

DUMONT

CATHODE-RAY TUBE

TYPE 5DAP-

The Du Mont Type 5DAP- 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. Other features of the 5DAP- 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.

For maximum brightness and stability in performance, all screens are provided with a highly-reflective metal backing.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Electrostatic	
Deflection Method	Electrostatic	
Direct Interelectrode Capacitances, Approximate		
Cathode to all other electrodes	3.3	$\mu\mu\text{f}$
Grid No. 1 to all other electrodes	5.1	$\mu\mu\text{f}$
D1 to D2	2.2	$\mu\mu\text{f}$
D3 to D4	1.4	$\mu\mu\text{f}$
D1 to all electrodes	4.9	$\mu\mu\text{f}$
D2 to all electrodes	4.9	$\mu\mu\text{f}$
D3 to all electrodes	3.5	$\mu\mu\text{f}$
D4 to all electrodes	3.5	$\mu\mu\text{f}$

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	21 1/4 \pm 3/16	Inches
Greatest Diameter of Bulb	5 1/4 \pm 3/32	Inches
Minimum Useful Screen	4 1/4	Inches

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

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GENERAL CHARACTERISTICS (Mechanical Data) (Continued)

Bulb	Special	
Bulb Contact	J1-21	
Basing	14AP	
Base	B12-37	
 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	$0.6 \pm 10\%$	Ampere
Post Accelerator Voltage	15,000	Max. Volts DC
Pattern Adjustment Electrode Voltage	2700	Max. Volts DC
Deflection Plate Shield Voltage	2700	Max. Volts DC
Astigmatism Electrode Voltage	2700	Max. Volts DC
Astigmatism Electrode Input	6	Max. Watts
Focusing Electrode Voltage	1600	Max. Volts DC
Accelerator Voltage	2700	Max. Volts DC
Accelerator Input	6	Max. Watts
Ratio Post Accelerator Voltage to Accelerator Voltage ¹	9.0	Max.

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RATINGS (Design Maximum Values) (Continued)

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
Peak voltage between accelerator and any deflection electrode	550	Max. Volts
Post Accelerator Resistance	210 to 750	Megohms

TYPICAL OPERATING CONDITIONS

Post Accelerator Voltage	12,000	Volts
Pattern Adjustment Electrode Voltage ²	1400	Volts
Deflection Plate Shield Voltage ³	1400	Volts
Astigmatism Electrode Voltage ⁴	1400	Volts
Focusing Electrode Voltage	180 to 580	Volts
Accelerator Voltage	1400	Volts
Grid No. 1 Voltage ⁵	-40 to -65	Volts
Modulation ⁶	45	Max. Volts DC
Deflection Factors:		
D1D2	48 to 63	Volts DC/Inch
D3D4	13 to 16.5	Volts DC/Inch
Useful Scan:		
D1D2	3.94 (10 cm)	Min. Inches
D3D4	1.97 (5 cm)	Min. Inches
Pattern Distortion ⁷		
Line Width "A" ⁸	.030	Max. Inch

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TYPICAL OPERATING CONDITIONS (Continued)

Gun Efficiency ⁹	6.0	Min. Percent
Focusing Electrode Current for any operating condition	-15 to +10	μ A
Spot Position ¹⁰		
P2 Light Output ¹¹	225	Ft. L. Min.
P11 Light Output ¹²	300	Ft. L. Min.
Post Accelerator Current ¹³	50	Max. μ A
Deflection Defocusing ¹⁴		

MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance	2.0	Max. Megohms
Resistance in any deflecting-electrode circuit ¹⁵	1.0	Max. Megohms

NOTES

1. This tube is designed for optimum performance when operating at a ratio of 8.5. 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 -90 to +60 volts with respect to the mean D1D2 plate potential.
3. Adjustment of the deflection plate shield voltage provides improved linearity of D3D4 deflection. For any necessary adjustment, its potential should not exceed ± 20 volts with respect to the mean D3D4 plate potential.
4. The astigmatism electrode should be adjusted for optimum spot shape. For any necessary adjustment, its potential will not exceed ± 100 volts with respect to the accelerator voltage.
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. All readings of beam current shall be in addition to the reading obtained for post accelerator current with beam cut-off.

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NOTES
(Continued)

7. All portions of a raster pattern adjusted so its widest points just touch the sides of a 4.052 x 2.032-inch rectangle (centered horizontally with respect to the tube face) will fall within the area bounded by this rectangle and an inscribed 3.94 x 1.97-inch rectangle.
8. For a beam current of 25 μ ADC, measured in accordance with MIL-E-1 specifications. All readings of beam current shall be in addition to the reading obtained for post accelerator current with beam cut-off.
9. The gun efficiency is the ratio of the beam current to the cathode current.
10. The undeflected and focused spot shall fall within a 9 x 19-mm rectangle centered with respect to the tube face center. The 19-mm dimension shall be in the D1D2 scan direction.
11. Measured with a Type 3 Photronic Cell, corrected for spectral response of the eye, using a 1.5 x 1.5-inch, 50-line raster, with $I_{b3} = 25 \mu$ A.
12. Measured with a Type 3 Photronic Cell, without eye correction, using a 1.5 x 1.5-inch, 50-line raster, with $I_{b3} = 25 \mu$ A.
13. 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.
14. With the D1D2 scan reversed (D1D2 scanning vertically, D3D4 scanning horizontally), the raster adjusted for best overall focus, and I_{b3} at 25 μ A, the line width anywhere within the minimum useful scan shall not exceed .050 inch.
15. 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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