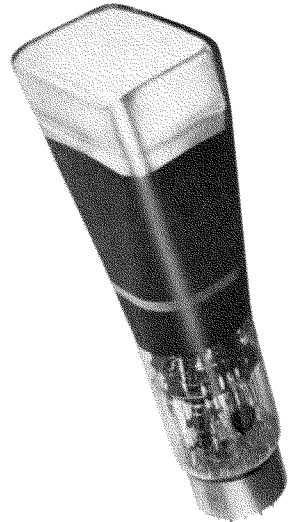


# 7ACP- CATHODE-RAY TUBE

The Du Mont Type 7ACP- is a 4 x 6 inch rectangular, three beam, electrostatic focus and deflection cathode-ray tube. Each beam is independent of the other except for accelerating potentials and heater connections. Post-acceleration is used to obtain maximum deflection sensitivity with high brightness. The electron gun structures are so designed as to require no appreciable focusing current. As many of the electrode connections as is practical have been brought out through the base pins in order to simplify the problem of connection. The Post-accelerator is connected to a bulb contact in order to obtain maximum insulation. For maximum brightness and stability in performance, all screens are provided with a highly reflective metal backing.



## GENERAL CHARACTERISTICS (Note 1)

### Electrical Data

Heater Voltage .....	6.3 Volts
Heater Current (All units) .....	1.8 ± 10% Amperes
Focusing Method .....	Electrostatic
Deflecting Method .....	Electrostatic

Phosphor	No. 2	No. 7	No. 19
Fluorescence	Green	Blue	Orange
Phosphorescence	Green	Yellow	Orange
Persistence	Long	Long	Long

Direct Interelectrode Capacitances	Min.	Max.	
Cathode to all other electrodes .....	5.0	7.0	μμf
Grid No. 1 to all other electrodes .....	5.0	7.0	μμf
D1 to D2 .....	2.2	4.0	μμf
D3 to D4 .....	1.4	2.8	μμf
D1 to all other electrodes .....	9.5	13.2	μμf
D2 to all other electrodes .....	9.3	13.2	μμf
D3 to all other electrodes .....	8.0	11.0	μμf
D4 to all other electrodes .....	8.0	11.0	μμf

### Mechanical Data

Overall Length .....	17 <sup>3</sup> / <sub>4</sub> ± <sup>3</sup> / <sub>8</sub> Inches
Greatest Bulb Dimension (Diagonal) .....	6 <sup>5</sup> / <sub>8</sub> ± 1/16 Inches
Minimum Screen Dimensions (Along Tube Axes) .....	3 <sup>1</sup> / <sub>4</sub> x 5 <sup>1</sup> / <sub>4</sub> Inches
Bulb Contact (Recessed Small Ball Cap) .....	J1-22
Base (25 Pin) .....	B25-139
Basing .....	Special

Base Alignment	
D3D4 trace aligns with Base Key and Tube Axis .....	± 10 Degrees
Positive voltage on D1 deflects beam approximately towards Pin No. 18	
Positive voltage on D3 deflects beam approximately towards Base Key	

Bulb Contact Alignment	
Bulb contact located on tube center line .....	± 1/4 Inch
Bulb contact on same side as Base Key	

Trace Alignment	
Angle between D1D2 and D3D4 traces .....	90 ± 2 Degrees
Corresponding traces of each gun align within .....	± 2 Degrees
D3D4 trace aligns with Bulb Side Wall .....	± 3 Degrees

## MAXIMUM RATINGS (Design Center Values)

Post-Accelerator Voltage .....	10,500 Max. Volts D-C
Accelerator Voltage (Note 2) .....	3,500 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage (Note 3) .....	3.0 Max.
Focusing Voltage .....	2,700 Max. Volts D-C
Grid No. 1 Voltage	
Negative Bias Value .....	300 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 Electrode .....	1,000 Volts

## TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage of .....	9,000 Volts D-C
For Accelerator Voltage of .....	3,000 Volts D-C
Focusing Voltage .....	595 to 1020 Volts D-C
Grid No. 1 Voltage (Note 4) .....	-67 to -112 Volts D-C
	Phosphors Nos. 2 & 7      No. 19
Modulation .....	15 (Note 5)      20 (Note 6) Max. Volts D-C
Line Width "A" .....	.036 (Note 7)      .024 (Note 8) Max. Inches
Light Output (Note 9) .....	100 (P2) Min. Ft. Lamberts
Deflection Factors:	
D1 and D2 .....	86 to 130 Volts D-C/Inch
D3 and D4 .....	84 to 126 Volts D-C/Inch
Useful Scan (Note 10)	
Spot Position (Note 11) .....	Within 15 mm Square

## CIRCUIT DESIGN VALUES

Focusing Voltage .....	198 to 340 Volts per Kilovolt of Accelerator Voltage
Focusing Current for any operating condition .....	-15 to +10 Microamperes
Grid No. 1 Voltage (Note 4) .....	-37.5 to -22 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 .....	19 to 29 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4 .....	19.5 to 30 Volts D-C/Inch/KV of Accelerator Voltage
Ratio Post-Accelerator Voltage to Accelerator Voltage .....	3.0
D1 and D2 .....	28.5 to 43.5 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4 .....	28 to 42 Volts D-C/Inch/KV of Accelerator Voltage
Resistance in any Deflection Electrode Circuit (Note 12) .....	1.0 Max. Megohms

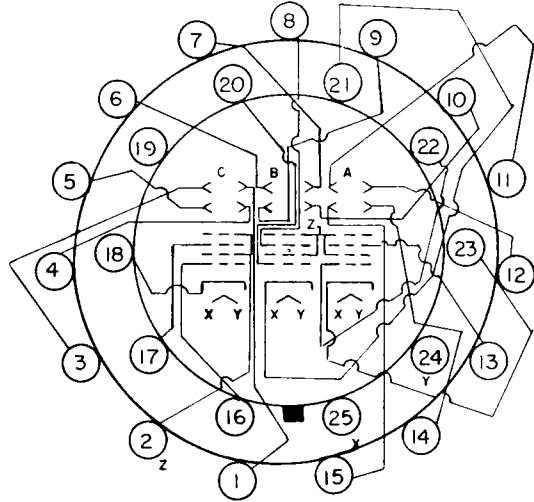
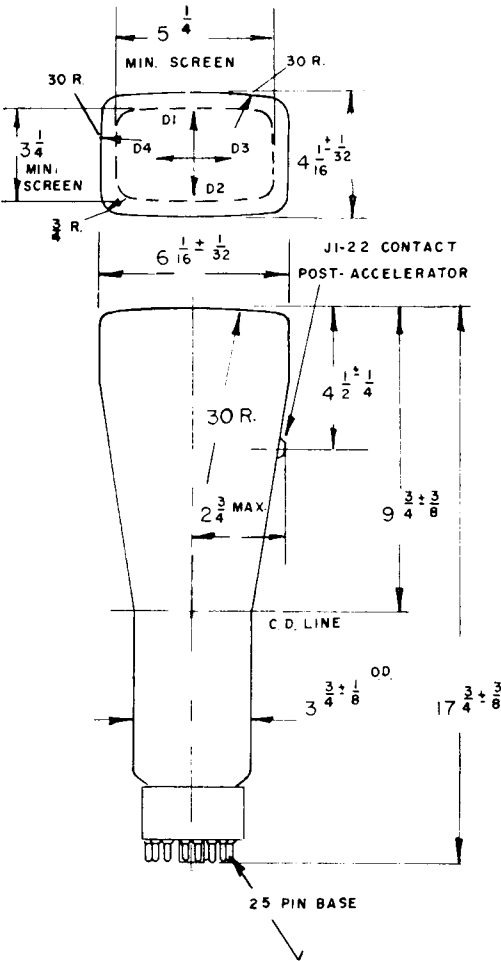
## NOTES

1. All tests to be made on each gun separately. Values are for each unit unless otherwise stated.
2. Accelerator power input (Avg.) should be limited to six watts. The P19 screen can be permanently damaged if the current density is permitted to rise too high. To prevent burning, minimum beam current densities should be employed.
3. This tube is designed for optimum performance when operating at an Eb3/Eb2 ratio of 3.0. Operation at other ratios of Eb3/Eb2 may result in changes in deflection uniformity and pattern distortion.
4. For visual extinction of the focused undeflected spot.
5. The increase in Grid No. 1 voltage from cut-off to produce an Ib3 of 50  $\mu$ AD-C.
6. The increase in Grid No. 1 voltage from cut-off to produce an Ib3 of 5  $\mu$ AD-C.
7. Measured in accordance with MIL-E-1 specifications using an Ib3 of 50  $\mu$ AD-C.
8. Measured in accordance with MIL-E-1 specifications using an Ib3 of 5  $\mu$ AD-C.
9. P2 and P7 Light Output — Measured in accordance with MIL-E-1 specifications with an Ib3 of 50  $\mu$ AD-C.
10. The minimum useful scan of Guns A and C is:  
D1D2 = 3.0 inches and D3D4 = 2.25 inches.  
The minimum useful scan of Gun B is:  
D1D2 = 3.0 inches and D3D4 = 3.0 inches.
11. 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 15 mm squares, the

centers of which are 1.5 inches from the geometric center of the tube face towards the bulb contact for guns A and C and 1.0 inch from the geometric center of the tube face away from the bulb contact for gun B, and the sides of which are parallel to the traces produced by deflecting electrodes D3 and D4 respectively.

12. It is recommended that the deflection electrode circuit resistances be approximately equal. Higher resistance values up to 5 megohms may be used for low beam current operation.

TYPE 7ACP-



BOTTOM VIEW

PIN NO.	ELEMENT
2	ACCELERATOR COMMON (Z)
24	HEATER COMMON (Y)
25	HEATER COMMON (X)
UNIT A	
11	DEFLECTOR D1
12	DEFLECTOR D2
13	FOCUSING ELECTRODE
14	DEFLECTOR D3
15	DEFLECTOR D4
22	GRID NO 1
23	CATHODE
UNIT B	
6	DEFLECTOR D1
7	DEFLECTOR D2
8	FOCUSING ELECTRODE
9	DEFLECTOR D4
10	DEFLECTOR D3
20	GRID NO 1
21	CATHODE
UNIT C	
1	DEFLECTOR D2
3	DEFLECTOR D1
4	DEFLECTOR D3
5	DEFLECTOR D4
16	GRID NO 1
17	FOCUSING ELECTRODE
18	CATHODE

TYPE 7ACP-  
AVERAGE CHARACTERISTICS

