



**21BCP4**  
**CATHODE-RAY TUBE**

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

**19 $\frac{1}{8}$ - BY 14 $\frac{3}{16}$ -INCH PICTURE SIZE**  
**FACEPLATE—SPHERICAL, GRAY**  
**EXTERNAL CONDUCTIVE COATING**  
**ALUMINIZED SCREEN**

**DESCRIPTION AND RATING**

The 21BCP4 is a rectangular all-glass picture tube which provides a 19 $\frac{1}{8}$  by 14 $\frac{3}{16}$ -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 21BCP4 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 . . . . .	70	Degrees
Horizontal . . . . .	65	Degrees
Vertical . . . . .	50	Degrees
Direct Interelectrode Capacitances, approximate		
Cathode to All Other Electrodes . . . . .	5	$\mu\mu\text{f}$
Grid-No. 1 to All Other Electrodes . . . . .	6	$\mu\mu\text{f}$
External Conductive Coating to Anode		
Maximum . . . . .	750	$\mu\mu\text{f}$
Minimum . . . . .	500	$\mu\mu\text{f}$

**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 . . . . .  $21\frac{7}{32} \pm \frac{1}{8}$  InchesWidth . . . . .  $20\frac{1}{4} \pm \frac{1}{8}$  InchesHeight . . . . .  $15\frac{9}{16} \pm \frac{1}{8}$  Inches

## Minimum Useful Screen Dimensions

Diagonal . . . . .  $20\frac{1}{8}$  InchesWidth . . . . .  $19\frac{1}{8}$  InchesHeight . . . . .  $14\frac{3}{16}$  InchesNeck Length . . . . .  $7\frac{1}{2}$  Inches

Bulb Number, ASA Designation—J170B

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 . . . . . 25 Pounds

**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  $\pi$  . . . . . 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.

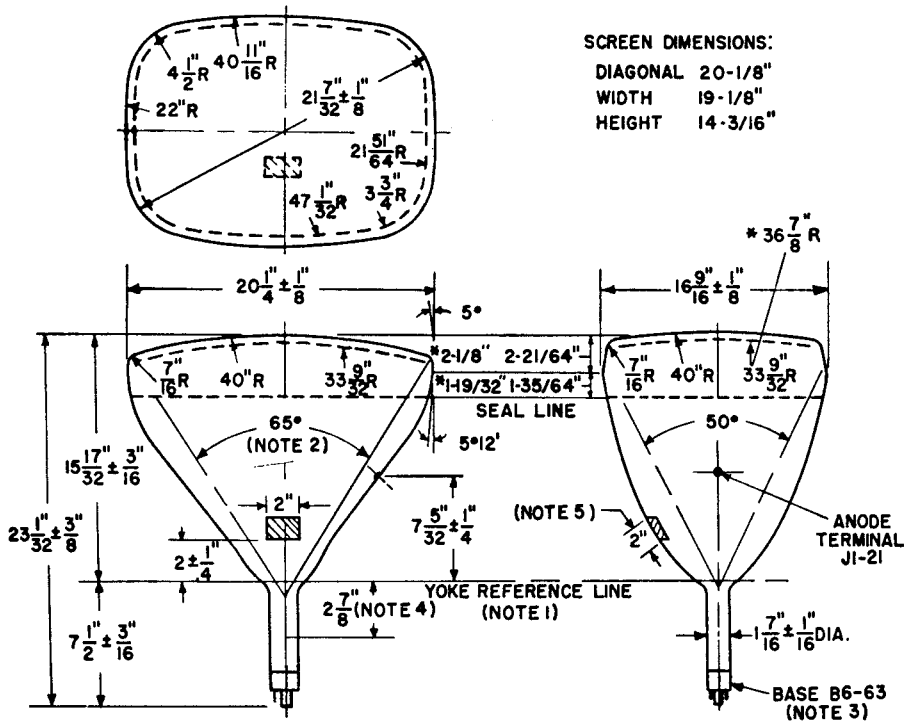
‡ Anode, grid-No. 3 and grid-No. 5 which are connected together within the tube are referred to herein as anode.

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.



SCREEN DIMENSIONS:  
 DIAGONAL 20-1/8"  
 WIDTH 19-1/8"  
 HEIGHT 14-3/16"

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°.
3. ANODE TERMINAL ALIGNS WITH PIN-NO.6 ± 30 DEGREES.
4. APPROXIMATE POSITION OF CENTERING MAGNET, IF USED.
5. EXTERNAL CONDUCTIVE COATING CONTACT AREA.
- \* THIS SET OF VALUES ALSO POSSIBLE.

