

# 5YP- CATHODE-RAY TUBES

The Type 5YP- is an electrostatic focus and deflection cathode-ray tube, with very high sensitivity D3D4 deflection plates, featuring an intensifier for increased brightness and writing rate, with a minimum loss in deflection sensitivity.

The high D3D4 sensitivity is achieved by using long deflection plates and limiting the D3D4 scan to a useful portion of the full screen diameter. Capacitances are low, being comparable to other types such as the 5JP-A and 5RP-A, where deflection connections are made through the neck instead of the base.

The 5YP- is particularly useful for wide band oscillographs and for any application requiring high D3D4 deflection plate sensitivity.

## GENERAL CHARACTERISTICS

### Electrical

Heater Voltage .....	6.3 Volts
Heater Current .....	0.6 ± 10% Ampere
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, Approx.	
Cathode to all other electrodes .....	5 μmf.
Grid No. 1 to all other electrodes .....	5 μmf.
D1 to D2 .....	2 μmf.
D3 to D4 .....	2 μmf.
D1 to all other electrodes except D2 .....	2.5 μmf.
D2 to all other electrodes except D1 .....	2.5 μmf.
D3 to all other electrodes except D4 .....	2 μmf.
D4 to all other electrodes except D3 .....	2 μmf.

### Mechanical

Overall Length .....	17 $\frac{7}{8}$ ± $\frac{3}{8}$ Inches
Greatest Diameter of Bulb .....	5 $\frac{1}{4}$ ± $\frac{3}{32}$ Inches
Minimum Useful Screen Diameter .....	4 $\frac{1}{4}$ Inches
Bulb Contact (Recessed Small Ball Cap) .....	J1-22
Neck Contacts (Small Ball Caps) .....	J1-25
Base (Medium Shell Diheptal 12-Pin) .....	B12-37
Basing .....	14Q
Base Alignment:	
D1D2 trace aligns with Pin No. 5 and tube axis .....	± 10 Degrees
Positive voltage on D1 deflects beam approximately toward Pin No. 5	
Positive voltage on D3 deflects beam approximately toward Pin No. 2	
Angle between D3D4 and D1D2 traces .....	90 ± 2 Degrees
Bulb Contact Alignment:	
J1-22 contact aligns with D1D2 trace .....	± 10 Degrees
J1-22 contact on same side as Pin No. 5	

### MAXIMUM RATINGS—(Design Center Values)

Post Accelerator Voltage .....	8,000 Max. Volts D-C
Accelerator Voltage <sup>1</sup> .....	3,500 Max. Volts D-C
Ratio Post Accelerator Voltage to Accelerator Voltage .....	2.3 Max.
Focusing Voltage .....	1,550 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 D-C
Heater Positive with respect to Cathode .....	180 Max. Volts D-C
Peak Voltage between Accelerator and any	
Deflection Electrode .....	1,200 Max. Volts

## TYPICAL OPERATING CONDITIONS

For Post Accelerator Voltage of .....	4,000 Volts
For Accelerator Voltage of .....	2,000 Volts
Focusing Voltage .....	362 to 695 Volts
Grid No. 1 Voltage <sup>2</sup> .....	-30 to -90 Volts
Modulation <sup>3</sup> .....	52 Volts Max.
Line Width A <sup>3</sup> .....	.032 Inch Max.
P1 Light Output <sup>3</sup> .....	15 Ft. L. Min.
Deflection Factors:	
D1 and D2 .....	72 to 108 Volts D-C per Inch
D3 and D4 .....	24 to 36 Volts D-C per Inch
Deflection Factor Uniformity <sup>4</sup> .....	2% Max.
Useful Scan <sup>5</sup> :	
D1 and D2 .....	4.25 ( $\pm 2.125$ from tube face center) Inches
D3 and D4 .....	2.50 ( $\pm 1.25$ from tube face center) Inches
Pattern Distortion at 75% of useful scan <sup>6</sup> .....	2½% Max.
Frequency for 10% reduction in D3D4 deflection amplitude	
due to transit time <sup>7</sup> .....	200 mc.
Spot Position (Focused and Undelected) .....	Within a 5/16-inch radius circle <sup>8</sup>

## CIRCUIT DESIGN VALUES

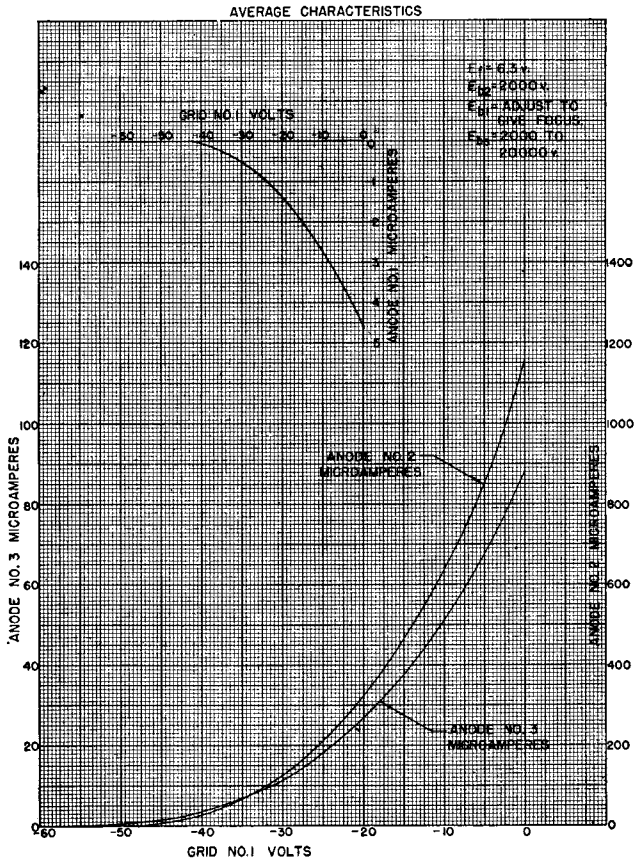
Focusing Voltage .....	181 to 348 Volts per Kilovolt of Accelerator Voltage
Focusing Current for any operating condition .....	-15 to +10 Microamperes
Grid No. 1 Voltage <sup>2</sup> .....	15 to 45 Volts per Kilovolt of Accelerator Voltage
Grid No. 1 Circuit Resistance .....	1.5 Max. Megohms
Deflection Factors:	
Post Accelerator Voltage = Accelerator Voltage	
D1 and D2 .....	30 to 45 Volts D-C/Inch/KV of Accelerator Voltage
D3 and D4 .....	9.5 to 14.5 Volts D-C/Inch/KV of Accelerator Voltage
Resistance in any Deflecting Electrode Circuit <sup>10</sup> .....	5 Max. Megohms

## NOTES

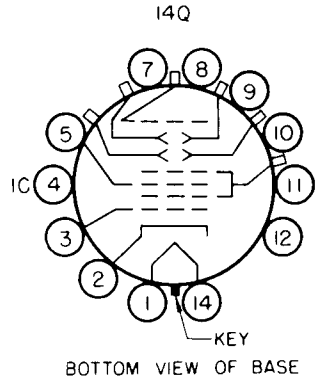
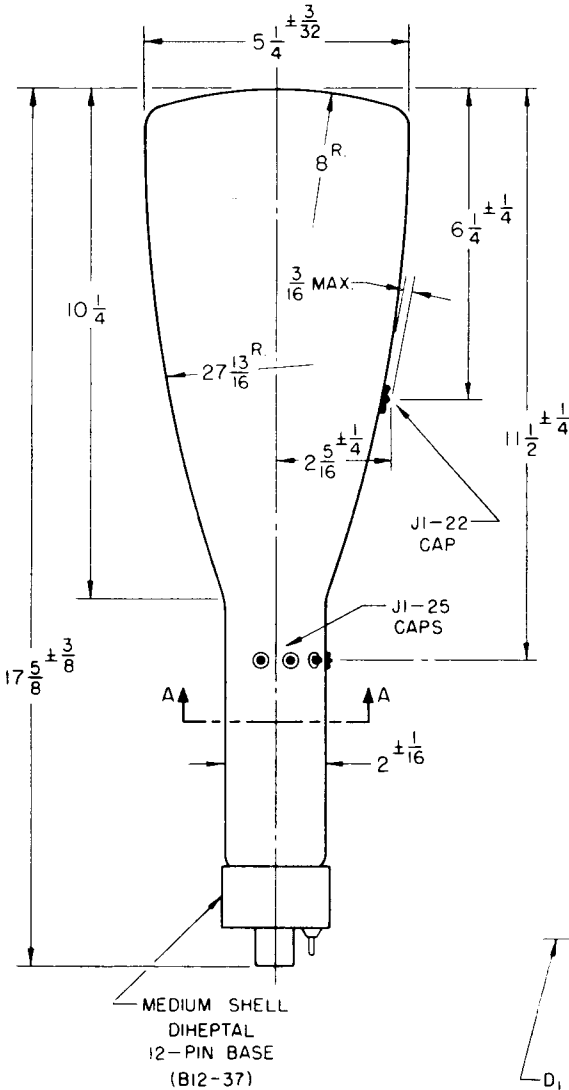
1. The product of accelerator voltage and average accelerator current should be limited to 6 watts.
2. Visual extinction of undeflected focused spot.
3. Measured in accordance with JAN-1A Specifications at a post accelerator current of 25 ua.
4. The deflection factor (for both D1D2 and D3D4 plate pairs, separately) for a deflection of less than 75% of the useful scan will not differ from the deflection factor for a deflection at 25% of the useful scan by more than the indicated value.
5. Reduction in useful scan when post accelerator voltage is greater than accelerator voltage is determined by the ratio of these voltages measured with respect to cathode. Values shown are therefore applicable to any operating condition with the same voltage ratios.
6. The edges of a raster pattern, whose mean dimensions are the indicated percentage of useful scan, shall not deviate from the mean dimension rectangle by more than the specified amount.
7. Computed.

8. Deflection accuracy may be obtained by combining angle between traces, deflection factor uniformity and pattern distortion characteristics. In general, for deflections less than those indicated, the accuracy will improve.
9. Centered with respect to the tube face with the tube shielded.
10. It is recommended that the deflecting electrode circuit resistances be approximately equal.
11. For optimum focus the average potentials of the deflection plates and second anode should be the same.

### 5YP1, 5YP2, 5YP11



TYPE 5YP-



PIN NO.	ELEMENT
1	HEATER
2	CATHODE
3	GRID NO 1
4	INTERNAL CONNECTION
5	FOCUSING ELECTRODE
14	HEATER

