

INCH-POUND

MIL-PRF-1/866F  
15 August 2012  
SUPERSEDING  
MIL-PRF-1/866E  
21 September 1999

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, CATHODE RAY  
TYPES 7ABP7A AND 7ABP19A

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: Electrostatic focus, magnetic deflection, aluminized screens.

PIN CONNECTIONS AND DIMENSIONS: See figure 1.

ABSOLUTE RATINGS:

Parameter:	Ef	Ec1	Ec2	Eb2	Ehk	Rg1	Eb1	Alt
Unit:	V	V dc	V dc	V dc	V dc	MegΩ	V dc	ft
Maximum:	6.9	0, -200	770	11,000	±180	1/	1,100	10,000
Minimum:	5.7	---	---	7,000	---	---	-500	---
Test conditions:	6.3	Adjust	300	7,000	---	---	Focus	1.0

See footnotes at end of table I.

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GENERAL:

Qualification: Required.

| This specification sheet uses accept on zero defect sampling in accordance with MIL-PRF-1, table III.

TABLE I. Testing and inspection

Inspection	Method MIL-STD-1311	Type	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Qualification inspection</u>							
Pressure (implosion)	1141	Both		---	---	---	---
Vibration	5111	Both		Width	---	2.0	mm
Direct-interelectrode capacitance	1331	Both	Cathode to all g1 to all g2 to all	Ck	---	8.0	pF
				Cg1	---	10.0	pF
				Cg2	---	10.0	pF
Electrode current (grid No. 2)	5201	Both	Ec1 = 0	Ic2	-15	+15	μA dc
Modulation	5223	P7A	Ib2 = 100 μA dc; overscanned defocused pattern	ΔEc1	---	32	V dc
		P19A	Ib2 = 2 μA dc; overscanned defocused pattern	ΔEc1	---	15	V dc
Base material insulating quality	1216	Both	Zone 5	---	---	---	---
<u>Conformance inspection, part 1</u>							
Voltage breakdown	5201	Both		---	---	---	---
Voltage breakdown (electrostatic types)	5201	Both		---	---	---	---
Gas ratio	5206	Both	<u>4/</u>	Gr	---	0.25	---
Neck straightness	5101	Both	<u>3/</u>	---	---	---	---
Bulb, screen, and faceplate quality	5106	Both		---	---	---	---
Spot position (magnetic deflection)	5231	Both		---	---	9.52	mm
Zero-bias anode current (magnetic deflection)	5236	P7A		---	---	---	---
Grid cutoff voltage	5241	Both		Ec1	-33	-77	V dc
Grid No. 1 leakage current	5251	Both		---	---	---	---
Focusing electrode voltage	---	P7A	Ib2 = 100 μA dc <u>2/</u>	Eb1	0	250	V dc
		P19A	Ib2 = 2 μA dc <u>2/</u>	Eb1	0	300	V dc

See footnotes at end of table.

TABLE I. Testing and inspection – Continued

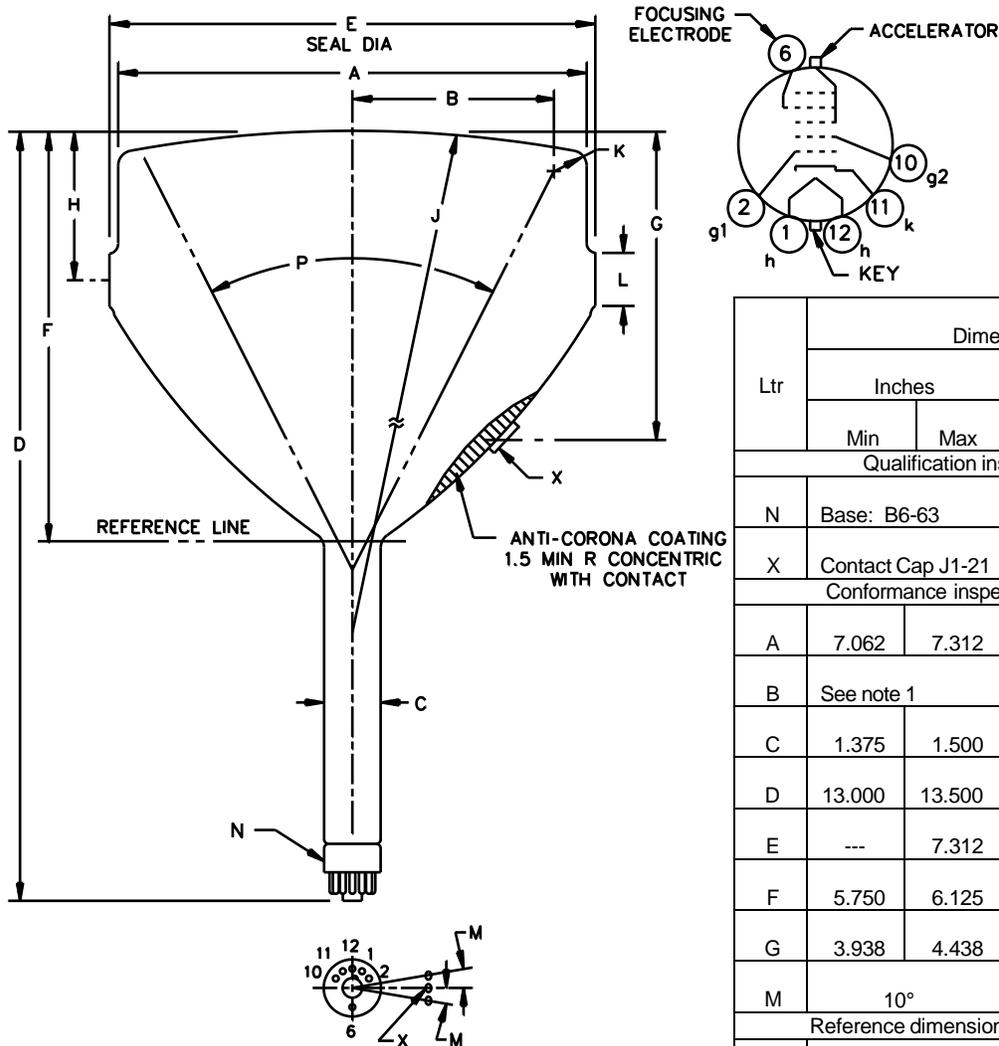
Inspection	Method MIL-STD-1311	Type	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 2</u>							
Heater current	1301	Both		If	540	660	mA
Side terminal and base alignment	5101	Both	Pin position No. 3	---	---	---	---
Neck and bulb alignment (magnetic types)	5101	Both		---	---	---	---
Secureness of base, cap, or insert	1101	Both		---	---	---	---
Face tilt	5101	Both		---	---	---	---
Cathode illumination	5216	Both		---	---	---	---
Stray light emission (conventional types)	5216	Both	Eb2 = 11,000 V dc; Ec2 = 770 V dc; Eb1 = 0	---	---	---	---
Screens	5221	Both		---	---	---	---
Line width A (electrostatic deflection)	5226	P7A	lb2 = 100 $\mu$ A dc	---	---	0.50	mm
		P19A	lb2 = 2 $\mu$ A dc	---	---	0.35	mm
Heater-cathode leakage current	5251	Both		---	---	---	---
Grid No. 2 leakage current	5251	Both		---	---	---	---
Base pin solder depth	1111	Both		---	---	---	---
Permanence of marking	1105	Both		---	---	---	---

See footnotes at end of table.

TABLE I. Testing and inspection – Continued

Inspection	Method MIL-STD-1311	Type	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 3</u>							
Life test	---	Both	Group C; t = 500 hours minimum; Eb2 = 11,000 Vdc; Ec2 = 770 V dc; Eb1 at focus	---	---	---	---
		P7A	Ib2 = 60 $\mu$ A dc	---	---	---	---
		P19A	Ib2 = 2 $\mu$ A dc	---	---	---	---
Life-test end points	---	P7A	Line width A Modulation	Width $\Delta$ Ec1	---	0.50 32	mm V dc
		P19A	Line width A Modulation	Width $\Delta$ Ec1	---	0.35 15	mm V dc
		Both	Grid No. 1 leakage current	---	---	---	---
			Heater-cathode leakage current	---	---	---	---
			Grid No. 2 leakage current	---	---	---	---
			Stray light emission (conventional types)	---	---	---	---

- 1/ When Ec2 is greater than 330 V dc, Rg1 shall not exceed 0.5 Meg $\Omega$ ; when Ec2 is less than 330 V dc, Rg1 shall not exceed 1.5 Meg $\Omega$ .
- 2/ Use an overscanned 35 to 105 line raster pattern with not less than .25 inch (6.35 mm) spacing between adjacent lines; adjust for best focus at center of tube.
- 3/ Cylinder shall be 5-inches (127.0 mm) long and 1.503 inches (139.78 mm) maximum inside diameter.
- 4/ This test to be performed at the conclusion of the holding period.



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Qualification inspection				
N	Base: B6-63			
X	Contact Cap J1-21			
Conformance inspection, part 2				
A	7.062	7.312	179.37	185.72
B	See note 1			
C	1.375	1.500	34.93	38.10
D	13.000	13.500	330.20	342.90
E	---	7.312	---	185.72
F	5.750	6.125	146.05	155.58
G	3.938	4.438	100.03	112.73
M	10°		10°	
Reference dimensions (see note 2)				
H	2.219		56.36	
J	24.00 R		609.60 R	
K	.375 R		9.53 R	
L	.750		19.05	
P	50°		50°	

NOTES:

1. The minimum useful screen radius shall be not less than 3 inches (76.2 mm).
2. Reference dimensions are for information only and are not required for inspection purposes.
3. The bulb shall be a J57-1/2C or J57-1/2D type.
4. Do not handle tube by the part of the bulb having the anticorona coating.
5. Dimension C applies to the entire length of the neck below the reference line. The reference line is determined by the point where a gauge 1.500 ± .003 inches (38.10 ± 0.08 mm) inside diameter and 2 inches (50.8 mm) in length will stop against the bulb body.

FIGURE 1. Outline drawing of electron tube types 7ABP7A and 7ABP19A.

Referenced documents. In addition to MIL-PRF-1, this specification sheet references MIL-STD-1311.

The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - CR  
Navy - EC  
Air Force - 85  
DLA - CC

Preparing activity:

DLA - CC  
  
(Project 5960-2012-046)

Review activities:

Army - AV, MI  
Navy - AS, CG, MC  
Air Force - 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.