

**TECHNICAL MANUAL**

**AVIATION UNIT AND INTERMEDIATE  
MAINTENANCE MANUAL**

**VOLUME 9 OF 9**

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

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\* This manual together with TM 1-1520-238-23-1, 16 May 1994, TM 1-1520-238-23-2, 16 May 1994, TM 1-1520-238-23-3, 16 May 1994, TM 1-1520-238-23-4, 16 May 1994, TM 1-1520-238-23-5, 16 May 1994, TM 1-1520-238-23-6, 16 May 1994, TM 1-1520-238-23-7-1, 16 May 1994, TM 1-1520-238-23-7-2, 16 May 1994, TM 1-1520-238-23-8, 16 May 1994, supersedes TM 55-1520-238-23-1, 7 June 1988, TM 55-1520-238-23-2, 7 June 1988, TM 55-1520-238-23-3, 7 June 1988, TM 55-1520-238-23-4, 7 June 1988, TM 55-1520-238-23-5, 7 June 1988, TM 55-1520-238-23-6, 7 June 1988, TM 55-1520-238-23-7, 7 June 1988, TM 55-1520-238-23-8, 7 June 1988, TM 55-1520-238-23-9, 7 June 1988, TM 55-1520-238-23-10, 7 June 1988, including all changes.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**  
**16 MAY 1994**

## APPENDIX A REFERENCES

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### A.1. GENERAL REFERENCES

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This appendix contains a list of official publications applicable to unit and intermediate maintenance. The list includes official publications used for maintenance of the Army AH-64A helicopter.

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### A.2. REFERENCES

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■ AR 95-1	Flight Regulations
AR 750-1	Army Materiel Maintenance Policy and Retail Maintenance Operation
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts and Heraldic Items)
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 40-501	Hearing Conservation
DA PAM 738-751	Functional Users Manual for the Army Aviation Maintenance Management System-Aviation (TAMMS-A)
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DOD-HDBK-263	Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment; Excluding Electrically Initiated Explosive Devices
DOD-HDBK-SB708-3	DOD Ammunition Codes
DOD 4160.21-M-1	Defense Demilitarization Manual (Restructured)
FM 1-500	Army Aviation Maintenance
FM 1-511	Army Aircraft Quality Control and Technical Inspection
FM 1-513	Battlefield Recovery and Evacuation of Aircraft
FM 1-514	Fundamentals of Rotor and Power Train Maintenance Techniques and Procedures
FM 3-5	NBC Decontamination
FM 10-68	Aircraft Refueling
FM 21-11	First Aid for Soldiers

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**A.2 REFERENCES – continued**

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MIL-STD-12	Abbreviations for Use on Drawings, and in Specifications, Standards and Technical Documents
SB 11-642	Repair and Return Procedures Under Overhaul and Repair (O&R) for Electronic Altimeter Set, AN/APN-209(V)
TB MED-524	Occupational and Environmental Health Control of Hazards to Health from Laser Radiation
TB 9-1300-385	Munitions Restricted or Suspended
TB 43-0106	Aeronautical Equipment Army Oil Analysis Program (AOAP)
TB 55-1520-238-23	AH-64A Components Requiring Maintenance Management and Historical Data
TB 55-1520-238-23-1	Warranty Program for AH-64A Attack Helicopter
TB 55-8100-200-24	Maintenance of Specialized Reusable Containers for Aircraft Equipment
TB 55-9150-200-24	Engine and Transmission Oils, Fuels, and Additives for Army Aircraft
TM 1-1270-476-T	Aviation Unit Troubleshooting Manual for Target Acquisition Designation Sight (TADS) Assembly for Army AH-64A Attack Helicopter, AN/ASQ-170
TM 1-1270-476-20	Aviation Unit Maintenance Manual for Target Acquisition Designation Sight (TADS) Assembly for Army AH-64A Attack Helicopter, AN/ASQ-170
TM 1-1270-476-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools (Including Depot Level Parts) for Target Acquisition Designation Sight (TADS) Assembly, AN/ASQ-170
TM 1-1500-204-23	General Aircraft Maintenance Manual
TM 1-1500-250-23	Aviation Unit and Intermediate Maintenance Technical Manual for General Tiedown and Mooring on All Series Army Models AH-64, UH-60, CH-47, UH-1, AH-1, OH-58 Helicopters
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures
■ TM 1-1500-344-23	Aircraft Weapons System Cleaning and Corrosion Control
TM 1-1520-238-CL	Operator's Checklist for Army AH-64A Helicopter
TM 1-1520-238-MTF	Maintenance Test Flight Manual for Army AH-64A Helicopter
TM 1-1520-238-PM	Phased Maintenance Inspection Checklist for Army AH-64A Helicopter
TM 1-1520-238-PMS	AH-64A Helicopter 10 Hour/14 Day Inspection Checklist

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**A.2 REFERENCES – continued**


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TM 1-1520-238-T	Aviation Unit and Intermediate Troubleshooting Manual for Army Model AH-64A Helicopter
■ TM 1-1520-238-10	Operator's Manual for Helicopter, Attack, AH-64A Apache
TM 1-1520-238-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Parts List for Attack AH-64A Helicopter
TM 1-1520-264-23	Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) Manual for Nondestructive Inspection Procedures for AH-64A Helicopter
TM 1-2835-213-23	Aviation Unit and Intermediate Maintenance Manual for Engine Assembly Gas Turbine (GTCP 36-55H), PN 3800102-2
TM 1-5855-265-T	Aviation Unit Maintenance Manual for Pilot Night Vision Sensor (PNVS) Assembly for Army AH-64A Attack Helicopter, AN/AAQ-11
TM 1-5855-265-20	Aviation Unit Maintenance Manual for Pilot Night Vision Sensor (PNVS) Assembly, AN/AAQ-11 (AH-64A Attack Helicopter)
TM 1-6625-3081-23P	Organizational and Direct Support Maintenance Repair Parts and Special Tools List for Electronic Equipment Test Facility TADS/PNVS Augmentation Equipment
TM 1-8145-476-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List for Target Acquisition Designation Sight (TADS) Assembly and Pilot Night Vision Sensor (PNVS) Assembly Shipping and Storage Containers
TM 3-4240-312-12&P	Operator's and Unit Maintenance Aircraft Chemical-Biological Mask, M43 Type 1 (CBR Blower)
TM 9-1090-208-23-1	Aviation Unit and Intermediate Maintenance Manual for M139 Helicopter Armament Subsystem, M230 30-Millimeter Automatic Gun, M140 Inventory and Deployment for Rocket Management Subsystem
TM 9-1090-208-23-2	Aviation Unit and Intermediate Troubleshooting Manual for M139 Helicopter Armament Subsystem, M230 30-Millimeter Automatic Gun, M140 Inventory and Deployment for Rocket Management Subsystem
TM 9-1090-208-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for M139 Helicopter Armament Subsystem, M230 30-Millimeter Automatic Gun, M140 Inventory and Deployment for Rocket Management Subsystem
TM 9-1095-206-23&P	Aviation Unit Maintenance and Aviation Intermediate Maintenance Manual (Including Repair Parts and Special Tools List) for General Purpose Aircraft Dispenser, M130
TM 9-1230-476-20-1	Aviation Unit Maintenance Manual for Army AH-64A Helicopter Fire Control System
TM 9-1230-476-20-2	Aviation Unit Troubleshooting Manual for Army AH-64A Helicopter Fire Control System

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**A.2 REFERENCES – continued**


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TM 9-1230-476-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for AH-64A Helicopter Fire Control System Fire Control Computer, Air Data Processor, Multiplex Remote Terminal Unit Type I, Type II, Type III, Omnidirectional Air Speed Sensor, and HELLFIRE/MMS/TADS/HME/FCS (AH-64A Application) for Fire Control System
TM 9-1230-476-30	Aviation Intermediate Maintenance Manual for Army AH-64A Helicopter Fire Control System
TM 9-1270-221-CL	Operational Checklist for Army AH-64A Helicopter Fire Control Subsystem Helmet Directed M142 Integrated Helmet
TM 9-1270-221-23	Aviation Unit and Intermediate Maintenance Manual for Helmet Directed Fire Control Subsystem, M142
TM 9-1270-221-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Helmet Directed Fire Control Subsystem, M142
TM 9-1270-233-23&P	Aviation Unit and Intermediate Maintenance Manual (Including Repair Parts and Special Tools List) for Integrated Helmet Unit
TM 9-1270-476-30	Aviation Intermediate Maintenance Manual for Target Acquisition Designation Sight (TADS) Assembly, AN/ASQ-170 (AH-64A Attack Helicopter)
■ TM 9-1300-206	Ammunition and Explosives Standards
TM 9-1427-475-20	Aviation Unit Maintenance Manual for Army AH-64A Helicopter Hellfire Missile Equipment (Point Target Weapon System) and Helicopter Launcher Interface (Aircraft Guided Missile Launcher, M272)
TM 9-1427-475-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for AH-64A Helicopter Hellfire Missile Equipment, Pilot Missile Control Panel, CPG Missile Control Panel, and Remote HELLFIRE Electronics
TM 9-1427-475-30	Aviation Intermediate Maintenance Manual for Army AH-64A Helicopter Hellfire Missile Equipment
TM 9-4925-233-CL	Operator's Checklist for Army AH-64A Helicopter Box Magazine Ammunition Loader
TM 9-4925-233-13	Operator's Aviation Unit and Intermediate Maintenance Manual for Box Magazine Ammunition Loader (Loader/Downloader)
TM 9-4925-233-23P	Operator's Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Box Magazine Ammunition Loader

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**A.2 REFERENCES – continued**


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TM 9-4935-476-13	Operator's Aviation Unit and Intermediate Maintenance Manual for Army AH-64A Helicopter Captive Boresight Harmonization Kit
TM 9-4935-476-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Army AH-64A Helicopter Captive Boresight Harmonization Kit
TM 9-8145-476-23	Aviation Unit and Intermediate Maintenance Manual for Target Acquisition Designation Sight/Pilot Night Vision Sensor Assembly (TADS/PNVS) Shipping and Storage Containers
TM 11-1520-238-23-1	Aviation Unit and Intermediate Maintenance Manual for Army Model AH-64A Helicopter Avionics Configuration
TM 11-1520-238-23-2	Aviation Unit and Intermediate Troubleshooting Manual for Army Model AH-64A Helicopter Avionics Configuration
TM 11-1520-238-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Army AH-64A Helicopter Avionics Configuration
TM 11-5855-265-30	Aviation Intermediate Maintenance Manual for Pilot Night Vision Sensor (PNVS) Assembly, AN/AQQ-11 (AH-64A Attack Helicopter)
TM 11-5895-1184-23	Aviation Unit and Intermediate Maintenance Manual for Symbol Generator MX-10465/ASQ
TM 11-5895-1184-23P	Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Symbol Generator MX-10465/ASQ
TM 11-6140-203-14-1	Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Aircraft and Nonaircraft Nickel-Cadmium Batteries (General)
TM 11-6140-203-14-2	Aviation Unit and Intermediate Maintenance Manual for Aircraft Nickel-Cadmium Batteries
■ TM 11-6140-203-23	Aircraft Nickel Cadmium Batteries
TM 11-6605-300-23&P	Aviation Unit and Intermediate Maintenance Manual (Including Repair Parts and Special Tools List) for Attitude Heading and Reference System, AN/ASN-143
TM 11-6625-3081-23	Organizational and Direct Support Maintenance Manual for Electronic Equipment Test Facility TADS/PNVS Augmentation Equipment Volume I, Volume II, Volume III, Volume IV, and Volume V
TM 11-6625-3085-12-1	Operator and Aviation Unit Maintenance Manual (AVUM) Deployment, Operation, and Teardown Procedures for AH-64A Electronic Equipment Test Facilities (EETF)

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**A.2 REFERENCES – continued**

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TM 11-6625-3085-12-2	Operator and Aviation Unit Maintenance Manual (AVUM) Procedures Test Van and Support Van Test Facility for AH-64A Electronic Equipment Test Facilities (EETF)
TM 11-6625-3085-12-3	Operator and Aviation Unit Maintenance Manual (AVUM) Procedures for Peculiar Subsystem and System Interface Devices for AH-64A Electronic Equipment Test Facilities (EETF)
TM 11-6625-3085-30	Aviation Intermediate Maintenance Procedures AH-64 Electronic Equipment Test Facility (EETF) Volume I, Volume II, Volume III, Volume IV, and Volume V
TM 38-230-1	Packaging of Material Preservation (Vol. I)
TM 38-230-2	Packaging of Material Preservation (Vol. II)
TM 43-0001-39	Army Data Sheets for Cartridges, Cartridge Activated Devices, and Propellant Activated Devices
TM 43-0106	Engineering Series – General Data and Usage Factors of Aerospace Metals for Aircraft Repair
TM 55-1500-322-24	Maintenance of Aeronautical Antifriction Bearings for Organizational, Intermediate, and Depot Maintenance Levels
TM 55-1500-323-24	Installation Practices for Aircraft Electric and Electronic Wiring
TM 55-1500-335-23	Nondestructive Inspection Methods
TM 55-1500-342-23	Army Aviation Maintenance Engineering Manual for Weight and Balance
TM 55-1500-343-23	Organizational and Intermediate Avionics Cleaning and Corrosion Prevention/Control
TM 55-1500-344-23	Aircraft Weapons System Cleaning and Corrosion Control (Superceded by TM 1-1500-344-23)
TM 55-1500-345-23	Painting and Marking of Army Aircraft
TM 55-1520-238-CL	Operator's Checklist for Army AH-64A Helicopter (Superceded by TM 1-1520-238-CL)
TM 55-1520-238-MTF	Maintenance Test Flight Manual for Army AH-64A Helicopter (Superceded by TM 1-1520-238-MTF)
TM 55-1520-238-S	Preparation for Shipment for Army AH-64A Helicopter
TM 55-1520-238-10	Operator's Manual for Army AH-64A Helicopter (Superceded by TM 1-1520-238-10)
TM 55-1680-317-23&P	Organizational and Direct Support Maintenance Manual With Repair Parts and Special Tools List for Army Aircraft Survival Kits

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**A.2 REFERENCES – continued**

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TM 55-1730-229-12	Operator's and Organizational Maintenance Manual, Power Unit, Aviation, Multi-Output GTED Electrical, Hydraulic, Pneumatic (AGPU), Wheel Mounted, Self-Propelled, Towable, AC400Hz, 3 PH, 0.8 PF, 155/200 V, 30 KW, DC 28 VDC, 700 AMPS, 60 LBS/MIN. at 40 PSIG Hydraulic 15 GPM at 3300 PSIG
TM 55-2620-200-24	Inspection, Maintenance Instructions, Storage, and Disposition of Aircraft Tires and Inner Tubes
TM 55-2835-208-23	Aviation Unit and Intermediate Maintenance Manual for Gas Turbine Engine (Auxiliary Power Unit - APU) Model T-62T-40-1 Part Numbers 116305-100 and 116305-200 (NSN 2835-01-083-9978) and (NSN 2835-01-166-9129)
TM 55-2840-248-23	Aviation Unit and Intermediate Maintenance Manual for Turboshaft Aircraft Engine Models T700-GE-700, T700-GE-701, and T700-GE-701C
TM 55-4920-325-14&P	Operator's, Organizational, Direct, and General Support Maintenance Manual Including Repair Parts and Special Tools List for Fuel-Quantity-Gage Capacitance Type Test Set
TM 55-4920-334-14	Operator's Organizational, Direct Support, and General Support Maintenance Manual for Environmental Controls Test Set (A/E 24T-102)
TM 55-4920-334-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List for Environmental Controls Test Set (A/E 24T-102)
TM 750-244-1-5	Procedures for Destruction for Aircraft and Associated Equipment to Prevent Enemy Use



## APPENDIX B MAINTENANCE ALLOCATION CHART

### SECTION I. INTRODUCTION

#### B.1. MAINTENANCE ALLOCATION CHART

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Aviation Maintenance concept for Army aviation. These maintenance levels, Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM), and Depot Maintenance are depicted on the MAC as:

- (1) AVUM – corresponds to an O code in the Repair Parts and Special Tools List (RPSTL).
- (2) AVIM – corresponds to an F code in the Repair Parts and Special Tools List (RPSTL).
- (3) DEPOT – corresponds to a D code in the Repair Parts and Special Tools List (RPSTL).

b. The maintenance to be performed below depot and in the field is described as follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and equipped to perform high frequency “On-Aircraft” maintenance tasks required to retain or return aircraft to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of ground support equipment (GSE), facilities required, authorized manning strength, and critical skills available. The range and quantity of authorized spare modules/components will be consistent with the mobility requirements dictated by the air mobility concept. (Assignments of maintenance tasks to divisional company size aviation units will consider the overall maintenance capability of the division, the requirement to conserve personnel and equipment resources, and air mobility requirements.)

(a) Company Size Aviation Units: Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of aircraft operational readiness. Perform maintenance inspections and servicing to include preflight, daily, intermediate, periodic (or phased), and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, built-in test equipment (BITE), installed aircraft instruments, or test, measurement, and diagnostic equipment (TMDE). Replace worn or damaged modules/components that do not require complex adjustments or system alinement and which can be removed/installed with available skills, tools, and ground support equipment. Perform operational and continuity checks and make minor repairs to the electrical system. Inspect, service, and make operational, capacity, and pressure checks to hydraulic systems. Perform servicing, functional adjustments, and minor repair/replacement to the flight control, propulsion, power train, and fuel systems. Accomplish airframe repair that does not require extensive disassembly, jiggling, or alinement. The manufacture of airframe parts will be limited to those items which can be fabricated with tools and equipment found in current air mobile tool and shop sets. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(b) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters, and detachment size units are normally small and have less than 10 aircraft assigned. Maintenance tasks performed by these units will be those which can be accomplished by the aircraft crew chief or assigned aircraft repairman and will normally be limited to preventive maintenance, inspections, servicing, spot painting, module/component fault diagnosis, and replacement of selected modules/components. Repair functions will normally be accomplished by the support AVIM unit.

(2) Aviation Intermediate Maintenance (AVIM).

(a) Provides mobile, responsive "One Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.)

(b) May perform all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment.

(c) Establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level.

(d) Inspects, troubleshoots, performs diagnostic tests, repairs, adjusts, calibrates, and aligns aircraft system modules/components. AVIM units will have capability to determine the serviceability of specified modules/components removed prior to the expiration of the Time Between Overhaul (TBO) or finite life. Module/component disassembly and repair will support the DX program and will normally be limited to tasks requiring cleaning and the replacement of seals, fittings, and items of common hardware. Airframe repair and fabrication of parts will be limited to those maintenance tasks which can be performed with available tools and test equipment. Unserviceable repairable modules/components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance.

(e) Performs aircraft weight and balance inspections and other special inspections which exceed AVUM capability.

(f) Provides quick response maintenance support, including aircraft recovery and air evacuation, on-the-job training, and technical assistance through the use of mobile maintenance contact teams.

(g) Maintains authorized operational readiness float aircraft.

(h) Provides collection and classification services for serviceable/unserviceable material.

(i) Operates a cannibalization activity in accordance with AR 750-1. (The aircraft maintenance company within the maintenance battalion of a division will perform AVIM functions consistent with air mobility requirements and conservation of personnel and equipment resources. Additional intermediate maintenance support will be provided by the supporting nondivisional AVIM unit.)

**B.2. USE OF THE MAINTENANCE ALLOCATION CHART (SECTION II).****NOTE**

Approved item names are used throughout this MAC. Generic terms/nomenclatures (if any) are expressed in parentheses and are not to be considered as official terminology.

a. This Maintenance Allocation Chart assigns maintenance functions to the lowest level of maintenance, based on past experience and the following considerations:

- (1) Skills available.
- (2) Time required.
- (3) Tools and test equipment required and/or available.

b. Only the lowest level of maintenance authorized to perform a maintenance function is indicated. If the lowest maintenance level cannot perform all tasks of any single maintenance function (e.g., test, repair), then the higher maintenance level(s) that can accomplish additional tasks will also be indicated.

c. A maintenance function assigned to a maintenance level will automatically be authorized to be performed at any higher maintenance level.

d. A maintenance function that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the next higher maintenance level. Higher maintenance levels will perform the maintenance functions of lower maintenance levels when required by the commander who has the authority to direct such tasking.

e. The assignment of a maintenance function will not be construed as authorization to carry the related repair parts or spares in stock. Information to requisition or otherwise secure the necessary repair parts will be as specified in the associated Repair Parts, and Special Tools List (RPSTL).

f. Higher level of maintenance organization commanders may authorize deviation from the assigned level of maintenance on a case by case basis or for up to one year when the lower level maintenance organization meets the following requirements:

- (1) The lower level maintenance organization must possess the trained personnel capable of performing the work.
- (2) Inspection may be performed by the lower level when expertise is available (or provided by the higher level).
- (3) Special tools/test equipment must be available (if required) at the requesting unit or furnished by the higher level.

**B.3. MAINTENANCE FUNCTIONS.**

Maintenance functions will be limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

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

c. **Service.** Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. **Remove/install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of placing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of equipment or a system.

h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and assigned maintenance level is shown as the 3rd position code of the SMR code.

i. **Repair.** The application of maintenance services,<sup>1</sup> including fault location/troubleshooting,<sup>2</sup> removal/installation and disassembly/assembly procedures,<sup>3</sup> and maintenance actions<sup>4</sup> to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. **Rebuild.** Those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

#### B.4. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. **Functional Groups (Columns 1 and 2).** The functional groupings shown in the sample below identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

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<sup>1</sup>Services – Inspect, test, service, adjust, align, calibrate, and/or replace.

<sup>2</sup>Fault locate/troubleshoot – The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

<sup>3</sup>Disassemble/assemble – Encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the lowest level of component identified as maintenance significant (i.e., assigned an SMR code) for the level of maintenance under consideration.

<sup>4</sup>Actions – Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

GROUP NUMBER	DESCRIPTION
00	Aircraft System
01	Aircraft General Servicing, handling, inspection requirements, lubrication requirements, overhaul and retirement requirements, cleaning, mooring, towing, jacking, hoisting, preservation requirements, weight and balance requirements, spot painting, complete painting, and subassembly painting requirements.
02	Airframe Structure Fuselage, empennage, pylons, wings mounts (engine and transmission), armor, seats, ramps, decks, and tiedowns.
03	Landing Gear Landing gear, skids, floats, skis, struts, wheel brakes, and mechanical mechanisms.
04	Power Plant Removal, installation, cooling systems, air induction, exhaust, oil systems, components, ignition systems, power control, harnesses, carburetors, fuel controls, pumps (engine driven), filters/particle separators, and Quick Change Assemblies (QCA). (See Power Plant Items, figure 2, for more detailed functions.)
05	Propellers/Rotors Systems Propellers, governors, rotors (main and tail), hubs, blades, dampeners, stabilizer bars, and swashplates.

GROUP NUMBER	DESCRIPTION
06	Drive Train Systems Transmission, gearboxes, clutches, shafting, oil systems, bearings, hangers, oil tanks, and freewheeling units.
07	Hydraulic and Pneumatic Systems Pumps, filters, reservoirs, cylinders, valves, servos, motors, starters, and accumulators.
08	Instrument Systems. Flight instruments, navigation instruments, engine instruments, miscellaneous instrument (i.e. clocks) sending units, panels, and flow meters.
09	Electrical System Motors, actuators, regulators, generators, starters, batteries, lighting, caution and warning lights, inverters, fault isolation systems, rotor brakes, and avionics provisions.
10	Fuel Systems Tanks, cells, filters, pumps, valves, auxiliary fuel systems, and refueling systems.
11	Flight Controls System Control sticks, pedals, cables, pulleys, push-pull rods, torque tubes, quadrants, force gradients, control surfaces bellcranks, and trim actuators (mechanical).
12	Utility Systems Fire detecting/extinguishing systems, oxygen systems, windshield wiper systems, mirrors, and de-ice/anti-ice systems.

GROUP NUMBER	DESCRIPTION
13	Environmental Control Systems (ECS) Heaters, air conditioners, defrosters, control mixing valves, and ducts.
14	Hoists and Winches Cargo/rescue hoists, winches, hooks, slings, loading systems, and emergency release systems.
15	Auxiliary Power Unit (APU) Fuel, exhaust, and ducting.

GROUP NUMBER	DESCRIPTION
16	Mission Equipment Spraying equipment, stores, racks, armament, reconnaissance, photography pods, and litters.
17	Emergency Equipment Ejection seats, canopies, jettison system, portable fire extinguishers, axes, and first aid kits.
18	Installed Avionics Components Communications and navigational black boxes.

b. **Maintenance Function (Column 3).** Column 3 lists the functions to be performed on the items listed in column 2.

c. **Maintenance Levels (Column 4).** The maintenance levels AVUM, AVIM, and DEPOT are listed on the Maintenance Allocation Chart with individual columns that include the work times for maintenance functions at each maintenance level. Work time presentations such as "0.1" indicate the average time (expressed in man-hours in whole hours or decimals) it requires a maintenance level to perform a specified maintenance function. If a work time has not been established, the columnar presentation shall indicate "-.-". Maintenance levels higher than the level of maintenance indicated are authorized to perform the indicated function.

d. **Tools and Equipment Reference Code (Column 5).** Column 5 specifies, by code, those common tool sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designed function.

e. **Remarks Code (Column 6).** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

**B.5. EXPLANATION OF COLUMNS IN TOOLS AND TEST EQUIPMENT REQUIREMENTS, SECTION III.**

a. **Column 1, Tools and Test Equipment Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. **Column 2, Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3, Nomenclature.** Name or identification of the tool or test equipment.

d. **Column 4, National Stock Number.** The National Stock Number of the tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number.

**B.6. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.**

- a. **Column 1, Remarks Code.** The code recorded in column 6, Section II.
- b. **Column 2, Remark.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART (AVIATION)  
FOR  
AH-64A HELICOPTER

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL			(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			AVUM (O)	AVIM (F)	DEPOT (D)		
01	AIRCRAFT GENERAL						
0101	HELICOPTER, ATTACK	INSPECT	2.5			6, 25, 27, 28, 68, 70, 95, 129, 131, 137, 140, 154, 156, 162, 174, 188A, 192, 205, 209, 216, 220, 222, 232, 238, 262, 271, 276,354B 363, 364, 371, 373, 376, 396, 398, 399, 435, 436, 445, 447	
		SERVICE	0.1				
0102	HYDRAULIC SYSTEM INSTL	SERVICE	0.6			70, 137, 156, 222, 232, 364, 373, 376, 398, 399, 435, 447	
0103	BRAKE SYSTEM INSTL	SERVICE	2.0			27, 129, 131, 154, 216, 222, 399	
0104	FUEL SYSTEM INSTL	SERVICE	0.4			27, 129, 154, 222, 232, 262, 376	
0105	KIT, HYDRAULIC HOSES	REMOVE INSTALL	0.4 0.4			69, 376	



(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL			(5) TOOLS & EQUIP REF CODE	(6) REMARKS CODE
			AVUM (O)	AVIM (F)	DEPOT (D)		
02	AIRFRAME STRUCTURE	INSPECT		0.3	0.3	376	
0201	FORWARD FUSELAGE	REPAIR	1.1	16.4		27, 60, 102, 112, 154, 155, 163, 199, 213, 215, 245A, 262, 272, 284, 339, 376, 377, 378	A, AD, AF
020101	CONTROL, SURFACE, SUPPORT	REPAIR		1.2		27, 154, 262, 377, 435	
020102	FRAME INSTALLATION ASSEMBLY	REPAIR	1.1			377	A, D, I, J, K, U, AD, AF
020103	FLOOR INSTALLATION ASSEMBLY	REPAIR	0.6	0.7		27, 50, 112, 154, 155, 163, 213, 262, 377	A, AD, AF
020104	FLOOR INSTALLATION ASSEMBLY	REPAIR	0.6	0.7		376	A, AD, AF
020105	COVER, ACCESS	REMOVE INSTALL REPAIR	0.5 0.5 1.1			377	
020106	COVER, ACCESS	REMOVE INSTALL REPAIR	0.2 0.2 0.4			377	
020107	COVER, ACCESS	REMOVE INSTALL REPAIR	0.2 0.2 0.4			377	
020108	DOOR, ACCESS	REMOVE INSTALL REPAIR	0.2 0.2 0.5			377	