

7BMP- CATHODE RAY TUBE

The E.T.C. 7BMP- is a 7-inch rectangular faced, single gun electrostatic deflection and focus cathode ray tube. The tube utilizes a post-accelerator and has been designed for high voltage operation with a resultant high brightness and small spot size. This tube has also been designed to minimum edge defocusing. The deflection plate leads and anode connections are brought out through the neck of the tube to minimize lead inductance and capacitance. The gun is designed to draw negligible focusing electrode current.

GENERAL CHARACTERISTICS

Electrical Data

Heater Voltage	6.3 ± 10% Volts				
Heater Current	0.6 ± 10% Amperes				
Focusing Method	Electrostatic				
Deflecting Method	Electrostatic				
Phosphor	No. 1	No. 2	No. 7	No. 11	No. 19 (Note 1)
Fluorescence	Green	Green	Blue	Blue	Yellow-Orange
Phosphorescence	-----	Green	Yellow	-----	-----
Persistence	Medium	Long	Long	Short	Medium Long
Direct Interelectrode Capacitances	Max.				
Cathode to all other electrodes	5.00 uuf				
Grid #1 to all other electrodes	6.00 uuf				
D1 to D2	4.00 uuf				
D3 to D4	1.6 uuf				
D1 to all	9.00 uuf				
D2 to all	9.00 uuf				
D3 to all	4.00 uuf				
D4 to all	4.00 uuf				

Mechanical Data

Overall Length	17 ± 3/8 Inches
Greatest Bulb Diameter	6-5/8 ± 1/16 Inches
Minimum Useful Screen	3-1/4 x 5-1/4 Inches
Bulb Contacts	
Bulb Contact	J1-25
Base	J1-22
Basing	B12-37

Base Alignment

D3D4 trace aligns approx. with Pin #2 ±10 Degrees  
 Positive voltage on D1 deflects the beam approx. towards Pin No. 5  
 Positive voltage on D3 deflects the beam approx. towards Pin No. 2

Bulb Contact Alignment

J1-22 contact aligns with D2 trace ± 10 Degrees  
 J1-22 contact on same side as No. 5

Trace Alignment

Angle between D1D2 and D3D4 trace 90 ± 1 Degrees  
 D1D2 trace aligns with bulb wall 1 Degree

MAXIMUM RATINGS - Design Center Values

Post-Accelerator Voltage	16,000 Max. Volts D-C
Accelerator Voltage	8,000 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage (Note 2)	2 Max.
Focusing Voltage	1750 Max. Volts D-C
Grid #1 Voltage	
Negative Bias Value	200 Max. Volts D-C
Positive Bias Value	0 Max. Volts D-C
Positive Peak Value	2 Max. Volts D-C
Peak Heater to Cathode Voltage	
Heater Negative with respect to Cathode	180 Max. Volts D-C
Heater Positive with respect to Cathode	180 Max. Volts D-C
Peak Voltage between Accelerator and any Deflection Electrode	750 Max. Volts

TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage	10000 Volts D-C
For Accelerator Voltage	5000 Volts D-C
Focusing Voltage	1000 to 1400 Volts D-C
Grid #1 Voltage (Note 3)	-53 to -87 Volts D-C
Modulation Factor (Note 4)	45 Volts Max.
Line Width A (Note 5)	<u>For P19</u> .30 .40 MM
Deflection Factors	
D1 and D2	125 to 150 Volts D-C/Inch
D3 and D4	100 to 125 Volts D-C/Inch
Deflection Factor Uniformity (Note 6)	1-1/2% Max.
Spot Position (Note 7) within 3/8 Inch Square Useful Scan	
1D2	5-1/4 Inches Min.
3D4	3-1/4 Inches Min.

CIRCUIT DESIGN VALUES

Focusing Current for any operating condition	-15 to +10 Microamperes
Grid #1 Circuit Resistance	1.5 Max. Megohms
Resistance in any deflecting Electrode Circuit (Note 8)	1 Megohms

NOTES:

- The tube can be severely and permanently damaged if the current density on the P19 screen is allowed to raise too high in static tests. For this reason, the length of time during which the screen is bombarded should be kept as short as possible and within the specified current limits.
- The tube is designed for optimum performances when operating at an  $E_{03}/E_{02}$  ratio of 2.0. Operation at other ratios may result in changes in deflection uniformity, pattern distortion and useful scan.

NOTES (CONT'D)

- 3 - Visual extinction of undeflected focus spot.
- 4 - The increase in grid voltage from cutoff to produce an  $I_{b3}$  of 25 uAdc for a P19 screen the  $I_{b3}$  should be limited to 5 uA Max.
- 5 - Measured in accordance with MIL-E-1 specifications using an  $I_{b3}$  of 25 uAdc. P19 screen an  $I_{b3}$  of 2 uAdc.
- 6 - The deflection (for both D1D2 and D3D4 plate pairs separately) for a deflection of less than 75% of the useful scan will not differ from the deflection factor for a deflection at 25% of the useful scan by more than the indicated value.
- 7 - Centered with respect to the tube face with the tube shielded.
- 8 - It is recommended that the deflection electrode circuit resistance be approximately equal. Higher resistance values up to five megohms may be used for low current operation.

