DU MONT

CATHODE-RAY TUBE

TYPE 5CWP-

The Du Mont Type 5CWP- is a flat face, two beam, electrostatic deflection and focus cathode-ray tube having improved deflection sensitivity, accuracy and low interaction between traces. The increased maximum ratings of the tube permit high brightness to be obtained, and the use of post acceleration and limited scan deflection electrodes improves the deflection sensitivity. The deflection electrode and acceleration electrode connections are brought out through the bulb wall to minimize lead inductance and capacity and to improve the insulation. This tube features a pattern adjustment electrode and individual astigmatism adjustment electrodes which are also brought out through the neck. A collar or ring base has been designed and incorporated into this tube for ease of connection to these leads.

The screen is aluminized for greater light output and to minimize screen charging effects.

GENERAL CHARACTERISTICS [1]

Electrical Data

Focusing Method	Electrostatic	
Deflecting Method	Electrostatic	
Direct Interelectrode Capacitances, Approx.		
Cathode to all	6.0	μμf
Grid No. 1 to all	4.0	μμf
D1 to D2	3.0	μμf
D3 to D4	2.0	μμf
D1 to all	7.0	μμf
D2 to all	7.0	μμf
D3 to all	4.0	μμf
D4 to all	4.0	μμf

Optical Data

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

Faceplate	Flat, Clear

DE-5830 - 2
4/13/60

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Clifton, New Jersey

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from JEDEC release #2803, May 9, 1960

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GENERAL CHARACTERISTICS (Continued)

Mechanical Data

Overall Length	20 ± 1/4	Inches
Greatest Diameter of Bulb	5 1/4 ± 3/32	Inches
Minimum Useful Screen Diameter	4 1/2	Inches
Bulb Contact	J1-22	
Collar	A14-93	
Base	B12-37	
Basing	Special	
Collar and Base Alignment		
Collar Pin No. 1 and Base Pin No. 4 each aligns with the D1D2 trace	± 10	Degrees

Positive Voltage on D1 deflects the beam approximately toward Base Pin No. 4
Positive Voltage on D3 deflects the beam approximately toward Base Key

Bulb Contact Alignment:		
Bulb Contact aligns with D1D2 trace	± 10	Degrees
Bulb Contact is on same side as the Base Pin No. 11		
Trace Alignment:		
D1D2 trace aligns with D3D4 trace	90 ± 1	Degrees
Corresponding traces of each gun align within	1	Degree

MAXIMUM RATINGS (ABSOLUTE MAXIMUM VALUES)

Heater Voltage	6.3	Volts
Heater Current at 6.3 Volts	0.6 ± 10%	Ampere
Post Accelerator Voltage	11,000	Max. Volts DC
Accelerator Voltage	5,500	Max. Volts DC
Accelerator Input	6	Max. Watts
Ratio Post Accelerator Voltage to Accelerator Voltage [2]	3	Max.
Astigmatism Electrode Voltage	5,500	Max. Volts DC
Astigmatism Electrode Input	6	Max. Watts
Pattern Adjustment Electrode Voltage	5,500	Max. Volts DC
Focusing Electrode Voltage	1,650	Max. Volts DC

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MAXIMUM RATINGS (ABSOLUTE 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 to Cathode Voltage		
Heater negative with respect to cathode	180	Max. Volts
Heater positive with respect to cathode	180	Max. Volts
Peak Voltage between Accelerator and any Deflection Electrode	1,100	Max. Volts

TYPICAL OPERATING CONDITIONS[3]

Post Accelerator Voltage	8,000	Volts
Accelerator Voltage	3,000	Volts
Astigmatism Electrode Voltage[4]	3,000	Volts
Pattern Adjustment Electrode Voltage[5]	3,000	Volts
Focusing Electrode Voltage	0 to 450	Volts
Grid No. 1 Voltage[6]	-45 to -75	Volts
Modulation[7]	35	Volts Max.
Line Width "A"[7a]	.25	MM Max.
Deflection Factors:		
D1 and D2	65 to 85	Volts DC/Inch
D3 and D4	45 to 65	Volts DC/Inch
Deflection factor uniformity[8]	2%	Max.
Useful Scan[9]		
D1D2 (±2" minimum from tube face center)	4	Inches
D3D4 (±1 1/2" minimum from tube face center)	3	Inches
Pattern Distortion[10]	3%	Max.
Tracking Error[11]	0.060	Max. Inches
Interaction Factor[12]	20×10^{-6}	In./Volt DC Max.
Spot Position (Undeflected)[13]	Within a 10-mm square	
Focusing Electrode Current for any operating condition	-15 to +10	Microamperes

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MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance		1.5	Max. Megohms
Resistance in any Deflecting-Electrode Circuit	14	1.0	Max. Megohms

NOTES

1. Values are for each unit unless otherwise stated.

2. This tube is designed for optimum performance when operating at an Eb3/Eb2 ratio of 2.6. Operation at other ratios of Eb3/Eb2 may result in changes in deflection uniformity, pattern distortion, tracking error, and useful scan.

3. Values given are for balanced deflection voltages. These values are measured with the accelerator, astigmatism and pattern adjustment electrodes connected together.

4. The astigmatism electrode should be adjusted for optimum spot shape. For any necessary adjustment, its potential will fall within a range of ± 100 volts with respect to the accelerator voltage.

5. The pattern adjustment electrode should be adjusted for optimum performance. For any necessary adjustment, its potential will be within a range of -300 to +50 volts with respect to the mean D1D2 plate potential.

6. Visual extinction of the focused, undeflected spot.

7. For a beam current of 25 μADC., measured in accordance with MIL-E-1 specifications.
   a. For a beam current of 2 μADC., measured in accordance with MIL-E-1 specifications.

8. The deflection factor (for both D1D2 and D3D4 plate pairs, separately) for deflections of less than 75% of the useful scan will not differ from the deflection factor for a deflection of 25% of the useful scan by more than the indicated value.

9. Centered with respect to the tube face and with the tube shielded.

10. All portions of a raster pattern, adjusted so its widest points just touch the sides of a 4.120 x 1.545-inch rectangle, will fall within the area bounded by the 4.120 x 1.545-inch rectangle and an inscribed 3.880 x 1.455-inch rectangle.

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NOTES (Continued)

11. With two-inch vertical traces (D3D4) superimposed at the tube face center and deflected horizontally ± 2 inches by voltages proportional to the relative deflection factors, horizontal separation of corresponding points on the traces shall not be greater than the indicated value.

12. The deflection of one beam when balanced DC voltages are applied to the deflection-electrodes of the other beam will not be greater than the indicated value.

13. With the free deflecting electrodes connected to the accelerator, and the tube shielded against external influences, the undeflected, focused spot will fall within a 10-mm square centered with respect to the tube face center.

14. It is recommended that the deflecting-electrode circuit resistances be approximately equal. Higher resistance values up to 5.0 megohms may be used for low beam current operation.

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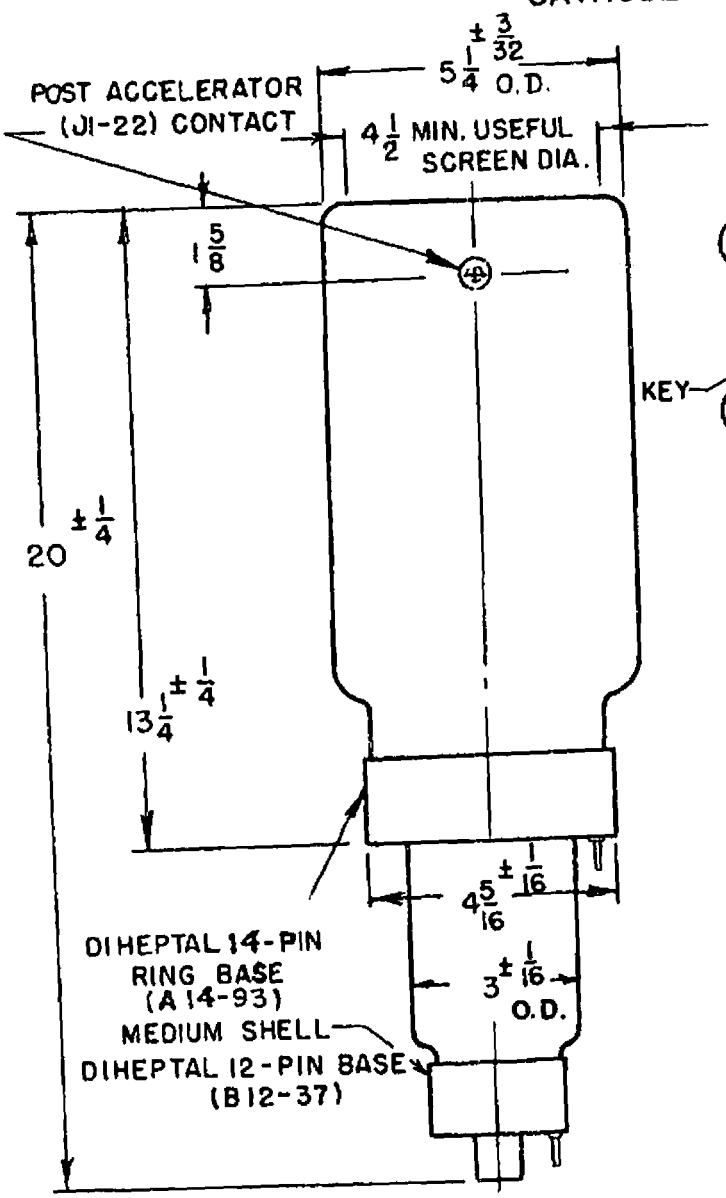
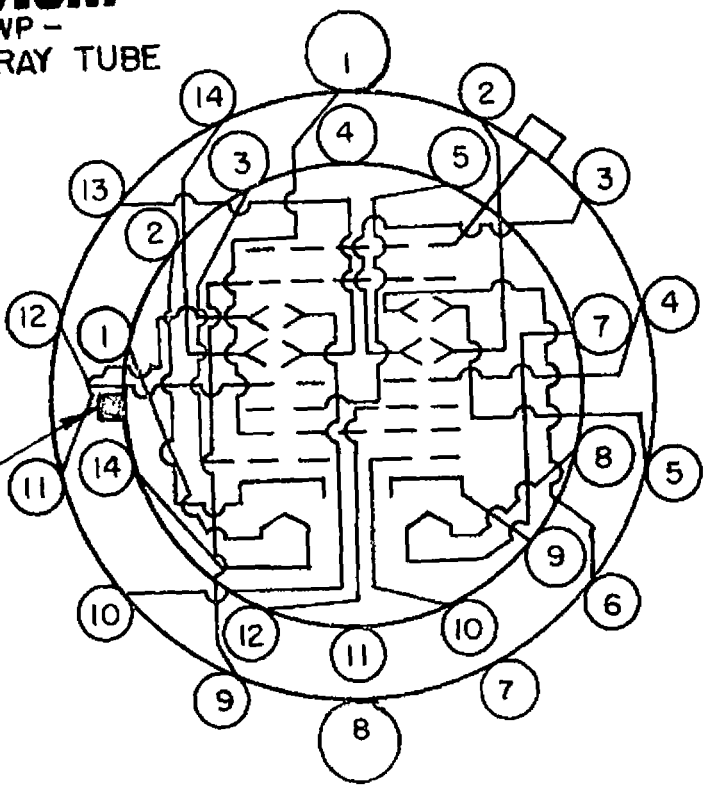
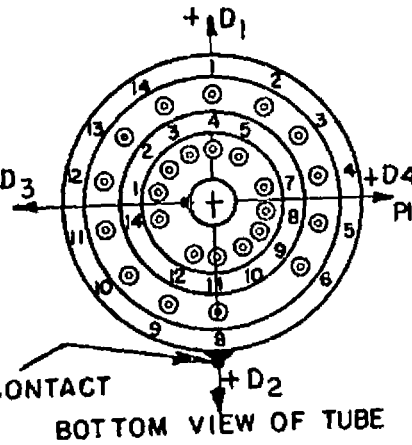




BASING

RING BASE

PIN NO.	ELEMENT
1	ACCELERATOR SHIELD
9	PATTERN ADJUSTMENT ELECTRODE
	GUN "B"
2	DEFLECTING ELECTRODE D_3
3	DEFLECTING ELECTRODE D_4
4	ASTIGMATISM CONTROL ELECTRODE
5	DEFLECTING ELECTRODE D_1
6	DEFLECTING ELECTRODE D_2
	GUN "A"
10	DEFLECTING ELECTRODE D_2
11	DEFLECTING ELECTRODE D_1
12	ASTIGMATISM CONTROL ELECTRODE
13	DEFLECTING ELECTRODE D_3
14	DEFLECTING ELECTRODE D_4



B12-37 BASE

PIN NO.	GUN "A" ELEMENT	PIN NO.	GUN "B" ELEMENT
1	HEATER	7	HEATER
2	CATHODE	8	HEATER
3	GRID NO. 1	9	CATHODE
5	FOCUSING ELECTRODE	10	GRID NO.1
14	HEATER	12	FOCUSING ELECTRODE

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