* TM 1-1520-238-10

TECHNICAL MANUAL

OPERATOR's MANUAL

FOR

HELICOPTER, ATTACK, AH-64A APACHE

HEADQUARTERS, DEPARTMENT OF THE ARMY

31 AUGUST 1994

* This manual supersedes TM 55-1520-238-10, dated 28 June 1984, including all changes.

Technical Manual

No. 1-1520-238-10

HEADQUARTERS
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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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TABLE OF CONTENTS

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TABLE OF CONTENTS – continued

TABLE OF CONTENTS – continued

CHAPTER 1
INTRODUCTION

1.1 GENERAL.

These instructions are for use of the operators. They apply to AH-64A helicopters.

1.2 WARNINGS, CAUTIONS, AND NOTES.

Warnings, Cautions, and Notes are used to emphasize important and critical instruction and are used for the following conditions:

WARNING

An operating procedure, practice, condition or statement, which if not correctly followed, could result in personal injury or loss of life.

CAUTION

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

NOTE

An operating procedure, condition or statement, which is essential to highlight.

1.3 DESCRIPTION.

This manual contains the best operating instructions and procedures for the AH-64A under most circumstances. The observance of limitations, performance, and weight balance data provided is mandatory. The observance of procedure is mandatory, except when modification is required because of multiple emergencies, adverse weather, terrain, etc. Basic flight principles are not included. ***THIS MANUAL SHALL BE CARRIED IN THE HELICOPTER AT ALL TIMES.***

The AH-64A helicopter is designed as a weapons-delivery platform and is equipped with point target (Hellfire missile), area weapon (30mm chain gun), and aerial rocket (2.75-inch folding-fin type) systems. The AH-64A carries two crewmembers: a pilot and a copilot/gunner (CPG).

1.4 APPENDIX A, REFERENCES.

Appendix A is a listing of official publications cited within the manual applicable to, and available for, flight crews.

NOTE

Appendix A shall contain only those publications referenced in the manual, and shall not contain Department of the Army blank forms.

1.5 APPENDIX B, ABBREVIATIONS AND TERMS.

Definitions of all abbreviations and terms used throughout the manual are included in Appendix B.

1.6 INDEX.

The index lists, in alphabetical order, paragraphs, figures, and tables contained in this manual by page number.

1.7 ARMY AVIATION SAFETY PROGRAM.

Reports necessary to comply with the safety program are prescribed in AR 385-40.

1.8 DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

For information concerning destruction of Army materiel to prevent enemy use, refer to TM 750-244-1-5.

1.9 FORMS AND RECORDS.

Army aviator's flight record and aircraft maintenance records, which are to be used by crewmembers, are described in DA PAM 738-751 and TM 55-1500-342-23.

1.10 EXPLANATION OF CHANGE SYMBOLS.

Changes to the text and tables, including new material on added pages, shall be identified by a vertical bar in the outer margin of the column of text in which the change appears, extending close to the entire area of the material affected. Change symbols for single column text shall be placed in the margin opposite the binding. Change symbols for double column text shall be placed in the margin adjacent to the binding for the columns of text nearest the binding. The change symbols shall be placed in the outer margin opposite the binding for the column of text farthest from the binding. Pages with emergency markings, which consist of black diagonal lines around three edges, shall have the vertical bar or change symbol placed in the margin between the text and the diagonal lines. Change symbols shall indicate the current changes only. A miniature pointing hand symbol shall be used to denote a change to an illustration. However, a vertical line in the outer margin (opposite the binding) rather than miniature pointing hands, shall be utilized when there have been extensive changes made to an illustration. Change symbols shall not be used to indicate changes in the following:

a. Introductory material.

b. Indexes and tabular data where the change cannot be identified.

c. Correction of minor inaccuracies, such as spelling, punctuation, relocation of material, etc., unless such correction changes the meaning of the instructive information and procedures.

1.11 SERIES AND EFFECTIVITY CODES

All AH-64A helicopters have BUCS equipment installed. In most helicopters, the system is deactivated; in some it is operable. The designator symbol B indicates text headings, text contents and illustrations pertaining to helicopters with an operable BUCS.

Some AH-64A helicopters have T700-GE-701C engines installed. Those helicopters will have components, instrumentation, performance parameters, and procedures different from helicopters with T700-GE-701 engines installed. The designator symbols 701 and 701C indicate material pertaining to those specific engines.

Some AH-64A helicopters have the 7-319200005-11 Fire Control Computer (FCC) with –51 software installed (EGI Mod); others have the 7-319200005-9A Fire Control Computer (FCC) with –49A software installed; others yet have the 7-319200005-5 FCC with –45 software. Because of differences in operation, displays, etc. designator symbols –45, –49A, and –51 will indicate material peculiar to that software installation.

1.12 USE OF SHALL, SHOULD, AND MAY.

Within this technical manual, the word ***shall*** is used to indicate a mandatory requirement. The word ***should*** is used to indicate non-mandatory but preferred method of accomplishment. The word ***may*** is used to indicate an acceptable method of accomplishment.

1.13 PLACARD ITEMS

All Placard Items (switches, controls, etc.) are shown throughout this manual in **BOLD FACE** capital letters.

CHAPTER 2
AIRCRAFT AND SYSTEMS DESCRIPTION AND OPERATION

Section I. AIRCRAFT

2.1 GENERAL.

The AH-64A helicopter is a twin engine, tandem seat, aerial weapons platform.

2.2 AIRCRAFT GENERAL ARRANGEMENT.

Figure 2-2 illustrates the general arrangement including accessing and some major exterior components.

2.2.1 Fuselage. The fuselage includes a forward, center, and aft section that employ aluminum alloy semimonocoque construction. All major weight items (crew, fuel, and ammunition) are supported by bulkheads, frames, and a longitudinal support structure. The forward fuselage contains the copilot/gunner (CPG) station. There are also provisions for mounting the target acquisition and designation sight (TADS), pilot night vision sensor (PNVS), and a 30mm area weapon. The center section contains the pilot crew station and provides support for the oleo-damped main landing gear, main transmission, wings, fuel cells, and ammunition bay. The aft section includes the vertical stabilizer and has provisions for mounting the tail landing gear. The avionics bay and stowage compartments are contained in the aft section. The tail rotor, driveshafts, gearboxes, and stabilator are attached to the aft section.

2.2.2 Wings. Left and right wings are attached to the center fuselage. They are of aluminum cantilever, spar, and rib construction. Each wing provides two hardpoints for external stores and hydraulic and electrical quick disconnects.

2.2.3 Rotors. The helicopter has a fully articulated four-blade main rotor system equipped with elastomeric lead-lag dampers. The tail rotor is a semi-rigid design and consists of four blades.

2.2.4 Engines. The helicopter is powered by two horizontally-mounted turbo-shaft engines. Power is supplied to the main transmission through engine-mounted nose gearboxes, shafts, and overrunning clutches. The main transmission drives the main and tail rotors and accessory gearbox.

2.3 SPECIAL MISSION KITS.

The helicopter can be equipped with an IR jammer kit, radar jammer kit, radar warning kit, winterization kit, chaff kit, and extended range kit. Refer to the applicable system for descriptive information.

2.4 PRINCIPAL DIMENSIONS.

Figure 2-3 illustrates principal helicopter dimensions.

2.5 TURNING RADIUS AND GROUND CLEARANCE.

Figure 2-4 illustrates helicopter turning radius and ground clearance.

2.6 DANGER AREAS.

2.6.1 Shaded Areas Illustrated. The illustrated shaded areas (fig 2-5) can be hazardous. Personnel approaching an operating helicopter must do so at a 45-degree angle from the front. The approach must be made from well outside the rotor disc area until recognition is received from the pilot. The pilot will then signal when closer approach is safe.

2.6.2 Air Flow. Air flow from the tail rotor and downwash from the main rotor are dangerous, even outside the turning radius of the helicopter when it is in hover or operating at takeoff power.

2.6.3 Exhaust Gases. Exhaust gases from the helicopter engines and auxiliary power unit (APU) can cause burns. Personnel should remain clear of these areas.

2.6.4 Canopy Jettison. During canopy jettison, acrylic fragments will be propelled approximately 50 feet from the helicopter. Personnel approaching a crash-damaged helicopter shall look for a signal from the crew that closer approach is safe.

2.6.5 Laser. The laser shall be given special safety considerations because of the extreme danger involved during its operation. Relatively low laser light levels can cause permanent damage to eyes and skin burns. There is an additional danger of electrical shock from laser components.

2.7 EQUIPMENT STOWAGE COMPARTMENTS.

The aft storage bay (fig 2-2) is for the stowage of tie down devices, protective covers, and other helicopter equipment. The loading conditions for this bay are covered in Chapter 6, Weight/Balance and Loading. The survival equipment storage bay (fig 2-2) is large enough to store a combat helmet, an environmental survival kit, a survival weapon, and a box of field-type rations for each crewmember. The loading limitations for this bay are covered in Chapter 6, Weight/Balance and Loading.

2.8 WINDSHIELD AND CANOPY PANELS.

2.8.1 Windshield. The windshield consists of two heated laminated glass windshields. One is directly forward of the CPG; the other is directly above his head. The canopy consists of five acrylic panels: Two on each side of the crew stations and one directly above the pilot.

2.8.2 Canopy Panels. The two canopy panels on the right are independently hinged. They latch and unlatch separately by interior or exterior handles. They swing upward to provide entrance to, and exit from, the crew station. Failure to properly close either canopy causes the **CANOPY** caution light on the pilot caution/warning panel (fig 2-7) to illuminate. The two canopy panels on the left side are fixed and do not open.

2.8.3 Canopy Jettison System. The canopy jettison system provides rapid egress paths when the helicopter access door(s) are jammed or blocked. It consists of three **CANOPY JETTISON** handles and detonation cords installed around the periphery of each of the four acrylic side panels on the sides of the pilot and CPG stations. The pilot handle (fig 2-1) is located at the upper left corner of the pilot instrument panel (fig 2-7). The CPG handle (fig 2-1) is located at the upper left corner of the CPG panel (fig 2-8). The external ground crew handle is located under a quick-release panel directly forward of the CPG windshield (fig 2-2). When operated, the system severs the four side panels. To arm the system, a **CANOPY JETTISON** handle is rotated 90° left or right, which uncovers the word **ARMED** on both sides of the handle. To activate the system, the rotated **CANOPY JETTISON** handle is pushed in, detonating a primer/initiator within the handle. The primer/initiator ignites the detonation cord which, in turn, ignites and burns around the periphery of the side panels. The burning action cuts a fine line around the side panels, severing them from the fuselage.

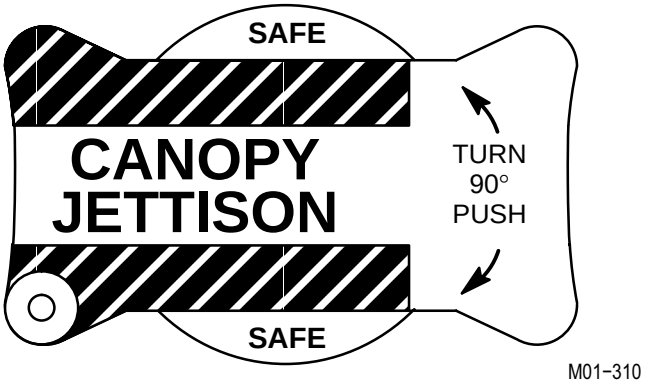
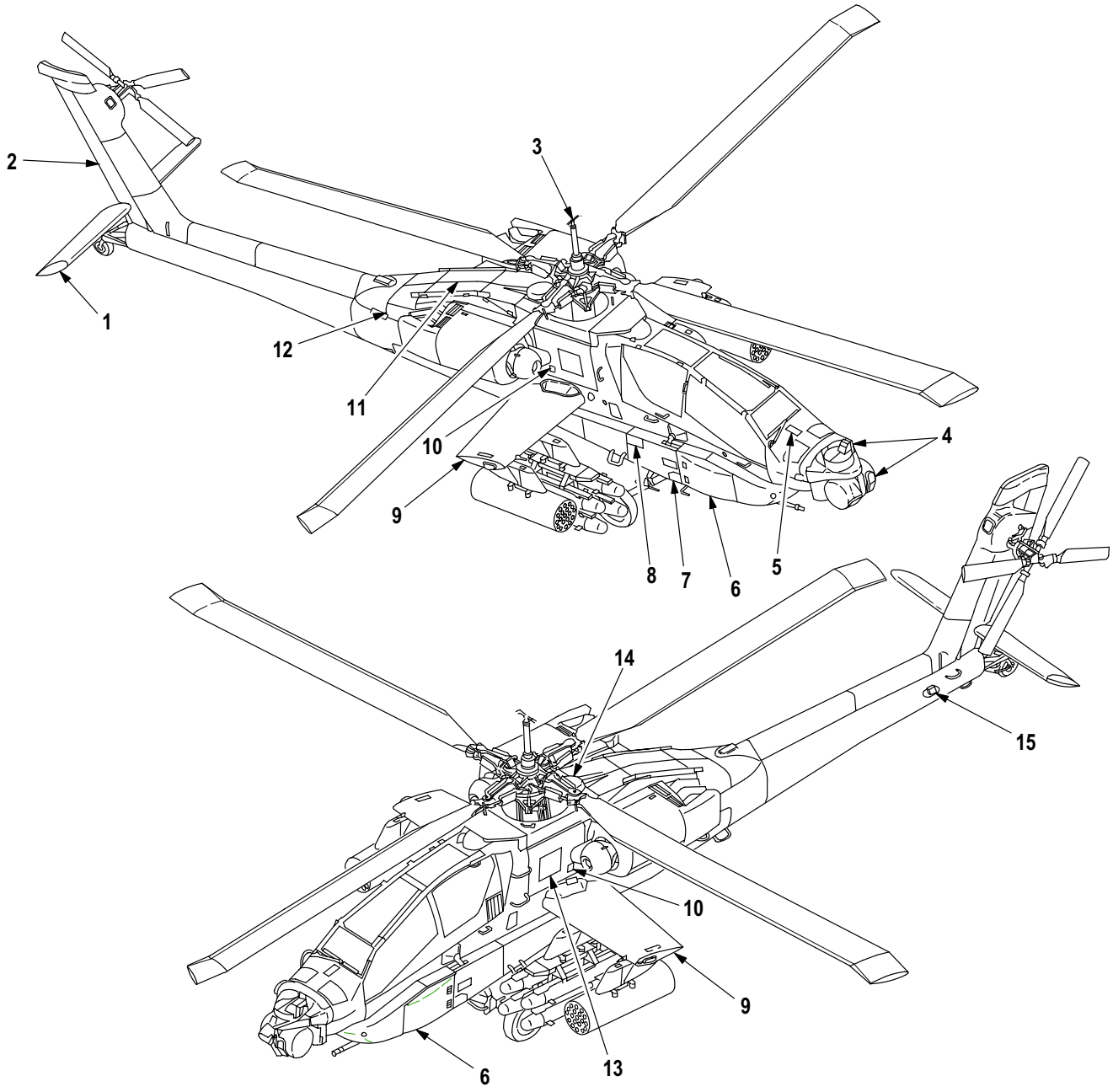


Figure 2-1. Canopy Jettison Handle



1. STABILATOR
2. VERTICAL STABILIZER
3. AIR DATA SENSOR
4. TADS AND PNVS TURRETS
5. CANOPY JETTISON HANDLE ACCESS DOOR
6. FORWARD AVIONICS BAY ACCESS DOOR
7. MOORING LUG ACCESS DOOR
8. FIRE EXTINGUISHER ACCESS DOOR
9. INTERCOMM ACCESS DOOR
10. MAIN TRANSMISSION OIL LEVEL SIGHT GAGE ACCESS DOOR
11. AFT EQUIPMENT BAY (CATWALK AREA) ACCESS DOORS
12. HYDRAULIC GROUND SERVICE PANEL ACCESS DOOR
13. HYDRAULIC OIL LEVEL SIGHT GAGE ACCESS DOOR
14. INFRARED COUNTERMEASURE DEVICE MOUNT
15. CHAFF PAYLOAD MODULE MOUNT

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Figure 2-2. General Arrangement (Sheet 1 of 2)