FM 3-04.500

Army Aviation Maintenance

August 2006

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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Field Manual
No. 3-04.500

Headquarters
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Army Aviation Maintenance

Contents

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Preface

Field Manual (FM) 3-04.500 introduces new doctrinal guidance to all aviation maintainers concerning aviation maintenance structure, organizations, and functions. The intended audiences for this manual are aviation maintenance commanders/leaders, officers/technicians, noncommissioned officers in charge (NCOICs), and aircraft repair and maintenance personnel. Chapters 1 through 10 provide maintainers with new doctrinal guidance on maintenance fundamentals, levels, and structures; maintenance and logistics management systems and operations to include automated systems; aviation maintenance/materiel officer duties and responsibilities; aviation logistics, quality control, production control, and component and airframe repair management and operations; and emerging concepts. Appendixes A through U provide aircraft maintainers with a wide range listing of supplemental topics to facilitate equipment support, field maintenance, and logistics management.

Warfighting is the Army's primary focus. Army aviation is strategically responsive, prepared to conduct prompt and sustained operations as part of joint, interagency, and multinational (JIM) teams. Army aviation, as a maneuver force, provides a third dimensional capability to the mobility of the land force.

Aviation maintenance support has never been more critical than in today's fluid contemporary operating environment (COE), where complex aircraft assets are continuously used at a high operational tempo (OPTEMPO). Today's technically complex aircraft demand equally experienced aircraft maintenance managers to continue providing quality maintenance and logistics management to their aircraft maintenance programs. The ability of an aviation unit to perform its wartime mission is numerically represented by its aircraft operational readiness rates. Higher operational readiness rates are a direct result of effective maintenance and logistics management by all aviation maintenance commanders/leaders, officers, technicians, and NCOICs.

Maintenance is critical for all aircraft weapon platforms, systems, subsystems, and aviation ground support equipment. The failure of an operating aircraft system or subsystem, resulting from improper maintenance procedures, can have catastrophic and deadly consequences to personnel and equipment. Aviation maintainers must adhere to the latest applicable aircraft technical manuals (TMs) and references when conducting maintenance on their assigned aircraft.

With modularity, each aviation maintenance company (AMC) and aviation support company (ASC) now possesses the capability to conduct split-based operations within a single theater of operations. Each AMC is responsible for performing field maintenance on its assigned/attached aircraft. ASCs assigned to aviation support battalions (ASBs) provide field maintenance support by conducting intermediate aviation maintenance according to the maintenance allocation chart (MAC).

Unless otherwise stated or made obvious by the context, use of the terms battalion or company also refer to squadron or troop. Similarly, the use of the term aviation maintenance company, or AMC, also refers to aviation maintenance troop (AMT).

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the United States Army Reserve unless otherwise stated.

The proponent of this publication is the United States Army Training and Doctrine Command (TRADOC). Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, United States (US) Army Aviation Warfighting Center, ATTN: ATZQ-TDD, Fort Rucker, AL 36362-5000.

> ***Note.*** For immediate assistance on issues affecting this FM, contact the Directorate of Training and Doctrine (DOTD), Doctrine Division, at DSN 558-1183/9350, commercial 334-255-1183/9350, or via e-mail at av.doctrine@us.army.mil.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

This publication has been reviewed for operations security considerations.

Chapter 1

Maintenance Fundamentals

This chapter covers basic doctrinal procedural guidance and maintenance fundamentals for aviation units on the battlefield. It discusses efficient and effective combat service support (CSS) functions needed by aviation units to conduct operations while sustaining optimum combat capability. Army aviation is a critical combat multiplier on the battlefield. The mission of Army aviation is to find, fix, and destroy the enemy through fire and maneuver and to provide combat, combat support (CS), and CSS functions in coordinated operations as an integral member of the combined arms team. Today's technically complex aircraft require equally robust maintenance, repair, and ground support equipment. To ensure that vital assets remain ready to fight, a well thought-out aviation maintenance management program must be in place. Aviation transformation infrastructure has evolved from years of peacetime and combat operational experience. History has shown that experienced maintenance managers who operated and maintained an effective, fluid maintenance program were able to adapt to the complexities and challenges of an unprecedented OPTEMPO and maximized Army aviation's contribution to the battlefield.

SECTION I – MAINTENANCE OPERATIONAL SUPPORT

Contents

1-1. The Army's maintenance program is broken down into two levels of maintenance: field-level maintenance and sustainment-level maintenance. These levels of maintenance support and span all three levels of war: tactical, operational, and strategic.

1-2. The goal of the operational maintenance plan is to support the operations and objectives of the aviation maneuver commander. The primary purpose of the maintenance plan is to enable maintainers to provide field maintenance and maximize the number of operational aircraft available to support the tactical battle.

1-3. Commanders tailor and position maintenance assets and capabilities within their assigned area of operations (AOs) to best support the mission. The maintenance-supply interface at the operational level is the fusion point between the field and sustainment maintenance management echelons. Maintenance managers in operational headquarters support the tactical battle by ensuring that the maintenance system supports campaigns and sustains theater forces.

CSS IMPERATIVES

1-4. Sustaining the battle requires aviation commanders and staffs to adhere to the CSS characteristics: responsiveness, simplicity, flexibility, attainability, sustainability, survivability, economy, and integration. These characteristics apply, across the range of military operations, to units conducting offense, defense, and stability and civil support operations. FM 1, FM 3-0(FM 100-5), FM 3-07, and FM 4-0(FM 100-10) cover these in detail.

RESPONSIVENESS

1-5. Responsiveness is the key characteristic of CSS. It means providing the right support in the right place and at the right time and being able to meet changing requirements on short notice. Responsiveness includes the ability to anticipate operational requirements. Aviation logisticians must anticipate future events and requirements by understanding the aviation maneuver commander's plan and by foreseeing events as operations unfold.

1-6. While continuing to support current operations, they must plan for future operations and attempt to foresee unexpected changes during the course of the conflict. This planning involves identifying, accumulating, and maintaining the required assets, capabilities, and information necessary to meet maintenance and logistics support requirements.

SIMPLICITY

1-7. Simplicity means avoiding complexity in both planning and executing aviation maintenance and logistics operations in support of CSS operations. Mission orders, drills, rehearsals, and SOPs contribute to simplicity.

FLEXIBILITY

1-8. Flexibility derives from the expertise in adapting logistics structures and procedures of CSS to changing situations, missions, and concepts of operations. Logistics plans and operations must be flexible enough to achieve both responsiveness and economy. Flexibility may include improvisation. Improvisation is the ability to make, invent, or arrange for what is needed from what is at hand. Improvised methods and support sources can maintain CSS continuity when the preferred method is undefined or not usable to complete the mission.

ATTAINABILITY

1-9. Attainability is generating the minimum essential supplies and services necessary to begin operations. Commanders determine the minimum levels of support considered to be acceptable to initiate operations.

SUSTAINABILITY

1-10. Sustainability is the ability to maintain continuous support during all phases of conflicts and major operations. Aviation logistics planners anticipate logistics requirements over time and synchronize the delivery of minimum sustainment stocks and levels to sustain ongoing operations or missions.

SURVIVABILITY

1-11. Commanders must determine how much of their logistical support assets should be relegated to combat support operations. The larger the number of aviation support Soldiers committed to security and combat support operations, the less effective maintenance and support operations become. The commander must weigh the threat against levels of support required and determine acceptable levels of risk. In some cases, ground forces may be required to augment CS operations. Being able to protect support functions from destruction or degradation equates to survivability. Robust and redundant support contributes to survivability but may run counter to economy of operations.

ECONOMY

1-12. Resources are always limited. Economy means providing the most efficient support to accomplish the mission. Commanders must consider economy in prioritizing and allocating resources. Economy reflects the reality of resource shortfalls, while recognizing the inevitable friction and uncertainty of military operations. Emerging information technologies, with modern software packages, continue to enhance the economy of aviation units' critical assets resources.

INTEGRATION

1-13. Integration consists of synchronizing CSS operations with all aspects of Army and JIM operations. Effective maintenance and logistics support can be achieved only through a thorough understanding of the maneuver commanders' intent and synchronization of their concept of operations and planning. Aviation logistics is an integral part of aviation operations at all levels. Integrating CSS operations with the operations of the aviation force is critical to mission success. Aviation maintenance units must be organized to execute "fix forward" maintenance procedures under a split-based operations concept.

FUNCTIONAL RESPONSIBILITIES

1-14. The functional responsibilities of Army aviation maintenance activities are to—

- Provide safe, reliable, and fully mission capable (FMC) aircraft to the user.
- Sustain materiel in an operational status and/or restore equipment to an FMC condition.
- Enhance or upgrade aircraft functional usefulness through MWOs, materiel changes, and product improvement.

PROGRAM OBJECTIVES

1-15. The program objective of Army aviation maintenance is to provide robust modular maintenance and logistics support to aviation weapon systems' end-item users. This support includes, but is not limited to, repair of airframes, engines, aircraft subsystems, avionics, communications, navigation, aircraft survivability equipment (ASE), aerial weapon systems, and fire control/fire direction items. It also provides CSS functions for other airborne mission equipment packages that support the total aviation weapons system life cycle.

MAINTENANCE SUPPORT CONCEPT

1-16. The maintenance support concept to accomplish these objectives will make the transition from its current three levels of aviation maintenance to the two-level maintenance structure. The two-level Army aviation maintenance structure consists of field- and sustainment-level maintenance.

1-17. The restructured aviation levels of maintenance reduce redundant echelons of pass-back aviation maintenance to tailored, robust, and mobile aviation maintenance units. This modular maintenance concept allocates personnel, tools, and equipment resources where they are most effective. This change will result in a robust aviation maintenance operation. The goal is to eliminate redundancy, where possible, while retaining core capabilities. These long-term efforts will culminate in significant reductions to the aviation logistics tail.

SECTION II – MAINTENANCE OBJECTIVES

1-18. Maintenance is a combat multiplier. When opposing forces have relative parity in numbers and quality of equipment, the force that combines skillful use of equipment with an effective maintenance program has a decided advantage. That force has an initial advantage if it enters battle with equipment that is operational and likely to remain operational. It has a subsequent advantage if it can quickly return damaged and disabled equipment to the battle. Securing this advantage is the purpose of a maintenance system.

1-19. A maintenance manager's objective is to maintain readiness at the optimal level with the least expenditure of resources. Managers must decide which resources are needed to support specific mission requirements and advise the commander on the logistics effect of various courses of action (COAs).

1-20. Maintenance management deals with the following factors affecting the unit mission:

- Command emphasis/intent.
- Day-to-day management skills.
- Supervision.

- Motivation.
- Technical skills.

1-21. Managers use these factors to channel maintenance efforts. Failure to achieve desired results often stems from failure in one or more of these areas.

COMMAND EMPHASIS

1-22. The commander sets the tone for what is important within the command. The personal example of leaders shows their concern for specific aspects of the unit's mission. The Soldiers in the command translate this concern into action. To place command emphasis on maintenance operations, the commander shows an active interest in these operations and in the materiel readiness of unit equipment. Maintenance managers use command emphasis to influence the support mission although they may not be in the chain of command. Commanders need to balance mission, security, training, and administrative requirements to form a cohesive unit.

MANAGEMENT SKILLS

1-23. Maintenance managers continually strive to improve their operations. Because the management process itself plays a key role in maintenance operations, managers should always look for ways to improve planning, organizing, coordinating, directing, and controlling. Managers must also look for ways to be proactive (influencing events before they happen) rather than reactive (reacting to events as they happen). Feedback and after-action reports (AARs) are also vital tools used by maintenance managers.

1-24. Under the stress of day-to-day operations, these elements may lose visibility and may not seem to have a direct bearing on materiel readiness. However, small improvements in the overall system produce greater results than a concentrated effort directed toward one or more areas. The maintenance manager must be careful that changes to maintenance operations do not undermine other initiatives established by the commander.

SUPERVISION

1-25. First-line supervisors are the vital link in the chain of command. Supervisors are the commander's first line of defense in the prevention of accidents. The prevention of accidents through composite risk management reduces or eliminates lost man-hours. Reducing or eliminating lost man-hours will, in turn, increase available manpower to execute the unit's maintenance mission. The commander depends on first-line supervisors to accomplish the day-to-day mission and to ensure the welfare of the troops.

1-26. First-line supervisors receive instructions and turn them into tangible results. Passing along the commander's requirements is only a small part of their responsibilities. Their major challenge lies in ensuring that the people who they supervise accomplish the mission correctly the first time. First-line supervisors are the individual Soldier's primary source of assistance and further professional development. These supervisors need to know the standards and objectives set by the chain of command to direct their Soldiers' efforts.

1-27. First-line supervisors must be aware of mission requirements and the capabilities and limitations of the Soldiers under their control. They must continuously train their subordinates to support the needs of the battlefield. Next to the mission, the welfare of Soldiers and their professional development are paramount in the supervisor's mind.

MOTIVATION

1-28. Motivation is the need instilled in an individual to perform designated tasks. The leadership demonstrated by commanders and supervisors greatly influences the motivation of Soldiers. Effective leadership is essential to motivation. Effective leaders define objectives, communicate them, evaluate how well they are achieved, and provide feedback to Soldiers doing the work. Maintenance managers often underestimate the importance of this process. Most Soldiers want to perform well, but they must know the objectives and standards and receive performance feedback. Superior achievement must be recognized, and substandard performance must be corrected.

TECHNICAL SKILLS

1-29. Technical skills involve the ability to perform tasks associated with duty positions. On-the-job training (OJT) enhances these technical skills. A technically and tactically trained Soldier is one of the commander's most important assets. When the battle begins, untrained maintainers will be of little use to the commander. The commander must continuously strive for high levels of training so that he can provide adequate maintenance support to operational units.

1-30. The Army training system depends on the unit commander's continuing the training process begun during advanced individual training (AIT). Training resources must be identified and made available to ensure quality training for all assigned Soldiers. The commander and the maintenance manager must use these resources to maximum advantage. To a maintenance company commander, training on technical tasks is as important as training on tactical skills. Mission training plans (MTPs) and Soldier training publications (STPs) establish the requirements for technical maintenance training.

1-31. Contract maintenance, although a valuable commodity to unprecedented OPTEMPO demands, can potentially diminish Soldier technical skills if improperly managed. Overreliance on contractor maintenance may continue to erode Soldiers' experience level. The loss of maintenance experience will negatively affect all aviation Soldiers as they progress to higher levels of responsibility. Every experience gained by today's Soldiers enhances their future leadership qualities and capabilities.

1-32. All aviation commanders must understand that maintenance tasks completed by contractors diminish training opportunities for assigned Soldiers and their supervisors. When practical, commanders/leaders should coordinate and create training opportunities involving Soldiers, as well as contractors, performing maintenance procedures.

SECTION III – MAINTENANCE PRINCIPLES

POSITIONING MAINTENANCE SUPPORT ASSETS

1-33. The nature of the modern battlefield demands that aircraft be repaired quickly and as far forward as possible. This requirement implies a forward thrust of maintenance within the combat aviation brigade (CAB) area of operations within the corps, division, and brigade combat team (BCT). Maintenance assets will move as far forward as the tactical situation permits to repair unserviceable and damaged aircraft to return them to the battle as quickly as possible.

1-34. The type and location of maintenance units that best support the commander's requirements are of prime concern to the aviation logistician. A viable maintenance system complements the capabilities of the supply system. When equipment is in short supply or otherwise unavailable to support requirements, commanders use the maintenance system to offset the shortfall. As equipment becomes complicated and technically advanced, it is easier to meet surge requirements by redirecting the maintenance effort than by influencing the supply effort.

1-35. Therefore, the job of maintenance managers, at all levels, is to ensure the proper mix (type and location) of maintenance support that best supports the tactical and operational commanders' requirements. In addition, early arrival of essential maintenance capabilities for force projection operations ensures that deployed aircraft are operational upon arrival into a theater of operations.

AVIATION PLANNING AND EXECUTION

1-36. Field maintenance operations must be conducted according to Army regulatory policies and procedures. An aviation maintenance unit relies on an efficient and effective maintenance program. A sound maintenance program, at its core, has a dedicated group of maintainers and technicians who take a simple approach to the planning and execution of scheduled and unscheduled maintenance.

1-37. This simple maintenance approach takes into consideration the following elements: problem, plan, people, parts, time, and tools (P4T2). P4T2 (Figure 1-1) provides a method of planning and a management tool for leaders at all levels. This management tool serves as a common-sense platform for effective leadership, oversight, and management of maintenance. Planning is a continuous process that must be continually updated, checked, and rechecked. P4T2 evolved within the aviation community from a simple concept of time, tools, and troops. Maintenance managers must devise a comprehensive maintenance program that considers the supported unit's assigned mission, OPTEMPO, and COE.

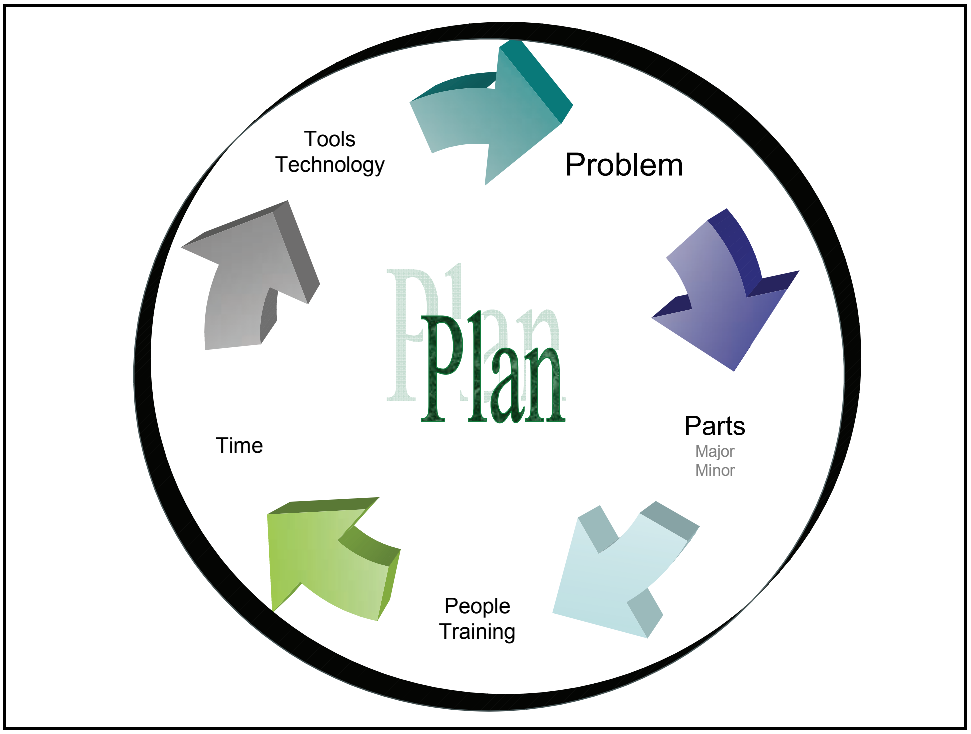

Figure 1-1. P4T2

SECTION IV – PROBLEM, PLAN, PEOPLE, PARTS, TIME, AND TOOLS

1-38. A comprehensive maintenance program will take into consideration all of the following: the problem, plan, people, parts, time and tools (P4T2).

IDENTIFICATION OF THE MAINTENANCE PROBLEM

1-39. The maintenance event or problem must first be identified (Figure 1-2). This process can be as simple as identifying a particular scheduled maintenance event, such as a 300-hour service that an assigned/attached aircraft is approaching, or replacing rivets in a driveshaft cover.

1-40. While conducting scheduled and unscheduled maintenance, maintenance managers or maintainers may encounter problems. Unanticipated/unscheduled maintenance may surface, affecting a mission after the mission has been accepted and planned for execution. Similarly, maintenance teams, when conducting scheduled maintenance (phase maintenance), may encounter problems that hinder timely completion of a scheduled maintenance phase.

Problem: 300-Hour Inspection
Plan:
People:
Parts:
Time:
Tools:

Figure 1-2. Identify the problem

1-41. When unforeseen problems are encountered during unscheduled maintenance, operational readiness and mission accomplishment will be hindered. Likewise, unforeseen problems encountered during scheduled maintenance will affect units' operational readiness rates. Maintenance managers must devise a maintenance plan that returns unserviceable (scheduled/unscheduled) aircraft to an FMC status.

1-42. Prescribed troubleshooting procedures are the first maintenance task that the crew and maintenance personnel must complete to standard, particularly during unscheduled maintenance:

- Are maintainers diagnosing the faults using established troubleshooting procedures?
- Are the components causing the aircraft fault properly identified and repaired?

1-43. Disciplined use of TMs and adherence to troubleshooting procedures and MACs are critical to aircraft readiness rates. Incorrect diagnosis at the start of maintenance troubleshooting procedures will waste time, repair parts, and ultimately, affect Class 9 (Air) budgets. If the maintainers cannot diagnose the problem, experts (maintenance officers/technicians, technical representatives, and aircraft maintenance contractors) should be involved early.

1-44. The ASB's ASC maintenance support personnel or logistics assistance representatives (LARs) will assist when requested. They will also provide maintenance support throughout the troubleshooting process.

MAINTENANCE PLANNING

1-45. Planning involves implementing measures and devices to correct the problem without discontinuing the mission. The unit's maintenance SOP and company maintenance plan are the first steps toward ensuring a solid basis for quality control. The PC officer, in planning maintenance, will ask—

- How will we accomplish the task?
- What is the maintenance plan for performing the task to completion?
- Who is responsible for performance of the task?
- Can the maintenance be performed by the owning unit, or will it have to be performed by the AMC or ASC?
- Can the maintenance be performed on site, or must the aircraft be relocated?

1-46. Commanders/leaders, maintenance officers, maintenance technicians, and supervisors must enforce and execute a detailed, well thought-out maintenance plan. The maintenance plan is continuously reviewed and updated. The planning process continues until the task or event is resolved (Figure 1-3).

1-47. The maintenance plan for scheduled services must contain adequate details to ensure uniformity. Such details could include the maintainer—

- Reviewing the maintenance task.
- Anticipating mandatory replacement parts.
- Gathering all of the parts in one location.
- Ensuring that required consumable material is on hand.
- Ensuring that all tools are available in sufficient quantity and type.
- Ensuring, if required, that calibration is current.

PROBLEM: 300-HOUR INSPECTION

PLAN: DEVELOP, CHECK, CHECK AND RECHECK

PEOPLE:

PARTS:

TIME:

TOOLS:

Figure 1-3. Develop the plan

1-48. Planning for unscheduled maintenance takes place after the fault is identified. This planning is a team effort and is conducted like any other battle drill. Together, the platoon leaders and company maintenance personnel must quickly identify necessary resources needed to do the job. Junior leaders can initiate the planning process simply by asking and obtaining answers to P4T2 questions outlined in this chapter.

1-49. Another aspect of planning includes having an adequate number of maintainers on hand to conduct the maintenance (scheduled/unscheduled). The maintenance manager and commander should deconflict maintenance events and required training—such as weapons qualification, APFT, airborne operations, and driver training—when they are preparing for major maintenance events.

1-50. If the primary stock number is not available, check Federal Logistics (FEDLOG) data for substitute or interchangeable stock numbers. In some cases, parts, components, and common hardware may have multiple stock numbers because more than one manufacturer produces the same part.

1-51. Technical supply coordinates with the supply support activity (SSA) to see if parts/components are available locally**.** If the part is not available at the SSA, check with other aviation units or activities. PC coordinates with similar units with the same mission design series (MDS) aircraft to see if parts are available**.** Production control (PC) also coordinates with quality control (QC), CRP, ARP, and flight companies to work after normal duty hours if extended maintenance is required.

1-52. PC should coordinate with the ASC at the ASB for maintenance support or with contractor field service representatives (CFSRs), maintenance contractors, and LARs for assistance and guidance on accomplishing repair and ordering parts/components if necessary**.**

PEOPLE REQUIRED TO PERFORM MAINTENANCE

1-53. Maintenance managers should consider whether they have adequately trained maintenance personnel in sufficient numbers to do the job. In the development stage of the plan, they should include the people and parts to correct the aircraft fault (Figure 1-4). Maintenance managers will assess available resources to ensure that adequately trained personnel and the required level of expertise are available. Trained personnel will have the military occupational specialty (MOS) classification or additional skill identifier authorizing them to perform the repairs.

1-54. The MAC in the prescribed technical manual will show the level of maintenance required to perform repairs. Driven by the MAC, the maintenance manager will determine if repairs can be done internally (AMC) or externally (ASC/contractors) (see Figure 1-5). The manager will determine if adequately trained personnel are available to perform those repairs.

1-55. The platoon leaders and platoon sergeants enforce supervision requirements. Supervision is an on-going process and must be accomplished throughout the entire phase of the repair. Section sergeants are responsible for the direct supervision of maintenance personnel who are performing specific jobs or repairs.

1-56. AMC and ASC commanders and first sergeants (1SGs) must continually manage the use of low-density MOS Soldiers. Leaders should ensure that the priority is for Soldiers to perform jobs that hone their technical skills instead of working on nonjob-related details or duties.

PROBLEM: 300-HOUR INSPECTION

PLAN: DEVELOP, CHECK, CHECK AND RECHECK

PEOPLE: TEAM ASSIGNMENT

PARTS:

TIME:

TOOLS:

Figure 1-4. Identify the people

1-57. At every opportunity, new Soldiers should be placed with more experienced ones to conduct specific tasks. This training practice will ensure that the new Soldiers get the training and experience that they need to perform the task on their own in the future.

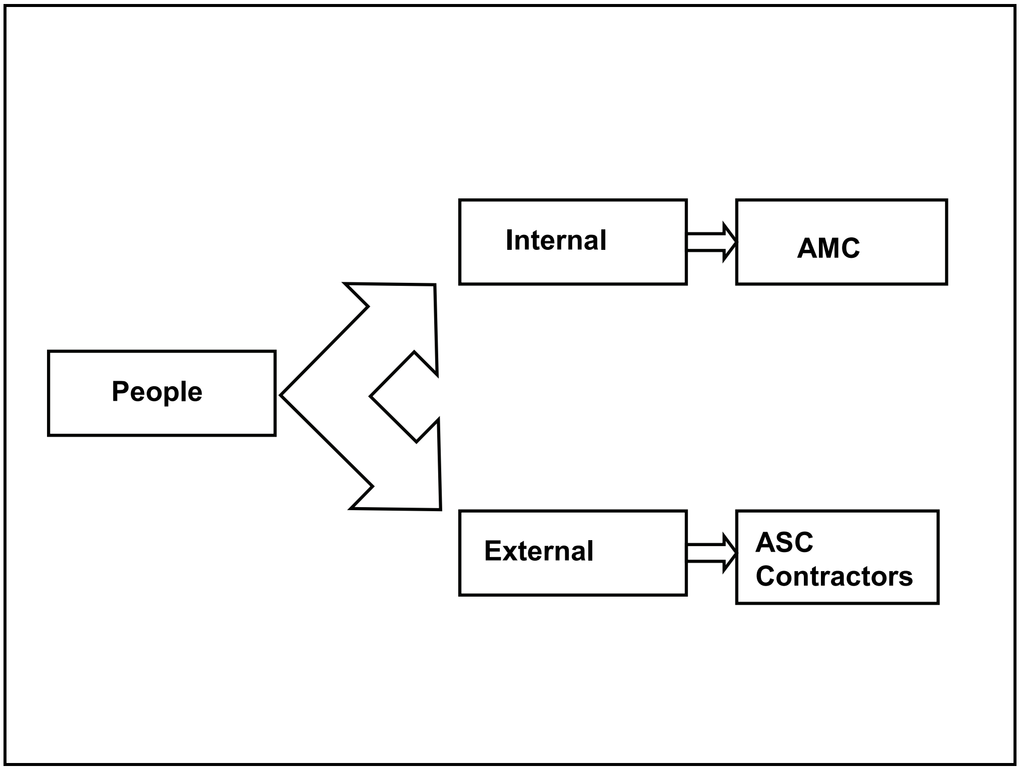

Figure 1-5. People: internal versus external

PARTS REQUIRED TO PERFORM MAINTENANCE

1-58. Before performing maintenance, PC section personnel should ask themselves, "Do we have the correct type and quantity of parts to complete the maintenance task?" Parts assessments are necessary to determine what is required and available to correct deficiencies (Figure 1-6). An assessment of all required parts, to include all associated common hardware, is essential. A forgotten small piece of common hardware will have the same nonmission capable effect as the lack of a major component.

1-59. Having the correct type and quantity of parts on-hand is critical to the timely completion of any repair task or service. Junior leaders must check with aviation logistics/technical supply personnel to determine if needed aircraft repair parts are available. If parts/components are not available, a request for the necessary parts/components must be processed immediately.

1-60. Before beginning scheduled maintenance events, to reduce not mission capable supply (NMCS) time, PC will ensure that owning unit personnel order time-change components with ample lead time. The timing and coordination of known replacement parts and components are essential to the reduction of maintenance down time.

> ***Note.*** QC personnel will notify maintenance officers and NCOs when 100 hours remain until replacement of hourly components and/or when two months remain until replacement of calendar components.

PROBLEM: 300-HOUR INSPECTION

PLAN: DEVELOP, CHECK, CHECK AND RECHECK

PEOPLE: TEAM ASSIGNMENT

PARTS: 300 SERVICE PACK

TIME:

TOOLS:

Figure 1-6. Identify the parts

1-61. Crew chiefs and maintenance personnel must accurately identify the correct types and quantities of parts/components required to facilitate the maintenance action. If repairs are beyond their capability, then a DA Form 2407-E (Maintenance Request) is generated by ULLS-A and submitted to the ASC PC for support.

1-62. Prompt submission of an ULLS-A generated DA Form 2407-E to a higher-level maintenance support is essential to facilitate ASC personnel in acquiring the necessary parts. This same form can be used by ASC maintainers to record accomplishment of maintenance requested on the work order.

1-63. Aircraft maintainers and crew chiefs must ensure that removed components are properly cleaned and inspected to determine serviceability. They must properly tag and store serviceable parts removed from an aircraft and inspected by a technical inspector to ensure that parts are on-hand and serviceable when it is time to reinstall them. In addition, aircraft maintainers and crew chiefs must properly tag unserviceable components, have QC technically inspect and sign the tag, and promptly turn in components to the aviation logistics/technical supply section.

1-64. Maintenance managers will encounter maintenance or logistics challenges that may, ultimately, affect the unit's assigned mission. Maintenance managers must consider time and tools to minimize or eliminate these challenges.

TIME ALLOCATED FOR MAINTENANCE ACTION

1-65. Maintenance managers should consider the following questions when conducting maintenance procedures:

- How much time is the maintenance action going to take (Figure 1-7)?
- Do we have the time free from detractors to effect the repair?
- How much time is adequate to complete the maintenance tasks?

1-66. For the maintenance manager, time is of the essence and critical to mission accomplishment**.** Maintenance managers must evaluate time constraints with the unit's assigned mission to determine if the available time to accomplish a maintenance repair is adequate (Figure 1-8).

1-67. The estimated completion date of maintenance that will bring aircraft to a mission capable (MC) status is crucial in forecasting combat power within the battalion in support of the CAB. Time management is critical in maintenance operations. Leaders must allow adequate time for aircraft maintainers to perform maintenance on the equipment.

PROBLEM: 300-HOUR INSPECTION

PLAN: DEVELOP, CHECK, CHECK AND RECHECK

PEOPLE: TEAM ASSIGNMENT

PARTS: 300 SERVICE PACK

TIME: EST. TIME

TOOLS:

Figure 1-7. Identify the time

1-68. If additional problems are identified or shortages of resources occur that result in an extension of the estimated completion date, platoon leaders must inform the PC officer immediately. Ensuring that the PC officer and brigade/battalion aviation maintenance officer (BAMO) are aware of unforeseen maintenance problems is critical, especially when the unit's capabilities are exceeded.

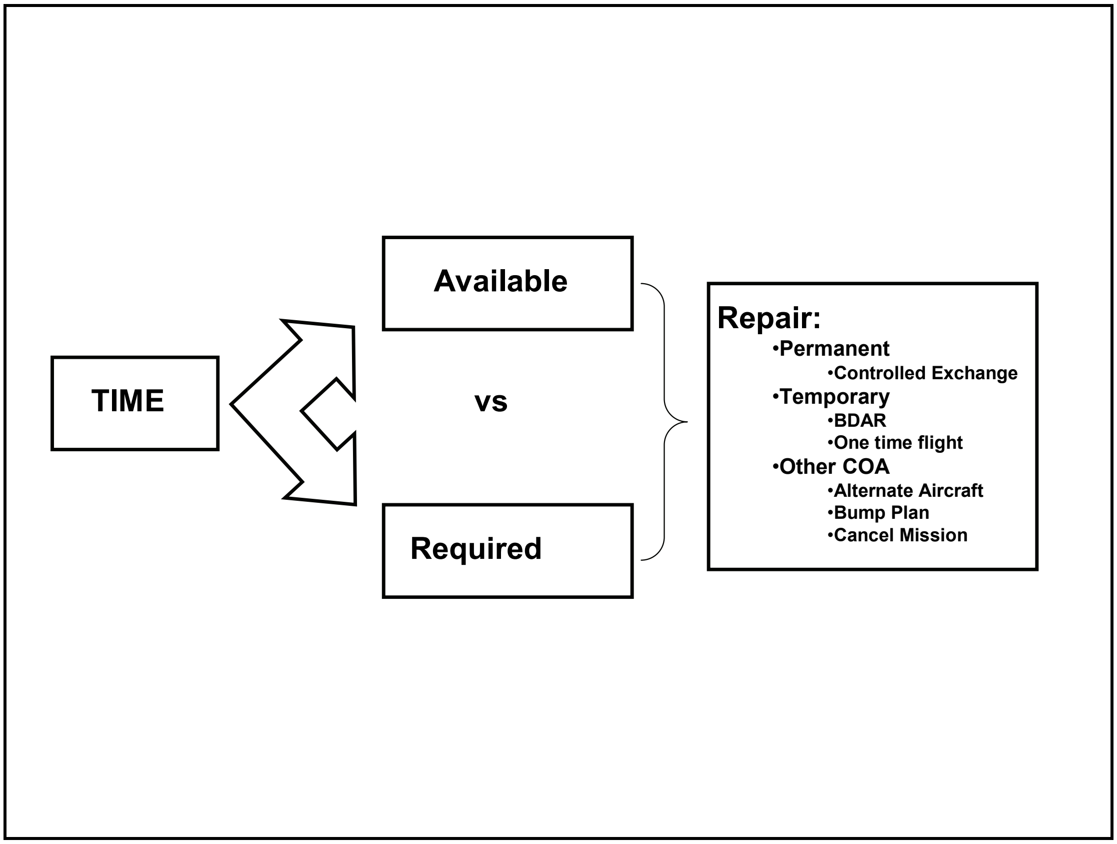

Figure 1-8. Time: available versus required

TOOLS REQUIRED TO PERFORM MAINTENANCE

1-69. The maintenance manager, when assessing maintenance procedures, will ask himself if the unit has the correct type and quantity of tools to perform the maintenance tasks. Having the required tools in adequate numbers to perform a given task is necessary, especially when maintenance personnel are conducting split-based operations. With the implementation of modularity in the Army aviation transformation structure, tools required to perform split-based operations were evaluated for inclusion in units to meet split-based maintenance requirements.

1-70. Supervisors must identify the tools required to do the job and make sure that they are on hand and serviceable and, if they require calibration, calibrated (Figure 1-9). Using the wrong tools, such as pliers when a socket wrench is the correct choice, only wastes time and can injure aircraft maintainers or cause additional damage to equipment. Junior leaders must educate themselves on the different tools and enforce TM standards when aircraft maintenance is performed.

PROBLEM: 300-HOUR INSPECTION

PLAN: DEVELOP, CHECK, CHECK AND RECHECK

PEOPLE: TEAM ASSIGNMENT

PARTS: 300 SERVICE PACK

TIME: EST. TIME

TOOLS: TMDE/SPECIAL

Figure 1-9. Identify the tools

TECHNICAL TRAINING

1-71. Technical training begins with the individual and is greatly affected by ability, aptitude, and attitude. Aviation maintainers are formally trained on a predetermined set of critical tasks at three primary training bases: the United States Army Aviation Logistics School (USAALS), Fort Eustis, Virginia; the U.S. Army Aviation Warfighting Center (USAAWC), Fort Rucker, Alabama; and the Military Intelligence Center, Fort Huachuca, Arizona. Figure 1-10 shows the career development model for career management field (CMF) 15.

1-72. Each Soldier receives progressive aircraft training based on level of responsibility on selected critical tasks. USAALS does not train airframe repairers to perform crew chief duties, nor are crew-chief duties explicitly taught.

1-73. AIT should not be considered the end of individual training. At the conclusion of a given Soldier's AIT, the training that he has received is basically equivalent to that of an apprentice. The gaining aviation unit commander is then responsible for enhancing and expanding the training that Soldiers received in AIT. This enhanced unit training will increase the maintainers' ability, skill, and knowledge.

1-74. A well-trained maintainer will become an asset, allowing him to confidently perform specific flight-line duties in support of an aviation maintenance program, regardless of how aggressive that maintenance program is. This training includes the integration of both airframe and supportive maintenance specialties. An apprentice possesses entry-level knowledge and a skill set that must be carefully groomed and honed to develop a master or seasoned maintainer.

1-75. A Soldier's maintenance abilities, knowledge, and skills are one of the commander's most important assets. When the battle begins, untrained maintainers will be of little use to the commander. Therefore, a commander must make his assigned Soldiers' training in their area of expertise while in garrison a priority.

1-76. The commander/leader, maintenance officers/technicians, and NCOICs must identify all training resources and are tasked with making their Soldiers' training meaningful. The commander and the maintenance manager must use these resources to maximum advantage. To a maintenance company commander, training on technical tasks is as important as training on tactical skills. MTPs and STPs establish the requirements for technical maintenance training.

1-77. Leaders at all levels must ensure that Soldiers are rotated through as many positions in their respective and associated field of training as possible to develop well-rounded skill sets. Upon reception and in-processing, Soldiers and noncommissioned officers (NCOs) should be screened for their past duty positions and given different jobs to ensure that they are as well-rounded as possible.

1-78. Maintenance training is an integral component to combat readiness training in an aviation unit. It must be incorporated into scheduled training periods. Maintenance management training may be scheduled as a part of leader development training. Aircraft maintenance training may also be made part of an individual Soldier's training scheduled during sergeant's time. For "sergeant's time training" to be productive, commanders and first sergeants must protect it from distracters. Similarly, hands-on instruction by maintenance supervisors must be incorporated into scheduled and unscheduled maintenance periods.

1-79. Maintenance training is often best achieved when "learning by doing." OJT, with carefully provided NCOIC supervision, provides huge dividends to aviation units in the long term. Through conducting OJT, maintenance supervisors are required to keep good records in Soldier job books to ensure that critical tasks are not overlooked in the training plan.

1-80. Likewise, Soldiers proficient in certain tasks may oversee apprentice Soldiers in execution of maintenance tasks. For example, an aviation maintainer may gain proficiency under the supervision of an experienced phase maintenance team chief before becoming a crew chief. The cross-training maintenance tasks are also important, especially in low-density MOSs.

1-81. Leaders at all levels must understand basic maintenance management principles. This understanding includes how to plan for and manage flow charts, bank time, scheduled and unscheduled maintenance, aircraft performance deficiency write-up procedures, when to defer maintenance, and the Army's supply system. Training must also include cross training of enlisted maintenance personnel to maximize their benefit to the unit and their own professional development.

CMF 15 Aviation Maintenance Professional Development Model							
Rank							
Duty Assignments	Team Leader		Team Leader	Squad Leader	Platoon SGT	See 15Z	See 15Z
			Squad Leader	Section Sergeant	Detachment SGT	First Sergeant	SGM / CSM
				Technical Inspector	ACFT Quality Control Supervisor	ATC Chief	ACFT MAINT SR SGT
				Platoon Sergeant	ACFT Production Control NCO		BN/BDE CSM
Special Assignments	Soldiers must serve successfully in critical operational assignments prior to and after completion of any special assignment. Soldiers should avoid back to back special (TDA) assignments.						
	Corporal Recruiter		Recruiter	Recruiter	Senior Recruiter	Mil Science Instuctor	Chief Career Mng NCO
			Drill Sergeant	Drill Sergeant	Senior Drill Sergeant	Senior Career Advisor/	Directorate SGM
				Instructor	Senior Instructor	Manager	
				AC/RC Advisor	Career Management NCO	AC/RC Advisor	
					Career Advisor		
Operational Assignment Time Objective	0-5 YRS			5-10 YRS	10-15 YRS	15-20 YRS	20-30 YRS
Recommended Publications	AR 670-1	STP 21-1 SMCT	FM 3-25.26 FM 22-100	FM 21-20 STP 21-24 SMCT	DA PAM 600-25	FM 3-21.5 FM 21-75	FM 7-0 AR 350-17
Professional Military Education			WLC	BNCOC	ANCOC	SMC/CSM (D)	
Promotion	PV 2 - 6 Months PFC - 12 Months	SPC - 26 Months	SZ- 24 Month: PZ - 36 Month	SZ - 48 Months PZ - 84 Months	Announced by HQDA	Announced by HQDA	Announced by HQDA
Retention Control Point	3 Years	SPC - 10 Years SPC(P) 15 Years	SGT-15 Years SGT(P) - 20 Ye	SSG - 20 Years SSG(P) - 24 Yea	SFC-24 Years SFC(P)-26 Years	MSG - 26 Years MSG(P) - 30 Years	SGM - 30 Years CSM- 30 Years

Figure 1-10. CMF 15 professional development model

LEADER TRAINING

1-82. Commanders must afford junior leaders the opportunity to develop an understanding of maintenance operations and management. This leadership development is an essential building block, critical to leadership development. The fundamentals of administrative maintenance management can be observed and learned by involvement in regularly scheduled PC meetings. Attendance and involvement in the battalion PC meeting is only one level of maintenance management and is an enabler in the development of junior leaders.

1-83. Maintenance development at all levels is an important aspect of leadership. Maintenance management affects mission training/execution of essential wartime missions. Development of junior leaders is critical for their professional development; it also prepares them for the next level of responsibility.

Chapter 2

Maintenance Levels and Structure

The COE in which the Army now operates creates a challenging environment for Army aviation personnel and equipment. Coupled with this challenge, aviation platforms are experiencing unprecedented OPTEMPOs while waging the Global War on Terrorism (GWOT). To alleviate the workload and enhance working conditions in this environment, a comprehensive unit maintenance program is critical for the sustainment of all weapon platforms, aircraft systems and subsystems, and aviation ground support equipment (AGSE). A well-established and well-managed maintenance program exponentially increases the availability of operational assets for aviation maneuver commanders conducting training and tactical missions.

SECTION I – TWO-LEVEL MAINTENANCE

Contents

2-1. Army Regulation (AR) 750-1 and DA Pamphlet 750-1 outline the concepts, roles, responsibilities, and authority requirements of the Army maintenance program. The aviation maintenance support system is divided into two categories or levels: field and sustainment. These levels fall under the overall Army National Maintenance Program (NMP). Because of Army transformation, command and control authority for field-level maintenance is now within the direct control of the combat aviation brigade commander.

2-2. The aviation logistics transformation plan removed the multilayered pass-back maintenance concepts of the past. The new maintenance concept provides maintainers with the capability of replacing forward and repairing in the rear. In the contiguous and noncontiguous battle areas, the rear is generally defined as an area that provides higher security and capability. Aviation maintainers will continue to repair limited items forward within the ASB, returning repaired components to either the customer or the unit's PLL.

FIELD MAINTENANCE

2-3. Field maintenance is performed by combat aviation brigade personnel assigned to flight companies, aviation maintenance companies, and aviation support companies (ASCs). The aviation maneuver battalion's assigned flight companies perform authorized maintenance procedures within their capability. AMCs assigned to aviation maneuver battalions provide maintenance support to all flight companies. As compared to the ASC, aviation maneuver battalion AMCs are more agile, flexible, and mobile because they have reduced sets, kits, outfits, tools, and special tools (SKOT).

2-4. Both the AMC and the ASC are authorized to perform field-level maintenance. The AMC is limited to performing unit maintenance according to the MAC. The ASC, in addition to performing unit maintenance and because of the additional SKOT that it is assigned, is authorized to perform intermediate maintenance.

SUSTAINMENT MAINTENANCE

2-5. According to FM 4-0(FM 100-10), sustainment maintenance is the Army's strategic support. The strategic support base is the backbone of the National Maintenance Program and the sustainment maintenance system. At this level, maintenance supports the supply system by economically repairing or overhauling components. Maintenance management concentrates on identifying the needs of the Army supply system and developing programs to meet the supply system demands.

2-6. Sustainment maintenance support is divided and primarily performed by three separate entities: the original equipment manufacturers (OEMs) and their CFSRs; Army depots, located at fixed bases in the continental United States (CONUS); and by the national maintenance (NM) sources of repair (SORs).

2-7. On a case-by-case basis, the combat aviation brigade may request a letter of authorization asking for specialized repair authorization (SRA) from Aviation and Missile Command (AMCOM) LARs to perform limited depot repairs on specific equipment classified as depot level according to the MAC. Figure 2-1 shows a graphic depiction of two-level maintenance, which illustrates the supported and supporting relationships of field to sustainment maintenance.

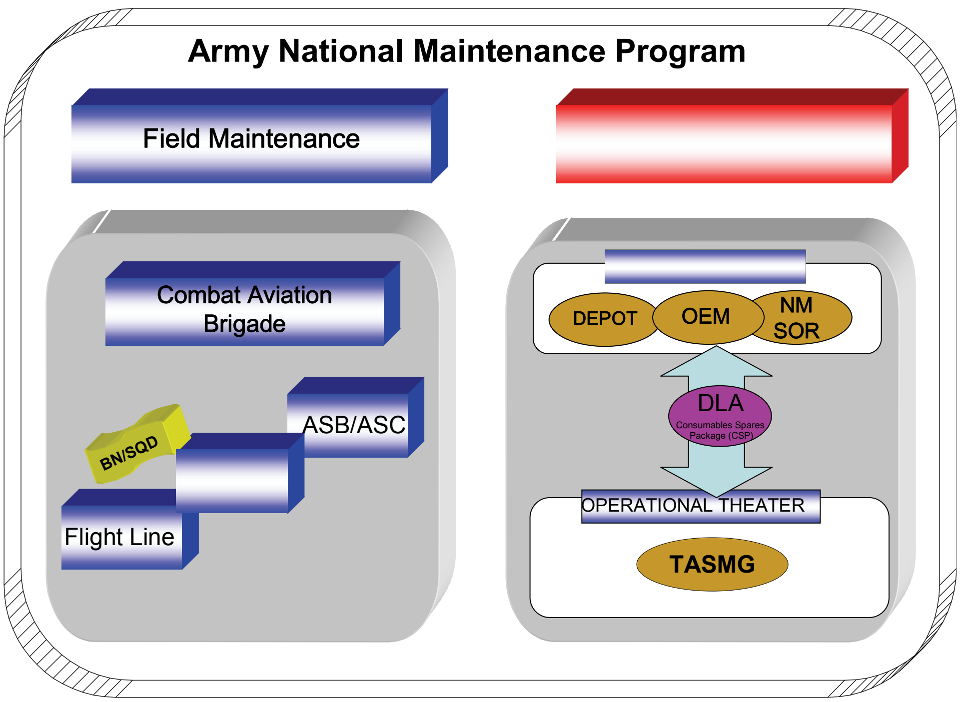

Figure 2-1. Two-level maintenance

SECTION II – AVIATION FIELD MAINTENANCE STRUCTURE

FIELD MAINTENANCE CHARACTERISTICS

2-8. Combat aviation brigade assets primarily perform field maintenance. Field maintenance includes both unit and intermediate maintenance. The brigade commander has complete operational command and control of all aviation maintenance operations at and below the division level. Field maintenance comprises aviation maintenance platoons (AMPs), AMCs, and ASCs. Aviation field maintenance is characterized by "on system maintenance," generally replacing components or performing component repair and return to the user. Aviation field maintenance capability varies based on SKOT, personnel assigned, and the authority directed by AR 750-1.

FIELD MAINTENANCE TEAMS

2-9. Modularity allows combat aviation brigade units flexibility through the formation of field maintenance teams (FMTs). FMTs vary in composition depending on the support requirements, duration, and availability of personnel. The maintenance manager must know the estimated duration of the mission and the supported aircraft type to plan and forecast.

2-10. FMTs may be as large as company (minus) elements or only a few Soldiers. Commanders and maintenance managers send people; parts; test, measurement, and diagnostic equipment (TMDE); and tools to forward areas as required by the mission. Mission roles of the FMT vary from forward arming and refueling points (FARPs) to semipermanent, habitual relationships supporting specific units. FMTs conduct battle damage assessment and repair (BDAR) and/or downed aircraft recovery team (DART) operations critical to mission support requirements.

FLIGHT LINE AND COMPANY OPERATIONS

2-11. Company maintenance activities primarily maintain Army aircraft by conducting scheduled maintenance. Unscheduled maintenance is conducted within the unit's capability. Allowing unit maintainers a degree of ownership in their assigned aircraft will generally enhance the quality and standards of maintenance performed, thus improving overall unit readiness.

2-12. Crew chiefs and aviation maintenance personnel perform aircraft launch and recovery (L/R) operations and maintain aircraft logbooks. They perform both scheduled and unscheduled unit maintenance to include the replacement of major subsystem components, maintenance operational checks, and vibration analysis. The battalion flight companies receive backup support from the aviation maintenance company when performing both scheduled and unscheduled maintenance.

AVIATION MAINTENANCE COMPANY

2-13. The AMC is organic to aviation maneuver battalions; for example, the general support aviation battalion (GSAB), attack reconnaissance battalion (ARB), and assault helicopter battalion (AHB) assigned to combat aviation brigades (CABs). Figure 2-2 depicts a GSAB with a supporting AMC and assigned systems repair sections and shops responsible for providing maintenance and logistics support to three line companies.

2-14. The purpose of the AMC is to manage the battalion's maintenance program and provide field-level maintenance to enable combat aviation brigade aircraft to sustain aviation combat power. The AMC is organized to provide quick, responsive internal maintenance support and repair according to the MAC. The aviation maintenance company troubleshoots airframe and component malfunctions, performs maintenance and repair actions, removes and replaces aircraft components, and performs maintenance test flights (MTFs) and maintenance operational checks (MOCs). The AMC provides logistics support by processing, requesting, and storing Class 9 (Air) aircraft repair parts.

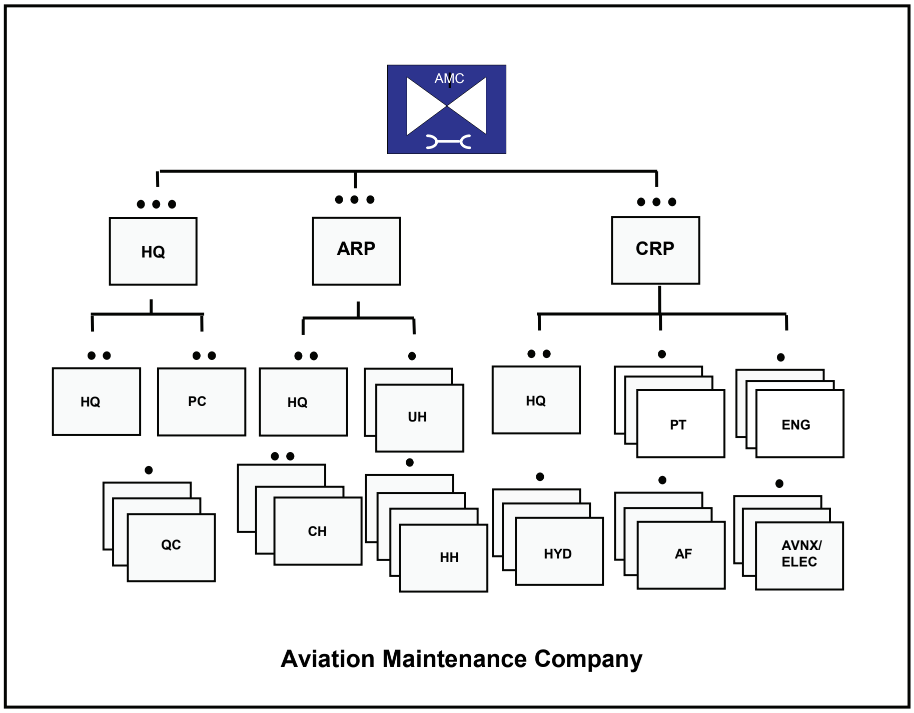

Figure 2-2. Aviation maintenance company assigned to a GSAB

2-15. The AMC conducts BDAR and recovery operations within its capability and is assisted by the ASC. The AMC provides mobile, responsive BDAR and DART operations support through FMTs. FMTs repair aircraft onsite or prepare them for evacuation. The aviation maintenance company commander and PC officer coordinate and schedule maintenance at forward locations of the battalion. The members of the forward element must be able to diagnose aircraft damage or serviceability rapidly and accurately. FMT operations follow these principles:

- FMTs may be used for aircraft, component, avionics, or armament repair.
- When the time and situation allows it, FMTs repair on site, rather than evacuate aircraft; these repairs includes BDAR.
- FMTs must be 100 percent mobile and transported by the fastest means available (usually by helicopter).
- FMTs sent forward may be oriented and equipped for special tasks to include recovery operations; type of aircraft recovery will depend on the assets available.

2-16. In some situations, normal maintenance procedures must be expedited to meet operational objectives. In such cases, the unit commander may authorize the use of aircraft combat maintenance and BDAR procedures. Aircraft combat maintenance and BDAR are an aviation maintenance company responsibility with backup from supporting ASC units.

2-17. The BDAR concept uses specialized assessment criteria, repair kits, applicable technical manuals, and trained personnel to return damaged aircraft to the battle as soon as possible (ASAP). These repairs are often a short-term solution; temporary repair methods are used to meet operational needs only. Temporary repair methods will not be used if the tactical situation allows application of standard repair methods. When the tactical situation allows it, permanent repairs will be conducted on all aircraft that previously received temporary repairs.

AVIATION MAINTENANCE PLATOON

2-18. The aviation maintenance company assigned to an aviation maneuver battalion (GSAB and AHB) comprises three modular aviation maintenance platoons. These platoons are outfitted and provided with resources to perform split-based operations to support the line companies. The AMP maintains unit-level operational readiness goals and aircraft availability. The AMP employs maintenance personnel using shop equipment contract maintenance (SECM) trucks to transport sets, kits, and outfits (SKO), special tools and test equipment (STTE), AGSE, and deployment support kits (DSKs) (Class 9 aviation spare/shop stock).

2-19. The aviation maintenance platoons assigned to an AMC are the following: headquarters platoon (PC with technical supply personnel and QC), airframe repair platoon, and a component repair platoon consisting of power train, engine, hydraulics, airframe, and avionics/electrical repair sections. In an ARB, the component repair platoon is also assigned a systems (armament/avionics/electrical) repair section, which is responsible for troubleshooting and repairing armament systems, subsystems, and components. Each platoon is task organized and comprises three to four maintenance squads.

HEADQUARTERS PLATOON

2-20. The HQ platoon consists of a headquarters, PC with technical supply personnel, and a quality control section.

Production Control

2-21. PC manages all maintenance production within the AMC to maximize maintenance resources. PC receives and processes work requests and coordinates, schedules, and prioritizes both maintenance and shop workloads. In addition, PC maintains the status of aircraft parts and shop reports. PC coordinates inspection, maintenance operational checks, and maintenance test flights, as well as the return of repaired aircraft and equipment to supported units.

Quality Control

2-22. QC enforces standards in repair, overhaul, modification, safety of flight, and other required maintenance functions. QC follows the priorities that PC provides and maintains constant communication pertaining to the status and progress of maintenance. QC is also responsible for oversight of compliance with safety regulations in all maintenance areas.

2-23. The QC section is accountable directly to the commander, thereby eliminating potential conflicts of interest among the production control section, the maintenance shops, and the supported units. This accountability structure allows the inspectors to maintain objectivity in the performance of their inspection duties. QC should be composed of the most qualified and technically proficient maintainers.

Technical Supply

2-24. Technical supply obtains, stores, and/or issues Class 9 (Air) (bench stock, PLL, shop stock, and authorized stockage list [ASL] items) for assigned/attached maintenance sections and shops.

AIRFRAME REPAIR PLATOON

2-25. The ARP consists of specific sections tailored to the battalion that it supports. For example, the following sections are assigned to a GSAB: headquarters, utility helicopter, cargo helicopter, and medical evacuation (MEDEVAC) helicopter repair sections. The ARP performs scheduled and unscheduled maintenance, troubleshoots faulty components, and removes and replaces aircraft components.

COMPONENT REPAIR PLATOON

2-26. The CRP employs maintenance personnel using SECM trucks (two per platoon) to transport SKO, STTE, AGSE, and DSK (Class 9 aviation spare/shop stock). The CRP assigned to a GSAB and AHB consists of a headquarters and the following systems repair sections: power train, engine, hydraulics, airframe, and avionics/electrical. In an ARB, the component repair platoon is also assigned an armament systems repair section. The armament section is part of the avionics/electrical repair section.

2-27. The CRP systems repair sections perform preventive maintenance of aircraft components and structures that require specialized technical skills. In addition, maintainers assigned to these sections perform scheduled and unscheduled maintenance, troubleshoot faulty components, remove and replace aircraft components, perform BDAR procedures, manage DSK spares at the platoon level, and provide mission support to flight companies.

2-28. The armament piece, which is part of the armament/avionics/electrical section, is responsible for troubleshooting and repairing armament systems, subsystems, and components. Personnel assigned to the armament systems repair section conduct preventive maintenance and testing and troubleshooting of aircraft weapons systems and subsystems. They also perform cleaning, servicing, and ammunition loading and unloading of weapons systems to include configuration changes. They are also responsible for repairing and replacing weapons platforms components according to applicable publications and references.

MAINTENANCE PROCEDURES

2-29. Maintenance procedures include troubleshooting and diagnostics of airframe and component malfunctions. Removing an unserviceable line replaceable unit (LRU) or component and replacing it with a known serviceable LRU or component is an accepted troubleshooting technique. Additional maintenance actions include repairing or servicing the assigned or attached aircraft's weapons platforms.

2-30. Aviation maintainers operate and maintain aviation ground support equipment and operate and perform unit-level maintenance on the auxiliary ground power unit (AGPU), generators, and ground support equipment. Aviation logistics/technical supply personnel operate unit-level Standard Army Management Information System (STAMIS), requisition Class 9 (Air) spares, and manage the battalion's Class 9 (Air) prescribed load list (PLL).

2-31. The AMC performs BDAR at the platoon level. It also performs unit-level repairs on Aviation Life Support Systems (ALSS). The force structure design is highly mobile and modular to the platoon level in support of an operational company. The AMC performs production control, quality control, and maintenance management and maintenance test pilot functions. Maintenance personnel rig aircraft for recovery operations.

2-32. The AMC manages the battalion maintenance support program and operates a centralized tool room. In coordination with elements of the forward support company (FSC), the AMC conducts battalion-level FARP operations according to FM 3-04.104(FM 1-104).

AVIATION SUPPORT COMPANY

2-33. Aircraft maintenance above the aviation maneuver battalion level is provided by the aviation support company (ASC). ASCs are assigned to the ASB and are responsible for performing field-level maintenance to include intermediate-level maintenance. ASCs provide field-level maintenance support to AMCs and their assigned aircraft and equipment. The ASC primarily performs intermediate maintenance support according to the applicable technical manual MAC. When requested by AMCs, ASCs also provide backup unit maintenance support.

2-34. The ASC performs production control maintenance management and quality assurance of supported aircraft to ensure airworthiness and conducts system and subsystem repairs on all aircraft or repair parts and components work ordered through the PC section. The ASC provides aviation logistics support operations for CAB assets. The ASC is capable of supporting CAB split-based operations. The following platoons are assigned to an ASC: headquarters platoon, airframe repair platoon, and component repair platoon. See Figure 2-3.

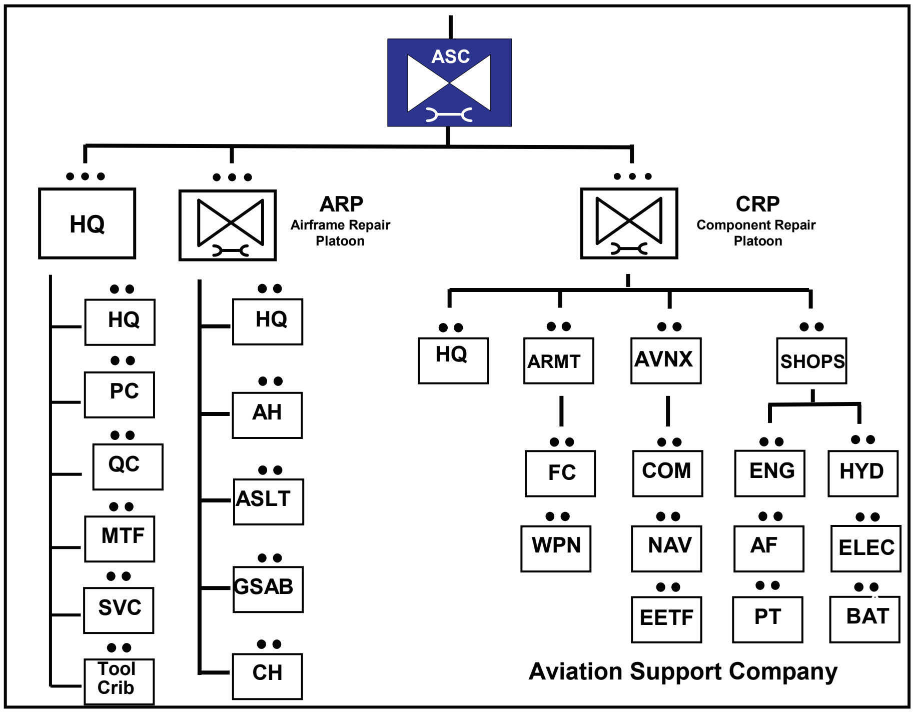

Figure 2-3. Aviation support company

2-35. ASBs assigned at the division level will have an assigned signal company (see Figure 2-4). Nondivisional ASBs will not be assigned a signal company (see Figure 2-5).

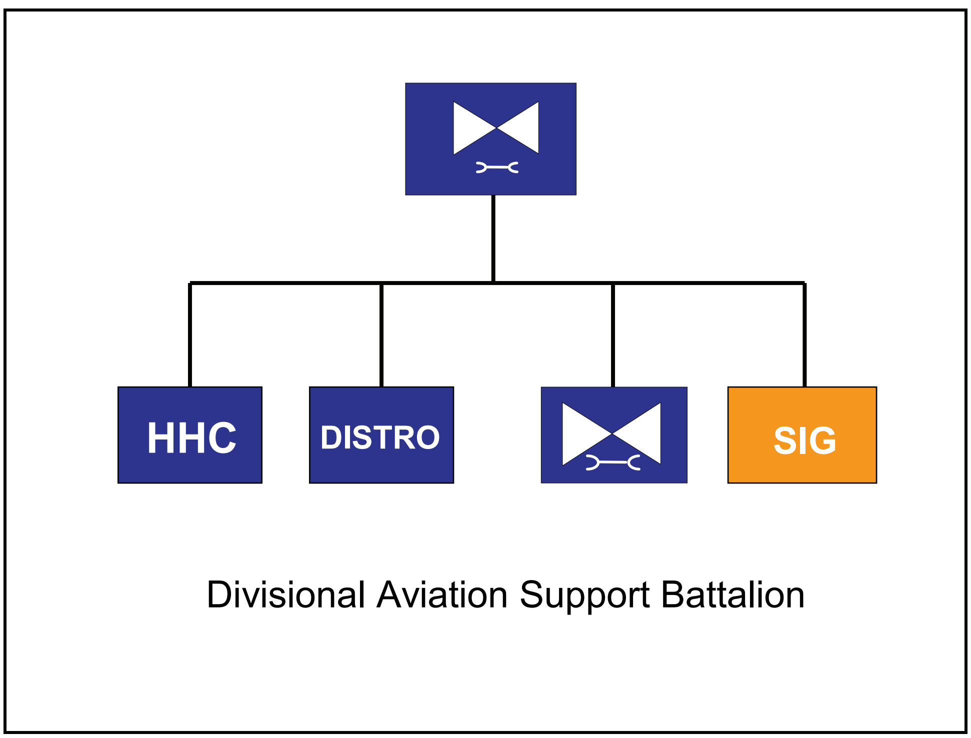

Figure 2-4. Divisional aviation support battalion

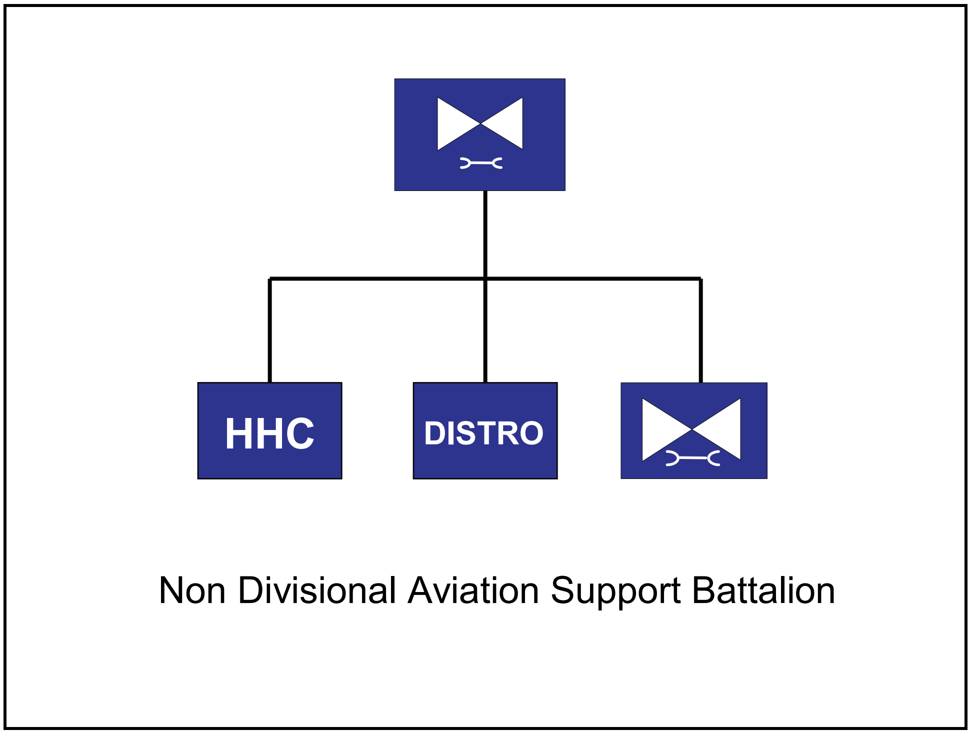

Figure 2-5. Nondivisional aviation support battalion

SPLIT-BASED OPERATIONS

2-36. Strategic split-based operations refer to performing certain logistic and maintenance administrative and management functions outside the joint operations area (JOA). These functions can be performed in a secure theater location or at an intermediate staging base (ISB) or home station. Soldiers and civilians can perform personnel, materiel, and distribution management functions without deploying to the JOA if the STAMISs are adequate. The STAMISs help minimize strategic lift requirements and reduce the sustainment footprint in theater while still meeting support requirements.

2-37. Operational split-based operations refer to performing certain logistic and maintenance functions within a given theater of operation, in more than one location. The aviation maintenance company assigned to reconnaissance and attack and assault battalions can provide equal maintenance support to each of the three assigned operational flight companies at different locations within a single theater.

2-38. The AMC assigned to the GSAB can support two locations for the command and control company, three locations for the CH-47 company, and four locations for the MEDEVAC company within a single theater of operation. The ASB can support from two locations with a less-capable capacity at one location. The ASB can provide both backup support to the AMC or task force and intermediate maintenance according to the maintenance allocation chart.

ARMY NATIONAL GUARD FACILITIES

2-39. Army National Guard facilities provide for aircraft storage, field maintenance, air operations planning and coordination, and unit training. Most Army Aviation Support Facilities (AASFs) consist of hangars, armories, operations buildings, and associated administrative facilities.

SECTION III – AVIATION FIELD MAINTENANCE ROLES

2-40. The AMC and ASC maintenance programs must be fully enforced, supported, and managed by commanders/leaders, maintenance officers/technicians, and senior NCOs at all levels. Additional staff assigned to the different levels of maintenance provides the hands-on management to ensure that the commander's aviation field maintenance program remains fluid and operating at its optimum capacity.

COMMANDERS

BATTALION

2-41. The battalion commander establishes and enforces maintenance standards according to applicable regulatory policies and procedural guidance. He prioritizes and allocates resources, provides training guidance, and is responsible for safely executing the maintenance mission, quality control, and materiel readiness.

COMPANY

2-42. The company commander plans, directs, and supervises the operations and employment of the company. The AMC commander is responsible for providing maintenance support to the aviation maneuver battalion. He provides command guidance to the PC officer concerning maintenance support actions.

NONCOMMISSIONED OFFICERS

PLATOON SERGEANTS

2-43. Platoon sergeants have overall responsibility for the conduct and oversight of all maintenance activities within their platoons. Platoon sergeants are the first-line supervisors, responsible for ensuring that all assigned aircraft are maintained according to regulatory policies, standards, and procedures.

TEAM LEADERS

2-44. Team leaders have overall responsibility for all assigned scheduled/phase maintenance operations. They will coordinate special tools, repair parts, and personnel to facilitate and expedite maintenance actions.

MAINTENANCE OFFICERS

BRIGADE AVIATION MATERIEL OFFICER

2-45. The BAMO is the primary adviser to the brigade commander for the effectiveness and efficiency of the aviation maintenance program in the unit. The BAMO recommends actions and forecasts future capabilities based on the existing maintenance posture.

2-46. The BAMO plans maintenance actions based on operational necessities. He also maintains a daily status of all aircraft in the combat aviation brigade. The BAMO is normally a maintenance evaluator (ME), responsible for the following:

- Provides advice to the battalion commander on all aviation maintenance and logistics issues.
- Oversees quality control functions.
- Resolves aircraft maintenance standardization issues.
- Attends the brigade safety and standardization meeting.

BATTALION AVIATION MATERIEL OFFICER

2-47. The battalion aviation materiel officer (AMO) is the primary adviser to the battalion commander pertaining to the effectiveness and efficiency of the aviation maintenance program in the unit. The battalion AMO coordinates all maintenance and logistics outside of the battalion. The battalion AMO is primarily responsible for the management of Class 9 (Air) accounting and budgeting. The battalion AMO, normally an ME, is responsible for the following:

- Advice to the battalion commander on all aviation maintenance and logistics issues.
- Oversight of quality control functions.
- Resolution of aircraft standardization issues.
- Evaluation and training of battalion maintenance test pilots, if designated as an ME.
- Attendance at the battalion safety and standardization meeting.

2-48. The battalion AMO coordinates with the battalion executive officer (XO) and operations and training officer (S3) regularly to remain current on the tactical situation.

2-49. The battalion AMO coordinates maintenance support with the AMC or ASC PC officer as appropriate. The battalion AMO focuses on placing maintenance support forward to sustain maximum combat power. He coordinates with the BAMO as required.

SUPPORT OPERATIONS OFFICER

2-50. The support operations officer operates under the supervision of the ASB commander. The SPO provides technical supervision of daily logistics functions. The maintenance officer in the support operations office plans, coordinates, and provides technical supervision of intermediate maintenance conducted within the ASC of the ASB. The SPO interfaces with the brigade and battalion supply officers (S4s) and with BAMOs to establish maintenance priorities and resolve maintenance support issues. The supply and services cell in the ASB's support operations section tracks distribution and availability of Class 9 (Air) repair parts.

2-51. The SPO provides centralized, integrated, and automated command and control (C2) and planning for all distribution management operations within the battalion. The SPO coordinates with logistics operators in the fields of supply, maintenance, and movement management for the support of all units assigned or attached in the brigade area. The SPO's primary concern is customer support and increasing the responsiveness of support provided by subordinate units.

Note. Refer to FMI 4-90.23 for additional information on the support operations section.

ADDITIONAL STAFF

PRODUCTION CONTROL OFFICER

2-52. The PC officer is the principal maintenance manager and coordinator in the ASC or AMC and coordinates maintenance at both the company and battalion level. The PC officer is the AMC commander's primary maintenance advisor for all internal production and maintenance activities within the AMC. In the absence of an assigned battalion AMO, the PC officer will act as the battalion primary maintenance advisor at the battalion level.

2-53. While the commander commands, the PC controls the daily maintenance operations and workflow within the battalion. A concerted effort among the aviation commander, the PC officer, and the battalion AMO must be made at all times on maintenance issues requiring command-level attention.

QUALITY CONTROL OFFICER

2-54. Although not always a TOE position, the QC officer, when assigned, is responsible for the internal management of the QC section to include quality assurance of all work performed by the technical inspectors. The QC officer will coordinate priority of work with the unit's production control officer/QC NCOIC. To avoid conflict of interest, the QC officer is accountable to the commander.

AVIATION LOGISTICS/TECHNICAL SUPPLY OFFICER

2-55. Although not always a TOE position, the aviation logistics/technical supply officer, when assigned, is responsible for and has oversight over the internal management and daily operations of the aviation logistics/technical supply section to include requesting, processing, issuing, stockage, and turn-in of Class 9 (Air) repair parts and components. He coordinates high-priority urgency of need (UND) A and B parts requests, such as aircraft on ground (AOG), with the unit's production control officer. If authorized by the commander, he certifies and authorizes all high-priority Class 9 (Air) requests.

PRODUCTION CONTROL NCOIC

2-56. The PC NCOIC coordinates all maintenance actions in the absence of the PC officer. The PC officer and the PC NCOIC must function as a team. The PC NCOIC assists the PC officer and, in his absence, coordinates and establishes priorities of work with the unit's maintenance officers and noncommissioned officers, to include the following: quality control, ARP, armament section component repair platoons (CRPs), technical supply, and flight companies.

QUALITY CONTROL NCOIC

2-57. The QC NCOIC is directly responsible for the operational management of the quality control section. He coordinates and establishes priority of work with the QC OIC. In the absence of the OIC, the NCOIC will establish priority of work in support of the unit's maintenance effort as coordinated with PC. The QC NCOIC coordinates the effort of the QC section. The NCOIC distributes the work and supervises the technical inspectors for quality assurance of work assigned.

AVIATION LOGISTICS/TECHNICAL SUPPLY NCOIC

2-58. The aviation logistics/technical supply NCOIC coordinates high-priority requests with the aviation logistics/technical supply officer. He will be directly involved in the request process of high-priority (UND A and B) requisitions. He directs the work and supervises all aviation logistics actions assigned to the logistics clerks. The aviation logistics/technical supply NCOIC is directly responsible to the aviation logistics/technical supply OIC.

SECTION IV – AVIATION SUSTAINMENT MAINTENANCE STRUCTURE

2-59. Sustainment maintenance support is divided and primarily performed by three separate entities: the OEMs and their CFSRs; Army depots located at fixed bases in CONUS; and the national maintenance sources of repair. Sustainment maintenance supports the supply system and the fleet by economically repairing or overhauling components.

2-60. Generally, sustainment maintenance refers to all maintenance performed on equipment above and outside of the combat aviation brigade. The OEM CFSRs may, however, be placed within the combat aviation brigade to provide a limited forward sustainment maintenance capability. They operate out of fixed or semifixed facilities.

2-61. In special circumstances, caused by nonavailability of repair parts or components in the supply pipeline, which directly affects aviation readiness, the combat aviation brigade may obtain specialized repair authorization. This repair authorization, requested through the logistics assistance representative, will enable combat aviation brigades to perform limited depot repairs on specific equipment classified as depot.

U.S. ARMY MATERIEL COMMAND

2-62. The U.S. Army Materiel Command's (USAMC's) mission is complex and ranges from developing sophisticated weapon systems to maintaining and distributing spare parts. The USAMC mission is to provide superior technology, acquisition support, and logistics. The Army Materiel Command operates the research, development, and engineering centers; Army Research Laboratory; depots; arsenals; ammunition plants; and other facilities. Subordinate commands provide specific aviation support within the USAMC structure. These commands include AMCOM and the U.S. Army Communications-Electronics Command (CECOM).

2-63. The Army Materiel Command—

- Overhauls and upgrades Army equipment.
- Produces and provides bombs and ammunition for all of the military services.
- Provides on-the-ground logistics assistance to every unit in the Army.
- Provides new equipment training.
- Maintains the Army's pre-positioned stocks on land and at sea.
- Researches, develops, and acquires conventional ammunition for all of the Department of Defense (DOD).
- Supports acquisition of end items and parts for military weapon systems.

CECOM

2-64. The CECOM mission is to develop, acquire, and sustain superior information technologies and integrated systems. CECOM controls and operates Tobyhanna Army Depot.

2-65. Tobyhanna Army Depot (TYAD) is the largest, full-service electronics maintenance facility in DOD. The depot's mission is total sustainment, including design, manufacture, repair, and overhaul of hundreds of electronic systems. These include satellite terminals, radio and radar systems, telephones, electro-optics, night vision and anti-intrusion devices, airborne surveillance equipment, navigational instruments, electronic warfare (EW), guidance and control systems for tactical missiles, and Blue Force Tracking (BFT) installation kits.

U.S. ARMY AVIATION AND MISSILE COMMAND

2-66. AMCOM is a major subordinate command of the Army Materiel Command. AMCOM has direct operational control of the National Maintenance SOR and two Army depots: Corpus Christi Army Depot (CCAD) and Letterkenny Army Depot (LEAD).

National Maintenance Sources of Repair

2-67. The national maintenance manager is responsible for managing all sustainment-level reparables and selected field-level reparables according to AR 750-1. The national maintenance manager uses various sources of repair. The national maintenance program distributes sustainment maintenance workload across depot and nondepot activities based on national needs. The national maintenance program manager may establish the use of a theater aviation sustainment manager within a specific theater. The theater aviation sustainment manager provides a unified aviation maintenance life-cycle management command focused on the use of theater assets providing airframe maintenance, overhaul of aviation subassemblies, and crash/battle damage repair.

Corpus Christi Army Depot

2-68. CCAD is the Army's only organic facility for the repair and overhaul of rotary-wing aircraft. Corpus Christi Army Depot provides worldwide readiness, sustainment, and training support for all U.S. Army rotary-wing aircraft. CCAD is partnered with industry to overhaul, repair, modify, retrofit, and modernize Army aircraft and related engines and components. CCAD also provides hands-on training for Reserve, National Guard, and active-duty personnel. On a case-by-case basis, CCAD provides additional on-site depot maintenance support for crash damage analysis and repair. Depot maintenance is employed primarily in CONUS. However, it projects itself worldwide through maintenance support teams using organic assets and through contract programs.

2-69. CCAD provides the following maintenance support:

- Overhauls, repairs, modifies, retrofits, and modernizes aircraft systems.
- Maintains a mobilization and training base to provide capability for missions.
- Provides maintenance support services for aeronautical equipment worldwide.
- Provides project development and design services for special projects, as assigned.
- Provides worldwide telephone hot line and on-site technical assistance for the inspection, maintenance, and repair of customer aircraft and engines.

LETTERKENNY ARMY DEPOT

2-70. Letterkenny Army Depot provides a variety of support to the Army. Two aviation-specific systems that are overhauled and returned to the National Maintenance Program are the AH-64 Target Acquisition Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) and resetting and overhaul of AGPUs. AGPU reset and overhaul are functions of the Service Life Extension Program (SLEP). Letterkenny Army Depot also provides depot-level maintenance for Hellfire launchers and air-to-air Stinger pressure bottle refurbishment.

AVIATION DEPOT MAINTENANCE ROUNDOUT UNITS PROGRAM

2-71. The Aviation Depot Maintenance Roundout Units (ADMRU) program consists of a Headquarters and four aviation classification repair activity depots (AVCRADs) providing National Guard regional support. The primary mission of an AVCRAD is to provide backup regional aviation maintenance support for Army National Guard (ARNG) aircraft. The AVCRADs provide NMP repairs, limited depot airframe repair, aircraft painting, major airframe repair, repair of components classified as depot-level reparables (DLR), and the identification and classification of aviation receipts and stocks in storage. AVCRADs are postured and trained to support the Theater Aviation Maintenance Program (TAMP). AVCRADs support selected deploying/deployed aviation forces' RSO&I.

2-72. The ADMRU assets provide the following support to the full spectrum of operations:

- NMP repairs as directed by USAMC.
- Backup field-level maintenance.
- Capability to manage the theater DLR supply channels.
- BDAR.
- Estimated cost of repair assessments.
- Tailored maintenance contact teams to deploy forward.
- Engine repairs.
- Airframe repairs.
- Welding.
- Main rotor blade repair and balance.
- Composite material repairs.
- Electrical systems repairs.
- Avionics and armament repairs.
- Hydraulic component repairs and fabrication of lines.

2-73. The AVCRADs are fixed-base, limited depot facilities and initially mobilize in place but can deploy to a theater of operations. The AVCRADs are able to project forward limited, task-organized support using maintenance contact teams and classification support teams. Transportation within theater must be provided from additional nonorganic assets. Once mobilized and deployed, an AVCRAD provides support primarily from a fixed base. The AMCOM theater aviation maintenance program equipment package is movable, but not mobile. The AVCRAD, with additional attachments to perform its wartime mission, forms the Theater Aviation Sustainment Maintenance Group (TASMG) supporting the TAMP.

2-74. The AVCRADs—

- Provide backup field maintenance capability.
- Provide sustainment maintenance as directed by USAMC.
- Support deploying or deployed forces.
- Classify and inspect aviation stocks and components.
- Expand the aviation maintenance capabilities of CONUS depots.

THEATER AVIATION MAINTENANCE PROGRAM

2-75. The TAMP is an overarching capability to increase aviation readiness during deployments by providing sustainment maintenance capability forward. The TAMP provides theater-specific sustainment support and augments the CONUS/OCONUS sustainment repair facilities and activities previously detailed to expedite component repairs. It assists units during deployment and redeployment, provides technical assistance, and supports increased operational tempo to sustain Army aviation across the entire spectrum of operations. TAMP is a centrally coordinated and controlled aviation logistics sustainment program.

2-76. The following are TAMP tasks:

- Assist units in deployment and redeployment.
- Provide technical assistance.
- Provide SSA for Class 9 (Air) in the theater of operations.
- Provide single storefront for aviation logistics at echelon above corps (EAC).
- Provide limited sustainment maintenance.
- Provide backup field maintenance.
- Support the sustainment classification mission.
- Assist RSO&I aerial port of debarkation/seaport of debarkation (APOD/SPOD).
- Provide contact teams.
- Validate estimated cost of repair.
- Provide application of urgent modification work orders.
- Forecast and support theater aviation maintenance surge requirements in support of operations plan (OPLAN) coalition forces land component command (CFLCC).
- Provide special test and troubleshooting capability.
- Establish/manage staging areas, wash points, and inspections.
- Repair crashed or battle-damaged aircraft (BDAR).
- Receive, manage, and distribute ASL (aviation) within theater.
- Obtain special repair authority from AMCOM liaison.
- Facilitate and coordinate engineer requirement and authorization before repair.

THEATER AVIATION SUSTAINMENT MAINTENANCE GROUP

2-77. The TASMG is a functional part of the TAMP and is the operational capability to perform sustainment-level repairs, as directed by USAMC, in a combat environment or a mature theater of operation. The TASMG can support both manned and unmanned theater assets. The TASMG may assist in port-opening operations but is not solely responsible for this function. The TASMG focuses on the repair of specified components in support of the NMP as directed by AMC. The repaired components are returned to the supply system. The TASMG can perform repair and return of components and end items when required.

2-78. The TASMG is divided into the following components:

- AVCRAD.
- Group support company.
- Mobile oil lab detachment.
- Quartermaster aviation repair platoon.
- Theater aviation maintenance team.

2-79. The TASMG provides theater-level support for all aviation logistics and maintenance requirements, including the following:

- Sustainment maintenance of components in theater as directed by the USAMC.
- Field-level maintenance to support theater surge requirements.
- Repair of DLR components.
- Selected depot airframe repair.
- Oil analysis.
- Calibration of TMDE.
- Limited rapid parts fabrication capability and selective circuit card repair.

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Chapter 3

Maintenance and Logistics Management Supporting Programs and Equipment

To achieve or exceed the prescribed operational rates mandated by DA, aviation maintenance unit commanders and personnel must use all available supporting programs and equipment. This chapter provides Army aviation maintenance commanders/leaders, maintenance officers, maintenance technicians, and maintainers across the Army with a "**how-to**" on practices, procedures, and guidelines relative to various programs and equipment that are essential to Army aviation units. Aviation maintenance units depend on equipment and programs—such as AGSE, the Army Oil Analysis Program (AOAP), Army Calibration Program, Army Warranty Program, Logistics Assistance Program, Maintenance Assistance and Instruction Team (MAIT) Program, and New Equipment Training Program—to manage maintenance and logistics operations. These programs and equipment greatly increase the ability of aviation maintenance managers to manage the flow of maintenance and logistics critical to operational readiness rates, which are the bottom line in Army aviation. In the current COE, experienced aviation maintenance managers/technicians anticipate, analyze, and when necessary, seek assistance from supporting programs to manage their complex weapon systems and modern aircraft.

SECTION I – MAINTENANCE AND LOGISTICS SUPPORTING PROGRAMS

Contents

AVIATION RESOURCE MANAGEMENT SURVEY PROGRAM

3-1. The Aviation Resource Management Survey (ARMS) Program provides aviation personnel with expert technical assistance and on-site evaluations, as mandated by AR 95-1, to all units assigned to Forces Command (FORSCOM), TRADOC, Eighth United States Army (EUSA), Intelligence and Security Command (INSCOM), and United States Army European Command (USAREUR) aviation units. Major proponent areas of the ARMS include, but are not limited to, the following:

- Maintenance.
- Supply.
- Safety.
- Command support programs.
- Petroleum, oil, and lubricants (POL).
- Aviation life support equipment (ALSE).
- Operations.
- Aviation medicine.
- Standardization.
- Tactical operations (TACOPS).
- Air traffic services (ATS).

- Training management.

3-2. The ARMS program is a comprehensive survey of aviation units conducted every 18 to 24 months. These surveys assist aviation unit commanders in evaluating their unit's ability to conduct its mission safely and effectively.

3-3. FORSCOM units or units evaluated and inspected by FORSCOM ARMS teams can obtain ARMS information or assistance or download FORSCOM ARMS commander's guides (checklists) from the following site: https://freddie.forscom.army.mil/avn. For all other Army command units in need of their corresponding ARMS checklists, see the Army command ARMS inspection team designated POC.

Note. Refer to Appendix G for an example of a FORSCOM-generated ARMS checklist.

LOGISTICS ASSISTANCE PROGRAM

3-4. The USAMC Logistics Assistance Program (LAP) provides aviation users and maintainers of USAMC-managed equipment with both logistical and technical assistance. This assistance can be requested by supported units when materiel problems might adversely affect aircraft operational readiness rates.

Note. For more information and guidance concerning the USAMC LAP, refer to AR 700-4. In addition, refer to AR 700-138 and AR 750-1 for additional information on the LAP. For additional logistics assistance, contact LOGSA at https://weblog.logsa.army.mil.

3-5. Aviation maintenance commanders/leaders and maintenance officers/technicians may, while conducting aircraft maintenance, confront NMCS conditions. NMCS conditions may be the direct result of logistical problems that are either beyond their resource capability to resolve or that are clearly not within their responsibility. In cases beyond their resource capabilities, assistance will be provided to commanders/leaders and maintenance officers/technicians in analyzing readiness, identifying problems, determining responsibility for resolutions, and when appropriate, resolving problems.

RESPONSIBILITIES

3-6. The commander is responsible for developing a self-sustaining readiness capability that LARs will support. The LAP is not intended to be a permanent augmentation to the aviation maintenance commander. LARs, when available, provide assistance in resolving specific logistical problems. They can also provide limited training to assigned unit personnel when requested. When appropriate, LARs provide logistics resolution (normally on new equipment) to aviation maintenance units.

3-7. In addition, LAP responsibilities include providing commanders and unit maintainers with the technical guidance necessary to resolve logistic problems. These responsibilities include identifying and reporting, through channels, all logistic conditions that have an adverse effect on aircraft readiness. The LAP provides commanders with a single point of contact for USAMC logistic assistance.

3-8. The LAP is oriented to the early detection of logistic problems that affect aviation units and aircraft readiness. It also provides a means for logistic support activity managers to observe and to identify materiel and logistic system problems in the field.

FUNCTIONALITIES

3-9. In today's COE, new and complex equipment must be introduced into the Army system as rapidly as possible. With military personnel in constant rotation, training these Soldiers in new equipment or new procedures is critical to sustaining tactical operations. As a result, aviation maintenance units often need assistance in sustaining currency.

3-10. Logistics assistance is the advice, assistance, and training provided by qualified logisticians. They may be military or civilian employees of the Army or employees of industrial or commercial companies serving the Army under contract.

3-11. The LAP provides solutions to problems of supply and equipment, installation, operations, and maintenance. The program provides a pool of knowledgeable and experienced personnel from which all aviation units may request and draw assistance.

3-12. Logistics assistance personnel will coordinate actions with the commander and keep him fully informed of their findings and recommendations. Some functions of logistics assistance personnel are to—

- Give a hands-on demonstration to show units how to perform a given procedure.
- Advise both technical and nontechnical personnel.
- Help users evacuate and replace unserviceable equipment that cannot be repaired.
- Visit AMC and ASC activities to help improve supply, repair parts distribution, and maintenance support for using organizations.
- Help units locate deficiencies in supply and maintenance capabilities.
- Collect, evaluate, and exchange technical information.
- Instruct units in records management and in preparing unit supply records, PLLs, and authorized stockage lists.
- Instruct units in preparing equipment for field exercises and overseas deployment.
- Provide assistance on the care and preservation of stored material.
- Work through the AMCOM liaison engineers to facilitate and authorize maintenance to be performed at the unit or intermediate level that would otherwise be performed at depot.
- Coordinate with the MSC item managers to expedite repair parts' delivery wherever possible.
- Monitor the performance of assigned contractor personnel to ensure that the work being performed is according to the statement of work (SOW).

PERSONNEL AND SERVICES

3-13. LAP personnel are primarily a mix of Army military and civilian personnel. They are highly trained, experienced, physically qualified, and well versed in the missions, equipment, and procedures of the providing and supported commands.

3-14. These personnel are mobile and available for worldwide assignments. According to AR 700-4, they will be assigned or attached to the appropriate geographical logistics assistance office (LAO) when deployed to field command areas. Logistics assistance personnel are employed by, or under contract to, one of the major subordinate commands under the USAMC.

Logistics Assistance Representatives

3-15. LARs are highly trained and experienced DOD civilians in a specific MDS aircraft. LARs are generally assigned in support of aviation maintenance units. They support the unit in garrison and field environments including deployment to combat operations with the unit.

3-16. LARs are the direct representatives of the major support command (MSC) that they represent (AMCOM, CECOM, or TACOM). The LAR can provide maintenance and safety messages from the MSC to the unit and assist with the completion of the message requirements. The LAR is available to train unit personnel on new equipment or sustainment systems to include support and test equipment that is managed by the MSC.

3-17. As the representative of the MSC, the LAR can coordinate with systems engineers, as well as item managers, to authorize depot-level repairs and expedite the release and delivery of repair parts managed by the MSC. The LAR provides a direct link to the MSC commander 24 hours a day.

Contract Plant Services

3-18. Trained and qualified engineers or technicians employed by the manufacturer provide these services in the plants and facilities of the manufacturer. Through contract plant services, Army personnel are taught to install, operate, and maintain the manufacturer's equipment.

Contract Field Services

3-19. Qualified contractor personnel provide these services on site. Normally, they provide DA personnel with information on the installation, operation, and maintenance of new DA weapons, equipment, and systems.

Field Service Representative Services

3-20. Field service representatives are employees of manufacturers of military equipment or components. They provide liaison or advisory service between their company and military users of its products. Known in the field as "tech reps," they provide information from the manufacturer to update the Army's equipment capabilities. They also solve technical problems. Field service representatives serve as technical communication channels between manufacturers and military users.

ASSISTANCE REQUESTS

3-21. When requesting logistic assistance, aviation units should contact their local AMC LAO. Refer to AR 700-4, Chapter 4, for LAO geographic areas of responsibility. Requests for assistance should include the following information:

- Name and location of the aviation maintenance unit requiring assistance.
- Specific types and quantity of materiel or weapons (make and model) of the systems for which assistance is needed and a general description of the problem.
- Reasons why organic resources are not available.
- Estimated length of time that assistance is required, starting date, and point of contact.
- Type of logistic assistance personnel required.
- Specific requirements for security clearance.

ARMY OIL ANALYSIS PROGRAM

3-22. The AOAP is an Armywide coordinated program that improves the operational readiness of Army equipment, promotes safety, and detects impending aircraft system, subsystem, and component failures. The oil analysis detects impending aircraft system, subsystem, and component failure by analyzing oil samples and determining lubricant condition. Condition of the lubricants is determined through laboratory evaluation of used oils; the evaluation includes liquid lubricants or transfer fluids used in aircraft engines, transmissions, gearboxes, and pneudraulic systems.

3-23. The AOAP applies to all aviation units and units that operate and maintain aeronautical equipment. AR 750-1 defines the program's objectives, policies, and responsibilities. Technical Bulletin (TB) 43-0211 (aeronautical) identifies Army equipment enrolled in AOAP. Aircraft maintenance officers/technicians must be familiar with these references as well as with the AOAP forms in DA Pamphlet 738-751 governing oil samples.

3-24. Aircraft maintenance officers/technicians must ensure that the AOAP in each unit complies with all oil sampling requirements. The QC section normally oversees day-to-day operations of the program.

3-25. The AOAP is mandatory, at all levels of maintenance operations, for equipment specified in applicable publications. All Army aircraft and those systems identified in DA Pamphlet 750-8 will be enrolled in the AOAP. The AOAP director must approve all additions or deletions in writing.

3-26. The AOAP will be executed between the laboratory and the user unit. The servicing AOAP laboratories will evaluate the lubricating and hydraulic oils from all components enrolled in the program.

Intervals are specified in TB 43–0211 or DA Pamphlet 750-8 or upon notification by the servicing AOAP laboratory.

Note. To ensure safety of flight, an aircraft may be placed in an NMC status before formal receipt of a DA Form 3254–R.

3-27. All units and levels of command will have an AOAP monitor who is trained by the supporting lab or installation AOAP monitor. The AOAP monitor is a unit orders position.

3-28. During wartime, AOAP priority will be given to aeronautical items. During the transition to war, AOAP support will be provided by fixed labs and mobile or portable systems as they are available. During wartime, AOAP service will be—

- Provided as far forward as possible using the most-responsive system available.
- Event oriented, occurring during unit stand-downs or reconstitutions and field maintenance.

AIRCRAFT CONDITION EVALUATION PROGRAM

3-29. The U.S. Army currently uses the aircraft condition evaluation (ACE) methodology to conduct fleet surveillance and prioritize aircraft for induction into programmed depot maintenance. ACE is an annual program that evaluates all force-modernization aircraft (such as the CH-47, OH-58, UH-60, and AH-64) and selected legacy aircraft (such as the OH-58A/C and UH-1 assigned special missions).

3-30. AMCOM, as the NMP, is assigned the mission according to AR 750-1. The purpose of the ACE program is to evaluate and report the depot-level health of the airframe that is evaluated. The data are used to schedule aircraft for repairs and assist in determining depth of depot maintenance and repairs as well as locations.

ARMY WARRANTY PROGRAM

3-31. The Army Warranty Program covers all items procured for Army use purchased with an accompanying warranty. The Army Warranty Program includes aircraft, aircraft weapon systems, and aircraft repair parts and components. In addition, the Army also purchases warranties for items such as trucks, tractors, engines, transmissions, and construction equipment.

Note. Refer to AR 700-139 for additional guidance on the Army's warranty program.

3-32. Aviation units receiving newly fielded equipment and components should check the type of warranty that the Army purchased for their newly fielded equipment. Tailoring the warranty concept to fit the item and its intended use in a comprehensive manner with minimal effect on standard Army logistical procedures is the single most important aspect of the warranty acquisition process. Warranty tailoring is intended to protect the Army from the costs and frequency of systemic failures and to enact responsive remedies for failures of significant operational effect on aircraft readiness.

3-33. When newly fielded equipment under warranty experiences malfunction, aviation maintenance commanders/leaders/maintenance officers/technicians should request assistance from the LAP office for answers to or resolution of warranty issues or questions.

3-34. The LAO or LARs will provide advice and assistance to the Army command warranty control officer (WARCO) and aviation unit maintainers as part of the service interface established in AR 700-4. Representatives of the LAP will—

- Clarify warranty applications/exclusions and warranty claim/report procedures upon user or WARCO request.
- Provide warranty information to users/WARCOs as a secondary source of information.
- Provide specific assistance as outlined in materiel fielding plans (MFPs) and technical and supply bulletins/manuals and related documents for warranty management.

3-35. Aviation equipment and components covered by the Army warranty program require special handling during the warranty period to keep the warranty valid. Details concerning warranty provisions are published in supply letters. The WARCOs or LAOs will have a copy of the warranty supply letter on items within their area of support. Warranties will increase the time required to perform maintenance.

3-36. Once assistance and guidance is received from LAP technical representatives and warranty issues and concerns are addressed and resolved, aviation unit maintenance personnel shall submit a product quality deficiency report (PQDR). DA Pamphlet 738-751 provides PQDR procedural guidance and information.

3-37. Table 3-3, DA Pamphlet 738-751, shows the CECOM quality deficiency report (QDR) action point addresses for submission of CECOM PQDRs. To submit AMCOM-managed equipment PQDRs, refer to Table 3-4 for the AMCOM QDR action point address. DA Pamphlet 738-751 provides procedural guidance and instructions for completing DA Form 2407 (Maintenance Request) and DA Form 2407-1 (Maintenance Request-Continuation Sheet) to file warranty claim actions.

MAINTENANCE ASSISTANCE AND INSTRUCTION TEAM PROGRAM

3-38. The MAIT Program—developed under DCS, Assistant Chief of Staff (Logistics) (G4)—complements the LAP. The MAIT Program upgrades Army materiel and units to a state of readiness consistent with assigned goals needed to carry out the Army's operational and tactical missions. It will also ensure that commanders at all levels are provided assistance in identifying and resolving maintenance, supply, and maintenance management problems within their units.

Note. Refer to AR 750-1 for specific guidance on the MAIT Program.

3-39. The MAIT can also identify systemic problems in maintenance management and provide assistance to improve management of the maintenance workload at all levels of maintenance support. In today's COE, the MAIT develops unit capabilities to meet mobilization and contingency operations.

3-40. When MAIT visits are coordinated by a higher headquarters commander or requested by using units, commanders of units visited will—

- Ensure that appropriate personnel, materiel, and records are available for the MAIT during scheduled assistance and instruction visits.
- Act promptly to correct problems.
- Request assistance from supporting activities/higher headquarters to correct problems that cannot be corrected by the unit.
- Retain the latest two MAIT visit summaries.

POLICIES

3-41. MAIT visit results and summaries will not be given ratings or scores, nor will the information be revealed to any inspection agency. When the MAIT function is contracted, MAIT visit results will be available to quality assurance evaluators.

3-42. MAITs provide semiannual overview briefings or published status reviews to brigade, division, corps, installation, and senior-level Reserve Component commanders. Briefings should highlight significant problems encountered that apply commandwide but will not identify specific units involved. Special emphasis is placed on providing the commander with an overall assessment of conduct and supervision of preventive maintenance checks and services (PMCS) within the command.

PROCEDURES

3-43. MAIT visits will be required for specific units not meeting acceptable readiness standards or levels. Direct communication will be established between units in need of assistance and the supporting MAIT.

3-44. Coordination between the unit and Active Component MAITs will take place at least seven working days before a directed or programmed visit. ARNG MAITs will coordinate visits at least 30 calendar days before a directed or programmed visit.

3-45. MAITs, as a minimum, will have the capability to assist and instruct units in improving operations and management in the following areas:

- Preventive maintenance and equipment repair.
- Equipment condition and serviceability.
- Maintenance records and reports management.
- Calibration management.
- Proper use of tools and test equipment, troubleshooting, and fault diagnosis.
- Maintenance personnel management and training.
- Publications account management, distribution of publications, and proper use of publications.
- Planning, production, and quality control procedures.
- Safety.
- Shop operations, including SOPs.
- PLL procedures and PLL accountability.
- Proper implementation of the Army Warranty Program.
- AOAP.
- QDRs.
- Hazardous Materials (HAZMAT) handling.
- Chemical agent resistant coating (CARC)/camouflage painting pattern (CPP).

VISITS

3-46. MAIT visits are categorized as the following:

- Requested visits arranged by the unit commander requiring a MAIT or by commanders requesting a MAIT for subordinate units.
- Directed visits scheduled in advance.
- Programmed visits scheduled in advance.

Note. Requested and directed visits will be given precedence over programmed visits.

U. S. ARMY AVIATION AND MISSILE COMMAND

3-47. AMCOM is one of the major subordinate commands of the USAMC. It is responsible for commodity management of aeronautical equipment, including—

- Design, research, and development.
- Maintenance engineering.
- Supply and stock control.
- Logistics assistance for all Army aviation and aerial delivery equipment.

AMCOM PROJECT OLR

3-48. Project OLR is an AMCOM life-cycle managed organization. OLR is an entirely reimbursable entity; requests for assistance usually require funding from the customer. Project OLR's primary mission is the installation of components authorized by MWOs in support of the modernization, upgrade, sustainment, and improvement of the operational readiness of U.S. Army equipment.

3-49. Project OLR provides worldwide coverage via seven regionally located sites (CONUS and OCONUS) and numerous traveling teams. Each site has slightly different capabilities, but they all, ultimately, provide maintenance support for Army aviation platforms and missile systems and the associated GSE. This maintenance support ranges from depot-level repair capability for airframes, dynamic components, and subassemblies to maintenance and repair support for power plants, power trains, electronic/avionics assets, armament systems/components, and a multitude of testing and calibration capabilities in support of these systems/components.

3-50. Project OLR also provides the following capabilities:

- Overflow maintenance in support of field maintenance organizations:
  - Phase inspections.
  - Maintenance support.
- Foreign military sales (FMS)/transfer inspections.
- ACE inspections.
- Port operations support for deploying units and FMS transfer cases.
- Aviation reset.
- Mission Essential Packages.
- MWOs.
- AMCOM's Crash and Battle Damage Repair Program.

3-51. Project OLR maintains automated systems that track the MWO configurations to the tail-number level. Automation capabilities within OLR are also changing with the U.S. Army to include the use of ULLS, SAMS, and other automation tools that are being incorporated into Army aviation. The MWO configuration database can provide information by tail number identifying—

- Aircraft locations and units assigned.
- Applicable MWOs.
- Completed MWOs and dates completed.
- The OLR site that installed the MWOs.
- Applicable man-hours.
- ACE scores.

3-52. Project OLR provides worldwide maintenance coverage and regional support with strategic placement at home and abroad. The location and number of aircraft supported vary, depending on the assigned area of responsibility:

- Fort Lewis, Washington – Alaska, Washington, Oregon, California, Montana, Idaho, Nevada, Arizona, Utah, Wyoming, North Dakota, South Dakota, Nebraska, Minnesota, Iowa, and Wisconsin.
- Fort Hood, Texas – Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, Louisiana, and Mississippi.
- Fort Campbell, Kentucky, and Fort Rucker, Alabama – Michigan, Illinois, Indiana, Ohio, Kentucky, Tennessee, and Alabama.
- Fort Stewart, Georgia – Maine, New York, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, Pennsylvania, New Jersey, Maryland, West Virginia, Virginia, North Carolina, South Carolina, Georgia, and Florida.
- Fort Bragg, North Carolina, only.
- Europe – The European continent.
- Korea – Korea only.

NEW EQUIPMENT TRAINING TEAMS

3-53. The Logistics Assistance and New Equipment Training (NET) Division is one of the subordinate divisions of the Directorate for Readiness. Its mission is staff supervision and operational control of worldwide LAPs for Army aircraft and related support equipment. The division also provides representatives to make command staff visits and to manage all aspects of the new equipment training and support services.

3-54. An Army aircraft mobile training team is made up of either specialists or contract technical services personnel trained in the support of a particular aircraft. These teams are controlled by AMCOM and assist the commander in improving the proficiency of maintenance personnel at AMC and ASC levels. When the team completes a job, it prepares and forwards a report to AMCOM with consolidated findings.

AVIATION SUPPORT COMPANY LOGISTICS ASSISTANCE

3-55. When requested by AMC units, ASC units coordinate and provide informal technical and training assistance using mobile maintenance/logistics contact teams. Supporting maintenance activities must maintain a proactive liaison to assist aviation maintenance units. ASC contact teams—

- Assist in resolving problems identified by liaison visits.
- Instruct and advise on maintenance and repair parts procedures.
- Perform on-site maintenance when requested.
- Assist the MAIT when requested.

SECTION II – MAINTENANCE AND LOGISTICS SUPPORTING EQUIPMENT

ARMY TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT

3-56. AR 750-43 assigns Armywide management of the U.S. Army TMDE calibration and repair support (C&RS) program to HQ, AMC. In turn, the U.S. Army TMDE Activity (through AMC) is responsible for DA TMDE program execution and management. The National Guard Bureau is assigned management, command, and control over the ARNG maintenance companies and their assigned TMDE. It also controls calibration facilities at combined support maintenance shops. In addition, AR 750-43 prescribes policies and procedures, assigns responsibilities, and establishes goals and objectives applicable to the development, selection, acquisition, management, sustainment, and support of Army TMDE, associated test program sets (TPSs), embedded diagnostics and prognostics, and interactive technical manuals (IETMs).

Note. Refer to Appendix H for a sample TMDE SOP.

3-57. TMDE is essential to Army maintenance because of its distinctive ability to test, adjust, synchronize, repair, and verify accuracy, safety, readiness, and information assurance of aircraft systems, subsystems, and weapon platforms. The capability of Army weapons platform mechanical systems, radios and communication devices, radar systems, targeting devices and fire control systems, missiles, and aviation platforms to operate accurately and effectively depends on the synchronization of these precise measurements against known standards.

RESPONSIBILITIES

3-58. Aviation unit maintenance commanders must rely on a variety of programs and equipment to meet DA-established operational readiness rates. The value of a sound and established TMDE support program at AMCs or ASCs cannot be underestimated.

3-59. Unit commanders are responsible for all maintenance support programs to include TMDE. They must rely on a unit TMDE support coordinator to enforce policies contained in the unit maintenance SOP. The TMDE support coordinator is a unit orders position. The TMDE SOP establishes the standard that must be met by all unit maintainers and TMDE users.

Unit Maintenance Commander Responsibilities

3-60. Commanders at all maintenance support levels will designate, in writing, a unit TMDE support coordinator. The unit commander is responsible for—

- Coordinating war, emergency, and contingency plans with the United States Army Test Measurement and Diagnostic Equipment Activity (USATA) when TMDE calibration and repair support is a requirement.
- Coordinating major changes that affect C&RS requirements provided by USAMC elements with the USATA.
- Identifying TMDE support requirements to the USATA supporting organizations.
- Comparing the unit's property books, or TMDE inventory, with TB 43-180 to initially determine the C&RS requirements for the unit's TMDE items; upon request, the supporting TMDE support activity (TSA) can provide technical assistance to the TMDE owners/users in the identification of TMDE requiring support.
- Ensuring that all TMDE is identified to include TMDE that may be embedded in sets, kits, outfits, or other assemblages.
- Turning in TMDE—to include all operator documentation and basic issue items that are in excess of authorizations, through appropriate channels—for redistribution.
- Developing and executing training programs that will attain and maintain the highest level of proficiency among personnel in the use, maintenance, and calibration of TMDE.
- Reporting TMDE problems that affect unit readiness.
- Taking appropriate actions to remove unnecessary/outdated TMDE from unit requirements and authorizations documents.

TMDE Support Coordinator Responsibilities

3-61. The following TMDE instructions and outline delineate responsibilities for assigned TMDE support coordinators. This guidance will acquaint TMDE support coordinators with applicable references and publications as well as procedures to fully implement the U.S. Army TMDE support program. TMDE references and publications will enable all TMDE support coordinators to comply with as well as monitor their units' TMDE support program.

3-62. The TMDE support coordinator is the focal point of contact for all matters pertaining to TMDE support within the unit. The TMDE support coordinator is the principal interface between the TMDE user and the TMDE support organization. The assigned TMDE support coordinator should establish and maintain a good working relationship with TMDE support personnel and TMDE internal support operations. The TMDE support coordinator performs the following duties in support of his unit's TMDE program:

- Serves as the central point of contact for matters concerning TMDE calibration and repair support.
- Develops and implements the SOP for identification, turn-in, and control of TMDE requiring calibration and repair support.
- Ensures that hand receipt holders update hand receipts when changes to TB 43-180 or to supply catalogs occur.
- Assures compliance with AR 750-43, TB 750-25, TB 43-180, DA Pamphlet 750-8, command regulations, unit maintenance SOPs and appendixes, and the supporting area TMDE support team's (ATST's) external SOP.
- Reviews the instrument master records file (IMRF) to ensure that all authorized TMDE requiring calibration or repair support is contained therein and that the listed information is correct, notifying ATST of any changes.
- Ensures that the supporting ATST is advised when changes, additions, or deletions in the TMDE inventory occur to make sure that the IMRF is maintained according to TB 750-25.
- Coordinates with supporting ATST and unit personnel to ensure that the recording, scheduling, and reporting system is maintained as prescribed in AR 750-43 and TB 750-25.
- Monitors the projected item list to make certain that TMDE is submitted for calibration service according to the published schedule; when necessary, arranges for unscheduled calibration support.

- Monitors the delinquent item list to determine why TMDE was not submitted for calibration as scheduled; initiates action to obtain calibration service for these delinquent items.
- Highlights the delinquent list, notifies the appropriate hand receipt holder, and provides the unit commander with a monthly update.
- Ensures that the TMDE owner/user's delinquency rate (failure to submit for required support) is 2 percent or less.
- Assures that all organizational maintenance has been performed on TMDE submitted for support and that required accessories and manuals accompany the TMDE.
- Reviews all reports received from the support organization to—
  - Identify TMDE that was out-of-tolerance, repaired, or determined to be unserviceable when presented for calibration.
  - Determine if system maintenance checks previously performed using this out-of-tolerance TMDE must be repeated.
  - Advise TMDE owners/users who did not present their equipment for calibration, according to the schedule, that corrective action must be taken.
- Ensures that new items of TMDE not listed in TB 43-180 are reported according to TB 43-180 and to Appendix B of TB 750-25.
- Maintains a record of all items in temporary storage by nomenclature and model and serial number; ensures that this equipment is operational and the affixed DA Label 80 has been overstamped "calibrate before use."
- Notifies the supporting ATST, in writing, that TMDE has been placed in storage so that these items may be removed from the cyclic calibration schedule; ensures that a designated temporary storage area is established for storing calibrate before use (CBU)/void items.
- Constantly monitors the TMDE inventory to achieve maximum effectiveness; ensures that items that are seldom used are placed in temporary storage.
- Turns items never used into supply and deletes them from the TOE or TDA authorization.

3-63. Whether the unit or installation is large or small, the TMDE support coordinator's responsibility remains the same; that is, assuring that responsive TMDE calibration and repair support is provided. These services may be rendered by an ATST, area calibration laboratory or support center, DOD support facility, or direct support (DS)/general support (GS)/ASC support unit for the test, measurement and diagnostic equipment-support program (TMDE-SP).

3-64. The TMDE support coordinator must enforce compliance with the unit's TMDE SOP. He encourages TMDE users to identify their calibration and repair needs and conducts regular follow-ups to ensure that unit personnel adhere to the schedules and procedures for obtaining the required support.

3-65. By enlightening unit users about the goals and capabilities of the TMDE support program, TMDE users are kept informed and are aware of how critical it is for them to support and comply with the TMDE support program. Essentially, the customer should know that cyclic calibration of TMDE provides a high confidence factor in the integrity and reliability of measurements performed. Should the measurement capabilities of TMDE ever be in doubt, calibration should be requested.

3-66. When organizations or their maintenance operations are larger than is feasible for one TMDE support coordinator to manage TMDE support, consideration should be given to having an alternate TMDE coordinator. The unit maintenance commander can appoint an alternate TMDE support coordinator or have several unit coordinators appointed to a major mission area.

3-67. The overall responsibility for managing the TMDE support program will be retained by the primary unit coordinator. However, the primary coordinator needs to ensure that alternate TMDE coordinators are knowledgeable of the TMDE program objectives, policies, and procedures and of their inherent responsibilities.

User Responsibilities

3-68. The following checklist applies to unit TMDE users; additional checklists in applicable regulations also address compliance requirements and objectives that should be met by all TMDE users:

- Have the property book and hand receipts been reviewed to determine accountability requirements?
- Have TMDE calibration and repair requirements been identified?
- Does TMDE in use have a current DA Label 80 or DA Label 163 affixed and correctly annotated?
- Is TMDE (provided a limited calibration) identified with DA Label 163?
- Is physical inventory periodically conducted to verify the types and quantities of TMDE on hand that require calibration or repair?
- Are all TMDE changes, additions, and deletions identified to the supporting ATST as they occur?
- Is an operational check performed on items before they are placed in CBU status; is a correctly annotated DA Label 80 affixed; and has the supporting ATST been notified of the status change?
- When TMDE is removed from temporary storage (CBU), is it submitted for calibration before use?
- Is the storage area segregated from the work area?
- Are projected item lists provided by the supporting facility? Are they reviewed, and is corrective action taken?
- Are delinquent item lists (TMDE not presented for scheduled calibration) reviewed and corrective action taken by the affected hand receipt holder, and is the unit maintenance commander briefed?
- Are controls established to assure that TMDE is not used after expiration of the calibration due date on the DA Label 80 or DA Label 163?
- When there is doubt about the accuracy of TMDE, is action taken to request unscheduled calibration?
- Has an operator or organizational maintenance program for TMDE been established?
- Is operator or organizational maintenance performed as prescribed by equipment maintenance manuals?
- Are preventive maintenance services performed on TMDE as listed in the appropriate technical publications, and are faults recorded on DA Form 2404?
- Is DD Form 314 (Preventive Maintenance Schedule and Record) maintained at unit level for all calibration not required (CNR) items of TMDE requiring scheduled periodic preventive maintenance services other than calibration?

SUPPORT

3-69. Calibration and repair support requirements of instruments used in support of U.S. Army materiel will be listed in TB 43-180. The calibration procedures listed in TB 43-180 are DOD- or USATA-approved procedures and shall be used. The approved maintenance manual is also listed in TB 43-180.

Area TMDE Support Team Capabilities

3-70. TMDE designated in TB 43-180 as requiring ATST support must be transported to the location where the ATST is slated to provide calibration and repair services. When justified by sufficient workload or when the size or configuration of the TMDE precludes movement, the ATST will be dispatched to the TMDE owner/user site.

3-71. When a designated ATST is unable or not capable of providing calibration or repair service, the TMDE will be evacuated as directed by the calibration and repair center (CRC). The ATST is responsible for providing the necessary service and returning the repaired and calibrated TMDE to the owner/user.

When service external to the ATST is necessary, except for warranty TMDE, the ATST will arrange for the service and assure the return of the TMDE to the owner/user.

Area Calibration Laboratories/U.S. Army Primary Standards Laboratory Support

3-72. TMDE/standards requiring the support of Area Calibration Laboratories (ACLs) or U.S. Army Primary Standards Laboratory (USAPSL) may be transported to the ATSTs or shipped directly to the ACLs or USAPSL.

Management Reports

3-73. IMRF (master list) is distributed quarterly to TMDE support coordinators. TB 750-25 requires TMDE calibration and repair support activities to establish and maintain an IMRF. The IMRF for Test, Measurement, and Diagnostic Equipment-Support Program (TMDE-SP) supported by DS/GS/ASC units will also be maintained by the supporting ATST. The accuracy of these files rests, in part, with the TMDE owner/user who must initially provide accurate information and, thereafter, review master lists for accuracy and take corrective action when necessary.

3-74. The TMDE owner/user must advise the supporting ATST/DS/GS/ASC as changes, additions, or deletions in the TMDE inventory occur. The IMRF must contain all TMDE that requires support.

Forms and Labels

3-75. A DA Label 80 or DA Label 163 must be affixed to all calibration standards and TMDE identified in TB 43-180 as requiring calibration. This labeling certifies that the instruments have been calibrated to required specifications and indicates support dates.

Note. Refer to TB 750-25, Appendix C, for detailed instructions on the preparation of these labels. Instructions for maintenance forms are in DA Pamphlet 750-8.

3-76. Surveillance of the TMDE support program includes a review of forms and labels to ensure uniformity and proper annotation. Policies and questions pertaining to labels and forms used for instruments in storage are also specified in Appendix C, TB 750-25.

AVIATION GROUND SUPPORT EQUIPMENT

3-77. To sustain DA-mandated operational readiness rates, serviceable AGSE is essential for aviation units in reaching those objectives. Fully mission capable aircraft rates can be achieved only if the unit's assigned or attached AGSE is adequately maintained and fully mission-capable to support the aviation unit's tactical and training missions. Aircraft operational readiness rates are directly affected by the condition and serviceability of the unit's AGSE.

3-78. AGSE includes all equipment and special tools required to maintain aircraft and associated equipment. Support equipment (whose complexity, in some instances, approaches that of the aircraft) is needed to properly maintain and operate aircraft. Competent and trained aviation maintainers are necessary to keep these complex pieces of equipment serviceable and operational. Currently, there is no available school MOS in which a Soldier's sole training is only to support and maintain AGSE.

AUTHORIZATION DOCUMENTS

3-79. Authorization documents allocating AGSE to aviation units are TOEs (requirements documents), modification tables of organization and equipment (MTOEs) (authorizations documents), and TDAs. The MTOE lists equipment authorized for each section by paragraph and line item number (LIN). A recapitulation table shows totals for equipment listed in the MTOE by type. Components of sets, kits, and outfits are not reflected in these totals but are shown in supply catalogs prepared for each shop set authorized by the MTOE.

3-80. Ground support equipment (GSE) supporting a single MDS is referred to as peculiar ground support equipment (PGSE). Authorization of AGSE and PGSE is contained in the repair parts TM for that specific aircraft. For a complete authorization of AGSE and PGSE, maintainers must review the unit's TOE and all applicable supply catalogs for sets, kits, and outfits authorized as well as repair parts and special tools list (RPSTL) manuals for their assigned aircraft.

INSPECTIONS

3-81. The various types of inspections affecting AGSE in an aviation unit are general in nature. These inspections are designed to maintain AGSE in a serviceable and operational condition. The most common types of inspections performed by using aviation maintenance units are daily and periodic inspections. The regularity with which these inspections are performed is determined by frequency of operation and conditions under which the equipment is operated. For more specific and detailed inspections of assigned AGSE, refer to applicable references and publications.

MAINTENANCE

3-82. Most AGSE failures can be traced directly to poor or nonexistent maintenance practices. Establishing a sound unit AGSE maintenance SOP is the responsibility of the AGSE maintenance NCOIC. A person designated by the unit commander, the AGSE NCOIC should be trained and qualified to inspect and maintain all pieces of AGSE. AGPUs, compressors, heaters, towing vehicles, fueling vehicles, test stands, and electronic test equipment are examples of AGSE that must be maintained and ready to function whenever needed.

3-83. AGSE must be checked frequently for preventive maintenance and scheduled maintenance services. TM 1-1500-204-23-9 provides criteria and technical data for serviceability inspections, storage and shipment, and general maintenance procedures. Specific TMs contain operator and support maintenance procedures. Maintenance beyond the operator level will depend on the agency or proponent for the item and on the availability of maintenance capability.

3-84. To ensure AGSE availability, aviation maintenance managers will—

- Evaluate the operational status of AGSE.
- Emphasize individual responsibility by insisting that all operators be trained and licensed.
- Ensure that all appropriate publications are current, on hand, and used.
- Ensure that preoperation and postoperation checks and services are continuously done and documented.
- Allot time for preventive maintenance checks and services and scheduled maintenance (a good time to perform these checks is during normally scheduled motor stables).
- Conduct periodic inspections and inventories.
- Ensure that AGSE operation and maintenance standards are detailed in the unit SOP.

REPAIR PARTS

3-85. Units must maintain a PLL for AGSE as specified in the applicable TMs. Each unit is responsible for compiling and listing its PLL requirements. A copy of the AGSE PLL list will be provided to the supply supporting activity.

3-86. The combination of a lack of parts manuals, unreported local purchases of repair parts on the economy, makeshift repairs, controlled substitution, and parts ordered on an as-needed basis has failed to establish a demand for needed AGSE repair parts. Aviation units, for the most part, have little or no demand-supported AGSE PLL. As a result, some manufacturers have halted production of outdated equipment and its repair parts. The many different makes and models of one type of equipment further complicate the problem of identifying repair parts.

Note. If an aviation unit is having a difficult time obtaining repair parts for its assigned AGSE, input the AGSE national stock number into FEDLOG to obtain the source of supply (SOS) and commercial and government entity code (CAGE). Once the SOS and CAGE are identified, contact the inventory control point or the manufacturer directly to obtain needed repair parts.

STORAGE

3-87. AGSE shall be stored under cover or in buildings or as required in Supply Bulletin (SB) 38-8-1. The equipment shall be stored to permit access for inspection and servicing during the storage period. Adequate security measures and fire protection shall be provided. Equipment should be kept as dry as possible and be accessible for inspection and servicing during the time that it is in storage.

3-88. AGSE in storage does not require periodic calibration. Enter "CBU" on the DA Label 80 either at the time that the equipment is placed in storage or on the date indicated on the label as the calibrated due date.

3-89. AGSE preserved for long-term storage will be depreserved, exercised, and represerved within 12 months of the preservation date. Equipment preserved according to TM 1-1500-204-23-9 will be inspected at 90-day intervals.

REQUESTS FOR ADDITIONAL AGSE

3-90. Sometimes, aviation units need AGSE other than that authorized or required by TOE, MTOE, and TDA. Tropic, desert, or arctic environments often create the need for additional equipment to supplement authorized equipment listed in the unit's MTOE.

3-91. The unit in need of additional equipment should submit a request, in letter form, through command channels. The request should include the following information:

- Identification of the specific requesting unit.
- Number of applicable TOE, MTOE, or TDA.
- Complete nomenclature, stock number, and quantity of needed items.
- Justification for each item, including a statement that the item can be maintained.
- If the item is nonstandard, the reason for not using a standard item.
- Statement as to whether the additional equipment should be included in the TOE, MTOE, or TDA.

3-92. The repair parts and special tools list contained in applicable technical manuals shows AGSE needed to support assigned aircraft. If an item is listed, it can be requested, even if it is not included in the unit's TOE, MTOE, or TDA.

ACCOUNTABILITY

3-93. AR 710-2 states that, as a minimum, all property will be inventoried annually. Accountability compliance of assigned AGSE will be according to AR 735-5. Inventories should be conducted periodically. Aviation maintainers or supervisors will inventory basic issue items (BIIs) and any other equipment assigned to the AGSE at least monthly using the property book or accountable officer's hand receipts and appropriate supply catalogs.

FORMS AND PUBLICATIONS

3-94. DA Pamphlet 750-8 lists required DA forms on which data is to be recorded and maintained. The following DA forms are used in support of AGSE according to DA Pamphlet 750-8:

- DD Form 314.
- DD Form 1577 (serviceable tag).
- DD Form 1577-2 (Unserviceable [Reparable] Tag—Materiel).

- DA Label 80—used for equipment requiring calibration.
- DA Form 2404—used to list equipment faults that create an NMCS equipment status.

3-95. A reference library must be established with required publications on-hand to ensure that AGSE is properly operated and maintained. The reference library will contain technical publications, lubrication orders (LOs), MWOs, TBs, TMs, and supply catalogs.

Note. DA Pamphlet 25-30 lists publications required to support AGSE.

Chapter 4

Aviation Automated Maintenance and Logistics Management Systems and Operations

Aviation maintenance units increasingly depend on automated systems to manage maintenance and logistics operations. Automation continues to increase the ability of aviation maintenance managers/technicians to manage the flow of maintenance and logistics data using fielded STAMISs. This chapter provides aviation maintenance commanders, maintenance officers/technicians, and maintainers across the Army with a ***"how-to"*** for STAMISs that support aviation maintenance and logistics operations. In the current COE, fast-changing technology—that is leveraged with experienced aviation maintenance managers/technicians—forms the nucleus required to anticipate, analyze, and tailor available automated systems for effective and timely support of complex weapon systems and modern aircraft. Today's focus on adaptive planning and means to provide increased options for aviation commanders is prompting maintenance managers to embrace change, innovation, and flexibility at all levels. The measure of maintenance success on the battlefield will continue to be the availability of aircraft that are fully mission capable and ready to continue the fight.

SECTION I – THE STANDARD ARMY MANAGEMENT INFORMATION SYSTEM ARCHITECTURE

4-1. STAMIS is a functional information management system designed to increase the productivity of all maintainers and effectiveness of all aviation units. STAMIS will provide the logistics infrastructure required for any military ground or aviation operation. The technical goal is to establish a seamless and interoperable network. The network involves the integration and communication software used by all STAMISs.

4-2. STAMIS consists of computer hardware and software systems that automate diverse functions based on validated customer requirements. STAMIS facilitates the vertical and horizontal flow of logistics and maintenance status information to units Armywide.

Contents

4-3. Components of the system primarily include Unit Level Logistics System-Ground (ULLS-G), Unit Level Logistics System-Aviation (ULLS-A), Property Book Unit Supply Enhanced (PBUSE), Standard Army Retail Supply System (SARSS), Standard Army Maintenance System (SAMS), Integrated Logistics Analysis Program (ILAP), and Global Combat Service Support-Army (GCSS-A) (see Figure 4-1).

UNIT LEVEL LOGISTICS SYSTEM

4-4. ULLS is a STAMIS that provides aviation maintenance commanders, maintenance officers/technicians, and maintainers with the ability to track maintenance and materiel readiness management operations and prepare maintenance management forms and records. It also enables aviation logistics/technical supply personnel to process requests and initiate procedures that provide maintenance personnel with aircraft repair parts and components in support of aviation maintenance operations across the total Army.

4-5. ULLS is broken down into two separate systems that support dedicated functions and activities within a specific unit. Each performs different functions. The two ULLS systems are ULLS-Aviation and ULLS-Ground.

Note. Report all system problems to the ULLS unit administrator.

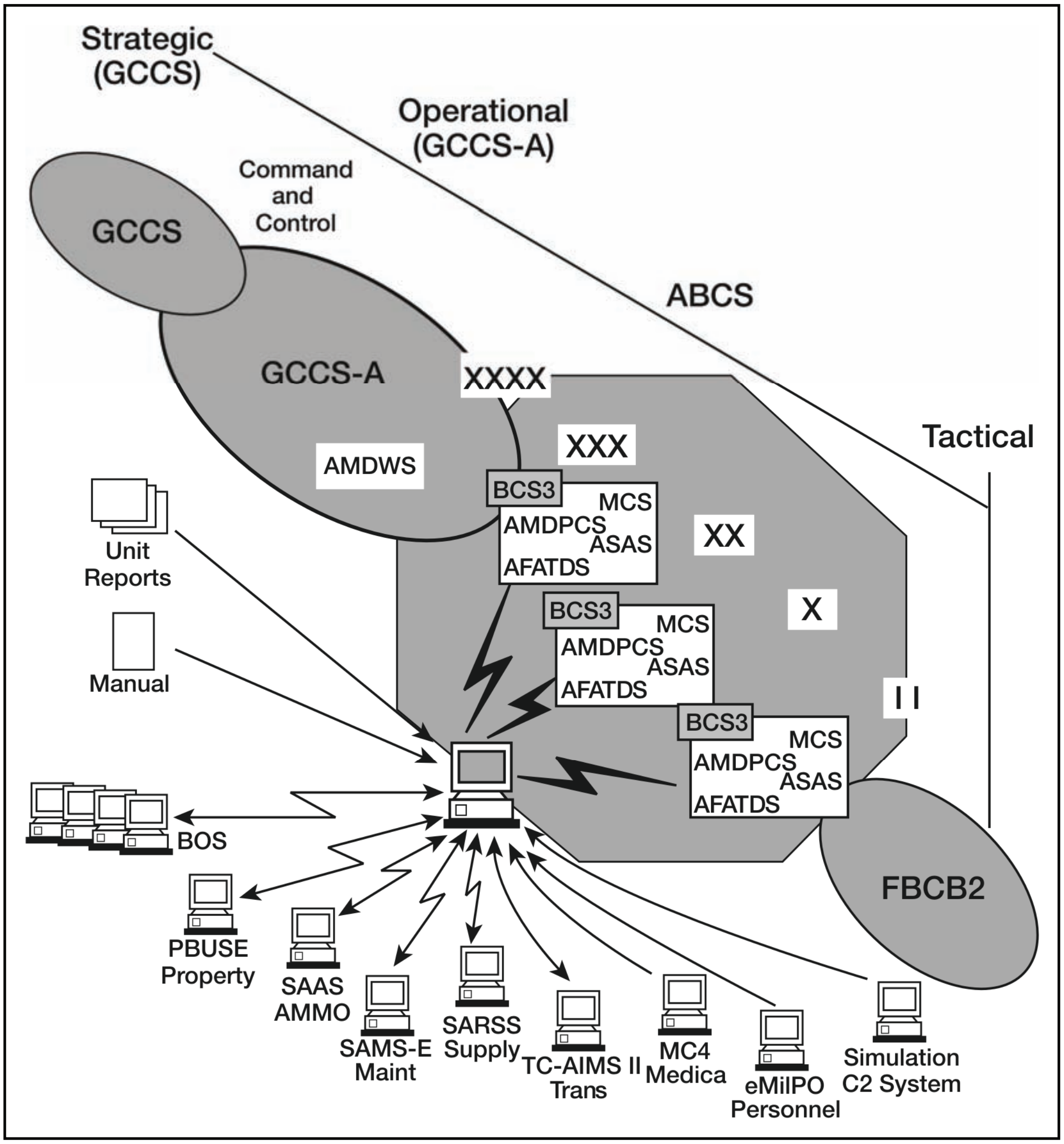

Figure 4-1. STAMIS architecture

UNIT LEVEL LOGISTICS SYSTEM–AVIATION

Note. ULLS-A is currently being fielded to Army aviation units. Fielding will be completed by the end of FY 06. ULLS–A, once fielded, will be the system of record to track all logistics and maintenance actions for all aviation maintenance units. The manual system (hard copies of forms and records) will be used as a backup if ULLS-A becomes nonfunctional. The PC office is responsible for coordinating the input and update of all maintenance and logistics actions into ULLS-A once the system is fully operational.

4-6. The ULLS-A program will enhance the Army's ability to more accurately track and control aviation maintenance, logistics, and aircraft forms and records. The ULLS–A program is designed to be user friendly while reducing man-hours through complete automation.

4-7. The ULLS-A is an innovative tool that assists aviation maintenance personnel with various tools to enhance aircraft reporting, status, and flying hours according to AR 700-138. Furthermore, ULLS-A can process aircraft transfers, maintain operational and historical records, process Class 9 (Air) repair parts, and enhance maintenance operations overall.

Note. ULLS–A is the system of record for unit-generated maintenance and logistics actions. The manual system will be used only as a backup in case ULLS–A is down.

4-8. In addition, ULLS-A automates bench stock (BS) listings by shop codes (stocked and maintained manually with an automated reordering process), PLL, reportable component management, and maintenance management processes performed by production control. ULLS-A is currently the system of record for all PLL/BS and The Army Maintenance Management System-Aviation (TAMMS-A) operations at the unit level. ULLS-A enhances and supports those tasks associated with controlled exchange of reportable components listed in TB 1-1500-341-01.

4-9. ULLS-A, at the AMC, is configured into a network operation. A notebook computer assigned to line companies facilitates those tasks previously performed on the manual logbook. Army aviation units are normally supported by three workstation computers (production control, quality control, and technical supply) and a file server (database) positioned in the PC office. These automated systems comprise the local area network (LAN).

4-10. A notebook computer per airframe is dedicated to support each of the unit's assigned aircraft. The notebook computers, depending on the COE, perform data transfer using either modem or diskette methods of transmission. The transfer of data entails recording procedures and tasks performed by crew members onto the LAN.

4-11. Tasks and activities performed by quality and production control are transferred to the aircraft notebook. These procedures will ensure that the ULLS-A is current and reflects the latest maintenance and logistics status assigned to the airframe.

4-12. ASCs are provided with an ULLS-A that supports those activities necessary to perform field maintenance support for customers and ORF/RTF aircraft. If an aircraft is work ordered to an ASC, the logbook and laptop computer assigned to the aircraft will accompany the aircraft to track and record all performed maintenance actions.

4-13. The ULLS-A allows PC to generate and manage ASC-level work orders and post statuses to the maintenance request register. ULLS-A provides the means to produce and manage internal work orders (intrashop), which are printed and supplied to the ASC component and airframe repair platoons.

UNIT LEVEL LOGISTICS SYSTEM–AVIATION MANAGEMENT OPERATIONS

4-14. At the flight/line company, the crew chief is responsible for daily data entries to ensure that ULLS-A accurately reflects status and condition. To maintain up-to-date automated records, maintenance personnel must promptly and accurately input all faults identified and inspections performed into the ULLS-A notebook. Maintenance personnel will enter related maintenance actions affecting the status of the original write-up into the ULLS-A notebook as they occur or at the earliest opportunity.

4-15. If a maintenance fault (other than the initial entry) with a grounding condition “X” is found (DA Form 2408-12-2E) directly affecting the MC or operational readiness (OR) condition of a given airframe, when addressing DA Form 2408-13-1E maintenance faults, maintenance personnel will immediately migrate the ULLS-A notebook faults into the PC section’s ULLS-A. Once the PC OIC/NCOIC is notified and maintenance information from an affected aircraft is migrated into the ULLS-A, maintenance actions to correct the fault with a grounding condition “X” status assigned to the airframe will begin immediately. If routine maintenance is being conducted to clear an entry from a DA Form 2408-13-1E, the PC section is notified to alert it that the affected airframe will be NMC until the maintenance actions are complete.

Note. According to DA Pamphlet 738-751, flight packs may be used for seven mission days while an aircraft is away from home station. Printed electronic forms from the flight pack (DA Form 2408-13-1/2/3) may be used when the ULLS-A is down. As soon as the system is operational, maintenance personnel will transfer entered information from the printed electronic forms and into the ULLS-A as soon as possible.

4-16. A single notebook computer can be used as a record-keeping tool for several aircraft; however, the logbook data card must be changed to switch between aircraft. The user should use only one data card per laptop to avoid possible data loss or corruption. Automated logbook entries are entered on the notebook computer and saved to the logbook data card. All logbook entries are performed according to DA Pamphlet 738-751 using the ULLS-A automated logbook program.

4-17. Aircraft data are entered into the ULLS-A automated logbook on a real-time or near real-time basis. Pilots, maintenance personnel, and crew members enter data and events into the logbook as required. Saved data are recorded onto the formatable media device inserted in the notebook computer.

4-18. All updated data entered and saved onto the logbook data card must be periodically migrated onto the server for access by workstation users (such as PC and QC). The updated data is migrated locally using the logbook data card and, remotely, via telephone modem.

Note. Crew members and maintenance personnel should migrate their data as frequently as possible. Frequent migration to and from the server provides timely recognition of any problem areas and allows for easier resolution.

4-19. Platoon sergeants/section chiefs monitor all daily data-entry operations by subordinate crew chiefs. They monitor daily data transfer operations from assigned ULLS-A workstations under their control according to established procedures. They also review all ULLS-A closed faults for completeness and correctness.

4-20. The PC office will provide procedural guidance on the functional aspects and operations of the ULLS-A. The PC officer in charge (OIC)/NCOIC coordinates all actions taken when an aircraft becomes partial mission capable (PMC) or not mission capable (NMC). Actions include, but are not limited to, aircraft systems and subsystems trouble-shooting, aircraft component repair/replacement, or the requisition process of a serviceable aircraft repair part/component.

4-21. Actions may also include controlled exchange when an aircraft repair part/component is in short supply or has long lead times. Once a COA has been determined, the ULLS-A database should be updated.

4-22. The PC office receives and coordinates daily data transfers from/to flight companies according to established schedules. It will perform all data-transfer functions to higher STAMIS for all maintenance and supply support. It prepares and provides required daily, weekly, and monthly reports to the BAMO or battalion AMO according to established policies and procedures.

4-23. Principal operators in the QC section will be the technical inspectors (TIs). The TIs will review the ULLS-A database in the flight company computers to ensure that all appropriate information (such as new and corrected faults, man-hours, when discovered, how recognized, and flight time) is entered correctly into the corresponding aircraft's ULLS-A notebook.

4-24. TIs will also review closed faults for completeness and correctness. They will keep all aircraft historical records—to include configuration control and weight and balance—current in the ULLS-A database. TIs archive completed records and forms according to established procedures. Records will be archived according to DA Pamphlet 738-751.

4-25. The ULLS-A Automated Logbook System interfaces with all levels of maintenance and operations. When safety-of-flight messages and technical bulletins are disseminated, updates to the user's logbook data are migrated back to the logbook from the server. Both the quality control and production control ULLS-A modules provide a system of checks and balances, enhancing the overall safety of operations.

4-26. Aviation logistics/technical supply personnel will perform automated logistics functions affecting requests, receipt, storage, issue, and accountability of the aviation maintenance unit's assigned PLL. When an airframe is down for parts, the PC OIC will direct aviation logistics/technical supply personnel to initiate automated aircraft repair parts and component requests.

4-27. NMCS aircraft will carry the highest priority designator (PD) assigned to the unit when the PC clerk processes a request for issue for a serviceable aircraft repair part or component. Corresponding status for NMCS aircraft will be inputted into ULLS-A and reported to the BAMO or battalion AMO through the PC office. ULLS–A can print a variety of reports in support of an aviation unit's maintenance posture.

UNIT LEVEL LOGISTICS SYSTEM–GROUND

4-28. ULLS-G speeds supply and maintenance operations at the unit level while eliminating errors that can occur under a manual system. ULLS-G also provides motor pool operations with dispatch capability. The ULLS-G alert dispatch option allows multiple dispatches to be printed. The operation of ULLS-G does not change between garrison and field environments.

PROPERTY BOOK UNIT SUPPLY ENHANCED

4-29. PBUSE is the Army's Web-based, state-of-the art CSS property accountability system. PBUSE features provide Standard Property Book System-Redesign (SPBS-R) functionality and data access by a permission control system for both garrison and tactical environments.

4-30. When tactical requirements dictate and direct connection to the Web is not possible, the system operates in a disconnected standalone mode. Upon completion of a standalone tactical requirement, the system is reconnected to the Web for resynchronization of the user's data to the central database.

4-31. PBUSE reduces the footprint and infrastructure requirements by consolidating two baselines into one. The system functionality provides many efficiencies for the logistics community. With PBUSE, the commander has a real-time view of assets, which allows him to access the system for queries without having to depend on the property book officer (PBO) to gather, prepare, and present the information. PBUSE also provides—

- Real-time total asset visibility throughout all levels of Army management.
- Automatic Logistics Army Authorization Document System (LOGTAADS) updates; LOGTAADS is a by-product of an MTOE. LOGTAADS, an electronic version of the MTOE, updates PBUSE and other property book accounting systems.
- Elimination of unique item tracking (UIT) reporting thorough automatic serial number tracking.
- Automated catalog changes.
- Unit transfer/task force/split operations.

STANDARD ARMY MAINTENANCE SYSTEM

4-32. SAMS increases the productivity of maintenance shops and provides commanders with accurate and timely maintenance management and logistics information at the ASC. It provides visibility of inoperative equipment and required repair parts, selected maintenance, equipment readiness, and equipment performance reports. It also provides completed work order data to the LOGSA for equipment performance and other analyses. The SAMS comprises Standard Army Maintenance System-Level 1 (SAMS-1) and Standard Army Maintenance System-Level 2 (SAMS-2).

4-33. The Standard Army Management System-Enhanced (SAMS-E) combines ULLS-G and SAMS-1 functions and upgrades SAMS-2 applications. SAMS-E supports sustainment TOE organization-level maintenance elements. It also supports DS/GS maintenance shop production activities and is considered a mission-critical system.

4-34. SAMS-E is located at consolidated company and separate company level and collocated at battalion level. SAMS-E provides consolidated maintenance and repair parts data and is located at the FMT's FSC within each aviation maneuver battalion and aviation support companies within the ASB.

STANDARD ARMY MAINTENANCE SYSTEM-1

4-35. SAMS-1 automates work order registration and document registers. It automates inventory control and reorder of shop and bench stock as well as automating work order parts and requisitioning. SAMS-1 is assigned to ASCs and FSCs.

4-36. SAMS-1—

- Automates maintenance documentation and information gathering and transmittal.
- Provides management of work orders and work order tasks.
- Allows transfer of repair parts/due-ins between work orders and shop stock.
- Accounts for direct, indirect, and nonproductive man-hours.
- Simplifies and standardizes the collection and use of maintenance data.
- Improves readiness management and visibility by providing equipment status and asset data.
- Raises the quality and accuracy of performance, cost, backlog, man-hour, and parts data through improved maintenance management.

4-37. SAMS-1 conducts logistics and maintenance interfaces with the following systems:

- ULLS.
- SAMS-2.
- Standard Army Retail Supply System–level 1 (SARSS-1).
- Standard Army Retail Supply System–Gateway (SARSS-Gateway).

STANDARD ARMY MAINTENANCE SYSTEM-2

4-38. SAMS-2 is an automated maintenance management system used at the ASB and the CSS automation office. The SAMS-2 is assigned to the CAB (heavy, medium, and light). SAMS-2 is also assigned to the TSC, deployable command posts (DCPs), CSS brigades, brigade support battalions (BSBs), and CSS battalions.

4-39. SAMS-2 is used by the field commands to collect and store equipment performance and maintenance operations data. This information is used to determine guidance to be given to their subordinate maintenance units for planning purposes.

4-40. SAMS-2 provides the capability of monitoring equipment nonmission capable status and controlling and coordinating maintenance actions and repair parts utilization to maximize equipment availability. It receives and processes maintenance data to meet information requirements of the manager and to fulfill reporting requirements to customers, higher SAMS-2 sites, and the higher maintenance levels. Data can be accessed instantly to fulfill management's needs in controlling, coordinating, reporting, analyzing, and reviewing.

4-41. SAMS-2 provides maintenance and management information to each level of command from the user to DA levels. SAMS-2 collects, stores, and retrieves maintenance information from SAMS-1 sites and allows managers to coordinate maintenance workloads. SAMS-2 passes significant maintenance and supply information to higher commands for the purpose of maintenance engineering and readiness reporting.

4-42. SAMS-2 conducts interfaces with the following systems:

- Unit Level Logistics System.
- SAMS-1.
- SAMS-2.
- Logistics Support Agency (LOGSA).

STANDARD ARMY MAINTENANCE SYSTEM-ENHANCED

4-43. SAMS-E automates maintenance functions, readiness reporting, unit status reporting functions, and unit-level supply. It provides day-to-day weapon system and subcomponent readiness status and maintenance and related repair parts information. It facilitates management functions from the tactical DS-/GS-level maintenance activities and the support field and sustainment maintenance concept (two levels of maintenance). SAMS-E is assigned to the ASC and FSC.

4-44. SAMS-E consists of both SAMS-1 and SAMS-2 applications and supports sustainment, TOE, and organizational-level maintenance elements. SAMS-E eliminates duplicate processes but includes critical unit-level functions of equipment operator and qualification, equipment dispatch, equipment PMCS, scheduling and recording, equipment fault records, ORGWON generation, AOAP, and AMSS reporting. SAMS-E allows multiple UIC/Department of Defense Activity Address Code (DODAAC) and stock storage in multiple locations. In addition, SAMS-E—

- Automates unit-level Class 9 (repair parts) functions.
- Enables same-day processing of requisitions to the source of supply, thus minimizing order-ship time.
- Integrates supply and maintenance applications to eliminate redundant functions.
- Automates demand history and stockage-level computations to avoid out-of-stock or excess conditions.
- Uses both FEDLOG and the SARSS catalog update.
- Identifies units as either direct or indirect (supported customer).
- Generates a work order automatically when an operator-level fault is initiated and the part is received.
- Changes management of unit data from DODAAC-based to UIC-based selection and entry.
- Retains the man-hour accounting on/off switch as an option in case of deployment.
- Provides password protection to operational processes and data elements.

STANDARD ARMY RETAIL SUPPLY SYSTEM

4-45. SARSS is a multiechelon supply management and stock control system that operates in tactical and garrison environments. SARSS comprises SARSS-1 at the direct support level, Standard Army Retail Supply System-level 2A/C (SARSS-2A/C) or corps/theater automated data processing service center (CTASC), and SARSS-Gateway. SARSS provides supply-related data to the ILAP system at various functional levels.

4-46. SARSS supports ULLS, SAMS, PBUSE, nonautomated customers, and the dual-based operations concept. SARSS is fully integrated from the user through theater Army (TA) level. It can support worldwide deployment of combat forces to contemporary operating environments to include stability and civil support operations missions.

STANDARD ARMY RETAIL SUPPLY SYSTEM-1

4-47. SARSS-1 is the standard supply system used for receipt, issue, replenishment, and storage operations. It operates at the ASB and combat support battalions. SARSS-1 in each supply echelon is capable of sustaining prime support responsibilities for each customer's unit. Each customer unit can interact directly with any SARSS-1.

4-48. SARSS-1 is the system of record. It maintains accountable balances and is supported by a SARSS-2A activity. It depends on SARSS-2B for catalog support and computation of stockage levels. SARSS-1 determines replenishment based on stockage levels furnished by the supporting SARSS-2B. It provides information data to SARSS-2A and SARSS-2B for stock management.

STANDARD ARMY RETAIL SUPPLY SYSTEM-2A/C/CORPS/THEATER AUTOMATED DATA PROCESSING SERVICE CENTER

4-49. SARSS-2A performs time-sensitive supply functions. These include management of controlled items, lateral search of stocks to fulfill unsatisfied customer's requirements from subordinate SARSS-1 activities, and redistribution of excess. SARSS-2AC/CTASC, when deployed, is fielded at the SC (T).

4-50. SARSS-2A/C operates on CTASC hardware. SARSS2-AC/CTASC performs time-sensitive supply management functions for referral, excess disposition, and management for Classes 2, 3 (P), 4, 7 and 9 (Air). It manages redistribution of supplies. SARSS-2A/C/CTASC also maintains a custodial availability balance file (ABF) that provides visibility of SARSS-1 assets to include both divisional and nondivisional functions. SARSS-2A/C processes include all of the SARSS-2A functions.

STANDARD ARMY RETAIL SUPPLY SYSTEM-2B

4-51. SARSS-2B performs management functions that are not time sensitive. These include document history, demand analysis, and catalog updates at installation and United States Property and Fiscal Officer (USP&FO). It supports subordinate SARSS-1 and SARSS-2A by performing stockage-level computations, tailoring catalog files, and maintaining active and inactive document history data.

STANDARD ARMY RETAIL SUPPLY SYSTEM-GATEWAY

4-52. SARSS-Gateway is an interactive/batch-oriented transaction processor that routes transactions to and from each interfacing STAMIS. It provides a communications network and the capability to send transactions to the Defense Automatic Addressing System (DAAS). It provides the appearance of a seamless, near real-time supply system to unit-level supply and maintenance activities.

4-53. SARSS-Gateway provides customer access to all assets that are available within a specified geographical area. Requests are electronically transmitted from customers to a gateway computer, where lateral search/issue decisions are made based on the ABF residing there. If assets are not available, the gateway forwards the request to the wholesale SOS and provides status to customers on the actions taken.

GLOBAL COMBAT SUPPORT SYSTEM–ARMY/TACTICAL

4-54. GCSS-Army/Tactical will be the Army's seamless, integrated, modular, and interactive sustainment information management and operations systems at all force support levels. The databases and processes of the application programs shall accommodate system operation in a network-centric and/or an information-centric environment that incorporates DOD standard data to the extent possible under a commercially available software package implementation.

4-55. GCSS-Army/Tactical will provide sustainment elements with a responsive and an efficient capability to rapidly anticipate, allocate, and synchronize the flow of logistics resources, services, and information among sustaining base elements and supported units at the strategic, operational, and tactical force levels.

4-56. GCSS-Army/Tactical enterprise resource planning (ERP) enables distribution managers to obtain a logistics and maintenance common operational picture (COP) of materiel in the pipeline, perform decision support analysis, and control their portion of the pipeline based on the three tenants of distribution: visibility, capacity, and control. A USAMC-led effort, ERP automates supply-chain management and defines the process used to manage all logistics and maintenance resources and their use in the enterprise. Its objective is to integrate all organizations and sustainment functions (including maintenance) into a single data warehouse.

4-57. GCSS-Army/Tactical shares data with joint information systems to allow for the sustainment of Army forces and joint forces. Logisticians, from tactical to national level, will have complete situational awareness of war-fighter requirements and in-transit visibility of supplies and services.

4-58. When fielded, the GCSS-Army/Tactical will be the Army Information Systems (AIS) of record with the capabilities to integrate existing logistics and maintenance STAMIS. The GCSS-Army/Tactical provides a “one-stop” information warehouse for logistics and maintenance support operations. The capabilities to be integrated will include logistics, property, ammunition, and maintenance functions (less medical) with significant enhancements. Some of the principal logistics STAMISs to be functionally integrated affecting aviation logistics and maintenance include the ULLS, SARSS, PBUSE, and SAMS. The GCSS-Army/Tactical modules include the following:

- A modernized maintenance module that integrates maintenance operations (ground and aviation) at all levels of maintenance.
- A modernized supply support activity module that integrates the supply management and operations at supply support activities and storage sites.
- A management module that integrates information from multifunctional sustainment data sources and allows for data exchange with other GCSS-Army/Tactical modules and external automation information systems.
- The GCSS-Army/Tactical will improve sustainment information management by eliminating duplicate information systems, improving the sharing of data, and leveraging advances in advanced information technology; it will provide the ability to support joint operations with sister services as well as provide support to allies.

4-59. The war fighter, for the first time, will reach back to a centralized database and obtain real-time information. The ERP solution will speed delivery of the right information, at the right time, to the right place, and reduce the logistics footprint on the battlefield. The initial implementation will focus on supply and maintenance. Follow-on increments will include integration with finance management, human resource, medical, transportation, and many other CSS functions. The future ERP solution will also interface with the Future Combat System (FCS).

SECTION II –LOGISTICS SUPPORT ACTIVITY

LOGISTICS INTEGRATED DATABASE

Note. The logistics integrated database (LIDB) stores national and tactical historical information and provides real-time status of Army readiness, requisition, supply, and maintenance and asset information to customers worldwide. The information needed to equip, arm, move, and sustain war fighters and fix and fuel their equipment and corresponding systems can be accessed from one central source, using one log-on identification and password. To gain access to “LIDB” support functions, complete LOGSA’s system access request (SAR) form and request access to “LIDB.” The SAR can be completed online from LOGSA’s web site: www.logsa.redstone.army.mil.

4-60. LOGSA is leveraging technology to provide immediate access to its many logistics Web-based tools, to include the logistics integrated database, the parts tracker, and other capabilities. This leap from the client-server environment to the World Wide Web (WWW) is supporting the quick response actions required in support of global operations, allowing anticipatory leadership on and off the battlefield.

4-61. LOGSA's logistics products and services include sustainment tools in support of equipment readiness for users, maintainers, and managers of the Army's aircraft systems, subsystems, and weapon systems. LOGSA's logistics tools independently and collectively contribute to the Army's transformation goals in reducing the logistics footprint.

4-62. LIDB uses modules (or file folders) to segregate the volumes of data into user-friendly packages. Primary modules are located on the main menu screen under the headings "Query Database" and "Decision Support" (see Figure 4-2).

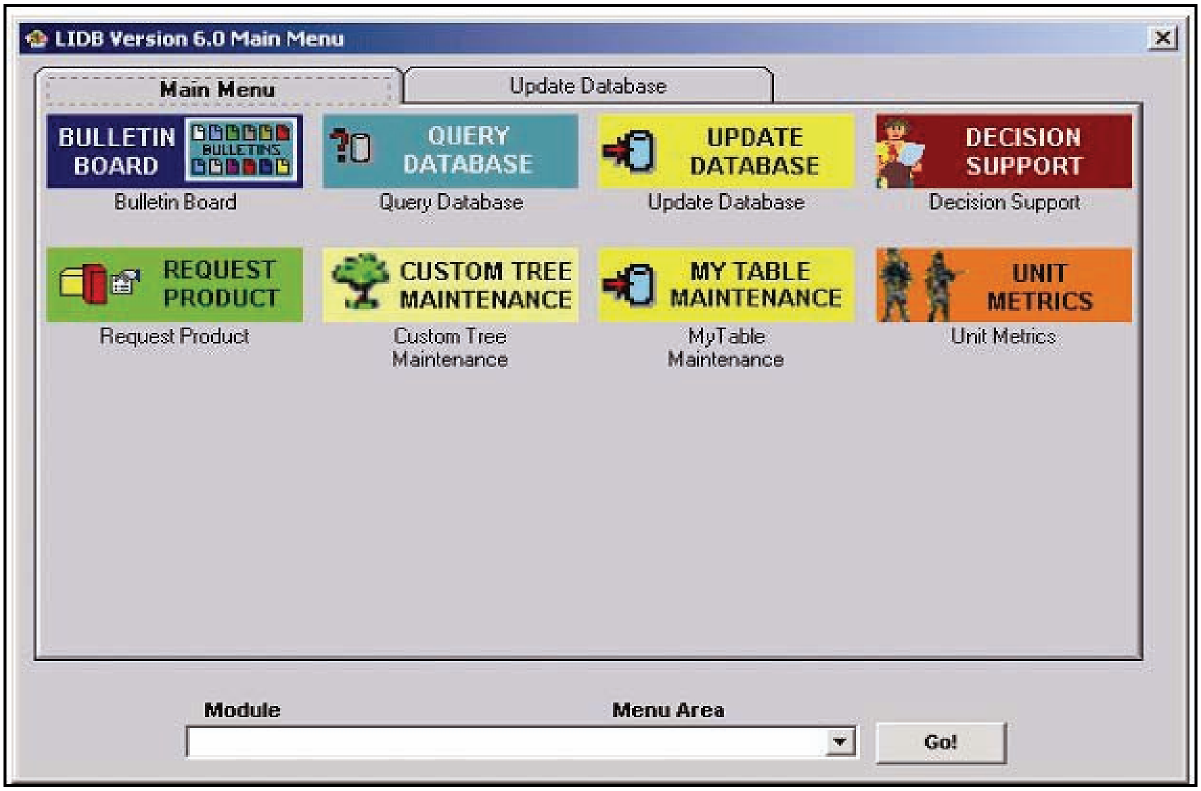

Figure 4-2, Logistics Integrated Database primary modules, main menu

4-63. From the Main Menu, double click on the "Query Database" menu icon. Once the query database menu is opened, the user can access modules and maintenance and logistics management information critical to all aviation maintenance commanders/leaders, maintenance officers/technicians, and maintainers (see Figure 4-3).

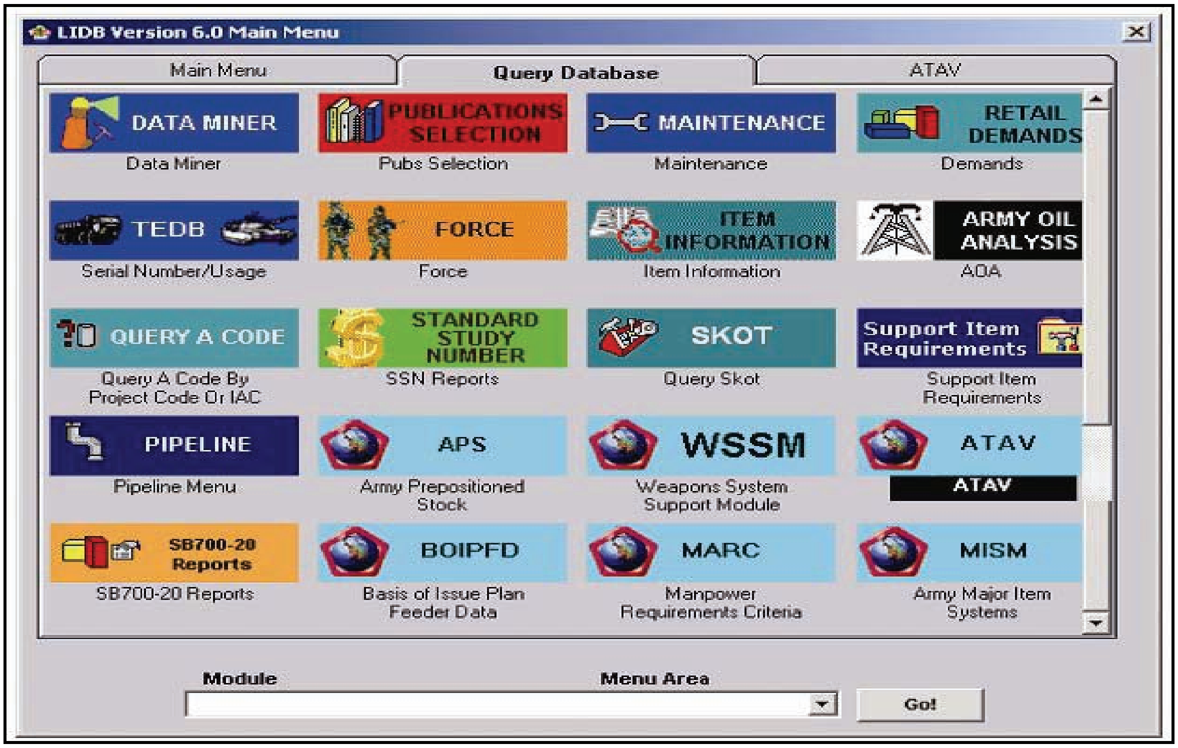

Figure 4-3. Logistics Integrated Database, Query Database

PUBLICATIONS MODULE

4-64. The publications module identifies all equipment publications required to maintain each Army-adopted end item and its components. The publications module provides aviation maintainers with the critical references that they need to conduct by-the-book maintenance. This module allows access to the following:

- A listing of technical manuals, including electronic technical manuals (ETMs)/IETMs; technical and supply bulletins; modification work orders; and supply catalogs.
- A list of publications for the major components that appear in the equipment's component of end items (COEIs), BIIs, and RPSTL.
- The same information found in DA Pamphlet 25-30 as well as command-authenticated publications (depot maintenance work requirements).
- A two-section list: one with the publications in LIN and national stock number (NSN) sequence, the other with a listing by publication number.

MAINTENANCE MODULE

4-65. The LIDB maintenance module contains data on completed maintenance actions reported from both direct support and general support units and activities from the total Army. The field maintenance systems that feed closed work orders are the SAMS.

4-66. The LIDB maintenance module includes a history of each maintenance action as it progressed through the maintenance process. This history allows maintenance managers to determine time spent in a particular status such as awaiting parts, in shop, awaiting pickup, or in initial inspection. This maintenance history is useful in determining what affects the downtime in the maintenance system. It also provides a listing of all parts used during a maintenance action. The LIDB maintenance module can generate reports on an entire item for a particular owning/support UIC or Army command or to a specific serially numbered end item.

RETAIL DEMANDS MODULE

4-67. The retail demands module contains all demands from units throughout the Army. Customers have access to data depicting repair parts' consumption rates and demands and costs for specific end items/repair parts. This information can be tailored for an individual unit's assigned DODAAC.

4-68. The module provides historical retail demand data generated from requesting units throughout the Army. The database is the Army's central repository for all individual requests for issue generated at the organizational level.

4-69. The field systems that feed LIDB are the ULLS, SARSS, AMC Installation Supply System (AMCISS), and SAMS. Customers can query by end item code (EIC), DODAAC, NIIN, installation, geographic area, and Army command/division.

ITEM INFORMATION MODULE

4-70. The item information module is the official Army catalog of Army-managed and Army-used items. These data provide information about all classes of inventory items that are critical to requisitioning, maintenance, and disposal of aircraft repair parts and components.

> ***Note.*** Information about an aircraft repair part or component's interchangeability or substitutability can also be accessed from this module.

4-71. The LIN report, NIIN report, reference number report, and Army Master Data File (AMDF) reports can be retrieved from the item information module. The AMDF reports include the item data, NIIN detail, interchangeability and substitutable data, component data, equivalent item data, order-of-use data, freight data, packaging data, medical user data, special Army data, and automatic return item list (ARIL) data.

SUPPORT ITEM REQUIREMENTS DATA

4-72. The support item requirements module provides data for parts used on end items, compares end-item part applications, and develops repair part requirements for support of end items in peacetime and contingency. Related program information on supply-related products and services follows. These products and services include repair parts to end item application, peculiar item and reverse support list allowance computation, and recommended ASL/PLL.

4-73. The support item requirements module offers "The Spare/Repair Parts to End Item Application," in addition to some new capabilities in an online environment. Current data are provided because the LIDB is continuously updated as new information is received.

4-74. Another helpful feature for aviation maintainers conducting lateral and vertical searches of aircraft repair parts is a report that compares two end items and identifies those parts that are peculiar to each and those parts found on both. This information is useful for identifying common or individual repair part applications.

4-75. The module also allows the user to compare an end item to a list of end items; for example, the TOE. This comparison is known as a reverse support list allowance card (SLAC). The user can also compare an end item to a list of end items and the ASL to identify candidates for deletion or stock-level reduction that result from the loss of a supported end item. This comparison is known as a tailored reverse SLAC. All of these reports can be printed or saved in word processing, spreadsheet, or database formats for local use.

PIPELINE MODULE

4-76. The "Pipeline" is the area within the LIDB where the user can find information regarding customer and requisition wait time, velocity management, and retrograde in-transit visibility. Pipeline is a centralized database, providing visibility of supply and transportation actions for requisitions placed by aviation units that could not be filled by the supporting ASB's SSA and, ultimately, passed to the wholesale system to be filled.

4-77. As materiel moves through the Pipeline to Army customers worldwide, automated supply and transportation systems feed the Pipeline current status on the location of the requested materiel. The pipeline provides a quick reference to requisition status, shipping information, and receipt of materiel requisitioned by the requesting unit.

4-78. Pipeline inquiry is available via WebLIDB and WebLOG. It may also be accessed through other DLAs' WEBLINK. Pipeline serves as the Army's single database for supply and transportation actions according to Military Standard Requisitioning and Issue Procedures (MILSTRIP), AR 725-50, and applicable DOD transportation regulations.

ELECTRONIC TECHNICAL MANUALS

4-79. LOGSA maintains the Army's technical publications repository. Sustainment of the ETM CDs is cyclical, occurring either quarterly or semiannually as necessary. All ETMs contained on the CDs are on LOGSA's Web page at www.logsa.army.mil under publications and forms, ETMs online. CDs must be ordered just like any other publication; as a result, the unit's publication account should be updated to automatically receive the latest release.

4-80. ETMs on CD allow lighter, more efficient deployments, simplifying the updating of changed publications and helping establish better readiness reporting. When the ETMs are used with the Electronic Technical Manual-Interface (ETM-I) software, ordering repair parts through ULLS and SAMS gives quicker, more accurate parts acquisition to support system requirements.

SUPPLY-RELATED PRODUCTS AND SERVICES

WEB LOGISTICS

4-81. The Army vision for the 21st century requires a radical change in the way that logisticians project and sustain America's Army. As logisticians move towards a multifunctional logistics environment, WebLOG provides a seamless, single logistics system to help meet this mission. Built on the integrated data environment of LIDB, WebLOG provides real-time logistics information in today's Web environment.

FEDERAL LOGISTICS DATA ON COMPACT DISK (CD-ROM)

4-82. FEDLOG is an interactive product available on CD-ROM and DVD, and on the World Wide Web. It contains unique logistical information for the Army, Navy, Air Force, and Marines and Federal Logistics Information System (FLIS). FEDLOG is the primary source of AMDF information for Army customers worldwide.

Note. Refer to Chapter 8 for additional information on FEDLOG.

ARMY PRE-POSITIONED STOCK

4-83. LOGSA provides visibility of war-reserve authorization and asset data via the Army pre-positioned stocks (APS) module in LIDB. This visibility includes the pre-positioned brigade sets, CSS material, and operational project stocks across all five APS stockpiles to include CONUS, Europe, Southwest Asia (SWA), Korea, and afloat. LOGSA also maintains the Army war-reserve stockage list in this module.

ROUTING IDENTIFIER CODE

4-84. LOGSA is the single responsible organization within DA that assigns, changes, and issues routing identifier codes (RICs). The RIC helps the war fighter get the requested item needed for his unit quickly and efficiently by routing the transaction to the corresponding source of supply. The RIC routes the request to all interservice and intraservice agencies interested in the supply transaction on that item.

4-85. A RIC contains the proper history of the requisition and can be accessed by all interested agencies. It indicates the document creator and recipient, whether it be requisition follow up or other transactions. Primarily, RIC tells war fighters who will supply the equipment needed to execute their missions (for example, aircraft repair part requisition RIC B17-AMCOM).

CONTINGENCY STOCKAGE CUSTOMER SUPPORT REQUIREMENTS LIST

4-86. LOGSA is the Army focal point for contingency stockage customer support requirement products to be used to support ASLs and PLLs. These are lists of combat repair parts for use at unit and direct support levels.

4-87. The listings can be used as a planning tool to determine Class 9 (Air) requirements in a combat/contingency environment. The listing includes the recommended support item's NSN, quantity, cost, weight, cube, and source of supply. The support item requirements module, added to LOGSA's LIDB, allows users to develop their own product in an online environment. If users do not have access to the LIDB, LOGSA will prepare the desired reports for them. The reports are the organizational/PLL and direct support ASL.

> ***Note.*** This chapter provides information on the support item requirements module found on the LIDB.

4-88. LOGSA is the source for recommended peacetime ASL/PLL/bench stock lists. It computes parts recommendations to support all equipment except Class 8 (medical) used in a peacetime (garrison) environment. The support item requirements module, added to LOGSA's LIDB, allows the user to develop his or her own ASL/PLL/bench stock candidate lists in an online environment.

> ***Note.*** Online users refer to this chapter for information on the support item requirements module found on the LIDB.

4-89. These reports assist field units with planning maintenance support and estimating the ASL/PLL operating costs. To get a recommended ASL or PLL, use the LIDB support item requirements module or, if LIDB access is not available, contact LOGSA via e-mail at amxsmlb@logsa.army.mil. Include the following information in the e-mail:

- Unit identification code (UIC).
- Level of maintenance performed (for example, unit, DS, or GS).
- Days of supply (DOS) required in 15-day increments.
- End item NIINs and on-hand quantities.
- Unit point of contact.
- Telephone number, mailing address, and e-mail address.

WEB LOGISTICS PARTS TRACKER

4-90. LOGSA's WebLOG parts tracker module can be accessed through the following site: www.logsa.army.mil. Parts tracker provides status of a requisition as it navigates the supply process. This status provides visibility of the requisition as it moves through the military or commercial transportation systems. Access to radio frequency (RF) tag information pinpoints the location of parts traveling through the Defense Transportation System (DTS).

4-91. The parts tracker also provides exact location information from commercial shippers, such as FedEx and UPS, by simply entering a document number. The parts tracker module demonstrates how, by integrating with other modules of the LIDB, it provides the Army with a single tool that performs analysis across the maintenance, readiness, and supply business processes.

4-92. The parts tracker relates readiness, maintenance, and supply issues to specific spare/repair parts and then locates those parts within the Army or joint supply chain or in transit within the logistics pipeline. The parts tracker will aid in the success of Army transformation by serving as a single analysis tool for war fighters and logisticians at the joint, strategic, national, or tactical levels.

4-93. The WebLOG parts tracker resides within the WebLOG materiel track module to track spare/repair parts and major end items in the Army's supply and transportation pipeline. WebLOG parts tracker can assist aviation maintenance units by tracking unit-generated aircraft repair parts requisitions by—

- Parts tracking by NIIN.
- Parts tracking by DODAAC and NIIN with a maximum of five NIINs.
- Parts tracking by RF tag.
- Parts tracking by document numbers with a maximum of five document numbers.
- Parts tracking by transportation control number (TCN).
- Parts tracking of parts shipped via FedEx or UPS by commercial transportation number.

THE LOGISTICS QUICK REACTION TEAM (LOG 911)

4-94. LOGSA's Logistics Quick Reaction Team (LOGQRT) can assist users with readiness, maintenance, supply support activity, transportation catalog, and logistic data. The goal of the LOG 911 team is to resolve problems within 48 hours. LOGQRT provides solutions to complex logistics issues such as the following:

- Providing logistics information, feedback, and assistance to garrison and deployed forces.
- Resolving deployment logistics issues affecting equipment readiness.
- Expediting requisitions and tracking movement of items affecting equipment readiness.
- Passing requisitions from deployed units during contingences to wholesale supply agencies.
- Providing critical supply, maintenance, and transportation information.

4-95. For assistance with logistic issues affecting equipment readiness, call the LOG 911 team. It can be contacted, via e-mail, at hotline@logsa.redstone.army.mil or logqrt@logsa.redstone.army.mil.

SECTION III – INTEGRATED LOGISTICS ANALYSIS PROGRAM

Note. The traditional tools embedded in the current STAMISs (SAMS and SARSS) and financial systems do not provide managers with the management reports required to manage in today's fluid environment. Thus, managers must gather data from various sources to perform their jobs. This process consumes a great deal of time and makes it difficult for managers to share information, which generally leads to incomplete and untimely answers. ILAP provides a personal computer-based tool that integrates the data. Register at the following site, https://www.ilap.army.mil/, to gain access to ILAP and the multiple reports that it generates.

INTEGRATED DATABASES

4-96. ILAP is the standard management tool used by the Army that collects, integrates, and displays logistics and financial data. ILAP operates at all echelons of the Army to provide management capability to unit, corps, installation, component, and theater levels. Financial data are pulled from Defense Finance and Accounting Service (DFAS) data sites. Logistics data are obtained from appropriate supply and maintenance sites. The cross-functional data are integrated and aggregated to upper echelons to provide summary decision support views and detailed information drill-down capabilities to the document detail level. This process of assembly and aggregation affords Army departmental users the opportunity to do Army-level analysis and data query.

4-97. ILAP augments the STAMIS. Managers at all levels execute their duties more efficiently and effectively by using integrated ILAP data. ILAP is most useful for managers who require data from disparate and isolated sources because ILAP virtually eliminates the time required for retrieval, integration, and display to support management analysis.

REPORTS

4-98. ILAP has been fielded throughout the active Army, U.S. Army Reserve, and Army National Guard. Widespread fielding of this system means that, wherever users are around the globe, they can gain access to an ILAP server. Through its management tool, ILAP augments, integrates, and exchanges data for managers. The management tool is easy to learn, access, and operate, and the reports are relevant for each level of organization.

4-99. Management reports in ILAP are developed with input from the customer in a rapid development process that includes showing the customer a management report, soliciting the customer's reaction to the report, and then modifying the report to begin another cycle. This process is repeated until the customer's requirement is met. Using this method increases the capability of the user by solving functional problems quickly. Listed below are management reports generated by ILAP. Reports generated by ILAP support supply, maintenance, and finance management functions. The following is not an all-encompassing list but represents a common set of routine management reports that ILAP can provide:

- Stock number analysis.
- Document number analysis.
- Document history.
- Recoverable management.
- ASL management.
- ASL review.
- Equipment status.
- Work order and parts research.
- Man-hour summary.
- Army working capital fund credit data.
- Credit details by document number.
- Army credit table.

Note. To interpret ILAP reports, the user must know the codes inside the ILAP report. The "Codes" tab provides most of the codes used in ILAP reports. The "Codes" tab is also available inside each of the ILAP reports to use as a reference.

4-100. Version 6.04 allows selected users to load ULLS PLL data into ILAP and query this data using the new ULLS PLL report under Supply in the Unit Management folder. This new feature enables a commander to acquire PLL visibility across his command.

4-101. Once a given report has been retrieved by ILAP, the results of all reports must be saved to the unit's local drives. *Users should not save data on the ILAP servers.* Furthermore, and to facilitate tracking and reconciliation of management reports, these reports can also be printed.

SECTION IV – DEFENSE LOGISTICS AGENCY AUTOMATED SYSTEMS

DEFENSE SUPPLY EXPERT SYSTEM

Note. The DEfense Supply eXpert (DESX) Web option can be reached at https://www.dlis.dla.mil/desx. To gain access to this site, the user must register and receive a log-in identification and password. Questions regarding registration forms for log-in identification and passwords can be sent to desx@dlis.dla.mi. For this option, the user must have a .mil or .gov domain address.

4-102. DESX is an automated computer system for tracking DOD supply requisitions and inventory items and for placing or modifying DOD requisitions. DESX allows queries by telephone, e-mail messages, or from World Wide Web forms. DESX systems are located at all 19 DOD inventory control points (ICPs) and are available for aviation maintenance customers 24 hours a day, seven days a week.

4-103. Five basic supply support options are available through DESX:

- Status checks.
- Stock availability checks.
- Ability to submit new requisitions.
- Ability to modify existing requisitions.
- Ability to talk with a customer service representative at certain sites.

Note. The new DESX system is centralized; there is just one place to go to submit queries. The DESX phone number is, toll-free, 1-866-DOD-DESX (1-866-363-3379). There is just one e-mail address for queries: supply@desx.dla.mil.

4-104. The e-mail option means that the user can now get order status or item availability or submit a new requisition or modify an existing requisition from the e-mail system. Each ICP in DESX has its own separate e-mail. Turnaround times for response can be as few as five seconds.

4-105. DESX will look up where the user's document number or NIIN is managed and will automatically submit the query to the right place. When the user does a Web query, he no longer has to pick which service or site manages the item—he just enters the NIIN, NSN, or document number. DESX provides aviation maintenance commanders/leaders, maintenance officers/technicians, and maintainers with critical logistical capabilities and data to facilitate maintenance within their maintenance facilities.

Note. DESX enables aviation maintenance managers to submit high-priority requests, to include AOG. It also enables them to modify a previously submitted routine priority request to a high-priority request when needed parts are at zero balance.

WEB VISUAL LOGISTICS INFORMATION PROCESSING SYSTEM

Note. To gain access to the Defense Automatic Addressing System Center's (DAASC's) wide array of automated logistics systems, such as Web Visual Logistics Information Processing System (WEBVLIPS), using aviation maintenance unit personnel must have a request log-on identification and password. To obtain a log-on identification and password, go to the following site: https://www.daas.dla.mil.

4-106. WEBVLIPS is a Web-based, access-controlled query system that is usable from any Internet-attached PC. It accesses the Logistics On-line Tracking System (LOTS), a DAASC relational database system, which portrays the life cycle of a logistics (request for issue) action.

4-107. ASC customers can use WEBVLIPS to track requisitions for aircraft repair parts or components from their release into the DOD pipeline, until the materiel is posted to the accountable records at the ASB's SSA. WEBVLIPS also can track reports of excess and the movement of those excesses to the destination depot or disposal.

4-108. WEBVLIPS integrates information on SOS, DOD project code, transaction status code, unit of issue code, signal code, hold code, advice code, and condition code, among others, to assist the user in tracking a request for issue through its life cycle.

4-109. WEBVLIPS—

- Allows the DAASC customer to track requisitions with a simple user interface.

- Provides a quick response time to subscriber inquiries.
- Processes inquiries by document number, unit activity, project code, transportation control number, or national stock number.
- Allows the DAASC customer to process queries regarding life cycle of specific request-for-issue transactions.
- Receives information about materiel management actions such as requisitions, supply/shipment status, and customer confirmations.

SECTION V – SINGLE STOCK FUND

4-110. Single stock fund (SSF) procedures represent one of the most far-reaching changes to the Army logistics processes. USAMC, as the National Manager, capitalized stocks previously maintained in both installation retail stock fund (RSF) accounts and operations and maintenance (O&M) accounts. SSF now extends down to the divisional and nondivisional ASL level. As a result, SSF has changed the way that the Army operates at every Army installation, corps, and USAMC integrated materiel management center (IMMC). The main SSF characteristics are a single point of sale, a single credit process, movement toward an integrated requirements determination and execution process, and movement toward national maintenance operations.

SINGLE POINT OF SALE

4-111. The single point of sale is the point at which a consumer-funded requisition is satisfied by a nationally controlled Army working capital fund-supply maintenance Army (AWCF-SMA) account. The current RSF and wholesale stock fund (WSF) points of sale were merged to create a single point of sale. Aviation maintenance companies' requisitions for aircraft repair parts and components are obligated upon submission to the AWCF SARSS-1. Billing occurs after an AWCF-SMA account issues the item.

4-112. The single point of sale could be in one of two places. If the item is stocked locally, the supporting AWCF-SMA SARSS-1 account fills the request and issues it to the aviation maintenance unit. If the item is not stocked locally, the request is passed to a higher source of supply and then the wholesale source of supply fills the request and issues the item.

Note. The ILAP provides financial management reports to the aviation maintenance unit's budget officers to facilitate Class 9 (Air) budget reconciliations. This chapter contains information on ILAP procedures.

SINGLE CREDIT PROCESS

4-113. Credit from the AWCF-SMA to the consumer-funded activity will be based on the new Army credit policy. Serviceable and unserviceable credit values are computed and corresponding "credit value indicator codes" are assigned annually. Computation of serviceable and unserviceable credit values are performed with the annual price update. Credit will be granted at the point of materiel turn-in (serviceable and unserviceable) from the consumer-funded activity to the supporting AWCF-SMA activity. These credit rates are stabilized, annualized in the year of execution, and predictable.

Note. See the previous note for information on financial management reports.

NATIONAL MAINTENANCE MANAGEMENT PROCESS

4-114. The national maintenance management (NMM) process is a strategy to move to a centrally coordinated and controlled repair-based logistics system. Under SSF, repair is performed for return to stock rather than repair and return to the owning organization. Under the NMP, items repaired and returned to stock will be repaired by an approved national maintenance provider (for example, organic depot contractor facility or below depot maintenance activity) to a national standard.

4-115. In essence, this program returns the item to a consistent, measurable expected life. This process creates efficiency in the Army's logistics systems, revolutionizing the way that the Army does its logistics.

4-116. USAMC participates with the tactical community in review/update of below depot-level requisitioning objectives (ROs) and retention levels during ASL reviews. The tactical commander, based on local readiness and training considerations, identifies DS/RX items. DS/RX items are funded with operation and maintenance, Army (OMA) dollars and will not be capitalized. Therefore, the national-level manager will not own, or have visibility, of these assets.

4-117. The world of maintenance, as aircraft maintainers knew it, has changed. Aircraft maintainers have made the transition to a national maintenance management concept encompassing two categories of maintenance. The two categories of maintenance management are at the national and field level. The overall objective of NMM is to increase fleet readiness at the weapon system level while reducing operation and sustainment costs by accomplishing repairs to a higher standard. This new process represents a major paradigm shift in the way that the Army does maintenance.

4-118. The national category consists of organic depots, the industrial base, and qualified below-depot activities:

- The overall focus is sustainment readiness.
- Items repaired are returned to the supply system.
- The source of funding is AWCF-SMA.

4-119. The field category consists of organizational, DS, and GS maintenance units/activities:

- The overall focus is near-term readiness to maintain and generate combat power.
- Items are repaired and returned to the user.
- The source of funding is OMA.

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Chapter 5

Aviation Materiel Officer

The BAMO or battalion AMO is integrated into the brigade/battalion's staff element of the headquarters and headquarters company (HHC). The HHC comprises the brigade/battalion's staff elements to include the CSS automation management office (CSSAMO) and the ground maintenance platoon. The support operation (SPO) section of the HHC provides a contract officer representative (COR) to manage/supervise the brigade's contract aviation maintenance teams and coordinates with LARs. The BAMO may reside within the SPO section if the commander prefers. The BAMO/battalion AMO duties and responsibilities differ from those of the SPO but may involve similar entities.

SECTION I – BAMO MILITARY OCCUPATIONAL SPECIALTIES

Contents

5-1. BAMO positions are assigned by MTOE/TDA. Refer to DA Pamphlet 611-21 to determine who is authorized to fill BAMO positions. The BAMO assigned to aviation maneuver brigades and battalion AMOs should work hand-in-hand with AMC production control personnel.

5-2. The BAMO/battalion AMO at the warrant officer four (W4)/warrant officer five (W5) level manages personnel, supply, equipment, and facility assets to maintain and repair Army rotary- and fixed-wing aircraft. He organizes maintenance elements to inspect, service, test, disassemble, repair, reassemble, adjust, and replace parts and retest aircraft or aircraft components. He prepares, implements, and maintains standing operating procedures for management of maintenance activities.

5-3. The BAMO/battalion AMO interprets regulations; technical manuals, including ETMs/IETMs; and orders pertaining to maintenance and logistics actions of Army aircraft for commanders and subordinates. He supervises the aviation equipment maintenance and repair shop, section, or platoon. He also directs maintenance and accountability of organizational test equipment, supplies, and recovery equipment.

5-4. The 151A0, as the ASB/ASC battalion aviation materiel officer, monitors and evaluates aircraft maintenance operations, processes, and procedures and the aviation materiel readiness status. The battalion aviation materiel officer provides guidance and technical input to subordinate aviation maintenance elements and other staff elements. The following section describes additional functions, duties, and responsibilities for the MOSs at the brigade level.

SECTION II – BAMO/BATTALION AMO DUTIES AND RESPONSIBILITIES

5-5. The BAMO/battalion AMO normally works alone but, depending on the unit and the MTOE structure, enlisted personnel may be assigned to the section to assist. The BAMO/battalion AMO office will provide continuous maintenance and logistical information to the commander and staff on aviation and aviation-related systems matters. The BAMO/battalion AMO keeps the command informed about current and future capabilities based on the current maintenance posture and plans maintenance actions based on operational necessities.

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5-6. The duties and responsibilities of the BAMO and battalion AMO include the following:

- The BAMO/battalion AMO is responsible to the brigade/battalion commander for all aircraft maintenance and related activities.
- Specific duties and responsibilities can be broken down into target objectives; for example—
  - Daily and weekly planning objectives.
  - Monthly, quarterly, and semiannual planning objectives.
  - Fiscal year (FY), calendar year (CY), and multiyear execution of planned objectives.

BAMO AND BATTALION AMO PLANNING OBJECTIVES

DAILY AND WEEKLY PLANNING OBJECTIVES

5-7. When planning daily and weekly objectives, he will monitor maintenance daily especially maintenance affecting mission readiness of the brigade/battalion aircraft. When aircraft mission readiness of the brigade/battalion is affected, he will—

- Keep the commander informed of the unit maintenance posture and current capabilities.
- Monitor maintenance automated systems.
- Ensure that aviation combat maintenance follows brigade, theater, and DA technical guidance.
- Participate in BDAR planning and risk assessments to include DART operations; refer to FM 3-04.513(FM 1-513) and Appendix E of this manual for more information.
- Monitor supply execution—primarily Classes 3, 5, and 9 (Air)—and Classes 2 and 7 only as they pertain to aviation maintenance.
- Respond to all levels of brigade staff concerns regarding aviation maintenance (P4T2) and execution of the maintenance plan.
- Adhere to established maintenance procedures.
- Ensure compliance with safety-of-flight (SOF) messages and aviation safety action messages (ASAMs) affecting assigned brigade/battalion airframes.

5-8. If he is a rated aviator, he conducts ME duties for brigade aircraft, to include the following:

- Readiness-level (RL) progressions.
- Annual Proficiency and Readiness Test (APART).
- Nonrated crew member training.
- Nonrated non-crew member training.
- Maintainer training and evaluation.

5-9. When organizing aircraft deployments, he will—

- Monitor the deployment execution and provide procedural guidance when necessary.
- Determine manning shortfalls and their effects on mission execution.

5-10. He will monitor daily execution of the following aircraft contracts (brigade level and, on a limited basis, at the battalion level):

- Project officer.
- COR.
- Administrative contracting officer representative (ACOR).

5-11. He will evaluate the following brigade/battalion aviation systems' maintainability and performance (combat):

- Aircraft systems and subsystems; for example, weapons, communications, survivability equipment, and special mission equipment.
- AGSE.
- Maintenance facilities.
- STAMIS.

5-12. He will monitor the Class 9 (Air) budget transactions.

MONTHLY, QUARTERLY, AND SEMIANNUAL PLANNING OBJECTIVES

5-13. When planning monthly, quarterly, and semiannual objectives, he will monitor scheduled and unscheduled maintenance with long-term ramifications affecting mission readiness of the brigade/battalion aircraft. When aircraft mission readiness of the brigade/battalion is affected, he will—

- Monitor and analyze monthly and FY aircraft readiness trends.
- Determine the manning/labor organization to execute CSS functions.
- Monitor training operations as required by the unit mission essential task list (METL).
- Monitor and guide commanders at all levels on the following:
    - AMC operations (TM 1-1500-328-23).
    - ASC operations.
    - Depot maintenance and combat retrograde MWOs.
    - Nonstandard equipment applications; for example, air worthiness release (AWR), interim statement of airworthiness qualification (ISAQ), or letter of authorization (LOA).
    - Organizing for BDAR.
    - TMDE (AR 750-43).
    - AOAP (AR 750-1).

5-14. He ensures that supply discipline is maintained and supply performance goals are met. He tracks performance goals in the following classes of supply: 3, 3 (packaged), 5, and 9 (Air).

5-15. He will ensure subordinate units' compliance and reporting of QDR-affected items. Furthermore, he will track RX performance and the use of ASC-level repair and return and monitor the effectiveness of the aviation float equipment program (AR 750-1).

5-16. He will participate in the following higher HQ maintenance staffing actions:

- SOP development.
- Maintenance policy development and adherence including the following actions:
    - Monitor ALSE resource issues.
    - Organize routine brigade aviation maintenance readiness councils, conferences, or meetings.
    - Monitor maintainer utilization and effectiveness.
    - Monitor automation execution and information technology (IT) discipline.
    - Adhere to applicable references, publications, and maintenance information messages (MIMs).

5-17. He will participate in brigade aviation standardization programs to include the following:

- Ensure training flight hours to include maintenance training.
- Plan and develop nonrated crew member performance standards.

- Plan and develop nonrated noncrew member performance standards.
- Plan and develop maintainer performance standards.
- Execute brigade maintenance excellence awards.

5-18. He will develop and maintain aircraft maintenance and logistics deployment plans for the brigade to include the following:

- Organize the deployment or recovery team.
- Determine resources required to execute the deployment and recovery.
- Coordinate with the unit maintenance officer to ensure that P4T2 needs are assessed and coordinated for each airframe.

5-19. He will coordinate maintenance procedures for nonstandard repair applications between LARs, OEM, and the applicable project management office (PMO). He will discuss issues with contracting officials on aviation contract performance affecting brigade/battalion assets.

5-20. He will develop operational needs statements (ONSs) or brigade/battalion-level operational requirements documents (ORDs) in response to aircraft maintenance and logistics operations. Once these operational documents are developed, he will—

- Send received output message (ROM) for the required system.
- Plan and execute small aviation systems support teams that solve a specific equipment shortcoming.
- Participate in Army command MWO planning groups.

5-21. He will monitor aircraft resource management and develop budget reports affecting aircraft assets and flight hours. He will—

- Track flying-hour dollars for aviation support needs.
- Track short-term, nonstandard equipment purchases and CSS.
- Oversee aviation maintenance services contracting if appointed as COR or ACOR.

FISCAL YEAR, CALENDAR YEAR, AND MULTIYEAR PLANNING OBJECTIVES

5-22. The BAMO—when executing planned objectives for fiscal year, calendar year, and multiyear execution—identifies resources and develops aircraft maintenance operation requirements and supporting plans at the brigade. To accomplish these plan objectives, he will—

- Participate in Army command policy development.
- Participate in TRADOC doctrine development.
- Participate in TRADOC doctrine review.
- Verify units' compliance with maintenance and logistics automation updates (software and hardware).

5-23. The BAMO will develop long-term aviation maintenance training plans and identify supporting resources. He will—

- Participate in Army command standardization councils.
- Participate in Headquarters, Department of the Army (HQDA), standardization issues.

5-24. The BAMO will project resources required to support upcoming deployments or redeployments. He will—

- Execute initial Army command coordination issues.
- Participate in leader reconnaissance to determine facilities and infrastructure to conduct aviation maintenance.

5-25. To determine contractor manning levels, the BAMO needs to execute upcoming missions at brigade level if appointed as COR or ACOR. He will—

- Participate in Army command contractor staffing missions.
- Project contractor staffing levels to meet additional maintenance requirements.

5-26. When acting as brigade/battalion material manager for assigned/attached aircraft, aircraft support, or AGSE issues, the BAMO will—

- Participate in program manager (PM), AMCOM, life-cycle management command (LCMC) planning conferences.
- Determine requirements and coordinate training and frequency for new aviation equipment.
- Participate in emergency change proposal (ECP) development.
- Participate in MWO planning.

5-27. The BAMO/battalion AMO will monitor brigade/battalion aviation resource management, to include the following:

- Flying-hour program execution and effect on allocated Class 9 (Air) budget.
- Contracting resources.
- AGSE maintenance.
- ALSE resources.
- Nonstandard equipment acquisition and CSS funding.
- BAMO equipment purchase and sustainment.

BAMO AND BATTALION AMO COORDINATING ACTIONS IN SUPPORT OF LOGISTICS AND MAINTENANCE MISSIONS

MANAGING AIRCRAFT AND WEAPONS SYSTEMS

5-28. When brigade/battalion aircraft are identified for aircraft or weapons systems modifications, improvements, or upgrades, he has unique responsibilities. The BAMO/battalion AMO will outline the unit's responsibilities and manage all coordination efforts to ensure smooth maintenance and logistics support between unit personnel and personnel responsible for aircraft or weapons system modifications, improvements, and upgrades. These responsibilities include the following:

- Schedule NET for maintainers and operators when required.
- Determine how equipment and weapons system improvements are going to affect the unit's assigned mission.
- Minimize disruption to the unit's mission by coordinating and arranging a systematic flow of aircraft into maintenance for scheduled modifications, upgrades, and improvements.
- Track forms and records of all completed aircraft and weapons system improvements.
- Ensure that all maintenance personnel and operators have up-to-date technical information to maintain improved and upgraded systems.
- Ensure that all required parts for systems upgrades are on hand before maintenance actions begin.
- Ensure that brigade/battalion aviation logistics/technical supply personnel follow policies and procedures to ensure that pertinent logistics forms and records are updated to show the addition of new items and the deletion of replaced items.
- Ensure that the completion of multiple MWOs on the same piece of equipment is coordinated and that all equipment is modified at the same time.
- Ensure that modified, upgraded equipment works together with other equipment once the modification is complete.

COORDINATING AUTOMATED ACTIONS

5-29. He can retrieve reports from the ULLS-A box. These STAMISs provide him with the flexibility to go into the automated system and retrieve any reports that he seeks to support the brigade/battalion's mission. He will coordinate with the CSS automation management office for evaluation and maintenance support of the ULLS.

5-30. Upgrades to laptops depend on the availability of float laptops. There must be close coordination between the CSS automation management office and BAMO or battalion aviation materiel officer to ensure that automated systems are operational and available at all levels. The CSS automation management office will continue to provide hardware support for the laptops for the duration of Data Collection and Analysis Management Information System (DCAMIS).

5-31. If an upgraded laptop is turned in to the CSS automation management office for repair and a replacement or spare is issued, the random access memory (RAM) must be removed from the turned in laptop and placed into the replacement laptop according to the brigade's SOP.

5-32. With ULLS-A, he can track maintenance man-hours, aircraft repair parts and components, maintenance work orders, and aircraft historical data. These are some of the overarching functions of this STAMIS.

5-33. He also has at his disposal LIDB Pipeline inquiry capabilities that are available via Web LIDB, PC Client LIDB, and WebLOG. LIBD may also be accessed through other DLA's WEBLINK functions. Pipeline serves as the Army's single database for supply and transportation actions according to the MILSTRIP, AR 725-50, and DOD transportation regulations.

5-34. The Pipeline is the area within LIDB where the user can find information regarding customer and requisition wait time, velocity management, and retrograde in-transit visibility. Pipeline is a centralized database providing visibility of supply and transportation actions for requisitions placed by aviation units that could not be filled by the supporting ASB's forward SSAs and, ultimately, were passed to the wholesale system to be filled.

Note. LIDB stores national and tactical historical information and provides real-time status of Army readiness, requisition, supply, maintenance, and asset information to customers worldwide. The information needed to man, arm, fix, fuel, move, and sustain warfighters and their systems can be accessed from one central source, using one log-on identification and password. To gain access to "LIDB" support functions, the user needs to complete LOGSA's SAR form and request access to "LIDB." The SAR can be completed online from LOGSA's web site: www.logsa.redstone.army.mil.

Assisting Supported Units in Locating Needed Parts

5-35. If an aircraft is NMCS for a minimum number of aircraft repair parts, a requisition PD of AOG may be used. AOG parts requests are typically approved by the owning company commander or battalion commander. Once an AOG parts request is approved, the AMC aviation logistics/technical supply section processes the request through the SSA.

5-36. AOG requests are processed directly to an SSA. The requesting unit will then immediately notify the BAMO or battalion AMO. He will also track AOG requests until the unit receives AOG components. AOG requests are transmitted by the most expeditious means.

5-37. He should conduct logistics horizontal and vertical searches for critical serviceable parts in support of the unit's maintenance mission. He coordinates logistics actions with the support operations officer. Once a part is located, steps and actions covering procurement of aircraft repair parts and/or the requisition process must be followed as outlined in the unit's maintenance SOP. If a supply support activity is not collocated with the supported unit, request information must be faxed to the SSA.

5-38. The DESX is another avenue that he can take to track parts and requisitions. DESX is an automated computer system for tracking DOD supply requisitions and inventory items and for placing or modifying DOD requisitions. DESX allows queries by telephone or e-mail messages or from World Wide Web forms. DESX systems are located at all 19 DOD ICPs, and are available for aviation maintenance customers 24 hours a day, seven days a week.

5-39. Five basic supply support options are available through DESX:

- Status checks.

- Stock availability checks.
- Ability to submit new requisitions.
- Ability to modify existing requisitions.
- Ability to talk with a customer service representative at certain sites.

Note. The DESX Web option can be reached at https://www.dlis.dla.mil/desx. To gain access to this site, the user must register and receive a log-in identification and password. Questions regarding registration forms for log-in identification and passwords can be sent to desx@dlis.dla.mi. To use this option, the user must have a .mil or .gov domain address.

SPO SECTION PROVIDING LOGISTICS SUPPORT AND DISTRIBUTION MANAGEMENT

5-40. The SPO section is organized to coordinate logistics support and provide distribution management to the CAB. It is also staffed to accomplish contracting, petroleum, ammunition, movement control, and transportation and to assist in tracking and expediting release of supplies (repair parts). The SPO officer coordinates with brigade and battalion S4s and with BAMOs to establish maintenance priorities and resolve maintenance and logistics support issues.

5-41. This section, under the direction of the SPO, provides centralized, integrated, and automated C2 and planning for all distribution management operations within the battalion. It coordinates with logistics operators in the fields of supply, maintenance, and movement management for the support of all units assigned or attached in the brigade area. Its primary concern is customer support and increasing the responsiveness of support provided by subordinate units. It continually monitors the support and advises the battalion commander on the ability to support future tactical operations.

5-42. With in-transit visibility (ITV)/total asset visibility (TAV), Battle Command and Sustainment System (BCS3), FBCB2, and MTS, the SPO section has access to more information and receives information in near real time. This access allows support operations to identify problems more quickly and allocate resources more efficiently. BCS3 gives support operations the visibility of the logistics status from the ASB back to theater level. This battle staff section serves as the POC for supported units. It directs problems to appropriate technical experts within subordinate branches. The duties of the SPO include the following:

- Conducts continuous logistics support analysis.
- Plans and coordinates aerial resupply and plans for landing zones (LZs) in the vicinity of the BSA.
- Develops the CSS synchronization matrix.
- Submits CSS forecasts to the CSS brigade SPO/DMC.
- Manages all flatracks throughput to and retrograding from the BSA.
- Coordinates and provides technical supervision for the ASB's sustainment mission, which includes supply activities, maintenance support, and coordination of transportation assets.
- Identifies tentative force structure and size to be supported.
- Coordinates the preparation of the support operations estimate on external support.
- Provides support posture and planning recommendations to the ASB commander.
- Sets up and supervises the logistics operations center.
- Provides centralized coordination for units providing external support to the brigade.
- Coordinates with the CAB S3 for air routes for supply and medical support.
- Analyzes the effect of BCS3 reports.
- Advises the battalion commander on the status of logistics support.
- Coordinates logistics support for units passing through the brigade's area.
- Analyzes contingency mission support requirements.

- Revises customer lists (as required by changing requirements, workloads, and priorities) for support of tactical operations.
- Coordinates external logistics provided by subordinate units.
- Advises the battalion commander on the supportability of ASB support missions and of shortfalls that may affect mission accomplishment.
- Serves as the single point of coordination for supported units to resolve logistics support problems.
- Plans and coordinates contingency support.
- Develops supply, service, maintenance, and transportation policies.

5-43. The SPO will perform functions as the BCS3 manager. The SPO must work with the intelligence officer (S2)/S3, S4, and communications officer (S6) to establish and manage the BCS3 network and database. The SPO must maintain direct support supply point and maintenance data entered into the system. Specific tasks for the support operations officer are the following:

- Gathers, inputs, and maintains supply point logistics data in the system; he must also conduct the SAMS-2 and SARSS download to BCS3 to capture support maintenance data.
- Develops the commander's tracked item list (CTIL) to track supply point items of interest to the commander.
- Sets message handling tables to correctly route supply logistics messages.
- Sets status thresholds for supply point items.
- Establishes reporting times for subordinate direct support units.
- Sets support to supported relationships to reflect which supply points support which units.
- Establishes and sets continuity operations pairing according to guidance from the CAB S4.

Note. FMI 4-90.23 contains additional information on the support operations section.

AVIATION READINESS REPORTING CAPABILITIES

5-44. Once the BAMO or battalion AMO retrieves the reports from the ULLS–A, he is required by AR 700-138 to forward a roll-up report to the LOGSA. The following are basic steps that must take place:

- Generation of the daily readiness report.
- Automated roll up of the reporting unit at the brigade/battalion maintenance office to the DAMO.
- Automated transmission of reports from the BAMO to the DAMO.
- Generation of the monthly readiness report.
- Automated transmission, via Knowledge Asset Management Network (KAMNET), to the Utility/Cargo/Attack Helicopters Project Office, Redstone Arsenal, Alabama).

RELATIONSHIP BETWEEN A BAMO/BATTALION AMO AND AN ACCOUNTABLE OFFICER AT THE SSA

5-45. A direct relationship between the BAMO/battalion AMO and the accountable officer is derived when they conduct transactions affecting the overaged reparable item list (ORIL) to reach a compromise on aircraft repair parts contained in the ORIL. An indirect relationship exists when they monitor ASL reviews or recommend stockage-level adjustments or aircraft repair parts data analysis.

5-46. In addition, monitoring of an SSA facility occurs in combat sustainment such as aircraft repair parts acquisition while on the move. Furthermore, it includes DLR turn-ins in combat and aircraft repair parts processing performance and customer satisfaction rates.

5-47. The relationship of a BAMO/battalion AMO and an AO at an SSA is crucial to the sustainment of serviceable aircraft systems and subsystems as well as AGSE. To further foster a professional relationship, the BAMO/battalion AMO should do the following:

- Conduct a face-to-face meeting with the AO to ensure that aviation needs, to include shortages of critical aircraft repair parts, are duly noted.
- Make the responsible AO aware of ever-changing aircraft repair parts requirements and priorities.
- Request that the AO keeps him informed of logistical issues to include STAMIS shortcomings.
- Allow the AO to serve as a point of contact for tracking aircraft repair parts/components off the installation.
- Allow the AO to provide guidance on turn-ins, credits, excesses, forms and records, and reports.
- Obtain assistance from the AO on all logistics issues (such as ASL, PLL, bench stock, and shop stock).
- Obtain tracking numbers for brigade/battalion/unit-generated document numbers on and off post.

GOVERNMENT FLIGHT REPRESENTATIVE (GFR)

5-48. The BAMO or the senior maintenance warrant officer or the most senior aviation maintenance warrant officer assigned to the brigade or below is trained to become the government flight representative (GFR), project officer/COR, or the (ACOR. These duties may become the responsibilities of the BAMO—or a senior warrant officer maintainer—when the brigade/battalion's aircraft, equipment, or property is maintained by contractors, to include maintenance test flight of Army helicopters.

5-49. Performance of these duties is essential, even more so when the primary providers of the contract are not collocated with the unit being provided maintenance support. The performance of these duties can take place in garrison or while aviation units are deployed from home station.

5-50. In addition, life support and CS for these contractors will typically fall to the BAMO assigned to a combat aviation brigade. The BAMO is responsible for managing all assigned contractors and providing for their overall welfare.

Note. Refer to FM 3-100.21(FM 100-21) and appendixes included in this manual for further guidance in meeting the needs of assigned contractors tasked with providing aviation maintenance and logistics support.

SECTION III – DEFENSE LOGISTICS AGENCY SOURCE OF SUPPLY ITEM MANAGERS

5-51. The BAMO/battalion AMO ensures that subordinate units have the required resources to perform their mission at any given time. He will use a variety of references and source contacts to retrieve information on aviation assets. The Defense Logistics Agency (DLA) is a source that provides supply support and technical and logistics assistance to all aviation maintenance units. DLA manages, stores, and distributes hardware and electronics used in the maintenance and repair of equipment and weapons systems.

Note. Refer to Defense Logistics Agency Customer Assistance Handbook for assistance in contacting the various sources of supply managers. To obtain a hard copy of this handbook, go to the following site: http://www.dla.mil/J-4/cust_req.asp. For an online version of this handbook, go to http://www.dla.mil/j-4/login.aspx.

5-52. DLA maintains three supply centers in the following locations:

- Defense Supply Center, Richmond, Virginia.
- Defense Supply Center, Columbus, Ohio.
- Defense Supply Center, Philadelphia, Pennsylvania.

5-53. Defense Supply Center, Richmond (DSCR), is the designated aviation supply chain manager. DSCR controls the SOSs S9G and S9R and can be reached at the following Internet address: http://www.dscr.dla.mil.

5-54. With Internet access to DSCR, he will be able to perform the following functions:

- View the current flight safety critical parts (FSCP) list.
- Input requisitions through the direct online ordering option; using this option does not preclude inputting/submitting the requisition into the user's appropriate command requisitioning system.
- Query the system for back-ordered items.
- Access the DESX system; this automated computer system can be used for tracking DOD supply requisitions and inventory items and for placing or modifying DOD requisitions.

5-55. Defense Supply Center, Columbus (DSCC), is the designated Land, Maritime, Supply Chain Manager and also manages electronic items once managed by the Defense Electronics Supply Center. DSCC controls the SOSs S9C and S9E and can be reached at the following Internet address: http://www.dscc.dla.mil. DSCC provides management control for repair parts used in land and maritime weapons system support.

5-56. Defense Supply Center, Philadelphia (DSCP), is the designated center responsible for managing SOSs S9I, S9M, and S9T. DSCP is the Soldier Support and Construction Supply Manager, which includes food, clothing, and textiles and medical and construction items. The general and industrial commodities (nuts and washers, bolts and studs, screws, packing and gaskets, pins, rivets, and springs), formerly managed by DSCP, are now managed by DSCC and DSCR detachments located at DSCP. The DSCP can be reached via the Internet at http://www.dscp.dla.mil.

5-57. The following item managers are listed below to support the BAMO at all levels to track and manage logistics maintenance/supply transactions:

- CECOM national stock number and part number search: http://lrc3.monmouth.army.mil/nsn/index.cfm.
- Defense Logistics Agency national item identification number (NIIN) lookup: (NIIN price, item size, and item name) https://www.daas.dla.mil/daasing.
- CECOM provisioning master record database: (parts breakout for desired CECOM end item, list of end items that use a particular NSN or NIIN) http://lrc3.monmouth.army.mil/nsn/index.cfm.
- Army Electronic Product Support NSN Data Lookup: (on the Web site, refer to DOD Item Managers [ITEM ANALYST CODES] and their contact information for information on any NSN in the supply system, NSN item price, codes, availability in the supply system) https://aeps.ria.army.mil/aepspublic.cfm.
- Defense Logistics Agency Home: http://www.dla.mil.
- Logistics Readiness Center: (see the Handy Tools Section) http://www.monmouth.army.mil/cecom/lrc/lrc.html.
- Global Transportation Network: (track any part, equipment, and household goods that are traveling in the DOD transportation network).
- DLA Part Requisition Tracking System (limited tracking ability) http://wegal.ogden.disa.mil/mrostatus/query.html.
- NSN Search Resource: http://www.monmouth.army.mil/cecom/lrc/nsnsearch.html.
- General Services Administration (GSA) *Advantage* On-Line (purchase items through the GSA system electronically) https://www.gsaadvantage.gov/advgsa/advantage/main/start_page.do.
- DOD E-Mall (requisition items through the DOD supply system electronically) https://emall6.prod.dodonline.net/main/.

SECTION IV – INTEGRATED LOGISTICS ANALYSIS PROGRAM

Note. The traditional tools imbedded in the current STAMIS (SAMS and SARSS) and financial systems do not provide managers with the management reports required to manage in today's fluid environment. Thus, managers must gather data from various sources to perform their jobs. The process of gathering data consumes a great deal of time and makes it difficult for managers to share information, which generally leads to incomplete and untimely answers. ILAP provides a PC-based tool that integrates the data. To gain access to ILAP and the multiple reports that it generates, register at the following site: https://www.ilap.army.mil/.

5-58. ILAP is available to the BAMO/battalion AMO to retrieve logistics and financial data to track Class 9 (Air) budget matters. ILAP is the standard management tool used by the Army to collect, integrate, and display logistics and financial data. ILAP operates at all echelons of the Army to provide management capability to unit, corps, installation, component, and theater levels.

5-59. Financial data are pulled from DFAS data sites. Logistics data are obtained from appropriate supply and maintenance sites. These cross-functional data are integrated and aggregated to upper echelons to provide summary decision support views and detailed information drill-down capabilities to the document detail level. This process of assembly and aggregation affords Army departmental users the opportunity to do Army-level analysis and data query.

SECTION V – COORDINATING LOGISTICS ASSISTANCE PROGRAM SUPPORT

LOGISTICS ASSISTANCE PROGRAM FUNCTIONALITIES

5-60. The USAMC LAP provides aviation users and maintainers of USAMC-managed equipment with both logistical and technical assistance. LAP assistance can be requested if assigned or attached aircraft are experiencing materiel problems that could adversely affect aircraft operational readiness rates.

Note. For additional information and guidance concerning the USAMC LAP, refer to AR 700-4. In addition, refer to AR 700-138 and AR 750-1 for more information on the LAP. For additional logistics assistance, contact LOGSA at the following Web site: https://weblog.logsa.army.mil.

5-61. Aviation maintenance commanders/leaders and maintenance officers/technicians may, while conducting aircraft maintenance, confront NMCS conditions. NMCS conditions may directly result from logistical problems that are either beyond their resource capability to resolve or clearly not within their responsibility.

5-62. In cases beyond their resource capability or outside their area of responsibility, assistance will be provided to commanders/leaders and maintenance officers/technicians when requested. LAP assistance will help units in analyzing readiness, identifying problems, determining responsibility for resolutions, and when appropriate, resolving problems.

LOGISTICS ASSISTANCE REPRESENTATIVES' RESPONSIBILITIES

5-63. LARs are highly trained and experienced DOD civilians specializing in specific MDS aircraft. LARs are generally assigned to support aviation maintenance units. They support the unit in garrison and field environments including deployment to combat operations with the unit.

5-64. The LAR is the direct representative of the major support command that he represents (AMCOM, CECOM, or TACOM). The LAR can provide maintenance and safety messages from the Army command to the unit and assist it with the completion of message requirements. The LAR is available to train unit personnel on new equipment or sustainment systems to include support and test equipment that is managed by its Army command.

5-65. As the representative of the Army command, the LAR can coordinate with the systems engineers, as well as the item managers, to authorize depot-level repairs and expedite the release and delivery of repair parts managed by the Army command. The LAR provides a direct link to the commander of the Army command 24 hours a day.

5-66. The commander is responsible for developing a self-sustaining readiness capability that LARs will support. The LAP is not intended to be a permanent augmentation to the aviation maintenance commander. LARs, when available, can provide assistance in resolving specific logistical problems. They can also provide limited training to assigned unit personnel when requested. When appropriate, LARs can provide logistics resolution (normally on new equipment) to aviation maintenance units.

5-67. Furthermore, LAP responsibilities include providing commanders and unit maintainers with the technical guidance to resolve logistic problems. Additional responsibilities are identifying and reporting, through channels, all logistic conditions that have an adverse effect on aircraft readiness. The LAP provides commanders with a single point of contact for USAMC logistic assistance.

5-68. The LAP is oriented to the early detection of logistic problems that affect aviation units and aircraft readiness. It also provides a means for logistic support activity managers to observe and identify materiel and logistic system problems in the field.

FUNCTIONALITIES

5-69. In today's COE, new and complex equipment must be introduced into the Army system as rapidly as possible. With military personnel in constant rotation, training these Soldiers in new equipment or new procedures is critical to sustaining tactical operations. As a result, aviation maintenance units often need assistance in sustaining currency.

5-70. Logistics assistance is the advice, assistance, and training provided by qualified logisticians. They may be military or civilian employees of the Army or employees of industrial or commercial companies serving the Army under contract.

5-71. The LAP provides solutions to problems of supply and equipment, installation, operations, and maintenance. The program provides a pool of knowledgeable and experienced personnel from which all aviation units may request and draw assistance.

5-72. Logistics assistance personnel will coordinate actions with the commander and keep him fully informed of their findings and recommendations. Some functions of logistics assistance personnel are to—

- Perform the work to show units how to execute a procedure.
- Advise both technical and nontechnical personnel.
- Help users evacuate and replace unserviceable equipment that cannot be repaired.
- Visit AMC and ASC activities to help improve supply, repair parts, and maintenance support for using organizations.
- Help units locate deficiencies in supply and maintenance capabilities.
- Collect, evaluate, and exchange technical information.
- Instruct units in records management and in preparing unit supply records, PLLs, and authorized stockage lists.
- Instruct units in preparing equipment for field exercises and overseas deployment.
- Provide assistance on the care and preservation of stored material.
- Work through the AMCOM liaison engineers to facilitate and authorize maintenance to be performed at the unit or intermediate level that would otherwise be performed at depot.
- Coordinate with MSC item managers to expedite repair parts delivery wherever possible.
- Monitor the performance of assigned contractor personnel to ensure that the work being performed is according to the SOW.

PERSONNEL AND SERVICES

5-73. LAR personnel are primarily a mix of Army military and civilian personnel. These highly trained, experienced, and physically qualified personnel are well versed in the supported unit's mission and equipment. LAR personnel also have expertise in providing maintenance and logistics support to aviation commands.

5-74. These personnel are mobile and available for worldwide assignments. According to AR 700-4, they will be assigned or attached to the appropriate geographical logistics assistance office when deployed to the field command areas. Logistics assistance personnel are employed by, or under contract to, one of the major subordinate commands under USAMC.

LAP Field Service Representative Services

5-75. Field service representatives are employees of manufacturers of military equipment or components. They provide liaison or advisory service between their company and military users of its products. Known in the field as "tech reps," they provide information from the manufacturer to update the Army's equipment capabilities. They also solve technical problems. Field service representatives serve as technical communication channels between manufacturers and military users.

Requesting Logistics Assistance Representatives' Assistance

5-76. When requesting logistic assistance, aviation units should contact their local USAMC LAO. Refer to AR 700-4, Chapter 4, for LAO geographic areas of responsibility. Requests for assistance should include the following information:

- Name and location of the aviation maintenance unit requiring assistance.
- Specific types and quantity of materiel or weapons (make and model) of the systems for which assistance is needed and a general description of the problem.
- Reasons why organic resources are not available.
- Estimated length of time that assistance is required, starting date, and point of contact.
- Type of logistic assistance personnel required.
- Specific requirements for a security clearance.

SECTION VI – COORDINATING MAINTENANCE ASSISTANCE AND INSTRUCTION TEAM SUPPORT

5-77. The MAIT is a program developed under the Deputy Chief of Staff (DCS), G4, that complements the LAP. MAIT support upgrades Army materiel and units to a state of readiness consistent with assigned goals needed to carry out the Army's operational and tactical missions. It will also ensure that commanders, at all levels, are provided with assistance in identifying and resolving maintenance, supply, and maintenance management problems within their units.

Note. Refer to AR 750-1 for specific guidance on the MAIT Program.

5-78. The MAIT also can identify systemic problems in maintenance management and provide assistance to improve management of the maintenance workload at all levels of maintenance support. In today's COE, the MAIT can develop unit capabilities to meet mobilization and contingency operations.

5-79. When MAIT visits are coordinated by the higher headquarters commander or requested by using units, commanders of units visited will—

- Ensure that appropriate personnel, materiel, and records are available to the MAIT during scheduled assistance and instruction visits.
- Act promptly to correct problems.

- Request assistance from supporting activities/higher headquarters to correct problems that cannot be corrected by the unit.
- Retain the latest two MAIT visit summaries.

POLICIES

5-80. MAIT visit results and summaries will not be given ratings or scores; nor will the information be revealed to any inspection agency. When the MAIT function is contracted, MAIT visit results will be available to quality assurance evaluators.

5-81. MAITs provide semiannual overview briefings or published status reviews to brigade, division, corps, installation, and senior-level Reserve Component commanders. Briefings should highlight significant problems encountered that apply commandwide but will not identify specific units involved. Special emphasis is placed on providing the commander with an overall assessment of conduct and supervision of PMCS within the command.

PROCEDURES

5-82. MAIT visits will be required for specific units not meeting acceptable readiness standards or levels. Direct communication will be established between the units in need of assistance and the supporting MAIT.

5-83. Coordination between the unit and Active Component MAITs will take place at least seven working days before a directed or programmed visit. ARNG MAITs will coordinate visits at least 30 calendar days before a directed or programmed visit.

5-84. MAITs, as a minimum, will be able to assist and instruct units in improving operations and management in the following areas:

- Preventive maintenance and equipment repair.
- Equipment condition and serviceability.
- Maintenance records and reports management.
- Calibration management.
- Proper use of tools and test equipment, troubleshooting, and fault diagnosis.
- Maintenance personnel management and training.
- Publications account management, distribution of publications, and proper use of publications.
- Planning, production, and quality control procedures.
- Safety.
- Shop operations, including SOPs.
- PLL procedures and PLL accountability.
- Proper implementation of the Army Warranty Program.
- AOAP.
- QDRs.
- HAZMAT handling.
- CARC/CPP.

VISITS

5-85. MAIT visits are categorized as the following:

- Requested visits arranged by the unit commander requiring a MAIT or by commanders requesting a MAIT for subordinate units.
- Directed visits scheduled in advance.
- Programmed visits scheduled in advance.

Note. Requested and directed visits will be given precedence over programmed visits**.**

SECTION VII – COORDINATING OR ASSISTING WITH THE EXECUTION OF AN AVIATION RESOURCE MANAGEMENT SURVEY INSPECTION PROGRAM

5-86. The ARMS Program provides aviation personnel with expert technical assistance and on-site evaluations, as mandated by AR 95-1, to all units assigned to FORSCOM, TRADOC, USAREUR, EUSA, and INSCOM aviation units. Main proponent areas of the ARMS include, but are not limited to, the following:

- Maintenance.
- Supply.
- Safety.
- Safety-related programs.
- POL.
- ALSE.
- Operations.
- Aviation medicine.
- Standardization.
- TACOPS.
- Air traffic services.
- Training management.
- Night vision goggles (NVG).

5-87. The ARMS Program is a comprehensive survey of aviation units conducted every 18 to 24 months. These surveys assist aviation unit commanders in evaluating their unit's ability to conduct its mission safely and effectively.

5-88. FORSCOM units or units evaluated and inspected by FORSCOM ARMS teams that need ARMS information or assistance or need to download FORSCOM ARMS Commander's Guides (checklists) can go to the following site: https://freddie.forscom.army.mil/avn. For all other Army command units in need of their corresponding ARMS checklists, see the Army command ARMS inspection team designated POC.

Note. Refer to Appendix G for a sample of a FORSCOM-generated ARMS checklist.

SECTION VIII – ULLS-A DIRECT SUPPORT SYSTEM (DSS) FUNCTIONS

BAMO ACCESSIBILITY TO DSS FUNCTIONS

5-89. Depending on the limitations of the user's assigned role, the DSS is a program that enables command elements to access the following options:

- Readiness Levels.
- Reliability of Systems.
- Maintainability of Assigned Assets.
- Phase Maintenance.
- Mission Statistics.
- Component Reports.
- Systems Reports.
- Ad-Hoc Reports.

5-90. Almost all options above, will allow the user to filter anywhere—from the entire fleet all the way down to a single aircraft. Roles within the brigade level can view everything within the brigade, battalions all the way down to company level. Battalion level can view the battalion with the subordinate companies. Companies can view company-level data through their PC shop.

DIRECT SUPPORT SYSTEM MENUS

DSS READINESS MENU

5-91. The readiness menu is where users would go to look at actual mission capabilities and statistics of assigned aircraft. It will provide in-depth information on scheduled and unscheduled maintenance events, statistics on component breakdowns, bank time, and maintenance man-hours required to accomplish assigned tasks. The readiness menu provides access to the following submenus:

- Mission Capable Percentages.
- Partial Mission Capable Percentages.
- Non-Mission Capable Percentages.
- All Readiness.
- Aircraft Bank Time.

DSS RELIABILITY MENU

5-92. The reliability menu helps commanders predict the reliability of their aircraft based on previous statistics. For example, the failures and removal submenu gives an idea about premature component failures that allows the commander to predict parts requirements for future deployments. The reliability menu provides access to the following submenus:

- Failure and Removal.
- Mission Data.
- Maintenance Events.
- All Reliability.
- Maintenance Status Summary.

DSS MAINTAINABILITY MENU

5-93. The maintainability menu shows all aspects of maintenance. For example, the maintenance burden submenu will break down maintenance by cost effectiveness throughout maintenance. The maintenance menu provides access to the following submenus:

- Maintenance Burden.
- Maintenance MTTR (Mean Time to Repair).
- Maintenance Workload.

DSS PHASE MAINTENANCE MENU

5-94. The phase maintenance is the menu that enables the user to see the numbers of maintenance events going through the program. The two submenus associated with this menu are the following:

- Phase Maintenance Events – Displays data on exactly how many write-ups that were carried into phase, during the execution of the phase, and carried out of phase.
- Phase maintenance workload – Shows all hours required for phase completion by either aircraft or the fleet.

DSS MISSION STATUS MENU

5-95. The mission status menu is the simple sum of the numbers of maintenance test flights expressed as an integer. The two submenus associated with this menu are the following:

- Mission Statistics – Can be filtered and grouped by fleet, tail number, and UIC for comparison purposes.
- Flight Operations – Shows flight hours by Mean Time Flight Hours, mean time before aborts, preflight aborts, in-flight aborts, hours flown by aircraft, and UIC.

DSS Component Reports Menu

5-96. The component reports menu will give the user a view of Mean Time Between Removals, which is the total hours for the end item divided by the number of removals. It gives a breakdown of all component data and the corresponding status. The component reports menu provides access to the following submenus:

- Aircraft Components.
- Engine Components.
- Hoist Components.
- Electrical Components.
- Weapons Systems Components.
- Component Analysis.
- Component Bank Time.

DSS Systems Reports Menu

5-97. The system reports menu provides access to the following submenus:

- Bank Time by UIC.
- Daily Maintenance.
- Aircraft Status.
- Maintenance Man Hours.
- Crew Flight Hours.

DSS Ad Hoc Reports Menu

5-98. The ad hoc reports menu provides access to the following submenus:

- Unschedule Faults.
- Flight Data.
- Phase Data.
- Phase Fault Data.
- Fleet Readiness Data.
- Fleet Reliability Data.
- Fleet Maintainability Data.
- Scheduled Faults.
- Fault Actions.
- Maintenance Man Hours.
- Crew Flight Hours.

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Chapter 6

Production Control Management and Operations

This chapter focuses on the aviation maintenance management operations principles required to maintain, repair, overhaul, and apply modification work orders, safety-of-flight messages, and other mandated maintenance functions. Judiciously applying these principles will verify the airworthiness of all assigned/attached aircraft. This chapter also provides PC personnel with a "**how-to**" guide to effectively manage maintenance operations. Efficient production management is the cornerstone of any effective maintenance team. PC must coordinate support with all levels of maintenance, both vertically and horizontally; therefore, two-way information flow is necessary between the PC office and supported sections/units. PC must develop and maintain visibility of the unit's OPTEMPO at all times, to include current and future operations; visibility of a unit's operations can be achieved by a close relationship with the operations officer. This relationship ensures that established DA standards for operational readiness rates are attained, not for the sake of numbers, but to provide a snapshot of the normal day-to-day availability of Army aircraft prepared to deploy worldwide. The PC office acts as the single point of contact for coordinating all actions on the flight line or at the support facility.

SECTION I – PRODUCTION CONTROL ORGANIZATION

6-1. The composition of each PC section varies, depending on the unit design and force structure and the number and type of aircraft supported. Field maintenance is conducted at both the AMC and within the ASC of the ASB.

6-2. Field-level maintenance comprises aviation maintenance platoons (AMPs) and AMCs. In addition, ASCs assigned to ASBs also provide field-level maintenance support. Together, AMCs and ASCs provide maintenance support to aviation flight companies assigned to aviation maneuver battalions. The ASB is organic to the combat aviation brigade.

6-3. Figures 6-1 and 6-2 show a typical layout of a production control shop for both the AMC and ASC.

Contents

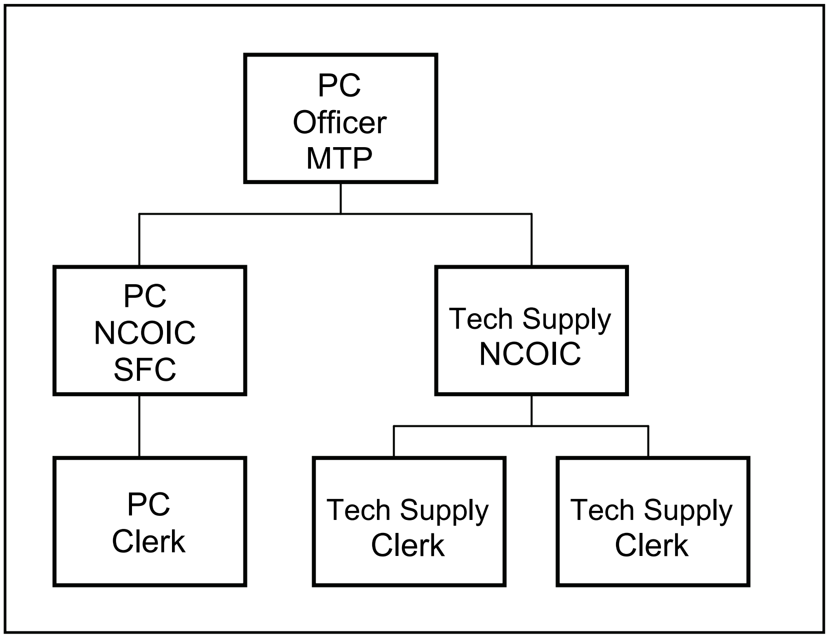


Figure 6-1. Typical AMC PC structure

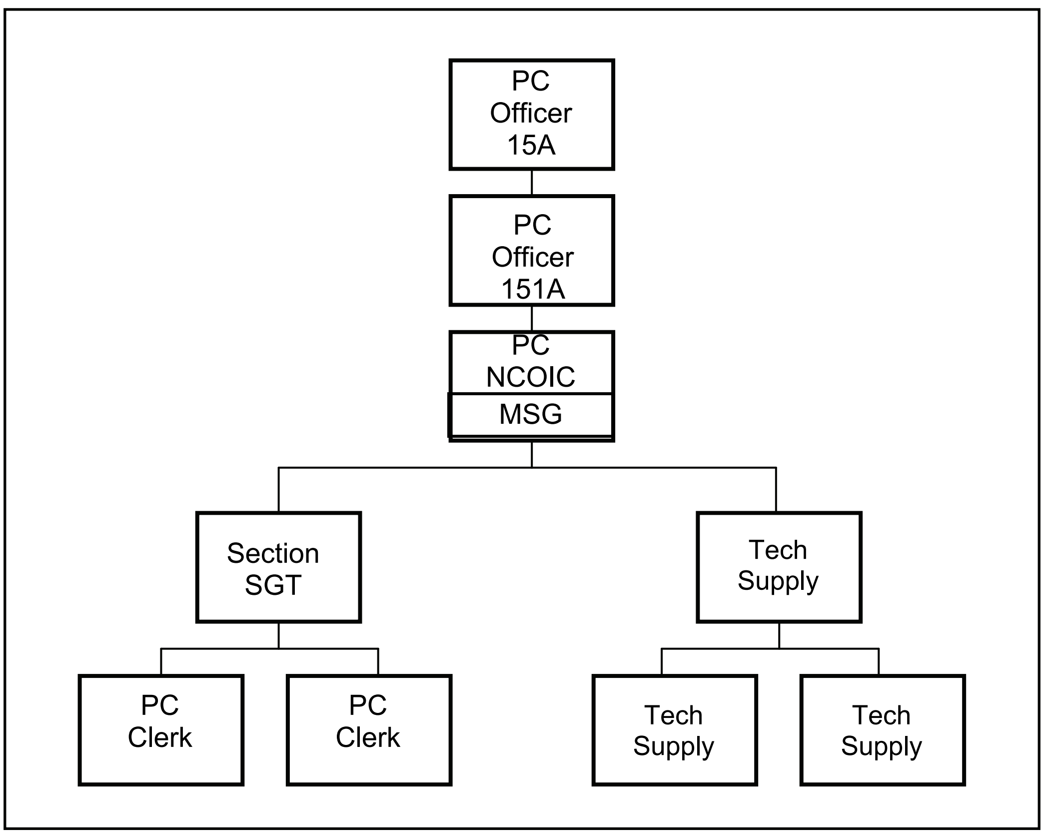


Figure 6-2. Typical ASC PC structure

SECTION II – PRODUCTION CONTROL DUTIES AND RESPONSIBLITIES

PRODUCTION CONTROL OFFICER

6-4. The aviation maintenance commander selects the PC officer based on skills, qualifications, experience, and leadership abilities. Preferably, the PC officer is a graduate of the aviation maintenance manager/maintenance test pilot course, depending on the force structure of the unit.

6-5. The PC officer is the principal maintenance manager-coordinator in the AMC or ASC and coordinates maintenance and logistics actions at both the company and battalion level. The PC officer is the AMC commander's primary maintenance advisor for all internal production and maintenance activities within the AMC.

6-6. In the absence of an assigned BAMO, the PC officer will act as the battalion primary maintenance advisor at the battalion level. While the commander commands, the PC officer controls the daily maintenance operations and workflow within the battalion. This relationship requires synergy between the two to balance unit maintenance priorities with unit mission requirements. The PC OIC orchestrates maintenance efforts and priorities by coordinating with the aviation commanders and with the BAMO and battalion AMO on maintenance issues requiring command-level attention.

COMMAND RELATIONSHIPS

6-7. The AMC or ASC commander has overall responsibility for all aviation maintenance activities and production. The PC officer is responsible for controlling all aviation maintenance production matters according to command guidance and acts as the direct link between the unit commanders and maintenance companies, platoons, and sections for all internal and external production issues.

6-8. The PC officer is the main point of contact between AMC aviation operational units and the ASC. If assigned to the ASC, the PC officer is the primary point of contact for the supported units. The commander and staff must be kept informed of critical maintenance issues and the operational status of battalion equipment.

6-9. The PC officer establishes, coordinates, and directs priorities of work and logistics with the maintenance officers and noncommissioned officers, to include quality control, the ARP, the CRP, the armament section/platoon, the aviation logistics/technical supply section, and flight companies. Responsibilities include, but are not limited to, the following:

- Analyze, plan, and coordinate required support for all maintenance activities.
- Supervise preparation of reports and records.
- Coordinate within the AMC and the ASC as required.
- Establish maintenance priorities based on command guidance.

BAMO/BATTALION AMO RELATIONSHIPS

6-10. When assigned to the AMC, the PC officer will assume the responsibilities of the BAMO/battalion AMO if the position is unfilled or the BAMO/battalion AMO is unavailable. The PC officer and the BAMO/battalion AMO must interact and closely coordinate all aviation maintenance and logistics activities. In the absence of the BAMO/battalion AMO, the PC officer assumes the additional external logistics responsibilities and coordinates all logistics issues.

SUPPORT OPERATIONS AND PC RELATIONSHIPS

6-11. The SPO officer assigned to the SPO section is responsible for logistics support and distribution management to supported aviation maintenance and support companies. The SPO officer, with the BAMO, provides logistics and maintenance support to all AMC/ASC PC officers. The SPO section, under the direction of the SPO officer, provides centralized, integrated, and automated C2 and planning for all distribution management operations within the aviation maneuver battalion.

6-12. When airframes are experiencing longer-than-normal NMCS times, the AMC/ASC PC officer will coordinate logistic actions with the SPO officer to expedite release of high-priority repair parts. To further assist the AMC/ASC PC officer, the SPO officer will coordinate with logistics representatives in the fields of supply, maintenance, and movement management to track or expedite release of high-priority repair parts.

6-13. With ITV/TAV, BCS3, FBCB2, and MTS, the SPO section has access to more information and receives information in near-real time. These systems allow support operations to identify problems more quickly and allocate resources more efficiently. BCS3 gives support operations the visibility of the logistics status from the ASB/SSA back to theater level.

Note. Refer to FMI 4-90.23 for additional information on the support operations section.

OFFICE ADMINISTRATION

6-14. The PC officer is responsible for the internal management and administration of the production control section. The PC officer provides oversight and supervision to ensure that all administrative duties are performed on a timely basis and that all reports and processes are executed and delivered on or before the required suspense.

PRODUCTION CONTROL NONCOMMISSIONED OFFICER IN CHARGE

6-15. The aviation maintenance commander and PC officer will select the PC NCOIC based on skills, qualifications, experience, and leadership abilities. Generally, the PC NCOIC is one of the most senior and experienced maintenance NCOs assigned to the unit. Preferably, the PC NCOIC should be an Advanced Noncommissioned Officers' Course (ANCOC) graduate.

6-16. The PC NCOIC will coordinate all maintenance actions in the absence of the PC officer and will act on his or her behalf when required. The PC officer and the PC NCOIC must function as a team. When one acts, the other must be aware of all decisions and priorities. The PC NCOIC will assist the PC officer and, in his absence, coordinate and establish priorities of work with the unit's maintenance officers and noncommissioned officers, to include the following: quality control, the ARP, the armament section, the CRP, technical supply, and flight companies.

PRODUCTION CONTROL CLERK

6-17. The aviation maintenance commander, PC officer, and first sergeant will select the PC clerk based on skills, qualifications, and experience. The PC clerk should be a senior-grade specialist with knowledge of aircraft systems and aircraft subsystems organic to the organization. He should have a working knowledge of automated systems (ULLS-A) and related software. In addition, the PC clerk should possess the knowledge to assist the PC NCOIC in managing the battalion ULLS-A server.

6-18. The PC clerk is responsible to the PC officer, the PC NCOIC, and ultimately, the aviation maintenance commander for the execution of administrative production control functions and processing and updating ULLS-A information. The PC clerk updates and processes work orders pertaining to aircraft systems and subsystems according to appropriate regulatory guidance, manuals, and the ULLS-A end-user's guide.

6-19. The PC clerk is the primary point of contact for distribution and evacuation of work-ordered unserviceable aircraft repair parts and components to the ASC. If assigned to the ASC, he generates internal work orders for maintenance support from assigned shops and maintenance sections. He also conducts work-order reconciliations with the flight companies according to the maintenance SOP as well as with assigned AMC platoons, shops, and sections.

6-20. The PC clerk assigned to the AMC will also reconcile external work orders with the ASC production control office. When assigned to an ASC, the PC clerk reconciles work-order statuses within the ASC and work-order statuses with the PC clerk of external maintenance activities as required. He processes forms and records from flight companies or, if assigned to an ASC, from the test flight section. The PC clerk distributes forms and records to the responsible parties in quality control and flight operations for inspection and according to AR 25-400-2 and DA Pamphlet 738-751.

SECTION III – PRODUCTION CONTROL MANAGEMENT OPERATIONS

PRODUCTION CONTROL MAINTENANCE MEETINGS AND AGENDA

6-21. The PC meeting provides one platform that consolidates and coordinates all maintenance and logistics actions. In addition, the meeting is designed to coordinate internal and external maintenance processes. This meeting ensures that all leaders and maintenance managers have a clear picture of current and projected combat power. A formal PC meeting is not always necessary. For example, a detachment may be small enough that the PC officer is able to monitor all maintenance activities without a meeting.

6-22. The maintenance meeting ensures that efforts of the maintenance managers are synchronized. It also ensures that all leaders have a clear picture of the current and projected combat power, who is conducting specific actions to generate combat power for future operations, and when these actions must occur. The maintenance meeting also serves as the forum to close the loop on open actions and, ultimately, ensures that all maintenance resources are allocated to enhance combat power for future combat operations. As a result, the commander has the maximum amount of combat power to conduct future operations.

6-23. The PC meeting allows the PC officer/NCOIC to coordinate with all levels of command and the entire maintenance team simultaneously. The PC meeting is held during normal duty hours, as defined by the mission cycle, at a suitable time for most essential personnel to participate. The PC officer/NCOIC determines daily status and changes affecting the operational readiness of the fleet.

6-24. The PC meeting is not just an aircraft status meeting; it is also a way of planning, adjusting, and forecasting maintenance and logistics actions. Unscheduled maintenance from the previous day/night operations may be discussed to prioritize or shift workflow from the previous plan. This management process allows the PC officer/NCOIC the flexibility to schedule, update, and provide policy guidance affecting all aviation maintenance and logistics actions. The PC meeting is most effective when there is strong two-way communication between the PC section and all members representing each section, shop, and company.

6-25. P4T2 optimizes the flow of all scheduled maintenance actions. Tracking scheduled maintenance actions is especially important when external support is required such as assistance from the ARP/CRP to support an engine service or a contact team from the ASC to provide intermediate field maintenance or unit field maintenance support assistance.

PC MEETING ATTENDEES

6-26. Commanders will afford junior leaders the opportunity to develop an understanding of maintenance operations and management, which is an essential building block of leadership development. They can observe and learn the fundamentals of administrative maintenance management by involvement in the PC meeting. Attendance and involvement in the battalion PC meeting is only one level of maintenance management and is an enabler in the development of junior leaders.

6-27. Maintenance development at all levels is an important aspect of leadership. Maintenance management affects mission training/execution of wartime missions. Development of junior leaders is critical for their professional development and preparation for the next level of responsibility. The following personnel should attend each PC meeting:

- AMC or ASC commanders/1SGs.
- Flight company commanders/1SGs (aviation operational units only).
- Platoon leaders/sergeants (flight platoon, AMC, or ASC).
- Battalion AMO.

- PC officer/NCOIC.
- PC clerk.
- ULLS-A administrator/clerk.
- Technical supply officer/NCOIC.
- QC officer/NCOIC.
- Shops officer/NCOIC.
- Maintenance officers/NCOIC.
- Maintenance test pilots.
- Armament officer/NCOIC.
- Contract support maintenance team lead.
- CFSR.
- LAR.

6-28. The following personnel are invited and encouraged to attend PC meetings. Time availability and schedule conflicts may interfere, however. Senior leadership is critical to the success of any maintenance program; therefore, weekly attendance is highly encouraged by the following individuals:

- Battalion XO.
- Brigade aviation materiel officer or battalion AMO.
- Battalion commander.
- Battalion CSM.
- Battalion assistant S3.

PC Meeting Agenda

6-29. The agenda of each PC meeting should follow a specific and well-defined format. This format will allow for a smooth transition of workflow and maintenance and logistics issues that affect those in attendance. The agenda can be built as the duty day progresses so that information is not forgotten at the following PC meeting.

6-30. The PC meeting is a team-building event that should not exceed one hour. The PC meeting provides essential personnel/leaders with situational awareness—not only in and around their areas of responsibilities but of the overall maintenance posture of the entire battalion. The PC meeting facilitates the organization of workflow and priorities and coordination among sections/platoons/companies.

6-31. NCOs are encouraged to interact with their counterparts/peers and leaders to obtain necessary support in the absence or unavailability of the PC staff. PC personnel must be immediately notified of any maintenance support performed in their absence. When these maintenance actions take place, they are the exception, rather than the rule. The PC staff will always direct and coordinate internal and external maintenance and logistics issues.

6-32. Coordination with PC is required to communicate maintenance and logistics issues that are negatively affecting company aircraft readiness rates. In addition, follow-ups and updates to PC will be the norm to ensure that a true picture of aircraft readiness is available to the battalion commander. All necessary work orders will be generated at PC in support of required maintenance support. PC meetings are used to communicate maintenance and logistics needs and wants. Figures 6-3 and 6-4 are examples that should be used as an agenda shell and tailored as required.

- **Roll Call**
  - PC Officer
  - PC NCOIC
  - PC Clerk/PC ULLS-A Administrative (Admin)
  - QC NCOIC
  - Technical (Tech) Supply NCOIC
  - Maintenance platoon (PLT) sergeant (SGT)
  - Shops PLT SGT
  - Armament/Avionics NCOIC
  - Line Troops PLT SGT
- **Administrative Data/Notes**
  - PC Officer/NCOIC
  - PC/ULLS-A Clerk
    - ULSS-A Send/Receive Update
    - Forms/Records
  - QC – Trends/Policy Changes/ Issues
  - Tech Supply NMCS Report Brief/Zero Lines PLL/ORILs Status
  - Maintenance PLT SGT
  - Shops PLT SGT
  - Armament/Avionics PLT SGT
- **Flight Company (each company rapidly briefs major changes and support requirements)**
  - Line Company Status Brief (Changes)
  - Flight Schedule
  - Scheduled Maintenance
  - Unscheduled Maintenance
- **CFSRs**
  - Aircraft Manufacture Representative
  - Specific Aircraft Component Representative
  - Support Contract Team Leader
  - AMCOM LAR
- **PC Resource Prioritization Plan**
- **Section Confirmation Briefs**
- **PC Outsourcing Requirements Brief**
- **Alibis**
- **PC Back Brief**
- **Commander's Closing Comments**

Figure 6-3. Typical AMC PC meeting agenda

- **Roll Call**
  - PC Officer
  - PC NCOIC
  - PC ULLS-A Admin
  - QC NCOIC
  - Tech Supply NCOIC
  - Maintenance PLT SGT
  - Shops PLT SGT
  - Armament/Avionics NCOIC
- **Administrative Data / Notes**
  - PC Officer/NCOIC
  - PC/ULLS-A Clerk
    - ULSS-A Update
    - Forms/Records
  - QC – Trends/Policy Changes/ Issues
  - Tech Supply NMCS Report Brief/Zero Lines PLL/ORILs Status
  - Maintenance PLT SGT
  - Shops PLT SGT
  - Armament/Avionics NCOIC
- **CFSRs**
  - Aircraft Manufacture Representative
  - Subcomponent Representative
  - Support Contract Team Leader
  - AMCOM LAR
- **PC Resource Prioritization Plan**
- **Section Confirmation Briefs**
- **Alibis**
- **PC Back Brief**
- **Commander's Closing Comments**

Figure 6-4. Typical ASC PC meeting agenda

EVALUATING AND ESTABLISHING PRIORITIES OF WORK

6-33. The PC officer is responsible for evaluating and establishing work priorities. The company commander's considerations must be taken into account, but the ultimate work prioritization responsibility falls on the PC officer. When conflicts arise between companies and the PC officer, the PC officer should establish work priorities in the best interest of the overall battalion maintenance program with the support of the AMC commander and the battalion commander.

6-34. This continuous evaluation of work priorities requires close supervision and follow up at all levels. Effective communication skills are required to best determine and relay the priorities of the day or week. The establishment of work priorities by the PC officer results in a balance of workload.

TYPICAL P4T2 APPLICATION

6-35. The use of P4T2 will result in a smoother and more predictable environment for both the supported and the supporting elements in the performance of inspections or services required and mission accomplishment of given tasks or services. Outlined below is an example of the P4T2 process that can be used in the PC meeting to increase communications and establish professional working conditions between the supported and the supporting team elements:

- Maintenance Sergeant: Identifies service. (Problem)
- Maintenance Sergeant: Briefs PC of the intended day to perform the service. (Plan)
- PC Officer: Inquires if required parts to perform the service are available. (Parts)
- PC Officer: Coordinates with the supporting element (internal or external). (People)
- Maintenance Sergeant: Updates the PC officer/NCOIC concerning the progress of the aircraft nearing the service window, time line, and expected service date. (People)
- PC Officer/NCOIC: Coordinates with appropriate shop/platoon supervisor. (People)
- Shop Supervisor: Validates that necessary tools and parts are on hand. (Tools/Parts)
- Shop Supervisor: Validates training of individual assigned to perform service. (Training)
- Maintenance Sergeant: Once the aircraft has entered the service window, notifies PC. (Plan)
- Maintenance Sergeant: Allocates time to perform the service; back briefs command and PC of the estimated time of completion. (Time)
- ULLS–A: Will be used to track all maintenance and logistics actions. (Technology)
- PC Officer: Orders execution of the service to shop supervisor. (Plan)

Note. The service may, of course, have to be rescheduled if unscheduled maintenance interrupts the aircraft's scheduling and the required number of hours cannot be flown into the service window.

AIRCRAFT MAINTENANCE STATUS PROCESSING

6-36. The aircraft daily status report is based upon data migration via the send disks, LAN, or wireless from the flight companies. PC will continually update the aircraft status board, if used. The ULLS-A server will be automatically updated once data migration is complete. The PC clerk will be responsible for informing the PC officer and NCOIC of any changes.

PRODUCTION CONTROL STATUS BOARD

6-37. The PC board (see Figure 6-5) is a graphic depiction that displays data on aircraft status or shop operations. Information recorded on the board is used to control current operations, plan anticipated work, and measure work performed. Although maintenance managers have quick access to information through ULLS-A, a well-planned and informative PC board (equipment status board) can serve as a highly visible source of information for the commander and other essential personnel (such as platoon leaders and section chiefs) and as a working draft for status reports. The status board provides information on the progress of work in other shops or sections in relation to work in their activities.

(UNIT) PC STATUS BOARD			
ACFT	STATUS	FAULT	REMARKS
037	/		
954	X	HARD LANDING	AWAITING TOOL – BELL (ASC)

Figure 6-5. Typical PC board layout

6-38. The design of the board should be simple and easy to work with. If a PC board is used, entries on the board must be accurate and prompt. The PC board is a good management tool and can be used when PC personnel are conducting a meeting. The PC officer organizes the board for his own management style. Some suggestions for entries on the board are the following:

- Current aircraft status (updated throughout the day as the status of aircraft changes).
- Priority of work.
- Status of special tools and equipment (such as hoists, tugs, AGPUs, and test sets).
- Reasons for stopped work.
- Work awaiting receipt of parts (can be used to track status of parts for NMCS aircraft).
- Document number and status.
- Work order number from ASC.
- Phase status (for example, "75%" [estimated percentage complete]).

MAINTENANCE MAN-HOUR ESTIMATES

6-39. MACs provide a baseline to establish initial estimates of man-hours required to accomplish a given repair or task. Accurate reporting to higher headquarters is important; however, it is more important to give an accurate estimate to the responsible operational company commander. The flight company maintenance officer must be able to accurately plan maintenance flow and back brief his commander on aircraft status to complete the assigned operational mission cycle.

6-40. Maintenance man-hour estimates should incorporate an evaluation of the training level of assigned personnel. The evaluation process allows for the development and training of supportive maintenance crews, which sometimes may extend maintenance downtime on the front end.

6-41. Allowing supportive maintenance personnel adequate training opportunities in a garrison environment will greatly enhance their maintenance abilities and increase overall maintenance performance and support in time of conflict. The management of military support maintenance, compared to contract support maintenance, must be carefully balanced to maintain Soldier proficiency.

WORK ORDER TRACKING/FILING SYSTEM

6-42. The tub file was once a manual system for tracking the status of work requests. In units modernized with the fielding of ULLS–A, tub files are no longer used. ULLS–A provides an efficient tracking mechanism for all maintenance and supply actions. This automated system provides all maintenance sections and shops personnel with a snapshot in time of all maintenance actions taking place within their areas of responsibilities.

6-43. PC is responsible for ensuring that an efficient system is in place for monitoring the status of all aircraft/component maintenance work and corresponding work orders within the unit. There are several methods for tracking the status of work orders outside of ULLS-A. PC personnel can track assigned work orders through files created under the "My Documents" folder; or they can be tracked within an Excel spreadsheet. Whichever method is used, PC shops will track work orders using the following categories:

- Inspection.
- Parts required.

- Waiting parts.
- Shop.
- Maintenance in progress.
- Inspection.
- Test flight.
- Delivery/pick-up.

AIRCRAFT COMPONENT EXCHANGE SYSTEMS

REPARABLE EXCHANGE PROCEDURES

> ***Note.*** Refer to Chapter 4 for information on SSF procedures and to Chapter 8 for more information on reparable exchange and controlled exchange procedures.

6-44. Reparable exchange (RX) is a supply system maintained at the ASB's distribution company's SSA. It speeds up the available repair parts system with recoverable repair items on hand for issue on a one-for-one basis. RX also enhances operational readiness by providing given repairs with minimal delays. DA Form 2765 (Request for Issue or Turn-in) and DA Form 2765-1 (Request for Issue or Turn-in) are prepared and hand-carried, along with the unserviceable items, to the ASB SSA RX section to exchange for a serviceable item.

6-45. RX items are normally repaired by the ASC's component repair section and then placed back into stockage at the SSA. If the component or LRU cannot be repaired, it is retrograded through supply channels.

6-46. An RX listing—containing the NSN, item description, end-item application, and authorization—will be distributed to all units supported by the ASB. RX items are not normally authorized on the unit PLL. All RX stocks should be located and maintained at the ASB's distribution company's SSA.

CONTROLLED EXCHANGE PROCEDURES

6-47. Controlled substitution or exchange is the removal of serviceable parts from an unserviceable item of equipment for installation on another item to make it serviceable. According to AR 750-1, repair parts and components may be removed from aircraft that are classified as NMCS; not mission-capable, maintenance (NMCM); or PMC. However, an aircraft or major component will not be stripped to the point where it is used primarily as an SOS and becomes uneconomical to repair. All parts removed from crash-damaged aircraft must be inspected according to TM 1-1500-328-23 before being used on serviceable aircraft. Controlled exchange should be approved only when the following criteria are met:

- The aircraft upon which the exchanged parts will be installed is NMCS, and replacement aircraft repair parts or components are on order and have a valid document number.
- Required aircraft repair parts or components are not available from the SOS within the required delivery date (RDD) indicated on the maintenance request.
- Controlled exchange items will not be taken from ORF aircraft.
- The contributing aircraft is NMCM, NMCS, or PMC.
- The maintenance effort required to restore the unserviceable airframe to an FMC condition is within the MAC authorization and the capability of the unit performing the controlled exchange.
- Once a controlled substitution or exchange action has been approved by the approving authority, the needed repair parts must be placed on order for the donor aircraft as the controlled exchange action begins; if possible, requested parts should have a valid supply or shipping status.
- The unserviceable component is appropriately tagged with the donor aircraft information and either work ordered to the ASC or prepared for turn-in to an SSA; this tagging is to retain the identity and integrity of the donor airframe or weapon system.

- The organization performing the controlled exchange takes prompt action to restore the unserviceable airframe or weapon system to an FMC condition.
- The controlled exchange satisfies a requirement already in the Army supply system; that requisition will be either canceled or used to restore the unserviceable end item or weapon system to FMC.
- All possible alternatives, to include a horizontal and vertical search of the supply system for needed aircraft repair parts, are pursued before a controlled substitution or exchange action takes place.
- A document number search for the aircraft part or component has been made to ensure that the part is not available for issue from the ASB's supply support activity.
- The controlled exchange action must bring the receiving aircraft to an FMC condition.

6-48. Shortages of repair parts may require the AMC unit commander or maintenance officer to use battle-damaged or unserviceable aircraft as a source of repair parts during combat operations. The intensity of combat, the need for operational aircraft, and the availability of the repair parts requesting system will dictate the extent to which controlled exchange will be necessary.

6-49. A record of removed parts must be maintained and aircraft records annotated for each item removed. The commander of the unit, or his designated representative, who owns the aircraft is the only approval authority for controlled exchange. Controlled exchanges at the ASC are approved by the ASB commander, installation materiel maintenance officer (IMMO), or commander's designated representative.

6-50. The exchange decision should be a consolidated maintenance team decision involving, first, the PC officer, QC officer, and technical supply officer and, secondly, the affected company commander. If the controlled exchange occurs between aircraft of different companies, both commanders should be involved in the decision-making process before the decision for controlled exchange proceeds to the battalion level for approval from the battalion commander or his designated representative.

6-51. Once a controlled exchange decision has been made and for tracking purposes, all personnel involved in the decision must take appropriate action in their sections. These actions will entail record management, control, and disposition of affected aircraft parts. Controlled exchange or substitution is a last-resort method for maintaining a flyable fleet. Adhering to these measures will prevent abuse of the controlled exchange program. Aviation maintenance units' SOPs must contain policies and procedures for the controlled substitution or exchange program.

6-52. Stringent and meticulous record-keeping procedures will be maintained during a controlled exchange action, particularly when items requiring historical data are transferred from one aircraft to another. There must be continuous dialogue between QC, PC, and maintenance personnel before, during, and immediately after all controlled exchange procedures.

6-53. Controlled exchange maintenance procedures should not be considered complete until all forms and records are closed out and filed according to the unit's maintenance SOP. Once a controlled exchange action has been approved, an authorization form will be initiated in four copies and distributed as follows:

- A copy will be used by the PC office for DA Form 1352 reporting purposes; this copy will be filed in the PC office's controlled-exchange logbook.
- Controlled-exchange sheets for each reporting period will be filed with the DA Form 1352 as supporting documentation according to AR 700-138.
- A copy will be given to QC for its controlled exchange files.
- A copy will be filed in the donor aircraft's logbook; aircraft records will be annotated to reflect item controlled exchanged to aircraft serial number. If it is a serial-numbered item, the serial number of the item will be reflected.
- A copy will be filed in the gaining aircraft's logbook; aircraft records will be annotated to reflect item controlled exchanged to aircraft serial number. If it is a serial-numbered item, the serial number of the item will be reflected.

MAINTENANCE MANAGEMENT PROCEDURES

SCHEDULING SYSTEM MANAGEMENT PRINCIPLES

6-54. A scheduling system that promotes efficient workflow is needed to ensure that customers receive their aircraft with the least possible delay. Many factors must be considered to develop a scheduling system. These factors may include the current workloads and priorities of the supported units, the availability of tools, and the supply of major components, parts, and hardware.

6-55. A PC operation requires a scheduling system and preplanned workflow. The PC element must track the following information to establish maintenance workweek priorities compatible with the unit's mission:

- Mission requirements and priorities of supported commanders, to include numbers of aircraft and specific capabilities required for those aircraft.
- Aircraft maintenance flow, by flying hours remaining for each assigned aircraft until upcoming scheduled maintenance inspections.
- Current total number of flight hours, status of avionics and armament, and the operational status of each assigned aircraft.
- Work in progress and work deferred.
- ASC work in progress and work deferred.
- Time-change requirements for components, by individual assigned aircraft tail number.

MANAGING SCHEDULED MAINTENANCE

6-56. Scheduled maintenance takes place anytime that an aircraft phase, progressive phase maintenance, and preventive maintenance services, to include scheduled component replacement, are conducted. Scheduled maintenance actions and procedures can suffer from a lack of coordination and communication. Poorly coordinated scheduled maintenance events will have a negative effect on the battalion's aircraft readiness.

6-57. To ensure minimum disruption to the supported unit's mission (training/tactical) and aircraft readiness, PC personnel will ensure that a suitable maintenance program is in place to coordinate all maintenance and logistics actions. Contents of the maintenance program must be fully communicated, by way of a maintenance SOP, to all levels of command within the battalion. Battalion leadership must accept responsibility and provide command emphasis in support of the maintenance program.

6-58. Maintenance functions are designed to maintain the fleet to a standard that allows the operational commander to accomplish the mission on time, every time. The PC office should have visibility on all major scheduled maintenance that requires internal and external support. The visibility of maintenance actions allows the PC officer/NCOIC to coordinate and forecast support, allowing for reaction time.

MANAGING UNSCHEDULED MAINTENANCE

6-59. Aircraft scheduled for daily mission (training/tactical) requirements may, on occasion, experience unexpected malfunctions, premature component breakdown, or battlefield damage, causing the aircraft to undergo unscheduled (reactive) maintenance. Unplanned aircraft system or subsystem or associated component malfunctions or breakdowns will prompt PC to coordinate for unscheduled (reactive) maintenance to bring affected aircraft to a fully mission capable status.

6-60. It is the PC officer's responsibility to prioritize, manage, and track unscheduled repairs and component replacements having a negative effect on the total mission capability of the battalion. The PC officer is responsible for coordinating maintenance support for assigned aircraft and airframe repair platoon and component repair platoon (ARP/CRP) maintainers, as required, to meet any mission requirements. Maintenance officers/technicians, NCOICs, and maintenance personnel are ultimately responsible for conducting maintenance repairs to affected aircraft systems or subsystems and associated components, according to established maintenance publications and references.

MANAGING DEFERRED MAINTENANCE

6-61. When the PC officer, or NCOIC in his absence, is prioritizing maintenance actions, he weighs maintenance actions in terms of what maintenance procedures must be performed immediately and which maintenance procedures can be postponed. When maintenance procedures are postponed, this action is commonly referred to as deferred maintenance.

6-62. Deferred maintenance actions must be performed at a time when an aircraft goes down for unscheduled maintenance or an airframe is scheduled for a preventive maintenance service or phase. Deferred maintenance actions cannot be delayed indefinitely, they must be coordinated and scheduled to be performed at the earliest opportunity. The commander is the approval authority for all deferred maintenance actions and should be notified immediately when the status of aircraft flightworthiness changes.

COORDINATING INTERNAL MAINTENANCE SUPPORT

6-63. The coordination of internal maintenance support is often facilitated at the daily PC meeting. All internal and organic support should be in tune with the daily operations of the flight companies to provide more reactive response time. Each flight company should be assigned a POC within each section for internal organic support. Not only should internal maintenance be driven by work-order requests for maintenance, but the section POC should also conduct a daily review of aircraft logbooks and take the lead on reporting open faults back to PC.

6-64. Should there be a requirement to initiate an additional work order request following the conduct of maintenance, the work order, once initiated, will track all initiated maintenance procedures until completed. Once maintenance procedures are complete, the work order will be closed. Corresponding work orders, once closed, document the required maintenance support and man-hours used for accountability. This process often relieves and alleviates the “us-versus-them” syndrome associated with support and supported units. This process should be used to develop a cohesive and reliable combat maintenance team, especially when maintenance personnel are preparing to conduct deployments of unit assets.

COORDINATING EXTERNAL MAINTENANCE SUPPORT

6-65. The PC officer/NCOIC interacts on a daily basis, or as required, to develop synergy on all maintenance actions. When higher-level external maintenance support has been coordinated, daily transmittals of STAMIS information are necessary to track ongoing maintenance actions. The PC officer/NCOIC should allow as much lead time as possible so that the P4T2 process can be implemented as required. Requests for external maintenance support are essential to any maintenance program. The PC officer/NCOIC should coordinate for required external maintenance support with the ASC PC office, as necessary, to maintain aircraft/fleet operational readiness.

DART/BDAR

Note. FM 3-04.513(FM 1-513) and Appendix E of this manual contain more information on BDAR.

6-66. The purpose of BDAR is to rapidly return disabled equipment to combat or to enable the equipment to self recover. BDAR is the commander’s responsibility—based on mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC)—and is accomplished by the operator/crew and field maintenance personnel. The PC officer is responsible for training and conducting BDAR and DART operations.

6-67. In addition, the PC officer is responsible for coordinating, organizing, assembling, and assigning the appropriate DART package to effect aircraft recovery. The PC officer will coordinate with the ASC PC officer if recovery is beyond the capability of the AMC. If assigned to the ASC, the PC officer will coordinate with the AMC to effect recovery of the downed aircraft.

COORDINATING MAINTENANCE TEST FLIGHT AND OPERATIONAL CHECKS

6-68. The PC officer will coordinate all MOCs and MTFs at the PC meeting with the flight company and, on case-by-case basis, throughout the duty day, as required. The ASC will coordinate the conduct of MOCs and MTFs also at PC meetings with the appropriate section. After a successful MOC, the aircraft status will be changed according to TM 1-1500-328-23 and AR 700-138 and appropriate aircraft technical manuals, including ETMs/IETMs.

MANAGING AN AIRCRAFT PHASE/PERIODIC MAINTENANCE PROGRAM

6-69. The modular force is changing the levels of responsibility and management of phase/periodic maintenance scheduling and flow. A methodical and purposeful flow of aircraft scheduled maintenance events increases overall readiness. Each flight company is individually responsible for managing the flow of aircraft into phase. The companies work with one another and the AMC to sequence major inspections to reduce lag times created because of limited assets to perform the inspections.

6-70. The PC officer will manage the overall battalion phase flow to ensure that multiple company aircraft are not in phase at the same time. The OPTEMPO will dictate the number of concurrent battalion aircraft in phase. The PC officer/NCOIC monitors and manages spacing between major scheduled maintenance events and phase maintenance inspections. Phase/periodic inspection planning is a critical part of mission readiness for aviation units.

6-71. Aviation commanders and the PC officer must ensure that aircraft phases are planned well into the future. Coordinating, planning, and scheduling are closely associated. Experienced PC officers and NCOs handle coordination, planning, and scheduling. They should specify, in detail, the work required to achieve the desired results by working closely with the companies.

COORDINATING PHASE/PERIODIC MAINTENANCE PROCEDURES

6-72. PC should coordinate closely with QC personnel when preparing intershop maintenance requests and accompanying forms and records. DA Forms 2408-13-1, 2408-13-2, 2408-13-3, and 2407 should specify, in detail, all work required or inspections to be performed. The following procedures apply to a typical PC section: prephase test flight, aircraft arrival, forms and records flow, final inspection, after-the-final inspection, posttest flight inspection, and release of aircraft.

Prephase Test Flight Inspection

6-73. During the prephase test flight inspection, maintenance personnel should conduct the following to facilitate maintenance procedures:

- Whenever practical, maintenance test pilots should perform a prephase test flight on aircraft scheduled for phase or periodic maintenance.
- The maintenance and PC officers should review the results to determine which platoon or section will do the required maintenance.
- Faults noted on the appropriate phase checklist become a part of the phase inspection.
- The TI assigned to make the phase inspection on the aircraft should accompany the test flight when possible.

Aircraft Arrival

6-74. When the aircraft arrives at the maintenance facility, the PC section and maintenance personnel conduct the following procedures:

- PC receives the DA Form 2407 and the aircraft's equipment logbook, historical files, and ULLS-A computer.
- PC personnel review the DA Form 2407.
- When PC personnel accept the aircraft, they log it on a DA Form 2405.
- QC personnel conduct a joint aircraft inventory with the supported unit before acceptance.

- Forms and records, to include DA Form 2407 and the logbook, are viewed by QC personnel.

6-75. Units under the ULLS-A system will follow the procedures outlined in the ULLS-A end-user manual. If the phase/periodic inspection is performed by the ASC operating under SAMS-1, PC personnel should use the procedures outlined in the SAMS-1 end-user manual.

Forms and Records Flow

6-76. When evaluating forms and records, PC and QC personnel will conduct the following procedures:

- PC personnel will complete title block 24 of DA Form 2407; a copy of the receipt and the inventory sheet go to the supported activity's representatives.
- PC personnel direct the workflow through the various shops, entering all maintenance requirements on the PC board and updating the ULLS–A.
- As work progresses through the shops and sections, QC personnel conduct in-progress inspections.
- QC personnel conduct inspections on intershop maintenance requests as they are completed, routing them to the PC shop.
- PC personnel extract the necessary information from the completed intershop maintenance requests and DA Forms 2408-13-1, 2408-13-2, and 2408-13-3 and enter necessary information on DA Form 2407.

6-77. Maintenance personnel will record faults on DA Forms 2408-13-1, 2408-13-2, and 2408-13-3. If the unit is assigned the ULLS–A, authorized personnel will make appropriate entries.

Final Inspection

6-78. QC and PC personnel, when processing the aircraft for final inspection, will perform the following procedures:

- PC personnel receive and consolidate all accumulated documents relating to the maintenance performed on the aircraft to ensure that all required maintenance is complete.
- The phase team NCOIC notifies QC that the aircraft is ready for final inspection; the phase team NCOIC provides forms and records for this inspection:
    - This inspection, in addition to the recorded in-progress inspections, ensures quality maintenance and an airworthy aircraft.
    - This inspection also serves to verify that inspection plates and panels have been correctly reinstalled and that the aircraft has been properly serviced and cleaned.
- QC personnel also check forms and records in the aircraft's equipment log assembly (records) to ensure that all entries are neat, correct, and up-to-date.

After-the-Final Inspection

6-79. QC and maintenance personnel will, after the final inspection is complete, conduct the following procedures:

- The TI signs or initials and enters the Julian date in block 26 of DA Form 2407 after the final inspection is complete; his signature or initials indicate that he has inspected the aircraft and verified that all services and repairs have been done.
- If the maintenance or repairs requested are recorded in the faults or remarks block of DA Form 2408-13-1 as an X grounding condition, the technical inspector must sign in the correcting information block.
- The TI determines whether a test flight or an MOC is required according to TM 1-1500-328-23 or appropriate aircraft manuals; if an MTF or MOC is required, PC is notified.
- Maintenance personnel remove the basic issue item list gear and loose equipment required for test-flight purposes from the loose equipment storage area and reinstall it in the aircraft.

- Maintenance personnel will annotate in the aircraft logbook if an MOC is required.
- If the unit is assigned the ULLS–A, authorized maintenance personnel will make appropriate entries.

Posttest Flight Inspection

6-80. The maintenance test pilot, QC, PC, and maintenance personnel will, after the posttest flight inspection is complete, conduct the following procedures:

- If a test flight is performed, the maintenance test pilot will perform a posttest flight inspection of the aircraft.
- If maintenance test pilots do not release the aircraft for flight, they make the required entry on DA Form 2408-13-1.
- Maintenance personnel again prepare the aircraft for a test flight.
- Maintenance personnel place all equipment belonging to the aircraft in the aircraft after the test flight, and then the aircraft is released.
- QC personnel return the completed paperwork, forms, and records to the PC shop.
- PC personnel notify the owning unit that the aircraft is ready for delivery.

Release of Aircraft

6-81. PC, QC, and maintenance personnel will, after releasing the aircraft, conduct the following procedures:

- QC personnel or the crew chief and the supported activity's representative perform a joint DA Form 2408-17 inventory.
- The PC clerk enters, in column H of the hardcopy DA Form 2405, the Julian date when aircraft maintenance was completed.
- The supported company's representative completes block 27 of the hardcopy DA Form 2407, signifying acceptance and delivery of the aircraft.
- If the unit is assigned the ULLS–A, authorized maintenance personnel will make appropriate entries.

MANAGING AIRCRAFT SCHEDULING FLOW

MANAGING BLOCK TIME SCHEDULING METHOD (FLOW CHART)

6-82. The benefits of the block scheduling system include the following:

- Flight companies have flexibility in selecting aircraft for missions during the operation.
- Flight companies can match the aircraft to the mission.
- It spreads the responsibility of aircraft assignments and staggers the aircraft on a flowchart.
- The maintenance officer can plan his workload instead of having to react to everyday changes in missions and unscheduled maintenance.
- The flowchart posture should still be at an optimum level after the mission/operation.

6-83. Block scheduling provides flight companies with flight-hour blocks computed from the battalion average. The overall battalion flow chart is maintained in the AMC by PC. For this system to be successful, battalion commanders must reinforce their maintenance officers' guidance and ensure that flight companies do not over fly their given block times. To determine how many hours that each aircraft will be allowed to fly during a given period, the maintenance officer uses the following formula:

- **Step 1:** Find the average hours per aircraft by dividing the total number of hours to be flown by the number of aircraft to be flown (for example, 180 hours to be flown, divided by 9 aircraft, equals 20 average hours per aircraft).
- **Step 2:** Plot the average hours per aircraft on the flowchart below the highest-time flyable aircraft; then draw a line parallel to the optimum bank-time line.

- **Step 3:** Compute the difference between each aircraft's current position on the flowchart and the new parallel line; these figures are the maximum amount of flight hours that the particular aircraft can fly during the mission (for example, aircraft 955 is 26 hours above the lower optimum line; therefore, it will be given a block time of 26 hours to fly).

6-84. The company flight schedule allows the maximum hours required to support the mission. The platoon sergeant or maintenance officer assigns aircraft aligned with the anticipated flight schedule requirements. Aircraft are assigned to flight crews with a minimum and maximum flight-hour requirement that must be flown to establish and maintain the flow of aircraft into scheduled maintenance events or to provide aircraft separation as required. When planning scheduled maintenance events, the assigned flight crews should fly the anticipated scheduled times. Under flying is, at times, as harmful to the flow of scheduled maintenance as over flying the aircraft.

MANAGING SLIDING SCALE SCHEDULING METHOD (FLOWCHART)

6-85. The maintenance manager should observe the following rules when he uses the sliding scale maintenance scheduling method (flowchart):

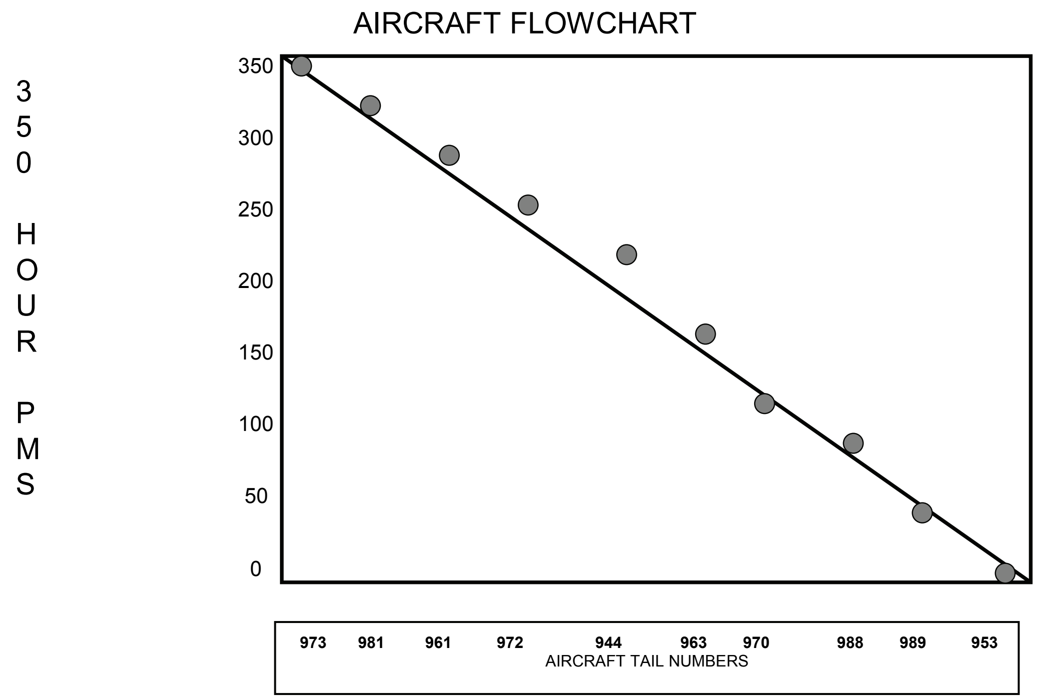
- Update the chart at least once each day that aircraft fly (if using ULLS-A, ensure that aircraft data are sent to PC daily).
- Fly aircraft that are above the optimum line to attempt to get them down to the line.
- Hold (do not fly) aircraft that are below the optimum line to attempt to bring them up to the line, or fly the minimum number of hours.
- Count aircraft that are in phase inspection zero towards actual bank time.
- Count aircraft that are grounded for any reason (other than phase) towards actual bank time.

Note. Remember that total actual bank time is only a relative indicator of the maintenance scheduling process.

6-86. Phase/periodic inspection planning is a critical part of mission readiness for aviation units. Aviation commanders/PC must ensure that aircraft phases are planned well into the future. Although many factors influence the best time for accomplishing aircraft phases, training exercises and deployments can have a major effect on the unit's bank time.

6-87. Flying more than one aircraft into phase at one time can severely affect and reduce the unit's operational readiness. To alleviate crisis management, the unit's flying-hour program, deployments, training, bank time, and the availability of resources (such as tools, maintenance personnel, repair parts, and special equipment) must be carefully considered when maintenance personnel are planning phases.

6-88. The aircraft flowchart is an important tool for scheduling aircraft for phase and for deciding which aircraft should fly certain missions. Figure 6-6 shows an example of a typical flowchart for a typical assault unit. The diagonal line represents the optimum bank time, or time until phase, for each individual aircraft. This flowchart demonstrates a unit with good total actual bank time (above optimum) and good separation between phases.



Optimum Bank Time = Number of ACFT X Phase Interval X ½ = 1750
Total Actual Bank Time = Total of all ACFT Hours Till Phase = 1840

Figure 6-6. Flowchart with good bank time

6-89. If every aircraft were exactly on the optimum line, this would represent the ideal bank time, or 1,750 flying hours, available. The optimum bank time could be expressed in terms of percentage available; for example, 50 percent bank time. Obviously, this is unrealistic because some aircraft will be above the line and some will be below the line. Therefore, the only way to obtain the actual bank time is to add the total flying hours remaining on all aircraft until the next phase/periodic inspection.

6-90. Thus, total actual bank time is only a relative indicator of how well the maintenance scheduling process is working compared to the ideal, or optimum, bank-time formula. Under heavy flying conditions (surge), bank-time available will obviously be lower than desired. In preparation for a surge, it is possible to push aircraft into phase earlier than under a normal flying regimen to increase the overall bank time available to the commander.

6-91. Figure 6-7 shows a flowchart of a unit with less than the optimum bank time. This unit has one aircraft (953) in phase and three aircraft within 25 hours of phase (970, 988, and 989). This unit has aircraft "stacked up" and awaiting phase. Although this unit may be posting good operational readiness rates on its end-of-month report, the unit is not able to schedule certain aircraft for missions because of low hours on nearly half of its fleet. Because of the low availability of aircraft hours, the unit's effectiveness to perform tactical/training missions is reduced.

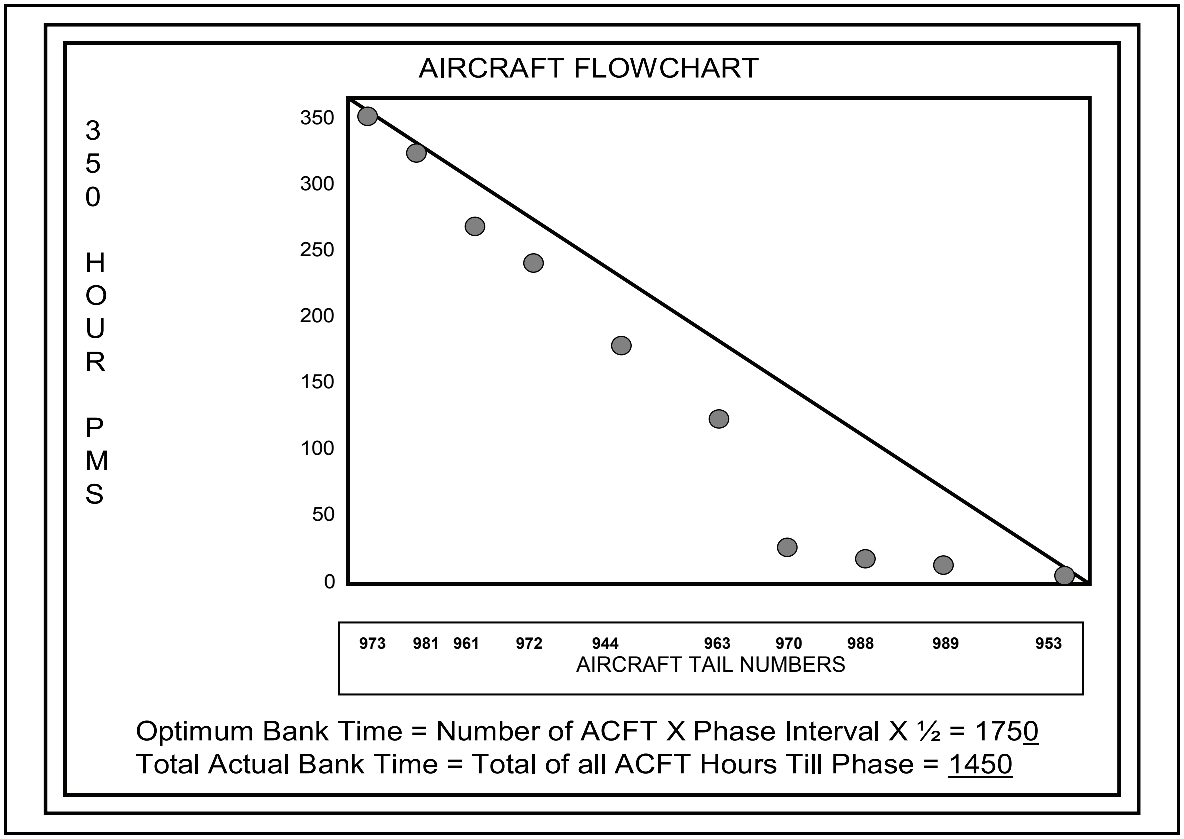


Figure 6-7. Bank time less than optimum

6-92. The flowchart is a simple, but effective, method that maintenance officers use. ULLS-A (Figure 6-8) provides a flowchart outlining bank time to assist maintenance managers in scheduling maintenance. Using the flowchart—

- Prevents an unnecessary backlog of scheduled maintenance inspections under normal conditions.
- Prevents a corresponding sudden surge in requirements for aircraft parts.
- Allows the unit maintenance officer a degree of control over individual aircraft hours flown.
- Provides a graphic depiction of future scheduled maintenance requirements.

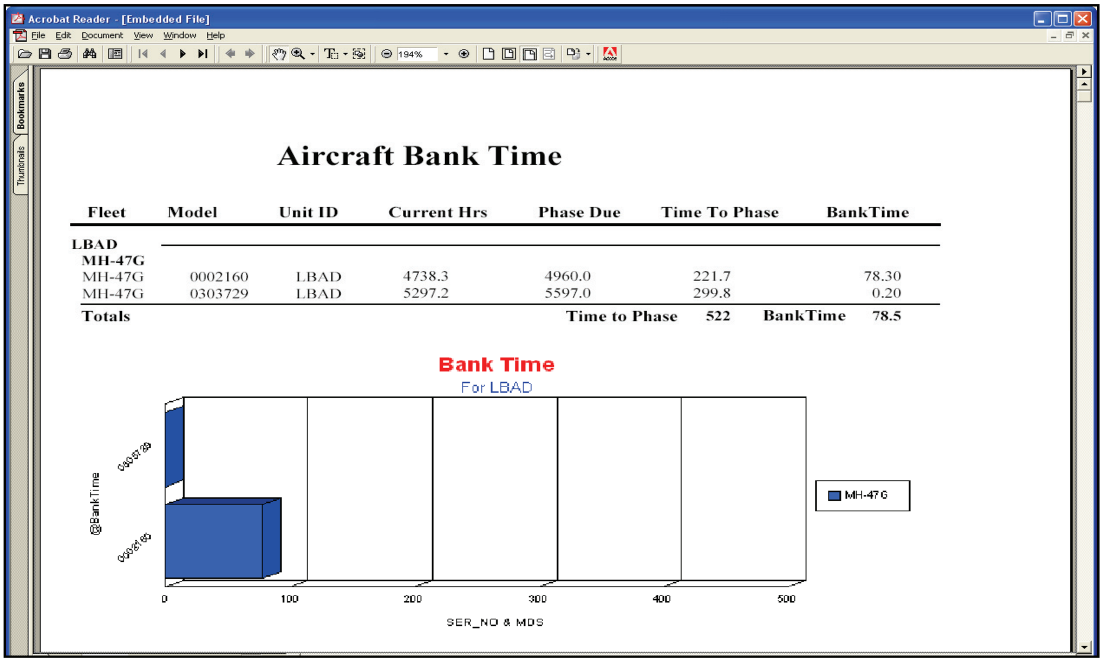


Figure 6-8. Aircraft bank time chart screen

MANAGING TIME-INTENSIVE SCHEDULED MAINTENANCE

6-93. Although the preceding management techniques are specifically oriented and tailored for the flow of phase/periodic maintenance, these management techniques can also be used to schedule flow and prepare for all recurring time-intensive maintenance activities. These time-intensive maintenance activities should not necessarily be expressed in terms of bank-time percentages, but the management of these intensive maintenance events is basically the same as phase bank time and flow.

6-94. In addition, the management of intensive scheduled maintenance may also be based on personnel limitations within a given unit. For example, the AMC TOE lists three 15B engine aviation repairers with only one 15B engine aviation repairer assigned and no inbound 15B. Because of engine aviation repairer shortages within the unit, engine services must, therefore, be carefully managed, essentially becoming a time-intensive maintenance event.

ARMY MAINTENANCE REGENERATION ENABLERS

6-95. According to AR 750-1, the authorized Army maintenance regeneration enablers are the following:

- Ready to fight (RTF).
- Operational readiness float (ORF).

RTF

6-96. RTF is a strategic asset deployed to the operational level in a combat theater consisting of an authorized quantity of assets that provide rapid weapon system replacement. These assets are maintained by USAMC activities with a sustainment maintenance mission to exchange aircraft with supported units when repairs cannot be accomplished. AR 750-1, Chapter 8, outlines RTF criteria.

6-97. RTF aircraft and subsystems may belong to an existing operational unit. At the discretion of the HQDA, Assistant Chief of Staff (Operations and Plans) (G3), that operational unit can be identified as a donor unit. Donor units will transfer combat-ready equipment and associated subsystems to a designated unit. RTF will be issued complete (with all authorized associated support items of equipment [ASIOE]/BII), less crew and Class 5. RTF assets will be—

- Maintained according to AR 750-1.
- Reported according to AR 700-138.
- Maintained as a fleet at centralized locations during peacetime.
- Maintained by the USAMC-designated support element at a training center/site or theater of operations during contingency missions, combat operations, wartime, and operations other than war.

ORF

6-98. ORF is a strategic asset deployed to an installation consisting of an authorized quantity of assets used to maintain established readiness levels or meet training availability requirements during peacetime. These assets are maintained by TDA and MTOE maintenance activities with a field or sustainment maintenance mission to exchange with supported units when repairs cannot be accomplished within Army command-established guidelines. ORF assets awaiting issue will be maintained at the Army maintenance standard defined in AR 750-1.

ORF Utilization

6-99. During peacetime, ORF assists in maintaining the readiness and operational posture of units. ORF assets will not be used to—

- Provide a source of repair parts (controlled exchange or cannibalization).
- Expand currently assigned missions or set up new operational missions.
- Replace items that have been cannibalized during peacetime.
- Satisfy temporary loan requirements.
- Set up a peacetime pool of equipment to be held as assets to reconstitute the force.
- Fill unit equipment shortages.
- Replace uneconomically reparable equipment.
- Augment war assets by deploying units.

6-100. During transition to war—

- Army commands will use ORF to enhance equipment readiness and may fill deploying unit shortages when coordinated with Office of the Deputy Chief of Staff (ODCS), G3; any remaining ORF will be reported to ODCS, G3, for redistribution guidance.
- Army commands deploying units to support peacekeeping, humanitarian aid, or disaster-relief efforts may coordinate with USAMC for ORF support; in these cases, Army commands may transfer ORF assets to USAMC, which will maintain and issue ORF assets in the area of operations.
- ORF assets will be issued only when the PD on the work order is 01 through 06 and the estimated repair time exceeds the Army command-established time criteria.
- All ORF exchange decisions will be approved by commanders in the grades of lieutenant colonel or above, after coordination with G3/S3 channels of the next higher command level, or the S3/G3 staff on behalf of the commander of the rank of colonel or above.
- Supported units will accept the ORF item as long as it is a like item or an authorized substitute according to SB 700-20 and it meets the Army maintenance standard according to AR 750-1.
- The exchange of an unserviceable reparable end item for an ORF asset will be accomplished as simultaneous (turn-in and issue) property book transactions; BII and COEI common to the end items will not be exchanged.
- Each time that a decision is made to float (whether assets are available or not), a demand for ORF will be recorded in SAMS with the appropriate code; a cumulative total of demands and downtime will be maintained to support the annual utilization report. The annual utilization report will be sent to the Army command ORF coordinator for input into LIDB for review by HQDA. HQDA will review each ORF item annually for retention of the authorization; repeated

low-demand data will be cause for removal from ORF authorization unless retention can be justified by the requesting Army command.

- Field-level units with ORF will submit a separate monthly readiness report using utilization code 4 according to AR 700-138.

6-101. Upon the outbreak of war, Army commands will use ORF to enhance equipment readiness and may fill shortages when coordinated with ODCS, G3; any remaining ORF will be reported to ODCS, G3 for redistribution guidance; deployed Army commands will transfer all remaining ORF assets to the USAMC-designated support element at the earliest opportunity.

Note. Refer to Chapter 8 for more ORF information.

Float ORF Account Changes

6-102. Army command ORF/RCF requests for additions, changes, or deletions to maintenance float support requirements are approved/disapproved by HQDA, DCS, G4, through the USAMC LOGSA LIDB ORF/repair cycle float (RCF) Online Program. AR 750-1, Chapter 8, provides formulas to compute the authorization level of float ORF.

SECTION IV – ULLS–A PRODUCTION CONTROL FUNCTIONS

Note. If the server is down for any reason, production control will process all maintenance-related functions manually. Once connectivity is restored, all manual entries will be uploaded into ULLS-A.

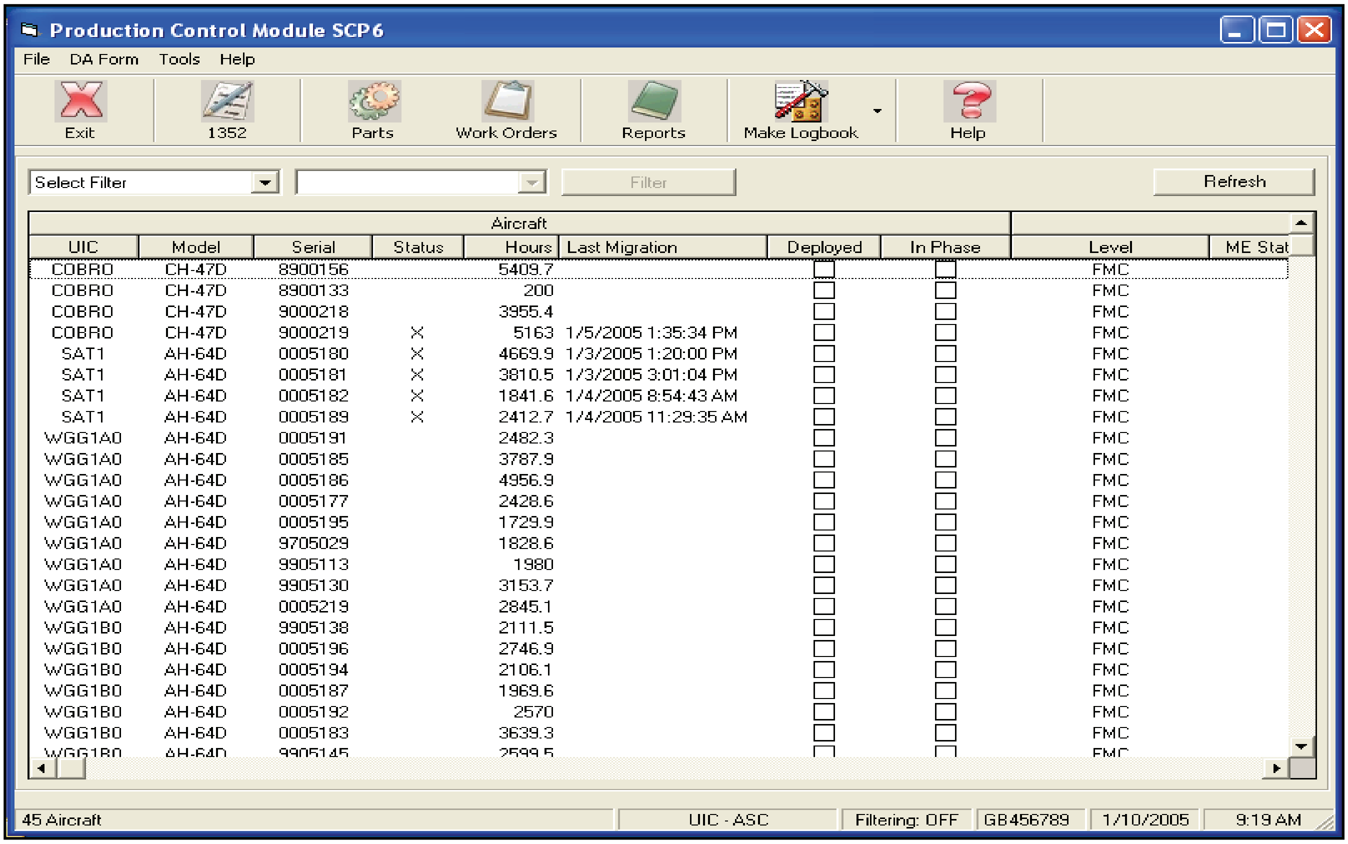
6-103. Production control, with the assistance of quality control personnel, commissions and decommissions the deployed server. The ULLS-A deployed server allows the unit the flexibility to "push" aircraft away from the primary database to support area operations. The deployed server enables maintenance personnel, to include TIs, to migrate maintenance-related data back to production control for flight hours and readiness reporting purposes.

6-104. When conducting split-based operations, the deployed server function provides a unit with the capability to deploy aircraft to support operations away from the unit's primary database. The deployed server allows maintenance managers access to management functions, except program administrator functions, while tracking maintenance actions.

6-105. The PC functions for the ULLS–A software are innovative and assist the PC user with various tools to enhance the following:

- Tracking aircraft status, reporting, and flying hours according to AR 700-138.
- Maintaining a work-order log.
- Initializing and processing work-order requests.
- Facilitating aircraft transfers.
- Initiating and tracking parts requisitions.
- Monitoring overall maintenance operations and generating required reports.

Note. Refer to Figure 6-9 to see how to access different functionalities (see previous paragraph) unique to PC. For access to the different functionalities assigned to this module, click on the corresponding icon.



UIC	Model	Serial	Status	Hours	Last Migration	Deployed	In Phase	Level	ME Stat
COBRO	CH-47D	8900156		5409.7		☐	☐	FMC	
COBRO	CH-47D	8900133		200		☐	☐	FMC	
COBRO	CH-47D	9000218		3955.4		☐	☐	FMC	
COBRO	CH-47D	9000219	X	5163	1/5/2005 1:35:34 PM	☐	☐	FMC	
SAT1	AH-64D	0005180	X	4669.9	1/3/2005 1:20:00 PM	☐	☐	FMC	
SAT1	AH-64D	0005181	X	3810.5	1/3/2005 3:01:04 PM	☐	☐	FMC	
SAT1	AH-64D	0005182	X	1841.6	1/4/2005 8:54:43 AM	☐	☐	FMC	
SAT1	AH-64D	0005189	X	2412.7	1/4/2005 11:29:35 AM	☐	☐	FMC	
WGG1A0	AH-64D	0005191		2482.3		☐	☐	FMC	
WGG1A0	AH-64D	0005185		3787.9		☐	☐	FMC	
WGG1A0	AH-64D	0005186		4956.9		☐	☐	FMC	
WGG1A0	AH-64D	0005177		2428.6		☐	☐	FMC	
WGG1A0	AH-64D	0005195		1729.9		☐	☐	FMC	
WGG1A0	AH-64D	9705029		1828.6		☐	☐	FMC	
WGG1A0	AH-64D	9905113		1980		☐	☐	FMC	
WGG1A0	AH-64D	9905130		3153.7		☐	☐	FMC	
WGG1A0	AH-64D	0005219		2845.1		☐	☐	FMC	
WGG1B0	AH-64D	9905138		2111.5		☐	☐	FMC	
WGG1B0	AH-64D	0005196		2746.9		☐	☐	FMC	
WGG1B0	AH-64D	0005194		2106.1		☐	☐	FMC	
WGG1B0	AH-64D	0005187		1969.6		☐	☐	FMC	
WGG1B0	AH-64D	0005192		2570		☐	☐	FMC	
WGG1B0	AH-64D	0005183		3639.3		☐	☐	FMC	
WGG1B0	AH-64D	9905145		2599.5		☐	☐	FMC	

Figure 6-9. Production Control Module ULLS-A screen

ULLS–A DA FORM 1352-1 (DAILY AIRCRAFT STATUS RECORD)

6-106. The DA Form 1352-1 (Daily Status Report) (see Figure 6-10) provides an accurate reporting of aircraft inventories, maintenance status, and flying time. The 1352-1 daily screen will be displayed, providing access to the authorized user for making desired individual entries onto the form.

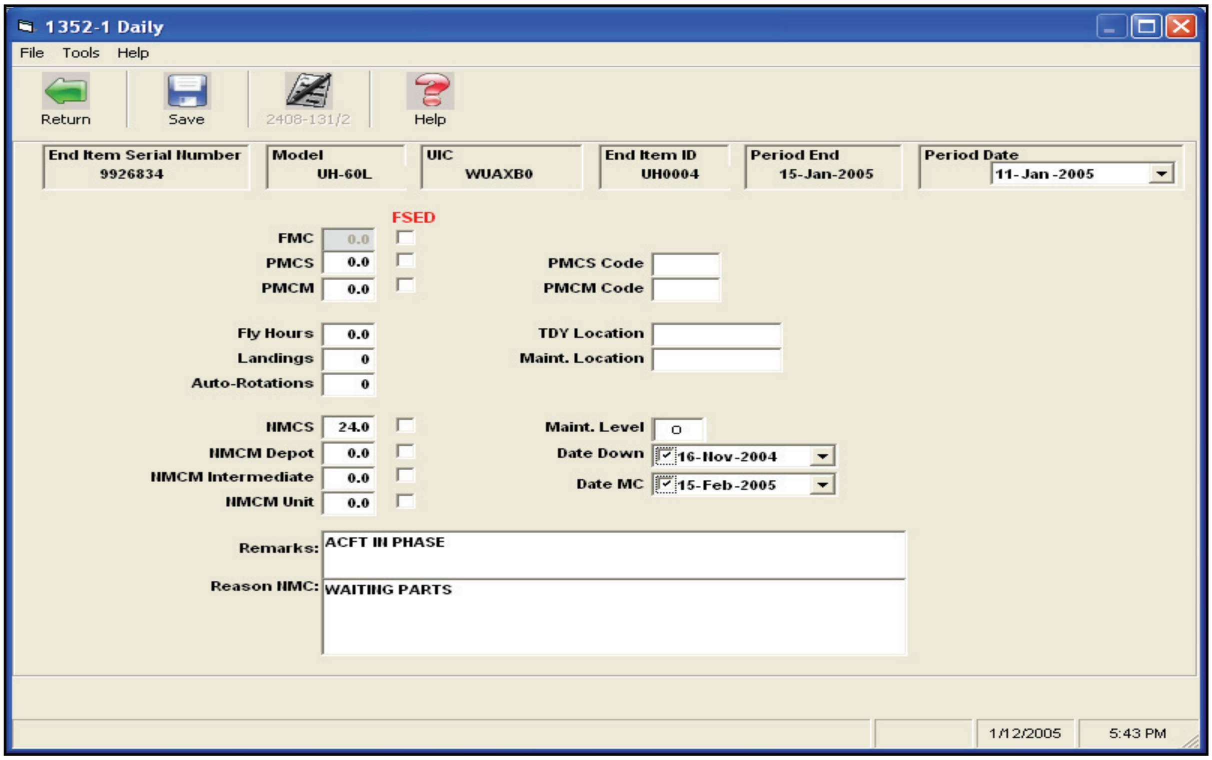


Figure 6-10. DA Form 1352-1 (Daily Aircraft Status Record) screen

6-107. The following DA Form 1352 back-side comments, blocks A–M data-entry options, are available to production control personnel. Enter remarks/comments as deemed appropriate (see Figure 6-11):

- FMC is 5% or More Below Goal.
- NMCS Exceeds Goal.
- NMCM Exceeds Goal.
- PMC Exceeds 5%.
- AC Involved In Depot Maintenance.

6-108. The following DA Form 1352 additional data-entry options are available to production control personnel on the back side of the form:

- Commander’s overall assessment.
- Comments by item of equipment.
- Comments: MOS or skill-level shortage.
- Comments: TMDE and AGSE/PGSE.
- Comments: maintenance facilities.
- Comments: maintenance workload.
- Comments: automated logistics systems.
- Comments: transportation or order ship times (OSTs).
- Comments: OPTEMPO.

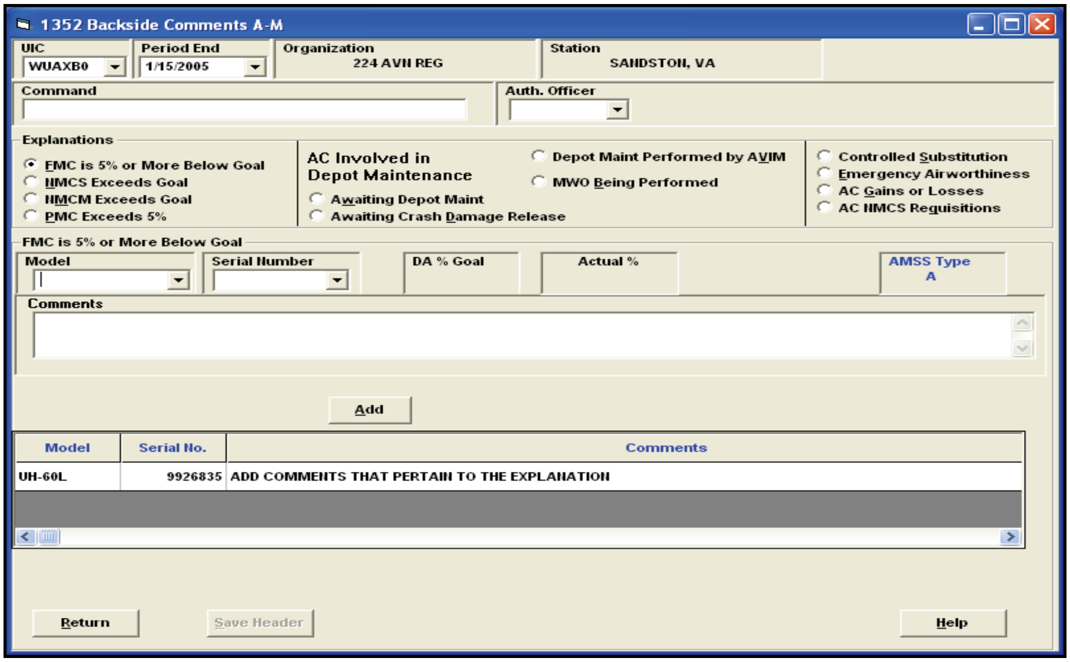


Figure 6-11. DA Form 1352 (back-side comments A–M) screen

ULLS–A DA FORM 1352 (ARMY AIRCRAFT INVENTORY STATUS AND FLYING TIME)

6-109. DA Form 1352 (Army Aircraft Inventory Status and Flying Time) (see Figure 6-12) provides PC personnel with an updated account of the following:

- Total aircraft hours flown.
- Total fully mission capable time.
- Partial mission capable supply time.
- Partial mission capable maintenance time.
- Total not mission capable supply.
- Total depot maintenance time.
- Total field-level maintenance (ASC) time.
- Total AMC time.
- Daily aircraft hours flown.
- Total number of landings.
- Total number of autorotations.

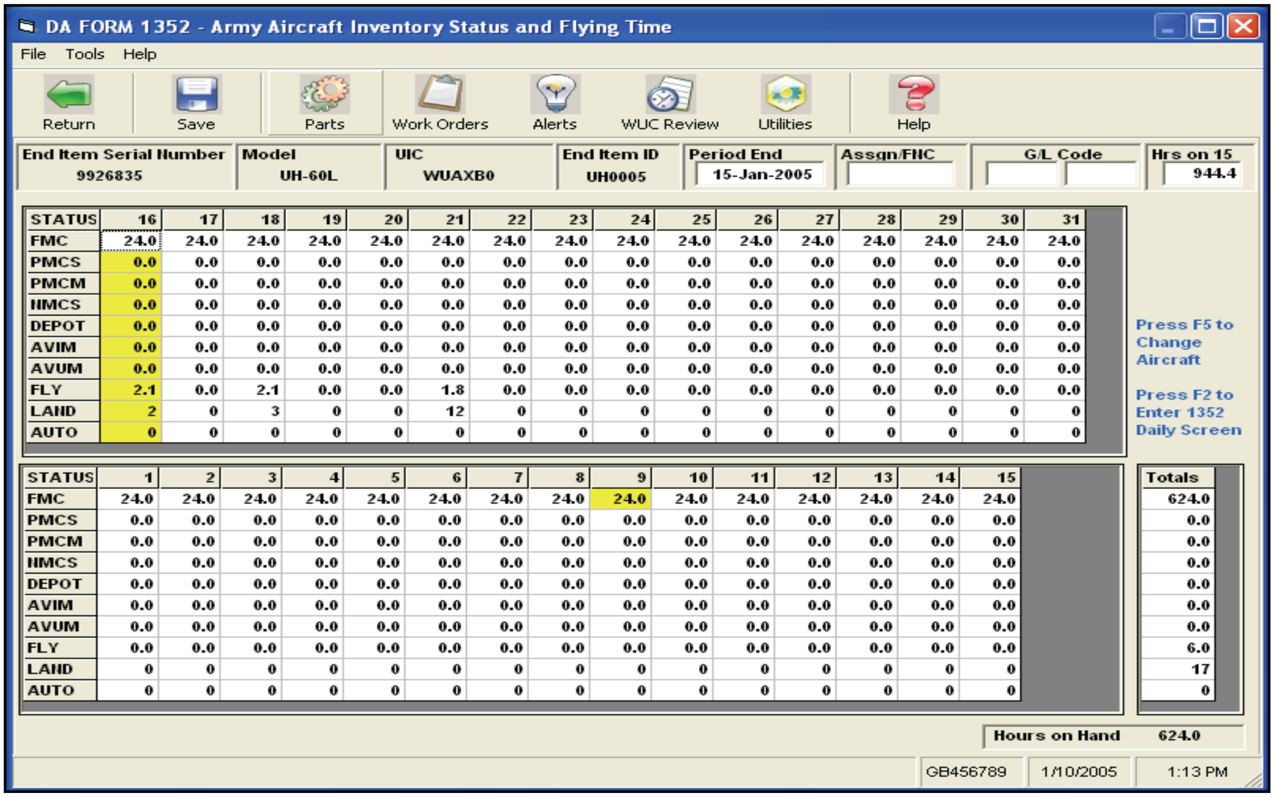
6-110. Other than the authorized PC user, only authorized QC users will be able to view and print the DA Form 1352. Only authorized PC users will be able to enter, modify, and save DA Form 1352 data.

6-111. When the "Parts" button on the DA Form 1352 menu screen (see Figure 6-12) is used, the authorized user can access the following screens:

- Pending parts requisitions.
- Parts currently on order.
- Creating parts requests.
- Updating requests (this will pull the document numbers to the parts screen from technical supply).

6-112. Once the "Parts" button is clicked, the "Parts view" screen will appear. The "Parts view" screen provides the PC authorized user with the following options:

- Accept/reject parts requested.
- View pending parts request.
- Create parts request.
- View DA Form 2408-13-1/2.
- View DA Form 2407.



End Item Serial Number	Model	UIC	End Item ID	Period End	Assgn/FNC	G/L Code	Hrs on 15
9926835	UH-60L	WUAXB0	UH0005	15-Jan-2005			944.4

STATUS	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
FMC	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
PMCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PMCM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NMCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEPOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVIM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLY	2.1	0.0	2.1	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LAND	2	0	3	0	0	12	0	0	0	0	0	0	0	0	0	0
AUTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATUS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Totals
FMC	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	624.0
PMCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PMCM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NMCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEPOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVIM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
LAND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
AUTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Hours on Hand 624.0

Figure 6-12. DA Form 1352 (Army Aircraft Inventory Status and Flying Time) screen

6-113. The DA Form 1352 can be accessed through the "Utilities" menu (see Figure 6-13). This menu provides the following options and printing capabilities:

- Daily status report.
- Hoist status report.
- DA Form 1352 front-side report.
- Feeder report.

6-114. From this location, the user has access to the following data entry options of the 1352 back-side comments blocks A-M; enter remarks/comments as deemed appropriate:

- FMC is 5% or More Below Goal.
- NMCS Exceeds Goal.
- NMCM Exceeds Goal.
- PMC Exceeds 5%.
- AC Involved In Depot Maintenance.

6-115. From the same location, the user has also access to the following data-entry options on the back side of the 1352, blocks N-1. Enter remarks/comments on the back side of the 1352 as deemed appropriate:

- Commander's overall assessment.

- Comments by Item of Equipment.
- Comments: MOS or Skill Level Shortage.
- Comments: TMDE.
- Comments: Maintenance Facilities.
- Comments: Maintenance Workload.
- Comments: Automated Logistics System(s).
- Comments: Transportation or Order Ship Times (OST).
- Comments: OPTEMPO.

6-116. From the same location, the user, after migrations are complete, will press the “update flight hours” button. Once pressed, all flight hours previously entered on DA Form 2408-12 will transfer, updating the 1352-1 and flight-hour reports.

Note. Refer to Figure 6-13 for information on how to access both DA Form 1352 and DA Form 1352-1.

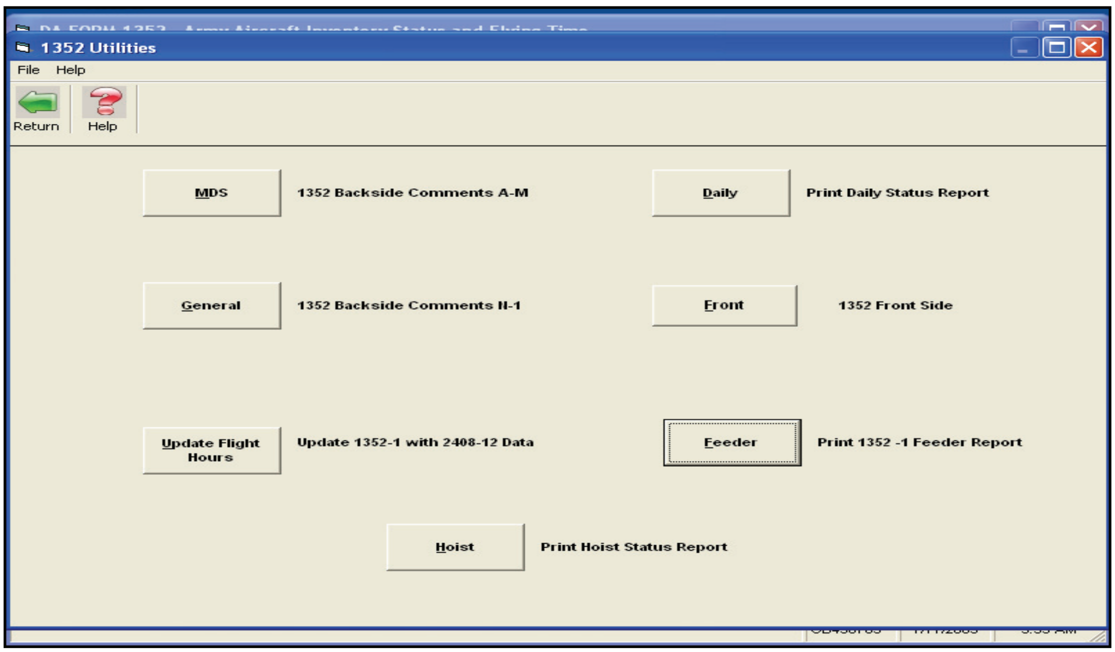


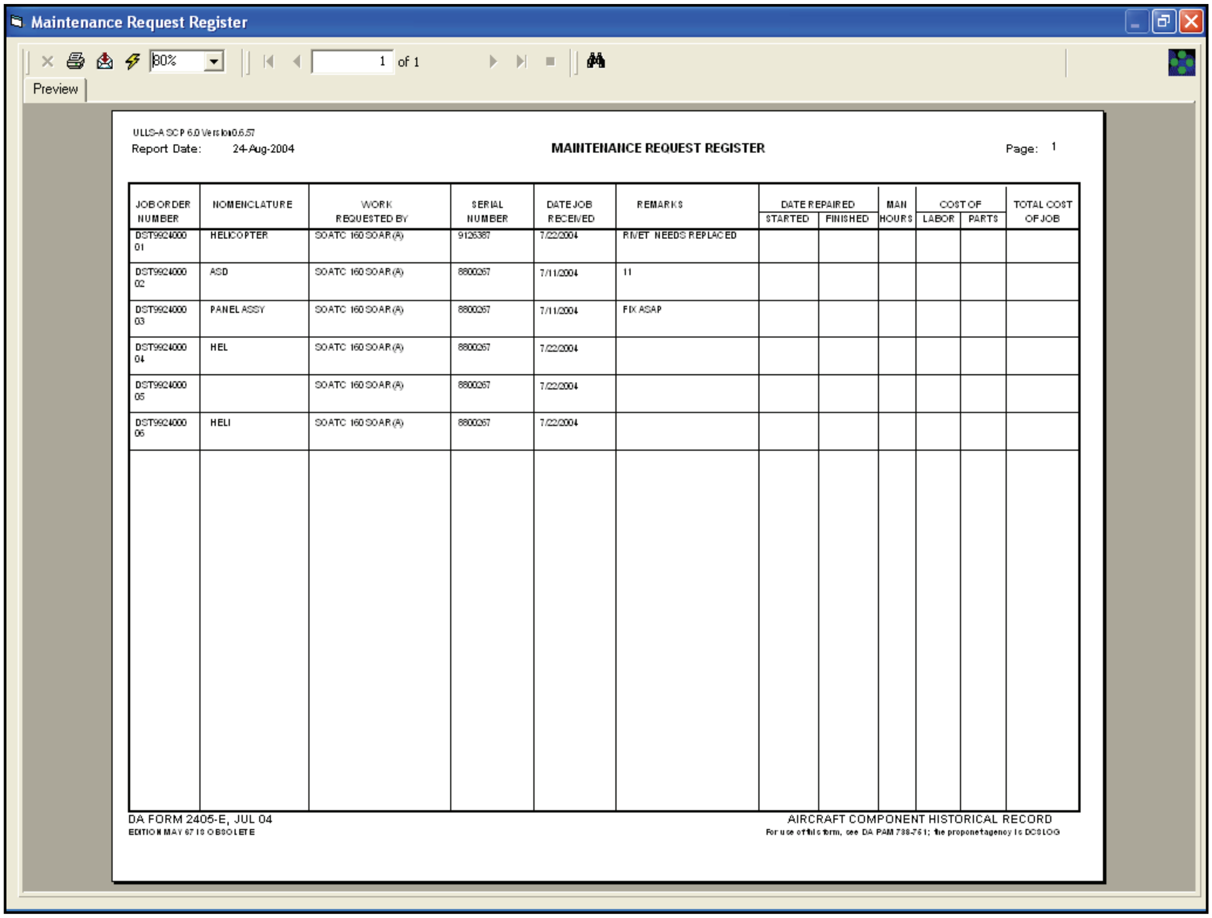
Figure 6-13. Utilities menu

6-117. The PC officer/NCOIC should monitor and review the DA Form 2405-E for high-priority work orders daily and for all other priorities at least weekly (Figure 6-14). As the latest ULLS-A version is fielded, the PC officer/NCOIC will be required to confirm aircraft status and parts requirements whenever aircraft go down. The PC officer must prioritize the workflow against the backlog of each shop to prevent an excess number of work orders.

6-118. Each shop NCOIC should be able to brief the backlog on a daily basis and further explain reasons for delay to the commander and PC officer/NCOIC. Reasons for delay will normally include back order of repair parts or lack of personnel. Excessive deferred maintenance is detrimental to overall aircraft deployability and the battalion’s combat power.

6-119. The overall condition of each airframe is affected by the total number of open work-order requests. The number of open work orders must be minimized. Deferred maintenance is not completed maintenance; both the PC office and the flight platoons/companies must push for the completion of open and active work-order requests. The PC officer/NCOIC, however, is responsible for managing and following up on the backlog of active work orders.

6-120. In addition to monitoring deferred maintenance work orders, the PC officer should evaluate the open fault status for each aircraft for excessive deferred maintenance. The trending of deferred maintenance should be tracked for fault on the logbook at less than 30 days, more than 30 days, and more than 60 days. Faults that have been deferred for more than 30 days should receive command emphasis to determine the validity of the delay.



ULLS-A SCP 6.0 Version0.6.57

Report Date: 24-Aug-2004

MAINTENANCE REQUEST REGISTER

Page: 1

JOB ORDER NUMBER	NOMENCLATURE	WORK REQUESTED BY	SERIAL NUMBER	DATE JOB RECEIVED	REMARKS	DATE REPAIRED		MAN HOURS	COST OF		TOTAL COST OF JOB
						STARTED	FINISHED		LABOR	PARTS	
DST9924000 01	HELICOPTER	SOATC 160 SOAR (A)	9126387	7/22/2004	RIVET NEEDS REPLACED						
DST9924000 02	ASD	SOATC 160 SOAR (A)	8800267	7/11/2004	11						
DST9924000 03	PANEL ASSY	SOATC 160 SOAR (A)	8800267	7/11/2004	FIX ASAP						
DST9924000 04	HEL	SOATC 160 SOAR (A)	8800267	7/22/2004							
DST9924000 05		SOATC 160 SOAR (A)	8800267	7/22/2004							
DST9924000 06	HELI	SOATC 160 SOAR (A)	8800267	7/22/2004							

DA FORM 2405-E, JUL 04
EDITION MAY 67 IS OBSOLETE

AIRCRAFT COMPONENT HISTORICAL RECORD
For use of this form, see DA PAM 738-751; the proponent agency is DCSLOG

Figure 6-14. Maintenance Request Register screen

ULLS–A DA FORM 2407

6-121. Authorized users have three options to access the Work Order menu: from the production control menu, at the initial start screen, or in the back-shops log-in screen. From any of the three options, authorized users can select the work order button to enter the DA Form 2407 work order main page (Figure 6-15).

6-122. From the DA Form 2407 work order main page, the user can choose from the following options:

- DA Form 2407 – this option enables the user to view the current highlighted DA Form 2407.
- DA Form 2408-13 1/2 – this option will bring the user to the current write-up on the DA Form 2407.
- New DA Form 2407 – this option enables the user to create a new DA Form 2407.
- Reports – this option enables the user to view, print, or electronically transfer the following reports:
    - Accepted work orders.
    - Work orders by shop.

- Work orders by age.
- Rejected work orders.
- Pending work orders.
- Work orders by status.

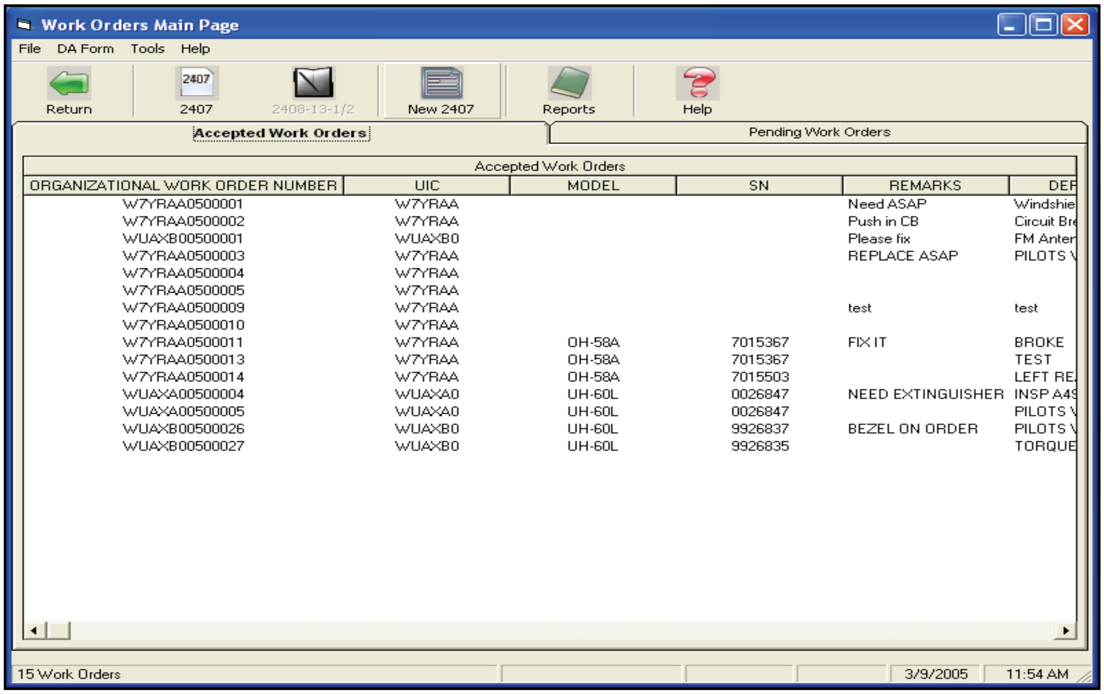


Figure 6-15. Work Orders Main Page screen

MONITORING STATUSES OF NMCS DOCUMENT NUMBERS

6-123. In the absence of the battalion AMO, the PC officer/NCOIC monitors the daily status of Class 9 (Air) repair parts that either affect the status of a work order or the overall mission readiness of an aircraft. Aviation logistics/technical supply reports the status of all AOG and NMCS parts requests during the daily PC meeting. Any changes in the status of these repair parts are briefed as soon as possible to the PC officer/NCOIC so that this information may be passed vertically and horizontally.

6-124. In the absence of the battalion AMO, the PC officer tracks the weekly expenditures—bench stock and unscheduled repair part requests and turn-in credit—to track the unit's overall financial fitness. The brigade aviation materiel officer must be notified if prolonged maintenance downtime results from the lack of AOG and high-priority repair parts requests.

6-125. The SOS item manager is the source for tracking information on a given high PD and/or AOG aircraft repair part request. He focuses on processing high-priority parts/AOG requests and release and shipment of critical repair parts. Through the ULLS-A, PC personnel can track such information as high PD and financial transactions and open the document register (see Figure 6-16).

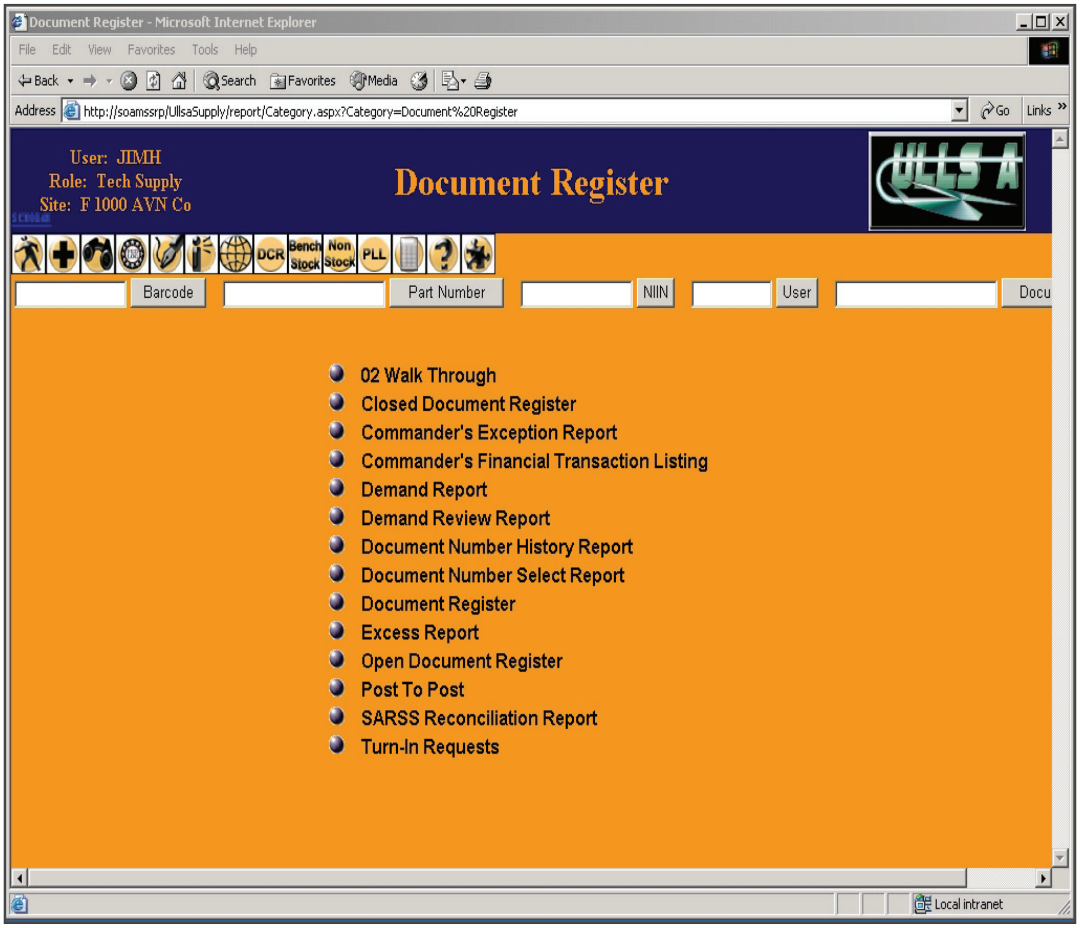


Figure 6-16. Document Register screen

6-126. The PC officer/NCOIC walks the floor/flight line several times a day to interact with the responsible maintenance test pilots, NCOs, and maintainers assigned to the battalion. This interaction allows periodic face-to-face coordination with the responsible parties and alleviates stress and frustration immediately by directing and redirecting ongoing maintenance activities.

ULLS–A AIRCRAFT TRANSFERS

6-127. When aircraft transfers are directed from the Army command, the standards of serviceability will apply according to TM 1-1500-328-23. A transfer is defined as a change of property accountability from one organization to another. The cost of transfer inspections and maintenance will be borne by the transferring activity.

6-128. Historical forms and records provide commanders and maintenance managers with information on aircraft transfers (gains/losses). These records must be controlled and kept safe from loss or damage.

6-129. The aircraft transfer option can be accessed from the main menu. Once the aircraft transfer option has been accessed, the user can transfer aircraft in two ways: transfer aircraft and transfer unit. With the *transfer aircraft* option, any single aircraft can be transferred. With the *transfer unit* option, an entire UIC can be transferred.

Note. Before any type of aircraft transfer, the DA Form 1352 must be completed with a gain/loss code and the gain/loss comments on the back side (Figure 6-17).

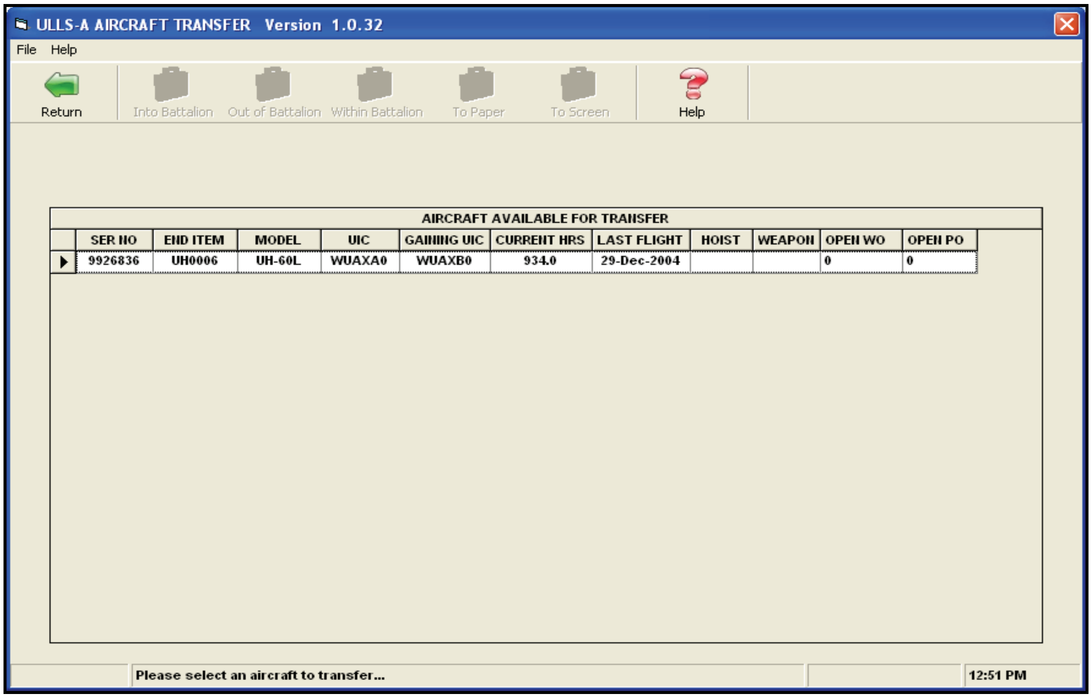


Figure 6-17. "ULLS-A AIRCRAFT TRANSFER" screen

Chapter 7

Quality Control Management and Operations

This chapter provides QC personnel with a "**how-to**" for identifying and reviewing standards of repair, overhaul, modification, safety of flight, and other required maintenance functions. This chapter also provides quality control personnel with an overview of quality control management operations procedures. Technical inspections are the commander's system of checks and balances. These inspections ensure high-quality maintenance and safety of Army aircraft. Meticulous quality control procedures for assigned aircraft decrease unscheduled maintenance, which can disrupt mission requirements and reduce combat readiness. Quality assurance lessens the possibility of maintenance error or inadequate aircraft inspections, which can lead to aircraft damage, personal injury, or death. QC sections are also responsible for safety in maintenance and shop areas.

SECTION I – QUALITY CONTROL PERSONNEL DUTIES AND RESPONSIBILITIES

Contents

QUALITY CONTROL OFFICER

7-1. The QC officer is selected, on orders, by the AMC or ASC commander based on skills, qualifications, and experience. Preferably, the QC officer will be a graduate of the aviation maintenance manager/maintenance test pilot course. He is responsible for the internal management of the QC section, to include quality assurance of all work performed by technical inspectors. The QC officer will coordinate the priority of work with the unit's production control officer/QC NCOIC.

QUALITY CONTROL NCOIC

7-2. The QC NCOIC is selected, on orders, by the AMC or ASC commander based on skills, qualifications, and experience. Generally, he will be one of the senior maintenance NCOs assigned to the unit. Preferably, the QC NCOIC will be a graduate of ANCOC. He is directly responsible for the operational management of the quality control section. He coordinates and establishes the priority of work with the QC OIC. In the absence of the OIC, the NCOIC will establish the priority of work in support of the unit's maintenance effort. The NCOIC distributes the work and supervises the technical inspectors for quality assurance of work assigned. The QC NCOIC coordinates the effort of the QC section.

QUALITY CONTROL TECHNICAL INSPECTORS

7-3. TIs are selected, on orders, by the unit commander based on skills, qualifications, and experience. Preferably, TIs are Basic Noncommissioned Officer Course (BNCOC) graduates. TIs are responsible to the QC OIC, the QC NCOIC, and ultimately, the aviation maintenance commander for quality assurance (QA) on all aircraft systems, subsystems, and associated equipment. TIs will be placed on orders signed by the first lieutenant colonel in the chain of command. This procedural step enables flexibility in the inspection of aircraft across the entire unit.

7-4. TIs are under the operational control, not supervision, of the PC maintenance officer. The maintenance officer establishes priorities for TI work assignments but does not supervise the work. The QC OIC or the NCOIC distributes the work and supervises the TIs to meet the PC maintenance officer's operational maintenance requirements.

7-5. When formally assigned by the AMC or ASC to the QC section under appointment orders, the QC OIC or NCOIC will serve as the TIs' rater. If the QC section does not have an OIC or NCOIC, the assigned commander rates the TI. This rating scheme will eliminate a conflict of interest, allowing TIs to remain objective in their quality assurance duties and ensuring that the crew's overall safety remains their goal.

7-6. TIs are the commander's designated representatives in aircraft SOF areas and airworthiness of the aircraft. Their most critical duties are the inspections of aircraft systems, subsystems, and the airframe. They are also responsible for component and shop inspections.

7-7. They are also responsible for maintaining the most current and updated master reference library to support all maintenance actions within the aviation maintenance unit. They also review publications, forms, and records for currency and accuracy.

7-8. TIs are responsible for the safety of all aircrew members. They do that by ensuring that all maintenance procedures comply fully with technical manuals and applicable references.

7-9. TIs are leaders, mentors, and trainers. They share the responsibility for improving the Soldier's understanding of aviation maintenance with that Soldier's platoon/section sergeant. They impart their experience and strive to teach Soldiers proper techniques and procedures.

SECTION II – QUALITY CONTROL MANAGEMENT

QUALITY CONTROL PROCEDURES

7-10. QC of a completed maintenance procedure with the appropriate logbook and form entries by the TI completes the maintenance cycle; these procedures are considered to be a management function. This process ensures that maintenance is performed according to maintenance manuals for specific aircraft. QC management is coordinated with all phases of PC and the maintenance workload to maintain maximum production effectiveness and high operational readiness rates.

7-11. Well-designed QC procedures assure that published QA standards are met, thus decreasing management efforts. Maximum effective production is balanced against quality—without lowering standards.

DELEGATION OF AUTHORITY ORDERS

7-12. Delegation of authority orders for performing critical duties in an aviation maintenance company must be approved by the commander. This authority is designated, in writing, by memorandum. The memorandum will state the functions, responsibilities, and duration of the assigned duties.

7-13. Completed delegation of authority forms (memorandums) are maintained on file until revoked, rescinded, or no longer applicable. Units will maintain a memorandum (orders), as applicable, on the following designated representatives:

- Commander (assumption of command orders).
- Technical inspectors (DA Pamphlet 738-751).
- Limited technical inspectors (DA Pamphlet 738-751).
- Maintenance test pilots (AR 95-1 and TM 1-1500-328-23).
- Unit safety officer and NCO (AR 385-95).
- Personnel signing equipment and component condition tags for turning in components and equipment (aircraft maintenance only) (DA Pamphlet 738-751).
- Personnel authorizing evacuation of aircraft with a grounding condition (X) status for a one-time evacuation mission (DA Pamphlet 738-751).
- Personnel authorized to change an aircraft with a grounding condition (X) status to (—) status for the performance of a one-time test flight (DA Pamphlet 738-751).
- Personnel inspecting aircraft first-aid kits (TM 1-1500-328-23).
- Weight-and-balance technician (AR 95-1).
- TMDE support coordinator and alternate (AR 750-43).
- Publications officer or NCO (DA Pamphlet 25-33).
- Corrosion prevention and control program monitor (TM 1-1500-328-23).
- Foreign object damage (FOD) prevention officer and NCO (AR 385-95).
- Personnel responsible for the FOD prevention plan (AR 385-95).
- AOAP monitor (TB 43-0211).
- Unit maintenance officer (AR 750-1).
- Controlled exchange officer (AR 750-1).
- Records management officer (AR 25-400-2).
- ULLS–A administrator.

7-14. Changes or revisions to subsequent Army publications affecting the above designations will be reviewed. Additions, deletions, or modifications of orders will be made at that time.

SECTION III – QUALITY CONTROL SECTION RESPONSIBILITIES

AIRCRAFT INSPECTIONS

7-15. Safety of the aircraft and crew depends on—

- A rigorous aircraft inspection before, during, and after a maintenance action is conducted.
- Compliance with all applicable maintenance publications and references.

Note. TM 1-1500-328-23 contains information on the preventive maintenance inspection system, acceptance inspection, transfer inspection, and in-storage inspection.

TRACKING AIRCRAFT TIME BEFORE OVERHAUL AND RETIREMENT LIFE COMPONENTS

7-16. QC personnel use computerized printouts or a time between overhaul (TBO) overhaul and retirement life component chart to monitor the in-service time of all aircraft components requiring replacement on an hour, cycle, meter, or calendar basis. For a list of these components, refer to the applicable aircraft maintenance manual.

7-17. TIs ensure that the time between overhaul or retirement life is not over flown unless specifically authorized in TM 1-1500-328-23. TIs review the TBO chart or computerized printouts and update information periodically but not less than the reporting period (see AR 700-138 for reporting criteria) and when reportable components are replaced.

> ***Note.*** Any method of tracking TBO or retirement components is acceptable; however, the preferred method is through ULLS-A. The importance of not over flying a repair part or component cannot be overstated.

7-18. There are three variations of the TBO chart, which can be used to track TBO items. Two variations are a time-change component schedule chart (Figure 7-1) and time-change bar graph component chart (Figure 7-2). The third variation is a TBO report generated by ULLS-A. TBO reports (Major Component Listings) produced by ULLS-A track replacement of aircraft components and are generated by part number or work unit code. If computerized printouts are used, make sure that they contain all required information (Figure 7-3) and maintain a separate disk copy in the QC office. QC personnel must notify maintenance officers and NCOs when 100 hours remain until replacement of hourly components and/or when two months remain until replacement of calendar components. In most cases, this notification allows adequate time for advance ordering of replacement parts.

> ***Note.*** Coordination and follow up of existing aircraft TBO parts requests must be made by unit maintenance personnel according to the unit's maintenance SOP.

TIME CHANGE COMPONENT SCHEDULE CHART

POSTED:

(BLACK) ☐ REPLACEMENT DUE

(RED) ☐ ITEM ON REQUISITION

(GREEN) ☐ ITEM ON HAND

				REPLACEMENT DUE								
ACFT TYPE	ACFT SERIAL NUMBER	TOTAL HRS	PMS-2 DUE	M/R BLADE S/N 00 00 01	M/R BLADE S/N 00 00 02	T/R GEARBOX	T/R PITCH CHANGE SHAFT					
UH-60L	93-24776	1224	1500	2400	2400	7500	2500					

Figure 7-1. Sample format for a time-change component schedule chart

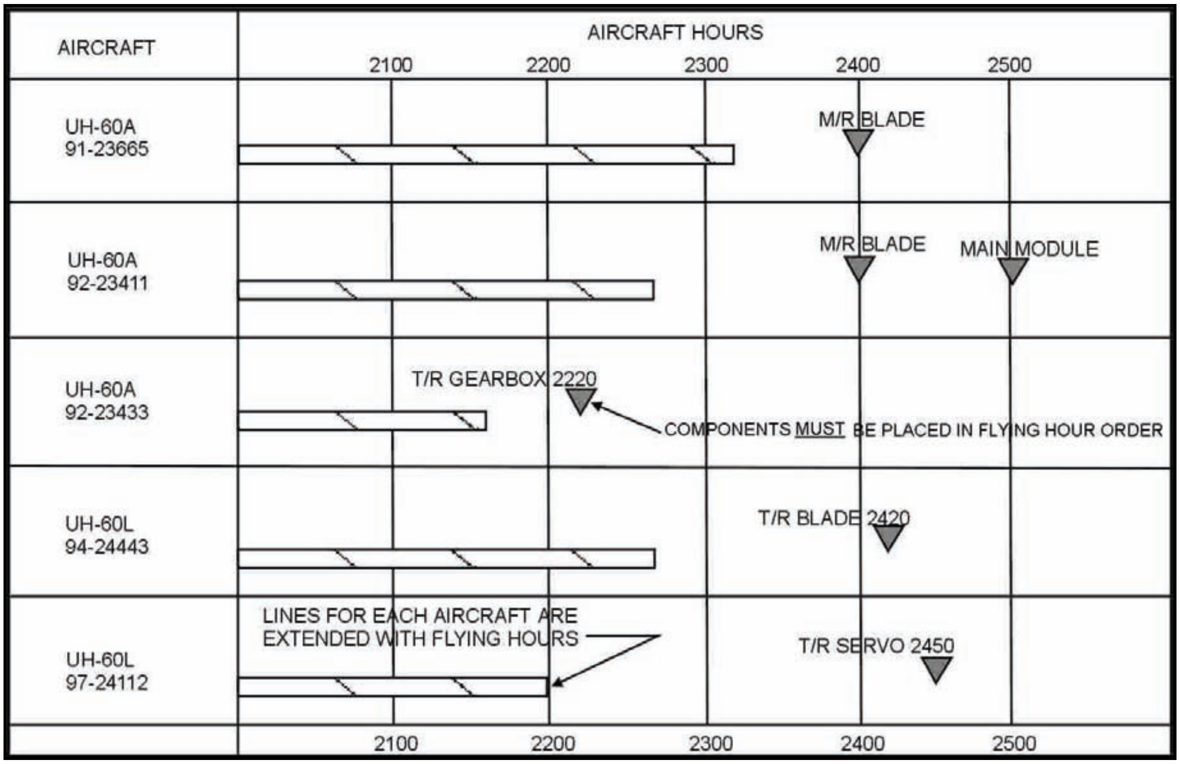


Figure 7-2. Sample format for a time-change bar graph component schedule chart

2408-16 COMPONENT PROJECTION REPORT

PCN: AVAHRIGA

REPORT DATE: 12-MAY-05 **UIC: WG31A8**

AIRCRAFT SERNO: 6916148 **CURRENT HOURS: 3576.8**

PROJECTED HOURS: 988

WUC	PART NUMBER	NSN	NOMENCLATURE	SERIAL NUMBER	AIRCRAFT HOURS TBO DUE	AIRCRAFT HOURS UNTIL DUE
85A81H84	286-811-148-1	1615818386653	RETENTION STRAP FITTING	A-4583	3695.0	118.2
85A81H84	286-811-148-1	1615010306653	RETENTION STRAP FITTING	A-1948	3695.0	118.2
85A81H83	286-818-123-3	5315000919358	RETENTION STRAP PIN	A19-38098	3695.0	118.2
85A81H83	286-818-123-3	5315000919358	RETENTION STRAP PIN	A19-38060	3695.0	118.2
85A81H	286-811-154-101	1615010631268	RETENTION STRAP	LK-11923	3695.0	118.2
85A81H	286-811-154-101	1615010631268	RETENTION STRAP	LK-11919	3695.0	118.2
84A85C	6895653	2915010444551	PUMP ASSY, FUEL	PE6398	4010.0	433.2
84A85G	2524912-2	2915011799734	GOVERNOR ASSY	86168686	4288.0	711.2
84A85A	2524911-3	2915012510688	FUEL CONTROL	337434	4473.0	896.2

Figure 7-3. Sample format for a computerized time-change computer printout

MAINTENANCE AND SHOP SAFETY INSPECTIONS

7-19. QC inspections of maintenance and shop areas are detailed, with the overall goal of establishing sound and disciplined maintenance procedures and practices. A QC inspection focuses on two areas. The maintenance facility, including maintenance and shop areas (maintenance and shop safety), is one area. The second area is the test, measurement, and diagnostic equipment (calibration) facility.

7-20. When performing the maintenance/shop safety and equipment inspection, TIs check the maintenance and shop areas for cleanliness and serviceability of and absence of corrosion on aviation ground support equipment. The inspection also includes checking for unobstructed fire lanes, serviceability of the hangar, serviceability of the fire extinguisher, and installation and use of equipment safety devices.

7-21. A shop or maintenance section area that is overcrowded and unsafe cannot produce quality work. TIs are charged with performing the maintenance/shop safety and equipment inspections to include the following:

- Cleanliness of maintenance and shop areas.
- Serviceability of and absence of corrosion on AGSE.
- Accessibility of and lack of obstructions to fire extinguishers.
- Serviceability and safe use of hoisting equipment and devices.

Note. Active-duty units will conduct these inspections monthly. National Guard and Reserve Component units will conduct these inspections quarterly.

7-22. Safety inspection forms will be maintained and filed in the QC section according to AR 25-400-2. A copy of the inspection will be given to the appropriate shop or maintenance section NCOIC for corrections of any deficiencies. If deficiencies are found, shop or maintenance sections will be reinspected to ensure compliance.

7-23. The United States Army Combat Readiness Center (USACRC) publication, *Commander's Guide to Aviation Resources Management for Aircraft Mishap Prevention*, outlines safety procedures. It provides safety-related guidance and procedures for all assigned TIs. Copies of the commander's guide can be obtained from the aviation safety officer (ASO). Minor changes to the commander's guide appear in the USACRC publication, *Flightfax*, which is distributed monthly to all Army aviation units.

7-24. For aviation safety policy, regulations, and procedures and questions or concerns related to the *Commander's Guide to Aviation Resources Management for Aircraft Accident Prevention*, go to the following Web site: http://www-rucker.army.mil/abso/abso-main.htm.

Note. The ARMS Program provides aviation personnel with expert technical assistance and on-site evaluations, as mandated by AR 95-1, to all units assigned to FORSCOM, TRADOC, USAREUR, EUSA, and INSCOM aviation units. For FORSCOM units or units evaluated and inspected by FORSCOM ARMS teams that are in need of ARMS information or assistance or to download FORSCOM ARMS commander's guides (checklists), go to the following Web site: https://freddie.forscom.army.mil/avn. For all other Army command units in need of ARMS checklists, see the Army command ARMS inspection team designated POC.

7-25. Other publications outlining specific safety precautions are FM 4-20.12(FM 10-67-1) and the TM 1-1500-204-23 series. In addition, see Appendixes D and G of this manual for composite risk management guidelines and a sample shop safety inspection checklist.

TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE)

7-26. Army TMDE C&RS is a USAMC mission. USATA has responsibility for executing this USAMC worldwide sustainment mission during war, military operations other than war (MOOTW), stability and civil support operations, and peace. The total Army TMDE support structure comprises Active and Reserve Component military, DACs, contracted personnel, and local nationals.

7-27. TMDE includes torque wrenches, testers, test sets, and other test equipment used to verify whether aircraft systems are functioning or malfunctioning according to applicable regulatory policies and published aircraft technical manuals. Depending on the design, TMDE may be portable or fixed in place.

7-28. Whether a unit contains specific items of equipment depends on its category of maintenance (AMC or ASC) and its prescribed TOE. TM 1-1500-204-23-series technical manuals contain detailed descriptions and operating instructions for the most common test equipment.

Note. Refer to applicable -23P aircraft RPSTL for a listing of aircraft-specific TMDE requirements. This list also grants units authorization for unit maintenance personnel to procure TMDE.

7-29. TMDE is used to test aircraft, components, and accessories. The equipment tests aircraft systems and subsystems for system functionality, analyzes malfunctioning units, and provides the maintainer with an accurate picture of serviceability.

7-30. QC inspectors use TMDE to obtain critical measurements and monitor maintenance procedures. Safe, economical operation of Army aircraft depends on the skilled use of TMDE in a comprehensive maintenance program. TIs ensure that the following measures are in place or take place:

- An organizational maintenance program for TMDE is established.
- An aviation maintenance TMDE support coordinator and alternate is appointed, on orders, by the aviation maintenance commander.
- The TMDE support coordinator is the aviation maintenance unit's primary point of contact (POC) for matters pertaining to TMDE support.
- An alternate TMDE coordinator is appointed and assigned the responsibility of monitoring the TMDE support program.
- Copies of appointment orders in the QC files are kept (AR 750-43 and AR 25-400-2).
- DA Form 7372 (TMDE Calibration and Repair Data) is submitted to the supporting activity for each item requiring calibration (TB 750-25).
- TMDE not listed in TB 43-180 is reported according to guidance published in it and TB 750-25.
- DA Label 80 or DA Label 163, with the appropriate signature on block 8, is attached to items requiring calibration.
- TMDE is calibrated at the prescribed interval (TB 43-180).
- After removal from temporary storage, TMDE for "calibration before use" will be submitted on Army aircraft or equipment.
- For calibrated TMDE items dropped or showing signs of misuse, suspect TMDE items will be submitted for calibration before use on Army aircraft or equipment.

Note. The goal of all aviation maintenance units' calibration programs is for the owner/user delinquency rate (failure to submit for required support) to be 3 percent or less according to AR 750-43.

AIRCRAFT WEIGHING REQUIREMENTS (ASC ONLY)

WEIGHT-AND-BALANCE REQUIREMENTS

7-31. Because of unique TMDE requirements, ASC maintenance personnel will perform aircraft weight-and-balancing procedures. AMC personnel appointed on aircraft weight-and-balance orders by the AMC commander can assist ASC maintenance personnel in weighing their assigned unit's aircraft.

WEIGHT-AND-BALANCE RECORDS

7-32. The assigned weight-and-balance technician maintains the aircraft's weight-and-balance records. TIs coordinate with the weight-and-balance technician anytime that maintenance on the aircraft could affect weight and balance. Refer to AR 95-1, TM 55-1500-342-23, the aircraft operator's manual, and the aircraft's technical maintenance manual for more information. The aircraft operator's manual and the applicable maintenance manual contain weight-and-balance data.

> ***Note.*** The automated weight-and-balance system authorization/paper methods are the only authorized methods for computing weight and balance.

7-33. Before an aircraft is delivered, the manufacturer inserts all aircraft-identifying data on the various charts and completes all forms. DD Form 365 series, charts, and any other pertinent data about the aircraft's weight and balance are maintained in a permanent binder. The binder and all forms list the aircraft's designation and serial number. Weight-and-balance technicians annotate any changes that affect the aircraft's weight and balance on these forms.

7-34. Weight-and-balance forms for each aircraft will be safeguarded and maintained according to applicable references. The aircraft serial number and information to be inserted on the charts or forms apply only to the individual aircraft. Individual weight-and-balance forms serve various purposes; therefore, their retention periods vary. Standard forms will be used with these data to provide an effective system for weight-and-balance control.

7-35. The weight-and-balance data and related forms for each aircraft will be maintained according to AR 95-1 and TM 55-1500-342-23. The point of contact information for the aeromechanics site is www.aeromech.redstone.army.mil. This site provides aircraft weight-and-balance assistance.

PUBLICATIONS PROGRAM MANAGEMENT

PUBLICATIONS MANAGEMENT PROCEDURES

7-36. QC, shops, and maintenance personnel establish and maintain a complete, up-to-date set of technical publications (to include ETMs/IETMs) for supported aircraft and equipment. These publications provide instructions on operation, maintenance, repair, modification, serviceability standards, testing, inspection, and storage of equipment. Publication personnel are appointed in the unit. They are responsible for ordering and maintaining the unit's publication accounts.

> ***Note.*** TMs are evolving to electronic formats known as ETMs and IETMs.

7-37. TIs perform a quarterly review of publication files (technical libraries), to include ETMs/IETMs, throughout the maintenance activity for completeness and currency.

7-38. TIs provide guidance in preparing and submitting recommendations for changes to maintenance and administrative publications. Recommendations for changes are submitted on DA Form 2028. TIs establish and maintain a file of recommended changes according to AR 25-400-2.

PUBLICATIONS FAMILIARIZATION CHART

7-39. QC, shop, and maintenance personnel must have a technical data familiarization chart or computer printout to ensure that maintenance personnel are familiar with changes to publications relevant to their duties. Familiarization charts will be updated quarterly or when a publication is changed (see examples in Figures 7-4 and 7-5). All publications used to maintain supported aircraft and related aviation equipment, as well as names of maintenance personnel, are listed on the familiarization chart.

7-40. Maintenance personnel enter their initials beside each publication to indicate their familiarity with that publication. Erase shops/maintenance personnel initials as new changes are received.

7-41. Once the change number is posted and after reviewing each new change, shops and maintenance personnel initial the chart or printout to indicate familiarity with the new changes. Each maintenance section or shop maintains separate charts or printouts. TIs check the charts or printouts during publication review to ensure the following:

- All publications (to include ETMs/IETMs) used by maintenance sections or shops are listed and current to include the latest changes.
- All maintenance section or shop personnel are listed.
- All personnel have initialed to indicate familiarization with the latest change or revision to the publications.

Note. According to DA Pamphlet 25-40, use only a black lead pencil to annotate printouts. After posting changes, write the word "posted" at the top of the change instruction sheet with initials and date.

Technical Data Familiarization Chart
***Quality Control Section**

Date last updated: ____________

By placing my initials opposite my name, I certify that I have read and I am familiar with the literature listed below as they pertain to my duties.

*Basic Publication	Date	Change	SFC Ang, G.	SSG Bow, W	SGT Smith, B	SSG White, B
AR 25-30	27-Mar-06		GA	WB	BS	BW
AR 25-400-2	15 Nov 04		GA	WB	BS	BW
AR 385-10	29 Feb 04		GA	WB	BS	BW
AR 385-95	10 Dec 99		GA	WB	BS	BW
AR 40-5	22 Jul 05		GA	WB	BS	BW
AR 700-138	26 Feb 04		GA	WB	BS	BW
AR 70-62	7 Jul 00		GA	WB	BS	BW
AR 710-2	8 Jul 05		GA	WB	BS	BW
AR 710-1	6 Sep 05		GA	WB	BS	BW
AR 750-43	14 Dec 04		GA	WB	BS	BW
AR 750-59	9 Dec 05		GA	WB	BS	BW
AR 95-1	3 Feb 06		GA	WB	BS	BW
DA PAM 25-33	15 Sep 96		GA	WB	BS	BW
DA PAM 25-40	5 May 05		GA	WB	BS	BW
DA PAM 710-2-1	31 Dec 97		GA	WB	BS	BW
DA PAM 750-8	25 Feb 05		GA	WB	BS	BW
DA PAM 738-751	15 Mar 99		GA	WB	BS	BW
FM 4-20.197 (FM 10-450-3)	20 Jul 06		GA	WB	BS	BW
FM 4.20.199 (FM 10-450-5)	30 Aug 99	3	GA	WB	BS	BW
TM 1-1500-204-23-1	1 Mar 00	3	GA	WB	BS	BW
TM 1-1500-204-23-2	29 Jan 99	3	GA	WB	BS	BW
TM 1-1500-204-23-3	22 Nov 96	2	GA	WB	BS	BW
TM 1-1500-204-23-4	30 Jul 99	5	GA	WB	BS	BW
TM 1-1500-204-23-5	15 Jun 99	3	GA	WB	BS	BW
TM 1-1500-204-23-6	7 Feb 97	4	GA	WB	BS	BW
TM 1-1500-204-23-7	30 Dec 93	1	GA	WB	BS	BW
TM 1-1500-204-23-8	15 Mar 01	1	GA	WB	BS	BW
TM 1-1500-204-23-9	15 Mar 01	4	GA	WB	BS	BW
TM 1-1500-204-23-10	1 Feb 00	3	GA	WB	BS	BW
TM 1-1500-328-23	1 Mar 00	1	GA	WB	BS	BW
TM 1-1500-335-23	1 Oct 97		GA	WB	BS	BW
TM 1-1520-237-23-1	17 Apr 06		GA	WB	BS	BW

*** Enter name of section or shop**
*** Enter manuals most commonly used when performing the duties of each shop or section**

Figure 7-4. Sample format for a technical data familiarization chart

FAMILIARIZATION CHART 4th Squadron, 7th Cavalry Airframe Shop					Date last Updated:	
Basic Publication	Change	WO1 Salazar	SSG Game	SGT Dodd	SPC Cooper	PFC Green
AR 95-1						
AR 95-2						
AR 25-400-2						
AR 700-138						
FM 3-04.513 (FM 1-513)						
TM 1-1500-328-23	1					
TM 1-1500-204-23-1	3					
TM 1-1500-204-23-2	3					
TM 1-1500-204-23-3	2					
TM 1-1500-204-23-4	5					
TM 1-1500-204-23-5	3					
TM 1-1500-204-23-6	4					
TM 1-1500-204-23-7	1					
TM 1-1500-204-23-8	1					
TM 1-1500-204-23-9	4					
TM 1-1500-204-23-10	3					
AR 25-30						
AR 25-400-2						
AR 700-138						
DA PAM 738-751						
BY PLACING MY INITIALS OPPOSITE MY NAME, I CERTIFY THAT I HAVE READ AND I AM FAMILIAR WITH THE LITERATURE LISTED ABOVE						

Figure 7-5. Sample format for a computer printout of a familiarization chart

Note. The shop sections or maintenance platoon NCOIC is responsible for tracking and posting pertinent information to the TM familiarization chart. In addition, it is his sole responsibility to keep assigned maintainers familiar with all changes affecting aircraft maintenance technical manuals and publications.

FORMS AND RECORDS MANAGEMENT

7-42. TIs manage and monitor all forms and records for accuracy and completeness. They monitor aircraft historical records, weight-and-balance records, aircraft maintenance records, blank forms, and PQDRs. TIs, aircrew members, aviation maintainers, maintenance managers, record clerks, supervisors, and commanders—at all levels of maintenance—including DOD contract support activities, have an equal stake in maintaining forms and records.

Note. TIs ensure that a 30-day supply of blank forms is always on hand to support maintenance operations.

AIRCRAFT HISTORICAL RECORDS

7-43. TIs maintain historical records for each aircraft assigned to their unit according to DA Pamphlet 738-751, Chapter 4 and Appendix D. TIs must ensure that all essential historical records are on file and updated according to published policies and regulations.

AIRCRAFT MAINTENANCE RECORDS

7-44. TIs monitor all records used in aircraft maintenance for accuracy and completeness according to DA Pamphlet 738-751. TIs check the accuracy of these records each time that they sign off on a deficiency and as the completed forms are turned into their office. Many units also establish reconciliation between the flight platoons and QC to assist in monitoring the accuracy of these records. See paragraphs 7-85 through 7-97 for required entries on aircraft forms and records and inspection procedures.

AVIATION MAINTENANCE MANAGEMENT FILE SYSTEM

7-45. The most important files maintained by QC personnel are teletype message (TWX) files such as SOF messages, ASAMs, and MIMs. These messages may ground aircraft, impose operating limitations, or provide information on aircraft maintenance techniques.

7-46. QC personnel maintain separate message files for each model of aircraft assigned or supported. They maintain one file for general messages. Messages are either informational or apply to specific models of aircraft. For more guidance on SOF messages, ASAMs, and files management, refer to ARs 95-1 and 25-400-2.

7-47. TIs also assist in preparing recommendations for changes to technical and administrative publications on DA Form 2028. The TI establishes and maintains a file of recommended changes according to AR 25-400-2.

MANAGING QUALITY DEFICIENCY REPORTS

7-48. TIs are responsible for maintaining a PQDR file according to AR 25-400-2, assigning PQDR control numbers according to DA Pamphlet 738-751, and establishing a PQDR log (see Figure 7-6). In addition, they check all submitted PQDRs for accuracy and completeness and assist in determining the category.

7-49. If an exhibit is needed, they ensure that all applicable forms and records accompany the exhibit (DA Pamphlet 738-751). TIs review applicable aircraft equipment improvement and maintenance digests before submitting the PQDR.

7-50. TIs investigate all continuing deficiencies to track equipment malfunctions and trends. If a materiel defect is involved, TIs submit a PQDR (two copies, according to DA Pamphlet 738-751) informing AMCOM of the problem. If the defect is due to an error in the maintenance procedure as found in the maintenance manual, TIs inform all maintenance personnel of the problem and its possible effects and how to correct it.

7-51. TIs will guide maintenance personnel in submitting a DA Form 2028 to correct shortcomings in the aviation technical maintenance manuals. If the breakdown of the repair part or component results from a manufacturer's defect, TIs will submit a PQDR.

CONTROL NUMBER	SUBJECT & CATEGORY	EXHIBIT DATE	SUBMISSION DATE	REPLY DATE
W81HTW030001	(CAT I) UH-60(L), Cracks in strut housing at bearing retaining pins.	12 JAN 06	12 JAN 06	24 JAN 06

Figure 7-6. Sample format for a deficiency report log

MANAGING RECOMMENDED CHANGES TO PUBLICATIONS

7-52. If a maintenance malfunction occurs as the result of an improper maintenance procedure outlined in a maintenance technical manual, the TI notifies the PC OIC, the maintenance officer, the maintenance or shops NCOIC, and maintenance personnel who performed the maintenance procedure. The TI provides a detailed description of the problem and its possible effects and, after researching the problem, provides guidance on how to correct it.

7-53. The TI provides guidance to all assigned/attached unit maintenance personnel in submitting proposed recommendations to correct all deficiencies outlined in the maintenance manual. The DA Form 2028 is prepared and forwarded to the agencies responsible for each manual so that corrective action can be taken. The agency responsible for the technical manual/reference in question is listed in the SUGGESTED IMPROVEMENTS statement in the heading of applicable manuals and publications, normally the first page.

7-54. TIs manage and track all submitted recommendations for changes to maintenance and administrative publications. Recommendations for changes are submitted on DA Form 2028. The TIs establish and maintain a file of recommended changes according to AR 25-400-2.

> ***Note.*** Copies of DA Form 2028 are found in the back of aviation technical maintenance manuals. Any recommended changes can also be submitted electronically at the Web site https://amcom2028.redstone.army.mil; in addition, the status of any recommended changes can be tracked at this Web site.

AVIATION TECHNICAL INSPECTION PROCEDURES

7-55. Technical inspection of aircraft maintenance ensures that standards and practices established by applicable publications are followed. It also ensures that all applicable technical requirements are met, maintenance performed is documented, and quality work is performed efficiently.

7-56. Before performing an inspection, QC personnel must review the latest applicable maintenance manual and regulatory policies to ensure that the inspection meets current requirements. To ensure crew members' safety and equipment reliability, inspection procedures must be standardized.

Status Symbols

7-57. Status symbols are used on forms and records to show the seriousness of faults, failures, deficiencies, and related maintenance actions and known safety hazards. The forms and records show the condition, readiness for flight, mission capabilities, operation, service, inspection, and maintenance of the aircraft system or subsystem or associated equipment.

> ***Note.*** Refer to DA Pamphlet 738-751 for a detailed discussion of status symbols denoting aircraft airworthiness.

Grounding Condition (X) Authorization

7-58. The TI is the commander's designated representative for aircraft maintenance quality assurance and QC management. Authorization to sign off "status symbol X, grounding condition" or "circled X" conditions is designated, in writing (by memorandum or on the DA Form 1687), by the owning aviation maintenance commander. This authorization provides the name, rank, and duty position of the TI and authorizes him to inspect and sign off "status symbol X, grounding condition" or "circled X" faults on specific aircraft models and components.

7-59. Both the TI's initials and signature or stamp (see Figure 7-7) are required to release an aircraft for flight. An official memorandum listing all QC personnel with their initials, signature, and personnel identifier (PID) next to their name will help eliminate unauthorized use by other unit personnel.

> ***Note***. Aircraft status symbols may be entered in black ink.

7-60. A TI or maintenance supervisor who works on a "status symbol X, grounding condition" or "circled X" fault cannot perform quality assurance on his own work. The work must be inspected and signed off by another person designated in writing by the commander.

7-61. If no repair work or maintenance is involved and only an inspection is required, the TI performs the inspection and signs off with no recheck. The parent unit's orders are sufficient authority to sign off a "status symbol X, grounding condition" or "circled X" faults on aircraft belonging to another unit (DA Pamphlet 738-751).

> ***Note.*** When authorization is given to sign off "status symbol X, grounding condition" or "circled X" faults on specific aircraft models or components, the memorandum must list these items and be signed by the commander. Keep a copy of the authorization on file in the QC office for six months after the representative departs the unit.

Inspection Stamps

7-62. An inspection stamp may be used to indicate a satisfactory condition. It carries the same authority as a TI's signature or PID and must be guarded against unauthorized use. If an inspection stamp is used, it is round and no larger than 1/2 inch in diameter (see Figure 7-7). It includes the unit designation and TI's number.

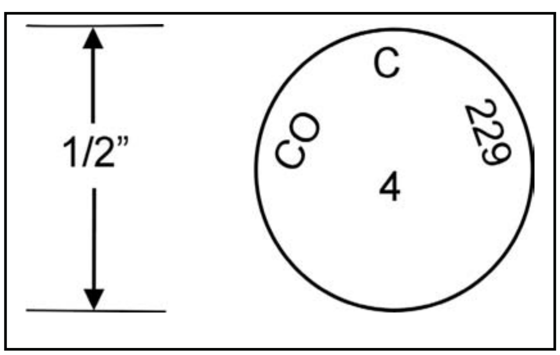


Figure 7-7. Inspection stamp sample

7-63. The following requirements must also be met:

- Keep stamps that have not been issued under lock and key.
- Destroy illegible stamps.
- Do not assign relieved stamps for six months.
- Keep a stamp inventory or register (see Figure 7-8) in the QC section.

STAMP NUMBER	ASSIGNED TO	DATE ASSIGNED	DATE RECEIVED
1	JERRY H. BROWN SSG	12-Jan-06	
2	JOHN W. DOE SGT	23-Aug 04	3-Dec-05
3			
4			
5			
6	STAMP DESTROYED (LOST)		
2	TONY L. SALAZAR SFC	4-Jun-05	
* ALL STAMP NUMBERS MUST BE INCLUDED AND ACCOUNTED FOR			

Figure 7-8. Sample inventory register of inspection stamps

Technical Inspections

7-64. Technical inspections are a visual, touch-and-feel inspection made by a technically qualified person (normally a QC TI). These inspections are performed on aircraft and associated equipment according to maintenance standards outlined in the aircraft suite of technical manuals.

7-65. Technical inspections will also be done on aviation-related equipment, maintenance and shop operations and areas, and supply facilities. The results of all technical inspections can be used to—

- Assure that quality maintenance is performed and is in full compliance with technical manuals.
- Determine serviceability of aircraft systems, subsystems, repair parts, and components.
- Estimate cost of damage resulting from accidents/incidents.
- Determine how many man-hours and repair parts are needed to restore equipment to a serviceable condition.
- Determine the cause of the unserviceable condition of the equipment.
- Determine the economical reparability of unserviceable equipment.

NONDESTRUCTIVE INSPECTION

7-66. Nondestructive inspection (NDI) is a tool used by TIs to complement a QC inspection. Aircraft components may have suspected metal flaws that must be confirmed or denied. A defect may be visible, but the severity or extent of the defect is unknown. For example, scratches can look like cracks and hairline cracks can look like scratches. In any case, the TI must evaluate the defect to determine whether nondestructive inspection methods are necessary to further evaluate the extent and severity of a defect.

7-67. Nondestructive inspection testing methods are used to determine the composition, integrity, dimensions, or properties of a component or structure without damaging the item. Some nondestructive inspection methods include liquid penetrant, magnetic particle, electromagnetic, ultrasonic, and penetrating radiation methods. AR 750-1, TM 1-1500-204-23-7, and TM 1-1500-335-23 cover nondestructive inspection details and procedures.

Note. Army military personnel performing NDI are required to be 15D-qualified and have an “N2” additional skill identifier (ASI).

QUALITY CONTROL TECHNICAL INSPECTION PROCEDURES

AIRCRAFT INSPECTIONS

7-68. Safety of the aircraft and crew depends on a rigorous aircraft inspection and compliance with all applicable maintenance publications (to include ETMs/IETMs) and other references. TM 1-1500-328-23 contains information on the preventive maintenance inspection system, acceptance inspection, transfer inspection, and in-storage inspection.

7-69. Aircraft are inspected to ensure that published specifications are followed, maintenance requirements are complied with, and quality work is completed efficiently. If a TI is not completely familiar with the area or the item being inspected, he must seek supervisory guidance.

7-70. A TI must review and become familiar with the technical manuals on the subject area or item that he is inspecting. A technical inspector will *never* rely solely on his experience to conduct quality assurance on an aircraft system, subsystem, and/or equipment. TIs will always use technical references when inspecting Army aircraft and equipment.

> ***Note.*** Technical inspectors, maintenance managers, maintenance personnel, and DOD contract support activities are responsible for using TMs for maintenance procedures and for ensuring that a safe, quality product is the end state.

PROCESSING UNIT AIRCRAFT FOR MAINTENANCE SUPPORT (ASC ONLY)

7-71. Owning unit representatives will accompany aircraft work ordered to the ASC for maintenance. They will review aircraft records with ASC personnel, resolve questions, and perform a joint inventory with ASC personnel. These representatives will accompany ASC technical inspectors on the initial and final inspection of the aircraft.

> ***Note.*** When coordination has taken place between AMC and ASC PC section personnel, AMC TIs will accompany ASC TIs when conducting a final inspection of AMC owned aircraft.

7-72. Upon completion of repairs and before acceptance of the aircraft, inspectors perform a joint inventory with ASC personnel, review aircraft records for accuracy and completeness, and inspect aircraft to ensure that requested work was properly performed. If repairs are deferred because parts are unavailable, TIs ensure that repair parts needed to complete required maintenance procedures have valid document numbers.

7-73. In general, TIs monitor maintenance procedures to ensure the following:

- Proper tools and equipment are used.
- Aircraft and components are maintained according to specific publications.
- Publications used are current.
- Forms and records are complete and accurate.
- Safety precautions are observed.
- Trained and competent maintainers are conducting aircraft maintenance.

7-74. TIs perform some aircraft inspections at specified times. These inspections include initial, 100 percent, in-progress, and final inspections.

Initial Inspection

7-75. ASC inspectors perform an initial inspection before the aircraft enters the shop for maintenance to verify that aircraft or components meet specifications of published maintenance manuals. This inspection determines deficiencies, work required, economical repair of aircraft and components, and accountability of equipment to include sensitive items if installed.

> ***Note.*** Minor ASC deficiencies will not justify refusal to accept an aircraft into the back shops.

7-76. All deficiencies are entered on DA Forms 2408-13-3. The forms are returned to PC after the inspection. Only those cowling and access panels necessary to inspect the faults listed on the DA Form 2407 by the ASC unit are removed.

One Hundred Percent Inspection

7-77. ASC TIs perform a 100 percent inspection. This type of inspection is usually performed if many faults are found during other inspections (such as initial inspections). QC personnel should coordinate with the PC or maintenance officer before performing a 100 percent inspection.

7-78. The TI performs the 100 percent inspection by removing all cowling and access panels and inspecting the entire aircraft, including all systems and components. Components, repair parts, and items to look for during the inspection (to include installation on the airframe) are as follows:

- Correct assembly.
- Proper safety techniques (for example, use of safety wire and cotter pins).
- Wear.
- Rigging.
- Leaks.
- Structural defects (such as cracks, punctures, loose rivets, and separation in honeycomb panels).
- Security of components.

In-Progress Inspection

7-79. The in-progress inspection is a continuing inspection performed periodically while the aircraft or component is in the shop (especially important during phase/periodic inspections). TIs should be available to answer the maintainers' questions and resolve problems. Maintenance team chiefs set up stations, if possible, so that the inspector is near the work being performed.

7-80. Equipment at each station should include all items needed to perform the inspection. All necessary forms, maintenance publications, tools, and test equipment should also be available. ASC TIs perform this inspection. It ensures that the final product is reliable; areas are inspected before they are covered with access panels or components. When maintenance procedures are not performed according to applicable maintenance publications, they are corrected immediately upon discovery.

7-81. The TIs will thoroughly review logbook forms and records before performing an in-progress inspection on aircraft in phase or undergoing periodic maintenance. The TIs will enter deficiencies missed by the maintenance team on DA Form 2408-13-1 (or 2408-13-1E, if electronically generated).

Final Inspection

7-82. A final inspection is a complete inspection and functional test, if required, of all aircraft or components released from the shop after maintenance. This inspection determines the following:

- Repairs meet the specifications of the maintenance manuals.
- Work requested on DA Form 2407 was completed.
- Correct tools and equipment were used.
- Entries on DA forms are complete and accurate.
- Aircraft or components conform to standards.

7-83. Major (X-grounding) deficiencies will be corrected before the aircraft or component leaves the shop. Minor (diagonal) shortcomings will be corrected based on the availability of parts and man-hours. All deferred maintenance will have a valid requisition or work-order number before maintenance personnel enter it on a DA Form 2408-13-1. The decision to defer maintenance rests with the commander or designated representative, as stated in DA Pamphlet 738-751.

FORMS AND RECORDS INSPECTION PROCEDURES

7-84. Forms and records are the first items checked in any aircraft inspection. All form entries must follow the policies in DA Pamphlet 738-751, TM 55-1500-342-23, and TB 43-0211. All necessary forms, publications (to include ETMs/IETMs), tools, and test equipment are available at the inspection station. Refer to DA Pamphlet 738-751 for the required locations of various forms. Some items to look for when inspecting forms are listed below.

> ***Note.*** Although hard copies of DA forms are still in use, many DA forms have been automated and can be generated electronically. The DA Form 2403-13-1 indicates that this form has been published by the United States Army Publishing Agency (USAPA); the DA Form 2408-13-1E indicates that this particular form has been electronically generated. As Army aviation continues to transform and as a direct result of automation, all DA forms used in Army aviation will be electronically generated. Refer to Section V of this chapter for guidance on electronically generated forms.

DA Form 2408-12

7-85. Normally, the pilot or crew member will fill in the total in each block to include flight hours and landings. The TIs ensure that hours and landings are correctly totaled and entered on the form.

DA Form 2408-13 Series

7-86. TIs ensure that the following actions are completed:

- Hours and landings are accurate and correctly carried forward from DA Form 2408-12 (Army Aviator's Flight Record).
- Current aircraft hours, landings, autorotations, APU history, and rounds fired, if applicable, are correctly carried forward from the previous DA Form 2408-12 and DA Form 2408-13 (Aircraft Status Information Record).
- The status in block 10 reflects the most serious uncorrected fault listed on DA Forms 2408-13-1, 2408-13-2, and 2408-13-3.
- All corrected X and circled-X corrective actions were inspected, according to applicable maintenance manuals, by an authorized inspector.
- All uncorrected entries signed off as carried forward from the previous DA Form 2408-13-1 are entered on the current DA Form 2408-13-1.
- Entries are carried forward word for word, and status symbols are correct.
- Inspection times are correctly carried forward from the previous DA Form 2408-13.

DA Form 2408-18

7-87. TIs ensure that all required inspection items are entered. They will update DA Form 2408-18 (Equipment Inspection List) with correct dates or times when a TM changes or a TWX directs the addition or deletion of a given inspection.

HISTORICAL RECORD LOGBOOK FORMS AND RECORDS INSPECTION

DA Form 2408-5 and DA Form 2408-5-1 (Equipment Modification Record)

7-88. TIs ensure that the following actions are completed:

- DA Form 2408-5 is the only historical record that shows the current configuration of the aircraft or training device/simulator.
- TIs will review all DA Forms 2408-5 for completeness and accuracy; they will ensure that the forms are maintained as prescribed in DA Pamphlet 738-751.

- All applicable modifications are entered in Section 4 of DA Form 2408-5.
- The required completion date is entered, in pencil, in block 5F for modification not met compliance criteria (paper form only).
- SOF and ASAM inspections will not be entered on this form.

DA Form 2408-15 (Historical Record for Aircraft)

7-89. TIs ensure that the following actions are completed:

- Check DA Form 2408-15 for completeness and accuracy.
- Enter pertinent historical data on the aircraft and associated equipment throughout its service life.

DA Form 2408-15-2 (Aircraft Vibration Record)

7-90. TIs ensure that the following actions are completed:

- The form is on hand for the aircraft.
- Significant historical data is shown, as required by DA Pamphlet 738-751.

DA Form 2408-16 (Aircraft Component Historical Record)

7-91. TIs ensure that the following actions are completed:

- Required forms are on hand as listed in DA Pamphlet 738-751.
- Serial numbers match component serial numbers on the aircraft.
- Computed replacement due times are correct and not past due.

DA Form 2408-16-1 (History Recorder, Component, Module Record)

7-92. TIs ensure that the following actions are completed:

- Required forms are on hand as listed in DA Pamphlet 738-751.
- Serial numbers match component serial numbers on the aircraft.
- Computed replacement due times are correct and not past due.

DA Form 2408-17

7-93. TIs ensure that the following actions are completed:

- All applicable items listed in the master inventory guide are listed.
- Property additions and deletions made after aircraft delivery are correctly reflected.
- All equipment checks have a signature in the corresponding numbered block at the bottom of the form.
- All items added, deleted, or short are explained on the back of the form (refer to DA Pamphlet 738-751).

DA Form 2408-19 Series

7-94. The following are the DA Form 2408-19-series forms:

- DA Form 2408-19 (Aircraft Engine Turbine Wheel Historical Record).
- DA Form 2408-19-1 (T53/T55 Turbine Engine Analysis Check Record).
- DA Form 2408-19-2 (T700 Series Turbine Engine Analysis Check Record).
- DA Form 2408-19-3 (Engine Component Operating Hours Record).

7-95. TIs ensure that these forms are completed according to DA Pamphlet 738-751 and applicable publications. These DA forms will be on hand for each gas turbine and engine turbine wheel as required.

DA Form 2408-20 (Oil Analysis Log)

7-96. TIs ensure that a properly completed form is on hand for each aircraft component in the AOAP. The DA Form 2408-20 is a semipermanent historical record of oil and grease samples taken and results of the laboratory test results for all aircraft components registered in the AOAP.

DD Form 365 Series

7-97. The following are the DD Form 365-series forms:

- DD Form 365.
- DD Form 365-1.
- DD Form 365-2 (Form B–Aircraft Weighing Record).
- DD Form 365-3 (Chart C–Basic Weight and Balance Record).
- DD Form 365-4 (Weight and Balance Clearance Form F–Transport/Tactical).

7-98. TIs ensure that these forms are on hand and up-to-date as required by AR 95-1 and TM 55-1500-342-23. Trained weight-and-balance technicians will be appointed on orders signed by the aviation maintenance commander.

MANAGING TECHNICAL COMPLIANCE OF AVIATION SAFETY-RELATED MESSAGES

7-99. The TI monitors and ensures compliance with SOF messages, ASAMs, modification work orders (MWOs), TBs, AWRs, and ISAQs. Compliance with all aviation safety-related messages is paramount to the safety of crew members, aircraft, and equipment.

Safety-of-Flight Messages/Aviation Safety Action Messages (ASAMs)

7-100. Once SOF messages and ASAMs are complied with, TIs will make required entries on applicable DA forms according to DA Pamphlet 738-751. All aviation maintenance units must submit an SOF or ASAM compliance status report according to the SOF message or ASAM instruction on their assigned aircraft.

7-101. The three types of aviation safety action messages are maintenance mandatory, informational, and operational. For a detailed discussion of SOF aviation safety action messages, refer to AR 95-1 and DA Pamphlet 738-751.

> ***Note.*** For a comprehensive listing of aviation SOF messages, to include MIMs, visit AMCOM's Web site at https://ams14.redstone.army.mil/safety/sof/index.html. AMCOM maintains consolidated listings, by airframe, of aviation SOF messages. Users must have Army Knowledge Online (AKO) credentials to access this site.

Modification Work Orders

7-102. MWOs become mandatory when they—

- Provide increased safety to personnel or equipment.
- Significantly raise the operational and support features of the equipment.

7-103. Refer to AR 750–10 for definitive priority criteria assigned to MWOs. The following are priorities assigned to MWOs: routine, urgent, or emergency.

7-104. Upon receipt of an MWO that applies to corresponding serial numbers of assigned aircraft, TIs enter MWO-required information on DA Form 2408-5 (refer to DA Pamphlet 738-751). MWOs applied to assigned aircraft will normally be accomplished by depot-level maintenance activities such as the Project OLR contract field team, CCAD, or contract maintenance activities performing overhaul/repair. Therefore, the depot-level maintenance activities will complete the MWO entry when the MWO is applied. If an

MWO is not applied by the specified date on the MWO directive, TIs will enter MWO data on DA Form 2408-13-1 (refer to DA Pamphlet 738-751).

7-105. MWOs are the only publications that authorize modification or alteration of Army equipment. MWOs are issued to—

- Provide compatibility with newer equipment.
- Prevent serious damage to equipment.
- Increase operational effectiveness.
- Reduce support requirements.

7-106. Each MWO contains specific instructions concerning the following:

- Time limit for compliance.
- Maintenance category to which the MWO applies.
- Parts required.
- Man-hours required.
- Form entries required.
- Method for performing the modification.
- Weight-and-balance data.

TECHNICAL BULLETINS

7-107. TBs, SOFs, and ISAQs direct one-time or, in special cases, a recurring inspection of an aircraft or component. DA Forms 2408-13-1, 2408-15, 2408-5-1, 2408-16, and 2408-18 are used to ensure compliance with TBs.

7-108. TIs ensure that all requirements of applicable aircraft TBs are met and required entries are made on applicable DA forms. TIs are also responsible for two actions: grounding an aircraft, if required by the TB (refer to AR 95-1), and submitting reports required by AR 95-1 to report compliance with TBs.

DA Form 2408-13-1

7-109. TIs or crew chiefs use the DA Form 2408-13-1 to enter the one-time inspection due on the aircraft or aircraft component. Technical inspections are performed according to the TB. Normally, if a TB is not applied within the time frame specified in the TB, the aircraft will be grounded.

7-110. Once the inspection is completed, as outlined in the TB, and no defects are found, the inspection due is signed off on DA Form 2408-13-1. If defects are found, they will be entered on DA Form 2408-13-1. Maintenance personnel are notified for corrective action. After deficiencies are corrected, the corrective action is inspected and the inspection due is signed off on DA Form 2408-13-1.

DA Form 2408-15

7-111. DA Form 2408-15 provides historical data on the aircraft and associated equipment throughout its service life. TIs enter a one-time inspection of an aircraft airframe and related systems and subsystems on this form. DA Form 2408-15 is used to record SOF messages, ASAMs, or TBs.

DA Form 2408-5-1

7-112. TIs enter TBs that apply to components on DA Form 2408-5-1 (refer to DA Pamphlet 738-751). The procedure is the same as for MWOs.

DA Form 2408-16

7-113. If a TB applies to a component on which DA Form 2408-16 is maintained, TIs enter TB compliance in block 7. DA Pamphlet 738-751 and TB 1-1500-341-01 for each MDS of aircraft list all components that require DA Form 2408-16.

DA Form 2408-18

7-114. A TB may require a recurring inspection at specified intervals. If so, TIs enter this inspection on DA Form 2408-18 for the aircraft.

Airworthiness Release

7-115. An airworthiness release is a technical document that provides operating instructions and limitations necessary for safe flight of an aircraft system or subsystem or associated equipment. This Army airworthiness approval is—

- Based on the results of design analysis, engineering ground test, and/or flight test.
- Required prior to operation of a new aircraft system or subsystem or associated equipment or a modification to the qualified or standard configuration.

7-116. For scout-/attack-related airworthiness releases go to the following website: https://www.scout-attack.jatdi.mil/warrior/safety/awr/index.html. For Blackhawk-related airworthiness releases, go to the following website: https://www.blackhawk.jatdi.mil/safety/awr/index.html.

Note. Refer to AR 70-62 for information on AWRs and ISAQs.

QUALITY CONTROL SUPPORT FOR MAINTENANCE EQUIPMENT AND PROGRAMS

Aviation Ground Support Equipment

7-117. This equipment includes all AMCOM-managed AGSE needed to maintain aircraft and associated equipment. TIs will ensure that the forms and records used to track maintenance and services for assigned AGSE comply with DA Pamphlet 750-8. AGSE support personnel will seek the QC technical inspector's guidance when filling out AGSE forms and records.

Note. Refer to Chapter 3 for more detailed procedures and guidance on the AGSE program.

The Foreign Object Damage Program

7-118. FOD may cause materiel damage, or it may cause a system or equipment to become inoperable, unsafe, or less efficient. To eliminate potential FOD or malfunction of an aircraft system or subsystem, TIs must take an active role in enforcing the FOD program. TIs will closely monitor ongoing maintenance procedures within the scope of their responsibilities to ensure that maintenance personnel are consistently practicing sound FOD procedures.

7-119. TIs must enforce FOD directives as outlined in the unit's maintenance SOP. They must work diligently with the unit's assigned FOD officer/NCOIC to ensure that the FOD program designed for their unit is effective, manageable, and observed by all maintainers. Foreign object damage prevention countermeasures will be integrated throughout the unit SOP.

The Army Oil Analysis Program

7-120. The commander appoints an AOAP monitor who has been properly trained and certified by the supporting laboratory. The AOAP monitor manages and monitors the program in the unit.

Note. Refer to Chapter 3 for more detailed procedures and guidance on the AOAP.

7-121. TIs will provide guidance, when called upon, to ensure that maintenance personnel are adequately trained in the techniques of drawing oil samples from aircraft components. TIs will ensure that all aircraft and components are entered in the program and that all required records are maintained. Refer to AR 750-1, TB 43-0211, and DA Pamphlet 738-751 for specific instructions. TIs will ensure the following:

- Oil samples are taken according to TB 43-0211.
- DD Form 2026 (Oil Analysis Log) is complete and accurate.
- All samples are dispatched expeditiously to the laboratory.
- Special samples requested by the laboratory are taken immediately.
- Notification is given to the assigned servicing laboratory of replacement or removal of AOAP components.

SECTION IV – QUALITY CONTROL REFERENCES AND PUBLICATIONS

7-122. Army regulations and publications (to include ETMs/IETMs) describe policies and procedures used in aircraft maintenance and logistics management. QC personnel ensure that publications and reference libraries are current and updated with the latest changes. TIs set up and maintain the master reference library, consisting of many types of supporting references and publications (to include ETMs/IETMs), to assist aviation maintenance units in conducting maintenance “by the book.”

Note. Refer to Appendix A of aircraft-specific technical manuals for an expanded list of references/publications used by a typical aviation maintenance unit. Refer to DA Pamphlet 25-30 for a more detailed listing of reference/publication requirements. Refer to Chapter 4 for guidance in accessing the LIDB Publications Module. This module contains a comprehensive listing of publications to support assigned end items. Refer to this manual for a link to the electronics technical manual site and for more information on managing a publications account.

ARMY REGULATIONS

7-123. ARs provide policies and responsibilities that govern administrative procedures and ensure compliance at all levels. AR series numbers identify the subject matter; that is, all ARs in the 95-series pertain to aviation. A subnumber, preceded by a dash, indicates additional information about the basic subject; for example, a specific aviation regulation such as AR 95-1.

DEPARTMENT OF THE ARMY PAMPHLETS

7-124. Department of the Army pamphlets contain permanent information or reference material. DA pamphlets are numbered in the same manner as ARs. A subnumber, preceded by a dash, distinguishes among DA pamphlets with the same basic number. All DA pamphlets in the 25 series are Army administrative publications; for example, DA Pamphlet 25-30 is an index of publications and blank forms while DA Pamphlet 25-33 is the standard Army publications system revision of the DA 12-series forms, usage, and procedures.

FIELD MANUALS

7-125. Field manuals outline military doctrine, tactics, and techniques. They include instructions and reference material on training, operations, and maintenance management. FMs are also numbered in the same manner as ARs. A basic number identifies the primary subject, and a subnumber indicates additional information; that is, FMs in the 3-04 series pertain to aviation operations—such as this manual and FM 3-04.111 (FM 1-111).

Note. Refer to the following Web site for electronic versions of FMs: https://atiam.train.army.mil/soldierPortal/. After entering the site, click on RDL Service Tab, click on "Official Departmental Publications," and then select "Field Manuals."

TECHNICAL MANUALS

7-126. TMs provide training information on a variety of subjects and on specific items of equipment. TMs for specific equipment provide instructions on operation, maintenance, and overhaul. They also provide a repair parts and special tools list and breakdown. The first two digits of these manuals identify the preparing technical service.

7-127. A dash and a four-digit number indicate the federal supply classification (FSC), including the equipment within the FSC assigned to commodity groups and classes. FSC provides unique information regarding a specific type of equipment; for example, -1510 represents fixed-wing aircraft while -1520 represents rotary-wing aircraft.

7-128. A dash and a three-digit number indicate the MDS of a particular aircraft. For example, -251 represents AH-64D helicopters while -248 represents OH-58D helicopters.

7-129. A dash and a two-digit number represent the category of maintenance. For example, -10 is for operators while -23 describes maintenance procedures for AMC/ASC maintainers to perform.

7-130. A serial number, preceded by a dash or a slash, is added when a TM is published in more than one volume; for example, -1, -2 or /1, /2. Each volume within a series of technical manuals will have its own table of contents.

7-131. The letter "P" is used as a suffix when the RPSTLs are published in a volume separate from the maintenance instructions. This volume will have the same basic number as the corresponding manuals for the same type of aircraft. For example, TM 1-1520-248-23 is the maintenance manual for an OH-58D. Adding the suffix letter "P" to that TM, denotes a RPSTL manual; for example, TM 1-1520-248-23&P is the RPSTL manual for the OH-58D.

Note. Refer to Chapter 4 for information on electronic technical manuals (ETMs/IETMs).

TECHNICAL BULLETINS

7-132. TBs contain technical information on equipment or professional management techniques. The most common TBs encountered by QC personnel direct one-time inspection of aircraft or components.

7-133. Urgent inspection requirements are initially sent to units by a TWX. The subsequent TB then supersedes the TWX. TBs directing one-time inspection are classified by priority as urgent, limited urgent, and normal.

SAFETY-OF-FLIGHT/AVIATION SAFETY ACTION MESSAGES

7-134. SOF and aviation safety action messages provide information concerning safe operation of an entire type or specific serial numbers of Army aircraft. These messages are transmitted by TWX to all organizations concerned. The message number indicates general or specific information. General (GEN) messages apply to all aircraft while specific messages apply only to a specific series of aircraft. Examples of these messages are the following:

- GEN-06-02:
  - This is a general message that applies to all aircraft or maintenance facilities.
  - It was written in FY 06.

    - It was the second general message sent in FY 06.
- AH-64-06-03:
    - This is a specific message that applies to the AH-64-series aircraft.
    - It was written in FY 06.
    - It was the third AH-64 message sent in FY 06.

7-135. The three types of SOF messages are emergency, operational, and technical.

EMERGENCY

7-136. Emergency messages contain information deemed critical in nature. These messages ground affected aircraft. They usually denote hazardous aircraft conditions that, unless complied with, have the high probability of causing aircraft damage or personal injury. Emergency SOF messages are later published as urgent TBs or MWOs.

OPERATIONAL

7-137. Operational messages apply to flight procedures, operating limits, or operational policy. These messages may ground affected aircraft for operational reasons.

TECHNICAL

7-138. Technical messages are issued by AMCOM and are later published as urgent action TBs or MWOS. When issued, these messages cause grounding of affected aircraft but allow them to fly with specific limitations.

SUPPLY BULLETINS

7-139. Supply bulletins (SBs) provide important supply information to maintenance personnel. This information includes the following:

- Stock number changes.
- Direct-exchange list changes.
- Reports on new materiel.

FEDERAL AVIATION ADMINISTRATIVE PUBLICATIONS

7-140. The FAA publishes references and publications on aviation and aircraft maintenance using different standards from those applied to Army aviation assets. When conducting maintenance on Army aviation assets, aviation maintainers will use only authorized Army-approved publications and references. Do not use FAA or any other Federal agency publications for Army aircraft maintenance unless authorized in writing or as part of a logistic support plan.

CHANGED/REVISED/RESCINDED PUBLICATIONS

7-141. Effective aircraft maintenance requires that the latest technical information be on hand at all times. Because Army publications are continually being updated, QC personnel must ensure that units have adequate quantities of current publications. Therefore, they need to understand how the publications distribution system operates. DA Pamphlet 25-33 provides necessary information for the TI. This pamphlet explains the following:

- How initial distribution and resupply are made.
- Which DA forms are required to order publications.
- Where to order publications.
- How a publications account is set up.

POSTING CHANGES

7-142. When posting changes to publications, personnel will ensure that the following procedures are followed:

- Be accurate and neat; a publication that is incorrect or incorrectly posted is as worthless as one that has not been posted.
- Use a sharp, black pencil so that posting can be erased easily in case of future changes or corrections.
- Print or write the authority for changing a basic publication in the outside margin of the page by the changed portion; this authority is usually a numbered change (for example, C1). If the changed portion affects more than one page, make the same notation on all pages concerned.
- Draw a line through the first and last lines of the text when three or more lines of text are affected; then connect these lines from top right to bottom left, forming a Z-shaped figure.
- Ensure that change numbers are posted in proper sequence; an urgent change may be posted out of sequence (ahead of previous numbered changes) if authority to do so is stated on its front page.
- Ensure that manuals are not superseded or rescinded.

Note. DA Pamphlet 25-40 is required reading for all TIs. It provides established guidelines and information on posting and filing publications.

INTERIM CHANGES

7-143. When there is no time to issue a printed change, a TWX is used to amend a publication. The message is identified as an interim change and prepared in the format of a published change. The message provides the exact language of the changed material. When posting the change, personnel will follow the procedures directed by the message. The message number and date are posted in the margin of the publication opposite the changed portions; for example, "DA message 0614202 Mar 06."

7-144. A copy of the message is filed in front of the basic publication or the last printed change. If a copy is not available, a cross-reference sheet is inserted, showing where a copy of the message can be found. When the next printed change or revision of the publication is received, the supersession notice is checked. If the notice states that the message is rescinded or superseded, the message or cross-reference sheet is removed and destroyed.

PUBLICATION REVISIONS

7-145. A publication revision is a complete new edition of an existing publication. It supersedes the preceding publication, together with all changes, supplements, and appendices.

PUBLICATION RESCISSIONS

7-146. A publication is rescinded (canceled) when its material becomes obsolete. Destroy obsolete publications. DA Pamphlet 25-30 contains a list of rescinded publications.

PUBLICATION DISPOSAL

7-147. Publications (to include ETMs/IETMs) will be discarded after they have been rescinded or superseded. Classified publications (to include ETMs/IETMs) are discarded according to AR 380-5 and unclassified publications (to include ETMs/IETMs) will be discarded according to instructions from the local disposal officer. However, do not discard old publications (to include ETMs/IETMs) until new ones are reviewed.

7-148. DA Form 12 series (Requirements for Distribution of Publications and Blank Forms) will be used to order the quantity of publications needed. If more publications are received than needed, the DA Form

12 series will be updated according to DA Pamphlet 25-33. Determine if other aviation units need the publications; if not, contact the post adjutant general (AG) publications officer for disposal instructions.

AVIATION MAINTENANCE COMPANIES' TECHNICAL LIBRARIES

7-149. Technical files and libraries are required on all assigned/attached equipment. Reference technical libraries should be located in an area that is convenient to maintenance personnel. Every effort must be made by immediate supervisors and QC personnel to provide maintainers with the most current maintenance publications and references.

MASTER AND SHOPS TECHNICAL LIBRARIES

7-150. TIs are responsible for two types of libraries: the master and shop libraries. The master library is located in the QC office and is used by all personnel. It contains publications required to maintain all series of aircraft and components owned or supported by the aviation maintenance companies. The shops library contains manuals on the specific duties of the shop. Inspectors ensure that these manuals are complete and up-to-date. TIs also check the master and shop libraries quarterly to ensure the following:

- Libraries are located conveniently to users.
- Libraries are set up alphanumerically.
- All required manuals are on hand or on order.
- No unnecessary publications are on hand.
- Changes are posted, and indexes reflect the status of publications on hand.
- No superseded or rescinded manuals are used.
- Classified manuals are controlled according to the AR 380 series.

PUBLICATIONS FILING SYSTEM

7-151. Technical publications (to include ETMs/IETMs) files will be maintained according to AR 25-400-2. DA Pamphlet 25-30 contains an index of DA publications and forms; publications will be verified against the listings in the latest index to ensure that they are current.

INTERSERVICE PUBLICATIONS ACCOUNTS

Air Force Publications

7-152. Some of the equipment used by the Army is procured through the Air Force. Publications to support these interservice items, however, are not always obtained with the equipment. To establish an Air Force publications account, use the following procedures:

- Complete two copies of Air Force Technical Order (AFTO) Form 43 (Air Force Technical Order).
- Complete one copy of AFTO Form 187 (Resupply and Initial Distribution Form).
- Mail copies to Commander, Oklahoma City Air Logistics Center, ATTENTION (ATTN): OC-ALC/M-MDUB, Tinker Air Force Base (AFB), OK 73145.

Navy Publications

7-153. Navy Publications and Forms Center (NPFC) 2004 will be used to order Navy publications. This index is available only on microfiche. There is no charge for Navy publications, but there is a charge for blank forms. To obtain permanent distribution of the index, write to Naval Publications and Forms Center, 5801 Tabor Avenue, ATTN: CODE 1011, Philadelphia, PA 19120.

7-154. Once an account is established, Navy publications can be ordered using DD Form 1348M (DOD Single Line Item Requisition System Document [Mechanical]). Requisitioning instructions are in AR 725-50. An authorized DODAAC number, which can be obtained from the unit supply document register, must be assigned to DD Form 1348M to order Navy publications.

7-155. After a UIC is established, publications are mailed to the address on the DODAAC. Permanent distribution of publications is obtained by writing to Commanding Officer, Naval Air Technical Services Facilities, 700 Robins Avenue, ATTN: CODE 321, Philadelphia, PA 19111. Binders used to store publications are available through the same procedures.

SECTION V – ULLS-A QUALITY CONTROL PROCEDURES

Note. If the server is down for any reason, quality control will process all logbook entries manually. Once connectivity is restored, all manual entries will be uploaded in ULLS-A.

ULLS–A QUALITY CONTROL PROGRAM ADMINISTRATION

7-156. The ULLS-A Quality Control Menu provides access to change, add, modify, and delete personnel, aircraft, and required maintenance or inspection data in the ULLS-A database. Each function is addressed in the ULLS-A EUM.

ULLS–A QUALITY CONTROL FUNCTIONS

7-157. Although commissioning and decommissioning of the deployed server are the responsibility of production control, QC personnel will assist in the process. The ULLS-A deployed server allows the unit the flexibility to push aircraft away from the primary database to support area operations. The deployed server enables TIs to have access to the historical records and migrate information back to production control for flight hours and reporting purposes.

7-158. When the aviation maintenance unit is conducting split-based operations, the Deployed Server Function provides a unit with the capability to deploy aircraft to support operations away from the unit's primary database. The deployed server allows quality control personnel access to all available QC functions, except program administrator functions.

7-159. The ULLS–A automated quality control program provides full data entry, editing, review, and report-generation capabilities. All DA Pamphlet 738-751 required forms and reports are provided in a paperless electronic environment.

Note. Refer to the ULLS–A End Users Manual (EUM) for additional user information and procedural guidance.

7-160. Five primary areas are shown on the Quality Control main menu screen (see Figure 7-9):

- "AIRCRAFT IDENTIFICATION CARD."
- System Status block.
- Menu toggle arrows.
- Main menu utilities.
- Flight/maintenance records.

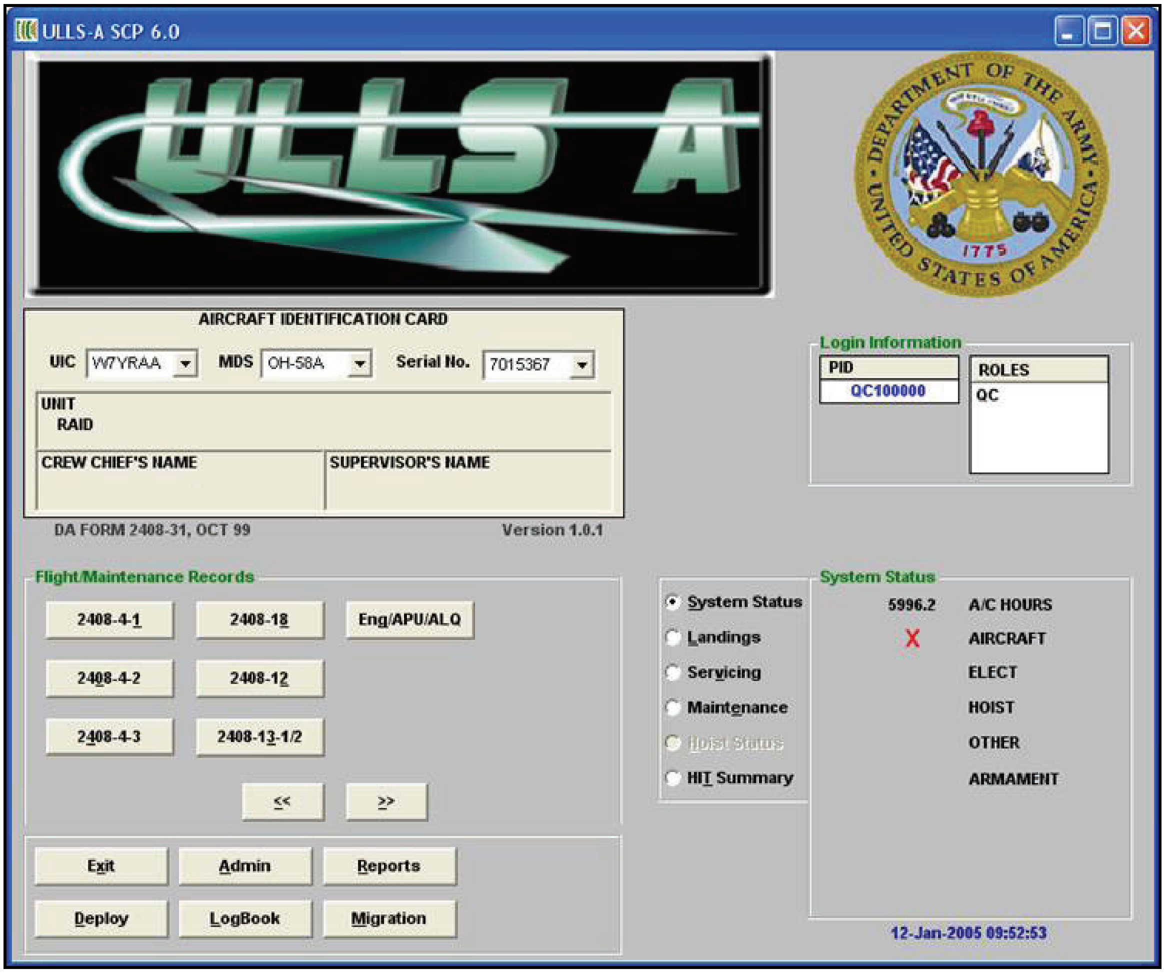


Figure 7-9. Quality control main screen menu

QUALITY CONTROL AIRCRAFT IDENTIFICATION CARD

7-161. The aircraft identification card is displayed on the upper-left area of the main menu screen (see Figure 7-9). Select UIC by clicking on the down arrow; from the drop-down list provided, select the assigned UIC. The same process can be used to select MDS; for example, UH-60A/L/M or AH-64A/D, as well as to select a specific aircraft serial number.

7-162. Once the UIC, MDS, and specific aircraft serial number are selected (highlighted), the data selected will appear in the field; the corresponding unit, crew chief, and supervisor names will be displayed. Selecting individual aircraft allows automated QC users to browse and view all records previously saved and migrated by ULLS-A Automated Logbook users.

QUALITY CONTROL SYSTEM STATUS BLOCK

7-163. The "System Status" block (Figure 7-9) on the lower right portion of the main menu screen provides a broad range of data for the aircraft and the current data and time. To view the data provided in the status block, click on the corresponding bullet with the mouse. The following data are provided:

- System Status.
- Landings.
- Services.
- Maintenance.

- Hoist Status.
- HIT summary.

Note. Like most software programs, ULLS-A uses the operating system clock as a time stamp. Do not change the computer's system clock settings without the guidance of the system administrator.

7-164. The "System Status" box indicates the status of aircraft hours and mission-related equipment aboard the aircraft. Once the aircraft is selected, it will show the current aircraft hours, the most critical open aircraft fault status, the most critical open weapon fault status, the most critical open electronic fault status, the most critical open hoist fault status, and the most critical related open fault status.

7-165. The "Landings" status box displays the current total number of standard and autorotational landings that the aircraft has executed.

7-166. The "Maintenance" status box is used to show either the status for preventive maintenance daily (PMD) or 10-hour/14-day inspection information, depending on the aircraft model. Information contained within this status box includes the following:

- The current preventive maintenance type.
- The date when the PMD inspection was completed.
- The aircraft hour when the PMD inspection was completed.
- The PID of the individual responsible for completing the PMD inspection.
- The next phase (type) maintenance (type) due.
- Aircraft hours when the next phase maintenance is due.

7-167. The "Hoist Status" box displays the current status of the hoist. Information contained within this status box includes the following:

- The serial number of the hoist.
- The status of the hoist.
- The cycles of the hoist.
- The current number of hours on the hoist.
- When the last 30-day inspection of the hoist was completed.

7-168. The health indicator test (HIT) Summary status box will display engine exhaust temperature and altitude ratios measured against maintenance officer created HIT check baseline ratios for the last 26 flights. Each engine has different formulas for determining HIT check values and their acceptable deviations from baseline ratios. The HIT check summary displays the following:

- Current aircraft hours.
- Flight date.
- Flight number.
- Engine HIT check values.
- HIT baseline button.

ULLS–A AUTOMATED QUALITY CONTROL RECORDS

7-169. There are three primary records menus in the Automated Quality Control program:

- Flight/Maintenance Records.
- Historical Records and Forms.
- Readiness/Other Records).

7-170. Automated Quality Control users can browse and view the "Flight/Maintenance Records" previously saved and migrated by ULLS-A Automated Logbook users. ULLS-A provides access to historical records, data entry, and utility features for the following records: flight/maintenance records and historical records.

7-171. ULLS–A “Flight/Maintenance Records” (see Figure 7-10) include the following automated forms:

- (DA Form) 2408-4-1 (Weapons Record Data).
- (DA Form) 2408-4-2 (Weapons Sighting Data).
- (DA Form) 2408-4-3 (Weapons Sighting Data).
- (DA Form) 2408-18.
- (DA Form) 2408-12.
- (DA Form) 2408-13-1/2.
- Eng/APU/ALQ (engine, auxiliary power unit [APU] history recorder, and ALQ-144 meter readings).

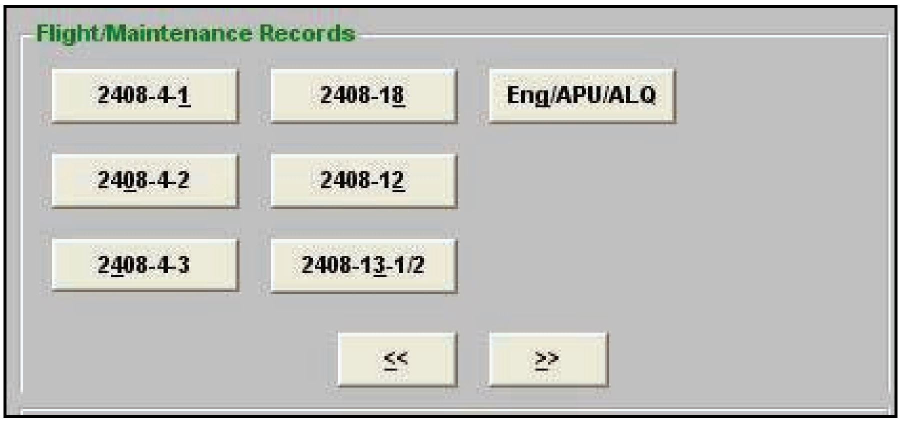


Figure 7-10. Flight/Maintenance Records menu

7-172. ULLS–A historical records (see Figure 7-11) include the following automated DA forms:

- 2408-5/-1.
- 2408-15.
- 2408-15-2.
- 2408-16/-1.
- 2408-17.
- 2408-19.
- 2408-19-1.
- 2408-19-2.
- 2408-19-3.
- 2408-20.
- 2408-33R (Meter Tracked Component Record).

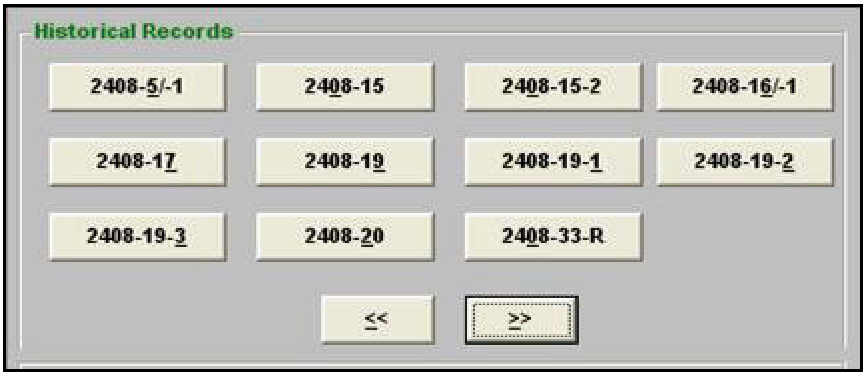


Figure 7-11. Historical Records menu

7-173. The ULLS-A Quality Control administrative menu provides access to change, add, modify, and delete personnel, aircraft, and operational and required maintenance or inspection data in the ULLS-A database (Figure 7-12).

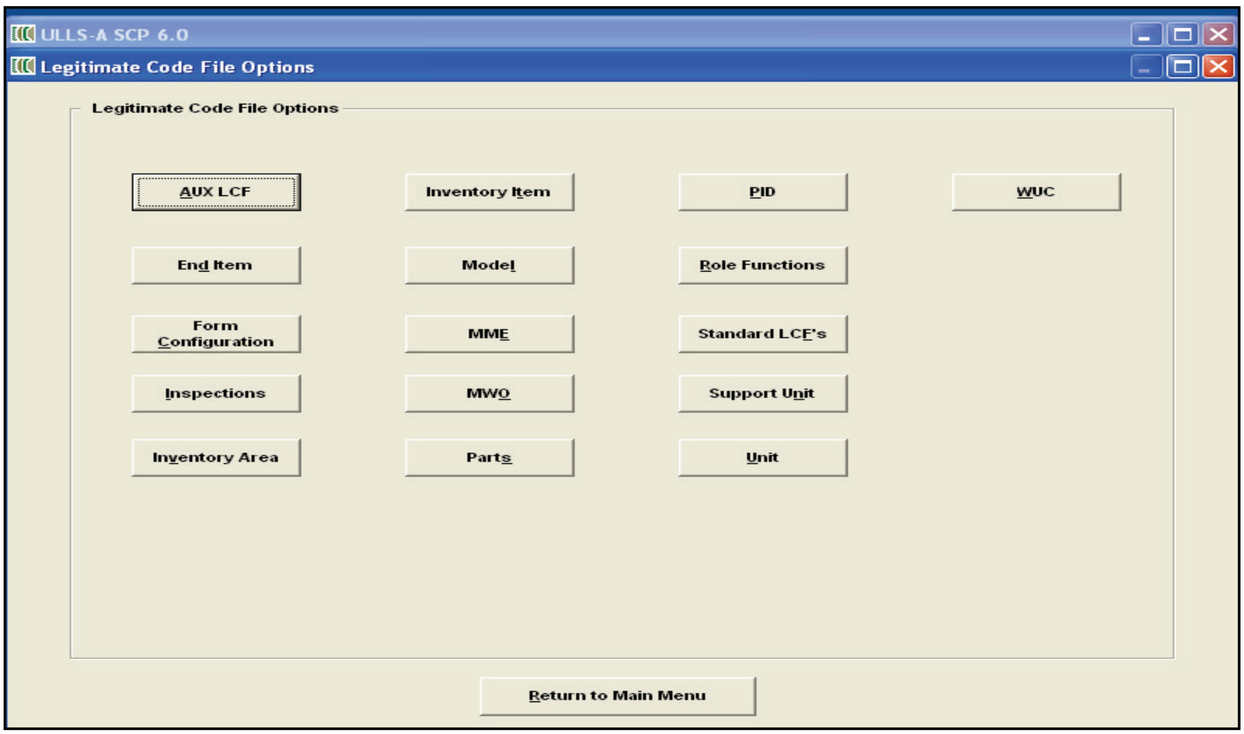


Figure 7-12. Administrative menu, Legitimate Code File Options

Chapter 8

Aviation Logistics/Technical Supply Management and Operations

This chapter provides the AMC and ASC commanders, maintenance officers/technicians, and maintainers across the Army's spectrum with the management tools to address and resolve aviation logistic issues. Effective aviation logistics management operations mean obtaining the right logistics support, from the right source, at the right time. This chapter provides aviation logistics/supply personnel and aircraft maintainers with a "**how-to**" on aviation logistics management procedures. Aviation logistics management involves identifying, procuring, and maintaining the minimum assets required to meet the current OPTEMPO in the COE. AMC and ASC maintenance officers and technicians are responsible for managing aviation logistics operations. AR 710-2, DA Pamphlet 710-2-1, and DA Pamphlet 710-2-2 address aviation logistics procedures and policies.

SECTION I – AVIATION LOGISTICS/TECHNICAL SUPPLY SECTION PERSONNEL DUTIES AND RESPONSIBILITIES

AVIATION LOGISTICS/ TECHNICAL SUPPLY OFFICER

8-1. The aviation unit maintenance commander personally selects the aviation logistics/technical supply officer based on training, demonstrated skills, qualifications, and documented experience. Preferably, the aviation logistics/technical supply officer is a graduate of the aviation maintenance manager course. He is responsible for and has oversight over the internal management and daily operations of the aviation logistics/technical supply section to include requesting, processing, issuing, stocking, and turning in aircraft repair parts and components.

> ***Note.*** The assignment of the aviation logistics/technical supply officer is an additional duty.

8-2. He will coordinate high-priority UND A and B parts requests with the unit's production control officer. If authorized by the commander, the aviation logistics/technical supply officer will certify and authorize all high-priority requisitions.

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AVIATION LOGISTICS/TECHNICAL SUPPLY NONCOMMISSIONED OFFICER

8-3. Aviation logistics/technical supply NCOICs are school trained. Preferably, the NCOIC will be the most senior logistician assigned to the unit. He will be directly responsible for the operational management of the aviation logistics/technical supply section to include the request, issue, stockage, and turn in of all Class 9 (Air) repair parts and components.

8-4. He will coordinate high-priority requests with the aviation logistics/technical supply officer. He will be directly involved in the request process of high-priority (UND A and B) requisitions. The aviation logistics/technical supply NCOIC directs the work and supervises all aviation logistics/technical supply actions assigned to the logistics clerks. The aviation logistics/technical supply NCOIC is directly responsible to the aviation logistics/technical supply OIC and, ultimately, to the aviation maintenance commander.

8-5. Aviation logistics/technical supply personnel must have a working knowledge and understanding of FEDLOG and national stock number breakdown. Refer to DA Pamphlet 710-2-2 for more information on cataloging and NSN breakdown.

AVIATION LOGISTICS/TECHNICAL SUPPLY CLERK

8-6. Aviation logistics/technical supply clerks are school trained. Preferably, the Class 9 (Air) logistics clerk will be the most skilled, qualified, and experienced enlisted logistician in the aviation unit. He processes all high-priority (UND A and B) and routine priority (UND C) aircraft requisitions. He will be responsible for requesting, issuing, stocking, and turning in all Class 9 (Air) repair parts and components. Clerks are responsible to the aviation logistics/technical supply OIC, the NCOIC, and ultimately, the aviation unit maintenance commander.

SECTION II – AVIATION LOGISTICS MANAGEMENT PRINCIPLES

CLASSES OF SUPPLY

8-7. Below are the 10 Army classes of supply identified and defined in Table 1-1 of AR 710-2. Of these classes of supply, the ones most commonly used in support of Army aviation maintenance are Classes 2, 3, and 5 and Class 9 (Air):

- **Class 1** – Subsistence, including free health and welfare items.
- **Class 2** – Clothing, individual equipment, tentage, tool sets and tool kits, hand tools, and administrative and housekeeping supplies and equipment (including maps). Class 2 items include items of equipment, other than major items, prescribed in authorization/allowance tables and items of supply (not including repair parts).
- **Class 3** – POL, petroleum and solid fuels, including bulk and packaged fuels, lubricating oils and lubricants, petroleum specialty products; solid fuels, coal, and related products.
- **Class 4** – Construction materials, to include installed equipment and all fortification/barrier materials.
- **Class 5** – Ammunition of all types (including chemical, radiological, and special weapons), bombs, explosives, mines, fuses, detonators, pyrotechnics, missiles, rockets, propellants, and other associated items.
- **Class 6** – Personal-demand items (nonmilitary sales items).
- **Class 7** –Major end items are equipment that is ready for its intended use: (principal items); for example, helicopters, launchers, tanks, mobile machine shops, and vehicles.
- **Class 8** – Medical material, including medical-peculiar repair parts.

- **Class 9** – Repair parts and components—including kits, assemblies and subassemblies, and reparables and nonreparables—needed to provide maintenance support of all equipment to include aviation-specific repair parts categorized as Class 9 (Air).
- **Class 10** – Material to support nonmilitary programs, such as agricultural and economic development, not included in Classes 1 through 9.

CATEGORIES OF SUPPLY

8-8. Supplies are requested and issued using three categories of supply. The three categories of supply are scheduled, demanded, and regulated.

SCHEDULED

8-9. Scheduled supplies may be reasonably predicted. Requisitions usually are not required for replenishment. Requirements are based mainly on troop strength, equipment density, mission demands, forecasts, or daily usage or a combination. Scheduled supplies normally are shipped to users based on preplanned distribution schemes.

8-10. Classes 1, 3 (bulk), 5, and 6 are typically scheduled supplies. Classes 1 and 6 are based on troop strength. Class 3 (bulk) is based on long–range forecasts, equipment densities, and historic usage factors. Class 5 is based on densities of weapons and the unit's assigned mission. Class 9 (Air) is based on aircraft flight-hour demands to ascertain predictable repair parts and kits required to support the established scheduled supplies.

DEMANDED

8-11. A requisition must be submitted for demanded supplies. Items in Classes 2, 3 (packaged), 4, 5, and 9 (Air) are considered demanded supplies. Aviation repair parts fall into this category and must be requisitioned through organizational STAMIS.

REGULATED

8-12. Regulated supplies may be scheduled or demanded. The commander and his staff must, however, closely control these supplies because of scarcity, high cost, and mission needs. Any item or group of items may be designated as regulated; normally, some items in Classes 2, 3 (bulk), 4, 5, and 7 are regulated. If an item is regulated, the commander who so designated it must approve its release before it is issued. Items designated as command–regulated are identified in operation plans and orders.

TYPES OF SUPPLIES

8-13. For accountability purposes, all Army property (except real property) is classified as expendable, nonexpendable, and durable. An accounting requirements code (ARC) is assigned to each item of supply to identify its specific classification and the degree of accounting and control that must be applied at the user level.

EXPENDABLE

8-14. Expendable items are identified by an "X" found in the ARC column of the AMDF contained on FEDLOG. Supplies that lose their identity when used to repair or complete other items are considered to be expendable. Examples are assemblies, repair parts, and accessories. This category includes all Class 9 (Air) repair parts and all items that are consumed in use, regardless of price. Some items, although classified as expendable, require additional supply and issue controls such as component assemblies, repair parts, and accessories identified as recoverable or pilferable items.

NONEXPENDABLE

8-15. Nonexpendable items are identified by an "N" found in the ARC column of the AMDF contained on FEDLOG. Nonexpendable supplies include all Class 7 items; these items will be assigned a line-item number. The AMDF contained on FEDLOG holds pertinent data, to include line numbers.

DURABLE

8-16. Durable items are identified by a "D" found in the ARC column of the AMDF contained on FEDLOG. The PBO at the appropriate level of command will designate the level of responsibility that will maintain the durable document register.

8-17. Each organizational element authorized by the PBO to request supplies will keep a document register for all supply actions. Durables require no formal accounting after issue to the user level but require hand-receipt control for hand tools that are coded durable.

Note. Refer to AR 735-5 for regulatory policies and procedural guidance.

METHODS OF DISTRIBUTION

8-18. A company uses voice or digital means to request resupply and report status. The method used is determined after an analysis of the factors of METT-TC. The Army has focused its doctrine on using distribution-based logistics. Distribution management centers (DMCs) manage distribution of all resources in their area of responsibility. The three distribution methods of resupply are supply point distribution, unit distribution, and throughput distribution.

SUPPLY POINT DISTRIBUTION

8-19. In supply point distribution, the supplying unit issues supplies from an established supply point. Aviation logistics/technical supply personnel move to a supply point to pick up their supplies, using their organic transportation and transport supplies to their area of operations.

Note. Generally, this the normal method used to distribute supplies to requesting units.

UNIT DISTRIBUTION

8-20. In unit distribution, the ASB may use combat logistics patrols (CLPs) to conduct unit distribution operations. Unit distribution provides delivery of supplies directly to the unit. A unit representative meets the resupply package at the logistics resupply point (LRP) and guides the package to the battalion or company's position.

THROUGHPUT DISTRIBUTION

8-21. Throughput distribution to combat units (forward areas) leverages configured loads, containerization, information, force structure design, technological enablers, and command-and-control relationships to deliver sustainment from the operational level directly to the requesting unit or the direct support unit. Shipments bypass one or more echelons in the supply chain and speed delivery forward. Throughput is more responsive to the user and provides more efficient use of transportation assets.

8-22. Throughput distribution reduces exposure to pilferage and damage. It is also more responsive to the needs of the user. Supplies are throughput, whenever possible, from the point of debarkation (POD) or local sources to the corresponding SSA based on the class of supply being delivered to the requesting unit. Throughput is used frequently to resupply FARP operations.

SECTION III – MANAGING AIRCRAFT COMPONENT REPLACEMENT OR EXCHANGE

REPARABLE EXCHANGE

8-23. To minimize downtime of aircraft assigned to aviation units, ASC SSAs maintain, on hand, a selected list of aircraft RX parts. When alerted by the PC OIC or maintenance officer/technician, assigned aviation logistics/technical supply personnel will scrub internal repair parts lists to see if the aircraft parts needed are aircraft RX parts.

8-24. If needed repair parts are RX items, aviation logistics/technical supply personnel will initiate the required forms to request serviceable RX aircraft repair parts or components. Request for turn-in forms must also be initiated to accompany unserviceable repair parts.

> ***Note.*** Aviation units must comply with applicable references and publications when processing requests for issue/turn-in documents. In addition, when processing unserviceable aircraft repair parts and components, aviation logistics/technical supply personnel must comply with guidance contained in the external SOP distributed by the ASB SSA.

8-25. Automatically generated forms or hard copies of DA Form 2765-1 (Request for Issue) and/or DA Form 2765-1 (Request for Turn-in) are prepared and hand-carried, along with the unserviceable components, to the ASB RX section for exchange with a serviceable item. Ensure that demands for components are logged into the STAMIS of record by the aviation logistics/technical supply clerk.

8-26. The RX program quickly provides the system with serviceable recoverable items on hand for issue on a one-for-one exchange basis. RX is a supply system maintained and managed by the SSA at the ASB level.

8-27. RX procedures exchange serviceable aircraft repair parts, components, and assemblies for unserviceable items using standard issue and turn-in documents and procedures. Normally, items being exchanged must be reparable or recoverable. However, RX is sometimes used for other types of items for which issue must be controlled.

8-28. An RX listing containing the NSN, item description, end-item application, and authorization will be distributed to all units supported by the ASB. RX items are normally not authorized on the unit's PLL. All RX stocks should be located and maintained at the ASB SSA level.

CONTROLLED EXCHANGE

8-29. Extreme care should be exercised by maintenance officers and technicians when contemplating controlled exchange actions; continued use of the same aircraft or weapon system for repair parts will lead to further and complete degradation of these systems. Instead, attention should be given to meticulous management of the supply system and its request process—more so when they are managing repair parts that are in short supply in the pipeline.

8-30. The unit's maintenance SOP must delineate responsibilities and actions to be taken by all maintenance and logistics personnel to ensure strict compliance with the unit's controlled exchange program. Aviation logistics/technical supply personnel must pay particular attention to the following:

- The aircraft upon which the exchanged parts will be installed is NMCS and replacement aircraft repair parts or components are on order and have a valid document number.
- Required aircraft repair parts or components are not available from the SOS within the RDD indicated on the maintenance request.
- Once a controlled substitution or exchange action has been approved by the approving authority, the needed repair parts must be placed on order for the donor aircraft as the controlled exchange action begins; if possible, requested parts should have a valid supply or shipping status.

- The unserviceable component is green tagged with the donor aircraft information and either work ordered to an ASC or prepared for turn-in to an SSA; this tagging is to retain the identity and integrity of the donor airframe or weapon system.
- When the controlled exchange satisfies a requirement already in the Army supply system, that requisition will be either canceled or used to restore the unserviceable end item or weapon system to FMC.
- All possible alternatives, to include a horizontal and vertical search of the supply system for needed aircraft repair parts, are explored before a controlled substitution or exchange action takes place.
- A document number search for the aircraft part or component has been made to ensure that the part is not available for issue from the ASB's SSA.

CANNIBALIZATION POINTS

8-31. According to AR 710-2, commanders authorized to establish a stock record account may authorize the setting up of cannibalization points. The number will be limited to those required to recover selected serviceable items from disposal material (accident-damaged aircraft repair parts). All parts and components removed from crash-damaged aircraft must be inspected, according to TM 1-1500-328-23, before being authorized for use on serviceable aircraft. Cannibalization points are established to provide—

- A supply source for difficult-to-obtain repair parts, components, and assemblies.
- A source of supply for high-priority requirements when delivery cannot be made by the required delivery date.
- A source of supply for items not stocked in the supply system.
- A listing of items available for cannibalization, provided at least quarterly to customers.

AIRCRAFT/COMPONENT MAINTENANCE FLOAT PROGRAM

8-32. The aircraft/component maintenance float program assists in maintaining the readiness posture of units during peacetime. It provides a quantity of selected end items authorized for stockage at a depot or Army command stock record account. It will be used for replacement of like items turned in by using units for which an immediate replacement is required to maintain an acceptable level of materiel readiness during peacetime. Two types of float are authorized: repair cycle float and operational readiness float.

Note. Refer to AR 750-1 for regulatory policy and procedural guidance on RCF and ORF.

REPAIR CYCLE FLOAT

8-33. An additional quantity of selected end items or major components of equipment is authorized for stockage at the wholesale supply system to replace like items of equipment withdrawn from using activities for scheduled depot maintenance or, in the case of aircraft, the depot maintenance of crash-damaged equipment. This float is primarily used to extend the economic service life of selected items of Army materiel by providing for timely depot maintenance without detracting from the materiel readiness of using activities.

8-34. RCF is a national asset, consisting of an authorized quantity of assets, used by the National Inventory Control Point (NICP) to replace like items turned in by the owning unit for a planned depot repair program. The NICP may issue RCF assets to fill MTOE/modified tables of distribution and allowances (MTDA) or ORF shortages when other assets are not available and directed to by the Army G3/Assistant Chief of Staff, G5, (Civil Affairs [G5]).

OPERATIONAL READINESS FLOAT

8-35. ORF is a strategic asset deployed to an installation, consisting of an authorized quantity of assets used to maintain established readiness levels or meet training availability requirements during peacetime.

ORF is a quantity of selected end items or major components of equipment authorized for stockage at CONUS installations and overseas support maintenance activities to extend the capability to respond to the materiel readiness requirements of supported activities.

8-36. The ORF program assists in maintaining the readiness posture of combat units, to include aviation units and specialized activities. The ORF is an additional controlled level of selected mission-essential items of equipment authorized to be on hand to meet unprogrammed aviation maintenance requirements when repair of similar items from a unit cannot be accomplished in a specified time.

8-37. The exchange of an unserviceable reparable end item for an ORF asset will be accomplished as simultaneous (turn-in and issue) property book transactions. Guidance for request for issue and turn-in procedures of ORF assets will be outlined in the SSA's external SOP. The SPO officer or distribution management officer (DMO) will determine when ORF assets will be used to satisfy a supported unit's required delivery date (RDD).

SECTION IV – AVIATION LOGISTICS MANAGEMENT PROCEDURES

MANAGEMENT OF LOADS

8-38. The requirement to keep records for basic and operational loads will be minimized. Document registers will continue to be kept to prevent duplicating document numbers and to assist in reconciliation or validation when required. The document number, description, quantity, and date completed are the minimum required to be posted to the document register. The units assigned ULLS-A will also track logistics transactions and related information.

8-39. Records of demands are critical and will be kept as a database for submission of replenishment requests. Units will keep basic loads and PLLs continually replenished. The four types of loads are basic loads, operational loads, ammunition basic loads, and prescribed loads.

BASIC LOADS

8-40. Basic loads are Army command-designated quantities of Classes 1 through 5 (Class 5 basic loads will not be used for training unless approved by HQDA DCS, G4 [DALO–SMA]), allowing a unit to initiate its combat operations.

8-41. Basic loads must be capable of being moved into a combat environment using organic transportation in a single lift. Basic load quantities will be used to support peacetime operations only when no supporting operational loads are available. Basic load items subject to deterioration or having a shelf life will be replaced as required. Excesses in basic loads caused by unit pack may be kept and used.

OPERATIONAL LOADS

8-42. Operational loads are quantities of Classes 1 through 5 (including maps) and 7 (except medical equipment repair parts) that a unit or organization is authorized to stock. These sustain its peacetime operation for a specific time.

8-43. These supplies may be moved into a combat environment if transportation is available after essential lift requirements have been met. Up to a 15-day stockage of expendable Classes 2, 3 (packaged), 4 and 7 supplies is authorized, based on the allowance in CTA 50–970.

AMMUNITION BASIC LOADS

8-44. Basic load of Class 5 supplies will be accounted for on property books. Records of responsibility are required. Army commands will designate which units are required to stock ammunition basic loads (ABLs) and prescribe the stockage requirements. Units not designated to actually have an ABL on hand will have a properly prepared and authenticated DA Form 581 on hand. This DA Form 581 will serve the purpose of satisfying the requirement for the ABL to be on hand or on order.

8-45. The PBO provides an information copy to the supporting ASP who will, depending on mission need and storage capability, ensure that either the ammunition is stocked or a pre-positioned requisition is in place for the ammunition required. The PBO will maintain the basic load authorization data on the property book to expedite deployment. Class 5 basic loads will not be used for training unless approved by HQDA DCS, G4 (DALO-SMA).

PRESCRIBED LOADS

8-46. Stockage of PLL line items is demand supported. AMC and ASC commanders must approve and sign the PLL list. Once the PLL is approved and signed, aircraft repair parts and components listed in the PLL can be stocked. In addition, AMC and ASC commanders must approve stockage of nondemand-supported repair parts in the PLL. Stockage of nondemand-supported repair parts is limited to 15 lines.

8-47. Army aviation maintenance units will ensure that PLL authorized for their units meets the following requirements:

- Records will be maintained reflecting demands and consumption and will be periodically reviewed (quarterly for the Active Army and semiannually for the United States Army Reserve (USAR) and ARNG).
- The total numbers of lines on a PLL will not exceed 150 lines according to AR 710-2; this limit does not apply to AMCs.
- PLL and related records will be kept in an area convenient to unit maintenance operations.
- Commanders will ensure that PLL is reviewed (monthly for ULLS-A users) and inventoried quarterly (semiannually for ARNG and USAR).
- Inventory results will be documented and maintained until the next inventory is conducted, and adjustments will be made according to AR 735–5.
- Commanders may centrally locate the PLLs for several subordinate units.
- Service items "consumed in use"—such as nuts, bolts, screws, tubing, and other common hardware—will be maintained in an area readily accessible to unit aviation repairers and maintainers.
- These items may be carried as part of an aviation maintenance unit's bench stock; bench-stock criteria requirements are outlined in AR 710-2.

8-48. Prescribed loads are quantities of maintenance-significant Classes 2, 4, and 9 (Air) organizational maintenance repair parts kept to support a unit's daily aviation maintenance program. A PLL will consist of unit maintenance repair parts Class 9 (Air) that are demand supported and nondemand supported and repair parts that are specified as initial stockage for newly introduced end items.

PRESCRIBED LOAD LIST/SHOP STOCK LIST MANAGEMENT

8-49. STAMIS of record supports PLL/ASL management. Forms generated by STAMIS now comply with LOGSA requirements. All AMCs and ASCs must establish internal SOPs to manage their own PLL/shop stock list (SSL).

Note. AR 710-2 provides management guidance for both PLL and SSL stockage items.

8-50. Based on accumulation of demand history, SARSS generates a PLL change list for each customer. This list shows proposed additions, changes, and deletions to a unit's PLL.

8-51. PLL add-and-retain criteria are controlled by manager parameters. Each proposed addition, deletion, and stockage-level change requires subsequent action by the customer and the ASB SSA.

8-52. The customer annotates the list to show desired action on proposed changes and sends the annotated list to the SSA. Using the annotated lists, the SSA sends change cards for processing in the PLL update process. An updated PLL is provided to each customer.

LOGISTICS MANAGEMENT AUTOMATED FORMS AND RECORDS

8-53. DA Form 2063-R (Prescribed Load List) provides space for entering on-hand balances, storage locations, reviews, and inventories. DA Form 2064 (Document Register for Supply Actions) must be maintained manually if the unit's document register is not automated or when the ULLS–A is down.

Note. Refer to DA Pamphlet 710-2-1 for guidance on the use of these forms.

8-54. The ULLS-A supply management module tracks demands for all unit-generated logistics requests. Demands recorded and tracked by ULLS-A will be reviewed by aviation logistics/technical supply personnel on a recurring basis. PLL lines that fail to meet the established demand criteria as outlined in regulatory policies will be evaluated by the maintenance officer or technician for deletion from the PLL. Although the ULLS-A supply module supports PLL requirements, it does not remove the need for unit management (accountability).

Note. Refer to the ULLS–A EUM for additional user information and procedural guidance. In addition, Section X contains additional guidance on ULLS–A technical supply procedures.

8-55. SARSS-1 provides the unit demand summary list monthly to each aviation maintenance unit. The list shows the unit's demands for PLL and non-PLL items. It also provides detailed demand data for review of the unit's demand history when aviation logistics/technical supply personnel consider changes to the PLL/SSL.

8-56. Each quarter, the PLL computation subprocess of the demand analysis process generates a PLL change list for each unit. This list identifies all items recommended for additions, deletions, or changes in authorized stockage levels. NSN and MCN lists are printed in NIIN sequence. MCNs are in full stock number sequence.

8-57. The aviation maintenance officer/technician must review the demand analysis list for accuracy. The review consists of analyzing the list and considering whether to add, delete, or recommend changes to stockage levels.

8-58. Once the review is complete, recommendations will be given to the aviation maintenance commander. Commanders have three choices—approve, disapprove, or modify the recommendations—before submitting the list to the SSA.

MANAGING BENCH STOCK ITEMS

BENCH STOCK MANAGEMENT PROCEDURES

8-59. Bench stock items are authorized for all aviation maintenance activities (AMCs and ASCs). Aviation maintenance officers/technicians, based on experience, should recommend additions, deletions, or stockage-level adjustments to ensure that maintenance procedures are not halted because of a shortage of bench-stock items.

8-60. The customer's work request priority may be used to request the quantity required to complete the job when stock is at zero balance. Bench-stock items are not demand supported. The authorized stockage level will be 30 days for all units not collocated with a higher level SSA; if collocated with an SSA, the authorized stockage level will be 15 days.

Note. Refer to Appendix U for compliance guidance on management, request procedures, and computation and stockage requirements of all bench-stock items assigned to aviation maintenance units.

8-61. According to AR 710-2, bench stocks are authorized at both AMC- and ASC-level units. Bench stocks are composed of low-cost, high-use consumable Classes 2, 3 (packaged), 4, and 9 (Air) (less components) items used by maintenance personnel at an unpredictable rate. Examples of these items are common hardware, resistors, transistors, wire, tubing, hose, thread, welding rods, sandpaper, sheet metal, rivets, seals, oils, grease, and repair kits.

8-62. The commander or maintenance officer/technician is required to conduct a semiannual review of the bench stock according to AR 710-2. No specified demand criteria exist that units must meet to add line items to the bench-stock list.

BENCH STOCK MANAGEMENT IN SUPPORT OF SPLIT-BASED OPERATIONS

8-63. As Army aviation continues its transformation into the modular force structure, the AMC within each aviation maneuver battalion will be highly dependent on sound bench-stock management techniques. This dependence will increase when designated bench stock assigned to aviation units, especially the AMC, will have to support maintenance teams sliced from the AMC to support more than one aviation operational unit's mission.

8-64. At the AMC, bench-stock management can be centralized, collocated with other aircraft repair parts, and internally managed by aviation logistics/technical supply personnel. Aviation operational units are authorized a load of bench stock for their daily maintenance procedures and services. The aviation logistics/technical supply section is responsible for coordinating and overseeing accountability procedures, to include regularly scheduled inventories, as outlined in AR 710-2. Aviation operational unit's bench-stock items can be stored in flyaway containers, or similar containers, to facilitate deployment in support of split-based operations and internal daily use.

8-65. At the ASC, bench-stock management and accountability is the responsibility of the individual section or shop authorized to carry and store bench stock. Trained aviation logistics/technical supply clerks will comply with all accountability and inventory requirements for their assigned bench stock in their section or shops.

8-66. An alternate method available for ASC units is to consolidate assigned aviation logistics/technical supply clerks and combine their assigned bench stock. The clerks and consolidated bench stock (CBS) will become a section answering directly to the PC OIC and NCOIC. This new section will provide PC with a greater ability to support split-based operations and stock the parts needed to accomplish aircraft and component repair expeditiously.

8-67. An ASC consolidated bench-stock section will standardize the unit's bench-stock management procedures. The bench stock will also be in a centralized location, facilitating the procurement of bench-stock items by all maintainers. The bench-stock section, with additional clerks, will allow the PC section to provide logistics support 24 hours a day, seven days a week; these additional clerks can be used to support ASC personnel conducting split-based operations.

MANAGING SHOP STOCK REPAIR PARTS

8-68. ASL items are maintained by the ASB SSA to support and complement aviation maintenance companies' PLL. The ASL is the SSA's authority to stock the item and is both controlled and flexible. It shows items that are proven, by experience, to be sufficiently active at an SSA to warrant stockage. It also contains other items with a projected need.

8-69. Shop stocks are demand-supported repair parts and consumables stocked within a support-level maintenance activity; for example, an ASB with a support-level maintenance mission authorized by an MTOE, a table of distribution and allowances (TDA), or a joint table of allowances (JTA).

8-70. These repair parts are used internally by the ASB to accomplish maintenance requests or programmed repair. Criteria for the number of demands required and the items authorized for stockage of shop stocks are outlined in AR 710-2.

CRITERIA FOR STOCKING AUTHORIZED STOCKAGE LIST ITEMS

8-71. An ASL of repair parts is maintained at the ASB SSA. The ASL is a list of all items authorized to be stocked at a specific level of supply to meet the logistics needs of the aviation customers that they support.

8-72. The supporting SSA's ASL becomes the source of supply from which aviation units can replenish their stockage of PLL items to authorized levels. These supporting SSAs also provide a direct-exchange service for reparable components.

8-73. To support decisions to stock items, demand history files will be maintained to reflect the most recent 12-month period. At the ASB SSA, demand frequency files will be maintained for each item issued to aviation units for Classes 2, 3 (packaged), 4 and 9 (Air). Items selected for stockage will make up the ASL.

8-74. Essentiality of a repair part or component is a primary consideration when aviation logistics/technical supply personnel determine the range of items for the ASL. The essentiality code (EC) for each NSN can be found in the AMDF. Repair parts selected for stockage will be restricted to the following ECs: C, D, E, and J.

MANAGING AUTHORIZED STOCKAGE LIST ITEMS

8-75. The ASL identifies authorized items to be stocked in the SSA to support customer demands. Although an item may qualify as an ASL item, the manager may or may not add the item to the ASL because of stockage and funding constraints of the SSA. SARSS considers an item qualified for stockage when it is demand-supported, an ORF item specifically authorized for incorporation, an initial provisioning item, and a mission-essential or mandatory stockage item.

8-76. SARSS automatically considers ASL items receiving insufficient demand during a 180-day period for a stockage list code (SLC) change or for deletion from the ASL. The SSA manager is responsible for managing the ASL.

REPARABLES MANAGEMENT

8-77. The stock records officer (SRO) at the supply support activity and maintenance shop officer at the ASB jointly select DS repair items, based on demand history and maintenance data.

8-78. According to DA Pamphlet 710-2-2, reparable management includes reparable assets that have a maintenance reparability code of D, F, H, or L. These assets are job ordered by the SSA to a maintenance unit or activity, repaired or washed out, and returned to the SSA for stock or disposition. Reparables are part of the SSA ASL. Supply support activities receive, store, and issue these assets from a specific reparable exchange activity.

8-79. Reparables may be selected for stockage if these items are—

- Authorized for removal or replacement at the support maintenance level or lower according to technical publications.
- Authorized for repair at the DS level and the maintenance unit is authorized the personnel and tools to do the repair.

8-80. The SSA maintains stock records for the items and assigns an SLC of Q3. The SSA processes requests from customers who have no unserviceable turn-in if the customer request includes a valid explanation of why an unserviceable is not available for turn-in.

SUPPLY SUPPORT ACTIVITY

8-81. The installation SSA will not maintain stockage levels, except for reparables repaired by the installation for DS SSAs or installation activities that are identified as DSS customers. Requisitions for those classes of supply under DSS will flow through the installation SSA for editing, funding, and screening of excesses before being sent to the distribution management center.

SECTION V – AVIATION LOGISTICS MANAGEMENT ADMINISTRATIVE GUIDELINES

LOGISTICS MANAGEMENT STANDING OPERATING PROCEDURES

8-82. The Class 9 (Air) repair parts appendix/annex to the AMC and ASC maintenance SOP must be written and kept updated to incorporate the latest changes. The PLL/ASL section responsible for managing assigned Class 9 (Air) aircraft repair parts will outline ULLS–A or SARSS automated procedures for all assigned/attached unit Soldiers.

8-83. The SOP will reflect the automated system that the command uses. The procedures specified in the SOP must conform to all applicable guidance in governing regulations, directives, and policies. The SOP should be a day-to-day management tool, used by all personnel affiliated with the maintenance operation. AR 710-2 and DA Pamphlets 710-2-1 and 710-2-2 are essential references for maintenance officers or technicians when writing an SOP.

LOGISTICS REFERENCE PUBLICATIONS

8-84. Supply publications are essential to edit requests for repair parts. As a minimum, the following publications must be available in the aviation logistics/technical supply section of the unit:

- AR 725-50.
- AR 710-2.
- DA Pamphlet 710-2-1.
- DA Pamphlet 710-2-2.
- SB 708–21 and SB 708–22.
- SB 708–41, SB 708–42, and SB 708–43.
- AMDF contained in FEDLOG.
- Supply catalogs.
- Identification lists (ILs).
- Master cross-reference lists.
- Technical manuals, including ETMs/IETMs, or commercial equivalent for supported equipment.
- Technical bulletins.
- Modification work orders.
- Automatic return item list.

FEDERAL LOGISTICS INFORMATION

8-85. The FEDLOG database provides aircraft maintainers and aviation logisticians with the ability to search FEDLOG to identify items in the inventory and order the correct aircraft part/component the first time.

8-86. FEDLOG is a for official use only (FOUO) product. Cataloging for all services has been consolidated under the Defense Logistics Information Service (DLIS). FEDLOG information is contained on six compact disks.

8-87. Aircraft maintainers and logisticians can query FEDLOG, using the six compact disks, to obtain management data, part and reference number data, freight data, supplier data, characteristics data, and representative drawing data. FEDLOG is also available in a digital video disk (DVD) format as well as through the Internet.

8-88. FEDLOG contains more than seven million active stock numbers and more than 12 million part numbers, all of which are itemized, indexed, and searchable. With data obtained from FEDLOG, aviation logistics/technical supply personnel can—

- Process and edit customer requests.
- Ensure NSN and part number accuracy of repair parts received.
- Update stock records.
- Ensure accuracy of inventories.
- Process receipt of aircraft repair parts/components.
- Facilitate Class 9 (Air) budget reconciliations by verifying dollar-cost value of newly processed aircraft repair requests as well as verifying dollar credits received for unserviceable turn-ins.

8-89. Aviation unit personnel contact the unit's publications officer or NCOIC to request a subscription to FEDLOG. All discs must be rendered unreadable before disposal or recycling.

8-90. The aviation support team performs cataloging support for both AMCOM-managed items and used items in direct support of the following weapons systems and airframes:

- AH-64A Apache and AH-64D Apache Longbow.
- OH-58D Kiowa Warrior.
- CH-47D/F Chinook.
- UH-60A/L/M Black Hawk.
- Air Warrior Survival Systems.
- Unmanned Aircraft Systems (UAS).

8-91. For subscription information or questions regarding usage of FEDLOG, contact USAMC Logistics Support Activity, ATTN: AMXLS-MLA Building 5307, Redstone Arsenal, AL 35797-7466 or contact LOGSA via e-mail: fedlog@logsa.redstone.army.mil.

SECTION VI – CLASS 9 (AIR) AIRCRAFT REPAIR PARTS MANAGEMENT

8-92. All available diagnostics equipment should be employed to determine the reasons for malfunctions before replacement of parts. Using this equipment will minimize component replacement as a troubleshooting method. Supply and maintenance activities consume 10 percent of the Army's annual budget. A reduction in these costs means an increase in available resources to support force structure, training, and other high-priority needs.

8-93. The ability to meet training and mission objectives within available resources will depend on reducing dollars spent on replacement of reparable parts. Therefore, assigned maintainers at the lowest possible level, if not otherwise precluded by policy or capability, should repair unserviceable, economically reparable parts. Local repair should be the primary source of repair whenever possible.

STORAGE OF AIRCRAFT REPAIR PARTS OR COMPONENTS

8-94. Commanders are directly responsible for safeguarding all supplies under their control. Storage of aircraft repair parts or components is a continuation of receiving and is preliminary to issuing operations. Accuracy of records and operations is critical to ensuring that items are quickly located and ready for issue as well as to ensure the correct and timely issue of needed repair parts.

8-95. The storage activity provides physical receipt, storage, maintenance-in-storage, and safeguarding of items and records. It maintains a locator system and issues aircraft repair parts or components received from supporting supply activities. Supplies received and signed for from an SSA will be processed and document registers reconciled.

8-96. Once NMCS aircraft repair parts (high-priority requisitions UND A) are received and processed and document registers reconciled, these repair parts will not be stored. Unit aviation logistics/technical supply personnel will contact owning units for immediate pick up of all high-priority requested parts.

Note. Aircraft repair parts received and processed and not released to owning units will be stored according to guidance outlined in this section.

8-97. PLL line items categorized as sensitive, classified, and pilferable require special controls when they are stored and moved. Stocks will be stored/secured and protected according to the control inventory item code (CIIC). This code is listed in the AMDF contained on FEDLOG. Care of aircraft repair parts or components in storage will be managed and inspected according to AR 740–3 and DOD 4145.19–R–1.

8-98. Bench stock and PLL line items will be stored in an area convenient to maintenance personnel and maintenance shops/work sites. Units must emphasize proper storage of aircraft repair parts during field operations. Unprotected repair parts, components, and assemblies can quickly deteriorate if exposed to the elements.

8-99. An inspection schedule must be established for items in storage. Unpackaged and unpreserved items must be inspected for rust, corrosion, and broken packs. Particular emphasis must be placed on items with an established shelf life (such as rubber gaskets, neoprene seals, and batteries) to ensure that expired-date packages are not issued.

8-100. All storage practices should comply with safety and environmental laws and regulations. Aviation logistics/technical supply supervisors must have a rotational plan, outlined in their SOP, for their personnel to follow when issuing stocks with an established shelf life.

DETERMINING NEED AND PRIORITY OF REQUISITIONS

8-101. The maintenance status of an airframe will determine the urgency of need for a specific requisition. The UND for a specific repair parts request will be determined by the production control officer or maintenance officer/technician.

Note. Refer to Section X of this chapter and the ULLS–A EUM for procedural guidance on using the technical supply module.

8-102. If an airframe is at work stoppage because of the lack of parts (NMCS), parts requested against that particular airframe will be ordered using a UND of "A," high priority. UND of "A," combined with the aviation unit's force activity designator (FAD), will determine the highest priority to be used.

Note. Refer to DA Pamphlet 710-2-1, Table 2-1, for further guidance.

8-103. If maintenance actions continue on an airframe and additional parts are still needed, then a UND of "B" high priority will be used to request serviceable replacement aircraft repair parts or components. UND of "B" high priority will be used by aviation logistics/supply personnel when requesting replacement PLL line items that are at zero balance. UND of "B," combined with an aviation unit's FAD, will determine the highest priority to be used.

Note. DA Pamphlet 710-2-1, Table 2-1, contains further guidance.

8-104. The commanding officer or his designated representative (in writing) of the requisitioning activity will personally review and approve all requisitions identified for expedited handling. The parts requisition classified as code "999," when used with an AOG classification, is approved for processing only when it meets the following conditions:

- The requisitioning unit is assigned FAD I, II, or III.
- The aircraft repair parts or components required are causing aircraft mission–essential systems or subsystems to be incapable of performing any of their assigned missions (NMCS).

- Unserviceable aircraft repair parts or components have been identified during maintenance or troubleshooting; serviceable aircraft repair parts are necessary to prevent aircraft mission-essential systems or subsystems from being unable to perform assigned operational missions or tasks. Required serviceable parts are needed within five days of the date of the requisition.

8-105. Limits to the quantity of AOG requisitions per aircraft while it is in a theater of operations will be established by the commodity command. The AOG approving authority at the DMC materiel readiness branch will validate that the affected aircraft is NMCS for that particular part order with an AOG project code.

> ***Note.*** Code 999 will also be used to identify items or equipment designated by the commanding officer or his designated representative as critically needed to perform the mission of the overseas unit/unit alerted for overseas deployment.

8-106. All other aircraft repair part or component requests, to include bench stock or forecasted requirements, will be processed using a UND of "C." UND of "C," combined with the aviation unit's FAD, will determine the priority to be used.

8-107. Should a UND of "C" priority request change to a high priority, submit a modification document to reflect the higher PD. Refer to AR 710-2 or Chapter 8 for guidance on submitting modification documents.

REQUISITION OF AIRCRAFT REPAIR PARTS

8-108. Aviation maintenance officers/technicians must manage Class 9 (Air) aircraft repair parts or components to reduce downtime of assigned aircraft. Effective management and disposition of aircraft repair parts will have a positive effect on aviation maintenance operations.

> ***Note.*** Refer to Section X of this chapter and the ULLS–A EUM for procedural guidance on using the technical supply module.

8-109. The aviation logistics/technical supply section, PC, QC, and line companies need to coordinate their efforts when making aviation logistics management decisions. The following questions will assist in determining the total logistics requirement for a unit's mission:

- How will an aggressive OPTEMPO affect maintenance operations?
- If the OPTEMPO is going to be high, will the Class 9 (Air) budget be robust enough to sustain it?
- How will unscheduled maintenance requirements affect the line company's operational tempo?
- Is the unit adhering to the PC section's aircraft flow chart?
- What TBO change components are coming due?
- What is the overall maintenance condition of a unit's assigned aircraft?
- Are serviceable repair parts available to fix an aircraft; if not, are they on order?
- Are the document numbers assigned to these parts valid?
- Is the shipping and supply status issued against these document numbers valid?
- Has a coordinated effort been made to schedule aircraft flight hours to match scheduled maintenance and supply delivery dates?

8-110. Aviation logistics/technical supply personnel will process all aircraft repair parts or component requests. They fill aircraft parts requisitions using internal Class 9 (Air) assets; these assets consist of bench stock and PLL line items. If the item is not stocked on the PLL or is at zero balance, the requisition is passed to the assigned SSA.

8-111. The SSA will fill the request from internal ASL assets or pass the requisition to the DMC. The SSA stores Class 9 (Air) ASL aircraft repair parts in support of maintenance requirements of all aviation maintenance units.

8-112. Aviation logistics/technical supply personnel must review all repair parts lists, to include bench stock and PLL, for availability before processing a request to a higher SOS. This review must include verification that the primary NSN being requested has no substitutes.

8-113. Aviation logistics/technical supply personnel will refer to the interchangeability and substitutability (I&S) file of FEDLOG for interchangeable or substitutable aircraft repair parts. This review will prevent needless aircraft downtime—when interchangeable or substitute repair parts may be readily available within the installation or command. AMC and ASC must submit all requests for supplies, regardless of source of supply, to the specific SSA that supports the unit for the specific class of supply requested.

AIRCRAFT REPAIR PARTS REQUISITION APPROVING AUTHORITY

8-114. Commanders are responsible for the accurate assignment of priority designators. The commander will either personally review or delegate this authority, in writing, on a memorandum order or a DA Form 1687. Normally, the production control officer or maintenance officer/technician, operating under a delegation of authority from the commander, will certify high-priority parts requests. DA Pamphlet 710-2-1 contains more guidance.

Note. Refer to Section X of this chapter and the ULLS–A EUM for procedural guidance on using the technical supply module.

8-115. Maintenance officers/technicians will refer to applicable technical manuals, including ETMs/IETMs, and verify the source, maintenance and recoverability (SMR) codes before authorizing high-priority aircraft repair part or component requests. Once an aircraft repair part is verified as authorized for the specific level of maintenance, the maintenance officer/technician will certify the request. Once the request is certified and approved, aviation logistics/technical supply personnel will process the repair parts request.

8-116. Maintenance officers/technicians will enter their initials on automatically generated document registers or DA Form 2064 if using manual document registers for all high-priority UND “A” and “B” aircraft repair parts requests that they have authorized. DA Pamphlet 710-2-1 and AR 725-50 contain further guidance.

8-117. ASB maintenance officers may provide authorization to perform a higher level of maintenance by aviation support company maintainers through an LOA. An LOA request will be processed through the ASB maintenance facility. The approved LOA serves to authorize initiation of the necessary repair parts requests. In these austere times of budget constraints, failure to obtain approval before ordering repair parts can have a significant effect on unit Class 9 (Air) budgets because not all LOA requests submitted are approved.

ISSUE OF AIRCRAFT REPAIR PARTS

8-118. Upon assuming command, aviation maintenance commanders will send a copy of assumption of command orders or appointing memorandum to each SSA and aviation logistics/technical supply section at ASC from which supplies are drawn. These documents authorize the commander/accountable officer to request/receipt for supplies. DA Form 1687 is used by the commander to designate additional responsible personnel to sign for and receive aircraft repair parts.

8-119. SSAs and aviation logistics/technical supply sections at ASCs will have assumption of command orders and DA Form 1687 on-hand from supported aviation unit commanders before aircraft repair parts will be released to aviation unit personnel. Logistics personnel will immediately notify requesting units when high-priority UND “A” and “B” repair parts are ready for pickup.

8-120. At both the AMC and ASC level, internal mechanisms, such as a logbook, can be used to track release of aircraft repair parts to requesting units. Logbook headings should include, as a minimum, the following information:

- NSN.
- Nomenclature.
- Document number.
- Quantity.
- Date.
- Printed name and signature of the individual receiving supplies.

MANAGING UNIT'S DOCUMENT REGISTERS

8-121. The requesting aviation unit's document register is a record of document numbers assigned to supply documents. It serves as the suspense file for open supply transactions. The three types of document registers are nonexpendable, durable, and expendable. Expendable document registers are kept by each element within a unit that is authorized to submit supply requests to an SSA. Use document registers to record supply transactions for expendable items.

> ***Note.*** Refer to Section X of this chapter and the ULLS–A EUM for procedural guidance on using the technical supply module.

8-122. The PBO designates, by a memorandum, those elements within a unit authorized to request expendable supplies. The memorandum will specify the class of supply, the DODAAC, and the block of document serial numbers that the element will use. Policies and procedures for maintaining the document register are detailed in Chapter 2 of DA Pamphlet 710-2-1.

8-123. Management of the aviation unit's document registers by aviation logistics/technical supply personnel includes timely updates of open document numbers' supply status and reconciliations/validations of assigned supply statuses. Continuous updates of open document numbers are an important step in maintaining a steady flow of critical NMCS parts into the unit. Accurate management of the unit's document registers also includes processing timely follow-up, modification, and cancellation documents on all open document numbers.

SUPPLY STATUSES

8-124. When an aircraft repair parts request is not filled by an SSA, a supply status is issued to customer units. Supply statuses inform the requester of the supplier's decision on a specific aircraft repair parts request. Supply statuses are provided by the SSAs to alert customer aviation units of a higher source of supply's intent in releasing the repair part requested. Supply statuses are provided by an SSA on automated forms or via diskette. Supply status is given in the form of status codes. These codes are found in Appendix C of DA Pamphlet 710-2-1.

DOCUMENT NUMBER RECONCILIATIONS/VALIDATIONS

8-125. According to AR 710-2, reconciliations will be accomplished monthly and validations, quarterly. Reconciliation of an aviation unit's document registers improves readiness and sustainability by keeping data that are more credible across all levels of the supply systems. The aviation logistics/technical supply officer ensures that aviation logistics/technical supply personnel and maintainers recognize that they are the driving force within the supply system. Accurate reconciliations minimize Class 9 (Air) funds involved in unneeded requisitions. Timely reconciliation provides management and command with visibility of the validation and reconciliation process.

8-126. Reconciliation and validation of open document registers are a process that begins with the first SOS providing its customers with a listing of due outs requiring validation. The process continues by reconciling the supporting SSA records with the customers' validated requirements. Each customer maintaining an expendable document register will validate and reconcile its open requisitions at least once each month.

8-127. SSA activities will provide supported units with an external SOP outlining the reconciliation and validation frequency of their supported units. Customer validation and reconciliation procedures will be of interest during ARMS inspections and command inspection programs.

8-128. In accomplishing reconciliation/validation of open document numbers, aviation logistics/technical supply personnel must do the following:

- Check TMs or applicable references to validate the authorization for aircraft repair parts or components.
- Check to determine if requested repair parts or components may have been obtained from another source.
- Determine if there have been any changes to PLL line items to justify an open document number listed in the assigned document register.

8-129. When items are identified as no longer required or excessive quantities are identified, requests for full or partial cancellation of the requirement will be submitted to the SSA. The failure to validate a requisition for two consecutive cycles may result in the cancellation of the requisitions by the SSA, further delaying critical maintenance actions.

PROCESSING REQUISITION FOLLOW-UPS

8-130. According to AR 710-2, processing follow-ups on open document numbers is not mandatory. However, it is highly recommended to process follow-ups on all open high-priority document numbers:

- Follow-ups will not submitted earlier than at least nine calendar days on PD 01 through 07 requests or when the estimated delivery date (EDD) on the latest supply or shipment status has not been received.
- For PD 09 through 15 requests, follow-ups will be conducted at the time of monthly reconciliation if supply or shipment status has not been received.
- If no status (supply or shipment) has been received, a follow-up document must be prepared.
- For high-priority PD 01 through 07 requests, contact the SSA and conduct a telephonic follow-up; for all others, submit the follow-up document to the SSA.

PROCESSING REQUISITION MODIFICATIONS

8-131. According to AR 710-2, modification documents are processed through an SSA under the following conditions:

- When a document number issued against an airframe under an anticipated not mission-capable, supply (ANMCS) has changed to an NMCS condition.
- When a document number issued against an airframe under a routine priority UND "C" has changed to either an ANMCS or NMCS condition.

8-132. In addition to submitting modification documents when a shift in priority designators has occurred, modification documents can also be submitted when project codes, required delivery dates, or advice codes have changed.

Note. AOG high-priority requests are unique to aviation maintenance. Contact the assigned SSA for guidance on modifying an aircraft parts request to an AOG request.

PROCESSING CANCELLATION OF REQUISITIONS

8-133. According to AR 710-2, a request for cancellation must be submitted when all or part of a quantity requested is no longer needed. Timely submission of cancellations will ensure the return of funds into the unit's Class 9 (Air) budget. Aviation logistics/technical supply personnel should know that a request for cancellation is not complete until verification is received from the SSA. Providing aviation customer units with a "BQ" status code indicates that the cancellation of a specific document number has taken place. When verification is received, do the following:

- When the entire quantity requested is cancelled, post the document register and enter "BQ" and the Julian date of the cancellation in the document register.
- When part of a quantity requested is canceled, post the document register and remove the "AC1," quantity, and Julian date of the cancellation document submitted to an SSA; enter "BQ," quantity canceled, and the Julian date of the cancellation verification in the document register.
- If no supply or shipment has been received, ensure that 14 calendar days have passed before processing these requests; follow-ups on cancellation requests are not mandatory, however.

AVIATION LOGISTICS/TECHNICAL SUPPLY MANAGEMENT TOOLS

8-134. Proper use and control of the automated supply system will enhance supply customer support. Commanders at all levels, as a minimum, review the following on a regular basis:

- Average time between submissions of a customer request receipt of materiel.
- Percentage of PLL/ASL lines at zero balance.
- Accuracy of readiness reports.
- Accuracy of reconciliation procedures.
- Requirement for repair parts needed against NMCS or ANMCS requirements or needed for normal replacement; document registers should also be checked to see if required items are on order.
- Number of items that are above the authorized retention level (excess); excess items increase cost and reduce available storage space.

8-135. At the unit level, document register entries should be compared to the latest customer due-out reconciliation list to ensure that all requests are valid. Document register entries that are identified as not valid should be researched; if the part is still needed, the aviation logistics/technical supply clerk should reorder it.

8-136. At the DMC, a number of output listings indicate the efficiency and effectiveness of the supply system. These listings are the following:

- Direct support unit (DSU) ASL lines with due outs.
- Controlled item requisition verification list.
- Cyclic input transaction statistics; delinquent count card list.
- Periodic material release order (MRO) statistics list.
- Daily input-output statistics.
- Financial stockage list.
- Input transaction and error list.
- Receipt-not-due-in list.
- Stock status report.
- Supply performance report.
- Transactions register.
- ASL status review list.
- Excess report.

SECTION VII – DISTRIBUTION MANAGEMENT CENTERS

DISTRIBUTION MANAGEMENT CENTER RESPONSIBILITIES

Note. The distribution management center (DMC) is responsible for managing theater distribution and is the maintenance manager for deployed Army forces. It is the link between the deployed forces and the support base. The DMC may also support equipment of other services or multinational forces.

8-137. The DMC will maintain management supervision over supply operations at the supply and maintenance activities. All operating SSAs are included, whether they are located in forward or rear areas. The Army supply system maintains its national stockage in CONUS and uses an expedient distribution and transportation system to provide resupply directly from the national sustaining base to individual SSAs worldwide, both in peacetime and during war. Distribution is accomplished by the DSS using surface transportation, sea lines of communication (SEALOC), and ALOC.

8-138. A principal function of the DMC is to advise the command and its supported units on significant trends and deviations from established standards and to recommend necessary actions. The DMC—

- Serves as the central data collection for asset visibility.
- Collects, maintains, analyzes, and acts on information presented in logistics and maintenance management information systems.
- Provides guidance and day-to-day planning for integrated maintenance and logistics management and policy.
- Provides SSAs with inventory management, stock control, and storage guidance.
- Provides for such services as the movement of assets/repair parts movement, cargo handling, and documentation.
- Synchronizes distribution functions through—
  - Distribution movement programs.
  - Asset management.
  - Routing information and policy.
  - Movement control distribution.

8-139. Typically, a DMC will function according to the type and level of CSS that it provides. A DMC provides CSS to the following echelons: theater, division/corps, brigade, battalion, and company.

8-140. The TSC is the highest logistics agency for the theater Army. DCPs are a separate SRC and are a forward presence of the TSC. Their structure complements functions of the TSC. The DCP will support forces in its AO/JOA. At the theater and division/corps, distribution management is provided by the respective DMCs.

8-141. The TSC SPO DMC is broken down into several sections and branches. The supply and materiel readiness branches are essential for the aviation maintenance commander, officers/technicians, NCOICs, and assigned maintainers.

DISTRIBUTION MANAGEMENT CENTER SUPPLY BRANCH

8-142. The DMC supply branch at theater level is responsible for distribution management and is tasked with performing the following functions:

- Executes theater management of Classes 1, 2 3 (packaged), 5, 6, and 7.
- Performs as the expediter and problem solver on all issues involving the commodities that it manages.
- Coordinates with the transportation integration branch for status on the distribution of commodities that it manages.

- Provides direction for receiving, storing, and issuing theater stocks according to the combat commander's support priorities.
- Passes requirements to the appropriate NICP.
- Validates the requirements being considered for local procurement before forwarding them to the contracting directorate.
- Provides that theater with on-hand visibility for major end items.
- Recommends priority of issue for major end items.
- Tracks and assists in the retrograde of major end items.
- Recommends cross-leveling priorities of major end items within the theater.

8-143. The job of Class 9 (Air) supply in the brigade is shared by the SSA assigned to the ASC and the supporting DMC. The SSA receives, stores, issues, and turns in the parts. Supply personnel in the materiel readiness branch of the DMC manage and account for the Class 9 (Air) inventory. They use demand history and command-directed actions to accomplish this.

8-144. To prevent overstockage in the SSA, SSAs are restricted to 10 days of Class 9 (Air) supply. The DMC determines the range of items that are physically stocked in the SSA/ASL. Selection is coordinated with the supply support activity officer/technician and the ASC commander. It is based on the unit's PLLs to be supported from the SSA and on the immediate mobility needs of forward support maintenance units.

8-145. For most Class 9 (Air) supplies, using units submit their requests to their designated SSA. Reparable exchange for selected reparable items (including components and subassemblies) is handled on a one-for-one exchange of the unserviceable item for a serviceable item. If the unit does not have an unserviceable item to exchange, it must submit a request (DA Form 2765-1) for the item. In some cases, controlled exchange and cannibalization may be required to obtain Class 9 (Air) supplies.

8-146. AMC customers in the ASC submit their Class 9 (Air) requisitions through their ULLS-A to the supporting SSA Class 9 SARSS. For ground Class 9, all customers submit their Class 9 ground requisitions through their ULLS-G to the supporting SSA Class 9 ground SARSS. All Class 9 air or ground requisitions are either filled at the SSA or passed to the higher source of supply through the higher DMC.

Note. SAMS-E, once fielded, will merge the capabilities of both ULLS-G and SAMS-1.

8-147. If a Class 9 requisition (air or ground) cannot be filled within the SSA, it is passed to a higher DMC. This action permits the supporting DMC to update required records, cross-level stocks, and process requests to the higher DMC. When a requisition is sent to and received by the higher DMC, the DMC SARSS-2A/B searches across all assigned Class 9 (Air) DSUs before referring a requisition to the TSC or back to an NICP.

8-148. SSAs store Class 9 (Air) items and issue them to their customers via supply-point distribution. All issues are reported to higher DMCs for updating of records. Turn-ins are handled in the same manner as receipts; they are also reported to the higher DMC. Class 9 (Air) items are stocked by the SSA and are distributed to ASC customers via supply-point distribution.

DISTRIBUTION MANAGEMENT CENTER MATERIEL READINESS BRANCH

8-149. The DMC materiel readiness branch at theater level is responsible for distribution management and is tasked with performing the following functions:

- Coordinates Army maintenance functions and Class 9 (Air and Ground) for the theater.
- Exercises staff supervision over aviation maintenance activities.
- Provides assistance on cross-leveling of aviation equipment in the theater and recommends cross-leveling of aviation repair parts.
- Passes requirements to the appropriate CONUS NICP.

- Supervises the equipment modernization plan according to established policies.
- Operates SARSS and SAMS.
- Performs integrated materiel management for automotive equipment, tactical wheeled vehicles, general-purpose vehicles, and materiel handling equipment.
- Exercises staff supervision over maintenance operations and priorities according to the combat commander's requirements.
- Coordinates the development of maintenance policy and programs.
- Conducts ongoing analysis of maintenance capabilities and requirements and makes suitable recommendations to the commander.
- Assists in determining appropriate positioning of maintenance assets to support customer units and provides technical data to the TSC.
- Recommends maintenance priorities, monitors theater maintenance operations, and provides maintenance management data and reports.

8-150. The TSC SPO, DMC materiel readiness branch, consists of various sections to include the ground maintenance section, electronic maintenance section, Class 9/automation section, and aviation section.

8-151. The aviation section performs materiel management for aeronautical and airdrop equipment and test equipment that is a part of, or used with, assigned materiel. This equipment includes materiel for aircraft and airdrop, avionics, aircraft armament, and related test equipment.

Note. The aviation section, when directed, monitors and provides guidance to the CFLCC on aviation maintenance activities.

8-152. Personnel assigned to the aviation section are as follows:

- Aircraft maintenance officer/major.
- Aviation logistics technician/CW5.
- Senior aircraft maintenance manager/sergeant major.
- Aircraft maintenance supervisor/sergeant first class.
- Aircraft maintenance supervisor/staff sergeant.
- Materiel control supervisor/staff sergeant.
- Materiel control/accounting specialist/specialist.
- Materiel control/accounting specialist/private first class.

Aircraft Maintenance Officer

8-153. The aircraft maintenance officer is a major. He exercises staff supervision over aviation maintenance activities. This supervision includes classification and diagnosis of malfunctions, repair and replacement of parts, overhaul of components, and testing and final inspection of equipment. If an ASB work overload occurs, this officer coordinates for further support through the area of responsibility (AOR) command or USAMC.

Aviation Logistics Technician

8-154. The aviation logistics technician is a CW5/151A. He monitors and manages theater aircraft maintenance operations, to include contract maintenance operations. He also applies PC principles and procedures to ASB operations, using reports generated from SARSS, SAMS, and ULLS.

SECTION VIII – U.S. ARMY MATERIEL COMMAND ITEM MANAGERS' RESPONSIBILITIES

8-155. USAMC item managers provide timely and useful logistics information and service to their supported customers. The timely service provided to supported customers includes all supply, maintenance, technical, and acquisition logistics information.

8-156. USAMC item managers direct and redirect the flow of critical aviation repair parts and components to the end user. The primary factor used in distribution of supplies is the priority designator established by aviation customers. Item managers arrive at a decision based not only on the priority designators but also on the required delivery dates and project codes assigned to customers' requisitions.

SECTION IX – LOGISTICS IN TRANSFORMATION

8-157. As the DOD and U.S. Army make the transition to the emerging network-centric warfare concepts—which are facilitated by the Information Age—logistics, as we know it, will also modernize. The U.S. Army will make the transition from the traditional massed-based methods of logistics support to performance-based logistics (PBL) and sense and respond logistics (S&RL). These emerging concepts will take advantage of the many recent technologic innovations in logistics support that will enable logistic transformation system support in the 21st century.

PERFORMANCE-BASED LOGISTICS

8-158. The DOD defines performance-based logistics as a strategy for weapon system product support that employs the purchase of support as an integrated, affordable performance package that optimizes system readiness. For performance-based logistics, "performance" is defined in terms of military objectives, using the following criteria:

- **Operational Availability**. The percent of time that a weapon system is available for a mission or ability to sustain operations tempo.
- **Operational Reliability**. The measure of a weapon system in meeting mission success objectives (percent of objectives met, by weapon system); depending on the weapon system, a mission objective might be a sortie, launch, destination reached, or capability, for example.
- **Cost per Unit Usage**. The total operating costs, divided by the appropriate unit of measurement for a given weapon system; depending on the weapon system, the measurement unit could be flight hours, launches, or miles driven, for example.
- **Logistics Footprint**. The Government/contractor size or "presence" of logistics support required to deploy, sustain, and move a weapon system; measurable elements include inventory/equipment, personnel, facilities, transportation assets, and real estate.
- **Logistics Response Time**. This is the time from logistics demand signal sent to satisfaction of that logistics demand; logistics demand refers to systems, components, or resources—including labor—required for weapon system logistics support.

8-159. The essence of performance-based logistics is buying performance outcomes, not individual parts and repair actions. In other words, performance-based logistics rewards high performance and penalizes poor performance.

8-160. PBL is an innovation that relates directly to UAS logistics requirements. PBL helps to create an increased responsibility for military contractors by tying their compensation to the operational availability of their products. This concept helps increase military awareness through the maximization of both organic and contractor support.

SENSE AND RESPOND LOGISTICS

8-161. S&RL is a broad and ambitious set of concepts that will result in enhanced military capability through DOD logistics transformation. S&RL is a logistics system interwoven with network-centric operations and based on highly adaptive, self-synchronizing, dynamically reconfigurable demand and supply networks that anticipate and stimulate actions to enhance capabilities or mitigate support shortfalls across the strategic, operational, and tactical levels of war.

8-162. Refer to AR 710-1, AR 710-2, AR 710-3, DA Pamphlet 710-2-1, and DA Pamphlet 710-2-2 for regulatory supply policies and procedures. For additional supply procedural guidance, refer to this manual, FM 4-0(FM 100-10), Joint Publication (JP) 4-0, and JP 4-03.

Note. References unique to a PBL-awarded contract must be included in all SOWs.

SECTION X – ULLS–A TECHNICAL SUPPLY FUNCTIONS

Note. If the server is down, technical supply must be able to locate assets in its site inventory, manually submit orders, and backdate orders into the ULLS–A, when available. By maintaining copies of specific reports and performing manual DCR processes, the aviation logistics/technical supply section will be able to assist units in maintaining their OPTEMPO until connectivity is restored.

8-163. The ULLS–A is an inventory management tool that allows visibility of assets through all phases of supply and maintenance by both Army and contractor personnel. To provide units with better asset visibility, validation, accountability, and life-cycle management, the DOD introduced and standardized a means of direct part marking of all unique identifier (UID) items within the DOD supply system.

Note. Refer to ULLS–A EUM for user information and comprehensive procedural guidance.

8-164. Various unique identification (UID) technologies will track designated assets in ULLS–A throughout their lifecycle. The ULLS–A design accommodates the following:

- UID barcodes.
- Radio frequency identification (RFID).
- Contact memory buttons (CMBs).

8-165. Assets within the supply system will be processed into ULLS–A at the point of receipt and may be marked with either a CMB, loaded with historical data about the part; an RFID marker; or a bar code label written with a UID number. The historical data may include the following:

- Asset modification status and history (as documented on DA Form 2408-5).
- Configuration (as documented on DA Form 2408-16).
- Significant historical events (as documented on DA Form 2408-15).
- DA Form 2410 component installation, removal, and repair data.
- Various aircraft component historical record data (as available; for example, DA Form 2408-20).

ULLS–A TECHNICAL SUPPLY ROLE

8-166. The technical supply role is responsible for overseeing the overall supply operation, to include management of all PLL, bench stock, shop stock, nonshop stock, kits, and deployment packages that sustain aviation units through the initial stages of deployment. Technical supply also reviews specified reports for accuracy (document control register, commander's exception report, and financial transaction listing).

8-167. The technical supply OIC/NCOIC will receive command-appointed authority to authorize high-priority designator (02 to 06) parts requests. Technical supply personnel will work closely with the PC section to improve the overall accountability and operability of the aviation's unit logistics system.

ULLS–A TECHNICAL SUPPLY OPTIONS

8-168. The following are some of the technical supply options available to authorized technical supply users/personnel (see Figure 8-1):

- To Do List.
- Asset Gain (parts picked-up from higher level supply support).
- Asset Search.
- Fed Log (Federal Logistics).
- Catalog (searches).
- Request A Part.
- Tech Supply Menu.
- Document Control Register.
- Bench Stock (assets).
- Non Stock (repair parts on hand that are not demand supported).
- Prescribed Load List.
- Shop Stock (items).
- Reports (technical supply).

8-169. The Things-To-Do option allows technical supply users to view tasks requiring their attention. Some of the actions requiring their attention are the following: requests awaiting processing by PC, 02 walk-through requisitions, pending issue, orders awaiting processing, orders awaiting submission, and replenishment required (PLL/bench stock).

8-170. The Asset Gain option provides users with the option to gain an asset for any catalog record currently residing in the database. If the catalog record is not part of the ULLS–A, it must be entered before processing any other action. Once the asset is gained, the user can search for the asset or view its last known physical location (for example, in-stock serviceable or unserviceable/awaiting repair).

8-171. The Asset Search option allows the user to locate the desired asset by part number or distinctive criteria. The distinctive criteria include serial number, NIIN, FSC, and location.

The Fed Log option allows the user to find pertinent information about a specific asset using FEDLOG data. FEDLOG data include part number, CAGE, and NSN.

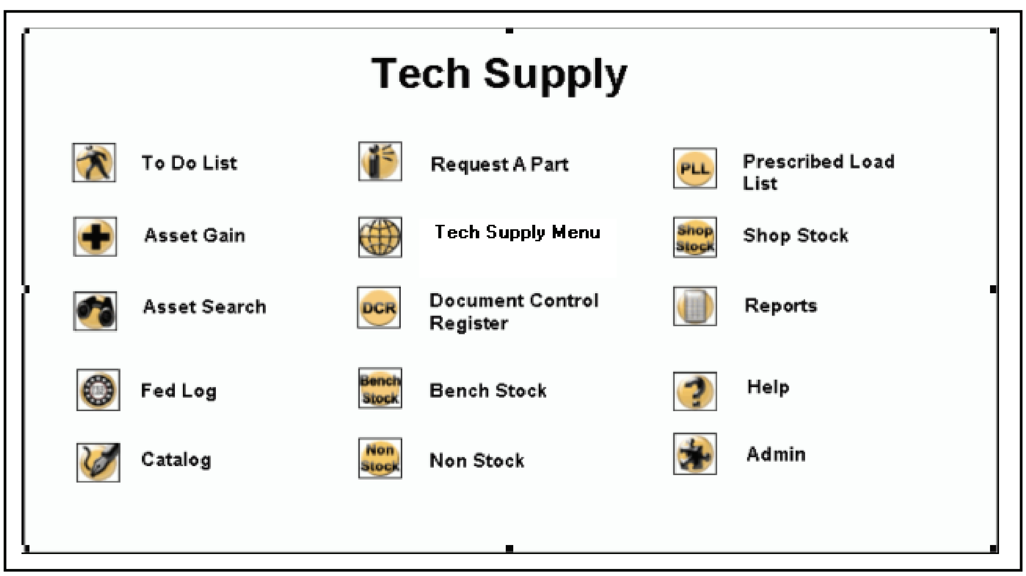

Figure 8-1. Tech Supply menu/options

8-172. The Catalog option allows users to add records to the database and assign them to PLL, bench-stock, or nonstock locations. The FEDLOG database can assist aviation logistics/technical supply personnel with verifying repair parts or components information before adding records via the Catalog option.

8-173. The Request A Part option enables users to request parts through a series of screens. Once the user fills in pertinent information, the system saves the record; once the record is saved, the saved record goes through an approval process. This process is incorporated into the "Things To Do Messages," to keep technical supply personnel advised of the latest information affecting the request cycle. Depending on approval and availability, requests are sent to technical supply for issuing or processing through SARSS when parts are not available. ULLS–A provides users with resources that increase visibility and management of assets currently in the system. There are three means of requesting/ordering parts:

- **SARSS ordering** – Current option available in ULLS–A.
- **Commercial ordering** – Near-future option available to ULLS–A.
- **Impact Visa Card purchase** – Future option available to ULLS–A.

8-174. The Tech Supply menu option allows users to control basic functions associated with technical supply. The following are five options available to users:

- Order management.
- Turn-in management.
- Accept turn-in management.
- SARSS management.
- MRO tracking links.

8-175. The Document Control Register option allows users to view/print all records contained in the document control register. This option enables aviation logistics/technical supply personnel to better oversee and manage the ordering process.

8-176. The Bench Stock option allows users to track and manage their assigned bench-stock inventory. It also allows aviation logistics/technical supply personnel to make changes to their minimum and maximum stockage levels based on use.

8-177. The Non Stock option allows users to track and manage their nonstock items. These are items that are managed by technical supply personnel that have not met the demand criteria according to DA Pamphlet 710-2-1.

8-178. The Prescribed Load List option allows users to track and manage their PLL items. These are items that have met the demand criteria according to DA Pamphlet 710-2-1.

8-179. The Shop Stock option allows users to track and manage their shop stock items, if applicable. Generally, ASC units and CH-47 units are allowed to maintain shop stock items based on guidance provided by DA Pamphlet 710-2-2.

8-180. The Reports option offers users several means for report generation. The database contains preformatted management reports, allowing users to generate custom reports; some of the reports generated by the ULLS–A are the following:

- Bench-stock reports.
- Delinquency reports.
- Document control register reports.
- Priority 02 walk-through reports.
- Closed document control register.
- Commander's exception reports.
- Commander's financial transaction listing.
- Excess reports.
- Turn-in requests.
- Inventory reports.

- Prescribed load list reports.
- Request reports.
- Shop-stock reports.
- Zero-balance reports.

ULLS–A REQUEST–APPROVAL–ORDER PROCESS

8-181. The ULLS–A technical supply request process is an intertwined system that requires the interactions of key personnel. The key personnel involved in the supply request process include the crew chief, the production control OIC/NCOIC, and aviation logistics/technical supply personnel (see Figure 8-2).

8-182. The ULLS–A request process is generally initiated by a crew chief when maintenance progress is hindered because of a lack of parts. He begins a parts search for required parts; if his search for needed parts is fruitless, he notifies PC and then initiates a part request into ULLS–A. Once the required parts request is entered into the system, it requires an approval action from the PC office before technical supply personnel can process the request through higher levels of supply.

8-183. The ULLS–A TTD option alerts PC that it has to review the parts request and verify whether the parts request initiated by the crew chief can or should be ordered by technical supply personnel. In addition to verifying the validity of the request, the PC OIC/NCOIC must also verify and approve the priority designator assigned to the repair parts request.

8-184. Once PC approves the repair parts request, the TTD alert of "Request Awaiting Processing By PC" at the crew chief and technical supply stations is removed. At that time, technical supply will process the repair parts request into the SARSS. SARSS will process the request and submit an updated supply or shipping status back to the ULLS–A.

8-185. Once SARSS releases the needed part back to the requesting unit, the part is entered into the ULLS–A as an asset gain. Once the part is processed into the system, it is ready for issue. At this time, the crew chief's Things-to-Do option will alert him with the following phrase: "Assets Available for Pick Up." Once the part is picked up, maintenance actions are ready to be resumed

> ***Note.*** While PC personnel are verifying and validating the parts request for subsequent approval, both the crew chief and technical supply will see the following entry when viewing their TTD option: "Request Awaiting Processing By PC."

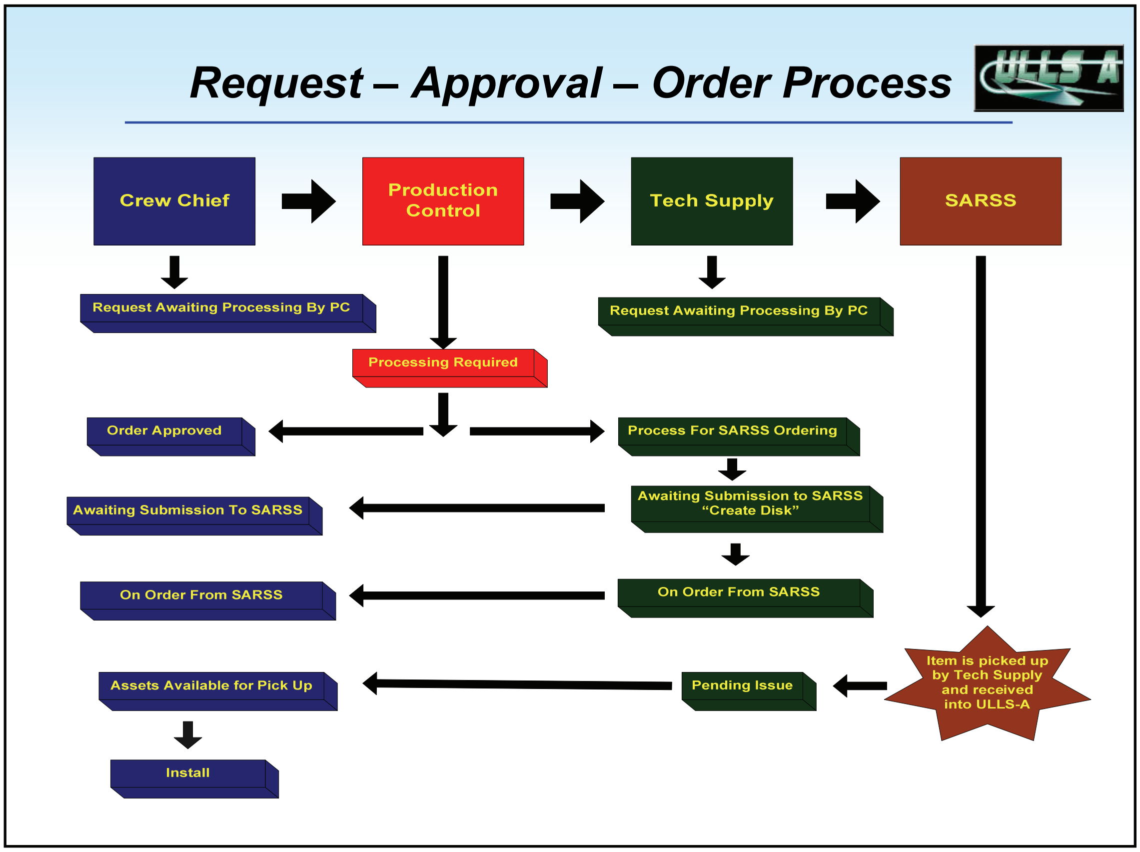

Figure 8-2. Repair parts request-approval-order process

Chapter 9

Component and Airframe Repair Platoon Maintenance Management and Operations

The ability of an aviation unit to perform its wartime mission is numerically represented by its aircraft operational readiness rates. Higher operational readiness rates are a direct result of effective maintenance and logistics management by all aviation maintenance leaders, officers, and technicians. This chapter provides CRP and ARP maintenance leaders and personnel with a "**how-to**" on internal management of component/airframe repair, replacement, and maintenance functions. Aviation maintenance support has never been more critical than in today's fluid COE, where aircraft assets are continuously used at an unprecedented OPTEMPO. As a result, CRP/ARP leaders must be directly involved in managing shop/section operations to obtain optimum productivity from their personnel to ensure that aviation assets are rapidly returned to the fight.

SECTION I – COMPONENT REPAIR PLATOON AT THE AMC/ASC

COMPONENT REPAIR PLATOON AT THE AVIATION MAINTENANCE COMPANY

9-1. Component repair platoons assigned to an AMC provide component repair support functions to their supported unit's assigned aircraft. Component repairs to aircraft systems will entail performing field-level maintenance repairs according to applicable technical manuals, including ETMs/IETMs, and the MAC. A continuous and balanced approach to component repair support will increase availability of serviceable aircraft repair parts, thus reducing aircraft downtime. Reducing aircraft downtime will proportionally increase aircraft availability and operational readiness rates. Increased aircraft availability provides aviation battalion commanders with much-needed aircraft to continue and win the fight.

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9-2. Sustaining a balanced approach to component repair/replacement will have a positive effect on aircraft operational readiness rates. Increasing availability of serviceable reparable parts through effective component repair management will, in time, reduce the logistics tail.

9-3. To sustain a balanced approach to component repair/replacement, an aviation maintenance manager, as a minimum, needs to assess several factors. The bottom line during this assessment is how quickly the aviation maintenance officer/technician, with assigned maintainers and repair assets, can return an airframe to the fight. Among the factors to be assessed are the following:

- How many unserviceable reparable components are holding down an airframe; if time is not a factor, proceed to repair unserviceable components or work order them to the next higher level of maintenance support.
- Are there serviceable replaceable components available to bring the airframe up; if time is of the essence and components are available, replace unserviceable components, repair unserviceables, or work order them to the next level of maintenance support.
- What is the cost of replacement for the aircraft repair part/component compared to the number of man-hours required to repair the aircraft component (if reparable); if reparable and time is not a factor, repair components.
- If reparable, how many man-hours are required to repair the aircraft component compared to the supply pipeline delivery time of aircraft repair parts/components; if the component has long lead times, even if time is a factor, repair components.
- If component repair is outside of the scope of AMC maintenance, according to the MAC, are there ASC assets nearby to assist with aircraft component repairs; if ASC assets are available, work order component.
- Does the unit have a full complement of TMDE to perform component repair? If yes, repair component; if no, work order component to next higher level of maintenance.
- Does the unit have a full complement of SKO to perform component repair? If yes, repair component; if no, work order component to next higher level of maintenance.
- Does the unit have a full complement of assigned and trained maintainers, according to the TOE, to perform component repair? If yes, repair component; if no, work order component to next higher level of maintenance.

9-4. Maintenance managers must be in direct communication with the PC and QC OIC when prioritizing component repairs. They must also assess the OPTEMPO of assigned aircraft and the contemporary environment where these airframes are operating. These operating environments range from a noncontiguous hostile environment, to a well-defined linear combat environment, to stability and civil support operations.

9-5. Once operational environment determinations have been assessed, maintenance managers can determine if the current environment is conducive for sustained maintenance operations. Sustained maintenance operations may include troubleshooting procedures to eventual repair of affected components. If the operating environment is not suitable for sustained maintenance operations, maintenance managers must coordinate maintenance support to meet operational requirements from higher levels of maintenance support.

9-6. Typically, in a GSAB, the CRP at the AMC has the following sections: the headquarters section and the shops section. The headquarters section within a CRP contains the following personnel: a platoon leader, who will generally be a 15A00; a 151A0 aviation maintenance technician; and a 15K40 who will serve as the CRP platoon sergeant.

9-7. The CRP comprises the following sections: power plant (engine), power train, structural (airframe), pneudralics (hydraulics), and avionics/electrical sections. The CRP will be modular—three teams per section—with the capabilities of supporting three separate company-level deployments. See Figure 9-1.

9-8. The CRP systems repair sections perform preventive maintenance of aircraft components and structures that require specialized technical skills. In addition, maintainers assigned to these sections perform scheduled and unscheduled maintenance, troubleshoot faulty components, remove and replace aircraft components and LRUs, perform BDAR procedures, and manage DSK spares at the platoon level.

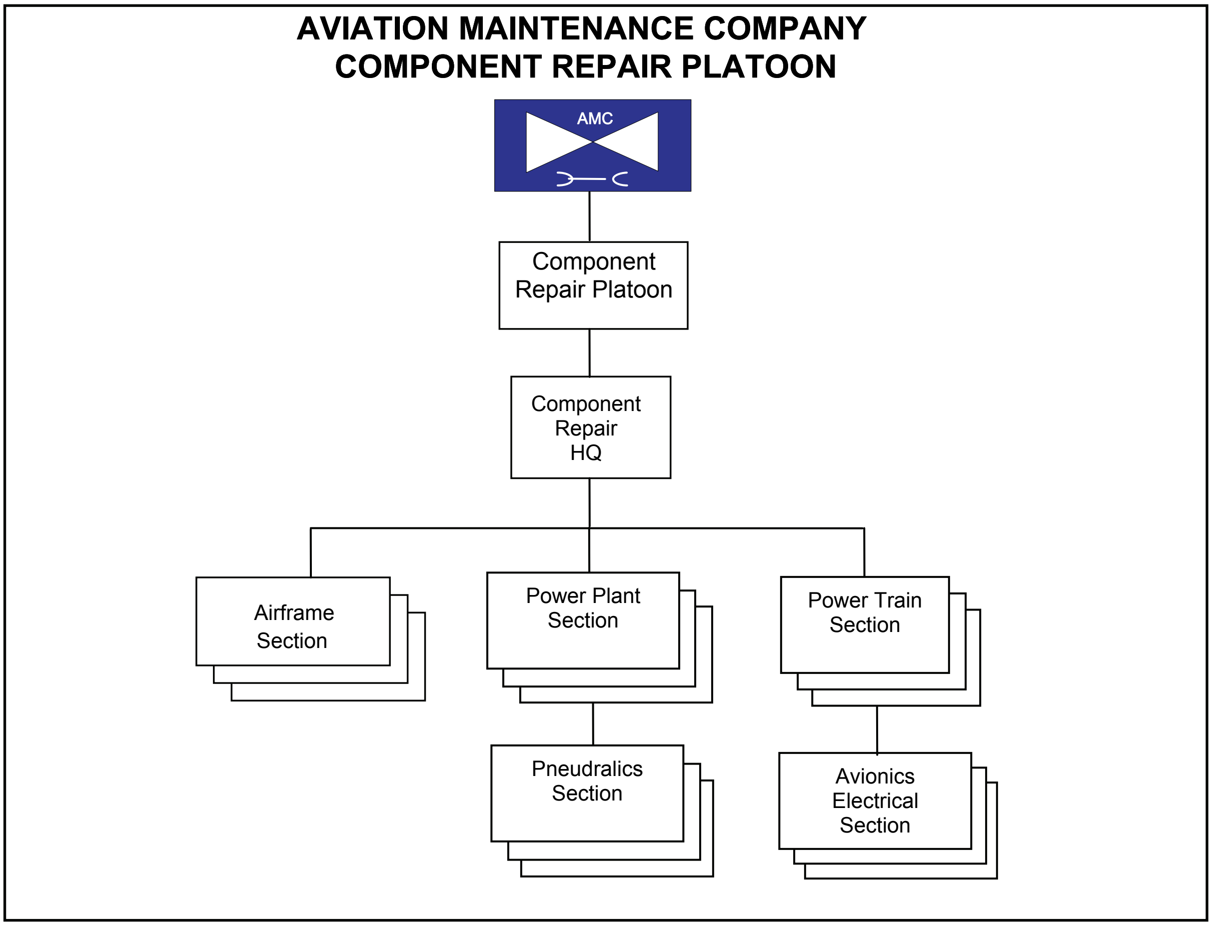

Figure 9-1. Component repair platoon at the AMC (typical layout for a general support aviation battalion/assault battalion)

9-9. The attack reconnaissance battalion AMC's CRP comprises the following sections: headquarters, power plant (engine), power train, structural (airframe), and pneudraulics (hydraulics) sections. The CRP also has a systems repair section, separate from the shops section, which consists of the armament/avionics/electrical repair sections. The CRP at the ARB will also be modular: three teams per section, with the capabilities of supporting three separate company-level deployments. See Figure 9-2.

9-10. The armament piece, part of the armament/avionics/electrical section, troubleshoots and repairs armament systems, subsystems, and components. Personnel assigned to the armament systems repair section conduct preventive maintenance and testing and troubleshooting of aircraft weapons systems and subsystems. They also repair and replace weapons platform components. The CRP at the ARB will also be modular: three teams per section, with the capabilities of supporting three separate company-level deployments.

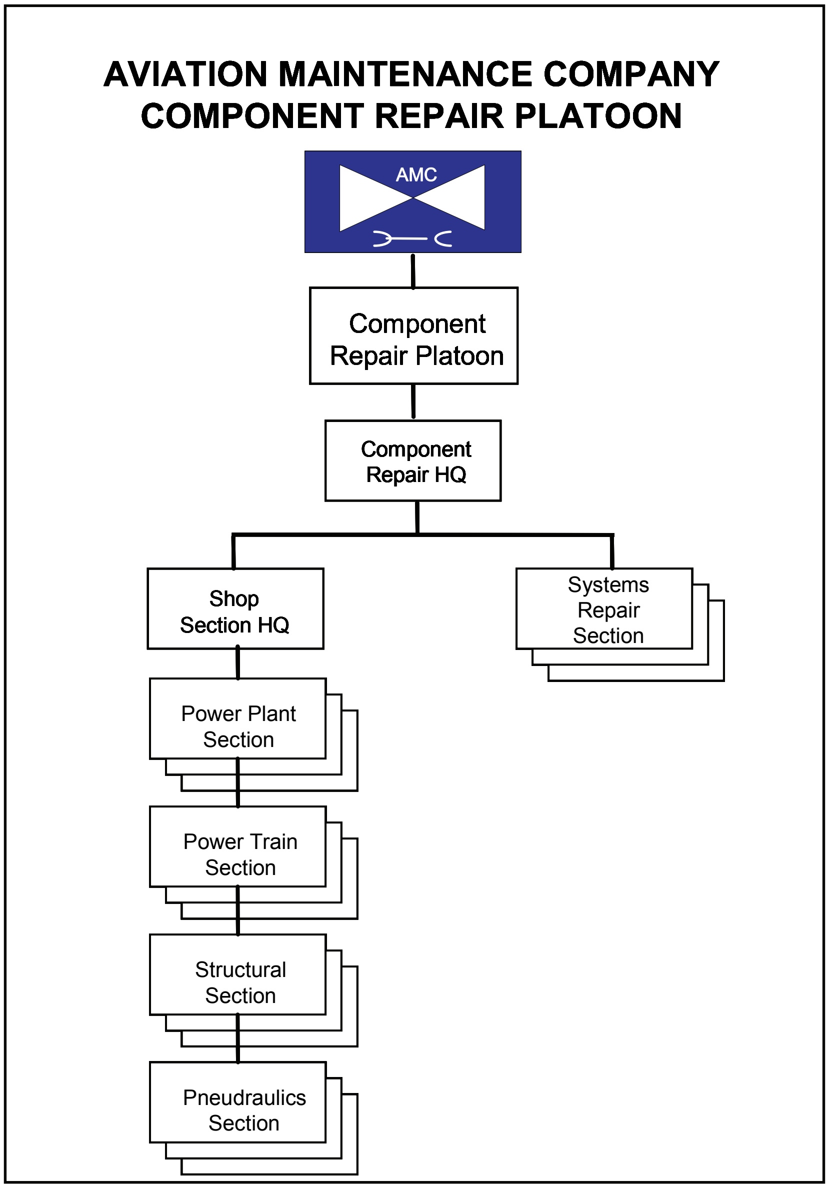

Figure 9-2. Component repair platoon at the aviation maintenance company of the attack reconnaissance (AH-64) battalion and attack reconnaissance (OH-58D) squadron

COMPONENT REPAIR PLATOON AT THE ASC

9-11. Component repair platoons assigned to an ASC provide field-level maintenance component repair support functions, to include intermediate-level maintenance, to the aviation maintenance company's assigned aircraft and corresponding aircraft systems and subsystems. Furthermore, the ASC's CRP section can provide unit-level component repair support when requested by the AMC's PC section and coordinated through the ASC's PC office.

9-12. The CRP performs airframe, LRU, and component repairs to aircraft systems at the ASC. These maintenance procedures entail performing field-level and limited sustainment-level maintenance repairs according to applicable TMs and the MAC. When requested by the ASC's PC section, AMCOM LARs will issue a letter of authorization enabling ASC's CRP maintainers to perform a one-time sustainment-level maintenance repair.

9-13. The battalion's CRP (organic to the combat aviation brigade) comprises a headquarters section. Generally, the platoon leader will be a maintenance officer (15A series MOS)/technician (151A), and the platoon sergeant will be a 15-series, preferably level-40, senior NCO. These individuals must manage personnel and equipment to sustain required readiness levels.

9-14. Typically, a CRP at an ASC organic to a CAB has the following sections: the headquarters section and the shops repair, armament repair, and avionics repair sections. The headquarters section within a CRP contains the following personnel: a platoon leader—who will generally be a 151A0 aviation maintenance technician or a 151AE aviation maintenance/armament technician—and a 15K40 who will serve as the CRP platoon sergeant.

9-15. The sections assigned to a CRP at an ASC are the shops, armament, and avionics sections. The shops section consists of power plant (engine) repair, structural (airframe) repair, power train repair, pneudraulics (hydraulics) repair, electric repair, and battery repair sections. The armament section consists of weapons systems repair and fire control repair sections. The avionics repair section consists of communications/equipment repair, navigation/flight control repair, and electronic equipment test facilities (EETFs) team (see Figure 9-3).

9-16. The CRP sections are capable of modular support to aviation units via the contact maintenance teams concept. This concept is further enabled through the use of five SECM vehicles per platoon.

9-17. The use of dedicated CRP sections' contact teams is confined to providing maintenance support to all supported AMCs. In addition, these contact maintenance teams can provide maintenance support beyond their scope once approval has been granted to the AMC by the ASC PC office. The ASC CRP will accompany the supported AMC using the AMC's organic transportation assets. Primary logistical support will be provided by the ASC with the AMC providing secondary logistical support to the ASC CRP maintenance contact teams.

9-18. The accountable officer at the SSA and the maintenance officer at the ASC determine—based on demands and maintenance capabilities—whether aircraft repair parts and components should be added to the RX program maintained at the ASC. Success of the RX program relies on the continuous component repair support provided by CRP repairers and, ultimately, on the management and administrative skills of the maintenance manager or the CRP NCOIC in the absence of the maintenance manager.

9-19. Continuous component repair support of customer AMCs and of the RX program will increase availability of serviceable aircraft repair parts, thus reducing the customers' aircraft downtime and the logistics tail. Sustaining a balanced approach to the battalion's component repair support program and the RX program will provide required aircraft repair parts when needed.

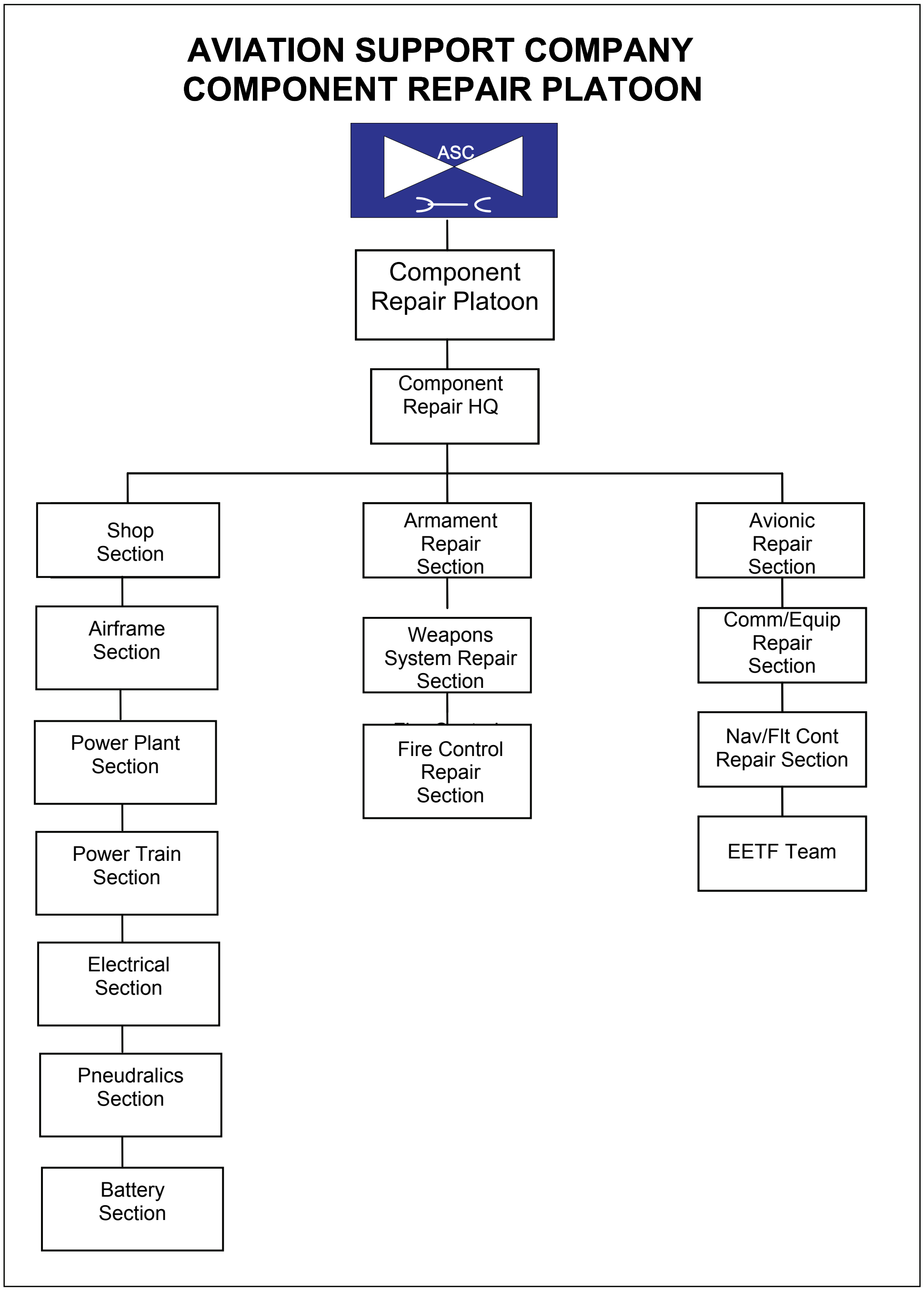

Figure 9-3. Component repair platoon at the aviation support company

SECTION II – AIRFRAME REPAIR PLATOON AT THE AMC/ASC

AIRFRAME REPAIR PLATOON AT THE AVIATION MAINTENANCE COMPANY

9-20. ARPs assigned to an AMC provide their supported aviation units with field-level scheduled and unscheduled maintenance support. Primary responsibility for unscheduled maintenance falls on the owning unit. However, when unit OPTEMPO increases, unscheduled maintenance support can be coordinated and requested through the AMC PC office. If the line company cannot complete the unscheduled maintenance in one day or less, it should contact the AMC PC office and request maintenance support. Location of the maintenance action can then be further coordinated by the line company and the AMC PC.

Note. Unscheduled maintenance is maintenance that is not part of a regular interval inspection or service.

9-21. Primary responsibility for periodic scheduled maintenance falls upon the owning unit. Prolonged scheduled maintenance—to include aircraft phases, compliance with recently published ASAMs/TBs, or MWO installation support—can be coordinated and requested by the owning unit through the AMC PC office.

9-22. Maintenance managers must directly communicate with the PC and QC OIC when prioritizing scheduled and unscheduled maintenance support. Coordination must also be established with the aviation logistics/technical supply officer for required/necessary aircraft repair parts and components before commencing maintenance procedures. If required/necessary aircraft repair parts and components are not available in the aviation logistics/technical supply section, the maintenance manager—with the aviation logistics/technical supply officer—must conduct horizontal and lateral searches of required/necessary parts.

9-23. Typically, in a GSAB, the ARP at the AMC has the following sections: the headquarters section and the airframe repair sections. The headquarters section within an ARP contains the following personnel: a platoon leader, who will generally be a 15A00, and a 15-series level-40 senior sergeant, who will serve as the ARP platoon sergeant.

9-24. The MOSs of ARP personnel will vary, depending on the type of MDS assigned to an aviation maneuver battalion. The ARP in Figure 9-3 illustrates a typical ARP designed to support a GSAB. The GSAB AMC ARP, comprises the following maintenance sections: CH-47, UH-60, and HH-60. The ARP will be modular, with the capabilities of supporting three separate company-level deployments (see Figure 9-4).

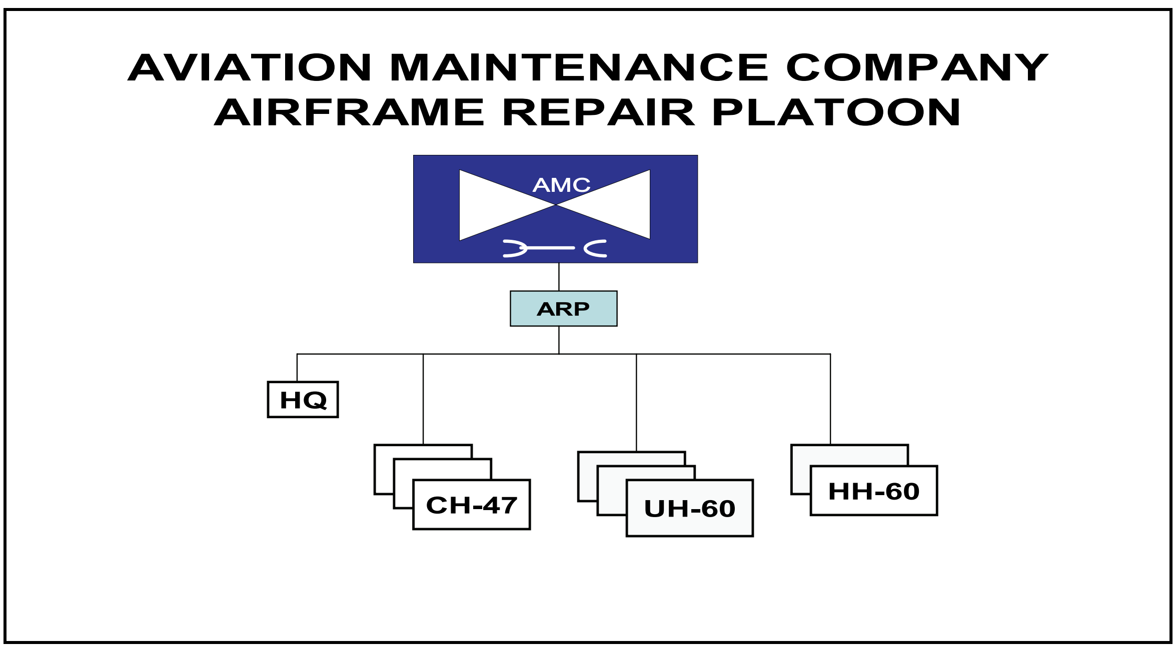

Figure 9-4. Airframe repair platoon at the AMC (typical layout for a GSAB)

9-25. The assault battalion AMC ARP comprises the following maintenance sections: headquarters and three UH-60 repair sections. The ARP will be modular, with the capabilities of supporting three separate company-level deployments (see Figure 9-5).

Note. The typical layout for both the attack reconnaissance battalion (AH-64) and the attack reconnaissance squadron (OH-58D) remains the same as the one depicted in Figure 9-5—with the exception that they will each have either three AH-64 or OH-58D sections assigned to them to support their MDS aircraft.

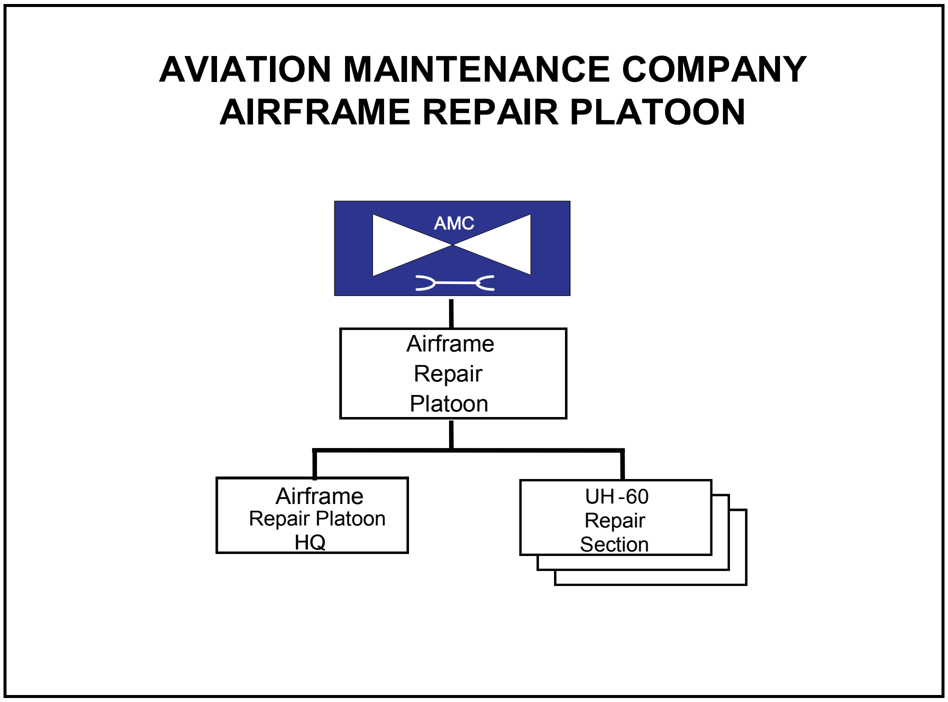

Figure 9-5. Airframe repair platoon at the AMC (typical layout of an assault battalion)

AIRFRAME REPAIR PLATOON AT THE ASC

9-26. Airframe repair platoons assigned to an ASC provide field-level, to include intermediate level, maintenance and limited sustainment-level maintenance support to AMC units (phase maintenance and preventive maintenance and services). Furthermore, the battalion's ARP provides technical assistance and maintenance support when requested by supported AMCs and coordinated through the ASC's PC office. This support entails performing field-level and, when authorized, sustainment-level (limited depot) repairs according to applicable technical manuals, including ETMs/IETMs, and the maintenance allocation chart. When requested by the ASC's PC section, AMCOM LARs will issue a letter of authorization enabling ASC's ARP maintainers to perform a one-time sustainment-level maintenance procedure.

9-27. The airframe repair platoon has modular maintenance contact teams to support battalion-level deployments. Airframe repair platoon personnel, with maintenance officers/technicians, perform in-depth troubleshooting and diagnostics of aircraft systems, subsystems, and components. The platoon also provides repair personnel for technical assistance, contact teams, and recovery teams.

9-28. The headquarters section within an ARP (organic to the combat aviation brigade) contains the following personnel: the platoon leader, who will be a captain; with a 15A00 MOS, and a 15-series level-40 senior sergeant who will serve as the ARP platoon sergeant.

9-29. Figure 9-6 illustrates an ARP assigned to an ASC. Typically, an ASC ARP will provide maintenance support to aviation maneuver battalions assigned to a combat aviation brigade. Aviation maneuver battalions assigned to a combat aviation brigade are the following: assault, GSAB, and attack reconnaissance. The ARP sections can provide modular support to the AMC using contact maintenance teams. The modular support is based on a contact support team concept using five SECM vehicles per platoon.

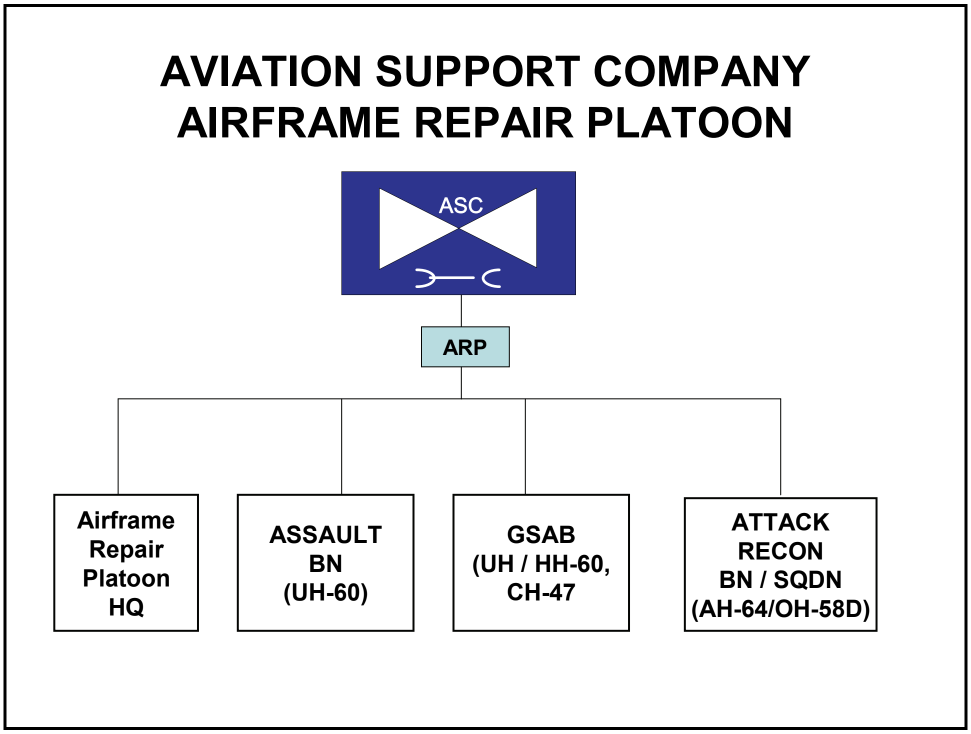

Figure 9-6. Airframe repair platoon at the ASC

SECTION III – PERSONNEL DUTIES AND RESPONSIBILITIES

PLATOON LEADER/SECTION OFFICER IN CHARGE

9-30. The platoon leader/section OIC should be selected by the aviation maintenance commander based on skills, qualifications, and experience. Generally, the component or airframe OIC at the ASC will hold a 15A00 series MOS. At the AMC, the ARP OIC will also hold MOS 15A00 OIC. At the AMC, in most cases, the CRP will have a 151A0 serve as the platoon leader/technician.

9-31. The component/airframe platoon leader/section OIC will be responsible for internal management of all maintenance functions and activities assigned to his platoon. He will ensure that maintenance personnel are trained on the most current unit and maintenance equipment assigned to the section. He will ensure that personnel are prepared to operate in a field environment/COE.

9-32. He will also be the focal point for all coordinating actions, both internal and external, regarding assigned aircraft maintenance work orders. He will be responsible for administrative and personnel actions affecting assigned personnel. He will manage assigned sections/shops, to include all maintenance procedures performed by component/airframe repair personnel.

9-33. He coordinates priority of work with the aviation maintenance technician if assigned. Work-order priority assignments are determined by the production control officer, or the NCOIC in his absence; PC personnel must coordinate and approve any deviations from these priorities. He will coordinate quality control inspections for all completed maintenance actions with the quality control section.

MAINTENANCE OFFICER/TECHNICIAN

9-34. The maintenance officer/technician should be selected by the aviation maintenance commander based on skills, qualifications, and experience. Generally, he will be the 151A0 assigned to the ASC/AMC CRP. He will be a graduate of the aviation maintenance manager course and the 151A0 certification course. Both at the ASC and the AMC, the armament platoon technician will be led by a 151AE. To be awarded MOS 151AE, he must graduate from the armament technician (AH-64/OH-58D) course.

9-35. At the ARP, the maintenance officer will be a 15-series MTP and a graduate of the maintenance manager/maintenance test pilot course. He will be directly responsible for the internal management operations of all shops/sections assigned to the ARP.

9-36. At the AMC/ASC, the maintenance officer/technician will coordinate work-order assignments based on the priority of work assigned by the PC officer. Coordination of work-order assignments must also involve the aviation maintenance technician if assigned. He will ensure that maintenance personnel are trained on the most current unit and maintenance equipment assigned to the section. He will ensure that personnel are prepared to operate in a field environment/COE.

9-37. The maintenance officer/technician manages all shops, armament, and repair sections' maintenance procedures involving aircraft equipment systems and subsystems and associated components and weapons platforms at the AMC level. In an armament shop/section, he supervises troubleshooting, isolation, and testing procedures of weapons platforms malfunctions in assigned aircraft armament systems.

9-38. At the ASC level, the maintenance officer/technician will manage shops, armament, and repair sections' maintenance procedures listed previously. In addition, he will also manage modification and overhaul of aircraft line replaceable units and components when directed by ASAMs, TBs, MWOs, and higher headquarters. He will supervise the administration of all required forms and records, to ensure that they comply with all pertinent regulations. He prepares and maintains the missile status reports according to applicable publications.

9-39. He will distribute work and track all high-priority work requests to completion, including quality assurances of finished maintenance actions. He coordinates for maintenance operational checks, test flights, and recovery/evacuation of aircraft when required. He will notify the PC office at the AMC when a work stoppage has occurred on a high-priority work request because of a lack of parts. When assigned to an ASC, he will also inform the shops or repair section OIC in addition to the PC office. The maintenance officer/technician is responsible for tracking down NMCS repair parts and components to include horizontal and vertical searches of critical aircraft repair parts. He also reviews weekly man-hour reports with section chiefs.

COMPONENT/AIRFRAME PLATOON NCOIC

9-40. The aviation maintenance commander and the first sergeant should select the platoon NCOIC based on skills, qualifications, and experience. Generally, the NCOIC will possess a 15-series MOS granted to him by an MOS-awarding TRADOC school and be a skill-level 40 senior NCO when assigned to these platoons.

9-41. He will be responsible to the component/airframe repair maintenance officer/technician at the AMC level. At the ASC level and depending on platoon assignment, he will be responsible to the maintenance officer/technician at the CRP or he will be responsible to the airframe repair platoon leader at the ARP. He provides guidance and mentorship to all assigned component/airframe repair personnel on troubleshooting procedures for all aircraft systems and subsystems and associated weapons systems and component repair.

9-42. He is responsible for the status of equipment on hand and any problems that arise affecting the overall maintenance and repair operation of the component/airframe sections. He will ensure that all maintenance actions and procedures are performed according to applicable aircraft technical manuals, including ETMs/IETMs. He will manage and coordinate all aviation ground support equipment maintenance. He provides guidance on procedures to complete and file required forms and records to ensure that they comply with all applicable regulations.

9-43. He will ensure that all shop personnel are familiar with the latest aircraft technical manuals, including ETMs/IETMs, and changes affecting maintenance and repair procedures. He will coordinate all maintenance support and actions in the absence of the component/airframe maintenance officer/technician. He will assist and advise the platoon leader/OIC to ensure that maintenance personnel are trained on the most current unit and maintenance equipment assigned to their section. He will ensure that personnel are prepared to operate in a field environment/COE.

COMPONENT/AIRFRAME SECTION NCOIC

9-44. The component/airframe section NCOIC should be selected by the component/airframe maintenance officer/technician based on skills, qualifications, and experience as well as the recommendation of the component/airframe repair platoon sergeant (PSG). Generally, he will possess a 15-series MOS, granted by an MOS-awarding TRADOC school to qualify him as a potential supervisor to oversee maintenance repair actions in a specific component/airframe section.

9-45. The component/airframe section NCOIC will supervise and assign work within the component/airframe sections. He ensures that required publications are on hand and that all applicable changes are promptly posted to support the repair functions of his assigned component/airframe section. He will coordinate all maintenance actions with the maintenance officer/technician or component/airframe repair platoon NCOIC to maintain optimum workflow of all assigned maintenance requests.

9-46. He must be fully cognizant of the capabilities of his assigned component/airframe section, subordinates, and equipment. He will ensure that subordinates are trained beyond AIT experience and capable of functioning at the OPTEMPO of the unit. He will manage the workload according to availability of resources and equipment.

9-47. He will inform the platoon leader at the ASC level, or the maintenance officer/technician at the AMC level, and component/airframe repair platoon NCOICs of any showstopper (maintenance, equipment, aircraft repair parts, or personnel) that will hinder completion of any maintenance work requests.

9-48. He will monitor all NMCS work order requests to ensure that assigned work orders have valid document numbers and supply statuses. He is responsible for the administrative management procedures, to include filing of all aircraft required forms and records according to AR 25-400-2. He will provide senior maintenance leaders with work-order status and updates.

9-49. The component/airframe section NCOIC at the ASC level will review the shop section summary with the maintenance officer/technician weekly. He is responsible for maintaining a weekly man-hour report and for submitting the report to the production control office on a prearranged schedule dictated by the PC OIC.

COMPONENT/AIRFRAME SECTION PERSONNEL

9-50. Component/airframe section personnel will possess a 15-series MOS granted to them by an MOS-awarding TRADOC school. They will be directly responsible to the component/airframe section NCOIC, component/airframe repair PSG, and aviation maintenance officer/technician.

9-51. Component/airframe section personnel are responsible for following all notes, warnings, and cautions listed in the technical manuals, including ETMs/IETMs, when performing component repairs and maintenance procedures on assigned maintenance work orders. They must maintain 100 percent accountability and serviceability of all assigned tools and equipment. They will be familiar with all applicable aircraft maintenance manuals and corresponding changes as they are posted.

SECTION IV – MAINTENANCE PROCEDURES

INSPECTIONS AND REPAIR PROCEDURES FOR AIRCRAFT SYSTEMS AND SUBSYSTEMS

9-52. Troubleshooting of affected aircraft systems and subsystems must take place before any maintenance action/aircraft component repair begins. Thorough and accurate troubleshooting of affected aircraft systems and subsystems narrows the scope and magnitude of maintenance and repairs, thus saving aviation units critical man-hours and, more importantly, Class 9 (Air) dollars.

9-53. Maintenance personnel must use only the latest and most current applicable aircraft maintenance manuals when conducting preinspections and troubleshooting procedures of unserviceable aircraft systems and subsystems. Using current maintenance technical manuals, including ETMs/IETMs, ensures that maintenance procedures meet current requirements, thereby ensuring that quality work is executed efficiently. In addition to using the latest applicable references and publications, CRP/ARP maintenance personnel will use only authorized tools when conducting aircraft maintenance. Maintenance supervisors will inventory sensitive items and tool boxes at least monthly using the property book or hand receipts. Maintenance personnel's assigned toolboxes should be inventoried after each maintenance task to help control FOD. Accountability will include procedures from the PBUSE.

Note. AR 710-2 provides regulatory guidance for inventory procedures.

9-54. A comprehensive inspection of aircraft systems and subsystems, to include components, is performed when numerous discrepancies are found on a preinspection or when deemed necessary by aviation maintenance commanders/maintenance officers/technicians. The inspection will include, but is not limited to, correct assembly/installation; proper safety techniques, such as use of cotter pins or safety wire application; wear; rigging; leaks; structural defects; battle damage, to include hidden or unobvious damage; and security of components.

9-55. Before repairs begin on any aircraft systems/subsystems, concepts of P4T2 must be analyzed and used. All maintainers must understand that in today's fluid and ever-changing COE, poorly developed or implemented plans and/or poorly executed maintenance procedures will prevent operational company commanders from having the required number of aircraft to conduct and complete their assigned missions.

9-56. When maintenance personnel conduct approved/authorized repairs of aircraft components, they must strictly adhere to established repair methodology. This methodology is outlined in all applicable aircraft technical manuals, including ETMs/IETMs. All maintainers, maintenance officers/technicians, technical inspectors, and DOD contract support activities are responsible for using TMs for maintenance procedures and to ensure a safe, quality product. Shop section NCOICs supervise repair procedures—to include the use of applicable aircraft technical manuals and/or ETMs/IETMs—when conducting approved component repairs.

9-57. The maintenance manager will contact the quality control section before he initiates maintenance actions such as temporary or permanent repairs on assigned aircraft that are not covered in aircraft technical manuals and/or ETMs/IETMs. The shops officer/maintenance technician, through the QC and PC officers, must seek authorization from a higher level of maintenance support when a component repair falls out of the norm or accepted guidelines as outlined in aircraft technical manuals, including ETMs/IETMs.

9-58. Letters of authorization approving maintenance procedures or component repairs not outlined in aircraft technical manuals, including ETMs/IETMs, can be granted by ASCs to perform intermediate field maintenance at the AMC. AMCOM LARs can grant letters of authorization to the ASCs to perform limited sustainment maintenance according to the MAC. While these maintenance organizations and agencies have the authority to approve nonstandard maintenance procedures or component repairs or authorize deviations from standard aircraft technical manuals, including ETMs/IETMs, they can make errors. As a result, maintenance personnel should proceed with caution when they perform nonstandard maintenance procedures or component repairs. When approved procedures do not pass the common-sense test, they should stop and seek further guidance or clarification.

PROCESSING WORK REQUEST PROCEDURES

9-59. The PC office will be the focal point or central location for processing customer, intershops, or higher-level maintenance support work orders. The PC officer will be the key manager in a maintenance activity where he will be the approval authority for generating internal or external work orders.

9-60. All supported companies must initiate work orders when seeking maintenance support from the AMC. The maintenance work order must be processed and accepted by the PC office before maintenance support or component repair can commence.

9-61. Maintenance work orders must also be authorized by the PC officer to include a priority designator. Once accepted by the PC office and a high-priority designator (01 through 03) has been assigned to work orders by the PC officer, they must be distributed by the PC clerk to the supporting shop/section immediately. For other than 01 through 03 priority designator maintenance work orders, work orders will be placed in the corresponding shop/section's in-box or given to the shops/section maintenance technician or NCOIC after the PC meeting.

9-62. The shops maintenance technician or NCOIC will routinely check with the PC office for work orders. Work orders assigned to the shops section will be processed by the automated system or logged into the shops work order document register (DA Form 2405 when used) and distributed to the corresponding shop/section chiefs.

9-63. Once a work order is assigned to a shop, the shops/section chief will ensure that all necessary files, forms, and records are accurate and complete according to applicable references and publications. He will verify that all repair parts needed to complete a maintenance procedure or component repair are on hand or on order. He must coordinate the use of special tools required to complete a job. Once all requirements to complete a job are met, he will assign the work to shop/section personnel.

Note. Work will *never* be started on any component or item to be repaired, unless it is accompanied by all required forms and records or otherwise directed by the production control officer/NCOIC. All DA Form 2410s and other historical records will be maintained in the AMC's QC office.

9-64. The supported AMC PC office will initiate and generate all higher-level maintenance support work orders to include ASC-level component repair. The AMC PC clerk will deliver the maintenance work orders seeking maintenance support to the ASC PC office.

9-65. For component repairs work orders, the PC office will submit the unserviceable component with accompanying work order to the supporting ASC. In addition, the AMC PC office will ensure that unserviceable components meet the standards set forth in the ASC's external SOP before submitting the work order and unserviceable component to the ASC PC office.

Note. The PC clerk must verify that the unserviceable component has all required documentation to include DA Form 2410 (if required) and unserviceable (reparable) tag/label (DD Form 1577-2/DD Form 1577-3) with the corresponding TI's stamp or signature. Before submitting it to the ASC PC office, it must be cleaned. If the component is listed as an RX according to the published ASC RX list, then request for issue and request for turn-in documents must accompany the part to obtain a serviceable component.

MONITORING CONTROLLED EXCHANGE PROCEDURES

Note. According to AR 750-1, controlled exchange is the removal of serviceable components from unserviceable, economically reparable end items for immediate reuse in restoring a like item or weapon system to an MC condition.

Note. For more information and guidance on controlled exchange procedures, refer to Chapter 6.

9-66. Controlled exchange, at both the AMC and ASC, is a coordinated logistics and maintenance action. It is considered to be an option of last resort, available to aviation maintenance commanders/officers when exploring means to return unserviceable aircraft to an FMC status. Generally, a controlled exchange action, by its very nature, at least doubles the man-hour requirements to complete a maintenance action. This action subjects the components and aircraft to additional handling that could cause accidental damage.

9-67. No controlled exchange actions can take place without the consent and authorization of the approval authority or his designated representative. Once approval has been granted, all controlled exchange actions will be performed according to TM 1-1500-328-23 and all forms and records will be filled out according to DA Pamphlet 738-751.

9-68. Controlled exchange of aircraft repair parts or components at the AMC level is approved by the commander only. If controlled exchange actions on AMC-assigned aircraft are contemplated, the ASC PC office will first obtain approval of the owning aviation maneuver battalion commander.

9-69. Once the owning battalion commander has approved the controlled exchange action, the ASB commander or his designated representative will acknowledge the action by also rendering approval for the controlled exchange action to proceed. Controlled exchange by the supporting AMC/ASC will be authorized only when it is the sole means of providing an FMC airframe or weapon system to a supported unit within the time frame indicated by the initial priority designator (IPD) on the maintenance request.

9-70. The aviation logistics/technical supply section must be notified and kept abreast of all controlled exchange actions affecting assigned aircraft for procurement of serviceable components. Aviation logistics/technical supply personnel will process a requisition requesting a serviceable like component to replace the one being controlled exchanged.

9-71. Maintenance officers/technicians/NCOICs will be directly involved in all controlled exchange actions. They will supervise all maintenance procedures, to include serviceable component removal from donor aircraft to installation of serviceable components on receiving aircraft.

9-72. Upon completion of all maintenance actions and procedures, the maintenance officer/technician will coordinate all technical inspections, MOCs, and MTFs through the PC office. The PC office will ensure that all controlled exchanges are reported on the DA Form 1352.

AIRCRAFT TROUBLESHOOTING PROCEDURES

9-73. The overarching principle of conducting on-site maintenance procedures and component repair as far forward as possible on the battlefield remains unchanged. Maintainers accomplish their mission by using advanced diagnostics, prognostics via embedded sensors, and troubleshooting techniques to diagnose the major component fault, at which point the component is either repaired or replaced at the breakdown site.

9-74. When the contemporary operating environment is not conducive to maintenance operations at the breakdown site, aircraft systems and subsystems and associated component troubleshooting procedures, repairs, and replacement will be conducted at a predetermined aviation maintenance support assembly area.

9-75. *All malfunctioning aircraft systems and subsystems and associated components must be diagnosed using troubleshooting procedures before wholesale replacement of components takes place.* All aircraft troubleshooting procedures must be conducted according to applicable aircraft TMs. Troubleshooting aircraft systems and subsystems and associated components is a maintenance team effort.

9-76. QC, PC, maintenance officers/technicians, maintenance personnel, and when appropriate, aircraft technical representatives/contractors must lend their expertise to identifying system, subsystem, or component malfunctions using accepted and by-the-book troubleshooting techniques.

9-77. When all standard troubleshooting procedures have failed to yield an accepted and valid diagnosis for a malfunctioning system, subsystem, or component, nonstandard troubleshooting procedures must be explored. The PC officer must coordinate all troubleshooting procedures not listed in aircraft technical manuals, including ETMs/IETMs.

9-78. He will seek approval from higher levels of maintenance support—such as ASCs, sustainment-level maintenance facilities, aircraft PMs, AMCOM, and CECOM—before troubleshooting/repair procedures can begin. Approval for troubleshooting/repair procedures not listed in any aircraft technical manuals, including ETMs/IETMs, can be obtained with an LOA from an AMCOM or a CECOM LAR.

9-79. Timely and accurate diagnosis of aircraft faults will conserve much-needed maintenance man-hours. During troubleshooting procedures, aviation maintenance officers/technicians will coordinate with QC and obtain the PC officer's approval before using a known good LRU for test purposes.

9-80. This troubleshooting technique will minimize the unnecessary expenditures of Class 9 (Air) repair part funds. Once troubleshooting procedures have been completed, LRUs used for test purposes will be reinstalled on donor aircraft and applicable forms and records will be signed off on by the TIs as applicable.

SECTION V – SHOPS/SECTION REPAIR POLICIES

MAINTENANCE FORMS AND RECORDS POLICIES

> ***Note.*** Refer to DA Pamphlet 738-751 for regulatory guidance when filling out aircraft forms and records. For filing and disposition of DA forms and records, refer to AR 25-400-2. Refer to Chapter 7 for additional guidance on forms and records.

9-81. The forms and records called for in this section provide valuable maintenance and logistics insight as well as tracking and management data to TIs, maintenance officers/technicians, and commanders. In addition, this valuable maintenance management tool provides all maintainers with a comprehensive picture of the condition, use, operation, maintenance status, and logistic needs of the assigned/attached aircraft and AGSE.

9-82. Finally, keeping accurate and descriptive data on all forms and records, when maintenance actions are complete, ensures that all crew members receive a safe and airworthy aircraft. FMC aircraft that are safe and airworthy provide commanders assets that stand ready for worldwide deployment and are capable of meeting all assigned tactical missions and contingencies.

9-83. Crew members, maintainers, technical inspectors, maintenance officers/technicians, PC record clerks, supervisors, leaders, and commanders—at all levels of maintenance—including DOD contract support activities, have an equal stake in maintaining accurate aircraft maintenance forms and records. Quality control technical inspectors will ensure that all aircraft maintenance forms and records comply with applicable publications and regulations.

COORDINATING MAINTENANCE ACTIONS AND REPAIRS

9-84. All supported aviation units will seek maintenance support for their assigned aircraft through the AMC PC office. Supported units will indicate the need for scheduled/unscheduled maintenance support according to the AMC's maintenance SOP. Coordination is necessary; the PC office must be alerted as soon as an aircraft system or subsystem is malfunctioning or the aircraft is grounded with an "X" condition.

9-85. As soon as the PC office is alerted of a pending aircraft grounding condition or system/subsystem malfunction or the aircraft is NMC, the PC clerk will generate an internal maintenance work order on DA Form 2407. Before the maintenance work request is internally assigned to a shop or maintenance section, the PC clerk will assign a tracking or work order number (WON) to the DA Form 2407. Once the WON is assigned and before the maintenance work order leaves the PC office, it must be entered, for tracking purposes, on DA Form 2405.

> ***Note.*** All required aircraft forms and records used for maintenance support can be either hard copies or electronically formatted, generated by the current STAMIS of record.

9-86. For maintenance work requests exceeding the maintenance capabilities of the AMC, the DA Form 2407 will be passed to the ASC requesting maintenance support. Requests for maintenance support include, but are not limited to, the following:

- Required ASC maintenance procedures/repairs as dictated in applicable aircraft maintenance TMs.
- Repairs beyond the AMC’s prescribed ability or capacity.
- Applications of MWOs and SOF messages/ASAMs/TBs while aircraft or components are work ordered to the ASC activity.
- Fabrication/assembly of items.
- Request for repair of aircraft components, LRUs, modules, assemblies, and subassemblies.
- Request for maintenance support from another maintenance activity or supporting unit.

9-87. Before work ordering an aircraft to an ASC for maintenance support, all required troubleshooting procedures should have been performed and properly documented by AMC maintenance personnel on DA Form 2408-13-1, DA Form 2408-13-2, or DA Form 2408-13-3. When all applicable aircraft forms and records have been completed and QC personnel have verified them, the AMC PC officer must coordinate all maintenance requests through the ASC PC office.

> ***Note.*** When troubleshooting procedures require valuable assets (personnel, tools, TMDE, or SKOs), time is of the essence as a result of the unit’s OPTEMPO, or the fault is intermittent—and to avoid compromising the safety of crew members or equipment—the AMC PC must coordinate with higher levels of maintenance support and work order the affected component or airframe.

9-88. When requested, ASC can provide scheduled, unscheduled, and/or on-site maintenance support. When maintenance support is requested from an ASC, all uncorrected faults on DA Forms 2408-13-1, 2408-14, and 2408-18 requiring ASC-level maintenance will be annotated on the DA Form 2407.

9-89. When the DA Form 2407 has been accepted by the ASC, the aircraft equipment logbook, keys, automated system of record laptop (complete with all accessories), weight-and-balance records, and historical records will accompany the aircraft. The exception to this requirement is when a request for ASC maintenance support is for on-site maintenance.

9-90. According to AR 700-138, aviation maintenance units must report their aircraft and equipment’s physical condition on a monthly basis. When aircraft system, subsystem, and/or component malfunctions are directly affecting a unit’s aircraft operational readiness, it must be reported.

9-91. Aviation maintenance officers/technicians and, ultimately, the commanders are responsible for reporting aircraft that are tracking NMCM, NMCS, or PMC time. Accuracy and timeliness for aircraft/equipment readiness reporting are critical.

9-92. Commanders of units and organizations that own Army aircraft will report according to AR 700-138 electronically through ULLS-A/AMSS or, if not fielded with ULLS-A/AMSS, manually on DA Form 1352. DA Form 1352-1 will be used to track daily aircraft status records. The AMSS, an integral part of ULLS/SAMS-1/SAMS-2, is designed to accumulate the necessary transactions/status changes at unit and support levels during the report period (sixteenth day, 0001 hour, of the month to the fifteenth day, 2400 hours, of the following month).

Note. Refer to AR 700-138 for regulatory guidance in filling out DA Forms 1352 and 1352-1.

AIRCRAFT COMPONENT REMOVAL POLICIES

9-93. Removing an aircraft component can render an airframe PMC or NMC. When an aircraft system, subsystem, and/or component is found unserviceable, unit maintenance personnel must follow established guidelines and prescribed aircraft TMs when removing unserviceable components. Maintenance personnel *will not* remove a component without approval from the PC officer or, in his absence, the PC NCOIC except when the removal of a component is called for in the execution of a maintenance task and is essential to gain access to another component with the intent being to return that item to the original position.

9-94. If, after extensive troubleshooting, an aircraft component is found to be unserviceable, the PC office will coordinate all maintenance actions. Maintenance actions will include coordination for quality control assistance and oversight when maintenance personnel remove an unserviceable aircraft component. In addition to generating associated maintenance work requests to remove unserviceable aircraft components, the PC office will coordinate logistics actions with the aviation logistics/technical supply officer to procure a serviceable replacement component.

Note. This chapter contains guidance on troubleshooting procedures.

9-95. The QC office and personnel will have direct oversight for the accuracy of entries made on all corresponding aircraft forms and records. The entries will correspond to all actions taken to remove an unserviceable aircraft component. QC personnel actions will also include comprehensive FOD inspections of affected aircraft system or subsystem areas where an unserviceable component was removed.

9-96. If there are no serviceable replacements in the logistics pipeline and to minimize aircraft downtime, check the corresponding aircraft TM's SMR code to see if the component is reparable. If the SMR code indicates that the unserviceable component is reparable, the PC office will immediately work order the item to the ASC on a high-priority maintenance work request.

9-97. Unserviceable components, once removed from an airframe, must be thoroughly cleaned, preserved, inspected by a TI, tagged, and packaged. DD Form 1577-2 will be filled out and attached to the unserviceable component. The unserviceable component and DD Form 1577-2 must undergo a technical inspection by a qualified TI before the unserviceable component is work ordered to an ASC maintenance support facility.

MONITORING USAGE OF MEASUREMENT AND DIAGNOSTIC EQUIPMENT

Note. Refer to aircraft-specific RPSTL TMs for special TMDE requirements.

9-98. The aviation maintenance commander must appoint a calibration program coordinator. The coordinator monitors the unit's TMDE electronically generated forms for correct utilization and status of equipment requiring calibration.

9-99. He will coordinate with all aviation maintenance sections to ensure timely submission of items requiring calibration before items are overdue and rendered unusable. He completes and maintains the unit master listing to include a comprehensive review for accuracy and serviceability status. He also acts as the approving authority for items required for priority calibration.

Note. Refer to Chapter 3 for additional information. Appendix H contains a sample TMDE SOP.

9-100. All aviation commanders/leaders and maintenance officers/technicians are responsible for ensuring that assigned maintenance personnel use only prescribed, serviceable, and functional TMDE as outlined in aircraft TMs. When a maintenance procedure requires the use of calibrated items, the calibrated item must not be outside of its calibration window.

9-101. Maintenance cannot be performed on an aircraft to a specific technical manual, including an ETM/IETM, standard unless calibrated items are calibrated and display a valid calibration sticker. An inadequate or a poorly maintained calibration program can cripple an entire fleet and cause irreversible mission failure.

Note. The unit's calibration program coordinator will ensure that TMDE identified for long deployments will not be due calibration while en route to a deployment site. If TMDE is identified as needing calibration while participating in a unit deployment, he will make an out-of-cycle calibration request for all items due calibration during deployments to the supporting installation calibration facility.

REQUIREMENTS FOR PROCESSING PARTS REQUESTS

Note. Refer to Chapter 8 for additional references on aviation logistics/technical supply management operations to include procedures for processing parts requests.

9-102. QC section personnel must serve as the eyes and ears for the commander and the PC or maintenance officer/technician when assessing the need of aircraft components to bring an aircraft to an FMC condition. After all troubleshooting procedures have been used, to include the use of a known good and serviceable component to narrow the scope of the malfunction, the need for a serviceable component should be easier to identify.

9-103. Once the need for a serviceable component has been identified, the next issue is whether the component in question is reparable. Maintainers, to include QC and PC personnel, must refer to the SMR code found on RPSTLs of prescribed aircraft technical manuals, including ETMs/IETMs, to ascertain whether the unserviceable component is reparable. If the SMR code indicates that the component is not reparable, then a request for issue of a serviceable component must be generated.

9-104. The aircraft maintenance condition must be thoroughly evaluated by the production control officer or the maintenance manager before he assigns a priority designator to the aircraft repair parts request. If an aircraft is undergoing extensive maintenance procedures, a routine priority designator is assigned to the request. If, however, the aircraft is down for only three or fewer components, then a high-priority designator is assigned to the aircraft repair parts request.

9-105. When approving a high-priority aircraft repair parts request, the commander or his designated representative must be familiar with the maintenance condition of that particular aircraft. Such familiarity will enable the aviation maintenance unit to request only the required repair parts, thus conserving limited resources.

9-106. An aircraft repair parts requests, once authorized and approved by the commander's designated representative, will be processed through the aviation logistics/technical supply section. Once a document number has been assigned to the parts request, it must be entered on the corresponding aircraft forms and records for tracking purposes.

MAINTENANCE REFERENCE/PUBLICATION LIBRARIES

Note. Refer to Appendix A of aircraft-specific technical manuals, including ETMs/IETMs, for an expanded list of references/publications used by a typical aviation maintenance unit. Refer to DA Pamphlet 25-30 for a more detailed listing of reference/publication requirements. Refer to Chapter 4 of this manual for guidance to access the LIDB Publications Module. This module contains a comprehensive listing of publications to support assigned end items. Chapter 4 also provides a link to the electronics technical manual site. Also, refer to Chapter 7 for more information on managing a publications account.

9-107. Understanding, knowledge, experience, and continuous training—to include knowledge of maintenance reference/publications—are the pillars of any aviation maintenance program. Timely updates of assigned reference/publications libraries are essential to proper maintenance practices.

9-108. Following the steps prescribed in the applicable maintenance manual eliminates redundancy. It facilitates maintenance procedures, and most importantly, it validates the airworthiness of the airframes upon completion of a maintenance procedure by assigned maintenance and repair personnel.

Note. If a maintenance procedure or repair in an aircraft technical manual, including an ETM/IETM, is suspected to be in error, submit a DA Form 2028. The section/shops/platoon NCOIC is responsible for coordinating all DA Form 2028 submission requirements with QC personnel.

9-109. Although the master reference/publications library is located in an aviation maintenance unit's QC section, every section, shop, and platoon responsible for conducting aircraft maintenance repairs and procedures is authorized a reference/publications library. Every section/shop/platoon NCOIC is responsible for researching and verifying technical publications requirements for his assigned maintenance and component repair areas.

9-110. NCOICs are responsible for ensuring that their reference/publications libraries are current and updated with the latest published changes. NCOICs must also train their assigned maintenance personnel in posting reference/publications changes. A fielded change that is not promptly posted makes that corresponding technical manual, including an ETM/IETM, unusable.

9-111. Assigned maintenance and repair personnel are responsible for familiarizing themselves with the appropriate technical manuals, including ETMs/IETMs, to include the latest changes, before conducting maintenance or repair procedures. Section/shops/platoon NCOICs monitor assigned maintenance personnel's compliance with aircraft technical manual familiarization using an updated and current familiarization chart. By-the-book maintenance not only includes having the corresponding aircraft technical manuals, including ETMs/IETMs, open but also using them to conduct maintenance/repair procedures.

Note. Refer to AR 25-30 for posting reference/publications requirements. For familiarization chart requirements, refer to Chapter 7.

MAINTENANCE REPAIR SECTION SHOP SAFETY

Note. Refer to Chapter 7, and Appendixes D and O for more information on maintenance and shops safety.

9-112. Maintenance repair sections and shops safety is an on-going process. Safety is to be observed not only when conducting maintenance and repair procedures but also in every phase of aviation operations.

An aviation maintenance section or shop that is below the established standard (safety hazards, unserviceable tools and equipment, out-of-calibration TMDE, or outdated references/publications) cannot perform quality maintenance. Safety of flight is compromised when maintainers, at any level, deviate from the established maintenance standard or fail to conduct by-the-book maintenance procedures.

9-113. Safety procedures must be adhered to by all airframe/component repair personnel during aircraft maintenance procedures. Maintenance leaders, officers/technicians, and NCOICs are responsible for providing close supervision and correcting unsafe acts.

9-114. When maintenance personnel are working on aircraft (including preflight and postflight)—on other than home garrison maintenance pads, parking aprons, and wash racks (for example, at a transient airfield or a field training environment)—fall protection (regardless of height above the ground) is defined as maintaining “three points of contact” (that is, one hand and two feet or two hands and one foot) on the hand holds, foot accesses/recesses, and walking/working surfaces designed into/provided on the aircraft. Furthermore, fall-restraint device usage is at the discretion of the maintenance supervisor or, in the absence of maintenance supervision, the PC OIC/NCOIC.

9-115. All NCOICs are responsible for keeping their assigned sections/shops safe, operational, and within the established standard as outlined in the aviation maintenance commander’s internal SOP. In addition, it is the TI’s responsibility to keep all assigned sections/shops within the established standard when conducting inspections of the maintenance sections, shops, and work areas, to include the hangar. These inspections will be conducted monthly or more frequently when maintenance procedures are conducted.

9-116. Any shortcoming, deficiency, or safety hazard identified during a safety inspection will be recorded on DA Form 2404 with copies given to the NCOIC and the maintenance officer/technician. The original copy will be kept by the QC section and filed according to AR 25-400-2. Safety shortcomings, deficiencies, or hazards that are considered to be a danger to personnel or equipment will be immediately brought to the attention of the NCOIC and maintenance officer/technician for corrective action.

9-117. Routine or noncritical shortcomings, deficiencies, or hazards found during a maintenance section and shops safety inspection will be corrected within 10 days. A completed DA Form 2404, indicating compliance with the safety inspection, will be given to the QC section for filing with the original copy. The QC section will give recommendations and guidance to assist in correcting faults. The QC section will reinspect to ensure that shortcomings and deficiencies turned in are corrected.

SECTION VI – ULLS–A BACK SHOPS (COMPONENT AND AIRFRAME REPAIR PLATOON) PROCEDURES

9-118. The ULLS-A BackShops program provides a comprehensive Web-based submitting and tracking system for work orders. This system allows PC to accept/reject work orders, track work orders, check progress and statuses of work orders for line units, and submit work orders to support units. BackShops accepts the work orders from PC and, if necessary, submits an intershop work order to the appropriate shop.

Note. Refer to the ULLS–A EUM for additional user information and procedural guidance.

9-119. The BackShops select role screen (see Figure 9-7) will be displayed with a drop-down menu, allowing the selection of the following roles:

- PCA-BS (production control administrator [unit production control]).
- PCU-BS (supported unit user).
- SC-BS (shop chief).
- SP-BS (shop platoon leader).
- ST-BS (shop technician).
- TI-BS (shop technical inspector).

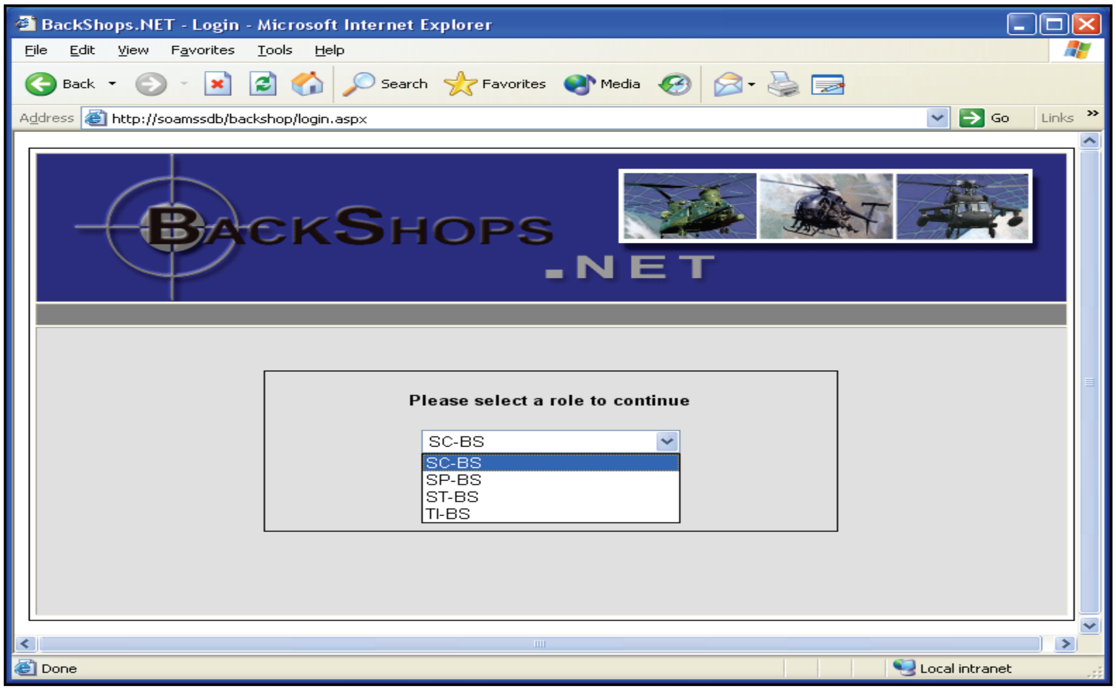

Figure 9-7. BackShops select role screen

ULLS–A PRODUCTION CONTROL ADMINISTRATOR—BACK SHOPS FUNCTIONS (PCA–BS)

9-120. Accessing the PCA-BS allows the production control administrator to—

- Create, view, and check the status of DA 2407s (work orders).
- View the comments that were added by the unit submitting the work order.
- Submit the work order from the units to the back shops for repair.
- If needed, have authorized personnel generate an inner shop work order.

9-121. Once the work order has been sent to the appropriate shop, the PCA can then view the DA Form 2407 to ensure that the work is being done and that the status of the ongoing maintenance is according to the technical manuals, including ETMs/IETMs. To accept the work order, the PCA-BS clicks on the "Accept" button (see Figure 9-8).

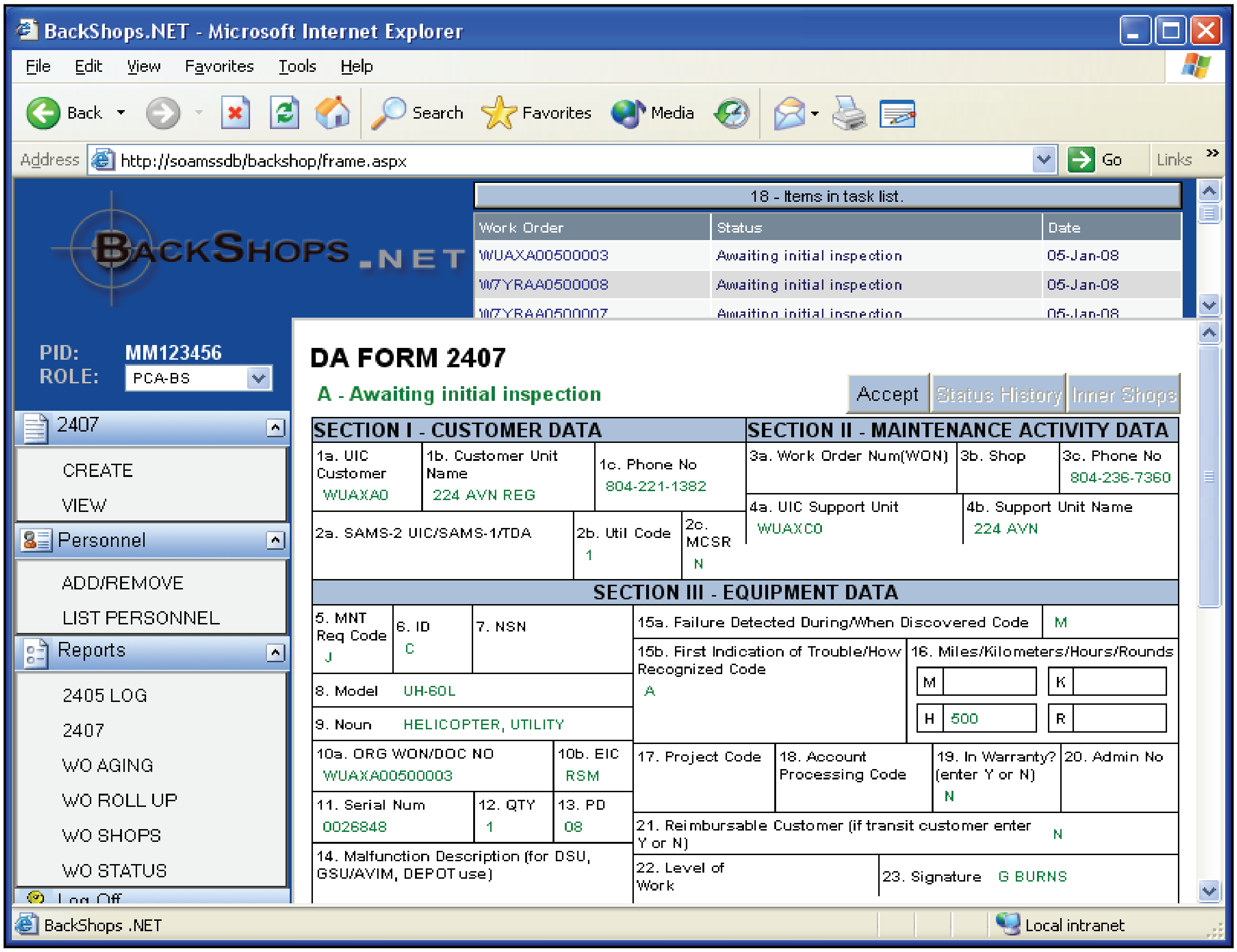

Figure 9-8. BackShops work order screen

9-122. Once the work order has been accepted internally by the back shops and a subsequent status has been assigned to it, authorized personnel, to include PC, can view the latest status assigned to the work order by clicking on the “Status History” button. If the same work order is in need of additional internal support from another shop or section, an internal work order can be generated requesting support by clicking the “CREATE” button. Once the internal work order has been generated, authorized personnel can the view the internal work order by clicking on the “Inner Shops” button (see Figure 9-8).

ULLS–A PRODUCTION CONTROL USER-BACK SHOPS (PCU–BS)

9-123. The production control user (PCU) is the supported unit production control representative. The PCU can view only the work orders and the corresponding statuses of work orders that have been submitted to the support unit. The PCU-BS will have a screen so that he can highlight the work order that has been sent to the ASC unit (see Figure 9-9).

Figure 9-9. Work orders sent to higher-level maintenance support

ULLS–A SHOPS CHIEF–BACK SHOPS (SC–BS)

9-124. The SC-BS ensures that all of the back shops are operating correctly and safely. He works with production control to ensure that work orders are processed and tracked to completion. The SC-BS also ensures that the shops are working according to all prescribed technical manuals, including ETMs/IETMs, and other publications.

9-125. Once a work order has been accepted from the PCA-BS and goes to a specific shop, the SC-BS can click on the DA Form 2407 to view the work order and see which shop it has gone to by clicking on the "Inner Shops" button (see Figure 9-10).

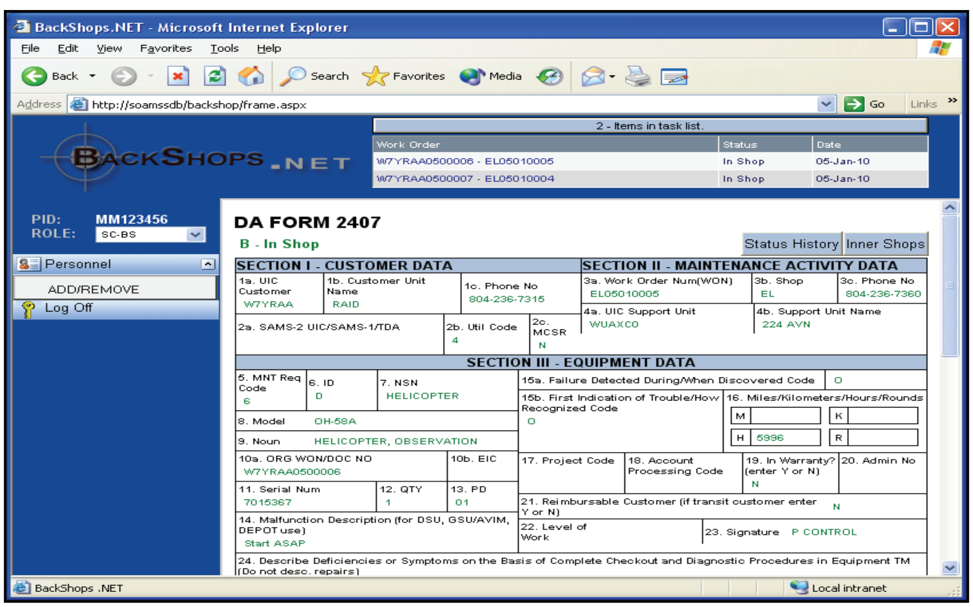

Figure 9-10. Work order screen (Inner Shops)

ULLS–A SHOPS TECHNICIAN-BACK SHOPS (ST–BS)

9-126. The ST-BS is the shops technician who is actually doing the work. The ST-BS will receive the work order from the PCA-BS and view the work order in its entirety to ensure that all of the appropriate blocks have been completed.

9-127. The ST-BS will scroll back to the bottom of the work order and click in Section IV, task requirements data; once he clicks, he will get a screen that shows the task requirements of the DA Form 2407. Then he will then scroll back to the top of the screen and select “Add Task” (see Figure 9-11).

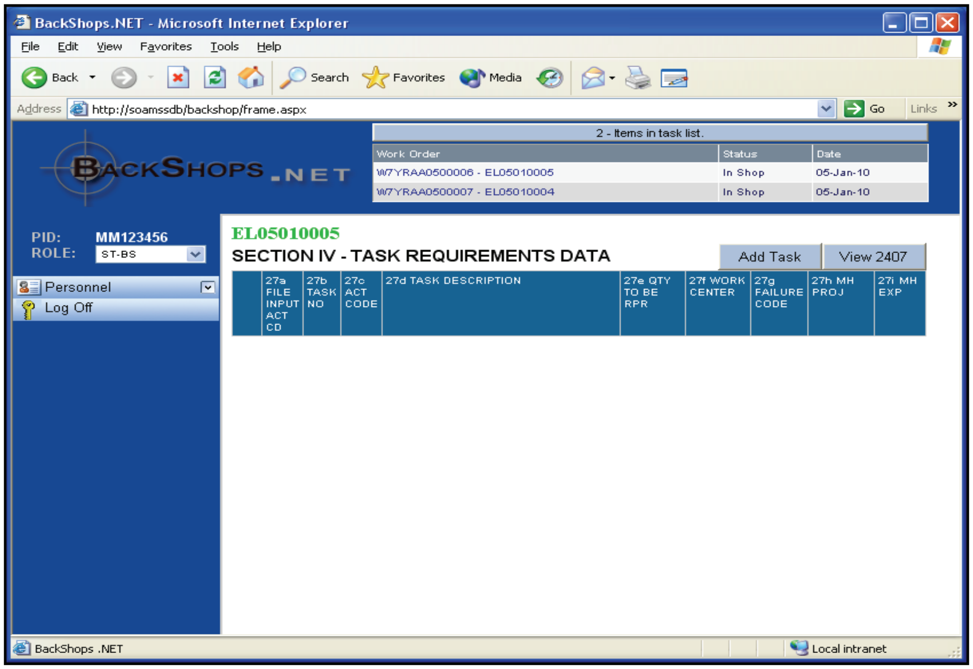

Figure 9-11. DA Form 2407-E, Section IV

9-128. Once the ST-BS accesses the “Add Task” fields (see Figure 9-12), he has a number of available fields in which to input data including the following:

- Quantity to be repaired.
- Work center.
- Failure code.
- Man-hours projected.
- Man-hours spent.
- Task description.
- Action code.
- Task number.
- PID assignment.

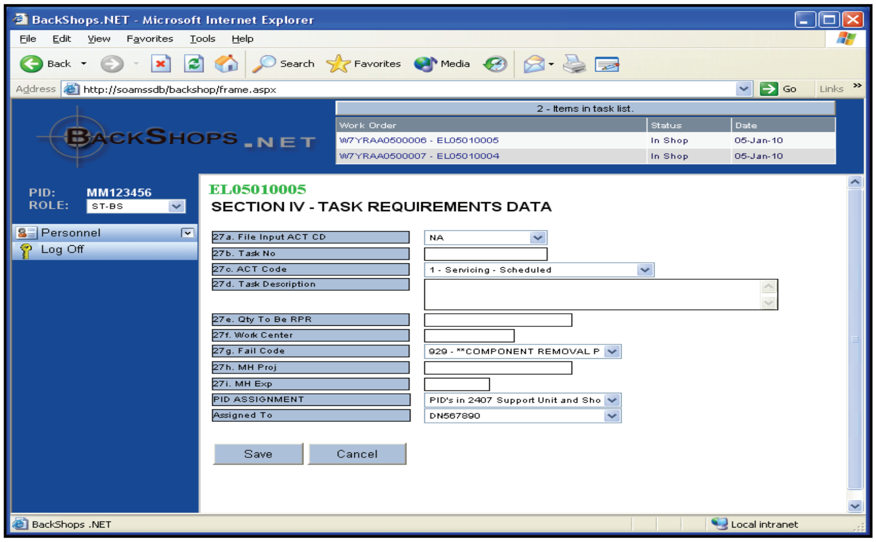

Figure 9-12. DA Form 2407-E, Section IV (data fields)

ULLS–A TECHNICAL INSPECTOR-BACK SHOPS

9-129. The TI-BS ensures that the maintenance was performed correctly and according to prescribed technical manuals, including ETMs/IETMs. To select the TI-BS, the user clicks on the role bar on the left side of the screen, scrolls down to the bottom, and selects TI-BS (see Figure 9-13). Once the TI-BS has been selected, a screen will appear that shows the work orders that are awaiting inspection (see Figure 9-13).

9-130. When the TI-BS is notified that the part or maintenance is complete and awaiting final inspection, the TI-BS inspects the maintenance that was performed. He then completes the appropriate blocks of the DA Form 2407 (see Figure 9-13).

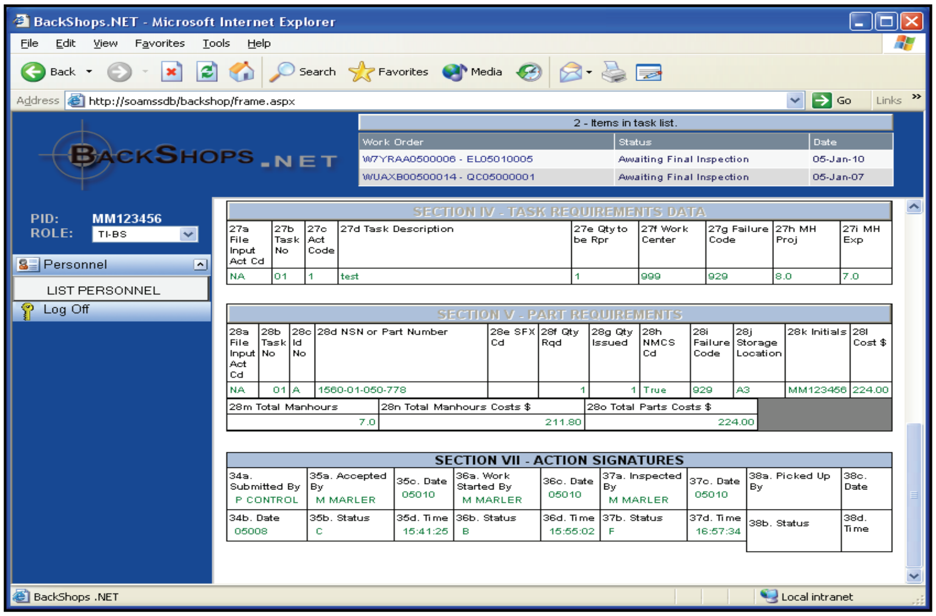

Figure 9-13. DA Form 2407-E, SECTION VII - ACTION SIGNATURES

Chapter 10

Aviation Maintenance Emerging Concepts

The DOD is changing the entire logistics process from a mass-based approach to a joint, multiservice "sense and respond logistics" (S&RL). This new approach will provide repair parts to the right place, at the right time. This chapter covers these logistics initiatives as applied to aviation. Although many of these systems are still developing, some of them are being used within sectors of the fleet in support of the current war fight and are considered to be the way ahead. The use of current commercial technologies will give the war fighter better situational awareness and a better means of supporting the fight with broad and systematic changes throughout the logistic and maintenance support system. Moreover, Army aviation maintenance seeks to make the transition from its maintenance-intensive scheduled maintenance program and reactive unscheduled maintenance program to a predictive and reliability-centered maintenance program.

SECTION I – AVIATION MAINTENANCE OBJECTIVES

10-1. Aviation Soldiers worldwide are supporting an Army that is serving a nation at war. The GWOT has increased aviation operations to a level not seen since the Vietnam Conflict. Despite some unique challenges, aviation Soldiers and their units have performed splendidly, often in austere and difficult COEs. They operate at high altitudes and in adverse weather; these conditions test the limits of the equipment, the operator, and the maintainers.

10-2. Aviation Soldiers, across the spectrum, are fighting against a unique and relatively unknown threat. Highly trained Army aviation maintainers, at all levels of support, continue to provide flight crews and operational commanders with safe, reliable, and fully mission capable aircraft. The often-overlooked maintainer operates in a third dimension in support of land-component commanders.

10-3. Changes will continue to be made—across the spectrum of doctrine, organization, training, materiel, leader development, personnel, and facilities (DOTMLPF)—to optimize Army aviation's role in warfighting. Leaders in operational units and trainers across the training spectrum must focus on the future while effectively leading and managing battle-focused training.

Contents

10-4. The primary tenets of Army aviation maintenance remain unchanged. They are to provide safe and MC aircraft to satisfy training and tactical mission requirements in support of the GWOT and stability operations and civil support operations. In time of war, Army aviation tactical missions primarily involve CS and protection; while in peacetime, the primary mission is training for the combat environment. The maintenance manager must be cognizant of the status and number of available aircraft to support the needs of the aviation maneuver battalion commander.

10-5. Establishing clear and concise maintenance objectives is much more challenging when resources (such as personnel, parts, and tools) allocated to the maintenance effort are limited or unavailable. When encountering these types of maintenance challenges, all maintenance managers must operate from a maintenance program that is both standardized and attainable. These established maintenance programs are conducive to not only increased aircraft availability but also, more importantly, a maintenance program that does not compromise safety.

10-6. The aviation maintainer's objective is to provide and sustain assigned aviation assets and return equipment to an FMC condition at the earliest opportunity. The program objective of Army aviation maintenance is to provide robust modular maintenance and logistics support to aviation maneuver battalions. This support includes, but is not limited to, the repair of aircraft systems and subsystems and associated weapon systems, and aviation ground support equipment.

10-7. To assist in this overall maintenance support mission, DOD has begun an effort to update and modify the Army's logistic business practices. Effective and sustainable logistics business practices will assist maintenance managers in providing enhanced logistics support to all warfighters. A by-product of enhanced logistics support is an increased warfighting capability for all deployed aviation forces.

10-8. New technologies provide commanders, at all levels, with enhanced logistics situational awareness. Enhanced logistic situational awareness will enable maintenance managers to have increased asset visibility. Asset visibility enables maintenance managers to better manage their maintenance program, ultimately reducing redundant maintenance procedures experienced through unnecessary controlled exchange of repair parts.

10-9. The Single Army Logistics Enterprise (SALE) provides logistics clarity to the maintainer who is looking at the COP for logistical information. This umbrella of systems will enable the Army to migrate several of its systems from STAMIS into the SALE system.

SECTION II – SINGLE ARMY LOGISTICS ENTERPRISE

10-10. The Army's SALE system (see Figure 10-1) will encompass all fixed-base facilities, including depots, arsenals, acquisition centers, and installations. It will also include all deployed unit levels down to the individual Soldier. Like the predecessor to the Logistics Modernization Program (LMP), the systems that GCSS will replace use many different legacy applications that will be phased out and migrated into the overall enterprise system. These net-centric enterprise systems will work in unison to provide connectivity, regardless of the location of the commander, logistician, or Soldier within the network or enterprise.

Figure 10-1. SALE

10-11. Army logistics systems must be able to *see* requirements in real time**,** *respond* to requirements with speed and precision, and *rapidly* establish forward *CSS* capabilities in support of expeditionary operations. SALE provides true horizontal and vertical integration of the Army's business processes and is the total architecture enabling end-to-end (E2E), or factory-to-foxhole, communication. SALE will contribute crucial functionality to handle specific mission-critical tasks within SALE such as supply-chain planning, sales and distribution, budget, and financial benefits.

10-12. Three major components serve as the foundation for SALE (see Figure 10-1):

- LMP incorporates fixed maintenance and supply installations within the National Maintenance Program.
- The Product Lifecycle Management Plus (PLM+) is a single source for master data management; PLM+ uses Web-centric technology to communicate with OEMs and link to other important internal and external components within the supply chain.
- The Global Combat Support System-Army/Tactical serves as the link to troops in the field.

10-13. The three major components of SALE will provide effective integration, both on the sustainment, or national, level and at the field, or tactical, level. SALE components will provide optimized mission capabilities across the enterprise. The complete SALE system will provide the Army with crucial efficiencies such as—

- Quicker response times for performance analysis and decision making.
- Improved aircraft and weapon systems management.
- Improved demand planning and consolidation of inventory records.

10-14. When SALE is fully deployed, some expected benefits include the following:

- Improvement in on-time readiness and customer satisfaction.
- Better visibility of global assets and financial data.
- A more agile, responsive logistics infrastructure.
- Greater efficiency in systems operations and improvement to system maintainability, adaptability, and scalability.

LOGISTICS MODERNIZATION PROGRAM

10-15. The LMP is an Army system (see Figure 10-1) used to store logistics data pertinent to the operations of the Federal supply system. LMP will replace the U.S. Army Materiel Command's Commodity Command Standard System (CCSS), which currently supports inventory control, repair and buy decisions, planning and budgeting, and its Standard Depot System (SDS).

10-16. LMP, when fully implemented, will support depot maintenance, property accountability, ammunition management, facilities management, and financial management functions. LMP benefits include the following:

- Provides a single source of data for reliable materiel commitment.
- Dramatically improves financial reporting integrity and transaction traceability.
- Enables interactive forecasts and planning for more than one million materiel needs in real time.

10-17. LMP will enable an order manager and global available-to-order (ATP) module to fill orders instantaneously by applying a rules-based, worldwide search. Its database comprises 1.4 million pieces of material. Every day, it processes 500,000 updates against backorders. The LMP maintains one set of financial information and provides real-time funds management and global inventory visibility. The system provides the USAMC with a modern, collaborative environment that will help the command concentrate on its core functions and make rapid, timely decisions.

PRODUCT LIFE-CYCLE MANAGEMENT PLUS

10-18. The PLM+ (see Figure 10-1) is recognized by the Army as a critical part of the logistics architecture. The PLM+ system is the major data manager of information, allowing for a direct link between the tactical enterprise and the national maintenance enterprise. It will handle both tactical data and product or plant management. PLM+ will be a key technical enabler to integrate E2E enterprise business processes between the GCSS-Army/tactical field-level logistics ERP and the Logistics Modernization (LOGMOD) Program national-level ERP. PLM+ is a system that encompasses logistics chain planning, acquisition and distribution, budget and finance, and product life-cycle management. The logistics chain planning, a process within PLM+, consists of demand planning, distribution planning, long-term and material requirements planning, and project systems and budget planning.

10-19. Another process of PLM+ enables the acquisition and distribution of Army material to include—

- Order management (back-order processing and MILSTRIP sales order processing).
- Buying (procurement, national maintenance management, and manufacturing and remanufacturing resource requirement planning).
- Distribution (inventory management, warehouse management, and single stock fund).

10-20. The PLM+ budget and finance process consists of general accounting DFAS and funds management and cost accounting budget formulation. The PLM+ product life-cycle management consists of provisioning, cataloging, packaging and freight, maintenance engineering, ammunition support, and bills of material.

10-21. The PLM+ processes enable suppliers—such as commercial contractors and Army industrial base (such as depots and arsenals) and other DOD (such as DLA and other services)—to provide requested materials to the customers such as Active Army, Army Reserve, National Guard, other DOD (Air Force [AF], Navy, Marines, and DLA), other Government agencies (Federal, state, and local), and foreign armed services.

10-22. PLM+ will be the single point of entry into the SALE from/to external systems and will interface GCSS-Army/tactical and LOGMOD to external systems. Product Manager Logistics Information Systems (PM-LIS) is responsible for logistics management systems throughout the acquisition life cycle of technology development, system development, production, deployment, and operations and support.

10-23. The PLM+ objectives are the following:

- Achieve a SALE.
- Serve as the "technical enabler" to link the field-level logistics system (GCSS-Army) with the national-level logistics system (PLM+).
- Establish a single access point to/from external systems and the SALE components:
  - Centralized automated flight records (CAFRS).
  - Condition based maintenance plus (CBM+).
  - Military flight operations quality assurance (MFOQA).
- Manage process integration between PLM+ and GCSS-Army/tactical.
- Manage SALE interfaces to external systems.
- Manage data common to PLM+ and GCSS-Army/tactical.
- Manage weapons system PLM+ functions.

10-24. PLM+ will deliver the following:

- Consistent/reliable logistics business process transactions within the SALE and with external trading partners.
- A single access point of entry to/from external interfaces—eliminating duplication.
- Total life-cycle systems management (TLCSM) support for Army weapon systems.
- Essential SALE architectural component, giving combat forces and logistics providers a decisive operational edge.

GCSS-ARMY

10-25. GCSS-Army (see Figure 10-2) will be the Army's seamless, integrated, modular, and interactive sustainment information management and operations systems at all force support levels. GCSS-Army will provide a single, common operating picture of the Army's tactical logistics requirements, assets, capabilities, and shortfalls. GCSS-Army shares data with joint information systems to allow for the sustainment of Army forces and joint forces. Logisticians, from tactical to national level, will have complete situational awareness of warfighter requirements and in-transit visibility of supplies and services.

10-26. GCSS-A will achieve the following:

- Speed the communication of user logistics requirements.
- Provide commanders and staffs, at all echelons and geographic locations, with a common operating picture of unit readiness and logistics resource status.
- Provide a system architecture that greatly simplifies the sharing of logistics management information to Army and joint command and control systems.
- Serve as the vehicle for the complete reengineering of Army logistics business processes to incorporate the latest advances in commercial business management.

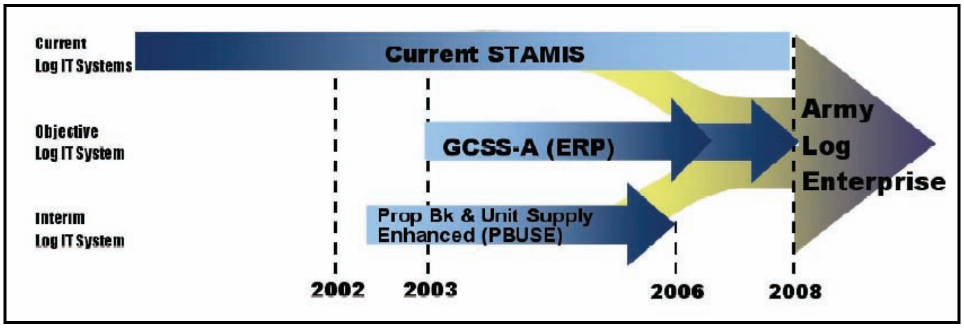

Figure 10-2. STAMIS timeline

10-27. The warfighter, for the first time, will reach back to a centralized database and obtain real-time information. The ERP solution will speed delivery of the right information, at the right time, to the right place and reduce the logistics footprint on the battlefield. The system will provide precise, real-time knowledge of the location and state of Army assets by allowing access to in-depth logistics information available on a near real-time basis.

PLATFORM MAINTENANCE ENVIRONMENT

10-28. The platform maintenance environment (PME) provides the functionality that allows the migration of data. The platform maintenance application (PMA)—

- Fills the requirement between GCSS-A and the aircraft platforms.
- Connects the Soldier to SALE.
- Establishes requirements for data extraction from the digital source collector platform and passing data to applicable systems; these systems include the following:
  - CBM+.
  - MFOQA.
  - CAFRS.
  - IETMs.
  - Flight operations and fleet management.
- Develops a common user interface.

SECTION III – AUTOMATED LOGISTICS AND INTEGRATED SYSTEMS

10-29. Automated Logistics and Integrated Systems (ALIS) provide the life-cycle management of all functional and technical aspects of the Army logistics systems. These systems include automation and sustainment of ammunition, maintenance, supply, property accountability, and finance.

10-30. ALIS manages a suite of Army logistics programs and products. The following is a brief description of those logistics systems.

10-31. Standard Army Ammunition System (SAAS) is the multilevel automated management, reporting, and accounting system that automates all retail life-cycle Class 5 management functions.

10-32. SAMS automates day-to-day weapon system and subcomponent readiness status, maintenance and related repair parts information, management functions from the tactical and field maintenance support, and the nontactical installation/table of distribution and allowance (I/TDA) activities. SAMS-E will replace ULLS–Ground and SAMS-1.

10-33. SARSS provides supply management and stock control at the Army retail level. These systems support the time-sensitive activities of receiving, storing, and issuing supplies; provide supply management functions; and place orders on the SOS the same day that they are received from a customer. SARSS is composed of three interrelated subsystems:

- SARSS-1.
- SARSS-2AC/B.
- SARSS-Gateway.

10-34. ULLS automates organizational-level supply, maintenance, property accountability, readiness, and unit status reporting functions in tactical units. It consists of two applications:

- ULLS-Ground.
- ULLS-A.

10-35. PBUSE provides an interactive automated property accountability, an asset visibility, and a management reporting system for unit/organizational property and equipment. PBUSE provides a Web-based property accountability system functionality in addition to seamless Federal Financial Management Improvement Act (FFMIA)/chief financial office (CFO) compliance.

10-36. ILAP provides a standard Army management tool that collects, integrates, and displays logistics and financial data. Joint Logistics Warfighting Initiatives (JLWIs) provide real-time asset visibility into traditionally closed logistics systems through a Web-based query of SARSS-1 and SAMS-1.

SECTION IV – COMMON LOGISTICS OPERATING ENVIRONMENT

10-37. The common logistics operating environment (CLOE) is a process to achieve the Army's vision for developing a technology-enabled force equipped with self-diagnosing equipment platforms that interact with a network CSS infrastructure that supports condition-based maintenance. CLOE will provide the joint warfighter with real-time, integrated health management and platform/Soldier status data to optimize combat resources and equipment readiness and improve battlefield distribution.

10-38. The goal of logistics transformation is to reduce the overall logistics footprint and have E2E, total, real, or near real-time visibility of all Class 9 (Air) repair parts from the factory to the foxhole. The main objective of CLOE is accurate, near real-time, actionable data and knowledge.

10-39. The overall goal of CLOE is to synchronize logistics concepts, organizations, and the latest generation of technologies into a single operational and technical architecture for current and future force structures. CLOE gives warfighters and logisticians, at all levels, total situational awareness within a common operating picture for all aspects of logistics, from factory to foxhole. At the same time, warfighters and logisticians will have a set of interfaces to processes such as calls for support, requisitioning an item from supply, in-transit visibility, and total asset visibility.

10-40. At the national level, CLOE data flows will enable fleet trending and analysis, reliability growth, adjustments to maintenance programs, and true prognostic capabilities that will leverage information resources to provide substantially better and more cost-effective CSS support. The data will support configuration management and failure analysis as well as adjustments to stock levels and consumable requirements. In addition, CLOE will permit performance-based logistics by providing information necessary to optimize system readiness.

10-41. CLOE ambitiously synchronizes multiple initiatives and programs to ensure that emerging logistics transformation concepts and processes work seamlessly. CLOE, thus, is several things at once:

- A logistics architecture developer for Combined Army Support Command (CASCOM) and TRADOC.
- The Army's conceptual guide to implement the *joint CSS* concept including S&RL and CBM+.
- A collaborative process to involve all of the stakeholders in the development effort.
- A technical means to integrate diverse systems, ensuring interoperability with joint service architectures.

10-42. Individual project or product management offices will develop the materiel solutions to enable the CLOE to fully support the warfighter. CLOE directly affects the individual platform, Soldier, and warfighting units. Its contributions include embedded platform health management, commander's situational awareness, a means to implement CSS, and sustainment operations improvement.

EMBEDDED PLATFORM HEALTH MANAGEMENT

10-43. CLOE-developed architectures define the environment for a vehicle to self-report platform and crew status autonomously or on demand without crew interaction. Embedded IETMs, linked with onboard sensors, will reduce the number of PMCS that the crew must perform. Embedded health management provides timely and accurate status of mechanical and sustainment systems, automatically; for example, the AH-64 Modernized Signal Processor Unit (Figure 10-3).

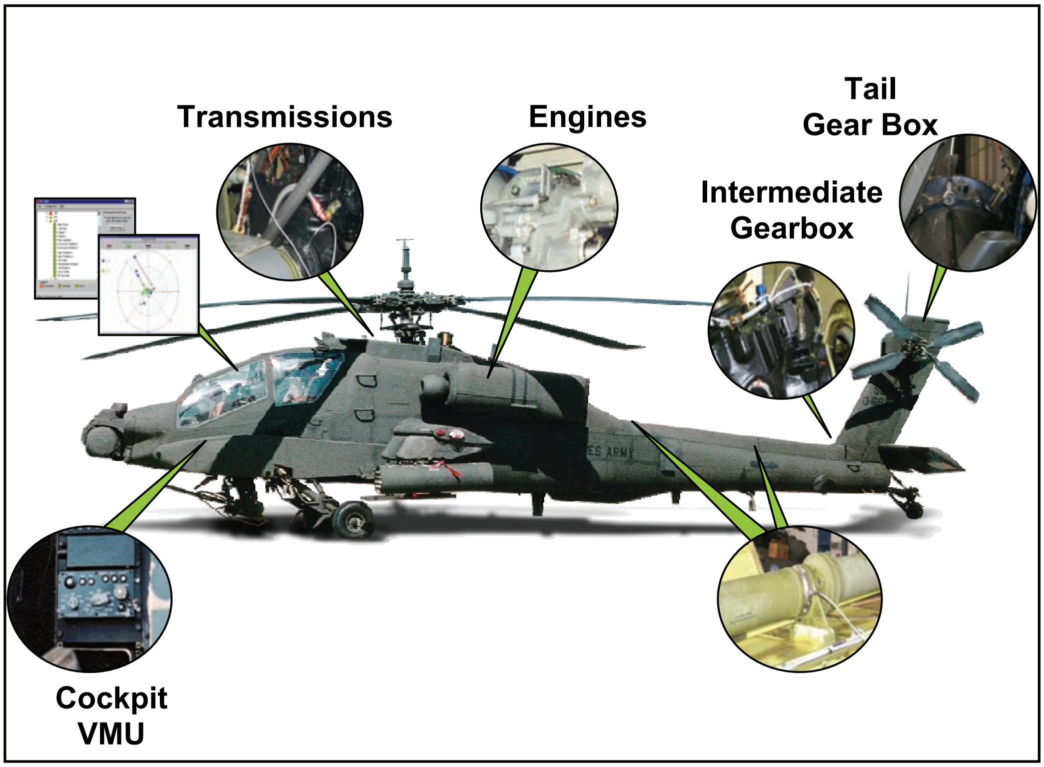

Figure 10-3. AH-64 Modernized Signal Processor Unit Overview

COMMANDER'S SITUATIONAL AWARENESS

10-44. To commanders and CSS managers, the embedded systems provide timely, accurate, and near real-time status reports for any echelon down to the individual platform level. This increased situational awareness provides unprecedented visibility of overall unit readiness and capabilities for mission planning and execution. Available information includes mechanical readiness, location, crew and maintenance or supply status, and key distribution information.

CSS

10-45. The common logistics operating environment directly supports the Army's initiatives toward enterprise integration. CLOE implements the information-centric CSS initiatives in the *joint CSS* concept, including S&RL, CBM+, and the linkages to enterprise resource planning and distribution systems. It is "born joint" and enables joint-force interoperability and interdependency, including sustainment, within network-centric warfare concepts.

10-46. CSS defines a fully modernized and transformed sustainment environment for the future that supports multifunctional, expeditionary, combined-arms units on a distributed, nonlinear battlefield. It allows generations of forces, with varying levels of information integration, to be interoperable in the single operating environment. It will enable S&RL to predict, anticipate, and coordinate logistics actions that provide warfighting advantages, spanning the full range of military operations.

CSS OPERATIONS IMPROVEMENT

10-47. Weapon systems that are compliant with CLOE-developed architectures will provide the information to allow the logistics system to anticipate demands and increase the accuracy of information in management information systems. As a result, CSS processes will experience reduced demand levels and smaller requirements for throughput of supplies and services.

10-48. The integrated enterprise will furnish logistical information to supported commanders, to ensure that they receive the right logistical support, at the right time. Information fusion merges operational and logistics information to create a single, integrated operational picture for both the commander and the logistics manager. Units will be able to track and redirect—and potentially reconfigure—forces, equipment, CSS, and support, even while on the move.

10-49. CLOE enablers will be able to provide insight into the status of CSS nodes and links to assure needed support or facilitate work-arounds for any type of disruption. National-level fleet managers will be able to anticipate demands for specialized materiel requirements (for example, means to minimize readiness effects of operation in desert sand conditions).

10-50. Emerging technologies will further enhance CLOE capabilities. CLOE will facilitate well-designed, real-time maintenance technology that will further reduce the logistics footprint (less inventory, less test equipment, and fewer maintainers), reduce repair cycle times, and improve weapon system availability. CLOE will also enable enhanced distribution systems that will provide unambiguous item identification, asset visibility, and environmental monitoring in field conditions. Taken together, these capabilities will provide commanders with powerful new planning tools for mission planning and CSS assessment.

10-51. At the tactical level, these information flows enhance the situational awareness of the tactical commander by providing current, accurate information on the operational status of assigned units. A single, integrated operational picture is provided to both the commander and the logistics manager. Logisticians can tailor logistics support to the current needs of each unit and make better use of available logistics resources. Productivity of aviation maintainers is improved by reducing time required for troubleshooting. Data-entry processes and information flows can be automated, reducing the administrative burden on both operators and logisticians.

SECTION V – NET-CENTRIC WARFARE

10-52. Net-centric warfare combines a powerful military force with information superiority, giving the warfighter greater awareness of his own forces, the enemy, and the battlefield environment. The United States now has a smaller, more lethal deployed military force. Net-centric operations permit forces to focus on specific targets, protecting the lives of American and coalition forces, as well as countless noncombatants.

10-53. Net-centricity is the realization of a networked environment—including infrastructure, systems, processes, and people—that enables a completely different approach to warfighting. The foundation for net-centricity is the DOD Global Information Grid (GIG). The GIG is the globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information—on demand—to warfighters, defense policymakers, and support personnel. Net-centricity will result in a completely digitized force, giving Soldiers and commanders real-time access to information from a broad range of systems (see Figure 10-4).

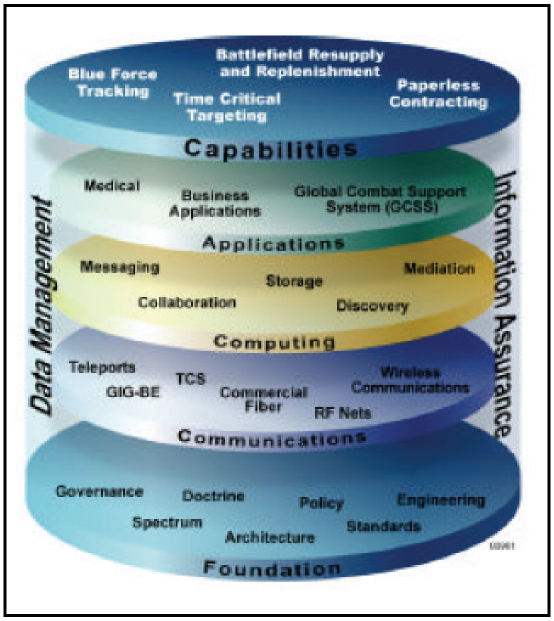

Figure 10-4. Integrated approach for delivering a net-centric environment

10-54. The Army Battle Command System (ABCS) (see Figure 10-5) takes full advantage of net-centricity to provide commanders with real-time or near real-time access to information from a broad range of systems. ABCS is an effort to bring 11 communications subsystems together onto one platform to provide interoperability. These 11 systems include the Force XXI Battle Command Brigade and Below (FBCB2), Global Command and Control System-Army (GCCS-A), Maneuver Control System (MCS), and All Source Analysis System (ASAS).

10-55. In addition to some common shared services, ABCS employs a mix of fixed/semifixed installations and mobile networks that are interoperable with theater, joint, and combined command-and-control systems. ABCS ties the subsystems together to mine data and provide a more integrated view on a single interface of what is happening on the battlefield—including real-time information on friendly and enemy forces. The goal is to outfit unit command posts by type and echelon with equal digital capabilities, common systems, seamless operations, and standard training requirements.

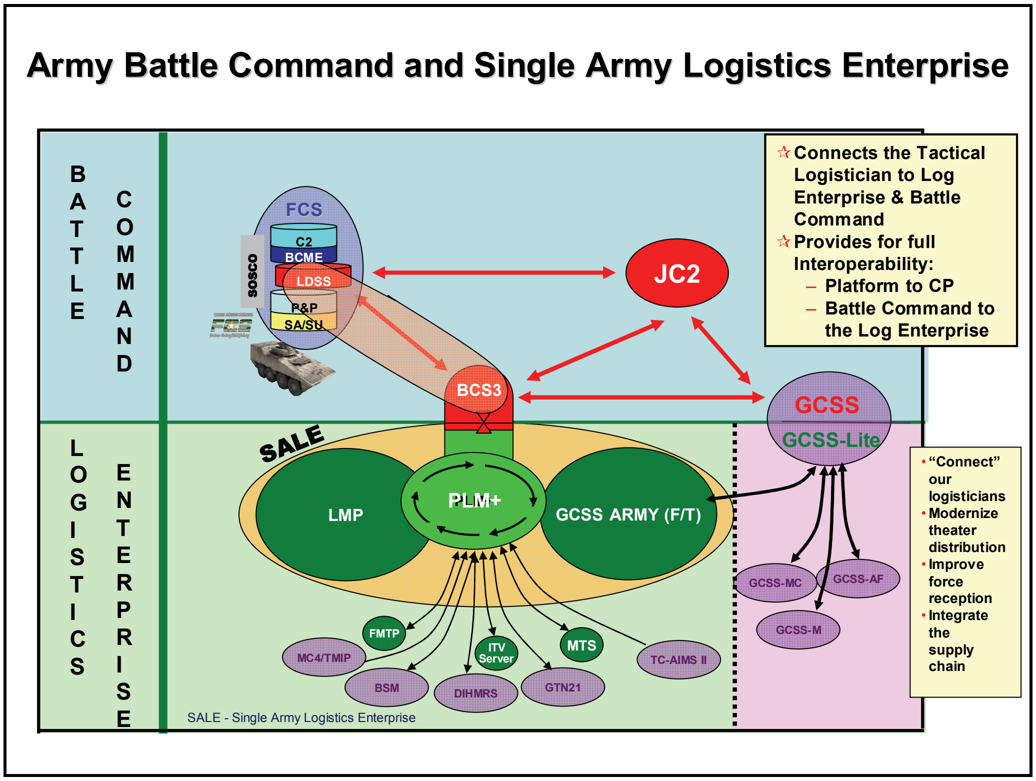

Figure 10-5. ABCS integration

SECTION VI – BATTLE COMMAND AND SUSTAINMENT SUPPORT SYSTEM

10-56. Commanders can see the logistics picture of the battlefield using BCS3's map-centric display. BCS3 operates in garrison, enabling peacetime as well as wartime operations. The system can operate in an unclassified environment; commanders, therefore, can plan, rehearse, train, and execute on one system. Soldiers do not have to carry disks around the battlefield to move data from unclassified to classified systems; they can conduct logistics operations on the unclassified network and, through the secure guard, migrate logistics information to the classified network to fulfill the logistics portion of the common operating picture.

BATTLE COMMAND SUSTAINMENT SUPPORT SYSTEM CAPABILITIES

10-57. BCS3 is the primary ABCS (see Figure 10-6) for the running estimates, which it accomplishes through current and future combat power reports, in-transit visibility, and the ability to track logistics-related commander's critical information requirement (CCIR) alerts. BCS3 provides RSO&I visibility and status. BCS3 also provides for electronic messaging and data exchange with ABCS and the movement tracking system. The overall system assists users in executing distribution management and convoy control. It emphasizes interfaces with other DOD data sources employing a data warehouse strategy and access to national databases.

10-58. BCS3 displays the latest available sustainment C2 in near real-time, continuous graphical representations across the AO; that is, friendly and enemy locations, logistic overlays, supply status, and combat power on a topographic map background. Analytical and decision-support tools enable commanders to make prudent decisions, rapidly and effectively.

10-59. BCS3 provides a running estimate of evolving logistics situations, including assessments of current and future combat power, which is essential for warfighters to assess their unit's capability to complete their mission. BCS3 integrates the COP, maintaining and generating logistic feeds to the running estimate requirement, as well as bringing in-transit visibility to the running estimate by assessing the effect of "dues in" on the current situation. Enabling the warfighter to view materiel in the pipeline is crucial to the accuracy of the running estimates; that is, projecting changes in status in 24-, 48-, and 72-hour representations. The warfighter can see combat power changes based on incoming materiel.

10-60. BCS3 also provides graphical displays of vehicle and cargo movements down to satellite-level, map-centric detail; by clicking on a specific unit icon, or vehicle; the system displays exactly how many critical items are available and projects status against requirements. In addition, the system provides log-related CCIR alerts. BCS3 users can tailor display screens, sort by columns, expand column widths, hide columns, and copy portions of displays for commanders' briefings.

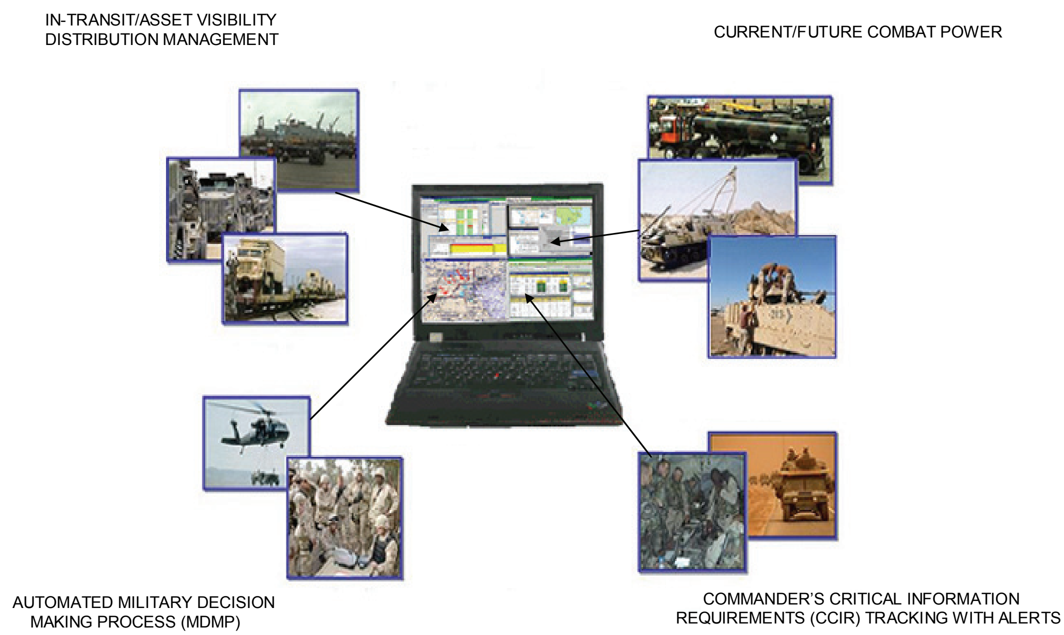

Figure 10-6. BCS3

COMBAT POWER (CURRENT AND FUTURE)

10-61. BCS3 presents a commander-centric assessment of weapon status with corresponding status of ammunition, fuel, maintenance, parts, and personnel. The highly tailorable, single-screen combat power report accommodates a variety of missions and command-unique definitions. BCS3 enhances situational understanding of dynamic changes in the OPTEMPO with updates to the combat power report, showing—at a glance—a selected unit's status with its immediate subordinate unit status. Reports can be launched from a map, and users can drill down to regions or situations of interest.

COMMANDER'S CRITICAL INFORMATION REQUIREMENTS

10-62. BCS3 accesses a database of unit personnel and equipment authorizations by SRC. Commanders preselect specific items that are critical to their current or future operations, creating the CTIL as part of the overall CCIR.

10-63. Commanders may tailor their combat power displays by defining essential subsets of equipment and materiel. By continuously monitoring CTIL assets, BCS3 tracks items within supply Classes 1, 5, 7, and 9 (Air) as well as personnel strength, maintenance, transportation, and medical status. Automated alerts to the CTIL level may be established, geared to specific unit or mission needs.

AUTOMATED MILITARY DECISION MAKING PROCESS

10-64. BCS3 provides the commander with logistics capabilities for MDMP—including the planning and decision-making process—with developmental guidelines, information sources, checklists, formats, and the graphic manifestation of the following:

- Concept of support.
- Concept-of-support overview matrix.
- Supporting sustainment overlay.

COMMON UNIT TASK ORGANIZATION (UTO) TOOL–AN ELEMENT OF MDMP

10-65. BCS3 enables users to maintain the UTO and track personnel and logistic information according to the force structure. Military-standard map icons—indicating type, size, name, and unit identification codes—depict the units on the UTO screen.

10-66. Whenever the task organization or concept of support changes, BCS3 automatically reconfigures reporting relationships, aggregating company-level data through the new parent unit. It automatically prepares and transmits messages, synchronizing UTOs among all BCS3 nodes.

ASSET VISIBILITY/DISTRIBUTION MANAGEMENT/IN-TRANSIT VISIBILITY

10-67. BCS3 collects and fuses data from multiple sources:

- FBCB2-BFT (unit and supply status).
- GCSS-Army/tactical and PBUSE (Class 7 system of record) legacy STAMIS (Class 7 maintenance, supply status, and personnel).
- Enterprise data concentrators—for example, ILAP/STAMIS concentrator and ITV.

10-68. BCS3 exchanges data with FBCB2-BFT, the digital battlefield system that delivered unprecedented success to the Army in Operations Enduring Freedom and Iraqi Freedom. Interfaces to the Movement Tracking System (MTS) and ITV feeds provide timely updates of sustainment vehicle locations. For example, movement of MTS-equipped vehicles is detected through an MTS control station, processed by BCS3, displayed on the common tactical picture map, and relayed to FBCB2, updating its map displays.

MOVEMENT TRACKING SYSTEM

10-69. The MTS is a critical battlefield enabler for combat support and Soldiers assigned to CSS battalions. MTS is bridging communication gaps that have existed for years. It is making up for the low number of frequency modulation (FM) radios in CSS units and overcoming the limitations of FM radio line-of-sight communications caused by long ranges or mountainous terrain.

10-70. MTS is a commercial, off-the-shelf product that has been "semiruggedized" to provide vehicle operators and their leaders with digital National Geospatial-Intelligence Agency maps, global positioning system (GPS) location data, and L-band (long-band) satellite two-way text messaging. MTS computer systems come in two configurations: a mobile system, which can be mounted in any tactical wheeled vehicle, and a laptop control station for use at platoon, company, battalion, or brigade headquarters.

10-71. The system enables Soldiers to see the position of, and communicate with, other MTS-enabled vehicles and control stations. Leaders can pass critical information, route and mission changes, and other information to their Soldiers while the Soldiers are on the road and conducting missions.

SECTION VII – COMMON OPERATIONAL PICTURE

10-72. The COP (see Figure 10-7) significantly improved logistics support to the warfighter. Visibility of supplies is critical to CSS and maintenance operations. However, to support combat operations, logisticians need to know not only the amount in transit but they also need to know how much was on hand and consumed, for all units. Three main systems were integrated to form the COP.

10-73. The systems were the ILAP, ITV, network, and the joint deployment and logistics model (JDLM). ILAP served as the data warehouse, integrating supply, finance, maintenance, and distribution information from standard legacy systems at hundreds of locations. ITV provided movement tracking of supplies from the continental United States to the theater—and all the way to support activities. The JDLM—a tool originally developed to support U.S. Army Europe and U.S. Air Force Europe in their mission planning—provided the necessary automated analysis to allow modeling, data mining, and graphical representation of information. The COP provides logistics planners with information on not only the location and quantity of supplies, but also, when paired with the tactical situation, it allows them to anticipate logistics issues and plan resupply operations.

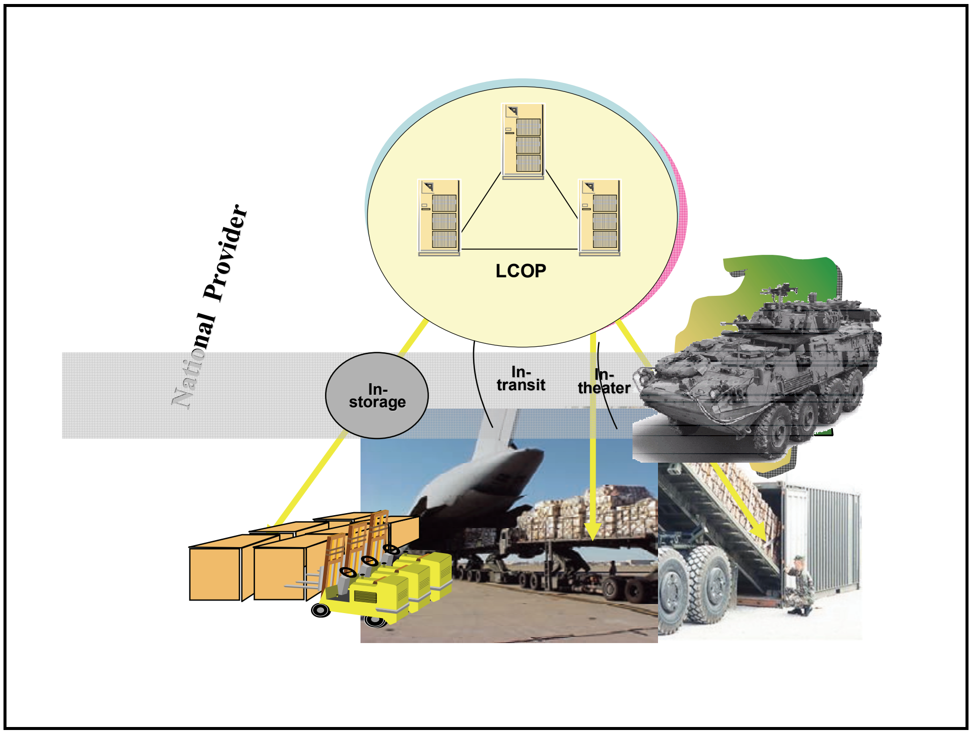

Figure 10-7. Common operational picture

SECTION VIII – CORE ENABLERS OF AUTOMATED LOGISTICS

10-74. The following are the core enablers of automated logistics:

- Two-level maintenance.
- Condition-based/predictive maintenance.
- Embedded diagnostics (ED)/embedded prognostics (EP), Health Utilization Monitoring Systems (HUMS), Spectrum Use Management System (SUMS), and Modernized Signal Processor Unit.
- Common aviation PME.

- Automated/Integrated Maintenance Management System.
- Digital aviation logistics.
- Technical data management and delivery.
- Automated identification technology/unique identification (UID).
- Tactical logistics data digitization (TLDD).
- MFOQA.
- CAFRS.

CONDITION-BASED MAINTENANCE PLUS

10-75. CBM+ will allow for optimized operational readiness through affordable, integrated, and embedded diagnostics and prognostics; automatic identification technology; and iterative technology refreshment. It is also DOD policy that CBM+ be "implemented to improve maintenance agility and responsiveness, increase operational availability, and reduce life cycle total ownership costs."

10-76. The goal of CBM+ is to perform maintenance only upon evidence of need. CBM+ tenets include the following:

- Design of systems that require minimum maintenance.
- Need-driven maintenance.
- Appropriate use of embedded diagnostics and prognostics through the application of reliability centered maintenance (RCM).
- Improved maintenance analytical and production technologies.
- Automated maintenance information generation.
- Trend-based reliability and process improvements.
- Integrated information systems providing logistic system response based on equipment maintenance condition.
- Smaller maintenance and logistics footprints.

10-77. CBM+ expands on these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. CBM+ can be defined as a set of maintenance processes and capabilities derived, in large part, from real-time assessment of weapon system condition, obtained from embedded sensors/external tests and measurements. Ultimately, these practices can increase operational availability and readiness at a reduced cost.

10-78. CBM+ enabling technologies include, but are not limited to, the following:

- Real-time data migration in a CLOE.
- Joint, common logistics operating picture (JCLOP).
- Closed-loop information systems that receive and transmit maintenance actions/instructions from the data warehouse down to the platform level and incorporate all automated systems.
- A common tactical STAMIS, such as the ULLS-A and, eventually, the GCSS-A, which will gather and integrate information obtained from the PME.
- Enterprise data warehouse (DW), capable of recording condition, usage, maintenance, parts tracking, environmental conditions, and intelligent prognostics; this DW must provide detailed data to aviation engineering directorate (AED) and OEM engineers while also providing summary programmatic information to program and materiel managers.
- Portable maintenance aids such as IETMs, PMEs, automated historical records, cockpit voice recorders (CVRs), and flight data recorders (FDRs).
- HUMS, which are the network of sensors that provides data to the PME for component condition determination and prognostic forecasting using ED and EP with nanosensors that monitor, transmit, and record operating parameters.
- In-line oil sensor technology and reporting that feeds the data bus for analysis and reporting.
- AITs used to enable UID of tangible items that facilitate accountability for financial officers.

- Parts-marking technologies, such as UID, ensuring data integrity and data quality throughout the life cycle of components of a weapon system.
- Regime recognition platform data linked to component AIT/UID to maintain a component's actual usage:
  - Automatic regime recognition enables the determination and storage of aircraft operating conditions that allow for the potential of CBM+.
  - For example, if an aircraft has been operated conservatively, component life can be extended; however, if a component has been operated in damaging conditions, the component life would be reduced.
  - Thus, health monitoring equipment and regime recognition alert maintainers to the actual status of equipment based on actual condition instead of just aircraft operating hours.
- Highly reliable components with integrated smart/self-diagnosing/repair technologies.
- Lighter multipurpose modular test kits and built-in automatic test equipment.
- Survivability enhancements (active and passive systems)/redundant systems.
- Embedded command and control and communications (EC3) for transmitting/data bursting ED/EP data from the platform through the CLOE infrastructure to maintainers for maintenance planning, to commanders for decision making, and to logisticians for parts acquisition decisions.
- TAV of the logistics pipeline.

OTHER DATA COLLECTION METHODS AND INPUTS

10-79. In addition to the enabling technologies listed previously, historical data collection methodologies—such as existing STAMIS, historical records, visual inspection, DA Form 2410 database, and incident and accident reports—will continue to provide valuable information on aircraft condition into the foreseeable future. CBM+ technology has the potential to monitor the health of aviation weapon systems and subsystems through the use of onboard diagnostics (near-term goal) and onboard/off-board prognostics (long-term goal). These advances will lead to component reliability improvements, reduced maintenance man-hours, and reduced aviation accidents and incidents.

10-80. Presently, the objective of CBM+ is to achieve a CLOE over the course of the next decade. The CLOE directly supports efforts to achieve the Army's integrated logistics enterprise and to enable joint force interoperability and interdependency, sense-and-respond logistics, network-centric warfare for logistics, and a fully modernized and transformed CSS environment for the future that supports multifunctional, expeditionary combined-arms units on a distributed, nonlinear battlefield. The transition to CBM+ will enable aviation to reduce the aviation logistics tail.

MILITARY FLIGHT OPERATIONS QUALITY ASSURANCE

10-81. MFOQA is the systematic collection and automated analysis of operational data from aircraft leading to continuous improvement in maintenance, flight operations, safety, and training, (MOST). This process gives leaders and staff, at all levels, the knowledge necessary to anticipate problems, avoid costly surprises, and seize opportunities using the data recording capabilities that currently are embedded or may be installed in Army aircraft. Under the concept of MFOQA, data recorders may include such items as flight data recorders, digital source collectors, and health usage monitoring systems.

10-82. The benefits of MFOQA are the following:

- Prevention of accidents.
- Improved cockpit discipline.
- Improved flight training.
- Reduced maintenance downtime.
- Reduced maintenance test flight requirements.
- Automation of aircraft records.

- Improved aircraft operational readiness.
- Identification of defective parts and components before failure.
- Availability of timely after-action reports, mission planning, and effective crew briefings.

TACTICAL LOGISTICS DATA DIGITIZATION

10-83. IETM facilitates maintenance and troubleshooting procedures, parts information, theory of operation, and illustrated graphics, which can be loaded onto a CD or lightweight portable computer. IETMs are a lightweight, cost-effective solution to accessing TMs on associated equipment systems.

10-84. The IETMs will be common to all helicopters in Army aviation. Current IETMs are considered to have achieved Class 3 functionality, which includes searchable data via hyperlinking of various technical manuals. The IETMs will continue to improve and develop, eventually being linked to the equipment and the maintenance network and will assist the technician with equipment diagnostics, troubleshooting, parts ordering, and maintenance planning at IETM Class 5.

SECTION IX – IN-TRANSIT VISIBILITY

10-85. ITV (see Figure 10-8) is the term that defines the reporting and management of what is moving within the DTS and the DOD's geographic operational theaters. It is the ability to track the identity, status, and location of unit equipment and nonunit cargo—from origin to destination. This management is not only physical management but also knowledge management: the ability to plan and predict requirements based on the information at hand. ITV is a component of TAV, which is the capability to provide users with timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, materiel, and supplies.

10-86. Joint-Automatic Identification Technology (J-AIT) provides a single point of contact for procurement and technical expertise across the suite of automatic identification enabling technologies. J-AIT supports CSS, TAV, and the integration of global supply chains. PM J-AIT provides automated near real-time accurate data collection, aggregation, and retrieval that enhance information management systems. J-AIT also manages RF-ITV for DOD, NATO, and coalition partners in support of expeditionary logistics and the joint war fight. For more information, visit the J-AIT Web site at https://www.eis.army.mil/ait or http://www.military-information-technology.com/article.cfm?DocID=995.

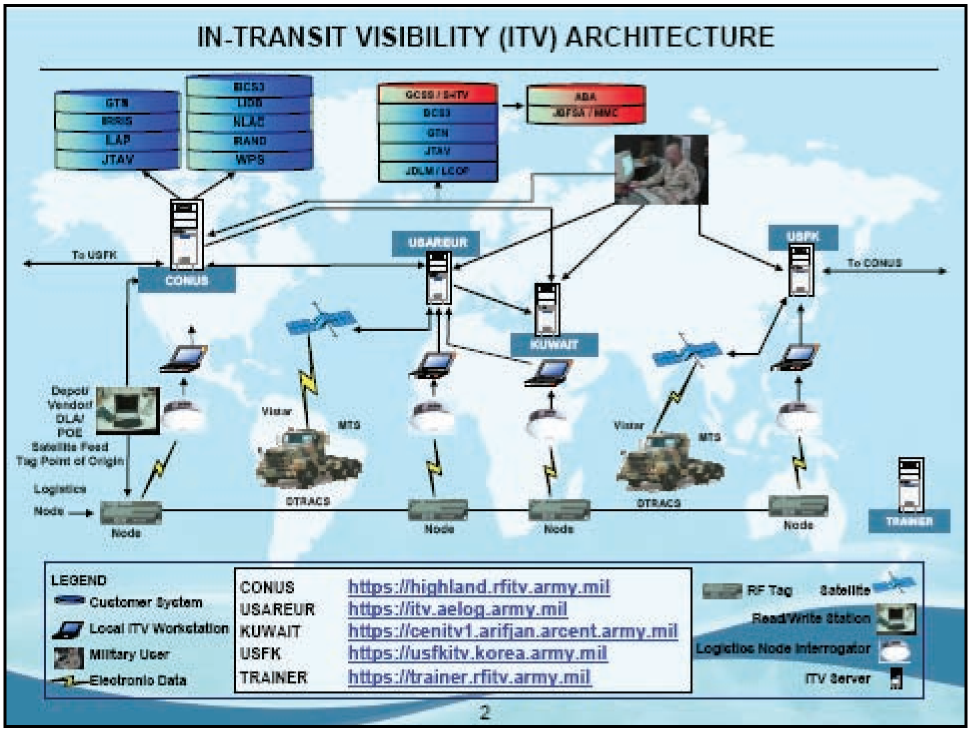

Figure 10-8. In-transit visibility

ITEM UNIQUE IDENTIFIERS

10-87. Item unique identification (IUID) (see Figure 10-9) is a system of marking items delivered to the U.S. Army with unique item identifiers, encoded in machine-readable symbologies and distinguishing an item from all other like and unlike items. The IUID program is a foundation for enabling the Army to achieve improved readiness, total asset visibility, improved life-cycle item management, and improved accountability.

10-88. A unique item identifier (UII) (see Figure 10-9) is a set of data marked on items that is globally unique, unambiguous, and robust enough to ensure data information quality throughout life and that supports multifaceted business applications and users. DOD requires that all items with an acquisition cost of $5,000 or more, all serially managed items, and some items meeting other criteria be marked with a UII.

Figure 10-9. Unique item identifier

10-89. For items serialized within an enterprise, a UII is derived by linking the enterprise identifier and the serial number. For items serialized within a part number, the UII is derived by linking the enterprise identifier, part number, and serial number. Each item that requires a UII is required to be marked, as a minimum, using a two-dimensional data matrix equipment category code (ECC) 200 bar code applied in a way that will ensure that the UII remains marked for the entire life cycle of the item.

10-90. It is important to differentiate between the UII and the medium that carries the UII. The UII is data. The data matrix bar code is one of many automatic identification technologies that can be used to carry that data. A bar code is not a UII, and a UII is not a bar code.

RADIO FREQUENCY IDENTIFICATION

10-91. A wide range of tags is available for mounting on products and assets. The type and design of RFID tags are selected according to customer requirements. The correct selection of RFID tags enables high-speed automatic scanning of products and assets equipped with an RFID tag (see Figure 10-10). There are three categories of RFID tags: active, semiactive, and passive.

ACTIVE TAGS

10-92. Active tags are battery-powered devices that have an active transmitter onboard; unlike passive tags, active tags generate RF energy and apply it to the antenna. This autonomy from the reader means that they can communicate at distances greater than 100 meters (roughly 300 feet).

SEMIACTIVE TAGS

10-93. Semiactive tags have built-in batteries and do not require energy from the reader to power the chip. This characteristic allows them to function with much lower signal power levels, resulting in distances of up to 10 meters.

PASSIVE TAGS

10-94. Passive tags are bar codes that refer to a broad range of optically- or laser-based, machine-readable data-encryption techniques. Passive tags are radio frequency identification devices that do not have any internal power source.

Figure 10-10. Radio frequency identification

SECTION X – CONNECTING THE LOGISTICIAN

10-95. The Army's "Connect the Logistician" (CTL) program is improving the flow of vital supplies to war fighters. The components of CTL are very small aperture terminal (VSAT), CSS automated information systems interface (CAISI), and satellite communications. The program, powered by the Combat Service Support Satellite Communications (CSS SATCOM) global VSAT-Internet protocol (IP) network, has become a major combat multiplier.

COMBAT SERVICE SUPPORT SATELLITE COMMUNICATIONS

10-96. CSS SATCOM is a compact, self-contained, lightweight system that includes an autoacquire antenna and built-in GPS. Soldiers with little or no satellite communications training can set up the system and be transmitting in 20 minutes or less; the system does not require specialized, technically knowledgeable Soldiers to set up and operate it.

VERY SMALL APERTURE TERMINAL

10-97. The CSS VSAT system (see Figure 10-11) includes built-in GPS receivers, a motorized satellite antenna, and a laptop computer that runs the CSS VSAT software program—enabling individuals with little or no satellite communications training to set up a satellite communications link and acquire non-classified Internet protocol router network (NIPR) access almost anywhere in the world. The system software determines the current location of the antenna, determines the satellite to be used, configures the modem, and automatically points the antenna, via GPS. VSAT is a combat power force multiplier, directly contributing to greater operational readiness rates and reduced downtime of combat systems.

Figure 10-11. CSS VSAT

COMBAT SERVICE SUPPORT AUTOMATED INFORMATION SYSTEMS INTERFACE

10-98. The system can be connected to either a local area network—via a hub, router, or switch—or to a wide area network (WAN), via a wireless interface—such as the CAISI (Figure 10-12). An operator using CAISI can operate a terminal up to four miles away from the antenna, greatly increasing survivability from incoming rounds.

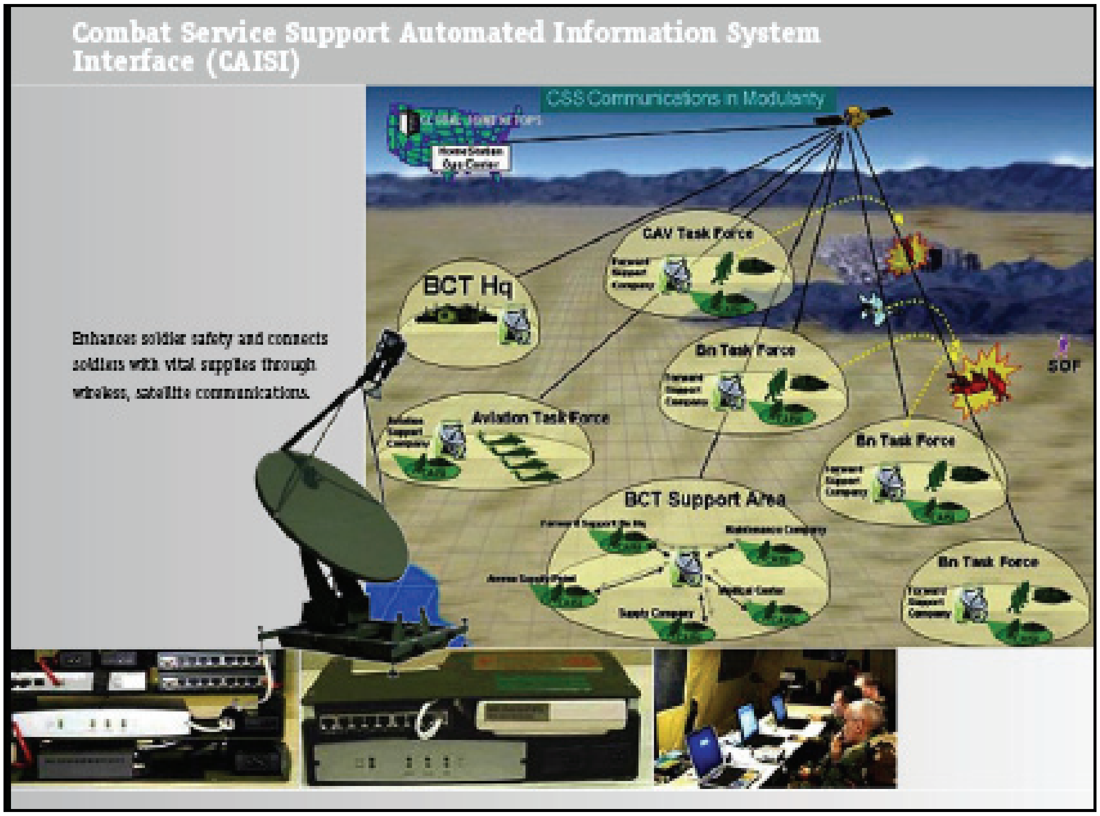

Figure 10-12. Combat Service Support Automated Information Systems Interface

10-99. CAISI extends tactical connectivity capability from the theater level to the brigade support area (BSA). It also provides traditionally-lacking communications for CSS missions such as supply chain management, maintenance, and business systems. CAISI has been lauded by CSS personnel for helping to eliminate the "sneaker net"—the need to physically walk information from one point to another in the rear area.

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Appendix A

Aviation Maintenance Company Internal Standard Operating Procedures

A well-drafted and thought-out SOP will provide the user with continuity, in the absence of leadership. Generally, an SOP is drafted to meet unique operational requirements and to standardize procedures within an aviation unit. When drafting an aviation maintenance SOP, the writers should always convey to the user the uniqueness and peculiarities of a given unit. The SOP provides the user with guidelines and procedures to execute a specific mission in the absence of direct leadership. The commander will review the SOP for content, context, and clarity of purpose. The aviation commander will approve and sign the SOP, after which it becomes a binding document—once he is satisfied that the SOP directly conveys his vision and that of his commander.

REQUIREMENTS FOR DRAFTING AN AVIATION MAINTENANCE COMPANY INTERNAL SOP

A-1. Figures A-1 and A-2 contain sample SOPs for both a headquarters section and PC section. The following information and requirements should be considered by AMC personnel when establishing an internal SOP: heading, applicability, purpose, scope, objectives, revisions, responsibilities, operations, procedures, general information, and references.

A-2. The heading of the SOP varies, depending on the type of internal SOP that the document is going to be. If the SOP is going to be part of an administrative SOP at the battalion level, then the heading will reflect the SOP as an appendix to the administrative SOP.

A-3. If the document is part of the AMC SOP, then the heading will list the name of the organization, the station, and the date. It will also include the SOP number (if used) and the type (internal or external) of SOP.

APPLICABILITY

A-4. This block or section identifies the unit personnel (assigned/attached) to which this SOP applies.

PURPOSE

A-5. This block or section states the overarching concept or reason that the SOP is written: that is, to provide a standardized guide for maintenance support procedures used by the AMC to define aircraft unit maintenance standard operating procedures, responsibilities, operational policies, and maintenance procedures for personnel performing aircraft maintenance and related ground support system repair. This section can be tailored for use by all AMCs to reflect their own peculiarities and MDS airframes as appropriate.

SCOPE

A-6. This block or section spells out guidance and information (general or specific) contained within the SOP. This section states whether this SOP applies to both garrison and field locations or while deployed to a theater of operations. If specific instructions are to be used while on deployment status, commanders/leaders may convey additional instructions or policies in this section.

> ***Note.*** The following information is as an example of specific instructions or guidance: "The following policies are established to augment this SOP while on deployed status; however, at a minimum, the provisions of this SOP will be complied with unless written deviation is authorized by the AMC commander. If this SOP conflicts with other Department of the Army (DA) or Department of Defense (DOD) directives, the higher authority reference takes precedence."

OBJECTIVES

A-7. This block or section states the objectives of the AMC: for example, to provide maintenance support to assigned units; perform maintenance on aircraft systems or subsystems, aircraft armament, and avionics equipment; provide related repair parts supply; and provide aircraft recovery support when requested.

REVISIONS

A-8. For an SOP to remain valid and relevant to the unit's stated objective, it must be current. The following entry can be used in this block or section: "This SOP must be reviewed and, if necessary, revised whenever a new or revised DA publication is fielded." In addition, the following information may be entered in this section/block: who can submit changes and how often, the classification of how urgent a stated change is and how soon must it be applied to update the unit's SOP, who determines the criticality of the recommended change, and who receives and reviews recommended SOP changes.

RESPONSIBILITIES

A-9. This block or section spells out what are normally considered to be specific responsibilities of a given commander/leader/maintainer. In addition, some of these responsibilities may fall under the category of "monitoring" a specific program or function assigned to the AMC. Some examples are the following:

- Monitor overall responsibility for the supervision of an effective and a safe maintenance program.
- Monitor the management of the aircraft PLL.
- Monitor a record of the daily aircraft flying hours and the operational readiness condition of each assigned/attached aircraft.

OPERATIONS

A-10. This block or section identifies, in detail, the full concept of operations contained within a given SOP. This block will contain, if applicable, deviations to established standard procedures. The following information can be included in this block or section:

- What type of function or service can be expected from an individual platoon, shop, or section.
- How business is to be conducted.
- The days and times that specific operations or procedures can be conducted.
- The type of standard procedures that maintainers must follow when seeking assistance.

PROCEDURES

A-11. The procedures block or section gives specific steps that need to be followed when dictating specific guidance. As an example, when writing the AOAP or the TMDE appendices to the SOP, the following information can be entered in this block or section:

- Samples must be taken within 15 minutes after shut down (hot).
- Cold samples must be explained in the circumstances block on DD Form 2026.
- Special samples must be marked "SPECIAL" in red.
- DD Form 2026 (Oil Analysis Request) will be turned into QC.
- Oil sample bottles will be marked with the aircraft serial number and component name.
- Oil samples will be turned in the same day that the sample was taken.

GENERAL INFORMATION

A-12. This block or section is optional. If used, the following blanket statement can be entered: "Close coordination from the crew chiefs, maintenance test pilots, platoon sergeants, and supporting sections in the AMC is essential to the success of a well-organized maintenance program." This SOP is divided into separate appendices that cover specific areas of aircraft maintenance. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

REFERENCES

A-13. As the title implies, this block or section contains all applicable references and publications used to write a specific appendix contained within the AMC's internal SOP.

Note. DA Pamphlet 25-30 contains a more detailed listing of reference/publication requirements. Refer to Chapter 8 for guidance to access the LIDB Publications Module. This module contains a comprehensive listing of publications that support assigned end items. Chapter 8 also has a link to the electronics technical manual site.

APPENDIX 1 (SOP Number) Headquarters, **(enter unit's name)** to ANNEX C (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314 **(enter name of parent organization and station)** 09 Jul 06 (date) Admin SOP (type of SOP)

1. Applicability:

a. This SOP applies to all persons assigned or attached to **(enter unit's name)**.

b. Deviation from the guidelines set forth by this SOP may only be authorized by the **(parent battalion)** commander, maintenance unit commander, or the PC officer.

2. Purpose: To define aircraft unit maintenance standard operating procedures, responsibilities, operational policies, and maintenance procedures for personnel performing aircraft maintenance and related ground support system repair in the **(enter unit's name)**.

3. Scope: This SOP provides information and guidance to all personnel performing maintenance on **(enter unit's name)** assigned/attached aircraft.

4. Objectives:

a. Provide safe, fully mission capable aircraft to meet all training and tactical mission requirements.

b. Ensure maximum operational readiness of equipment.

c. Provide early detection and correction of potential equipment failure at the AMC level and, if necessary, rapid evacuation to an ASC for support maintenance.

d. Enhance aircraft material readiness to achieve, as a minimum, the Department of the Army (DA) standard.

e. Standardize applicable maintenance and administrative procedures.

f. Coordinate recovery and evacuation of assigned/attached aircraft when airframes are nonmission capable and must be evacuated to the rear for repairs.

5. Revisions: This SOP must be reviewed and, if necessary, revised whenever a new or revised DA publication affecting the contents of this SOP is fielded. If no new DA publications have been fielded, this SOP will be reviewed every **(enter time)**. All personnel who are permanently assigned/attached to the **(enter unit's name)** may submit proposed changes to this document to commander, **(enter unit's name)**.

Figure A-1. Sample SOP for an AMC headquarters appendix

6. Responsibilities:

a. **(Enter unit's name)** commander:

(1) Has overall responsibility for the supervision of an effective and safe maintenance program.

(2) Is responsible to the **(enter name of parent operational battalion)** commander for the conduct of the aviation support company maintenance mission.

(3) Is responsible for the **(enter unit's name)** safety program.

(4) Monitors a record of the daily aircraft flying hours and the operational readiness condition of each assigned/attached aircraft.

(5) Monitors the work progress of the various maintenance sections to ensure that a balanced workload is maintained.

(6) Monitors the preparation and submission of all required status reports to the (**enter name of parent operational battalion)** commander.

(7) Monitors the coordination and scheduling requirements for supporting maintenance activities of all work beyond the **(enter unit's name)** capability.

(8) Monitors the management of the aircraft prescribed load list.

(9) Monitors the **(enter unit's name)** budget. Ensures that the Class 9 (Air) budget is reconciled by the unit's budget officer on a regular schedule. Alerts the **(enter name of parent operational battalion)** commander whenever a budget discrepancy or shortcoming is identified and no resolution is forthcoming from the resource management office.

b. **(Enter unit's name)** first sergeant:

(1) Is responsible to **(enter unit's name)** commander for coordination of all day-to-day action within the unit.

(2) Enforces hangar safety and maintenance/shop safety procedures.

(3) Monitors hangar space for cleanliness and safety.

(4) Establishes and maintains required on-the-job and cross-training programs within the unit for all assigned/attached personnel.

(5) Informs the **(enter unit's name)** commander of all maintenance and personnel matters that affect the unit's mission.

Figure A-1. Sample SOP for an AMC headquarters appendix (continued)

7. Organization:

a. **(Enter unit's name)**, Headquarters

b. Production Control Section

c. Quality Control Section

8. General information: Close coordination from the crew chiefs, maintenance test pilots, platoon sergeants, and the supporting sections in **(enter unit's name)** is essential to the success of a well-organized maintenance program. This SOP is divided into separate appendices that cover specific areas of aircraft maintenance. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

9. References:

AR 95-1	Flight Regulations
AR 385-10	Army Safety Program
AR 385-40	Accident Reporting and Records
AR 385-64	U. S. Army Explosives Safety Program
AR 385-95	Army Aviation Accident Prevention
AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below the National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test, Management, and Diagnostic Equipment Program
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-1	Leader's Unit Level Maintenance Handbook
DA PAM 750-8	The Army Maintenance Management System (TAMMS)
FM 3-04.500	Army Aviation Maintenance
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures

Figure A-1. Sample SOP for an AMC headquarters appendix (concluded)

Appendix 2 (Production Control) to Annex C (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314 **(enter name of parent organization and station)** 09 Jul 06 (date) Admin SOP (type of SOP)

1. Applicability:

a. This SOP applies to all persons assigned or attached to **(enter unit's name)**.

b. Deviation from the guidelines set forth in this SOP may be authorized only by the **(parent battalion)** commander, **(enter unit's name)** commander, or the PC officer.

2. Purpose: To standardize maintenance management procedures and operations within **(enter unit's name)**.

3. Scope: This SOP provides information and guidance to all personnel performing maintenance on **(enter unit's name)** aircraft.

4. Objectives:

a. Standardize maintenance procedures.

b. Ensure maintenance safety.

c. Maximize aircraft and equipment operational readiness.

5. Revisions: All personnel who are permanently assigned to the **(enter unit's name)** may submit proposed changes to this document to Commander, **(enter unit's name)**.

6. Responsibilities of Production Control Personnel:

a. The PC officer—

(1) Oversees the operational readiness of all assigned aircraft and related aviation ground support equipment.

(2) Ensures maintenance and utilization scheduling.

(3) Ensures the collection of all maintenance and readiness data.

(4) Ensures the accurate and timely submission of all required reports.

Figure A-2. Sample SOP for an AMC production control

(5) Coordinates with support maintenance activities and contract field service representatives.

(6) Performs duties as maintenance test flight evaluator, maintenance test pilot, and technical inspector.

(7) Supervises unit technical supply personnel, in the absence of an aviation logistics officer or a technical supply officer.

(8) Performs such additional duties as may be deemed necessary by the **(enter unit's name)** commander.

(9) Chairs and conducts production control meetings.

b. The PC NCOIC—

(1) Oversees internal operation of the PC office and technical supply, in the absence of an aviation logistics officer or a technical supply officer.

(2) Ensures the accuracy of flight company daily status reports, NMCS records, and DA Form 2408-12s and -13s.

(3) Conducts the daily PC meeting, in the absence of the PC officer.

(4) Submits the **(parent battalion's name)** daily aircraft status report to the aviation brigade.

(5) Ensures the smooth and timely accomplishment of all daily squadron aircraft maintenance tasks.

(6) Maintains accurate and up-to-the minute DA Form 1352-1s and ensures that the monthly DA Form 1352 report is submitted accurately and on time.

(7) Ensures that flight troop aircraft mission assignments enhance the battalion's maintenance posture.

Figure A-2. Sample SOP for an AMC production control (continued)

c. PC Clerk:

(1) Maintains an automated work order log when Standard Army Management Information System (STAMIS) is operational. When the STAMIS is inoperable, a manual work order log, DA Form 2405, must be used. When STAMIS resumes operation, all manual work order entries will be inputted into the system.

(2) Initiates and processes internal maintenance work orders. Notifies corresponding shops and sections for pickup of work orders.

(3) Initiates and processes external maintenance work orders. Submits work orders to higher-level maintenance and picks up repaired components.

(4) Performs all duties assigned by the PC NCOIC/PC officer.

7. Production Control Operations:

a. The production control section is the data collection, dissemination, and maintenance flow element for all field-level maintenance tasks performed on all battalion aircraft. To provide a consistent flow of information and maintenance tasks, the following standard procedures will be followed by all maintenance personnel.

(1) Production control meeting: PC meeting Monday–Friday at **(enter time)** hours.

Note. Refer to FM 3-04.500, Chapter 6, for information on topics of discussions, attendance requirements, and daily aircraft status reporting requirements.

(2) Daily aircraft status reports:

Figure A-2. Sample SOP for an AMC production control (continued)

(3) Work request processing: The following are procedures used by PC personnel when processing work requests for supported unit.

(a) In-house work requests will be submitted to the PC clerk/PC NCOIC on a DA Form 2407, or DA Form 2407-E if using ULLS–A, filled out according to DA PAM 738-751. If using ULLS-A, the crew chief needs to complete an aircraft migration to process the work request.

(b) The PC officer or, in his absence, the PC NCOIC will assign the priority.

(c) The PC clerk/PC NCOIC will log the work request, return the green copy to the originating unit or section, and forward the remaining copies to the appropriate shop for repair actions. Once the repair has been accomplished, the PC clerk/PC NCOIC will reconcile the PC work order log.

(d) For work requests exceeding the capabilities of **(enter unit's name)**, the DA Form 2407, or 2407-E if using ULLS – A, will be turned over to the aviation support company (ASC). Upon return of a copy of the DA Form 2407 or 2407-E indicating acceptance from ASC, the unit will be notified of the work order number. The original copy of the DA Form 2407 or 2407-E will remain on file in PC until the ASC completes the work.

(e) Work-order reconciliation may be requested by any PLT SGT, section SGT, or crew chief from PC at any time. However, work orders for a grounding (X condition) or PMC condition will be reconciled daily at the PC meeting.

(4) DA Forms 1352-1 and 1352 maintenance: The following aircraft forms are used by PC personnel to track aircraft flight hours for assigned or attached aircraft.

(a) DA Forms 2408-12 and -13 will be turned in by the unit to PC NLT **(enter time)** hrs for the previous day's/night's flights. (A unit using ULLS-A would include migration of aircraft logbook data during this time as well.)

(b) PC will forward the DA Form 2408-12s and 2408-13s to the **(enter unit's name)** quality control section after verification of flight hours and downtime.

Figure A-2. Sample SOP for an AMC production control (continued)

(5) Production control board: PC personnel use the PC board to keep track of aircraft readiness as well as maintenance and logistics actions.

(a) The production control board is used as a planning tool for daily aircraft maintenance.

(b) The production control board is updated daily at the PC meeting.

(c) Any activity within the battalion having updated aircraft status information will forward that information to PC immediately.

(d) This board will serve as the battalion commander's quick reference update of fleet status throughout the day.

b. Field operating procedures will mirror those operating procedures adhered to in garrison. However, flexibility is the essential. Production control will coordinate deviations required because of the field or tactical situation. Those procedures may include, but are not limited to, ordering parts, obtaining ASC support, and evacuating aircraft and aircraft components to higher maintenance, as well as any other situation not specifically covered in this SOP.

8. References: The following references are for both garrison and tactical SOPs. All personnel assigned or attached to the **(enter unit's name)** should review references to understand the overall concern for safety and maintenance procedures. These references should be reviewed regularly so that changes or new information provided by these publications can be implemented into this SOP as necessary.

AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below the National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test, Management, and Diagnostic Equipment Program
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	The Army Maintenance Management System (TAMMS)
FM 3-04.500	Army Aviation Maintenance
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures

Figure A-2. Sample SOP for an AMC production control (concluded)

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Appendix B

Aviation Support Company Internal Standard Operating Procedures

A well-drafted and thought-out SOP will provide the user with continuity, in the absence of leadership. Generally, an SOP is drafted to meet the unique operational requirements and to standardize procedures within a specific ASC. When drafting an aviation maintenance SOP, the writers should always convey to the user the uniqueness and peculiarities of a given unit. The SOP provides the user with guidelines and procedures to execute a specific mission in the absence of direct leadership. The commander will review the SOP for content, context, and clarity of purpose. The aviation commander will approve and sign the SOP, after which it becomes a binding document—once he is satisfied that the SOP directly conveys his vision and that of his commander.

REQUIREMENTS FOR DRAFTING AN AVIATION SUPPORT COMPANY INTERNAL SOP

B-1. Figures B-1 and B-2 show sample SOPs for both a PC and QC section. The following information and requirements should be considered by AMC personnel when establishing an internal ASC SOP: heading, applicability, purpose, scope, objectives, revisions, responsibilities, operations, procedures, general information, and references.

B-2. The heading of the SOP varies, depending on the type of internal SOP that the document is going to be. If the SOP is going to be part of an administrative or garrison SOP at the battalion level, then the heading will reflect the SOP as an appendix to the administrative or garrison SOP.

Note. See Figures B-1 and B-2 of this appendix for sample SOPs that are part of the battalion's garrison SOP.

B-3. If the document is part of the aviation support company maintenance SOP, then the heading will list the name of the organization and the station, the date, the SOP number (if used), and the type (internal or external) of SOP that it is.

APPLICABILITY

B-4. This block or section identifies the unit personnel (assigned/attached) to whom this SOP applies.

PURPOSE

B-5. This block or section states the overarching concept or reason that the SOP is written. Some example are to provide a standardized guide for maintenance support procedures used by the ASC or to define aircraft unit maintenance standard operating procedures, responsibilities, operational policies, types of technical inspections, and maintenance procedures for personnel performing aircraft maintenance and related ground support system repair. This section can be tailored for use by all ASCs to reflect their own peculiarities and type of maintenance and logistics support that they provide.

SCOPE

B-6. This block or section spells out guidance and information (general or specific) contained within the SOP. This section states whether this SOP is applies to both garrison and field locations or while deployed to a theater of operations. If specific instructions are to be used while on deployment status, commanders/leaders may use this section to convey additional instructions or policies.

> ***Note.*** The following information is an example of specific instructions or guidance: "The following policies are established to augment this SOP while on deployed status; however, at a minimum, the provisions of this SOP will be complied with unless written deviation is authorized by the company commander. If this SOP conflicts with other Department of the Army (DA) or Department of Defense (DOD) directives, the higher authority reference takes precedence."

OBJECTIVES

B-7. This block or section states the main and secondary objectives of an ASC. For main objectives, use the following as examples: to provide maintenance support to AMC; perform maintenance on AMC aircraft systems or subsystems; troubleshoot aircraft armament and avionics equipment; provide related repair parts supply; and provide aircraft recovery support when requested. Consider the inclusion of the following statement: "Essential to the ASC primary objective of providing maintenance support to AMCs is to sustain not only the operational effectiveness of the supported unit but also the combat readiness of the AMC's aircraft."

B-8. Secondary objectives, if units elect to use them, should include intangibles such as familiarize and educate platoon leaders, warrant officers, and junior noncommissioned officers on aircraft maintenance management procedures required to achieve the primary objective.

REVISIONS

B-9. For an SOP to remain valid and relevant to the unit's stated objective, it must be current. The following entry can be used in this block or section: "This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication is fielded." In addition, the following information may be entered in this section/block: who can submit changes and how often, the classification of how urgent a stated change is and how soon must it be applied to update the unit's SOP, who determines the criticality of the recommended change, and who receives and reviews recommended SOP changes.

RESPONSIBILITIES

B-10. This block or section spells out what are normally considered to be specific responsibilities of a given commander/leader/maintainer. In addition, some of these responsibilities may fall under the category of "monitoring" a specific program or function assigned to the AMC. Some examples are the following:

- Monitor overall responsibility for the supervision of an effective and a safe maintenance program.
- Monitor the management of the aircraft PLL.
- Monitor a record of the daily aircraft flying hours and the operational readiness condition of each assigned/attached aircraft.

OPERATIONS

B-11. This block or section identifies, in detail, the full concept of operations contained within a given SOP. This block will contain, if applicable, deviations to established standard procedures previously approved by the aviation support commander. The following information can be included in this block or section:

- What type of function or service can be expected from an individual platoon, shop, or section.
- How business is to be conducted.
- The days and times that specific operations or procedures can be conducted.
- The type of standard procedures that maintainers must follow when seeking assistance.

PROCEDURES

B-12. The procedures block or section gives specific steps that need to be followed when dictating specific guidance. As an example, when writing the AOAP or the TMDE appendices to the SOP, the maintenance manager enters the following information in this block or section:

- Samples must be taken within 15 minutes after shut down (hot).
- Cold samples must be explained in the circumstances block on DD Form 2026.
- Special samples must be marked "SPECIAL" in red.
- DD Form 2026 (Oil Analysis Request) will be turned into QC.
- Oil sample bottles will be marked with the aircraft serial number and component name.
- Oil samples will be turned in the same day that the sample was taken.

GENERAL INFORMATION

B-13. This block or section is optional. If used, the following blanket statement can be entered: "Close coordination from the crew chiefs, maintenance test pilots, platoon sergeants, and the supporting sections in the ASC is essential to the success of a well-organized maintenance program. This SOP is divided into separate appendices that cover specific areas of aircraft maintenance. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

REFERENCES

B-14. As the title implies, this block or section contains all applicable references and publications used to develop a specific appendix contained within the AMC's internal SOP.

Note. DA Pamphlet 25-30 contains a more detailed listing of reference/publication requirements. Refer to Chapter 8 of this manual for guidance to access the LIDB Publications Module. This module contains a comprehensive listing of publications to support assigned end items. Chapter 8 also has a link to the ETM site.

APPENDIX 2 (SOP number) Production Control to Annex F (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314 **(enter name of parent organization and station)** 09 Jul 06 (date) Garrison SOP (type of SOP)

1. Applicability: This SOP applies to all persons assigned or attached to **(enter unit's name)**.

2. Purpose: To ensure positive control of aircraft maintenance productivity, timely and efficient maintenance, assignment of work priorities within the ASC, as well as receiving and distribution of in-house work requests from supported AMCs. Produce and process internal work orders in support of ASC submitted work orders and coordinate implementation and use of ASC assets.

3. Scope: The ASC's PC office supports the aircraft maintenance and logistics functions of all AMCs.

4. Objectives:

a. Act as a single point of contact for the supported unit's maintenance functions and activities.

b. Initiate and monitor internal shops and maintenance section work orders in support of submitted AMC work orders.

c. Inform the AMC's PC office of work-order status.

d. Monitor progress of work in the various shops and maintenance sections to ensure that a balanced maintenance effort (such as parts availability and personnel requirements) is achieved to support the AMCs operational readiness rates.

e. Prepare and submit status reports of maintenance in progress to the AMC's PC office and higher headquarters, if required.

f. Coordinate and schedule requirements with sustainment maintenance facilities and contractor maintenance support for all work beyond the ASC's capability.

g. Coordinate activities of the quality control sections.

h. Monitor the flow of aircraft repair parts and components to support the maintenance effort.

i. Alert the AMC's PC office when a forms records inspection reflects that aircraft time-change components are in the window for replacement.

j. Alert the AMC's PC office and obtain its approval before conducting a controlled exchange action. (Controlled exchange is acceptable if it is the only suitable means to restore an AMC aircraft to a fully mission capable condition.)

Figure B-1. Sample production control (appendix) SOP

k. Maintain an automated maintenance request register so that it is current and up-to-date. (When the STAMIS is inoperable, a DA Form 2405 (Maintenance Request Register) must be used).

l. Coordinate all test flights within the ASC.

m. Coordinate work input to the shops and maintenance sections.

n. Maintain the ULLS-A LAN, and ensure that the ASC's ULLS-A is current and always operational.

5. Revisions: This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication affecting the contents of this SOP is fielded. If no new DA publications have been fielded, this SOP will be reviewed every **(enter time).** All personnel who are permanently assigned/attached to the **(enter unit's name)** may submit proposed changes to this document to Commander, **(enter unit's name)**.

6. Responsibilities:

a. Aviation Support Company Commander: The commander has overall responsibility for maintenance management and operations within the ASC in support of the AMC's helicopters.

b. Production Control Officer/Maintenance Officer: The PC officer is responsible to the ASC commander. The PC officer will advise the commander or maintenance officers on all matters pertaining to aircraft maintenance, parts consumption, and related areas affecting maintenance actions. The PC officer will advise the ASC commander and, if required, higher headquarters on all showstoppers (such as lack of personnel, repair parts, TMDE, and tools) that will negatively affect maintenance support of all supported AMC units.

c. Production Control NCOIC: The PC NCOIC is directly responsible to the PC officer and assists the PC officer in section operations. He also coordinates maintenance and logistics functions in the absence of the PC officer.

d. Production Control Clerk: The PC clerk is directly responsible to the PC NCOIC for overall section operations and coordination between shops and maintenance sections. The PC clerk assists the PC NCOIC with coordinating maintenance and logistics functions in support of AMC-submitted work orders. The PC clerk is also the link for all ULLS-A and SAMS inputs/issues.

e. PC Meetings: Production Control meeting will be conducted at **(enter suitable time for the unit),** Monday through Friday. Meetings will be in the production control office. Attendance by the following is mandatory: **(enter the name of the players that, as a minimum, are responsible for maintenance and logistics sustainment)**. The PC officer/NCOIC will chair the meeting.

Figure B-1. Sample production control (appendix) SOP (continued)

7. Production Control Operations:

a. The uniform flow of the aircraft and its associated components through the shops and maintenance sections must be maintained and regulated. Forms and records are processed as repairs are completed or parts are removed to reflect accurate status of an aircraft and parts under repair. The information originates from the shops or maintenance section's repair personnel and is passed on to the PC office via reports/send disk to the PC office.

b. The ULLS-A (automated system) will be maintained and kept up-to-date by the PC office for all aircraft-related work orders submitted by the AMCs. A manual DA Form 2405 (Maintenance Request Register) must be maintained in the absence of an operational STAMIS.

c. PC will receive AMC-submitted work requests, validate the work order, process it, establish priority (PC officer's responsibility), and coordinate the maintenance effort within the ASC repair facility. The PC representative notifies the appropriate section chiefs (shops or maintenance section OICs, technicians, or NCOICs) of the work assignment. The PC representative will estimate a time completion based on assigned priority designator, work required, and shop or maintenance section's workload. The PC officer will evaluate current workloads and establish priorities of work.

d. Upon notification of an aircraft's being NMCS for more than 24 hours, the PC NCOIC will screen all open work orders for scheduling of outstanding maintenance.

e. The ASC is responsible for keeping supported AMCs advised of the status of their aircraft while they are in the shop. The PC office will also provide a realistic forecast on the completion date of the aircraft maintenance so that they can make a firm commitment in operational planning and preparation of reports. Such information is required on a continuing basis and must be reported as accurately as possible. The PC office will be ASC's central platform to provide this information to customer units.

f. If an AMC work-ordered aircraft or associated component is in need of maintenance and the repair action falls outside the capability of the ASC, the PC office will coordinate higher level maintenance support to include depot or contractor maintenance.

8. General information: Close coordination from ASC's PC office, QC shop, shops and maintenance repair personnel, maintenance test pilots, and platoon sergeants assigned to **(enter unit's name)** is essential to a well-organized maintenance program. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

Figure B-1. Sample production control (appendix) SOP (continued)

9. References: The following are references that apply to this SOP.

AR 95-1	Flight Regulations
AR 385-10	Army Safety Program
AR 385-40	Accident Reporting and Records
AR 385-64	U. S. Army Explosives Safety Program
AR 385-95	Army Aviation Accident Prevention
AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below the National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test, Management, and Diagnostic Equipment Program
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	The Army Maintenance Management System (TAMMS)
DA PAM 750-1	Leader's Unit Level Maintenance Handbook
FM 3-04.500	Army Aviation Maintenance
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures

Figure B-1. Sample production control (appendix) SOP (concluded)

APPENDIX 3 (SOP number) **Quality Control** to ANNEX F (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314 **(enter name of parent organization and station)** 09 Jul 06 (date) Garrison SOP (type of SOP)

1. Applicability: This SOP applies to all quality control section personnel assigned or attached to **(enter unit's name)**.

2. Purpose: To outline the mission of the quality control shop and its duties and responsibilities. To establish guidelines while performing quality assurance procedures in support of **(enter unit's name)** while providing maintenance support to AMC units.

3. Scope: The ASC's quality control shop supports aircraft maintenance functions and procedures by performing by-the-book aircraft inspections of all AMC's owned aircraft and components.

4. Objective: A thorough and well-defined technical inspection is the ASC commander's system of checks and balances to ensure the highest quality maintenance in support of all AMC units. High-quality maintenance decreases unscheduled maintenance, which affects the supported AMC unit's operational readiness rates. Inadequate or poorly conducted aircraft inspections result in maintenance errors, which can lead to aircraft damage, personal injury, or even death.

5. Revisions: This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication affecting the contents of this SOP is fielded. If no new DA publication has been fielded, this SOP will be reviewed every **(enter time)**. All personnel who are permanently assigned/attached to the **(enter unit's name)** may submit proposed changes to this document to Commander, **(enter unit's name)**.

6. Responsibilities:

a. ASC Commander: The commander has overall responsibility for quality control and assurance within the unit.

b. Quality Control Officer: The QC officer is directly responsible to the commander for—

(1) Overseeing the overall management of the QC section.

(2) Advising the commander on all matters relating to QC/QA.

(3) Coordinating with the production control (PC) officer through all phases of production management to ensure a high-quality standard of maintenance.

(4) Ensuring compliance with ARs, TMs, ASAMs, DA PAMs, FMs, TBs, TWXs, AMCOM and other pertinent publications/references, and the ASC commander's policies/directives.

(5) Monitoring messages such as aviation maintenance advisory messages (MAMs) and safety-of-flight and maintenance information messages.

Figure B-2. Sample quality control (appendix) SOP

(6) Providing both scheduled and unscheduled walkthroughs of assigned shops and maintenance sections.

(7) Informing the commander of any QC/QA problems that may arise and recommending possible courses of action.

c. Quality Control Supervisor (NCOIC): The QC supervisor is directly responsible to the QC officer and the ASC Commander for—

(1) Supervising, training, and performance of QC personnel in all aspects of their assignments in relation to QC/QA policies and procedures.

(2) Ensuring that a current and complete master technical library is maintained within the QC shop.

(3) Assigning additional duties to QC personnel.

(4) Advising the QC officer on all matters relating to the operation of the QC section.

(5) Supervising QC personnel and reviewing forms and records for developing trends and recommending possible courses of action.

(6) Ensuring that technical inspector (TI) assignments to work requests are adjusted to meet the priorities/changes in maintenance requirements.

(7) Ensuring the health and welfare of QC personnel.

(8) Ensuring that the QC annex in the unit SOP and all policies/procedures are strictly adhered to by all unit personnel.

(9) Assuming all of the duties and responsibilities of the QC officer during his absence.

d. Technical Inspector (TI): The TI is directly responsible to the QC supervisor for—

(1) Performing initial, in-progress, and final inspections of aircraft/components during scheduled, unscheduled, and special inspections to ensure compliance with all applicable publications/directives.

(2) Rendering complete, accurate, and impartial reports of discrepancies, irregularities, and unsafe acts/conditions, whether directly involved or as an observer.

(3) Taking immediate corrective action and reporting any unsafe act/condition to the QC supervisor and notifying the unit safety officer if the situation warrants.

(4) Performing inspections of unserviceable material to determine if the material is economically reparable at the ASC's level of maintenance or if it requires return to a depot repair facility.

Figure B-2. Sample quality control (appendix) SOP (continued)

(5) Inspecting aircraft logbooks, historical records, weight-and-balance records, and any other pertinent records on file according to applicable publications to ensure completeness and accuracy of all entries. When an aircraft historical record entry is made by anyone other than a TI, a TI from the QC section will verify the entry. When an ASC TI makes an entry, another TI, the QC supervisor, or the QC officer will verify the entries. This procedure will be used to ensure completeness and accuracy of all entries.

(6) Entering all aircraft faults, deficiencies, and shortcomings noted on an inspection into the aircraft's forms and records while performing any inspection.

(7) Being familiar with the contents of DA PAM 738-751, FM 3-04.500, TM 1-1500-328-23, current directives, appropriate maintenance manuals, and all policies pertaining to this unit's mission.

7. Quality Control Procedures:

a. Safety-of-Flight (SOF) Messages/Aviation Safety Action Messages (ASAMS): Upon receipt, QC personnel will review and initial those TWX messages that relate to their individual area of responsibility. Messages that require a reply will have a response initiated on a memorandum prepared in duplicate. The original copy will be placed in the proper QC file, and one copy will be faxed to the appropriate authorities if requested in the message instructions.

b. Army Oil Analysis Program (AOAP): The technical inspector will be appointed on orders as the AOAP monitor according to FM 3-04.500. DD Form 2026 (Oil Analysis Request) will be reviewed for accuracy. TIs will assist maintenance personnel with proper sampling procedures and completion of the required forms. A TI appointed on unit orders as the AOAP NCO (Aviation) will review all of the lab results. The TI assigned to an aircraft will be responsible for making all required entries on the aircraft's DA Form 2408-20 (Oil Analysis Log). He will keep the PC office informed of the lab results.

Note. Refer to TB 43-0211 for guidance on AOAP procedures.

Figure B-2. Sample quality control (appendix) SOP (continued)

c. DA Form 2028 Program: The submission of a DA Form 2028 (Recommended Changes to Publications and Blank Forms) is the responsibility of the individual who identifies an error or recognizes the need for a change/an improvement. QC personnel will provide assistance and procedural guidance to anyone in need of assistance with form completion and submission. A copy of a submitted change will be kept on file, according to AR 25-400-2, for future reference.

d. Deficiency Reports: All deficiency reports will be submitted through the QC office. QC personnel will assist with SF 368 (Deficiency Report) completion. QC personnel will also ensure that the form is properly completed and submitted according to DA PAM 738-751. The exhibit must be properly marked and stored in an area designated by the PC office or the QC supervisor.

e. Modification Work Order (MWO): When an MWO for an aircraft or component is published, QC personnel will comply with the following procedures:

(1) Ensure that the MWO is valid and applies to the aircraft or component.

(2) Ensure that the required DA Form 2408-5 is completed according to DA PAM 738-751.

(3) Ensure that all pertinent historical data, as required by the MWO, for recording and reporting of modification, is entered or transposed to the applicable form and records according to DA PAM 738-751.

(4) Upon completion of the MWO, QC personnel will ensure that all forms and records are properly completed and that the required reports have been submitted according to MWO instructions.

f. Quality Control Files: The QC files will be established according to AR 25-400-2. These files will be the responsibility of all QC personnel to maintain. However, overall responsibility remains with the QC supervisor. A periodic inspection of the file system will be conducted to ensure compliance with AR 25-400-2. All QC personnel will be familiar with the file number system. Only the commander and QC personnel will have access to the QC files unless otherwise approved by the QC officer/supervisor. The required security of these files will be maintained at all times.

g. Requests for Orders: The QC supervisor will be responsible for initiating all unit orders for the commander concerning X and circle-X authority. These orders will be according to DA PAM 738-751, and FM 3-04.500. Canceled/revoked orders, resulting from such events as permanent change of station (PCS) or expiration term of service (ETS), will be maintained in the QC inactive orders file for six months from the date of cancellation. The QC orders file will be secured at all times.

Figure B-2. Sample quality control (appendix) SOP (continued)

h. Newly Assigned Technical Inspectors: Newly assigned TIs will be interviewed by the QC officer and supervisor to determine their experience level and other qualifications that would assist the QC section. Each TI will receive an initial counseling from the QC supervisor to outline his or her duties and responsibilities. Upon completion of this counseling session, the TI will be required to read the QC SOP. The QC officer and supervisors will determine when to initiate TI orders based on the individual's knowledge and experience level. Before the issuance of these orders, the individual will be counseled as to the responsibilities inherent with TI status from the QC supervisor. Each counseling session will be documented and placed on file in the QC office. The QC supervisor will maintain this file.

i. Master Library: A master technical library will be maintained in the QC office. All QC personnel will assist in maintaining the library. Publications in this library will not be allowed to leave the library. All changes will be posted, according to DA PAM 25-40, to the appropriate publications as soon as possible after receipt.

j. Tear-Down Analysis: The safety officer, maintenance officer, aircraft accident investigation board representatives, and the oil analysis laboratory technician will identify those components whose premature failure or wear, corrosion, or out-of-tolerance condition is suspected to have contributed to an aircraft mishap. If beyond the capability of this unit, these components will be sent to Corpus Christi Army Depot (CCAD), Texas, for a tear-down analysis, QC personnel will be prepared to review aircraft records and provide the required data to request a tear-down analysis. QC personnel will ensure that all of the required forms and records are completed according to DA PAM 738-751 and other applicable publications.

k. Technical Data Familiarization Chart: A technical data familiarization chart will be maintained in the QC office for all QC personnel. The required publications will be listed to include the QC SOP. Each individual within the QC section will be familiar with publications related to his assigned duties and will place the initial of his or her last name on the chart next to these publications. A TI will be assigned the task of maintaining the chart. As part of this additional duty, the TI will update the chart as publications become obsolete, superseded, or rescinded.

l. Quarterly In-House Inspection: A quarterly in-house inspection will be conducted by the QC supervisor to ensure that each section is conforming to the requirements set forth by ARs, DA PAMs, FMs, SOPs, TBs, and TMs to include any other directives that apply to that section. Each section will be inspected according to current applicable publications. All deficiencies will be annotated on DA Form 2404, initiated in duplicate. The original copy will be given to the section supervisor with a 10-working-day suspense. The duplicate copy will be placed in the QC files until the original is returned with deficiencies corrected. Based on the results of this inspection, QC personnel may perform a follow-up inspection within 30 days of the original. The principal areas of concentration will be, although not limited to, maintenance procedures, safety, shop practices, FOD control, technical libraries, files, forms and records, TMDE, and tool control.

Figure B-2. Sample quality control (appendix) SOP (continued)

m. QC Office Physical Security: The QC supervisor has the overall responsibility for the keys and locks required by the QC office. Each individual assigned to the QC section will be issued a key for access to the office. He will sign for the key upon receipt. He will return the key to the supervisor when no longer assigned to the QC section. At the end of each duty day, all windows and doors will be secured. The security sheet on the exterior door will be completed and initialed.

n. DA Form 2410 Control Log: A DA Form 2410 control log will be maintained by QC personnel for all components removed, replaced, repaired, and/or installed by the maintenance personnel of this unit that require maintenance management and historical data. Each TI is primarily responsible for entering the required data for his assigned aircraft components. The entries must be legible and accurate. If a component is received without the required DA Form 2410 information, a TI will attempt to acquire the information through all sources available. The information may be annotated on such documents as DD Form 1574, another unit's DA Form 2410 control log, or an aircraft DA Form 2408-16 series. The TI may also contact 2410 Hotline for the required information.

o. Inspection Stamps: An inspection stamp may be used in lieu of an authorized inspector's signature. If available, an inspection stamp will be issued primarily to the inspectors who are assigned to the QC shop. This stamp must be guarded against unauthorized use and will comply with the prescribed requirements contained in FM 3-04.500. The QC supervisor will maintain a stamp inventory register. Any stamp not issued will be maintained in a secure location at all times. Once a TI is reassigned, the stamp will be turned back to the QC supervisor and will not be reassigned for a period of six months. Any stamp that has become illegible will be destroyed. Additional or replacement inspection stamps may be requisitioned through local purchase procedures according to AR 710-2.

p. Special Inspections: Special inspections will be completed at specified times. A 10 percent tolerance will only apply prior to the time that the inspection is due. The inspection will not be flown past the due time unless coordination has been made with QC or the maintenance officer to approve the extension. The inspection will only be extended as long as the 10 percent tolerance allows. Finite life items cannot be extended past the due date and time. Special inspection will be adhered to according to TM 1-1500-328-23.

q. Forms and Records: The signature of the person making the entry will follow initial entries in the fault block of the DA Form 2408-series forms.

8. General information: Frequent coordination from ASC's PC office, QC shop, shops and maintenance repair personnel, maintenance test pilots, and platoon sergeants assigned to **(enter unit's name)** is essential to a well-organized maintenance program. All quality control personnel should become familiar with this document and conduct their daily quality assurance inspections and maintenance operations according to guidance contained within this SOP.

Figure B-2. Sample quality control (appendix) SOP (continued)

9. References: The following references are for both garrison and tactical SOPs. All personnel assigned or attached to the **(enter unit's name)** should review references to understand the overall concern for safety and maintenance procedures. These references should be reviewed regularly so that changes or new information provided by these publications can be implemented into this SOP as necessary.

AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below the National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test, Management, and Diagnostic Equipment Program
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	The Army Maintenance Management System (TAMMS)
FM 3-04.500	Army Aviation Maintenance
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures

Figure B-2. Sample quality control (appendix) SOP (concluded)

Appendix C

Aviation Support Company External Standard Operating Procedures

A well-drafted and thought-out SOP will provide the user with continuity, in the absence of leadership. Generally, an SOP is drafted to meet the unique operational requirements and to standardize procedures within a specific ASC. When drafting an external ASC maintenance SOP, the writers should always convey to the user (AMC units) the uniqueness and peculiarities of a given unit. The external SOP provides the user (AMC) with guidelines and procedures to follow when seeking maintenance support from an ASC. The ASC commander will review the SOP for content, context, and clarity of purpose. The ASC commander will approve and sign the SOP—once he is satisfied that the SOP directly conveys his vision and that of his commander. The SOP then becomes a binding document.

REQUIREMENTS FOR DRAFTING AN AVIATION SUPPORT COMPANY EXTERNAL SOP

C-1. The following information and requirements should be considered by ASC personnel when establishing an external SOP: heading, applicability, purpose, scope, objectives, revisions, responsibilities, operations, procedures, general information, and references (See Figure B-1 for a sample SOP for a PC in support of an AMC unit).

C-2. When writing the external SOP, list the name of the organization and the station, the date, and the SOP number (if used) in the document's heading.

Note. See Figure C-1 for a sample external SOP with heading.

APPLICABILITY

C-3. This block or section identifies the type of units for which the ASC is providing maintenance and logistics support.

PURPOSE

C-4. This block or section states the overarching concept or reason that the SOP is being written; for example, to provide a standardized guide for supported AMC units requesting maintenance support from the ASC, ASC responsibilities in support of AMC units, command and control, maintenance support in tactical theater of operations, operational policies, and detailed guidance for ASC maintainers conducting maintenance in support of AMC aircraft and related ground support system repair. This section can be tailored for use by all ASCs to reflect their own peculiarities and type of maintenance and logistics support that they provide.

SCOPE

C-5. This block or section spells out guidance and information (general or specific) contained within the SOP. This section states whether this SOP applies to both garrison and field locations or while deployed to a theater of operations. If specific instructions are to be used while on deployment status, commanders/leaders may use this section to convey additional instructions or policies when providing maintenance support.

> ***Note.*** The following information can be used as an example to provide specific instructions or guidance: "The following policies are established to augment this SOP while on deployed status; however, at a minimum, the provisions of this SOP will be complied with unless written deviation is authorized by the ASC commander. If this SOP conflicts with other Department of the Army (DA) or Department of Defense (DOD) directives, the higher authority reference takes precedence."

OBJECTIVES

C-6. This block or section states the main and secondary objectives of an ASC. For main objectives, use the following as examples: to provide maintenance support to the AMC, to perform maintenance on AMC aircraft systems or subsystems, to troubleshoot aircraft armament and avionics equipment, to provide related repair parts supply, and to provide aircraft recovery support when requested by AMC units.

C-7. Consider the inclusion of the following statement: "Essential to the ASC primary objective of providing maintenance support to AMCs is to sustain not only the operational effectiveness of the supported unit but also the combat readiness of the AMC's aircraft."

C-8. Secondary objectives, if units elect to use them, should include intangibles such as expose and educate platoon leaders, warrant officers, and junior noncommissioned officers on aircraft maintenance management procedures required to achieve the primary objective.

REVISIONS

C-9. For an SOP to remain valid and relevant to the unit's stated objective, it must be current. The following entry can be used in this block or section: "This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication is fielded." In addition, the following information may be entered in this section/block: who can submit changes and how often, the classification of how urgent a stated change is and how soon must it be applied to update the unit's SOP, who determines the criticality of the recommended change, and who receives and reviews recommended SOP changes.

RESPONSIBILITIES

C-10. This block or section spells out the specific responsibilities of a given commander/leader/maintainer. In addition, some of these responsibilities may fall under the category of "monitoring" a specific program or function assigned to the ASC. Some examples are the following:

- Monitor overall responsibility for the supervision of an effective and safe maintenance program.
- Monitor the management of the aircraft prescribed load list.
- Monitor a record of the daily aircraft flying hours and the operational readiness condition of each assigned/attached aircraft.

OPERATIONS

C-11. This block or section identifies, in detail, the full concept of operations contained within a given SOP. This block will contain, if applicable, deviations to established standard procedures previously approved by the aviation support commander. The following are examples of the type of information that can be included in this block or section:

- The type of function or service that can be expected from an individual platoon, shop, or section.
- How business is to be conducted.
- The days and times that specific operations or procedures can be conducted.
- The type of standard procedures that maintainers must follow when seeking assistance.

PROCEDURES

C-12. The procedures block or section gives specific steps that need to be followed when dictating specific guidance. When writing the AOAP or the TMDE appendixes to the SOP, the maintenance manager can use the following examples as guidelines for entering information in this block or section:

- Samples must be taken within 15 minutes after shut down (hot).
- Cold samples must be explained in the circumstances block on DD Form 2026 (Oil Analysis Request).
- Special samples must be marked "SPECIAL" in red.
- DD Form 2026 will be turned into QC.
- Oil sample bottles will be marked with the aircraft serial number and component name.
- Oil samples will be turned in the same day that the sample was taken.

GENERAL INFORMATION

C-13. This block or section is optional. If used, the following blanket statement can be entered: "Close coordination from the crew chiefs, maintenance test pilots, platoon sergeants, and the supporting sections in the ASC is essential to a well-organized maintenance program." This SOP is divided into separate appendices that cover specific areas of aircraft maintenance. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

REFERENCES

C-14. As the title implies, this block or section contains all applicable references and publications used to develop a specific appendix contained within the ASC's external SOP.

Note. DA Pamphlet 25-30 contains a more detailed listing of reference/publication requirements. Refer to Chapter 8 of this manual for guidance to access the LIDB Publications Module. This module contains a comprehensive listing of publications to support assigned end items. Also, see Chapter 8 for a link to the ETM site.

APPENDIX 1 (SOP number) Production Control to ANNEX F (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314 **(enter name of parent organization and station)** 09 Jul 06 (date) External SOP (type of SOP)

1. Applicability: This SOP applies to all soldiers assigned or attached to **(enter unit's name)** responsible for maintenance and logistics support.

2. Purpose: To ensure positive control of aircraft maintenance productivity, timely and efficient maintenance, and assignment of work priorities within the ASC, as well as receiving and distribution of in-house work requests from supported AMCs. Produce and process internal work orders in support of AMC-submitted work orders and coordinate implementation and use of ASC assets to best serve the needs of all AMC customer units.

3. Scope: The ASC's production control office supports the aircraft maintenance and logistics functions of all aviation maintenance companies. The ASC unit will immediately notify AMC customer units when additional policies and procedures are developed to augment this SOP while on deployed status; however, at a minimum, the provisions of this SOP will be complied with unless written deviation is authorized by the ASC commander. If this SOP conflicts with other Department of the Army (DA) or Department of Defense (DOD) directives, the higher authority reference takes precedence.

4. Objective: This external SOP establishes procedures to be followed by AMC units requesting support maintenance for aircraft and maintenance-related functions from the ASC. Customers are requested to follow this external SOP in all transactions with the ASC. The customer's production control personnel are encouraged to directly coordinate—by e-mail or telephone or in person—with the ASC's production control officer or NCOIC for maintenance support. AMCs are also advised to contact ASC PC personnel when they reach a work stoppage as a result of a shortage of repair parts. Essential to the ASC's primary objective of providing maintenance support to AMCs is to sustain not only the operational effectiveness of the supported unit but also the combat readiness of the AMC's aircraft.

5. Revisions: This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication that affects the contents of this SOP is fielded. If no new DA publications have been fielded, this SOP will be reviewed every **(enter time).** All supported AMCs and personnel who are permanently assigned/attached to the **(enter unit's name)** may submit proposed changes to this document to Commander, **(enter unit's name)**.

Figure C-1. Sample external production control SOP

6. Responsibilities:

a. Aviation Support Commander: The aviation support commander has overall responsibility for providing one-stop maintenance and logistics support to all supported AMCs.

b. Production Control Officer/Maintenance Officer: The PC officer is responsible to the ASC commander. The PC officer will advise the commander or maintenance officers on all matters pertaining to aircraft maintenance, parts consumption, and related areas affecting maintenance actions. The PC officer will advise the ASC commander and, if required, higher headquarters on any showstoppers (such as lack of personnel, repair parts, TMDE, and tools) that will negatively affect maintenance support of all supported AMC units.

c. Production Control NCOIC: The PC NCOIC is directly responsible to the PC officer and assists the PC officer in running PC. He also coordinates maintenance and logistics functions in the absence of the PC officer.

d. Production Control Clerk: The PC clerk is directly responsible to the PC NCOIC; he assists the PC NCOIC with overall section operations and coordination between shops and maintenance sections. The PC clerk assists the PC NCOIC with coordinating maintenance and logistics functions in support of AMC-submitted work orders. The PC clerk is also the link for all ULLS-A and SAMS inputs/issues.

7. Production Control Operations:

a. **Assistance Visits:** The ASC unit will make assistance visits to all supported AMC units upon request. Reports on visits will be forwarded directly to the supported unit commander and will not be routed through command channels.

b. **Hours of Operations:**

(1) Normal duty hours for the ASC unit are the following:

Monday	0630 to 1700
Tuesday	0630 to 1700
Wednesday	0630 to 1700 (0900-1130 Motor Stables)
Thursday	0730 to 1700 (0730-1130 Junior Leader Training)
Friday	0630 to 1600

(2) Hours for accepting work orders are the following. During motor stables and junior leader time, only high-priority work orders will be accepted:

Monday	0900 to 1115	1300 to 1615
Tuesday	0900 to 1115	1300 to 1615
Wednesday	Motor Stables	1300 to 1615
Thursday	Junior Leader Time	1300 to 1615
Friday	0900 to 1115	1300 to 1515

(3) Work orders and on-site maintenance can be accepted after normal hours if coordination is established with the production control officer, technical supply, or NCOIC.

Figure C-1. Sample external production control SOP (continued)

c. **Maintenance Requests and Procedures:**

(1) General: The AMC production control officer or NCOIC will coordinate maintenance requests directly with the ASC production control officer, maintenance technician, or PCNCO. Direct coordination is encouraged and paramount to successful maintenance support. Direct coordination will allow AMC units to inform this unit of the type of maintenance to be performed, parts required, and the period when the aircraft will arrive or be available for on-site maintenance. The ASC production control officer or commander is the final approving authority for all work requests submitted.

(2) Priorities: Priorities of open work requests will be assigned by the production control officer. Priorities will be based on priority designation assigned by the unit, age of the work request, and if the discrepancy is scheduled or unscheduled. If the discrepancy is the sole reason for grounding the aircraft, it will be assigned the highest priority designator. If there are multiple grounding discrepancies, the AMC unit will coordinate with production control to indicate the priority.

(3) Scheduled Maintenance: Scheduled maintenance will be requested on DA Form 2407, or 2407-E if using ULLS–A. This form will be completed according to DA Pamphlet 738-751. All uncorrected faults existing on DA Forms 2408-13-1, 2408-14, and 2408-18 requiring ASC-level maintenance will be annotated on the DA Form 2407 or 2407-E. Deferred work requests previously submitted for the same equipment will be reviewed at this time. The aircraft equipment logbook, keys, ULLS-A laptop (complete with all accessories), weight-and-balance records, and historical records will accompany the aircraft when accepted by the ASC. When a work request is submitted for “on-site” maintenance, the logbook, laptop, and historical records will be maintained by the unit.

(4) Unscheduled Maintenance: Request unscheduled maintenance in the same manner as explained previously. Again, direct coordination with PC is encouraged.

(5) On-site Maintenance: On-site maintenance is a service extended to all AMC-supported units; every effort will be made to honor on-site work requests. Submit the request on DA Form 2407 or 2407-E, and coordinate it through the ASC production control section. On-site maintenance is governed by the amount of maintenance required and the current workload of this unit. If possible, limit on-site maintenance requests to component change and minor airframe repair. Do not submit on-site requests for phased maintenance inspections.

(6) Deferred maintenance: Deferred maintenance requests will be submitted to production control as soon as possible after a deficiency that can be deferred is discovered. Deferred work orders will be accepted on ASC-level discrepancies. Supported units should not submit deferred work requests on AMC-level discrepancies unless prior coordination between production control officers has been completed and agreed upon. Units should order the required repair parts and, upon receipt, work order the component or aircraft to the ASC unit. The equipment should be available for inspection to determine parts needed/special tools required to perform the repair. Deferred maintenance will be scheduled by the ASC production control office as soon as possible once necessary repair parts and required tools are available and coordination has been made with the supported unit.

Figure C-1. Sample external production control SOP (continued)

(7) Evacuated Maintenance: The decision to evacuate a work request to contractor maintenance support/depot will be made solely by the ASC production control office. The decision to evacuate will be based on the ASC's present workload, personnel, tools on hand, the extent of the repair to be made, and the ability of contractor maintenance support/depot to react to the specified need.

(8) Procedures: Personnel submitting DA Form 2407 or 2407-E for maintenance support (aircraft or components) will report to the ASC production control section (not shop areas). Compliance with the procedures listed in paragraph 7d below will facilitate the administrative and inspection requirements for in processing a work-order request.

d. **Work-Order Submissions:**

(1) An aircraft or component will be accepted only if it is thoroughly cleaned, packaged, and properly preserved. If the aircraft or component is delivered in a condition other than stated above, it will not be accepted. When the customer arrives, follow the steps listed below.

(a) Report to the ASC PC office to initiate a work-order request.

Note. 03 Priority and ASC-level maintenance must be accepted by PC before reporting to QC.

(b) Report to QC with a work order to be reviewed by a technical inspector. Present the aircraft historical records to the quality control section for a complete records check. Corrections will be made by the supported AMC unit.

(c) Conduct a complete aircraft inventory jointly with the supporting unit. Representatives of both the AMC and ASC units will sign the inventory check sheet. One copy will be retained by quality control, with one copy given to the customer's representative.

(d) Inspect all serial-numbered components listed on DA Form 2408-16-1 to ensure thorough accountability of these listed items.

(e) Submit a DA Form 2407 or 2407-E, completed according to DA PAM 738-751, identifying the specific fault or discrepancy.

(f) Follow the QC section's directions regarding which platoon is to accept bulky or heavy components/aircraft, if necessary.

(g) Submit the work requests and cover sheet to the ASC PC office to open work orders.

(h) Ensure that aircraft fuel tanks are either full or empty before performing maintenance on the fuel system.

Figure C-1. Sample external production control SOP (continued)

(i) Ensure that ignition key and door lock keys accompany the aircraft.

(j) Leave large or heavy items at QC shop at the discretion of the TI.

(2) When the maintenance performed requires a test flight, all faults found during the inspection and subsequent flight will be added to the DA Form 2407 or 2407-E. When the airframe is still at the ASC at the end of a given reporting period, aircraft status will be reported to the owning units on DA Form 1352-1 (Feeder Report).

(3) Owning units will receive weekly updated reports designating the current status of all their open work requests at the ASC unit. Unit maintenance officers are encouraged to use this report and direct any questions about aircraft or component status to the ASC production control office.

e. **Processing Avionics Components:** All incoming equipment will have a DA Form 2407 or 2407-E work order completed according to DA Pamphlet 738-751. Class 9 avionics components handled as Class 9 repair parts in the RX supply system will be ordered using automated request for issue documents or a hard-copy DA Form 2765-1 through the supply support activity (SSA). If a replacement component is in stock, it will be issued immediately. The turned in component will then be work ordered by the SSA to the ASC's avionics platoon for repair and returned to stock. If a replacement component is not available, the SSA will issue the unit a due out. All incoming aircraft batteries will be work ordered on DA Form 2407 or 2407-E directly to production control.

f. **Processing Armament Components:** Armament weapons platforms systems will be processed through the ASC's production control section on a DA Form 2407 or 2407-E. RX items are listed by the SSA according to AR 710-2. RX components will be processed in the same manner as avionics RX items.

g. **Phase Maintenance:** Complete the following additional requirements when the customer (AMC) requests phase maintenance support.

(1) All aircraft will have at least two hours of flight time remaining to accomplish a prephase test flight by the ASC unit. If required, coordination will be made by the ASC's PC for the owning unit to perform the test flight. The owning unit will also be responsible for completion of the engine flush, defueling of the aircraft, and taking all AOAP samples before acceptance.

(2) The aircraft will be thoroughly washed and cleaned. After the aircraft has been moved to where the inspection will occur, sufficient panels will be removed by the AMC to allow a thorough inspection by ASC personnel.

(3) A phase book will accompany the aircraft.

(4) All replacement TBO components "on hand" required to be replaced during the inspection will accompany the aircraft.

Figure C-1. Sample external production control SOP (continued)

(5) Any replacement parts or components on hand will accompany the aircraft.

(6) Aircraft requiring excessive unit-level maintenance will be returned to the unit with all nongrounding unit-level discrepancies uncorrected.

(7) Aircraft with more than five controlled exchanges will not be accepted. No more than five are allowed during phase maintenance.

(8) The AMC QC shop will provide the ASC TI with a copy of the ULLS-A audit and component reconciliation report.

(9) All aircraft will be 100 percent ULLS-A compliant before acceptance of any phase or transfer aircraft.

h. **Progressive Phase Maintenance:** The following additional requirements will be completed when requesting progressive phase maintenance (PPM) support.

(1) All aircraft will have sufficient flight time remaining to accomplish the general maintenance test flight by the ASC unit required for PPMs 7 and 15. If required, coordination will be made by the ASC's PC for the owning unit to perform the test flight.

(2) The aircraft will be thoroughly washed and cleaned. After the aircraft has been moved to where the inspection will occur, sufficient panels will be removed by the AMC to allow a thorough inspection by ASC personnel.

(3) The appropriate numbered progressive phase maintenance book will accompany the aircraft.

(4) All replacement TBO components "on hand" required to be replaced during the PPM will accompany the aircraft.

(5) Any replacement parts or components on hand will accompany the aircraft.

(6) Aircraft with excessive unit-level maintenance will be returned to the unit with all nongrounding unit-level discrepancies uncorrected.

(7) Aircraft with more than five controlled exchanges will not be accepted. No more than five are allowed during PPM.

(8) The AMC QC shop will provide the ASC TI with a copy of ULLS-A audit and component reconciliation report.

(9) All aircraft will be 100 percent ULLS-A compliant before the acceptance of any PPM or transfer aircraft.

Figure C-1. Sample external production control SOP (continued)

i. **Aircraft Weighing:**

(1) Request aircraft weighing through production control on a DA Form 2407 or 2407-E. Aircraft weighing will be accomplished on-site. If the requesting unit cannot meet the criteria in TM 1-1500-342-23, special coordination must be accomplished through production control to allow the use of the ASC's hangar facility.

(2) The following steps will be completed before the acceptance and during the aircraft weighing.

(a) Clean the aircraft, inside and out.

(b) Service the aircraft with proper fluids and fuel to the correct levels. Fuel tanks will be either completely full or completely empty.

(c) Perform an accurate DD Form 365-1 inventory, and complete all appropriate forms. Remove all nonstandard configuration equipment.

(d) Ensure that all OH-58Ds have no weapons systems mounted.

(e) Position the aircraft in the hangar in the best available area commensurate with floor surface condition. The area will be roped off with "Aircraft on Jacks" signs posted.

(f) Complete all new DD Form 365 series from the weighing work sheet once the airframe is returned to the AMC unit (the owning unit's QC shop is responsible for completing the required forms).

j. **Components:** All reportable components identified in TB 1-1500-341-01 submitted for maintenance will be accompanied by all applicable historical records. All components submitted will be clean, with perishable surfaces adequately protected from damage. Incomplete or cannibalized components will not be accepted. The components will be tagged with a completed "Unserviceable Reparable" tag. The aircraft serial number that the component was removed from will be placed in block 16a, "Remarks" section, of the DA Form 2407 or 2407-E. For items requiring manufacture—such as lines, fittings, and hoses—an example of the component should accompany the work order.

k. **Restricted Shops:** All visitors must report to production control. Component repair, shop stock section, and quality control shops are designed for the exclusive use of this unit.

Note. Admission to these shops may be granted only by the production control officer, maintenance tech, PC NCOIC, or the ASC commander.

Figure C-1. Sample external production control SOP (continued)

l. **Controlled Exchange:**

(1) Authority: Aircraft on work order to the ASC are the direct responsibility of the ASC production control officer. All requests to remove a subassembly, component, or repair part from an aircraft on work order request will be directed to the ASC production control officer. Authority to approve a supported unit's request for controlled exchange rests solely with the ASC commander, production control officer, or in their absence, by the production control maintenance technician.

(2) Documentation: Removal of any component or repair part from an aircraft on work order request to the ASC will be requested on an ASC locally reproduced "Request for Controlled Exchange" sheet in quadruplicate. The appropriate entries will be made on the aircraft logbook or phase book, as required, for all parts removed. Removal will be accomplished by the requesting unit. If the unit has already ordered a replacement part, the document number will be entered on the controlled exchange sheet. The replacement part, when received, will be turned over to the ASC to be installed on the work-ordered airframe. One copy of the "Request for Controlled Exchange" sheet will be placed with each aircraft DA Form 2408-13-1, showing where the part was removed or installed; one copy is to be turned in to production control, for entry in the controlled exchange log; and a copy is to be given to the AMC's PC office.

m. **Test Measurement and Diagnostic Equipment (TMDE):** The ASC provides TMDE repair and calibration for limited armament and avionics equipment. The ASC does not provide any other TMDE repair or calibration. All TMDE support is accomplished by the local TMDE calibration lab located at (**enter location**). Individual TMDE items common to the aviation maintenance company (AMC) table of organization and equipment (TOE) are available for use by support units. Coordination will be made through the production control office for the use of these items. The ASC is not responsible for maintaining TMDE solely for the use of customer units when requested. The decision to release any equipment will be based on priorities within the ASC and the availability of the equipment.

n. **Aircraft Recovery and Evacuation:** The following procedures are used by ASC personnel when conducting or supporting aircraft recovery and evacuation operations.

(1) Aircraft recovery operations are those that result in movement of inoperative aircraft systems or components from the battlefield or field site to a maintenance facility. Recovery may require on-site repair of an aircraft for a one-time flight or preparation for movement directly to the nearest appropriate maintenance activity.

(2) Aircraft recovery is the responsibility of the owning AMC unit. If the recovery is beyond the AMC recovery team's capability, ASC support can be requested.

Figure C-1. Sample external production control SOP (continued)

(3) The ASC will provide a contact team for maintenance and recovery of aircraft in a non-air worthy condition, if requested. The team will include an aircraft maintenance officer, a forward repair and recovery crew. Recovery of the aircraft will be the responsibility of the supported unit. If geographical location or conditions dictate recovery operations by an organization outside of this command, coordination will be made only after approval of the next-higher headquarters commander.

(4) The priority for means of recovery follows:

(a) *Fly out method:* Complete on-site repair or component replacement, as necessary, to return the downed aircraft to operational status.

(b) *Ground recovery method:* When an aircraft is deemed unserviceable for a one-time fly to a maintenance facility, the aircraft will be evacuated via ground recovery, using vehicle transport.

(c) *Aerial recovery method:* If the fly out or ground recovery methods are deemed unsuitable, then aerial recovery can be employed.

(5) Requests for recovery should be made telephonically to expedite recovery procedures. The request will then be followed by a DA Form 2407 or 2407-E, requesting aircraft recovery. All information known about the condition of the aircraft—for example, engine and transmission indications, crew member procedures taken, and the precise location of the aircraft—will be conveyed to the ASC production control officer as soon as it is known.

o. **Operational Readiness Float (ORF) Program:**

(1) The purpose of maintaining ORF aircraft is to replace unserviceable aircraft that cannot be readily repaired according to AR 750-1. Within **(local policy or directive and installation)**, aircraft ORF assets will be issued when the total time to repair an unscheduled work request exceeds 600 repair hours or when a scheduled work request will exceed 800 repair hours. The total time to repair an aircraft will consist of repair hours and waiting parts time.

(2) The decision to float ORF assets will be a coordinated effort. The ASC production control officer will recommend whether to float an aircraft. The request to float an ORF aircraft will be forwarded through the aviation support company (ASC) BAMO to Deputy Chief of Staff for Logistics (DSCLOG) for approval.

Figure C-1. Sample external production control SOP (continued)

(3) ORF aircraft will be exchanged on an item-for-item basis within the mission design series (MDS). Property accountability will be maintained according to AR 710-2 and AR 735-5. All equipment not included on the aircraft basic issue item list (BIIL) will be maintained by separate accountability. Unit property and COMSEC equipment will be removed before exchange.

(4) The following are turn-in and exchange procedures.

(a) All panels will be opened upon arrival for inspection. This procedure will ensure that there is no remaining trapped water, oil, hydraulic fluid, dirt, ammunition casings, or other items that are not an integral part of the aircraft.

(b) The following paperwork is required to effect the transaction:

- DA Form 1352-1 feeder.
- Logbook.
- Historical records.
- Six-month file of DA Forms 2408-13.
- Weight-and-balance records.
- DA Form 2407 or 2407-E (completed).
- Fuel card.
- DA Form 3161 (completed).
- Phase book (if phase is to be included in repair).
- ULLS-A laptop (complete).

(c) A copy of the DA Form 2407, or 2407-E, and 2404-13-1—stating which components are missing, if any—will accompany the aircraft logbook to the ASC production control office when the aircraft is ready for turn-in. The DD Forms 365-1 and 365-3 will be updated, if necessary.

(d) Items of equipment missing because of combat or accident damage may be listed in a statement signed by the unit commander briefly explaining the facts behind the loss. All recovery items, even if damaged beyond repair, must be available for inventory.

(e) The following actions must be accomplished before turn-in of aircraft:

- All soundproofing, troop seats, first-aid kits, fire extinguishers, and clocks must be installed.
- All avionics equipment must be installed, or a copy of the report of survey for missing components must be included in the logbook.
- The aircraft data plate must be placed with the aircraft.
- If the data plate is not available because of combat loss or other circumstances, a certificate of loss in four copies is required.
- If the data plate is missing through loss other than combat, a replacement must be requested through channels from AMCOM.

Figure C-1. Sample external production control SOP (continued)

- All other aircraft forms, records, and items of equipment listed on the DA Form 2408-17 must be placed with the aircraft; if they are not with the aircraft, a statement, signed by the commander, explaining the reason for their loss will be shown with the name of a duly appointed survey officer.
- Before the transfer of an aircraft, DA Form 2408-17 will be signed in the appropriate block to indicate that it is current and that all required adjustments have been made to the DA Form 2408-17 and the weight-and-balance records.
- DA Form 1352-1 feeder information for the DA Form 1352 is completed; this information will include status through 2400 hours of the day of transfer.
- An inventory and serial-number check must be performed by the supporting unit.

(f) The float transaction is complete when the ASC float accountable officer and gaining unit representative sign the DA Form 3161. All inspections and inventories will be accomplished before this signing.

(g) This is a permanent transaction, and the replacement item becomes unit TOE property. Float items are not loaned or issued on a temporary basis and cannot be used to fill TOE shortages.

Note. Once an aircraft enters the float account, the previous owning unit has no claim to that aircraft. The ASC will in no way ensure the future issuance of any aircraft based on previous ownership. In addition, funding to bring an incoming floated aircraft to a flyable FMC status will be the previous owner's obligation.

(5) The ASC will maintain the aviation ORF assets according to applicable aircraft maintenance manuals. The direct support platoon will assign personnel to perform daily inspections and maintenance, as required, to maintain all ORF assets in a flyable condition. The ORF aircraft are reportable monthly on the unit's ORF DA Form 1352 report. The serviceable ORF aircraft may be flown four (4) hours each month for airworthiness and serviceability checks. These hours do not count in the unit flying-hour program, and they cannot be used to support unit missions. Unserviceable ORF assets will be placed in maintenance on an 03 priority and work started to return the item to a serviceable condition. The status and condition of all ORF aircraft will be reported daily to the BAMO.

p. **Aircraft Pick-up by AMC Units:** All paperwork and logbooks will be inspected by an authorized representative of the owning unit. Individual line units will not deal directly with the ASC. The acceptance aircraft inventory will be verified at this time. Organization copies of DA Forms 2407 or 2407-E, 2407-1 or 2407-1-E, and 1352-1 or 1352-1-E (Feeder Report) will accompany the aircraft. The ASC will take corrective action on all X-grounding condition write-ups that are found by the AMC unit during the acceptance inspection that are incidental to the maintenance performed by this unit. Unless the aircraft is on a "Work Request Only" maintenance request, this unit's maintenance test flight is considered a final test of airworthiness and the ASC is *not* required to meet the standards of an owning unit's "acceptance" test flight.

Figure C-1. Sample external production control SOP (continued)

q. **Disagreements:** Differences in technical inspectors' opinions or other reasons may create disagreement about the quality of work performed. The AMC customer will immediately bring such matters to the attention of the ASC production control officer. Customers will not take corrective actions themselves or get involved in arguments with personnel of this unit. If matters cannot be resolved between the production control officer and the customer, the commanding officer of the AMC unit will be notified. Any questions concerning procedures contained within this SOP will be directed to the ASC production control officer.

8. General information: Close coordination from the ASC's PC office, QC shop, shops and maintenance repair personnel, maintenance test pilots, and platoon sergeants assigned to **(enter unit's name)** is essential to a well-organized maintenance support program. All maintenance personnel should become familiar with this document and conduct their daily maintenance operations according to guidance contained within this SOP.

9. References:

AR 95-1	Flight Regulations
AR 385-10	Army Safety Program
AR 385-40	Accident Reporting and Records
AR 385-64	U. S. Army Explosives Safety Program
AR 385-95	Army Aviation Accident Prevention
AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below The National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test, Management, and Diagnostic Equipment Program
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	The Army Maintenance Management System (TAMMS)
DA PAM 750-1	Leader's Unit Level Maintenance Handbook
FM 3-04.500	Army Aviation Maintenance
TM 1-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures

Figure C-1. Sample external production control SOP (concluded)

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Appendix D

Aviation Maintenance Composite Risk Management

Composite risk management (CRM) is the tool/process that assists decision makers in an aviation maintenance unit with reducing the risk or mitigating the hazard—by systematically identifying, assessing, and designing out or controlling risk arising from operational factors—and making informed decisions that weigh risks against mission benefits. Risk is an expression of a possible loss or negative mission effect stated in terms of probability and severity.

COMPOSITE RISK MANAGEMENT GUIDANCE

D-1. The goal of Army CRM is to prevent the injury or loss of personnel, damage to or loss of equipment, or degradation of force application readiness. The CRM process begins with identifying hazards or operational risks from a holistic standpoint. Next, whenever possible, hazards must be eliminated. If they cannot be eliminated, the risk presented by the hazard is assessed for severity and probability of occurrence. For hazards that cannot be eliminated, controls are developed to reduce the probability of occurrence/hazard severity.

D-2. Residual risk is any risk remaining when all possible measures to eliminate or control a hazard have been performed and are assessed for severity and probability of occurrence. Reviewing procedures should be included as a mitigation tool as well.

D-3. The CRM process provides aviation maintenance commanders/leaders, maintenance officers/technicians, and NCOICs with a method to assist them in identifying the optimum COA when conducting maintenance procedures and maintenance support operations in a fluid COE.

D-4. CRM must be fully integrated into planning, preparation, execution, and focused logistics operations, both garrison and field locations or while deployed to a theater of operations. Anyone who directs or affects the actions of others will use the CRM process during every aspect of operations for which he is responsible.

D-5. CRM facilitates the mitigation of risks and threats to the force. The fundamental goal of CRM in a maintenance environment is to enhance maintenance operations, thereby increasing operational readiness of aviation assets to complete the mission while protecting the force. Additional guidance/information on CRM procedures is available on the USACRC's homepage at the following Web site: https://crc.army.mil/RiskManagement/default.asp?iChannel=25&nChannel=RiskManagement

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Note. Figure D-13 contains essential CRM terms and definitions.

APPLICATION OF COMPOSITE RISK MANAGEMENT

D-6. When assessing the risk of hazards in maintenance operations and operations at-large, the aviation maintenance commander/leader, maintenance officer, and NCOICs evaluate both tactical risk, accidental risk, and those risks that are characterized as everything else.

D-7. Tactical risk is risk associated with hazards that exist because of the presence of the enemy or an adversary. It applies to all levels of war and across the spectrum of operations. In the current COE, the commander alone determines how and where he is willing to take tactical risk. Tactical risks are weighted against the backdrop of maintenance missions assigned to the AMC/ASC such as conducting aircraft recovery operations, establishing forward arming and refueling points, or conducting maintenance forward of the forward line of own troops (FLOT).

D-8. Accident risk includes all operational risk considerations other than tactical risk. It includes risks to the friendly force. It also includes risks posed to civilians' maintenance contractors assigned to an AMC/ASC. It can include activities associated with hazards involving friendly personnel, civilians, maintenance contractors, and equipment readiness as well as environmental conditions.

D-9. Accident risks exist, regardless of enemy action. Hazards that contribute to accident risks include personnel who are not adequately trained to conduct certain kinds of maintenance or recovery operations, equipment that is not fully operational and environmental conditions that make operations more dangerous such as limited visibility, extreme cold weather, or inhospitable terrain.

D-10. The aviation maintenance commander/leader and maintenance officer/technician and NCOICs manage accident risk. The unit's senior leadership should be constantly looking for accident hazards associated with their areas of expertise and either eliminate the hazard or implement controls to reduce the risk.

D-11. Additional risk considerations are the aforementioned everything else, such as—

- Psychosocial factors (personal problems such as divorce).
- Criminal activity (assault or murder), suicide, communication factors (clearly stated and accurately received messages).
- Physiological factors (fatigue).
- Pathophysiological factors (drug or alcohol abuse).
- Psychological factors (fear, proficiency, or situational awareness).
- Personality factors ("hooah" factor or passive-aggressive behavior).
- Physical factors (visibility, strength, mobility, and size).
- Culture (organizational, regional, and international).
- Time.

D-12. The same CRM process is used to assess and evaluate tactical risk, accident risk, and every other kind of risk. The process is not static; it is cyclic and dynamic. CRM is a systematic process, which necessitates—

- Identifying these hazards holistically.
- Assessing these hazards in terms of probability and severity of occurrence.
- Developing viable controls to reduce the risk.
- Deciding if the benefit from conducting maintenance operation justifies the risk (making an informed risk decision).
- Implementing functional controls.
- Supervising/evaluating the effectiveness of the controls.

D-13. If the aviation maintenance commander determines that the risk level is too high, he directs the development of additional controls or alternate controls or he modifies, changes, or rejects the COA. He may also need to elevate the decision to a higher level of authority.

D-14. Aviation maintenance commanders/leaders should use the CRM matrix (Figure D-1) as a tool to apply the CRM process concurrently with the MDMP. The matrix outlines the CRM process steps as they relate to each step of the MDMP. CRM considerations apply to garrison or tactical and on duty or off duty—24 hours a day, seven days a week.

D-15. The CRM matrix, with the commanders' guidance, is used to communicate how much risk commanders will accept in allowing maintainers to conduct maintenance operations under less-than-ideal conditions. CRM is applied to reduce the risk of the full range METT-TC hazards, including enemy action and other associated hazards.

Military Decision-Making Process	Identify Hazards	Assess Hazards	Develop Controls and Make Risk Decision	Implement Controls	Supervise and Evaluate
1. Receipt of Mission	X				
2. Mission Analysis	X	X			
3. COA Development	X	X	X		
4. COA Analysis (War-Game)	X	X	X		
5. COA Comparison			X		
6. COA Approval			X		
7. Orders Production				X	
8. Rehearsal	X	X	X	X	X
9. Execution and Assessment	X	X	X	X	X

* FM 5-0 (FM 101-5)

Figure D-1. CRM matrix integrated into the military decision-making process (MDMP)

COMPOSITE RISK MANAGEMENT RESPONSIBILITIES

D-16. The aviation maintenance commander is responsible for weighing mission requirements and CS measures. He must compare and balance the risk against mission expectations. A CRM assessment, based on FM 5-19 and Figure D-1, should be completed before flight.

D-17. This process forms a direct relationship between CS and CRM. In the force-protection process, three elements are considered: planning, operations, and sustainment. CRM facilitates the force-protection process by integrating risk assessment and control development for each element specified in Figure D-1.

D-18. Successful CRM is underwritten by the chain of command. Minimizing risk is the responsibility of everyone in the AMC/ASC, from the highest commander, through his subordinate leaders, to each individual maintainer. Maintenance officers/technicians and NCOICs assist the commander in minimizing unnecessary risk by increasing the degree of certainty in all maintenance support operations.

D-19. Managing risk is critical for all maintenance operations, both garrison and field locations or while deployed to a theater of operations. In addition, consideration must be given to those areas ascribed as everything else to address anything that could affect performance, degrade capability, or reduce the number of personnel available to perform the mission. Commanders should issue clear risk guidance.

D-20. Maintenance officers/technicians and NCOICs use the CRM process to assess operational areas of responsibility. They also use it to make control measure recommendations to reduce or eliminate risk when conducting maintenance support operations in fluid and dynamic COEs. Examples of this process include the following:

- Applying CRM during the MDMP to identify force-protection shortcomings in Battlefield Operating Systems (BOS) functions.
- Developing and implementing controls to conduct maintenance in the COE in support of aviation units while avoiding unnecessary risk to assigned/attached personnel.
- Providing support to operational requirements and establishing procedures and standards that are clear and practical for each specified and implied task.
- Considering on-duty internal organizational and external off-duty factors that affect individual performance when developing controls to reduce risk during maintenance support operations.

D-21. There must be a hierarchy for residual risk approval authority. Overall, approval authority guidance must support the Army command policy. Basically, the higher the risk involved, the higher the approval authority.

D-22. The commander, when directed by higher headquarters to support maintenance support missions that he considers being other than normal in a high risk environment, will—

- Issue clear risk guidance—what risk to accept or where to accept risk.
- Select hazard-control options that are appropriate to the mission.
- Make the risk decision for a COA that demonstrates full confidence in maintainers' ability, both tactically and technically, to execute a chosen COA in support of the assigned maintenance mission.
- Enforce and evaluate the unit's execution of risk controls during the assigned maintenance support mission.
- Provide training on the CRM process and ensure that maintainers understand the who, what, where, when, and why of managing risk.
- Supervise and evaluate the unit's execution of risk controls during the assigned maintenance support mission.
- Assess the effectiveness of the unit's CRM program.
- Elevate the acceptance of a high-risk mission to the appropriate decision/approval authority.

D-23. The maintenance officer/technician will provide CRM recommendations to the commander in support of an assigned maintenance mission to include the following:

- Identify hazards and shortcomings (such as lack of personnel and equipment and extreme environments/locations) most likely to affect the maintenance support mission, possibly resulting in loss of unit personnel or damage to Army equipment.
- Mitigate hazards by developing and recommending control options that resolve the reasons for hazards, thereby mitigating or eliminating the risk.
- Integrate hazards and selected controls into a functional operational plan and SOPs, if necessary.
- Integrate control measures into a functional operational plan and SOPs, if the hazards are identified as procedural oversights.
- Review and exercise procedures so that their effectiveness can be evaluated as part of the CRM process.
- Constantly monitor and address the threats associated with maintenance operations regarding the activity being performed and the interface between the human, machine, and environment.

D-24. The aviation maintenance unit's safety officer (if assigned) will—

- Assist the commander, maintenance officer/technician, and maintenance personnel with CRM integration during mission planning, mission training, mission execution, sustainment operations, recovery operations, and mission evaluation (AAR).
- Assess unit CRM performance during every aspect of the mission; recommend changes to risk-reduction control measures as needed.
- Coordinate training on the CRM process and educate soldiers and civilians at every level on the practical application of CRM as a life skill.
- Make recommendations to the commander/leaders to mitigate hazards associated with all unit operations.
- Survey unit operations, SOPs, and procedures to detect shortfalls or hazards and make recommendations for resolution.

D-25. The aviation maintenance commander/leader performs or delegates performance of the composite risk management process for each step in troop-leading procedures (Figure D-2).

Troop-Leading Steps		Identify Hazards	Assess Hazards	Develop Controls & Make Risk Decision	Implement Controls	Supervise and Evaluate
1	Receive mission	X				
	Perform initial METT-TC analysis	X				
2	Issue the warning order	X				
3	Make a tentative plan	X	X			
3A	Make an estimate of the situation	X	X			
3B	Conduct a detailed mission analysis	X	X			
3C	Develop situation and courses of action for—	X	X			
3C1	-Enemy situation (enemy COAs)	X	X			
3C2	-Terrain and weather (OCOKA)	X	X			
3C3	-Friendly situation (troops and time available)	X	X			
3C4	-Courses of action (friendly)	X	X			
3D	Analyze courses of action—war-game	X	X			
3E	Compare courses of action			X		
3F	Make decisions			X		
3G	Expand selected COA into tentative plan			X		
4	Initiate movement				X	
5	Reconnoiter				X	
6	Complete the plan				X	
7	Issue the order				X	
8	Supervise and refine the plan					X

Figure D-2. CRM integrated into troop–leading procedures

COMPOSITE RISK MANAGEMENT PROCESS

D-26. All operational environments contain hazards. Combat operations, CS operations, and CSS operation to include maintenance support operations and even day-to-day training present unique hazards for all maintenance units involved. Likewise, such things as human factors, materiel factors, and environmental factors related to hazards must be considered.

IDENTIFY HAZARDS

D-27. The ability of commanders, maintenance officers/technicians, and NCOICs to identify hazards is essential. (Everyone needs to be able to identify hazards.) Once hazards are identified, they are entered on block 6 of the risk-management worksheet (Figure D-3).

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)
Perform Aircraft Recovery Operations	042100SEP06	042200SEP06	20060920

4. PREPARED BY:

a. LAST NAME	b. RANK	c. POSITION
TONY GAME	MAJOR	AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	<u>ADVERSE ENVIRONMENT</u> - Hostile Environment - Limited Visibility - Terrain Accessibility			ID Hazards			
	<u>CONTINUOUS OPERATIONS</u> - Fatigue						
	<u>UNFAMILIAR TERRAIN</u> - Maintenance Plan - Ground Recovery - Recovery Zone						
	<u>INADEQUATE PLANNING TIME</u>						

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

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Figure D-3. Composite risk management worksheet—identify hazards

D-28. Identify hazards holistically, based on the factors of METT-TC as a guide when planning to conduct an aircraft recovery mission or task (Figure D-4). Considerations and sources include, but are not limited to, the following:

- Aviation maintenance commander assessment of the threat.
- Condition and location of disabled aircraft.
- Disabled aircraft accessibility.
- Commander’s critical information requirements.
- Tactical situation.
- Maintenance and tactical SOPs.
- Reconnaissance of recovery area.
- Experience of recovery team members.
- Recovery assets.
- Procedure and performance evaluations.
- OPTEMPO.
- Personnel tempo (PERSTEMPO).
- Personal protective equipment (PPE).

- Fatigue.
- Fear.
- Organizational culture.
- Crew mix.

MISSION:
- Conduct aircraft recovery mission (aerial or surface).
- Assess the aircraft damage or maintenance problem.
- Prepare for a one-time evacuation mission to a maintenance site.

CONDITIONS:
- Location of downed airframe indicates that aerial recovery is the only means to recover airframe.
- Conditions indicate possible enemy encounter.
- LZ: 114 mi from departure point, 100 yd wide, sand/dirt/grass.
- WX: restricted visibility en route & LZ (illum, rain, fog, loose sand).

SITUATION:
- DART: fully qualified, experienced, superb teamwork.
- Aircraft recovery mission brief at 041530 Sep 06 (DART).
- The aviation maintenance commander authorizes dispatch of a DART.

Figure D-4. Example of mission factors collected

D-29. Review the mission's METT-TC factors to identify situations and hazards that may hinder aircraft recovery operations and are most likely cause loss of or damage to equipment or injury to personnel or result in mission degradation; that is, determine whether those potential hazards identified are adequately controlled at this or the next-lower echelon of command. To determine if a hazard requires CRM, answer the questions in the matrix of Figure D-5 to determine if the hazard actually poses a threat and needs to be risk managed.

> ***Note.*** All hazards identified must be assessed in terms of the probability of occurrence and the consequences in terms of severity (effect on the individual, equipment, and mission).

	Adequate	
QUESTIONS	**YES**	**NO**
Support—Is type/amount/capability/condition of support adequate to control hazard? • Personnel. • Supplies. • Equipment/materiel. • Services/facilities.	**Yes** **Yes**	**No** **No**
Standards—Is guidance/procedure adequately clear/practical/specific to control hazard?	**Yes**	
Training—Is training adequately thorough and recent enough to control hazard?	**Yes**	
Leadership—Is leadership ready, willing, and able to enforce standards required to control hazard?	**Yes**	
Unit Self-Discipline—Is unit performance and conduct self-disciplined to control hazard?	**Yes**	
If all answers are "yes," then no further action is required. If one or more answers are "no," this hazard needs risk management. Enter the hazard on the composite risk management work sheet.		

Figure D-5. Determining if a hazard requires CRM

D-30. Hazards that require CRM are identified. The safety officer/NCO, maintenance officer/technician, or leader ensures that they are entered in block 5 of the work sheet (Figure D-3).

Assess Hazards

D-31. This step examines each hazard, in terms of probability and severity, to determine the risk level as a consequence of exposure to the hazard. The result is an estimate of risk from each hazard and an estimate of the overall risk to the mission caused by each identified hazard. Leaders must use all available tools such as SMEs and regulations; however, experience and best judgment are often the basis for selecting the risk level. See Figure D-6.

Risk Level:
E - Extremely High
H - High
M - Moderate
L - Low

		HAZARD PROBABILITY				
		Frequent	Likely	Occasional	Seldom	Unlikely
severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Figure D-6. Composite risk assessment matrix—assess hazards

D-32. Provide the risk level for each hazard to the responsible leader and safety officer/NCO preparing the CRM work sheet. It is then entered in block 7 of the risk management worksheet as the initial risk level for each hazard (Figure D-7).

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)
Perform Aircraft Recovery Operations	042100SEP06	042200SEP06	20060920

4. PREPARED BY

a. LAST NAME	b. RANK	c. POSITION
TONY GAME	MAJOR	AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	ADVERSE ENVIRONMENT - Hostile Environment - Limited Visibility - Terrain Accessibility	EH					
	CONTINUOUS OPERATIONS - Fatigue	H					
	UNFAMILIAR TERRAIN - Maintenance Plan - Ground Recovery - Recovery Zone	H					
	INADEQUATE PLANNING TIME	EH					

Assess Hazards

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

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Figure D-7. Composite risk management worksheet—assess hazards

DEVELOP CONTROLS

D-33. After assessing each hazard, aviation maintenance commanders/leaders develop one or more controls that either eliminate the hazard or reduce the risk (probability/severity) of a hazardous incident. For each hazard identified, he develops one or more control options that either avoid the hazard or reduce its risk to a level that meets the commander's risk guidance. Controls should address the reasons that the hazard needs to be mitigated.

D-34. The aviation maintenance commander/leader provides controls to the safety officer/NCO. The safety officer/NCO enters this information in block 8 of the composite risk management worksheet (Figure D-8).

COMPOSITE RISK MANAGEMENT WORKSHEET For use of this form, see FM 5-19; the proponent agency is TRADOC			
1. MSN/TASK Perform Aircraft Recovery Operations	2a. DTG BEGIN 042100SEP06	2b. DTG END 042200SEP06	3. DATE PREPARED (YYYYMMDD) 20060920

4. PREPARED BY:		
a. LAST NAME TONY GAME	b. RANK MAJOR	c. POSITION AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	ADVERSE ENVIRONMENT - Hostile Environment - Limited Visibility - Terrain Accessibility	EH	Coordination for Passage Points Enemy Situation Friendly Situation AMC will Brief Entry and Exit Strategies from Recovery Areas				
	CONTINUOUS OPERATIONS - Fatigue	H	Ensure that the DART is Fully Briefed and Rested				
	UNFAMILIAR TERRAIN - Maintenance Plan - Ground Recovery - Recovery Zone	H	Ensure that the DART has Current Photos/Maps of Recovery Zone				
	INADEQUATE PLANNING TIME	EH	Full Rehearsal will be Conducted				

Develop Controls

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)
☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY			
a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

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Figure D-8. Composite risk management worksheet—develop controls

DETERMINE RESIDUAL RISK

D-35. An essential element of the risk decision is determining if the risk is justified. Aviation maintenance commanders must compare and balance the risk against mission expectations. They alone decide if controls are sufficient and acceptable and whether to accept the resulting residual risk. If they determine that the risk level is too high, commanders will then seek higher headquarters' guidance to develop additional controls or alternate controls to reduce the risk.

D-36. Commanders may place constraints on subordinates that restrict their freedom of action to accept risk in instances in which the risk might imperil the following:

- Their intent or their higher commander's intent.
- A critical capability of their unit.

D-37. Determining overall mission risk by averaging the risks of all threats is not valid. If one threat has high residual risk, the overall residual risk of the mission is high, no matter how many moderate- or low-risk threats are present.

D-38. However, leaders should always consider the cumulative effect of numerous hazards when assessing the overall mission risk. They may decide to increase the overall residual mission risk accordingly.

D-39. For each hazard, use the composite risk-assessment matrix (Figure D-6), experience, and judgment to determine the level of risk remaining, assuming that the controls are implemented. Provide the residual risk level for each hazard to the safety officer/NCO. The applicable risk level designator is then entered in block 9 of the risk management worksheet (Figure D-9).

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)
Perform Aircraft Recovery Operations	042100SEP06	042200SEP06	20060920

4. PREPARED BY:

a. LAST NAME	b. RANK	c. POSITION
TONY GAME	MAJOR	AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	ADVERSE ENVIRONMENT - Hostile Environment - Limited Visibility - Terrain Accessibility	EH	Coordination for Passage Points Enemy Situation Friendly Situation AMC will Brief Entry and Exit Strategies from Recovery Areas	H H H			
	CONTINUOUS OPERATIONS - Fatigue	H	Ensure that the DART is Fully Briefed and Rested	M			
	UNFAMILIAR TERRAIN - Maintenance Plan - Ground Recovery - Recovery Zone	H	Ensure that the DART has Current Photos/Maps of Recovery Zone	M			
	INADEQUATE PLANNING TIME	EH	Full Rehearsal will be Conducted	H			

Determine Residual Risk

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE ☒ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

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Figure D-9. Composite risk management worksheet—determine residual risk

DETERMINE COURSE OF ACTION RISK

D-40. An overall risk level for each COA is determined, assuming that the commander selects the controls and that they are implemented. The COA's overall risk level is the same as the hazard with the highest residual risk. The COA's risk level is checked in block 13 (Figure D-9).

D-41. The feasibility and acceptability of each COA, in terms of residual risk, is analyzed. The residual risk criterion for each COA is scored, using weights determined by the aviation maintenance commander/leader. These scores are entered on the decision matrix.

D-42. Hazards, controls, and risks are briefed to the higher headquarters commander. Composite risk management worksheets may be used for this purpose.

MAKE RISK DECISION

D-43. The commander selects the COA and decides whether to accept the COA's risk level. He decides which level of residual risk that he will accept and approves control measures that will result in that level or a lower level of risk.

D-44. He obtains the higher commander's approval to accept any level of residual risk that might imperil the higher commander's intent or is not consistent with his risk guidance. In block 14, the name, rank, and duty position of the commander accepting the COA's risk level is entered (Figure D-10).

IMPLEMENT CONTROLS

D-45. Based on the higher headquarters commander's decision and risk guidance, the aviation maintenance commander determines how each control will be put into effect or communicated to the maintenance personnel who will make it happen; for example, maintenance SOP, tactical SOP (TACSOP), mission briefing, and rehearsals. The information is entered in block 10 of the composite risk management worksheet (Figure D-10).

D-46. The aviation maintenance commander and maintenance officer/technician and NCOICs coordinate controls, integrate them into the appropriate mission brief, and confirm understanding by maintainers during the rehearsal.

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)
Perform Aircraft Recovery Operations	042100SEP06	042200SEP06	20060920

4. PREPARED BY:

a. LAST NAME	b. RANK	c. POSITION
TONY GAME	MAJOR	AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	ADVERSE ENVIRONMENT - Hostile Environment - Limited Visibility - Terrain Accessibility	EH	Coordination for Passage Points Enemy Situation Friendly Situation AMC will Brief Entry and Exit Strategies from Recovery Areas	H H H	Mission Brief Mission Brief Mission Brief		
	CONTINUOUS OPERATIONS - Fatigue	H	Ensure that the DART is Fully Briefed and Rested	M	Maintenance SOP		
	UNFAMILIAR TERRAIN - Maintenance Plan - Ground Recovery - Recovery Zone	H	Ensure that the DART has Current Photos/Maps of Recovery Zone	M	Mission Brief Rehearsals		
	INADEQUATE PLANNING TIME	EH	Full Rehearsal will be Conducted	H	Maintenance SOP		

Implement

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE ☒ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE
SALAZAR	COL	BDE/CDR	

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Figure D-10. Composite risk management worksheet—implement

SUPERVISE

D-47. Aviation maintenance commanders/leaders supervise mission rehearsal and execution to enforce standards and controls. Techniques may include spot checks, inspections, situation reports and back briefs, buddy checks, and close supervision.

D-48. During maintenance support missions, commanders/leaders, maintenance officers/technicians, and NCOICs must continuously monitor controls to ensure that these controls remain effective. Senior maintainers and individuals anticipate, identify, and assess new hazards to implement controls and mitigate identified hazards. Senior maintainers must continually assess variable hazards such as fatigue, equipment serviceability, and the environment.

D-49. Aviation maintenance commanders/leaders must modify controls to keep risks within acceptable levels throughout assigned missions. Senior maintainers must continuously plan to ensure that controls emplaced at the beginning of the mission can be applied to changes in the operational situation. Likewise, as new hazards develop, the leader must identify mitigating controls to address the hazards.

D-50. Senior maintainers provide control supervision methods to the responsible leader and safety officer/NCO, applicable information is then entered in block 11 (Figure D-11).

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)
Perform Aircraft Recovery Operations	042100SEP05	042200SEP05	20050920

4. PREPARED BY:

a. LAST NAME	b. RANK	c. POSITION
TONY GAME	MAJOR	AVIATION SUPPORT COMMANDER

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFECTIVE
	ADVERSE ENVIRONMENT - Hostile Environment - Limited Visibility - Terrain Accessibility	EH	Coordination for Passage Points Enemy Situation Friendly Situation AMC will Brief Entry and Exit Strategies from Recovery Areas	H H H	Mission Brief Mission Brief Mission Brief	Direct Supervision Mission Updates	Supervise
	CONTINUOUS OPERATIONS - Fatigue	H	Ensure that the DART is Fully Briefed and Rested	M	Maintenance SOP	Direct Supervision	
	UNFAMILIAR TERRAIN - Maintenance Plan - Ground Recovery - Recovery Zone	H	Ensure that the DART has Current Photos/Maps of Recovery Zone	M	Mission Brief Rehearsals	Mission Updates Rehearsals	
	INADEQUATE PLANNING TIME	EH	Full Rehearsal will be Conducted	H	Maintenance SOP	Direct Supervision	

Additional space for entries in Items 5 through 11 is provided on page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE [X] HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE
SALAZAR	COL	BDE/CDR	

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Figure D-11. Composite risk management worksheet—supervise

COMPOSITE RISK-MANAGEMENT ASSESSMENT

D-51. Senior maintainers evaluate the effectiveness of each control in reducing the risk of the targeted hazard. They provide a “yes,” if it is effective, or “no,” if it is not, to the responsible leader and safety officer/NCO; the responsible individual enters applicable information on the composite risk management worksheet (illustrated in Figure D-11), block 13.

D-52. For each control judged not effective, senior maintainers determine why and what control needs to be implemented to mitigate the identified hazard in the future. Changing the control, developing a different control, or changing the method of implementation or supervision are actions taken by the responsible leader to address inadequacies in selected controls. Staff members provide this information to the responsible leader and safety officer/NCO, who discuss it during the AAR.

D-53. The responsible leader, along with the safety officer/NCO evaluates the unit's composite risk-management performance and discuss it during the AAR. The matrix in Figure D-12 may be used for this discussion.

	GO	NO-GO
Identified the most important hazards.		
Available facts for each METT-TC factor gathered and considered?		
Hazards (enemy and accident) most likely to result in loss of force application power identified?		
Assessed risk level of each hazard.		
Valid method/tool used to assess initial risk levels?		
Developed appropriate control options and determined residual risk.		
Each control addressed hazard reasons?		
Residual risk level realistic for each hazard?		
Valid method/tool used to determine the residual risk level for each COA?		
Residual risk level for each COA entered on the decision matrix?		
Made risk decision for selected COA.		
Valid procedure/guidance used for determining risk decision authority?		
Clearly communicated hazards and controls to responsible unit/leadership.		
Controls integrated into appropriate paragraphs and graphics of the OPORD/FRAGO and rehearsals?		
Implemented and enforced controls.		
Effective methods used to supervise/enforce controls?		

Figure D-12. Composite risk-management task standards and performance assessment

RISK-MANAGEMENT ASSESSMENT TOOLS AND PITFALLS

D-54. In an unchanging environment or static situation, units may find a tool, such as a standardized risk assessment card or checklist, to be of some value in the initial mission analysis and COA development. However, such a tool, used alone, will probably not identify all hazards for every mission in a fluid COE. Aviation maintenance units should continually strive to gain and maintain situational and operational awareness.

D-55. Completing just the composite risk assessment alone—without implementing effective controls—usually results in a "GO" or "NO-GO" decision based on the initial risk only. Identifying hazards alone does not necessarily provide resolution or reduced risk.

D-56. The CRM process provides reasonable controls to support mission accomplishment without exposing the force to unnecessary residual risk. Pitfalls arise when commanders, leaders, and units use CRM tools without adapting them to the factors of METT-TC or when they do not consider the holistic application of CRM.

TERMS AND DEFINITIONS

D-57. Figure D-13 gives definitions for risk-management terms.

Acceptable Risk - The portion of identified risk that is allowed to persist without further controls.

Condition - The readiness status of personnel and equipment with respect to the operational environment during mission planning, preparation, and execution. Readiness that is below standard leads to human error, material failure, and inadequate precautions for environmental factors, which may cause accidents, fratricide, and mission degradation.

Controls - Actions taken to eliminate threats or reduce their risk.

CRM - The process of identifying, assessing, and controlling risks arising from operational factors and making decisions that weigh risks against mission benefits.

Exposure - The frequency and length of time that personnel and equipment are subjected to a hazard.

Extremely High Risk - Risk that could result in loss of ability to accomplish the mission if threats occur during the mission. A frequent or likely probability of catastrophic loss or frequent probability of high loss exists.

Hazard - Any actual or potential condition that can cause injury, illness, or death of personnel, damage to or loss of equipment, property, or mission degradation (FM 5-0); a condition or activity with potential to cause damage, loss, or mission degradation (JP 1-02). A hazard is an actual or a potential condition that can cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation.

High Risk - Risk that could result in significant degradation of mission capabilities in terms of the required mission standard, inability to accomplish all or parts of the mission, or inability to complete the mission to standard if threats occur during the mission.

Low Risk - Risk that could result in expected losses having little or no effect on accomplishing the mission.

Moderate Risk - Risk that could result in degraded mission capabilities in terms of the required mission standard. The unit will also have a reduced mission capability if hazards occur during the mission.

Operational Protection - The conservation of the forces' fighting potential so that it can be applied at the decisive time and place. This activity includes actions taken to counter the enemy's forces by making friendly forces (including operational formations and personnel) systems and operational facilities difficult to locate, strike, and destroy.

Figure D-13. Composite risk-management terms and definitions

Probability. The likelihood that an event will occur. Levels of probability are—

- Frequent—Occurs often, continuously experienced.
- Likely—Occurs several times.
- Occasional—Occurs sporadically.
- Seldom—Unlikely, but could occur at some time.
- Unlikely—Can assume that it will not occur, but not impossible.

Residual Risk - The level of risk remaining after controls have been identified and selected for threats that may result in loss of combat power. This term and its definition apply only in the context of this publication and should not be referenced outside of this publication.

Risk - Chance of hazard or bad consequences; the probability of exposure to chance of injury or loss from a hazard; risk level is expressed in terms of hazard probability and severity.

Risk Assessment - Identification and assessment of hazards; an identified hazard is assessed to determine the risk (both the probability of occurrence and resulting severity) of a hazardous incident because of the presence of a hazard.

Risk Decision - The decision to accept or not to accept the risk associated with an action—made by the commander, leader, or individual responsible for performing the action.

Risk Management Integration - The embedding of risk management principles and practices into Army operations, culture, organizations, systems, and individual behavior.

Risk Management - The process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk cost with mission benefits.

Severity - The expected consequence of an event (hazardous incident) in terms of degree of injury, property damage, or other mission-impairing factors (potential loss of combat power). Levels of severity are—

> **Catastrophic** - Loss of ability to accomplish the mission or mission failure. Death or permanent total disability (accident risk). Loss of major or mission-critical system or equipment. Major property (facility) damage. Severe environmental damage. Mission-critical security failure. Unacceptable collateral damage.
>
> **Critical** - Significantly (severely) degraded mission capability or unit readiness. Permanent partial disability, temporary total disability exceeding three months (accident risk). Extensive (major) damage to equipment or systems. Significant damage to property or the environment. Security failure. Significant collateral damage.
>
> **Marginal** - Degraded mission capability or unit readiness. Minor damage to equipment or systems, property, or the environment. Lost day because of injury or illness not exceeding three months (accident risk).

SME – Subject matter expert.

Threat - Source of danger; any opposing force, condition, source, or circumstance with the potential to negatively affect mission accomplishment/degrade mission capability, injure or kill personnel, or damage/destroy equipment or property. This term and its definition apply only in the context of this publication and should not be referenced outside of this publication.

Figure D-13. Composite risk-management terms and definitions (concluded)

Appendix E

Aircraft Recovery, Evacuation, Battle Damage Assessment, and Repair

The loss of an aircrew/airframe is catastrophic and negatively affects any unit engaged in training or tactical operations. Continued losses of aircrews/airframes, regardless of the operating environment, will demoralize unit personnel. Losses of airframes in the COE, regardless of the length of time that they are lost, will ultimately affect the force application readiness and capability of aviation units fighting the GWOT. Continued loss of airframes will rapidly deplete available ORF assets. This appendix provides the aviation maintenance commanders/leaders, maintenance officers/technicians, NCOICs, and maintainers with a "**how-to**" in defining battle damage assessment and procedures and guidance for recovery and evacuation of downed aircraft.

Note. FMs 3-04.513 and 3-04.111 contain additional information on BDAR as well as further guidance and procedures on recovery and evacuation of downed aircraft. Figure E-1 of this appendix contains major aircraft recovery, evacuation, and battle damage assessment and repair terms and definitions.

BATTLEFIELD MANAGEMENT

E-1. Historically, the effort at recovering aircrews or aircraft off the battlefield has been minimal and poorly coordinated, at best. Today, personnel recovery teams and DART/BDAR teams provide the methods for retrieving aircrews and aircraft as well as regenerating those resources necessary to maintain momentum on the battlefield. FM 3-04.111(FM 1-111), Chapters 4 and 8, provides commanders with guidance on personnel recovery, aircraft recovery, and BDAR missions. JP 3-50.2 and JP 3-50.21 contain information on Army and joint recovery procedures; JP 3-52 contains information on airspace control.

RECOVERY/EVACUATION PRIORITIES

E-2. According to FM 3-04.111(FM 1-111), personnel recovery (PR) is the priority followed by the recovery of downed aircraft and equipment. Any rotor aircraft near the downed crew can conduct personnel recovery operations. These aircraft should be cleared into the recovery site immediately after the area has been secured. Equipment recovery operations may be conducted simultaneously with the personnel recovery operation or delayed until personnel recovery operations are complete. *Downed aircraft or equipment recovery operations must never compromise personnel recovery operations.*

E-3. Aircraft tasked with recovery operations will remain off station until specifically cleared for the approach by the task force commander responsible for recovery operations. The same is true for the departing recovery site; aircraft will remain at the site until cleared for departure by the task force commander responsible for recovery operations.

E-4. Simply stated, recovery priorities are recovery of the aircrew and simultaneous evaluation of the aircraft. If, after a thorough damage assessment by the assessor, he determines that the aircraft is still an asset, a decision must be made to either evacuate the aircraft to the nearest maintenance facility or repair the aircraft on station. In either case, security for the DART personnel tasked with recovery operations is paramount to the safety of all maintenance personnel.

AIRCRAFT RECOVERY

E-5. Aircraft assets and supporting equipment used in direct support of force application operations are normally repaired as far forward and as rapidly as possible. However, when conditions are not conducive to sustained aircraft maintenance operations, damaged aircraft must be evacuated. The commander is responsible for planning recovery operations when aircraft are not safe to repair in the area of hostilities. When damages exceed the immediate repair capabilities of maintenance units, including BDAR procedures, the aircraft must be recovered.

E-6. Aircraft recovery operations move inoperable aircraft from the battlefield to a maintenance collection point (MCP) or to the nearest maintenance facility. Aircraft that cannot be repaired for a one-time flight from the downed site are evacuated directly to the first appropriate MCP or maintenance activity aerially, via another aircraft, or surface, via ground vehicles. In contrast to aircraft recovery, aircraft evacuation is the movement of an inoperable aircraft between maintenance points to a higher echelon of maintenance. Evacuation of aircraft normally occurs when, in consideration of METT-TC, repairs to aircraft are beyond the capability of the lower echelon of maintenance.

PUBLICATIONS

E-7. FM 3-04.513(FM 1-513) provides detailed procedures for preparing and performing aerial recovery operations for specific aircraft. FM 3-04.120(FM 1-120) provides doctrinal guidance on the requirements, procedures, and C2 tasks involved in planning, coordinating, and executing the airspace control function.

RESPONSIBILITY

E-8. Aircraft recovery is the responsibility of the operational aviation unit, using its AMC elements within the limits of its organic lift capability. Supporting ASCs provide backup recovery support when recovery is beyond the AMC DART's capability. Recovery operations require a highly coordinated effort between the owning organization, its ASC support, the ground element in whose area the recovery will take place, and any organization that may provide aircraft or vehicle assets to complete the recovery. Overall, control of the recovery rests with the task force commander responsible for aircraft recovery operations.

PLANNING

E-9. Because of the details involved—to include safety parameters, recovery operations, and to a lesser degree, maintenance—evacuations are easily detected and subject to attack by enemy forces, regardless of COEs and combat intensity. Command, control, and crew and DART coordination are crucial to encompass a recovery mission within the framework of safety.

E-10. Aircraft recovery operations are planned within the context and urgency of the mission, the size of the force, and the density of recovery assets at the disposal of commanders. Aircraft recovery procedures are included in unit SOPs, contingency plans, operation orders, and air mission briefings.

SPECIAL ENVIRONMENTS

E-11. Recovery operations in a CBRN environment pose special risks to personnel. These risks can be minimized through the wearing of protective clothing by the recovering crew at the scene of the downed aircraft. In addition, the receiving crew at the maintenance site should wear protective clothing because of possible contamination of the disabled aircraft, the recovering aircraft, and rigging sets.

E-12. Night recovery operations increase hazards and the need for security. Increased risk must be weighed against the urgency—considering time, weather, and the tactical situation. Composite risk management is an absolute, regardless of the type of aircraft recovery mission being considered.

Note. Appendix D contains detailed instruction on composite risk management procedures.

AIRCRAFT COMMANDER AND AIRCREW

E-13. When an aircraft is forced down, the aircraft commander, or one of his crew, will use the aircraft radio (if operable and the tactical situation permits) to notify the parent AMC commander of the problem and request DART assistance.

E-14. This information may be relayed through other aircraft operating in the area at the time of the incident as time and security allow. The crew takes the first step by accessing the aircraft malfunction and determining the extent of the problem. Crew members relay this information to the AMC commander, providing him with as much detail as possible. Information relayed to the commander falls under two categories: critical information and minimum information.

E-15. The following information is considered critical in planning recovery operations and should be relayed to the planning commander as soon as feasible:

- Location of the aircraft.
- Assessment of site security (if enemy activity is seen, this information must be relayed).
- Adaptability of the site (existing weather conditions required for the insertion of a DART with the option of augmenting with BDAR personnel).
- Evaluation of aircraft damage, to the extent possible, so that needed BDAR personnel, equipment, and parts requirements can be estimated.
- Information on crew and passenger condition to determine their capability to assist in repairing the damage (for example, the aircraft pilot in command (PIC) may be able to fly the aircraft out, eliminating the need for an aviator as part of the BDAR).
- Information provided by air traffic controllers.

E-16. The following information is considered the minimum required for in-flight emergencies:

- Aircraft identification and type.
- Nature of emergency.
- Pilot’s needs.
- Aircraft position (grid or latitude and longitude coordinates).

E-17. Depending on the enemy situation, status of the crew, and aircraft communications, the following items or additional pertinent information will be obtained from the pilot or aircraft operator:

- Aircraft mission design series and tail number.
- Crew status and condition, if needed, and whether they are able to evacuate aircraft.
- Describe extent of damage and whether the aircraft is airworthy.
- Enemy activity.
- Aircraft altitude when it went down.
- Approximate fuel remaining in aircraft.
- Pilot-reported weather.
- Time and place of last-known position.
- Heading since last-known position.
- Airspeed when aircraft went down.
- Navigation equipment capability.
- Navigational aid (NAVAID) signals received.
- Visible landmarks.
- Number of people on board.
- Point of departure and destination.
- Emergency equipment on hand.
- Weapons available, if any.

INITIAL INSPECTION

E-18. The ASC commander authorizes dispatch (normally airlift) of a DART with manuals, recovery kit, BDAR kits, materials, and parts, as the mission dictates, to the recovery site. The team's initial on-site inspection determines the actual extent of damage. It also provides information needed to determine which of the following alternatives apply:

- Augmenting the DART with BDAR personnel and equipment.
- Rigging aircraft for aerial or surface recovery and making necessary recovery arrangements (repair not feasible at repair site).
- Cannibalizing critical components and abandoning (recover at later time) or destroying aircraft (repair or recovery not feasible); the decision to destroy an aircraft will be based on the possibility of an abandoned aircraft falling into enemy hands (according to TM 750-244-1-5).
- Clearing the aircraft for immediate return to battle, deferring minor damage repairs to a later time.
- Making permanent repairs, returning the aircraft to a completely serviceable condition.
- Making temporary repairs that will allow safe return of the aircraft to meet immediate battle needs, deferring higher standard permanent repairs to a later time.
- Repairing the aircraft to allow a one-time evacuation flight back to an MCP or maintenance area that is more secure and has better resources.

ASSESSMENT

E-19. An experienced assessor will assess aircraft battle damage. One of the assessor's primary tasks is to determine the location of the damaged aircraft relative to the battlefield and the extent of the threat. Modern air defense threats may make aerial recovery in forward areas of the battlefield an impractical or unacceptably high risk.

E-20. The ability to determine rapidly that a one-time flight is feasible or that a quick-fix repair is possible is important. This decision may prevent a situation in which the aircraft would otherwise be destroyed (in place) to prevent capture by or provide the enemy with critical equipment that may ultimately compromise friendly forces.

E-21. Once the battle subsides, maintenance decisions are based on standard operational maintenance practices. Deferment of maintenance tasks is a "fly now, pay later" concept. Postponing maintenance, where feasible, will provide the force application commander with increased availability for short periods only.

DOWNED AIRCRAFT RECOVERY TEAM COMPOSITION AND PROCEDURES

E-22. Each AMC and ASC organization will prepare for aircraft recovery contingencies by designating an aircraft recovery team. The DART is dispatched to downed aircraft sites as the situation requires and as the intensity of the conflict allows. Capabilities and decisions for recovery missions forward of the FLOT differ considerably from those on the friendly side.

E-23. The DART usually consists of maintenance personnel, a maintenance test pilot, an aircraft assessor, and a TI (the TI may also serve as the assessor). All will be trained to prepare aircraft for recovery. The team chief ensures that appropriate rigging and recovery equipment is kept ready for quick-notice recovery missions.

E-24. The team's size and composition depend on the type and size of disabled aircraft, type of recovery aircraft or vehicle, and length of time that the recovery area will be accessible. At times dictated by local circumstances, one team may function as both the BDAR team and the recovery team, switching roles as the situation develops.

E-25. Aircraft recovery operations are time sensitive. AMC and ASC units form DARTs from within their personnel assets. A stand-alone or combined DART may perform any of the following actions:

- Assess repair requirements.
- Repair the aircraft or prepare it for a one-time evacuation mission.
- Recommend recovery by aerial or ground means.
- Rig the aircraft for recovery.
- Serve as the ground crew for helicopter lift.
- Serve as the crew to secure the load aboard a vehicle.
- If the aircraft is not reparable, determine which parts, subsystems, or components can be salvaged and remove them.
- Destroy, or take part in the destruction of, a disabled aircraft that is to be abandoned (according to TM 750-244-1-5).

E-26. A DART may respond to the recovery of a downed aircraft from within the unit, a supported unit or an adjacent unit or any aircraft that is disabled within a sector. Normally, the team is transported with its equipment, by air, to the scene of the disabled aircraft and extracted by air upon completion of the mission.

E-27. Both delayed and immediate recovery missions normally are planned as a part of all flight operations but are especially critical for cross-FLOT operations. Commanders may be required to use internal assets to conduct a delayed aircraft recovery from their own unit, with or without additional detailed planning time.

E-28. General procedures typically are covered in unit SOPs. For example, the unit SOP may specify a radio frequency to be used or a color of light or smoke to be used for recognition; the last aircraft in the flight may be designated as the maintenance aircraft.

DESTRUCTION OF AIRCRAFT AND ASSOCIATED EQUIPMENT

E-29. Destruction of aircraft and associated equipment that cannot be recovered and are in danger of enemy capture may be initiated and conducted according to TM 750-244-1-5. The authority for destruction will be delineated and included in SOPs and OPORDs. If possible, aircraft are cannibalized before destruction. The higher headquarters command assigned to a theater of operations, on a mission basis, mandates recovery and evacuation of enemy, allied, and other U.S. services' aircraft using higher-echelon assets.

E-30. Upon receipt of orders from the proper authority, or according to common standard operating procedures, equipment destruction should be as thorough as time, personnel, and means permit. Priority must always be given to the destruction of classified equipment and associated documents. When lack of time prevents complete destruction of equipment, priority is to be given to the destruction of essential parts. The same priority for destruction of repair parts of a major item necessary to render that item inoperable must be given to the destruction of similar repair parts located in storage areas.

BATTLE DAMAGE ASSESSMENT AND REPAIR

E-31. During sustained force application operations, situations arise that make expediting normal maintenance procedures imperative. In such cases, the unit commander will authorize the use of BDAR procedures. BDAR is an AMC-level responsibility, with backup from supporting ASC units.

E-32. The concept uses specialized assessment criteria, repair kits, and trained personnel. BDAR modifies peacetime aircraft maintenance standards to safely return damaged aircraft to battle as soon as possible. Often, such return-to-battle repairs will be temporary, necessitating future permanent follow-up actions when force application operations subside and the tactical situation permits.

E-33. The BDAR system can multiply force capability in a force application environment by augmenting the existing peacetime maintenance system. The following discussion defines BDAR requirements and procedures at the AMC level. Similar actions apply to ASC BDAR teams when used as backup support.

TEAM COMPOSITION AND MATERIALS

E-34. The BDAR team is formed using maintainers belonging to an AMC unit. A typical team includes a trained inspector for damage assessment, two or three component and airframe repairers (15-series MOS), and a maintenance test pilot. The actual composition of a team, given a specific BDAR mission, depends on the type and extent of maintenance work anticipated.

E-35. The team will use BDAR technical manuals, including ETMs and IETMs, containing revised aircraft damage assessment criteria and repair procedures. These manuals are formally processed and validated publications for force application environments only, as authorized by the unit commander. Each type of aircraft has its own BDAR technical manuals, including ETMs/IETMs, that provide the following:

- Force application damage inspection and assessment techniques.
- Force application area maintenance serviceability and deferability criteria.
- Cannibalization techniques that permit quick, efficient removal of critical components and structures from unreparable and nonrecoverable aircraft.

E-36. The BDAR team will be provided with specially designed combat repair kits for repairing major aircraft systems. With the tools and materials in these kits, team members can make quick, temporary combat-damage repairs. Kits are man-portable (suitcase-sized).

SURFACE RECOVERY

E-37. Surface recovery and evacuation use ground equipment and wheeled vehicles to move disabled aircraft to an MCP or a maintenance facility. Planning a surface recovery follows these logical steps:

- Evaluate the downed aircraft.
- Determine the equipment and transportation needed to recover it.
- Perform a thorough reconnaissance, and evaluate available ground routes to and from the recovery site.

E-38. Once the above criteria and steps are met, expand these steps to include characteristics of the recovery site and special tactical considerations:

- The dangers of improvised explosive devices (IEDs).
- Likely enemy avenues of approach.
- Minefields and actions to minimize the danger of booby-traps in downed aircraft.
- The possible need for tactical cover.
- Need for troop or aerial escort to protect against ambush.

Advantages

E-39. Surface recovery restricts the enemy’s ability to detect movement of recovery assets to an area relatively close to the movement routes. It can be used when weather conditions prohibit flight. In addition, the threat of total loss of the aircraft during transport because of recovery equipment malfunction is low.

Disadvantages

E-40. Surface recovery may tie up route security assets badly needed elsewhere. The time needed for surface recovery is much greater than for aerial recovery. Recovery personnel and equipment assets are tied up for longer periods during surface recovery. This relatively high exposure time on the battlefield with slow-moving equipment increases the threat.

E-41. In addition, a significant amount of aircraft disassembly or modification is often required to adapt the aircraft to surface travel; for example, the shortening of height dimensions to accommodate overhead road clearances or the fabricating of extensions for trailers because the aircraft wheelbase is too wide. Ground routes must be accessible, and meticulous reconnaissance of the route is required. Loading procedures and travel on rough terrain can further damage the aircraft.

AERIAL RECOVERY

E-42. Aerial recovery involves attaching the aircraft to suitable airlift recovery equipment, connecting it to the lifting helicopter, and flying it to the MCP or maintenance area. All helicopters must be rigged according to applicable manuals (see FM 3-04.513[FM 1-513]). Again, planning for this type of recovery entails thorough analysis of the recovery site and the threat associated with relatively slow air movement over a battlefield. Medium-lift helicopters will be required for aerial recovery of heavier aircraft.

Advantages

E-43. Aerial recovery reduces the time that recovery assets are tied up and exposed to the battlefield. Route reconnaissance and security escort requirements are considerably less compared to surface recovery. In addition, the need for aircraft disassembly is greatly reduced. Recovery site accessibility requirements are not as rigid. The distance from which recovery assets may be obtained is much greater.

Disadvantages

E-44. The possibility exists for complete loss of aircraft through failure of recovery equipment. Although exposure time is less, the distance from which recovery activities are detectable is much greater. Loss of recovery assets through enemy action will be more severe, effectively degrading total force fighting capabilities. This is due to the multiuse value and relative low density of airlift helicopters, particularly medium-lift helicopters, compared to ground recovery vehicles.

TERMS AND DEFINITIONS

E-45. Figure E-1 lists major aircraft recovery, evacuation, and battle damage assessment and repair terms and definitions.

- **Downed Aircraft Recovery Team.** The DART normally comprises selected aviation maintenance company personnel. (These personnel include technical inspector, maintenance test pilot or pilot, maintenance personnel, radio operator, and security force). The team extracts an aircraft from a downed location to a safe location, using aerial recovery kits, a trained recovery team, and recovery aircraft. Augmentation of the DART mission with BDAR-trained component and repair platoon personnel can recover downed aircraft using BDAR measures. These measures expedite the recovery and return of aircraft to continue the fight. In addition, they prevent the aircraft from falling into enemy hands and retain control of the aircraft for future use as controlled exchange program for other aircraft and induction into a BDAR program for eventual reintegration into the battle. Refer to FM 3-04.513.
- **Battle Damage Assessment and Repair.** BDAR is the use of specialized aircraft damage assessment criteria, repair kits, and trained personnel to modify peacetime aircraft maintenance standards. The concept includes the return of damaged aircraft to a safe location and, eventually, to battle as soon as possible. Refer to FM 3-04.513.
- **Maintenance Evacuation.** Maintenance evacuation is the physical act of moving an aircraft from one maintenance location on the battlefield to another. Movement is either by fly-out or aerial/ground recovery means. Evacuation is to effect repair, cross-level maintenance workloads, or relieve units of disabled aircraft during tactical moves.
- **Rescue Coordination Center.** The Army component commander plans, coordinates, and directs the execution of combat search and rescue (CSAR) and DART operations and establishes a rescue coordination center (RCC) within the commander's AO. The component commander may not directly establish an RCC. If an RCC is not established, the Army commander must designate an existing headquarters or staff section to perform the duties of the RCC.
- **Trigger.** According to FM 1-02, a trigger is an event or time-oriented criteria used to initiate planned actions directed toward achieving surprise and inflicting maximum destruction on the enemy. It is also a designated point or points (selected along identifiable terrain) in an EA used to mass fires at a predetermined range. A trigger, as it applies to this manual, would be an event or time-oriented criteria used to initiate planned actions toward extracting downed aircrews and recovering downed aircraft.
- **Assessor.** An assessor is one who can assess aircraft battle damage. One of the assessor's primary tasks is to determine the location of the damaged aircraft relative to the battlefield and the extent of the threat. Modern air defense threats may make aerial recovery in areas forward of the FLOT an impractical or of unacceptably high risk. The ability to determine rapidly that a one-time evacuation mission is feasible or that a quick-fix repair is possible is important. It may prevent a situation in which the aircraft would otherwise be destroyed (in place) to prevent capture by the enemy. Once the battle subsides, maintenance decisions are based on standard operational maintenance practices. An assessor can be one or a combination of the following: the aircrew of the downed aircraft, aircrew of another aircraft, or the DART aircrew. The assessor's mission is to provide the commander with an initial assessment of the downed aircraft. Based on METT-TC, the assessor can, when appropriate, provide a more detailed assessment.

Figure E-1. Aircraft recovery, evacuation, and battle damage assessment and repair terms

Appendix F

Aviation Maintenance Unit Deployment/Redeployment

We will prioritize solutions which optimize smaller, lighter, more lethal, yet more reliable, fuel efficient and more survivable options. . . . we intend to transform the Army, all components, into a standard design . . . that [will] allow us to put a combat capable brigade anywhere in the world in 96 hours once we have received execute liftoff, a division on the ground in 120 hours, and five divisions in 30 days.

General Eric K. Shinseki

Former Chief of Staff of the Army

The world's strategic environment has changed in dramatic ways. Uncertainty and the growing world complexity cast a large shadow over any attempt by military planners to prepare for or predict the types of contingencies that our forces will confront in the future in support of national objectives. Although, it is prudent to prepare for a long war, "come-as-you-are" crisis-response operations are the most likely actions that the military will be required to undertake. Aviation maintenance units must now, more than ever, be ready to deploy at a moment's notice to anywhere in the world and provide maintenance support to keep aviation units fully operational as they participate in any contingencies/warfighting efforts.

DEPLOYMENT RESPONSIBILITIES

F-1. A unit movement officer (UMO) and alternate are appointed, in writing, for each aviation maintenance unit. The alternate UMO is normally an NCO. The UMO is trained at a school or within the unit. UMOs perform the following duties:

- Develop and maintain unit movement/deployment plans.
- Supervise the preparation and execution of unit load plans, including vehicle load plans.
- Train unit load teams.
- Ensure that unit personnel authorized to certify hazardous materials are available.
- Prepare and maintain documentation needed for unit movements.
- Assist in preparation of unit passenger and cargo manifests; inspect manifests for accuracy.
- Maintain liaison with the departure airlift control group (DACG) for airlift operations.
- Coordinate with higher headquarters and supporting units for operational and logistical support of unit movements.
- Maintain a UMO continuity folder.

F-2. In addition to the above duties, the UMO must be familiar with the following:

- The transportability of the unit's organic equipment and cargo.
- Movement of HAZMAT peculiar to the unit.
- The hazardous materials certification process.
- Procedures for requesting commercial and military transportation.
- Unit RF tag requirements.
- Required deployment and transportation references.

HAZARDOUS CARGO CERTIFYING OFFICIAL

F-3. Preparation and shipment of hazardous cargo are critical deployment requirements. Improper procedures can result in loss of life or equipment, monetary penalty, or at a minimum, frustrated cargo. Aviation unit commanders, safety officers, and UMOs need to identify and determine which equipment/cargo may be defined as hazardous and require specific handling/packaging, documentation, and marking.

F-4. Each aviation unit requires at least one individual trained to certify hazardous cargo. The commander designates this individual in writing. The designation must include the scope of the individual's authority. These individuals can certify documents for all modes of shipment, to include commercial and military hard-surface/line-haul, rail, sea, and air. The hazardous cargo certifying official is responsible for ensuring that shipments are properly prepared, packaged, labeled, marked, and placarded. The certifying official is also responsible for personally inspecting the item being certified and signing the HAZMAT documentation.

F-5. The hazardous cargo certifier must be trained at a DOD-approved school on applicable regulations for all modes within the past 24 months. This person must also receive refresher training every two years to continue to certify shipments of hazardous materials for transportation.

UNIT LOADING TEAMS

F-6. Units are required to have an appropriate number of personnel trained in vehicle, aircraft, ship/vessel, and railcar loading/unloading techniques. Training can be arranged through the installation unit movement coordinator (UMC) or division transportation officer (DTO). Specific skills required include the following:

- Activating vehicle load plans.
- Preparing vehicles for shipment (purging, protecting fragile components, weighing, and marking for air and rail movement).
- Performing aircraft and railcar tie-down procedures.
- Loading and unloading unit vehicles on aircraft and railcars.

F-7. Load team composition is tailored to the type and quantity of equipment and time available for loading. The following guidelines are provided for planning purposes:

- For rail movement, a well-trained team of five operators, using prefabricated tie-down devices, can complete loading/lashing of equipment on a chain-equipped flatcar in about 15 minutes; units are normally provided 72 hours for loading once the cars are spotted.
- For air movement, a six-person team can provide efficient loading and tie-down of equipment.

MOVEMENT PLANNING

F-8. To meet contingency support requirements, aviation maintenance units must develop deployment movement plans and SOPs. An effective movement plan contains sufficient detail to prepare units to execute strategic deployments. The unit movement SOP is a generic document that outlines functions that should occur automatically upon notification of a unit movement. In addition to movement plans and SOPs, units often maintain movement binders and battle books, which contain movement information and instructions. Movement plans can be mobilization movement plans/deployment movement plans.

UNIT MOVEMENT STANDARD OPERATING PROCEDURES

F-9. The unit movement SOP should be generic enough to fit any given movement situation. The SOP should address alert functions as well as day-to-day operations. The SOP defines the duties of subordinate units/sections that will bring the unit to a higher state of readiness. These duties can be written in separate annexes that can be easily separated and issued to leaders for execution.

F-10. Functions addressed in the SOP could include unit property disposition, supply draw (unit basic load [UBL]), equipment maintenance, vehicle and container loading, security, marshaling procedures, purchasing authorities, unit briefings, and other applicable deployment activities.

Note. Refer to FM 4-01.15(FM 55-15) for a sample transportation SOP format.

F-11. For deployment preparation and execution, units may use either a readiness SOP (RSOP) or supplement their higher headquarters RSOP/deployment SOP. The RSOP normally addresses the overall deployment concept, force packages, training requirements, the alert notification system, logistics support, personnel and equipment readiness, outload support, soldier readiness program, and command and control at critical points. This document is essential for the orderly execution of rapid force deployments in response to crisis situations.

MOVEMENT/DEPLOYMENT BINDERS AND BATTLE BOOKS

F-12. In addition to the movement SOP, units often maintain movement or deployment binders and battle books. Movement/deployment binders contain the unit's deployment plan and include items such as appointment orders and training certificates, recall rosters, a current automated unit equipment list (AUEL), copies of load cards and container packing lists, prepared copies of transportation requests, convoy movement requests and special handling permits, and blocking, bracing, packing, crating, and tie-down (BBPCT) requirements.

F-13. The battle book documents how the aviation unit commander accomplishes his mission in the specified AO. It should include the organization and responsibilities for the unit's RSO&I within the theater. The following items, if applicable, should be included in the battle book:

- Maps of convoy routes within the AO, to include critical areas that the unit will pass through en route to its employment location.
- Plans and locations for drawing APS.

UNIT DEPLOYMENT

F-14. Aviation unit deployment encompasses all activities from origin or home station, specifically including intracontinental United States, intertheater and intratheater movement legs, and staging and holding areas. During major contingencies, aviation units deploy from power projection platforms (PPPs) and power support platforms (PSPs) within the United States or from forward bases.

PREDEPLOYMENT ACTIVITIES

F-15. Predeployment activities are those actions performed at home station or point of origin to prepare individuals, units, and materiel for deployment. They are essentially constant and ongoing activities performed at home station before and continuing after warning and alert notification.

F-16. During predeployment activities, the commander establishes movement priority that may be divided into such groups as advance party and main body. Movement of unit personnel depends on the situation and is based on a thorough METT-TC assessment.

MOVEMENT TO PORT OF EMBARKATION

F-17. Movement orders, along with any additional guidance, are forwarded to the appropriate subordinate commands, deploying units, and the installation. Deploying units are then validated and configured for movement to the port of embarkation (POE).

F-18. The Surface Deployment and Distribution Command (SDDC) website is http://www.sddc.army.mil/. The port call message identifies the date that the unit must have its equipment at the POE to meet the available to load dates (ALDs). The deploying aviation unit's higher headquarters or the installation normally prepares a movement schedule or order containing unit movement times and modes for movement to POEs.

F-19. The movement mode from POE to POD determines how unit equipment is prepared for deployment. In an overseas deployment, unit equipment will normally be sent by sea two or three weeks before the unit's main body personnel depart for the area of operation by air.

F-20. Some equipment and cargo configuration may need to be accomplished at marshaling areas near the aerial port of debarkation (APOE) or marshaling and staging areas near the seaport of embarkation (SPOE). This is due to equipment and cargo preparations required by the movement to POE mode.

F-21. For example, a unit may convoy from home station to the APOE. Organic vehicles moving on highways must be in the correct configuration for safe highway movement. Once the equipment reaches the APOE marshaling area, the unit reconfigures and prepares vehicles, as needed, to meet airlift requirements.

F-22. Deploying units begin preparing their equipment for deployment in unit marshaling areas and motor pools. Activities include preparation of required documentation (such as military shipping labels and hazardous cargo labels), vehicle and personnel preparation, preparation of sensitive cargo, and containerization of equipment.

F-23. Based on local deployment procedures, the equipment may move from the unit marshaling areas to a central staging area on the installation for further processing. The installation staging area (ISA) is a centralized location where deploying units assemble their equipment for continued movement to the POE. The installation normally provides command and control of the ISA by establishing a control center, monitoring unit movements, and validating unit equipment preparation.

F-24. Upon arrival at the ISA, deploying equipment is inspected for cleanliness, serviceability, proper shipping configuration, documentation, fuel levels, and any other criteria required to meet deployment standards. Equipment failing to meet standards is placed in holding areas until deficiencies are corrected.

F-25. When established standards are met, the equipment is sequenced for loading according to the mode of transport. Before leaving the ISA, each unit updates its AUEL with actual equipment weights, dimensions, and loads for preparation of the deployment equipment list (DEL).

F-26. From the ISA, units continue their movement to POEs. Based on the unit's proximity to the POE, the availability of rail cars, and the type of unit equipment, the unit may move to the POE by convoy, rail, commercial truck or bus, or a combination of these means. Army rotary-wing aircraft normally self-deploy to the POE. Passengers usually move to the POE by organic vehicles or by military or commercial buses. The two most common modes for moving equipment to POE are highway and rail.

UNIT REDEPLOYMENT

F-27. Redeployment is the transfer of a unit, an individual, or supplies deployed in one area to another area, to another location within the area, or to the zone of the interior for the purpose of further employment. Although many of the considerations for redeployment correspond to those for deployment, there are differences. During deployment, elements of a unit are configured for strategic movement and then reassembled into an effective force in the theater. During redeployment, the goal is the same if the unit is redeploying to a new theater to undertake operations. The goal differs, however, if the unit is redeploying to home locations, rather than building a force for theater operations.

REDEPLOYMENT PROCEDURES

F-28. Redeployment preparation involves reestablishing unit integrity and accountability of personnel and equipment. Units normally redeploy to home stations as pure units. Redeployments to new theaters may require organizational modifications based on mission requirements.

F-29. Installations normally have assigned redeployment responsibilities for supporting Army forces stationed in the United States. For foreign-based forces, the foreign home installation and the area support group (ASG) have redeployment responsibilities. Upon initiation of redeployment operations, installations begin preparatory actions to receive units at the POD and move them to their home/demobilization station.

F-30. Movement guidance to redeploying units addresses the following:

- Preparing subordinate unit movement plans.
- Updating unit movement documentation.
- Identifying and coordinating channels for any additional transportation support needed to move unit personnel and equipment to POEs.
- Preparing and submitting redeployment DELs.

REDEPLOYMENT ROUTING

F-31. The redeployment plan designates redeploying unit routing to POEs. After completion of military operations, redeploying forces move to designated assembly areas (AAs). Based on the redeployment scenario, redeploying units could then move from the AA directly to the POE marshaling areas for loading.

F-32. The routing of units to their final destination depends on—

- Strategic lift asset availability.
- Theater transportation facilities and their throughput capacities.
- Distance/geography between unit location and POE.
- Potential for hostile action.
- Force size.
- Time available.
- Follow-on destination and mission.

F-33. Upon receiving a warning order, the unit starts the redeployment process. Units evaluate the assigned mission, current unit status, and requirements to accomplish the redeployment mission. If the unit is redeploying to another theater, it must also plan for employment in that theater. Depending on their mission and redeployment scenario, redeploying units may perform the following functions as a part of the movement to POE phase:

- **Move to assembly areas**. The unit normally conducts a tactical movement to the AA and continues to receive CSS through normal support channels.
- **Reorganize**. Unit reconstitution for redeployment involves those actions required to assemble and organize the unit and to cross-level personnel, supplies, and equipment as necessary; units are consolidated under their UICs.
- **Process personnel and equipment for redeployment**. This process includes all actions that can be completed at the AA, assuming availability of support assets and supplies.

F-34. Commanders/leaders should complete the following key items as early as possible in the redeployment process:

- Identify soldiers and civilians who will deploy as individuals to supporting personnel managers.
- Conduct medical screening.
- Perform equipment checks and services according to technical manuals, including ETMs or IETMs.
- Conduct an equipment inventory (Class 7, organizational clothing and individual equipment (OCIE), and BIIs).
- Refine the DEL, and verify unit line number (ULN) data.
- Requisition required parts.
- Schedule/defer required maintenance.

F-35. Movements personnel initiate movement documentation. The unit completes all documentation before loading. Documentation includes hazardous shipping declarations, papers, labels, placards, secondary cargo load plans/cards, packing lists, and military shipping labels. The DEL is completed with actual weights, dimensions, and final destination before producing labels and applying them to equipment and containers.

REFERENCES

F-36. When accessing selected restricted distribution field manuals, users may be challenged for a TRADOC Army Doctrine and Training Digital Library (ADTDL) password. To obtain a password, go to the TRADOC ADTDL page, https://atiam.train.army.mil/soldierPortal/, and follow registration instructions. Figure F-1 contains references for this appendix.

AFJM 24-204 & TM 38-250	Preparing Hazardous Materials for Military Air Shipment
AR 220-1	Unit Status Reporting
AR 600-55	The Army Driver and Operator Standardization Program (Selection, Training, And Licensing
AR 600-8-101	Personnel Processing
AR 710-2	Inventory Management Supply Policy Below Wholesale Level
FM 3-0(FM 100-5)	Operations
FM 4-01.30(FM 55-10)	Movement Control
FM 4-01.011(FM 55-65)	Unit Movement Operations
FM 3-35(FM 100-17)	Mobilization, Deployment, Redeployment, and Demobilization
FM 100-17-1	Army Pre-Positioned Afloat Operations
FM 100-17-2	Army Pre-Positioned Land
FM 100-17-3	Reception, Staging, Onward Movement, and Integration
FM 100-17-5	Redeployment
FORSCOM/ARNG Reg. 55-1	Unit Movement Planning
JP 3-35	Joint Deployment and Redeployment Operations
TM 38-250	Preparing Hazardous Materials for Military Air Shipments

Figure F-1. References

Appendix G

Commander's Aviation Maintenance and Logistics Management Checklist

Army aviation units and assigned aircraft continue to provide land component commanders with the decisive edge in conducting operations in the third dimension. Army aviation units, when fully operational, are employed to aggressively gain the initiative, build and maintain momentum, and exploit success in support of full spectrum operations and the GWOT. Maintaining fully mission capable aircraft in the fight is the responsibility of all maintenance commanders/leaders, maintenance officers/technicians, and maintainers. Aviation maintenance commanders should use the maintenance and logistics management checklist as found in the Web site listed below. They should familiarize themselves with the checklist contents. The checklist provides aviation maintenance commanders with an insight into the overarching concept of aviation maintenance operations. An additional value of the checklists for aviation maintenance commanders is that compliance with its contents by all assigned maintainers ensures adherence to specific guidance contained in all applicable publications and references when conducting aviation maintenance. The Figure G-1 checklist is based on the checklist developed and currently used by FORSCOM, G3, ARMS inspection teams. The FORSCOM ARMS checklist is Version 10, effective as of 1 October 2005, and is revised annually at the FORSCOM ARMS Conference.

Note. The ARMS Program provides aviation personnel with expert technical assistance and on-site evaluations, as mandated by AR 95-1, to all units assigned to FORSCOM, TRADOC, USAREUR, EUSA, and INSCOM aviation units. For FORSCOM units or units evaluated and inspected by FORSCOM ARMS teams that are in need of ARMS information, assistance, or to download FORSCOM ARMS Commander's Guide (checklists), go to the following Web site: https://freddie.forscom.army.mil/avn. For all other Army command units in need of their corresponding ARMS checklists, see the Army command inspection team designated POC.

MAINTENANCE MANAGEMENT ARMS CHECKLIST

G-1. The ARMS checklist applies to aviation units based on the following guide: (AC) Aviation Company, (AS) Aviation Support, (UAS) Unmanned Aircraft System, (FP) Flight Platoon, (DE) Detachment, (RA) Raid, (OS) OSA, (SE) SEMA, (OF) Other Fixed Wing, (BN) Battalion Level, (AU) All Units, (AF) Airfields, (CO) Contractor, (OV) OSA Validator.

Note. ARMS checklists provide information for the preparation of an ARMS inspection, sample SOPs, pre-ARMS field survey, and other information and assistance.

G-2. The following functional sections are areas of interest during an ARMS inspection: Maintenance Management (PC), QC, AGSE, TMDE, Hangar and Shop Operations, Battery Shop, Avionics Shop, Armament Shop, Publications Management, and NDI.

Note. Figure G-1 is based on a sample version of a FORSCOM maintenance management (production control) ARMS checklist. For current maintenance management FORSCOM checklists, go to the Web site listed above.

MAINTENANCE MANAGEMENT

G-3. Figure G-1 shows a sample maintenance management checklist with reference number and publications guidance for affected functional areas.

#1. Does the unit daily aircraft status report contain timely, accurate information? (FM 3-04.500: PARA 4-80). (C-23, C-12, C-26, UC-35 SOW) (AU)

#2. Are aircraft being reported on the contractor status reports correctly? (Maint SOP) (C-12, C-23, UC-35 SOW, PARA 3.0, and Appendix D) (C-26 combat logistics system [CLS] SOW, PARA 3.1.2.1, and OSA mission essential subsystem list [MESL])

#3. Are aircraft flow charts maintained to reflect the current maintenance posture? (FM 3-04.500, D-7, D-10). (AC, AS, DE, RA, FP)

#4. Are DA Forms 1352-1 and 1352 data accurately submitted (includes controlled exchange reporting)? (AR 700-138, PARA 3-2) Is disposition of DA Forms 1352 and 1352-1 correct? (AR 700-138, PARA 3-2)

#5. Is DA Form 1352-1 (feeder) data for supported units provided to owning organizations and activities? (ASC/depot/AVCRAD only) (AR 700-138, PARA 3-2(f)(3)) (AS)

#6. Did the unit make aircraft FMC and MC goals? (AR 700-138, Table 3-3). The unit will furnish to the inspector the last three months of FMC/MC rates. List FMC/MC rates for the unit if DA goals are not achieved. (AU)

#7. Are maintenance request register(s) (DA Form 2405) used and accurately maintained when an automated/computerized work request system is not available? (DA PAM 738-751, PARA 3-10) (Automated users use ULLS-A End Users Manual) (AC, AS, DE, RA, FP, UAS)

#8. Is all issued aircraft survivability equipment (ASE) installed and fully operational? (AR 700-138, Table 3-12, note 3g) (AU)

#9. Is the Army Records Management Information System (ARIMS) used? Are files labeled correctly? (AR 25-400-2, PARA 1-6) (AU)

#10. Does the PC section/COR/QAR have current publications with changes posted? If electronic publications are used, is reading and printing capability available? (FM 3-04.500, PARA 8-16 through PARA 8-18).

#11. Are faults reviewed by the PC element soon after transfer? (ULLS-A end users manual, PARA 7-287, PARA 7-287, 7.2.9 fault review—automated users only) (AC, AS, DE, RA)

Figure G-1. Sample maintenance management checklist with references for affected functional areas

#12. Are send transactions to higher level created daily (ULLS-A end users manual, PARA 7.2.10 if the brigade system is not used?) (AC only)

#13. Are all controlled exchanges approved and records maintained for each item removed? (AR 750-1, PARA 4-9) FM 3-04.500, PARA 6-17, TM 1-1500-328-23, PARA 10-4d) (AU)

#14. Have load cards been developed in preparation for mobilization? (FORMDEPS FR 500-3-3, PARA 4-I-7, page 48, and FR 55-1) (AU)

#15. Does the unit SOP clearly define current operations to include the following areas? AU (predeployment in theater reset) controlled exchange ___, material readiness reporting ___, CPC ___, ULLS-A ___, aircraft recovery ___, evacuation procedures ___, TMDE ___, publications SOP/plan ___, files management ___, AOAP ___, weight and balance ___, ground support equipment management ___, FOD ---, battery shop operations ___, hangar ___, and individual shop operations ___. (AR 95-1, PARA 7.1d; AR 750-1, PARA 3-7b; AR 700-138, PARA 3-2; TB 750-25, PARA 3-10a(2); AR 385-95, PARA 2.2b(2), PARA 3.3; TB 385-4, PARA 1-5; FM 3-04.500, Appendix E-9;DA PAM 25-33, PARA 5.1; TM 1-1500-328-23, PARA 8-2b, 10-2e; ULLS-A users manual) (AC, AS, ED, RA)

#16. Does the on-site SOP clearly define procedures for the following? Foreign object damage (FOD) prevention (AR 385-95, PARA 3-1/2, Appendix D) ___, Maintenance test flight/functional check flight (TM 1-1500-328-23) ___, Recovery of grounded aircraft away from home station ___, Hearing conservation with regard to military and contractors (AR 385-95, PARA 3-3) ___, all aspects of inclement weather to include disposition of aircraft and notification procedures and mooring and hangaring of aircraft (TM 1-1500-250-23 ___, Ground handling of aircraft-specific for site location (TM 1-1500-204-23-1 PARA 3) ___ (OS, OF)

#17. Has the unit identified equipment shortages and taken corrective action to resolve equipment shortages? Units will ensure that all shortages are identified to include all authorized MTOE and support equipment that are on hand or on order. Examples: BDAR kits, tool sets, ground support equipment. (According to FORSCOM Regulation 500-3-1, Annex D, PARA 5.5.2; FR 700-2, PARA 1-5e, page 6) (AU)

Figure G-1. Sample maintenance management checklist with references for affected functional areas (concluded)

Appendix H

Test Measurement and Diagnostic Equipment

TMDE is essential to Army maintenance because of its distinctive ability to test, adjust, synchronize, repair, and verify accuracy, safety, readiness, and information assurance of aircraft systems/subsystems, weapon platforms, and equipment using highly precise measurements across the physical/dimensional, radiological, electrical, electronic, and electro-optical spectrums. Because of its uniqueness and various functionalities, TMDE is recognized as a unique commodity of equipment that requires centralized support considerations.

MANAGEMENT AND CONTROL

H-1. AR 750-43 assigns Armywide management of the U.S. Army TMDE Calibration and Repair Support (C&SR) Program to HQ, USAMC, except for the ARNG. In turn, the U.S. Army TMDE Activity (through USAMC) is responsible for the DA TMDE program management and execution. The National Guard Bureau is assigned management, command, and control over ARNG maintenance companies (TMDE). It also controls calibration facilities at combined support maintenance shops.

H-2. Calibration and repair support requirements of instruments used in support of U.S. Army materiel will be listed in TB 43-180. The calibration procedures listed in TB 43-180 are DOD- or USATA-approved procedures and shall be used. The approved maintenance manual is also listed in TB 43-180.

CALIBRATION TEAM SUPPORT

H-3. TMDE designated in TB 43-180 as requiring assistance from an ATST must be transported to the location where the ATST is scheduled to provide calibration and repair services. When justified by sufficient workload or when the size or construction of the TMDE precludes movement, the ATST will be dispatched to the TMDE owner/user site.

H-4. When an ATST cannot provide a calibration or repair service, the TMDE will be evacuated as directed by the calibration and repair center. The ATST is responsible for providing the necessary service and returning the repaired and calibrated TMDE to the owner/user. When service external to the ATST is necessary, except for warranty TMDE, the ATST will arrange for the service and return unit TMDE to the owner/user.

MANUFACTURER SUPPORT

H-5. TMDE support requiring the manufacturer's calibration or repair will be arranged by the supporting activity. If the TMDE is under warranty, the owner/user will arrange for support and send it to the manufacturer for service.

PROCEDURES AND GUIDELINES

H-6. Calibrated TMDE used in Army aviation maintenance replicates the precision, performance, and safety that are built into aircraft systems and subsystems during the manufacturing process. The capability of Army aircraft systems and subsystems—for example, aviation platforms and weapon platform mechanical systems—to operate accurately and effectively depends on the synchronization of these precise measurements against known standards.

H-7. All TMDE owners or users will do unit-level maintenance on organic TMDE. General-purpose TMDE and selected special-purpose TMDE repair support will be obtained from the area calibration repair center responsible for supporting the geographic area where the TMDE owner or user is located.

H-8. All aviation maintenance units will be responsible for all assigned TMDE, to include the accuracy and precision of TMDE when used. Accuracy and precision of TMDE is assured only when the equipment is inside the window of calibration. If doubt exists as to the accuracy of the TMDE, the piece of equipment in question "WILL NOT BE USED" until the TMDE calibration support facility has recalibrated the item in question.

STANDING OPERATING PROCEDURES

H-9. Standing operating procedures standardize and facilitate a recurring process or program. The TMDE SOP, once developed and written by the unit's TMDE coordinator/monitor, must be signed by the aviation unit commander. (Figure H-1 contains a sample unit TMDE SOP.)

Note. Appendixes A, B, and C contain general guidance and instructions for drafting and developing unit-specific SOPs.

APPENDIX 8 (SOP number) Test, Measurement, and Diagnostic Equipment (TMDE) Calibration Procedures **to Annex F (Aircraft Maintenance) of 3rd Squadron, 7th US Cavalry, Fort Stewart GA 31314** (enter name of parent organization and station) **09 Jul 06 (date) Garrison SOP (type of SOP)**

1. Applicability:

a. This SOP applies to all persons assigned or attached to **(enter unit's name)**.

b. Deviation from the guidelines set forth in this SOP may be authorized only by the **(parent battalion or higher headquarters)** commander, maintenance unit commander, or the PC officer.

2. Purpose: To provide specific instructions for all assigned/attached unit personnel in obtaining TMDE support from the unit's coordinator/monitor. To establish policies and procedures for maintaining high standards of readiness and usefulness on all equipment requiring calibration.

3. Scope: This SOP defines TMDE maintenance and calibration requirements, responsibilities, operational policies, and usage procedures for personnel when performing aircraft maintenance for **(enter unit's name)**.

4. Objectives:

a. To ensure that TMDE sets, tools, and special tools (equipment listed in TB-43-180) are in serviceable operating condition.

b. To ensure that all TMDE sets, tools, and special tools are current and have a valid DA Label 80. If an instrument becomes unserviceable during use, the TMDE owner/user will void the DA label.

c. To ensure standardization of applicable maintenance calibration and administrative procedures when the coordinator/TMDE NCO manages the unit calibration program.

Figure H-1. Unit TMDE SOP

5. Revisions: This SOP must be reviewed and, if necessary, revised whenever a new or revised Department of the Army (DA) publication that affects the contents of this SOP is fielded. If no new DA publications have been fielded, this SOP will be reviewed every **(enter time).** All personnel who are permanently assigned/attached to the **(enter unit's name)** may submit proposed changes to this document to Commander, **(enter unit's name)**.

6. Responsibilities:

a. Test Measurement and Diagnostic Equipment Coordinator.

(1) Initiates, coordinates, supervises, and administers the TMDE program within **(enter unit's name)**.

(2) Ensures that procedures and guidance for the TMDE program are disseminated to all sections in **(enter unit's name)**

(3) Ensures that equipment is turned in for calibration before the due date and that all required forms and records are accurately prepared and expeditiously submitted.

(4) Keeps the commander informed on all matters that will have a negative effect on the TMDE program.

(5) Ensures that all test and measuring equipment is on a schedule that will ensure compliance with TB 43-180.

b. Test Measurement and Diagnostic Equipment Noncommissioned Officer.

(1) Accomplishes duties assigned by the TMDE coordinator.

(2) Assures prompt delivery and pickup of items turned in for calibration.

(3) Monitors the unit computer-run sheets for correct utilization and status of equipment requiring calibration.

(4) Coordinates with each section within **(enter unit's name)** to ensure timely submission of items requiring calibration before items are overdue.

(5) Spot checks each section within **(enter unit's name)** maintaining tools that require calibration for up-to-date DA Label 80s and ensures that each section maintains sufficient documentation to control and supervise its own section's equipment within the TMDE program.

(6) Serves as the liaison between **(enter unit's name)** and installation TMDE support personnel.

(7) Completes and maintains the unit master listing to include reviewing it for accuracy and status. Copies are received from installation calibration by the TMDE NCO. One is to be maintained by the TMDE NCO, and the second copy is given to the individual shops to be updated, corrected, and returned to the TMDE NCO so that the master list can be updated.

Figure H-1. Unit TMDE SOP (continued)

(8) Notifies each section when its equipment nears its calibration interval and advises the section to remove the equipment to prevent its use. To prevent improper use of expired equipment, it must be properly tagged.

(9) Acts as approving authority for items required for priority calibration.

Note. In units with a shortage of assigned personnel, the TMDE coordinator and NCO can be the same.

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c. Section Supervisor.

(1) Supervises his section tool room personnel.

(2) Ensures compliance with directives and memorandums from the TMDE NCO concerning his section's equipment.

(3) Ensures that each section maintains a recall system consisting of a chart or card file to indicate both status and date due calibration of each item.

(4) Ensures that all equipment requiring calibration is maintained and stored according to prescribed policies.

d. Tool Room Custodian.

(1) Uses TB 43-180 to determine identification and category for each item requiring calibration; for example, "A" level and "C" level.

(2) Maintains a recall system, chart, or card file to indicate both status and date due calibration of each item by model number, noun-nomenclature, serial number, and national stock number.

(3) Turns in the item one week before it reaches its due date to the TMDE NCO with DA Form 2402 (Sections 1 and 4 completed) properly completed according to DA PAM 738-751 and TB 43-180.

(4) Takes out-of-service items that are suspected or known to be damaged (for example, dropped) or in any way unserviceable, green tags the items, and as soon as possible, turns them into the TMDE NCO for turn-in to the installation calibration support facility for repair.

(5) Initiates DA Form 2402 for each item of equipment to be presented for calibration and DD Form 1577-2 if item is unserviceable before turn-in.

Figure H-1. Unit TMDE SOP (continued)

(6) Conducts 100 percent inventory of all items calibrated, and updates master calibration listing monthly.

(7) Maintains a copy of the latest printout (normally published monthly) issued by the calibration office.

7. Test Measurement and Diagnostic Equipment/Calibrations Procedures:

Note. All TMDE calibration coordinators and NCOs must attend the TMDE calibration coordinator briefing/class given by the TMDE calibration support facility before assuming responsibilities as a TMDE calibration coordinator/NCO.

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a. Turn-in of TMDE for calibration.

(1) The shop/section coordinator or hand receipt holder will submit equipment to be calibrated to the unit TMDE coordinator/NCO.

(2) Turn-in of items will be accomplished during normal operating hours and will be accompanied by a DA Form 2402.

(3) The unit TMDE coordinator will provide each shop/section with a list of the items that require calibration on a monthly basis. This list will also include the date that the item will be turned in.

(4) The unit TMDE coordinator will always inspect the item for cleanliness, completeness, and serviceability before acceptance.

(5) Once the equipment is accepted, the item will be entered on DA Form 2405 and assigned a control number.

(6) The TMDE coordinator will date and sign blocks 13 and 14 and enter the control number in block 15 of DA Form 2402.

(7) Copy number 1 of DA Form 2402 will be returned to the customer as a receipt.

(8) If an item is damaged, a damage statement will accompany the equipment.

(9) If an item is nonoperational, a DA Form 2402 will accompany the equipment.

Figure H-1. Unit TMDE SOP (continued)

b. Pick-up of TMDE with a DA Form 2402.

(1) When notified by the TMDE calibration support facility that an item is ready for pick up, the unit TMDE coordinator will pick up the item.

(2) The owning shop/section will be notified to pick up the item from the unit TMDE coordinator.

(3) The original copy of DA Form 2402 will be required at the time of pick up.

(4) The individual picking up the items will sign and date blocks J and L of the DA Form 2405.

(5) The TMDE coordinator will initial block I of the DA Form 2405.

c. Pick-up of TMDE without a DA Form 2402.

(1) The hand-receipt holder or the shop/section TMDE coordinator will submit a memorandum stating the circumstances surrounding the loss of DA Form 2402.

(2) The unit TMDE coordinator will then process the memorandum as if it were copy 1 of DA Form 2402.

(3) The unit TMDE coordinator will date and sign the memorandum and provide a copy to the hand-receipt holder or shop/section TMDE coordinator.

(4) This memorandum will be maintained on file until the item is again turned in for calibration or repairs.

d. Turn-in and Pick-up of TMDE for Technical Inspection and Condition Coding.

Note. Any TMDE item that has been identified as excess to the shop/section or unit must be turned in to the TMDE calibration support facility for inspection and assignment of a condition code according to AR 725-50. The following steps must be accomplished.

(1) Block 12 of DA Form 2402 will be annotated “TI for Turn-in, Excess.”

(2) The TMDE coordinator will prepare a DA Form 2407 and submit the item to the TMDE calibration support facility according to the SOP.

(3) When returned, the shop/section TMDE coordinator will pick up the item according to TB 750-25.

(4) The blue copy will also be provided to the owner for turn-in to unit supply.

Figure H-1. Unit TMDE SOP (continued)

e. Calibration Recall System

(1) All TMDEs will be turned in on time for calibration when due. No delinquencies will be incurred.

(2) A master list and projected list are provided by the TMDE calibration support facility to the unit TMDE coordinator to track TMDE calibration schedules.

(3) The unit TMDE coordinator will prepare a memorandum each month and send it to each shop/section with TMDEs due calibration listed for that month.

(4) If a TMDE item cannot be turned in on time, a memorandum explaining the reason why and signed by the shop/section OIC/NCOIC will be forwarded to the unit TMDE coordinator/NCO, at least two weeks before the due date.

(5) Delinquent items will be turned in immediately for calibration. The shop/section OIC/NCOIC will provide a memorandum to the unit TMDE coordinator/NCO stating the reasons why the items became delinquent.

f. Emergency Calibrations.

(1) Shops/sections may obtain emergency or priority calibration service and permission to deviate from normal intervals.

(2) TMDE is critical and the only available item to perform specific maintenance procedures for the unit to accomplish assigned tactical or training missions.

g. Calibration for Deployment.

(1) Because of mission requirements, some TMDE may come due for calibration while on deployed status. The following steps will be taken to prevent expiration of DA Label 80.

(a) When notified of a deployment, the unit TMDE coordinator/NCO will instruct all shop/section TMDE coordinators to review the DA Label 80 for expiration dates on all TMDEs identified for deployment.

(b) Any item that will be due calibration up to 30 days after completion of the deployment will be submitted for calibration before deployment.

(2) A memorandum requesting exception-to-policy calibration support will be drafted by the coordinator/TMDE NCO and signed by the commander.

(3) Items needing calibration will be submitted to the calibration support facility with accompanying signed memorandums.

Figure H-1. Unit TMDE SOP (continued)

h. Test Measurement and Diagnostic Equipment Calibration Support Facility Database.

(1) All MTOE-authorized TMDEs will be entered into the TMDE calibration support facility database, to include calibration before use (CBU) and calibration not required (CNR) items.

(2) No TMDE that is still MTOE-authorized, whether obsolete or not, will be deleted from the database unless coded out unserviceable.

(3) Excess TMDEs can be deleted from the database.

(4) A copy of the turn-in document from unit supply, whether it is for an excess or for an unserviceable turn-in, will be provided to the unit TMDE coordinator before deletion of that item from the database.

i. Reconciliation and Inspection.

(1) A monthly reconciliation of the TMDE database and TMDE hand receipts will be conducted between the unit TMDE coordinator/NCO and the shop/section TMDE coordinators.

(2) Any new items not on the database will be added to the database. Items that were turned in and not deleted from the database will be deleted.

(3) Discrepancies between the DA Label 80 due dates and the master or projected list due dates will be addressed immediately to the TMDE calibration support facility by the unit TMDE coordinator/NCO.

(4) A periodic inspection will be conducted by the unit TMDE coordinator/NCO of all shops/sections using the TMDE inspection checklist listed on the next page. Results of the inspection will be provided to the shop/section OIC/NCOIC.

8. <u>General information</u>: Close coordination—from the unit's TMDE coordinator/NCO and the supporting sections' calibrations facilitators—in **(enter unit's name)** is essential to the success of a well-organized TMDE calibrations program. This appendix is a source document that must be referred to for internal guidance by all TMDE users in the maintenance unit and by personnel responsible for the care and upkeep of all assigned calibrated items.

9. <u>References:</u>

AR 700-138	Army Logistics Readiness and Sustainability
AR 710-2	Supply Policy Below the National Level
AR 750-1	Army Material Maintenance Policy
AR 750-43	Army Test Measurement and Diagnostic Equipment Program
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 750-1	Leader's Unit Maintenance Handbook
FM 3-04.500	Army Aviation Field Maintenance and Logistics Management
TB 43-180	Calibration and Repair Requirements for the Maintenance of Army Materiel
TB 750-25	Maintenance of Supplies and Equipment; Army Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Repair Support Program

Figure H-1. Unit TMDE SOP (concluded)

H-10. The checklist in Figure H-2 applies to TMDE users and TMDE coordinators/NCOs. Refer to the checklist for compliance with applicable regulatory requirements of the TMDE support program.

- Is a physical inventory periodically conducted to verify the types and quantities of TMDE on-hand that require calibration/repair?
- Have the property books and hand receipts been reviewed to determine calibration/repair requirements for the TMDE therein?
- Is TB 43-180 used to establish calibration requirements and intervals?
- Are all TMDE changes, additions, and deletions identified to the supporting calibration facility as they occur?
- Does the TMDE owner/user present TMDE for calibration according to the schedule provided by the support facility?
- Are projected items lists provided by the support facility, and are they reviewed for accuracy?
- Are delinquent items lists (TMDE not presented for scheduled calibration) reviewed and corrective action taken?
- When there is doubt about the accuracy of TMDE, is action taken to request unscheduled calibration?
- Does the instrument user perform required organizational maintenance on the instrument?
- Has an operator/organizational maintenance program for TMDE been established?
- Are operator/organizational maintenance performed as prescribed by equipment maintenance manuals?
- Does TMDE in use have a current DA Label 80 or DA Label 163 affixed and properly annotated?
- When a calibration report is required for an item, is the calibration report number entered instead of the technician's name (in block # 4)?
- Are DA labels only used by facilities with an authorized calibration mission?
- When DA labels cannot be affixed to an instrument or its container, are card or book files maintained with the labels affixed to a card or page?
- Is TMDE that was provided a limited calibration identified with a DA Label 163?
- Are the DA Labels 163 signed by the supervisor who approved the limited use?
- For instruments that do not require calibration, are DA Labels 80 overprinted CNR, annotated properly, and affixed to the instruments?
- Are controls implemented for the control and use of CNR overprinted labels?
- Based on foreseeable applications of the TMDE placed in storage, is storage adequate?
- Are storage conditions (such as environment and access) adequate for instruments in this status?

Figure H-2. TMDE inspection checklist

- Are instruments designated for storage removed from the work area?
- Is the storage area segregated from the work area?
- Is an operational check being performed on items before they are placed in CBU status, and has the supporting calibration facility been notified of the status change?
- Are all instruments placed in storage in serviceable condition?
- Are instruments held in storage with DA Labels 80 overprinted CBU identified as such in the IMRF?
- Are instruments held in storage removed from the cyclic calibration projected items list?
- Are reviews conducted and recorded in a logbook at 180-day intervals to revalidate the need for storage?
- When TMDE is removed from storage (CBU), is it submitted for calibration before being used?
- When instruments are turned in as excess, are controls established by the unit's equipment manager to prevent reissue?

Figure H-2. TMDE inspection checklist (concluded)

Appendix I
Contractors on the Battlefield

The Army's primary mission is to deter war and, if deterrence fails, to fight and win. Contracting plays a key role in the Army's ability to support this mission and provides a responsive alternative to increasing the number of support forces necessary to perform the mission. During every phase of an operation, contracting support can be used to augment the support structure. Contracting personnel establish their operations with or near the local vendor base to support deployed forces. Contracting support bridges gaps that occur as military logistics resources are being mobilized and may be necessary for the duration of the contingency. While contractors consistently support deployed armed forces, commanders need to fully understand their role in planning for and managing contractors on the battlefield and to ensure that their staff is trained to recognize, plan for, and implement contractor requirements. The basic doctrine laid out in AR 95-20 and FM 3-100.21(FM 100-21) provides essential information for understanding basic contracting and contractor management.

PLANNING PROCESS

I-1. Planning for contractor support is an integral part of planning for any operation and follows the same process as any other aspect of a military operation. Planning for an operation, whether deliberate or crisis action, requires the integration of force application, protection, and focused logistics capabilities.

I-2. For contractor support to be successful, it must be formally integrated early in the deliberate planning process to ensure that it is adequately considered. Significant contractor planning in a crisis-action situation is problematic, at best, because of the short timeframe available. Regardless, the planning must identify and include specific requirements and responsibilities in the operational plan.

RISK ASSESSMENT

I-3. The decision to use contractors in an area of operations requires an assessment of risks posed to contract personnel and their potential effects on the operation itself. Commanders must consider the difficulties facing contractors when hostile action against them is likely. If the contractor fails to provide the required support, it could jeopardize the overall success of the operation; contractor support may not be suitable. The primary areas of concern include responsive support, the transition from peace to war, continuation of essential services, and if it exists, organic capability.

I-4. Risk assessment considers essentiality, or the effect on the military mission; alternatives to contractors, which look at active/reserve military forces, DAC capabilities, and other services; multinational force and host-nation support; and danger to the individual. For example, system contracts for technical assistance and sustainment are critical to readiness, with few or no alternatives to contractors.

I-5. Units/organizations or activities requiring support on the battlefield must carefully draft the requirements to specify the services and conditions under which they are required. Potential contractors must be fully aware of what is involved. When contractors are willing to perform under dangerous conditions, the cost of a contract may be substantially influenced by the risk that the contractor is being asked to accept. In addition, contractors may be willing to perform under dangerous conditions if the Army meets specified security requirements by providing escorts, training, protective clothing and equipment, or site security to ensure their protection and safety.

CONTRACTOR PLANNING CONSIDERATIONS

I-6. Aviation maintenance and logistics contractor support should not be considered just another support option when maintenance managers are planning military operations. Some unique considerations are involved when maintenance managers plan for this type of support.

I-7. Proper planning should, however, make contractor-provided support reasonably transparent to the end user. Planning for contractor support identifies the full extent of contractor involvement, how and where contractor support should be provided, and any responsibilities that the Army may have in supporting the contractor. Also, the need for contingency arrangements must be in place if a contractor fails to, or is prevented from, performing an assigned support mission.

CONTRACTING SUPPORT PLANNING

I-8. The contracting support plan ensures that theater-contracting personnel plan, prepare, and coordinate to support deployed forces. It ensures that theater support contracting plans and procedures are known and included in appropriate portions of the OPLANs/operations orders (OPORDs).

I-9. Contracting professionals use this plan to integrate the function of contracting into the concept of support, ensuring that host-nation support, contingency contracting, and other support options are included and time-sequenced in all support planning.

COMMUNICATING CONTRACTOR REQUIREMENTS

I-10. The OPLANs/OPORDs, with or without a separate contractor integration plan annex, must describe the scope of contractor support as well as contractor integration requirements. This information then becomes the basis for developing contract requirements. The contract and its supporting documentation define all requirements for the contractor.

I-11. Likewise, OPLANs/OPORDs must provide the same information to units receiving the support. Commanders, unit members, and contractors must understand that the contractor is not legally obligated to meet any requirement (deployment, CS, life support, or in-theater management) not contained in the contract; without a requirement specified in the contract, the government has no basis for directing or requiring any contractor action.

I-12. If the government directs the contractor to meet requirements that are beyond the specifications of the contract without proper modification, the government can expect to be billed/charged or the contractor may refuse to meet the requirements. If funds are not available, the law may be violated.

I-13. All requirements for contractor support originate in a Government SOW that describes the parameters (what, where, and when) of the requirement, Government support to be provided (such as transportation, security, and life support), and the restrictions and control measures that apply to the contractor. The SOW, along with terms and conditions, becomes the contract for the support requested.

GOVERNMENT STATEMENT OF WORK

I-14. A SOW defines the Government's requirements in clear, concise language, identifying specific work to be accomplished and incorporating it into the contract. The SOW is the contractor's mission statement. SOWs, prepared by the requiring unit or activity, must be individually tailored to consider the period of performance; deliverable items, if any; and the desired degree of performance flexibility.

I-15. The work to be performed is described in terms of "what" the required output is—rather than either "how" the work is accomplished or the number of hours provided. Any requirements beyond the SOW may expose the government to claims and increased costs. In addition, contractor roles and functional requirements—as well as security issues and the relationship to the military chain of command—must be accurately and adequately defined in the SOW.

CONTRACTORS

I-16. Contractors who have existing contracts with the Army must be included in the planning process as early as possible for a new operation. This early involvement ensures that they thoroughly understand the mission and have an opportunity to provide feedback to the military planner on what is commercially feasible and affordable.

TYPES OF CONTRACTORS

I-17. Contractor support is categorized by the type of support that contractors provide on the battlefield to aviation maintenance units. Battlefield contractors are generally referred to as theater support contractors, external support contractors, or system contractors.

I-18. Commanders and planners must be aware that a requirement for a particular system or capability may result in the introduction of these type of contractors into the operational plan. Contractor management and planning is often significantly different, depending on the type of contractor support provided.

THEATER SUPPORT CONTRACTORS

I-19. Theater support contractors support deployed operational forces under prearranged contracts, or contracts awarded from the mission area, by contracting officers serving under the direct contracting authority of the Army principal assistant responsible for contracting (PARC) or other service/joint/multinational chief of contracting responsible for theater support contracting in a particular geographical region.

I-20. Theater-support contractors provide goods, services, and minor construction, usually from local commercial sources, to meet the immediate needs of operational commanders. Theater support contracts are the type of contracts typically associated with contingency contracting.

EXTERNAL SUPPORT CONTRACTORS

I-21. External support contractors provide a variety of force application and focused logistics to deployed forces. External support contracts are let by contracting officers from support organizations such as USAMC. USAMC, for example, provides commercial depot support through contracts coordinated by its commodity commands.

I-22. They may be prearranged contracts or contracts awarded during the contingency itself to support the mission and may include a mix of U.S. citizens and third-country nationals and local national subcontractor employees. External support contracts include the Logistics Civil Augmentation Program (LOGCAP) administered through USAMC's LSE, sister service LOGCAP-equivalent programs such as the Civil Reserve Air Fleet (CRAF); commercial sealift support administered by the U.S. Transportation Command (USTRANSCOM); and leased real property and real estate procured by the United States Army Corps of Engineers (USACE).

SYSTEM CONTRACTORS

I-23. System contractors support many different Army materiel systems under prearranged contracts for Acquisition, Logistics and Technology (ALT) PEO/PM offices and USAMC's Simulations, Training and Instrumentation Command (STICOM). Supported systems include, but are not limited to, weapon systems, aircraft, C2 infrastructure—such as the ABCS and STAMIS and communications equipment.

I-24. System contractors, made up mostly of U.S. citizens, provide support in both garrison and field locations or while deployed to a theater of operations. They may provide either temporary support during the initial fielding of a system, called interim contracted support (ICS), or long-term support for selected materiel systems, often referred to as CLS.

CONTRACTOR AND MILITARY DIFFERENCES

I-25. The type and quality of support that a contractor provides is similar to that provided by a military CS or CSS support unit, when considered from a customer perspective. However, commanders and their staffs must be aware that there are some fundamental differences. These differences include the following:

- Contractors perform only tasks specified in contracts; "other duties as assigned" does not apply in a contract environment.
- Contractors and their employees are not combatants but civilians "authorized" to accompany the force in the field.
- Contractor status as civilians accompanying the force in the field is clearly defined in the Geneva Conventions and other international agreements.
- Depending upon their duties, they may be at risk of injury or death incidental to enemy attacks on military objectives.

LOCATION AND MOVEMENT ON THE BATTLEFIELD

I-26. Army aviation maintenance operations may occur in a nonlinear operational environment without clearly defined traditional borders or boundaries. In these circumstances, contractors can expect to perform virtually anywhere in the AO, subject to the terms of the contract and the force application commander's composite risk assessment.

I-27. Generally, contractors are assigned at echelons above division (EAD). If the Army Forces (ARFOR) commander, however—based on force application and joint task force (JTF) commander guidance and METT-TC and the terms and conditions of the contract—determines that contractor services are required at lower echelons, they may be temporarily deployed into the division area as needed, consistent with the terms of the contract and the tactical situation.

I-28. If critical aircraft system contractors are required forward on a permanent basis, the ARFOR commander requests an exception to policy from HQDA. In reaching his decision, the ARFOR commander considers joint and Army service component commander (ASCC) guidance, the risk to the mission, and the risk to contractor employees.

I-29. Contractors may be required to use the in-transit visibility/automated information technology devices to provide distribution management visibility. In that case, they must either be provided with Government-furnished equipment (GFE) or have equipment that is compatible with the DOD format.

I-30. The general policy of the government is that contractors furnish all equipment and services required for the performance of a contract. However, the Government can provide equipment and services, when necessary, to achieve significant savings, standardization, or expedited performance or when it is otherwise in its best interest.

I-31. Contracts that provide for GFE to contractors must specify what support, property, and training that the Army will furnish to the contractor before an operation begins. Contracts must also specifically address responsibility for storage, maintenance, accountability, and testing of all furnished vehicles and equipment.

ROLE OF CONTRACTORS

I-32. Contractors can augment support for CSS and CS functions in peacetime and on the battlefield. Some of those functions and the contracted support associated with them are maintenance support, transportation support, and supply and field services.

MAINTENANCE SUPPORT

I-33. System contractors perform sustainment maintenance on specified aircraft systems and weapons systems, to include subsystems. The contracts are usually awarded on a case-by-case basis and extend over long periods, encompassing both peacetime and wartime.

I-34. Contingency contractors may be used for limited support and usually in circumstances involving low levels of violence. These contracts, which are executed only during the contingency, normally focus on providing routine, general logistics support.

TRANSPORTATION SUPPORT

I-35. System contractors are generally not involved except as part of a direct vendor delivery in peacetime. During operations, they will routinely deliver to the port of embarkation.

I-36. Contingency contractors may perform selected mode and terminal operation functions (for example, drivers and stevedores) to augment Army transportation units as METT-TC permits. Militarily significant water port operations routinely use contracted stevedore and long-shore capability.

SUPPLY AND FIELD SERVICES

I-37. System contractors can perform item management, stockage, and direct delivery for selected system-specific components. They may also provide management, stockage, and delivery for specific ammunition items. They will normally manage high-value munitions and munitions requiring close control or relatively high levels of continuous maintenance or security.

I-38. Contingency contractors can, as determined by METT-TC, provide base operations type of support to deployed military forces in austere AOs. They can also provide technical expertise and assistance for maintenance, logistics, surveillance, utilities, demilitarization, transportation, and safety and accountability of munitions and hazardous materials.

CONTRACTING OFFICER REPRESENTATIVE

I-39. A COR is the contracting officer's designated representative who assists in monitoring the technical and administrative aspects of a contract. The COR is the link between the requiring unit, activity, or supported unit and the contractor, using the contract administration/management process.

I-40. This individual is designated in writing and must be a qualified military member (in the grade of sergeant [SGT] or above) and/or government employee to perform the duties and responsibilities delegated by the contracting officer.

> ***Note.*** Unit CORs should attend a contracting officer representative course to fully understand all contract-driven requirements. Fort Lee, Virginia, is responsible for all COR course material.

I-41. The specific duties and responsibilities of a COR are delegated, in writing, by the contracting officer. Typically, a COR assists the contracting officer in the following areas:

- Maintaining liaison and direct communications with both the contractor and the contracting officer.
- Monitoring the contractor's performance, notifying the contracting officer of deficiencies noticed during surveillance, and recommending appropriate corrective action.
- Verifying that the contractor performed the technical and management requirements of the contract.
- Performing all necessary inspections.
- Verifying that the contractor corrected all correctable deficiencies.
- Accepting government supplies and services.
- Verifying invoices.
- When applicable, coordinating the deployment/redeployment preparation of contractor employees who deploy with the force.
- Assisting in contractor-employee day-to-day management to include visibility and accountability reporting as well as other contractor operations management issues that may affect contractor or unit requirements.

Note. Figure I-1 provides a sample list of responsibilities for an aviation maintenance COR.

I-42. Although the COR provides a vital link between the military and the contractor, his authority has certain limits. A COR is prohibited from—

- Making any agreement with the contractor requiring the obligation of public funds.
- Making any commitments or changes that affect price, quality, quantity, delivery, or other terms and conditions of the contract.
- Encouraging the contractor—by words, actions, or a failure to act—to undertake new work or an extension of existing work beyond the contract period.
- Authorizing a contractor to obtain property for use under a contract.
- Interfering with the contractor's management prerogative by "supervising" contractor employees or otherwise directing their work efforts.

Contracting officer's representative for the aviation maintenance contract field teams in the USAREUR area of operations:

1. Advises and assists the readiness branch chief on aviation equipment maintenance readiness and contractual matters related to contingency operations (CONOPS) and units deploying and redeploying in support of contingency operations.

2. Reviews OPLANs, exercise directives, and situation reports (SITREPs).

3. Provides technical and staff assistance to other USAREUR staff agencies and coordinates with HQDA G4, other Army commands, and USAREUR major subordinate commands on maintenance matters.

4. Compiles/analyzes maintenance data, identifies problem areas, and resolves problems.

5. Validates theater aviation maintenance contractor requirements.

6. Recommends action to achieve maintenance goals and objectives.

7. Prepares briefings, fact sheets, and information papers and briefs officials at all levels of command.

8. Represents the G4 at meetings on maintenance issues, problems, and requirements.

9. Maintains functional files.

10. Provides technical assistance to the contracting officer.

11. Ensures compliance with the technical requirements of the contract.

12. Ensures receipt of all deliveries.

13. Inspects and accepts services required.

14. Maintains detailed records of contractor performance.

15. Certifies invoices and receiving reports.

16. Refers contractor disagreements or deficiencies (in writing) to the contracting officer for resolution.

17. Sponsors all contractors and their dependents.

Figure I-1. Sample COR responsibilities within an Army command

APPLICABLE REFERENCES

I-42. The Army continues to develop policies and procedures for using contractors during peacetime and, more importantly, on the battlefield. Figure I-2 contains a list of publications with more information on the role, deployment, C2, location on the battlefield, security, and other issues pertaining to contractors.

AR 95-20	Contractor's Flight and Ground Operations
AR 690-11	Use and Management of Civilian Personnel in Support of Military Contingency Operations
AR 700-137	Logistics Civil Augmentation Program (LOGCAP)
AR 715-9	Contractors Accompanying the Force
DA PAM 690-47	DA Civilian Employee Deployment Guide
DA PAM 715-16	Contractor Deployment Guide
DODI 3020.37	Continuation of Essential DOD Contractor Services During Crises
FM 3-100.21(FM 100-21)	Contractors on the Battlefield
FM 5-0(FM 101-5)	Army Planning and Orders Production
FM 4-93.41 (FM 63-11)	Logistics Support Element
FM 5-19	Composite Risk Management
FM 4-100.2 (FM 100-10-2)	Contracting Support on the Battlefield

Figure I-2. References

Appendix J
Environmental Management

The Army's primary mission is to win this nation's wars through the application of overwhelming force application power. Warfare, by its very nature, is destructive to humans and their natural environment. Environmental damage is a consequence of force application. However, the commander in the field is often required to restrict the application of force. He must conform to the law of land warfare: those written and unwritten conventions and customs that protect against unnecessary suffering and facilitate the restoration of peace. Extraordinary advances in technology, accompanied by a historically unprecedented growth in global population, have dramatically altered the characteristics and demands of the battlefield. Army units, to include aviation unit personnel, must be prepared to respond across the "entire operational spectrum, from humanitarian to combat" and the four operational categories (offense, defense, stability, and civil support operations), sometimes within the same operation. Deployed forces must be able to conform to the environmental protection requirements of the theater commander without impairing force application effectiveness. ***Military environmental protection*** *is the application and integration of all aspects of natural environmental considerations, as they apply to the conduct of military operations.*

ENVIRONMENTAL COMPLIANCE AS A REGULATORY REQUIREMENT

J-1. Heightened environmental concern has led all federal agencies, including the DOD, to consider the environmental consequences of proposed actions to avoid costly litigation and remediation requirements. Compliance with environmental laws and regulations is now a necessary cost of doing business. The Army and its units will comply with all environmental laws and regulations applying to installations or theaters of operation.

J-2. The sources of environmental laws influencing the actions of U.S. military forces include federal, state, local, and host-nation (HN) laws, as well as international treaties. FM 3-34.500(FM 3-100.4), Appendix A, provides an overview of the key environmental laws, regulations, and treaties that apply to unit-level operations. These come from a variety of sources to include federal, state, local host nation, executive order, Department of Defense policies and directives, and international agreements.

ENVIRONMENTAL RESPONSIBILITIES

J-3. Commanders/leaders, aviation maintenance officers/technicians, NCOICs, and maintainers must understand their individual duties and responsibilities for environmental protection and become environmental stewards. To practice stewardship, U.S. military personnel must understand the basic environmental management responsibilities that apply to their work area or assigned duties.

COMMANDERS

J-4. The aviation maintenance commander's role in environmental stewardship centers on instilling an environmental ethic in his soldiers and maintenance civilian contractors (if assigned) under his control. Commanders train their subordinate leaders on stewardship, counsel them on doing what is right, lead by example, and enforce compliance with laws and regulations. FM 4-04.4(FM 3-100.4), Appendix D, identifies sources of environmental assistance available to commanders.

J-5. Commanders will meet with key installation environmental personnel to obtain information on, and assistance with, environmental protection issues to include setting up a unit program. Commanders should also turn to these personnel for detailed guidance on regulatory compliance and environmental assessments and to review environmental problems common to other commanders on the installation or in the unit.

J-6. The primary point of contact should be located at the installation's environmental office. This office is normally part of the directorate of public works (DPW) at most Army installations.

MAINTENANCE OFFICER/TECHNICIAN

J-7. The maintenance officer/technician plans, coordinates, and supervises maintenance and repair activities. In many instances, these activities use significant quantities of hazardous material (HM) and generate hazardous waste (HW). The maintenance officer/technician ensures safe use, storage, and disposal of these materials, which often includes operating temporary storage areas for products such as used oils, contaminated fuels, paint residues, spill cleanup residues, and solvents. Disposal of hazardous materials or wastes should be done according to the aviation unit's maintenance SOP.

J-8. Because maintenance personnel work with hazardous chemicals, the maintenance officer/technician must ensure that all personnel comply with hazardous communications (HAZCOM) requirements. The maintenance officer/technician will ensure that a valid and current unit environmental plan SOP is available and that maintenance unit personnel are familiar with its contents. FM 4-04.4(FM 3-100.4), Appendix C, contains a sample unit environmental plan SOP.

MAINTENANCE PERSONNEL

J-9. Aviation maintenance personnel have the inherent professional and personal responsibility to understand and support their unit's environmental program. They must do the following:

- Comply with environmental requirements in unit and installation SOPs.
- Maintain environmental awareness throughout daily activities to include all aviation maintenance procedures.
- Provide recommendations to the chain of command on techniques to ensure compliance with environmental regulatory requirements.
- Identify the environmental risks associated with individual and team tasks.
- Support recycling programs.
- Report HM and HW spills immediately.
- Make sound environmental decisions based on guidance from the chain of command, training, and personal concepts of right and wrong.

ESTABLISHING A UNIT-LEVEL PROGRAM

J-10. To establish an effective aviation maintenance unit environmental program, the unit commander/leader, with assistance from the aviation maintenance officer/technician and NCOICs, should—

- Designate an environmental compliance officer (ECO) who is properly trained and qualified; this individual will coordinate with appropriate environmental personnel and ensure that the unit complies with environmental laws and regulations.
- Identify the requirements for environmental training, qualifications, and certification of unit personnel and Environmental Compliance Assessment System (ECAS) inspections that may affect the unit and common environmental problem areas and how to avoid them.
- Ensure that the unit has a well-written SOP that addresses environmental issues and procedures that apply to the unit (coordinate environmental requirements with appropriate installation/chain of command personnel).

ENVIRONMENTAL COMPLIANCE OFFICER/NONCOMMISIONED OFFICER

J-11. The HW coordinator may also serve as the environmental compliance officer/NCO. This person is the unit POC and is responsible for environmental education, SOP updates, preparation of environmental risk assessments, and incident reporting. Commanders, along with the HW coordinator and the environmental compliance officer/NCO, must—

- Ensure that all unit personnel have had or are scheduled to receive environmental awareness training.
- Designate, in writing, an environmental compliance officer/HW coordinator and ensure that he is properly trained and qualified.
- Ensure that the unit environmental compliance officer interfaces with appropriate environmental personnel and that the unit complies with environmental laws and regulations.
- Meet with battalion S3, S4, and installation personnel who deal with environmental issues.
- Identify requirements concerning the Environmental Compliance Assessment Program (ECAP) inspections that may affect the unit and how to avoid or protect environmentally sensitive areas.
- Ensure that the unit SOP addresses environmental issues/procedures and coordinate environmental requirements with appropriate installation/chain of command personnel.

ARMY ENVIRONMENTAL COMPLIANCE ASSESSMENT SYSTEM

J-12. Compliance of environmental regulations is a command responsibility. All aviation maintenance units must be aware of the regulations and publications governing environmental protection. All aviation maintenance units handle HW and HM. Each maintenance unit, company and above, must designate, in writing, a HW coordinator.

J-13. The units must comply with the ECAP protocol and will be periodically inspected. The units can attain the ECAP protocols from environmental division/DPW. Environmental awareness training should ensure that all personnel know to report any notice of tax, penalty, fee, fine, sanction, or other compliance order arising from local, state, or federal environmental requirements or enforcement activities.

J-14. The units will also report alleged violation of any local, state, or federal environmental law or regulation. These violations will be reported to the commander, environmental division, or the environmental law attorney, Office of the Staff Judge Advocate.

HAZARDOUS MATERIALS

J-15. The Army's objective is to minimize health hazards and environmental damage caused by the use and misuse of HM. A hazardous material is one that, because of its quantity, concentration, physical, chemical, or infectious characteristics, may do the following:

- Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

HAZARDOUS WASTE

J-16. The presence of HW is a cause for concern among installation personnel and nearby residential populations. Yet, hazardous substances are an unavoidable part of Army maintenance functions and activities and ultimately result in some waste generation.

J-17. The proper handling and disposal of these wastes will minimize danger and ensure the safety of people and the environment. If a unit deals with HW, commanders/leaders, with assistance from aviation maintenance officers/technicians and NCOICs, should do the following:

- Establish an HW management program to comply with HW regulations.
- Ensure that HW is properly identified; label stored waste and the containers that hold HW with the correct danger and warning signs.
- Ensure that wastes do not accumulate beyond allowable quantity and time limits.

- Maintain proper HW records, and report periodically, as required by the Environmental Protection Agency (EPA).
- Employ waste minimization techniques as a part of pollution prevention efforts.
- Ensure compliance with on-post HW transportation requirements; contact the installation Defense Reutilization and Marketing Office (DRMO) or DOL for details.
- Ensure compliance with off-post HW transportation requirements; public road use increases transportation requirements; contact installation DOL/furnishings management officer for movement approval.
- Ensure that drivers transporting HW are qualified; transporters of HM must be trained, by law, according to Department of Transportation (DOT) HM 181 and 126F.
- Establish an HW training program, and ensure that adequate personnel training occurs; most installations conduct HW train-the-trainer programs.
- Ensure that the unit ECO has sufficient support to carry out his duties.
- Ensure that unit personnel use their PPE when handling HW.
- Ensure that adequate spill prevention and control equipment is on hand.
- Establish HW fire/explosion procedures.
- Establish HW spill/leak procedures.
- Establish emergency first-aid procedures.
- Ensure that unauthorized storage or disposal of HW does not occur; HW must be stored in authorized containers only and disposed of as directed by the environmental management officer (EMO)/DRMO.

HAZARDOUS COMMUNICATION

J-18. An effective HAZCOM program will assist leaders in determining which hazardous chemicals are present in their units, how to protect their soldiers from the hazards that those chemicals present, and how to properly store and use those chemicals. The installation safety officer is the POC for most HAZCOM matters, the Material Safety Data Sheet (MSDS) program, and the HAZCOM training program.

GOOD HOUSEKEEPING

J-19. Good housekeeping is another basic management practice. It involves a number of activities in areas such as maintenance, operations, and training. For instance, preventing spills is a good housekeeping practice for both safety and environmental reasons.

UNIT MAINTENANCE

J-20. Unit maintenance activities may significantly affect the environment. Most Army environmental programs affect maintenance operations in some way. Some specific areas of concern are as follow.

SPILL PREVENTION AND RESPONSE

J-21. Army policy, as well as Federal law, requires units to prevent spills of oil and hazardous substances and to provide prompt response to contain and clean up such spills. These laws, regulations, and policies prohibit any discharge of oil or hazardous substance from installations, vehicles, aircraft, and watercraft into the environment without a discharge permit.

J-22. Installation requirements shape spill prevention and response plans for units within their jurisdiction/command. During deployments, the deployment order directs spill prevention and response procedures. During contingency operations or in a force application environment, spill prevention and response procedures are defined by the HN or theater guidance and the unit SOP.

HAZARDOUS MATERIALS STORAGE AND HANDLING

J-23. Aviation maintenance and motor pool personnel work with a variety of HM/HW. Depending on the class of supply, the unit's supply room or technical supply section controls requisitions and receipts for HM and prepares documentation for turn-in of HW. Aviation maintenance personnel and motor pool mechanics generate HW by lubricating, servicing, and repairing aviation and ground equipment. Maintenance personnel must do the following:

- Requisition only the minimum amount of HM needed; when possible, substitute nonhazardous materials.
- Practice inventory control of all HM/HW (to include monitoring HM shelf life and HW accumulation dates).
- Store HM/HW in approved containers and locations.
- Maintain an MSDS for each HM used.

SUPPLY

J-24. Depending on the class of supply, unit supply/technical supply personnel account for all materials during HM/HW requisition, transportation, storage, and disposal. Unit commanders/leaders ensure that their supply personnel observe stringent HM supply economy measures. Units order only the very minimum amount of HM needed. When possible, supply personnel order biodegradable, environmentally safe materials.

J-25. When storing products, supply personnel ensure first-in, first-out (FIFO) stock rotation to minimize the turn-in of out-of-date material. They also follow installation storage guidelines for marking materials, maintaining MSDSs, and turning in excess materials to the installation's "pharmacy" points. Finally, unit leaders ensure that supply personnel turn-in or dispose of HM/HW according to local regulations. Compliance includes coordinating with the local environmental office and DRMO.

PLANNING

J-26. Preparation is essential to mission success, and the same holds true for environmental awareness and protection. Environmental awareness can be incorporated into the unit training program with minimal additional planning. Most topics can be reviewed by contacting the environmental division, natural resources branch (NRB), Staff Judge Advocate (SJA), and/or range control. In most cases, environmental division and NRB are located under the DPW.

J-27. Figure J-1 is a general point-of-contact matrix to assist personnel with environmental concerns. When overseas, refer to the U.S. agencies providing liaison with the equivalent of the points of contact. If there is no host-nation equivalent, all training and maintenance will be conducted under U.S. policies and requirements. Units should coordinate with these organizations to provide a briefing before deployments.

UNIT-LEVEL ENVIRONMENTAL PROGRAMS

J-28. Unit personnel must be familiar with the various environmental programs found at the unit level. Training Circular (TC) 5-400 gives additional information about the following environmental programs:

- HM programs.
- HW programs.
- HAZCOM programs.
- Pollution prevention and minimization of toxic and hazardous waste (HAZMIN) recycling programs.
- Spill prevention and response plan programs.

TOPIC	POINT OF CONTACT
Air pollution	Environmental Division
Archaeological and historic sites	Environmental Division and NRB
Clean and safe water	Environmental Division
Legal considerations	Environmental Law Attorney, Office of the Staff Judge Advocate (OSJA)
Hazardous material and waste	Directorate of Logistics, Defense Reutilization and Marketing Office, Environmental Division, and the fire department
Noise pollution	Environmental Division, Range Control (Directorate of Plans, Training, and Mobilization [DPTM])
Range clearances and restrictions	Range Control (DPTM)
Standing operating procedures	Environmental Division
Spill reporting	Environmental Division
Threatened/endangered species	NRB
Water pollution	Environmental Division
Wetland protection	NRB, Range Control

Figure J-1. Environmental POC matrix

ARMY NATIONAL GUARD (NG) AND RESERVE COMPONENT CONSIDERATIONS

J-29. When collocated with active duty units or when called to active duty, NG/Reserve Components will adhere to the same stringent handling, storage, and disposal criteria. When NG/ Reserve Components are not on active-duty status or collocated with active-duty units or their supporting HQs, their requirements may differ. NG units routinely operate under environmental regulations and laws of a particular state. NG units coordinate through their State area command (STARC) for environmental guidance when deploying to installations in other states.

J-30. Reserve Component units with subordinate units residing in different states will comply with substantially different environmental laws. The supporting HQ develops policies that account for differences in state and local laws and regulations. Units separated from their supporting installation must ensure that SOPs and contingency plans adequately address local laws and regulations.

J-31. Given the distances between NG and Reserve Component units and their supporting HQ, HM/HW turn-in may require alternative methods such as line haul or contractor removal. The cost of HM/HW turn-in may warrant pollution prevention initiatives to reduce, reuse, or recycle HM/HW on-site. Solvent distillation, for example, may provide significant cost savings over conventional disposal.

J-32. Disaster-relief missions present units with challenging environmental protection requirements. Units must not add their own HM/HW to the existing environmental problem. ECOs in NG units coordinate with their state area regional command STARC HQ for HM/HW support. Unit ECOs also coordinate regularly with disaster-relief HQ to determine threats from HM/HW exposure—polychlorinated biphenyls (PCBs) from transformers, POL, or decaying bodies. Unit leaders ensure that their soldiers have appropriate PPE when exposed to HM/HW in the disaster area.

AWARENESS AND COMPLIANCE

J-33. ARs 200-1 and 200-2 explain the Army's environmental programs. Appendix A, in both regulations, references the additional documents that should be reviewed. TC 3-34.489 provides a comprehensive listing of all items of interest in the preparation for operating near and avoiding environmentally sensitive areas. Another good reference for environmental issues is graphic training aid (GTA) 05-08-002 (Environmental-Related Risk Assessment) booklet that can be downloaded and printed. GTAs can be downloaded from the United States Army Training Support Center/General Dennis J. Reimer Training and Doctrine Digital Library at AKO. At the General Dennis J. Reimer Training and Doctrine Digital Library, look for GTAs under the Commandant Approved Training section and select from the Type list.

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Appendix K

Aviation Maintenance in Extreme Environments

The U.S. Army has a global area of responsibility and deploys to accomplish missions in austere environments. The contemporary strategic environment and the scope of U.S. commitment dictate that the US Army be prepared for a wide range of contingencies anywhere in the world, from the deserts of southwest Asia and the jungles of South America and southeast Asia to the Korean Peninsula and central and northern Europe. The Army's fundamental purpose is to win wars through land-force dominance—regardless of location, climate, or type of environment. Often, maintenance procedures used in one environment will not be appropriate for another. Commanders must be aware of the unique implications of performing aircraft maintenance in extreme environments. They must ensure that adequate planning takes place and thorough preparations are made before conducting maintenance operations in these extreme environments.

SECTION I – DESERT, JUNGLE, MOUNTAIN, AND COLD WEATHER

GENERAL CONSIDERATIONS

K-1. Operations may be conducted in many different types of environments. These include desert (hot and sandy), jungle (high humidity), mountain (high altitudes), or extremely cold climates. Conducting aircraft maintenance in these types of environments can be challenging and daunting. To be prepared to conduct aviation maintenance support operations, commanders, at a minimum, must consider the following factors:

- Modifications to normal repair part stockage levels; these include increased numbers of filters, bearings, and seals when operating in windy, sandy, or cold environments.
- Mobility restrictions; for example, mountains, heavy foliage, ice, and sandy terrain.
- Effects on personnel and equipment performance; for example, altitude and excessive heat or cold.
- Communications restrictions.
- Special shelter requirements.
- Modifications to normal scheduled and preventive maintenance.
- Specialized equipment and clothing requirements.
- The need for additional maintenance personnel when conducting maintenance in extreme cold environments.

DESERT MAINTENANCE OPERATIONS

K-2. Conditions in an arid environment can damage military equipment and facilities. Temperatures and dryness are major causes of equipment failure, and wind action lifts and spreads sand and dust, clogging and jamming anything that has moving parts. Aircraft, sensors, and weapons are all affected. Rubber components, such as gaskets and seals, become brittle, and oil leaks are more frequent.

ENVIRONMENTAL CONSIDERATIONS

K-3. The desert is probably the most severe of all environments in which aviation units must operate. All aviation functions must adapt to survive in the desert environment. The following characteristics are commonly found in a desert environment and may contribute to equipment degradation:

- Heat.
- Sand and dust.
- Wind.
- Temperature variations.
- Static electricity.

EFFECTS OF HEAT

K-4. Flying time and performance of helicopters are degraded as the altitude and heat increase. Helicopter performance is also affected by humidity. Aircraft canopies have been known to bubble under direct heat and should be covered when not in use.

EFFECTS OF SAND AND DUST

K-5. Dust and sand can easily cause failure of such items as cyclic and collective electrical switches, digital entry keyboards, radio tuning knobs, and circuit breakers. Sand erosion causes steady wear on rotor heads, leading edges of rotor blades, Teflon® bearings, and all turbine engine blades. Blowing sand gradually degrades optical instruments and windscreens by pitting and scratching. Sand, dirt, and dust accumulation on oil cooler surfaces creates loss of cooling efficiency in an environment where that ability is paramount.

K-6. Sand mixed with oil forms an abrasive paste. Lube fittings and bearing seals require frequent monitoring and inspections. If they are damaged or missing, sand will enter the housing and cause bearing failure. Heat soaking of sensitive electronic "black boxes" will produce increased failures and demands on aircraft cooling systems.

EFFECTS OF WIND

K-7. Desert winds, by their velocity alone, can be destructive to large and relatively light materiel such as aircraft, tentage, and antenna systems. To minimize the possibility of wind damage, materiel should be sited to benefit from wind protection and should be firmly picketed to the ground.

EFFECTS OF TEMPERATURE VARIATIONS

K-8. In deserts with relatively high-dew levels and high humidity, overnight condensation can occur wherever surfaces (such as metal exposed to air) are cooler than the air temperature. Condensation can affect such items as optics and fuel lines. Clean optics and weapons frequently. Weapons systems, even if not lubricated, accumulate sand and dirt caused by condensation.

EFFECTS OF STATIC ELECTRICITY

K-9. Static electricity is prevalent and poses a danger in the desert. It is caused by atmospheric conditions, coupled with an inability to ground out because of dryness of the terrain. It is particularly prevalent with aircraft or vehicles having no conductor contact with the soil.

K-10. The difference of electrical potential between separate materials may cause an electrical discharge between them when contact is made, and if flammable gases are present, they may explode and cause a fire. Poor grounding conditions aggravate the problem. Be sure to tape all sharp edges (tips) of antennas to reduce wind-caused static electricity. When maintainers operate from a fixed position, ensure that equipment is properly grounded.

K-11. Static electricity is also a hazard with helicopter sling loads. Exercise care when handling and transporting unlike materials that might generate static electricity. In addition, turn off all switches, uncouple electrical connectors, and ground aircraft electrically operated weapon systems before rearming. Static electricity will also ruin circuit boards and other electronic equipment.

PREVENTIVE MAINTENANCE

K-12. Preventive maintenance is vital for aircraft and equipment to remain serviceable in a desert environment. It entails the need for more frequent inspections, daily cleaning, and engine flushing. Maintenance practices should emphasize measures to keep sand from contaminating systems and equipment. As much as possible, all maintenance should be done in an enclosed maintenance facility or a maintenance shelter. This measure will help prevent sand from entering the internal working parts of larger assemblies.

K-13. Protective covers should be used at all times. Optics can be protected in flight by stowing during landing, take-off, and FARP operations. Windscreens, blade covers, nose covers, and engine inlet covers should be installed when aircraft are not in use. Covers should have a tight fit to avoid flapping. Sand on the underside of a vibrating cover can scratch the windscreen. Use of covers, combined with smart parking orientation, will alleviate some "heat-soaking" problems.

K-14. A climatic heat aircraft protective system is a camouflage screen designed to protect the aircraft. This system will not weather a full-fledged blowing dust storm. Unused aircraft should be hangared or, at a minimum, well protected when exposed to a sandy environment. On those systems that have a pressurized air system for cooling, extra filtration and decreasing cleaning intervals will solve most problems.

K-15. STAMIS, such as ULLS-A automation hardware, will require added preventive maintenance emphasis to keep them operational. The three worst enemies of a computer—heat, sand and dust—are everywhere in the desert. As a result, when STAMIS is unused, it must be covered and protected from the elements.

MAINTENANCE SHELTERS

K-16. There are currently two shelter options in addition to organic shelters. The unit maintenance tent is a canvas structure built on a metal frame. This shelter, available through normal supply channels, can accommodate one small aircraft.

K-17. The second option is a large area maintenance shelter (LAMS), commonly called a "clam shell," which is a commercial hangar that has many available options. This shelter, available through AMCOM, can accommodate several large aircraft. Both tents are mobile, but they require a significant amount of cargo space and manpower, commensurate with their sizes, to transport and set up.

INCREASED MAINTENANCE PROCEDURES

K-18. Rotor blades and turbine engines are the two most significant areas of increased maintenance. These items will multiply the maintenance workload many times, depending on the unit's basing and flying techniques. Engine problems and compressor blade degradation occur on all aircraft while in normal flight. Engine problems and compressor blade degradation greatly increase in a desert environment.

K-19. These problems are also encountered in aircraft's auxiliary power units (APUs). Operation Enduring Freedom (OEF) and Operations Iraqi Freedom (OIF) have seen their fair share of engine failures or loss of power as a result of sand digestion. Different systems vary in their susceptibility to the effects of sand.

Engines

K-20. Many systems rely on an inlet particle separator system to reduce engine wear. These systems are not efficient at idle RPM. Ground runs must be kept at an absolute minimum. Filtration kits for all aircraft are now available through AMCOM's readiness directorate. Because none of these systems are completely effective, new hot-end flush procedures have been developed.

K-21. Instead of compressor cleaning, emphasis is on the power turbine section. Sand can accumulate in the blades of the power-generating wheels. This sand will eventually glaze, which inhibits cooling and heat expansion. In-flight health indicator check procedures are available but require training and close monitoring as a predictive tool.

Rotor Blades

K-22. Rotor blades require one of two current solutions. Blade painting requires relatively high repetition and inspection. Blade taping requires skilled application and an increase in rotor track and balance effort. Both solutions are short-term and require diligence by the crew during preflight and post-flight inspections.

Bearings

K-23. Teflon® bearings also will see a rise in failures. Two current strategies include water flushing and protective dust boots. These procedures and kits are available through AMCOM.

Aircraft Survivability Equipment

K-24. The AN/ALQ 144 is susceptible to main bearing failure in a sandy environment. ASE should be covered whenever the aircraft is not in use.

INCREASED MAINTENANCE SUPPORT

K-25. AMC requirements for assistance from ASC units may increase. The QC mission broadens to train all flight crew personnel in the additional inspection requirements. Flying crews will also be training on desert flying techniques that complement the maintenance effort.

K-26. Increased AMC mobility requirements will place greater emphasis on ASC contact team support. The distance between AMC and ASC units will increase, creating problems in communications and in locating units. Contact teams must have reliable communications to contact supported units.

REVERSE CYCLE

K-27. Maintenance personnel will consume more water and should be more closely supervised during the heat of the day. Productivity will decrease as the environment becomes harsher. Reverse-cycle maintenance may be a solution to adverse daylight conditions. Establishing fighter management procedures will compliment maintenance operations when the OPTEMPO is higher than normal.

K-28. Many lessons learned are available from units that have participated in National Training Center (NTC) rotations, Operations Desert Shield and Desert Storm, and OEF and OIF. Situational awareness is paramount to the success of any mission to include maintenance support operations. Conducting maintenance operations in a desert environment is not business as usual. FM 3-97.3(FM 90-3) contains more information on desert operations.

JUNGLE MAINTENANCE OPERATIONS

K-29. Army aircraft are a force application system that is unaffected by the lack of accessible roads encountered in jungle areas. Most Army aircraft can land in small clearings during protection and focused logistics missions, as a result; aircraft have become a vital part of U.S. jungle operations. U.S. forces have used helicopters in the jungle for reconnaissance, air assault, command and control, resupply, and medical evacuation.

EFFECTS OF HEAT AND MOISTURE

K-30. In jungle operations, lenses and dials quickly fog with internal moisture. Electrical connections corrode quickly, and battery life is shorter than normal. Weapons tend to rust quickly and must be cleaned and oiled more often than in other areas.

K-31. Canvas rots and rubber deteriorates much faster in these conditions. An aggressive corrosion-prevention program should be initiated. All parts and systems are susceptible to corrosion. Avionics are particularly sensitive to moisture, condensation, and corrosion.

Note. A comprehensive corrosion preventive SOP should be part of the aviation maintenance company's SOP. This SOP should provide preventive measures and guidance to minimize the destructive effects of corrosion on Army aircraft and equipment.

MAINTENANCE GUIDANCE

K-32. Preventive maintenance practices must be emphasized. Scheduled maintenance must be performed on a more frequent and regimented schedule than in temperate climates. Higher maintenance requirements, combined with transportation difficulties, may require units to carry increased loads of repair parts. PLLs must reflect the increased turnover of those parts that deteriorate or wear out faster in the jungle.

MOVEMENT

K-33. Several factors greatly influence the type of transportation that can be used and the way that maintenance is performed. These factors include the absence of adequate trails, roads, and waterways; the density of natural growth; the number of rainy seasons; the security of routes; and the general nature of the terrain in a jungle environment.

K-34. AMC units should request on-site ASC maintenance when required. Air delivery of ASC maintenance support teams (MSTs) to the AMC location will be used whenever practical. Aircraft (log birds) may be required to deliver repair parts and evacuate materiel.

INCREASED MAINTENANCE SUPPORT

K-35. When units are widely dispersed, ASC units may have to augment the AMC maintenance effort and perform more extensive maintenance than during normal operations. This is due to difficulties in evacuating materiel for backup and overflow maintenance.

FIELD SITES

K-36. Because of the characteristics normally encountered in jungle terrains, fewer good sites are available for maintenance operations. Considerable engineer effort may be required to prepare suitable locations. Therefore, maintenance units may be unable to deploy as often as they would in more favorable terrains.

K-37. In areas where monsoon rains occur, maintenance sites must be selected carefully. These limitations may force maintenance units to locate with other types of units. Collocating units simplifies the problems of security from ground attack for such areas and is likely to be necessary in areas of large-scale guerrilla activity. However, such concentrations present good targets for air attack and require provisions for air defense. For more details on jungle operations, refer to FM 3-97.5(FM 90-5).

MOUNTAIN MAINTENANCE OPERATIONS

K-38. The multiplicity of possible missions makes the likelihood of U.S. involvement in mountain operations extremely high. With about 38 percent of the world's landmass classified as mountains, the Army must be prepared to deter conflict, resist coercion, and defeat aggression in mountains as in other areas.

LIMITATIONS OF MOUNTAIN OPERATIONS

K-39. Major mountain ranges normally found in desert regions, jungles, and cold climate zones present many challenges to military operations. Mountain operations may require special equipment, special training, and acclimatization. Historically, the focus of mountain operations has been to control the heights or passes. Changes in weaponry, equipment, and technology have not significantly shifted this focus.

K-40. Commanders should understand a broad range of different requirements imposed by mountain terrain when conducting aviation maintenance support operations. These include the significant effect of severe environmental conditions on the capabilities of units, and their personnel and their equipment and the extreme difficulty of ground mobility in mountainous terrain.

K-41. Maintenance in mountain operations can be difficult. Rugged terrain and abrupt changes in elevations limit the reliability of roads and suitable areas for unit locations. High altitudes and weather affect the performance of troops and equipment. Personnel must be trained to adapt to high altitudes, and equipment may need adjustment to operate efficiently at higher elevations.

MAINTENANCE GUIDANCE

K-42. Aircraft may be needed to move repair parts and contact teams on site and to evacuate unserviceable items. ASC units must be located as close as practical to the AMC units that they support. Maintenance support is critical in mountain areas. Therefore, the commander making area assignments must provide units with enough space to perform their maintenance functions. For more details on mountain operations, refer to FM 3-97.6(FM 90-6).

K-43. When conducting mountain operations, fixing aircraft systems and equipment as far forward as possible is critical to tactical operations. In low mountains, equipment recovery and aviation maintenance teams are critical in keeping limited routes clear and returning damaged aircraft to the battle in the shortest possible time. In high mountains, these teams are generally less critical to units operating there because terrain often limits vehicle use.

K-44. Helicopter repair teams are critical in all mountainous environments because of helicopters flying at or near the maximum limits of their operational capabilities to meet increased needs for helicopter support. In all cases, maintenance turn-around time increases to compensate for fatigue and the other effects of the environment on maintenance personnel.

SUPPLY GUIDANCE

K-45. Mountain warfare depends on accurate logistical planning if supply operations are to function smoothly in support of maintenance operations. To win in any AO, commanders normally seek to move and strike as rapidly as possible. Rapidly changing tactical situations may cause long supply lines, resulting in delay or complete disruption of supply operations.

K-46. To mitigate these risks, situational understanding, rapid decisions, and continuous coordination between tactical and logistical planners are essential. Stockpiling and caching supplies may also help to decrease the risks to resuppply.

TRANSPORTATION GUIDANCE

K-47. Transportation assets for mountain operations are often limited, and their use requires sound planning. Although vehicles are used to move supplies as far forward as possible, they may not be able to reach deployed units. Using smaller cargo vehicles, with improved cross-country mobility and dedicated aircraft, is paramount to sustaining units in the mountains.

K-48. Locally obtained animals, indigenous personnel, or force application soldiers must often move supplies from roads and trails to unit positions. The poor quality of road networks requires increased engineer effort. The rugged mountain terrain aids in infiltration, increasing security requirements along the route.

K-49. Air resupply should always be considered to reduce the transportation burden on ground assets. Therefore, support personnel should be well-trained in aerial resupply and sling-load operations. Aerial resupply—either by parachute drop, free drop, or cargo helicopter—may be available for a variety of tactical situations. However, unpredictable weather and air currents, cloud cover, and lack of suitable landing zones make aerial delivery unreliable. Higher elevations decrease overall aircraft lift capabilities.

COLD-WEATHER MAINTENANCE OPERATIONS

K-50. The cold has been identified as an enemy of military forces and equipment since the beginning of recorded history. When employed in a cold region, a force actually faces two enemies: the tactical enemy and the environment, which also aggressively attacks and can destroy equipment and men.

EFFECTS OF COLD WEATHER

K-51. Army forces may be required to conduct sustained operations in temperatures as low as -65°F. Under such conditions, personnel are subject to decreased efficiency and cold casualties, equipment is prone to breakdowns, supply problems are increased, and operations are restricted and complicated by the environment.

K-52. Unit leaders must ensure that personnel and equipment can withstand the challenges of cold weather. U.S. Army equipment is among the best in the world for use in cold climates. However, soldiers and their leaders must understand the effects of cold weather and adapt operations and maintenance to overcome environmental conditions.

K-53. The terrain and climate of northern regions, and other areas similar in terrain and climate, complicate military operations. Operations in snow, ice, and extremely cold conditions require special training, personnel acclimation, and special operational techniques.

K-54. Trafficability is one of the biggest problems in northern operations. This is especially true during spring breakup and in summer when the ground thaws and the ice in streams and lakes melts. With few roads in such regions, track-laying vehicles of the low-ground-pressure type may provide the only means of cross-country mobility. Mud, muskeg, swamp, marsh, and open water hamper all ground movement in spring and summer.

K-55. Therefore, thorough ground reconnaissance is necessary for overland movement. Extreme cold improves trafficability, although tracked vehicles and sleds may be required for movement. Weather conditions in winter may limit the use of aircraft.

K-56. Extreme climatic conditions hamper on-site maintenance operations and curtail personnel effectiveness. Therefore, maintenance performed on site, as well as recovery of disabled aircraft and equipment, will take more time and effort. Evacuation of unserviceable items from using units to support maintenance is a logistical challenge.

FACTORS AFFECTING LOGISTICS

K-57. Vast distances or major climatic or terrain obstacles to air or ground movement, or a combination of these factors, often separate focused logistics elements from supported forces. As a result, logistical planning must be continuous and aggressive, using all modes of transportation. Unit standard operating procedures (SOPs) and training plans should address the following:

- Unit distribution is the rule and not the exception.
- Weapon platform performance have known limitations as a result of cold temperatures and experience a larger number of malfunctions and breakdowns.
- Generally speaking, a rather robust PLL package and bench stock should accompany aviation maintenance contact teams whenever deployed in arctic conditions.

MAINTENANCE GUIDANCE

K-58. The importance of maintenance, especially PMCS, must be impressed on all cold-region soldiers. Maintenance of mechanical equipment is exceptionally difficult in the field during cold weather. Added time is needed to complete tasks. Even shop maintenance cannot be completed at normal speed. Maintainers must allow equipment to thaw out and warm up before making repairs. This time lag cannot be overemphasized and must be included in all planning.

K-59. Personnel efficiency also is reduced by the bulky and clumsy clothing worn in extremely cold areas. Because it is dangerous to handle cold metal with bare hands, operators/maintainers must wear mittens or gloves at all times. Losing the sense of touch further reduces the soldier's efficiency. Even routine operations, such as handling latches or opening engine compartments, become frustrating and time-consuming when performed with protected hands.

K-60. At temperatures below -20°F, maintenance may take five times as long. Complete winterization, diligent maintenance, and well-trained maintenance teams are crucial in reducing the adverse effects of cold weather.

K-61. Listed below are several requirements that affect maintenance directly and require planning and preparation before maintenance operations are conducted in a cold-weather environment:

- Heated maintenance shelters for aircraft repair or to conduct routine maintenance.
- Proper clothing and tools for maintainers.
- Adequate portable heaters.
- Adequate lighting.
- Adequate flow of repair parts.

MAINTENANCE FACILITIES

K-62. The availability of maintenance facilities can be critical to the maintenance mission. Without some type of permanent or temporary shelter, even routine maintenance can become extremely difficult.

Buildings and Shelters

K-63. Heated buildings or shelters are necessary when conducting aircraft maintenance in a cold weather environment. Proper and satisfactory aircraft PMCS is difficult unless personnel are working in reasonably comfortable temperatures. Maintenance of many components requires careful and precise servicing and inspections. Without the use of heaters, the increase in maintenance man-hours is roughly from 25 percent to 200 percent above normal.

K-64. When buildings are not available, maintenance tents are a temporary and expedient method to use for maintenance. If possible, tents should have wood flooring and be heated by portable duct heaters.

Lighting Equipment

K-65. Daylight can be scarce in cold climates. Lighting equipment must be available to furnish adequate illumination for maintenance services. Lights with ample cable extensions, attachment plugs, connectors, and spare bulbs are essential.

MAINTENANCE PERSONNEL

K-66. More mechanics are needed to maintain equipment in cold-weather operations. At a minimum, a highly organized, more intensive effort is required of maintainers. Providing heated buildings or shelters for maintenance of aircraft systems and equipment increases work efficiency and morale.

SPECIAL EQUIPMENT FOR MAINTENANCE OPERATIONS

K-67. Northern operations require a considerable amount of specialized equipment such as tracked vehicles, sleds, heated shelters, and heated shop facilities. Every item of equipment is affected by extreme cold and snow in the winter and by mud and water in the summer. Extreme conditions increase wear and tear on equipment and increase the quantity and variety of parts required for maintenance. For more details on operations in northern regions, refer to FMs 31-70 and 31-71.

K-68. The problems of increased maintenance stem directly from the low temperatures. Special precautions and equipment are necessary to ensure efficient operation of the aircraft. Operation of aircraft at temperatures below -50° F should not be attempted except in emergencies, unless the aircraft, with the appropriate winterization kit and auxiliary systems that have proven reliable at lower temperatures.

K-69. The standard portable combustion type of heater, incorporating a blower and flexible hoses for application of heat to localized areas, may be used for preheating aircraft components and systems before starting. In addition to preheating engines for starting, these units may also be employed to heat specific portions of the aircraft so that maintenance personnel can work without gloves. When temperatures remain below freezing, aircraft batteries not in use should be removed and stored in a warm place.

K-70. Mooring of aircraft is made relatively simple in regions of extreme cold by the expedient method of placing one end of a rope on the ground, covering it with snow, melting the snow and allowing it to freeze, then mooring the aircraft.

K-71. Maintenance time factors may be multiplied by five in areas of extreme cold. Aircraft mechanics are greatly hampered by the heavy winter clothing and gloves. Installation of auxiliary equipment—such as winter cowls, oil dilution systems, personnel heaters, and covers—also adds time to normal maintenance operations. Maintenance units usually require additional personnel in the airframe sections.

K-72. Operation of aircraft, particularly helicopters with their inherent vibrations, in temperatures below –35° F results in a marked increase in metal fatigue. All metals become increasingly brittle as the temperature decreases. Aircraft fatigue will be evidenced by an increase in the number of skin cracks and popped rivets in stress areas. Careful attention must be devoted to these areas in all stages of maintenance operations.

Note. Areas of interest to be inspected on a more frequent basis for stress cracks as direct result of the environment include the following: engine decks, tail-boom hard points, and gearbox mounting points.

SECTION II – NIGHT AIRCRAFT MAINTENANCE

NIGHT AIRCRAFT MAINTENANCE OPERATIONS

K-73. Battle doctrine calls for around-the-clock aviation operations. These operations, in turn, need fully productive, 24-hour-per-day aircraft maintenance capabilities. Maintenance done at night on aircraft that have flown all day allows those same aircraft to be assigned to missions early the next day. This systematic approach avoids their being “stacked up” in maintenance with night-flying aircraft for the first part of the day.

Note. A sound fighter management program is critical to sustain around-the-clock maintenance in support of tactical missions.

LIGHT DISCIPLINE

K-74. Light discipline is imperative to night maintenance activities on the battlefield. The closer to the main battle area (MBA) that a unit operates, the more restrictive light suppression precautions must be. Units operating relatively close to the MBA need to perform night maintenance inside closed blackout shelters.

K-75. The approach would be with self-powered light under lightweight portable blackout enclosures that can be easily moved from one location to another. Units should perform forward night maintenance inside large (full-aircraft) lighted blackout shelters only if enough internal lighting can be provided without using noise-producing power generators.

MISSION, ENEMY, TERRAIN, TROOPS–TIME AVAILABLE AND CIVILIAN CONSIDERATIONS

K-76. Units operating toward the rear of the FLOT will normally have more latitude concerning the distance from which they must consider enemy detection. Rigid blackout provisions will still apply to all “inside” white light work, but certain tasks will be allowable outside, with subdued lighting devices.

K-77. The degree of detection avoidance on the battlefield will be determined on a case-by-case basis. Generally, units operating farthest to the rear will be those whose prime mission is performing maintenance functions such as the ASC. Because of the large task volume, some of the workload will have to be handled outside available shelters.

K-78. METT-TC will play a major role in determining the extent of night maintenance that can be used safely and effectively. In the open-desert type of Southwest Asian terrain, the faintest light may be visible from a distance. That same light would not be detected from a comparable distance in the forested, hilly European scenario.

K-79. The commander must implement control measures to ensure the safety of maintenance personnel and equipment. If night force application operations are required, composite risk management will mitigate safety hazards for both maintenance personnel and equipment.

K-80. Certain tasks are difficult to perform at night under light-discipline conditions. For example, maintenance jobs that require rotor blade turning or engine run (such as rotor track and fuel control adjustment) must be done outside. These types of maintenance procedures normally require significant area lighting. When lighting is an issue, adequate light discipline should be waived. If that is not possible, these maintenance tasks will be delayed until daylight.

K-81. A single all-encompassing, definitive concept for night aircraft maintenance operations is not feasible. Each organization must establish and alter its plan for implementing night operations as it meets specific environmental conditions as well as threat changes on the battlefield. For example, as a unit moves forward into open terrain, its night maintenance considerations will differ considerably from when it moves rearward into a closed environment.

PREPARATION

K-82. Baseline criteria must be developed to help determine the degree of light discipline required in various tactical situations. A number of factors will influence the determination such as estimated enemy detection capabilities, terrain, weather, level of maintenance, and type of aircraft requiring maintenance.

EFFECTS ON PERSONNEL AND MAINTENANCE

PRODUCTION CONTROL

K-83. Systematic PC procedures must be developed to ensure safe, efficient continuity of work on a 24-hour basis. The assignment of work and flow of maintenance-related forms and records must be as accurate and efficient under multishift operations as under single-shift (daytime) maintenance.

QUALITY CONTROL

K-84. QC procedures for night maintenance must be especially rigid. The potential for “missing something” increases as the adequacy of the work environment diminishes and the fatigue level of night workers increases. Of particular concern are the visual restrictions associated with working in subdued (red or green) lighting, compared to white light. Workers who are on night shift generally also perform only about 70 percent as well as day workers because of the mental fatigue associated with disruptions in the body’s internal clock (a condition called shift lag).

K-85. QC tasks requiring maintenance operational checks or test flights may have to wait until daylight for sign off. Procedures and criteria for the night aircraft maintenance program (NAMP) must be developed. The main concern is that quality and SOF standards are maintained at the same level as for daytime maintenance.

WORK SCHEDULE

K-86. For night maintenance, units are staffed for 12-hour operations. Aviation units with AMC capabilities should organize personnel resources in teams that will allow around-the-clock maintenance capability. As a rule, the day shift maintenance effort should equal about 80 percent of the AMC potential effort. Night maintenance should represent 20 percent of the unit’s effort. ASC units have greater night maintenance potential because they are located well back of the FLOT.

K-87. Light and noise disciplines are still major considerations, but they are less significant than for AMC units. AMC platoons/companies should request ASC augmentation or MSTs for extended maintenance operations. ASC units must provide support consistent with the force application mission and needs of their supported AMC units.

TRANSITION BETWEEN SHIFTS

K-88. The chances of something "falling through the crack" increases when a wide range of maintenance tasks is interrupted and passed for completion to work crews other than those who started them. This transition of maintenance actions is particularly true at the ASC level.

K-89. Administrative controls, such as detailed coordination meetings between shift supervisors, must be inherent to units using 24-hour maintenance operations. Supervisors must avoid any tendency to rush or circumvent such requirements so that personnel can "get on with the work." If it is to succeed, the transition from day to night shift must be handled efficiently.

PHYSIOLOGICAL FACTORS

K-90. Obviously, vision is reduced during night operations; however, numerous other human factors can also affect night maintenance. A comprehensive, detailed human factors indoctrination program must be developed for supervisors and repairers. Adjustment periods should be established, to the extent possible, that will allow newly assigned personnel to adapt to night work.

K-91. A sudden reversal of normal sleep patterns can result in an unavoidable tendency to become drowsy while performing critical maintenance tasks. Personnel often times suffer from exhaustion as a result of fatigue caused by working through the night. Fatigue makes performing of even the simplest of mental tasks more difficult. In addition, because of general feelings of tiredness and sluggishness, they perceive routine jobs to be more taxing than usual, and as a result, they may tend to save tough jobs for the daytime crew.

K-92. This fatigue is particularly common during low-intensity operations. Physiological factors that must be considered in night aircraft maintenance are as follows:

- The eyes normally require about 40 minutes to fully adapt to darkness.
- Adjustment to a new work schedule requires about one day for each hour of shift change.
- Forward shift rotations (days to evenings to nights) allow faster adjustment than backward rotations (nights to evenings to days).
- Because the body's clock is set by exposure to the daylight, most night workers never fully adjust.
- Fatigue affects a repairer's night vision, muscular actions, and mental abilities.
- People experience a loss of depth perception and color distinction at night.
- Smoking either three cigarettes in rapid succession or 20 to 30 cigarettes a day reduces night vision by about 20 percent.
- The danger of FOD increases at night.
- Diet affects night vision; individuals should eat only highly nutritious foods.

SECTION III – CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR OPERATIONS

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR THREAT

K-93. This section addresses the different types of chemical, biological, radiological, and nuclear (CBRN) operations, their effects on the unit's mission, and proper decontamination procedures for personnel and equipment. Threat forces around the world have inventories of CBRN munitions and agents. Some threat vehicles and aircraft possess overpressure systems, filtration devices, and detection systems to protect their crews.

K-94. Aircraft maintenance personnel are often dispersed to locations where CBRN detection devices are not available and where qualified medical help may not be readily available. Their missions could be severely affected by chemical and biological agents.

K-95. The use of chemical or biological agents against U.S. maintenance facilities and units will allow threat forces to isolate vital materiel from the battlefield with little risk of tactical exposure to their own forces. Aviation unit commanders and staff planners at every level must deal with the effect that CBRN operations and attacks will have on their unit.

K-96. They must consider ways to resume operations at the earliest opportunity. Decontamination of unit personnel, equipment, supplies, and operating areas is an arduous, time-consuming task that requires careful, realistic planning. FM 3-11.5(FM 3-5) contains more-detailed information on decontamination procedures.

AIRCRAFT DECONTAMINATION

K-97. Aircraft frequently operate in small elements (usually of three to six aircraft) with little or no organic ground support. Organic decontamination capability for the aircraft is very limited. Currently, only one M-11 decontamination apparatus and two 1-1/3-quart cans of decontaminating solution 2 (DS2) are authorized as onboard decontamination equipment. (This decontaminant can be used only on a very small portion of the aircraft surface because it is highly caustic and will destroy most aircraft materials.)

K-98. Standard decontaminants and decontamination procedures currently in use will ruin many types of aviation equipment and materials. See FM 3-11.5(FM 3-5), Chapter 7, for decontaminants that are approved for use on selected parts of aircraft.

CONTAMINATION AVOIDANCE

K-99. Any type of decontamination is costly. Resources must be diverted from fighting the enemy to decontaminating the aircraft. Therefore, repair personnel must know and practice contamination avoidance first.

K-100. Contamination avoidance saves time and other resources that would otherwise be used up in decontamination. Simple, common-sense measures can be used to avoid contamination or at least reduce its extent. (See FM 3-11.3[FM 3-3] for information on contamination avoidance.) The following are measures that will avoid or reduce contamination if implemented:

- Know what areas are contaminated and avoid these, if possible.
- Pick landing zones that will have a reduced splash effect if aircraft must land in contaminated areas.
- Limit the spread of contamination into the aircraft from outside; for example, ground crews at the FARP should conduct arming and refueling without requiring the aircrew to exit the aircraft.
- Conduct inspections without touching or shaking items; many inspection points can be inspected visually.
- Increase the use of covers when not flying; use engine covers, flyaway gear, and hatches. If possible, provide overhead cover for parked aircraft.
- Limit the number of aircraft that must operate in a contaminated area, or use aircraft already contaminated.
- Line the troop compartment with plastic as a field-expedient way to limit the spread of contamination when Soldiers are transporting contaminated personnel or casualties; a plastic curtain can be fastened between the troop compartment and the flight compartment with tape or Velcro® to limit contamination transfer. The aircraft's heater can be used with the curtain to create an overpressure in the pilot's compartment; this procedure will limit vapors from entering the compartment.
- Apply M9 paper to the landing gear of the aircraft; FARP personnel should always check the M9 paper before servicing the aircraft; another piece of M9 paper can be placed on the windscreen where the aircrew can see it.

DECONTAMINATION PROBLEMS FOR AVIATION EQUIPMENT

K-101. When an assigned aircraft is contaminated, the mission becomes very difficult and crew efficiency steadily degrades. Decontamination can stop the degradation of contaminated equipment; however, aside from being costly, special problems occur during decontamination of aviation equipment. The decontamination method, as well as the extent of decontamination, depends on the specific activities of the aircraft. Most activities require operational decontamination.

K-102. Surfaces are washed with decontaminants to remove gross contamination from agents that are harmful through skin contact. Even after decontamination, these surfaces will still give off agent vapors, and the decontamination agent itself will exude from the contaminated materials. Individuals should avoid, if possible, contacting contaminated surfaces with their bare skin. If the agent is absorbed through the skin, they can become potential casualties. Complete decontamination of aircraft components is necessary to allow maintenance personnel to work on the aircraft without wearing cumbersome protective gear.

DECONTAMINATION SITES

K-103. Operational aviation decontamination is normally done in the FARP and AMC areas. Thorough decontamination of aircraft components will be done at ASC areas. The procedures at each activity will specify where the decontamination support will come from, if it is required. For example, operational chemical company personnel and their equipment might be required to support combat aviation brigade ASC areas.

EFFECT ON MAINTENANCE

PLANNING

K-104. Maintenance personnel must be prepared to provide maintenance support on the integrated battlefield. To provide this support, individual soldiers must be trained to survive an initial nuclear or chemical attack and to continue the mission in a toxic environment under great physical and mental stress.

K-105. The long-term problems caused by contamination make it doubly important that maintenance units protect themselves. When possible, maintenance activities should occupy protected areas, such as underground garages or concrete buildings, to provide cover from liquid chemical agents and shielding from radioactive contamination.

K-106. Pressurized shelters, such as the M20, will protect soldiers doing component maintenance. The M20 will use an existing shelter as a skeleton and conform to its shape and size. Units should establish SOPs for contaminated aircraft and equipment maintenance procedures as follows:

- Inspection and contaminated maintenance collection point procedures.
- Procedures for performing unit-level immediate decontamination or requesting deliberate equipment decontamination from a CBRN defense company.
- Procedures for repair without electronic test equipment (if equipment is destroyed by blast or electromagnetic pulse [EMP]).
- Responsibilities and procedures for establishing and operating a contaminated-equipment holding area.

CONTAMINATION HAZARDS

K-107. The following are some special hazards that maintenance personnel may encounter while working on contaminated equipment:

- Petroleum products tend to trap chemical contaminants.
- An aircraft that is safe for an operator to use without mission-oriented protective posture-level 4 (MOPP-4) protection may be unsafe for a mechanic to repair.
- Chemical contaminants may collect in bolt threads, hydraulic fluids, and closed assemblies; a mechanic might break open a component, for example, and be exposed to lethal concentrations of

hazardous vapors. Casualties could be high unless all repairs and preventive maintenance on previously contaminated aircraft are done in MOPP-4.

- Oil, grease, and dirt seriously degrade the protective qualities of the chemical protective suit; mechanics must keep themselves as clean as possible. Extra protective suits should be on hand to replace dirty ones.
- Wet-weather gear helps keep protective suits clean but increases heat buildup and will eventually be penetrated. The combination of protective gear and wet-weather gear provides good (although hot) protection from a combination of toxic chemicals, grease, and oil contamination; fuel handlers' aprons and field-expedient rubber sleeves can provide some added protection with less heat buildup.

CONTAMINATION CONTROL

K-108. Contamination must not be spread. Contaminated equipment must not be taken into a clean shop. Maintenance teams should make every effort to repair contaminated equipment in a contaminated MCP. Repaired, but contaminated, equipment must be returned to contaminated units, whenever possible.

K-109. Even if equipment has gone through unit immediate decontamination, it can still be hazardous to handle. A previously contaminated unit will already be conducting periodic contamination checks and will be able to use the equipment safely because of the precautions being taken.

K-110. Contaminated equipment and tools must be stored at a location downwind of clean areas. Every effort must be made to control the spread of contamination. Contaminated aircraft and equipment should not be evacuated for repairs. If ASC maintenance is required, an MST will be sent forward to effect repairs in the contaminated MCP. ASC maintenance units should treat all customer equipment as contaminated until inspection proves otherwise.

K-111. Contaminated tools and equipment will be used to repair contaminated equipment. Because it is difficult to decontaminate equipment well enough to eliminate risk to mechanics, it may be impractical to decontaminate tools and equipment used to repair contaminated equipment.

K-112. Segregate tools and equipment that are used to repair contaminated equipment from uncontaminated tools. Protection from contaminated equipment must be provided. The Army's present ability to detect contamination in the field is limited. Toxic vapor trapped by oil or held inside a closed assembly may appear at some point during maintenance.

K-113. Because decontamination cannot guarantee safety for unprotected mechanics, the aviation maintenance officer/technician must decide which MOPP level that the mechanics should use; this decision becomes a tactical decision. Maintainers should use MOPP levels consistent with the threat and the mission.

SAFEGUARDS

K-114. Safeguards must be taken to protect people both inside and outside contaminated areas. Chemical-agent detection equipment should be operated while contaminated equipment is being repaired. The testing must be a continuous process. Vapor hazards may not be present in open terrain, but as soon as the aircraft is moved into an area where air does not circulate, significant toxic vapors may concentrate.

K-115. If contamination is detected after an assembly is opened, it can be decontaminated quickly by flushing with jet fuel, diesel fuel, or motor gasoline. The unserviceable component must then be marked and taken to the contaminated holding area. In that area, it can weather or undergo a thorough decontamination.

K-116. For reparable assemblies, personnel should either wait until the assembly no longer gives off vapor or replace it with a new assembly. The fuel used for flushing must also be marked as contaminated. It should be dumped in the contaminated sumps at the decontamination site or disposed of according to the unit SOP.

K-117. Maintenance personnel repairing equipment contaminated with radiation should wear dosimeters and be closely monitored for exposure. They must never exceed exposure levels. When the highest acceptable levels are reached, personnel should be replaced, mission permitting. The amount of radiological contamination that personnel can be exposed to varies. It depends on operational exposure guidance and the tactical situation.

Priorities for monitoring equipment should go first to the recovery teams, then to inspection point MSTs, and then to the MCP.

AIRCRAFT MARKING

K-118. Mark aircraft and equipment to protect others. Aircraft and equipment that are contaminated or that have been decontaminated to low-risk levels for operators and crews could still present a serious hazard to mechanics. They need to know that the equipment has been contaminated.

K-119. Contaminated aircraft must be identified with standard triangular contamination signs on all four sides and at the operator's controls. Write the type and date of contamination on the signs, which should be easily visible from the outside of the aircraft. For nonpersistent agents, signs may not be removed until decontamination has been verified by a detailed inspection. Contamination signs on aircraft and equipment contaminated with persistent agents will not be removed even after decontamination.

MAINTENANCE SUPPORT OPERATIONS

K-120. Contaminated equipment maintenance should be performed from a clean area. Work within a clean area can be done at reduced MOPP and with greater efficiency. When CBRN attacks have occurred within the support area, the unit must assume that all equipment is contaminated and the aviation maintenance unit must set up separate inspection points and MCPs.

K-121. All aircraft, personnel, and supplies must pass through an inspection point before they enter the maintenance area. There, inspectors in MOPP 4 can use heaters or torches to warm equipment while they check it for contamination. The vapor hazard from liquid contamination may be undetectable at 65°F (18°C) in the open yet become lethal at 80°F (26°C) or when brought into closed areas. Some biological contamination, including toxins, may not be detectable. Contamination must be assumed to be present if the equipment came from an area known to have been contaminated. Radiacmeters will easily detect radiological contamination.

DISPOSITION OF CONTAMINATED EQUIPMENT

K-122. The inspection team must segregate the equipment. Uncontaminated equipment can go straight to the maintenance area. Contaminated vehicles and equipment must be marked with contamination signs. A decision must then be made on the disposition of each item. If the equipment is contaminated and repairs can be performed in MOPP 4, the item may be sent through decontamination or left to weather.

K-123. If weathering is the choice, the marked equipment must be placed in a holding area where it can decontaminate itself. Waiting for equipment to weather before repair may be a luxury that a commander cannot afford. It may take weeks in cool weather. The next choice is to perform unit restoration decontamination before any repairs are made.

K-124. Priority equipment must be decontaminated first, but setting priorities is often not easy. For instance, with four attack helicopters equipped with antitank weapons lightly contaminated, all four could be decontaminated and repaired in the time that it would take to decontaminate and repair one heavily contaminated utility helicopter. Decisions such as this require coordination between maintenance and operational staffs.

K-125. Decontamination should be done only if it is cost-effective. When a persistent agent is involved, every effort should be made to replace a contaminated component with the next higher assembly that can be done in MOPP 4. Contaminated equipment or components should be marked and placed in the holding area to await disposition instructions from higher headquarters.

CONTAMINATION CONTROL

K-126. Uncontaminated teams should not perform on-site maintenance and generally should not attempt recovery of contaminated equipment. Unserviceable contaminated equipment and aircraft should be recovered to the decontamination site or contaminated MCP by other contaminated vehicles or aircraft.

K-127. Both AMC and ASC maintenance activities will send teams forward to repair or recover aircraft and equipment even though contamination status of said equipment is unknown. The teams must be in MOPP 4 and must test the equipment for contamination. If contamination exists, the maintenance team must decide whether repairs can be made in MOPP 4. If they cannot, the equipment must be decontaminated.

K-128. Any surfaces that the maintenance team must touch to repair or recover the aircraft must be given an operator's spray down with an approved decontamination apparatus. This spray down will not reduce the level of MOPP needed but offers some additional protection and limits spread. Maintenance teams must carry extra onboard decontaminants for this purpose. The objective is to limit transferring liquid contamination from the equipment being repaired to the maintenance or recovery team or its equipment.

K-129. After equipment and tools have been used for contaminated maintenance, they should remain contaminated. Use rags to wipe off only the gross contamination. Dispose of the rags in a sump, or bury them and mark the location. Maintenance teams may go through a MOPP gear exchange or detailed troop decontamination, but the team's equipment and tools should be left alone.

K-130. A fresh team can use the contaminated tools on other contaminated equipment. For extended repairs, a fresh team relieves a contaminated team, which moves back and undergoes detailed decontamination. After a rest, the newly decontaminated team rotates forward and relieves the contaminated team.

K-131. Support from a contaminated area is limited to the amount of time that soldiers can operate in MOPP 4. This time restriction severely limits the maintenance support within a contaminated area. It may be possible to extend the time that the unit can continue to support from the contaminated location by scheduling periodic withdrawal of personnel to a clean area for complete personnel decontamination and a rest period at a reduced MOPP level. For continued effectiveness, however, the unit must leave the area, go through a detailed equipment and decontamination process, and set up shop in a clean area.

K-132. Time limits may dictate that only the most critical repairs continue while a portion of the unit moves to a clean area. The limited organic transportation capability may require that some unit and customer equipment be left behind. After reorganization at the clean area, this equipment may be recovered or repaired using the procedures described for supporting from a clean area.

CONTAMINATION AVOIDANCE

K-133. Contamination avoidance should be the keystone of the support strategy in an CBRN environment. Unit CBRN defense personnel should monitor the CBRN situation by maintaining contact with higher headquarters and their counterparts in supported units. Before dispatch of MSTs, as much information as possible must be obtained relating to the threat along the route of march and at the support location. The location and availability of complete equipment decontamination stations must be carefully monitored. These facilities are operated under the supervision of elements of the division's chemical company. Force application elements usually have priority of support. FM 4-93.3(FM 63-3) contains more details.

Appendix L
Aircraft Cleaning

With Army aviation elements and equipment deployed and engaged in the ongoing GWOT, the harsh and unusual environments we are currently fighting in ads to the fair wear and tear (FWT) of all aircraft systems and equipment. Aircraft and aircraft component washing and cleaning procedures are an essential piece in the overall scope of maintaining Army aircraft mission readiness. All aviation maintenance commanders/leaders, maintenance officers/technicians, NCOICs, and maintainers across the spectrum must comply with established procedures and frequencies when cleaning aircraft and associated equipment. These aircraft cleaning procedures and frequencies must be carefully and deliberately executed to ensure that aircraft systems and equipment do not succumb to corrosion-related problems.

Note. Refer to TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, and TM 1-1500-344-23-4 and aircraft-specific technical manuals, including electronic ETMs and IETMs, for corresponding aircraft and aircraft component washing, cleaning, and freshwater rinse procedures.

GENERAL AIRCRAFT CLEANING PROCEDURES

Note. All aircraft shall be washed and cleaned every 30 days, unless aircraft are stationed within two miles of salt water. Extended or low-level operations over salt water require daily freshwater rinsing. External corrosion-prone areas will require more frequent cleaning. Refer to unit's internal maintenance SOP for further specific guidance on aircraft cleaning.

L-1. Aircraft should be cleaned regularly to—

- Prevent corrosion by removing salt deposits, other corrosive soils, and electrolytes.
- Maintain visibility through canopies and windows.
- Allow a thorough inspection for corrosion and corrosion damage.
- Reduce fire hazards by the removal of accumulations of leaking fluids.
- Improve overall appearance.
- Ensure aerodynamic efficiency of the aircraft.
- Maintain special paint scheme characteristics.

L-2. Use of high-pressure wash on any part of this aircraft is prohibited. Do not rinse aircraft with a solid stream of water. Use a soft spray pattern to avoid damage and water intrusion. Water must not be directed at such areas as pitot tubes, static ports, gearboxes, fillers, and vents. Critical areas shall be adequately protected (such as ground plugs and covers). Use low water flow pressure to avoid forcing water past static and dynamic seals. Avoid water intrusion into such equipment as light fixtures, electrical components, and antennas.

L-3. Washing of a main rotor or tail rotor head requires a reapplication of corrosion preventive compound (CPC). (Refer to applicable aircraft technical manuals, including ETMs and IETMs, consumables appendix, for the type of CPC to be used) to designated areas. Use appropriate water flow and media that will not lead to scratching of the transparent sections of the canopy.

L-4. Aviation MIMs provide aviation maintenance personnel with instructions and guidance on how to comply with revised or improved maintenance procedures.

Note. For example, the following GENERAL-MIM-2005-005 – *Proper Low Pressure Cleaning of Army Rotary Wing Aircraft Weapon System* references aircraft that return from operations in SWA exhibiting damage because of improper cleaning/freshwater rinsing with unauthorized commercial high-pressure spray cleaners. (For further information on this maintenance condition, refer to the above-mentioned MIM).

L-5. Use a soft flow or spray pattern to dissolve, dislodge, and flush away visible salt encrustation as well as rinse the external surfaces. A recommended flow of eight gallons per minute at about 25 pounds per square inch (PSI) supply pressure is recommended. Water should be directed at an angle of 15 to 30 degrees from the surface. Ensure that sufficient water flow is achieved on all surfaces.

AIRCRAFT RINSING PROCEDURES

L-6. Pre-position blades at about 45 degrees relationship to fuselage longitudinal centerline to minimize water drainage into the main transmission deck area. Generally, a sequence to be followed should be one that starts the rinsing cycle at the top and works itself down. For example, the following sequence is one that follows the methodology explained above:

- Main rotor blades.
- Main rotor head.
- Main rotor fairing.
- Left side of center fuselage, left nacelle, and wing.
- Canopy and forward fuselage (top and sides).
- Right side of center fuselage, right nacelle, and wing.
- Forward and center fuselage belly.
- Tail rotor blades, hub, and swashplate.
- Vertical stabilizer (from up to down).
- Horizontal stabilator.
- Top and sides of tail boom.
- Tail boom belly.

FINISHING/CLEANUP STEPS

L-7. After components have been exposed to water wash, apply CPC (refer to applicable technical manuals, including ETMs and IETMs, for correct CPC to be applied) to electrical/electronic connectors, switches, and transducers if applicable. Wipe any standing water from the transmission deck. Wipe up any standing water inside the tail boom. Also, apply CPC to such areas as the horizontal stabilator mount and pylon rack pivot features if applicable.

PREFERRED WASHING PROCEDURES

L-8. Rinse aircraft surfaces when necessary to reduce skin temperature. Streaking will occur if cleaning solutions are allowed to run down hot painted surfaces. Apply recommended cleaning compound (identified in the consumables appendix of technical manuals, including ETMs/IETMs) from a pail, spraying equipment, or foaming equipment. When necessary, scrub surfaces with brush (fitted with a cleaning pad or sponge) or with a cleaning brush.

L-9. Rinse away the loosened soil and cleaner solution with freshwater. Rinse the cleaner solution and loosened soil from aircraft surface with a fan spray nozzle, directed at an angle of 15 degrees to 30 degrees from the surface. Continue rinsing until all evidence of cleaner solution and soils have been removed from the aircraft.

Note. This procedure shall be used when freshwater is available for rinsing purposes.

ALTERNATE CLEANING PROCEDURES

L-10. This procedure is for use only when water is not available for rinsing or when cold weather prevents the use of water. Using a applicator bottle, apply cleaning compound (identified in applicable appendix of technical manual, including ETMs and IETMs) to exterior surfaces of the aircraft (no more than a few square feet at a time). Scrub, then wipe cleaner solution and loosened soil from the surface with a clean cloth. Rinsing with a cloth wet with freshwater following the use of cleaning compound is desirable. Rinse cleaned surfaces with freshwater when available.

ENGINE CLEANING PROCEDURES

L-11. When using established and standardized engine cleaning procedures, the result will be enhanced performance of installed engines. Routine engine washes will extend the service life by reducing internal temperatures of the power plant and ensure that maximum power can be developed throughout the flight envelope.

Note. The HIT check will not be used as an indicator of the cleanliness of the internal portions of the engine.

L-12. Engines will be cleaned as part of the regularly established scheduled flight hour inspections, and prior to the prephase general maintenance test flight. Production control may defer the engine cleaning to a later date because of mission requirements by making a DA Form 2408-13 entry. Before cleaning an engine, maintenance personnel will familiarize themselves with TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, and TM 1-1500-344-23-4 and applicable engine, gas turbine applicable technical manuals, including ETMs/IETMs, for specific engine cleaning instructions.

Note. Shortcuts to save time (such as safety wiring the bleed bands closed) during the engine wash procedure are not authorized.

L-13. Maintenance personnel will use only approved engine washing compounds as directed by applicable technical manuals, including ETMs/IETMs. Consult the technical manuals, including ETMs/IETMs, and the HAZMAT officer for currently approved compounds.

L-14. Compressor cleaning consists of internal washing of the compressor with a cleaning compound that is intended for use on an engine displaying definite evidence of performance deterioration because of an accumulation of foreign material deposits on the compressor blades. The applicable maintenance manual contains specific procedures.

L-15. All cleaning procedures should be accomplished with the applicable maintenance manual. Precautions must be taken when working with cleaning substances.

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Appendix M

Flight Line Operations

Aviation maintenance commanders/leaders, maintenance officers/technicians, and NCOICs must be actively engaged and safety conscious when supervising maintenance operations on the flight line. Aviation is an inherently dangerous business, more so when maintainers are conducting aircraft system, subsystem, and component maintenance on the flight line while rotors are turning.

Note. TM 1-1500-204-23 series contains further guidance on conducting flight-line operations.

FLIGHT LINE SAFETY

M-1. To avoid injury to personnel or damage to aircraft, observe the following procedures and general safety rules when servicing, operating, mooring, maintaining, or moving aircraft on the ground.

HEARING PROTECTION

M-2. Noise levels reached during ground run-up of Army aircraft may cause permanent hearing loss. Maintenance personnel shall wear adequate hearing protection when working on aircraft while engines are in operation.

Note. Aircraft maintenance personnel should use hearing protection normally issued after attending auditory testing as part of hearing-conservation classes.

FOREIGN OBJECT DAMAGE

M-3. To prevent FOD, safety precautions must be followed and shall be strictly observed during maintenance of turbine engines.

Note. Ensure that air inlet and tailpipe dust excluders are installed at all times when engines are not being operated except when it is known that the engine will be operated immediately following shutdown.

M-4. Regularly police parking, runways, taxiways, and run-up and exhaust areas to ensure that areas are free of foreign objects that could be ingested by the engine. Special attention shall be given to cleaning of cracks and expansion seams in hard-surfaced areas where engines are operated. Tests have indicated that these are the main sources of foreign objects that are ingested.

M-5. Before each engine start, thoroughly inspect and clean inlet ducting. Remove all loose nuts, bolts, tools, or other objects that would cause engine damage and possible subsequent failure. After work has been accomplished, inspect to ensure that all accessories and attaching parts are secure and that work areas are cleared of foreign objects before engine operation.

Note. Ensure that all tools used during a maintenance procedure are accounted for once a maintenance action is complete.

M-6. Adhere to gas turbine-powered aircraft taxiing and parking procedures as outlined in applicable technical bulletins. These procedures minimize damage because of material being thrown by the exhaust blast into the intake of other aircraft. Ensure that gas turbine-powered aircraft takeoff and landing procedures are such as to avoid the intake of foreign objects blasted from runways and runway shoulders by preceding aircraft.

M-7. Provide properly marked receptacles in all work areas into which materials—such as trash, ferrous and nonferrous scrap, and safety wire—may be placed. Periodically instruct personnel concerned with aircraft maintenance of foreign object hazards to ensure that maximum preventive measures are taken.

SAFETY PRECAUTIONS AROUND AIRCRAFT

M-8. The following safety precautions will be employed to ensure safety around helicopters on the flight line.

- Stand clear of plane-of-rotation of engine cooling fan during operation.
- Stand clear of tail rotor plane-of-rotation during operation.
- Approach main rotor blades, which tend to droop at decreased speeds, with caution—especially blades with a low plane-of-rotation.

PARKING AND MOORING

M-9. For specific instructions on parking and mooring particular aircraft, refer to the applicable maintenance TM. The following instructions apply to all Army aircraft:

- Do not park or moor aircraft closer than wing or rotor span, except by authority of the commander, maintenance officer, or the commander's designated representative.
- Park aircraft where transparent enclosures are not in direct rays of the sun whenever possible.
- Install gear-locking devices (when applicable).
- Attach mooring ropes to aircraft and ground fittings at an angle of about 45 degrees; attach mooring ropes, and install mooring devices as specified in applicable technical maintenance manuals.
- Place fully charged, 50-pound carbon-dioxide fire extinguishers in readily accessible areas where aircraft are parked.
- Park aircraft to be moored for storage at least 750 feet from center of nearest taxiway; provide adequate clearance for maintenance, servicing, fire lanes, and taxiways; all aircraft parked inside enclosures will be grounded at all times.
- Place chocks fore and aft of main landing gear wheels; do not use parking brakes as substitutes for chocks.
- Use steel chocks for snow or ice operating only; use sandbags on steel matting.
- Use wooden chocks for all other operations.
- Set brakes only after they have cooled.

GROUND HANDLING OF ARMY AIRCRAFT

M-10. Aircraft shall not be moved where, or in such a manner, that injury to personnel or damage to the aircraft or property will be the result. Ensure that tow tug drivers are trained to tow all types of aircraft before towing, and exercise supervision at all times. For specific instructions on a particular aircraft, refer to the applicable technical maintenance manual. Ensure that safety is observed at all times when conducting ground-handling operations.

TOWING ARMY AIRCRAFT

M-11. Tow Army aircraft according to applicable maintenance TMs. The following procedures are for general towing of all aircraft:

- Ensure that towing attachments, lines, and bars are of adequate capacity, serviceable, and secured firmly to designated tow fittings of aircraft and tow vehicle before towing aircraft.

- Do not exceed the walking speed of the slowest team member, with a maximum speed of 5 miles per hour; tow with extreme care over ice or snow or rough, rocky, or muddy ground and in congested areas.
- Ensure that ground guides can see 360 degrees around the aircraft being towed, especially when the aircraft is entering or exiting a hangar.
- Use caution when towing aircraft in extremely low temperatures to prevent damage to hydraulic seals, which would result in strut leakage.

PUSHING ARMY AIRCRAFT

M-12. Push aircraft by hand according to the applicable maintenance TM. The senior person will brief duties and dangers of ground handling aircraft. The following procedures are for general hand moving of all aircraft:

- Position ground handling wheels (when applicable) in down-and-locked position.
- Apply physical pressure for pushing, lifting, and turning only at authorized pressure points as designated in the applicable maintenance TM.
- Push by hand at proper pressure points.

STATIC GROUNDING OF ARMY AIRCRAFT

M-13. All aircraft parked outside will be grounded and bonded according to applicable references and publications, to the aerospace ground equipment while servicing (for example, fueling or defueling, arming ammunition or explosives, oxygen, hydraulic fluids, or any type of flammable liquids). Grounding is not necessary for aircraft parked outside unless one of the above services is being accomplished.

M-14. Grounding of aircraft is required when external power is applied to the aircraft. *All aircraft parked inside a hangar must be grounded at all times.*

ARMY AIRCRAFT REFUELING

M-15. Servicing aircraft with fuel and defueling aircraft requires the utmost precaution because of the highly flammable characteristics of fuel. Personnel performing fueling and defueling operations must be thoroughly familiar with all applicable references and publications. Personnel must also be completely familiar with the type of aircraft being serviced.

M-16. Aircraft shall have all fuel cells fully serviced before being parked or stored in a hangar. All fuel cells should be full to minimize the presence of flammable vapors within the fuel cell (for safety purposes) and, in addition, to minimize water condensation and subsequent microbiological growth that contaminates the fuel. This procedure should be adhered to at all times except when impending mission requirements shall necessitate a reduced fuel load or when an aircraft shall require maintenance to the fuel system.

MAINTENANCE TEST FLIGHTS AND MAINTENANCE OPERATIONAL CHECKS

M-17. MTFs are categorized as general test flights and limited test flights. Section III of TM 1-1500-328-23 outlines specific and mandatory requirements for accomplishment of aircraft test flights and maintenance operational checks.

MAINTENANCE TEST FLIGHT

M-18. According to TM 1-1500-328-23, an MTF is a flight for which the primary purpose is to determine airworthiness of the aircraft. The airframe, flight controls, power plant, systems accessories, and items of equipment should be functioning according to predetermined specifications during flight.

M-19. Accomplish MTFs with assistance, as necessary, from the most proficient flight crew available: that is, copilot, TIs, crew chiefs and observers. To be sure that test flights are properly conducted, only aviators who are MTP course graduates or have qualified as stated below will be selected to perform MTFs (general or limited test flights).

M-20. Aviation maintenance commanders can designate aviators who are not graduates of the Maintenance Test Pilot's Course (MTPC) as maintenance test pilots upon completion of an evaluation administered according to AR 95-1. However, according to AR 95-1, the individual must successfully complete the maintenance manager's portion of the aviation maintenance manager's course (AMMC)/MTPC. Minimum crew possible will board aircraft during all test flights according to the applicable -10 technical manual.

Note. Contractor maintenance test pilots will be qualified by attending the track portion of AMMC/MTPC (flight only) or be qualified by attending the track portion of AMMC/MTPC (flight only) or by paragraph N-20 above (maintenance manager's portion not required).

M-21. Maintenance test flights are classified as general test flights and limited test flights.

MAINTENANCE OPERATIONAL CHECKS

M-22. MOCs are accomplished on the ground through engine run-up, aircraft taxiing, or use of auxiliary power or testing equipment, to simulate conditions under which the system is to operate. The purpose of an MOC is to assure that aircraft systems or components that have been disturbed during an inspection or maintenance action have been repaired, reassembled, or adjusted satisfactorily.

Note. MOCs that require engine run-up to check systems or component operation must be performed by qualified personnel who are current in the specific MDS aircraft according to AR 95-l.

RUN-UP AND TAXIING OF ARMY AIRCRAFT

M-23. Nonrated personnel who start, run, warm-up test, taxi, or otherwise operate aircraft on the ground will be fully qualified, demonstrate satisfactory ability, and be authorized to perform such duties, according to AR 95-1.

Note. Nonrated personnel cannot run up rotary-wing aircraft under any conditions.

M-24. Aviation maintenance commanders/leaders, maintenance officers/technicians, and NCOICs must be actively engaged and safety conscious when supervising maintenance operations on the flight line. Aviation is an inherently dangerous business, more so, when maintainers are conducting aircraft systems, subsystems and component maintenance on the flight line while rotors are turning.

Note. TM 1-1500-204-23 series contains further guidance for conducting flight-line operations.

Appendix N

Aircraft Storage and Shipment

Army aviation units are currently undergoing an aggressive transition into a modular force. These modular aviation units will be call upon to deploy and support a myriad of CS and focused logistics missions across the globe. They will provide joint force commanders with a lethal and flexible force to rapidly deploy from CONUS or abroad in support of full-spectrum operations. Deployment will be by strategic airlift or sea lift or self-deployment, with a maritime force aboard aircraft carriers, or by any combination of these means. Deployment of aviation units will, at some point, consist of shipment and storing of airframes while en route to a theater of operations.

Note. Refer to applicable aircraft technical manuals, including ETMs and IETMs, and TM 1-1500-204-23 series for further guidance when preparing aircraft for storage and shipment.

STORAGE OF ARMY AIRCRAFT

N-1 The categories of aircraft storage are flyable storage, short-term storage, intermediate storage, and long-term storage. The length of time that the aircraft will be inactive will determine which of the following categories of storage will be used.

TYPES OF STORAGE

Flyable Storage

N-2 Flyable storage is the prescribed procedure to maintain a stored aircraft in operable condition. Next to daily use, this category of storage keeps the aircraft in the best possible condition. All scheduled preventive maintenance will be performed on aircraft in flyable storage, and periodic operation of the aircraft and all systems is required. There is no time limit on flyable storage.

Note. When an aircraft is placed in storage, process DA Form 2408-series forms according to DA Pamphlet 738-751. Include an entry indicating the type of storage, the date placed in storage, and the date that representation is due.

Short-Term Storage

N-3 Short-term storage is used to store an aircraft for up to 45 days. Aircraft in short-term storage require extensive preservation but very little periodic attention.

Intermediate Storage

N-4 Intermediate storage is used to store aircraft from 46 to 180 days. Aircraft in intermediate storage require very extensive preservation but minimal periodic attention.

Long-Term Storage

N-5 Procedures for long-term storage are not available for the storage of Army aircraft. If storage beyond 180 days is required, the aircraft will be depreserved, returned to flyable status, operated, and represerved according to this chapter.

PLACING AIRCRAFT IN STORAGE

N-6 The higher headquarters commanding officer shall be responsible for initiating action to place aircraft in storage. The aviation maintenance commander—upon receipt of guidance from the higher headquarters commander and according to applicable references and publications—will place aircraft in storage. The type of storage used shall be selected based on the length of time that the aircraft will be inactive.

> ***Note.*** The length of time that the aircraft will be onboard a sea vessel while being tactically deployed will determine the category of storage to be used.

PREPARATION FOR AIRCRAFT STORAGE

N-7 When the decision is made to place aircraft in flyable, short-term, or intermediate storage, the aircraft will be prepared according to the applicable USAMC TMs. Authorization to deviate from published procedures will be obtained, in writing, from Commander, AMCOM.

INSPECTION OF STORED AIRCRAFT

N-8 All aircraft placed in storage shall be carefully inspected at regular intervals of 60 days or less, depending on local conditions. Stored aircraft shall be corrosion-treated if this precaution is found necessary during inspection for corrosion. Particular attention shall be given to those areas where moisture deposits will not evaporate rapidly. Normally, corrosion will not be as prevalent on painted surfaces as on unpainted surfaces. The aviation maintenance commander responsible for the storage facilities will be responsible for establishing a program of periodic inspections of stored aircraft. This is in addition to some of the steps outlined below:

- Ensure proper preservation and ventilation of stored aircraft, and take immediate action to correct all unsatisfactory conditions.
- Ensure that drainage holes on the underside of the fuselage, wing, center section, and control surfaces remain unobstructed.
- Make spot checks during hot weather among each type and model of stored aircraft to determine maximum interior temperatures encountered (when temperature exceeds allowable limits, actions must be taken to ventilate aircraft).
- Employ forced ventilation when other methods of ventilation are not adequate to prevent sweating in the interior of aircraft and resulting accumulation of condensation and mildew.
- Inspect exterior locks, ground wires, chocks, mooring ropes, rods, and eyes every 30 days and immediately after the aircraft has been subjected to high-velocity winds (exceeding 40 miles per hour).

MAINTENANCE OF STORED AIRCRAFT

N-9 Maintenance managers should ensure that adequate maintenance is accomplished to maintain the aircraft in the proper state of preservation according to applicable aircraft maintenance technical manuals, including ETMs/IETMs. For aircraft in flyable storage, calendar and dual-criteria inspections will be completed as they become due.

REMOVAL OF AIRCRAFT FROM STORAGE

N-10 When an aircraft is removed from storage, the inspection and maintenance performed will depend on the type of storage that the aircraft has been in:

- Depreserve aircraft according to applicable USAMC technical manuals, including ETMs/IETMs.
- Perform preventive maintenance daily inspection and all calendar and dual-criteria inspections that are due.
- Correct aircraft deficiencies, as required.
- Perform MOC/MTF, as required, according to TM 1-1500-328-23.

SHIPMENT OF ARMY AIRCRAFT

N-11 Step-by-step procedures for the preparation, loading, tie down, and unloading of Army aircraft for shipment by vessel, truck, and cargo aircraft are provided in the preparation for shipment manual applicable to the aircraft. Authority to deviate from the procedures in the applicable preparation for shipment manual must be obtained, in writing, from the Commander, AMCOM.

> ***Note.*** The shipment technical manuals are identified by an "–S" at the end of the applicable MDS. For example, the UH-60 MDS shipment technical manual is TM 1-1520-237-23-S.

TACTICAL SHIPMENT OF ARMY AIRCRAFT

N-12 Tactical shipment is the transport and delivery of the maximum quantity of helicopters that can be shipped in near–flyable condition:

- Tactical shipment of helicopters by cargo aircraft requires the use of C-5 or C-17 cargo aircraft.
- Maximum quantities of helicopters that can be loaded for tactical shipment will vary with the size of the vessel to be used.

CHARACTERISTICS OF SHIPMENT VIA CARGO AIRCRAFT

N-13 Cargo aircraft shipment provides a safe, rapid method of helicopter delivery. Transport via a C-5 cargo aircraft provides the greatest load-carrying platform; as a result, the highest number of Army helicopters can be shipped via this platform. The next platform, with a lower payload capability, is the C-17. The one with the least payload-carrying capacity is the C-141B. Moderate helicopter disassembly is required for C-5 or C-17 shipment. Extensive disassembly and critical helicopter height adjustment (kneeling) is required for C-141B shipment.

> ***Note.*** Determining cargo aircraft balance and tie-down requirements is a function of the cargo aircraft loadmaster. In case of conflict, Air Force requirements found in Technical Order–9 series take precedence.

CHARACTERISTICS OF SHIPMENT VIA SEAGOING VESSEL

N-14 Vessel shipment requires the least disassembly of any delivery method except helicopter self–ferry. When both topside and main decks are loaded to top capacity, vessel shipment will deliver the greatest quantity of helicopters of any method discussed in this appendix. Shipment on a topside deck of a vessel is not recommended. Helicopters may be subjected to damage from gale-force winds and heavy seas, even when properly prepared.

CHARACTERISTICS OF SHIPMENT VIA CARGO TRUCKS

N-15 Shipment by tractor–trailer provides delivery of one helicopter per transport trailer; moderate helicopter disassembly is required. Helicopters shipped by truck are vulnerable to shipping damage caused by road hazards, loss of trailer stability, or any breakdown of the trailer running gear. Truck transport will normally be used for retrieval of downed or unserviceable helicopters.

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Appendix O

Safety Guidance and Procedures

Aviation operations involve inherently higher risk (higher probability of accidents and more severe consequences) than most ground operations. Historically, when deployed to force application theaters, Army aviation has suffered more losses to accidents than to enemy action. Aviation accidents in force application environments are typically the same type experienced in peacetime. A sound and effective safety program for maintenance operations is a basic requirement for all Army aviation maintenance units. Aviation maintenance commanders are responsible for protecting and preserving Army personnel and equipment against accidental loss. Everyone in the unit must be constantly alert to recognize and correct potentially dangerous safety and operational hazards immediately. All personnel must understand the inherent hazards of working in and around aircraft and know the additional safety principles discussed in this appendix. *Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources: hence, accident composite risk management will be exercised by decision makers at all levels of command.*

Note. AR 385-10 contains guidance on developing a sound and comprehensive maintenance unit safety program. In addition, Appendix D of this publication ad FM 5-19(FM 100-14) contain further guidance on composite risk management procedures.

ACCIDENT CAUSES

O-1. Aviation maintenance commanders, maintenance officers/technicians and NCOICs—in combination with assigned aviation safety officers—must evaluate maintenance operations to identify potential root causes for accidents. Identifying hazards or potential causes of maintenance-related incidents will not completely eliminate accidents; however, they will mitigate ongoing maintenance operations while minimizing the potential of mission degradation, injury or loss of personnel, or damage or destruction of equipment as a consequence of aviation operations.

O-2. An aviation accident is seldom caused by a single factor. Accidents are more likely to result from a series of events and a combination of factors such as human error, materiel failure, or environment. This fact must be recognized in developing an aviation accident prevention program. The following areas are not all-inclusive but are examples of those areas that require constant command attention to prevent aviation accidents:

- Human factors.
- Training, education, and promotion.
- Equipment design, adequacy, and supply.
- Normal and emergency procedures.
- Maintenance.
- Facilities and services.
- Environment.
- OPTEMPO.
- PERSTEMPO.

O-3. USACRC has found that human error accounts for about 80 percent of total mishaps. Maintenance-related mishaps do account for a percentage of total mishaps in terms of both human-error related causal factors as well as materiel-related causes. As expected, more complex aircraft have higher maintenance mishap rates; however, accidents caused solely by materiel failure are considerably rarer than human-error accidents. The interface between man and machine during maintenance operations increases the potential for accidents.

O-4. At unit level, commanders and maintenance supervisors must ensure that their personnel know of maintenance errors generated in their own units. They can be made aware of those in other units by examples found in *Flightfax*, *Countermeasures*, *PM* magazine, and other publications. All maintenance activities and personnel must strictly adhere to published maintenance procedures and apply composite risk management at all levels of operations.

SAFETY REGULATIONS

O-5. Department of Defense Instruction (DODI) 6055.1 provides the underpinnings for safety across the DOD. AR 385-10 regulates overall safety in the Army. This regulation integrates Occupational Safety and Health Act requirements into the Army Safety Program. AR 385-95 regulates the Army Aviation Accident Prevention Program. AR 385-40 covers accident reporting and records. DA Pamphlet 385-40 covers Army accident investigation and reporting. FM 5-19(FM 100-14) provides the doctrine and guidance for applying CRM to all Army operations.

O-6. The following personnel have major responsibilities in the unit's Aviation Accident Prevention Program: the commander, the maintenance officer/technician, the unit's safety officer, all aviators, the flight surgeon, the unit safety NCO, and individual Soldiers/civilians. A complete knowledge of aviation personnel, materiel, and maintenance operations is necessary to establish and maintain an effective aviation accident prevention plan. The plan must be tailored to the mission and requirements of the command. All activities that affect aviation operations must be considered.

SAFETY RESPONSIBILITIES

O-7. Accidents and injuries can hamper the unit's ability to complete its required mission. The unit commander must ensure that all personnel know proper operation and safety-related procedures for all aircraft, vehicles, equipment, tools, and machinery. Soldiers/civilians/maintainers are responsible for protecting equipment and the lives of fellow workers. Therefore, they must actively participate in safety programs and training.

O-8. The primary safety responsibility for all maintenance work performed on the aircraft or on its components rests with the individual performing the work. However, peers and the leadership providing oversight are equally responsible for providing an additional measure of protection. The importance of doing the right thing, policing each other, and providing direct supervision regarding safety cannot be overstated.

UNIT COMMANDER

O-9. Commanders are responsible for compliance with DOD, DA, Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), and EPA requirements. Commanders will establish other requirements, as necessary, for protection of personnel and equipment under their control.

O-10. The commander establishes a written commander's safety philosophy. He develops current safety goals, objectives, and priorities, and includes them in quarterly training guidance (annually for the Reserve Component). The commander understands and applies the CRM process to the entire spectrum of unit operations, activities, and personnel from a holistic standpoint.

O-11. The commander ensures that unit staff, subordinate leaders, and individual Soldiers and civilians are trained on the CRM process as a life skill that is applied equally to both on-duty and off-duty activities. The commander integrates identified risk controls into maintenance SOPs (a stand-alone written commander's accident prevention plan is no longer required) and ensures that written SOPs exist for all functional shop and maintenance areas and for all operations within the command.

O-12. Aviation unit commanders are responsible for ensuring that all activities of their units are conducted according to established safety rules, regulations, and publications. These regulations include all of the aforementioned DOD instructions, ARs, and DA Pamphlets as well as FMs, TBs, TMs, and other required local installation directives and policies.

O-13. Aviation unit commanders are also responsible for determining the cause of accidents and for ensuring that measures are taken to prevent their recurrence. They must also be aware of and enforce all safety policies and requirements established by higher headquarters.

O-14. Unit commanders are responsible for requesting permission from higher headquarters to deviate from an established safety rule or regulation. This request, including full particulars and detailed plans and specifications, is submitted to the higher headquarters commander for approval. However, unit commanders cannot rely on the safety programs of higher headquarters to ensure the safety of their people. They must also establish their own safety programs and become personally involved in implementing and enforcing them.

AVIATION MAINTENANCE OFFICER/TECHNICIAN

O-15. The aviation maintenance officer/technician ensures that an effective maintenance program is developed and maintained. The aviation maintenance officer/technician will—

- Continuously monitor QC through coordination with QC personnel, ensuring that QC personnel complete SF 368 (Product Quality Deficiency Reports) according to applicable references and publications.
- Ensure adequate training and cross training of maintenance personnel; ensure that a formal continuing education program is available to provide maintenance personnel with current information on techniques, procedures, and modifications.
- Ensure proper and timely aircraft inspections.
- Ensure adequate program supervision to guarantee that maintenance personnel are aware of, and comply with, all technical directives affecting aircraft operations.
- Ensure that discrepancies (write-ups) are correctly identified as to status and that they are properly cleared.
- Monitor and manage the EIR program and the AOAP.
- Provide maintenance personnel with lessons-to-be-learned from accident summaries that cite maintenance as the accident cause factor.
- Ensure that maintenance test pilots (Army and contractor) meet the requirements of AR 95-1 and TM 1-1500-328-23 to perform maintenance test flights, and ensure that maintenance test flights are performed according to appropriate directives.
- Ensure that all subordinate leaders and maintainers understand and apply the CRM process to all maintenance operations.
- Use the CRM process to mitigate or eliminate hazards associated with the personnel and activities that might affect the safe performance of maintenance operations.

UNIT NONCOMMISSIONED OFFICERS IN CHARGE/SUPERVISORS

O-16. Effective supervision is the key to accident prevention. In their daily contact with Soldiers, NCOICs are in a position to personally observe working conditions and potential hazards affecting maintenance procedures. NCOICs must apply all established accident prevention measures in the performance of their duties especially when supervising daily maintenance operations.

O-17. They should conduct meetings with their subordinates at regular intervals to brief them on safety procedures; to obtain feedback, as well as suggestions, on ways of improving safety practices; and/or to announce any new safety procedures. Such meetings should be held in the work (shop or hangar) area. The agenda should include the following:

- The overall job and the results expected.
- The how, why, and when of the job and any ideas from the group on ways to improve methods and procedures.
- The part that each Soldier will play; supervisors must ensure that all personnel understand the significance of individual roles.

- Existing and anticipated hazards and the action needed to resolve these problems.
- The need for prompt, accurate reporting of all injuries, accidents, or near accidents, and the importance of first aid when required.
- The need to search constantly for, detect, and correct unsafe practices and conditions to prevent accidents and injuries.
- The need for maintainers to understand and apply the CRM process to all maintenance operations.

AVIATION SAFETY OFFICER/NCO

O-18. The unit's aviation safety officer/NCO assists, advises, and makes recommendations to the unit commander regarding aviation accident-prevention matters. He observes aircraft support activities (such as POL, maintenance, operations, and enlisted crew members' training) to detect and report unsafe practices or procedures. He participates in unit safety surveys and inspections.

O-19. The aviation safety officer/NCO provides CRM training to all leaders and maintainers, ensuring that unit personnel understand and apply the CRM process to all operations conducted within the organization. In addition, all individuals are encouraged to apply CRM to off-duty activities as a life skill.

INDIVIDUAL SOLDIER/MAINTAINER

O-20. All personnel must be aware of the safety rules established for their individual and collective protection. Each person is responsible for reading and adhering to all unit SOPs, instructions, operating procedures, checklists, and other safety-related data. They must observe and apply all notes, cautions and warnings found on all applicable aircraft maintenance TMs. Personnel must then apply all cautions and safeguards in their everyday work areas.

O-21. Soldiers/civilians are responsible for bringing to their supervisor's attention safety voids, hazards, and unsafe or incomplete maintenance procedures. Each person must follow through until the problem is corrected, then cooperate in developing and practicing safe working habits. The unit commander should make certain that this spirit of cooperation prevails throughout the unit.

O-22. Soldiers/civilians are responsible for understanding and applying the CRM process to all duties and maintenance activities that could result in performance degradation, injury or illness, damage or destruction of equipment or to those off-duty activities or issues that affect their ability to report for duty and perform in a safe and effective manner.

O-23. When working on aircraft (including preflight and postflight) on other than home garrison maintenance pads, parking aprons, and wash racks (for example, at a transient airfield or a field training environment), fall protection (regardless of height above the ground) is defined as maintaining *"three points of contact"* (that is, one hand and two feet or two hands and one foot) on the hand holds, foot accesses/recesses, and walking/working-like surfaces designed into/provided on the aircraft. In addition, fall-restraint device usage is at the discretion of the maintenance supervisor or in the absence of maintenance supervision, the PC OIC/NCOIC.

OPERATIONAL PROCEDURES

O-24. Aviation maintenance commanders/leaders, aviation maintenance officers/technicians, and NCOICs will ensure that physical standards for facilities and equipment meet or exceed safety and health standards established in pertinent host government, Federal, State, and local statutes and regulations and in Army regulations.

O-25. Ensure that the composite risk management process is incorporated in directives, unit maintenance SOPs, special orders, training plans, and operational plans to minimize accident risk and that SOPs are developed for all operations entailing risk of death, serious injury, occupational illness, property loss, or mission degradation.

O-26. Establish specific plans to assure continuity of safety and operational hazard (OH) program services during tactical operations or mobilization. These plans will address mission definition, organizational concepts, and staffing and operational procedures required to assure maximum safety function support to the force application mission. All aviation units will develop such plans.

OPERATIONAL HAZARDS

O-27. An operational hazard is any condition, action, or set of circumstances that compromises the safety of Army aircraft, associated personnel, airfields, or equipment. OHs should be corrected at the lowest level possible. OHs include inadequacies, deficiencies, or unsafe practices pertaining to aircraft operations, aircraft maintenance or inspections, or flight and maintenance training and education.

OPERATIONAL HAZARD REPORT

O-28. DA Form 2696 (Operational Hazard Report) is used to record information about hazardous acts or conditions before accidents occur. The operational hazard report (OHR) form is available on the Army electronic library CD-ROM and the USAPA Web site. Place blank copies of the report forms in areas where they are readily available to all aviation-related personnel.

SUBMITTING OPERATIONAL HAZARD REPORTS

O-29. Any person (military or civilian) may submit an OHR. The signature and address of the individual submitting the OHR are desirable but not mandatory unless the individual wishes to have a copy of the completed report returned. An OHR is not required when an aircraft accident report will be prepared according to AR 385-40 or when a deficiency report (DR) will be submitted according to DA Pamphlet 738-751.

ROUTING THE OPERATIONAL HAZARD REPORT

O-30. The OHR will be submitted to an ASO or Army flight operations office. A report sent to an operations office will be promptly forwarded to the organization ASO.

HAZARD COMMUNICATION

O-31. Aviation unit commanders will develop and implement a unit HAZCOM program to ensure compliance with 29 Code of Federal Regulations (CFR) 1910.1200 and DODI 6050.5 directives. Commanders will ensure that an accurate inventory is maintained of all hazardous chemicals used by unit maintenance personnel.

O-32. The hazardous communication officer ensures that MSDSs are readily available for and used by personnel handling hazardous chemicals. He ensures that personnel handling hazardous chemicals receive training as specified by DOD and Federal statute. He also makes sure that hazardous chemicals are properly labeled, stored, used, and disposed of.

SHOP SAFETY

O-33. A shop that is below standard cannot put out high-standard, quality work. To ensure that shops/sections maintain a high safety standard, TIs will conduct an informal inspection of the various shops/sections periodically. Any deficiencies or shortcomings, identified as below-standard maintenance practices or safety hazards, will be brought to the attention of the shop maintenance technician/supervisor immediately. A file of all safety inspections is kept in the QC section, and a file copy is kept in the subject area inspected.

O-34. The USACRC publication, *Commander's Guide to Aviation Resources Management for Aircraft Mishap Prevention*, outlines safety procedures. It provides safety-related guidance and procedures for all assigned TIs. Copies of the commander's guide can be obtained from the unit ASO. Minor changes to the commander's guide appear in the USACRC publication, *Flightfax*, which all Army aviation units receive monthly. To obtain information on aviation safety policy, regulations and procedures as well as answers to questions or concerns relating to the commander's guide: http://www-rucker.army.mil/abso/abso-main.htm.

MAINTENANCE SHOP

O-35. The shop NCOIC supervisor responsible for maintenance shop safety will emphasize accident-prevention measures and shop equipment safety. To minimize shop-related accidents, the shop NCOIC will satisfactorily address the following questions:

- Does the shop NCOIC/supervisor emphasize accident prevention measures and check for marking and width of personnel safety aisles, safety and warning posters, and smoking and nonsmoking areas? (Refer to this publication, TM 1-1500-204-23-1, and DA Pamphlet 385-1.)
- Is all stationary and portable shop electrical equipment properly grounded? (Refer to TM 1-1500-204-23-1 and National Electrical Codes.)
- Is there a program in effect to encourage reporting of problem areas such as hazards, near accidents, and unsafe shop practices? (Refer to ARs 95-1, 385-40, and 385-95.)
- Are equipment and vehicle operators thoroughly familiar with the equipment's operation, handling, care, and preventive maintenance? (for example: Do operators have permits? [Refer to AR 600-55.]. Is the maintenance manual near equipment? [Refer to this publication]. Is the equipment or vehicle maintained according to organizational and operator's manuals?)
- When parts or items are removed from aircraft, are they marked and stored to be plainly seen? (Refer to this publication.)
- Are proper safety procedures practiced to prevent FOD when maintenance is performed on turbine engines?
- Are run-up and exhaust areas policed? Are containers available for trash and loose objects? Are loose hardware and other foreign objects removed? (Refer to TM 1-1500-204-23 series.)
- Are grounding cables provided for aircraft in hangars? Are they used? Has an initial electrical resistance test been performed and recorded on grounding points? (Refer to National Fire Codes, TM 1-1500-204-23 series, and FM 4-20.12 [FM 10-67-1].)
- Are grounding safety wires visible? Are they bright yellow?
- Is adequate lighting provided for maintenance shops and hangars?
- Are parts removed from aircraft immediately written up on appropriate forms? (Refer to DA Pamphlet 738-751.)
- Are required numbers and types of fire extinguishers available? Are aircraft and ground fire extinguishers checked as required? Are shop personnel trained to use fire-fighting equipment? (Refer to this publication and TM 1-1500-204-23 series.)
- Are trained specialists available to maintain special equipment, such as ejection seat and armament, when installed in unit aircraft? (Refer to this publication and AR 95-1.)
- Are shops clean and floors grease-free? (Refer to this publication.)
- Do personnel using power tools (for example, drills, grinders, lathes, and torches) wear safety goggles and noise-attenuating devices as required? Do repairers remove jewelry while performing maintenance? (Refer to TM 1-1500-204-23 series and ARs 40-5 and 385-10.)
- Are hoisting instructions for lifting aircraft components or aircraft followed? Are cranes, hoists, cables, slings, and forklift trucks inspected, weight-tested, and stenciled with the load rating? (Refer to TB 43-0142.)
- Are aircraft on jacks labeled, and is access to them restricted? Are aircraft jacks marked with the maximum lifting capacity? (Refer to this publication, TM 1-1500-204-23 series, and OSHA Standard 1910.244.)
- Do personnel in the instrument shop know the procedures for cleaning up mercury spills? (Refer to TB 385-4.)
- Are oily rags stored in closed metal containers? Are containers properly labeled? (Refer to this manual and TM 1-1500-204-23 series.)
- Are hydraulic, fuel, and oil lines protected from dirt while disconnected? (Refer to TM 1-1500-204-23 series.)
- Are all ammunition and pyrotechnics removed from aircraft before maintenance and before putting aircraft in hangars? (Refer to TM 1-1500-204-23 series.)

- Are engine, hydraulic, propeller and rotor, technical supply, and other work areas clean and well arranged? (Refer to this publication and TM 1-1500-204-23 series.)
- Are oxygen gaseous storage areas properly marked? Are oxygen gaseous cylinders stored in a separate building (area) from aircraft servicing and maintenance areas? Are empty and full cylinders stored separately? (Refer to TM 1-1500-204-23 series and National Fire Codes, Standard 410B.)
- Are sample bottles available to check fuel contamination in aircraft fuel tanks during preflight? (Refer to FM 4-20.12 [FM 10-67-1].)
- Are proper containers used and stored? Are containers clean and adequate? Are samples properly discarded? Is a fire point nearby? Are complete daily inspections conducted? (Use PMD/preventive maintenance services [PMS] cards and DA Form 2408-13 and 13-1.)
- Are tops of booths, shelves, and other surfaces in the paint shop clean to prevent lint accumulation? Are dope or paint deposits removed from the floor? Are there fire blankets at strategic points and the required number (and correct type) of fire extinguishers provided throughout the paint shop? Is electrical equipment in the paint shop explosion-proof? Are smoking restrictions enforced? (Refer to TM 1-1500-204-23 series.)
- Are unsealed hydraulic fluid containers considered contaminated and destroyed? (Refer to TM 1-1500-204-23 series.)
- Are the assigned aircraft marked and painted to include warnings? (Refer to TM 55-1500-345-23.)
- Are necessary accident prevention signs posted in the shop area? (Refer to TM 1-1500-204-23 series.)
- Are aircraft parked in hangars? Are aircraft batteries disconnected? Are static ground cables attached? Are drip pans placed beneath aircraft?
- Does gasoline-powered equipment (such as tugs and APUs) parked in hangars overnight have full fuel tanks?

HAND TOOLS AND EQUIPMENT

O-36. The shop NCOIC supervisor responsible for hand tools and equipment safety will emphasize accident-prevention measures and hand tools and equipment safety. To minimize hand tools and equipment accidents, the shop NCOIC will satisfactorily address the following questions:

- Are racks, shelves, or toolboxes provided for tools not in use?
- Are precautions taken to prevent tools from dropping or falling from ladders, scaffolds, platforms, or other elevations?
- Are tools frequently inspected by responsible personnel? Are defective tools turned in for repair or salvage?
- Are tools with sharp cutting edges carried in protective covers?
- Are power tools equipped with guards? Are electrical contacts enclosed? Is wiring well insulated and grounded?
- Are exposed sharp edges smoothed down when work is completed?
- Are ladders used, rather than improvised ladders, such as packing cases or barrels?
- Are parts and items removed from the aircraft stowed out of the way or marked so that they are visible day or night?
- Are tools stored so that sharp edges do not protrude?
- Are electrical tools used inside the aircraft?
- Are nuts and bolts torqued as specified in the appropriate TM?
- Are items stored in the tool crib cleaned and lubricated to prevent rust? Are they within the calibration due date if calibration is required? (Refer to TB 43-180.)
- Are grease guns labeled with contents?

WELDING EQUIPMENT

O-37. The shop NCOIC supervisor responsible for welding equipment safety will emphasize accident-prevention measures and welding equipment safety. To minimize welding equipment accidents, the shop NCOIC will satisfactorily address the following questions:

- During welding or cutting operations, is caution observed to prevent sparks from starting fires? Is a fire extinguisher available?
- Are safety goggles provided for operators using oxyacetylene equipment?
- During electric welding operations, is the operator wearing a face shield or helmet with shaded falter glass, protective sleeves, gloves, and apron? Are welding operations screened off when other personnel are nearby?

GENERAL HOUSEKEEPING

O-38. The shop NCOIC supervisor responsible for general housekeeping of the shops area will emphasize accident-prevention measures and housekeeping. To minimize housekeeping-related accidents, the shop NCOIC will satisfactorily address the following questions:

- Are covered, fire-resistant rubbish cans used in work areas?
- Are self-closing covered metal waste cans conveniently located to dispose of oil rags and waste?
- Are volatile flammable liquids used for washing or cleaning parts? Are they stored in open containers? Are working quantities of such liquids confined to approved containers?
- Is dripping or spilling of oil prevented? Are drip pans or other suitable means provided to collect excess oil?
- Are conspicuously marked fire extinguishers of the appropriate type provided in armament, maintenance, and training areas?
- Are all fire extinguishers properly charged, periodically tested, and ready for instant use?
- Are all unit personnel trained to use fire extinguishers?

Appendix P

Foreign Object Damage Program

A sound and effective FOD program for maintenance operations is a basic requirement for all Army aviation maintenance units. An FOD control program, with aggressive effort, will improve operational efficiency, provide for a safer operating environment, and reduce maintenance down time. All personnel who operate, maintain, or service aircraft or aviation ground support equipment are responsible for adhering to the commander's published FOD program. Everyone in the unit must be constantly alert to identify problem areas that can lead to foreign object damage and potentially dangerous safety and operational hazards to personnel and equipment. All personnel must understand the inherent hazards of foreign object damage when working in and around aircraft and know that one individual can make the difference in avoiding potentially dangerous situations as a result of FOD. *Accidents as a result of FOD are an unacceptable impediment to Army missions and tactical operations.*

Note. AR 385-95 contains guidance on developing a sound and comprehensive FOD program.

CAUSES OF FOREIGN OBJECT DAMAGE

P-1. FOD is damage to or malfunction of an aircraft caused by an object that is alien to an area or system or is ingested by or lodged in a mechanism of an aircraft. Foreign object damage may cause material damage, or it may cause a system or equipment to be unusable, unsafe, or less efficient.

P-2. Some examples of FOD are ingestion of loose hardware or grass by an engine, flight controls jammed by hardware or tools, and tires cut or propellers or tail rotors damaged by debris on the ramp or taxiway.

FOREIGN OBJECT DAMAGE PREVENTION MEASURES

P-3. The objectives of an FOD prevention program are to find and correct potential hazards and to eliminate the causes of FOD. Training, work-site design, discipline, motivation, and follow-up on FOD incidents are essential factors of a sound program. All unit maintenance personnel will take an active role in FOD prevention.

P-4. An effective FOD prevention program can enhance force application readiness by saving material, manpower, and money. Therefore, FOD prevention must be an essential part of each unit's aviation accident-prevention program.

P-5. The unit FOD prevention program will be in writing, and all unit personnel will be familiar with its contents. All aviation maintenance units must develop an SOP that meets their local needs; more importantly, it should meet the need for FOD reduction. Foreign object damage prevention countermeasures will be integrated throughout the unit SOP.

Note. AR 385-95, Appendix C, contains an example of an FOD prevention SOP.

P-6. A unit FOD control checklist should be developed for use by FOD prevention officers, NCOs, and unit personnel. (See Figure P-1 for a sample unit FOD inspection checklist.)

BIWEEKLY FOD INSPECTION CHECK LIST	SATISFACTORY	UNSATISFACTORY
1. Are maintenance personnel practicing FOD control procedures regularly as required by the unit's SOP?		
2. Do maintenance personnel conduct a tool inventory after maintenance procedures are complete or at the end of the day?		
3. Do NCOs conduct regularly scheduled checks of work areas to ensure that FOD prevention measures are observed?		
4. Are equipment and material not in use kept clear of maintenance areas?		
5. Is equipment available to keep runways, taxiways, hover lane, and parking areas clean?		
6. Are runways and other areas normally used for hover and ground operations inspected regularly?		
7. Where practical, are ground recons made of all landing areas to determine FOD potential?		
8. Are all personnel periodically briefed on FOD and prevention techniques?		
9. Do aircrews and operating personnel report unsatisfactory conditions when first encountered?		
10. Is the unit receiving USACRC publications and posters on FOD?		
11. Do unit bulletin boards contain information on FOD?		
12. Do work areas have FOD posters displayed?		
13. Are FOD containers with locally manufactured "STAY SHUT" lids handily located around the hangar area?		
14. Are FOD containers prominently labeled?		
15. Are the tools accounted for after the work is completed?		
16. Are maintenance personnel familiar with the FOD prevention program in the unit?		
17. Are OHRs being submitted on FOD problems when encountered?		
18. Are the inlet and outlet covers used when required?		
19. Are all crew members and maintenance personnel motivated and committed to FOD prevention?		
20. Are tool room personnel monitoring tool accountability and serviceability of tools?		
FOD Officer's/NCO's Name	**UNIT**	**DATE**

Figure P-1. Sample unit FOD inspection checklist

RESPONSIBILITIES

P-7. FOD programs, to be effective, must be carefully tailored to the needs and mission of specific aviation units to include aircraft maintenance units. FOD programs must be enforced, observed, and practiced daily. Commanders at all levels are responsible for enforcing FOD programs. They rely on their unit aviation safety officer (when assigned), FOD officer/NCO, and unit maintenance personnel to make the FOD program effective.

UNIT COMMANDER

P-8. Aviation unit commanders establish an FOD prevention program tailored to the needs of their unit. When establishing a sound and comprehensive FOD prevention program, commanders will appoint an FOD prevention officer/NCO to implement the unit FOD prevention program. This may be an additional duty for any unit officer/NCO other than the ASO/aviation safety noncommissioned officer (ASNCO) or the aviation maintenance officer.

UNIT AVIATION SAFETY OFFICER

P-9. The unit aviation safety officer (when assigned) will monitor and survey the FOD program to ensure effectiveness and adherence. Whenever possible, the unit safety officer attends all of the unit's safety meetings to address potential FOD problems, prevention, or investigations. The unit safety officer briefs new personnel on their responsibility for FOD prevention and keeps the commander and FOD officer/NCO informed on FOD issues.

UNIT FOREIGN OBJECT DAMAGE OFFICER/NONCOMMISSIONED OFFICER

P-10. The FOD officer/NCO will track scheduled FOD inspections and will investigate all known and suspected FOD damages. He monitors the unit tool accountability program. He will delegate specific areas of responsibility (such as a hangar or shop/maintenance work area) to appropriate unit personnel. The unit foreign object damage officer/NCO maintains surveillance for unsatisfactory FOD conditions and takes corrective action immediately.

P-11. The FOD officer/NCO conducts surveys and documents results (minimum once per month) and inspects all unit areas to ensure that the FOD prevention program is viable and working. He notifies the unit ASO of hazards found during surveys for analysis and control option development. The FOD officer/NCO ensures that FOD inspection checklists cover, as a minimum, procedures outlined in the unit's FOD SOP. He uses the checklist for each inspection and submits the completed checklist to the unit's ASO.

UNIT MAINTENANCE PERSONNEL

P-12. All unit personnel must take an active role in FOD prevention. They must be responsible and accountable for all actions taken when performing aircraft maintenance. They will perform all maintenance tasks according to applicable maintenance technical manuals, including ETMs and IETMs. Unit maintenance personnel will use the "clean-as-you-go" approach to maintenance, making a thorough check of the area after each task is completed.

P-13. Maintainers, when conducting maintenance procedures, will ensure that all aircraft openings—such as ports, lines, holes, and ducts—are properly protected to keep foreign objects from accidentally entering. Ensure that all tools, hardware, and other equipment are accounted for at the end of each maintenance operation; mark tools for ease of accountability. Inspect all equipment before use to ensure that it will not cause damage. Ensure that care is taken when installing any piece of test equipment.

P-14. Unit maintenance personnel will check engine inlet screens for loose, trapped, or broken objects that may produce FOD. When in doubt, they will immediately report FOD and potential FOD to the first-line supervisor. Unit maintenance personnel will place all residue and objects that may produce FOD in the proper container.

FOREIGN OBJECT DAMAGE PROCEDURES

P-15. Identification of FOD hazards—the opportunity for FOD to find itself into an aircraft via ingestion or possible contamination of the aircraft's fluids—is always there. When an aircraft ingests foreign objects or fluids, FOD will occur. It may cause material damage, or it may cause a system or equipment to be unusable, unsafe, or less efficient. The result of an errant tool jamming flight controls while in flight can be catastrophic to equipment and personnel.

P-16. All assigned personnel will ensure that the following hazards are avoided during all aspects of aviation maintenance operations:

- Grease on work shoes/boots – FOD can lodge in the grease and transfer to the aircraft or AGSE.
- Litter – police litter (such as nuts, bolts, cotter pins, safety wire, and rivets) in the work areas to minimize or eliminate the potential of damage to the aircraft, AGSE, or personnel.
- Jewelry – ensure that no jewelry (such as rings, watches, identification. tags, and pin-on rank) is worn during maintenance/inspections.

FOREIGN OBJECT DAMAGE INVESTIGATION AND REPORTING

P-17. All FOD hazards will be reported through the OHR or accident investigation system. These data should be communicated to first-line supervisors, to the FOD officer/NCO, and ASO for immediate resolution. *If there is a question about whether potential or suspected FOD hazards need to be reported, report it!* The FOD officer/NCO/ASO will assist unit personnel in selecting an appropriate COA.

FOREIGN OBJECT PREVENTION IN MAINTENANCE AREAS

P-18. Once the air inlet and compressor sections have been removed for maintenance, they will be inspected before they are reinstalled. The section chief, maintenance supervisor, or a unit technical inspector will conduct inspections of the air inlet and compressor sections before installation of said components. Engine inlet covers will be on all aircraft at all times unless the aircraft is being inspected or the engine inlet or exhaust area is being worked on.

P-19. Bolts, nuts, rivets, fasteners, screws, washers, safety wire and other residue will be disposed of in receptacles marked for FOD materials. These receptacles should be conspicuously placed on the flight line and in the hangar. All tools and supplies will be accounted for upon completion of all maintenance actions to include maintenance operational checks/test flights.

P-20. Such hazards as oil spills and grease spots on ramp, hangar, maintenance, or shop work areas will be cleaned up immediately after they occur. Enforcing this policy will reduce accidents in maintenance areas.

FOREIGN OBJECT DAMAGE WALK PROCEDURES

P-21. FOD walks will be included on the company-training schedule; they should be nonnegotiable. FOD walks will be conducted at least once a week; maximum participation is encouraged to include all available crew members (aviators and crew chiefs). All FOD containers will be emptied and FOD collected at the completion of the unit's FOD walks.

TOOL BAG PROCEDURES

P-22. Tool bags are highly encouraged and should be used with toolboxes. Required tools for a specific maintenance procedure will be put into the tool bag before use on the aircraft. *A Ziploc® bag is a field-expedient FOD receptacle.* A Ziploc® bag will be placed in the tool bag for use as a FOD bag during maintenance procedures.

P-23. After work is complete, tools will be removed from the tool bag, inventoried, and returned to their toolboxes. The Ziploc® bag containing FOD will be discarded in an approved disposal container.

Appendix Q

Corrosion Prevention and Control Program

Aviation maintenance commanders and maintenance officers/technicians at all levels must ensure that all Army policies and procedures for the detection and treatment of corrosion for aircraft and associated equipment are followed. CPC will be achieved by incorporation of the latest state-of-the-art corrosion control technology in the original equipment design, in the manufacturing, in all levels of maintenance, in supply, and in the storage processes. A CPC program with aggressive effort will minimize aircraft and equipment damage and increase operational efficiency and readiness. In addition, a well-established CPC program will provide for a safer operating environment and reduce maintenance down time. All personnel who operate, maintain, or service aircraft or aviation ground support equipment are responsible for adhering to the commander's published CPC program. Everyone in the unit must be constantly alert to identify problem areas that can lead to corrosion-induced damage and create potentially dangerous safety and operational hazards to personnel and equipment. All aircraft maintenance personnel must be aware of the catastrophic consequences created by corrosion left unchecked. *Aircraft or equipment damage as a result of corrosion is an unacceptable impediment to Army missions and tactical operations.*

Note. Refer to all applicable aircraft technical manuals, including ETMs and IETMs, and references listed at the end of this appendix for guidance on developing a sound and comprehensive CPC program and unit maintenance SOP.

OBJECTIVES

Q-1. All aviation units responsible for aircraft maintenance shall establish corrosion control programs as required by their higher headquarters. The type of program depends on the environment to which the aircraft may be exposed. At sea, conditions are considered to be the most severe. In this environment, aircraft are exposed to salt spray, ship stack gases, and aircraft engine exhausts. In other environments, land-based aircraft may be exposed to industrial gases, salts, rain, mud, and mists containing sea salts.

Q-2. A comprehensive CPC program shall include trained maintenance personnel who will be responsible for the prevention, early detection, reporting, and repair of corrosion damage. Such a program requires a dedicated effort by all maintenance personnel to prevent corrosion before it starts.

Q-3. The maintenance manager, with the assistance of QC personnel, will establish and implement inspections, procedures, and corrosion preventive measures to augment corrosion control procedures deemed necessary by the aviation maintenance commander and maintenance officer/technician. The maintenance manager delineates both individual and collective responsibilities for the conduct, management, and enforcement of the corrosion preventive and control program.

Q-4. The commander ensures that all maintenance supervisors, technical inspectors, aircraft crew members, and selected component repair section personnel receive training in aircraft CPC program according to AR 750-59, TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, TM 1-1500-344-23-4, and TM 1-1500-328-23. Required entries for aircraft forms and records must be outlined and understood by all unit personnel for the unit's CPC program to be effective.

Q-5. These efforts will improve the operational readiness of equipment and minimize costly repairs. In addition, they will prolong the service life of TBO and condition change components installed on assigned aircraft through prompt identification and treatment of corrosion-damaged aircraft repair parts and components.

RESPONSIBILITIES

UNIT COMMANDER

Q-6. Aviation commanders will integrate CPC awareness into all levels of maintenance to include support maintenance provided by aircraft maintenance contractors. CPC directives, guidelines, and procedures will be published as an appendix to the unit's aircraft maintenance SOP. The SOP will provide adequate instructions and awareness without reducing mission effectiveness. Commanders will ensure the following:

- CPC directives and guidelines should be emphasized when maintainers conduct aviation maintenance procedures.
- A CPC monitor is designated and appointed on unit orders; the monitor is an additional duty, normally assigned to a TI or maintenance NCO.
- The CPC monitor receives full training in corrosion prevention, treatment, and safety, if the monitor is not a graduate from an accredited corrosion course or program.
- Specific CPC responsibilities are delegated to appropriate maintenance officers/technicians, maintenance supervisors, and technical inspectors.
- Unit maintenance SOP CPC procedures are complete and revised when necessary; all maintenance personnel will familiarize themselves and comply with specified CPC procedures contained in the maintenance SOP.
- The effectiveness of the unit's CPC program must be continuously reviewed; all recommendations for improvement must be reviewed, and all approved changes should be promptly implemented.

UNIT CORROSION PREVENTION CONTROL PROGRAM NONCOMMISSIONED OFFICER IN CHARGE/CORROSION PREVENTION CONTROL MONITOR

Q-7. The CPC program NCOIC will coordinate all actions affecting the CPC program and work with maintenance supervisors, TIs, and mechanics to determine the effectiveness of the unit's CPC program. The NCOIC will advise the commander on all CPC concerns and findings. The NCOIC implements and coordinates the commander's CPC program, ensuring that all unit personnel are trained to conduct CPC procedures in support of the aviation unit's maintenance support mission.

Q-8. The unit's NCOIC will monitor techniques and proficiency of maintenance personnel accomplishing corrosion inspections and aircraft washings, taking immediate corrective action when needed. Monitoring should include, but is not limited to, spot checks of chemicals used, dilution of cleaning compounds, and application of corrosion preventive and water displacing compounds.

PROCEDURES

Q-9. An effective CPC program shall include thorough cleaning, inspection, preservation, and lubrication, at specified intervals, according to applicable aircraft maintenance TMs and TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, and TM 1-1500-344-23-4, Chapters 3 and 4 and Appendixes C, D, and E. Check for corrosion damage and integrity of protective finishes during all scheduled and unscheduled maintenance.

Q-10. Early detection and repair of corrosion will limit further damage. Maintenance personnel treat corrosion as prescribed in applicable references and publications as soon as possible, and use only approved materials, equipment, and techniques.

Q-11. The unit CPC monitor will observe inspections and other maintenance actions to determine the extent of corrosion on supported aircraft, ensuring that prompt action is taken to treat any corrosion detected. All problems involving corrosion shall be entered on the aircraft's DA Form 2408-13-1 according to DA Pamphlet

738-751. The status symbol will depend on the degree of corrosion, location, and allowable limits for the area as directed by the applicable aircraft maintenance technical manual, including ETM/IETM.

Q-12. To prevent further deterioration, corrective action must be taken as soon as possible. When a corrosion defect/fault is assigned a "*Diagonal (/)" status symbol and corrective action is not initiated within 30 days from date of discovery, the aircraft status symbol will be changed to an "X, grounding condition."* The aircraft will remain grounded and reported as NMC on readiness reports until corrective action has been taken.

Q-13. Aviation unit's NCOICs, maintenance personnel, and crew members will ensure accomplishment of scheduled CPC inspections and actions no later than the specified due date or hours as entered on the DA Form 2408-18. When operational requirements preclude timely accomplishment of scheduled inspections and maintenance actions, the following guidelines are established:

- Corrosion inspections or actions prompted by a special occurrence or as required by airframe operating time according to the special inspections sections of the airframe and engine technical manuals, including ETMs/IETMs, will be accomplished not later than (NLT) the time specified in the manual.
- When the aircraft is away from home station and facilities are unavailable, scheduled corrosion inspections and maintenance actions will be deferred with the higher headquarter commander's approval.
- Once the aircraft has returned to home station or to a maintenance facility, it will not be flown until required corrosion inspections and corrective maintenance actions are completed according to applicable aircraft maintenance technical manuals, including ETMs/IETMs.

PREVENTIVE MAINTENANCE PROCEDURES

Q-14. The prevention and control of corrosion on aircraft and related equipment is a command responsibility and vital to unit readiness. When it is neglected, the potential for aircraft to become unsafe for flight is increased. Each aviation maintenance unit emphasize the importance of the corrosion control program and lend its full support to ensure that the CPC program receives sufficient priority to be accomplished along with other required maintenance.

Q-15. To prevent corrosion, a constant cycle of cleaning, inspection, operational preservation, and lubrication must be followed. Prompt detection and removal of corrosion will limit the extent of damage to aircraft components. The preventive maintenance program requires all of the procedures specified above but also includes corrosion removal, paint removal, surface treatment, sealing, and painting. A disciplined preventive maintenance program includes the following:

- Regularly scheduled aircraft washing as specified by the maintenance unit's SOP.
- Regularly scheduled cleaning or wiping down all exposed unpainted surfaces, such as landing gear struts and actuating rods of hydraulic cylinders with a compatible fluid or lubricant, as outlined in the maintenance unit's SOP.
- Keeping low-point drains open.
- Inspecting, removing, and reapplying preservative compounds on a scheduled basis.
- Earliest detecting and repairing of damaged protective coatings.
- Using clean water with low chloride content for aircraft washing and rinsing.
- Using padded panel racks to store panels/parts for aircraft and equipment during maintenance; using protective measures to prevent abrasions/scratches resulting from placement of such items as parts, tools, and toolboxes on wings, fuselage, or other aircraft surfaces.

CLEANING PROCEDURES

Q-16. Use only authorized cleaning compounds and solvents as described in TM l-1500-344-23 or the appropriate TM. Dilution of materials will follow the recommendations in the aircraft-specific maintenance technical manuals, including ETMs/IETMs, or the label on the container. *More is not always better!* Comply with dilution instructions.

Q-17. Exposure to chemical compounds can pose potential health hazards. Supervisory personnel must make sure that everyone complies with all product warning statements and placards. Maintenance personnel should avoid direct skin contact with solvents, breathing of vapors, and ingestion by swallowing. All personnel will have free access to MSDSs to ensure compliance with required safety procedures.

Note. Refer to applicable MSDSs for instructions and guidance on working with specific solvents and cleaning solutions.

Q-18. The CPC program monitor will evaluate potential health problems and make sure that proper equipment is used and that all cautions are observed. PPE will be worn, to include items such as goggles, gloves, aprons, and boots.

Q-19. Aircraft cleaning is the first step in preventing aircraft corrosion. Cleaning requires knowledge of the materials and methods needed to remove corrosive contaminants and fluids, which tend to retain contaminants. Aircraft should be cleaned regularly to—

- Prevent corrosion by removing salt deposits, other corrosive soils, and electrolytes.
- Allow a thorough inspection for corrosion and corrosion damage.
- Reduce fire hazards by removing accumulations of leaking fluids.

Frequency of Cleaning

Q-20. All aircraft shall be cleaned according to schedules required by applicable aircraft-specific maintenance technical manuals, including ETMs/IETMs. Under certain local conditions, depending on the type of aircraft and usage, the normal wash cycle may not be sufficient. More frequent cleaning may be required for certain types of aircraft when—

- Excessive exhaust gases accumulate within impingement areas.
- Paint is peeling, flaking, or softening.
- Fluid leakage (such as coolant, hydraulic fluid, or oil) occurs.
- Exposure to salt spray, salt water, or other corrosive materials occurs.

Daily Cleaning

Q-21. When an aircraft is deployed within 3 miles of salt water or when flown below 3,000 feet over salt water, daily cleaning or wipe down is required on all exposed, unpainted surfaces such as landing gear struts and actuating rods of hydraulic cylinders.

Immediate Cleaning

Q-22. Affected areas must be cleaned immediately if—

- Spilled electrolyte and corrosive deposits are found around battery terminals and the battery area.
- Aircraft are exposed to corrosive fire-extinguishing materials.
- Salt deposits, relief tube waste, or other contaminants are apparent.
- Aircraft are exposed to significant amounts of salt water.
- Fungus growth is apparent.
- Chemical, biological, nuclear, radiological (CBNR) contaminants are detected.

PRESERVATION PROCEDURES

Q-23. Prevention-control measures—to include cleaning, treatment, and preservation—must be conducted as soon as possible according to applicable aircraft-specific maintenance technical manuals, including ETMs/IETMs. When aircraft or associated equipment are suspected of being exposed to any type of environmental or atmospheric condition that potentially could contribute to any type of corrosion, aircraft will be cleaned, treated, and preserved.

Q-24. Aircraft will be lubricated and corrosion-preventive compounds applied after a wash, according to the aircraft-specific maintenance technical manuals, including ETMs/IETMs.

Note. Sealant and corrosion-preventive compounds shall be used according to TM 55-1500-345-23, TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, and TM 1-1500-344-23-4 or the aircraft-specific maintenance technical manual, including ETMs/IETMs.

Q-25. When corrosion is discovered during an inspection and subsequently removed, the area must be properly treated. The metal and finish for the part or surface must be correctly identified. If any temporary finish is removed, pretreat metal when necessary and apply new paint/coating.

Q-26. The reliability of complex avionics systems is critical for aircraft operations and mission accomplishment. Corrosion is a major cause of avionics failure. Corrosion on avionics equipment is similar to that found on airframe structures; however, small amounts of corrosion on avionics equipment can cause intermittent or complete system malfunctions. TM 1-1500-344-23-1, TM 1-1500-344-23-2, TM 1-1500-344-23-3, and TM 1-1500-344-23-4 and applicable component maintenance technical manuals, including ETMs, will be used to mitigate these issues.

CORROSION PREVENTION CONTROL PROGRAM REFERENCES

Q-27. Figure Q-1 lists corrosion prevention control program references.

AR 750-1	Army Materiel Maintenance Policies
AR 750-59	Army Corrosion Prevention and Control Program
TM 1-1500-204-23-(Series)	General Aircraft Maintenance Manuals
TM 1-1500-344-23-1	Cleaning and Corrosion Control Volume I Corrosion Program and Corrosion
TM 1-1500-344-23-2	Cleaning and Corrosion Control Volume II Aircraft
TM 1-1500-344-23-3	Cleaning and Corrosion Control Volume III Avionics and Electronics
TM 1-1500-344-23-4	Cleaning and Corrosion Control Volume IV Consumable Materials and Equipment for Aircraft and Avionics
TM 55-1500-345-23	Painting and Marking of Army Aircraft
DA PAM 738-751	Functional User's Manual for the Army Maintenance Management System-Aviation (TAMMS-A)

Figure Q-1. Corrosion-prevention references

Appendix R
Tool Room/Tool Crib Procedures and Practices

Aviation maintenance commanders/leaders, maintenance officers/technicians, and NCOICs will account for and control all tools and equipment used in aircraft maintenance. Aircraft maintainers should become thoroughly familiar with tools usage and tool-room guidelines and procedures. Familiarity with their assigned tools and tool-room guidelines and procedures will enable aircraft units to experience continued mission reliability. The Army aircraft maintainer has a variety of tools at his disposal. There are basic hand tools, measuring tools, power tools, special tools for aircraft, and torque tools. All of these tools are equally important when conducting aircraft maintenance and, when properly used, they ensure that aircraft are airworthy and mission ready. *All assigned or attached aircraft maintenance personnel who manage, account for, or use special tools, calibrated tools, and tools, in general to maintain aircraft or aviation ground support equipment are responsible for adhering to the commander's published unit maintenance SOP.*

Note. Refer to all applicable aircraft TMs and references listed at the end of this appendix for guidance on the management, accountability, use, and maintenance of all assigned tools.

TOOLS (SPECIAL AND COMMON)

R-1. A special tool is designed to perform a specific task for use on a specific end item or a specific component of an end item and is not available in the common tool load that supports that end item or aviation unit. It is authorized by the RPSTL located within the prescribed aircraft-specific maintenance TM.

R-2. If a specific component requiring this special tool is used on a variety of end items, the tool will still be considered special and listed in all applicable end item RPSTLs.

Note. If aviation maintenance units are lacking special tools outlined in the appendix of their respective RPSTL, they can initiate and process request for issue documents to procure them.

R-3. If the tool is used on various components of various end items and not identified to a specific task, the tool will be defined as common. These types of common tools are placed and normally found in the applicable SKOs that support those various end items or placed in the additional authorization list (AAL).

R-4. Special tools having NSNs are identified in the special tools list of the MAC. Special tools that need to be fabricated/made from bulk materials appear in the RPSTL. Special tools are not components of a SKO and are not authorized in a supply catalog (SC).

RESPONSIBILITIES AND PROCEDURES

R-5. Aviation maintenance tool rooms must fully support all ongoing aircraft maintenance operations. Responsible personnel should design a sound plan of support to provide required common and special tools to maintenance personnel when needed. Aviation maintenance commanders/leaders, maintenance officers/technicians, and NCOICs are responsible to draft and implement an SOP outlining tool room management and support responsibilities. In addition, this SOP will provide information and guidance to all personnel wishing to sign out tools.

RESPONSIBILITIES

Commander

R-6. The aviation maintenance commander has overall responsibility for the functionality of the unit's assigned tool room. He will obtain maximum efficiency and use of personnel, facilities, and tools (special and common) when required to provide around-the-clock tool room support to sustain ongoing critical maintenance operations and procedures.

R-7. As the primary hand-receipt holder, he will maintain accountability of all special tools and AGSE according to AR 735-5. Establish policies and procedures to be adhered to when signing out tools from the tool room to support aircraft- and maintenance-related functions. The overarching goal of tool room support is to provide the required support to increase operational readiness of aircraft.

Section Sergeant/Maintenance Supervisor

R-8. The section sergeant/maintenance supervisor has direct oversight and responsibility of the tool room. He will ensure that the tool room custodian is in direct compliance with all procedures outlined in the tool room SOP. He has supervisory responsibility for all assigned tools in the tool room and will ensure tool accountability by conducting a regularly scheduled quarterly inventory of the tool room.

R-9. He will prepare a memorandum showing the results of the inventory. Any shortages noted will be accounted according to AR 735-5. Output from an automated system will satisfy this requirement. He will conduct random serviceability inspections of assigned tools in the tool room regularly.

Tool Room/Tool Crib Custodian

R-10. The tool room/tool crib custodian is responsible for all tools contained within the tool room or tool crib maintaining 100 percent accountability of tool room. He will issue and receive tools according to procedures outlined in the unit's maintenance SOP. Any tool from a tool room/tool crib needed to complete a maintenance procedure will be signed out before they can be removed from the tool room/tool crib.

R-11. The tool room/tool crib custodian will maintain an updated roster of all assigned or attached unit personnel authorized to sign out tools. All tools issued from a tool room/tool crib become the personal responsibility of the recipient (user). Special/common hand tools, tool sets, and kits, when not signed out, are secured and controlled according to the physical security standards of AR 190-51.

R-12. The tool room/tool crib custodian will inspect all tools and equipment for completeness and serviceability before issue. He will conduct by-the-book preventive maintenance on all items assigned to the unit's tool room on a continuing basis. An inventory sheet should be used to account for every tool/item that is part of a given SKO. If a tool is issued out of an SKO, the tool will be issued, accompanied by a copy of the inventory sheet. The inventory sheet will be used every time that the item is issued and returned to ensure continuous accountability.

R-13. The tool room will be inventoried monthly using the current supply catalog. A comprehensive tool room/tool crib inventory will be conducted before change of custodianship. Results, to include shortcomings or unserviceable/damaged tools or equipment, will be reported to the responsible aviation section sergeant/maintenance supervisor. Unserviceable or damaged tools will be turned in to the responsible aviation section sergeant/maintenance supervisor. The supervisor will ensure that replacements are ordered.

PROCEDURES

R-14. The tool room/tool crib is a controlled access area that ensures safekeeping and accountability of property. Tools needed away from garrison will be signed for on a temporary hand receipt. Personnel not assigned to the unit may sign out tools after coordination with the maintenance officer/technician or PC NCOIC and a properly completed signature card is on file in the tool room. Tools will be hand-receipted on a DA Form 2062.

R-15. Contact teams/personnel requiring tools in support of unit/element deployments are required to hand receipt tools for their respective maintenance support mission. In addition, they are responsible for turning in those tools once redeployed or at the completion of the rotation/mission unless other arrangements have been made with the tool room NCO/custodian.

TOOL PROCEDURES AND PRACTICES

R-16. The Army aircraft maintainer has a variety of tools at his disposal. There are basic hand tools, measuring tools, power tools, special tools for aircraft, and torque tools. All aircraft maintainers need to be familiar with tool procedures and practices. As a result, the aircraft maintenance unit can experience continued mission reliability for all of its assigned aircraft.

TOOL CARE

R-17. The efficiency of an aircraft maintainer and the tools that he uses is determined largely by the condition in which the tools are kept and maintained. Tools should be wiped clean and dry before being placed in a toolbox. If their use is not anticipated in the near future, they should be lubricated to prevent rust. This is especially true if tools are stored under conditions of extreme humidity or are continuously exposed to salt air.

TOOL STORAGE

R-18. Tools should always be kept in their appropriate storage place when not in use. A toolbox or case not only keeps the tool protected from dirt, but it also ensures that the tool can be found, as long as it is returned to its place after use. The toolbox should be locked and stored in a designated area and an inventory list maintained for that box.

Note. At the completion of a maintenance procedure, all aircraft maintainers should conduct an inventory of their tool box when used. Complete accountability of their assigned tools will reduce FOD accidents/incidents. All tools should be returned to their rightful place once maintenance is complete or at the end of the business day.

TOOL BOXES

R-19. Tool boxes are used for storing tools. Portable tool boxes are used for carrying and storing a variety of hand tools. Tool bags are usually made of canvas. Regardless of the type of storage device that is used to carry tools to and from the flight line or the hangar or when maintenance personnel conduct maintenance in a shop or maintenance area, an inventory must be conducted to account for all tools used during a maintenance procedure.

Note. The use of cadmium- and zinc-plated tools on Army aircraft is prohibited. Use only chrome-plated steel or unplated steel tools during disassembly or reassembly of aircraft components.

TOOL ROOM/TOOL CRIB REFERENCES

R-20. Figure R-1 shows tool room/tool crib references.

AR 710-2	Supply Policy Below the National Level
AR 735-5	Policies and Procedures for Property Accountability
AR 190-51	Security of Unclassified Army Property (Sensitive and Nonsensitive)
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures)
TM 1-1500-204-23-9	Manual for General Aircraft Maintenance (Tools and Ground Support Equipment)

Figure R-1. Tool room/tool crib references

Appendix S
Hangar and Shop Operations

All supervisory personnel in Army hangars and shops are responsible for a continuing and effective shop program to include established maintenance operations and procedures. All aircraft maintainers should become thoroughly familiar with their assigned shops and maintenance sections SOP. Familiarity with their respective shop/section's SOP will enable maintenance personnel to gain confidence, not complacency, when conducting maintenance operations in support of their unit's assigned mission. Conducting safe and reliable hangar and shop operations will ensure continued aircraft airworthiness. *All assigned or attached aircraft maintenance personnel responsible for maintenance support must adhere to the commander's published unit maintenance SOP.*

Note. Refer to all applicable aircraft technical manuals, including ETMs and IETMs, and references listed at the end of this appendix for guidance on hangar and shop operations.

SHOP AND MAINTENANCE OPERATIONS

S-1. This appendix contains instructions and procedures that are general and apply to hangar and shop operations. Maintenance instructions that are specific to a particular aircraft are contained in the applicable aircraft maintenance technical manuals, including ETMs/IETMs, and will be used with general information contained in TM 1-1500-204-23 series.

SHOP OPERATIONS AND EQUIPMENT

S-2. When maintenance supervisors/NCOICs establish or maintain shop operations, they should take care to provide proper spacing between equipment so as not to create a safety hazard while providing easy access in case of emergencies. Shop equipment is arranged to best meet the needs of the particular shop operation. All equipment must be arranged with utmost care to reduce or eliminate danger to personnel.

S-3. All flammables shall be stored according to applicable references and publications and in full compliance with the existing aviation maintenance unit's SOP. Each aviation maintenance unit shall provide protected storage areas for flammable or hazardous materials. Care should be taken to provide security and proper handling of items in these areas.

Note. MSDSs for all consumables used during maintenance operations will be centrally located and readily available for all aircraft maintenance personnel.

MAINTENANCE OF SHOP EQUIPMENT

S-4. The upkeep and maintenance of supporting shop equipment and machinery is essential to aircraft maintenance. It shall be divided into operator maintenance and major repair.

Operator Maintenance

S-5. Operator maintenance consists of cleaning, lubrication, and minor adjustments. It also includes periodic visual inspection to preclude possible damage, failure, or breakdown because of such conditions as loose or excessively worn parts or defective wiring connections, insulation, and safety appliances.

Major Repair

S-6. Major repair consists of all repair work not performed by operators. Major repair within the scope of facilities shall be accomplished locally. Repairs not within the scope of local facilities shall be accomplished through a work order to direct support or a commercial contractor.

PAINTING AND REPAINTING OF SHOP EQUIPMENT

S-7. When complete repainting is necessary, the original painted surface shall be refinished with synthetic gloss enamel, Federal Specification TT-E-489. The color shall be green, color shade 14260.

Work Areas and Critical Parts

S-8. Work areas and critical parts will be highlighted by painting with Federal Specification TT-E-489. The color shade shall be 13655 yellow enamel.

Start and Stop Buttons

S-9. Start buttons shall be painted with Federal Specification TT-E-489, green synthetic gloss enamel, color shade 14260. Stop buttons for electrical switches used for emergency stopping of machinery shall be painted with red synthetic gloss enamel, Federal Specification TT-E-489, color shade 11105.

Hazardous Areas

S-10. On some equipment, extremely hazardous conditions may exist—such as open flywheels, gears, or other moving parts—that cannot be guarded or that might be impractical to guard. These parts may be painted with Federal Specification TT-E-489, orange synthetic gloss enamel, color shade 12197. Painting of machined parts—such as faceplates, chucks, or spindles—is not authorized.

HANGAR AND SHOP SAFETY

S-11. All supervisory personnel in Army hangars and shops are responsible for a continuing and effective shop safety program. To implement and maintain this program, shop supervisors will use bulletin boards, signs, and any other effective method. Shop personnel will cooperate in the shop safety program by making helpful recommendations and continually exercising care and caution in the operation of all shop equipment. The following paragraphs describe electrical, machine tool, and fire safety precautions.

Electrical Safety

S-12. The following electrical safety precautions shall be observed in Army hangars and shop operations:

- Ensure that all unauthorized personnel are clear of the area before opening valves or energizing electrical circuits for starting machinery.
- Connect electrical tools to a low-resistance ground.
- Lay out electrical cables and air hoses to portable units so that there is no danger of tripping.
- Whenever possible, disconnect aircraft batteries when undergoing maintenance performed in the hangar.
- Use substantial low-resistance conductors to ground all stationary and portable machines, equipment, or other devices in which static charges may be generated or that require electrical circuits of a hazardous nature.
- Ensure that all switches and electrical equipment are of the enclosed explosion-proof type.

- Ground all metal apparatus to avoid the danger of igniting test fluid fumes or creating electrical shock.

Machine and Power Tool Safety

S-13. The use of machine and power tools in support of aircraft maintenance operations demands that safety precautions be observed by all to include the following:

- Personnel operating machinery shall wear eye protection as prescribed.
- A protective face shield or safety glasses shall be worn when operating a grinder regardless of whether the grinder is equipped with attached shields.
- A protective face shield or safety glasses shall be worn when filing or drilling on aircraft surfaces.
- Aircraft maintenance personnel working in and around aircraft or in shops where noise levels are high shall wear adequate hearing protection.

Fire Safety

S-14. Unsafe equipment and fire hazards are the main factors to be observed while planning safety procedures for hangars and shops. Unsafe equipment shall be reported immediately. A constant vigilance must be maintained to seek out fire hazards. Fire hazards are constantly present in the shop where sparks, friction, or careless handling can cause an explosion that may destroy equipment or buildings and injure or kill personnel.

Note. Fire lanes shall be marked and kept clear for emergency personnel in case of fire.

PARKING OF AIRCRAFT AND EQUIPMENT IN HANGARS

S-15. Safety lanes should be clearly marked and kept clear of parked aircraft and equipment. The width of fire lanes between parked aircraft should be slightly greater than the wingspan of parked aircraft to facilitate removal of any one aircraft from parking area and to permit ease of movement for mobile fire fighting equipment within the affected area.

S-16. When parking aircraft and equipment in enclosed areas, such as a hangar, they shall be spaced far enough apart to provide adequate clearance for maintenance, servicing, and fire lanes. Observe the following parking precautions:

- The direction in which the aircraft are to be parked shall be determined by ease of maintenance and servicing and according to the unit's maintenance SOP.
- Parking arrangement shall adapt to use local space facilities to the maximum.
- Double-row lateral parking, with first and second rows of aircraft placed tail to tail, shall be accomplished where possible.
- Aircraft shall be static-grounded from basic structure of aircraft to a low resistance ground.
- After parking aircraft, chock securely and release parking brake.
- Drip pans shall be placed under aircraft and shall be emptied and cleaned daily.

LOCATION AND TESTING OF STATIC GROUND POINTS

S-17. Static ground points are located throughout the hangar for static grounding of aircraft. The grounding point is marked by a yellow circle 18 inches in diameter, with a 2-inch black border surrounding it. The words ***STATIC GROUND CONNECTION*** and a numeric or alphanumeric identification of the grounding rod shall be stenciled in black on the yellow circle.

S-18. The electrical resistance of each grounding system should be as low as possible but not greater than 10,000 ohms. A log must be kept for permanent or semi-permanent airfields to show the identification of each rod, the date tested, and the reading in ohms. If the measured resistance of a rod is greater than 10,000 ohms, the rod should immediately be marked ***DEFECTIVE DO NOT USE*** and it should be removed or replaced as soon as possible.

S-19. A log is not required at temporary refueling points. Each ground rod must be inspected when it is installed. Ground wires are inspected monthly. The grounding system must be inspected and tested annually or when there is a possibility of mechanical damage. If any damage is found, it must be repaired immediately.

S-20. All aircraft parked in a hangar must be grounded (earthed) at all times. Ground support equipment in a hangar must be grounded at all times when in contact with the aircraft being worked on.

EMERGENCY EVACUATION OF AIRCRAFT FROM ASSIGNED HANGAR

S-21. A plan for the emergency evacuation of aircraft from a hangar must be established and implemented by the maintenance officer/technician using the expertise of the aviation safety officer and other applicable elements. Care must be taken to ensure the safe evacuation of as many aircraft as possible in an emergency.

HANGAR AND SHOP OPERATIONS REFERENCES

S-22. Figure S-1 lists hangar and shop operations references.

AR 95-1	Flight Regulations
AR 385-10	Army Safety Program
AR 750-1	Army Materiel Maintenance Policy
DA PAM 750-1	Leader’s Unit Maintenance Handbook
DA PAM 738-751	Functional Users Manual for the Army Maintenance Management System—Aviation (TAMMS-A)
TM 1-1500-204-23	Aviation Unit Maintenance Manual for General Aircraft Maintenance (General Maintenance and Practices)

Figure S-1. Hangar and shop operations references

Appendix T
Unmanned Aircraft Systems

Here we are in the year 2002, fighting the first war of the 21st century, and the horse cavalry was back and being used, but being used in previously unimaginable ways. It showed that a revolution in military affairs is about more than building new high-tech weapons, though that is certainly part of it. It's also about new ways of thinking, and new ways of fighting."

Secretary of Defense Donald H. Rumsfeld

at the National Defense University, 31 January 2002

Unmanned Aircraft Systems operations consist of many interrelated functions that depend on a responsive supply system and thorough maintenance program. Planning, managing, and executing supply support and maintenance for UAS involve synchronization and seamless integration. At all levels of operations, logistics and maintenance are essential functions in sustaining systems and keeping subsystems operational.

LOGISTICS IN TRANSFORMATION

T-1. As the DOD and U.S. Army make the transition into the emerging network-centric warfare concepts that are facilitated by the Information Age, logistics, as we know it, will also modernize. The U.S. Army will make the transition from the traditional mass-based methods of logistics support to PBL and S&RL. These emerging concepts will take advantage of the many technologic innovations in logistics support known today and will enable logistic transformation system support in the 21st century.

PERFORMANCE-BASED LOGISTICS

T-2. The DOD defines performance-based logistics as a strategy for weapon system product support that employs the purchase of support as an integrated, affordable performance package designed to optimize system readiness. For performance-based logistics, "performance" is defined in terms of military objectives, using the following criteria:

- **Operational Availability**. The percent of time that a weapon system is available for a mission or ability to sustain operations tempo.
- **Operational Reliability**. The measure of a weapon system in meeting mission success objectives (percent of objectives met, by weapon system); depending on the weapon system, a mission objective might include a sortie, launch, destination reached, and capability.
- **Cost per Unit Usage**. The total operating costs, divided by the appropriate unit of measurement for a given weapon system; depending on weapon system, the measurement unit could be flight hours, the number of launches, or miles driven.
- **Logistics Footprint**. The government/contractor size or "presence" of logistics support required to deploy, sustain, and move a weapon system; measurable elements include inventory/equipment, personnel, facilities, transportation assets, and real estate.
- **Logistics Response Time**. This is the time from logistics demand signal sent to satisfaction of that logistics demand. "Logistics Demand" refers to systems, components, or resources, including labor, required for weapon system logistics support.

T-3. The essence of performance-based logistics is buying performance outcomes, not the individual parts and repair actions. In other words, performance-based logistics rewards high performance and penalizes poor performance (Figure T-1).

T-4. One such innovation directly relating to the UAS personnel is PBL. PBL helps to create an increased responsibility for military contractors by tying their compensation to the operational availability of their products. This concept helps increase military awareness through the maximization of both organic and contractor support.

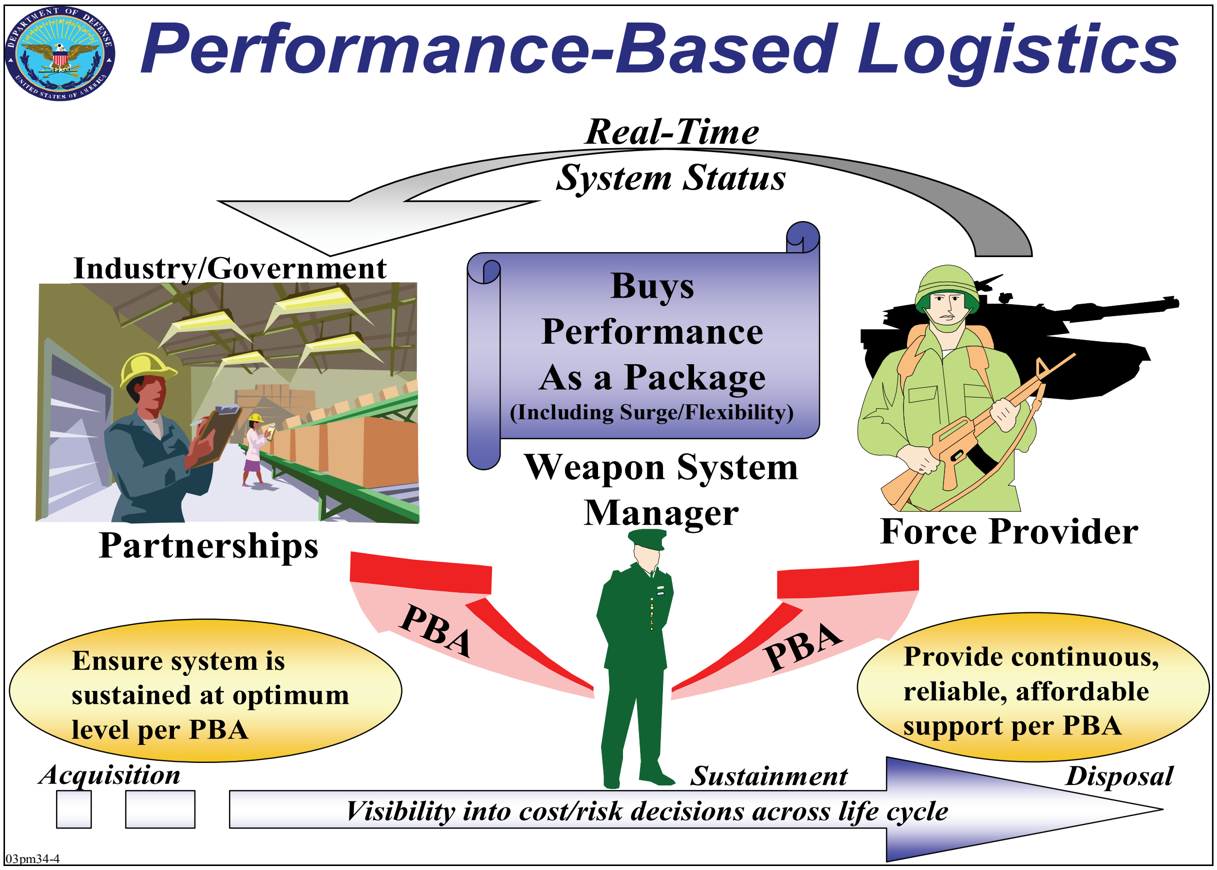

Figure T-1. An overview of performance-based logistics

SENSE AND RESPOND LOGISTICS

T-5. S&RL is a broad and ambitious set of concepts that will result in enhanced military capability through DOD logistics transformation. S&RL is a logistics system interwoven with network-centric operations and based upon highly adaptive, self-synchronizing, and dynamically reconfigurable demand and supply networks that anticipate and stimulate actions to enhance capability or mitigate support shortfalls across the strategic, operational, and tactical levels of war (Figure T-2).

Figure T-2. Metrics of mass-based, just-in-time, and sense-and-respond logistics

T-6. AR 710-1, AR 710-2, AR 710-3, DA Pamphlet 710-2-1 and DA Pamphlet 710-2-2 contain regulatory supply policies and procedures. This manual and FM 4-0(FM 100-10), JP 4-0, and JP 4-03 contain additional supply procedural guidance.

Note. References unique to a PBL-awarded contract must be included in all SOWs.

LOGISTICAL REQUIREMENTS

T-7. Unlike other organizations on the battlefield, a UAS deployed and dispersed geographically across the theater, corps, and division (brigade, battalion, company, platoon, and squad) requires focused logistics from forward units regardless of the C2 relationships that exist.

T-8. Both Hunter UAS and Shadow TUAS units have the same responsibilities as other units to request and obtain supplies and logistics support. The initial entry force will carry 24 hours of Class 1 (food and water) and Class 3 (POL); it will have 72 hours of Class 9 (Air).

T-9. Class 3 (POL) for Hunter UAS and Shadow TUAS units is a unique class of supply. Current Hunter UAS and Shadow TUAS engines use motor gasoline (MOGAS). Hunter units obtain Class 3 directly from supporting Class 3 bulk supply units. For Shadow TUAS units, Class 3 will be provided by the supported brigade.

Note. Hunter MQ-5Bs aerial vehicles will be issued to units in FY06 to include units currently operating the Hunter RQ-5A. The Hunter MQ-5Bs will have heavy fuel engines that use JP-8.

T-10. All system-peculiar/specific repair parts, including Class 9 (Air), are coordinated for delivery or delivered by contractor logistics support (CLS) contact teams. When deployed away from the battalion, the supported unit or forward support battalion (FSB) provides common items.

T-11. Shadow TUAS is currently managed under the performance-based logistics concept. The contractor is responsible for providing total product support for the UAS using a performance-based, contractor-managed supply and maintenance system that imposes performance metrics to support the system operational requirements. Performance will be measured on a recurring basis, and the contractor receives incentives to exceed defined contract performance metrics. The Hunter short-range UAS is currently managed under a CLS concept.

TWO-LEVEL MAINTENANCE FUNCTIONS

T-12. Maintenance procedures for UAS are established according to the Army two-level maintenance system: field and sustainment maintenance. Maintenance faults that cannot be corrected by the unit are sent directly to the sustainment/maintenance support facility.

T-13. The most significant change incorporated by two-level maintenance is the elimination of multiple echelons of pass-back aviation intermediate maintenance. The first echelon of two-level maintenance is field-level maintenance, which is conducted within the combat aviation brigade. Field-level maintenance is characterized by “on-system” maintenance. Sustainment maintenance is characterized by “off-system” maintenance, and aircraft components will generally be repaired and returned to the supply system.

T-14. Currently, Shadow TUAS and Hunter UAS repair parts and spares are maintained and repaired directly by CLS personnel. Many of these parts and spares are not maintained by LOGSA, nor do they have NSNs assigned because of the low density of the required repair parts.

FIELD-LEVEL MAINTENANCE

T-15. The first echelon of two-level maintenance is field-level maintenance. Field-level maintenance of Hunter UAS and Shadow TUAS is performed on-site by UAS unit maintenance personnel and includes UAS assembly and disassembly, preflight and postflight checkouts and inspections, minor structural repairs, servicing, troubleshooting, and limited repair (primarily LRU removal and replacement).

T-16. Built-in-test (BIT) procedures support fault location and diagnostics to the LRU level and objective card level. Once the fault has been located, the faulty item will be evacuated to a sustainment (depot) facility.

T-17. UAS Operator (MOS15W) consists of maintenance tasks intended to keep the system operational and prevent deterioration. Operators will perform the following:

- PMCS.
- Preoperational tests to verify that the system is ready to operate using BITs as interpreted at the ground control station.
- Visual inspection (validate ground control station menu readings/interpretations) and a BIT analyzer.

T-18. Aircraft powerplant repairer (MOS 15B), aircraft structural repairer (MOS 15G), and OH-58D armament/electrical/avionics systems repairer (MOS 15J) perform the following maintenance functions on their portions of the UAS:

- Fault detection and isolation.
- Removal and replacement of inoperative chassis mounted components and LRUs down to card level.
- Functional tests and BIT.
- Periodic inspection or replacement to comply with scheduled maintenance requirements, corrosion prevention, detection, and removal.
- (MOS 15J only) Electronic maintenance covering payloads and electronic-based components repair by removal and replacement of LRUs.

T-19. Field maintenance actions typically involve replacement of system components. Uniformed maintenance personnel will generally performed these repairs, at least through corps/ JTF level. Some examples of field maintenance include the following:

- Replacing complete engine assemblies, heavy fuel engines.
- Replacing a starter on an engine assembly.
- Timing of a fuel injection pump.
- Replacing a temperature sensor.

- Replacing a head gasket.
- Replacing an external maintenance wiring harness.

T-20. Raven field maintenance typically includes routine inspections, servicing, cleaning, and adjusting. Specialized training and tools are not required to perform Raven field maintenance. Questions regarding the Raven system may also be sent to the following e-mail address: raven@tUAS.redstone.army.mil.

T-21. Improved GNAT (IGNAT) field maintenance is provided by CLS. No military personnel are currently involved in the maintenance process. IGNAT logistics and maintenance is based on the approved two-tier maintenance system (field and sustainment).

T-22. Field maintenance personnel perform the following.

- Daily and turnaround inspections.
- Scheduled maintenance.
- Troubleshooting.
- LRU removal and replacement.

SUSTAINMENT-LEVEL MAINTENANCE

T-23. The second echelon of two-level maintenance is sustainment-based maintenance, which consists of the USAMC depots; TASMG, which consists of an AVCRAD that provides a limited depot capability; and OEMs.

T-24. UAS sustainment maintenance is pushed forward directly to the operational units. Sustainment maintenance is used for major airframe components, propulsion system, control and autopilot systems, GCS, and data link and communications suite repair to component level. Sustainment activities provide software upgrades and maintenance.

T-25. Typically, sustainment maintenance includes the internal troubleshooting and repair of LRUs and shop replacement units (SRUs), control and autopilot systems, Guidance Control System (GCS), and data link communications suite, and overhaul of engines and transmissions that are generally returned to the supply system.

T-26. CLS/field support representative (FSR) teams perform forward UAS sustainment maintenance. Uniformed maintenance personnel, DA civilians, or contractors with the corresponding authority to perform sustainment maintenance normally perform UAS sustainment maintenance at echelons above brigade (EAB).

T-27. General Atomics–Aeronautical Systems Incorporated (GA-ASI) performs the following sustainment maintenance functions:

- Manage parts inventory.
- Maintain rotatable stock of shop and line replaceable units.
- Maintain a stock of bit parts.
- Receive components from field site for repair.
- Issue replacement units to field site.
- Test and evaluate units to determine need for repair.
- Fault isolation to bit part.
- Issue repaired components to rotatable pool.

T-28. Raven TUASS does not use forward sustainment maintenance. When Raven TUASs are not reparable at the field level, they are turned in to unit supply (S4) for evacuation to a repair facility.

CONTRACT LOGISTICS SUPPORT

T-29. Hunter UASS, IGNAT, and Shadow TUAS systems currently operate under the on life-cycle CLS supported maintenance concept. This maintenance approach provides Hunter UASS, IGNAT, and Shadow TUAS units direct forward-based support by CLS teams.

T-30. Forward based sustainment-level maintenance is provided to Hunter UASS units by teams of five CLS personnel. Shadow TUAS units are supported by mobile maintenance facility (MMF) teams and consist of four

CLS personnel. The MMF is located at division but is forward deployed to operate directly with the Shadow TUAS unit. The MMF goes forward based on the needs of the supported BCT. The CLS team provides sustainment-level maintenance.

T-31. Unserviceable and nonreparable parts and components that cannot be repaired by the CLS teams are sent to the forward repair activity (FRA)/the electronic service support center (ESSC) within theater to allow for quick turn around of critical system components and returned to the supply system.

PRODUCTION CONTROL

T-32. Currently, there is no dedicated PC element in Hunter UASS or Shadow TUAS units. Therefore, commanders select PC NCOICs based on their skills, qualifications, and experience. The PC NCOIC oversees and supervises the unit's UASS equipment and maintenance operations.

T-33. The PC NCOIC is responsible for tracking maintenance and logistics statuses directly affecting assigned UASS. He will also track all maintenance actions and scheduled maintenance flow.

QUALITY CONTROL

T-34. As with production control, current Hunter UASS and Shadow TUAS units do not have dedicated QC personnel. To better track quality assurance on all UASS maintenance performed, commanders will select QC personnel based on their skills, qualifications, and experience.

T-35. One of the maintenance section's 15Js and 15Bs will perform quality assurance functions as the commander's assigned QC inspectors. They will ensure that maintenance performed on the unit's UASs and shelters is accomplished according to UASS-TAMMS procedures.

UNMANNED AIRCRAFT SYSTEMS–FORMS AND RECORDS

T-36. This section covers the preparation, management and historical record-keeping of forms and records needed to manage maintenance, control the use, and report warranty actions and deficiencies on the (Army) Unmanned Aircraft Systems and associated equipment.

T-37. The Department of the Army Pamphlet 738-751 provides the model for evaluating the Unmanned Aircraft Systems material condition in support of UAS and UAS-associated equipment materiel readiness and safety.

T-38. The forms cited in DA Pamphlet 738-751 require deviations to the instructions for completing the data fields and blocks to accommodate the UAS and UAS associated equipment uniqueness; for example, no onboard cockpit; UAS ground control station performs ground-to-air control and air-to-air control via data link.

T-39. The forms and records are used to—

- Control operations.
- Control and manage maintenance of UAS, UAS-associated equipment, and UAS mission-related equipment.
- Track UAS components, modules and flight safety-related parts, by serial number, to support reconstruction of UAS component historical records for component configuration and maintenance and failure analysis.
- Track configuration, application of ECPs, MWOs, **Reportable** Components, TUAS Field Notices (Flight Safety Notices, Safety Action Messages, Safety of Use Messages, and Technical Bulletins on UASs, UAS associated equipment, and UAS mission-related equipment.)
- Collect maintenance performance and related logistic data to perform maintenance analysis for possible redesign and improvement of fielded UAS equipment according to AR 750-1.
- Submit deficiency reports such as equipment improvement recommendations (EIRs) and PQDRs.
- Evaluate UAS materiel condition in support of UAS and UAS-associated equipment readiness and safety.

UNMANNED AIRCRAFT SYSTEMS–LOGBOOK AND HISTORICAL RECORDS

Unmanned Aircraft Systems-Logbook Forms and Records

T-40. UAS logbook forms and records are filed in the UAS logbook for easy access by the UAS operators, maintenance, and quality control personnel. The UAS logbook has a combination of operational and maintenance forms and records that provide a record of the following:

- UAS system and aircrew flight information and servicing data.
- Engine operational data.
- Payloads and other subsystems status.
- When the next scheduled maintenance inspection is due.
- When the next special inspection or item replacement is due.
- Faults and correcting information.
- UAS and UAS mission-related equipment condition status.
- Related maintenance actions.
- Uncorrected or deferred faults or maintenance.

Unmanned Aircraft System–Historical Records

T-41. Historical records are permanent records of historical data for UAS Systems, time change (TC), retirement change (RC), and condition change (CC). Historical records are not part of the logbook. They are normally filed in the PC or QC shop. The QC shop keeps a record of—

- Configuration changes, application of ECPs, MWOs, *reportable* components, TUAS field notices (flight safety notices, safety action messages, safety of use messages, and technical bulletins on UAS, UAS-associated equipment, and UAS mission-related equipment).
- Track UAS components, modules, and flight safety related parts, by serial number, to support reconstruction of UAS component historical records for component configuration and maintenance and failure analysis.
- Collect maintenance performance and related logistic data and all significant events on the UAS and UAS system and its components.
- Results of engine analysis checks/maximum power checks.
- Receipt, transfer, and disposal of UAS and UAS-associated and -related mission equipment.
- Software version of software installed on UAS, UAS-associated equipment, mission-related equipment, UAS survivability electronic countermeasures and avionics systems LRUs.

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Appendix U

Bench Stock Management

Bench stock items are authorized for all aviation maintenance activities (AMC and ASC). Aviation maintenance officers/technicians based on experience, should recommend additions, deletions, or stockage-level adjustments to ensure that maintenance procedures are not halted because of a shortage of bench stock items. Bench stock items are not demand supported.

Note. This appendix contains guidance on management and request procedures for all bench stock items assigned to aviation maintenance units.

U-1. According to AR 710-2, bench stocks are authorized at both AMC- and ASC-level units. These items are stored near the work area. This storage gives maintenance personnel direct access to the supplies. Management of bench stock items is a maintenance team effort, beginning with aviation unit maintainers/crew chiefs, ending with the maintenance officer/technician.

Note. AR 710-2 and DA Pamphlet 710-2-2 contain additional regulatory management policy on bench stock items.

U-2. Bench stocks are composed of low-cost, high-use, consumable Classes 2, 3 (packaged), 4, and 9 (Air) (less components) items used by maintenance personnel at an unpredictable rate. Examples of these items are common hardware, resistors, transistors, wire, tubing, hose, thread, welding rods, sandpaper, sheet metal, rivets, seals, oils, grease, and repair kits.

U-3. Two records are required for bench stock management: a bench stock list and bench stock replenishment tags.

PROCEDURES FOR PREPARING A MANUAL BENCH STOCK LIST

U-4. When using manual procedures to manage bench stock, prepare the bench stock list on a memorandum or plain bond paper. The subject is “Bench Stock List.” Include the date prepared, unit/activity, and UIC. List the stock number, unit of issue, item description, stockage quantity (authorized stockage by approving authority), and location of each bench stock item. (See Figure U-1.) The person preparing the list (normally the shop officer) signs it and sends it to the unit commander or unit/installation maintenance officer for approval and signature.

BENCH STOCK LIST

PREPARED: 20060614 UIC: WCMFD0 HIGHLIGHT PRICE: $150.00

ORGANIZATION: D CO 159TH AVN REGT DODAAC: W36N0T

'*' = EXCEEDS HIGHLIGHT PRICE

Shop Code	NIIN	Noun	Storage Location	Minimum Stockage	Price	Unit of Issue
*A	000344641	CIRCUIT	A0001	4	$262.00	EA
E	000364197	LIGHT, IN	E0001	50	$.85	EA
E	000364421	CONNECTO	E0002	50	$1.20	EA
M	000366967	SCREW, AS	M0001	20	$2.39	HD
G	000366995	SEAL, NON	G0001	100	$.59	FT
C	001255256	BATTERY	C0001	2	$12.48	EA
K	001433115	LAMP, INC	K0003	50	$.12	EA
G	001436234	RIVET, BL	G0003	100	$.09	EA
*A	002542199	CONNECTI	A0005	2	$278.23	EA
D	010102536	CHAIN AS	D0007	5	$109.29	EA

Prepared by:
Stephen Perkins
CW4, AV
Shops Officer

Approved by:
Charles Childers
CW5, AV
Maint Officer (or CDR)

Figure U-1. Sample of a bench stock list

U-5. To change minimum and maximum stockage levels, aviation maintenance units assigned the ULLS–A should perform the following functions: access the supply module within ULLS–A, click on the bench stock icon, and select change min/max stock levels (see Figures U-2 and U-3). When quantities have been adjusted, print a bench stock report. At the end of the printed report, the technical supply manager can indicate who prepared the list and who authorized the list.

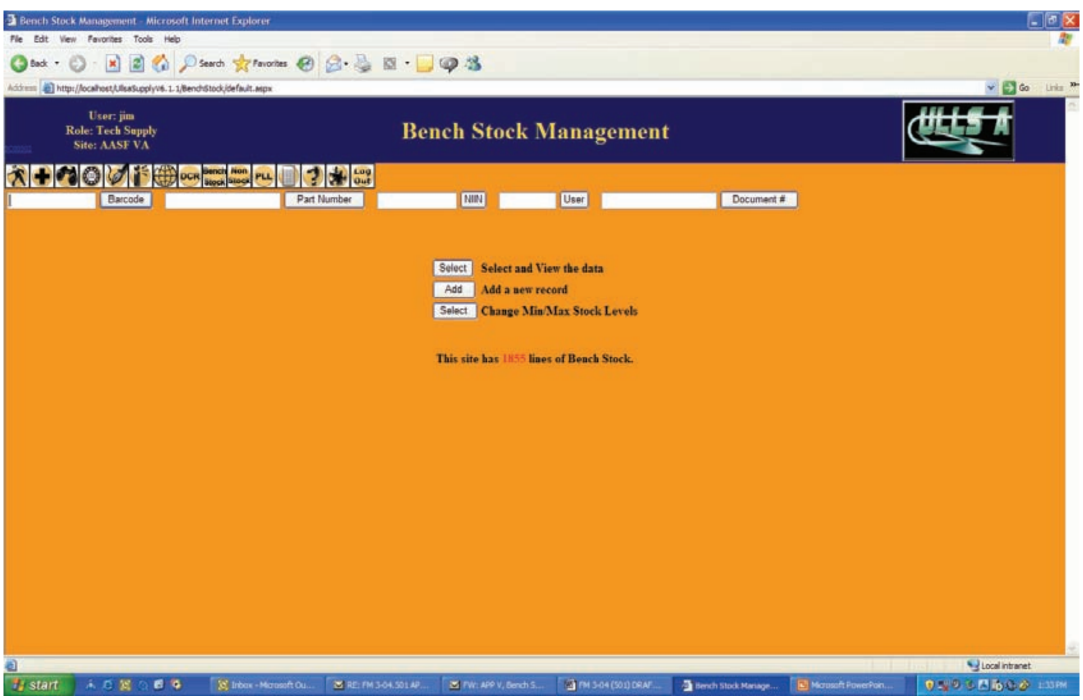


Figure U-2. ULLS–A bench stock management screen

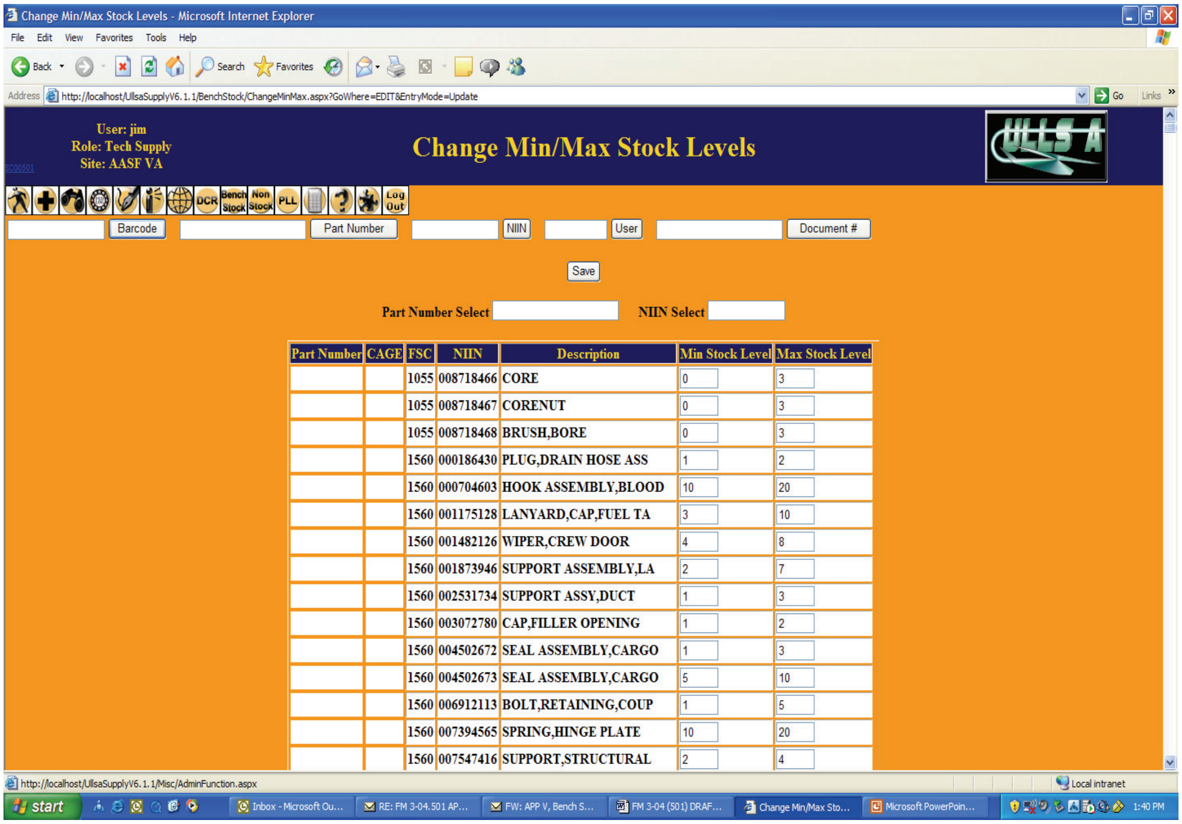
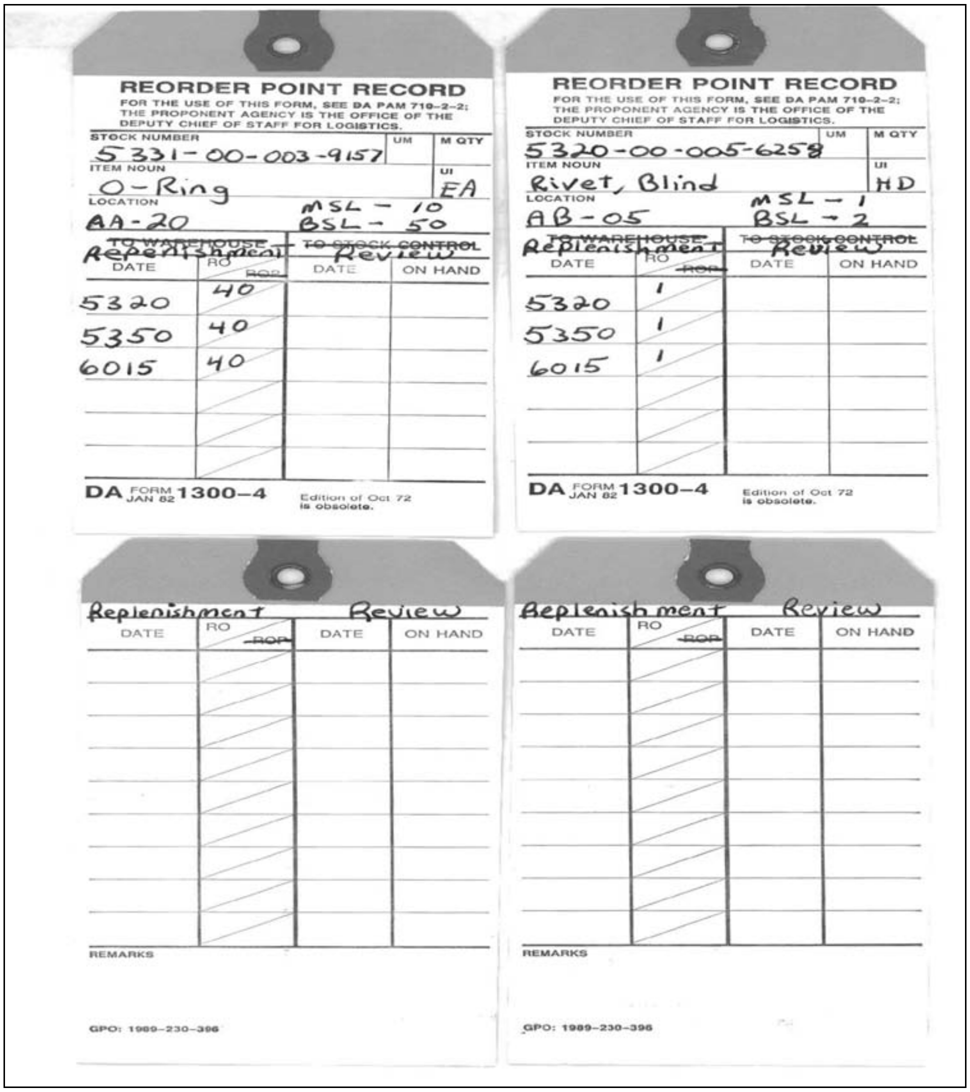


Figure U-3. ULLS–A bench stock change minimum/maximum stock levels

PROCEDURES FOR BENCH STOCK REPLENISHMENT TAGS

U-6. The aviation logistics/technical supply personnel will provide instructions to maintenance personnel on how to use DA Form 1300–4 (Reorder Point Record) as a bench stock replenishment tag. They will place the tag in or near the location of each bench stock item or in a consolidated file collocated with the items. Essential data elements of the bench stock replenishment tag are the following: stock number, unit of issue, item noun, basic stockage level (BSL), minimum stockage level (MSL), location, julian date ordered, and quantity ordered.

U-7. When a replenishment request for a bench stock item is submitted, enter the date and quantity from the request on the left side of the tag. The right side of the tag can be used to record results of the semiannual bench stock reviews. Use of an alternate form is authorized when conditions such as bin size preclude the use of the DA Form 1300–4; however, all data elements must be used to ensure continuity if an alternative or locally prepared form is used (see Figure U-4).


REORDER POINT RECORD
FOR THE USE OF THIS FORM, SEE DA PAM 710-2-2; THE PROPONENT AGENCY IS THE OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS.
STOCK NUMBER: 5331-00-003-9157 | UM | M QTY
ITEM NOUN: O-Ring | UI: EA
LOCATION: AA-20 MSL - 10 BSL - 50
~~TO WAREHOUSE~~ Replenishment | ~~TO STOCK CONTROL~~ Review

DATE	RO ~~ROP~~	DATE	ON HAND
5320	40		
5350	40		
6015	40		

DA FORM JAN 82 1300-4 Edition of Oct 72 is obsolete.

REORDER POINT RECORD
FOR THE USE OF THIS FORM, SEE DA PAM 710-2-2; THE PROPONENT AGENCY IS THE OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS.
STOCK NUMBER: 5320-00-005-6258 | UM | M QTY
ITEM NOUN: Rivet, Blind | UI: HD
LOCATION: AB-05 MSL - 1 BSL - 2
~~TO WAREHOUSE~~ Replenishment | ~~TO STOCK CONTROL~~ Review

DATE	RO ~~ROP~~	DATE	ON HAND
5320	1		
5350	1		
6015	1		

DA FORM JAN 82 1300-4 Edition of Oct 72 is obsolete.

Replenishment Review

DATE	RO ~~ROP~~	DATE	ON HAND

REMARKS
GPO: 1989-230-396

Replenishment Review

DATE	RO ~~ROP~~	DATE	ON HAND

REMARKS
GPO: 1989-230-396

Figure U-4. Sample bench stock replenishment tag using DA Form 1300-4

U-8. The DA Form 1300-4 replenishment card (tag) captures usage of bench stock at the AMC user level. This information is necessary to establish a 30-day stock and an MSL (reorder point). Without a known usage for a known period, it is extremely difficult to establish a 30-day supply while eliminating excess stock.

U-9. Units should establish a method to determine actual usage for two review periods, and divide this quantity by 12 (12 months, two review periods) to determine an average 30-day stock. For example, during the first review period, 50 nuts were used and during the second review period, 40 of the same nuts were used. During the two review periods (12 months), 90 nuts were used. Dividing this by 12, the requirement for 30 days would be 7.5, rounded to 8 each.

U-10. If the nut comes in an issue of each, then 8 would be the maximum stock level and the minimum would be the established MSL. For items with an issue of one hundred (HD), then one hundred (or 1) would be the maximum stockage level and the minimum would be the established MSL.

U-11. To establish an MSL, aviation logistics/technical supply personnel determine the order-to-ship time and how many bench stock items are used during the order-to-ship time. That number would be the reorder point. To effectively manage the unit bench stock, eliminate excess, and establish a go-to-war bench stock, the user must first identify actual usage of this class of supply.

U-12. The authorized stock level, or BSL, is the maximum level authorized by the maintenance officer. When the MSL level is reached, it is time to reorder. The amount to reorder will be sufficient to return the stock level to the maximum.

PROCEDURES FOR REPLENISHMENT OF BENCH STOCK ITEMS

U-13. ULLS-A users will use the MSL method of replenishing bench stock as the STAMIS is defaulted to this method. Manual users can use the replenish as used, replenish on a schedule, a combination of as used or schedule, or the MSL system.

U-14. The MSL system is preferable because it is easier to manage and track usage of bench stock items. Tracking usage via the MSL facilitates technical supply personnel conducting semiannual reviews. The MSL replenishment system parallels the reorder point philosophy.

U-15. The recommended procedure for processing the replenishment is for technical supply to have the mechanics or crew chiefs pull the DA Form 1300-4 from the item location bin when the stockage level reaches the MSL. Technical supply personnel would then run the replenishment process in ULLS-A. Once the replenishment screen appears (Figure U-5) in NIIN sequence, technical supply personnel would tag the item and the system would run the replenishment request. ULLS-A will use the difference between the maximum level and minimum level to order the shortages (Figure U-5).

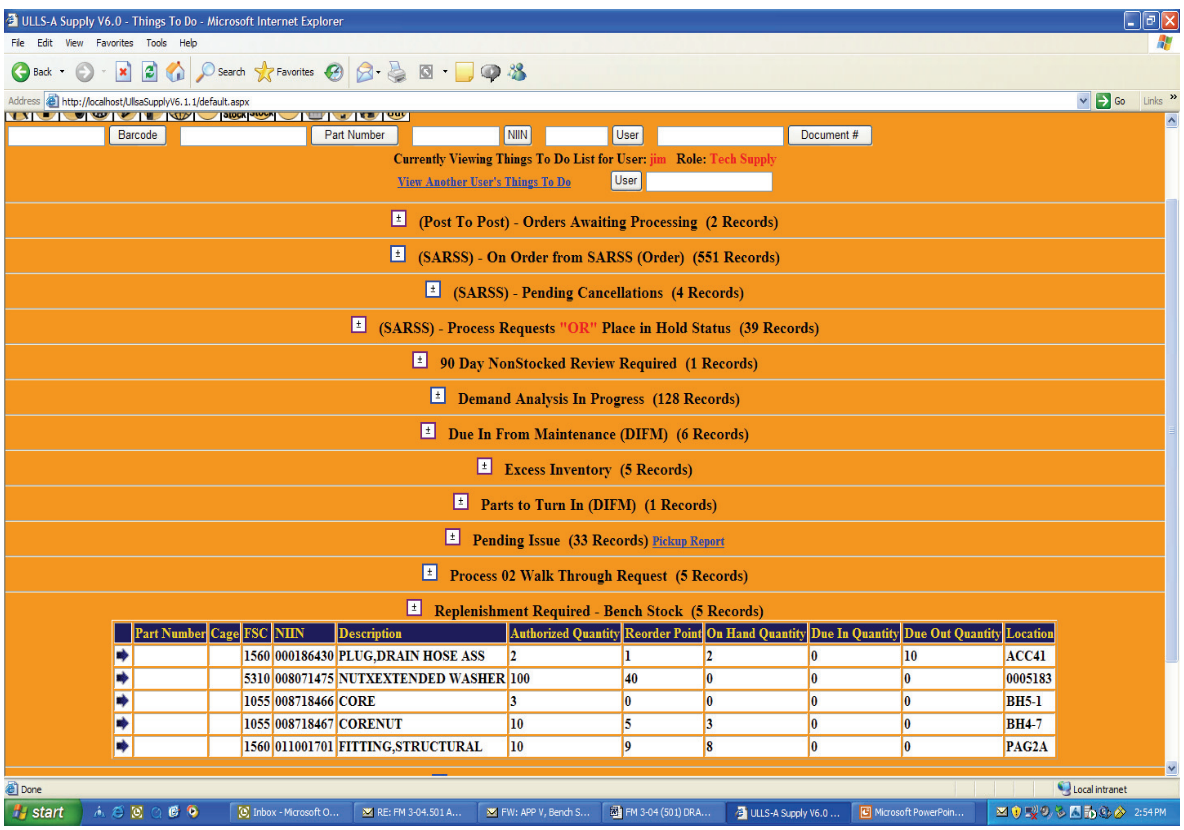


Figure U-5. ULLS–A bench stock replenishment screen

U-16. The minimum and maximum stockage levels once inputted (see Figures U-2 and U-3) should match the numbers reported on the corresponding DA Form 1300-4.

PROCEDURES FOR BENCH STOCK REVIEW PROCESS

U-17. The commander or maintenance officer/technician is required to conduct a semiannual review of the bench stock according to AR 710-2. This process is accomplished by reviewing the bench stock list and the usage/replenishment data on the DA Form 1300-4 (Bench Stock Replenishment Tag).

Note. The using unit should ensure that all replenishment requests are recorded on the replenishment tag. Figure U-6 shows an example of an ULLS-A bench-stock replenishment review list.

PREPARED: 20060614

UIC: WCMFD0 ORGANIZATION NAME: D CO 159TH AVN REGT DODAAC: W36N0T

SHOP CODE INSTRUCTIONS: IF PART IS TO BE REPLENISHED, INDICATE BY PLACING A ‘Y’ IN THE REPL DSG FIELD.

SHOP CD	LOC	NIIN	NOUN	MIN STCK LEVEL	DATE LAST REPLENISH	DATE LAST REVIEWED	REPL DSG	REPL REV	QTY REV
A	A0005	002542199	CONNECTI	2	20051124	20006023		1	3
A	A0001	000344641	CIRCUIT	4	20050922	20006023		0	0
A	A0002	000368617	CONNECTO	20	20051124	20006023		1	20
D	D0001	000573740	PACKING	10	20051124	20006023		1	10
D	D0005	008460504	PACKING	50	20051124	20006023		1	50
D	D0006	009093020	YOKE, BU	10	20050922	20006023		0	0
E	E0001	000364197	LIGHT, IN	50	20051124	20006023		1	50
E	E0003	000383914	CABLE AS	5	20050922	20006023		0	0
G	G0001	000366995	SEAL, NON	100	20051124	20006023		1	100
G	G0004	001539838	HANDLE, E	2	20050922	20006023		0	0
K	K0005	009115652	HARNESS	5	20050922	20006023		0	0
K	K0004	001433133	LAMP, INC	25	20050922	20006023		0	0
M	M0002	000531078	SCREWXMA	50	20050922	20006023		0	0
M	M0003	009230439	FILTER E	5	20051124	20006023		1	5
P	P0003	008571729	HOSE, NON	25	20050922	20006023		0	0

Figure U-6. ULLS-A example of a bench-stock replenishment review list

Glossary

SECTION I – ACRONYMS AND ABBREVIATIONS

A2	Army airspace
A2C2	Army airspace command and control
AA	assembly area
AAL	additional authorization
AAR	after-action review
AARMS	Army Aviation Readiness Management System
AASF	Army aviation support facility
AB	aviation brigade
ABCS	Army Battle Command System
ABF	availability balance file
ABL	ammunition basic load
AC	aircraft
ACFT	aircraft
ACL	Army Calibration Laboratories
ACofS	Assistant Chief of Staff
ACOR	administrative contracting officer representative
ACR	armored cavalry regiment
ACRC	Army Calibration and Repair Center
act	action
ADA	air defense artillery
admin	administrative
ADMRU	aviation depot maintenance round-out unit
ADP	automatic data processing
ADTDL	Army Doctrine and Training Digital Library
AED	aviation engineering directorate
AF	airfield
AFATDS	Advanced Field Artillery Tactical Data Systems
AFB	Air Force Base
AFTO	Air Force technical order
AG	Adjutant General
AGPU	auxiliary ground power unit
AGSE	aviation ground support equipment
AH	attack helicopter
AHB	assault helicopter battalion
AIS	Army Information Systems
AISM	automated information system manual

AIT	automated identification technology
AKO	Army Knowledge Online
AL	annual leave
ALD	available to load dates
ALIS	Automated Logistics and Integrated Systems
ALOC	air lines of communication
ALSE	aviation life support equipment
ALSS	aviation life support systems
ALT	Acquisition, Logistics, and Technology
AM	amplitude modulation
AMC	aviation maintenance company
AMCISS	AMC Installation Supply System
AMCOM	United States Army Aviation and Missile Command
AMCP	aircraft maintenance collection point
AMDF	Army master data file
ammo	ammunition
AMO	aviation maintenance officer
AMP	aviation maintenance platoon
AMSS	Army materiel status system
AMT	aviation maintenance troop
ANMCS	anticipated not mission-capable, supply
ANCOC	advanced noncommissioned officers course
AO	area of operation
AOA	Army oil analysis
AOAP	Army Oil Analysis Program
AOG	aircraft-on-ground
AOR	area of responsibility
APART	Annual Proficiency and Readiness Test
APD	Army Publishing Directorate
APOD	aerial port of debarkation
APOE	aerial port of embarkation
APP	appendix
APS	Army pre-positioned stocks
APU	auxiliary power unit
AR	Army regulation
ARB	attack reconnaissance battalion
ARC	accounting requirements code
ARFOR	Army forces
ARIL	automatic return item list
ARIMS	Army Records Information Management System
ARMD	armored

ARMS	Aviation Resource Management Survey
ARMT	armament
ARNG	Army National Guard
ARP	airframe repair platoon
ARS	attack reconnaissance squadron
AS	aviation support
ASAM	aviation safety action message
ASAP	as soon as possible
ASAS	all-source analysis system
ASB	aviation support battalion
ASC	aviation support company
ASCC	Army service component commander
ASE	aircraft survivability equipment
ASF	Army stock fund
ASG	area support group
ASI	additional skill identifier
ASIOE	associated support items of equipment
ASL	authorized stockage list
ASNCO	aviation safety NCO
ASO	aviation safety officer
ASP	ammunition supply point
assy	assembly
AT	antitank
ATAV	Army total asset visibility
ATC	air traffic control
atch	attached
ATHS	airborne target hand-over system
atk	attack
ATKHB	attack helicopter battalion
ATKHC	attack helicopter company
ATO	available to order
ATS	air traffic services
ATST	area TMDE support team
ATTN	attention
AU	all units
Aug	August
aug	augmentation
AUEL	automated unit equipment list
auth	authorization
auto	automatic
aux	auxiliary

AVCRAD	aviation classification repair activity depot
AVIM	aviation intermediate maintenance
AVLOG	aviation logistics
AVN	aviation
AVUM	aviation unit maintenance
AWCF	Army working capital fund
AWOL	absent without leave
AWR	airworthiness release
BAMO	brigade aviation maintenance officer
BBPCT	blocking, bracing, parking, crating, and tie-down
BCS3	battle command sustainment support system
BCT	brigade combat team
BDA	battle damage assessment
BDAR	battle damage assessment and repair
BDE	brigade
BDR	battle damage repair
begin	beginning
BFT	Blue Force Tracking
BII	basic issue item
BIIL	basic issue item list
BIT	built-in test
BITE	built-in test equipment
bk	book
BLDG	building
BMO	battalion movement officer
BN	battalion
BNCOC	basic noncommissioned officers course
BOIPFD	basis of issue plan feeder data
BOS	Battlefield Operating Systems
BR	branch
BS	bench stock
BSA	brigade support area
BSB	brigade support battalion
BSL	basic stockage level
C&RS	calibration and repair support
C2	command and control
C4I	command, control, communications, computers and intelligence
CAB	combat aviation brigade
CAGE	commercial and government entity (code)
CAFRS	centralized automated flight records
CAISI	combat service support automated information systems interface

CARC	chemical agent resistance coating
CASCOM	Combined Arms Support Command
cat	category
CAV	cavalry
CB	circuit breaker
C/B	center of balance
CBM	condition based maintenance
CBM+	condition based maintenance plus
CBNR	chemical, biological, nuclear, radiological
CBNRE	chemical, biological, nuclear, radiological, electromagnetic pulse
CBS	consolidated bench stock
cbt	combat
CBU	calibrate before use
CC	condition change
CCAD	Corpus Christi Army Depot
CCIR	commanders critical information requirements
CCSS	commodity command standard system
CD	compact disk
CDP	contingency deployment package
CDR	commander
CD-ROM	compact disk-read only memory
CE	communications-electronics
CECOM	Communications-Electronics Command
cen	center
CEO	communications-electronics officer
CFLCC	coalition force land component command
CFO	chief financial officer
CFR	Code of Federal Regulations
CFSR	civilian field service representative
CG	center of gravity
CH	cargo helicopter
CIIC	control inventory item code
CINC	commander in chief
CIV	civilian
CL	checklist
CLOE	common logistics operating environment
CLP	combat logistics patrol
CLS	contract logistics support
CMB	contact memory button
CMD	command
CMF	career management field

CMMI	command maintenance management inspection
CMOC	civil-military operations center
CNR	calibration not required
CofS	chief of staff
CO	commanding officer
co	company
COA	course of action
COE	contemporary operating environment
COEI	components of end items
COMM	communications
COMMZ	communications zone
COMSEC	communications security
con	control
CONOPS	concept of operations
CONUS	Continental United States
COOP	continuity of operations
COP	common operational picture
COR	contract officer representative
COTS	commercial off the shelf
CP	command post
CPC	corrosion-preventive control
CPM	combat phase maintenance
CPP	camouflage painting pattern
CPT	captain
CRAF	Civil Reserve Air Fleet
CRC	calibration and repair center
CRM	composite risk management
CRP	component repair platoon
CS	combat support
CSA	Chief of Staff of the Army
CSB	corps support battalion
CSG	combat service group
CSM	command sergeant major
CSS	combat service support
CSSAMO	CSS automation management office
CSSB	combat service support battalion
CSSCS	combat service support control system
CSS SATCOM	combat service support satellite communications
CTA	common tables of allowances
CTASC	Corps Theater Automated Data Processing Service Center
CTIL	commander’s tracked item list

CTL	connect the logistican
CUCV	commercial utility cargo vehicle
CVR	cockpit voice recorder
CW5	chief warrant officer five
CY	calendar year
D	durable; day
DA	Department of the Army
DAAS	defense automatic addressing system
DAASC	defense automatic addressing system center
DAC	Department of the Army civilian
DACG	departure airlift control group
DAMO	division aviation maintenance officer
DA PAM	Department of the Army Pamphlet
DART	downed aircraft recovery team
DCAMIS	data collection and analysis management information system
DCM	depot classification mission
DCP	deployable command post
DCR	document control register
DCS	deputy chief of staff
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations and Plans
DDN TAC	defense data network terminal access controller
DE	detachment
DEL	deployment equipment list
DESX	DEfense Supply eXpert
DET	detachment
DEW	directed-energy weapon
DFAR	Department of Defense Acquisition Regulation
DFAS	Defense Finance & Accounting Service
DIR	director(ate)
DIV	division
DLA	Defense Logistics Agency
DLIS	Defense Logistics Information Service
DLR	depot-level reparable
DMC	distribution management center
DMO	distribution management officer
DMRD	defense management review decision
doc	document
DOD	Department of Defense
DODAAC	Department of Defense activity address code
DODI	Department of Defense Instruction

DOL	Directorate of Logistics
DOS	days of supply
DOT	Department of Transportation
DOTD	Directorate of Training and Doctrine
DOTMLPF	doctrine, organization, training, materiel, leader development, personnel and facilities
DPTM	Directorate of Plans, Training, and Mobilization
DPW	Directorate of Public Works
DR	deficiency report
DRMO	Defense Reutilization and Marketing Office
DS	direct support
DS2	decontaminating solution 2
DSA	division support area
DSC	distribution stockage code
DSCC	Defense Supply Center, Columbus
DSCP	Defense Supply Center, Philadelphia
DSCR	Defense Supply Center, Richmond
DSK	deployment support kit
DSL	digital subscriber line
DSN	defense switched network
DSS	direct support system
DSU	direct support unit
DTO	division transportation officer
DTS	Defense Transportation System
DVD	digital video disk
DW	data warehouse
E2E	end to end
EA	engagement area
EAB	echelons above brigade
EAC	echelons above corps
EAD	echelons above division
EAPS	engine air particle separation
EC	essentiality code
EC3	embedded command and control and communications
ECAP	environmental compliance achievement program
ECAS	Environmental Compliance Assessment System
ECC	equipment category code
ECO	environmental compliance officer
ECOD	estimated cost of damage
ECP	emergency change proposal
ECTM	engine-trend monitoring

ED	embedded diagnostics
EDD	estimated delivery date
EETF	electronic equipment test facility
EGT	exhaust gast temperature
EIC	end item code
EIR	equipment improvement recommendation
eMILPO	electronic military personnel office
EMO	environmental management officer
EMP	electromagnetic pulse
EOM	end of mission
EP	embedded prognostics
EPA	Environmental Protection Agency
ERFS	extended range fuel system
ERP	enterprise resource planning
ESSC	electronic service support center
ESSS	external stores support system
est	estimated
ETM	electronic technical manual
ETM-I	electronic technical manual-interface
ETS	expiration term of service
EUM	end users manual
EUSA	Eighth United States Army
EW	electronic warfare
exp	expire
1SG	first sergeant
FAA	Federal Aviation Administration
FAD	force activity designator
FARP	forward arming and refueling point
FBCB2	Force XXI battle command brigade and below
FC	fire control
FCS	Future Combat System
FDR	flight data recorder
FEDLOG	Federal Logistics
FEDS	flexible engine diagnostic system
FFMIA	Federal Financial Mangement Improvement Act
FHP	flying hour program
FIFO	first in, first out
fig	figure
FIST	fire support team
fld	field
FLIS	Federal Logistics Information System

FLOT	forward line of own troops
FLT	flight
FLY	flyable
FM	field manual; frequency modulation
FMC	fully mission capable
FMO	forms management officer
FMT	field maintenance team
FOD	foreign object damage
FORMDEPS	Forces Command Mobilization and Execution Planning System
FORSCOM	Forces Command
FOUO	for official use only
FR	Federal Register
FRA	forward repair activity
FRAGO	fragmentary order
FRT	freight
FS	fire support
FSB	forward support battalion
FSC	forward support company
FSCP	flight safety critical parts
FSE	fire support element
FSO	fire support officer
FSR	field support representative
ft	feet
FWD	forward
FWT	fair wear and tear
FY	fiscal year
G1	Assistant Chief of Staff (Personnel)
G2	Assistant Chief of Staff (Intelligence)
G3	Assistant Chief of Staff (Operations and Plans)
G4	Assistant Chief of Staff (Logistics)
G5	Assistant Chief of Staff (Civil Affairs)
GA	Georgia
GA-ASI	General Avionics-Aeronautical Systems Incorporated
GCCS	Global Command and Control System
GCSS	Global Command Support System
GCSS-A	Global Command Support System-Army
GEN	general
GFE	Government furnished equipment
GIG	global information grid
G/L	ground/land
GND	ground

GP	group
GS	general support
GSA	General Services Adminstration
GSAB	general support aviation battalion
GSE	ground support equipment
GSU	general support unit
GTA	graphic training aid
GTN	global transportation network
GUI	graphic user interface
GWOT	global war on terrorism
GWT	gross weight
H	hours
HAZCOM	hazardous communications
HAZMAT	hazardous material
HAZMIN	hazard minimization
HBCT	heavy brigade combat team
HD	hundred
HEL	helicopter
heli	helicopter
HELLFIRE	heliborne fire and forget missile (system)
HF	high frequency
HHB	Headquarters and Headquarters Battalion
HHC	Headquarters and Headquarters Company
HHD	Headquarters and Headquarters Detachment
HHT	Headquarters and Headquarters Troop
HIT	health indicator test
HM	hazardous material
HMMWV	high mobility multipurpose wheeled vehicle
HN	host nation
HNS	host nation support
HOSP	hospital
HQ	headquarters
HQDA	Headquarters, Department of the Army
HR	hour
HSC	headquarters and supply company
HSS	horizonal store support
HUMS	Health Utilization Monitoring System
HW	hazardous waste
hy	heavy
I&S	interchangeability and substitutability
IAC	Information Analysis Center

IAIC	immediate action interim change
ICP	inventory control point
ICRC	installation calibration and repair center
ICS	intercommunications system
ICS3	integrated combat service support system
ID	identification
IDN	initial distribution number
IED	improvised explosive device
IETM	interactive electronic technical manual
IEW	intelligence and electronic warfare
IFR	instrument flight rules
IFTE	intermediate forward test equipment
IGNAT	Improved GNAT
IHFR	improved high-frequency radio
IL	identification list
ILAP	integrated logistics analysis program
IMMC	installation materiel maintenance center
IMMO	installation materiel maintenance officer
IMRF	instrument master record file
inop	inoperative
INSCOM	United States Army Intelligence and Security Command
INTEL	intelligence
INTL	international
IP	Internet protocol
IPD	initial priority designator
IPS	inlet particle separation
IR	infrared
ISA	installation staging area
ISAQ	interim statement of airworthiness qualification
ISB	intermediate staging base
ISS	Installation Supply System
IT	information technology
I/TDA	installation/table of distribution and allowances
ITV	in-transit visibility
IUID	item unique identification
J-AIT	Joint-Automatic Identification Technology
JC2	Joint Command and Control
JCLOP	joint command logistics operating picture
JDLM	joint deployment and logistics model
JIM	joint, interagency, and multinational
JLWI	joint logistics warfighting initiatives

JOA	joint operations area
JP	joint publication
JRTC	Joint Readiness Training Center
JTA	joint table of authorization/allowances
JTF	joint task force
K	kilometers
KAMNET	knowledge asset management network
km	kilometers
KVDT	keyboard video display terminal
lab	laboratory
LAMS	large area maintenance shelter
LAN	local area network
LAO	logistics assistance office
LAP	logistics assistance program
LAR	logistics assistance representative
LASSO	logistics automation systems support office
LCF	legitimate code file
LCMC	life cycle management command
LCOP	logistics common operating picture
LDSS	Leader Development Support System
LEAD	Letterkenny Army Depot
LIDB	logistics integrated database
LIN	line item number
LM	logic module
LMP	Logistics Modernization Program
LMP+	Logistics Modernization Program Plus
LNO	liaison officer
LO	lubrication order
LOA	letter of authorization
LOC	lines of communication
LOG	logistics
LOGCAP	logistics civil augmentation program
LOGMOD	logistics modernization
LOGQRT	logistics quick reaction team
LOGSA	logistics support activity
LOGTAADS	Logistics Army Authorization Document System
LOS	line of sight
LOTS	logistics on-line tracking system
L/R	launch and recovery
LRP	logistics resupply point
LRU	line replaceable unit

LSE	logistics support element
LT	light
LZ	landing zone
M	miles; month
MAC	maintenance allocation chart
MACE	mobilization AVCRAD control element
maint	maintenance
MAIT	maintenance assistance and instruction team
MAM	maintenance advisory message
MARC	Manpower Requirements Criteria
MAT	materiel
MATCAT	materiel category
MBA	main battle area
MC	mission capable
MC4	Medical Communications for Combat Casualty Care
MC4/TMP	Medical Communications for Combat Casualty Care/Troop Medical Procedures
MCN	management control number
MCO	movement control officer
MCP	maintenance collection point
MCS	Maneuver Control System
MCSR	materiel condition status report
MDMP	Military Decision Making Process
MDS	mission design series
ME	maintenance (test pilot) evaluator
med	medical
MEDCOM	Medical Command
MEDEVAC	medical evacuation
MEP	Mission Essential Program
METL	mission essential task list
METT-TC	mission, enemy, terrain, troops, time available, and civilian considerations
MFOQA	military flight operations quality assurance
MFP	materiel fielding plan
MGT	management
MI	military intelligence
MIG	metal inert gas
MIL	military
MILSTRIP	Military Standardization Requisitioning and Issue Procedures
MIM	maintenance information message
MISM	Army major items systems map
MM	maintenance manager

mm	millimeter
MMC	materiel management center
MMDF	maintenance master data file
MME	missile maintenance equipment
MMS	mast mounted sight
MOC	maintenance operational check
MOGAS	motor gasoline
MOOTW	military operations other than war
MOPP	mission-oriented protective posture
MOS	military occupational specialty
MOST	maintenance, flight operations, safety, and training
MP	military police
MPN	MSE packet network
MRE	meals ready to eat
MRM	maintenance reporting and management
MRO	materiel release order
MSC	major support command
MSDS	material safety data sheet
MSE	mobile subscriber equipment
MSG	master sergeant
msl	missile
MSL	minimum stockage level
MSN	mission
MSR	main supply route
MSS	missile sight subsystem
MST	maintenance support team
MTDA	modification table of distribution and allowances
MTF	maintenance test flight
MTOE	modification table of organization and equipment
MTP	maintenance test pilot; mission training plan
MTPC	maintenance test pilot's course
MTS	Movement Tracking System
MTTR	mean time to repair
MWO	modification work order
N	nonexpendable
NA	not applicable
NAMP	night aircraft maintenance program
NATO	North Atlantic Treaty Organization
NAV	navigation
NAVAID	navigational aid
NCIE	Network Centric Information Environment

NCO	noncommissioned officer
NCOIC	noncommissioned officer in charge
NCS	net control station
NDI	nondestructive inspection
NDT	nondestructive testing
NEC©	national electrical code
NET	New Equipment Training
NETCOM	Network Enterprise Technology Command
NFC	national fire code
NFPA	National Fire Protection Association
NG	National Guard
NICAD	nickel cadmium
NICP	National Inventory Control Point
NIIN	national item identification number
NIPR	non-classified Internet protocol router network
NIST	National Institute of Standards and Technology
NLT	not later than
NM	nautical mile
NMC	not mission-capable
NMCE	not mission capable, equipment
NMCM	not mission-capable, maintenance
NMCS	not mission-capable, supply
NMM	national maintenance management
NMP	National Maintenance Program
NPFC	Navy Publications and Forms Center
NPT	nonproductive time
NRB	natural resources branch
NRI	net radio interface
NSN	national stock number
NTC	National Training Center
num	number
NVG	night vision goggles
O&M	operations & maintenance
OBSN	observation
OCIE	organizational clothing and individual equipment
OCM	on-condition maintenance
OCOKA	Observation, Cover and Concealment, Obstacles, Key Terrain, Avenues of Approach (battlefield terrain)
OCONUS	Outside Continental United States
OCR	optical character reader
ODCS	office of the deputy chief of staff

ODCSLOG	Office of the Deputy Chief of Staff for Logistics
OEF	Operation Enduring Freedom
OEM	original equipment manufacturer
OF	other fixed wing (code)
OH	observation helicopter
OHR	operational hazard report
OIC	officer in charge
OIF	Operation Iraqi Freedom
OJT	on-the-job training
OLR	on-location repair
OMA	operation and maintenance, Army
ONS	operational needs statement
OP	operator
OPCON	operational control
OPLAN	operation plan
OPORD	operation order
OPS	operations
OPSEC	operations security
OPTEMPO	operational tempo
OR	operational readiness
ORD	operational requirements document
ORF	operational readiness float
org	organization
ORIL	overaged reparable item list
ORL	office record list
OS	operational support
OSA	Operational Support Airlift
OSAA	Operational Support Airlift Agency
OSC	operations support command
OSHA	Occupational Safety and Health Administration
OSJA	Office of the Staff Judge Advocate
OST	order ship time
OT	overtime
OTMS	operations, training, maintenance, and safety
OTR	one-time repair
OV	OSA validator
P	promotable
P4T2	problem, plan, people, parts, time and tools
P&P	procurement and production
PA	Pennsylvania
PAM	pamphlet

PARA	paragraph
PARC	prinicipal assistant responsible for contracting
PB	property book
PBA	performance based agreement
PBL	performance based logistics
PBO	property book officer
PBUSE	property book unit supply enhanced
PC	production control
PCA-BS	production control administrator – back shops
PCB	polychlorinated biphenyl
PD	priority designator
PE	periodic
PEO	program executive officer
PERS	personnel (U.S. Army)
PERSCOM	Personnel Command
PERSTEMPO	personnel tempo
PFC	private first class
PGSE	peculiar ground support equipment
PIC	pilot in command
PID	personnel identification code
P-level	primary level
PLL	prescribed load list
PLM+	product life cycle management plus
PLT	platoon
PLT SGT	platoon sergeant
PM	program manager
PMA	platform maintenance application
PMC	partially mission capable
PMCS	preventive maintenance checks and services
PMD	preventive maintenance daily
PME	platform maintenance environment
PM-LIS	Product Manager-Logistics Information System
PMO	project management office
PMS	preventive maintenance services
PNVS	pilot's night vision system
POC	point of contact
POD	port of debarkation
POE	port of embarkation
POL	petroleum, oils, and lubricants
PPE	personal protective equipment
PPM	progressive phase maintenance

PPP	power projection platform
PQDR	product quality deficiency report
PR	personnel recovery
PRAM	preliminary report of aircraft mishap
proj	project
prop	property
PSG	platoon sergeant
PSI	pounds per square inch
PT	productive time
pub	publication
PV2	private second class
QA	quality assurance
QAR	quality assurance representative
QC	quality control
QDR	quality deficiency report
QM	quality management
QSS	quick supply store
qty	quantity
R	rounds
R&R	repair and replace
RA	raid
RC	retirement change
RCC	rescue coordination center
RCF	repair cycle float
RCM	reliability centered maintenance
RDD	required delivery date
recon	reconnaissance
REP	repair
retrans	retransmission
RF	radio frequency
RFID	radio frequency identification
RF-ITV	radio frequency- intransit asset visiblity
RI	retention item
RIC	routing identifier code
RL	readiness level
RM	reparable management
RO	requisitioning objective
ROM	received ouput message
ROP	reorder point
RPM	revolutions per minute
RPR	repaired

RPSTL	repair parts and special tools list
rpt	report
rqd	required
RQR	required
RSF	retail stock fund
RSO	radiation safety officer
RSO&I	reception, staging, onward movement and integration
RSOP	readiness standing operating procedures
RTF	ready to fight
RX	reparable exchange
S1	adjutant
S2	intelligence officer
S3	operations and training officer
S4	supply officer
S5	Civil Affairs Officer
S6	communications officer
S&RL	sense and respond logistics
S&S	supply and service
SAAS	Standard Army Ammunition System
SAILS	Standard Army Intermediate Level Supply System
SALE	Single Army Logistics Enterprise
SAMS	Standard Army Maintenance System
SAMS-1	Standard Army Maintenance System-Level One
SAMS-2	Standard Army Maintenance System-Level Two
SAMS-E	Standard Army Maintenance System-Enchanced
SAR	system access request
SARSS	Standard Army Retail Supply System
SARSS-1	Standard Army Retail Supply System-Level 1
SARSS-2	Standard Army Retail Supply System-Level 2
SARSS-G	Standard Army Retail Supply System-Gateway
SATCOM	satellite communication
SB	supply bulletin
SC	supply catalog
SCA	supply control activity
SC-BS	shops chief - back shops
SCP	standard change package
SCT	scout
SC(T)	sustainment command theater
SDDC	Surface Deployment and Distribution Command
SDF	support deployed forces
SDI	SAGE database inquiry

SDS	standard depot system
SEALOC	sea lines of communications
sec	section
SECM	shop equipment contract maintenance
Sep	September
ser	serial
serno	serial number
SFC	sergeant first class
SFDLR	Stock Funding of Depot Level Reparables
SGM	sergeant major
SGT	sergeant
SIG	signal
SITREP	situation report
SJA	Staff Judge Advocate
SKO	sets, kits, outfits
SKOT	sets, kits, outfits, tools, and special tools
SLAC	support list allowance card
SLC	stockage list code
SLEP	Service Life Extension Program
S-level	secondary level
SMA	supply maintenance-Army
SME	subject matter expert
SMR	source, maintenance and recoverability
SN	serial number
SOF	safety of flight
SOP	standing operating procedures
SOR	source of repair
SOS	source of supply
SOW	statement of work
SPBS-R	Standard Property Book System – Redesign
SPC	specialist
SPO	support operations office
SPOD	seaport of debarkation
SPOE	seaport of embarkation
SPT	spt
SQD	squadron
SQDN	squadron
SR	senior
SRA	specialized repair activity
SRC	standard requirements code
SRO	stock records officer

SRU	shop replacement units
SSA	supply support activity
SSF	single stock fund
SSG	staff sergeant
SSL	shop stock list
SSN	social security number
STAMIS	Standard Army Management Information System
STANAG	standardization agreement
STARC	State area command
STARPUBS	Standard Army Publications System
ST-BS	shop technician – back shops
STICOM	Simulations Training and Instrumentation Command
STP	Soldier training publication
STTE	special tools and test equipment
SUMS	Spectrum Use Management System
SUP	supply
SUPV	supervisor
SURG	surgeon
svc	service
SWA	Southwest Asia
SYS	system
TA	theater army
TAA	tactical assembly area
tac	tactical
TAC	terminal access controller
TACCS	Tactical Army Combat Service Support Computer System
TACOM	Tank-Automotive and Armament Command
TACOPS	tactical operations
TACSAT	tactical satellite
TACSOP	tactical standing operating procedures
TADS	target acquisition designation sight
TAMMS	The Army Maintenance Management System
TAMMS-A	The Army Maintenance Management System-Aviation
TAMP	theater aviation maintenance program
TASM	theater aviation sustainment maintenance
TASMC	theater aviation sustainment maintenance capability
TASMG	theater aviation sustainment maintenance group
TASO	terminal area security officer
TAV	total asset visibility
TB	technical bulletin
TBO	time before overhaul

TBP	to be published
TC	training circular
TCN	transportation control number
TCS	temporary change of station
TDA	table of distribution and allowances
TDC	theater distribution center
TDD	things-to-do
TDE	test and diagnostic equipment
TDY	temporary duty
TEAC	turbine engine analysis check
tech	technical
TECOM	Testing and Evaluation Command
TEDB	TAMMS equipment database
TF	task force
TI	technical inspector
TI-BS	technical inspector-back shops
TLCSM	total life-cycle systems management
TLDD	tactical logistics data digitization
TM	technical manual
TMDE	test, measurement, and diagnostic equipment
TMDE-SP	test, measurement, and diagnostic equipment-support program
TMP	transportation motor pool
TNG	training
TO	technical order
TOC	tactical operations center
TOE	table of organization and equipment
TOPN	theater of operations
TOW	tube-launched optically tracked wire-guided (missile)
TPFDD	time-phased force deployment data requirements
TPS	test program set
TRADOC	Training and Doctrine Command
TRANS	transportation
TRANSCOM	Transportation Command
TRP	troop
TS	technical supply
TSA	TMDE Support Activity
TSC	theater sustainment command
TSC MMC	Theater Support Command Materiel Management Center
TSO	TMDE support office
TUAV	tactical unmanned aircraft system
TWX	teletype message

TYAD	Tobyhanna Army Depot
UAS	unmanned aircraft system
UBL	unit basic load
UH	utility helicopter
UHF	ultra high frequency
UIC	unit identification code
UID	unique identification
UII	unique item identification
UIT	unique item tracking
ULLS	Unit-Level Logistics System
ULLS-G	Unit-Level Logistics System-Ground
ULN	unit line number
UMC	unit movement coordinator
UMMIPS	Uniform Materiel Movement and Issue Priority System
UMO	unit movement officer
UND	urgency of need
U.S.	United States
USAALS	United States Army Aviation Logistics School
USAAMC	United States Army Aeromedical Center
USAAWC	United States Army Aviation Warfighting Center
USACE	United States Army Corps of Engineers
USACRC	United States Army Combat Readiness Center
USAF	United States Air Force
USAMC	United States Army Materiel Command
USAPA	United States Army Publishing Agency
USAPSL	United States Army Primary Standards Laboratory
USAREUR	United States Army European Command
USATA	United States Army TMDE Activity
USFK	United States Forces Korea
USP&FO	United States Army Property and Fiscal Officer
USR	unit status report
USTRANSCOM	United States Transportation Command
util	utility
UTO	unit task organization
VA	Virginia
VMEP	vibration management enhancement program
vs	versus
VSP	vertical stores pylon
WAN	wide area network
WARCO	warranty control officer
WEBVLIPS	Web Visual Logistics Information Processing System

WO	work order
WO3	Warrant Officer Three
WO4	Warrant Officer Four
WO5	Warrant Officer Five
WON	work order number
WPN	weapon
WSF	wholesale stock fund
WSRO	weapons system replacement operations
WSSM	Weapons System Support Module
WUC	work unit code
WX	weather
X	times (multiplication)
XMSN	transmission
XO	Executive Officer
Y	yes
yd	yards
yr	year

SECTION II – TERMS

assessor

A trained maintenance technician whose function it is to assess aircraft battle damage

battle damage assessment

The process used to determine if repair of a battle-damaged aircraft or system can be safely deferred either for a one-time evacuation flight of the aircraft or to return the aircraft to service for a limited number of flight hours; the three major tasks of battle-damage assessment are damage inspection, damage evaluation, and repair deferability assessment

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