



## CATHODE-RAY TUBE

### TYPE 4FP-

The Du Mont Type 4FP- is a 3 1/2-inch square, single beam, electrostatic deflection and focus cathode-ray tube designed to scan the full useful screen area. The deflection electrodes and accelerator leads are brought out through the neck in order to produce maximum insulation while minimizing inductance and capacitance. Post acceleration is used to obtain high brightness with small spot size.

## GENERAL CHARACTERISTICS

### Electrical Data

Focusing Method  
Deflection Method

Electrostatic  
Electrostatic

#### Direct Interelectrode Capacitances, Approximate

|                                    |      |     |
|------------------------------------|------|-----|
| Cathode to all other electrodes    | 3.90 | μμf |
| Grid No. 1 to all other electrodes | 6.20 | μμf |
| D1 to D2                           | 1.75 | μμf |
| D3 to D4                           | 1.00 | μμf |
| D1 to all other electrodes         | 3.90 | μμf |
| D2 to all other electrodes         | 4.15 | μμf |
| D3 to all other electrodes         | 2.95 | μμf |
| D4 to all other electrodes         | 2.80 | μμf |

### Optical Data

| Phosphor No.    | 1      | 2          | 7          | 11    |
|-----------------|--------|------------|------------|-------|
| Fluorescence    | Green  | Blue-Green | Blue-White | Blue  |
| Phosphorescence | Green  | Green      | Yellow     | ----  |
| Persistence     | Medium | Long       | Long       | Short |

### Mechanical Data

|                                   |              |        |
|-----------------------------------|--------------|--------|
| Overall Length                    | 12 ± 1/4     | Inches |
| Greatest Bulb Dimensions:         |              |        |
| Height                            | 3 1/2 ± 1/16 | Inches |
| Width                             | 3 1/2 ± 1/16 | Inches |
| Diagonal                          | 4 1/4 ± 3/32 | Inches |
| Minimum Useful Screen Dimensions: |              |        |
| Width                             | 2 7/8        | Inches |
| Height                            | 2 7/8        | Inches |

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GENERAL CHARACTERISTICS (Mechanical Data) (Continued)

|                                                                         |            |         |
|-------------------------------------------------------------------------|------------|---------|
| Bulb Contact                                                            | J1-22      |         |
| Neck Contacts                                                           | J1-25      |         |
| Base (Medium Shell Diheptal, 12-Pin)                                    | B12-37     |         |
| Basing                                                                  | 14Q        |         |
| Base Alignment:                                                         |            |         |
| D1D2 trace aligns with Pin No. 4 and tube axis                          | $\pm 10$   | Degrees |
| Positive voltage on D1 deflects beam approximately toward Pin No. 11    |            |         |
| Positive voltage on D3 deflects beam approximately toward J1-22 contact |            |         |
| Bulb Contact Alignment:                                                 |            |         |
| J1-22 contact aligns with D3D4 trace                                    | $\pm 10$   | Degrees |
| J1-22 contact on same side as Pin No. 7                                 |            |         |
| Centerline of J1-22 contact lies on centerline of side wall             | $\pm 3/16$ | Inch    |
| Trace Alignment:                                                        |            |         |
| Angle between D3D4 and D1D2 traces                                      | $90 \pm 1$ | Degrees |
| D3D4 trace aligns with bulb wall                                        | $\pm 3$    | Degrees |

MAXIMUM RATINGS (Design Maximum Values)

|                                                               |                |               |
|---------------------------------------------------------------|----------------|---------------|
| Heater Voltage                                                | 6.3            | Volts         |
| Heater Current at 6.3 Volts                                   | $0.6 \pm 10\%$ | Ampere        |
| Post Accelerator Voltage                                      | 6600           | Max. Volts DC |
| Accelerator Voltage                                           | 3300           | Max. Volts DC |
| Ratio Post Accelerator Voltage to Accelerator Voltage         | 2.0            | Max.          |
| Accelerator Input (Average)                                   | 6              | Max. Watts    |
| Focusing Voltage                                              | 1650           | Max. Volts DC |
| 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                       | 180            | Max. Volts    |
| Heater Positive with respect to cathode                       | 180            | Max. Volts    |
| Peak Voltage between Accelerator and any deflection electrode | 750            | Volts         |

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# DUMONT

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#### TYPICAL OPERATING CONDITIONS

|                                    |                       |               |
|------------------------------------|-----------------------|---------------|
| Post Accelerator Voltage           | 4000                  | Volts DC      |
| Accelerator Voltage                | 2000                  | Volts DC      |
| Focusing Voltage                   | 335 to 615            | Volts DC      |
| Focusing Voltage <sup>1</sup>      | 430 to 470            | Volts DC      |
| Grid No. 1 Voltage <sup>2</sup>    | -52 to -87            | Volts DC      |
| Deflection Factors:                |                       |               |
| D1D2                               | 105 to 145            | Volts DC/Inch |
| D3D4                               | 85 to 115             | Volts DC/Inch |
| Line Width "A" <sup>3</sup>        | .017                  | Inch Max.     |
| Modulation <sup>3</sup>            | 35                    | Volts Max.    |
| Deflection Distortion <sup>4</sup> |                       |               |
| Spot Position <sup>5</sup>         | Within a 10-mm Square |               |
| Useful Scans:                      |                       |               |
| D1D2                               | Full Scan             |               |
| D3D4                               | Full Scan             |               |

#### CIRCUIT DESIGN VALUES

|                                                             |     |              |
|-------------------------------------------------------------|-----|--------------|
| Grid No. 1 Circuit Resistance                               | 1.5 | Max. Megohms |
| Resistance in any Deflection-Electrode Circuit <sup>6</sup> | 1.0 | Max. Megohms |

### NOTES

1. For a vertical trace 2.5 inches at a post accelerator current of 2  $\mu$ A.
2. For visual extinction of the focused, undeflected spot.
3. Measured in accordance with MIL-E-1 specifications at a post accelerator current of 25  $\mu$ ADC.

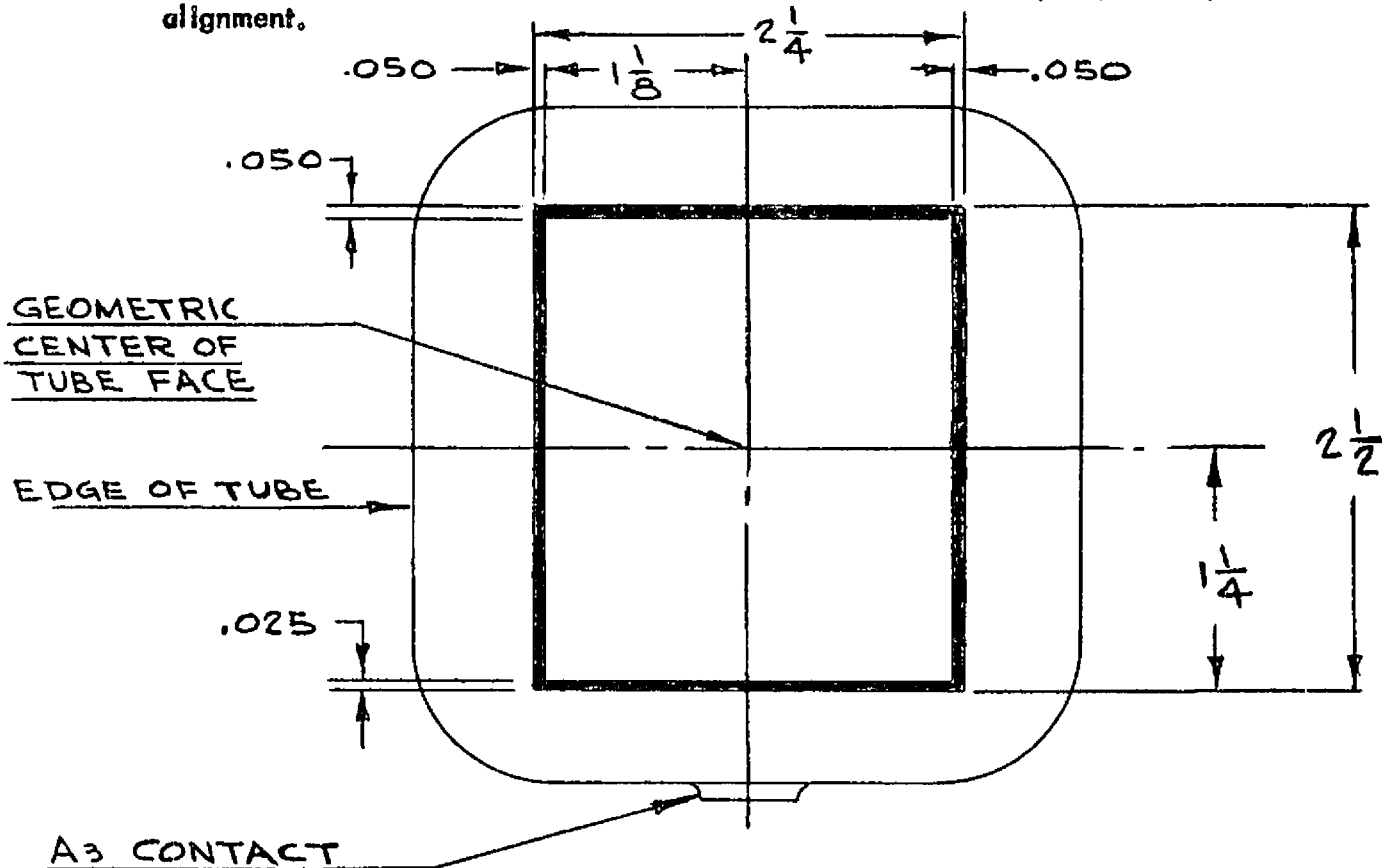
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NOTES  
(Continued)

4. The edges of a focused raster pattern  $2 \frac{1}{4}$  inches wide and  $2 \frac{1}{2}$  inches high, centered with respect to the tube face, will fall within the shaded area formed by the two rectangles as shown below.

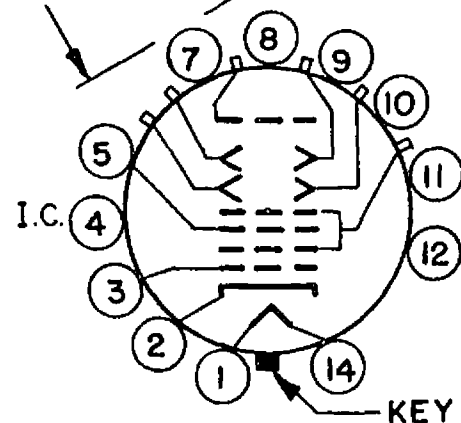
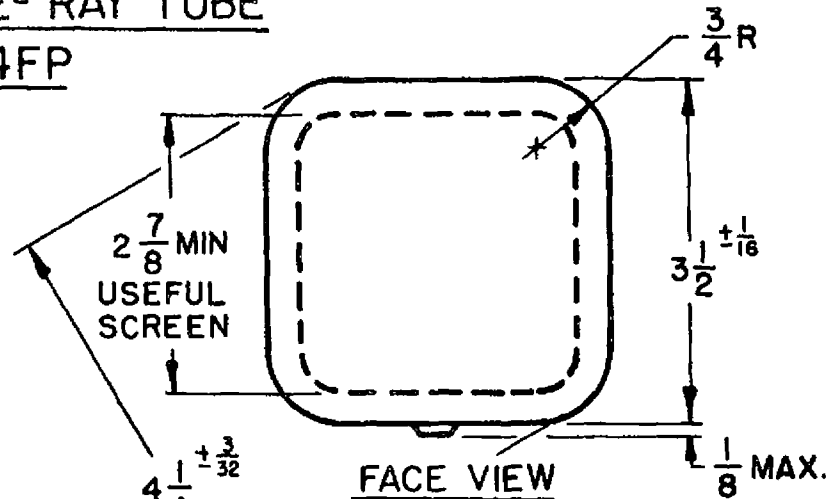
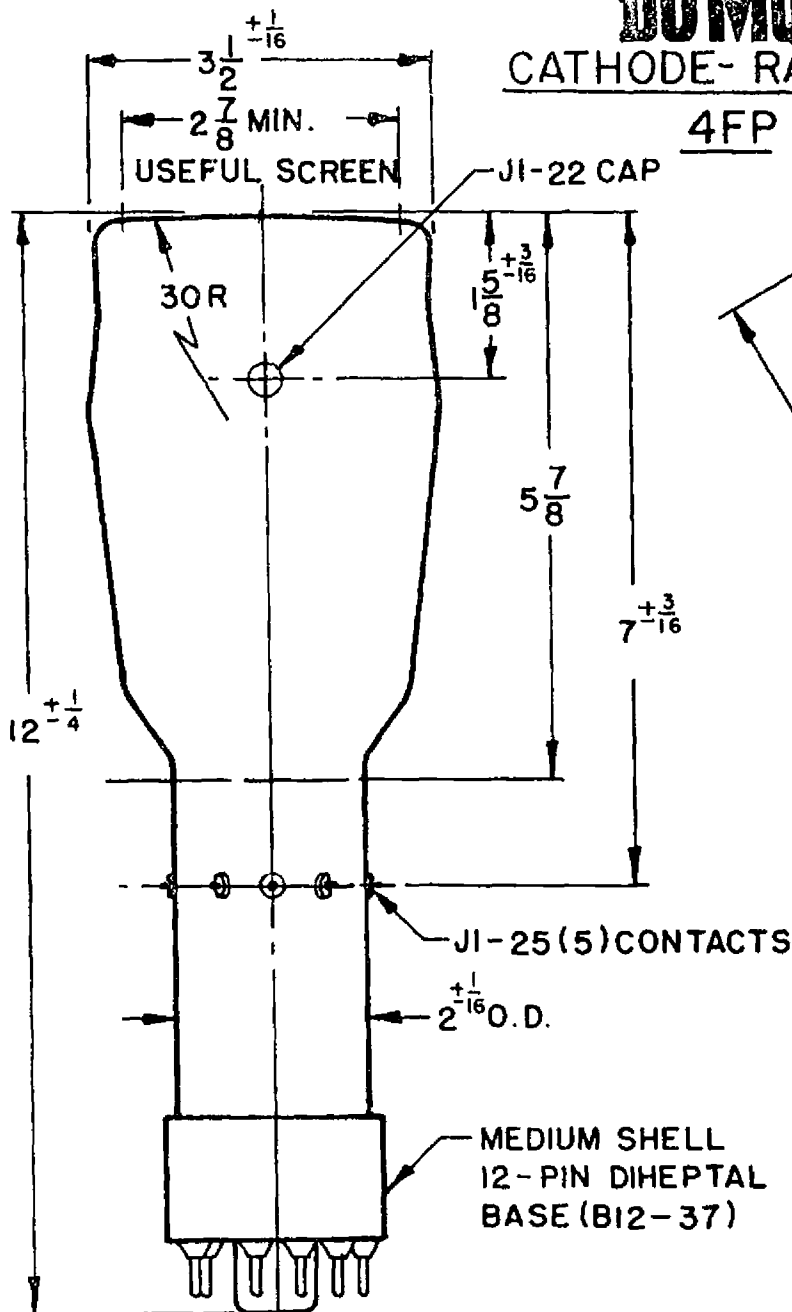
This test shall include all deviations including pattern distortion, keystoneing, and angle alignment.



5. With the deflecting electrodes connected to the accelerator, and the tube shielded against external influences, the focused spot will fall within a 10-mm square centered with respect to the tube face and the sides of the square parallel to the traces produced by the deflection plate pairs.
6. 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.

# **DU MONT** CATHODE-RAY TUBE

**4FP**



**BOTTOM VIEW**

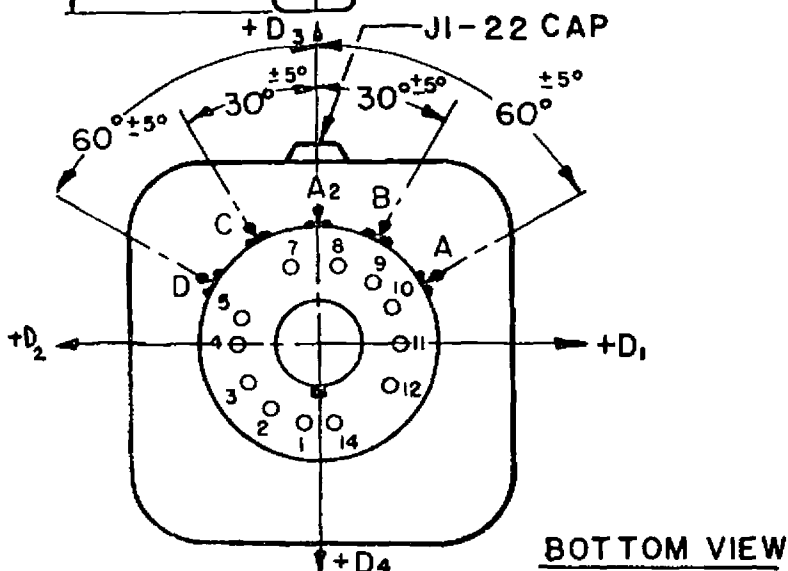
| PIN NO. | ELEMENT             |
|---------|---------------------|
| 1       | HEATER              |
| 2       | CATHODE             |
| 3       | GRID NO.1           |
| 4       | INTERNAL CONNECTION |
| 5       | FOCUSING ELECTRODE  |
| 14      | HEATER              |
| CAP     | POST ACCELERATOR    |

## TERMINALS

- A — DEFLECTING ELECTRODE-D<sub>1</sub>
- B — DEFLECTING ELECTRODE-D<sub>2</sub>
- C — DEFLECTING ELECTRODE-D<sub>3</sub>
- D — DEFLECTING ELECTRODE-D<sub>4</sub>
- A<sub>2</sub> — ACCELERATOR

## NOTE:

1. J1-22 CAP LOCATED ON TUBE CENTER LINE  $\pm \frac{3}{16}$  INCH.



**BOTTOM VIEW**

Allen B. Du Mont Laboratories, Inc.  
Clifton, New Jersey

TD-4836-2

2-19-60

FORM 809-CB-4-55-5M

