

**TECHNICAL MANUAL**

**AVIATION UNIT**

**MAINTENANCE MANUAL**

**FOR**

**ARMY AH-64A HELICOPTER**  
**(NSN 1520-01-106-9519)**  
**(EIC: RHA)**

**FAULT DETECTION/  
LOCATION SYSTEM**

**SUPERSEDURE NOTICE:** This manual supersedes  
TM 1-1520-238-T-1, dated 8 May  
1990, including all changes.

**DISTRIBUTION STATEMENT A:** Approved for public  
release; distribution is  
unlimited.

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**HEADQUARTERS**  
**DEPARTMENT OF THE ARMY**  
**31 March 1992**

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON D.C., 19 December 1997

**AVIATION UNIT  
MAINTENANCE MANUAL  
FOR  
ARMY MODEL  
AH-64A HELICOPTER  
NSN 1520-01-106-3519  
(EIC: RHA)**

**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 these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you.

You may also provide DA Form 2028 information to AMCOM via e-mail, datafax, or the World Wide Web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: [2028@redstone.army.mil](mailto:2028@redstone.army.mil). Instructions for sending an electronic 2028 may be found at the back of the applicable Operator's manual immediately preceding the hardcopy 2028. For the World Wide Web use: <https://amcom2028.redstone.army.mil>.

**OZONE DEPLETING CHEMICAL INFORMATION:**

This document has been reviewed for the presence of Class I Ozone depleting chemicals. As of Change 7 dated 27 February 1998, all references to Class I Ozone depleting chemicals have been removed from this documentation by substitution with chemicals that do not cause atmospheric Ozone depletion.

\* **SUPERSEDURE NOTICE:** This manual supersedes TM 1-1520-238-T-1, dated 8 May 1990, including all changes.

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## HOW TO USE THIS MANUAL – continued

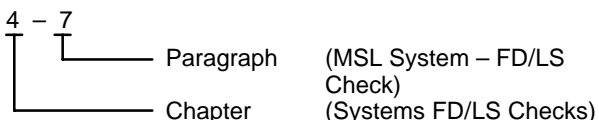
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### OVERVIEW

If you can't find information, you can't do the job. Learn how to use this manual. Check how the manual is put together. Look at these examples. Before using the manual, learn how it works.

The manual is made up of chapters. The chapters are made up of paragraphs which are grouped into sections, and all are numbered. Every job and the information you need has a number. This lets you find it when you need it.

Example: Task Paragraph Number: 4-7



### MANUALS

This manual has appendix A. This appendix has information you will need. It contains a list of all official publications referenced in this Technical Manual.

### CHAPTERS

Each chapter has one or more paragraphs.

- a. Chapter 1 has six paragraphs divided into two sections. The first section contains general information describing the fault detection and location system (FD/LS). The second section contains descriptions of FD/LS operating modes.
- b. Chapter 2 has three paragraphs divided into two sections. The first section contains locator figures of the cockpit controls and circuit breakers. The second section contains a locator figure of the aft avionics bay circuit breakers.
- c. Chapter 3 has four paragraphs composed of aircraft systems power-up, power down procedures, auxiliary power unit (APU) operating instructions, and APU emergency procedures.
- d. Chapter 4 has 23 paragraphs composed of FD/LS checks **01** through **19** and **33** through **36**. The paragraphs are numbered the same as the FD/LS maintenance menu.

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**HOW TO USE THIS MANUAL – continued**

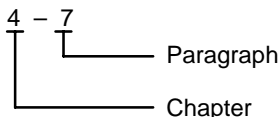
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**PARAGRAPHS**

Paragraphs make up chapters. It is the paragraphs that have the information you need for any job. **USE THE INDEX TO FIND THE PARAGRAPH YOU NEED. DON'T USE THE PAGE NUMBERS.**

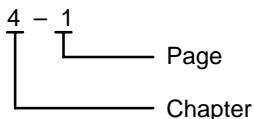
**PARAGRAPH NUMBERING**

Paragraphs are in two parts. The first is the chapter. The second is the paragraph. Each number is separated by a dash as shown in example:



**PAGE NUMBERING**

All page numbering is by chapters. Paragraph numerals are not included in the page numbers. The first number is the number of the chapter; the second number is the number of the page in that chapter. The numbers are separated by a dash as shown in the example:



**NOTE:** Page numbers are not used to find information. Use paragraph numbers.

**MANUAL INDEX**

The index for the entire manual is in the back of the manual. The index lists all paragraph titles in alphabetical order. After you find the title in the index, it tells the paragraph number. For example, if you need information on the MSL System FD/LS check, go to the “F” section of the index and look under “FD/LS Check, Systems”. There you will find:

MSL System FD/LS Check . . . . . Para 4-7

The index informs you that the missile FD/LS check is in chapter 4, paragraph 7.

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## HOW TO USE THIS MANUAL – continued

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You can find your paragraph in the index, even if you only know a single word in the title. In the sample FD/LS Check title you could also find your paragraph by looking under “MSL”.

Examples:

MSL System FD/LS Check . . . . . Para 4-7

Any paragraph can be located in the way described. If you know the name of the operation, system, assembly, description, etc., you can use one of the words to find the paragraph number in the index. It makes locating information quick and easy.

### **GLOSSARY**

The glossary in this manual is a list of abbreviations and acronyms. Abbreviations are shortened terms for words. Acronyms are shortened terms for several words and use only the first letter of each of the words. Abbreviations and acronyms are defined the first time used within the text of the chapter where they are found. The list in the glossary, however, provides a good place to check if there is any doubt.

The glossary also contains definitions of unusual terms that appear in the manual. Check the list of definitions if you see a word in the manual you're not sure of.

It is always a good idea to look over the glossary and become familiar with abbreviations, acronyms, and unusual terms.

### **INITIAL SETUP**

Each maintenance task is headed by an initial setup. This table outlines what is needed as well as certain conditions which must be met before starting the task. DON'T START A TASK UNTIL:

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

An example initial setup is shown on page vii. Not all tasks have all the headings shown.

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## HOW TO USE THIS MANUAL – continued

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The following subparagraphs (a through e) explain each part of the initial setup.

- a. **Title:** The title in the upper border contains the paragraph number and title of the task as listed in the index.
- b. **Tools/Equipment:** Special tools and equipment are listed when needed. Special tools and equipment use are called out in the task.
- c. **Personnel Required:** This heading lists the number of people required to perform the task. Unless otherwise specified, any qualified and/or certified individual is authorized to perform power applications and FD/LS checks on the AH-64A.
- d. **References:** This lists other technical manuals (TMs) you will need to complete the task. The steps in the task will tell you when you must refer to another TM. Paragraphs contained within the volume being referenced will not be shown in list of References.
- e. **Equipment Conditions:** This lists things that must be done before starting the task. It may require an operation such as installing HELLFIRE modular missile systems (HMMS) launchers on the helicopter, installing training missiles, or removing parts, assemblies, etc. These operations are described in other tasks or TMs. The TMs that describe how to do these operations are referenced here. The statement “Helicopter safed” will appear here only in the power applications tasks. The reference refers to TM 1-1520-238-23 where helicopter safety procedures are described. Be sure to do the things necessary as called out under equipment conditions; then do the task.

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**HOW TO USE THIS MANUAL – continued**


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**INITIAL SETUP EXAMPLE**


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**4-7. MSL SYSTEM – FD/LS CHECK**


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4-7

**Tools:**

<u>Nomenclature</u>	<u>Part Number</u>
M-36 HELLFIRE Training missile (2)	1300377

**Personnel Required:**

(2)

**References:**

TM 1-1520-238-23	TM 9-1090-208-23-2
TM 9-1230-476-20-1	TM 9-1230-476-20-2
TM 9-1425-475-20	TM 9-1427-475-20
TM 11-1520-238-23-2	

**Equipment Conditions:**

<u>Ref</u>	<u>Condition</u>
TM 9-1427-475-20	HMMS launchers installed
TM 9-1425-475-20	Training missiles (2), minimum installed

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**HOW TO USE THIS MANUAL – continued**


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**WARNINGS, CAUTIONS, AND NOTES**

<b>WARNING</b>
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An operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

<b>CAUTION</b>
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An operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness or long term health hazards to personnel.

**NOTE**

An essential operating or maintenance procedure, condition, or statement which must be highlighted.

**USING AH-64A HELICOPTER EFFECTIVITY CODES**

Helicopter effectivity codes designate differences between helicopters by helicopter serial numbers. These codes consist of three letters which represents various helicopter serial number blocks. They are used in this manual as necessary to identify cockpit configuration.

To use the Helicopter Effectivity Codes, note the helicopter serial number on the tail of the helicopter. Use this serial number to determine which configuration to use.

The effectivity codes, which are shown inside triangles, and helicopter serial number blocks are as follows:

<b><u>Code</u></b>	<b><u>Helicopter Serial Number</u></b>
<b>AAN</b>	83-23787 through 85-25415
<b>ACD</b>	85-25416 and subsequent
<b>ACY</b>	82-23355 thru 92-0485 (Before MWO 9-1230-476-50-01)
<b>ACZ</b>	82-23355 thru 92-0485 (After MWO 9-1230-476-50-01) 94-0328 and subsequent

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**HOW TO USE THIS MANUAL - continued**

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<u>Code</u>	<u>Helicopter Serial Number</u>
<b>ADC</b>	Before MWO 1-1520-238-50-49
<b>ADD</b>	After MWO 1-1520-238-50-49
<b>ADP</b>	After MWO 1-1520-238-50-50
<b>ADY</b>	Before AMWO 9-1270-476-55-04
<b>ADZ</b>	After AMWO 9-1270-476-55-04

# CHAPTER 1 INTRODUCTION

## CHAPTER OVERVIEW

Chapter 1 contains general information describing the Fault Detection and Location System and operating modes.

## CHAPTER INDEX

Para Title	Para No.
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Fault Detection and Location System (FD/LS) – General .....	1-1
Major Functions .....	1-2
Controls and Indicators .....	1-3
Display Indications .....	1-4
<b>Section II – FD/LS OPERATING MODES</b>	
FD/LS Operation – General .....	1-5
Operator Applications for the DEK (ADC) – General .....	1-6
Operator Applications for the CDU (ADD) – General .....	1-7

## **Section I. GENERAL INFORMATION**

### **1-1 FAULT DETECTION AND LOCATION SYSTEM (FD/LS) – GENERAL.**

FD/LS is a method of automatically performing a built-in-test of various systems/line replaceable units (LRUs). Flight crew and maintenance personnel are provided with continuous monitoring of flight critical and mission essential systems, and keyboard initiated system testing. Faults are isolated to the malfunctioning system and LRUs. Various aircraft controls, displays, and indicators interface with FD/LS providing caution/warning advisory information and the media for operator interaction. FD/LS is a software module which resides within the fire control computer (FCC). The FCC is considered the primary bus controller and must be on-line to execute FD/LS functions. The back-up bus controller (BBC) contains a limited version of system fault detection.

#### **1-2 MAJOR FUNCTIONS.**

- a. Provides caution/advisory displays, warning displays, and audible tones while monitoring flight critical and mission essential equipment performance.
- b. Detects failed systems during flight and ground operations.
- c. Isolates down to the aviation unit maintenance (AVUM) replaceable LRU.
- d. Displays operational status (GO/NO-GO) of the systems that interface with the multiplex (MUX) bus.