

INCH POUND  
MIL-PRF-1/383E  
24 March 2006  
SUPERSEDING  
MIL-PRF-1/383D (NAVY)  
28 July 1998

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, MAGNETRON  
TYPE 6344A

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:** Magnetron, pulse, 5450 to 5825 MHz tunable frequency, 175 kw minimum peak power output, integral magnet, air cooled. Unilaterally interchangeable with 6344 magnetron in all systems.

**ABSOLUTE RATINGS:** (See Note 13)

Independent:

Parameter:	if (surge)	tk	VSWR	Turner Torque	Anode T	Bushing T	epy	Input Capacitance
Unit:	a	sec	---	in-oz	°C	°C	kv	pF
Maximum:	10	---	1.5:1	160	150	175	24.0	25
Minimum:	---	180	---	---	-65 Note 2	-65 Note 2	---	---

Dependent: (See Note 14)

Parameter:	Ef	If	ib	Pi	pi	Du	tpc	prp
Unit:	V	A	a	W	kw	---	μs	pps
Maximum:	15.5	3.0	30.0	720	720	0.001	2.5	4,000
Minimum:	---	---	---	---	---	---	0.25	---

tpc (μs)	rrv kv/μs (Note 1)		tfc (μs) (Note 12)
	Min.	Max.	
2.5	70	140	0.70
1.5	70	160	0.60
1.0	70	165	0.50
0.25	70	180	0.20

**PHYSICAL CHARACTERISTICS:**

Dimensions: See figure 1.  
Mounting position: Any.  
Support: Mounting flange.  
Cooling: Forced air required (Note 4).  
Magnet: Note 15.  
Coupling: Waveguide flange UG-148C/U conforming to MIL-DTL-3922/62.  
Net weight: 25 pounds maximum.

**GENERAL:**

Qualification - Required

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Table I. Testing and Inspection.

Inspection	Method MIL-STD- 1311	Conditions	Acceptance Levels (see Note 19)	Symbol	Limits Min	Limits Max	Unit
<u>Qualification</u>							
Air cooling	1143	Osc. (2); Notes 2, 4 and 5	---	$\Delta T$	---	150	$^{\circ}\text{C}$
High frequency vibration	1031	No voltage; t = 60	---	---	---	---	---
Starting torque	4223		---	Torque	---	160	in.-oz
Operating torque	4223		---	Torque	---	160	in.-oz
Tuner stop torque	4223		---	Torque	---	200	in.-oz
Temperature coefficient	4027	T = 45 $^{\circ}$ to 75 $^{\circ}\text{C}$ ; f = 5,600 MHz; (Note 10) Osc. (1)	---	$\Delta F$ $\Delta T$	---	0.25	MHz/ $^{\circ}\text{C}$ .
<u>Conformance inspection, part 1</u>							
Heater current	1301	Ef = 13.5 V, tk = 180 sec. (min)	0.65	---	2.35	2.75	A
		VSWR = 1.05 (max)					
<u>Oscillation (1)</u>							
Heater-cathode warm-up time	4303	Ef = 13.5 V; tk = 180 sec. (max); Ef = 13.5 V for test	---	---	---	---	
Pulse characteristics	4304	tp = 0.25 $\pm$ 0.03 $\mu\text{s}$ ; Du = 0.00024 rrv = 180 kv/ $\mu\text{s}$ (min); Note 1	---	---	---	---	
Average anode current	1256	Ib = 5.3 mA dc	---	---	---	---	
	4250	Note 9	0.65	Po	43	---	watts
Power output	4308	Notes 6 and 7	0.65	$\Delta F$	---	2.0 tp	MHz
RF bandwidth	4308	Notes 6 and 7	0.65	Ratio	8	---	dB
Minor lobes							
<u>Oscillation (2)</u>							
Heater-cathode warm-up time	4303	Ef = 13.5 V; tk = 180 sec (max); Ef = 13.0 V for test Note 3					

See notes at end of table.

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Table I. Testing and Inspection -Continued.

Inspection	Method MIL-STD- 1311	Conditions	Acceptance Levels (see Note 19)	Symbol	Limits Min	Limits Max	Unit
<u>Conformance inspection, part 1</u> - Continued.							
Pulse characteristics	4304	$t_p = 1.30 \pm 0.13 \mu s$ ; $D_u = 0.00085$ $r_{rv} = 160 \text{ kv}/\mu s$ (min); Note 1	---	---	---	---	---
Average anode current	1256	$I_b = 18.7 \text{ mA dc}$ ;	---	---	---	---	---
Pulse voltage	4306	Note 6	0.65	epy	20.0	23.0	kv
Power output	4307	Note 6	0.65	Po	150	---	watts
Mechanical tuning range	4223	Upper Limit	0.65	F	---	5825	MHz
		Lower Limit	0.65	F	5450	---	MHz
RF bandwidth	4308	Notes 6 and 7	0.65	F	---	2.0/ $t_p$	MHz
Minor lobes	4308	Notes 6 and 7	0.65	Ratio	8	---	dB
Stability	4315	Notes 6, 8 and 16	0.65	Missing pulse	---	0.25	%
Pulling factor	4310	Note 6; VSWR = 1.5	0.65	$\Delta F$	---	15	MHz
Pushing factor	4311	Note 6; $I_b = 16.5$ to 20.5 mA dc	0.65	$\Delta F$	---	2.0	MHz
<u>Conformance inspection, part 2</u>							
Low frequency vibration	1031	No voltage; $t = 60 \text{ sec}$ ;	6.5	---	---	---	---
Stability	4315	Osc. (1); Notes 6, 8 and 17	0.65	Missing Pulse	---	0.25	%
<u>Conformance inspection, part 3</u>							
Life test	---	Group D; Osc. (2) Frequency = 5450 MHz (Note 11); VSWR = 1.5:1 (min) cycled through $\lambda_g$ in 15 min (max) See Note 18		RF time	1200	---	cycles
					1000	---	hours

See notes at end of table.

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Table I. Testing and Inspection -Continued.

Inspection	Method MIL-STD- 1311	Conditions	Acceptance Levels (see Note 19)	Symbol	Limits Min	Limits Max	Unit
<u>Conformance inspection, part 3</u> -Continued							
Life test end points	---						
Power output		Osc. (2); Note 6		Po	120	---	Watts
Tunable frequency		Osc. (2) Upper limit Osc. (2) Lower limit		F F	--- 5450	5825 ---	MHz MHz
RF bandwidth		Osc. (1) and Osc. (2)		F	---	3.0/tp	---
Minor lobes		Osc. (1) and Osc. (2)		Ratio	6	---	---
Stability		Osc. (2); Notes 6 and 8		Missing Pulse	---	0.5	%
Stability		Osc. (1); Notes 6, 8 and 17		Missing Pulse	---	0.5	%

NOTES:

1. The rate of rise of voltage (rrv) shall be expressed in kilovolts per microsecond. Any capacitance used in the viewing system shall not exceed 6 pF.
2. The temperature shall be measured at the point shown on figure 1.
3. The heater voltage for standby operation is 13.5 volts  $\pm$ 10 percent. The schedule by which the heater voltage shall be reduced after the application of high voltage shall be as follows:

For Pi up to 250 watts, Ef = 13.5  $\pm$ 10 percent  
 For Pi 250 watts to 300 watts, Ef = 13.4  $\pm$  10 percent  
 For Pi 300 watts to 400 watts, Ef = 13.2  $\pm$  10 percent  
 For Pi 400 watts to 500 watts, Ef = 13.0  $\pm$  10 percent  
 For Pi 500 watts to 600 watts, Ef = 12.5  $\pm$  10 percent

4. With a total airflow of approximately 30 c.f.m. at approximately 760 mm Hg. and 25°C, the temperature shall not exceed the limit specified.
5. The frequency shall be the frequency of minimum power output between 5450 and 5825 MHz.
6. Though the requirement exists continually from 5450 to 5825 MHz, tests shall be performed at the following frequencies:

F1 = 5450  $\pm$  5 MHz  
 F2 = 5625  $\pm$  5 MHz  
 F3 = 5825  $\pm$  5 MHz

7. The spectrum shall be measured with a VSWR of 1.5 introduced in the load at a distance no greater than 1 meter from the magnetron coupling flange, the phase being adjusted to produce maximum spectrum degradation. A satisfactory spectrum is one whose slope does not change sign more than once for power levels greater than the specified dB below its peak.
8. Stability shall be measured with the tube terminated in a transmission line of 1.5 VSWR adjusted in phase to produce maximum instability. The tube shall be considered stable if the specified missing pulse limit is not exceeded during any 3 minute interval of a 6-minute test period.
9. The power output shall be continuous over the range from 5450 to 5825 MHz. At no frequency in this range shall the power output be less than the specified minimum value.

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NOTES: - Continued.

10. The frequency shall be measured at the extremes of the specified temperature range. The anode temperature shall be measured at the point shown on figure 1.
11. Starting at 5450 MHz the frequency will be increased in 75 MHz increments after each 200 hours (approximately) of total cycle operation.
12. The time of fall of current (tfc) is measured from the zero to 85 percent level of the trailing edge of the current pulse.
13. The ratings have been divided into two groups as follows:
  - a. Independent (ratings which may be obtained simultaneously).
  - b. Dependent (ratings which are interrelated and may not necessarily be obtained simultaneously).

14. To relate the various parameters, the following formula shall be used:

$$P_i = I_b \times D_u \times 21500$$

15. In handling and mounting the magnetron, care shall be exercised to prevent demagnetization.
16. This test shall be performed at the conclusion of the holding period.
17. The requirement shall be met with the heater voltage at plus 10 percent and minus 10 percent from the voltage specified for test.
18. Test cycles shall be as follows:

Condition	I <sub>b</sub>	E <sub>f</sub>	Duration
Standby	0 A	13.5 v	3.0 Min. (Max)
Osc. (2)	18.7	13.0	50 Min. (Min)
Off	0	0	7.0 Min. (Min)

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

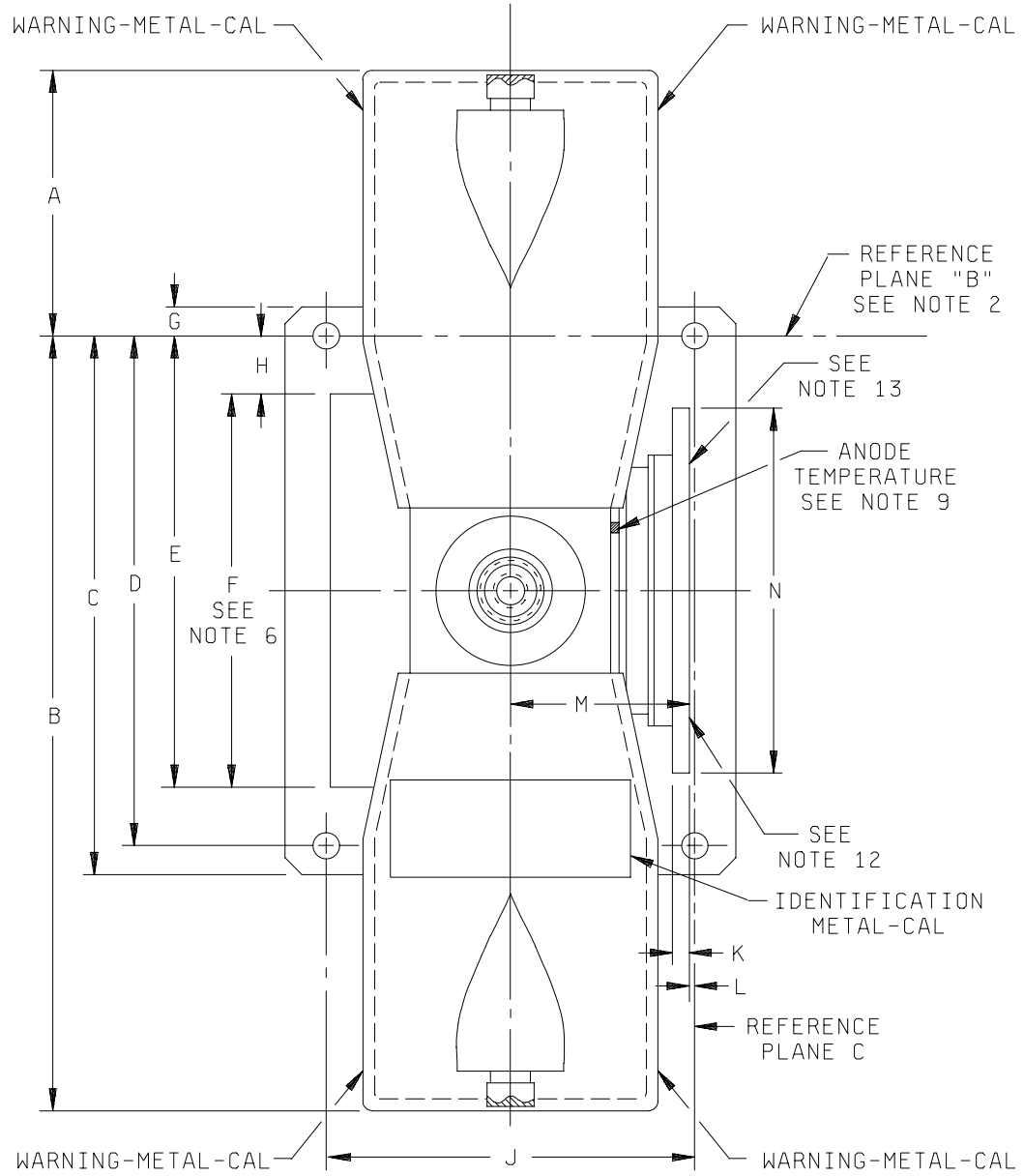


FIGURE 1. Outline dimensions of tube type 6344A.

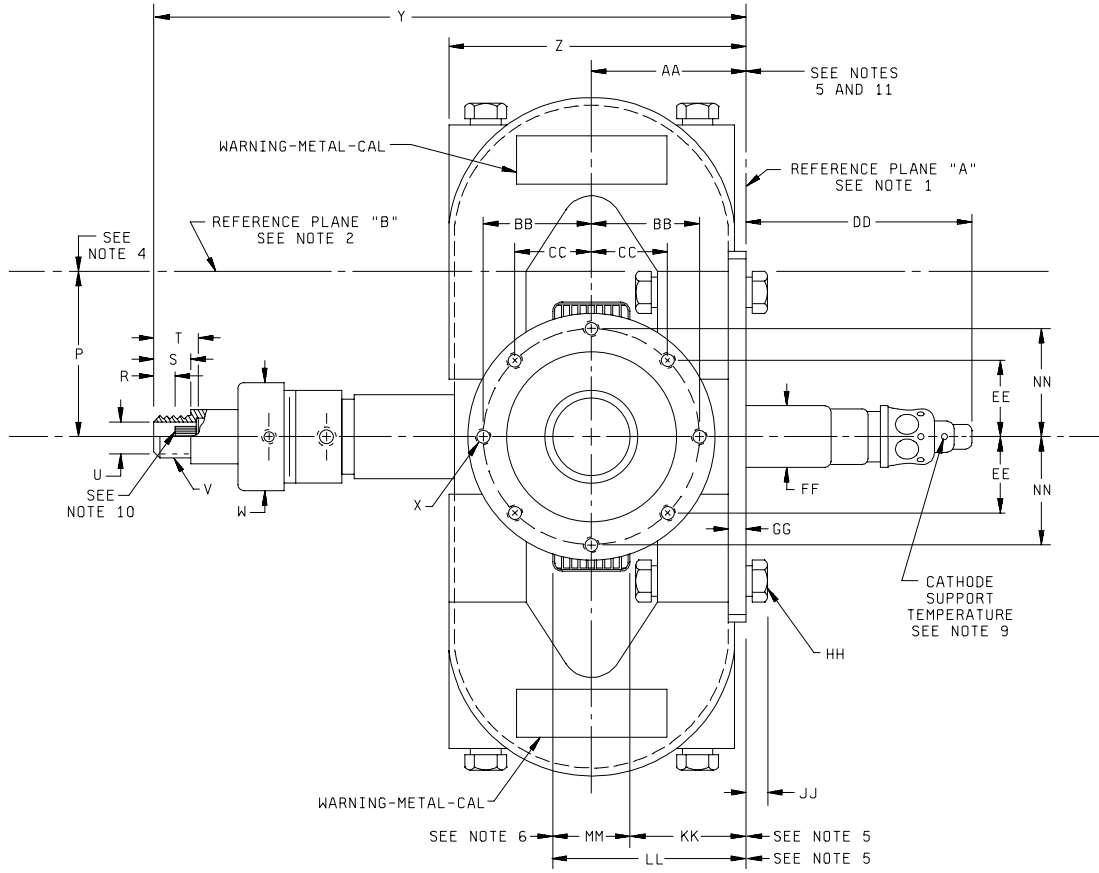


FIGURE 1. Outline dimensions of tube type 6344A. -Continued.

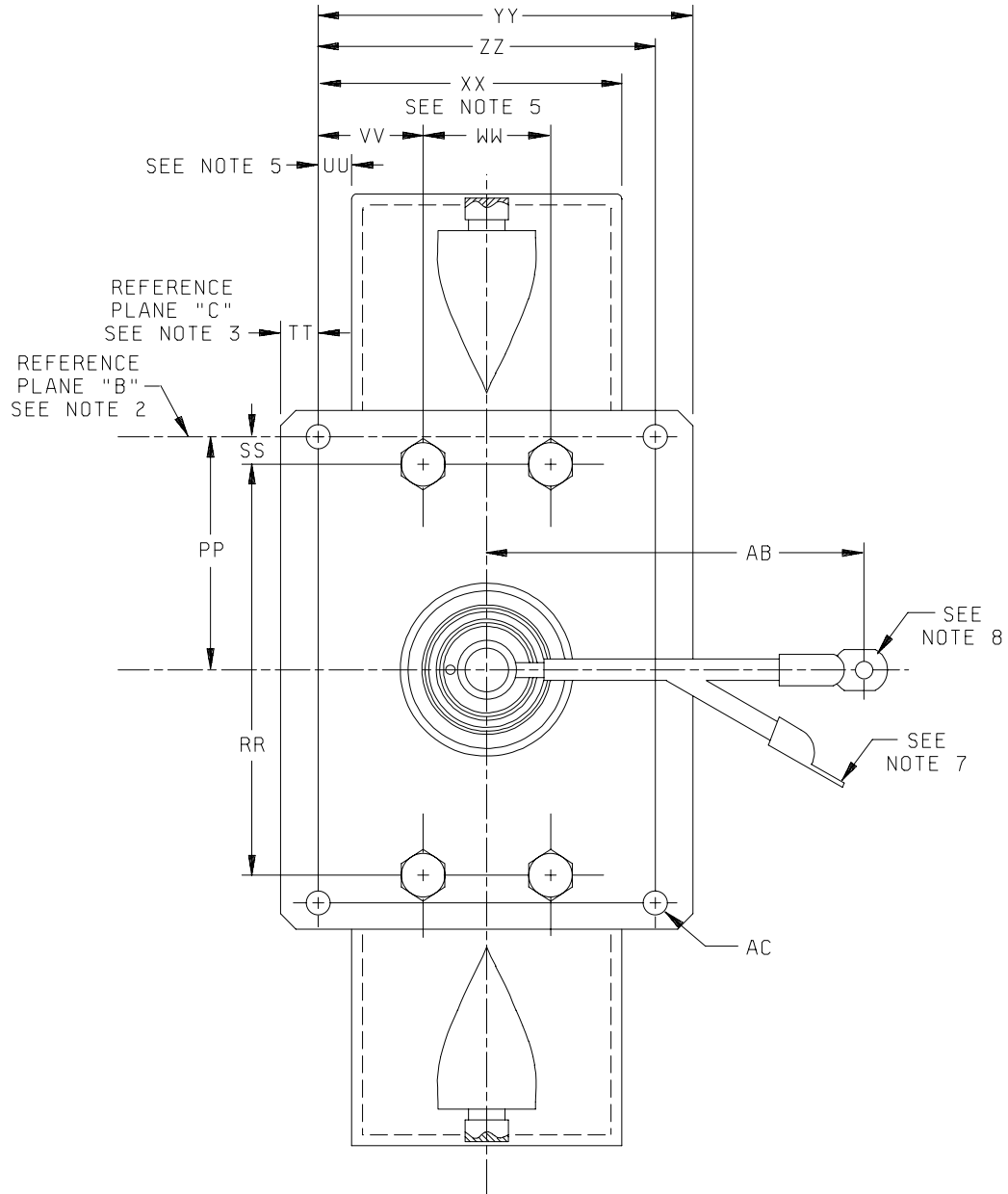


FIGURE 1. Outline dimensions of tube type 6344A. -Continued.



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Table 1 Dimensions (in inches) for Figure 1.

A	3.125 MAX.	T	0.627 ± 0.027	KK	1.500 MAX.
B	8.250 MAX.	U	0.440 DIA ± 0.005	LL	3.000 MAX.
C	5.460 MAX.	V	5/8-24 NEF 2	MM	1.206 ± 0.030
D	5.125 ± 0.010	W	1.750 MAX. DIA.	NN	1.625 ± 0.010
E	4.750 MAX.	X	#10-32 NF-1 8 Holes	PP	2.562 ± 0.040
F	4.150 ± 0.030 Note 6	Y	9.125 MAX.	RR	4.500
G	0.340 MAX.	Z	4.687 MAX.	SS	0.312
H	0.375 MIN.	AA	2.270 ± 0.025	TT	0.340 MAX.
J	4.000 MAX.	BB	1.625 ± 0.010	UU	0.218 MIN. Note 5
K	0.185	CC	1.149 ± 0.010	VV	1.250
L	0.024 ± 0.040	DD	3.625 MAX.	WW	1.375
M	1.937	EE	1.149 ± 0.010	XX	3.750 MAX. Note 5
N	3.739 DIA. ± 0.015	FF	1.250 MAX. DIA.	YY	4.205 MAX.
P	2.563	GG	0.250	ZZ	3.875 ± 0.010
R	0.315 ± 0.030	HH	¼-20 NC2 HEX. HD Bolt	AB	10" ± ¼
S	0.474 ± 0.010	JJ	0.375 MAX.	AC	0.344 ± 0.008 DIA 4 Holes

NOTES:

- Reference plane "A" lies in top surface of mounting plate.
- Reference plane "B" perpendicular to "A" passing through the two holes in mounting plate as shown.
- Reference plane "C" perpendicular to "A" and "B" passing through the two holes in mounting plate as shown.
- Parts on this axis may deviate from center line by 1/8 inch.
- Includes angular as well as lateral deviation.
- This dimension applies to size of radiator only.
- Common heater-cathode connection.
- Heater connection.
- Cathode support and anode temperature shall be measured at points indicated.
- Spline requirements:
  - 14.5 Pressure angle
  - 48 Pitch
  - 12 Teeth
  - 0.25 Pitch diameter
- Refers to the centerline of the waveguide as determined by centerline of tapped holes.
- The output flange shall be parallel to reference plane "C" within 0.025 inch.
- The glass portion of the output shall not extend beyond the flange.

NOTES

Referenced documents. In addition to MIL-PRF-1, this specification sheet references the following documents:  
MIL-DTL-3922/62 and MIL-STD-1311.

Custodians:  
Navy - EC  
DLA - CC

Preparing activities:  
DLA - CC

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

(Project 5960-2006-008)

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 <http://assist.daps.dla.mil/>.