

<p>NOTICE OF CHANGE</p>

<p>NOT MEASUREMENT SENSITIVE</p>

MIL-STD-40051A(TM)
NOTICE 1
15 February 2001

**DEPARTMENT OF DEFENSE
STANDARD PRACTICE**

**PREPARATION OF DIGITAL TECHNICAL INFORMATION
FOR
MULTI-OUTPUT PRESENTATION OF TECHNICAL MANUALS**

TO ALL HOLDERS OF MIL-STD-40051A:

1. THE FOLLOWING PAGES OF MIL-STD-40051A HAVE BEEN REVISED AND
SUPERSEDE THE PAGES LISTED:

<u>NEW PAGE</u>	<u>DATE</u>	<u>SUPERSEDED PAGE</u>	<u>DATE</u>
<i>BASIC</i>			
vii	15 Feb 01	vii	2 Mar 99
viii	2 Mar 99	viii	Reprinted without change
1-4	15 Feb 01	2-4	2 Mar 99
19	2 Mar 99	19	Reprinted without change
20	15 Feb 01	20	2 Mar 99
25	15 Feb 01	25	2 Mar 99
26	2 Mar 99	26	Reprinted without change
29	15 Feb 01	29	2 Mar 99
30	15 Feb 01	30	2 Mar 99
31	15 Feb 01	31	2 Mar 99
32	15 Feb 01	32	2 Mar 99
35	2 Mar 99	35	Reprinted without change
36	15 Feb 01	36	2 Mar 99
37	2 Mar 99	37	Reprinted without change
38	15 Feb 01	38	2 Mar 99
39	15 Feb 01	39	2 Mar 99
40	2 Mar 99	40	Reprinted without change

<u>NEW PAGE</u>	<u>DATE</u>	<u>SUPERSEDED PAGE</u>	<u>DATE</u>
<i>BASIC (CONT)</i>			
41	2 Mar 99	41	Reprinted without change
42	15 Feb 01	42	2 Mar 99
45	2 Mar 99	45	Reprinted without change
46	15 Feb 01	46	2 Mar 99
49	15 Feb 01	49	2 Mar 99
50	2 Mar 99	50	Reprinted without change
63	15 Feb 01	63	2 Mar 99
64	2 Mar 99	64	Reprinted without change
69	15 Feb 01	69	2 Mar 99
70-71	2 Mar 99	70-71	Reprinted without change
72	15 Feb 01	72	2 Mar 99
79	2 Mar 99	79	Reprinted without change
80	15 Feb 01	80	2 Mar 99
85	15 Feb 01	85	2 Mar 99
86-87	2 Mar 99	86-87	Reprinted without change
88-89	15 Feb 01	88-89	2 Mar 99
90	2 Mar 99	90	Reprinted without change
101	15 Feb 01	101	2 Mar 99
102	2 Mar 99	102	Reprinted without change
109	2 Mar 99	109	Reprinted without change
110	15 Feb 01	110	2 Mar 99
115-118	15 Feb 01	115-118	2 Mar 99
119	2 Mar 99	119	Reprinted without change
120	15 Feb 01	120	2 Mar 99
127	15 Feb 01	127	2 Mar 99
128	2 Mar 99	128	Reprinted without change
133	15 Feb 01	133	2 Mar 99
134	2 Mar 99	134	Reprinted without change
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147	15 Feb 01	147	2 Mar 99
148	2 Mar 99	148	Reprinted without change

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169	15 Feb 01	169	2 Mar 99
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181	15 Feb 01	181	2 Mar 99
182	2 Mar 99	182	Reprinted without change
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1	15 Feb 01	1	2 Mar 99
2	2 Mar 99	2	Reprinted without change
<i>PART 2</i>			
1	15 Feb 01	1	2 Mar 99
2	2 Mar 99	2	Reprinted without change
3	2 Mar 99	3	Reprinted without change
4	15 Feb 01	4	2 Mar 99
4a	15 Feb 01	New page	
4b blank	15 Feb 01	New page	
<i>PART 3</i>			
1	2 Mar 99	1	Reprinted without change
2	15 Feb 01	2	2 Mar 99
7	15 Feb 01	7	2 Mar 99
8	2 Mar 99	8	Reprinted without change
<i>PART 4</i>			
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2	15 Feb 01	2	2 Mar 99
3	15 Feb 01	3	2 Mar 99
4	15 Feb 01	4	2 Mar 99
5	15 Feb 01	5	2 Mar 99
6	2 Mar 99	6	Reprinted without change
17	15 Feb 01	17	2 Mar 99
18	2 Mar 99	18	Reprinted without change

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41	2 Mar 99	41	Reprinted without change
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PART 5

1	2 Mar 99	1	Reprinted without change
2	15 Feb 01	2	2 Mar 99
11	2 Mar 99	11	Reprinted without change
12	15 Feb 01	12	2 Mar 99

PART 6

1	2 Mar 99	1	Reprinted without change
2	15 Feb 01	2	2 Mar 99
19	2 Mar 99	19	Reprinted without change
20	15 Feb 01	20	2 Mar 99
DD Form 1426	15 Feb 01	DD Form 1426	2 Mar 99

2. Changes are indicated by a vertical bar in the margin of the page. Changes to the matrixes in appendix A are indicated by gray shading.

3. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

4. Holders of MIL-STD-40051A will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the standard is completely revised or canceled.

Custodians:

Army - TM

Review Activities:

Army - AC1, AL, AR, AT,
AV, CR, EA, MI,
PT

Preparing Activity:

Army - TM

Project Number:

TMSS A362

AMSC A7329

AREA TMSS

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MIL-STD-40051A (TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content, style and format requirements for all technical manuals (TMs) for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of MIL-STD-40051-1A through MIL-STD-40051-6A. This section does not include documents cited in other sections of this multipart standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in section 3, 4, and 5 of MIL-STD-40051-1A through MIL-STD-40051-6A, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

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MIL-PRF-28000	—	Digital Representation for Communication of Product Data: IGES Application Subsets and IGES Application Protocols.
MIL-PRF-28001	—	Markup Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text.
MIL-PRF-28002	—	Raster Graphics Representation in Binary Format, Requirements for.
MIL-PRF-28003	—	Digital Representation for Communication of Illustration Data: CGM Application Profile.
MIL-PRF-87268	—	Manuals, Interactive Electronic Technical - General Content, Style, Format, and User-Interaction Requirements

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STANDARDS

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DEPARTMENT OF DEFENSE

MIL-STD-17	—	Mechanical Symbols.
MIL-STD-100	—	Engineering Drawing Practices.
MIL-STD-1309	—	Definition of Terms for Testing, Measurement, and Diagnostics.
MIL-STD-1686	—	Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric).
MIL-STD-2361	—	Digital Publications Development.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-113	—	Guide for the Selection of Lubricants, Functional Fluids, Preservatives and Specialty Products for use in Ground Equipment Systems.
MIL-HDBK-263	—	Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment, Excluding Electrically Initiated Explosive Devices (Metric).
MIL-HDBK-275	—	Guide for Selection of Lubricants, Fluids, and Compounds for Use in Flight Vehicles and Components.
MIL-HDBK-9660	—	Handbook for DoD-Produced CD-ROM Products.
MIL-HDBK-1222	—	Guide to the General Style and Format of U.S. Army Work Package Technical Manuals.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

H4/H8	—	Cataloging Handbook: Commercial and Government Entity Code (United States and Canada) - Name to Code.
H6	—	Federal Supply Cataloging Handbook.

(Copies of Handbooks H4/H8 and H6 are available from the Commander, Defense Logistics Services Center, Battle Creek, MI 49017-3084.)

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2.2.2 Other Government documents and publications. The following other Government documents and publications form a part of this document to the extent specified herein. Unless specified otherwise, the issues are those cited in the solicitation. e

AR 385-62	—	Regulations for Firing Guided Missiles and Heavy Rockets for Training, Target Practice and Combat.
AR 385-64	—	U.S. Army Explosives Safety Program
CTA 50-970	—	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).
DA PAM 385-64	—	Ammunition and Explosives Safety Standards
DA PAM 738-750	—	Functional Users Manual for The Army Maintenance Management System (TAMMS).
DA PAM 738-751	—	Functional Users Manual for The Army Maintenance Management System-Aviation (TAMMS-A).

(Application for copies should be addressed to U.S. Army Publications Distribution Center, 1655 Woodson Road, St. Louis, MO 63114-6181.)

DOD 5200.1-R	—	DoD Information Security Program.
DOD 5220.22-M	—	National Industrial Security Program for Operating Manual.
DOD 5230.24	—	Distribution Statements on Technical Documents.

(Copies of DOD 5200.1-R are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Copies of DOD 5220.22-M are available from the U.S. Government Printing Office, ATTN: Superintendent of Documents, Washington, DC 20402-0001. Copies of DOD 5230.24 are available from Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5904.)

EO12196	—	Occupational, Safety and Health Programs for Federal Employees.
EO12958	—	Classified National Security Information.
FM 1-500	—	Army Aviation Maintenance.
Joint Pub 1-02	—	Department of Defense Dictionary of Military and Associated Terms.
TB 750-93-1	—	Functional Grouping Codes: Combat, Tactical, and Support Vehicles and Special Purpose Equipment.
TM 1-1500-328-23	—	Aeronautical Equipment Maintenance Management Policies and Procedures. e
TM 55-1500-335-23	—	Nondestructive Inspection Methods.

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TM 55-1500-342-23	—	Army Aviation Maintenance Engineering Manual, Weight and Balance.
TM 1-1500-204-23	—	Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) for General Aircraft Maintenance. (Consists of ten volumes.)

(Copies of these publications are available from the U.S. Army Publications Distribution Center, 1655 Woodson Road, St. Louis, MO 63114-6181.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified therein. 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 documents not listed in the DoDISS are the issues of the documents cited in the solicitation (6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Y14.15-1966 (R1973)	—	Electrical and Electronic Diagrams.
ANSI Y32.10	—	Diagrams, Fluid Power, Graphic Symbols for.
ISO 8879	—	Information Processing - Text and Office Systems - Standard Generalized Markup Language (SGML).
ISO 9000 Series	—	Quality

(Application for copies should be addressed to the American National Standards Institute Inc., 1430 Broadway, New York, NY 10018-3308.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASME Y14. 38	—	Abbreviations and Acronyms
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(Application for copies should be addressed to the American Society of Mechanical Engineers, 3 Park Avenue, New York, NY 10016-5990.)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 91-84	—	Graphic Symbols for Logic Functions.
IEEE 200-75	—	Reference Designators for Electrical and Electronics Parts and Equipments.
IEEE 260-78	—	IEEE Standard Letter Symbols for Units of Measurement.

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3.148 Task. A sequence of user actions with a beginning and an end. User tasks relate to installation, checkout, operation, and maintenance of systems or equipment.

3.149 Technical Manuals (TM). Manuals that contain instructions for the installation, operation, maintenance, and support of weapon systems, weapon system components, and support equipment. TM information may be presented, according to prior agreement between the contractor and the Government, in any form or characteristic, including hard printed copy, audio and visual displays, electronic imbedded media, disks, other electronic devices, or other media. They normally include operational and maintenance instructions, parts lists, and related technical information or procedures exclusive of administrative procedures.

3.150 Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, electrical or electronic characteristics of an item and comparing those characteristics with prescribed standards.

3.151 Test, Measurement, and Diagnostic Equipment (TMDE). Any system or device used to evaluate the operational condition of an end item or subsystem thereof, or to identify and/or isolate any actual or potential malfunction. TMDE includes diagnostic and prognostic equipment, semiautomatic and automatic test equipment (with issued software), and calibration test or measurement equipment.

3.152 Time Between Overhaul (TBO) items. Those items having a definite retirement schedule within a defined overhaul interval, e.g., those items which must be replaced within a system assembly, subassembly, or component between scheduled overhauls.

3.153 Title Block Page. The first page after the warning summary in the front matter portion of a TM. It identifies the TM by publication number, date, title and NSN/part number/model of equipment covered in the manual.

3.154 Top-down generation breakdown. The pyramidal breakdown of an end item, with the top item being the complete end item. The process of breakdown is established from the engineering drawing structure in an NHA progression until the lowest reparable in each family tree group is identified. All nonreparables (spare parts) can be identified in like manner to establish their NHA relationships.

3.155 Unit maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "O" in the third position of the SMR code. An "O" appearing in the fourth position of the SMR code indicates complete repair is possible at the unit maintenance level.

3.156 Usable on code (UOC). A three-position alphanumeric code representing the applicable configuration in which an item is used. When an item is used on all configurations or when only one configuration is covered by the RPSTL, UOCs should not be shown.

3.157 User. A person using the technical manual.

3.158 Wiring diagram. Diagram illustrating signal flow or wiring connections. Where appropriate, voltage readings should be shown.

3.159 Work packages (WP). Presentation of information functionally divided into individual task packages in the logical order of work sequence. These WPs should be stand alone general information, description, theory, operating, maintenance, troubleshooting, parts, and supporting information units containing all information required for directing task performance.

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MIL-STD-40051A (TM)

4. GENERAL REQUIREMENTS.

4.1 General. Technical content requirements for the preparation and delivery of all technical manuals and revisions covering operation and maintenance, at all levels of maintenance through overhaul (depot), including Depot Maintenance Work Requirements (DMWRs) are provided in MIL-STD-40051-1A through MIL-STD-40051-6A.

4.2 Types of technical manuals. Appendix A, Technical Manual Content Selection Matrixes, lists specific technical content requirements for each type of maintenance manual, including multilevel TMs, covered by this standard. Each type of TM shall provide in detail the maintenance coverage prescribed for the applicable maintenance level(s) by the Maintenance Allocation Chart (MAC) and SMR-coded items.

4.3 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished through the use of the matrixes provided in Appendix A. The applicability of some requirements is also designated by one of the following statements: unless specified otherwise by the acquiring activity; as/when specified by the acquiring activity; or when specified by the acquiring or proponent activity.

4.4 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definitions (DTDs) and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to 4.6 for information on obtaining or accessing the DTDs and FOSIs.

4.5 Use of the DTDs/FOSIs.

4.5.1 Page-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

4.5.2 Frame-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. Development of frame-based TMs is accomplished through the use of the DTDs combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

4.6 Obtaining the DTDs/FOSIs. The DTDs, FOSIs and associated tag and attribute descriptions, which are SGML constructs, may be obtained from the Army SGML Registry and Library (ASRL). The ASRL assets may be obtained using the methods described in MIL-STD-2361 as follows:

- a. World Wide Web (WWW): ASRL homepage Uniform Resource Locator (URL) <http://www.asrl.com/>

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4.8.7.2.3.1 Format for hazardous materials warnings with icons. Hazardous materials warnings with icons consist of a heading (WARNING), the icon(s), and a full description of the hazardous material and the precautions to be taken. They immediately precede the text to which they apply. For commonly used substances only (e.g. dry cleaning solvent, hydraulic fluids, paints, etc.), an abbreviated format may be used for hazardous materials warnings. The abbreviated format consists of the heading (WARNING), the icon(s), and the nomenclature (signal word(s)) of the hazardous material. In this case the full description of the warning is placed in the warning summary at the front of the TM. Icons may be used in technical manuals warnings either singly or in combination. When icons are used in combination, the placement and format should adhere to the methods provided in MIL-HDBK-1222.

4.8.8 Chapters.

4.8.8.1 Chapter title page <titlepg>. Each chapter shall begin with a chapter title page. See figure 4 for an example of a chapter title page. A chapter title page shall always be a right-hand page. A separate chapter title page is not required for pocket size manuals. For pocket manuals, the chapter number and title may be placed on the top of the first page of the first work package of the chapter

4.8.8.2 Chapter numbering. Chapters shall be numbered in sequential order throughout the TM using Arabic numerals. Chapters shall not be renumbered in separate volumes.

4.8.9 Work packages.

4.8.9.1 Work package title block. All work packages shall have a title block (Refer to figure 1). The title block shall consist of the work package identification information described in MIL-STD-40051-1A through MIL-STD-40051-6A, as applicable.

4.8.9.2 Work package sequential numbering. To maintain a sequential order in the TM and to facilitate referencing, each work package (WP) shall be assigned a six digit number beginning with the number 0001 00. There shall be one blank space between the forth and fifth numerals. The work package sequence numbers shall run consecutively throughout the TM. For example, the first work package in Chapter 2 will be assigned the number immediately following the last work package number in Chapter 1 (e.g., if 0010 00 is the last WP in Chapter 1, 0011 00 will be the first work package in Chapter 2). WP sequence numbers shall be assigned in numerical sequence, initially by the first four digits, then by the last two digits. (Refer to figure 1).

4.8.9.2.1 Assignment of the last two digits of the work package sequence number. The last two digits of the WP sequence number shall be reserved to permit unlimited expansion of the TM to incorporate new configuration data without affecting the WP sequence numbers already assigned, and to permit adding one or more WPs between any two existing WPs during any revision cycle. The placement within the TM shall depend on the technical content task arrangement and its relationship to the existing WP and the WP(s) to be added. During any revision cycle, the first WP sequence number to be assigned after an existing basic WP sequence number shall be identified as "01"; for example, "0029 00" shall be followed by "0029 01". Subsequent WP sequence numbers to be assigned after "01" shall be "02" through "99"; for example, "0029 02" through "0029 99".

4.8.9.2.2 Assignment of work package sequence numbers in volumized TMs. When a TM is divided into two or more volumes, the WP sequence number shall continue in sequence. The first volume shall contain as many WPs as necessary beginning with 0001 00. The work packages contained in the second and subsequent volumes shall be numbered consecutively beginning with the number immediately following the last work package sequence number in the preceding volume.

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4.8.9.3 Work package page numbering. Each work package shall be page numbered consecutively using the six digit work package sequence number followed by -1, -2, -3, etc. (e.g., 0001 00-1, 0001 00-2, etc.). Page numbers shall be centered at the bottom of the page. Even numbers shall be assigned to the left-hand pages and odd numbers to right-hand pages. (Refer to figure 1).

4.8.9.4 Work package identification number. For data base retrieval purposes, a unique number shall be assigned to each work package. This WP identification number will not appear on the printed or screen display page and should not be confused with the WP sequence number in 4.8.9.2. It shall be assigned when preparing the document instance in accordance with the modular DTDs and shall not be changed throughout the life of the WP. The WP identification number shall consist of an alpha designation for the type of information contained in the work package, a five digit block number assigned by the acquiring activity, and the TM number less the maintenance level dash numbers.

- a. The following alpha designators shall be assigned to the specific types of information contained within the work packages.

G	-	Descriptive information and theory of operation
I	-	Inspection
O	-	Operator instructions
T	-	Troubleshooting procedures
M	-	Maintenance instructions
R	-	Repair Parts and Special Tools List (RPSTL)
S	-	Supporting Information

- b. Examples of work package data base identification numbering are shown below.

M00432-9-1425-646

<u>M</u>	Identifies a WP containing maintenance instructions.
<u>00432</u>	Identifies the 432nd work package containing specific maintenance instructions for the M270 Armored Vehicle Mounted Rocket Launcher.
<u>9-1425-646</u>	Identifies the M270 Armored Vehicle Mounted Rocket Launcher TM.

T02000-1-1520-238

<u>T</u>	Identifies a WP containing troubleshooting procedures.
<u>02000</u>	Identifies the 2000th work package containing specific troubleshooting procedures for the AH-64A Helicopter.

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- a. Definition list. The definition list shall consist of the term and the definition. The definition list may have the headers, “**Term**” and **Definition**” above the appropriate sections of the list. Refer to MIL-STD-2361 or MIL-PRF-28001 for more information on the development of lists.
- b. Random list. The random list shall consist of one or more items in a random order.
- c. Sequential list. The sequential list shall consist of one or more items in a specified order, such as alphabetic, numeric, or alphanumeric.

4.8.14 Placement of text.

- a. Preferred text format for 8-1/2 by 11-inch manuals is single column (page wide), although double column can be used. Both single and double column formatted WPs can be included in a single TM if it would make the data more readable or comprehensible, however, both formats should not be used in the same chapter. Text is single spaced (double spaces between procedural steps).
- b. Procedural step text shall not be placed on an illustration.
- c. Text shall always be positioned within the image area. Text shall not be wrapped around an illustration.
- d. The first line of a paragraph shall not be located at the bottom of the page or column. The last line of a paragraph shall not be placed at the top of a new page. Do not place the title or header on the last line of a page or column. Widows and orphans are not allowed.

4.8.15 Placement of illustrations. Illustrations shall be placed as close to their reference in text as possible. Illustrations may float on a page to reduce the white space on a page. Whenever possible, place illustrations on the same or facing page of associated text. Foldout illustrations shall not be included in work packages, but shall follow the last work package, the glossary, or the alphabetical index, whichever forms the last portion of the manual or volume.

4.8.15.1 Rotating illustrations. When necessary, illustrations may be placed sideways on a page (rotated 90 degrees counterclockwise).

4.8.15.2 Placement of text and related illustrations for pocket TMs. Place text for pocket-size manuals on the right-hand pages with supporting illustration on the facing left-hand pages.

4.8.15.3 Repeating illustrations. Illustrations are not repeated unless necessary to support multipage descriptions of tasks or to support a different requirement in another part of the TM.

4.8.16 Margin data. Margin data (usually headers and footers) shall be placed outside the area of the page used for either text, full-page tabular data, or full-page illustrations, but within the printing area dimensions of the page. (Refer to 4.8.16.1 and 4.8.16.2.) Complete headers and footers shall be prepared for all pages except TM covers and title block pages.

4.8.16.1 Headers. Headers shall consist of the TM number centered at the top of each page and the WP sequence number (refer to 4.8.9.2) placed at the extreme top right of each page (Refer to figure 1). If the manual is jointly used by two or more Services, only the acquiring activity's TM number shall be placed on each page. TM numbers for pocket TMs are required on front and back covers only. For pocket manuals only, the WP sequence number may be placed only on the first page of the work package providing it is included as part of the page number on all pages of the work package. The work package sequence number shall be placed at the extreme top right below the TM number on foldout pages.

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4.8.16.2 Footers. Footers shall include the security classification markings (refer to 4.8.22) if any, the page numbers, (refer to figure 1) and other information as specified by the acquiring activity (i.e., change designator).

4.8.16.2.1 Page numbering. For all TMs page numbers shall be centered at the bottom of the page. Even numbers shall be assigned to left-hand pages and odd numbers to right-hand pages. For horizontal TMs, the upper pages shall have even numbers, and the lower pages shall have odd numbers. Page numbers shall be in boldface type. Page numbering for RPSTLs shall also be in accordance with this paragraph and paragraphs 4.8.16.2.1.1 through 4.8.16.2.1.3.

4.8.16.2.1.1 Front matter. Page numbering for front matter shall be as follows.

- a. Front cover. Front covers shall be unnumbered.
- b. Warning summary. The pages of the warning summary shall be numbered consecutively using lowercase letters (i.e., a, b, c, etc.).
- c. Change transmittal page. The change transmittal page shall be unnumbered.
- d. List of effective pages/work packages. When a list of effective pages/work packages is prepared, it shall be numbered with upper case letters (i.e., A, B, etc.).
- e. Title block page, table of contents, and the How to Use This Manual section. These pages shall be numbered consecutively using lower case Roman numerals beginning with i (i.e., i, ii, iii, etc.).

4.8.16.2.1.2 Rear matter. DA Form 2028s, authentication pages, metric conversion charts (on the inside of the back cover), and back covers shall be unnumbered.

4.8.16.2.1.3 Blank pages. A blank page shall be assigned a number, but it shall appear on the preceding or following page. For example, if page 0001 00-10 of a work package is blank, page 0001 00-9 shall have the number 0001 00-9/10 blank; or if page 0001 00-9 of a work package is blank, page 0001 00-10 shall have the number 0001 00-9 blank/10.

4.8.17 Abbreviations and acronyms.

- a. The first use of abbreviations and acronyms shall have the word(s) spelled out completely with the abbreviation or acronym in parentheses immediately after the word(s). Abbreviations and acronyms which are accepted as words (radar, sonar, laser, etc.) need not be spelled out.
- b. Abbreviations and acronyms used shall be in accordance with ASME Y14.38, except that abbreviations may be plural (s) or possessive ('s). New abbreviations and acronyms shall not duplicate those presently listed in ASME Y14.38 where possible.
- c. All nonstandard abbreviations and acronyms (excluding acronyms for Electrostatic Discharge (ESD) and Hardness-Critical Processes (HCP)) shall be defined in the "list of abbreviations/acronyms" paragraph of the general information work package. (Refer to 5.3.1.9.11.)
- d. Abbreviations and acronyms used in tables, but not found in the text or in any other portion of the TM, shall be spelled out in a footnote to the applicable table. Abbreviations and acronyms used in illustrations or figures, but not found in the text or in any other portion of the TM, shall be spelled out in a note to the applicable illustration or figure.

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- e. When abbreviations or acronyms are used as markings on the equipment (placarding), the same abbreviations or acronyms shall be used in the TM.

4.8.18 Symbols.

4.8.18.1 General information for symbols. All nonstandard symbols (excluding icons) shall be defined in the "list of abbreviations/acronyms" paragraph of the general information work package. (Refer to 5.3.1.9.11) New symbols shall not duplicate those presently listed in MIL-STD-17 where possible.

4.8.18.2 Metric symbols. Metric symbols shall be in accordance with IEEE 945-84. e

4.8.19 Nuclear hardness (hardness-critical processes) marking. All Hardness-Critical Processes shall be marked with the acronym **HCP** as shown in subparagraph "b" below. The acronym shall be prepared in boldface type and in the same style and size as the adjacent text. The acronym shall not be shown with the titles in the table of contents. Use of the acronym is as follows.

- a. When the entire task and all subordinate paragraphs and steps relate to establishing nuclear hardness, the acronym **HCP** shall precede the task title. (For example, **HCP DISASSEMBLY**.)
- b. When the entire task and all subordinate paragraphs and steps do not contribute to establishing nuclear hardness, only those which do contribute shall be annotated with the acronym **HCP**. For example,

SERVICING

1. _____.
2. **HCP** _____.

- c. Operating or maintenance actions which could degrade hardness, but which are not directly involved in establishing nuclear hardness, shall not be annotated with the acronym, but shall be preceded by a caution.

4.8.20 Electrostatic Discharge (ESD) sensitive marking.

- a. All paragraphs addressing handling or maintenance which could damage ESD sensitive parts shall be identified by the acronym **ESD** as shown below. Preparation and use of the acronym shall be similar to the requirements of 4.8.19. For example,

REMOVAL

1. _____.
2. **ESD** _____.

- b. Handling or maintenance actions which could damage ESD sensitive parts, but which are not directly related to handling or maintenance of ESD sensitive parts, shall not be annotated with the acronym ESD, but shall be preceded by a caution.
- c. Mark figures, drawings, and schematics with the ESD acronym in accordance with MIL-STD-1686.

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4.8.21 Quality Assurance (QA) symbol. Depot and aviation maintenance procedures which have a major quality assurance effect shall be identified by the acronym **QA** in boldface letters. Only procedures at the step level shall be labeled with **QA**. (For example, 1. **QA** _____.)

4.8.22 Security classification, emergency page and protective markings.

4.8.22.1 Security classification markings. When specified by the acquiring activity, a classified TM shall be prepared. The security classification markings for classified TMs, titles of parts, chapters, work packages, appendixes, paragraphs, illustrations, tables, and their contents, shall be identified in accordance with DoD 5200.1-R and DoD 5220.22-M, and Executive Order 12958. For guidance on classification and handling restrictive markings on Compact Disk-Read Only Memory (CD-ROM), refer to MIL-HDBK-9660. Also refer to MIL-HDBK-1222 for specific information on security classification markings. Additional instructions applicable to security classification markings are described in paragraphs 4.8.22.2 through 4.8.22.6.

4.8.22.2 Overall security classification. The overall security classification assigned to a TM shall agree with the highest security classification assigned to any portion within, and shall be marked accordingly at the top and bottom of the front cover, title block page, and rear cover sheets. The security classification markings for pages, including those for unclassified pages, shall be bold and at the top and bottom center of each page. (Refer to figure 5.)

4.8.22.3 Blank page backing a classified page. Blank pages normally require no copy. However, if the reverse side of a blank page contains classified material, security markings for the blank page shall be bold and at the top and bottom center of the blank page. The blank page shall reflect the highest classification of the reverse side, and include the statement "This page is unclassified".

4.8.22.4 Emergency page markings. When specified by the acquiring activity, emergency pages shall be prepared. Pages containing emergency information shall have a dark bold border that indicates to the user that they are emergency pages. The border should go to the edge of the page if the composition system allows it and should be made up of characters such as large Xs, large asterisks, or large slashes. (Refer to figure 6 for examples of emergency page markings.)

4.8.22.5 Protective markings. When specified by the acquiring activity, a FOR OFFICIAL USE ONLY protectively marked manual shall be prepared. In FOR OFFICIAL USE ONLY manuals, the protective marking shall be bold and at the bottom of each page.

4.8.22.6 COMSEC protective markings. Unless requirement is specifically excluded by the acquiring activity, Army Communications Security (COMSEC) Equipment Manuals shall contain the protective marking "FOR OFFICIAL USE ONLY".

4.8.23 Referencing.

4.8.23.1 Other documents. Reference shall be made only to other documents available and authorized to the user. Reference shall be to the publication number and, when necessary, to the work package sequence number. References to pending publication actions shall not be made.

4.8.23.2 Government specifications and standards. Reference shall be made to the basic number for Government specifications and standards.

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4.8.25 Nomenclature.

4.8.25.1 Nomenclature consistency and applicability. Nomenclature, other terms, and names shall be consistent within a manual and throughout the RPSTL, MAC, and other directly related manuals. Statements that explain applicability for individual items of equipment shall use specific serial numbers, block designations, model designations, or similar identification. Such terms as "on later equipment" and "on early serial numbers" shall not be used.

4.8.25.2 Official/approved nomenclature. Unless specified otherwise by the acquiring activity, only approved names and official nomenclature shall be used. (Official nomenclature shall be the nomenclature used in the RPSTL.) If unofficial nomenclature (common name) is approved, an appropriate nomenclature cross-reference list shall be prepared for the TM. (Refer to MIL-STD-40051-1A.) Shortened versions of the approved nomenclature are not considered deviations. Approved nomenclature shall be used wherever the use of a common name might be ambiguous.

4.8.25.3 Military terms. Military terms used shall be in accordance with Joint Pub 1-02, or any approved dictionary or glossary of Army military terms.

4.8.25.4 Automatic electronic test and checkout terminology. Terms used for automatic electronic test and checkout shall be in accordance with MIL-STD-1309.

4.8.26 Comprehensibility. Technical manuals shall be written for the target audience. Reading grade level shall be as specified by the acquiring activity.

4.8.27 Graphics.

4.8.27.1 Graphic format. All graphics developed in accordance with this standard shall be delivered in one of the three graphic formats: MIL-PRF-28003, Computer Graphic Metafile (CGM); MIL-PRF-28002, Continuous Acquisition and Life-cycle Support (CALS) Raster; or MIL-PRF-28000, Initial Graphics Exchange Specification (IGES). Other commercial graphic formats are acceptable if approved by the acquiring activity.

- a. The CGM file format is the preferred graphics file format.
- b. All graphics files for a particular TM should be applied in the same graphics format if practical. Otherwise, files may be delivered in any combination of the allowable formats.
- c. Appropriate header and identification information shall be included in each graphics file. Refer to the applicable specification for the specific requirements.

4.8.27.2 Types of graphics. As applicable, the following types of graphics shall be used in the preparation of TMs. Preferred format of these graphics and typical examples are provided in MIL-HDBK-1222.

- a. Line drawings.
- b. Photographs.
- c. Engineering drawings.
- d. Diagrams.
- e. Charts and graphs.

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f. Tools and test equipment illustrations.

4.8.27.2.1 Line drawings. Line drawings including exploded views, locator views, and detailed views shall be used to support the operational and maintenance procedures, and the RPSTLs. Examples of line drawings are provided in MIL-HDBK-1222.

- a. When index numbers are used to locate and identify equipment components or parts, the index numbers shall be assigned sequentially (clockwise, disassembly, or in the order mentioned in text).
- b. To assist the maintenance technician or operator in locating major components, controls and indicators, etc., locator views may be included.
- c. When the illustration does not adequately or clearly depict the subject matter or part(s), specific detailed views may be included to support the main illustration.

4.8.27.2.2 Multiview and multisheet illustrations. Multiview and multisheet illustrations may be used to clarify, identify significant features, or further detail equipment assemblies, subassemblies, and detailed parts. Refer to MIL-HDBK-1222 for examples of multiview and multisheet illustrations.

4.8.27.2.3 Photographs. Photographs may be used for illustrations. When a photograph provides for better clarity than a line drawing, the photograph should be used. Photographs should not be used on foldouts. If the intention is to use photographs in lieu of line art, it is preferred that a digital camera be used to produce the required photos. This negates the use of halftones and the need for retouching and screening.

4.8.27.2.3.1 Prescreened photographs. If paper output is the final product, prescreened photographs are acceptable as final reproducible copy provided they have been screened only once, and the screen on the final sized illustrations shall be as specified by the acquiring activity. When prescreened photographs are used, they shall be clearly marked to indicate prescreening. As specified by the acquiring activity, unscreened continuous tone photographs and/or original illustrations shall be supplied with final reproducible copy.

4.8.27.2.4 Engineering drawings. Engineering drawings may be used with the approval of the acquiring activity. Engineering drawings are controlled documents and when used, they shall be used in their entirety, without modification. They must be reduced or redrawn to meet page size restrictions. When the controlled elements of an engineering drawing (i.e., title block, sources of supply, revision data, etc.) are removed, leaving only the “field” of the drawing, it is treated as a typical line drawing.

4.8.27.2.5 Diagrams.

4.8.27.2.5.1 Diagram specifications. Diagrams shall be prepared in accordance with the specifications listed below.

<u>Subject</u>	<u>Equipment Covered</u>	<u>Specification</u>	
Abbreviations	All	ASME Y14.38	Ⓒ
Drafting Practices	Mechanical, Electrical and Electronic	ANSI Y14.15-1966 (R1973)	
Engineering Drawing Practices	All	MIL-STD-100	

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Graphic Symbols	Electrical and Electronic Mechanical Digital (Logic) Fluid Power	IEEE 315A-86, IEEE 280-85 MIL-STD-17 IEEE 91-84 ANSI Y32.10
Reference Designators	Electrical and Electronic	IEEE 200-75
Unit Symbols	All	IEEE 260-78
Logic	All	IEEE 91-84

4.8.27.2.5.2 Types of diagrams. The following types of diagrams may be included in the IETM. Refer to MIL-HDBK-1222 for examples of types of diagrams.

- a. Block diagrams.
- b. Schematic diagrams.
- c. Pictorial diagrams.
- d. Cutaway diagrams.
- e. Logic diagrams.
- f. Wiring diagrams/wire lists.
- g. Cable diagrams.
- h. Piping diagrams.
- i. Test setup diagrams.

4.8.27.2.6 Charts and graphs. Charts and graphs shall be prepared as illustrations. Instructions shall be provided for use and interpretation of complex graphs.

4.8.27.2.7 Tools and test equipment illustrations. Only uncommon or unusual uses and connections for test purposes shall be illustrated if it is essential to do so to avoid misunderstanding. Unusual operations shall also be illustrated. Special tools and test equipment shall be illustrated, as applicable. Standard tools and test equipment shall not be illustrated, nor shall self-evident or generally known uses be shown.

4.8.27.3 Elements of illustrations.

4.8.27.3.1 Border rules and boxes. Border rules and boxes shall not be used for single illustrations, but are used to separate multisection illustrations on the same page or for locator/detail views. (Refer to MIL-HDBK-1222 for an example of border rules and boxes.)

4.8.27.3.2 Use of the human figure. When necessary, illustrations may include a human figure or parts of the body. The illustrated human figure shall not obscure necessary details of the item(s) being illustrated.

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4.8.27.3.3 Credit lines.

- a. The photographer's or illustrator's name shall not appear on any illustration.
- b. A manufacturer's name, symbol, or trademark shall not appear on illustrations for the purpose of identifying the illustration.

4.8.27.3.4 Callouts. Index numbers, reference designators, nomenclature, leader lines, sweep arrows, legends, and other identifiers shall be used, when necessary, to identify significant features. Refer to MIL-HDBK-1222 for examples of the use of these types of identifiers.

4.8.27.3.4.1 Index numbers. Index numbers start with Arabic numeral 1 and continue consecutively. Index numbers continue in sequence from one sheet to another in a set of multisheet illustrations.

- a. When a series of illustrations are used within the same informational, operational, maintenance, or troubleshooting work package (e.g., theory, operator instruction, or removal procedure), index numbers shall continue from one illustration in that series to the next, however, if an item that already has been assigned an index number is used in more than one illustration in that series, it must retain the same index number.
- b. Index numbers shall be in clockwise sequence (beginning at 11 o'clock), disassembly sequence, or in order of mention in the text.
- c. All items shown as exploded shall be identified. Items drawn in phantom need not be identified.
- d. Index numbers shall not be contained within circles unless required for a specific reason.

4.8.27.3.4.2 RPSTL figures. For RPSTL figures, the sequence of index numbers start at 11 o'clock and proceed clockwise.

4.8.27.3.5 Leader lines and arrowheads. Leader lines shall be uniform, short, and as straight as possible; avoid the use of dogleg-shaped lines unless absolutely necessary. Arrowheads may be added for clarity. Do not allow leader lines to touch the callout. Do not allow arrowheads to enter the object to which they apply. If it is necessary to enter the object to provide for greater clarity, a breakoff symbol shall be used in lieu of an arrowhead.

4.8.27.3.6 Illustration legends. When necessary for clarity, legends shall be prepared to identify index numbers on illustrations. Legends shall be a part of the illustration and shall not be placed in the text area. Examples of legends are provided in MIL-HDBK-1222.

4.8.27.3.7 Procedures on illustrations. Procedural steps shall not be placed on illustrations.

4.8.27.4 Graphic techniques. In addition to the graphic techniques provided in 4.8.27.4.1 through 4.8.27.4.10 refer to MIL-HDBK-1222 for suggested graphic techniques used for the preparation of U.S. Army TMs.

4.8.27.4.1 Illustration figure numbers. Figure numbers for illustrations contained in work packages shall be avoided whenever possible. However, figure numbers for Depot Maintenance Work Requirements (DMWRs), Repair Parts and Special Tool Lists (RPSTLs), and foldouts are required. Figure numbers shall be placed on the illustration and be an integral part of the illustration.

4.8.27.4.2 DMWR figure numbers. Figures shall be numbered consecutively within each work package starting with the Arabic numeral 1.

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4.8.27.4.3 RPSTL figure numbering. Figures for RPSTL TMs shall be numbered sequentially within a RPSTL chapter (not within each work package), using Arabic numerals beginning with 1. Figures in RPSTL supporting information work packages shall also be numbered sequentially within a RPSTL chapter (not within each work package), using Arabic numerals beginning with 1.

4.8.27.4.4 Foldout figure numbering. Foldout figures shall be numbered in consecutive ascending numerical sequence within each WP, beginning with Arabic number 1. Figures are numbered in the order of reference in the WP text. Figure numbers for foldouts shall be placed preceding the figure title under the illustration. The figure number shall be an integral part of the foldout illustration.

4.8.27.4.5 Multisheet numbering. Multisheet figures shall be consecutively sheet numbered following the title; for example, "Figure 2. Wing Hydraulic Assembly (Sheet 1)." or "Figure 1. Cable Assembly W12 Wiring Diagram (Sheet 1)." Remaining sheets shall be numbered in consecutive order, Sheet 2, Sheet 3, etc.

4.8.27.4.6 Illustration figure titles. When titles are used refer to MIL-HDBK-1222 for placement and format.

4.8.27.4.7 Illustration identification numbers. Each illustration shall be assigned a unique identification number provided by the proponent activity.

- a. Contractor's identification number may be used when approved by the proponent activity.
- b. When the identification number is to be printed in the TM, such number shall be approximately 4- to 6- point type and placed in the lower right-hand corner of the illustration (within the graphics area) sufficiently removed to avoid being confused as part of the illustration.

4.8.27.4.8 Portraying signal flow. Signal flow, especially for electrical and electronic equipment, critically affects the understandability of diagrams. To assist the TM user in following the diagram, where possible, major signal or pressure flow shall be from left to right, and feedback or return flow shall be from right to left.

4.8.27.4.9 Color in illustrations. Unless specified otherwise by the acquiring activity, black and shades of black (one color) shall be used for TMs. Prior approval for color will be obtained by the acquiring activity from the U.S. Army Publishing Agency (USAPA). The acquiring activity will provide written approval, designating color(s) to be used.

4.9 Style and format requirements for technical content of frame-based TMs. The technical content format requirements for frame-based TMs shall be in accordance with the general requirements contained in MIL-PRF-87268 and the specific requirements provided in 4.9.1 through 4.9.24 of this standard. Guidance for preparation of CD face and flyleaf information is contained in Appendix A of MIL-HDBK-1222.

4.9.1 Development of work package technical manuals. The style and format guidance provided in this standard has been established to facilitate the development of technical information for the WP concept. The WP concept is defined as a logical combination of requirements and improved presentation techniques designed to enhance digital display of frame-formatted pages. A work package IETM is specifically designed to support individual functional information including troubleshooting and maintenance work tasks for a weapon system or equipment in accordance with the requirements of MIL-STD-40051-1A through MIL-STD-40051-6A.

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4.9.2 IETM divisions. The hierarchy of a frame-based TM consists of introductory matter, planning data and a series of work packages that include the types of data listed below.

Descriptive information and principles of operation
 Troubleshooting information
 Procedural information (operator and maintenance tasks)
 Supporting Information

4.9.2.1 Work packages. Work packages shall be used to logically divide TM data into functional descriptive or task-oriented information.

4.9.2.1.1 Work package content. Work packages may contain identification information, initial setups, descriptive information, and operating, troubleshooting, and maintenance tasks. These data types can be further divided into paragraphs, procedural steps, tables, lists, warnings, cautions and notes, and supporting graphics. Parts information shall be accessible in any of the data types, as necessary. Refer to MIL-STD-40051-1A through MIL-STD-40051-6A for the specific content requirements for each of the functional work package types (i.e., description information, operator's instructions, troubleshooting, and maintenance).

4.9.2.1.2 Parts information in work packages. Parts information shall be available at the point of the presentation in any work package to which the specific weapon system and equipment replaceable and repairable part is identified. Inclusion of parts information shall be used to:

- a. Identify a part or parts by part number and name.
- b. Provide any additional parts data required to order the part.
- c. Show the relationship of a part to other parts of the system or equipment.
- d. Enhance or clarify the supporting operator, descriptive, or theory of operation data.

4.9.2.1.3 Development of individual work packages. Ideally, each WP in a manual will be an independent, stand alone data unit. It may be required to group some information or maintenance tasks in one work package and divide others into several WPs. Division or selection of coverage will depend on various factors. These factors may include but are not limited to:

- a. A specific work package that is required by MIL-STD-40051-1A through MIL-STD-40051-6A.
- b. A specific work package that is required by the IETM content selection matrix provided by the contracting activity (Refer to Appendix A).
- c. A WP may be determined by the operational modes, complexity of the troubleshooting or maintenance action, or level(s) of troubleshooting or maintenance covered. Separate WPs may be developed for the same equipment or component for different maintenance levels (e.g., a WP for operator's maintenance and a WP for direct support maintenance for the same item of equipment).
- d. Two or more WPs for an identical troubleshooting or maintenance task may be required because the task is performed differently due to differences in configurations.

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- e. Separate WPs due to different initial setup information for a set of maintenance tasks covering a repairable component. If the support equipment, tools, materials and personnel used to perform removal and installation is very different than the support equipment, tools, materials and personnel used to perform disassembly and reassembly for the same system or component, it may be better to separate this information into two WPs.

4.9.3 Font size and style. Font style, size, and spacing shall be in accordance with MIL-PRF-87268.

4.9.4 Use of alerts. An alert is any message, communication, notice, or output which requires manual acknowledgment from the user of the IETM. Alert messages shall be displayed within a border. Preferred styles and formats of alert borders are provided in MIL-HDBK-1222. Alerts shall be used to convey the following types of information, such as:

- a. Warnings, cautions, and notes (Refer to 4.9.5)
- b. Hardness-critical processes (Refer to 4.9.16).
- c. Electrostatic discharge (ESD) sensitive parts (Refer to 4.9.17).
- d. Flight safety critical aircraft parts (FSCAP) (Refer to 5.4.1.7.22)

4.9.5 Warnings, cautions, and notes.

4.9.5.1 Use and placement.

- a. A warning shall precede the text of any procedure involving a clear danger to the person doing that procedure. A caution shall precede the text of any procedure involving a clear risk of damage to the equipment. A note, used to highlight essential procedures, conditions, or statements may either precede or follow the text. If multiple warnings, cautions, or notes apply to the same text, the warnings shall appear first, cautions second, notes last.
- b. Warnings, cautions, and notes shall not be numbered. When a warning, caution, or note consists of two or more paragraphs, the header **WARNING**, **CAUTION**, or **NOTE** shall not be repeated above each paragraph. Warnings, cautions and notes on unrelated topics may not be contained under one heading.
- c. When warnings or cautions exist in separate categories for the same set of technical information, they shall be successively displayed in decreasing order of severity: Warnings first, followed by cautions. Warnings or cautions in the same category shall be successively displayed. However, there shall be no requirement to determine an order of importance within the same category. When related warnings or cautions of the same category for the same block of technical information, it is permissible to group them within a common alert border but they shall be visually distinct. In such a case the title shall indicate the combined danger.

4.9.5.1.1 Display requirements for warnings, caution, and notes. Warnings, cautions, and notes shall be prominently displayed and shall be treated as an alert. The warning, caution, and note alert shall stay active as long as the condition exists. The alert shall remain displayed until the user manually acknowledges the alert. The warnings and cautions shall be contained within a border. Preferred styles and formats for borders are provided in MIL-HDBK-1222.

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4.9.5.2 Hazardous material warnings. Procedures prescribed for the operation and maintenance of equipment are consistent with the safety standards established by the Occupational Safety and Health Act (OSHA) Public Law 91-596 and Executive Order 12196. When exposure to hazardous chemicals or other adverse healths factors or use of equipment cannot be eliminated, guidance pertaining to the exposure is included in the TM. A list of personnel protective devices should also be included. Hazardous materials warnings shall be presented in the standard warning format without an icon (as described above in 4.9.5.1). Hazards that result from a combination of materials must clearly be identified to indicate that mixing or combining the materials creates the hazard.

4.9.6 Work packages. Each work package shall include the work package identification information described in MIL-STD-40051-1A through MIL-STD-40051-6A, as applicable. Work package identification information shall be displayed in the title bar area of the user's EDS.

4.9.6.1 Work package initial setup information <wpinfo>. Initial setup information shall be included in each work package and shall immediately follow the WP identification information. It provides the maintenance technician with general information, equipment, parts, material, and authorized personnel required to perform and complete all the maintenance tasks included in the work package. For initial setup information requirements for specific types of work packages, refer to MIL-STD-40051-2A through MIL-STD-40051-4A. e

4.9.6.2 Work package identification number. For data base retrieval purposes, a unique number shall be assigned to each work package. This WP identification number will not appear when viewed on the user's EDS display page. If LSA/LMI has been developed, the LCN numbers assigned to the information or task data may be used to identify the WP. If LSA/LMI data is not available, an optional numbering method may be used. A typical method of numbering is provided below.

- a. The WP identification number may consist of an alpha designation for the type of information contained in the work package, a five digit block number assigned by the acquiring activity, and the TM number less the maintenance level dash numbers as follows.

(1) The following alpha designators shall be assigned to the specific types of information contained within the work packages.

G	-	Descriptive information and theory of operation
I	-	Inspection
O	-	Operator instructions
T	-	Troubleshooting procedures
M	-	Maintenance instructions
S	-	Supporting information

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- b. Random list. The random list shall consist of one or more items in a random order.
- c. Sequential list. The sequential list shall consist of one or more items in a specified order, such as alphabetic, numeric, or alphanumeric.

4.9.11 Display of text. All descriptive information and task text shall be displayed in accordance with MIL-PRF-87268. Refer to MIL-HDBK-1222 for typical examples of screen text.

4.9.12 Display of illustrations. Illustrations shall be displayed on the user's EDS in accordance with MIL-PRF-87268. Refer to MIL-HDBK-1222 for typical examples of screen text.

4.9.13 Title bar. The title bar area of the user's EDS shall contain the official title of the information. The title shall be repeated and displayed in the client text area. The title shall be the same as appears in the list of contents.

4.9.14 Abbreviations and acronyms. Acronyms, abbreviations, and unusual terms may be used in any WP text, when applicable. It is not necessary to spell out the words completely after the first use of an acronym or abbreviation. An acronyms, abbreviations, and uncommon terms work package shall be developed explaining all acronyms, abbreviations, and unusual terms used in the IETM (Refer to paragraph 5.4.2). It is not necessary to make the acronyms, abbreviations, and uncommon terms work package automatically accessible when an acronyms, abbreviations, or uncommon term is used in a WP. When needed the acronyms, abbreviations, and uncommon terms work package may be manually selected using the IETM list of contents.

- a. Abbreviations and acronyms which are accepted as words (radar, sonar, laser, etc.) need not be included.
- b. Abbreviations and acronyms used shall be in accordance with ASME Y14.38, except that abbreviations may be plural (s) or possessive ('s). New abbreviations and acronyms shall not duplicate those presently listed in ASME Y14.38M where possible.
- c. When abbreviations or acronyms are used as markings on the equipment (placarding), the same abbreviations or acronyms shall be used in the IETM.

4.9.15 Symbols.

4.9.15.1 General information for symbols. All nonstandard symbols shall be defined in the WP of nonstandard symbols (refer to paragraph 5.4.2). New symbols shall not duplicate those presently listed in MIL-STD-17 where possible.

4.9.15.2 Metric symbols. Metric symbols shall be in accordance with IEEE 945-84.

4.9.16 Nuclear hardness (hardness-critical processes) marking. All Hardness-Critical Processes shall be preceded with the alert acronym "**HCP**". Use of the acronym is as follows.

- a. When the entire task and all steps relate to establishing nuclear hardness, the **HCP** alert shall precede the first step of the task.
- b. When the entire task and steps do not contribute to establishing nuclear hardness, only those which do contribute shall be annotated with the **HCP** alert.

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- c. Operating or maintenance actions which could degrade hardness, but which are not directly involved in establishing nuclear hardness, shall not be annotated with the acronym, but shall be preceded by a caution.

4.9.17 Electrostatic Discharge (ESD) sensitive marking.

- a. All steps addressing handling or maintenance which could damage ESD sensitive parts shall be preceded by the alert acronym **“ESD”**.
- b. Handling or maintenance actions which could damage ESD sensitive parts, but which are not directly related to handling or maintenance of ESD sensitive parts, shall not be annotated with the acronym ESD, but shall be preceded by a caution.
- c. Mark figures, drawings, and schematics with the ESD acronym in accordance with MIL-STD-1686.

4.9.18 Quality Assurance (QA) symbol. To indicate depot and aviation maintenance procedures which have a major quality assurance effect, a statement such as “QA check” shall be used following the procedure or step.

4.9.19 Security classification and protective markings. When specified by the acquiring activity, a classified IETM shall be prepared. The security classification markings for classified IETMs, shall be identified in accordance with DoD 5200.1-R and DoD 5220.22-M, Executive Order 12958 and MIL-PRF-87268. For guidance on classification and handling restrictive markings on Compact Disk-Read Only Memory (CD-ROM), refer to MIL-HDBK-9660.

4.9.20 Referencing.

4.9.20.1 Other documents. When authorized by the acquiring activity, reference shall be made only to other documents available and authorized to the user. Reference shall be made by publication number. References to pending publication actions shall not be made.

4.9.20.2 Government specifications and standards. When authorized by the acquiring activity, reference shall be made to the basic publication number for Government specifications and standards.

4.9.20.3 Within the IETM. When it becomes necessary to reference to other work packages, descriptive information, maintenance tasks, or other data within the same IETM, it shall be linked and referenced by title or appropriate text. The title shall be the same used in the list of contents.

4.9.20.4 Equipment, components, and parts. Reference to parts of the equipment and to equipment components may be by nomenclature, model, type, reference designator. The referenced items may be linked to a graphic for identification and location.

4.9.20.5 National Stock Numbers (NSNs) and Part Numbers (P/Ns). NSNs and part numbers shall not be included in any text, tables, or illustration contained in a work package. NSN and part number information for all equipment, components and parts shall be accessible at any point in the presentation of WP text, tables and illustrations, when necessary, for the purpose of identification and parts ordering.

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4.9.24.2.1 Line drawings. Line drawings including exploded views, locator views, and detailed views shall be used to support the operational, troubleshooting, and maintenance procedures. Examples of line drawings are provided in MIL-HDBK-1222.

- a. When index numbers are used to locate and identify equipment components or parts, the index numbers shall be assigned sequentially (clockwise, disassembly, or in the order mentioned in text).
- b. To assist the maintenance technician or operator in locating major components, controls and indicators, etc., locator views may be included.
- c. When the illustration does not adequately or clearly depict the subject matter or part(s), specific detailed views may be included to support the main illustration.

4.9.24.2.2 Multiview illustrations. Multiview illustrations may be used to clarify, identify significant features, or further detail equipment assemblies, subassemblies, and detailed parts. Refer to MIL-HDBK-1222 for examples of multiview illustrations.

4.9.24.2.3 Digital Photographs. Digital photographs may be used for illustrations when a photograph provides for better clarity than a line drawing. If the intention is to use photographs in lieu of line art, it is preferred that a digital camera be used to produce the required photos.

4.9.24.2.4 Engineering drawings. Engineering drawings may be used with the approval of the acquiring activity. Engineering drawings are controlled documents and when used, they shall be used in their entirety, without modification. They must be reduced or redrawn to meet page size restrictions. When the controlled elements of an engineering drawing (i.e., title block, sources of supply, revision data, etc.) are removed, leaving only the “field” of the drawing, it is treated as a typical line drawing.

4.9.24.2.5 Diagrams.

4.9.24.2.5.1 Diagram specifications. Diagrams shall be prepared in accordance with the specifications listed below.

<u>Subject</u>	<u>Equipment Covered</u>	<u>Specification</u>	
Abbreviations	All	ASME Y14.38	ø
Drafting Practices	Mechanical, Electrical and Electronic	ANSI Y14.15-1966 (R1973)	
Engineering Drawing Practices	All	MIL-STD-100	
Graphic Symbols	Electrical and Electronic Mechanical Digital (Logic) Fluid Power	IEEE 315A-86, IEEE 280-85 MIL-STD-17 IEEE 91-84 ANSI Y32.10	
Reference Designators	Electrical and Electronic	IEEE 200-75	

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Unit Symbols	All	IEEE 260-78
Logic	All	IEEE 91-84

4.9.24.2.5.2 Types of diagrams. The following types of diagrams may be included in the IETM. Refer to MIL-HDBK-1222 for examples of types of diagrams. Additionally, when authorized by the acquiring activity, specific types of diagrams such as schematic and wiring diagrams may also be provided in a paged-based paper format.

- a. Block diagrams.
- b. Schematic diagrams.
- c. Pictorial diagrams.
- d. Cutaway diagrams.
- e. Logic diagrams.
- f. Wiring diagrams/wire lists.
- g. Cable diagrams.
- h. Piping diagrams.
- i. Test setup diagrams.

4.9.24.2.6 Tools and test equipment illustrations. Only uncommon or unusual uses and connections for test purposes shall be illustrated if it is essential to do so to avoid misunderstanding. Unusual operations shall also be illustrated. Special tools and test equipment shall be illustrated, as applicable. Standard tools and test equipment shall not be illustrated, nor shall self-evident or generally known uses be shown.

4.9.24.3 Elements of illustrations.

4.9.24.3.1 Border rules and boxes. Border rules and boxes shall not be used for single illustrations, but are used to separate multisection illustrations on the same page or for locator/detail views. (Refer to MIL-HDBK-1222 for an example of border rules and boxes.)

4.9.24.3.2 Use of the human figure. When necessary, illustrations may include a human figure or parts of the body. The illustrated human figure shall not obscure necessary details of the item(s) being illustrated.

4.9.24.3.3 Credit lines.

- a. The photographer's or illustrator's name shall not appear on any illustration.
- b. A manufacturer's name, symbol, or trademark shall not appear on illustrations for the purpose of identifying the illustration.

4.9.24.3.4 Callouts. Index numbers, reference designators, nomenclature, leader lines, sweep arrows, legends, and other identifiers shall be used, when necessary, to identify significant features. When hotspot techniques are used in conjunction with callouts, an explanation shall be provided in the "how to use" portion of the IETM. Refer to MIL-HDBK-1222 for examples of the use of these types of identifiers.

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5.3.1.9.8 Preparation for storage or shipment <pssref>. Reference shall be made to the preparation for storage or shipment procedures, including packaging and administrative storage, found in the applicable maintenance instructions work package.

5.3.1.9.9 Warranty information <wrntyref>. When the TM covers equipment that is under warranty and a Warranty Technical Bulletin (WTB) is published, the applicable WTB shall be referenced. When a WTB is not published, the following statement shall be included.

"WARRANTY INFORMATION

The (insert name of equipment) is warranted for (insert miles or other timeframe as appropriate). The warranty starts on the date found in block 23 of DA Form 2408-9, Equipment Control Record. Report all defects to your supervisor, who will take appropriate action."

5.3.1.9.10 Nomenclature cross-reference list <nomenreflist>. A cross-reference list shall be prepared when unofficial nomenclature (common name) is approved by the proponent activity.

5.3.1.9.11 List of abbreviations/acronyms <loa>. A list shall be prepared, consisting of all abbreviations, acronyms, signs, or symbols used in the TM. For **aircraft TMs only**, a statement shall be prepared that abbreviations are in accordance with ASME Y14.38, except when the abbreviation stands for a marking actually found in the aircraft.

5.3.1.9.12 Quality Assurance (QA) (depot and aviation only) <qainfo>. When specified by the acquiring activity, reference shall be made to the pertinent QA TM(s) or include the appropriate general QA information. If QA information is not referenced but is included in the TM, it shall be stated that the text of each quality assurance procedure or step in the TM is preceded (and highlighted) by the addition of "QA." The abbreviation "QA" shall be defined either in a note or in the text. For **aircraft maintenance TMs**, include a reference to FM 1-500.

5.3.1.9.13 Quality of material <qual.mat.info>. A statement(s) similar to the following shall be included:

"Material used for replacement , repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment."

5.3.1.9.14 Safety, care, and handling <sftyinfo>. The following general precautions and safety regulations shall be prepared.

- a. For **ammunition TMs**, information shall be prepared to comply with AR 385-62. References to applicable Army Regulations (ARs) for range safety and danger zones during training and combat shall be included. Explanations and official definitions shall be prepared for such safety-related terms as "misfire," "hangfire," and "cook-off," which describe characteristics associated with the specific items(s) covered by the TM under preparation. A reference to AR 385-64 and DA Pam 385-64 shall be made for general ammunition care, handling, and safety.
- b. For TMs covering equipment with radioactive parts or components, information shall be prepared to comply with Nuclear Regulatory Commission provisions, and references to applicable ARs and safety TMs on radioactive materials shall be included. If additional coverage on radioactive materials is needed, but is not included in applicable TMs, instructions shall be prepared as required. In addition, the following information shall be prepared for inclusion throughout the TM.

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- (1) Nuclear warning notices shall be placed at the beginning of any instruction covering procedures that will expose personnel to a nuclear radiation hazard.
 - (2) Procedures to be followed prior to maintenance actions, or in the event of breakage of radioactive parts or components, including safety, care, and handling instructions.
 - (3) Radioactive parts or components shall be shown and identified on a parts location diagram or illustration, and warning notices.
 - (4) A list of radioactive parts or components and the type and quantity of radioactive material involved shall be included as part of equipment data. (Refer to MIL-STD-40051- 1A.)
 - (5) Instructions for the disposal of radioactive material, such as the requirement to double bag all broken tritium sources in plastic.
- c. Electrostatic Discharge (ESD) control standards for the protection of electrical and electronic parts, assemblies, and equipment shall be prepared. The ESD classes shall be identified. (Refer to MIL-STD-1686 and MIL-HDBK-263 which contains ESD control procedures and material necessary to protect these items.) (For classifications of ESD marking procedures, refer to 4.8.20.)
- d. For **DMWRs**, when applicable, reference shall be made to the electromagnetic compatibility standards (e.g., MIL-STD-461 and MIL-STD-462) that apply to the equipment covered in the DMWR.

5.3.1.9.15 Nuclear hardness <hcp>. If equipment covered in the TM has nuclear survivability requirements (i.e., overpressure and burst, thermal radiation, electromagnetic pulse, or transient radiation effects on electronics), it shall be so stated. (Refer to 4.8.19 for marking Hardness Critical Process (HCP) procedures.) The following statement shall be included:

"NUCLEAR HARDNESS

All hardness critical procedures in this manual are marked with the acronym **HCP** as follows:

1. When an entire task, including all paragraphs and procedures, is considered hardness critical, only the task title will be marked by the acronym **HCP**, placed before the title.
2. When only certain processes and steps within the work package are hardness critical, only the applicable processes and steps will be marked by placement of the acronym **HCP** between each applicable step number and the text."

5.3.1.9.16 Security measures for electronic data <secret>. Instructions for handling, loading, purging, overwriting, or unloading classified electronic data under usual or unusual conditions, shall be developed. Instructions shall meet the requirements of current regulations as they pertain to automation security.

5.3.1.9.17 Calibration <calref>. Equipment requiring calibration shall be identified, and reference shall be made to the publication containing the applicable calibration procedure.

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“PHASED SCHEDULE

The phased maintenance inspection checklist contains requirements for inspection of the (*insert aircraft model*) aircraft on a phased schedule having a (*insert flight hour cycle*) hour (*flight hours*) cycle with (*insert phase hours*) hour phases. Each requirement included herein is designated for accomplishment at least once, but not more than (*insert number of phases*) times during the (*insert flight hour cycle*) hour cycle.

EXCEEDING THE PHASED SCHEDULE

The phased maintenance inspection intervals designated are the maximum and shall not be exceeded except in actual operational emergencies as explained herein. It is the Commander's responsibility to determine (on an individual aircraft basis) when inspection intervals may be exceeded. For this purpose, operational emergencies are conditions of combat, or conditions of disaster which necessitate flight to evacuate aircraft or personnel. When aircraft are operated beyond the normal inspection due time because of such emergency situations, a circled red X status symbol and an appropriate statement (to include authority) must be entered in block 16 and 17 of DA Form 2408-13 (Aircraft Inspection and Maintenance Record) until such time as the inspection is complete. When inspections are delayed to meet emergency requirements, Commanders will assure that the aircraft status symbol reverts to a red X and that delayed inspections are accomplished immediately upon termination of the actual emergency. When unusual local conditions (utilization, type of mission, personnel, periods of inactivity, environmental conditions, etc.) dictate, it is the prerogative and responsibility of the Maintenance Officer to increase the scope and/or frequency of maintenance or inspection as necessary to ensure safe operation (TM 1-1500-328-23). 00

MAINTENANCE ACTIVITIES

The inspections prescribed by this checklist will be accomplished at specified phases by Aviation Unit Maintenance (AVUM) activities with assistance of Aviation Intermediate (AVIM) and Depot Maintenance activities when required.

LIMITATIONS

The checklist does not contain instructions for repair, adjustment or other means of rectifying conditions. Neither does it contain special tolerances, limits or instructions for special troubleshooting to find causes for malfunctions. Such data will be obtained from the latest issue of the aircraft (*insert applicable aircraft technical manuals*) series Maintenance Manuals.

CHANGEOVER TO THE PHASED MAINTENANCE SYSTEM

Changeover shall be accomplished in accordance with instructions provided in TB 55-1500-337-24 entitled, 'Phased Maintenance System for Army Aircraft'. The requirements of this TB must be accomplished prior to implementation of Phase 1 inspection requirements specified in this checklist.

PRE-INSPECTION MAINTENANCE TEST FLIGHT (MTF)

A pre-inspection MTF to duplicate non-hazardous equipment problems, determine unsatisfactory conditions, determine equipment operation problems, etc., is recommended prior to start of aircraft disassembly for phased maintenance inspection. The decision to perform the pre-inspection MTF, however, shall be the responsibility of the unit Maintenance Officer.

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SPECIAL INSPECTIONS, CALENDAR INSPECTIONS AND LUBRICATION REQUIREMENTS

Special inspections, calendar inspections and lubrication requirements contained in (*insert applicable aircraft technical manual*) and those listed on the aircraft's DA Form 2408-18 shall be reviewed and accomplished in accordance with the "inspection due" requirements specified in those documents.

TIME BETWEEN OVERHAUL (TBO) AND RETIREMENT LIFE ITEMS CHECK

Prior to start of the applicable phased maintenance inspection, a check will be made of components and their remaining operating hours prior to removal. The latest issue of the aircraft's (*insert applicable aircraft technical manual*) and DA Form 2408-16 shall be referred to for a complete listing of components and their TBO and retirement life.

USING THE PHASED INSPECTION CHECKLIST

1. A new checklist shall be used each time phased maintenance is due on the aircraft. This checklist is arranged such that it can be separated by area and distributed to the maintenance crew.
 - a. Space is provided on each checklist form for entering the following data:
 - (1) The number of the maintenance inspection phase being performed.
 - (2) Aircraft serial number.
 - (3) Date of the inspection.
 - (4) Total hours. (Block provided for local use.)
 - b. For each inspection item a column is provided for entering the following data:
 - (1) Status of the aircraft as the result of the inspection requirement.
 - (2) Aircraft fault and/or remarks indicated by the inspection requirement.
 - (3) Action taken to correct the fault.
 - (4) Initials of person performing the corrective action.
2. The checklist is formatted to eliminate the requirements to use DA Form 2404 as temporary records during phased inspections. This checklist pertains to all (*insert applicable aircraft*) aircraft and may, therefore, contain inspection requirements applicable to specific equipment not installed on individual aircraft. When this situation is encountered, those requirements that are not applicable need not be performed.
3. A Supplemental Checklist Sheet form (DA Form 4676-R) is to be used for local reproduction. Copies of this form will be used to write up faults, remarks and corrective actions when additional space is required. These supplemental sheets will be used instead of DA Form 2404 in the accomplishment of the phase maintenance inspections.

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4. Faults and remarks on the DA Form 2408-13 and DA Form 2408-14 may be transcribed to this checklist at the discretion of the unit Maintenance Officer.

PHASE NUMBERS

In the column headed 'Inspect Phase Nos.' and adjacent to the sequence number of each inspection requirement, there will appear the word 'ALL' or a series of numbers. The word 'ALL' indicates that inspection requirement shall be accomplished at each phase (or at every *(insert hours)* hour interval) of the *(insert number of hours)* hour cycle. The numbers represent the phase number at which that inspection requirement is to be accomplished. For example, if the numbers *(insert first number)* and *(insert second number)* are shown, this indicates that inspection requirement is to be accomplished at phases *(insert first number)* and *(insert second number)* only (or at every *(insert appropriate hour)* hour interval). If only one number is indicated, then that inspection requirement is accomplished at that phase (or at every *(insert cycle hours)* hours interval). At the completion of phase *(insert last phase number)* the cycle starts over again with Phase 1.

STATUS SYMBOLS

The status column will be used only to enter the status symbol of a fault discovered when performing an inspection requirement. The status symbols used are the same as those defined in TM 38-750. The status symbol shall be entered by the person(s) performing the inspection and is determined by the type of fault that is found. Do not enter a horizontal dash (-) on the checklist merely to show a particular inspection requirement is due. If an inspection requirement reveals no fault, a status symbol will not be entered. The person clearing or correcting the fault shall place his last name initial over the status symbol. A red X or a circled red X status symbol will not be initialed over until after the corrective action has been approved and signed off by a Technical inspector or designated supervisor.

FAULTS AND/OR REMARKS

Fault entries in the Faults and/or Remarks column shall be brief remarks which describe the conditions resulting from the inspection and which require corrective action. The initials of the person making the entry will be entered immediately after the entry. If no fault was found, this column will be left blank.

ACTION TAKEN

- a. Entries in the Action Taken column shall be brief remarks which describe the action taken to correct the fault described in the adjacent Faults and/or Remarks column. When faults are assigned a red X status, the corrective action shall be inspected and signed off by the Technical Inspector or designated supervisor.
- b. If no fault was found, an appropriate remark shall be entered in the column to indicate that the inspection was accomplished, i.e., 'Inspected and found OK'. If an inspection item is not applicable to the particular inspection phase number in work or to specific equipment installed on an individual aircraft, a 'N/A' entry is required. The initials of the person making the entry shall be entered in the Initial column.

INITIAL

The person correcting the indicated fault shall enter his initials in the initial column opposite the first line of the Action Taken entry.

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FINAL RECORDS CHECK

After all corrective actions have been completed and following completion of the phased inspection, the Technical Inspector or designated supervisor shall verify that all applicable forms and records have been properly updated. All uncorrected faults shall be entered on DA Form 2408-13, prepared for that date or to the DA Form 2408-14. A Final Records Checklist shall be used to ensure forms and records have been inspected for completeness and accuracy prior to release of the aircraft from the phased maintenance inspection. The inspector verifying the final records check shall enter his initials adjacent to the indicated form or record on the Final Records Checklist. The initials entered shall be registered on the Signature Sheet adjacent to that person's signature.

SIGNATURE SHEET

All personnel performing inspection and/or maintenance tasks shall place their signatures and initials on the signature sheet. The purpose of the signature sheet is to provide a correlation between initials entered on the individual checklist sheets and the actual names of the personnel accomplishing these tasks.

MAINTENANCE OPERATIONAL CHECKS

After the completion of any required corrective actions to any of the components of a functional system of the aircraft, maintenance operational checks (MOC) shall be performed on that system to determine the effectiveness of the maintenance actions performed and to verify the proper operation of that system. These MOC shall be performed in accordance with TM 1-1500-328-23. Copies of supplemental sheets (DA Form 4676-R), may be used to record and sign off the Maintenance Operational Checks performed.

MAINTENANCE TEST FLIGHT

When all required inspections have been accomplished and initialed in accordance with the above procedure, a daily inspection in accordance with the TM specified in the inspection checklist work package will be performed on the aircraft to permit performance of a maintenance test flight (MTF). The MTF shall be performed in accordance with the requirements of (insert applicable aircraft technical manuals) and TM 1-1500-328-23 using the MTF form in the MTF technical manual.

CHECKLIST DISTRIBUTION

The completion of each phased maintenance inspection shall be recorded on DA Form 2408-13 as prescribed by TM 38-750. The signed checklist, together with all continuation sheets, shall be attached to DA Form 2408-13, and filed for the six months period as required by TM 38-750. At the end of the six months period, these records shall be transferred to, and filed with, the aircraft historical records, until that same phase is repeated during the next cycle (e.g., the checklist, added continuation sheets, and DA Form 2408-13 for Phase 1, Cycle 1, shall remain on file in the aircraft historical records until Phase 1, Cycle 2 is completed).

INSPECTION AREAS

WP (*insert WP number and figure number*) reflects the inspection areas of the (*insert applicable aircraft model*) aircraft. Those areas are titled as shown. Figure (*insert number*) shows the location of access doors and panels which require removal at various phased maintenance inspections.

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5.4.1.7.5 Hand receipt (HR) information <handreceipt>. The following statement may be included in operator's/unit maintenance IETMs.

"HAND RECEIPT (HR) INFORMATION

This IETM contains hand receipts that list end item related equipment (i.e., COEI, BII, and AAL) that must be accounted for.

5.4.1.7.6 Corrosion prevention and control <cpcdata>. A statement similar to the following shall be prepared.

"CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS)."

For **aircraft IETMs**, this information shall include a reference to TM 55-1500-343-23 (Organizational and Intermediate Avionic Cleaning and Corrosion Prevention/Control).

5.4.1.7.7 Ozone depleting substances (ODS) <odsddata>. The continued use of ODS has been prohibited by Executive Order 12856 of 3 August 1993. The use of ODS in Army IETMs is prohibited. A listing of these substances will be provided by the acquiring activity.

5.4.1.7.8 Destruction of Army materiel to prevent enemy use <destructmat>. Reference shall be made to the appropriate TM(s) covering the destruction of Army materiel to prevent enemy use as provided by the proponent activity.

5.4.1.7.9 Preparation for storage or shipment <pssref>. Reference shall be made to the preparation for storage or shipment procedures, including packaging and administrative storage, found in the applicable maintenance instructions work package.

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5.4.1.7.10 Warranty information <wrntyref>. When the IETM covers equipment that is under warranty and a Warranty Technical Bulletin (WTB) is published, the applicable WTB shall be referenced. When a WTB is not published, the following statement shall be included:

"WARRANTY INFORMATION

The (insert name of equipment) is warranted for (insert miles or other timeframe as appropriate). The warranty starts on the date found in block 23 of DA Form 2408-9, Equipment Control Record. Report all defects to your supervisor, who will take appropriate action."

5.4.1.7.11 Nomenclature cross-reference list <nomenreflist>. A statement on how to access the nomenclature cross-reference list shall be included. (Refer to 4.9.22).

5.4.1.7.12 List of abbreviations / acronyms <loa>. A statement on how to access a list of all abbreviations, acronyms, signs, or symbols used in the IETM shall be included (Refer to 4.9.14). For **aircraft IETMs only**, a statement shall be prepared that abbreviations are in accordance with ASME Y14.38, except when the abbreviation stands for a marking actually found in the aircraft. e

5.4.1.7.13 Quality Assurance (QA) (DMWR and aviation only) <qainfo>. When specified by the acquiring activity, reference shall be made to the pertinent QA TM(s) or include the appropriate general QA information. If QA information is not referenced but is included in the IETM, it shall be stated that the text of each quality assurance procedure or step in the IETM is preceded (and highlighted) by the addition of a statement such as "QA check". For **aircraft maintenance IETMs**, include a reference to FM 1-500.

5.4.1.7.14 Quality of material <qual.mat.info>. A statement(s) similar to the following shall be included:

"Material used for replacement , repair, or modification must meet the requirements of this IETM. If quality of material requirements are not stated in this IETM, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment."

5.4.1.7.15 Safety, care, and handling <sftyinfo>. The following general precautions and safety regulations shall be prepared.

- a. For **ammunition IETMs**, information shall be prepared to comply with AR 385-62. References to applicable Army Regulations (ARs) for range safety and danger zones during training and combat shall be included. Explanations and official definitions shall be prepared for such safety-related terms as "misfire," "hangfire," and "cook-off," which describe characteristics associated with the specific item(s) covered by the IETM under preparation. A reference to AR 385-64 and DA Pam 385-64 shall be made for general ammunition care, handling, and safety. e
- b. For IETMs covering equipment with radioactive parts or components, information shall be prepared to comply with Nuclear Regulatory Commission provisions, and references to applicable ARs and safety TMs on radioactive materials shall be included. If additional coverage on radioactive materials is needed, but is not included in applicable TMs, instructions shall be prepared as required. In addition, the following information shall be prepared for inclusion throughout the IETM.
 - (1) Nuclear warning notices shall be placed at the beginning of any instruction covering procedures that will expose personnel to a nuclear radiation hazard.

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this IETM. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), directly to: *(Insert name and address of proponent)*. You may also send in your recommended changes via electronic mail or by fax. Our fax number is *(insert DSN and commercial number of proponent)*. Our e-mail address is *(insert address of proponent)*. A reply will be furnished to you.

INSPECTION AREAS

Inspection areas are shown in the PREVENTIVE MAINTENANCE SERVICES INSPECTION CHECKLIST."

5.4.1.9 General information work package <pm-ginfowp> (Phased Maintenance Checklist Only). This general information work package shall include verbatim the text below within the quotation marks except for the information indicated by italicized text. Italicized text shall be deleted, and as applicable, replaced with the appropriate information.

"PHASED SCHEDULE

This phased maintenance inspection checklist contains requirements for inspection of the *(insert aircraft model)* aircraft on a phased schedule having a *(insert flight hour cycle)* hour *(flight hours)* cycle with *(insert phase hours)* hour phases. Each requirement included herein is designated for accomplishment at least once, but not more than *(insert number of phases)* times during the *(insert flight hour cycle)* hour cycle.

EXCEEDING THE PHASED SCHEDULE

The phased maintenance inspection intervals designated in the checklist are the maximum and shall not be exceeded except in actual operational emergencies as explained herein. It is the Commander's responsibility to determine (on an individual aircraft basis) when inspection intervals may be exceeded. For this purpose, operational emergencies are conditions of combat, or conditions of disaster which necessitate flight to evacuate aircraft or personnel. When aircraft are operated beyond the normal inspection due time because of such emergency situations, a circled red X status symbol and an appropriate statement (to include authority) must be entered in block 16 and 17 of DA Form 2408-13 (Aircraft Inspection and Maintenance Record) until such time as the inspection is complete. When inspections are delayed to meet emergency requirements, Commanders will assure that the aircraft status symbol reverts to a red X and that delayed inspections are accomplished immediately upon termination of the actual emergency. When unusual local conditions (utilization, type of mission, personnel, periods of inactivity, environmental conditions, etc.) dictate, it is the prerogative and responsibility of the Maintenance Officer to increase the scope and/or frequency of maintenance or inspection as necessary to ensure safe operation (TM 1-1500-328-23). ce

MAINTENANCE ACTIVITIES

The inspections prescribed by the checklist will be accomplished at specified phases by Aviation Unit Maintenance (AVUM) activities with assistance of Aviation Intermediate (AVIM) and Depot Maintenance activities when required.

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LIMITATIONS

The checklist does not contain instructions for repair, adjustment or other means of rectifying conditions. Neither does it contain special tolerances, limits or instructions for special troubleshooting to find causes for malfunctions. Such data will be obtained from the latest issue of the aircraft (*insert applicable aircraft technical manuals*) series Maintenance Manuals.

CHANGEOVER TO THE PHASED MAINTENANCE SYSTEM

Changeover shall be accomplished in accordance with instructions provided in TB 55-1500-337-24 entitled, 'Phased Maintenance System for Army Aircraft'. The requirements of this TB must be accomplished prior to implementation of Phase 1 inspection requirements specified in this checklist.

PRE-INSPECTION MAINTENANCE TEST FLIGHT (MTF)

A pre-inspection MTF to duplicate non-hazardous equipment problems, determine unsatisfactory conditions, determine equipment operation problems, etc., is recommended prior to start of aircraft disassembly for phased maintenance inspection. The decision to perform the pre-inspection MTF, however, shall be the responsibility of the unit Maintenance Officer.

SPECIAL INSPECTIONS, CALENDAR INSPECTIONS AND LUBRICATION REQUIREMENTS

Special inspections, calendar inspections and lubrication requirements contained in (*insert applicable aircraft technical manual*) and those listed on the aircraft's DA Form 2408-18 shall be reviewed and accomplished in accordance with the "inspection due" requirements specified in those documents.

TIME BETWEEN OVERHAUL (TBO) AND RETIREMENT LIFE ITEMS CHECK

Prior to start of the applicable phased maintenance inspection, a check will be made of components and their remaining operating hours prior to removal. The latest issue of the aircraft's (*insert applicable aircraft technical manual*) and DA Form 2408-16 shall be referred to for a complete listing of components and their TBO and retirement life.

USING THE PHASED INSPECTION CHECKLIST

1. A new checklist shall be used each time phased maintenance is due on the aircraft. This checklist is arranged such that it can be separated by area and distributed to the maintenance crew.
 - a. Space is provided on each checklist form for entering the following data:
 - (1) The number of the maintenance inspection phase being performed.
 - (2) Aircraft serial number.
 - (3) Date of the inspection.
 - (4) Total hours. (Block provided for local use.)

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- b. For each inspection item the following data shall be entered:
- (1) Status of the aircraft as the result of the inspection requirement.
 - (2) Aircraft fault and/or remarks indicated by the inspection requirement.
 - (3) Action taken to correct the fault.
 - (4) Initials of person performing the corrective action.
2. The checklist eliminates the need to use DA Form 2404 as temporary records during phased inspections. The checklist pertains to all (*insert applicable aircraft*) aircraft and may, therefore, contain inspection requirements applicable to specific equipment not installed on individual aircraft. When this situation is encountered, those requirements that are not applicable need not be performed.
 3. A Supplemental Checklist Sheet form (DA Form 4676-R) is to be used for local reproduction. This form will be used to write up faults, remarks and corrective actions when additional space is required. These supplemental sheets will be used instead of DA Form 2404 in the accomplishment of the phase maintenance inspections. When this form is not provided on the IETM, the paper form shall be used.
 4. Faults and remarks on the DA Form 2408-13 and DA Form 2408-14 may be transcribed to the checklist at the discretion of the unit Maintenance Officer.

PHASE NUMBERS

Under the entry headed 'Inspect Phase Nos.' and adjacent to the sequence number of each inspection requirement, there will appear the word 'ALL' or a series of numbers. The word 'ALL' indicates that inspection requirement shall be accomplished at each phase (or at every (*insert hours*) hour interval) of the (*insert number of hours*) hour cycle. The numbers represent the phase number at which that inspection requirement is to be accomplished. For example, if the numbers (*insert first number*) and (*insert second number*) are shown, this indicates that inspection requirement is to be accomplished at phases (*insert first number*) and (*insert second number*) only (or at every (*insert appropriate hour*) hour interval). If only one number is indicated, then that inspection requirement is accomplished at that phase (or at every (*insert cycle hours*) hours interval). At the completion of phase (*insert last phase number*) the cycle starts over again with Phase 1.

STATUS SYMBOLS

The status entry will be used only to enter the status symbol of a fault discovered when performing an inspection requirement. The status symbols used are the same as those defined in TM 38-750. The status symbol shall be entered by the person(s) performing the inspection and is determined by the type of fault that is found. Do not enter a horizontal dash (-) on the checklist merely to show a particular inspection requirement is due. If an inspection requirement reveals no fault, a status symbol will not be entered. The person clearing or correcting the fault shall place his last name initial over the status symbol. A red X or a circled red X status symbol will not be initialed over until after the corrective action has been approved and signed off by a Technical inspector or designated supervisor.

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FAULTS AND/OR REMARKS

Fault entries under “Faults and/or Remarks” shall be brief remarks which describe the conditions resulting from the inspection and which require corrective action. The initials of the person making the entry will be entered immediately after the entry. If no fault was found, no additional fault entry data is required.

ACTION TAKEN

- a. Entries under “Action Taken” shall be brief remarks which describe the action taken to correct the fault described under “Faults and/or Remarks”. When faults are assigned a red X status, the corrective action shall be inspected and signed off by the Technical Inspector or designated supervisor.
- b. If no fault was found, an appropriate remark shall be entered under “Action Taken” to indicate that the inspection was accomplished, i.e., 'Inspected and found OK'. If an inspection item is not applicable to the particular inspection phase number in work or to specific equipment installed on an individual aircraft, a 'N/A' entry is required. The initials of the person making the entry shall be entered in the Initial column.

INITIAL

The person correcting the indicated fault shall enter his initials in the initial column opposite the first line of the Action Taken entry.

FINAL RECORDS CHECK

After all corrective actions have been completed and following completion of the phased inspection, the Technical Inspector or designated supervisor shall verify that all applicable forms and records have been properly updated. All uncorrected faults shall be entered on DA Form 2408-13, prepared for that date or to the DA Form 2408-14. A Final Records Checklist shall be used to ensure forms and records have been inspected for completeness and accuracy prior to release of the aircraft from the phased maintenance inspection. The inspector verifying the final records check shall enter his initials adjacent to the indicated form or record on the Final Records Checklist. The initials entered shall be registered on the Signature Sheet adjacent to that person's signature. When this form is not provided on the IETM, the paper form shall be used.

SIGNATURE SHEET

All personnel performing inspection and/or maintenance tasks shall place their signatures and initials on the signature sheet. The purpose of the signature sheet is to provide a correlation between initials entered on the individual checklist sheets and the actual names of the personnel accomplishing these tasks. When this signature sheet is not provided on the IETM, the signature sheet shall be used.

MAINTENANCE OPERATIONAL CHECKS

After the completion of any required corrective actions to any of the components of a functional system of the aircraft, maintenance operational checks (MOC) shall be performed on that system to determine the effectiveness of the maintenance actions performed and to verify the proper operation of that system. These MOC shall be performed in accordance with TM 1-1500-328-23. Supplemental sheet forms (DA Form 4676-R), may be used to record and sign off the Maintenance Operational Checks performed. When this form is not provided on the IETM, the paper form shall be used.

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MAINTENANCE TEST FLIGHT

When all required inspections have been accomplished and initialed in accordance with the above procedure, a daily inspection in accordance with the TM specified in the inspection checklist work package will be performed on the aircraft to permit performance of a maintenance test flight (MTF). The MTF shall be performed in accordance with the requirements of (insert applicable aircraft technical manuals) and TM 1-1500-328-23 using the MTF form in the MTF technical manual. e

CHECKLIST DISTRIBUTION

The completion of each phased maintenance inspection shall be recorded on DA Form 2408-13 as prescribed by TM 38-750. The signed checklist, together with all continuation sheets, shall be attached to DA Form 2408-13, and filed for the six months period as required by TM 38-750. At the end of the six months period, these records shall be transferred to, and filed with, the aircraft historical records, until that same phase is repeated during the next cycle (e.g., the checklist, added continuation sheets, and DA Form 2408-13 for Phase 1, Cycle 1, shall remain on file in the aircraft historical records until Phase 1, Cycle 2 is completed). When these forms or an electronic equivalent of these forms are not provided on the IETM, the paper forms shall be used.

INSPECTION AREAS

The PHASED MAINTENANCE CHECKLIST reflects the inspection areas of the (*insert applicable aircraft model*) aircraft. Those areas are titled as shown. The checklist provides the location of access doors and panels which require removal at various phased maintenance inspections.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this IETM. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), directly to: (*Insert name and address of proponent*). You may also send in your recommended changes via electronic mail or by fax. Our fax number is (*insert DSN and commercial number of proponent*). Our e-mail address is (*insert address of proponent*). A reply will be furnished to you."

5.4.2 Additional introductory information work packages. The following work packages shall be developed to support the technical information developed for the IETM.

- a. Abbreviation, acronyms, and uncommon terms WP (Refer to 4.9.14) <abbrevwp>.
- b. Symbols WP (Refer to 4.9.15) <symbolwp>.

5.4.3 Alphabetical index <aindx>. An alphabetical index is not required.

5.4.4 Reporting errors and recommending improvements DA Form 2028 <da2028>. A blank DA Form 2028, or an electronic equivalent, should be provided in the IETM so the users can notify the proponent if any mistakes are found or any recommended improvements can be made to the IETM. Guidelines shall be included for completing the form. When this form or an electronic equivalent of this form is not provided on the IETM, the paper form shall be used.

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6. NOTES.

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The MIL-STD-40051A series prescribes requirements applicable to various types of technical manuals, and the revisions for these manuals as prepared by or for the Department of the Army.

6.2 Issue of DODISS. When this document is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation. (See 2.2.1.)

6.3 Tailoring guidance. The acquiring activity should tailor any required options offered herein in accordance with Appendix A, Technical Manual Content Selection Matrixes.

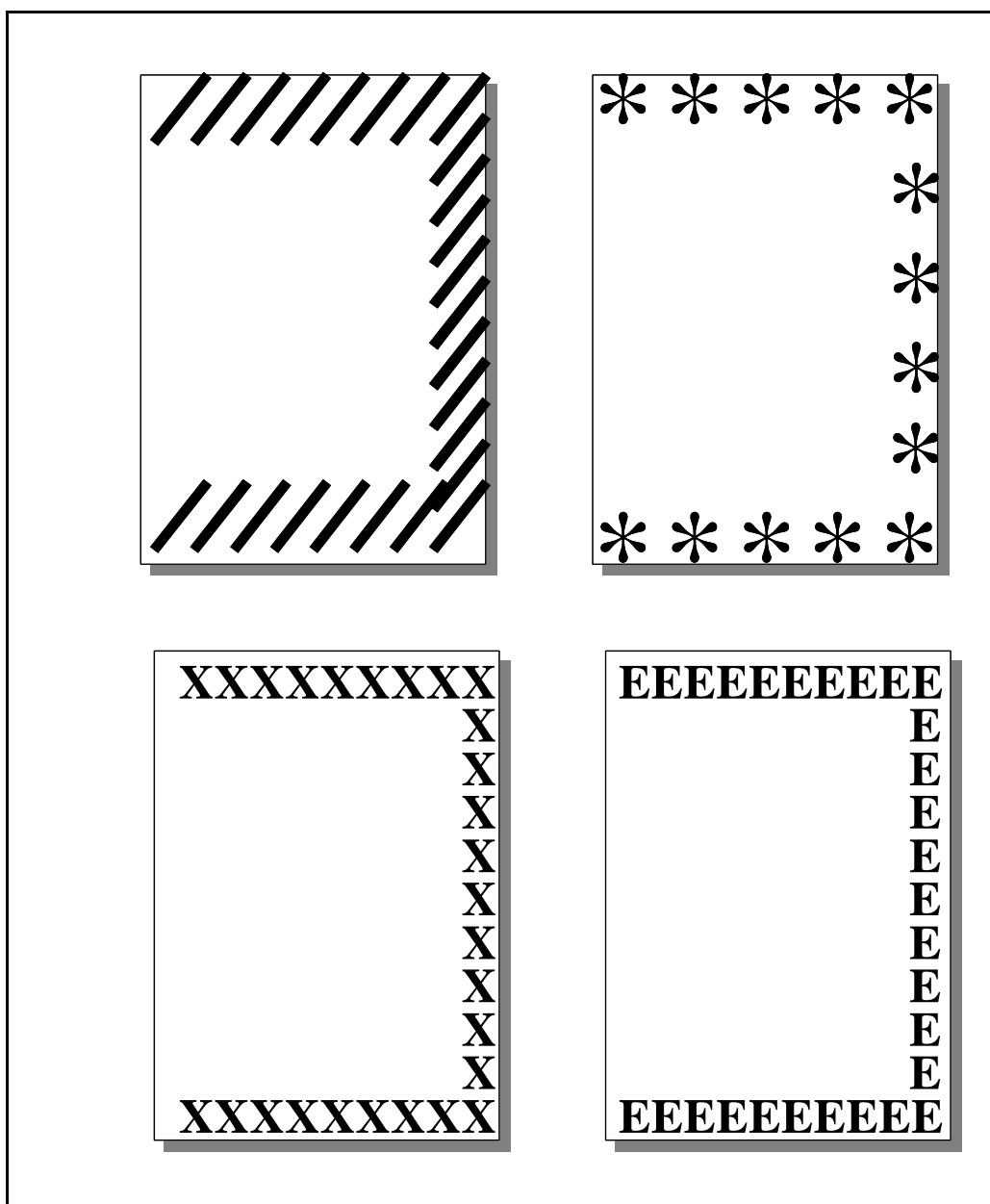
6.4 Subject term (key word) listing. The following terms are to be used to identify the MIL-STD-40051A series documents during retrieval searches,

- Additional authorization list (AAL)
- Basic issue items (BII)
- Basis of issue (BOI)
- Continuous Acquisition Life-cycle Support (CALS) raster
- Computer graphics metafile (CGM)
- Components of end item (COEI)
- Depot maintenance work requirement (DMWR)
- Expendable and durable items list
- Illustrations
- Initial Graphics Exchange Specification (IGES)
- Introductory information
- Maintenance allocation chart (MAC)
- Maintenance instructions
- Operator instructions
- Quality assurance (QA)
- Repair parts and special tools lists (RPSTL)
- Security classification
- Standard Generalized Markup Language (SGML)
- Supporting information
- Theory of operation
- Troubleshooting procedures
- Work package (WP)
- Work package identification number

6.5 Change from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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FIGURE 6. Examples of emergency page markings.

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SECURITY CLASSIFICATION	
TM NUMBER	
<hr/>	
TECHNICAL MANUAL	
TYPE OF PUBLICATION	
MAINTENANCE LEVELS FOR	
NOMENCLATURE OF EQUIPMENT	
TYPE, MODEL, PART NUMBER	
NATIONAL STOCK NUMBER (EIC)	
OR	
SUBJECT	
SUBTITLE	
ILLUSTRATION	
<u>AVAILABILITY STATEMENT</u>	
<u>SUPERSEDURE NOTICE</u>	
<u>DISCLOSURE NOTICE</u>	
<u>DISTRIBUTION STATEMENT</u>	
<u>WARNING</u>	
<u>DESTRUCTION NOTICE</u>	
<hr/>	
SERVICE NOMENCLATURE	
CHANGE- DATE	TM DATE

FIGURE 7. Example of a TM front cover.

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TM 3-6665-339-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 1 JUNE 1996

TECHNICAL MANUAL

OPERATOR'S MANUAL

**NUCLEAR-BIOLOGICAL-CHEMICAL
RECONNAISSANCE SYSTEM (NBCRS)**

FOX M93E1

NSN 6665-01-372-1303 (EIC Y60)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual, direct to: Technical Director, Edgewood Research Development and Engineering Center, ATTN: SCBRD-ENL-V, Aberdeen Proving Ground, MD 21010-5423. You may also send in your recommended changes via electronic mail or by fax. Our fax number is *(insert DSN and commercial number of proponent)*. Our e-mail address is *(insert address of proponent)*. A reply will be furnished to you.

DISTRIBUTION STATEMENT C - Distribution authorized to U.S. Government Agencies and their contractors. This publication is required for administrative and operational purposes, as determined on 22 October 1990. Other requests for this document shall be referred to Technical Director, Edgewood Research Development and Engineering Center, ATTN: SCBRD-ENL-V, Aberdeen Proving Ground, MD 21010-5423.

WARNING - This document contains export-controlled technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751 et seq) or Executive Order 12470. Violation of these export laws is subject to severe criminal penalties.

DESTRUCTION NOTICE - Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

FIGURE 13. Example of a title block page, and reporting of errors and recommending improvements statement.

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TM 3-665-339-10

TABLE OF CONTENTSWP Sequence No.

WARNING SUMMARY

HOW TO USE THIS MANUAL

CHAPTER 1 - INTRODUCTORY INFORMATION WITH THEORY OF OPERATION

General Information	0001 00
Equipment Description and Data	0002 00
Introduction	0003 00
Powerpack Theory of Operation	0004 00
Fuel System Theory of Operation	0005 00
Electrical System Theory of Operation	0006 00
Hydraulic System Theory of Operation	0007 00
Amphibious System Theory of Operation	0008 00
Bilge Pumps and Drain valves Theory of Operation	0009 00
Fire Extinguisher System Theory of Operation	0010 00

CHAPTER 2 - OPERATOR INSTRUCTIONS

Description and Use of Controls and Indicators	0011 00	e
Operate Intercom	0012 00	e
Operate NBC Collective Protection System (Operate Microclimatic System and M42 Mask)	0013 00	e
Operate Domelight	0014 00	e
Operate Portable Fire Extinguisher	0015 00	e
Enter Driver's Station	0015 00	e
Adjust Seat, Safety Belt, and Mirror	0016 00	e
Power Up Hull Systems	0017 00	e
Install Periscopes	0018 00	e
Operate Ballistic Shield	0019 00	e

i

FIGURE 14. Example of Table of Contents.

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APPENDIX A

TECHNICAL MANUAL CONTENT SELECTION MATRIXES

A.1 SCOPE

A.1.1 Scope. This appendix lists technical content requirements for technical manuals for all major weapon systems and all types of equipment, including test and support equipment. These requirements are applicable for all maintenance levels through overhaul (depot), including DMWRs. Technical requirements are provided for both page-based and frame-based TMs

A.2 APPLICABLE DOCUMENTS.

This section is not applicable to this appendix.

A.3 DEFINITIONS.

This section is not applicable to this appendix.

A.4 GENERAL REQUIREMENTS.

This section is not applicable to this appendix.

A.5 DETAILED REQUIREMENTS.

A.5.1 General. Tailoring of the technical content requirements contained in MIL-STD-40051A through MIL-STD-40051-6A for page-based manuals is provided in A.5.1.1 through A.5.1.1.1. Tailoring instructions for frame-based TMs are provided in A.5.1.2 through A.5.1.2.2.

A.5.1.1 Tailoring requirements for page-based technical manuals. Tables are provided that list all applicable technical content requirements for the development of the following page-based TMs This Appendix is a mandatory part of this standard. The information contained herein is intended for compliance. Copies of the applicable tables will be completed and added as an attachment to the Document Summary List of the contract.

NOTES

1. All TM titles start with the words "TECHNICAL MANUAL" followed by the titles given above.
2. If your RPSTL information contains DEPOT parts/special tools indicate this in the title (e.g., Unit, Direct support, and General Support Maintenance Manual with Repair Parts and Special Tools List including Depot Repair Parts and Special Tools).
3. If your parts information in your IETM contains DEPOT parts/special tools indicate this in the title (e.g., Unit, Direct support, and General Support Maintenance Manual with Parts Information including Depot Repair Parts and Special Tools).
4. If your DMWR IETM contains parts information indicate this in the title (e.g., Depot Maintenance Work Requirement including Parts Information for).

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<u>PUB TYPE</u>	<u>TITLE</u>	<u>APPLICABLE TABLE</u>
-10	Operator's Manual for	A.1
-12	Operator's and Unit Maintenance Manual for	A.1
-12&P	Operator's and Unit Maintenance Manual including Repair Parts and Special Tools List for	A.1
-13	Operator's, Unit, and Direct Support Maintenance Manual for	A.1
-13&P	Operator's, Unit, and Direct Support Maintenance Manual including Repair Parts and Special Tools List for	A.1
-14	Operator's, Unit, Direct Support, and General Support Maintenance Manual for	A.1
-14&P	Operator's, Unit, Direct Support, and General Support Maintenance Manual including Repair Parts and Special Tools List for	A.1
-20	Unit Maintenance Manual for	A.2
-20&P	Unit Maintenance Manual including Repair Parts and Special Tools List for	A.2
-20 (aviation)	Aviation Unit Maintenance Manual for	A.4
-20&P (aviation)	Aviation Unit Maintenance Manual including Repair Parts and Special Tools List for	A.4
-23	Unit and Direct Support Maintenance Manual for	A.3
-23&P	Unit and Direct Support Maintenance Manual including Repair Parts and Special Tools List for	A.3
-23 (Aviation)	Aviation Unit and Intermediate Maintenance Manual for	A.4
-23&P (Aviation)	Aviation Unit and Intermediate Maintenance Manual including Repair Parts and Special Tools List for	A.4
-24	Operator's, Unit, Direct Support, and General Support Maintenance Manual for	A.3
-24&P	Operator's, Unit, Direct Support, and General Support Maintenance Manual including Repair Parts and Special Tools List for	A.3
-30	Direct Support Maintenance Manual for	A.2
-30&P	Direct Support Maintenance Manual including Repair Parts and Special Tools List for	A.2

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<u>PUB TYPE</u>	<u>TITLE</u>	<u>APPLICABLE TABLE</u>
-30 (Aviation)	Aviation Intermediate Maintenance Manual for	A.4
-30&P (Aviation)	Aviation Intermediate Maintenance Manual including Repair Parts and Special Tools List for	A.4
-34	Unit, Direct Support and General Support Maintenance Manual for	A.3
-34&P	Direct Support and General Support Maintenance Manual including Repair Parts and Special Tools List for	A.3
-40	General Support Maintenance Manual for	A.2
-40&P	General Support Maintenance Manual including Repair Parts and Special Tools List for	A.2
DMWR	Depot Maintenance Work Requirement for	A.6
DMWR w/RPSTL	Depot Maintenance Work Requirement including Repair Parts and Special Tools List	A.6
RPSTL	Repair Parts and Special Tools List for	A.5
-T	Aviation Unit Troubleshooting Manual for OR Aviation Intermediate Troubleshooting Manual for OR Aviation Unity and Intermediate Troubleshooting Manual for	A.7
Aircraft PMS	Preventive Maintenance Services Manual for	A.8
Aircraft PM	Phased Maintenance Inspection Checklist for OR Phased Maintenance Checklist for	A.9
IETM (Operator)	Interactive Electronic Technical Manual Operator's Manual for	A.10
IETM (-24&P)	Interactive Electronic Technical Manual Unit, Direct Support, and General Support Maintenance Manual Including Parts Information for	A.11
IETM (AVIM/AVUM) -23&P	Interactive Electronic Technical Manual Aviation Unit and Aviation Intermediate Maintenance Manual Including Parts Information for	A.11
IETM (DMWR)	Interactive Electronic Technical Manual Depot Maintenance Work Requirement for	A.12

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A.5.1.1.1 Technical content tables. Tables A.1 through A.9 simplify tailoring the technical content requirements of technical manuals prepared using this standard as a guide. The tables indicate which parts of MIL-STD-40051 are applicable and list the content requirements for each type of TM. The content requirements for each applicable TM shall be arranged in the order presented in the tables. Inclusion of the applicable tables of this appendix is mandatory and is intended for compliance.

A.5.1.2 Tailoring guidance for frame-based technical manuals. Unless otherwise directed by the acquiring activity, all maintenance instructions (operators through overhaul (depot)) for major weapon systems and all types of equipment, including test and support equipment, shall be on a single CD-ROM. This includes parts information data base or RPSTL, troubleshooting, PMS and PMI checklists, when applicable. The following types of technical manuals should not be combined with the maintenance instructions on the single CD-ROM.

- a. Aircraft Operators Manuals.
- b. DMWRs.
- c. Certain types of Operator Manuals when directed by the acquiring activity.

A.5.1.2.1 Additional tailoring requirements. Due to the EDS limitations for displaying schematics and wiring diagrams provided in IETMs, the acquiring activity may require that the schematics and wiring diagrams be printed on paper in a double king size (11-inch by 17-inch) as a supplement to the IETM.

A.5.1.2.2 Technical content tables. Tables A.10 through A.12 simplify tailoring the technical content requirements of frame-based technical manuals prepared using this standard. The tables indicate which parts of MIL-STD-40051A are applicable and list the content requirements for each type of TM. Inclusion of the tables of this appendix is mandatory and is intended for compliance.

A.5.2 Intended use. First determine the types of TMs required for each acquisition and then duplicate the table(s) that contain the content requirements for those types of TMs. Indicate the types of TMs needed by filling in the blank after "TM Requirements Matrix for" at the top of each matrix. For each type of TM selected, indicate in the open blocks the "TM Content" desired by entering an "R" for "REQUIRED" content, "NR" for content that is "NOT REQUIRED", or "O" for optional content that may be required in the TM later by the Government, but can not be determined at the time of the contract. All blocks for the selected TM types in Tables A.1 through A.12 must be completed with an "R", "NR", or an "O" for each TM acquisition. The blocks that already contain an "R" are required and cannot be changed. The blocks containing "NR" are not required for that type of TM and should not be included. The blocks that are shaded are as required. The remarks page can be used to provide the contractor additional instructions.

A.5.3 Acquisition requirements. The properly executed Technical Manual content Selection Matrix table becomes contractually binding when it is made part of the contract, statement of work or any other contractual instrument.

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Table A.1 TM Requirements Matrix for _____

TM Content	-10	-12 -12&P	-13 -13&P	-14 -14&P	MIL-STD- 40051A Reference	Element Name
FRONT MATTER	R	R	R	R	5.3.1	<FRNT>
Front cover	R	R	R	R	5.3.1.1	<frntcover>
Warning summary	R	R	R	R	5.3.1.2	<warnsum>
Change transmittal page	R	R	R	R	5.3.1.3	<chgsheet>
List of effective pages / work packages	R	R	R	R	5.3.1.4	<loepwp>
Title block page	R	R	R	R	5.3.1.5	<titleblk>
Table of contents	R	R	R	R	5.3.1.6	<contents>
How to use this manual	R	R	R	R	5.3.1.7	<howtouse>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	R	R	R	5.3.1.9	<ginfowp>
Scope	R	R	R	R	5.3.1.9.1	<scope>
Maintenance forms, records, and reports	R	R	R	R	5.3.1.9.2	<mfr>
Reporting equipment improvement recommendations (EIR)	R	R	R	R	5.3.1.9.3	<eir>
Hand receipt (HR) manuals					5.3.1.9.4	<handreceipt>
Corrosion prevention and control (CPC)	R	R	R	R	5.3.1.9.5	<cpcdata>
Ozone depleting substances (ODS)	R	R	R	R	5.3.1.9.6	<odsdata>
Destruction of Army materiel to prevent enemy use	R	R	R	R	5.3.1.9.7	<destructmat>
Preparation for storage or shipment	R	R	R	R	5.3.1.9.8	<pssref>
Warranty information					5.3.1.9.9	<wrntyref>
Nomenclature cross-reference list					5.3.1.9.10	<nomenreflist>
List of abbreviations/acronyms					5.3.1.9.11	<loa>
Quality assurance (QA) (aviation only)					5.3.1.9.12	<qainfo>
Quality of material					5.3.1.9.13	<qual.mat.info>

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MIL-STD-40051A (TM)

Table A.1 TM Requirements Matrix for _____

TM Content	-10	-12 -12&P	-13 -13&P	-14 -14&P	MIL-STD-40051A Reference	Element Name
<i>Safety, care, and handling</i>	R	R	R	R	5.3.1.9.14	<sftyinfo>
Nuclear hardness					5.3.1.9.15	<hcp>
Security measures for electronic data					5.3.1.9.16	<secref>
Calibration					5.3.1.9.17	<calref>
Copyright credit line					5.3.1.9.23	<copyrt>
Supporting information for repair parts, special tools, TMDE, and support equipment	NR				5.3.1.9.24	<supdata>
CHAPTER 1. DESCRIPTION AND THEORY OF OPERATION	R	R	R	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	R	R	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	R	R	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	R	R	R	1- 5.2.2	<locdesc>
Differences between models					1- 5.2.3	<eqpdiff>
Equipment data	R	R	R	R	1- 5.2.4	<eqpdata>
Equipment configuration					1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>	R	R	R	R	1- 5.3	<thrywp>
CHAPTER X. OPERATOR INSTRUCTIONS	R	R	R	R	2- 5.1	<opim>
<i>DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS WORK PACKAGE</i>	R	R	R	R	2- 5.2.3.2	<ctrlindwp>
<i>OPERATION UNDER USUAL CONDITIONS WORK PACKAGE</i>	R	R	R	R	2- 5.2.3.3	<opusualwp>
Siting requirements					2- 5.2.3.2	<site>
Shelter requirements					2- 5.2.3.3	<shelter>
Assembly and preparation for use					2- 5.2.3.4	<prepforuse>

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Table A.2 TM Requirements Matrix for _____

TM Content	-20 -20&P	-30 -30&P	-40 -40&P	MIL- STD- 40051A Reference	Element Name
FRONT MATTER	R	R	R	5.3.1	<fnt>
Front cover	R	R	R	5.3.1.1	<fntcover>
Warning summary				5.3.1.2	<warnsum>
Change transmittal page	R	R	R	5.3.1.3	<chgsheet>
List of effective pages / work packages	R	R	R	5.3.1.4	<loepwp>
Title block page	R	R	R	5.3.1.5	<titleblk>
Table of contents	R	R	R	5.3.1.6	<contents>
How to use this manual	R	R	R	5.3.1.7	<howtouse>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	R	R	5.3.1.9	<ginfowp>
Scope	R	R	R	5.3.1.9.1	<scope>
Maintenance forms, records, and reports	R	R	R	5.3.1.9.2	<mfr>
Reporting equipment improvement	R	R	R	5.3.1.9.3	<eir>
Hand receipt (HR) manuals				5.3.1.9.4	<handreceipt>
Corrosion prevention and control (CPC)	R	R	R	5.3.1.9.5	<cpcdata>
Ozone depleting substances (ODS)	R	R	R	5.3.1.9.6	<odsdata>
Destruction of Army materiel to prevent enemy	R	R	R	5.3.1.9.7	<destructmat>
Preparation for storage or shipment	R	R	R	5.3.1.9.8	<psref>
Warranty information				5.3.1.9.9	<wrntyref>
Nomenclature cross-reference list				5.3.1.9.10	<nomenreflist>
List of abbreviations	R	R	R	5.3.1.9.11	<loa>
Quality assurance (QA) (aviation only)				5.3.1.9.12	<qainfo>
Quality of material				5.3.1.9.13	<qual.mat.info>
Safety, care, and handling	R	R	R	5.3.1.9.14	<sftyinfo>
Nuclear hardness				5.3.1.9.15	<hcp>
Security measures for electronic data				5.3.1.9.16	<secrref>
Calibration				5.3.1.9.17	<calref>
Copyright credit line				5.3.1.9.23	<copyrt>

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MIL-STD-40051A (TM)

Table A.2 TM Requirements Matrix for _____

TM Content	-20 -20&P	-30 -30&P	-40 -40&P	MIL-STD- 40051A Reference	Element Name
Supporting information for repair parts, special tools, tmde, and support equipment				5.3.1.9.24	<supdata>
CHAPTER 1. DESCRIPTION AND THEORY OF OPERATION	R	R	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	R	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	R	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	R	R	1- 5.2.2	<locdesc>
Differences between models				1- 5.2.3	<eqpdiff>
Equipment data	R	R	R	1- 5.2.4	<eqpdata>
Equipment configuration				1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>	R	R	R	1- 5.3	<thrywp>
CHAPTER X. TROUBLESHOOTING PROCEDURES	R	R	R	3- 5.3	<tim>
<i>TROUBLESHOOTING INDEX WORK PACKAGE</i>				3- 5.3.4.2	<tsindexwp>
<i>OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WORK PACKAGE</i>				3- 5.3.4.6	<opcheckwp> <tswp> <opcheck- tswp>
CHAPTER X. MAINTENANCE INSTRUCTIONS NOTE All maintenance work packages shall include a title block, initial setup, and all maintenance tasks applicable to the equipment.	R	R	R	4- 5.3	<mim>
<i>SERVICE UPON RECEIPT WORK PACKAGE</i>	R	NR	NR	4- 5.3.4.1	<surwp>
Siting		NR	NR	4- 5.3.4.1.1	<siting>
Shelter requirements		NR	NR	4- 5.3.4.1.2	<shltr>
Service upon receipt of materiel		NR	NR	4- 5.3.4.1.3	<surmat>
Installation instructions		NR	NR	4- 5.3.4.1.4	<install>
Preliminary servicing of equipment		NR	NR	4- 5.3.4.1.5	<preserv>

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Table A.3 TM Requirements Matrix for _____

TM Content	-23 -23&P	-24 -24&P	-34 -34&P	MIL- STD- 40051A Reference	Element Name
FRONT MATTER	R	R	R	5.3.1	<fnt>
Front cover	R	R	R	5.3.1.1	<fntcover>
Warning summary	R	R	R	5.3.1.2	<warnsum>
Change transmittal page	R	R	R	5.3.1.3	<chgsheet>
List of effective pages / work packages	R	R	R	5.3.1.4	<loepwp>
Title block page	R	R	R	5.3.1.5	<titleblk>
Table of contents	R	R	R	5.3.1.6	<contents>
How to use this manual	R	R	R	5.3.1.7	<howtouse>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	R	R	5.3.1.9	<ginfowp>
Scope	R	R	R	5.3.1.9.1	<scope>
Maintenance forms, records, and reports	R	R	R	5.3.1.9.2	<mfr>
Reporting equipment improvement recommendations (EIR)	R	R	R	5.3.1.9.3	<eir>
Hand receipt (HR) information				5.3.1.9.4	<handreceipt>
Corrosion prevention and control (CPC)	R	R	R	5.3.1.9.5	<cpcdata>
Ozone depleting substances (ODS)				5.3.1.9.6	<odsdata>
Destruction of Army materiel to prevent enemy use	R	R	R	5.3.1.9.7	<destructmat>
Preparation for storage or shipment	R	R	R	5.3.1.9.8	<psref>
Warranty information				5.3.1.9.9	<wrntyref>
Nomenclature cross-reference list				5.3.1.9.10	<nomenreflist>
List of abbreviations	R	R	R	5.3.1.9.11	<loa>
Quality assurance (QA) (aviation only)				5.3.1.9.12	<qainfo>
Quality of material				5.3.1.9.13	<qual.mat.info>
Safety, care, and handling	R	R	R	5.3.1.9.14	<sftyinfo>
Nuclear hardness				5.3.1.9.15	<hcp>

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Table A.3 TM Requirements Matrix for _____

TM Content	-23 -23&P	-24 -24&P	-34 -34&P	MIL-STD- 40051A Reference	Element Name
Security measures for electronic data				5.3.1.9.16	<secref>
Calibration				5.3.1.9.17	<calref>
Copyright credit line				5.3.1.9.23	<copyrt>
Supporting information for repair parts, special tools, tmde, and support equipment				5.3.1.9.24	<supdata>
CHAPTER 1. DESCRIPTION AND THEORY OF OPERATION	R	R	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	R	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	R	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	R	R	1- 5.2.2	<locdesc>
Differences between models				1- 5.2.3	<eqpdif>
Equipment data	R	R	R	1- 5.2.4	<eqpdata>
Equipment configuration				1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>	R	R	R	1- 5.3	<thrywp>
CHAPTER X. TROUBLESHOOTING PROCEDURES	R	R	R	3- 5.3	<tim>
<i>TROUBLESHOOTING INDEX WORK PACKAGE</i>				3- 5.3.4.2	<tsindxwp>
<i>OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WORK PACKAGES</i>				3- 5.3.4.6	<opcheckwp> <tswp> <opcheck-tswp>
CHAPTER X. MAINTENANCE INSTRUCTIONS NOTE All maintenance work packages shall include a title block, initial setup, and all maintenance tasks applicable to the equipment.	R	R	R	4- 5.3	<mim>
<i>SERVICE UPON RECEIPT WORK PACKAGE</i>	R	R	NR	4- 5.3.4.1	<surwp>

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Table A.4 TM Requirements Matrix for _____

TM Content	AVUM -20 -20&P	AVIM -30 -30&P	AVUM/AVIM -23 -23&P	MIL-STD- 40051A Reference	Element Name
FRONT MATTER	R	R	R	5.3.1	<frnt>
Front cover	R	R	R	5.3.1.1	<frntcover>
Warning summary	R	R	R	5.3.1.2	<warnsum>
Change transmittal page				5.3.1.3	<chgsheet>
List of effective pages / work packages				5.3.1.4	<loepwp>
Title block page	R	R	R	5.3.1.5	<titleblk>
Table of contents	R	R	R	5.3.1.6	<contents>
How to use this manual	R	R	R	5.3.1.7	<howtouse>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	R	R	5.3.1.9	<ginfowp>
Scope	R	R	R	5.3.1.9.1	<scope>
Maintenance forms, records, and reports	R	R	R	5.3.1.9.2	<mfrf>
Reporting equipment improvement recommendations (EIR)	R	R	R	5.3.1.9.3	<eir>
Hand receipt (HR) information				5.3.1.9.4	<handreceipt>
Corrosion prevention and control (CPC)	R	R	R	5.3.1.9.5	<cpdata>
Ozone depleting substances (ODS)				5.3.1.9.6	<odsdata>
Destruction of Army materiel to prevent enemy use	R	R	R	5.3.1.9.7	<destructmat>
Preparation for storage or shipment	R	R	R	5.3.1.9.8	<psref>
Warranty information	R	R	R	5.3.1.9.9	<wmtref>
Nomenclature cross-reference list				5.3.1.9.10	<nomenreflist>
List of abbreviations	R	R	R	5.3.1.9.11	<loa>
Quality assurance (QA) (aviation only)				5.3.1.9.12	<qainfo>
Quality of material				5.3.1.9.13	<qual.mat.info>
Safety, care, and handling	R	R	R	5.3.1.9.14	<sftyinfo>
Nuclear hardness				5.3.1.9.15	<hcp>
Security measures for electronic data				5.3.1.9.16	<secrref>
Calibration				5.3.1.9.17	<calref>

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Table A.4 TM Requirements Matrix for _____

TM Content	AVUM -20 -20&P	AVIM -30 -30&P	AVUM/AVIM -23 -23&P	MIL-STD- 40051A Reference	Element Name
Flight safety critical aircraft parts (FSCAP)					<fscap.req>
Copyright credit line				5.3.1.9.23	<copyrt>
Supporting information for repair parts, special tools, tmde, and support equipment				5.3.1.9.24	<supdata>
CHAPTER 1. DESCRIPTION AND THEORY OF OPERATION	R	R	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	R	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	R	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	R	R	1- 5.2.2	<locdesc>
Differences between models				1- 5.2.3	<eqpdif>
Equipment data	R	R	R	1- 5.2.4	<eqpdata>
Equipment configuration				1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>				1- 5.3	<thrywp>
CHAPTER X. TROUBLESHOOTING PROCEDURES	R	R	R	3- 5.3	<tim>
<i>TROUBLESHOOTING INDEX WORK PACKAGE</i>				3- 5.3.4.2	<tsindxwp>
<i>OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WORK PACKAGES</i>				3- 5.3.4.6	<opcheckwp> <tswp> <opcheck-tswp>
CHAPTER X. MAINTENANCE INSTRUCTIONS NOTE All maintenance work packages shall include a title block, initial setup, and all maintenance tasks applicable to the equipment.	R	R	R	4- 5.3	<mim>
<i>SERVICE UPON RECEIPT WORK PACKAGE</i>	R	NR	R	4- 5.3.4.1	<surwp>
Siting		NR		4- 5.3.4.1.1	<siting>

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Table A.6 TM Requirements Matrix for _____

TM Content	DMWR and DMWR with RPSTL	MIL-STD- 45001A Reference	Element Name
FRONT MATTER	R	5.3.1	<frnt>
Front cover	R	5.3.1.1	<frntcover>
Warning summary		5.3.1.2	<warnsum>
Change transmittal page	R	5.3.1.3	<chgsheet>
List of effective pages / work packages	R	5.3.1.4	<loepwp>
Title block page	R	5.3.1.5	<titleblk>
Table of contents	R	5.3.1.6	<contents>
How to use this manual	NR	5.3.1.7	<howtouse>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	5.3.1.9	<ginfowp>
Scope	R	5.3.1.9.1	<scope>
Maintenance forms, records, and reports	R	5.3.1.9.2	<mfr>
Reporting equipment improvement recommendations (EIR)	R	5.3.1.9.3	<eir>
Hand receipt (HR) information		5.3.1.9.4	<handreceipt>
Corrosion prevention and control (CPC)		5.3.1.9.5	<cpdata>
Ozone depleting substances (ODS)		5.3.1.9.6	<odsdata>
Destruction of Army materiel to prevent enemy use		5.3.1.9.7	<destructmat>
Preparation for storage or shipment		5.3.1.9.8	<pssref>
Warranty information		5.3.1.9.9	<wrntyref>
Nomenclature cross-reference list		5.3.1.9.10	<nomenreflist>
List of abbreviations/acronyms		5.3.1.9.11	<loa>
Quality assurance (QA) (aviation only)		5.3.1.9.12	<qainfo>
Quality of material		5.3.1.9.13	<qual.mat.info>
Safety, care, and handling	R	5.3.1.9.14	<sftyinfo>
Nuclear hardness		5.3.1.9.15	<hcp>
Security measures for electronic data		5.3.1.9.16	<secrref>
Calibration		5.3.1.9.17	<calref>

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Table A.6 TM Requirements Matrix for _____

TM Content	DMWR and DMWR with RPSTL	MIL-STD- 45001A Reference	Element Name
Engineering change proposals (ECP)	R	5.3.1.9.18	<ecp>
Deviations and exceptions	R	5.3.1.9.19	<deviation>
Mobilization requirements	R	5.3.1.9.20	<mobreq>
Flight safety critical aircraft parts	R	5.3.1.9.21	<fscapreq>
Cost considerations	R	5.3.1.9.22	<cost>
Copyright credit line		5.3.1.9.23	<copyrt>
Supporting information for repair parts, special tools, tmde, and support equipment	R	5.3.1.9.24	<supdata>
CHAPTER 1. DESCRIPTION AND THEORY OF OPERATION	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	1- 5.2.1	<eqpinfo>
Location and description of major components		1- 5.2.2	<locdesc>
Differences between models		1- 5.2.3	<eqpdiff>
Equipment data		1- 5.2.4	<eqpdata>
Equipment configuration		1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGES</i>		1- 5.3	<thrywp>
CHAPTER X. TROUBLESHOOTING PROCEDURES	R	3- 5.3	<tim>
<i>PRESHOP ANALYSIS WORK PACKAGE</i>	R	3- 5.3.4.3	<pshopanalwp>
<i>COMPONENT CHECKLIST WORK PACKAGE</i>	R	3- 5.3.4.4	<compchklistwp>
<i>OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WORK PACKAGES</i>		3- 5.3.4.6	<opcheckwp> <tswp> <opcheck-tswp>

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Table A.10 TM Requirements Matrix for_____

TM Content	Operator's	MIL-STD-40051A Reference	Element Name
INTRODUCTORY MATTER	R	5.4.1	<frnt>
IETM Installation data	R	5.4.1.1	<howtouse>
CD content frame	R	5.4.1.2	<ietm.contents>
Revision summary frame	R	5.4.1.3	<loepwp>
Identification information	R	5.4.1.4	<frntcover>
List of contents	R	5.4.1.5	<contents>
How to use this IETM	R	5.4.1.6	<howtouse>
<i>ABBREVIATIONS, ACRONYMS, AND UNCOMMON TERMS WORK PACKAGE</i>	R	5.4.2	<abbrevwp>
<i>SYMBOLS WORK PACKAGE</i>	R	5.4.2	<symbolwp>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	5.4.1.7	<ginfowp>
Scope	R	5.4.1.7.1	<scope>
Reporting errors and recommending improvements statement	R	5.4.1.7.2	<reporting>
Maintenance forms, records, and reports	R	5.4.1.7.3	<mfr>
Reporting equipment improvement recommendations (EIR)	R	5.4.1.7.4	<eir>
Hand receipt (HR) information		5.4.1.7.5	<handreceipt>
Corrosion prevention and control (CPC)	R	5.4.1.7.6	<cpcdata>
Ozone depleting substances(ODS)	R	5.4.1.7.7	<odsdata>
Destruction of Army materiel to prevent enemy use	R	5.4.1.7.8	<destructmat>
Preparation for storage or shipment	R	5.4.1.7.9	<pssref>
Warranty information		5.4.1.7.10	<wrntyref>
Nomenclature cross-reference list		5.4.1.7.11	<nomenreflist>
List of abbreviations/acronyms		5.4.1.7.12	<loa>

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Table A.10 TM Requirements Matrix for _____

TM Content	Operator's	MIL-STD-40051A Reference	Element Name
Quality assurance (QA) (aviation only)		5.4.1.7.13	<qainfo>
Quality of material	R	5.4.1.7.14	<qual.mat.info>
Safety, care, and handling	R	5.4.1.7.15	<sftyinfo>
Nuclear hardness		5.4.1.7.16	<hcp>
Security measures for electronic data		5.4.1.7.17	<secref>
Calibration		5.4.1.7.18	<calref>
Copyright credit line		5.4.1.7.24	<copyrt>
DESCRIPTION AND THEORY OF OPERATION	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	1- 5.2.2	<locdesc>
Differences between models		1- 5.2.3	<eqpdiff>
Equipment data	R	1- 5.2.4	<eqpdata>
Equipment configuration		1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>	R	1- 5.3	<thrywp>
OPERATOR INSTRUCTIONS	R	2- 5.1	<opim>
<i>DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS WORK PACKAGE</i>	R	2- 5.2.3.2	<ctrlindwp>
<i>OPERATION UNDER USUAL CONDITIONS WORK PACKAGE</i>	R	2-5.2.3.3	<opusualwp>
Siting requirements		2- 5.2.3.3.2	<site>
Shelter requirements		2- 5.2.3.3.3	<shelter>
Assembly and preparation for use		2- 5.2.3.3.4	<prepforuse>
Initial adjustments, before use and self-test		2- 5.2.3.3.5	<initial>

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Table A.11 TM Requirements Matrix for_____

TM Content	Unit, Direct Support (DS) and General Support (GS)	AVUM/A VIM	MIL-STD-40051A Reference	Element Name
INTRODUCTORY MATTER	R	R	5.4.1	<fnt>
IETM Installation Data	R	R	5.4.1.1	<howtouse>
CD content frame	R	R	5.4.1.2	<ietm.content>
Revision summary frame	R	R	5.4.1.3	<loepwp>
Identification information	R	R	5.4.1.4	<fnt cover>
List of contents	R	R	5.4.1.5	<contents>
How to use this IETM	R	R	5.4.1.6	<howtouse>
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<i>SYMBOLS WORK PACKAGE</i>	R	R	5.4.2	<symbolwp>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	R	5.4.1.7	<ginfowp>
Scope	R	R	5.4.1.7.1	<scope>
Reporting errors and recommending improvements statement	R	R	5.4.1.7.2	<reporting>
Maintenance forms, records, and reports	R	R	5.4.1.7.3	<mfrf>
Reporting equipment improvement recommendations (EIR)	R	R	5.4.1.7.4	<eir>
Hand receipt (HR) information			5.4.1.7.5	<handreceipt>
Corrosion prevention and control (CPC)	R	R	5.4.1.7.6	<cpcdata>
Ozone depleting substances (ODS)	R	R	5.4.1.7.7	< odsdata>
Destruction of Army materiel to prevent enemy use	R	R	5.4.1.7.8	<destructmat>
Preparation for storage or shipment	R	R	5.4.1.7.9	<pssref>
Warranty information			5.4.1.7.10	<wrntyref>
Nomenclature cross-reference list			5.4.1.7.11	<nomenreflist>
List of abbreviations/acronyms			5.4.1.7.12	<loa>
Quality assurance (QA) (aviation only)			5.4.1.7.13	<qainfo>
Quality of material	R	R	5.4.1.7.14	<qual.mat.info>
Safety, care, and handling	R	R	5.4.1.7.15	<sftvinfo>

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Table A.11 TM Requirements Matrix for _____

TM Content	Unit, Direct Support (DS) and General Support (GS)	AVUM /AVIM	MIL-STD-40051A Reference	Element Name
Nuclear hardness			5.4.1.7.16	<hcp>
Security measures for electronic data			5.4.1.7.17	<secrref>
Calibration			5.4.1.7.18	<calref>
Copyright credit line			5.4.1.7.24	<copyrt>
DESCRIPTION AND THEORY OF OPERATION	R	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	R	1- 5.2.2	<locdesc>
Differences between models			1- 5.2.3	<eqpdiff>
Equipment data	R	R	1- 5.2.4	<eqpdata>
Equipment configuration			1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGE</i>	R	R	1- 5.3	<thrywp>
TROUBLESHOOTING PROCEDURES	R	R	3- 5.3	<tim>
<i>TROUBLESHOOTING INDEX WORK PACKAGE</i>			3- 5.3.4.2	<tsindxwp>
<i>OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WORK PACKAGE</i>	R	R	3- 5.3.4.6	<opcheckwp> <tswp> <opcheck-tswp>
MAINTENANCE INSTRUCTIONS NOTE All maintenance work packages shall include a title block, initial setup, and all maintenance tasks applicable to the equipment.	R		4- 5.3	<mim>
<i>SERVICE UPON RECEIPT WORK PACKAGE</i>	R	R	4- 5.3.4.1	<surwp>
Siting			4- 5.3.4.1.1	<siting>
Shelter requirements			4- 5.3.4.1.2	<shltr>
Service upon receipt of materiel			4- 5.3.4.1.3	<surmat>

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Table A.12 TM Requirements Matrix for _____

TM Content	DMWR	MIL-STD-40051A Reference	Element Name
INTRODUCTORY MATTER	R	5.4.1	<frnt>
IETM Installation data	R	5.4.1.1	<howtouse>
CD content frame	R	5.4.1.2	<ietm.contents>
Revision summary frame	R	5.4.1.3	<loepwp >
Identification information	R	5.4.1.4	<frntcover>
List of contents	R	5.4.1.5	<contents>
How to use this IETM	R	5.4.1.6	<howtouse>
<i>ABBREVIATIONS, ACRONYMS, AND UNCOMMON TERMS WORK PACKAGE</i>	R	5.4.2	<abbrevwp>
<i>SYMBOLS WORK PACKAGE</i>	R	5.4.2	<symbolwp>
<i>GENERAL INFORMATION WORK PACKAGE</i>	R	5.4.1.7	<ginfowp>
Scope	R	5.4.1.7.1	<scope>
Reporting errors and recommending improvements statement	R	5.4.1.7.2	<reporting>
Maintenance forms, records, and reports	R	5.4.1.7.3	<mfrf>
Reporting equipment improvement recommendations (EIR)	R	5.4.1.7.4	<eir>
Hand receipt (HR) information		5.4.1.7.5	<handreceipt>
Corrosion prevention and control (CPC)	R	5.4.1.7.6	<cpcdata>
Ozone depleting substances (ODS)	R	5.4.1.7.7	<odsdata>
Destruction of Army materiel to prevent enemy use	R	5.4.1.7.8	<destructmat>
Preparation for storage or shipment	R	5.4.1.7.9	<pssref>
Warranty information		5.4.1.7.10	<wrntyref>
Nomenclature cross-reference list		5.4.1.7.11	<nomenreflist>
List of abbreviations/acronyms		5.4.1.7.12	<loa>
Quality assurance (QA) (aviation only)		5.4.1.7.13	<qainfo>
Quality of material	R	5.4.1.7.14	<qual.mat.info>
Safety, care, and handling	R	5.4.1.7.15	<sftyinfo>

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Table A.12 TM Requirements Matrix for _____

TM Content	DMWR	MIL-STD-40051A Reference	Element Name
Nuclear hardness		5.4.1.7.16	<hcp>
Security measures for electronic data		5.4.1.7.17	<secref>
Calibration		5.4.1.7.18	<calref>
Engineering change proposals (ECP)	R	5.4.1.7.19	<ecp>
Deviations and exceptions	R	5.4.1.7.20	<deviation>
Mobilization requirements	R	5.4.1.7.21	<mobreq>
Flight safety critical aircraft parts (FSCAP)	R	5.4.1.7.22	<fscapreq>
Cost considerations	R	5.4.1.7.23	<cost>
Copyright credit line		5.4.1.7.24	<copyrt>
DESCRIPTION AND THEORY OF OPERATION	R	1- 5.1	<gim>
<i>EQUIPMENT DESCRIPTION AND DATA WORK PACKAGE</i>	R	1- 5.2	<descwp>
Equipment characteristics, capabilities, and features	R	1- 5.2.1	<eqpinfo>
Location and description of major components	R	1- 5.2.2	<locdesc>
Differences between models		1- 5.2.3	<eqpdif>
Equipment data	R	1- 5.2.4	<eqpdata>
Equipment configuration		1- 5.2.5	<eqpconfig>
<i>THEORY OF OPERATION WORK PACKAGES</i>		1- 5.3	<thrywp>
CHAPTER X. TROUBLESHOOTING PROCEDURES	R	3- 5.3	<tim>
<i>PRESHOP ANALYSIS WORK PACKAGE</i>	R	3- 5.3.4.3	<pshopanalwp>
<i>COMPONENT CHECKLIST WORK PACKAGE</i>	R	3- 5.3.4.4	<compchklistwp>
<i>COMBINED OPERATIONAL CHECKOUT AND TROUBLESHOOTING WORK PACKAGE</i>		3- 5.3.4.6.5	<opcheck-tswp>

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MIL-STD-40051-1A(TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content requirements for the preparation of description and theory of operation data for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs) . The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

The applicable documents in section 2 of MIL-STD-40051A apply to this Part.

3. **DEFINITIONS.**

The definitions in section 3 of MIL-STD-40051A apply to this Part.

4. **GENERAL REQUIREMENTS.**

4.1 General. Descriptive information with theory of operation shall be prepared for weapon systems, major equipment, components and applicable support and interface equipment. Information required to provide the user with a physical description, and functionally explain how the weapon system or equipment operates shall be included.

4.2 Maintenance level applicability. Requirements contained in this standard are applicable to all maintenance levels unless specifically noted in bold and in parentheses (i.e., **Direct Support**). The labeled requirements shall be applicable to all TMs containing that maintenance level. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A Appendix A.

4.3 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Description and Theory of Operation and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the modular DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., <**descwp**>) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

4.4 Use of the DTDs / FOSIs.

4.4.1 Page-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

4.4.2 Frame-based TMs. The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based TMs is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

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4.5 Content structure and format. The examples provided herein and in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Description and Theory of Operation.

4.6 Style and format. MIL-STD-40051A provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.7 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.8 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished using Appendix A, Technical Manual Content Selection Matrixes, of MIL-STD-40051A. The applicability of some requirements is also designated by one of the following statements: unless specified otherwise by the acquiring activity; as/when specified by the acquiring activity; or when specified by the acquiring activity.

5. DETAILED REQUIREMENTS.

5.1 Preparation of description information and theory of operation. Description information and theory of operation shall be prepared and subdivided into individual work packages to provide the user with information for descriptive data about the weapon system or equipment, and an explanation of how the weapon system or equipment works. Weapon system and equipment description and theory of operation data shall be developed in narrative or tabular form, or by whatever method is most simple or effective to convey the specific TM application. When necessary for clarity or improved understanding, illustrations shall be used to support the narrative or tabular information. Each work package developed for description and theory of operation shall consist of WP identification information and the required descriptive and theory of operation data.

5.1.1 Work package identification information <wpidinfo>. All work packages shall include the identification information entries in the following sequential order, as applicable.

- a. Maintenance levels <maintlvl>. The maintenance level(s) shall be included (e.g., Direct support maintenance).
- b. End item nomenclature <eicnomen>. The nomenclature of the end item <name> and the system, subsystem, equipment or component name <sysnomen> covered in the WP (including AN type designation, if applicable) shall follow the applicable maintenance level. When applicable, the NSN <nsn>, model(s) <modelno>, and part number(s) <partno> should be placed below the nomenclature. When the WP covers more than one model and/or part number, all models and/or part numbers shall be listed.
- c. WP title <title>. The title of the description information or the theory of operation data that is included in an individual work package shall be listed (i.e., M144 Shop Van Semitrailer Theory of Operation).
- d. Effectivity notice <appconfig>. If applicable, an effectivity notice shall be included. When the work package does not apply to all configurations of the weapon system/equipment, the applicable configurations <name> covered by the work package shall be listed. Omit this requirement if the same tasks/procedures apply to all configurations. (If certain configurations require different tasks/procedures, separate work packages shall be prepared.)

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MIL-STD-40051-2A(TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content requirements for the preparation of operator instructions for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

The applicable documents in Section 2 of MIL-STD-40051A apply to this Part.

3. **DEFINITIONS.**

The definitions in Section 3 of MIL-STD-40051A apply to this Part.

4. **GENERAL REQUIREMENTS.**

4.1 General. Operator instructions shall be prepared for weapon systems, major equipment, components and applicable support and interface equipment. Operating instructions shall describe the operation authorized for the operator/crew. Procedures and supporting illustrations shall be prepared so that personnel can prepare the weapon system/equipment for operation, identify and locate operational controls and indicators, and operate the weapon system/equipment safely and efficiently in both normal and emergency conditions.

4.2 Maintenance level applicability. Requirements contained in this standard are applicable to all maintenance levels unless specifically noted in bold and in parentheses (i.e., **Direct Support**). The labeled requirements shall be applicable to all TMs containing that maintenance level. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A, Appendix A.

4.3 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Operators Instructions and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the modular DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., **<opim>**) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

4.4 Use of the DTDs/FOSIs.

4.4.1 Page-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

4.4.2 Frame-based TMs. The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based TMs is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

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4.5 Content structure and format. The examples provided in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Operation Instructions.

4.6 Style and format. MIL-STD-40051A provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.7 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.8 Safety devices and interlocks. Information shall be prepared pertaining to the purpose and location of all safety devices and interlocks in conjunction with the pertinent procedures.

4.9 Electrostatic discharge (ESD) sensitive parts. If the equipment contains ESD sensitive parts, components, or circuits, cautions and ESD labels shall be incorporated into the applicable tasks and procedures to ensure ESD sensitive parts are not damaged or degraded during Maintenance and operation. Refer to MIL-STD-40051A for requirements on labeling with ESD. Actions which could damage ESD sensitive parts, but which are not directly related to handling or operation of ESD sensitive parts, shall not be annotated with the ESD acronym, but shall be preceded by a caution statement.

4.10 Nuclear hardness. If the weapon system/equipment has nuclear survivability requirements (for example, over pressure and burst, thermal radiation, electromagnetic pulse, or transient radiation effects on electronics), cautions and Hardness-Critical Processes (HCP) labels shall be incorporated into the applicable tasks and procedures to ensure the hardness of the equipment is not degraded during handling or operation. Refer to MIL-STD-40051A for requirements on labeling with HCP. Actions which could degrade hardness, but which are not directly involved in establishing nuclear hardness, shall not be annotated with the acronym, but shall be preceded by a caution statement.

4.11 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished using Appendix A, Technical Manual Content Selection Matrixes, of MIL-STD-40051A. The applicability of some requirements is also designated by one of the following statements: unless specified otherwise by the acquiring activity; as/when specified by the acquiring activity; or when specified by the acquiring activity.

5. DETAILED REQUIREMENTS.

5.1 Preparation of operator instructions. Operator instructions shall be prepared and subdivided into individual work packages that provide the operator of the weapon system/equipment with descriptions and use of controls and indicators and operation of the weapon system/equipment under usual, unusual and emergency conditions. Weapon system and equipment operator data shall be developed in narrative or tabular form, or by whatever method is most simple or effective to convey the specific TM application.

5.2 Operator instructions work packages.

5.2.1 Work package content. Work packages shall include WP identification information, initial setup information, and all required operator instruction information. When initial setup information differs for specific operator instructions, additional work packages shall be developed. Work packages shall stand-alone and contain complete start-to-finish operator procedures. The words "END OF WORK PACKAGE" shall be placed below the last data item (i.e., text, illustration, etc.) of the work package. The operator instructions work packages described in 5.2.3 shall be prepared, as applicable.

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5.2.2 Work package identification information <wpidinfo>. All work packages shall include the identification information entries in the following sequential order, as applicable.

- a. Maintenance levels <maintlvl>. The maintenance level(s) shall be included (i.e., Operator maintenance).
- b. End item nomenclature <eicnomen>. The nomenclature of the end item <name> and the system, subsystem, equipment or component <sysname> name covered in the WP (including AN type designation, if applicable). When applicable, the NSN <nsn>, the model(s) <modelno>, and part number(s) <partno> shall be placed below the nomenclature. When the WP covers more than one model and/or part number, all models and/or part numbers shall be listed.
- c. WP title <title>. The title of the operating instructions task that is included in an individual work package shall be listed (i.e., M144 Shop Van Semitrailer Operation Under Usual Conditions).
- d. Effectivity notice <appconfig>. If applicable, an effectivity notice shall be included. When the work package does not apply to all configurations of the weapon system/equipment, the applicable configurations <name> covered by the work package shall be listed. Omit this requirement if the same tasks/procedures apply to all configurations. (If certain configurations require different tasks/procedures, separate work packages shall be prepared.)
- e. Supersedure notice <wpsupersede>. **For page-based TMs**, if applicable, a supersedure notice shall be placed below the effectivity notice. If the WP supersedes a WP in the same manual, the supersedure notice shall be as follows: "This WP supersedes (WP number), (dated)." If the superseded WP is contained in another manual, the notice shall include the publication number as follows: "This WP supersedes (WP number), (dated), contained in TM X-XXXX-XXX-20." If an unclassified or classified WP supersedes a classified WP, the notice shall be as follows: "This WP supersedes (WP number), (dated), which should be destroyed in accordance with applicable security regulations."
- f. Joint use. When TMs are acquired and specified by the Army for joint use with another or other Services (Joint Service TMs), work packages in joint publications which do not apply to all Services concerned shall be marked to indicate the Services to which they apply (for example, LANDING GEAR MAINTENANCE (ARMY ONLY)). For **IETMs**, this data need not be displayed on the user's EDS.

5.2.3 Types of operator instructions work packages. The following types of operator instructions WPs shall be developed, as applicable.

- a. Description and use of controls and indicators work package <ctrlindwp>.
- b. Operation under usual conditions work package(s) <opusualwp>.
- c. Operation under unusual conditions work package(s) <opunuwp>.
- d. Stowage and decal/data plate guide work package <stowagewp>.
- e. On-vehicle equipment loading plan work package <eqploadwp>.

NOTE: In cases where operating instructions are divided by crew station assignment (or auxiliary equipment), work packages shall be developed to support each crew-served station.

5.2.3.1 Examples of required operating instructions work packages. Refer to MIL-HDBK-1222 for typical examples of operating instructions WPs for both page-based and frame-based technical manuals.

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5.2.3.2 Description and use of controls and indicators work package <ctrlindwp>. Information shall be prepared for the description and use of all system or equipment controls and indicators. An introduction may be included in the work package. A description and use of controls and indicators <ctrlinddesc> shall be prepared for each equipment, assembly, or control panel having controls and indicators. A table <ctrlindtab> (**standard information**) or list may be used to explain the use of the controls and indicators. Illustrations shall be prepared for all operator controls and indicators. For each control and indicator, the following entries shall be provided.

- a. The name (nomenclature) <ctrlind> of the control or indicator as it appears on the equipment. Controls and indicators that are not labeled, such as the accelerator or brake pedals, shall be identified. Each control and indicator shall be clearly labeled as it appears on the equipment.
- b. The function of the control or indicator <function>.
- c. An index number <key> , if an index number is used in lieu of nomenclature on the illustration to locate and identify the control or indicator on an illustration.

5.2.3.3 Operation under usual conditions work package <opusualwp>. Instructions to operate the weapon system/equipment and auxiliary equipment in all modes of operation shall be prepared. Any combination of control settings that will create a hazard to personnel or cause damage to equipment shall be preceded by a warning or caution. Instructions to ensure proper grounding of equipment shall be prepared. The operational tasks <opertsk> described in 5.2.3.3.2 through 5.2.3.3.8 shall be included, as applicable.

5.2.3.3.1 Initial setup information <wpinfo>. Initial setup information shall be included in each work package and shall always precede the technical content of the WP. It provides the maintenance technician with general information, equipment, parts, material, and authorized personnel required to perform and complete all the operating tasks included in the work package. Setup information requirements are described below.

- a. Test equipment <testeqp>. All test equipment required to perform the procedure shall be listed by, as a minimum, name <name> and part <partno> or model number <modelno> designation, as part of the identification number <identno>. For **page-based** manuals, test equipment shall be listed by name <name>, item number, and WP number <xref> if a separate WP has been developed containing an overall listing of test equipment for the system or equipment. This will eliminate the need to repeat the part and model numbers throughout the TM.
- b. Tools and special tools <tools>. The tool kit (box) assigned to the mechanic (on a 1-per-mechanic-by-MOS basis) to be used in maintenance of a particular equipment shall be listed by, as a minimum, name <name>, tool kit number (<partno> or <nsn>), supply catalog (SC) <sc>, or TM number <tmno>. No tool in the kit shall be further identified. Other tools required for performance of all tasks for the maintenance levels covered in the work package shall also be identified in the initial setup. "Other tools" includes tools which are part of/components of shop sets authorized to sections/teams; tools authorized by RPSTL and CTA-50-970; special and fabricated tools; and items of Test, Measurement and Diagnostic Equipment (TMDE). For **page-based** manuals, if a separate WP has been developed containing an overall listing of tools and special tools, the tools and special tools shall be listed by name <name>, item number, and WP number <xref>. This will eliminate the need to repeat the part and model numbers throughout the TM.
- c. Materials/parts <mtrlpart>. All expendable items and support materials, mandatory parts, bulk items, and flight safety critical aircraft parts shall be listed by, as a minimum, name <name>, part number <partno>, if any, and quantity <qty>, if applicable. The item number and supporting information work package <xref> which lists these items shall be given. For **page-based** manuals, if a separate WP has been developed containing an overall listing of materials/parts, the materials/parts shall be listed by name <name>, item number, and WP number <xref>. This will eliminate the need to repeat the part and numbers throughout the TM. For example:

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Grease (Item 5, WP 0120 00)
Range Lock (P/N 8675309)
Frequency Converter, A31029270-1
Bracket Assembly, Chemical Alarm, A3070119
Clamp, Loop, TM 11-1520-238-23P, Group 110503

NEW PAGE

MIL-STD-40051-3A(TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content requirements for the preparation of troubleshooting procedures for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

The applicable documents in section 2 of MIL-STD-40051A apply to this Part.

3. **DEFINITIONS.**

The definitions in section 3 of MIL-STD-40051A apply to this Part.

4. **GENERAL REQUIREMENTS.**

4.1 General. Troubleshooting procedures shall be prepared for weapon systems, major equipment, components and applicable support and interface equipment. Troubleshooting procedures and supporting illustrations shall be prepared so that operator/crew and maintenance personnel can perform all required operator through depot level (overhaul) troubleshooting.

4.2 Development of troubleshooting instructions. Troubleshooting instructions shall cover all items comprising the weapon system/equipment, such as assemblies, subassemblies, components, wiring, junction boxes, and accessories. Troubleshooting procedures shall isolate faults to the part(s) authorized by the RPSTL for repair or replacement at the maintenance level addressed. Tasks shall be presented in the order in which they are performed. Approved Logistics Support Analysis (LSA) or Logistics Management Information (LMI), and service experience, performance data on similar equipment, and all other reliability, maintainability, and supportability (RMS) and operational availability (Ao) data available shall be used in the preparation of specific troubleshooting procedures. Troubleshooting procedures shall begin with testing, observed problems, a fault symptom or malfunction and shall diagnose to a single fault/failure. Troubleshooting shall refer to specific maintenance or repair tasks to correct the fault. Instructions, where applicable, shall flow from operator level through unit/AVUM, direct support/AVIM, and general support until the fault is isolated. Procedures shall include schematics and illustrations as needed (or shall reference to required schematics, etc.). Troubleshooting data shall be test and fault-isolation oriented. Troubleshooting instructions shall include detailed inspection and troubleshooting information. Instructions shall include or reference to functional descriptions of subsystems being diagnosed to aid the operator/technician. The method used for identifying system equipment test points, including the requirements and methods of determining defects through visual inspection, shall be explained.

4.3 Maintenance level applicability. Requirements contained in this standard are applicable to all maintenance levels unless specifically noted in bold and in parentheses (i.e., **Direct Support**). The labeled requirements shall be applicable to all TMs containing that maintenance level. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A, Appendix A.

4.4 Depot maintenance work requirements. When the acquiring activity specifies that a Depot Maintenance Work Requirement (DMWR) shall be prepared to the best commercial practices, the depot requirements contained in this standard shall be used only as a guide; therefore, the conforming modular DTD for troubleshooting procedures cannot be used.

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4.5 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Troubleshooting Procedures and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., <tswp>) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

4.6 Use of DTDs/FOSIs.

4.6.1 Page-based TMs The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

4.6.2 Frame-based TMs The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based TMs is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

4.7 Content structure and format. The examples provided herein and in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Troubleshooting Procedures.

4.8 Style and format. MIL-STD-40051A, provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.9 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.10 Safety devices and interlocks. Information shall be prepared pertaining to the purpose and location of all safety devices and interlocks in conjunction with the pertinent procedures.

4.11 Electrostatic discharge (ESD) sensitive parts. If the equipment contains ESD sensitive parts, components, or circuits, cautions and ESD labels shall be incorporated into the applicable tasks and procedures to ensure ESD sensitive parts are not damaged or degraded during Maintenance and operation. Refer to MIL-STD-40051A for requirements on labeling with ESD. Actions which could damage ESD sensitive parts, but which are not directly related to handling or operation of ESD sensitive parts, shall not be annotated with the ESD acronym, but shall be preceded by a caution statement.

4.12 Nuclear hardness. If the weapon system/equipment has nuclear survivability requirements (for example, over pressure and burst, thermal radiation, electromagnetic pulse, or transient radiation effects on electronics), cautions and Hardness-Critical Processes (HCP) labels shall be incorporated into the applicable tasks and procedures to ensure the hardness of the equipment is not degraded during handling or operation. Refer to MIL-STD-40051A for requirements on labeling with HCP. Actions which could degrade hardness, but which are not directly involved in establishing nuclear hardness, shall not be annotated with the acronym, but shall be preceded by a caution statement.

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- f. Joint use. When TMs are acquired and specified by the Army for joint use with another or other Services (Joint Service TMs), work packages in joint publications which do not apply to all Services concerned shall be marked to indicate the Services to which they apply (for example, LANDING GEAR MAINTENANCE (ARMY ONLY)). For **IETMs** this data need not be displayed on the user's EDS.

5.3.3 Initial setup information <wpinfo>. Initial setup information shall be included in each work package and shall always precede the technical content of the WP. It provides the maintenance technician with general information, equipment, parts, material, and authorized personnel required to perform and complete all the testing and operating tasks included in the work package. Setup information requirements are described below.

- a. Test equipment <testepp>. All test equipment required to perform the procedure shall be listed by, as a minimum, name <name> and part <partno> or model number <modelno> designation, as part of the identification number <identno>. For **page-based** manuals, test equipment shall be listed by name <name>, item number, and WP number <xref> if a separate WP has been developed containing an overall listing of test equipment for the system or equipment. This will eliminate the need to repeat the part and model numbers throughout the TM.
- b. Tools and special tools <tools>. The tool kit (box) assigned to the mechanic (on a 1-per-mechanic-by-MOS basis) to be used in maintenance of a particular equipment shall be listed by, as a minimum, name <name>, tool kit number (<partno> or <nsn>), supply catalog (SC) <sc>, or TM number <tmno>. No tool in the kit shall be further identified. Other tools required for performance of all tasks for the maintenance levels covered in the work package shall also be identified in the initial setup. "Other tools" includes tools which are part of/components of shop sets authorized to sections/teams; tools authorized by RPSTL and CTA-50-970; special and fabricated tools; and items of Test, Measurement and Diagnostic Equipment (TMDE). For **page-based** manuals, if a separate WP has been developed containing an overall listing of tools and special tools, the tools and special tools shall be listed by name <name>, item number, and WP number <xref>. This will eliminate the need to repeat the part and model numbers throughout the TM.
- c. Materials/parts <mtrlpart>. All expendable items and support materials, mandatory parts, bulk items and flight safety critical aircraft parts shall be listed by, as a minimum, name <name>, part number <partno>, if any, and quantity <qty>, if applicable. The item number and supporting information work package <xref> which lists these items shall be given. For **page-based** manuals, if a separate WP has been developed containing an overall listing of materials/parts, the materials/parts shall be listed by name <name>, item number, and WP number <xref>. This will eliminate the need to repeat the part and numbers throughout the TM. For examples, see Part 2, page 4a, para 5.2.3.3.1c.
- d. Personnel required <persnreq>. Personnel <name> and the number of personnel <qty> shall be identified if the task requires more than one. The Military Occupational Specialty (MOS) designation <nameid> is not necessary, but it may be included. For example,

Personnel Required
 Artillery Mechanic 68M10 (1)
 Artillery Mechanic 66J30 (1)

- e. References <ref>. When necessary, other work packages, TMs, foldouts and other sources (<extref>/<xref>) that are needed to complete the operating tasks shall be listed here. Only references not listed in equipment conditions shall be listed. For example,

References
 TM 9-1015-252-20&P
 WP 0100 00

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- f. Equipment conditions <eqpconds>. Any special equipment conditions required before the procedure can be started shall be listed here and cross-referenced to the appropriate source (<extref> or <xref>) for setting up the condition <condition>. For example,

Equipment Condition
Firing mechanism removed (WP 0010 00)

- g. Special environmental conditions <specenv>. Any special environmental conditions (such as ventilation, lighting, or temperature) <condition> that are required shall be listed here. The reason <reason> that such conditions are needed shall be explained. For example,

Special Environmental Condition
Darkened area required for testing lights.

- h. Drawings required <dwgreq>. When necessary, all drawings (which are not included in the work package) required to complete the maintenance tasks shall be listed here. Drawings shall be listed by title <dwgname> and drawing number <dwgno>. For example,

Drawings Required
Power Supply Schematic (132E470092)

- i. Estimated time to complete the task <time.to.complete>. If required by the acquiring activity, the estimated time it will take to complete the operating task shall be included. Approved Logistics Support Analysis (LSA) or Logistics Management Information (LMI), and service experience, performance data on similar equipment, and all other reliability, availability, and maintainability (RAM) data available shall be used to estimate the time required to complete the task.

5.3.4 Types of testing and troubleshooting work packages. The following types of testing and troubleshooting WPs shall be developed, as applicable.

- a. Troubleshooting index work package <tsindxwp>.
- b. Preshop analysis work package <pshopanal> (DMWR only).
- c. Component checklist work package <compchklistwp> (DMWR only).
- d. Technical description work package <techdescwp> (For page-based Aircraft Troubleshooting Manual only).
- e. Operational checkout and troubleshooting procedures work packages.

5.3.4.1 Examples of required testing and troubleshooting work packages. Refer to MIL-HDBK-1222 for typical examples of testing and troubleshooting WPs for both page-based and frame-based technical manuals.

5.3.4.2 Troubleshooting index work package <tsindxwp>. This work package shall consist of either a malfunction/symptom index <tsindx> or a system/subsystem index <tsindx>. Initial setup information is not required for this work package.

5.3.4.2.1 Malfunction/symptom index <tsindx>. When all probable faults have been determined and described, prepare a malfunction/symptom index work package using the exact description of the fault or symptom as was used in the troubleshooting procedures. Group symptoms to common system areas both in the malfunction/symptom index and in the troubleshooting procedures. For example, if a system has a data link, communications, radar, display, and tracking systems, the symptoms would be grouped into each related area. All fault symptoms of a communications nature would fall into the communications group. The symptoms may be further divided into functions within the communications group that would be common. The same would be done for radar, data link, display, and tracking systems. This index shall include the following data.

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MIL-STD-40051-4A(TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content requirements for the preparation of maintenance procedures for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

The applicable documents in section 2 of MIL-STD-40051A apply to this Part.

3. **DEFINITIONS.**

The definitions in section 3 of MIL-STD-40051A apply to this Part.

4. **GENERAL REQUIREMENTS.**

4.1 General. Maintenance instructions shall be prepared for major weapon systems, equipment, components and applicable support and interface equipment. Maintenance procedures and supporting illustrations shall be prepared so that maintenance personnel can perform all required operator through depot level (overhaul) maintenance.

4.2 Development of maintenance instructions. Maintenance instructions shall be prepared for all items comprising the weapon system/equipment, such as assemblies, subassemblies, components, wiring, junction boxes, and accessories. Tasks shall be presented in the order in which they are performed. Sound engineering principles and techniques, approved Logistics Support Analysis (LSA) or Logistics Management Information (LMI), service experience, performance data on similar equipment, and all other reliability, maintainability, and supportability (RMS) and operational availability (Ao) data available shall be used in the preparation of specific maintenance instructions.

4.3 Maintenance level applicability. Requirements contained in this standard are applicable to all maintenance levels unless specifically noted in bold and in parentheses (i.e., **-Direct Support**). The labeled requirements shall be applicable to all TMs containing that maintenance level. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A, Appendix A.

4.4 Depot maintenance work requirements. When the contracting activity specifies that a Depot Maintenance Work Requirement (DMWR) shall be prepared to the best commercial practices, the depot requirements contained in this standard shall be used only as a guide, therefore, the conforming modular DTD for maintenance instructions cannot be used.

4.5 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Maintenance Instructions and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the modular DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., **<maintwp>**) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

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4.6 Use of the DTDs / FOSIs.

4.6.1 Page-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

4.6.2 Frame-based TMs. The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based TMs is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

4.7 Content structure and format. The examples provided herein and in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Maintenance Instructions.

4.8 Style and format. MIL-STD-40051A provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.9 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.10 Safety devices and interlocks. Information shall be prepared pertaining to the purpose and location of all safety devices and interlocks in conjunction with the pertinent procedures.

4.11 Electrostatic discharge (ESD) sensitive parts. If the equipment contains ESD sensitive parts, components, or circuits, cautions and ESD labels shall be incorporated into the applicable tasks and procedures to ensure ESD sensitive parts are not damaged or degraded during Maintenance and operation. Refer to MIL-STD-40051A for requirements on labeling with ESD. Actions which could damage ESD sensitive parts, but which are not directly related to handling or operation of ESD sensitive parts, shall not be annotated with the ESD acronym, but shall be preceded by a caution statement.

4.12 Nuclear hardness. If the weapon system/equipment has nuclear survivability requirements (for example, over pressure and burst, thermal radiation, electromagnetic pulse, or transient radiation effects on electronics), cautions and Hardness-Critical Processes (HCP) labels shall be incorporated into the applicable tasks and procedures to ensure the hardness of the equipment is not degraded during handling or operation. Refer to MIL-STD-40051A for requirements on labeling with HCP. Actions which could degrade hardness, but which are not directly involved in establishing nuclear hardness, shall not be annotated with the acronym, but shall be preceded by a caution statement.

4.13 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished using Appendix A, Technical Manual Content Selection Matrixes, of MIL-STD-40051A.

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5. DETAILED REQUIREMENTS.

5.1 Preparation of maintenance instructions. Maintenance instructions shall be prepared and subdivided into individual work packages that provide maintenance information to enable a technician to receive, process, inspect, clean, service, test and repair the weapon system/equipment and associated weapons replacement assemblies/shop replacement assemblies (WRAs/SRAs) to an acceptable performance standard. Maintenance tasks shall be developed in accordance with the LSA/LMI, Maintenance Allocation Chart (MAC) or Maintenance Plan, and the Source, Maintenance, and Recoverability (SMR) codes developed for the weapon system/equipment and components. Maintenance work packages shall be arranged to coincide with the Functional Group Code (FGC) sequence followed in the MAC or Repair Parts and Special Tools List (RPSTL).

5.2 Types of maintenance. Depending on the type and complexity of the weapon system/equipment, the TM may contain the following maintenance categories.

- a. Weapon system/equipment maintenance. <maintsk>
- b. Component maintenance. <maintsk>
- c. Assembly maintenance. <maintsk>
- d. Subassembly maintenance. <maintsk>
- e. Auxiliary equipment maintenance. <auxeqwp>
- f. Software maintenance. <maintsk>
- g. Ammunition maintenance. <ammowp>
- h.. Preventive maintenance services (**aircraft only**). <pms-inspecwp>
- i. Phased maintenance inspections (**aircraft phased maintenance checklist only**) <pmi-cklistwp>

5.3 Maintenance work packages. Individual maintenance work packages shall be developed for the overall weapon system/equipment and each maintainable system, subsystem, and WRA/SRA for each applicable maintenance level as indicated in the approved MAC or maintenance plan.

5.3.1 Work package content. Work packages shall include WP identification information, initial setup information, and all maintenance tasks, such as remove, inspect, service, test, install, replace, disassemble, assemble, repair, clean, adjust, align, etc. When initial setup information differs for specific maintenance tasks, additional work packages shall be developed. Work packages shall stand-alone and contain complete start-to-finish maintenance procedures. The words "END OF WORK PACKAGE" shall be placed below the last data item (i.e., text, illustration, etc.) of the work package containing the maintenance procedure. The maintenance work packages described in 5.3.4.1 through 5.3.4.22 shall be prepared, as applicable.

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5.3.2 Work package identification information. All work packages shall include the identification information entries in the following sequential order, as applicable .

- a. Maintenance levels <maintlvl>. The maintenance level(s) shall be included (i.e., Direct support maintenance).
- b. End item nomenclature <eicnomen>. The nomenclature of the end item <name> and the system, subsystem, equipment or component name <sysnomen> covered in the WP (including AN type designation, if applicable) shall follow the applicable maintenance level. When applicable, the NSN <nsn>, model(s) <modelno>, and part number(s) <partno> should be placed below the nomenclature. When the WP covers more than one model and/or part number, all models and/or part numbers shall be listed.
- c. WP title <title>. All maintenance tasks that are included in an individual work package shall be listed (i.e., "Removal, Cleaning, Inspection, Installation" or "Disassembly, Reassembly" in the title.
- d. Effectivity notice <appconfig>. If applicable, an effectivity notice shall be included. When the work package does not apply to all configurations of the weapon system/equipment, the applicable configurations <name> covered by the work package shall be listed. Omit this requirement if the same tasks/procedures apply to all configurations. (If certain configurations require different tasks/procedures, separate work packages shall be prepared.)
- e. Supersedure notice <wpsupersede>. If applicable, a supersedure notice shall be placed below the effectivity notice. If the WP supersedes a WP in the same manual, the supersedure notice shall be as follows: "This WP supersedes (WP number), (dated)." If the superseded WP is contained in another manual, the notice shall include the publication number as follows: "This WP supersedes (WP number), (dated), contained in TM X-XXXX-XXX-20." If an unclassified or classified WP supersedes a classified WP, the notice shall be as follows: "This WP supersedes (WP number), (dated), which should be destroyed in accordance with applicable security regulations."
- f. Joint use. When TMs are acquired and specified by the Army for joint use with another or other Services (Joint Service TMs), work packages in joint publications which do not apply to all Services concerned shall be marked to indicate the Services to which they apply (for example, LANDING GEAR MAINTENANCE (ARMY ONLY)). For **IETMs**, this data need not be displayed on the user's EDS.

5.3.3 Initial setup information <wpinfo>. Initial setup information shall be included in each work package and shall immediately follow the WP identification information. It provides the maintenance technician with general information, equipment, parts, material, and authorized personnel required to perform and complete all the maintenance tasks included in the work package. Setup information requirements are described below.

- a. Test equipment <testeqp>. All test equipment required to perform the procedure shall be listed by, as a minimum, name <name> and part <partno> or model number <modelno> designation, as part of the identification number <identno>. For **page-based** manuals, test equipment shall be listed by name <name>, item number, and WP number <xref> if a separate WP has been developed containing an overall listing of test equipment for the system or equipment. This will eliminate the need to repeat the part and model numbers throughout the TM.

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- b. Tools and special tools <tools>. The tool kit (box) assigned to the mechanic (on a 1-per-mechanic-by-MOS basis) to be used in maintenance of a particular equipment shall be listed by, as a minimum, name **<name>**, tool kit number (**<partno>** or **<nsn>**), supply catalog (SC) **<sc>**, or TM number **<tmno>**. No tool in the kit shall be further identified. Other tools required for performance of all tasks for the maintenance levels covered in the work package shall also be identified in the initial setup. "Other tools" includes tools which are part of/components of shop sets authorized to sections/teams; tools authorized by RPSTL and CTA-50-970; special and fabricated tools; and items of Test, Measurement and Diagnostic Equipment (TMDE). For **page-based** manuals, if a separate WP has been developed containing an overall listing of tools and special tools, the tools and special tools shall be listed by name **<name>**, item number, and WP number **<xref>**. This will eliminate the need to repeat the part and model numbers throughout the TM.
- c. Materials/parts <mtlpart>. All expendable items and support materials, mandatory parts and flight safety critical aircraft parts shall be listed by, as a minimum, name **<name>**, part number **<partno>**, if any, and quantity **<qty>**, if applicable. The item number and supporting information work package **<xref>** which lists these items shall be given. For **page-based** manuals, if a separate WP has been developed containing an overall listing of materials/parts, the materials/parts shall be listed by name **<name>**, item number, and WP number **<xref>**. This will eliminate the need to repeat the part and numbers throughout the TM. For examples, see Part 2, page 4a, para 5.2.3.3.1c.
- d. Personnel required <persnreq>. Personnel **<name>** and the number of personnel **<qty>** shall be identified if the task requires more than one. The Military Occupational Specialty (MOS) designation **<nameid>** is not necessary, but it may be included. For example,

Personnel Required
 Artillery Mechanic 68M10 (1)
 Artillery Mechanic 66J30 (1)

- e. References <ref>. Other work packages, TMs, foldouts and other sources (**<extref>**/**<xref>**) that are needed to complete the maintenance tasks shall be listed here. Only references not listed in equipment conditions shall be listed. For example,

References
 TM 9-1015-252-20&P
 WP 0100 00

- f. Equipment conditions <eqpconds>. Any special equipment conditions required before the procedure can be started shall be listed here and cross-referenced to the appropriate source (**<extref>** or **<xref>**) for setting up the condition **<condition>**. For example,

Equipment Condition
 Firing mechanism removed (WP 0010 00)

- g. Special environmental conditions <specenv>. Any special environmental conditions (such as ventilation, lighting, or temperature) **<condition>** that are required shall be listed here. The reason **<reason>** that such conditions are needed shall be explained. For example,

Special Environmental Condition
 Darkened area required for testing lights.

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- h. Drawings required <dwgreg>. All drawings (which are not included in the work package) required to complete the maintenance tasks shall be listed here. Drawings shall be listed by title <dwgname> and drawing number <dwgno>. For example,

Drawings Required
Power Supply Schematic (132E470092)

- i. Estimated time to complete the task <time.to.comp>. If required by the acquiring activity, the estimated time it will take to complete the operating task shall be included. Approved Logistics Support Analysis (LSA) or Logistics Management Information (LMI), and service experience, performance data on similar equipment, and all other reliability, availability, and maintainability (RAM) data available shall be used to estimate the time required to complete the task.

5.3.4 Types of maintenance work packages.

5.3.4.1 Service upon receipt work package <surwp>.

- a. This work package shall contain information required for the user to ensure that the equipment will be adequately inspected, serviced, and operationally tested before it is subjected to use <geninfo>.
- b. Procedures shall be prepared for performing visual inspection of ammunition received from the ammunition supply facility. This inspection shall include verification that ammunition received was that requisitioned. Instructions shall be prepared for a condition check of the shipment (pallets, containers, boxes, and legibility of markings). Instructions shall be prepared to note the quantity of each lot for recording purposes.
- c. For equipment that requires extensive service upon receipt, this work package shall be further subdivided into the following tasks <surtask> described in 5.3.4.1.1 through 5.3.4.1.12.

5.3.4.1.1 Siting <siting>. Siting instructions peculiar to the equipment shall be prepared, as applicable. In preparing the instructions, operational and maintenance features shall be considered, such as the following:

- a. Location.
- b. Proximity to power sources.
- c. Effective ranges.
- d. Terrain requirements to avoid screening, reflections, ground clutter, and other poor operational conditions due to terrain.
- e. Technical requirements.
- f. Shelter locations.
- g. Compensating for adverse siting conditions.
- h. When the equipment contains large components such as towers and antennas that require orientation to a baseline during siting.

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5.3.4.3.2.1.2 Mandatory replacement parts <mrplpart>. All items that must be replaced during PMCS whether they have failed or not shall be identified. For **frame-based TMs**, the PMCS shall include the mandatory replacement parts information entries listed below for each mandatory part. For **page-based TMs**, the information entries shall be placed in a table (Refer to figure 1). The table shall follow the PMCS.

- a. Interval
- b. Item number.
- c. Part number.
- d. National stock number (NSN).
- e. Nomenclature.
- f. Quantity.

If there are no mandatory replacement parts for your PMCS, the following statement shall be included in lieu of the parts information:

"There are no mandatory replacement parts required for these PMCS procedures."

5.3.4.3.3 Preventive Maintenance Checklist (PMC) (operator only). When specified by the acquiring activity, a PMC shall be prepared as a separate document. Information for a PMC shall come from the applicable operator's PMCS.

5.3.4.4 Preventive maintenance inspections work package (aircraft only) <pmiwp>. This work package shall contain the requirements outlined in 5.3.4.4.1 through 5.3.4.4.3.

5.3.4.4.1 General information and introduction (aircraft only). The following paragraph shall be inserted.

"GENERAL INFORMATION

This work package contains complete requirements for special inspections, overhaul and retirement schedule, and standards of serviceability applicable to the aircraft. The inspections prescribed in this work package shall be accomplished at specified periods by AVUM activities, with the assistance of AVIM activities when required. Complete Daily, Intermediate, Periodic, or Phased inspections are contained in the (insert applicable aircraft inspection checklist TM)."

5.3.4.4.2 Standards of serviceability (aircraft only). The following paragraph shall be inserted.

"Standards of serviceability to be utilized in the day-to-day inspection and maintenance of the aircraft can be found as fits, tolerances, wear limits, and specifications in the aircraft maintenance manuals. Standards of serviceability for transfer to aircraft are contained in TM 1-1500-328-23."

5.3.4.4.3 Special inspections (aircraft only).

- a. Definition and general information. The following paragraph shall be inserted.

"This information supplements scheduled inspections as outlined in the applicable aircraft inspection checklists. Inspection of items which are required to be inspected at intervals not compatible with airframe operating time or airframe inspection intervals is also included. Refer to DA PAM 738-751 (Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A)) for applicable forms, records, and worksheets required for these inspection intervals. Typical examples of this type of inspection are as follows.

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- (1) Inspections which are solely contingent upon specific conditions or incidents that occur (e.g., hard landings, overspeed, or sudden stoppage), wherein immediate inspection is required to ensure safe flight.
 - (2) Inspection of components or airframe on a calendar basis: e.g., first aid kits, weight and balance check, aircraft inventory."
- b. Requirements. Components and other items which qualify under the criteria for special inspections, e.g., hard landings, sudden stoppage, overspeed shall be included. These inspections shall be grouped under specific aircraft areas. A line drawing of the aircraft or accessory showing sequence for inspection by area shall be included. The area identified shall include all surfaces, materials, components, and equipment pertaining to that specific location. The following inspection data entries shall be included, as applicable. For **page-based TMs**, the information entries shall be placed in a table **<pmi.pecul.tab>**.
- (1) Aircraft serial or tail number **<serialno>**.
 - (2) Date of inspection **<date>**.
 - (3) Area number **<areano>**.
 - (4) Inspection number **<itemno>**.
 - (5) Inspection interval **<interval>**.
 - (6) Name of component being inspected **<compname>**.
 - (7) Inspection procedure **<proc>**.

5.3.4.5 Aircraft lubrication instructions work package (aircraft only) <lubewp>. This work package shall contain the requirements outlined in 5.3.4.5.1 and 5.3.4.5.2.

5.3.4.5.1 Lubrication instructions (aircraft only). Lubrication schedules shall be prepared to present all applications and procedures, lubricants, and lubrication points to completely lubricate aircraft.

5.3.4.5.2 Lubrication charts (aircraft only).

- a. Lubrication charts shall consist of a main drawing prepared as a three-dimensional diagram, and such enlarged or detailed views as are considered necessary to identify items which otherwise would be obscured. They shall show all lubrication requirements for all parts of the aircraft requiring periodic lubrication, other than those lubricated by the main engine oil system. The charts shall also indicate type of lubricant, method of application, and frequency. (Refer to figure 2.)
- b. Use of black silhouette figures representing a likeness of the tool used in the application (oil can, grease gun, brush, or hand) shall be the accepted means of presenting application methods on the lubrication chart.
- c. Abbreviations, as specified in MIL-HDBK-275, shall be used to present lubricant types. In the event a lubricant does not have an abbreviation listed in MIL-HDBK-275, the abbreviation shall be provided by the procuring activity. Assigned application symbols, type abbreviations, and frequency shall be placed within the standard lubrication symbols.

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5.3.4.9.1.28 Ammunition markings <ammo.markings>. Instructions shall be prepared for marking ammunition and ammunition containers.

5.3.4.9.1.29 Procedures needed to activate ammunition, mine, etc. <arm>. Procedures shall be prepared for activation of ammunition, mines, etc.

5.3.4.10 General maintenance work packages <gen.maintwp>. These work packages shall contain common, general, or standard maintenance procedures (e.g., specific torque wrench usage, lockwire procedures, "O" ring seal installation, external power connections, etc.) applicable to other maintenance work packages contained within the TM that require the general maintenance procedures to complete the tasks. Maintenance tasks listed in 5.3.4.9.1 may be included, as applicable. These WPs may be referenced in other maintenance work packages.

5.3.4.11 Phased maintenance inspection work package (aircraft phased maintenance checklist only) <pmi-cklistwp>. Phased maintenance inspection data shall include the information described in 5.3.4.11.1 through 5.3.4.11.5.

5.3.4.11.1 Inspection area diagrams. Diagrams locating the inspection areas and the access doors and panels which require removal at various phased maintenance inspections of the aircraft shall be included. (Refer to figure 7 and 8).

5.3.4.11.2 Phased maintenance checklist. The following information shall be developed for the phased maintenance checklist.

- a. The work package shall begin with the following note:

"NOTE

Prior to start of the Phased Maintenance Inspection, it is recommended that a pre-inspection maintenance test flight (MTF) be conducted. Accomplishment of the MTF shall be determined by the unit maintenance officer. The pre-inspection MTF should be conducted by a maintenance test pilot following a review of the aircraft forms and records and a briefing from the crew of the aircraft. The MTF is recommended to assess the aircraft performance and identify deficiencies that should be corrected while the aircraft is undergoing phased maintenance inspections."

- b. The checklist shall consist of the following specific types of data entries. For **paged-based TMs**, the checklist data shall be contained in a table.
 - (1) Phase number <phaseno>. The inspection phase number shall be entered by the person planning the phased inspection.
 - (2) Area name and number <inspect-area>. The following types of inspections shall be entered, as applicable:
 - (a) General inspection <geninspec> items specified by the acquiring activity.
 - (b) Aircraft area inspection <areainspec> items approved by the acquiring activity. List shall be a logical sequence requiring a minimum of time and motion on the part of the individual performing the inspection.

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- (c) Aircraft Power On Checks **<pwron-inspec>** as approved by the acquiring activity.
- (d) Aircraft final inspection **<finalinspec>** requirements as specified by the acquiring activity.
- (3) Aircraft serial number **<serialno>**. The aircraft serial number shall be entered by the person performing the inspection.
- (4) Date **<date>**. The date the phased maintenance check was performed shall be entered by the person performing the inspection..
- (5) Total hours this area **<totalhrs>**. The total hours it took to complete the specific type of inspection shall be entered by the person performing the inspection.
- (6) Inspect phase number **<inspecphase>**. Enter the phase number or numbers at which the inspection requirement is to be accomplished. If the inspection shall be done at each phase, the word "ALL" shall be entered.
- (7) Inspection requirements **<requiremnt>**. The inspection procedures shall be included in the order of performance for each aircraft inspection area as described in subparagraph (2) above.
- (8) Status **<status>**. Status symbols defined in DA PAM 738-751 shall be entered. The status symbol of a fault discovered when performing an inspection requirement shall be entered by the person performing the inspection. If an inspection reveals no fault, a status symbol shall not be entered. The person correcting the fault shall place his last name initial over the status symbol. A red X or a circled red X symbol will not be initialed over until after the corrective action has been approved and signed of by a technical inspector or designated supervisor.
- (9) Faults and/or remarks **<ident-faults>**. The person performing the inspection shall enter brief remarks which describe the conditions resulting from the inspection and which require corrective action. The initials of the person making the entry shall be entered immediately following the remarks. If no faults are found, no entry is necessary.
- (10) Action taken **<actionreq>**. Brief remarks which describe the action to be taken to correct the fault shall be entered by the person that performed the inspection. If no faults are found, an appropriate statement shall be entered to indicate that the inspection was accomplished such as, "inspected and found OK". If an inspection is not applicable to the inspection phase being performed, "N/A" shall be entered.
- (11) Initials **<initials>**. Initials of the person performing the action to correct the indicated fault shall be entered.

5.3.4.11.3 MTF form and rotor smoothing record. When all required inspections have been accomplished and initialed in accordance with the above procedure, a daily inspection in accordance with the TM specified in the inspection checklist work package will be performed on the aircraft to permit performance of a maintenance test flight (MTF). The MTF shall be performed in accordance with the requirements of the applicable aircraft technical manuals and TM 1-1500-328-23 using the MTF form in the MTF technical manual.

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5.3.4.21.1 Introduction for depot mobilization requirements work package (DMWR only) <intro>. The following text shall be included verbatim.

"DEPOT MOBILIZATION REQUIREMENTS

INTRODUCTION

Scope

The purpose of this work package is to streamline and accelerate the overhaul process during the mobilization of the depot.

Explanation of Mobilization Requirements

The mobilization requirements include a list of instructions for modifying preshop analysis and/or overhaul procedures. The pertinent procedures to be modified are referred to by page and work package number, followed by the action to be taken."

5.3.4.21.2 Mobilization requirements <mobilreq>. Mobilization requirements consist of a list of actions that shall be in effect during depot mobilization. The work packages that are modified by these actions shall be noted. For **page-based TMs only**, this data can be in the form of **standard information <mobiltab>**. (Refer to figure 15.) For **ITEMs only**, the mobilization action shall be listed and linked to the specific step in the applicable task.

5.3.4.22 QA requirements work package (DMWR only) <qawp>. This work package shall include the data described in 5.3.4.22.1 through 5.3.4.22.7

5.3.4.22.1 Statement of responsibility <responsibility>. The following information shall be included.

"STATEMENT OF RESPONSIBILITY

The depot/contractor is responsible for complying with the quality assurance requirements contained in this work package and in accordance with ISO 9000 Series standards or equivalent. The commodity manager reserves the right to perform inspections or make changes that ensure the depot work being done meets the quality standards of the DMWR and preserves the inherent reliability of the item."

5.3.4.22.2 Definitions <def>. Definitions shall be prepared for all QA terms extensively used in the Depot Maintenance Work Requirement (DMWR).

5.3.4.22.3 Special requirements for inspection tools and equipment <specialreq>. Any special requirements for the maintenance and calibration of tools and test equipment used for QA inspections shall be listed.

5.3.4.22.4 Certification requirements <certreq>. Any certification or licensing requirements for processes, procedures, materials, equipment, or personnel skills shall be listed. The list shall include appropriate standards, specifications, regulations, or laws that apply. The list shall reference the text in the DMWR where there is a requirement for a soldering, welding, or magnetic particle inspection certification, radioactive substance, or test driver licenses.

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5.3.4.22.5 In-process inspections <inprocess>. The following statement shall be included.

"IN-PROCESS INSPECTIONS

In-process quality assurance inspections are contained throughout the overhaul procedures of this DMWR. These inspections are immediately followed by a statement such as "QA check" to identify them, and they are the minimum inspections required. Additional quality assurance inspections may be established by the depot or the commodity manager."

5.3.4.22.6 Acceptance inspections <acceptance>. The following statement shall be included.

"ACCEPTANCE INSPECTIONS

Items overhauled in accordance with this DMWR will be accepted based on the following criteria:

1. Conformance to quality of material requirements.
2. Conformance to all in-process quality assurance inspections.
3. Conformance to all final assembly testing requirements.
4. Conformance to the preservation, packaging, and marking requirements."

5.3.4.22.7 First article inspection <first>. When applicable, first article inspection/test shall be prepared for the DMWR in accordance with ISO 9000 Series standards or equivalent.

5.3.4.23 Wiring diagrams work package <wiringwp> (-20/AVUM level or above only). This work package shall include wiring and cable provisions contained in the equipment/end item, including all systems or equipment which can be installed or removed later (e.g., mission-related systems/equipment). Applicability of diagrams shall be explained in relation to equipment configuration. At a minimum, the wiring data described in 5.3.4.23.1 through 5.3.4.23.4 shall be included.

5.3.4.23.1 Introduction <intro>. Information shall be prepared to include the scope of the work package. A statement shall be included explaining that wiring diagrams and essential wiring information are provided for all electrical and electronic systems and circuits.

5.3.4.23.2 Wire identification <wireid>. Identification of wires by number shall be explained. A list of circuit designators and a wire identification diagram shall be prepared.

5.3.4.23.3 Abbreviations <abbrev>. A statement shall be prepared that abbreviations are in accordance with ASME Y14.38, except when the abbreviation stands for a marking actually found in the equipment.

5.3.4.23.4 Wiring diagrams <wiringdiag>. Wiring diagrams shall be prepared for all electrical and electronic systems and circuits.

6. NOTES.

The notes in section 6 of MIL-STD-40051A apply to this Part.

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MIL-STD-40051-5A(TM)

1. SCOPE.

1.1 Scope. This standard establishes the technical content requirements for the preparation of Parts Information (PI) or Repair Parts and Special Tools Lists (RPSTLs) for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). Parts Information (PI) requirements are applicable for frame-based technical manuals and Repair Parts and Special Tools Lists (RPSTLs) requirements for paged-based manuals.

2. APPLICABLE DOCUMENTS.

The applicable documents in section 2 of MIL-STD-40051A apply to this Part.

3. DEFINITIONS.

The definitions in section 3 of MIL-STD-40051A apply to this Part.

4. GENERAL REQUIREMENTS.

4.1 General. The PI and RPSTL provides authorized spares and repair parts; special tools; special Test, Measurement, and Diagnostic Equipment (TMDE); and other special support equipment required for performance of all levels of maintenance of the weapon system/equipment, subsystems, assemblies, and components. They authorize the requisitioning, issue and disposition of spares, repair parts and special tools in accordance with the Source, Maintenance and Recoverability (SMR) codes. When a TM with parts information or a RPSTL with combined levels of maintenance is authorized, the TM/ RPSTL shall contain spares and repair parts data for all levels covered, even though lower levels of maintenance are covered in a separate TM/RPSTL. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A, Appendix A.

4.2 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Maintenance Instructions and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the modular DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., <plwp>) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

4.3 Use of the DTDs / FOSIs.

4.3.1 Page-based T.S. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all T.S. prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

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4.3.2 Frame-based TMs. The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based T.S. is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

4.4 Content structure and format. The examples provided herein and in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Troubleshooting Procedures.

4.5 Style and format. MIL-STD-40051A provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.6 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.7 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished using Appendix A, Technical Manual Content Selection Matrixes, of MIL-STD-40051A. The applicability of some requirements is also designated by one of the following statements: unless specified otherwise by the acquiring activity; as/when specified by the acquiring activity; or when specified by the acquiring activity.

5. DETAILED REQUIREMENTS.

5.1 General. The requirements provided in this Part of the standard are applicable for both page-based and frame-based TMs. Requirements for the preparation of Parts Information (PI) for frame-based TMs are contained in 5.2. Page-based requirements for the preparation of RPSTL data are contained in 5.3.

5.2 Parts information development.

5.2.1 Preparation of PI for frame-based technical manuals. A data base of supporting parts information shall be developed. The parts information data base shall be used to identify all replaceable or repairable parts authorized at the applicable levels of maintenance. The parts information data base shall include parts information data for all authorized spares and repair parts of the system/equipment, special tools, repair kits and kit repair parts, special test, measurement, and diagnostic equipment (TMDE), other support equipment required for performance of maintenance, and Basic Issue Items (BII). The parts information <pim> shall be accessible in any work package presentation that a specific part is identified, including but not limited to:

- a. Parts cited in any operating or maintenance task.
- b. Parts cited in troubleshooting procedures.

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FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list or special tools list work package.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC: ..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

<u>Code</u>	<u>Used On</u>
PAA	Model M114
PAB	Model M114A
PAC	Model M114B

NOTE: Include the above UOC content, as applicable.

“Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in *(enter applicable TM number)*.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index work packages and the bulk material list in the repair parts list work package.”

NOTE: For a combined narrative-RPSTL manual associated publications shall not be included.

“Associated Publications. The publication(s) listed below pertains to the *(enter item name)*:

<u>Publication</u>	<u>Short Title</u>
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NOTE: The following paragraph shall appear only in the unit maintenance RPSTL special instructions.

“Illustrations List. The illustrations in this RPSTL contain unit authorized items. Illustrations published in *(enter applicable TM number for the higher maintenance level RPSTL, e.g., for direct support, general support, etc.)* that contain unit authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded "O" in the third position of the SMR code, therefore, there may be a break in the item number sequence.”

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“HOW TO LOCATE REPAIR PARTS**1. When NSNs or P/Ns Are Not Known.**

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When P/N Is Known.

First. If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.”

NOTE: Include 4 only if the RPSTL has a reference designator index work package.

“4. When Reference Designator Is Known.

First. If you know the reference designator, look in the REFERENCE DESIGNATOR column of the reference designator index work package. Note the figure and item number.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

ABBREVIATIONS**Abbreviation****Explanation”**

NOTE: Include uncommon abbreviations used in the RPSTL. List/define those not found in ASME Y14.38.

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MIL-STD-40051-6A(TM)

1. **SCOPE.**

1.1 Scope. This standard establishes the technical content requirements for the preparation of supporting information (previously known as appendixes) for major weapon systems, and their related systems, subsystems, equipment, weapons replacement assemblies (WRAs), and shop replacement assemblies (SRAs). The requirements are applicable for all maintenance levels through overhaul (depot) including Depot Maintenance Work Requirements (DMWRs). The requirements can be used to develop TMs in a variety of output forms including interactive screen presentations (frame-based manuals) and paper paged-based manuals.

2. **APPLICABLE DOCUMENTS.**

The applicable documents in section 2 of MIL-STD-40051A apply to this Part.

3. **DEFINITIONS.**

The definitions in section 3 of MIL-STD-40051A apply to this Part.

4. **GENERAL REQUIREMENTS.**

4.1 General. Supporting information shall be prepared for weapon systems, major equipment, components and applicable support and interface equipment. Supporting information requirements are included for the preparation of technical data that supplements the specific operation and maintenance information contained in the TM. This supplemental information includes reference data, general maintenance and parts information and associated illustrations.

4.2 Maintenance level applicability. Requirements contained in this standard are applicable to all maintenance levels unless specifically noted in bold and in parentheses (i.e., **Direct Support**). The labeled requirements shall be applicable to all TMs containing that maintenance level. An explanation of all applicable Department of Army maintenance levels is provided in MIL-STD-40051A, Appendix C.

4.3 Preparation of digital data for electronic delivery. Technical manual data prepared and delivered digitally in accordance with this standard shall be Standard Generalized Markup Language (SGML) tagged using the Document Type Definition (DTD) for Maintenance Instructions and the Formatting Output Specification Instance (FOSI) or style sheets in accordance with MIL-STD-2361. Refer to MIL-STD-40051A (paragraph 4.6) for information on obtaining or accessing this DTD. SGML tags used in the modular DTD are noted throughout the text of this standard in bracketed, bold characters (i.e., <**macwp**>) as a convenience for the TM author and to ensure that the tags are used correctly when developing a document instance.

4.4 Use of the DTDs / FOSIs.

4.4.1 Page-based TMs. The DTDs referenced in this standard interpret the technical content and structure for the functional requirements contained in this standard and are mandatory for use. The FOSIs referenced herein interpret the style and format. As specified by the contracting activity, FOSIs or style sheets may be used to produce final reproducible paper copy for all TMs prepared in accordance with this standard. For additional information on DTDs and specific FOSIs, refer to MIL-STD-2361.

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4.4.2 Frame-based TMs. The DTD referenced in this standard interprets the technical content and structure for the functional requirements contained in this standard and is mandatory for use. Development of frame-based TMs is accomplished through the use of the DTD combined with the requirements contained in MIL-PRF-87268. The requirements contained in MIL-PRF-87268 apply unless they conflict with the requirements in this standard. The requirements in this standard take precedence over the requirements contained in MIL-PRF-87268. A FOSI or style sheet is used to interpret the style and format for frame-based screen display. For additional information on DTDs and specific FOSIs or style sheets, refer to MIL-STD-2361.

4.5 Content structure and format. The examples provided herein and in MIL-STD-40051A are an accurate representation of the content structure and format requirements contained in this Part and shall be followed to permit the effective use of the DTD for Supporting Information.

4.6 Style and format. MIL-STD-40051A provides style and format requirements for the preparation of both page-based and frame-based TMs. These requirements are considered mandatory and are intended for compliance.

4.7 Work package development. Technical manual data developed in accordance with this standard shall be divided into individual, stand alone units of information called work packages. A work package shall consist of descriptive, operational, maintenance, troubleshooting, support, or parts information for the weapon system or equipment.

4.8 Selective application and tailoring. MIL-STD-40051A contains some requirements that may not be applicable to the preparation of all technical manuals. Selective application and tailoring of requirements contained in MIL-STD-40051A are the responsibility of the acquiring activity and shall be accomplished using Appendix A, Technical Manual Content Selection Matrixes, of MIL-STD-40051A. The applicability of some requirements is also designated by one of the following statements: unless specified otherwise by the acquiring activity; as/when specified by the acquiring activity; or when specified by the acquiring activity.

5. DETAILED REQUIREMENTS.

5.1 Preparation of supporting information. Supporting information shall be developed as work packages. Supporting information work packages are described in 5.2 through 5.12. WPs shall include WP identification information (MIL-STD-40051-1A, 5.1.1). For **page-based TMs**, these work packages shall be placed in the TM in the order in which they are presented herein, as applicable.

5.2 References work package <refwp>. This work package shall list all publications referenced in the TM and required by the user to operate and/or maintain the equipment. It shall consist of a scope <scope> and publication list <publist>.

5.2.1 Scope <scope>. Information concerning the use and content of the references work package shall be prepared. (Refer to figure 1.)

5.2.2 Publication list <publist>. Individual paragraphs shall be prepared for each publication type. All related/referenced publications, with the exception of those publications that are currently unpublished, shall be listed. This list shall identify the publications by number <pubident> and title <name>. If the publication is nongovernment, the source shall be given. Titles shall be listed alphabetically under each publication type. (Refer to figure 1.) If a List of Applicable Publications (LOAP) exists, it may be referenced.

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5.10.2 Flight safety critical aircraft parts (FSCAP) <fscap>. For aircraft, Flight Safety Critical Aircraft Parts (FSCAP) and installations identified under the FSCAP program shall require special handling during overhaul. A critical characteristic is any feature throughout the life cycle of a FSCAP, such as dimension, tolerance, finish, material or assembly, manufacturing process, inspection process, operation, field maintenance requirement, depot overhaul requirement, or other feature that if nonconforming, missing, or degraded, could cause failure or malfunction of a FSCAP. FSCAPs shall be listed (Refer to figure 13) by their nomenclature, part number, CAGEC, and critical characteristic. Throughout the work package, warnings shall be included emphasizing critical instructions to be followed. These warnings are FSCAP warnings and inserted whenever necessary.

5.11 Support items work package <supitemwp>. This work package shall combine any the supporting lists described in 5.5 through 5.10, as applicable. This work package shall be developed when the data contained in these supporting lists are minimal and creating a separate work package for each list is unnecessary. The work package may include an introduction and the applicable lists described in 5.5 through 5.10.

5.12 Additional work packages <genwp>. Additional work packages may be prepared when the work packages previously described herein will not support the data/information to be presented.

6. NOTES.

The notes in section 6 of MIL-STD-40051A apply to this Part.

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REFERENCES

This work package lists all field manuals, forms, technical manuals and miscellaneous publications referenced in this manual.

FIELD MANUALS

FM 31-70	Basic Cold Weather Manual
FM 90-3	Desert Operations
FM 21-11	First Aid for Soldiers
FM 90-6	Mountain Operations
FM 3-3	NBC Decontamination Avoidance
FM 3-19	NBC Reconnaissance
FM 31-71	Northern Operations
FM 9-207	Operation and Maintenance of Ordnance Material in Cold
Weather	
FM 20-22	Vehicle Recovery Operations

FORMS

DD 518	Accident Identification Card
DA Form 2408-9	Equipment Control Record
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2408	Equipment Log Assembly (Records)
DA Form 2062	Hand Receipt
SF 91	Motor Vehicle Accident Report
DA Form 2408-20	Oil Analysis Log
SF 368	Product Quality Deficiency Report
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2408-14	Uncorrected Fault Record
DA Form 2408-4	Weapon Record Data

TECHNICAL MANUALS

TM 9-1300-200	Ammunition, General
TM 750-244-6	Destruction of TACOM Equipment
TM 11-5695-286-14	Hand Set Microphone

FIGURE 1. Example of references. Ⓔ

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2,3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4,5,6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of this form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE	1.DOCUMENT NUMBER MIL-STD-40051A(TM)	2.DOCUMENT DATE (YYMMDD) 990302
3.DOCUMENT TITLE Preparation of Digital Technical Information for Mult-Output Presentation of Technical Manuals		
4.NATURE OF CHANGE <small>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</small>		
5.REASON FOR RECOMMENDATION		
6.SUBMITTER		
a.NAME <small>(Last, First, Middle Initial)</small>	b.ORGANIZATION	
c.ADDRESS <small>(Include Zip Code)</small>	d.TELEPHONE <small>(Include Area Code)</small> (1)Commercial (2)AUTOVON <small>(If applicable)</small>	7.DATE SUBMITTED (YYMMDD)
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