The SAMP- is a 5" electrostatic focus and deflection cathode ray tube designed for oscilloscope applications. The SAMP- has very high sensitivity and low capacitance of the vertical deflecting electrodes making the tube well suited for wide band amplifiers with their characteristics low signal output and low capacitance load requirement. The gun features a small spot size of high brilliance, and a low voltage electrostatic focus lens is employed, requiring only a small fraction of the accelerator voltage for focusing.

**GENERAL DATA**

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<tr>
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<th>SAMP1</th>
<th>SAMP2</th>
<th>SAMP7</th>
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<tr>
<td>Phosphor Fluorescence</td>
<td>Green</td>
<td>Green</td>
<td>Blue</td>
<td>Blue</td>
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<tr>
<td>Phosphorescence Persistence</td>
<td>-----</td>
<td>Green</td>
<td>Yellow</td>
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<td>Focusing Method</td>
<td>Electrostatic</td>
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<tr>
<td>Deflection Method</td>
<td>Electrostatic</td>
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</tbody>
</table>

**ELECTRICAL DATA**

**HEATER CHARACTERISTICS:**

- Heater Voltage: 6.3±10 % volts
- Heater Current: 0.6 amps.
- Peak Heater - Cathode Voltage: 180 volts DC
  - Heater Negative with Respect to Cathode: 180 volts DC
  - Heater Positive with Respect to Cathode: 180 volts DC

**DIRECT INTERELECTRODE CAPACITANCES:** (µfd) (approx.)

- Grid #1 to all other electrodes: 4.2
- Cathode to all other electrodes: 3.8
- D1 to D2: 3.0
- D3 to D4: 1.9
- D1 to all other electrodes: 6.1
- D2 to all other electrodes: 5.7
- D3 to all other electrodes: 4.2
- D4 to all other electrodes: 3.7

**DESIGN CENTER MAXIMUM RATINGs:**

- Anode Voltage (Note 1): 6000 volts DC
- Focusing Voltage: 1500 volts DC
- Grid #1 Voltage
  - Negative Bias Value: 200 volts DC
  - Positive Bias Value: 0 volts DC
  - Positive Peak Value: 0 volts
- Peak Voltage Between Anode and Any Deflecting Electrode: 1200 volts

* Available in all popular phosphors.
ELECTRICAL DATA (Cont'd)

CHARACTERISTICS AND TYPICAL OPERATION:

- Heater Voltage: 6.3 volts
- Anode Voltage: 2500 volts DC
- Focusing Voltage: 0 to 300 volts DC
  -4 to -56 volts DC
- Grid #1 Voltage (Note 2): 40 to 50 volts DC/inch
- Deflection Factors:
  - D1-D2: 20 to 25 volts DC/inch
  - D3-D4
- P1 Light Output (Note 3): 15 Ft. L. Min.
- Modulation (Note 3): 45 Max. volts DC
- Line Width A (Note 3): 0.032 Inch Max.
- Anode Current (Note 3): 800 Microamperes DC Max.
- Useful Scan:
  - D1-D2: 4.00 (± 2.00 min. from tube face center) inches
  - D3-D4: 2.50 (± 1.25 min. from tube face center) inches
- Spot Position (Note 7): Within a 5/16 inch radius circle
- Design Values:
  - Focusing Current for any operating condition: -15 to +15 μAcd
  - Grid #1 Voltage (Note 2): -13.6 to -22.4 volts DC per kilovolt of accelerator voltage
  - Grid #1 Circuit Resistance:
  - D1-D2: 1.5 meg. max.
  - D3-D4: 16 to 20 volts DC/inch/KV of accelerator Voltage
  - Deflection Factors:
    - D1-D2: 8 to 10 volts DC/inch/KV of anode voltage
    - D3-D4
  - Deflection Factor Uniformity (Note 4):
    - 1 % Max.
  - Pattern Distortion @ 75% of useful scan (Note 5):
    - 2 % Max.
  - Resistance in any Deflection Electrode Circuit (Note 8):
    - 1 meg. max.
- Base Alignment:
  - D1-D2 trace aligns with pin #5 and tube axis ±10 degrees
  - Positive Voltage on D1 deflects beam approximately toward pin #5
  - Positive Voltage on D3 deflects beam approximately toward pin #2
  - Angle between D3, D4 and D1, D2 traces

* Cathode should be returned to one side or to the mid-tap of the heater transformer winding.

Note 1: The product of anode voltage and average anode current should be limited to 6 watts.

Note 2: Visual extinction of undeflected focused spot.

Note 3: Measured in accordance with MIL-E-1 Specifications.

Note 4: The deflection factor (for both D1, D2, D3 and D4 plate pairs, separately) for any 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.

Note 5: All portions of a raster pattern, adjusted so its widest points just touch the sides of a 1.912 x 3.060—inch rectangle, will fall within the area bounded by the 1.912 x 3.060—inch rectangle and an inscribed 1.837 x 2.940—inch rectangle.

Note 6: 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.
Note 7: When the tube is operated at typical operating conditions (E1 = 6.3 V., Eb2 = 2500 V., Eb1 at focus); E4 adjusted to avoid damage to the screen; with both of the deflecting electrodes connected to the accelerator; and with the tube shielded against external influences, the spot will fall within a 5/16 inch radius circle, centered on the tube face.

Under stable operating conditions, the position of the spot will not shift with changes in intensity by more than .025 inch.

Note 8: It is recommended that the deflecting electrode circuit resistances be approximately equal.

Note 9: An adjusted DC potential between the accelerator and the deflection plates may be used to secure best overall focus.