7YP- CATHODE-RAY TUBE

The Du Mont Type 7YP- is a seven-inch diagonal, square-faced flat-faced, electrostatically deflected and focused cathode-ray tube containing five electron-guns in a single glass envelope. Each electron beam may be independently focused, deflected and intensity-modulated. The single post-accelerator is common to all the electron-guns. The Type 7YP- is one of the line of Du Mont tight-tolerance cathode-ray tubes.

The Type 7YP- is utilized in those applications requiring the display of five independent phenomena on a single cathode-ray tube screen for comparison and observation. Each of the electron guns is positioned to scan adjacent separate areas of the screen and the 3D4 scan of each is limited to provide maximum sensitivity on this axis. The deflection electrode and accelerator connections are brought out through the bulb wall to minimize lead inductance and capacity and to improve insulation. A collar or ring-base provides easy connections to these leads.

GENERAL CHARACTERISTICS (Note 1)

Electrical

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.	
Cathodes to all other electrodes	3.5	6.5	μμf
Grid No. 1 to all other electrodes	4.0	7.0	μμf
D1 to D2	1.3	2.7	μμf
D3 to D4	1.6	3.2	μμf
D1 to all other electrodes	5.5	8.1	μμf
D2 to all other electrodes	5.5	8.0	μμf
D4 to all other electrodes	5.2	7.8	μμf
D3 to all other electrodes	5.2	7.8	μμf

Mechanical

Overall Length	18½±⅔ Inches
Greatest Bulb Diagonal	7-1/32 Inches
Minimum Useful Screen Width (Note 2)	4.5 Inches
Bulb Contact (Recessed Small Ball Cap)	J1-22
Collar (22 Pin)	Special
Base (25 Pin)	B25-139
Basing	Special

Collar and Base Alignment

Collar Pin No. 1 and Base Key each aligns with the D3D4 trace ..... ±10 Degrees

Positive voltage on D3 deflects the beam towards the index pin of the Ring Base

Positive voltage on D1 deflects the beam approximately towards Pin 6 of the Ring Base

Bulb Contact Alignment
- Bulb Contact Aligns with D3D4 trace ..... ±10 Degrees
- Bulb Contact on same side as Base Key and Collar Pin No. 1 ..... ± ¼ Inch
- Bulb Contact located on tube center line ..... ± 3 Degrees
- Bulb Wall (wih Contact) Aligns with D1D2 Trace

Trace Alignment
- D1D2 trace aligns with D3D4 trace ..... 90±2 Degrees
- Corresponding traces align within ..... 2 Degrees

MAXIMUM RATINGS—(Design Center Values)

Post-Accelerator Voltage ..... 7,000 Max. Volts D-C
Accelerator Voltage (Note 3) ..... 3,500 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage (Note 4) ..... 2.0 Max.
Focusing Voltage ..... 1,500 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
- Heater Positive with respect to Cathode ..... 180 Max. Volts

Peak Voltage between Accelerator and any deflection electrode ..... 1,250 Volts

TYPICAL OPERATING CONDITIONS

For Post-Accelerator Voltage of ..... 4,000 Volts D-C
For Accelerator Voltage of ..... 2,000 Volts D-C
Focusing Voltage ..... 450 to 650 Volts D-C
Grid No. 1 Voltage (Note 5) ..... —50 to —90 Volts D-C
Modulation Factor (Note 6) ..... 55 Max. Volts D-C
Line Width "A" (Note 7) ..... .026 Max. Inches
Deflection Factors:
- D1 and D2 ..... 68 to 84 Volts D-C/Inch
- D3 and D4 (Note 8) ..... 27 to 37 Volts D-C/Inch

Deflection Factor Uniformity (Note 9) ..... 2% Max.
Useful Scan (Note 10)
- D1 and D2 ..... 4.5 Min. Inches
- D3 and D4 ..... 1.5 Min. Inches

Interaction Factor (Note 11) ..... .00001 Max. Inches/Volt

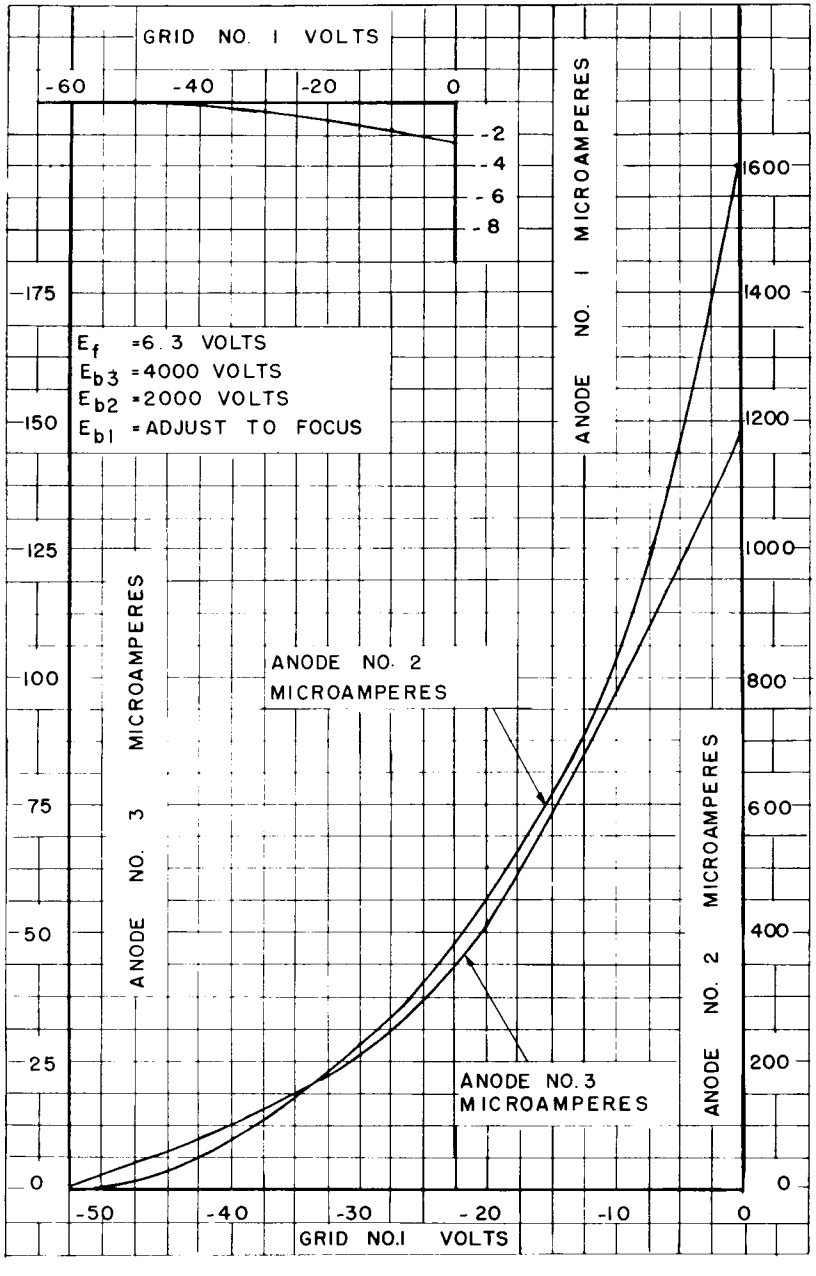
CIRCUIT DESIGN VALUES

Focusing Voltage ..... 225 to 325 Volts per Kilovolt of Accelerator Voltage
Focusing Current for any operating condition ..... —15 to +10 Microamperes
Grid No. 1 Voltage for (Note 5) .. —25 to —45 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 ..... 25 to 33 Volts D-C/Inch/KV of Accelerator Voltage
- D3 and D4 ..... 11 to 16 Volts D-C/Inch/KV of Accelerator Voltage
- Ratio Post-Accelerator Voltage to Accelerator Voltage 2.0
- D1 and D2 ..... 34 to 42 Volts D-C/Inch/KV of Accelerator Voltage
- D3 and D4 ..... 13.5 to 18.5 Volts D-C/Inch/KV of Accelerator Voltage
- Resistance in any Deflecting-Electrode Circuit (Note 12) ..... 1.0 Max. Megohms

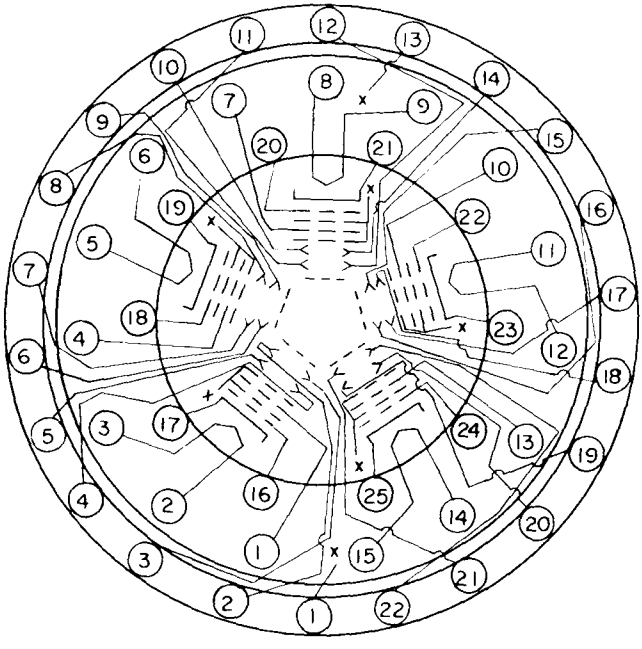
NOTES

1. Values are for each unit unless otherwise stated.
2. Following the bulb contour.
3. Accelerator power input (Avg.) should be limited to 6 watts.
4. This tube is designed for optimum performance when operating at an Eb3/Eb2 ratio of 2.0. Operation at other ratios of Eb2/Eb2 may result in changes in deflection uniformity and pattern distortion.
5. Visual extinction of the undeflected, focused spot.
6. The increase in Grid No. 1 voltage from cut-off to produce an Ib3 of 50 μADC.
7. Measured in accordance with MIL-E-1 specification using an Ib3 of 25 μADC.

TYPE 7YP-
AVERAGE CHARACTERISTICS



TYPE 7YP-



BOTTOM VIEW

22 PIN COLLAR BASE

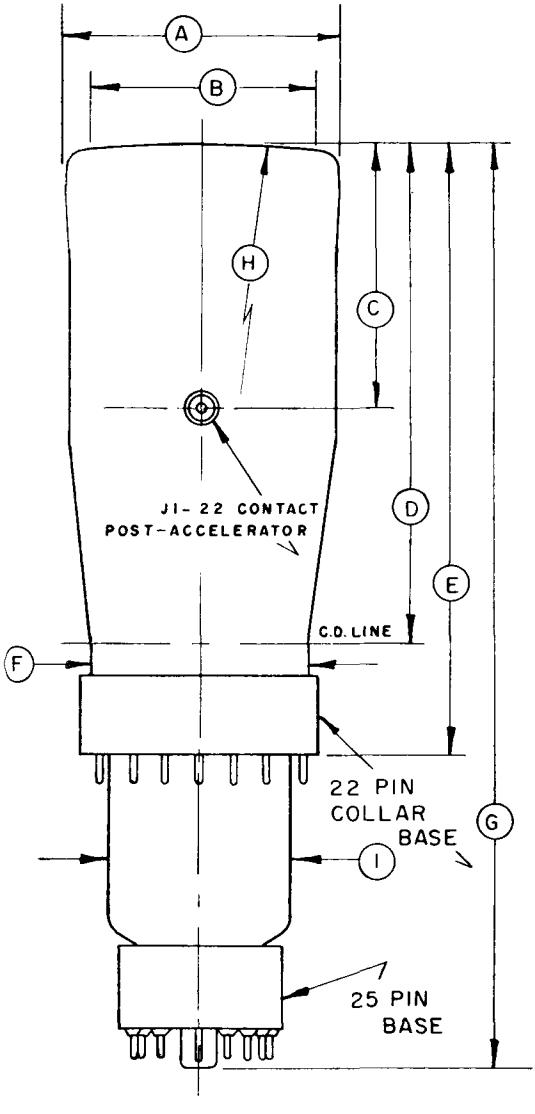
PIN NO.	ELEMENT	BEAM
1	ACCELERATOR	
2	DEFLECTOR D2	A
3	DEFLECTOR D1	A
4	DEFLECTOR D3	A
5	DEFLECTOR D4	A
6	DEFLECTOR D1	B
7	DEFLECTOR D3	B
8	DEFLECTOR D4	B
9	DEFLECTOR D2	B
10	DEFLECTOR D3	C
11	DEFLECTOR D1	C
12	DEFLECTOR D2	C
13	ACCELERATOR	
14	DEFLECTOR D4	C
15	DEFLECTOR D1	D
16	DEFLECTOR D2	D
17	DEFLECTOR D4	D
18	DEFLECTOR D3	D
19	DEFLECTOR D4	E
20	DEFLECTOR D3	E
21	DEFLECTOR D2	E
22	DEFLECTOR D1	E

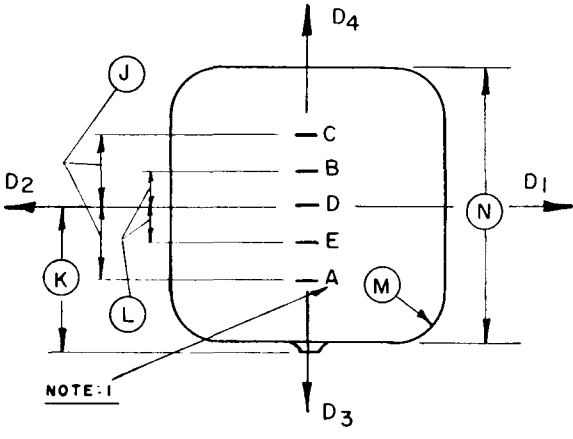
25 PIN BASE

PIN NO	ELEMENT	BEAM
1	FOCUSING ELECTRODE	A
2	HEATER	A
3	HEATER	A
4	FOCUSING ELECTRODE	B
5	HEATER	B
6	HEATER	B
7	FOCUSING ELECTRODE	C
8	HEATER	C
9	HEATER	C
10	FOCUSING ELECTRODE	D
11	HEATER	D
12	HEATER	D
13	FOCUSING ELECTRODE	E
14	HEATER	E
15	HEATER	E
16	GRID NO.1	A
17	CATHODE	A
18	GRID NO1	B
19	CATHODE	B
20	GRID NO1	C
21	CATHODE	C
22	GRID NO.1	D
23	CATHODE	D
24	GRID NO1	E
25	CATHODE	E

8. The deflection in this direction is limited to ±.75 Min. Inches from the undeflected spot position.
9. Measured in accordance with MIL-E-1 specification.
10. Centered about normal undeflected spot positions.
11. The deflection of one beam when balanced D-C Voltages are applied to the deflection electrodes of the other will not be greater than the indicated value.
12. It is recommended that the deflecting electrode circuit resistances be approximately equal.

TYPE 7YP-





FACE VIEW

NOTE: 1 BEAM A CENTERS ON POSITION A, ETC. WITHIN 5/16 RADIUS CIRCLE. INDEX PIN, KEY AND BULB CONTACT EACH ALIGN WITH D3D4 TRACE ± 10.°

REF.	DIMENSIONS
A	5.5 $^{+.03}_{-.06}$ DIA.
B	4.5 MIN SCREEN
C	5 1/4 ± 1/4
D	10 NOM.
E	12 1/4 ± 1/8
F	4 13/32 ± 3/32 DIA.
G	18 1/2 ± 3/8
H	40 R.
I	3 3/4 ± 1/16 O.D.
J	1 1/2 NOM.
K	2.797 MAX.
L	3/4 NOM.
M	1 R.
N	5.5 $^{+.03}_{-.06}$ DIA.