

INCH-POUND

MIL-P-3984J
 AMENDMENT 3
12 June 2000
 SUPERSEDING
 AMENDMENT 2
 30 July 1998

MILITARY SPECIFICATION

PROPELLANTS FOR SMALL ARMS AMMUNITION

This Amendment forms a part of MIL-P-3984J dated 25 May 1992, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

- * 2.1.1, SPECIFICATIONS, MILITARY: Change "MIL-N-244" to "MIL-DTL-244".
- * 2.1.1, STANDARDS, MILITARY: Delete, MIL-STD-109 – Quality Assurance Terms and Definitions”
- 2.1.2, DRAWINGS: Delete “8858848 – Marking Diagram and Sealing of Metal Lined Wooded Packing Boxes for Shipment of Propellants” and add “12972488 – Drum, Fiber”.
- * 2.1.3: Add new subparagraph:

“2.1.3 Non-government publications. The following document (s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documented not listed in the DODISS are the issues of the documents cited in the solicitation, (see 6.2).

AMERICAN SOCIETY FOR QUALITY CONTROL

ANSI/ISO/ASQC A8402 – Quality Management and Quality Assurance Vocabulary

(Application for copies should be addressed to the American Society for Quality Control, 611 East Wisconsin Ave., Milwaukee, WI 53202)”

PAGE 3

- * 3.1.1, Nitrocellulose: In the first sentence, change “MIL-N-244” to MIL-DTL-244”. In the second sentence change “Extracted Nitrocellulose or propellant rework....” to “Extracted nitrocellulose or propellant rework or a combination of both....”. Add the following to the end of the paragraph: “The nitrocellulose used shall have a minimum nitrogen content of 12.00 percent. However, the nitrogen content of the total nitrocellulose extracted from the propellant must meet the requirements of the applicable propellant drawing.”

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PAGE 4

- * 3.2.2.1: Delete in its entirety and substitute the following:

“3.2.2.1 Chamber. The chamber pressure obtained with test cartridges shall be within the limits specified in Table I. EPVAT testing, when required, shall be conducted at the casemouth and its values are represented in Table I as psi or Mpa. Copper crusher testing, when required, shall be conducted on cartridges drilled at the mid-case area and its values are represented in Table I as CUP.”

- * 3.2.2.2: Delete in its entirety and substitute the following:

“3.2.2.2 Port. The port pressure obtained with test cartridges shall be within the limits specified in Table I.”

- * 3.2.2.3: Delete in its entirety.

PAGE 5

- * 3.2.9, Cyclic rate: Below the 5.56MM rifle listing add:

“5.56MM (MG) 650 to 950”

PAGE 6

- * 3.2.11.1, Cartridge 7.62MM: Within the extreme temperature variation table heading, change “(PSI)” to “(psi/CUP)”.

PAGE 10

- * 4.4.2.1, Lot sampling: In the last sentence, change “hermetically” to “airtight”.

- * 4.4.2.2, Test sampling: In the second sentence, change “hermetically” to “airtight”.

PAGE 12

- * 4.4.3.1.2, Velocity Uniformity Table on page 12: Delete in its entirety and substitute the new included page 12.

PAGE 15, 16, AND 17

- * Table I, Ballistic Requirements for Propellant and Notes: Delete in its entirety and substitute new included page 15, 16, and 17.

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PAGE 18 AND 19

* Table II, Sampling Size of Test Cartridge for Ballistic Tests: Delete “HEI PGU 17/B” and “PGU 18/B” from both pages in their entirety.

* Table II: Both pages, under the heading “CARTRIDGE CALIBER, TYPE AND MODEL”:

For 7.62MM, change “Special Ball M118” to “Long Range M118”, and change “Match /16 M852” to “Match M852”.

For 20MM, change “HEI 8/ M56” to “HEI 5/ M56” and change “SAPHEI PGU-18/B 11/” to “SAPHEI PGU-28/B 5/ 11/”.

PAGE 18

Table II, under the heading “TRACE”: For 5.56MM Ball M855, delete “200” and for 5.56MM Tracer M856, add “200”.

PAGE 19

* Table II, under the heading “SCREEN PERFORATION”: For 7.62MM Match M852, delete “0”, and for .50 Cal Blank M1A1/M928, change “200” to “300 10/”.

* Table II, under the heading “CYCLIC RATE, MG”: For .50 Cal Blank M1A1/M928, change “100 12/” to “300 10/”.

* Table II, under the heading “NOISE LEVEL, MG”: For .50 Cal HPT T251, delete “100 12/”, and for .50 Cal Blank M1A1/M928, add “300 10/”.

* Table II, under the heading “EXTREME TEMP.”: For 7.62MM Long Rifle M118 and 7.62MM Match M852, change “40” to “80”.

PAGE 20

* Table II, Notes: Delete Notes 10, 12, and 13 in their entirety and add new note 10: “10/ 100 each at 0, 70, and 125 degrees F.”

PAGE 22

5.1.3: Delete in its entirety and substitute the following:

“5.1.3 Level C. (CONUS shipment and short term storage). For trucks or trailer on flat car shipment and short term storage (2 years maximum), not more than 100 pounds net weight for HPC- and WC-type propellants nor more than 150 pounds net weight for IMR-type propellants shall be packed in a fiber drum in accordance with drawing 12972488. The fiber drums may be reused if they comply with the inspection requirements of 4.4.3.2.”

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PAGE 23

5.2.2: Delete in its entirety and substitute the following:

“5.2.2 Level C. The drum shall be marked as required in 49 CFR, 172 Subpart D, paragraph 172.301 (a) and with the following information:

Nomenclature
National Stock Number
Lot Number
Web (if available)
Grain (if applicable)
Gross Weight
Net Weight
Storage Temperature (if required)
“For CONUS Shipment Only” (alternately, see 5.2.3.b)

*

If POP marking is not specified on the applicable drawing (s), or if the POP marking specified is outdated, requiring retesting, then the contractor shall conduct POP tests in accordance with 5.3. After completion of the requirements of 5.3, POP marking shall be applied to the drum as specified by the government.

Letters shall be a minimum of ½ inch high and shall be marked with:

- a) Ink, Stencil, Black No. 37038, Type I, III, or IV of CID A-A-208, or
- b) A printed weatherproof label (print shall be in black color)”

5.2.3: Delete in its entirety and substitute the following:

“5.2.3 Special marking. All level C containers shall be marked with the following information:

- a) Silk screened onto the container or on a printed label affixed to the side:

“AFTER TWO YEARS FROM DATE OF MANUFACTURE, APPROVAL BY THE RESPONSIBLE PROCURING AGENCY IS REQUIRED PRIOR TO THE LOADING OF THIS PROPELLANT INTO AMMUNITION”

- b) If not included on the label per 5.2.2, using the letter size and stencil ink per 5.2.2, mark the front and back of the container, 180 degrees apart with:

“For CONUS Shipment Only””

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Add new paragraph:

“5.3 Performance oriented packing (POP). The exterior pack cited above shall meet all of the POP test requirements in accordance with the Code of Federal Regulations, Title 49 (49 CFR). A POP test report shall be generated in accordance with DI-PACK-81059 following the tests. POP testing may be waived if an acceptable non-government analogy can be made in accordance with 49 CFR to another pack which has successfully completed the testing. This analogy must also be documented in accordance with DI-PACK-81059. When completed, either POP test report must be kept on file by the contractor and must also be submitted to the U.S. Army Research Development and Engineering Center, ATTN: AMSTA-AR-WEP, Picatinny Arsenal, New Jersey, 07806-5000. (Note: If a POP test report is prepared against an acceptable analogy, the analogy POP test report must also be submitted to AMSTA-AR-WEP.) The POP marking to be applied to the exterior pack shall be as specified by the government after review and acceptance of submitted POP test report.”

Add new paragraph:

“5.4 Item hazard classification. All U.S. manufacturers shall make certain that the item is tested in accordance with Part 173, Subpart C, Section 173.58 (a) of 49 CFR, Parts 106-180 to assign proper Class and Division for all explosives (Division 1.1, 1.2, 1.3, and 1.4 explosives). Registration with the Associate Administrator of Hazardous Materials safety is required in accordance with Part 173, Subpart C, Section 173.56 (b) (1) or 173.56 (c) of 49 CFR so that proper markings in accordance with Part 172, Subpart D, Section 172.301 (a) and 172.320 (a) are met.

All foreign manufacturers shall make certain that the dangerous goods are tested in accordance with United Nations Committee of Experts on the Transportation of Dangerous Goods (as published in UN Document ST/SG/AC.10.11, latest revision, Recommendations for the Transport of Dangerous Goods – Tests and Criteria) to determine the proper class and division (Class 1-9 and Division 1.1 – 1.6 for explosives). Registration for air and vessel transport is required with each manufacturing country’s National Competent Authority is issued in accordance with Part 2, Paragraph 1.3 of the International Civil Aviation Organization (ICAO) Technical Instructions and approves the hazard classification and compatibility group assignment and assigns the appropriate shipping name to the dangerous goods. The proper packaging, marking, and labeling is contained in the United Nations Committee of Experts on the Transport of Dangerous Goods (as published in UN Document ST/SC/AC.10.1, latest revision, Recommendations on the Transport of Dangerous Goods.)

For air transport, the dangerous goods must comply with the provisions of the International Air Transport Association (IATA) Dangerous Goods Regulations and for vessel transport, the dangerous goods must comply with the provisions of the Intergovernmental Maritime Organization’s International Maritime Dangerous Goods Code (IMDG Code).

These documents shall be forwarded to the U.S. Army Industrial Operations Command (IOC), ATTN: AMSIO-PC, and AMSIO-SF, Rock Island, Illinois 61299-6000.”

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* 6., Notes: Within the parenthetical sentence in the “NOTES” heading, change “manatory” to “mandatory”.

* 6.10, Subject term: Under the keyword listing, add the following:

“Cannon Caliber Ammunition
Cannon Caliber Propellant”

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VELOCITY UNIFORMITY TABLE

Cartridge Model & Type		"Ballistic Sample" Velocity	"Representative Sample" Velocity Variation	"Representative Velocity S. D. (max)	
				Initial Test	Retest
5.56mm 1/	M193 Ball EPVAT (217C gage)	3165±10	+25	30	25
	M196 Tracer EPVAT (217C gage)	3115±10	±25	30	25
	M855 Ball EPVAT (6203 gage)	3000±10	±25	30	25
	M855 Ball EPVAT	3020±10	±25	30	25
	M856 Tracer EPVAT (6203 gage)	2990±10	±25	30	25
	M856 Tracer EPVAT	3010±10	±25	30	25
7.62mm 1/	M62 Tracer (GM)	2680±5	±20	24	20
	M62 Tracer (GM) EPVAT	2665±5	±20	24	20
	M62 Tracer (GMCS)	2750±5	±20	24	20
	M62 Tracer (GMCS) EPVAT	2735±5	±20	24	20
	M80 Ball	2750±5	±20	24	20
	M80 Ball EPVAT	2735±5	±20	24	20
	M118 Long Range	2580±5	±20	24	20
	M276 Dim Tracer (GM)	2680±5	±20	24	20
	M276 Dim Tracer (GM) EPVAT	2665±5	±20	24	20
	M276 Dim Tracer (GMCS)	2750±5	±20	24	20
	M276 Dim Tracer (GMCS) EPVAT	2735±5	±20	24	20
M852 Match	2550±5	±20	24	20	
9mm 1/	M882 Ball EPVAT (6203 gage)	1230±5	±20	21	18
	M882 Ball EPVAT	1230±5	±20	21	18
Cal. .30	M2 Ball	2740±5	±20	24	20
	M25 Tracer	2665±5	±20	24	20
Cal. .45	M26 Tracer	885±5	±20	21	18
	M1911 Ball	855±5	±20	21	18
Cal. .50 1/	M8 API 2/	2910±10	±20	36	30
	M8 API EPVAT 2/	2905±10	±20	36	30
	M17 Tracer	2910±10	±20	36	30
	M17 Tracer EPVAT	2905±10	±20	36	30
	M20 APIT 2/	2910±10	±20	36	30
	M20 APIT EPVAT 2/	2905±10	±20	36	30
	M33 Ball	2910±10	±20	36	30
	M33 Ball EPVAT	2905±10	±20	36	30
20mm	M56 HEI 3/	3380±15	±30	36	30
	M99 TP	2680±15	±30	36	30
	M940 MPT-SD	3350±15	±30	36	30
	PGU-27/B TP	3410±15	±30	36	30
	PGU-27/B TP EPVAT				
	PGU-28/B SAPHEI 3/	3410±15	±30	36	30
	PGU-28/B SAPHEI EPVAT 3/				
	PGU-30/B TPT 3/	3410±15	±30	36	30
30mm 1/	M788 TP EPVAT	2582±30	±50	60	50
	M789 HEDP EPVAT	2582±30	±50	60	50

Failure of the propellant to comply with the criteria of the uniformity test shall be cause for rejection of the lot subject to testing of a second sample. The second test shall be made using propellant from the original container in which the sample failure occurred in the initial test. The second sample shall consist of twenty rounds. The criteria shall remain the same except for velocity standard deviation, which shall not exceed the value indicated above under "Retest". Failure of the second sample to comply with the criteria of the uniformity test shall be cause for rejection of the lot. The velocity uniformity test is not required for cartridges not listed in the above table.

Notes: (1) Unless indicated otherwise, the EPVAT gages to be used are as follows: 5.56mm--6215, 7.62mm--6203, .9mm--6215, Cal. .50--6215, 30mm--617. (2) When testing for M8 API or M20 APIT requirements, M33 Ball or M17 Tracer projectiles may be used, respectively. (3) When tested with inert projectile.

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Table I: Ballistic Requirements for Propellants

Cartridge Model & Type	Instrument Velocity		Chamber Pressure 2/		Port Pressure (avg) 5/	Max Ind. Action Time (ms)	Extreme Temp. 3/	
	Dist. (ft)	Average (fps)	Max. S.D.	Max Avg. 4/			Max S.D. 5/	Max Ind. Chamber Pressure 5/
	5.56 MM 1/							
M193 Ball EPVAT (217C)	78.0	3165±20	25	53,000 psi	14,400±2000	2.5	61,000	N/A
M196 Tracer EPVAT	78.0	3115±20	25	53,000 psi	14,400±2000	2.5	61,000	
M195 Grenade	5.5	155±5	2	N/A	N/A	N/A	N/A	N/A
M197 HPT	N/A	N/A	N/A	70,000±2000 CUP	N/A	N/A	N/A	N/A
M200 Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M855 Ball EPVAT (6203)	78.0	3000±20	25	53,000 psi	12,700 7/	2.5	58,000 8/	2.5
M855 Ball EPVAT	78.0	3020±20	25	56,700 psi	15,300 7/	2.5	61,700 8/	2.5
M856 Tracer EPVAT	78.0	2990±20	25	53,000 psi	12,700 7/	2.5	58,000 8/	N/A
M856 Tracer EPVAT	78.0	3010±20	25	56,700 psi	15,300 7/	2.5	61,700 8/	N/A
7.62 MM 1/								
M60 HPT	N/A	N/A	N/A	67,000±2500 CUP	N/A	N/A	N/A	N/A
M61 AP	78.0	2750±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M62 Tracer (GM)	78.0	2680±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M62 Tracer (GM)	78.0	2665±15	20	51,000 psi	9325±1320	2.5	58,000	N/A
M62 Tracer (GMCS)	78.0	2750±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M62 Tracer (GMCS)	78.0	2735±15	20	51,000 psi	9325±1320	2.5	58,000	N/A
M64 Grenade	5.5	160±5	2	N/A	N/A	N/A	N/A	N/A
M80 Ball	78.0	2750±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M80 Ball EPVAT	78.0	2735±15	20	51,000 psi	9325±1320	2.5	58,000	N/A
M82 Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M118 Long Range	78.0	2580±15	20	52,000 CUP	12,500±2000	2.5	N/A	N/A
M160 Frangible	53.0	1320±30	N/A	N/A	N/A	N/A	N/A	N/A
M276 Dim Tracer (GM)	78.0	2680±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M276 Dim Tracer (GM)	78.0	2665±15	20	51,000 psi	9325±1320	2.5	58,000	N/A
M276 Dim Tracer (GMCS)	78.0	2750±15	20	48,000 CUP	12,500±2000	2.5	55,000	N/A
M276 Dim Tracer (GMCS)	78.0	2735±15	20	51,000 psi	9325±1320	2.5	58,000	N/A
M852 Match	78.0	2550±15	20	48,000 CUP	12,500±2000	2.5	N/A	N/A
9 MM 1/								
M882 Ball EPVAT (6203)	53.0	1230±25	20	31,175 psi	N/A	N/A	36,250	N/A
M882 Ball EPVAT	53.0	1230±25	20	34,075 psi	N/A	N/A	39,150	N/A
M905 HPT EPVAT	N/A	N/A	N/A	48,000±2500 psi	N/A	N/A	N/A	N/A
Caliber .30								
M1 & M2 ALT HPT	N/A	N/A	N/A	67,500±2500 CUP	N/A	N/A	N/A	N/A
M2 Ball	78.0	2740±15	20	48,000 CUP	N/A	2.5	60,000	N/A
M3 Grenade	5.5	180±5	12	N/A	N/A	N/A	N/A	N/A
M14 API	78.0	2780±15	20	48,000 CUP	N/A	2.5	60,000	N/A
M25 Tracer	78.0	2665±15	20	48,000 CUP	N/A	2.5	60,000	N/A
M72 Match	78.0	2640±15	N/A	48,000 CUP	N/A	N/A	N/A	N/A

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Table I: Ballistic Requirements for Propellants

Cartridge Model & Type	Instrument Velocity			Chamber Pressure		Port Pressure (avg) 5/	Max Ind. Action Time (ms)	Extreme Temp. 3/	
	Dist. (ft)	Average (fps)	Max. S.D.	Max Avg. 4/	Max S.D. 5/			Max Ind. Chamber Pressure 5/	Max Ind. Action Time (ms)
						Chamber Pressure 2/			
Caliber .30									
M1909 Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Caliber .38									
M41 Ball	15	950±45	N/A	15,000 CUP	N/A	N/A	N/A	20,000	N/A
Caliber .45									
M1 HPT	N/A	N/A	N/A	22,000±1000 CUP	1000	N/A	N/A	N/A	N/A
M9 Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M26 Tracer	25.5	855±15 11/	18	16,500 CUP	600	N/A	N/A	19,500	N/A
M1911 Ball	25.5	855±15 11/	18	16,500 CUP	600	N/A	N/A	19,500	N/A
M1911 Ball, Match	25.5	855±15 11/	18	16,500 CUP	600	N/A	N/A	19,500	N/A
Caliber .50 1/									
M1 HPT	N/A	N/A	N/A	62,500±2500 CUP	3000	N/A	N/A	N/A	N/A
M1A1/M928 Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M8 API	78.0	2910±15	30	53,000 CUP	N/A	N/A	2.5	62,500	N/A
M8 API EPVAT	78.0	2905±15	30	63,000 psi	N/A	N/A	2.5	72,500	N/A
M17 Tracer	78.0	2910±15	30	53,000 CUP	N/A	N/A	2.5	62,500	N/A
M17 Tracer EPVAT	78.0	2905±15	30	58,500 psi	N/A	N/A	2.5	68,000	N/A
M20 APIT	78.0	2910±15	30	53,000 CUP	N/A	N/A	2.5	62,500	N/A
M20 APIT EPVAT	78.0	2905±15	30	58,500 psi	N/A	N/A	2.5	68,000	N/A
M33 Ball	78.0	2910±15	30	53,000 CUP	N/A	N/A	2.5	62,500	N/A
M33 Ball EPVAT	78.0	2905±15	30	63,000 psi	N/A	N/A	2.5	72,500	N/A
M48A2 Spotter-Tracer	78.0	1745±10	9	36,000 CUP	N/A	N/A	3.5	48,000	N/A
T251 HPT	N/A	N/A	N/A	62,500±2500 CUP	3000	N/A	N/A	N/A	N/A
20 MM									
M54 HPT	N/A	N/A	N/A	67,500±1500 CUP	2500	N/A	N/A	N/A	N/A
M56 HEI	78.0	3380±25	30	55,000 CUP	2000	N/A	3.5	N/A	3.5
M99 TP	78.0	2680±25	30	45,000 CUP	2000	N/A	3.5	N/A	3.5
M206 TPT	78.0	3430±25	30	47,500 CUP	N/A	N/A	5.5	52,000 14/	N/A
M940 MPT-SD	78.0	3350±25	30	55,000 CUP	2000	N/A	3.5	N/A	3.5
GU-27/B TP	78.0	3410±25	30	55,000 CUP	N/A	N/A	3.5	N/A	3.5
PGU-27/B TP EPVAT									
PGU-28/B SAPHEI	78.0	3410±25	30	55,000 CUP	N/A	N/A	3.5	N/A	3.5
PGU-28/B SAPHEI									
PGU-30/B TPT	78.0	3410±25	30	55,000 CUP	N/A	N/A	3.5	N/A	3.5
PGU-30/B TPT EPVAT									
30 MM 1/									
M788 TP EPVAT	78.0	2582±32	49	320 Mpa 15/	415 6/	N/A	4.0	N/A	4.0
M789 HEDP EPVAT	78.0	2582±32	49	320 Mpa 15/	415 6/	N/A	4.0	N/A	4.0

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* Table I Notes:

1. Unless indicated otherwise, the EPVAT gages to be used are as follows:

5.56MM – 6215, 7.62MM – 6203, 9MM – 6215, Cal. .50 – 6215, 30MM – 617

2. Unless the test method is specified in the purchase contract or order, cartridges with both EPVAT and CUP listings may be tested using either method.

3. For the permissible variations in average velocity and chamber pressure at extreme temperatures, see 3.2.11.

4. For HPT rounds, the limits for average pressure are listed in lieu of the maximum average.

5. The pressure units for Standard Deviation, Port Pressure, and Extreme Temperature Chamber Pressure are the same as for the corresponding Chamber Pressure units at ambient temperature.

6. The maximum mean chamber pressure plus three standard deviations is listed in lieu of the maximum standard deviation.

7. The minimum mean port pressure minus three standard deviations is listed in lieu of the average port pressure.

8. The maximum average is listed in lieu of the maximum individual reading.

9. When tested with proof slug, drawing B1052289.

10. When tested with the following M118 components:

Bullet:	12977194
Case:	12977196
Primer:	10535489-1

11. In universal receiver.

12. When testing for M8 API or M20 APIT requirements, M33 Ball or M17 Tracer projectiles may be used, respectively.

13. When tested with inert projectiles.

14. The individual maximum chamber pressure applies at $70 \pm 2^\circ$ F only.

15. When tested in the M230 test barrel, drawing 9390748.

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The margins of this amendment are marked with asterisks or vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment 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 amendment.

Custodians:
Army – AR
Navy – OS

Preparing activity:
Army – AR
(Project 1376-0074)