

# 5CP-A CATHODE-RAY TUBES

The Type 5CP-A Cathode-ray Tubes are designed for oscillographic applications. The intensifier principle is used to provide a maximum deflection sensitivity for a given final accelerating voltage. A glass envelope has been designed to provide great mechanical strength and the tube base design provides adequate insulation between electrode leads for high altitude installation. The gun is designed to draw negligible focusing electrode current.

The four types differ only in the characteristics of the fluorescent screens. Other screen types may be obtained on special order.



## GENERAL CHARACTERISTICS

### Electrical

Heater Voltage ..... 6.3 Volts  
 Heater Current .....  $0.6 \pm 10\%$  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, Nominal

Cathode to all other electrodes	.....	9 $\mu$ f.
Grid No. 1 to all other electrodes	.....	8 $\mu$ f.
D1 to D2	.....	2 $\mu$ f.
D3 to D4	.....	2 $\mu$ f.
D1 to all other electrodes except D2	.....	7 $\mu$ f.
D2 to all other electrodes except D1	.....	7 $\mu$ f.
D3 to all other electrodes except D4	.....	5 $\mu$ f.
D4 to all other electrodes except D3	.....	6 $\mu$ f.

### Mechanical

Overall Length	.....	$16\frac{3}{4} \pm \frac{3}{8}$ Inches
Greatest Diameter of Bulb	.....	$5\frac{1}{4} \pm \frac{3}{32}$ Inches
Minimum Useful Screen Diameter	.....	$4\frac{1}{2}$ Inches
Bulb Contact	.....	J1-22
Base	.....	B12-37
Basing	.....	14J

#### Base Alignment:

D1D2 trace aligns with Pin No. 5 and tube axis	.....	$\pm 10$ 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	.....	$90 \pm 3$ Degrees

#### Bulb contact alignment:

J1-22 contact aligns with D1D2 trace	.....	$\pm 10$ Degrees
J1-22 contact on same side as Pin No. 5		

## MAXIMUM RATINGS—(Design Center Values)

Anode No. 3 Voltage (Accelerator High-Voltage Electrode) .....	4000 Max. Volts D-C
Anode No. 2 Voltage <sup>1</sup> .....	2000 Max. Volts D-C
Ratio Anode No. 3 Voltage to Anode No. 2 Voltage .....	2.3 Max.
Anode No. 1 Voltage .....	1000 Max. Volts D-C
<b>Grid No. 1 Voltage</b>	
Negative Bias Value .....	200 Max. Volts D-C
Positive Bias Value .....	0 Max. Volts D-C
Positive Peak Value .....	2 Max. Volts
<b>Peak Heater-Cathode Voltage</b>	
Heater Negative with respect to Cathode .....	125 Max. Volts D-C
Heater Positive with respect to Cathode .....	125 Max. Volts D-C
Peak Voltage between Anode No. 2 and any Deflection Electrode .....	500 Max. Volts

## TYPICAL OPERATING CONDITIONS

For Anode No. 3 Voltage of .....	2000	3000	4000 Volts
For Anode No. 2 Voltage of .....	2000	1500	2000 Volts
Anode No. 1 Voltage for focus .....	375 to 690	280 to 515	375 to 690 Volts
Grid No. 1 Voltage <sup>2</sup> .....	-30 to -90	-22.5 to -67.5	-30 to -90 Volts
<b>Deflection Factors:</b>			
D1 and D2 .....	62 to 84	58 to 80	78 to 106 D-C V/in.
D3 and D4 .....	54 to 74	50 to 68	66 to 90 D-C V/in.
Anode No. 1 Voltage for focus .....	18.7% to 34.5% of Eb2 Volts		
Grid No. 1 Voltage <sup>2</sup> .....	1.5% to 4.5% to Eb2 Volts		
Anode No. 1 Current for any operating condition .....	-15 to +10 Microamperes		
<b>Deflection Factors:</b>			
No 3rd Anode or Eb3 = Eb2			
D1 and D2 .....	31 to 42 Volts D-C per inch per Kilovolt of Eb2		
D3 and D4 .....	27 to 37 Volts D-C per inch per Kilovolt of Eb2		
Eb3 = Twice Eb2			
D1 and D2 .....	39 to 53 Volts D-C per inch per Kilovolt of Eb2		
D3 and D4 .....	33 to 45 Volts D-C per inch per Kilovolt of Eb2		
Spot Position (Undelected) <sup>3</sup> .....	Within 25 Millimeters square		

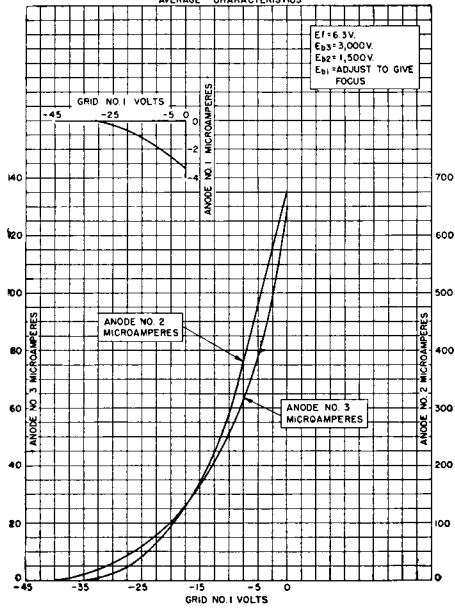
## MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance .....	1.5 Max. Megohms
Resistance in any Deflecting-Electrode Circuit <sup>4</sup> .....	5 Max. Megohms

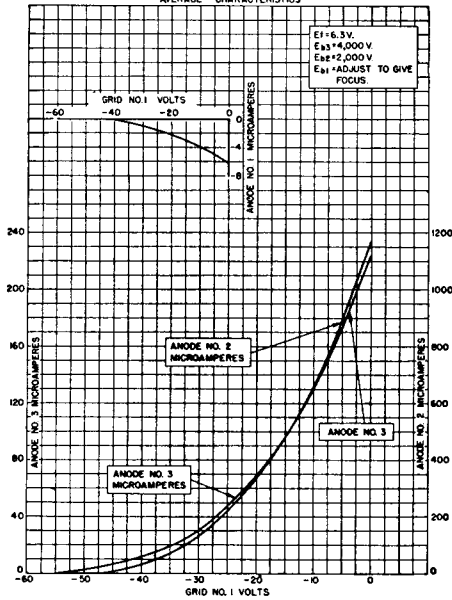
## NOTES

1. The product of Anode No. 2 voltage and average Anode No. 2 current should be limited to 6 watts.
2. Visual extinction of undeflected focused spot.
3. When the tube is operated at (1) normal heater voltage; (2) Eb3 = 3000 volts; (3) Eb2 = 1500 volts; (4) Eb1 adjusted for focus; (5) Ec1 set at such a value as will avoid damage to the screen; (6) with each of the deflecting electrodes connected to Anode No. 2; and (7) with the tube shielded against external influences:  
The spot will fall within a 25 mm. square, the center of which coincides with the geometric center of the tube face and the sides of which are parallel to the traces produced by deflecting electrodes D1 and D2 and by deflecting electrodes D3 and D4 respectively.
4. It is recommended that the deflecting electrode circuit resistances be approximately equal.
5. For optimum focus the average potentials of the deflection plates and second anode should be the same.

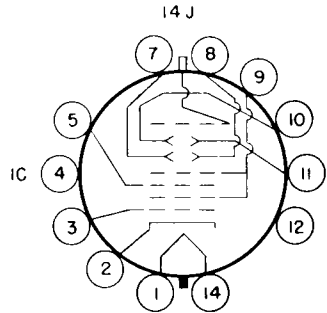
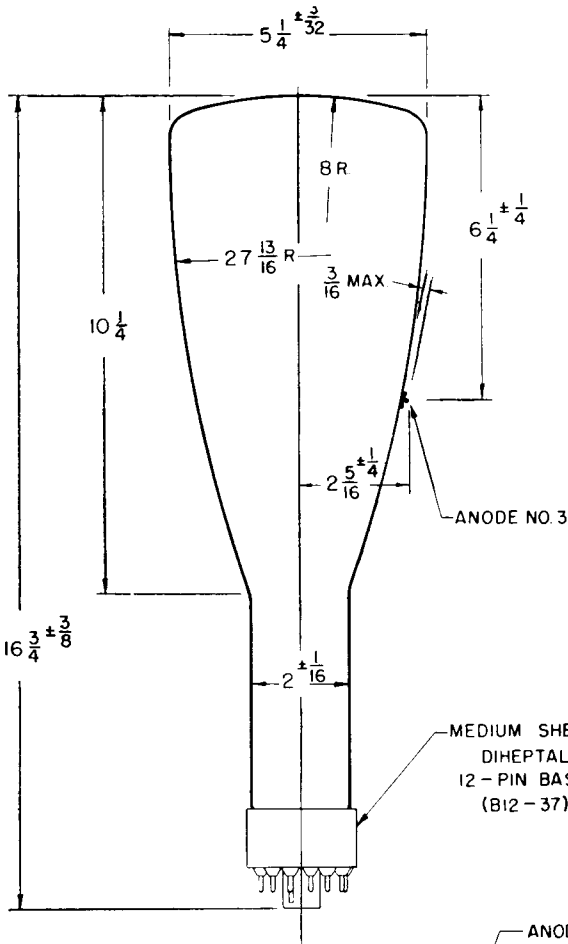
5CP-A  
AVERAGE CHARACTERISTICS



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# TYPE 5CP-A



BOTTOM VIEW OF BASE

PIN NO	ELEMENT
1	HEATER
2	CATHODE
3	GRID NO 1
4	INTERNAL CONNECTION
5	ANODE NO. 1
7	DEFLECTING ELECTRODE $D_3$
8	DEFLECTING ELECTRODE $D_4$
9	ANODE NO. 2, GRID NO. 2
10	DEFLECTING ELECTRODE $D_2$
11	DEFLECTING ELECTRODE $D_1$
14	HEATER

