4DP- CATHODE-RAY TUBES

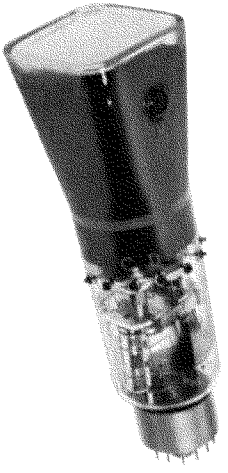
The Du Mont Type 4DP- is a dual-beam cathode-ray tube featuring the usable screen area of 5-inch tubes without occupying the space a five-inch tube requires. The 3.5-inch *square* faceplate of the 4DP- is partly responsible for this feature. Short overall length adds further to the space-saving design.

The two electron guns mounted in the 4DP- are completely independent of one another except for common accelerator and post-accelerator connections. In addition, deflection-plate and accelerator electrode leads are brought out through the tube wall for minimum capacitances and as insulation from other terminals.

Post-acceleration of the electron streams provides greater trace brilliance with minimum sacrifice in deflection sensitivity. Increased deflection sensitivity appreciably reduces the necessary gain of driver-amplifiers.

Du Mont's exclusive tight-tolerance manufacturing technique results in excellent tracking accuracy between beams.

Screen types other than those listed are available on order.



GENERAL CHARACTERISTICS (Note 1)

Electrical Data

Heater Voltage			6.3 Volts	
Heater Current			0.6 ± 10% Ampere	
Deflection Method			Electrostatic	
Focusing 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 other electrodes	3.6	5.0	μμf
Grid No. 1 to all other electrodes	3.7	5.1	μμf
D1 to D2	1.5	2.3	μμf
D3 to D4	1.5	2.3	μμf
D1 to all	4.0	5.3	μμf
D2 to all	4.0	5.3	μμf
D3 to all	4.8	6.5	μμf
D4 to all	4.8	6.5	μμf

Mechanical Data

Overall Length	12¼ ± ¼ Inches
Greatest Bulb Dimension (Diagonal)	4¼ ± 3/32 Inches
Minimum Useful Screen Dimensions (Rounded Corners)	2⅞ x 2⅞ Inches
Bulb Contacts (Post Accelerator)	
Recessed Small Ball Cap	J1-22
Bulb Contacts (Accelerator and Deflection Electrodes)	
Small Ball Cap	J1-25
Base — Medium Shell Diheptal, 12 Pin	B12-37
Basing	14Y
Base Alignment	
D3D4 trace aligns with Base Key and Tube Axis	± 10 Degrees
Positive Voltage on D1 deflects the beam approximately toward Pin. No. 4	
Positive Voltage on D3 deflects the beam approximately toward the Base Key	

Bulb Contact Alignment
Post Accelerator and Accelerator Contacts align with D1D2 trace ..... ± 10 Degrees
Bulb Contact (J1-22) on same side as Base Pin No. 4
Trace Alignment
Angle between D1D2 and D3D4 traces ..... 90 ± 2 Degrees
Corresponding traces of each gun align within ..... ± 2 Degrees
D1D2 trace aligns with bulb wall ..... ± 3 Degrees

MAXIMUM RATINGS (Design Center Values)

Post-Accelerator Voltage ..... 6000 Max. Volts D-C
Accelerator Voltage ..... 3000 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage (Note 2) ..... 2.0 Max.
Focusing Voltage ..... 1500 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
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 Electrodes ..... 750 Volts

TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage of ..... 4000 Volts D-C
For Accelerator Voltage of ..... 2000 Volts D-C
Focusing Voltage ..... 335 to 615 Volts D-C
Grid No. 1 Voltage (Note 3) ..... —52 to —87 Volts D-C
Modulation (Note 4) ..... 35 Max. Volts D-C
Line Width "A" (Note 5) ..... .024 Max. Inches
Deflection Factors:
D1 and D2 ..... 115 to 140 Volts D-C/Inch
D3 and D4 ..... 90 to 115 Volts D-C/Inch
Spot Position (Note 6) ..... Within 5/8 Inch Square
Tracking Error (Note 7)

CIRCUIT DESIGN VALUES

Focusing Voltage ..... 167 to 308 Volts per Kilovolt of Accelerator Voltage
Focusing Current for any operating condition ..... —15 to +10 Microamperes
Grid No. 1 Voltage (Note 3) ..... —26 to —44 Volts per Kilovolt of Accelerator Voltage
Grid No. 1 Circuit Resistance ..... 1.5 Max. Megohms
Deflection Factors:
Ratio Post-Accelerator Voltage to Accelerator Voltage 1.0
D1 and D2 ..... 44 to 54 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4 ..... 39 to 50 Volts D-C/Inch/KV of Accelerator Voltage
Ratio Post-Accelerator Voltage to Accelerator Voltage 2.0
D1 and D2 ..... 57.5 to 70 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4 ..... 45 to 57.5 Volts D-C/Inch/KV of Accelerator Voltage
Resistance in any Deflection Electrode Circuit (Note 8) ..... 1.0 Max. Megohms

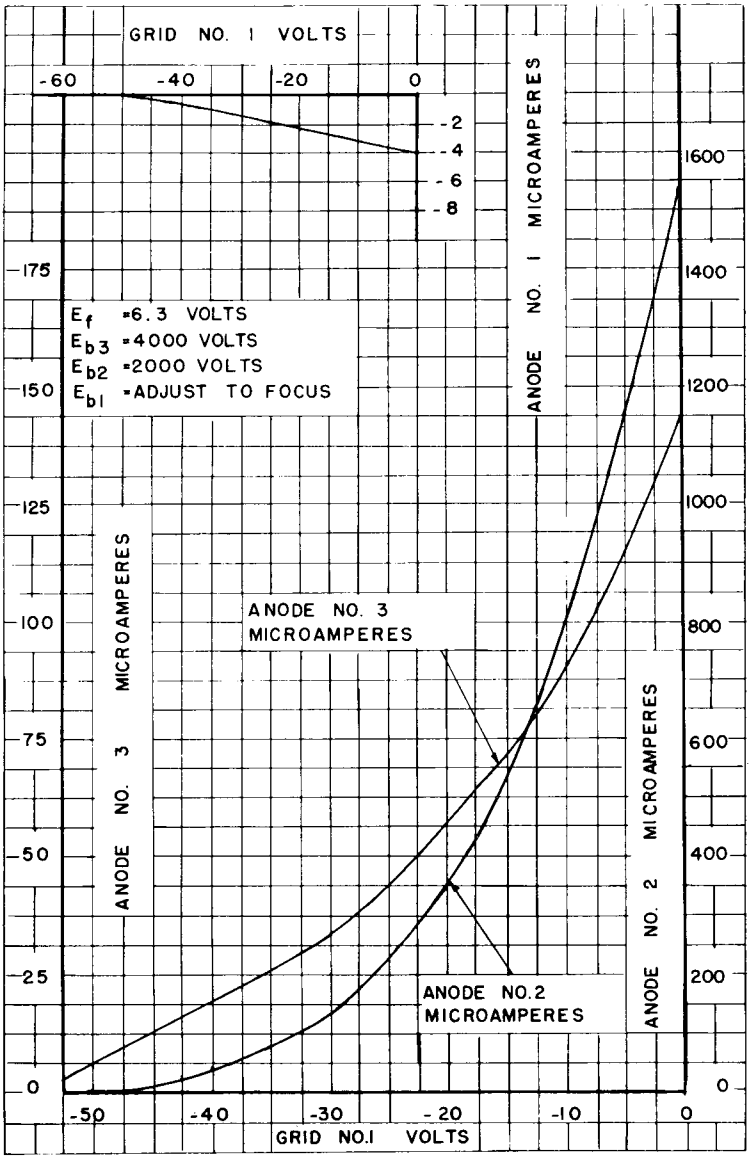
NOTES

1. The values shown are for each unit unless otherwise stated. All tests are to be made on each gun separately.
2. This tube is designed for optimum performance when operating at an Eb3/Eb2 ratio of 2.0. Operation at other ratios of Eb3/Eb2 may result in changes in deflection uniformity, pattern distortion, and tracking accuracy.
3. The visual extinction of the focused, undeflected spot.
4. The increase in Grid No. 1 voltage from cut-off to produce an Ib3 of 25 μAD-C.
5. Measured in accordance with MIL-E-1 specifications, using an Ib3 of 25 μAD-C.
6. When the tube is operated at typical operating conditions, and with (1) Eb1 adjusted for focus, (2) Ec1 set at such a value as will avoid damage to the screen, (3) each of the deflecting electrodes connected to the accelerator and (4) the tube shielded against external influences; the spots will fall within a 5/8 inch square, the center of which coincides with the geometric center of the tube face, and the sides of which are parallel to the traces produced by deflecting electrodes D1 and D2 and by deflecting electrodes D3 and D4 respectively.
7. The tracking accuracy over an area bounded by ± 1-7/16 inches from the geometric center of the tube in the D1D2 plane and ± 1 1/8 inches in the D3D4 plane shall be such that if the two spots are made coincident at the tube face center and then each

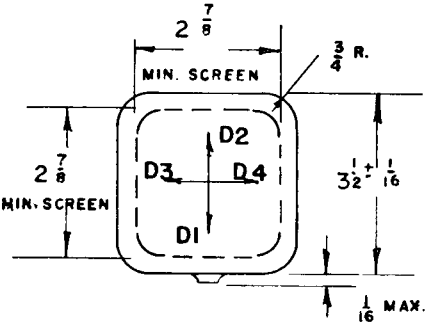
is moved to any spot within above area by means of deflection voltages that should give corresponding deflections in the D1D2 or D3D4 direction from the tube face center, the two spots will lie within 0.043 of an inch of each other.

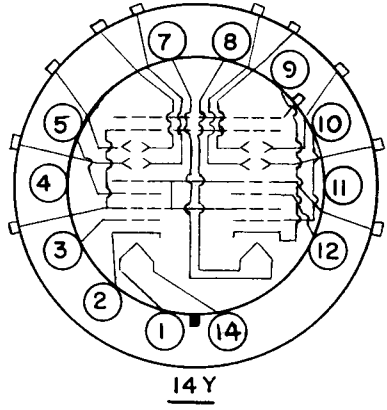
8. It is recommended that the deflection electrode circuit resistance be approximately equal. Higher resistance values up to 5.0 megohms may be used for low beam current operation.
9. After compensation for deflection sensitivity and centering, the deviation of the D1D2 trace shall not vary from a straight line tangent to the trace by more than .050 of an inch at ± 1⅛ inches from the geometric center of the tube face.

TYPE 4DP-
AVERAGE CHARACTERISTICS

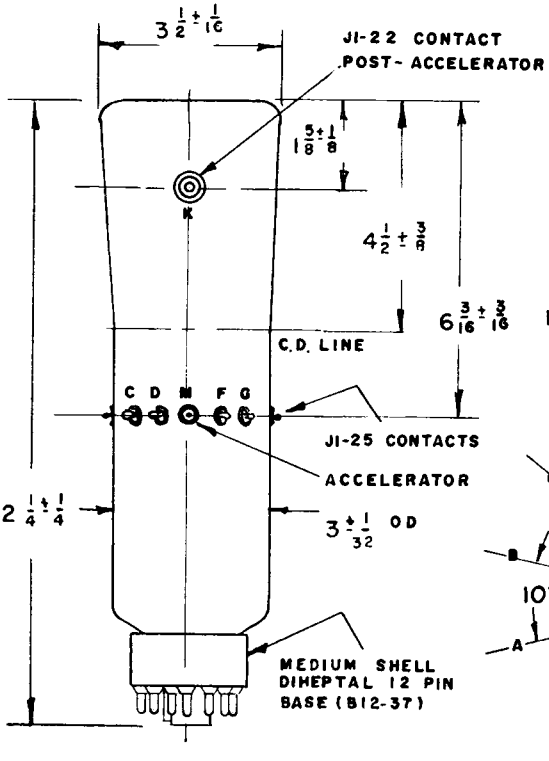


TYPE 4DP-

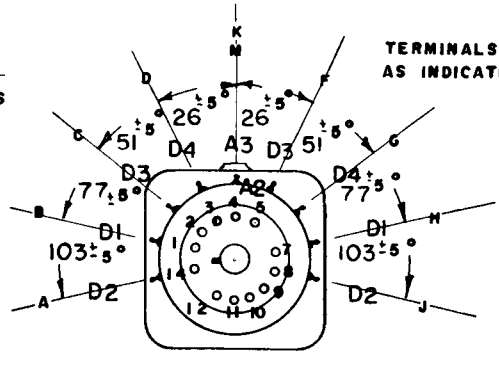




14Y



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



BOTTOM VIEW

TERMINALS MARKED AS INDICATED

NOTE: 1. ANGLES WITH RESPECT TO ACCELERATOR CONTACT.
2. THE BULB SHALL BE A TYPE J28-B1