

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, CATHODE RAY
 TYPE 10WP7A *

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Magnetic deflection and electrostatic focus, aluminized screen.

DIMENSIONS AND PIN CONNECTIONS: See figure 1.

ABSOLUTE RATINGS:

| Parameter: | Ef | Ec1 | Ec2 | Eb1 | Eb2 | Rg | Ehk | Alt |
|----------------------|------------|----------------|------------|-------------|-----------------|-----------|-------------|---------------|
| Unit: | V | V dc | V dc | V dc | V dc | Meg | V dc | ft |
| Maximum: Minimum: | 6.9 5.7 | 0, -200 --- | 600 --- | 900 -450 | 13,200 7,000 | 1/ --- | ±180 --- | 80,000 --- |
| Test conditions: | 6.3 | Adjust | 300 | Focus | 10,000 | --- | --- | --- |

See footnotes at end of table I.

GENERAL:

Qualification: Required.

* Replaces tube types 10WP7 and MIS 12750.

TABLE I. Testing and inspection.

| Inspection | Method | Notes | Conditions | Symbol | Limits | | Unit |
|---|--------|-------|-----------------------|-----------------|--------|-------------|----------|
| | | | | | Min | Max | |
| <u>Qualification inspection</u> | | | | | | | |
| Base material insulating quality | 1216 | --- | Zone 5 (min) | --- | --- | --- | --- |
| Cathode illumination | 5216 | --- | | --- | --- | --- | --- |
| Barometric pressure, reduced | 1002 | --- | 21 mmHg | --- | --- | --- | --- |
| Pressure (implosion) | 1141 | --- | | --- | --- | --- | --- |
| Direct-interelectrode capacitance | 1331 | --- | k to all g1 to all | Ck Cg1 | --- | 8.0 10.0 | pF pF |
| Vibration (cathode-ray tubes) | 5111 | --- | | Width | --- | 2.0 | mm |
| Shock | 5115 | --- | | --- | --- | --- | --- |
| <u>Conformation inspection part 1</u> | | | | | | | |
| Bulb, screen, and faceplate quality | 5106 | --- | | --- | --- | --- | --- |
| Voltage breakdown | 5201 | --- | | --- | --- | --- | --- |
| Voltage breakdown (magnetic deflection) | 5201 | --- | | --- | --- | --- | --- |
| Modulation | 5223 | --- | Ib2 = 100 μ A dc | ΔE_{c1} | --- | 32 | V dc |
| Spot position (magnetic deflection) | 5231 | --- | | --- | --- | 0.5 | inch |
| Face tilt | 5101 | --- | | --- | --- | --- | --- |
| Grid cutoff voltage | 5241 | --- | | Ec1 | -33 | -77 | V dc |
| Grid No. 1 leakage current | 5251 | --- | | --- | --- | --- | --- |
| Anode No. 1 leakage current | 5251 | --- | | --- | --- | --- | --- |
| Zero-bias anode current (magnetic deflection) | 5236 | --- | | --- | --- | --- | --- |
| Gas ratio | 5206 | --- | | Gr | --- | 0.25 | --- |
| Neck straightness | 5101 | 2/ | | --- | --- | --- | --- |
| Focusing electrode voltage | --- | 3/ | Ib2 = 100 μ A dc | Ec1 | 0 | 600 | V dc |
| Line width A (magnetic deflection) | 5226 | 3/ | Ib2 = 100 μ A dc | Width | --- | 0.55 | mm |

See footnotes at end of table.

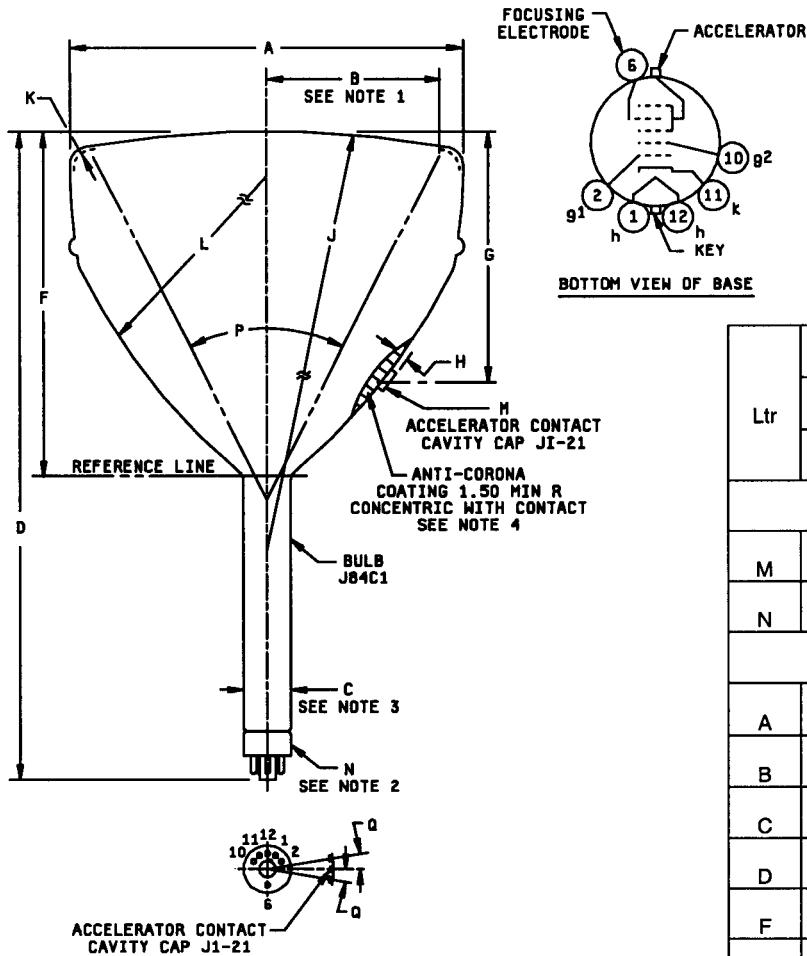
TABLE I. Testing and inspection - Continued.

| Inspection | Method | Type | Conditions | Symbol | Limits | | Unit |
|---|--------|------|--|---------------|--------|------------|------------|
| | | | | | Min | Max | |
| <u>Conformance inspection, part 2</u> | | | | | | | |
| Secureness of base, cap, or insert | 1101 | --- | | --- | --- | --- | --- |
| Heater current | 1301 | --- | | If | 540 | 660 | mA |
| Heater-cathode leakage current | 5251 | --- | | --- | --- | --- | --- |
| Screens | 5221 | --- | | --- | --- | --- | --- |
| Stray emissions | 5216 | --- | Eb2 = 13,200 V dc; Ec2 = 600 V dc; Eb1 = 0 | --- | --- | --- | --- |
| Electrode currents (Grid No. 2) | 5201 | --- | Ec1 = 0 | Ic2 | -15 | +15 | µA dc |
| Grid No. 2 leakage current | 5251 | --- | | --- | --- | --- | --- |
| Neck and bulb alignment | 5101 | --- | | --- | --- | --- | --- |
| Side terminal and base alignment | 5101 | --- | Pin No. 3 | --- | --- | --- | --- |
| Base pin solder depth | 1111 | --- | | --- | --- | --- | --- |
| Permanence of marking | 1105 | --- | | --- | --- | --- | --- |
| <u>Conformance inspection, part 3</u> | | | | | | | |
| Life test | --- | --- | Group C; t = 500 hours (min); Eb2 = 13,200 V dc; Ec2 = 600 V dc; Eb1 = focus; Ib2 = 60 µA dc | --- | --- | --- | --- |
| Life-test end points: | --- | | | | | | |
| Modulation | 5223 | --- | Ib2 = 100 µA dc | ΔEc1 Width | --- | 32 0.55 | V dc mm |
| Line width A | 5226 | --- | Ib2 = 100 µA dc | | | | |
| Heater-cathode leakage current | 5251 | --- | | | | | --- |
| Grid No. 1 leakage current | 5251 | --- | | | | | --- |
| Grid No. 2 leakage current | 5251 | --- | | | | | --- |
| Anode No. 1 leakage current | 5251 | --- | | | | | --- |
| Stray light emission (conventional types) | 5216 | --- | | | | | --- |

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

- 1/ When Ec2 is greater than 330 V dc, Rg1 shall not exceed 0.5 Meg. When Ec2 is less than 330 V dc, Rg1 shall not exceed 1.5 Meg.
- 2/ The neck and base straightness shall be determined by the insertion of the tube neck in a cylinder 5 inches (127.00 mm) long and 1.500 +.003, -.000 inches (38.10 +0.08, -0.00 mm) inside diameter. This cylinder should move freely between the reference line and the base of the assembled tube.
- 3/ The raster shall overscan the tube face. The centerline of the raster shall be adjusted for best focus.



| Ltr | Dimensions | | | |
|-----------------------------------|---------------------|--------|-------------|--------|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| Qualification inspection | | | | |
| M | Bulb contact: J1-21 | | | |
| N | Base: B6-63 | | | |
| Conformance inspection, part 2 | | | | |
| A | 10.380 | 10.620 | 263.65 | 269.75 |
| B | 4.500 | --- | 114.30 | --- |
| C | 1.380 | 1.500 | 35.05 | 38.10 |
| D | 16.560 | 17.310 | 420.62 | 439.67 |
| F | 9.250 | 9.620 | 234.95 | 244.35 |
| G | 6.880 | 7.620 | 174.75 | 193.55 |
| H | --- | .190 | --- | 4.83 |
| Reference dimensions (see note 5) | | | | |
| J | 42.000 | | 1066.80 | |
| K | .380 | | 9.65 | |
| L | 20.000 | | 508.00 | |

NOTES:

1. The minimum useful screen radius.
2. The base shall be a small shell duodecal 6-pin, B6-63.
3. Dimension C applies to entire length of neck below the reference line. The reference line is determined by the point where a gauge 1.500 + .003 inch (38.10 + 0.08 mm) inside diameter and 2 inches in length will stop against the bulb body.
4. Do not handle tube by the part of the bulb having the anti-corona coating.
5. Reference dimensions are for information only and are not required for inspection purposes.

FIGURE 1. Outline drawing of electron tube type 10WP7A.

Custodians:

Army - CR

Navy - EC

Air Force - 11

DLA - CC

Preparing Activity:

DLA - CC

(Project 5960-3551-19)

Review activities

Army - MI

Navy - AS, CG, MC, OS, SH