INCH-POUND

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SUPERSEDING
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23 December 1976

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, CATHODE RAY
TYPE 7AGP19

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: A 7.5 inch (190.5 mm) diameter, single beam, electrostatic focus and deflection cathode-ray tube having a special deflection structure for minimum deflection defocusing.

PIN CONNECTIONS AND DIMENSIONS: See figure 1.

ABSOLUTE RATINGS:

Parameter:	Ef	Ec1	Eb1	Eb2	ed	Rg	Zd	Ehk
Unit:	V	V dc	V dc	V dc	v	Meg	Meg	V dc
Maximum:	6.9	0	3,500	10,000	2,000	1.5	5.0 1/	± 180
Minimum:	5.7	-300	----	5.000	---	---	---	---
Test condition:	6.3	Adjust	Focus	8,000	---	---	---	---

See footnotes at end of table I.

GENERAL:

Qualification - Required.

TABLE I. Testing and inspection.

Inspection	Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Qualification inspection							
Face tilt	5101	---		---	---	---	---
Cathode illumination	5216	---		---	---	$10x10^{-6}$	fL
Deflection - factor uniformity	5248	---		---	---	1	%
Deflection defocusing	---	5/		---	---	1:1.5	Ratio
Direct - interelectrode capacitance	1331	---	Cathode to all	Ck	---	10.5	pF
			Grid 1 to all	Cg1	---	11.5	pF
			D1 to D2	C1D2	---	5.2	pF
			D3 to D4	C3D4	---	2.3	pF
			D1 to all	CD1	---	12.5	pF
			D2 to all	CD2	---	12.5	pF
			D3 to all	CD3	---	8.0	pF
			D4 to all	CD4	---	8.0	pF
Pressure (implosion)	1141	---		---	---	---	---
Vibration	5111	---		---	---	---	---
Conformance inspection, part 1		8/					
Voltage breakdown	5201	---		---	---	---	---
Voltage breakdown (electrostatic types)	5201	---		---	---	---	---
Gas "cross"	5206	3/ 7/	Beam current = 2 µA dc	---	---	---	---
Angle between traces	5101	---		---	89	91	Degrees
Bulb, screen, and faceplate quality	5106	4/		---	---	---	---
Modulation	5223	3/	Beam current = 2 µA dc	ΔEc1	---	22	V dc
Line width "A" (electrostatic deflection)	5226	3/	Beam current = 2 µA dc	Width	---	0.26	mm
Spot position (electrostatic deflection)	5231	---		---	---	15	mm
Spot displacement (leakage)	5231	---		---	---	10	mm
Grid cutoff voltage	5241	---		Eco	-105	-175	V dc
Focusing voltage at cutoff	5246	---		Eb1	2,000	2,950	V dc
Deflection factor	5248	---	+1D2	DF	175	195	V dc/in.

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

Inspection	Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 1 - Continued.							
Deflection factor	5248	---	+3D4	DF	170	186	V dc/in.
Pattern distortion	5103	---		1D2 3D4	--- ---	.5 1	% %
Grid No. 1 leakage current	5251	---		---	---	---	---
Anode No. 1 leakage current	5251	---		---	---	---	---
Anode No. 2 leakage current	5251	---		---	---	---	---
Conformance inspection, part 2							
Heater current	1301	---		If	540	660	nA
Electrode current (anode No. 1)	5201	---		Ib1	-15	+10	µA dc
Base alignment (electrostatic types)	5101	---	+1D2, index pin	---	---	---	---
Stray light emission	5216	6/	Eb2 = 10,000 V dc	---	---	---	---
Line width "B" (electrostatic types)	5226	3/	Beam current = 2 µA dc	Width	---	0.28	mm
Heater - cathode leakage current	5251	---		Ihk	---	15	µA dc
Screen (P19)	5221	---		cBf D0.1 D1.0 D1.0-D10	575 410 335 75	--- --- --- 120	cB cB cB cB
Secureness of base, cap or insert	1101	---		---	---	---	---
Base pin solder depth	1111	---		---	---	---	---
Permanence of marking	1105	---		---	---	---	---

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

Inspection	Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 3							
Life test (1)	---	3/	Group C; beam current = 2.0 µA dc; Eb2 = 10,000 V dc	t	500	---	hours
Life test (1) end points:	---						
Modulation	5223	3/	Beam current = 2.0 µA dc	ΔEc1	---	22	V dc
Line width "A"	5226	3/	Beam current = 2.0 µA dc	Width	---	0.26	mm
Line width "B"	5226	3/	Beam current = 2.0 µA dc	Width	---	0.38	mm
Life test (2)	---	3/	Group C; beam current = 2.0 µA dc; Eb2 = 10,000 V dc	t	1,000	---	hours
Life-test (2) end points:	---						
Modulation	5223	3/	Beam current = 2.0 µA dc	ΔEc1	---	44	V dc
Line width "A"	5226	3/	Beam current = 2.0 µA dc	Width	---	0.52	mm
Line width "B"	5226	3/	Beam current = 2.0 µA dc	Width	---	0.76	mm

1/ It is recommended that the deflection electrode circuit resistance be approximately equal.

2/ The P19 screen can be permanently damaged if the current density is permitted to rise too high. To prevent burning, minimum beam current densities shall be employed.

3/ Beam current is measured by applying a sufficient voltage to either D1 or D2 to deflect a 1 by 1 inch (25.4 by 25.4 mm) raster until the raster cannot be seen on the screen. Grid No. 1 bias voltage is adjusted so that either D1 or D2 will collect 2 microamperes.

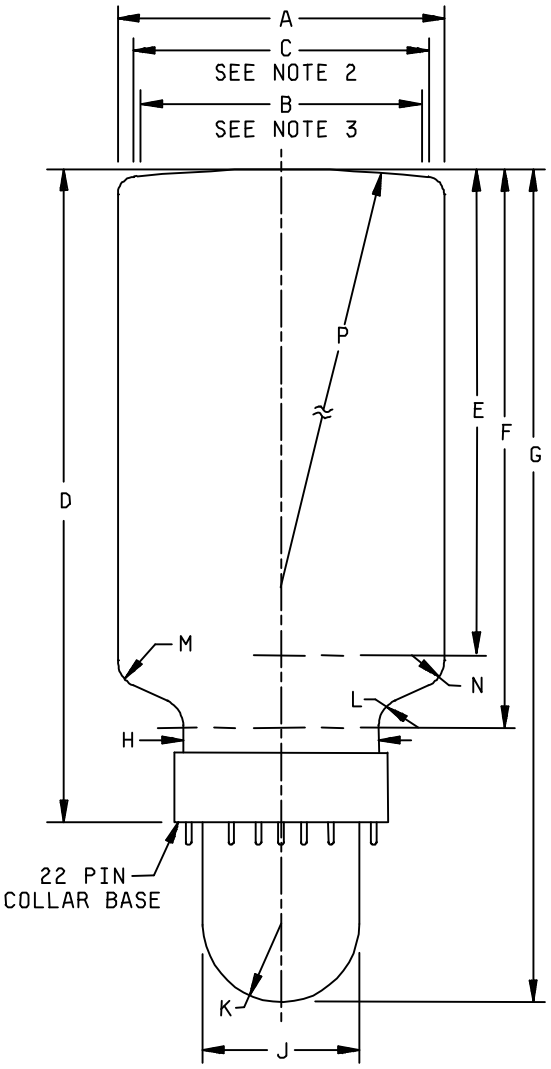
4/ No dead spot of diameter greater than 1 millimeter shall be permitted within the quality area, and in any 2-inch (50.8 mm) circle within the quality area not more than one of a diameter greater than 0.7 millimeter, and not more than four of a diameter greater than 0.3 millimeter.

5/ The ratio of the line width of a 6-inch (152.4 mm) long trace, adjusted for best center focus, to the line width measured on the faceplate axis when the trace is deflected perpendicularly ± 3 inches (± 76.2 mm) from the face center by a balanced dc voltage, shall be not greater than the value specified herein.

6/ With the tube enclosed in a lightproof container, with the potential specified herein applied, and with no deflecting fields applied, the tubes shall be biased to cutoff. Under these conditions, the entire face of the tube shall be examined for stray emission by an observer who has accommodated his eyes to viewing the face of the cathode-ray tube for at least 2 minutes through an aperture in the lightproof container. If stray emission occurs, scanning fields such as would be required to produce a 1 by 1 inch (25.4 by 25.4 mm) raster shall be applied, under which condition, the stray emission shall disappear completely.

7/ Test shall be performed at the conclusion of the holding period.

8/ Inspection shall be 100 percent.



Pin No.	Element
1	Accelerator
3	Deflector D1
5	Deflector D2
9	Focusing electrode
11	Cathode
12	Grid No. 1
14	Heater
15	Heater
19	Deflector D3
21	Deflector D4

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 2				
A	7.312	7.688	185.72	195.28
B	6.750	---	171.45	---
C	7.031	---	178.59	---
D	14.500	15.000	368.30	381.00
E	10.500	11.000	266.70	279.40
F	12.250	12.750	311.15	323.85
G	18.688	19.000	474.68	482.60
H	4.312	4.500	109.52	114.30
J	3.469	3.656	88.11	92.86
Reference dimensions (see note 4)				
K	.781 R		19.84 R	
L	.500 R		12.70 R	
M	5.063 R		128.60 R	
N	.875 R		22.22 R	
P	30.000 R		762.00 R	

NOTES:
1. Index pin to align with ID2 trace ± 10°.
2. Minimum useful screen.
3. Minimum quality area.
4. Reference dimensions are for information only and are not required for inspection purposes.

FIGURE 1. Outline drawing of electron tube type 7AGP19.

Custodians:
Army - CR
Navy - EC
DLA - CC

Review activities:
Army - MI
Navy - AS, CG, MC, OS

Preparing activity:
DLA - CC

(Project 5960-N254)