

INCH-POUND

MIL-PRF-1/297F  
w/AMENDMENT 1  
5 December 2016  
SUPERSEDING  
MIL-PRF-1/297F  
6 March 2015

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, MAGNETRON  
TYPE 2J55

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:** Fixed frequency,  $9,375 \pm 30$  MHz, pulse type, integral magnet, rated peak power output 40 kW.

**ABSOLUTE RATINGS:**

Parameter:	EF	tk	epy	ib	Pi	pi	tpc	Du	T (anode)	Alt
Unit:	V	sec	kv	a	W	kw	$\mu$ s	---	$^{\circ}$ C	ft
Maximum:	6.93	---	16	16	180	230	2.5	0.001	100	10,000
Minimum:	---	120	---	---	---	---	---	---	---	---

**PHYSICAL CHARACTERISTICS:** See figure 1.

Input connection: See figure 1.

Output coupling: Mates with UG52B/U flange (MIL-DTL-3922/59).

Magnet isolation: See note 2.

**WEIGHT:** 4 pounds (approximate).

**MOUNTING POSITION:** Any

**TEST CONDITIONS:** See note 2.

Parameter:	Ef	tk	tpc	trv	Du	Ib	VSWR	T (anode)
Unit:	V	sec	$\mu$ s	$\mu$ s	---	mA dc	---	$^{\circ}$ C
Tolerance:	---	---	$\pm 10\%$	---	---	---	---	---
Test 1:	0	120 (min)	1.0	0.2 (max)	0.001	12	1.15 (max)	80 (approx)
Test 2:	2.5 note 3	120 (min)	2.0	0.2 (max)	0.00065	8	1.15 (max)	80 (approx)

**GENERAL:**

I Qualification – Required.

AMSC N/A

FSC 5960



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TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Test	Conditions	Symbols	Limits		Units
						Min	Max	
<u>Qualification Inspection</u>								
High-frequency vibration	1031	---	---	No voltages	---	---	---	---
Temperature coefficient	4027	---	1		$\Delta F/\Delta T$	---	0.25	MHz/ °C
Low-temperature operation	1026	---	1	$t_k = 120$ (max); $T_A = -65^\circ\text{C}$	---	---	---	---
Barometric pressure, reduced	1002	---	1	Pressure = 380 mmHg (abs)	---	---	---	---
Snap-on stability	4315	5	2	VSWR = 1.1 (max)	MP	---	1	%
Forced cooling	1143	4, fig 1 (16)	1	$T_A = 25^\circ \pm 5^\circ\text{C}$	T	---	50	°C
<u>Conformance inspection, part 1</u>								
Heater current	1301	---	---	$E_f = 6.3$ V	I <sub>f</sub>	0.90	1.10	A
Pulse voltage	4306	---	1		epy	11	13	kv
Pressurizing	4003	---	---	40 to 45 psia	---	---	---	---
Power output	4250	---	1	$t = 300$ (max)	P <sub>o</sub>	40	---	W
RF bandwidth	4308	---	1	I <sub>b</sub> = 11 to 13 mA dc	BW	---	3/tpc	MHz
Pulling factor	4310	---	1	VSWR = 1.5	$\Delta F$	---	15	MHz
Stability	4315	5	2	VSWR = 1.1 (max)	MP	---	1	%
Fixed frequency	---	---	1		F	9,345	9,405	MHz
<u>Conformance inspection, part 2</u>								
Low-frequency vibration	1031	---	---	No voltages	---	---	---	---
<u>Conformance inspection, part 3</u>								
Life-test provisions	---	---	1	Group D	t	500	---	hrs
Life-test end points	---	---	---					
Power output	4250	---	1		P <sub>o</sub>	30	---	W
RF bandwidth	4308	---	1		BW	---	3/tpc	MHz

See notes at end of Table I.

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NOTES:

1. This specification sheet uses accept on zero defect sampling plan in accordance with MIL-PRF-1, table III.
2. In handling and mounting the tube, care shall be taken to prevent demagnetization. Magnetic materials or devices shall not be brought within 2 inches of the tube.
3. The product of the pulse duration in seconds and the pulse recurrence frequency in hertz shall not exceed 0.0007 for  $P_i = 150$  kW, or greater, and shall not exceed 0.001 in any circumstance. The pulse recurrence frequency shall be 325 pps, or greater. During high-voltage pulsed operation, the heater voltage should be varied with input power approximately in accordance with the formula:

$$E_f = 6.3 \sqrt{1 - \frac{P_i}{150}}$$

where:  $E_f = 0$  for all values of  $P_i$  greater than 150. The heater should be protected against input pulse power by an appropriate filter.

4. With an airflow, at standard atmospheric pressure, of 65 cfm directed at the cooling fins from an orifice of 1-11/64 inches (29.77 mm) by 1-23/64 inches (34.53 mm), the rise above the ambient temperature specified shall not be exceeded. The orifice shall be located 0.25 inch (6.35 mm) from the cooling fins.
5. The missing pulses shall be counted during any 3 minutes of a test interval of 6 minutes, or less. A missing pulse is defined as one whose energy within a  $\pm 1$  percent frequency range of the normal test frequency is 70 percent of a normal pulse, or less.

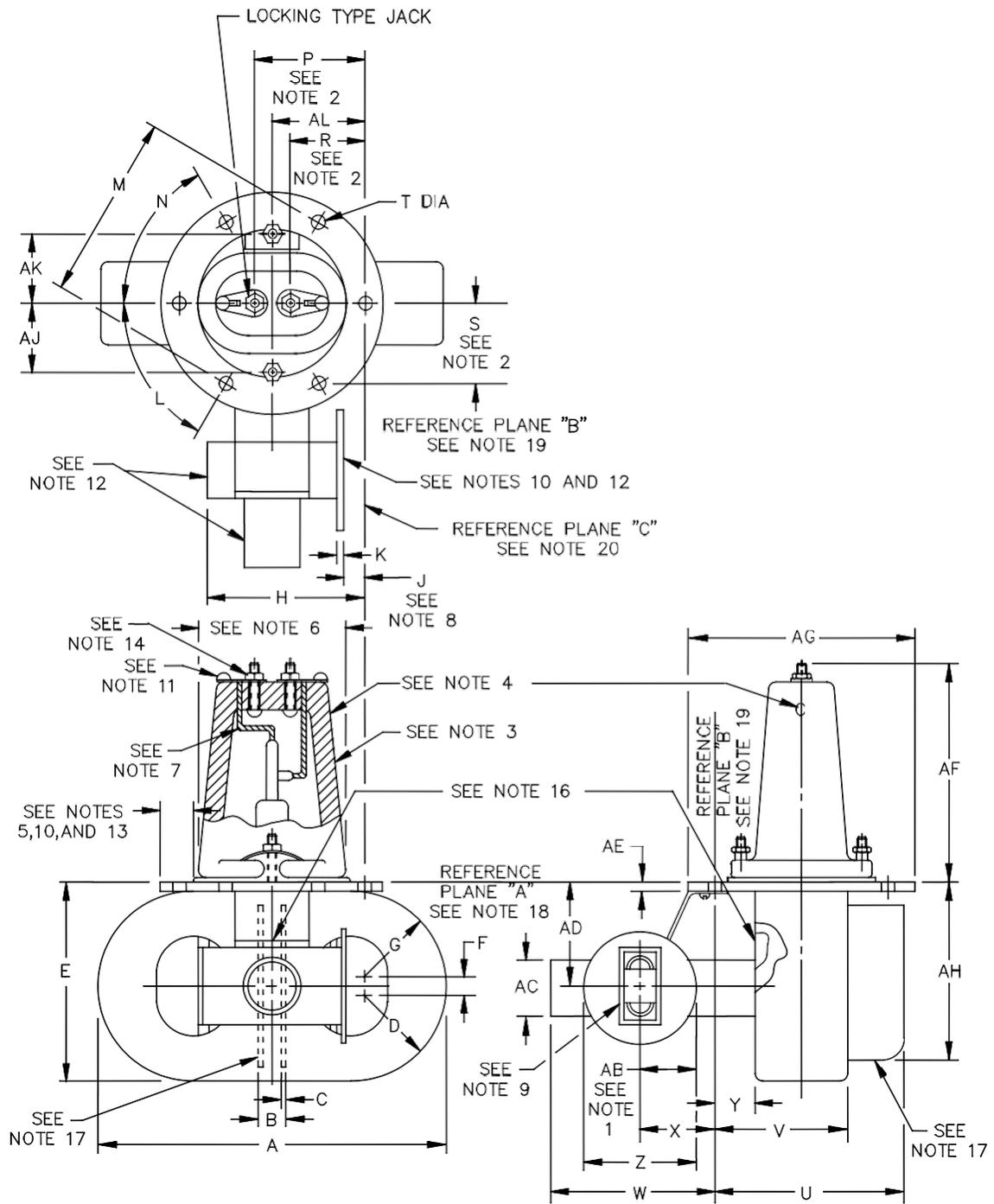


FIGURE 1. Outline drawing of electron tube type 2J55.

See notes at end of Figure I.

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NOTES:

1. Output flange to be concentric with the open end of the guide to within 0.010 inch (0.25 mm).
2. The jack holes shall be within a radius of 0.023 inch (0.58 mm) of true location specified but shall be spaced 0.500 inch (12.70 mm)  $\pm$  0.010 inch (0.25 mm) with respect to each other. The center lines of the holes shall be perpendicular to reference plane 'A' within 3°.
3. Pyrex glass, porcelain, or approved equivalent.
4. Indicate common cathode connection by letter C.
5. With the flange resting on a plane surface, the flatness of the mounting plate 0.500 inch (12.70 mm) from the outer edge shall be such that a 0.010 inch (0.25 mm) thickness gauge 0.125 inch (3.18 mm) wide shall not enter for a distance of more than 0.250 inch (6.35 mm).
6. Metal surfaces shall be covered by painted finish except inside of waveguide, jack terminals and surfaces, covered by note 10.
7. Filament leads shall be flexible and slack.
8. Tolerance includes angular as well as lateral deviations of the surface.
9. Output to mate with UG52B/U flange (MIL-DTL-3922/59).
10. Shall be free from paint.
11. Leads soldered to terminal clip.
12. All joints in waveguide assembly shall be vacuum tight to provide hermetic seal at flange.
13. All joints in mounting plate shall be vacuum tight to provide hermetic seal.
14. Heater connection.
15. Any portion of the assembly extending above this surface shall be within a 1.109 inch (28.17 mm) radius of the true center of the plate.
16. Anode temperature measurement point.
17. Radiator fins.
18. Reference plane A is defined as a plane passing along the surface of mounting plate as shown.
19. Reference plane B is defined as a plane passing through the center of the two mounting plate holes at plane A and is perpendicular to plane A.
20. Reference plane C is defined as a plane passing through the center of the mounting plate hole (as shown) at plane A and is mutually perpendicular to planes A and B.
21. Dimensions are in inches. Metric equivalents are in parentheses.

Dimensions in inches with metric equivalents (mm) in parentheses.		
Ltr	Minimum	Maximum
Conformance inspection, part 1 (see note 1 Page 3)		
J	0.417 (10.59)	0.457 (11.61)
Z	1.743 (44.27)	1.757 (44.63)
Conformance inspection, part 2		
A		5.375 (136.53)
B		0.500 (12.70)
E		3.125 (79.38)
H		2.500 (63.50)
K	0.080 (2.03)	0.090 (2.29)
L	59° 48'	60° 12'
M	2.869 (72.87)	2.881 (73.18)
N	59° 48'	60° 12'
T	0.190 (4.83)	0.196 (4.98)
U		2.745 (69.72)
W		2.661 (67.59)
X	1.172 (29.77)	1.212 (30.78)
Y	0.432 (10.97)	
AB	0.859 (21.82)	0.891 (22.63)
AF	2.922 (74.22)	3.047 (77.39)
AG	3.219 (81.76)	3.281 (83.34)
AH		2.969 (75.41)
AJ	0.875 (22.23)	0.937 (23.80)
AK	0.875 (22.23)	0.937 (23.80)
AL	1.406 (35.71)	1.468 (37.29)
Conformance inspection, part 3 (periodic check)		
AD	1.542 (39.17)	1.582 (40.18)
AE	0.120 (3.05)	0.130 (3.30)
Reference dimensions		
C	0.062 (1.57)	
D	1.344 (34.14)	
F	0.374 (9.50)	
G	1.344 (34.14)	
P	1.687 (42.85)	
R	1.187 (30.15)	
S	1.245 (31.62)	
V	2.057 (52.25)	
AC	0.750 (19.05)	

FIGURE 1. Outline drawing of electron tube type 2J55 - Continued.

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Referenced documents. In addition to MIL-PRF-1, this document references the following:  
MIL-STD-1311  
MIL-DTL-3922/59

The margins of this specification sheet are marked with vertical lines to indicate modifications generated by this amendment. 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.

Custodians:

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

Preparing activity:  
DLA - CC

(Project 5960-2017-001)

Review activities:

Navy - AS, CG, OS, SH  
Air Force - 99

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