

DUMONT

CATHODE-RAY TUBE

TYPE 5DBP-

The Du Mont Type 5DBP- is a 5 1/4-Inch diameter, single beam, electrostatic focus and deflection cathode-ray tube. The focusing electrode draws negligible electron current. The tube features a linear post accelerator - a spiral resistance winding - which extends from the tube face to the deflection plate region, allowing for a gradual voltage gradient. The deflection plate structure has been designed to minimize deflection plate splash. Other features of the 5DBP- are high deflection sensitivities, high writing rates, and a pattern adjustment electrode to minimize pattern distortion. An astigmatism electrode is provided to allow for optimum spot shape adjustment. A low current heater is employed to reduce power requirements.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Electrostatic	
Deflection Method	Electrostatic	
Direct Interelectrode Capacitances, Approximate		
Cathode to all other electrodes	3.5	μf
Grid No. 1 to all other electrodes	5.5	μf
D1 to D2	2.5	μf
D3 to D4	1.2	μf
D1 to all electrodes	6.2	μf
D2 to all electrodes	5.7	μf
D3 to all electrodes	4.2	μf
D4 to all electrodes	3.7	μf

Optical Data

Phosphor Number	1	2	5	7	11	15
Fluorescent Color	Green	Blue-Green	Blue	Blue-White	Blue	Blue-Green
Phosphorescent Color	----	Green	----	Yellow	----	-----
Persistence	Medium	Long	Very Short	Long	Short	Extremely Short

Mechanical Data

Overall Length	19 1/2 $\pm$ 1/4	Inches
Greatest Diameter of Bulb	5 1/4 $\pm$ 3/32	Inches
Minimum Useful Screen Diameter	4 1/4	Inches
Bulb	Special	
Bulb Contact	J1-21	

Allen B. Du Mont Laboratories, Inc.
Clifton, New Jersey

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5/12/60

FORM 809 8C-7-59-5M

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GENERAL CHARACTERISTICS (Mechanical Data) (Continued)

Basing	14AT	
Base	B14-37	
Base Alignment:		
D3D4 trace aligns with Pin No. 1 and tube axis	± 10	Degrees
Positive voltage on D1 deflects beam approximately toward Pin No. 5		
Positive voltage on D3 deflects beam approximately toward Pin No. 1		
Bulb Contact Alignment:		
Cap aligns with Pin No. 1	± 10	Degrees
Cap aligns with D3D4 trace	± 10	Degrees
Cap on same side as Pin No. 1		
Trace Alignment:		
Angle between D3D4 and D1D2 traces	90 ± 1	Degrees

RATINGS (Design Maximum Values)

Heater Voltage	6.3	Volts
Heater Current at 6.3 Volts	$0.3 \pm 10\%$	Ampere
Post Accelerator Voltage	8000	Max. Volts DC
Pattern Adjustment Electrode Voltage	2700	Max. Volts DC
Astigmatism Electrode Voltage	2700	Max. Volts DC
Astigmatism Electrode Input	6	Max. Watts
Focusing Electrode Voltage	1500	Max. Volts DC
Accelerator Voltage	2700	Max. Volts DC
Accelerator Input	6	Max. Watts
Ratio Post Accelerator Voltage to Accelerator Voltage ¹	3.5	Max.
Grid No. 1 Voltage		
Negative Bias Value	200	Max. Volts DC
Positive Bias Value	0	Max. Volts DC
Positive Peak Value	0	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



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RATINGS (Design Maximum Values) (Continued)

Peak voltage between accelerator and any deflection electrode	550	Max. Volts
Post Accelerator Resistance	48 to 240	Megohms

TYPICAL OPERATING CONDITIONS

Post Accelerator Voltage	5000	Volts
Accelerator Voltage	1400	Volts
Pattern Adjustment Electrode Voltage ²	1400	Volts
Astigmatism Electrode Voltage ³	1400	Volts
Focusing Electrode Voltage	180 to 580	Volts
Post Accelerator Current ⁴	15 to 75	μA
Grid No. 1 Voltage ⁵	-34 to -56	Volts
Modulation ⁶	40	Max. Volts DC
Deflection Factors:		
D1D2	25 to 35	Volts DC/Inch
D3D4	25 to 35	Volts DC/Inch
Useful Scan:		
D1D2	4.25	Inches
D3D4	4.25	Inches
Pattern Distortion ⁷		
Line Width "A" ⁶	.022	Max. Inch
Cathode Current ⁸	425	Max. μADC
Focusing Electrode Current for any operating condition	-15 to +10	μA
Spot Position ⁹	Within a 5/16-inch radius circle	
P1 Light Output ¹⁰	25	Ft. L. Min.
P2 Light Output ¹⁰	18	Ft. L. Min.
P11 Light Output ¹¹	20	Ft. L. Min.
Deflection Defocusing ¹²		

MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance	2.0	Max. Megohms
Resistance in any Deflecting-Electrode Circuit ¹³	1.0	Max. Megohms

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N O T E S

1. This tube is designed for optimum performance when operating at a ratio of 3.5. Operation at other ratios may result in changes in deflection uniformity, pattern distortion and/or useful scan.
2. The pattern adjustment electrode should be adjusted for optimum performance. For any necessary adjustment, its potential will be within a range of -50 to +100 volts with respect to the mean D1D2 plate potential.
3. The astigmatism electrode should be adjusted for optimum spot shape. For any necessary adjustment, its potential will fall within -50 to +125 volts with respect to the accelerator voltage.
4. Measured with Grid No. 1 at cut-off. Post accelerator current is the current flowing through the post accelerator resistance which is connected between the post accelerator and pattern adjustment electrode. All readings of beam current shall be in addition to the reading obtained for post accelerator current.
5. Visual extinction of the undeflected, focused spot.
6. For a beam current of 25 μ ADC, measured in accordance with MIL-E-1 specifications.
7. With a raster pattern centered on tube face and the size of which is adjusted so that the widest points of the pattern just touch the sides of a 3.300-inch square, no point on these pattern sides will lie within an inscribed 3.200-inch square.
8. For a beam current of 25 μ ADC.
9. With the deflecting electrodes connected to the accelerator and the tube shielded against external influences, the undeflected and focused spot will fall within a 5/16-inch radius circle centered with respect to the tube face center.
10. Measured with a Type 3 Photronic Cell, corrected for spectral response of the eye, using a 2 x 2-inch, 50-line raster, with $I_{b3} = 25 \mu A$.
11. Measured with a Type 3 Photronic Cell, without eye correction, using a 2 x 2-inch, 50-line raster, with $I_{b3} = 25 \mu A$.
12. Maximum deflection defocusing ± 2 inches from the center in either scan direction shall not exceed $1 \frac{3}{4}$ times line width "A". Correction voltages are to be adjusted only when measuring line width "A".
13. It is recommended that the deflecting-electrode circuit resistances be approximately equal. Higher resistance values up to five megohms may be used for low beam current operation.

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FORM 809-CB-4-BB-0H