

TYPE 7AEP- CATHODE-RAY TUBES

The Du Mont Type 7AEP- is a 7 inch diameter, single beam, post-accelerator, electrostatic focus and deflection cathode-ray tube employing a flat face plate to reduce parallax error. Tolerances are tightly controlled and feature: angle between D1D2 and D3D4 traces held to $90^\circ \pm 1^\circ$, deflection factors held to within 10% with low pattern distortion, and grid cutoff bias is maintained to within 25%. The gun employed draws negligible focusing electrode current.

The inherently higher sensitivity of this line of "Tight-Tolerance" cathode-ray tubes, such as the 5AFP-, over previously available commercial tubes permits smaller, lower cost amplifiers, while tight tolerances afford greater freedom in cathode-ray and radar equipment design.



GENERAL CHARACTERISTICS

Electrical Data

Focusing Method			Electrostatic
Deflecting Method			Electrostatic
Direct Interelectrode Capacitances	Min.	Max.	
Cathode to all	2.9	4.5	$\mu\mu\text{f}$
Grid No. 1 to all	3.7	6.4	$\mu\mu\text{f}$
D1 to D2	1.7	2.7	$\mu\mu\text{f}$
D3 to D4	1.0	1.8	$\mu\mu\text{f}$
D1 to all	5.4	7.6	$\mu\mu\text{f}$
D2 to all	5.4	7.6	$\mu\mu\text{f}$
D3 to all	3.4	5.5	$\mu\mu\text{f}$
D4 to all	3.4	5.5	$\mu\mu\text{f}$

Optical Data

Phosphor Number	1	2	7	11
Fluorescent Color	Green	Green	Blue	Blue
Phosphorescent Color	—	Green	Yellow	—
Persistence	Medium	Long	Long	Short

Mechanical Data

Overall Length	$15\frac{1}{2} \pm \frac{1}{4}$ Inches
Greatest Diameter of Bulb	$7 \pm \frac{3}{32}$ Inches
Minimum Useful Screen Diameter	$6\frac{1}{8}$ Inches
Bulb Number	J56Y1
Bulb Contact — Recessed Small Ball Cap	J1-22
Base — Medium Shell Diheptal, 12 Pin	B12-37
Basing	14J
Base Alignment	
D1D2 trace aligns with Pin No. 5 and tube axis	0 ± 10 Degrees
Positive voltage on D1 deflects beam approximately toward Base Pin No. 5	
Positive voltage on D3 deflects beam approximately toward Base Pin No. 2	
Bulb Contact Alignment	
J1-22 contact aligns with D1D2 trace	0 ± 10 Degrees
J1-22 contact on same side as Pin No. 5	
Trace Alignment	
Angle between D3D4 and D1D2 traces	90 ± 1 Degrees

MAXIMUM RATINGS (Design Center Values)

Heater Voltage	6.3 Volts
Heater Current at 6.3 Volts	0.6 ± 10% Ampere
Post-Accelerator Voltage	8000 Max. Volts D-C
Accelerator Voltage	4000 Max. Volts D-C
Ratio Post-Accelerator Voltage to Accelerator Voltage (Note 1)	2.0
Accelerator Input	6.0 Max. Watts
Focusing Electrode Voltage	1250 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-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 Max. Volts

TYPICAL OPERATING CONDITIONS

Post-Accelerator Voltage	4000 Volts
Accelerator Voltage	2000 Volts
Focusing Electrode Voltage	380 to 620 Volts
Grid No. 1 Voltage (Note 2)	-45 to -75 Volts
Deflection Factors:	
D1 and D2	81 to 101 Volts D-C per Inch
D3 and D4	67 to 83 Volts D-C per Inch
Deflection Factor Uniformity (Note 3)	3% Max.
Pattern Distortion (Note 4)	2½% Max.
Modulation (Note 5)	37 Max. Volts D-C
Line Width "A" (Note 5)022 Max. Inches
Light Output (Note 5) Phosphor #1	20 Foot Lamberts Min.
Focusing Electrode Current for any operating condition	-15 to +10 µA
Spot Position (focused and undeflected) (Note 6)	Within a 15 mm Square
For Accelerator Voltage not shown in the preceding table, the following can be used as a guide:	
Focusing Electrode Voltage	19% to 31% of Accelerator Volts
Grid No. 1 Voltage	2.2% to 3.8% of Accelerator Volts
Ratio Post-Accelerator to Accelerator Voltage	1.0
D1 and D2	33 to 40 Volts D-C per Inch per Kilovolt of Accelerator Voltage
D3 and D4	27 to 33 Volts D-C per Inch per Kilovolt of Accelerator Voltage
Ratio Post-Accelerator to Accelerator Voltage	2.0
D1 and D2	40 to 52 Volts D-C per Inch per Kilovolt of Accelerator Voltage
D3 and D4	33 to 42 Volts D-C per Inch per Kilovolt of Accelerator Voltage

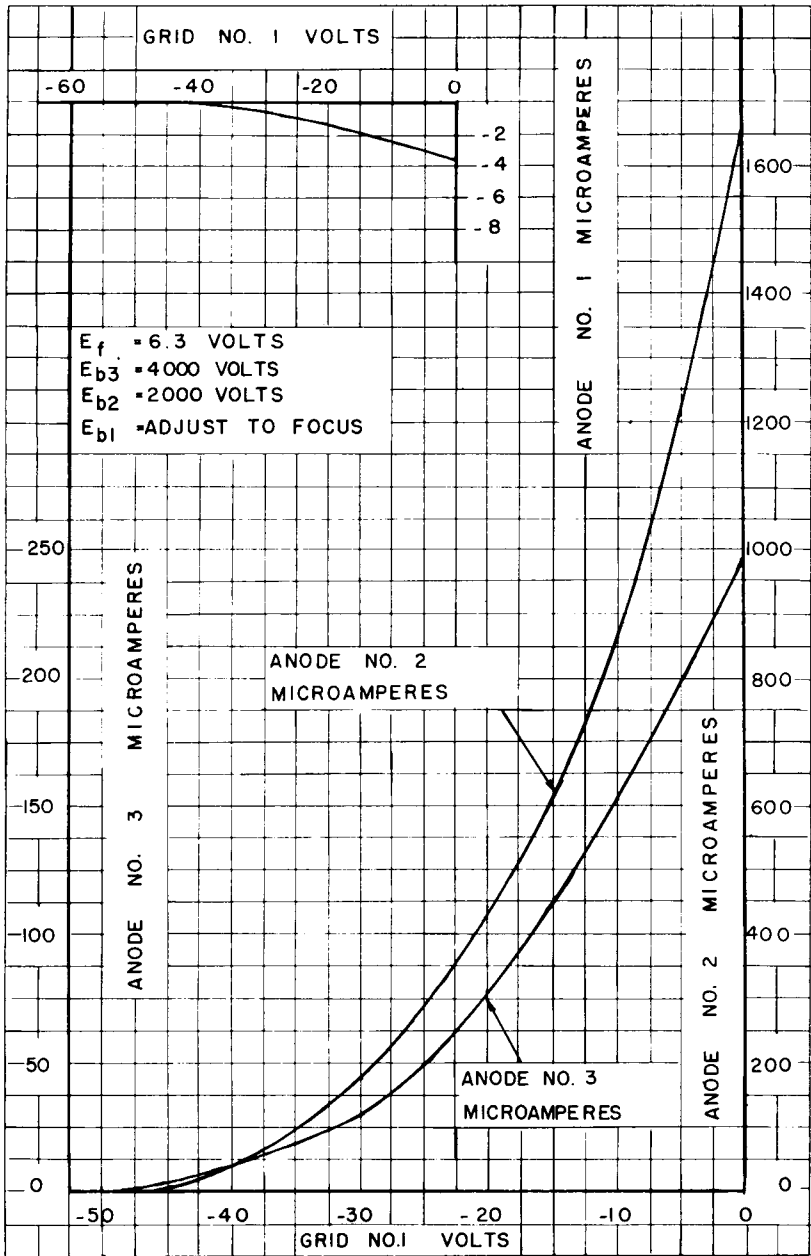
MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance	1.5 Max. Megohms
Resistance in any Deflecting Electrode Circuit (Note 7)	1.0 Max. Megohms

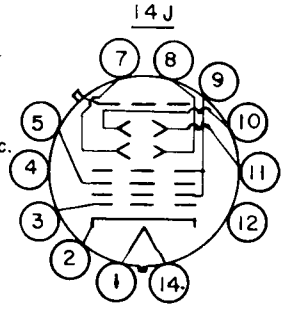
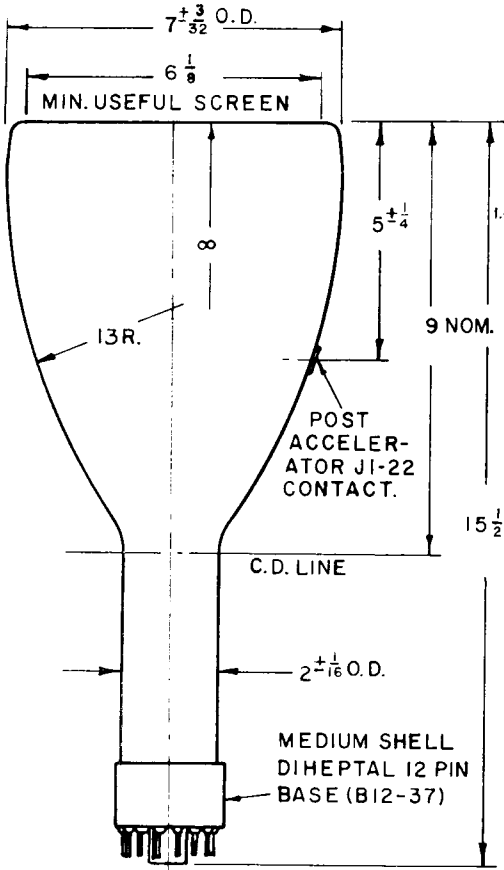
NOTES

1. 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 and pattern distortion.
2. Visual extinction of undeflected focused spot.
3. As per MIL-E-1 specifications.
4. All portions of a raster pattern, adjusted so its widest points just touch the sides of a 4.100 inch square will fall within the area bounded by the 4.100 inch square and an inscribed 3.900 inch square.
5. For an Ib3 of 25 µADC measured in accordance with MIL-E-1 specifications.
6. Centered with respect to the tube face and with the tube shielded. Connect free deflecting electrodes to accelerator.
7. It is recommended that the deflecting-electrode circuit resistance be approximately equal. Higher resistance values up to five megohms may be used for low beam current operation.

TYPE 7AEP-
AVERAGE CHARACTERISTICS



TYPE 7AEP-



PIN NO.	ELEMENT
1	HEATER
14	HEATER
2	CATHODE
3	GRID NO. 1
5	FOCUSING ELECTRODE
11	DEFLECTOR D ₁
10	DEFLECTOR D ₂
7	DEFLECTOR D ₃
8	DEFLECTOR D ₄
9	ACCELERATOR
4	INTERNAL CONNECTION

NOTE:
1. THE BULB SHALL BE A J56YI TYPE.

