TYPE 5BDP- CATHODE-RAY TUBES

The Du Mont Type 5BDP- is a five inch, flat-faced, electrostatically focused and deflected Cathode-ray Tube with two independently controlled beams and incorporating an intensifier sub-divided into several steps. This feature permits operation at high voltages and ratios of intensifier to second anode voltage resulting in a high writing rate. The deflector leads are brought out directly through the bulb wall in order to minimize lead inductance and capacitance. To prevent film-fogging, and for maximum brightness and stability in performance, all screens are provided with a highly reflective metal backing.

Metallized screen types other than those listed below are available on special order.

GENERAL CHARACTERISTICS (Note 1)

Electrical Data

Heater Voltage			6.3 Volts	
Heater Current			0.6 ± 10% Amperes	
Focusing Method			Electrostatic	
Deflecting Method			Electrostatic	
Phosphor	No. 1	No. 2	No. 7	No. 11
Fluorescence	Green	Green	Blue	Blue
Phosphorescence	——	Green	Yellow	——
Persistence	Medium	Long	Long	Short
Direct Interelectrode Capacitances		Min.	Max.	
Cathode to all		3.4	4.4	μμf
Grid No. 1 to all		3.1	4.1	μμf
D1 to D2		1.8	2.7	μμf
D3 to D4		1.3	2.1	μμf
D1 to all		5.3	6.8	μμf
D2 to all		5.3	6.8	μμf
D3 to all		4.5	5.8	μμf
D4 to all		4.5	5.8	μμf

Mechanical Data

Overall Length ..... 18¼ ± ¼ Inches
Greatest Diameter of Bulb ..... 5¼ ± 3/32 Inches
Minimum Useful Screen Diameter ..... 4¼ Inches
Bulb Contacts — Recessed Small Ball Cap J1-22
Neck Contacts — Skirted Miniature C1-2
Base — Medium Shell Diheptal, 12 pin B12-37
Basing 14AB
Base Alignment
  Base Key aligns with the D1D2 trace ..... ± 10 Degrees
  Positive voltage on D2 deflects the beam approximately towards Base Key
  Positive voltage on D3 deflects the beam approximately towards Base Pin No. 4
Bulb Contact Alignment
  Bulb Contacts Align with D3D4 trace ..... ± 10 Degrees
Bulb Contacts on same side as Base Pin No. 4
Trace Alignment
  D1D2 trace aligns with D3D4 trace ..... 90 ± 2 Degrees
  Corresponding traces of each gun align within ..... ± 2 Degrees

MAXIMUM RATINGS (Design Center Values)

Post-Accelerator Voltage ..... 25,500 Max. Volts D-C
Accelerator Voltage (Note 2) ..... 3,500 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage ..... 10 Max.
Focusing Voltage ..... 1,550 Max. Volts D-C

Grid No. 1 Voltage	
Negative Bias Value	200 Max. Volts D-C
Positive Bias Value	0 Max. Volts D-C
Positive Peak Value	0 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	1,200 Max. Volts

TYPICAL OPERATING CONDITIONS

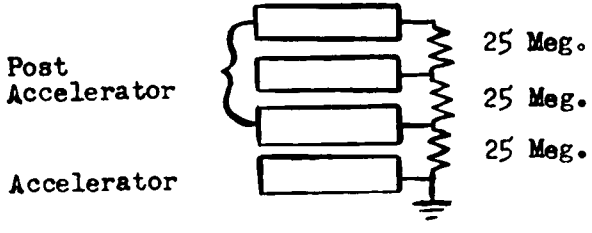
For Post-Accelerator Voltage of (Note 3)	14,000 Volts
For Accelerator Voltage of (Note 3)	2,000 Volts
Focusing Voltage	400 to 630 Volts
Grid No. 1 Voltage (Note 4)	—45 to —75 Volts
Modulation (Note 5)	45 Max. Volts
Line Width "A" (Note 5)	.020 Max. Inches
Line Width "B" (Note 5)	.024 Max. Inches
Interaction Factor: (Note 6)	14×10^{-6} In./Volt D-C Max.
Deflection Factors:	
D1 and D2	130 to 160 Volts D-C/Inch
D3 and D4	111 to 133 Volts D-C/Inch
Spot Position (Undeflected) (Note 7)	Within a 16 mm Square
Useful Scan (Note 8)	
Pattern Distortion (Note 9 & 10)	

CIRCUIT DESIGN VALUES

Focusing Voltage	200 to 315 Volts per Kilovolt of Accelerator Voltage
Focusing Current for any operating conditions	—15 to +10 Microamperes
Grid No. 1 Voltage (Note 4)	—22.5 to —37.5 Volts per Kilovolt of Accelerator Voltage
Grid No. 1 Circuit Resistance	1.5 Max. Megohms
Resistance in any Deflecting-Electrode Circuit (Note 11)	1.0 Max. Megohm

NOTES

1. Values are for each unit unless otherwise stated.
2. Accelerator power input (Avg.) should be limited to six watts. At 100 μA D-C beam current, the cathode current shall not exceed 2 mA D-C. To protect tube against damage this measurement should be taken by pulsing the grid from cutoff to the specified beam current at a 10% cycle and multiplying the current meter readings by 10.
3. Equally divided over the three intensifier electrodes.
   Suggested method of connection:



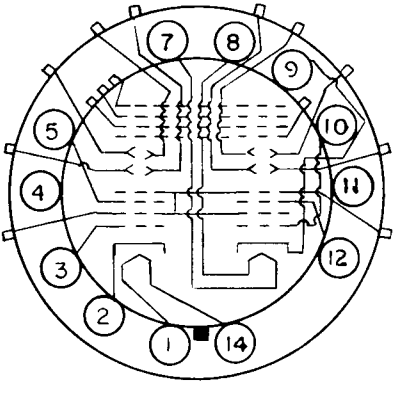
4. Visual extinction of undeflected focused spot.
5. For an Ib3 of 50 μA D-C.
6. The deflection of one beam when balanced D-C voltages are applied to the deflection electrodes of the other beam will not be greater than the specified value.
7. With the tube shielded against external influences, Eb3 = 14,000 volts, Eb2 = 2,000 volts, and Eb1 adjusted for focus centered with respect to the tube face.

8. Minimum useful scan diameter is limited at high ratios of Eb3/Eb2 to 4 inches at 5:1, 3.5 inches at 7:1 and 2.5 inches at 10:1.

9. The total vertical movement of the upper edge of a 3 inch vertical trace, (centered with respect to the tube face), deflected horizontally 1.5 inches to the left and right of the center of the tube face, shall not exceed 0.12 inch. The total vertical movement of the lower edge of the 3 inch trace also shall not exceed 0.12 inch. The D3D4 trace shall be considered vertical.

10. The sum of the total horizontal movement of the left and right edges of a 3 inch horizontal trace, (centered with respect to the tube face), deflected vertically 1.5 inches above and below the center of the tube face, shall not exceed 0.12 inch. The D1D2 trace shall be considered horizontal.

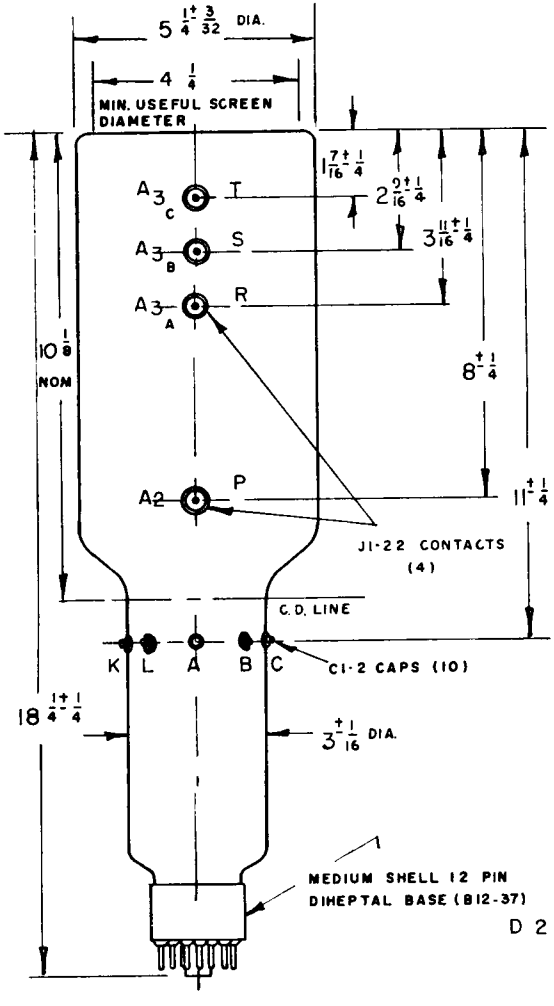
11. It is recommended that the deflecting electrode circuit resistances be approximately equal. Higher resistance values up to 5.0 megohms may be used for low beam current operation.



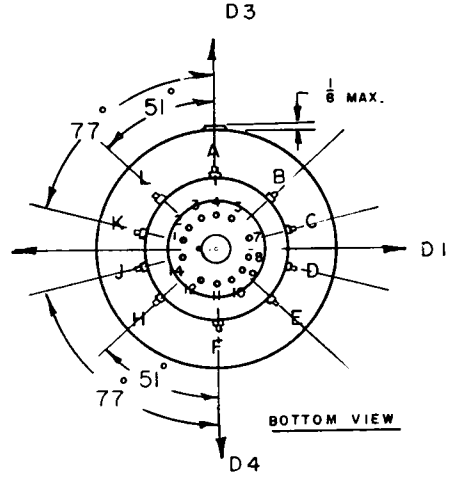
BOTTOM VIEW

UNIT A		UNIT B	
PIN NO.	ELEMENT	PIN NO.	ELEMENT
1	HEATER	7	HEATER
2	CATHODE	8	HEATER
3	GRID NO. 1	9	CATHODE
4	NO CONNECTION	10	GRID NO. 1
5	FOCUSING ELECTRODE	11	NO CONNECTION
14	HEATER	12	FOCUSING ELECTRODE

TYPE 5BDP-



ENVELOPE TERMINALS	CORRESPONDING INTERNAL ELEMENTS
A	ACCELERATOR- GUNS A B B
	GUN - B
B	RIGHT HORIZ. DEFL. PLATE
C	LEFT HORIZ. DEFL. PLATE
D	UPPER VERT. DEFL. PLATE
E	LOWER VERT. DEFL. PLATE
F	ACCELERATOR- GUNS A B B
	GUN - A
H	LEFT HORIZ. DEFL. PLATE
J	RIGHT HORIZ. DEFL. PLATE
K	LOWER VERT. DEFL. PLATE
L	UPPER VERT. DEFL. PLATE
P	FIRST BAND- ACCELERATOR
R	POST ACCELERATOR - 3A (INTENSIFIER) LOWER POTENTIAL
S	POST ACCELERATOR-3B (INTENSIFIER) MEDIUM POTENTIAL
T	POST ACCELERATOR-3C (INTENSIFIER) HIGHEST POTENTIAL



NOTE 1- BULB CONTACTS AND BASE PIN NO. 4 ALIGN WITH D3 D4 TRACE ± 10 DEGREES.

2- ANGULAR DIMENSIONS HAVE A TOLERANCE OF ± 5 DEGREES.

3. THE BULB SHALL BE A TYPE J42-M1 WITHOUT CONTACTS.

TYPE 5BDP-
AVERAGE CHARACTERISTICS