DUMONT

CATHODE-RAY TUBE

TYPE 5DWP-

The Du Mont Type 5DWP- is a 5 1/4-inch diameter, single beam, electrostatic focus and deflection cathode-ray tube. The tube features 10 cm. vertical and horizontal scan, high deflection sensitivities, high writing rates, and a pattern adjustment electrode to minimize pattern distortion. An astigmatism electrode is provided to allow adjustment for optimum spot shape. A low current heater is employed to reduce power requirements. Beam gating electrodes are provided to cut off the beam independent of Grid No. 1.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Electrostatic	
Deflection Method	Electrostatic	
Direct Interelectrode Capacitances, Approximate		
Cathode to all other electrodes	3.0	μμf
Grid No. 1 to all other electrodes	5.7	μμf
D1 to D2	2.0	μμf
D3 to D4	1.1	μμf
D1 to all electrodes	5.2	μμf
D2 to all electrodes	5.0	μμf
D3 to all electrodes	3.3	μμf
D4 to all electrodes	2.8	μμf
Beam Gating Electrodes		

Optical Data

Phosphor Number	1	2	5	7
Fluorescence	Yellow-Green	Yellow-Green	Blue	White
Phosphorescence	----------	Green	----	Yellow-Green
Persistence	Medium	Medium	Medium-Short	Long

Phosphor Number	11	15	31
Fluorescence	Blue	Green	Green
Phosphorescence	----	-----	-----
Persistence	Medium-Short	Very Short	Medium-Short

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Divisions of Fairchild Camera and Instrument Corp.
Clifton, N. J.

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GENERAL CHARACTERISTICS (Continued)

Mechanical Data

Overall Length	20 1/4	Inches Max.
Greatest Diameter of Bulb	5 1/4 ± 3/32	Inches
Minimum Useful Screen Diameter	4 1/4	Inches
Bulb	Special	
Bulb Contact	J1-21	
Basing	Special	
Base	B14-38	
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 midway between Pins No. 11 and 12	± 10	Degrees
Cap aligns with D1D2 trace	± 10	Degrees
Cap on same side as Pin No. 11		
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~~ 0.6 ± 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]	3.6	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
Peak voltage between accelerator and any beam gating electrode	100	Max. Volts

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
Interelectrode Shield Voltage	1400	Volts
Focusing Electrode Voltage	180 to 580	Volts
Post Accelerator Current[4]	15 to 75	μA
Grid No. 1 Voltage[5]	-34 to -64	Volts
Modulation[6]	45	Max. Volts DC
Deflection Factors:		
D1D2	25 to 35	Volts DC/Inch
D3D4	25 to 35	Volts DC/Inch
Useful Scan:		
D1D2	10	Cm
D3D4	10	Cm

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TYPICAL OPERATING CONDITIONS (Continued)

Beam Gating Voltage [14, 15, 16]	70	Max. Volts
Pattern Distortion [7]		
Line Width "A" [6]	.030	Max. Inch
Cathode Current [8]	625	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]		
Gun Efficiency [8, 17]	4%	Min.
Pattern Shift [16]	5/16	Inch Max.

MAXIMUM CIRCUIT VALUES

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

NOTES

1. This tube is designed for optimum performance when operating at a ratio of 3.6. 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.

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NOTES
(Continued)

5. Visual extinction of the undeflected, focused spot.

6. For a beam current of 25 μADC, measured in accordance with MIL-E-1 specifications. In no case will the Grid No. 1 voltage be less than -5 volts for a beam current of 25 μADC.

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 3.3-inch square, no point on these pattern sides will lie within an inscribed 3.2-inch square.

8. For a beam current of 25 μADC.

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 maximum Ib3 = 25 μA.

11. Measured with a Type 3 Photronic Cell, without eye correction, using a 2 x 2-inch, 50-line raster, with maximum Ib3 = 25 μA.

12. Design Goal (final specification to be determined). Maximum deflection defocusing ± 2 inches from the center in the horizontal direction and ± 2 inches from the center in the vertical direction shall not exceed 1 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.

14. Voltage necessary for raster cut-off at minimum specified light output. For optimum performance, one beam gating electrode should be connected to the accelerator, and the beam gating voltage applied to the other electrode should be positive with respect to the accelerator voltage.

15. Beam Gating Stray Emission Specification to be determined.

16. Pattern shift during beam gating, with beam current of 25 μA, will be no more than 5/16 inch and will be in the direction of the D1D2 trace.

17. The gun efficiency is the ratio of the beam current to the cathode current.

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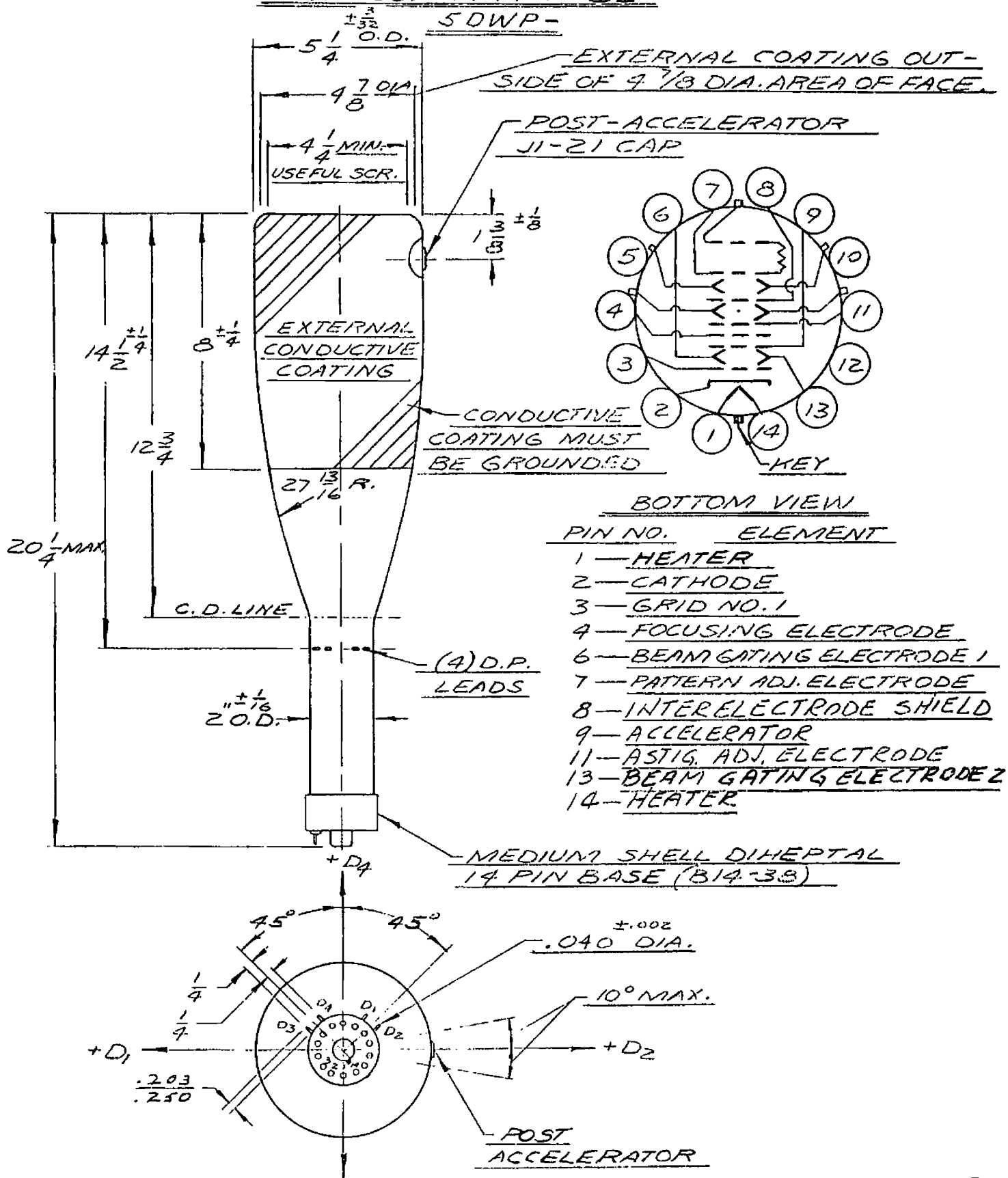

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