

INCH-POUND

MIL-PRF-1/999C  
13 January 2012  
SUPERSEDING  
MIL-PRF-1/999B  
27 August 1999

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, GAS SWITCHING  
TYPE 6163

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: ATR, broadband, F0 = 9,050 MHz.

ABSOLUTE RATINGS:

Parameter:	Incident power	Du	TA (nonoperating)	Alt
Unit:	kw	---	°C	ft
Maximum:	250	0.001	+100	10,000
Minimum:	4	---	-40	---

PHYSICAL CHARACTERISTICS:

Dimensions: See figure 1  
Mounting position: Any.  
Test mounts: See figures 2, 3, and 4.  
Weight: 0.13 pound (approximate).  
Application: 6/

TEST CONDITIONS:

Parameter:	Incident power	tp	pr	σ'	F
Unit:	kw	μs	pps	---	MHz
Tolerance:	±5%	±0.15	±10%	Max	---
Test condition 1:	4	0.5	1,000	---	F4
Test condition 2:	20	1.0	1,000	1.02	F3
Test condition 3:	200 (min)	1.0	1,000	1.2	F4

Frequency		
F	Max	±
1	9,050	---
2	9,050	0.1%
3	9,050	1.0%
4	9,050	3%

GENERAL:

Qualification: Not required

Preproduction sample approval: Required. 1/

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

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TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Test	Conditions	Symbol	Limits		Unit
						Min	Max	
<u>Preproduction sample approval inspection</u>		<u>1/</u>						
Loaded Q	4461	<u>2/</u>	---	F0 = F1	QL	---	8.5	---
High-level VSWR	4474	<u>2/</u>	2		VSWR	---	1.15	---
Degradation due to vibration	4021	---	---		---	---	---	---
<u>Conformance inspection, part 1</u>								
Tuning susceptance	4482	<u>2/</u>	---	F0 = F2; g = 0.05	b	-0.06	+0.06	---
Firing time	4486	<u>3/</u>	1		t	---	10	sec
Arc loss	4488	<u>3/</u>	1		La	---	0.8	dB
Electrical symmetry	---	<u>2/ 4/</u>	---	F0 = F2; g = 0.05	---	---	0.06	cm
Temperature cycling (nonoperating)	1027	---	---		---	---	---	---
<u>Conformance inspection, part 2</u>								
Dielectric material strain	4101	---	---		---	---	---	---
Normalized conductance	4484	<u>2/</u>	---	F0 = F2	g	---	0.06	---
Recovery time	4471	<u>2/</u>	3		t	---	10	μs
<u>Conformance inspection, part 3</u>								
Life test	---	<u>6/</u>	3	Group D	t	500	---	hrs
Life-test end points:	---							
Tuning susceptance	4482	<u>2/</u>	---	Method A; F0 = F2; g = 0.05	b	-0.08	+0.08	---
Arc loss	4488	<u>3/</u>	1		La	---	1.0	dB
Normalized conductance	4484	<u>2/</u>	---	F0 = F2	g	---	0.1	---
Recovery time	4471	<u>2/</u>	3		t	---	15	μs
Temperature cycling life test	1027	---	---	Group D; 10 cycles (min)	---	---	---	---

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

- 1/ Preproduction sample approval requirements hereby replace any qualifications requirements referable to the product covered herein. The term "First article testing" shall be considered as synonymous with the term "Preproduction sample approval testing." All tests applicable herein (including all preproduction sample approval and conformance inspection, parts 1, 2, and 3) shall be performed during preproduction sample inspection. A failure of any one tube in any of the tests shall be cause for decision of preproduction sample disapproval.
- 2/ The tube under test (TUT) shall be mounted in test mount A as detailed in figures 2 and 3.
- 3/ This test shall be performed at least 168 hours after pumping and at least 24 hours after any previous discharge.
- 4/ The shift in position of the voltage minimum, resulting from reversing the TUT in the test mount, shall be within the specified limits when measured in an RG-51/U waveguide.
- 5/ This tube is designed for application in pairs mounted in the wide walls of RG-51/U waveguide.
- 6/ The TUT shall be mounted in test mount B as detailed in figure 4.

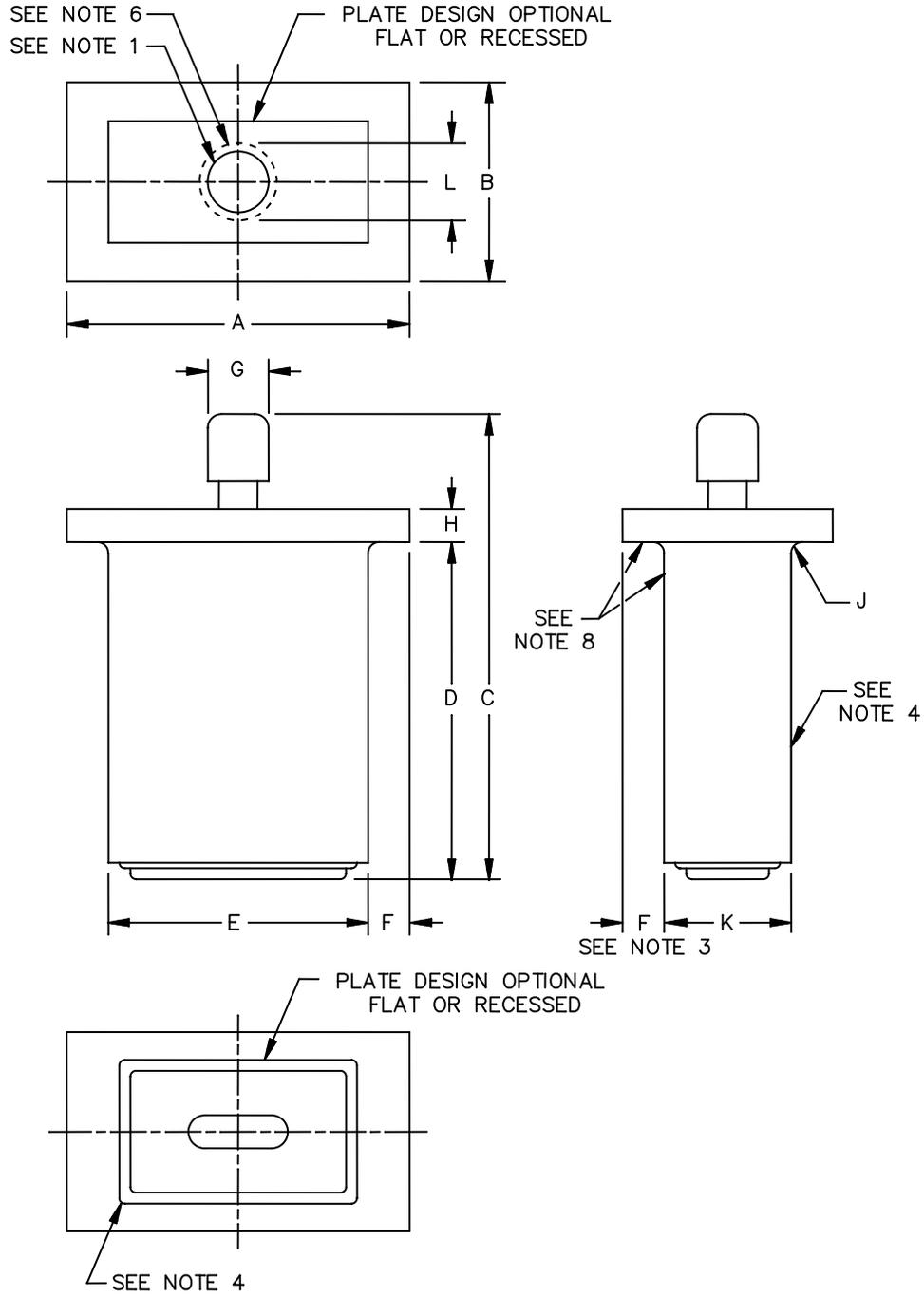


FIGURE 1. Outline drawing of electron tube type 6163.

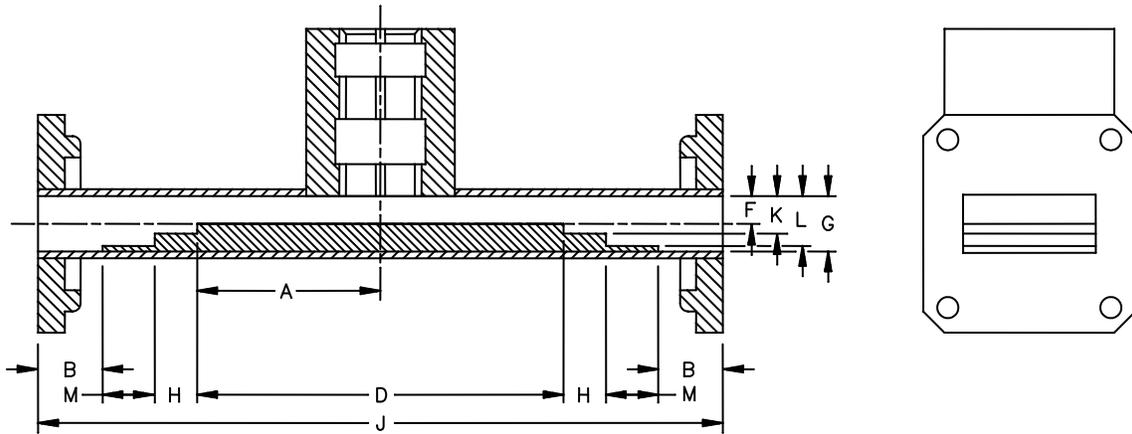
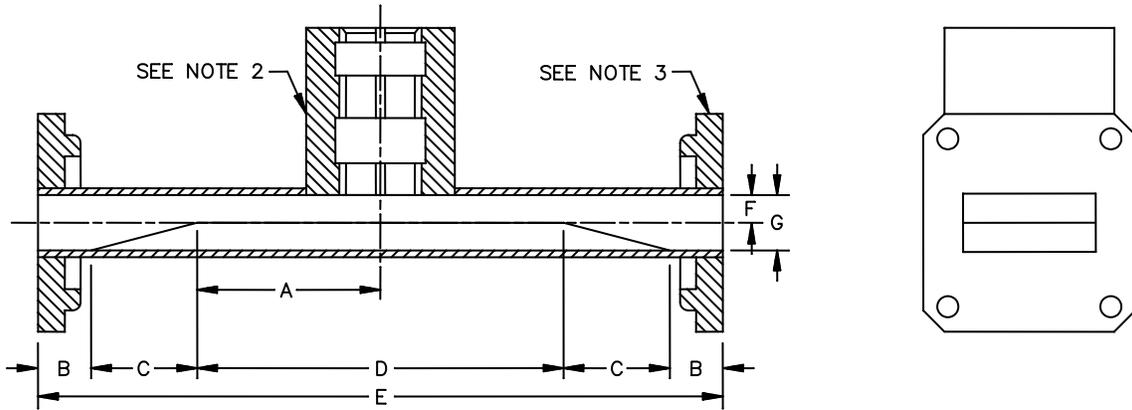
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Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Preproduction sample approval inspection (see note 9)				
G	---	.281	---	7.14
Conformance inspection, part 1 (see note 10)				
A	1.265	1.285	32.13	32.64
B	.770	.780	19.56	19.81
C	---	1.719	---	43.66
D	1.296	1.302	32.92	33.07
F	.125	---	3.18	---
Conformance inspection, part 2				
E	.995	1.005	25.27	25.53
H	.117	.133	2.97	3.38
J	---	.020 Rad	---	0.51 Rad
K	.495	.505	12.57	12.83
L	---	.438	---	11.13

NOTES:

1. The tubulation shall fall within a circle .438 inch (11.13 mm) diameter maximum located from the center lines of the end plate.
2. An optional cosmetic silver plate 100 MSI minimum or equivalent finish may be applied, at the manufacturer's discretion.
3. Applies to four walls for full length from radius J to window plate.
4. Four long edges of tube body shall have a .020 inch (0.51 mm) ±.010 inch (0.25 mm) approximate radius.
5. A radius of .031 inch (0.79 mm) maximum or a chamfer of .016 (0.41 mm) x 45° maximum permissible on the window plate corners.
6. Spread of solder to be held within area shown.
7. No gaskets are to be used with this tube.
8. These surfaces on all four sides shall be perpendicular to each other within .010 inch (0.25 mm) for full length of body from radius J to window plate.
9. Preproduction sample approval requirements hereby replace any qualification requirements referable to the product covered herein. The term "First article testing" shall be considered as synonymous with the term "Preproduction sample approval testing." All tests applied herein (including all preproduction sample approval and conformance inspection, parts 1, 2, and 3) shall be performed during preproduction sample inspection. A failure of any one tube in any of the tests shall be cause for decision of preproduction sample disapproval.
10. Unless otherwise specified, the acceptance level for all tests listed under conformance inspection, part 1, shall be 1.0. Acceptance shall be based upon accept on zero (c = 0) sampling plan in accordance with table III of MIL-PRF-1.

FIGURE 1. Outline drawing of electron tube type 6163 - Continued.



ALTERNATE DESIGN OF TEST MOUNT

NOTES:

1. Method of fabrication optional.
2. Dimensions of socket shown on figure 3.
3. Flanges may be UG-51/U or UG-52A/U.
4. All internal edges to have .015 inch (0.38 mm) to .031R inch (0.79 mm)

Ltr	Dimensions			
	Inches		mm	
	Min	Max	Min	Max
Conformance inspection				
A	1.590	1.610	40.39	40.89
C	3.190	3.210	81.03	81.53
D	3.190	3.210	81.03	81.53
F	.248	.250	6.30	6.35
G	.494	.500	12.55	12.70
H	.396	.406	10.06	10.31
K	.309	.313	7.85	7.95
L	.371	.375	9.42	9.53
M	.394	.414	10.01	10.52
Reference dimensions				
B	.50		12.70	
E	10.59		268.99	
J	5.81		147.57	

FIGURE 2. Test mount "A" outline.

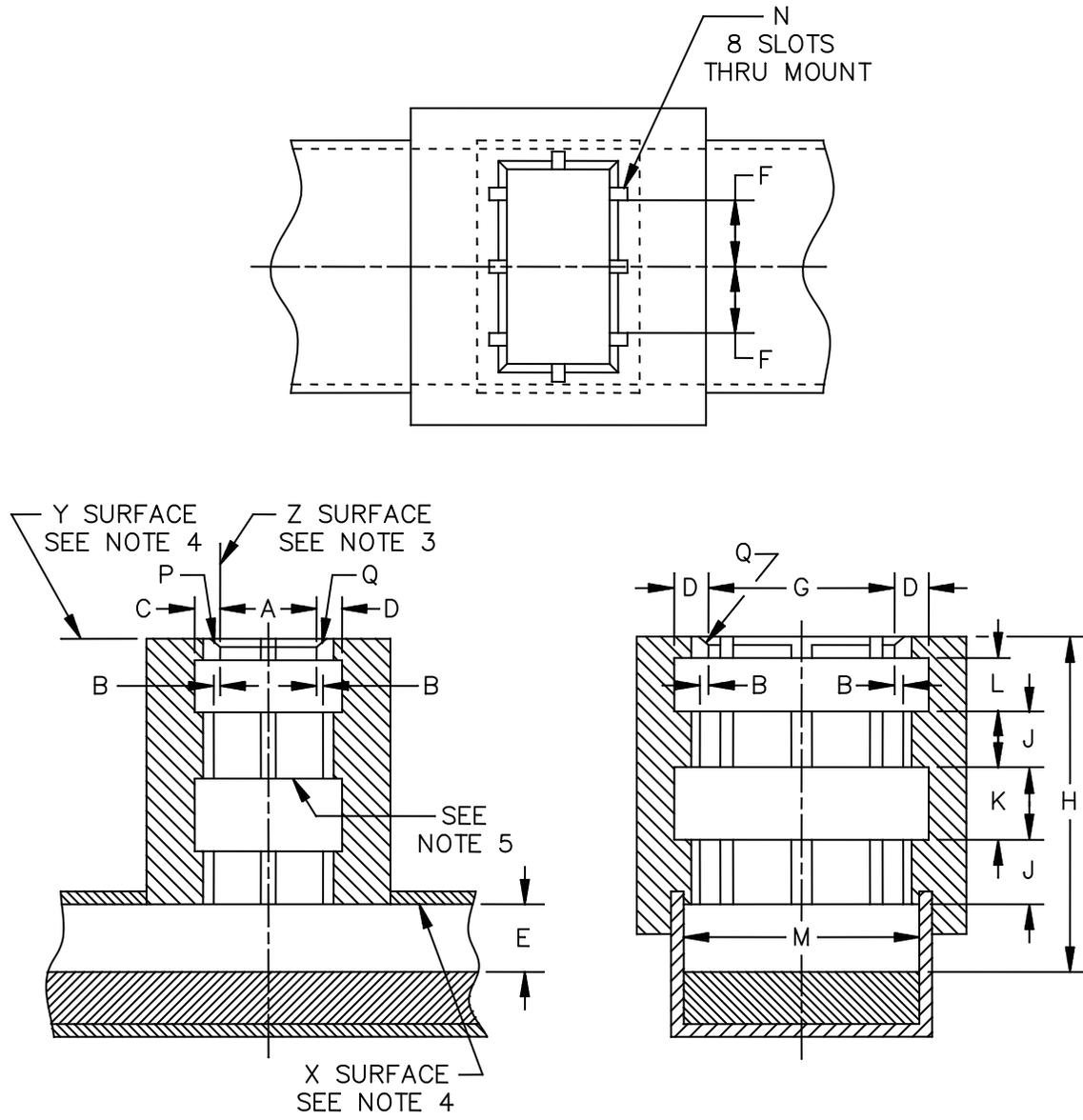


FIGURE 3. Test mount "A" details.

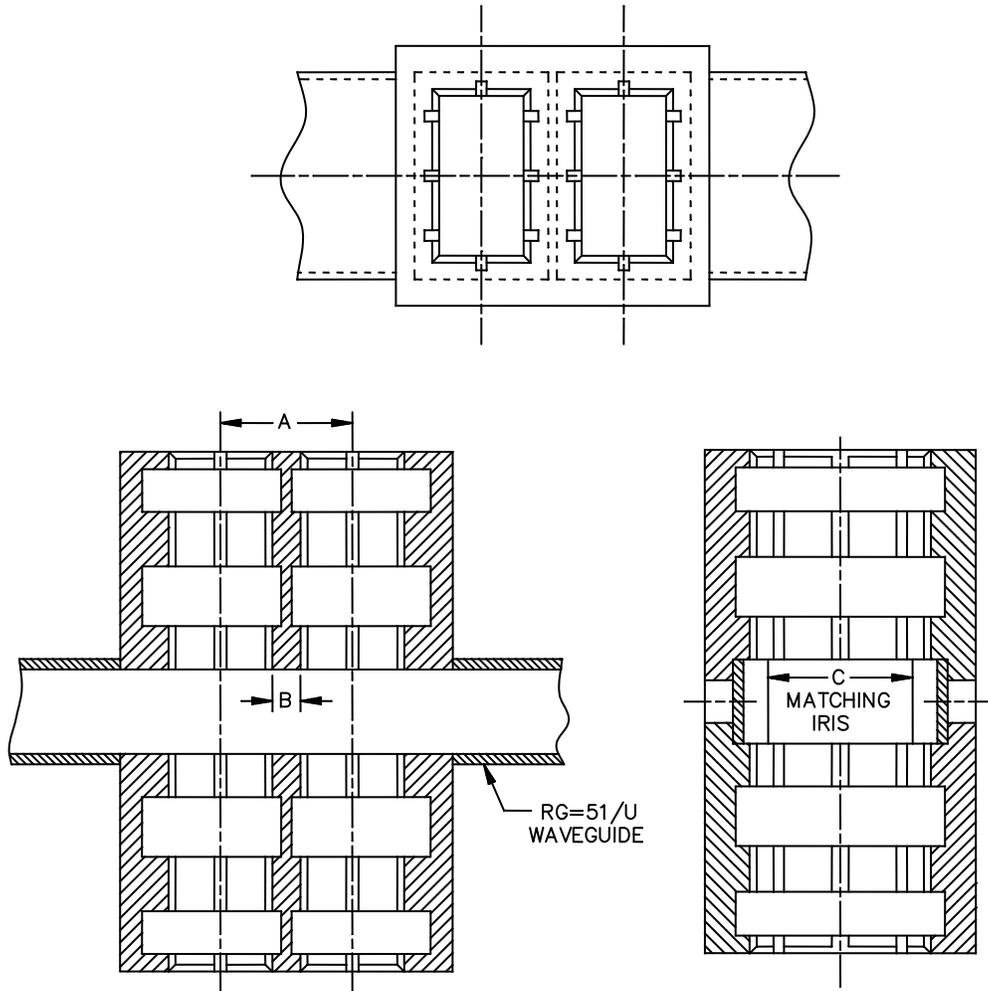
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Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection				
A	.506	.511	12.85	12.98
B	.016	.020	0.41	0.51
C	.126	.135	3.20	3.43
D	.196	.205	4.98	5.21
G	1.006	1.012	25.56	25.70
H	1.550	1.554	39.37	39.47
J	.288	.298	7.32	7.57
K	.352	.362	8.94	9.19
L	.257	.267	6.53	6.78
Reference dimensions				
E	.249		6.32	
F	.344		8.74	
M	1.122		28.50	
N	.062 x .062		1.57 x 1.57	
P	.031 TYP		0.79 TYP	
Q	.031 x 45° TYP		0.79 x 45° TYP	

NOTES:

1. Method of fabrication optional.
2. Suitable clamp shall be provided to insure proper seating of tube in mount.
3. Pressure shall be provided to press the tube against surface "Z".
4. Surfaces "X" and "Y" shall be parallel within  $\pm 0^{\circ}5'$ .
5. All internal edges to have .015R inch (0.38 mm) to .031R inch (0.79 mm).

FIGURE 3. Test mount "A" details - Continued.



NOTES:

1. Internal dimensions of each socket same as detail of test mount "A".
2. Method of fabrication optional.
3. Suitable clamps shall be provided to insure proper contact of tubes in mount.
4. Matching IRIS for dimension C:  $.846 \pm .003$  inches ( $21.49 \pm 0.08$  mm).

Ltr	Dimensions			
	Inches		mm	
	Min	Max	Min	Max
A	.799	.801	20.29	20.35
B	.122	.128	3.10	3.26
C	21.41	21.57	543.8	547.9

FIGURE 4. Test mount "B"

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

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Custodians:

Army - CR  
Navy - EC  
Air Force - 99  
DLA - CC

Preparing activity:

DLA - CC

(Project 5960-2011-015)

Review activities:

Army - AR, MI  
Navy - AS, CG, MC, OS, SH  
Air Force - 19

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