDP4 CATHODE-RAY TUBE

21-INCH, RECTANGULAR GLASS
FOCUS—ELECTROSTATIC
DEFLECTION—MAGNETIC
72-DEGREE DEFLECTION ANGLE

19 $\frac{1}{8}$ - BY 15-INCH PICTURE SIZE
FACEPLATE—SPHERICAL, GRAY
EXTERNAL CONDUCTIVE COATING
ALUMINIZED SCREEN

DESCRIPTION AND RATING

The 21BDP4 is a rectangular all-glass picture tube which provides a 19 $\frac{1}{8}$ - by 15-inch picture for direct-view television reception. It employs electrostatic focusing and magnetic deflection. The outstanding feature of this tube is the fact that it does not require an ion-trap magnet; thus better resolution at all times is assured. Other features of the 21BDP4 include a high-quality fluorescent screen which is aluminized to increase light output, a gray faceplate which improves picture contrast, and an external conductive coating which serves as a filter capacitor when grounded.

GENERAL

ELECTRICAL

Heater Voltage	6.3	Volts
Heater Current	0.6 \pm 10%	Amperes
Focusing Method—Electrostatic		
Deflecting Method—Magnetic		
Deflection Angle, approximate		
Diagonal	72	Degrees
Horizontal	67	Degrees
Vertical	53	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes5	$\mu\mu\text{f}$
Grid-No. 1 to All Other Electrodes6	$\mu\mu\text{f}$
External Conductive Coating to Anode		
Maximum750	$\mu\mu\text{f}$
Minimum500	$\mu\mu\text{f}$

OPTICAL

Phosphor Number—P4, Sulfide Type	
Fluorescent Color—White	
Phosphorescent Color—White	
Persistence—Short	
Faceplate—Gray	
Light Transmission at Center, approximate	71 Percent



MECHANICAL

Over-all Length.....	23 $\frac{1}{32}$ \pm $\frac{3}{8}$	Inches
Greatest Bulb Dimensions		
Diagonal.....	21 $\frac{3}{8}$ \pm $\frac{1}{8}$	Inches
Width.....	20 $\frac{1}{4}$ \pm $\frac{1}{8}$	Inches
Height.....	16 $\frac{3}{8}$ \pm $\frac{1}{8}$	Inches

Minimum Useful Screen Dimensions

Diagonal.....	20 $\frac{1}{4}$	Inches
Width.....	19 $\frac{1}{8}$	Inches
Height.....	15	Inches

Neck Length.....	7 $\frac{1}{2}$	Inches
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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.....	27	Pounds
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MAXIMUM RATINGS*

DESIGN-CENTER VALUES†

Anode Voltage‡.....	18,000 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	16,000	Volts DC
Focusing-Electrode Voltage for Focus.....	+50 to +550	Volts DC
Focusing-Electrode Current.....	-15 to +25	Microamperes DC
Grid-No. 2 Voltage.....	300	Volts DC
Grid-No. 1 Voltage \blacktriangle	-28 to -72	Volts DC

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.

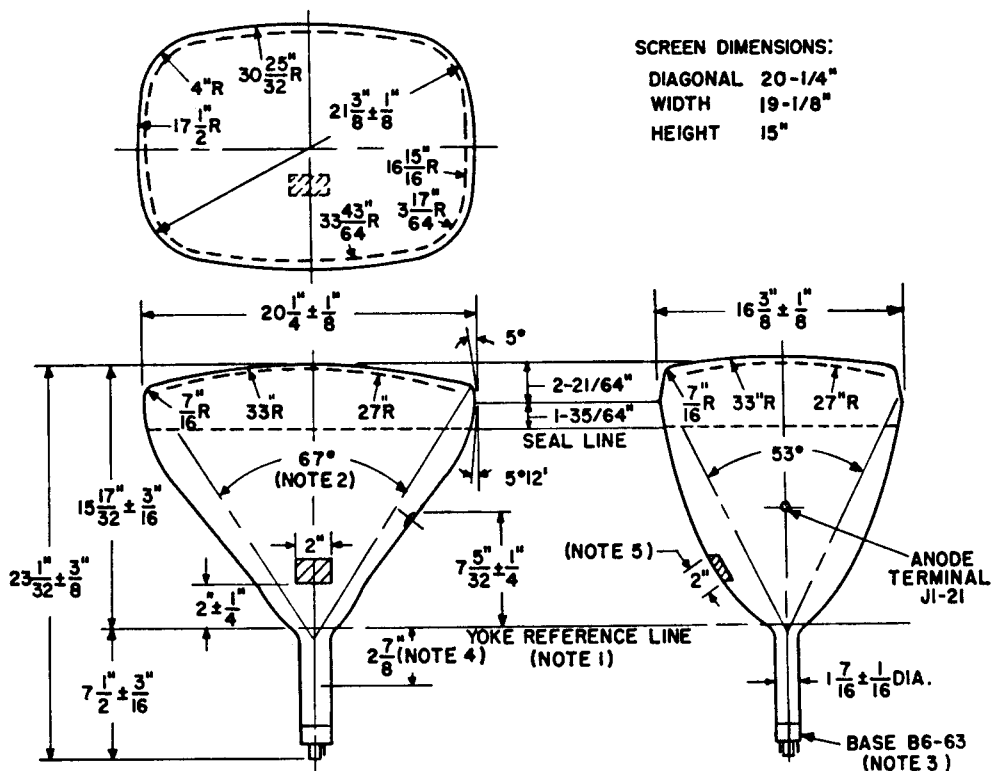
‡ Anode, grid-No. 3 and grid-No. 5 which are connected together within the tube are referred to herein as anode.

§ 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.

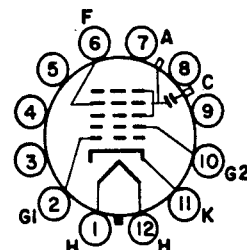
π Brightness and focus quality decrease with decreasing anode voltage. In general, the anode voltage should not be less than 14,000 volts.

▲ For visual extinction of focused raster.



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 72°.
3. ANODE TERMINAL ALIGNS WITH PIN-NO.6 ±30 DEGREES.
4. APPROXIMATE POSITION OF CENTERING MAGNET, IF USED.
5. EXTERNAL CONDUCTIVE COATING CONTACT AREA.



BASING DIAGRAM
12 L