

# 5BP-A CATHODE-RAY TUBES

The Type 5BP-A Cathode-ray Tubes are electrostatically focussed and deflected cathode-ray tubes with four free deflection plates for balanced deflection. Employing low accelerating voltages, the Type 5BP-A Cathode-ray Tubes are designed for applications where the use of an intensifier is not essential. The electron gun is designed to draw negligible focusing electrode current.

The Type 5BP-A is recommended for replacement only.



## 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. 11 |
| Fluorescence | Green  | Blue   |
| Persistence  | Medium | Short  |

### Direct Interelectrode Capacitances, Nominal

|                                           |                     |
|-------------------------------------------|---------------------|
| Grid No. 1 to all other electrodes .....  | $8.0 \mu\text{f.}$  |
| D1 to D2 .....                            | $1.4 \mu\text{f.}$  |
| D3 to D4 .....                            | $1.2 \mu\text{f.}$  |
| D1 to all other electrodes except D2 .... | $8.0 \mu\text{f.}$  |
| D2 to all other electrodes except D1 .... | $7.5 \mu\text{f.}$  |
| D3 to all other electrodes except D4 ..   | $10.0 \mu\text{f.}$ |
| D4 to all other electrodes except D3 .... | $7.5 \mu\text{f.}$  |

### Mechanical

|                                                                      |                                                                   |
|----------------------------------------------------------------------|-------------------------------------------------------------------|
| Overall Length .....                                                 | $16\frac{3}{4} \pm \frac{3}{8}$ Inches                            |
| Greatest Diameter of Bulb .....                                      | $5\frac{1}{4} + \frac{1}{16}$ , Inches<br>— $\frac{3}{32}$ Inches |
| Minimum Useful Screen Diameter .....                                 | $4\frac{1}{2}$ Inches                                             |
| Base .....                                                           | Medium Magnal                                                     |
| Basing .....                                                         | 11N                                                               |
| Base Alignment                                                       |                                                                   |
| 3D4 trace aligns with Pin No. 1 and tube axis .....                  | $\pm 10$ Degrees                                                  |
| Positive voltage on D1 deflects beam approximately toward Pin No. 4. |                                                                   |
| Positive voltage on D3 deflects beam approximately toward Pin No. 1. |                                                                   |
| Angle between 3D4 and 1D2 traces .....                               | $90 \pm 3$ Degrees                                                |

## MAXIMUM RATINGS—(Design Center Values)

|                                                                     |                     |
|---------------------------------------------------------------------|---------------------|
| Anode No. 2 Voltage .....                                           | 2000 Max. Volts D-C |
| Anode No. 1 Voltage <sup>1</sup> .....                              | 1000 Max. Volts D-C |
| Grid No. 1 Voltage                                                  |                     |
| Negative Bias Value .....                                           | 125 Max. Volts D-C  |
| Positive Bias Value .....                                           | 0 Max. Volts D-C    |
| Positive Peak Value .....                                           | 2 Max. Volts        |
| Peak Voltage between Anode No. 2 and any Deflection Electrode ..... | 500 Max. Volts      |

## TYPICAL OPERATING CONDITIONS

|                                       |            |            |       |
|---------------------------------------|------------|------------|-------|
| For Anode No. 2 Voltage of .....      | 1500       | 2000       | Volts |
| Anode No. 1 Voltage for focus .....   | 253 to 422 | 338 to 562 | Volts |
| Grid No. 1 Voltage <sup>2</sup> ..... | -15 to -45 | -20 to -60 | Volts |

### Deflection Factors:

|                 |          |          |                    |
|-----------------|----------|----------|--------------------|
| D1 and D2 ..... | 52 to 74 | 70 to 98 | Volts D-C per Inch |
| D3 and D4 ..... | 47 to 67 | 63 to 89 | Volts D-C per Inch |

|                                                       |                             |
|-------------------------------------------------------|-----------------------------|
| Anode No. 1 Voltage for focus .....                   | 16.9% to 28.1% of Eb2 Volts |
| Grid No. 1 Voltage <sup>2</sup> .....                 | 1% to 3% of Eb2 Volts       |
| Anode No. 1 Current for any operating condition ..... | -50 to +10 Microamperes     |

### Deflection Factors:

|                 |                                                     |
|-----------------|-----------------------------------------------------|
| D1 and D2 ..... | 35 to 49 Volts D-C per Inch per Kilovolt of Eb2     |
| D3 and D4 ..... | 31.5 to 44.5 Volts D-C per Inch per Kilovolt of Eb2 |

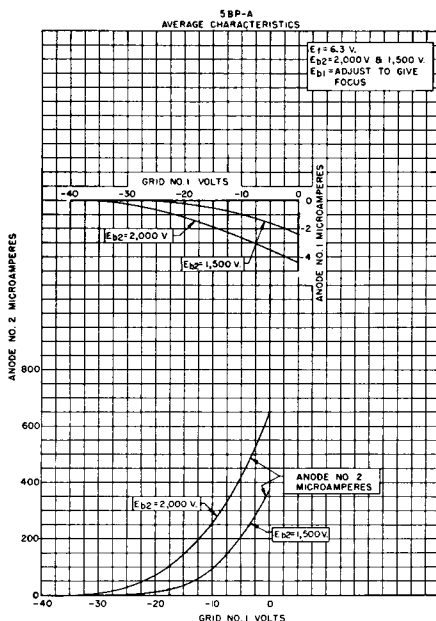
Spot Position (Undelected)<sup>3</sup> ..... Within 15 Millimeters square

## MAXIMUM CIRCUIT VALUES

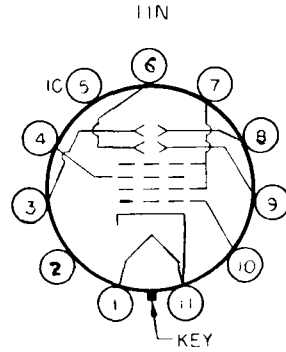
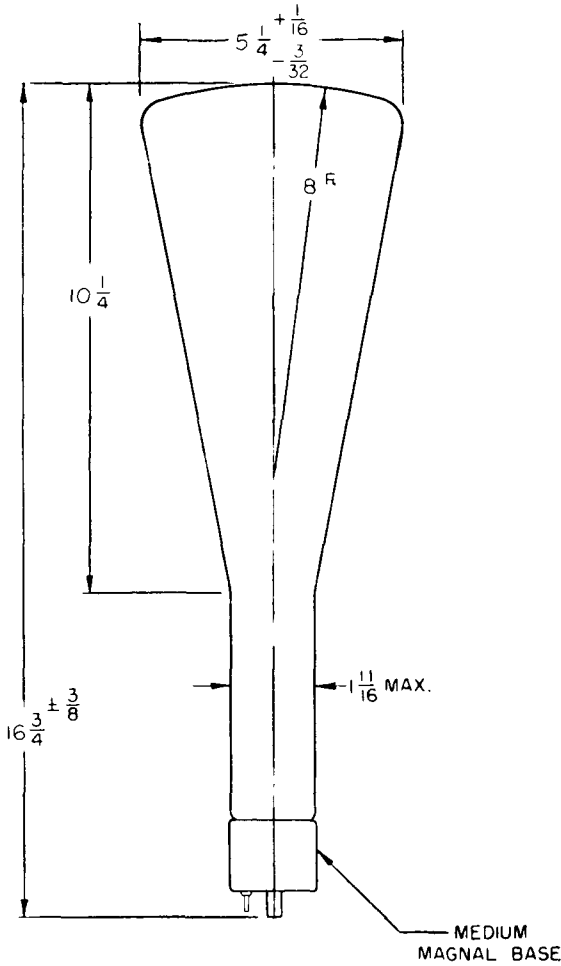
|                                                                   |                  |
|-------------------------------------------------------------------|------------------|
| Grid No. 1 Circuit Resistance .....                               | 1.5 Max. Megohms |
| Resistance in any Deflecting Electrode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

## NOTES

1. Anode No. 2 and Grid No. 2, which are connected together within the tube, are referred to herein as Anode No. 2.
2. Visual extinction of undeflected focused spot.
3. With Eb2=1500 volts and Eb1 adjusted for focus.
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.



# TYPE 5BP-A



BOTTOM VIEW OF BASE

| PIN NO. | ELEMENT                    |
|---------|----------------------------|
| 1       | HEATER                     |
| 2       | NO CONNECTION              |
| 3       | DEFLECTING ELECTRODE $D_1$ |
| 4       | ANODE NO. 1                |
| 5       | INTERNAL CONNECTION        |
| 6       | DEFLECTING ELECTRODE $D_4$ |
| 7       | ANODE NO. 2, GRID NO. 2    |
| 8       | DEFLECTING ELECTRODE $D_2$ |
| 9       | DEFLECTING ELECTRODE $D_3$ |
| 10      | GRID NO. 1                 |
| 11      | HEATER AND CATHODE         |