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DEPARTMENT OF THE ARMY FIELD MANUAL

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MAINTENANCE BATTALION AND COMPANY OPERATIONS (NONDIVISIONAL)

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JULY 1968

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 18 September 1970

**MAINTENANCE BATTALION AND COMPANY OPERATIONS
(NONDIVISIONAL)**

FM 29-22, July 1968, is changed as follows:

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By Order of the Secretary of the Army:

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WASHINGTON, D.C., 26 July 1968

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*This manual supersedes FM 29-22, 6 July 1965, including C 1, 14 March 1967, and applicable portions of FM 29-21 (TEST), 7 April 1967; and together with FM 29-20, 26 July 1968 and FM 29-30, 26 July 1968, supersedes FM 55-45, 1 June 1965.

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CHAPTER 1

INTRODUCTION

1-1. Purpose

a. This manual contains guidance in the organization and procedures employed to provide maintenance support of Army materiel in the theater of operations. Emphasis is placed on nondivisional direct support (DS) and general support (GS) maintenance (as defined in AR 750-1) of class VII and IX materiel and certain other supported equipment items, to include repair and calibration of various tools and testing equipment.

b. Specifically, this manual is designed to:

(1) Describe the nondivisional direct and general support maintenance system provided within the field army area and the communications zone in a theater of operations.

(2) Identify the various nondivisional maintenance units employed to provide this support; to include their organization, mission, concept of operations, and relationship to the several types of headquarters engaged in controlling and directing maintenance operations.

(3) Serve as a guide at maintenance battalion and company levels for the provision of direct and general support maintenance services.

(4) Provide basic guidance for supported commanders and staff officers relative to the composition, employment and operating procedures of the maintenance and evacuation systems in order that they may be made aware of the support capabilities and limitations of the units providing them such support.

(5) Effect uniformity in teaching, training, and implementation of direct and general support maintenance procedures.

c. Users of this manual, acting within the scope of their designated authority, may vary

specific procedures contained herein when it is evident that such variations will result in improved maintenance service.

1-2. Scope

a. This manual encompasses the overall system and procedures employed to provide direct and general support maintenance, direct support repair parts supply, and maintenance-related functions for Army materiel within the theater of operations, from division rear boundary to the communications zone ports. Included are provisions for providing supplementary organizational maintenance and evacuation support to supported units, and backup maintenance and evacuation support to division maintenance elements of separate brigades.

b. Since the organization, mission, and operation of the division maintenance battalion are detailed in FM 29-30, mention of division maintenance in this manual is limited to relationships between the division maintenance battalion and supporting maintenance units operating in the corps area, and to procedures for providing backup and supplementary maintenance support to the divisions.

c. Appendix B provides a listing of types of materiel maintained by units covered in this manual, and an indication of the specific units that provide maintenance support for these items.

d. Exceptions to the maintenance support missions and capabilities of the DS and GS maintenance units addressed in this manual are listed below, together with indication of units responsible for providing maintenance and/or repair parts supply support for such commodities:

★(1) Class V maintenance support, to include class VII and IX components of large missile systems, is provided by elements of ammunition groups within corps support brigades or within the supply and maintenance command of TASCOM. For a comprehensive description of the class V support systems and procedures see FM 9-6, FM 9-38, and FM 9-59.

★(2) Medical materiel in the field army is supported by units of the FASCOM medical brigade; and within the communications zone by elements of the TASCOM medical command—particularly the medical depots. Pertinent information is contained in FM 8-10.

(3) Airdrop items are supported by the airdrop supply company of a supply and service battalion within an army support group or a field depot of the supply and maintenance command. Consult FM 29-45 for pertinent details.

(4) Certain topographic and printing equipment is maintained by the user. Appropriate technical manuals apply. See FM 5-146.

(5) Within the field army area, maintenance of clothing, bedding and light textiles is provided by elements of the supply and service battalions of corps and army support brigades. Similar units within the TASCOM supply and maintenance command provide such support for the communications zone. FM 21-15 and FM 29-45 apply.

(6) Although the support of cryptological systems is not a responsibility of the maintenance units covered in this manual, a brief discussion of crypto support is contained in chapter 7. For specific details on cryptologistics support refer to FM 29-11 (TEST).

1-3. Employment of Automatic Data Processing Systems (ADPS)

The employment of automatic data processing systems (ADPS) within maintenance support units will provide for the rapid processing and transmission of maintenance support data, and will serve to enhance the quality and timeliness of maintenance support and maintenance management at all levels. Detailed technical guidance and operating procedures are contained in procedural manuals furnished by the military or contract systems designers. Appropriate automatic data processing equipment (ADPE)

will be provided through MTOE action. For the application of ADP and maintenance management, see FM 29-20.

1-4. Application

a. Unless otherwise specified, the doctrine in this manual is applicable without modification to—

(1) General war, to include consideration for the employment of, and protection from, nuclear munitions and chemical, biological, and radiological agents.

(2) Limited war.

(3) Cold war, to include stability operations.

b. The manual also provides guidance for the employment of non-air defense weapons against low altitude air threat.

c. The manual is in consonance with the following International Standardization Agreements which are identified by type of agreement and number at the beginning of each appropriate chapter: STANAG 2113, Destruction of Military Technical Equipment, and SOLOG 75, Procedures for Repair and Recovery of Military Technical Equipment.

1-5. Recommended Changes

★Users of this manual are encouraged to submit recommendations to improve its clarity or accuracy. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and permit complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commanding Officer, US Army Combat Developments Command Maintenance Agency, Aberdeen Proving Ground, Maryland 21005. Originators of proposed changes which would constitute a significant modification of approved Army doctrine may send an information copy through command channels to the Commanding General, U.S. Army Combat Developments Command, Fort Belvoir, Virginia 22060, to facilitate review and followup.

CHAPTER 2

DIRECT SUPPORT MAINTENANCE UNIT ORGANIZATION, MISSION, AND FUNCTIONS

Section I. DIRECT SUPPORT MAINTENANCE IN THE FIELD ARMY

2-1. General

This section describes a type organization for a DS maintenance battalion. It includes the missions, organizations, and functions of the various units that comprise the battalion.

2-2. Organization of the DS Maintenance Battalion

a. Direct support maintenance battalions are assigned to the Field Army Support Command (FASCOM) and are attached to the support groups of the corps support brigades and the army support brigade. See FM 54-3 for details.

b. The DS maintenance battalion (fig 2-1) is a composite, functional organization in that it provides maintenance and repair parts support for a great variety of equipment. From this one supporting organization, a using unit receives direct support maintenance and repair parts support for the bulk of equipment in its possession. A capability for maintenance and repair parts support of certain high density missile systems (for class VII and IX components only) may also be provided.

c. The DS maintenance battalion contains a variable number of maintenance units attached to a headquarters team in accordance with the mission to be performed. A type DS maintenance battalion includes a headquarters and headquarters team, maintenance battalion; a maintenance company, rear, (DS); a transportation aircraft maintenance DS company; and two light DS maintenance companies. A rocket and missile support detachment (TOE 9-550)

may also be attached for support of high density missile systems. The units attached to the battalion are similar in organizational structure to the maintenance support units found in the ROAD division. Therefore, the DS maintenance battalion, or elements thereof, may be used to replace like type elements within a division maintenance battalion.

d. The battalion provides DS maintenance, repair parts supply, and evacuation support to nondivisional units of the combat zone. It also provides technical assistance services.

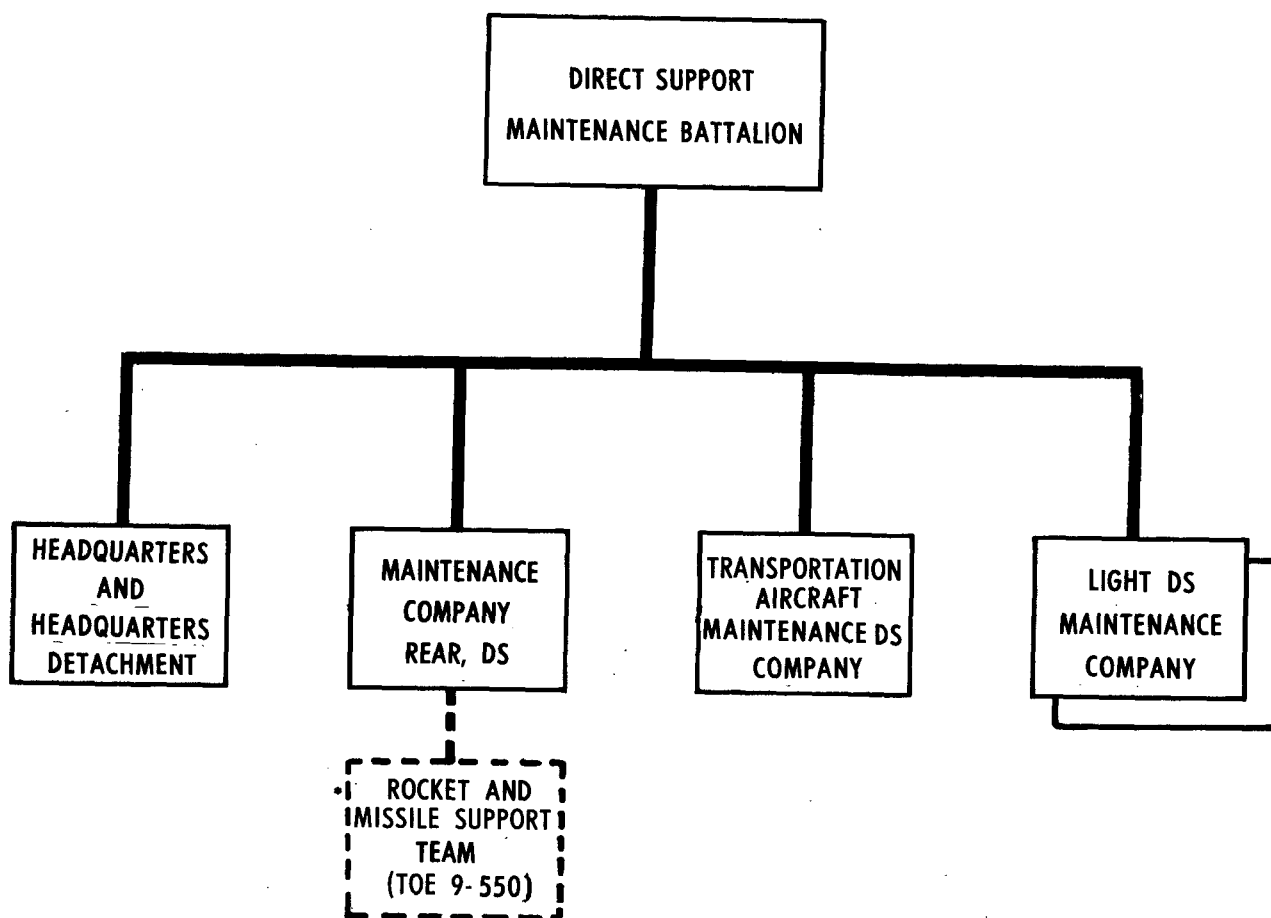
2-3. Headquarters and Headquarters Detachment, Maintenance Battalion

a. *Organization and Mission.* The detachment is organized as depicted in figure 2-2. It commands and exercises technical supervision and control over all combat service support units attached to the battalion. It also exercises supervision over and provides support to attached units in matters relating to administration, tactical operations, report preparation and submission, and training. A decontamination section may be attached to the battalion to provide limited decontamination support for units attached to the battalion. This detachment can be employed as the command and control organization for a DS or GS maintenance battalion.

b. *Functions of Unit Elements.*

(1) *Battalion headquarters.* This section consists of the battalion command element and staff officers.

(a) *Command element.* This element, consisting of the battalion commander, execu-



NOTE: These teams, TOE 9-550, are provided when required by densities of missile system equipment requiring support and the geographical position of units supported. These teams provide direct support maintenance and repair parts to high density missile systems such as Lance, Shillelagh, TOW, and Chaparral. These teams are normally attached to the ammunition group, but may be attached to the DS maintenance battalion. Further details on missile system support can be found in FM 9-6 and FM 9-59.

★Figure 2-1. Type organization DS maintenance battalion.

tive officer and sergeant major, performs all those functions associated with command, to include providing direction, effecting redeployment, establishing policies, exercising control, supervision and inspecting operations of attached units, planning, providing recommendations to the support group commander and commanders of supported units, and briefing the commanders and staffs of higher headquarters on battalion operations and problems.

(b) *Staff element.* This element consists

of staff officers who obtain, analyze, and furnish operational and technical information to the commander and higher headquarters; direct the operations of the various sections of the detachment; exercise staff supervision and direction over the operations of units attached to the battalion; and prepare and transmit estimates, plans, and instructions.

(2) *Detachment headquarters.* This section, commanded by the adjutant, provides personnel for the performance of detachment ad-

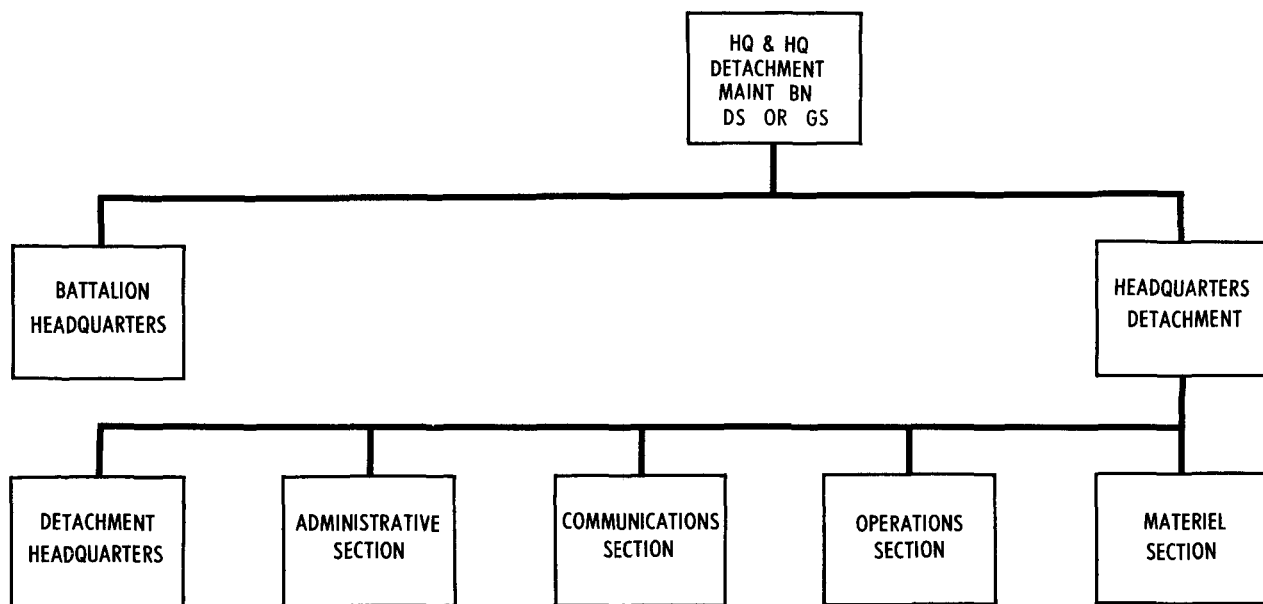


Figure 2-2. Headquarters and headquarters detachment, maintenance battalion.

ministration, unit supply, and organizational maintenance functions.

★(3) *Administrative*. This section, under the supervision of the adjutant, performs personnel, clerical, secretarial, duplicating, mailing, and related duties for the battalion headquarters. It provides advice and direction on matters relating to replacements, command correspondence, awards, records control, and administration. It maintains a central publications library and distributes pertinent publications to attached units. This section is also responsible for maintenance of a central classified document file and for maintaining battalion historical records.

(4) *Communications*. This section operates under the supervision of the operations officer and an officer who has been designated as "battalion communications officer." It provides battalion headquarters with 24-hour communications between battalion headquarters and adjacent, higher, and lower headquarters. It also operates the battalion communications message center.

(5) *Operations*. This section, under the supervision of the operations officer, performs the following functions:

(a) Maintains an up-to-date situation map and charts to keep the battalion commander and staff and all battalion elements aware of the operational and tactical situation. This map will include locations of battalion units, supported units, backup supporting activities, collecting points, and locations of suspected guerrilla activity.

(b) Collects and disseminates intelligence data and information on tactical operations, both enemy and friendly, to include existing or potential guerrilla activity, which affects battalion security and operations.

(c) Coordinates with other battalion staff officers to insure preparation and implementation of reasonable and realistic battalion plans and policies.

(d) Obtains and distributes maps, aerial photographs, and photo maps.

(e) Prepares agenda for conferences as necessary.

(f) Prepares and supervises the execution of area damage control plans, individual and unit training and tactical plans of the headquarters and battalion units, including counter-guerrilla, stability operations, and unit security operations.

(g) Coordinates reconnaissance for new locations for the battalion, including the selection of alternate areas. Also coordinates with the signal center providing communications by providing information on planned moves.

(h) Plans and supervises implementation of tactical security measures for the battalion, including security measures during displacement. Reviews plans of attached units for adequacy and conformity to battalion plans and policies. Establishes and supervises battalion training programs, working in close coordination with the materiel officer for technical training. Establishes and operates battalion-level schools as required.

(i) Collects, assembles, evaluates, and disseminates information within and for the battalion on matters affecting battalion operations.

(j) Serves as principal staff coordinator for the preparation of support plans, relocation of units, and mission assignments, and initiates action to accomplish same.

(k) Plans and coordinates the movement of battalion headquarters and attached units.

(l) Prepares, publishes, authenticates, and distributes battalion operations orders, movement orders, and SOP.

(6) *Materiel section.* This section, under the supervision of the materiel officer, is responsible for supervision and management of the battalion's maintenance, repair parts supply, and evacuation missions and resources. This section performs the following functions:

(a) Establishes necessary reports and controls to insure proper and successful accomplishment of the battalion mission.

(b) Provides advice and recommendations to the commander and staff on maintenance and repair parts supply matters.

(c) Prepares plans and policies for mission operations and assures that they are being followed and are functioning effectively based on broad guidance furnished by the commander, and instructions and information from the Maintenance Management Center (MMC) of the support brigade headquarters.

(d) Keeps the commander informed on progress, status, requirements, and anticipated or existing problems, including remedial action.

(e) Manages and supervises the battalion's technical mission and resources.

(f) Provides information to and coordinates with the operations section on the preparation of support plans, relocation of units, utilization of sites and facilities, training requirements, and mission assignments.

(g) Reviews and recommends changes to MMC actions to balance workloads among attached units.

(h) Informs attached units of evacuation policies and procedures.

(i) Collects and maintains policy files, technical information, instructions and guidance provided by the MMC or higher headquarters, and provides this information to attached units.

(j) Assures that effective procedures are followed to insure realistic stockage of maintenance supplies and their preservation and control through directives, direct contact, and followup practices. Insures that maintenance support operations are accomplished.

(k) Collects and evaluates reports, and takes appropriate action at battalion level on the basis of information indicated in these data. Reports are kept to a minimum and restricted to those that the battalion headquarters requires for operations.

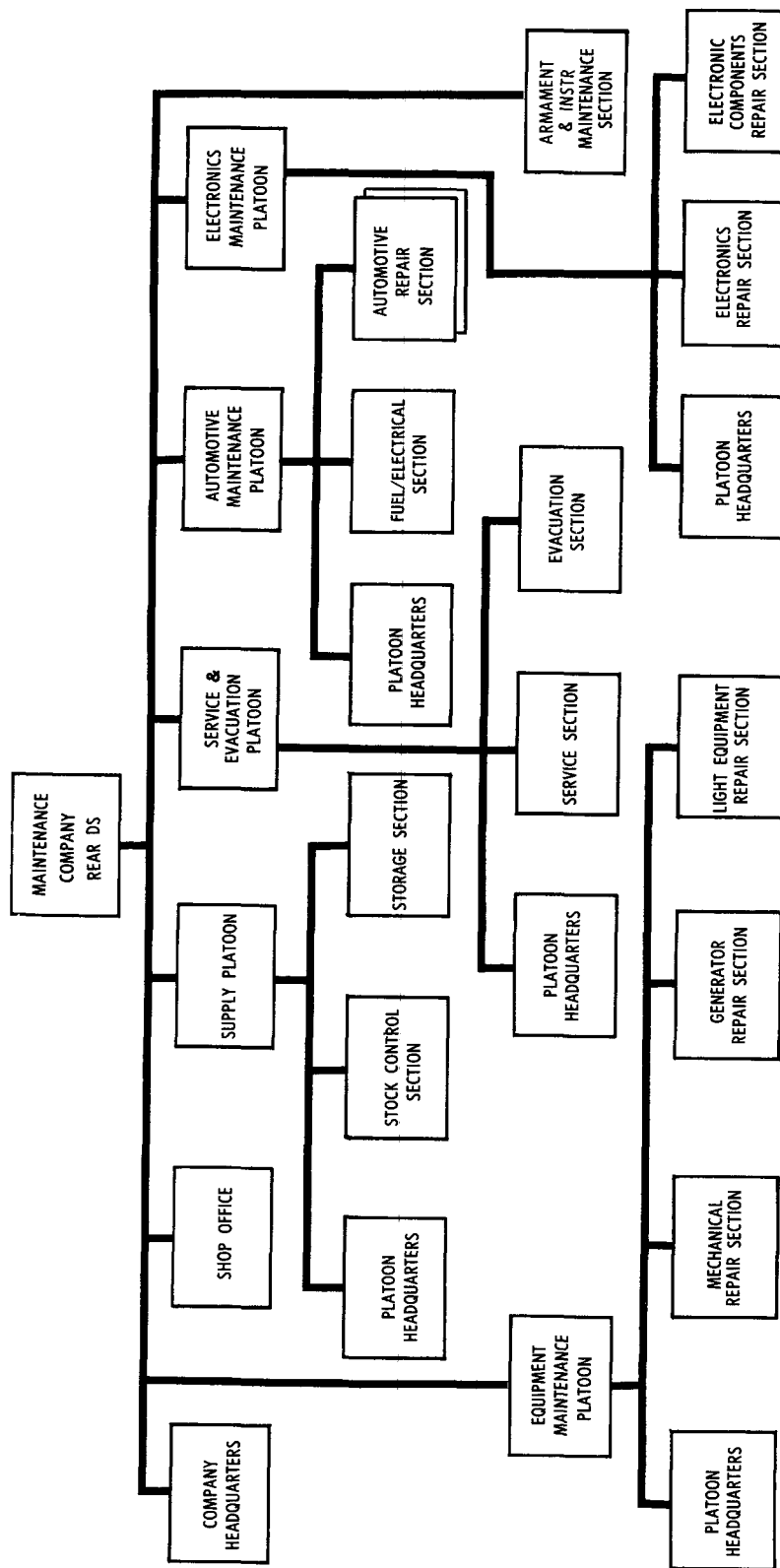
(l) Conducts visits to higher headquarters, attached units, and supported units.

(m) Conducts inspections of attached units to determine operational status.

(n) Supervises the technical training and cross-training of maintenance and maintenance-supply personnel, determines requirements and recommends policies for on-the-job training, and obtains reports on the progress of such training.

(o) Provides information on the characteristics, capabilities, and limitations of materiel.

(p) Establishes procedures and controls for the management of operational readiness float and direct exchange stocks, and reviews and approves, or disapproves, direct exchange lists of subordinate units. These procedures and controls must be in consonance with policies, procedures, and controls established by higher headquarters.



★Figure 2-8. Maintenance company, rear (DS)

(q) Maintains coordination with the MMC and group headquarters relative to workload status, problem areas, priorities, special instructions, repair parts requirements, and disposition of materiel requiring evacuation. FM 54-4 explains in detail organization and functions of group headquarters.

(r) Develops and implements techniques to assist in the control of workload within attached units of the battalion and to improve efficiency and production.

(s) Maintains close coordination with adjacent DS maintenance battalions to effect the exchange of maintenance information and the review and comparison of shop practices and techniques.

(t) Reviews reports, information letters, digests, and similar materiel generated as a result of maintenance data collection and analysis and provided by the MMC through group headquarters. Takes appropriate action with respect to this information.

(7) *Battalion supply.* This section, under the supervision of the supply officer is responsible for matters related to organizational supply operations of the detachment and attached units.

★2-4. Maintenance Company Rear (DS)

★*a. Organization and Mission.* This company is organized as indicated in figure 2-3. It provides DS maintenance, limited evacuation, and maintenance supply support to nondivisional units on an area support basis. When a missile support team is attached, this company also provides support for high density type missile systems.

b. Functions of Unit Elements.

(1) *Company headquarters.* This element performs the command, administrative, organizational supply, and organizational maintenance functions for the company. In addition, it provides messing and communications facilities.

★(2) *Shop office.* This element is responsible for operational control of technical mission functions of the company. It is normally divided into two elements—shop operations and inspection.

(a) The shop officer is responsible for coordination of all company activities engaged in mission operations; for administrative, management, and production control functions related to direct support maintenance operations; for direction of the evacuation of materiel that cannot be repaired by the company; for the dispatch of on-site maintenance teams and liaison teams; for interpreting and applying instructions and directives from the unit commander and higher headquarters; for planning and supervising production; for determination of repair priorities; for proper utilization of assets to achieve maximum production and efficiency; for scheduling shop workload input, including modification work order requirements; for developing operational procedures.

★(b) The inspection element determines the causes of unserviceability of equipment; prescribes the repairs required; assures the quality and completeness of work performed; prepares parts and job estimates; performs inspections as directed by the company commander; and recommends the further evacuation of work that exceeds the capabilities or capacity of the company.

(3) *Supply platoon.* This platoon is composed of a headquarters, a stock control section, and a storage section. It provides repair parts and maintenance materials required by company maintenance activities and supported units. The platoon is responsible for receipt, storage, informal accounting, and issuance of repair parts and other supply items, and for obtaining replenishment of its supply stocks. It also accomplishes supply documentation incident to the evacuation of materiel, provides technical assistance to supported units, and assists supported units in the establishment and maintenance of prescribed load lists (PPL) (see AR 735-35).

(4) *Service and evacuation platoon.* This platoon consists of a headquarters, and service and evacuation sections. The platoon headquarters supervises and controls operations of the platoon. The service and evacuation sections function as indicated below:

(a) *Service section.* This section provides allied trades support to other elements of the company and to supported units. It also pro-

vides services to other companies of the battalion, as necessary. Allied trades support includes welding, painting, metal body repair, radiator repair, the fabrication of parts and tools not otherwise available, and the repair of canvas/leather items such as holsters, binocular cases, vehicle canvas, upholstery, heavy tentage, and tarpaulins.

(b) *Evacuation section.* This section provides personnel and heavy equipment for heavy lift operations within the company, for lifting and transporting heavy items, and for performing recovery and evacuation operations. The capabilities of this section are also used to augment the recovery and evacuation capabilities of the light maintenance companies and supported units, as necessary.

(5) *Automotive maintenance platoon.*

★(a) This platoon performs DS maintenance on vehicular equipment of all types supported by the company to include material handling equipment. It contains a headquarters, which supervises and controls operations of the platoon, two automotive repair sections, and a fuel-electrical systems repair section. Each of the two automotive repair sections can operate independently; thus, one of the sections may perform its mission at the company base area while the other operates at a remote location (e.g., for the performance of on-site maintenance for extended periods).

(b) This platoon is one of the prime elements of the company maintenance shop. It performs maintenance on items directed to it by the shop office and provides personnel for on-site repairs at supported unit locations or at the site of equipment failure. Repair operations include both job-shop and bench-type repair, depending on the size and characteristics of the items involved. Maintenance functions performed by this platoon emphasize the repair of end items by the replacement of unserviceable components, with unserviceable components being evacuated to GS maintenance facilities for repair. Other repair functions include testing, adjustment, maintenance calibration, minor parts replacement, and the repair of fuel-electrical and brake system components.

(c) This platoon also provides personnel for the inspection of items turned in to the

direct exchange section (e.g., fuel-electrical system repairman) operated by the supply platoon.

★(6) *Electronics maintenance platoon.* This platoon is also an integral element of the company maintenance shop. It contains a platoon headquarters for the supervision and control of platoon operations; an electronics repair section that performs direct support maintenance on electronic instruments, radio, telephone, teletype, and radar equipment; and an electronic component repair section that performs maintenance on EAM equipment, fire control computers, and photographic equipment. The platoon performs maintenance on items directed to it by the shop office, and also provides personnel and equipment for the performance of on-site maintenance and technical assistance.

★(7) *Armament and instrument maintenance section.* This section performs direct support maintenance on towed and self-propelled artillery and turret weapons of tanks. It also inspects and performs maintenance on small arms and fire control instruments and topographic instruments.

★(8) *Equipment maintenance platoon.* Types of items repaired by this platoon include construction, generator and refrigeration equipment, office machines, fuel dispensing equipment, burners and fire units, food service equipment, laundry and bath units, and chemical protection and detection equipment.

2-5. Transportation Aircraft Maintenance DS Company

a. *Organization and Mission.* This company is organized as depicted in figure 2-4. It provides direct support repair, supply support, and field recovery service for aircraft, aircraft avionics, and aerial weapons organic to nondivisional units in the field army.

b. *Functions of Unit Elements.*

★(1) *Company headquarters.* This section provides for command of company operations; performs administrative services; performs organizational maintenance on unit communications equipment, small arms, and ground support equipment; provides communications,

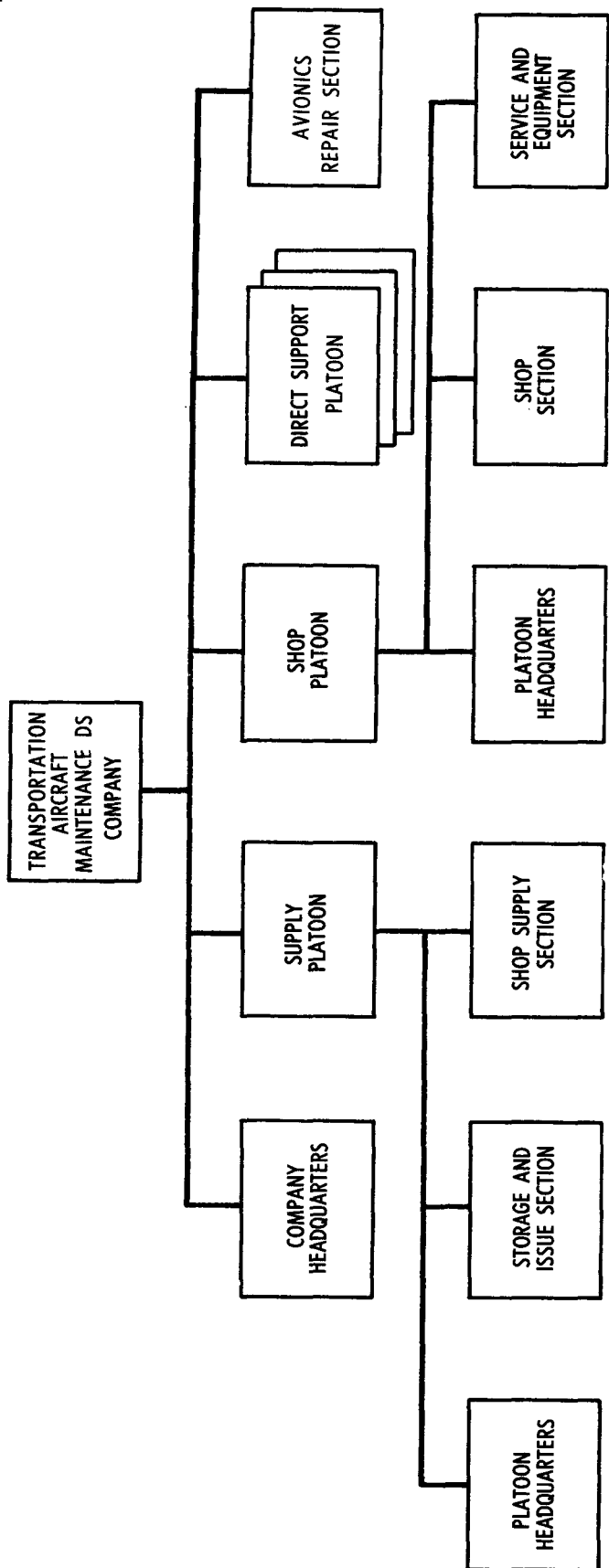


Figure 2-4. Transportation aircraft maintenance DS company.

messaging, and organizational supply; and provides personnel for the accomplishment of production and quality control functions. The functions of production and quality control personnel assigned to the company headquarters are as follows:

(a) *Production control officer.* The production control officer, assisted by the production control supervisor, is responsible to the company commander for the functions of production controls. He:

1. Coordinates with supported units in scheduling maintenance into the shop.
2. Accepts and programs work.
3. Determines work priorities within established guidelines.
4. Coordinates with the shop platoon leader in assigning work within the shop and effects coordination with other unit elements.
5. Monitors work progress.
6. Establishes standards to measure the efficiency of operations.
7. Coordinates with the quality control technician to assure accomplishment of necessary inspections.
8. Submits reports as required by battalion and higher headquarters.
9. Determines whether items are to be repaired locally or evacuated for higher category repair.

(b) *Quality control technician.* The quality control technician is responsible to the company commander for quality control. The quality control technician is assisted by technical inspectors who are utilized for on-site inspections. Additional inspectors are provided the shop platoon for determination of repair requirements and the conduct of in-process inspections. Functions of the inspectors include:

1. Performing initial, in-process, and final inspections to determine condition of equipment, extent of repairs required, specific nature of required repairs, and parts requirements.
2. Performing safety-of-flight inspections to assure that no unsafe condition exists in aircraft.
3. Making recommendations relative

to evacuation of items for higher category repair.

4. Assisting in the inspection of aircraft and allied equipment of supported units.

(2) *Shop platoon.* This platoon is composed of a headquarters, a shop section, and a service and equipment section. This element performs the actual repairs accomplished in the shop area.

★(a) *Platoon headquarters.* The platoon leader is responsible for the supervision and management of the platoon, planning and assignment of work, and preparing and maintaining maintenance records and reports. He is assisted by an aircraft repair technician, an avionics repair technician, and a shop foreman. Inspectors are provided for inspection functions and clerks to prepare and maintain records and reports required for shop operations and for submission to higher headquarters.

(b) *Shop section.* This element repairs aircraft components, and aircraft armament. Personnel from this element may be utilized to augment on-site repair capabilities (e.g., avionics repair).

(c) *Service and equipment section.* This section maintains organic shop sets, wheeled vehicles, generators, and materials handling equipment, and operates and maintains the fuel-servicing tank trucks and petroleum storage facilities. It requests, receives, stores, and issues repair parts for organizational maintenance of equipment. Personnel of this section also operate and maintain the two utility helicopters used for transporting contact teams and for the emergency delivery of repair parts. Additionally, pilots of this section operate organic helicopters in aerial evacuation of non-flying aircraft.

(3) *Supply platoon.* The platoon headquarters receives and processes supply requests submitted by supported units, directs shipment of requested items, and maintains records on the status, location, and quantities of repair parts stocked by the company. The storage and issue section receives, stores, and issues repair parts for aircraft, avionics, and aerial armament. The shop supply section draws supplies from the storage and issue section for use by the shop

platoon and the DS platoons. Platoon headquarters arranges for replenishment of repair parts stocks by submitting repair parts requests to the support brigade Stock Control Center (SCC).

★(4) *Direct support platoons.* The aircraft maintenance company contains three direct support platoons. Each platoon can provide on-site maintenance and technical assistance to aviation units. The extent of repairs is limited by the equipment authorized the platoon and by the degree of disassembly permitted by the operational situation or other factors. Since the direct support platoon does not have an aerial weapons repairman, assistance is obtained from the shop section when such requirements must be met.

★(5) *Avionics repair section.* The avionics repair section inspects, tests, adjusts, replaces, and makes minor repairs on avionics equipment (less OV-1 peculiar equipment) and insures that avionics equipment is operational before issue of replacement aircraft or before its installation in aircraft.

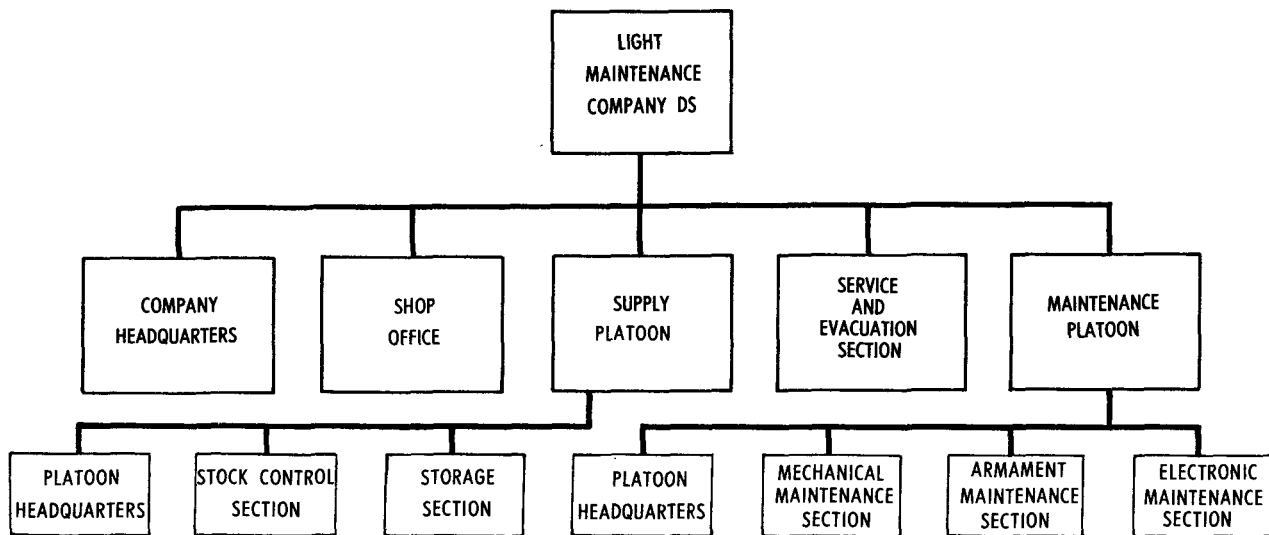
★*c. Man-hours Per Month Repair Capability.* See Table of Organization and Equipment (TOE) for man-hours per month repair capabilities for direct support maintenance of aircraft,

aircraft armament, and avionics equipment within the transportation aircraft maintenance DS company.

★2-6. Light Maintenance Company (DS)

★*a. Organization and Mission.* The company is organized as indicated in figure 2-5. It provides direct support maintenance, limited evacuation, and maintenance supply support to non-divisional units in the field army area.

★*b. Functions of Unit Elements.* The elements of the company operate similarly to their counterparts in the maintenance company rear (para 2-4), except that productive capacities of the light maintenance company (DS) are reduced because of the reduced size of company elements as compared to counterpart elements in the maintenance company, rear (DS). The maintenance company, rear (DS) possesses a greater variety of skills and equipment than is available in the light maintenance company (DS). Generally, both companies perform the same type maintenance, repair parts supply, and evacuation functions in support of units they support. When units supported by the light maintenance company require services of a type that are not within its capability, but are represented in the maintenance company, rear, the



★Figure 2-5. Light maintenance company (DS).

latter provides the required support with arrangements being made by the light maintenance company (DS). Some of the differences between the maintenance company, rear, DS, and light maintenance company (DS) include the following:

★(1) The technical supply mission of the light maintenance company (DS) is performed by a supply platoon. Repair parts are obtained by submitting requests to the brigade SCC. Under certain conditions, the supply platoon of the maintenance company, rear, DS, may respond to supply requirements placed on the light maintenance company (DS), which cannot be satisfied by the company supply section.

★(2) The light maintenance company (DS) has a service and evacuation section; in the maintenance company, rear, this element is platoon size. The service and evacuation platoon of the maintenance company, rear, can provide more expensive and varied service support and has a greater capability for heavy lift and evacuation operations. Thus, the service and evacuation platoon of the maintenance company, rear,

DS, is required to provide supplementary support to the light maintenance company (DS).

★(3) The maintenance company, rear, DS, has three maintenance platoons and an armament maintenance section, while all repair capability (except that provided by the service element) is concentrated in the maintenance platoon in the light maintenance company (DS). This platoon lacks the workload capacity and some of the repair capabilities of the automotive equipment and electronics maintenance platoons and the armament maintenance section in the maintenance company, rear (e.g., no camera, radar, central office equipment, or topographic instrument repairmen are provided in the light maintenance company (DS)). Therefore, when the light maintenance company (DS) receives jobs for which it has no repair capability, but the capability exists in the maintenance company, rear, such jobs are evacuated for repair to the maintenance company, rear, or battalion may augment the light maintenance company (DS) if the workload in such items is a continuing one.

Section II. DIRECT SUPPORT MAINTENANCE IN THE COMMUNICATION ZONE

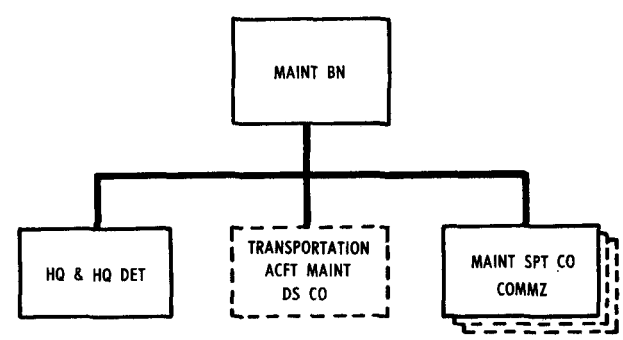
2-7. General

a. This section describes the combat service support responsibilities of the Theater Army Support Command (TASCOM), which are, for the most part, carried out by the subordinate "major mission" commands of the TASCOM. Of its six major subordinate commands, the TASCOM depends upon the Area Support Command (ASCOM) and the supply and maintenance command (SMC) for accomplishment of its COMMZ direct support and general support maintenance and supply (except medical) support mission. Such functions are performed by functionalized or specialized DS or GS maintenance units which are normally attached to maintenance battalions under the control of either the ASCOM or the SMC.

b. Although the organizational structure for command, control, and management of the COMMZ's combat service support operations differ from that of the field army, most of the individual maintenance units found in the

COMMZ are of the same type as, or similar to those units employed within the field army area.

c. The organization, mission, and operations of the ASCOM, the SMC, and their respective subordinate headquarters which control the op-



AS REQUIRED.

★Figure 2-6. Maintenance battalion, area support group, COMMZ.

erating battalions and their attached maintenance units are contained in FM 29-20, FM 54-5-1 (TEST), FM 54-6, and FM 54-7.

2-8. Maintenance Battalion, Area Support Group, COMMZ

a. Organization. The organization of the maintenance battalion, area support group is depicted in figure 2-6.

b. Mission. The battalion provides functionalized direct support maintenance and repair parts supply for units located in or passing through the COMMZ. Types of equipment supported include automotive, construction, materials handling, artillery and armament, small arms, instruments, fire control equipment, electronic, power generating, refrigeration, air compression, chemical, office machines, heavy textile and leather items.

2-9. Headquarters and Headquarters Detachment, Maintenance Battalion

a. Organization. This unit of the COMMZ maintenance battalion is the same type organization that is used with both the DS and GS maintenance battalions used throughout the FASCOM, see figure 2-2.

b. Mission. The mission and functions of this unit are the same as those covered in paragraph 2-3.

★2-10. Maintenance Company (DS) (COMMZ)

a. Organization. The organization of the (DS) COMMZ maintenance company is shown in figure 2-7.

b. Mission. Provides direct and general support maintenance to units assigned to, or passing through the COMMZ. Exceptions to the maintenance support mission are artillery, crypto, fire control, ADP, EAM, ground approach, medical and airdrop equipment, and aircraft and aircraft components.

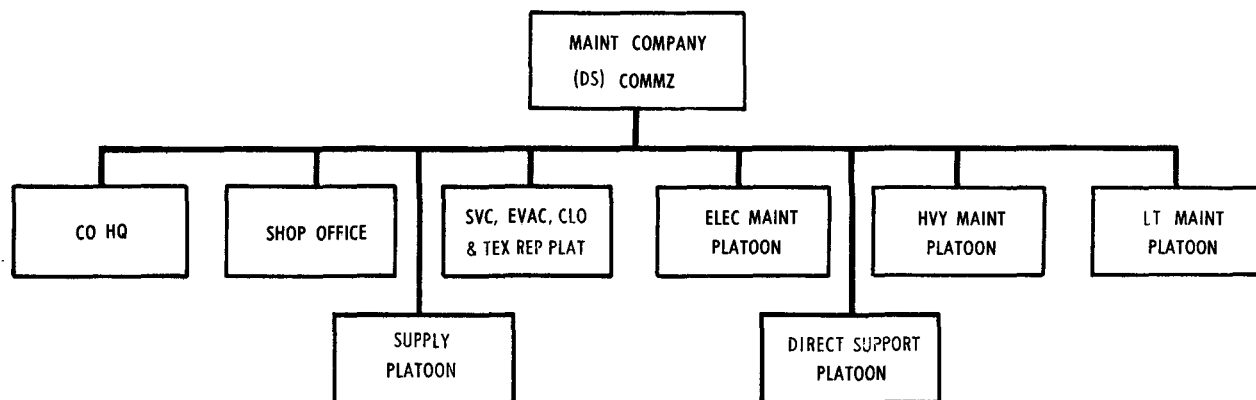
c. Capabilities.

(1) The primary mission of this company is to perform DS maintenance. The secondary mission is to perform limited GS maintenance.

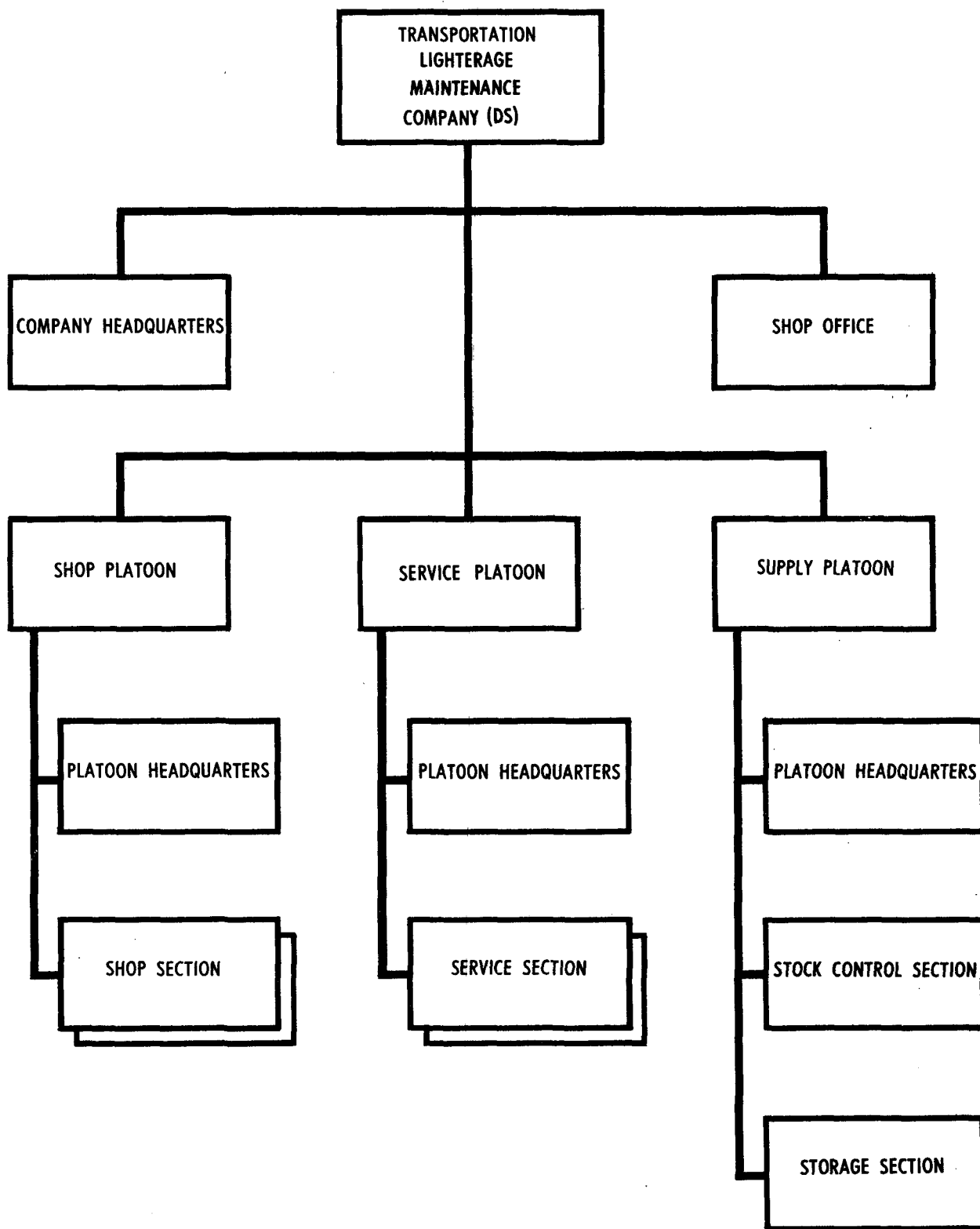
(2) Maintenance that is beyond the capability or capacity of the company will be evacuated to designated field depots or performed by cellular type repair teams, which may be attached to the company. Although it has both a direct and general support capability, the elements of this unit operate essentially as those of the maintenance company, rear, see paragraph 2-4 for further details.

2-11. Transportation Aircraft Direct Support Maintenance Company

a. Organization. The organization of the



★Figure 2-7. Maintenance company (DS) (COMMZ).



★Figure 2-8. Transportation lighterage DS company.

transportation aircraft DS maintenance company employed in the COMMZ is shown in figure 2-4.

b. Mission. To perform direct support maintenance on Army aircraft, aircraft armament and avionics equipment, and related supply and recovery support of nondivisional aviation units.

2-12. Transportation Lighterage Direct Support Company

★*a. Organization and Mission.* This company is composed as indicated in figure 2-8. The transportation lighterage DS company provides DS maintenance and receives, stores, and issues all repair parts required for organizational and DS maintenance of transportation amphibians and landing craft. The unit is not assigned to a maintenance battalion. It is normally assigned to a theater army support command and attached to a transportation terminal battalion or group for operational control.

b. Functions of Unit Elements.

(1) *Company headquarters.* The headquarters provides the personnel for command, administration, communications, mess, unit supply, and other functions normally performed by a headquarters.

(2) *Shop office.* The shop office exercises production and quality control over the maintenance and repair activities of the unit. The shop officer is primarily concerned with programming the unit's maintenance capability and is responsible for assigning priorities and maintaining a system for controlling work backlogs in the shop.

★(3) *Shop platoons.* The shop platoons, consisting of a platoon headquarters and two shop sections each, comprise the principal repair and maintenance elements of the unit. The shop platoon leaders are responsible for intrashop coordination of the shop sections and provide firm control over workloads and materiel. The repair control sergeant in the shop office conducts initial inspections on amphibians and landing craft, parts, and assemblies being processed into the maintenance shop and lists discrepancies to determine the work to be accomplished and the parts required. The radio

and radar repairmen required to support this portion of the company's mission are also assigned to the platoon.

★(4) *Service platoon.* The platoon consists of a platoon headquarters and two service sections. It furnishes personnel to organize contact teams for on-site repair of disabled amphibians and landing craft and provides maintenance personnel for the unit's organic vehicles and engineer equipment. In addition, the service section can provide direct support detachments to accompany lighterage units on special missions in remote areas for short periods.

★(5) *Supply platoon.* The supply platoon is responsible for receiving supply requirements from the shop platoons and supported units and, in turn, taking action through further supply requests to the supporting supply source. The platoon maintains records to reflect the number of items required, on hand, due in, and due out. The supply officer directs requisitioning and issuing of and accounting for supply items used by the shop platoons in accomplishing their direct support mission. He has the same responsibilities for those repair parts and supplies used by supported lighterage companies in their organizational maintenance functions. The platoon is made up of a stock control section and storage section.

★(a) The stock control section maintains stock control records. The section accepts and edits requisitions from shop platoons and supported units and directs issue by the storage section.

★(b) The storage section is responsible for receiving, storing, preserving, packing, crating, and issuing the repair parts, supplies, and materiel required in the performance of the unit's direct support mission.

c. Staff Supervision. A marine engineer technician (warrant officer) on the terminal battalion staff is responsible for staff supervision of organizational and DS maintenance for the amphibians and other marine equipment in the attached companies. He is additionally responsible for staff supervision of GS maintenance if this function is assigned at battalion level. This officer supervises correct recording of maintenance activities within the battalion in accordance with existing directives and conducts peri-

odic inspections as necessary. He prepares reports of inspections as necessary. He prepares reports of inspections, disseminates technical information, and provide technical maintenance assistnace when required.

★2-13. Support of High-Density-Type Missiles

Because of requirements to provide DS maintenance for certain high-density-type missile sys-

tems on an area basis, a missile support team may be attached to one of the units of the DS maintenance battalion. This team normally is attached to an element of the ammunition group. The method of employing such teams within the organizational structure of the army or corps support brigades will be determined by the densities of equipment and locations of units to be supported. Details on support of missiles are found in FM 9-6 and FM 9-59.

CHAPTER 3

GENERAL SUPPORT MAINTENANCE UNIT ORGANIZATION, MISSION AND FUNCTIONS

3-1. Introduction

a. This chapter describes a type organization for a general support maintenance battalion, and the missions, organizations, and functions of the various units that make up the battalion.

b. The units discussed in this chapter are employed as part of the general support organization of the field army support command (FASCOM). These same units are also employed in the communications zone (COMMZ), with assignment to the supply and maintenance command, TASCOM, and attachment to a field depot. Thus, while this chapter discusses employment of these units in the field army area, identical units are employed as part of the COMMZ support structure. The unit functions and methods of operation are basically the same regardless of the area of employment.

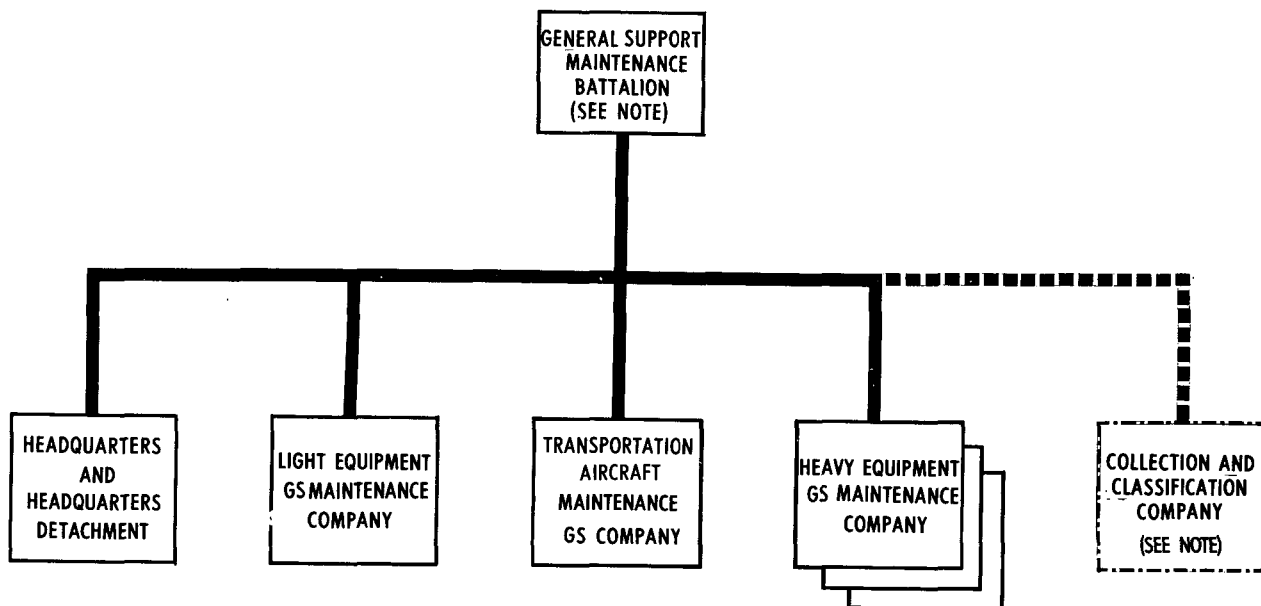
3-2. Organization and Functions, GS Maintenance Battalion

a. General support maintenance battalions are assigned to the field army support command and are attached to support groups of the corps and army support brigades. These battalions provide general support level maintenance service in support of the supply system. They also perform direct support maintenance by accomplishing that portion of the direct support maintenance workload (overflow) that exceeds the capacities of divisional and nondivisional direct support maintenance battalions. Control of workload input and disposition is exercised by the maintenance management center of support brigade headquarters. Workload is received from divisional and nondivisional direct support maintenance battalions and collection and classification companies, as directed by the

brigade maintenance management center. With few exceptions, repaired items are returned to supply stocks.

★*b.* The composition of the maintenance battalion is extremely variable, depending on its assignment, mission, the area in which it operates, and its workload. The mission of the battalion is to perform general support maintenance and overflow direct support maintenance on almost all types of maintainable materiel with the exception of that materiel listed in chapter 1. Depending on its organization, the battalion may also repair tires, have the mission for marine and rail maintenance, and may have the mission of collection, classification, and disposition of materiel. Thus, the mission of a GS maintenance battalion may require the repair of the following types of items: vehicles, armament, and related items; aircraft and related items; marine and rail equipment; communications/electronics and photographic items; materials handling equipment; office machines; laundry, bath, and bakery equipment; sewing machines; burners, fire units, and heaters; food service equipment; petroleum, oil, and lubricants handling and dispensing equipment; infrared and electrical devices; cranes, bulldozers, and scrapers; lighting equipment and power generators; electric motors; reproduction and survey equipment; refrigeration and air conditioning equipment; smoke generators; flamethrowers; decontamination and protective equipment; and components of all of the foregoing.

c. The GS maintenance battalions attached to the support groups in the corps and army support brigades are tailored to provide maintenance support depending on the types and dens-



NOTE: Each corps support brigade contains two support groups. Each of these two support groups contains a GS maintenance battalion. The C&C company is allocated on the basis of one per support brigade; therefore, only one of the two support groups of each corps support brigade will have a C&C company attached to its maintenance battalion.

Figure 3-1. Type organization GS maintenance battalion, support group, corps support brigade.

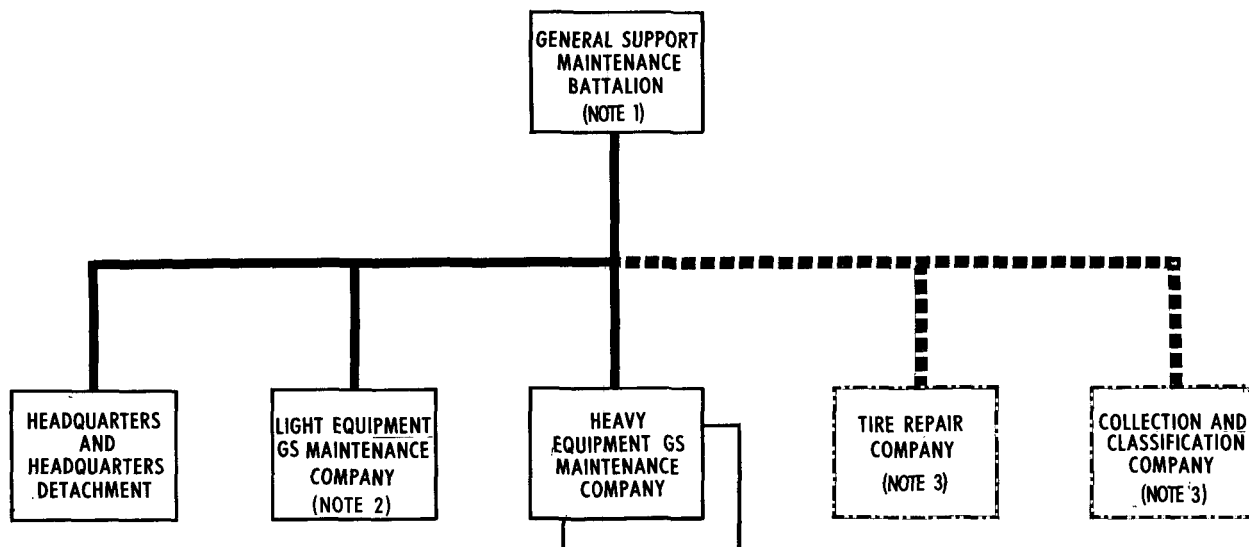
ities of units and equipment found in their respective support areas. Thus, the composition of battalions is not necessarily identical except for the headquarters and headquarters detachments.

(1) In the corps area, two support groups are assigned to each corps support brigade. A GS maintenance battalion is attached to each support group (fig 3-1). Units comprising the GS maintenance battalion include a headquarters and headquarters detachment and any combination of—a light equipment GS maintenance company, a transportation aircraft maintenance GS company, and one or more heavy equipment GS maintenance companies. In addition, one GS maintenance battalion in each corps support brigade will have a collection and classification (C&C) company.

(2) In the army service area, two support groups are assigned to the army support brigade. Each of these support groups normally

has two GS maintenance battalions of mixed composition attached (fig 3-2). Type units that may be attached to the GS maintenance battalion include the headquarters and headquarters detachment, light equipment GS maintenance company, and heavy equipment GS maintenance companies. In addition, one of the GS maintenance battalions in the support brigade contains a tire repair company and one contains a C&C company. An aircraft maintenance capability is not provided, since the composition of the army support brigade contains one or more transportation aircraft GS maintenance battalions.

★*d.* Maintenance companies of the GS maintenance battalion concentrate on the repair and overhaul of major components (engine assemblies, clutch assemblies, transmissions, differentials, cross drive transmissions, and auxiliary equipment generators, starters, carburetors, etc.) of end items. Overhaul is accomplished in



NOTES: 1. For an independent corps operation, railway and/or marine maintenance units may also be attached to the battalion.

2. There are normally only two such units to be divided among the three GS maintenance battalions of the army support brigade as needed.

3. This unit is allocated on the basis of one per army support brigade; therefore, only one of the maintenance GS battalions in the support brigade structure will contain a tire repair company and only one will contain a C&C company.

Figure 3-2. Type organization GS maintenance battalion, support group, army support brigade.

accordance with the IROAN principle in that the item is given a thorough inspection to determine unserviceability and the reasons therefor, but only those items which are broken, exhibit wear in excess of prescribed tolerances, or are out of adjustment are repaired. Parts are not replaced because of wear unless their continued use with newer parts may result in an undesirable mismatch and premature failure. As workload permits, large end items may also receive overhaul at the general support level when such items are combat essential and critical to support operations. GS maintenance units employ production-line techniques to the extent possible, as this is the most efficient means of production. To facilitate production-line operations, however, it is necessary to centralize the repair of certain components in selected companies and to develop backlogs of work to achieve economy and efficiency in operations.

e. Many items repaired by units of the GS

maintenance battalion will fall into the category of "test and measuring equipment." Before such items are returned to supply channels (or, in some cases, to DS maintenance units), their accuracy must be checked and certified. Some of these items require only maintenance calibration, which is performed by the repairing GS maintenance unit within its capabilities. When the maintenance calibration required exceeds the capability of the repairing unit or when higher calibration is required (A-level, e.g., secondary transfer or secondary reference), arrangements are made for necessary support from the Army calibration company (see FM 29-27). Elements of the Army calibration company (secondary transfer sections) will visit GS maintenance units on a scheduled basis to provide calibration support for organic test and measuring equipment and for items that exceed the repairing units' maintenance calibration capabilities.

3-3. Headquarters and Headquarters Detachment, GS Maintenance Battalion

a. This is the same headquarters unit that is used throughout the corps, army service area, and COMMZ for command and direction of direct support and general support maintenance units comprising a battalion-size organization. The mission, capabilities, and organization of this unit are the same as indicated in paragraph 2-3 and figure 2-2; however, the types of units comprising the battalion differ.

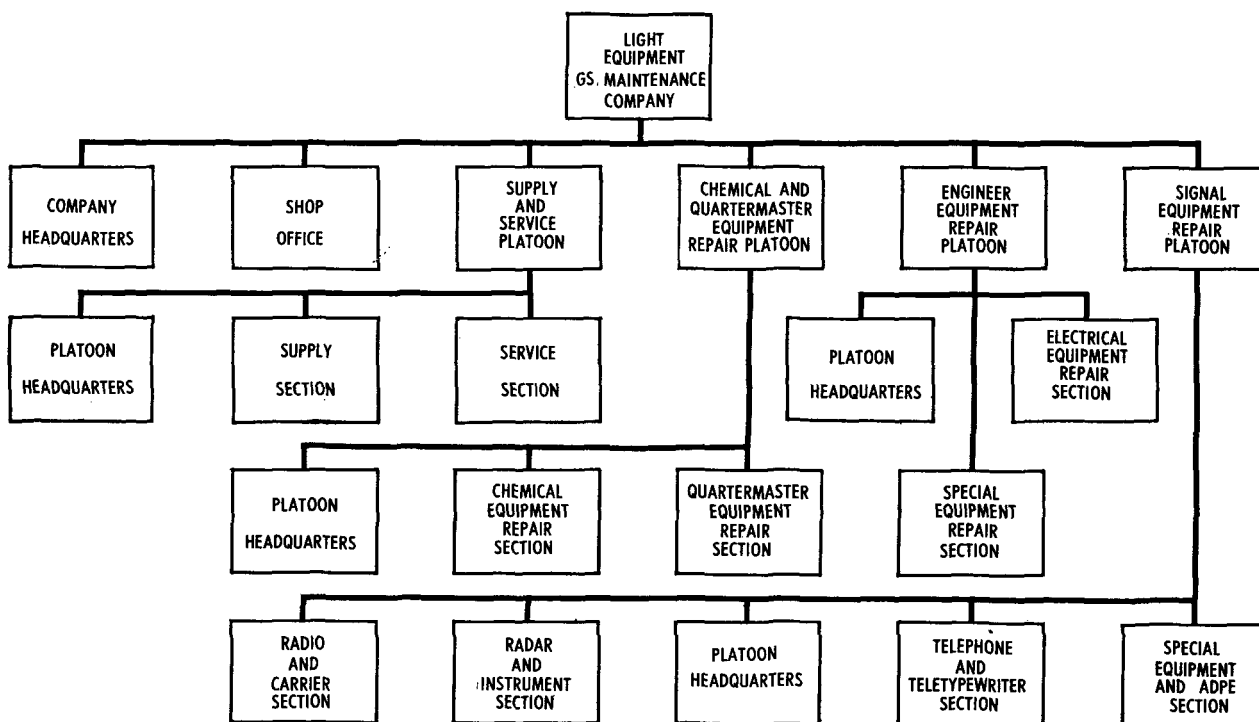
b. Because the types of units attached to the battalion and their missions differ, the functions of battalion headquarters also differ when the battalion headquarters functions in a general support role. Essentially, these differences are as follows:

★(1) Operational readiness float and direct exchange are not mission activities of the general support level.

(2) At the general support level, emphasis is on the repair of components by production-

line techniques rather than repair of end items by component replacement as is the case at the DS level. Consequently, battalion headquarters at the GS level becomes involved in providing assistance and supervising operations of attached units to assure proper scheduling of work, efficient layout for production-line operations, proper application of standards and priorities, quality control, determination of parts requirements for production runs, and other aspects of maintenance operations peculiar to the GS level.

(3) At the general support level, the MMC exercises more direction and control over individual unit maintenance operations than at the direct support level. Maintenance units at the direct support level serve the user of equipment, and battalion headquarters plays a significant role in assuring that direct support is timely, adequate, and responsive; the MMC enters the picture primarily to indicate standards and support priorities, and to provide instructions for items that must be evacuated for general support maintenance.



★Figure 3-3. Light equipment GS maintenance company.

3-4. Light Equipment GS Maintenance Company

a. Organization and Mission. The company is organized as indicated in figure 3-3. It provides general support maintenance for light equipment end items and components thereof.

b. Functions of Unit Elements.

(1) *Company headquarters.* This section provides for command of company operations, performs administrative services and organizational maintenance, and performs communications, messing, and organizational supply functions for the company.

(2) *Shop office.* This section is usually divided into two elements—a shop office and an inspection section. The shop office is responsible for administrative management, and production control functions, for interpreting and applying directives and instructions from higher headquarters, for planning and supervising production, for completing equipment records and preparing and submitting records and reports required by higher headquarters, and for developing operational procedures. The inspection element is responsible for determining the causes of unserviceability of equipment, determining the repairs that must be accomplished, quality control, and recommending further evacuation of disposition, if appropriate.

(3) *Platoons (engineer equipment repair, signal equipment repair, and chemical and quartermaster equipment repair).* The repair platoons perform the repair functions of the company. The platoons normally use the bench or production-line operation methods, depending on the characteristics of the item(s) being repaired, the quantity of such items, and direction from the brigade MMC with respect to the performance of maintenance on a production-line basis. These platoons may all be present at one time in the company and each may be performing its normal repair functions, the platoons may be augmented for the performance of production-line maintenance, or the platoons or elements thereof may be temporarily attached to another company to facilitate maintenance on a production-line basis.

(4) *Supply and service platoon.* This platoon contains a platoon headquarters, a supply section, and a service section. The platoon headquarters directs and coordinates operations. The supply and service sections function as indicated below:

(a) *Supply section.* This section requisitions, maintains in storage, and issues repair parts and maintenance supplies required for company maintenance operations. Stockage is based on a level of up to 15 days of supplies; however, support brigade headquarters may authorize higher levels of stockage in anticipation of production-line runs. The supply section also keeps records on the types of repair parts that must be obtained through fabrication and notifies the shop office of such requirements.

(b) *Service section.*

1. Contains specialists and special equipment which are pooled to work in support of all repair sections/platoons of the company. The section is responsible for providing welding, machining, sheet metal, fuel/electric, sewing machine, textile/leather, and carpentry services to other elements of the company. The section also provides support for the lifting and movement of heavy items.

2. Performs work which is assigned by the shop office. Work is accomplished in the service section area, or by dispatching the necessary personnel and equipment to do the work in the area of the platoon initiating the request.

3. In addition to performing such functions as welding and heavy lift, is frequently able to recondition worn parts, fabricate new tools, and fabricate jigs and fixtures for production-line maintenance.

3-5. Heavy Equipment GS Maintenance Company

a. Organization and Mission. This company is organized as indicated in figure 3-4.

★(1) Provides general support maintenance for components of wheeled and tracked vehicles, artillery, heavy construction equipment (including power equipment), and vehicle-mounted chemical equipment.

(2) Provides general support maintenance for small arms, instruments, and fire control equipment (less that provided by elements of the ammunition group).

(3) Performs general support maintenance on army reserve stocks of the type equipment supported.

b. Functions of Unit Elements.

(1) *Company headquarters.* This section provides for command of unit operations, performs organizational maintenance, and performs administrative services, messing, and organizational supply functions for the company.

(2) *Shop office.* This section is normally divided into two elements—a shop office and an inspection section. The shop office serves as the coordinating office between the maintenance elements and the repair parts supply element of the company; supervises quality and production control; establishes shop policy; assigns work; and plans and supervises production methods. It also completes equipment records and prepares and submits equipment records and reports as required by higher headquarters. The inspection element is responsible for determining the repairs that must be accomplished, recommending further evacuation or disposition and quality control.

(3) *Maintenance platoons/elements.* The maintenance platoons and the service section of the supply, service, and evacuation platoon perform the repair functions of the company.

(a) *Armament maintenance platoon.* This platoon repairs all items of armament materiel. The artillery section repairs and overhauls all types of conventional artillery as well as the trainer, launching, and guidance equipment (except optics) associated with antitank missile systems. The small arms section repairs and overhauls all types of small arms. The instrument section repairs all items of instruments and nonintegrated fire control items associated with artillery materiel (including optics), and repairs the field artillery digital analogue computer (FADAC).

(b) *Special equipment maintenance platoon.* This platoon repairs end items and components of construction equipment; vehicle-mounted chemical equipment; bakery, laun-

dry, and bath equipment; and materials handling equipment. To the extent possible, these repairs are performed on a production-line basis for separate commodity groupings.

(c) *Automotive maintenance platoons.* These platoons overhaul, for return to stock, unserviceable wheeled or tracked vehicle engines, power train assemblies, fuel and electrical components, and associated automotive equipment. Again, production-line techniques are employed when practicable.

(4) *Supply, service and evacuation platoon.* This platoon contains a headquarters which controls and coordinates platoon operations and supply, service, and evacuation sections which function as follows:

(a) *Supply section.* This section requisitions, maintains in storage, and issues repair parts and maintenance materials required for company maintenance operations. Stockage is based on a level of up to 15 days of supplies, but support brigade headquarters may authorize higher levels of stockage in anticipation of production-line operations.

(b) *Service section.* This section is responsible for welding, machine shop, sheet metal fabrication, sewing machine, textile/leather repair, and carpentry services to other elements of the company. It can provide valuable support for the conduct of production-line maintenance operations by the field fabrication of jigs, fixtures, racks, bins, and dollies.

(c) *Evacuation section.* This section provides the personnel and equipment to accomplish the movement and lifting of heavy materiel for company maintenance operations and displacement. The section may also be required to assist supported units in the evacuation of materiel.

3-6. Transportation Aircraft Maintenance GS Company

When employed in the corps service area, this unit is attached to a headquarters and headquarters detachment GS maintenance battalion. Normally, one or more of these units will be found in each corps support brigade. In the army service area, more of these units are required because of heavier aircraft maintenance workload; consequently, when employed in the

army support brigade, this unit is attached to a headquarters and headquarters detachment, aircraft maintenance GS battalion. For details on the organization and operations of this unit, see paragraph 3-11 and figure 3-9.

3-7. Tire Repair Company

a. Organization and Mission. This unit is organized as shown in figure 3-5. It receives, inspects, segregates, classifies, and repairs pneumatic tires ranging in size from 700/16 to 2950/29, and repairs tubes of all sizes.

b. Functions of Unit Elements.

(1) *Company headquarters.* This section provides for command of company operations and performs administrative services and organizational supply functions for the company.

(2) *Shop office.*

(a) The shop office performs production and quality control functions, management and control of mission operations, and administrative functions required for record and report preparation, maintenance, and submission.

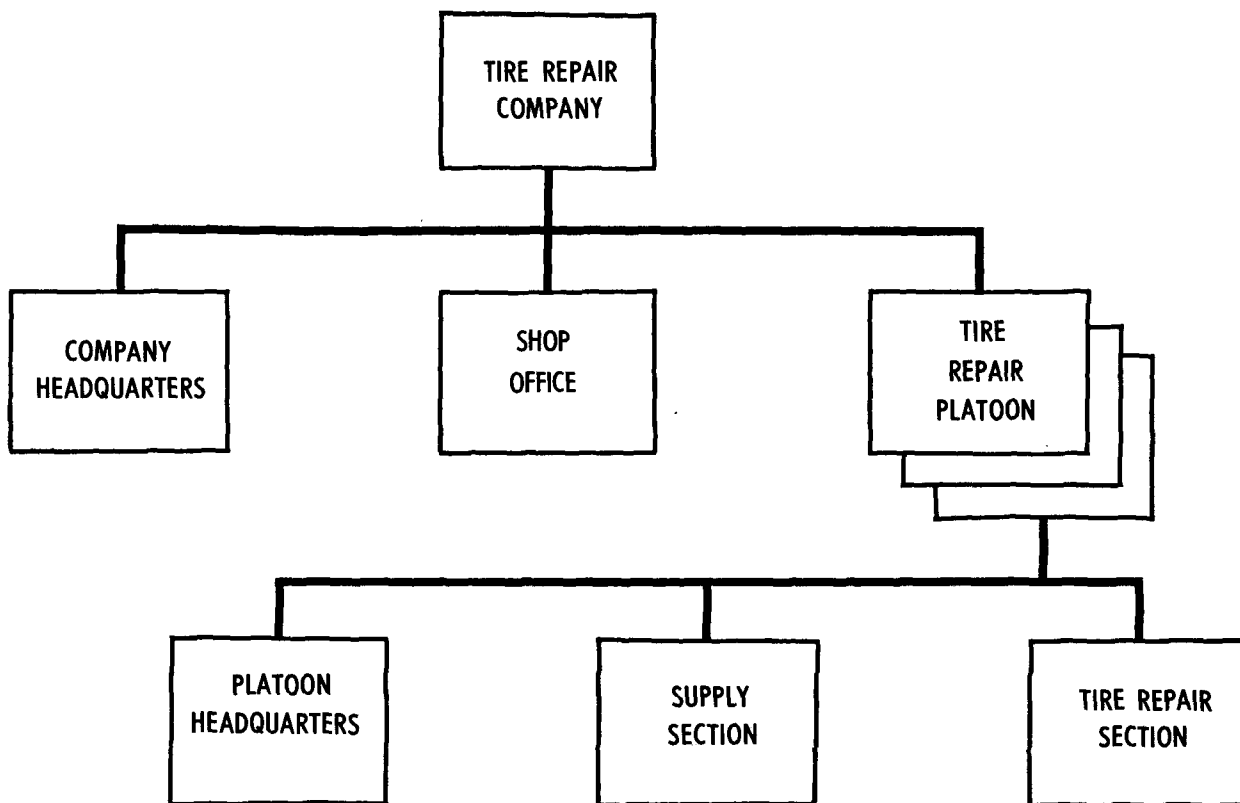


Figure 3-5. Tire repair company.

1. Production control and maintenance management functions include—routing and scheduling work; technical supervision of shop activities; planning, directing, and controlling work flow; analyzing job productivity, improving layout, and developing or improving techniques to promote maximum productivity while maintaining quality standards; initiating

job orders directing the performance of work; maintaining records of completed work; preparing and submitting reports on shop progress; and maintaining current information on priorities, lists of controlled items, and destinations to which repaired items and salvage are to be shipped.

2. The inspectors of the shop office

perform an initial inspection of tires and tubes to determine the type of repairs required and to estimate the quantity and type of materials to be used. All essential repairs are indicated on each item by use of a rubber-marking crayon. During repair operations, inspectors perform in-process inspections to insure quality control. After repair, all tires and tubes are inspected. Those evidencing poor workmanship and defective materials are returned for reprocessing; those deemed serviceable are reported to the brigade SCC. and are held pending disposition instructions from the MMC.

(3) *Tire repair platoons.* Each tire repair platoon consists of a platoon headquarters, a supply section, and a tire repair section. These platoons are organized, manned, and equipped so as to be able to conduct operations independently of company headquarters, lacking only the capability for unit administration and mess support.

(a) *Platoon headquarters.* The headquarters provides command and technical supervision of personnel directly involved in the repair of tires and tubes. When the platoon is operating separately, the platoon leader, platoon sergeant, assistant platoon sergeant, and shop clerk perform the management and control functions associated with the receipt, control, repair, and disposition of work. Tire inspectors are also provided for inspection and quality control functions. When the platoon is operating with the parent company, inspectors will normally work with inspectors from the shop office.

(b) *Supply section.* The supply section performs all supply functions necessary for the accomplishment of the tire repair mission. The supply section maintains a stockage of materials required for tire and tube repair. Functions of the section include requisitioning, control, in-storage maintenance, and issue of supplies; determining requirements; maintaining a locator system; and physical movement and storage of supplies required for mission operations. When a tire repair platoon is operating independently, the supply section of the platoon performs all these functions for its parent platoon; when the tire repair platoon is operating with the company, the supply sections

of each repair platoon are consolidated into one shop supply element for efficiency and economy of operations.

(c) *Tire repair sections.* These sections perform the actual tire and tube repair functions of the company. They operate on a two-shift per day basis and perform their functions on a production-line basis as directed by the shop office. Repairs are made in accordance with requirements indicated by the tire inspectors.

3-8. Collection and Classification Company

a. *Organization and Mission.* This company is organized as shown in figure 3-6. It establishes and operates a maintenance collecting point for the receipt, inspection, classification, segregation, disassembly, preservation, and proper disposition of serviceable, unserviceable, or abandoned U.S. materiel of a mechanical, electrical, or electronic nature. As necessary, it also assists the technical intelligence effort in the movement, temporary storage, processing, and disposition of captured items of foreign materiel (except explosive items).

b. *Functions of Unit Elements.*

(1) *Company headquarters.* This section provides for command of unit operations, performs organizational maintenance and supply functions and provides administrative services and messing support for the company.

(2) *Shop office.* The shop office is divided into a control section and an inspection, identification, and classification section. These elements perform the following functions:

(a) *Control section.* This section provides operational control for all mission activities of the company, establishes and implements control procedures, and prepares and maintains required records and reports. It provides reports to the MMC and/or the SCC, on materiel received, processed, and disposed of by the company. Under the automated procedures, most of this data is provided to the ADP center which provides the information required by the MMC/SCC (FM 29-20). It determines the processing and disposition of materiel, expediting the processing of critical or short supply items. Processing and disposi-

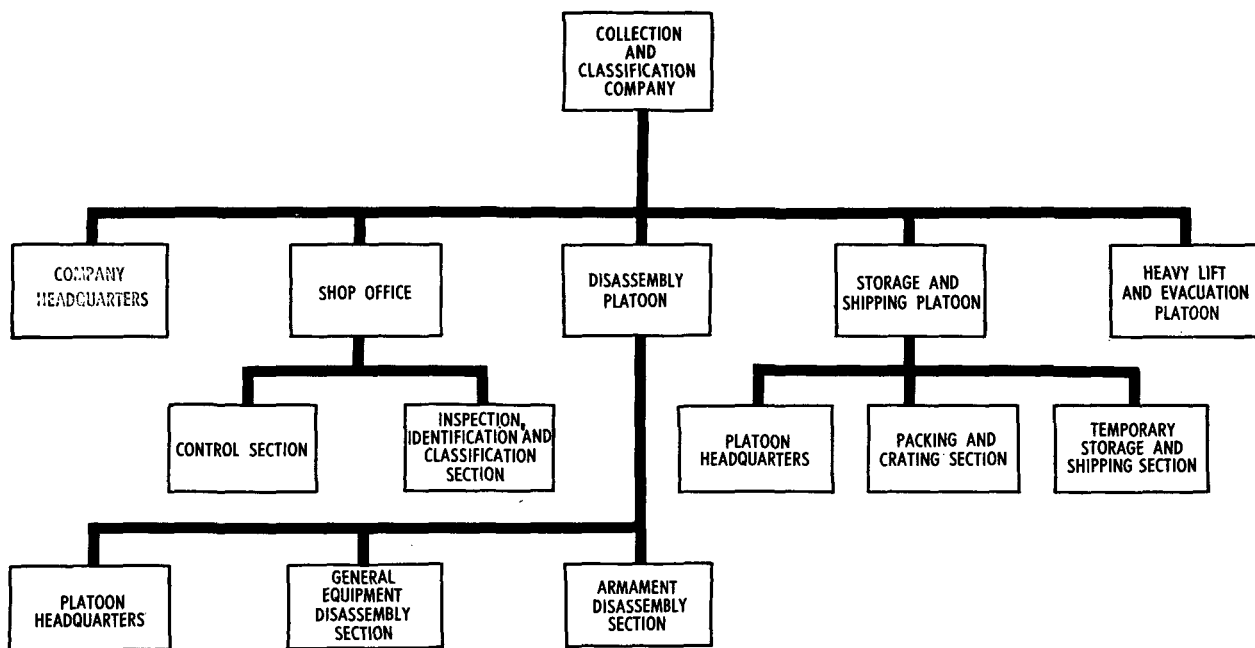


Figure 3-6. Collection and classification company.

tion of materiel are based on the following:

1. Inspection and classification reports.

2. Information obtained from equipment records that accompanied the item(s) (e.g., equipment logbooks provide information on equipment use, age, and previous maintenance actions that could have a bearing on whether the item is repaired or whether the item will be salvaged with only certain components being reclaimed therefrom).

3. Instructions from higher headquarters (disposition instructions, lists of items in short supply, lists of items to be obtained through cannibalization, and lists of items that must be repaired regardless of costs involved).

4. Estimated cost of repairs in terms of time and materials.

(b) *Inspection, identification, and classification section.* This section inspects and classifies materiel; provides the control section with reports on the receipt, condition, and classification of received materiel; identifies materiel by stock number and nomenclature; and, based on instructions from the control section and the condition of materiel,

routes materiel to the appropriate section of the disassembly platoon or the appropriate section of the processing, storage, and shipping platoon. Materiel is routed as follows:

1. Materiel classified as serviceable and foreign materiel will be routed to the storage and shipping platoon for preservation, packing, marking, and temporary storage pending shipment.

2. Materiel declared economically repairable and which does not require disassembly is also sent to the storage and shipping platoon for processing, temporary storage, and eventual shipment.

3. Uneconomically repairable materiel containing needed serviceable or repairable repair parts is routed to the disassembly platoon for reclamation of needed items. Reclaimed items are then sent to the storage and shipping platoon. Residue resulting from disassembly is also sent to the storage and shipping platoon, where it is held pending receipt of disposition instructions or disposed of in accordance with previously provided instructions.

4. When a cannibalization point is

operated by the company, certain designated uneconomically repairable items will be directed to the cannibalization point operated by the storage and shipping platoon.

5. Scrap and excess materiel (items that will not be processed because of a lack of supply requirements coupled with equipment obsolescence) is also directed to the storage and shipping platoon for disposal action in accordance with directions from higher headquarters.

(3) *Disassembly platoon.*

(a) The armament disassembly section of this platoon disassembles armament-type materiel; the general equipment disassembly section disassembles other types of items processed by the company. Disassembly is accomplished as directed by the shop office.

(b) Disassembly is accomplished only to the extent necessary to remove designated parts safely and without damage. The disassembly sections may work from lists of needed parts provided previously by the shop office, or specific disassembly instructions may be indicated on the job order provided by the inspection, classification, and identification section of the shop office.

(c) Serviceable and economically repairable repair parts are cleaned, classified, and routed to the packing and crating section of the storage and shipping platoon. If such items require further inspection or identification, the inspection, identification, and classification section of the shop office provides the necessary assistance.

(d) After removal of designated items, residue materiel is sent to the temporary storage and shipping section of the storage and shipping platoon, where it is stored pending disposition instructions.

(4) *Storage and shipping platoon.* This platoon performs all required packaging, packing, storage, and shipping functions of the company. It accomplishes the disposition of all materiel in accordance with special or automatic disposition instructions provided by the MMC through the shop office. Materiel handled includes serviceable and unserviceable end items and components which will be shipped to supply facilities, repair facilities, technical intelligence activities, or evacuated further to other collec-

tion facilities; and scrap and other residue generated through unit disassembly operations or initially classified as scrap by inspection personnel of the shop office. When directed, this platoon will also operate a cannibalization point. The functions of platoon elements are as follows:

(a) *Platoon headquarters.* This element directs, controls, and supervises platoon operations.

(b) *Packing and crating section.* This section performs the preservation, packing, and crating functions associated with unit operations. It receives serviceable and economically repairable items directly after receipt by the unit and examination by personnel of the inspection, identification, and classification section. These items are those that do not require disassembly. The section will also receive components, assemblies, subassemblies, and parts from the disassembly platoon. Before items are routed to the packing and crating section, they are tagged as to serviceability, nomenclature, and stock number. After receipt of items by the packing and crating section, they are preserved, as necessary; packaged, boxed, or crated, as appropriate; and packages or boxes are marked with identification, to include nomenclature, stock number, quantity, and serviceability. The packaged items are then routed to the temporary storage and shipping section where they are stored pending disposition.

(c) *Temporary storage and shipping section.* This section temporarily stores all materiel directed to it by other elements of the company and accomplishes disposition in accordance with special instructions or automatic disposition instructions provided by the MMC. In addition to serviceable and unserviceable items that will be shipped to supply, maintenance, or technical intelligence facilities or further evacuated for higher category repair, this section will dispose of scrap material generated through company disassembly operations, and will dispose of that materiel, which, because of conditions and lack of supply system requirements, is directed to be disposed of as salvage. In addition, it will operate a cannibalization point when the company is directed to operate such a facility. The section maintains informal records

on items it receives. Serviceable and unserviceable records are maintained. When items are shipped from the company, this section prepares shipping documents. It also coordinates with the shop office to assure the preparation and proper disposition of equipment records which must be initiated and forwarded concurrently with the transfer of equipment.

(5) *Heavy lift and evacuation section.* This section provides the company with the personnel and equipment required for lifting and movement of heavy materiel. It is equipped with cranes, tank transporters, tank recovery vehicles, wreckers, and forklift trucks. It performs limited recovery and evacuation operations for the company, including necessary assistance to DS units. However, the efforts of the section are required primarily for the movement of heavy materiel within the collecting point, the performance of heavy lift operations required for disassembly, and the loading and offloading of heavy materiel.

★3-9. Transportation Aircraft Maintenance GS Battalion

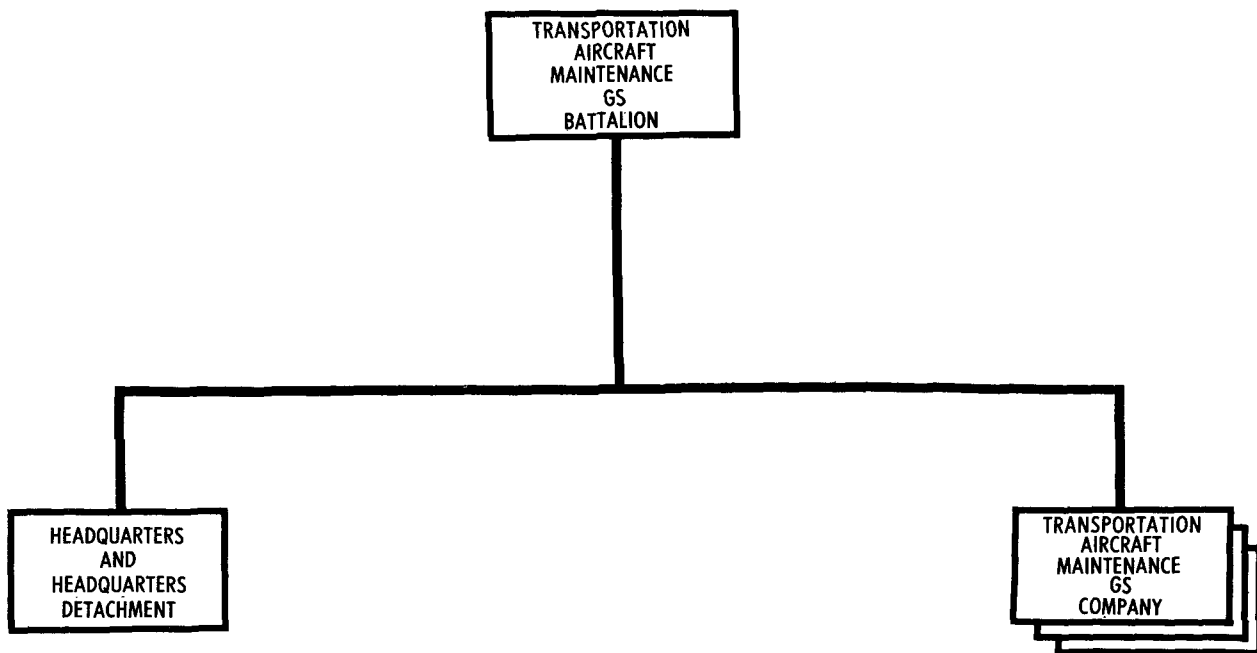
a. This battalion consists of a headquarters

and headquarters detachment and a variable number of aircraft maintenance GS companies. A type composition of the battalion is depicted in figure 3-7.

★b. The battalion provides GS maintenance and overflow DS maintenance for Army aircraft, avionics, and aerial armament.

c. This battalion is employed only in the army service area. In the corps area, aircraft maintenance support is provided by aircraft maintenance DS and GS companies attached to DS and GS maintenance battalions. General support aircraft maintenance units of the battalion perform the maintenance support functions for the battalion and provides aircraft recovery assistance to supported aircraft maintenance DS companies; the headquarters and headquarters detachment performs command, control, management, and supervisory functions. The battalion functions as follows:

(1) Mission assignments are received from army support brigade headquarters. These assignments are made through the support group. The support group will assign areas of operation to the battalion based on mission assignments made by brigade and recommendations



★Figure 3-7. Transportation aircraft maintenance GS battalion.

of the maintenance battalion commander and staff. Based on the overall mission, battalion will assign missions to attached units and will assign areas of operation. It will supervise, direct, and control operations within the overall policies and direction provided by support brigade headquarters and the MMC.

(2) The MMC controls input of battalion workload by providing evacuation instructions to aircraft maintenance DS companies. Through receipt and analysis of maintenance data provided by aircraft maintenance companies of the battalion and other aircraft maintenance companies of other battalions in the support brigade's area, the MMC keeps track of workload, effects workload balancing between battalions, and provides instructions on the disposition of repaired items or scrap. The MMC also provides instructions and guidance on priorities, critical items, reclamation requirements, repair time limits, standards, and production techniques.

(3) Units of the battalion provide maintenance data and reports directly to the MMC or its supporting ADP center, depending on report format. (Maintenance operational data and reports suitable for submission in punch card format are converted to this format at reporting unit level and sent to the ADP center; reports and data that cannot be machine-processed are submitted to the MMC.) Certain reports (e.g., materiel readiness) must go through command channels. Normally, individual maintenance companies will convert maintenance data and reports into punch card format and deliver these to battalion headquarters where facilities are provided for their transmission to the MMC. Instructions and guidance provided by the MMC are disseminated to individual units of the battalion through battalion headquarters.

(4) Units of the battalion receive maintenance workloads from aircraft maintenance DS companies of DS maintenance battalions in the army service area. Workload may also be received from aircraft maintenance DS or GS maintenance companies operating in the corps area (attached to DS or GS maintenance battalions) as the result of cross-leveling of workloads between support brigades. However, most of the aircraft maintenance battalion's work-

load will be in support of aircraft maintenance DS companies operating in the army service area.

(5) Maintenance beyond the repair capabilities, capacities, or authorized level of repair of the aircraft maintenance GS companies comprising the battalion is evacuated to an aircraft maintenance GS company of a COMMZ field depot (in accordance with disposition instructions provided by the MMC). Equipment received from supported direct support units (e.g., equipment requiring GS level modification) is repaired for return to the using unit. Disposition of other repaired items is as directed and based on instructions provided by the SCC. Disposition action for repaired items may include return to stock at the general support level, issue to an aircraft maintenance DS company to meet an outstanding request, or retention as shop stock by the repairing unit.

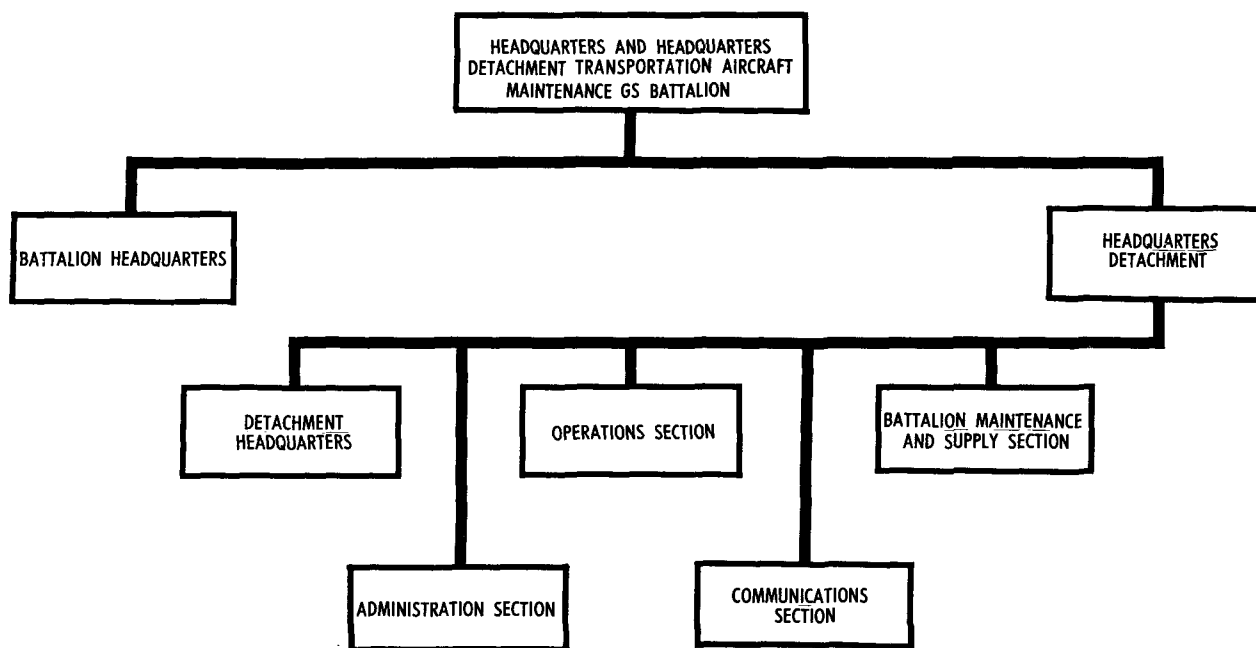
(6) Maintenance units comprising the battalion obtain repair parts for the performance of their maintenance missions by submitting requests directly to the stock control center. The SCC directs shipment from the aircraft repair parts platoon of the appropriate aircraft and missile repair parts company.

★3-10. Headquarters and Headquarters Detachment, Transportation Aircraft Maintenance GS Battalion

a. Organization and Mission. This detachment is organized as shown in figure 3-8. It provides command, control, staff planning, and administrative and technical supervision of attached aircraft maintenance GS companies.

b. Functions of Unit Elements. Functions of unit elements are as follows:

(1) *Battalion headquarters.* Battalion headquarters provides command and staff supervision to insure timely and effective accomplishment of the technical mission of the battalion. It furnishes the structure and capacity to advise and assist the commander in all phases of command of the battalion. Staff members assist in administration, control, and direction of the technical effort. The battalion staff includes an executive officer, a battalion supply officer (S4), an adjutant (S1), and an operations officer (S3). The battalion commander, execu-



★Figure 3-8. Headquarters and headquarters detachment, transportation aircraft maintenance GS battalion.

tive officer, and operations officer should be qualified aircraft maintenance officers.

(2) *Detachment headquarters.* The detachment headquarters provides the command and headquarters support for the headquarters and headquarters detachment, to include unit administration, mess, security, training, and discipline.

(3) *Administration section.* The administration section performs normal administrative functions for the battalion, other than personnel record keeping. It initiates personnel actions, orders, morning reports, and other correspondence as required. The personnel staff noncommissioned officer serves as the essential liaison link between unit clerks of attached companies and the personnel services company, and the finance direct support company of the

support brigade. (The personnel services company processes personnel administrative actions, including classification, personal affairs, maintenance of personnel records, certain pay changes, and personnel accounting. The finance direct support company provides finance support.)

(4) *Operations section.* The operations section plans for and provides overall guidance, supervision, and control of battalion tactical and technical operations. This section also plans, directs, and supervises intelligence, training, and inspection activities within the battalion.

(5) *Communications section.* The communications section provides the communications center for the battalion and establishes,

maintains, operates and controls the battalion radio net and switchboard. Sufficient personnel are authorized within the section to operate the communications system around the clock.

(6) *Battalion maintenance and supply section.* The battalion maintenance and supply section provides staff planning and guidance for battalion organizational maintenance and supply activities.

3-11. Transportation Aircraft Maintenance GS Company

a. Organization and Mission. This company is organized as shown in figure 3-9. It provides general support maintenance for aircraft and aircraft armament and overflow direct support maintenance for aircraft, avionics, and aircraft armament for divisional and nondivisional direct support aviation maintenance units in the field army.

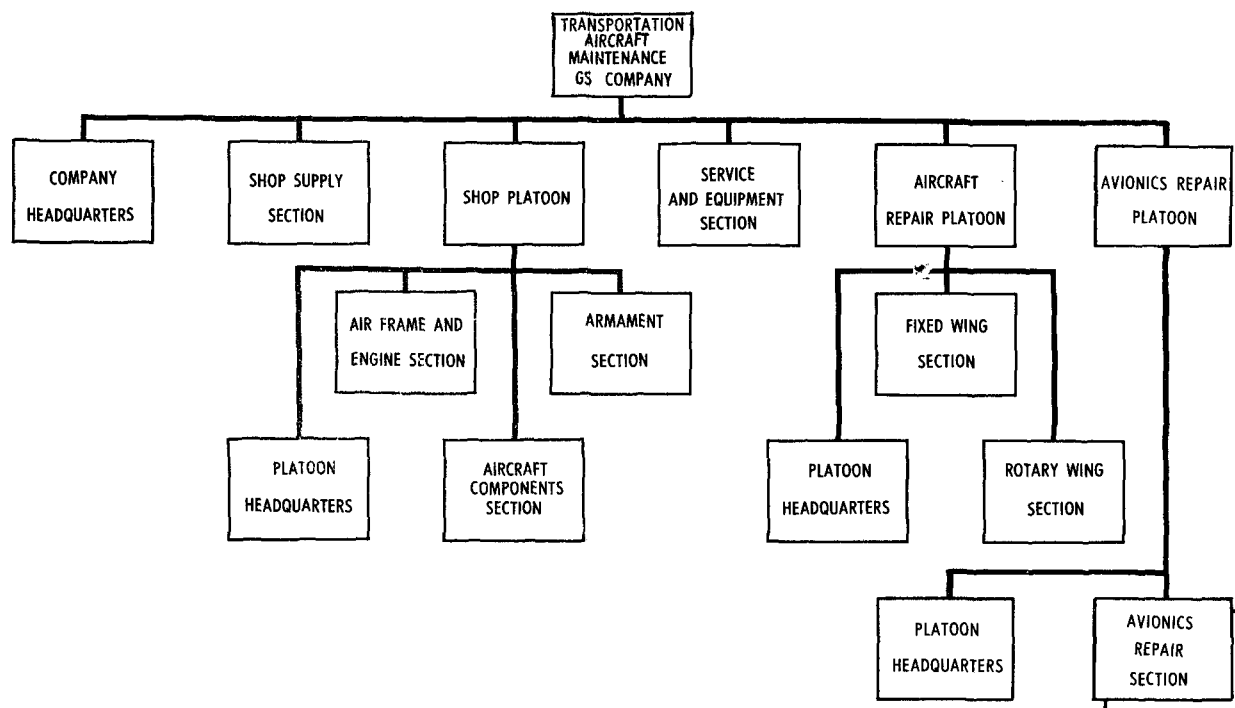


Figure 3-9. Transportation aircraft maintenance GS company.

b. Functions of Unit Elements.

(1) *Company headquarters.* This section provides for command of unit operations, performs organizational maintenance on unit small arms and communications equipment, and performs administrative services, messing, and organizational supply functions. The headquarters also contains production and quality control personnel.

(a) *Production control.* Production control personnel plan the unit's repair program, interpret or recommend and implement production control procedures, schedule shop workload, and prepare required records and reports.

(b) *Quality control.* Quality control technician and inspection personnel are responsible for quality control, coordination and performance of inspections, assurance of quality control, and preparation of records and reports.

(2) *Shop platoon.* This platoon consists of a platoon headquarters, an airframe and engine section, an aircraft component repair section, and an armament section. Functions of these elements are as follows:

(a) *Platoon headquarters.* The platoon headquarters provides the personnel for supervising and managing the allied shops and for compiling maintenance data, coordination of

repair parts requirements, completing maintenance records, and preparing maintenance reports.

(b) *Airframe and engine section.* The airframe and engine section repairs airframes, engines, and engine components of Army aircraft.

(c) *Aircraft components section.* The aircraft component section repairs rotors, propellers, power trains, electrical systems, instruments, and hydraulic systems. It also has a limited capability for fabrication of repair part and certain special tools.

(d) *Armament section.* The armament section performs GS maintenance on aerial weapons.

(3) *Aircraft repair platoon.* This platoon consists of a headquarters, a fixed wing section, and a rotary wing section. The platoon headquarters provides supervision, control, and coordination of platoon repair activities; compiles maintenance data; and prepares maintenance reports. The fixed wing section removes and replaces components of fixed wing aircraft. Components are routed to the shop platoon for repair. The rotary wing section performs similar functions on rotary wing craft. This platoon also provides repairmen to make up technical assistance teams.

(4) *Shop supply section.* This section requisitions, receives, stores, maintains records for, and issues repair parts and other maintenance materials required to support unit maintenance operations. It also prepares special reports as required by higher headquarters and regulations. Items handled by the section include repair parts for aircraft and related components, aerial weapons systems, some parts for avionics equipment, and related supply items such as aircraft paint, special tools, oxygen, etc. Requests for repair parts and maintenance materials are submitted to the brigade SCC (Under automated procedures, through the ADP center).

(5) *Service and equipment section.* This section maintains the trailer and semi-trailer-mounted shop sets, materials handling equipment, generators, and wheeled vehicles organic to the company; requisitions, receives, stores, and issues repair parts for organiza-

tional maintenance of organic equipment; operates the organic helicopters and performs organizational maintenance thereon; and operates and maintains the fuel-dispensing tank trucks and petroleum storage facilities. In addition, this section contains the equipment for accomplishing recovery and evacuation of aircraft. If downed aircraft to be recovered by helicopter exceed the lift capability of organic aircraft, necessary airlift must be obtained from other sources.

(6) *Avionics repair platoon.* This platoon consists of a platoon headquarters and avionics repair sections. Normal supervision, control, and coordination of the platoon's repair activities is provided by the platoon headquarters. In addition, it compiles required operational data and prepares necessary maintenance reports. The repair sections perform general support and overflow direct support maintenance on aircraft armament items.

3-12. Diesel-Electric Locomotive Repair Company

a. Company organization is depicted in figure 3-10. The company performs GS maintenance and, when necessary, DS maintenance on diesel-electric locomotives and railway cranes. It provides support to railway equipment maintenance companies of the railway battalions attached to a transportation railway group. Because of the single-user nature of its support, maintenance operations are coordinated, on a daily basis, with the supported transportation railway service unit. When feasible, the company should be located near the railway group that it supports.

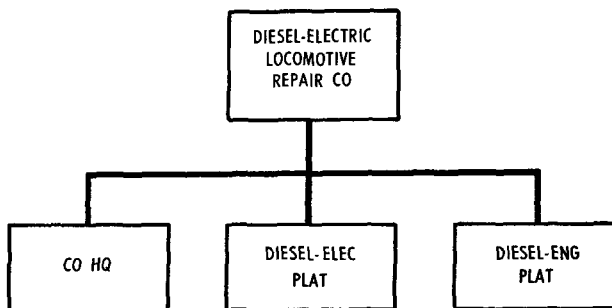


Figure 3-10. Diesel-electric locomotive repair company.

b. General operational guidance and maintenance policies, procedures, and requirements for records and reports, guidance and directives on administrative matters, and guidance on stock levels are provided by the parent field depot of the SMC. As with other maintenance units, reports and data required by the SMC or TASCOM are provided to the SMC MMC or its supporting ADP center, depending on the type report submitted.

3-13. Transportation Railway Supply and Car Repair Company (GS)

Company organization is depicted in figure 3-11. The company performs GS maintenance on railway rolling stock, railway car floors, sidings, ends, running boards, doors, and safety appliances.

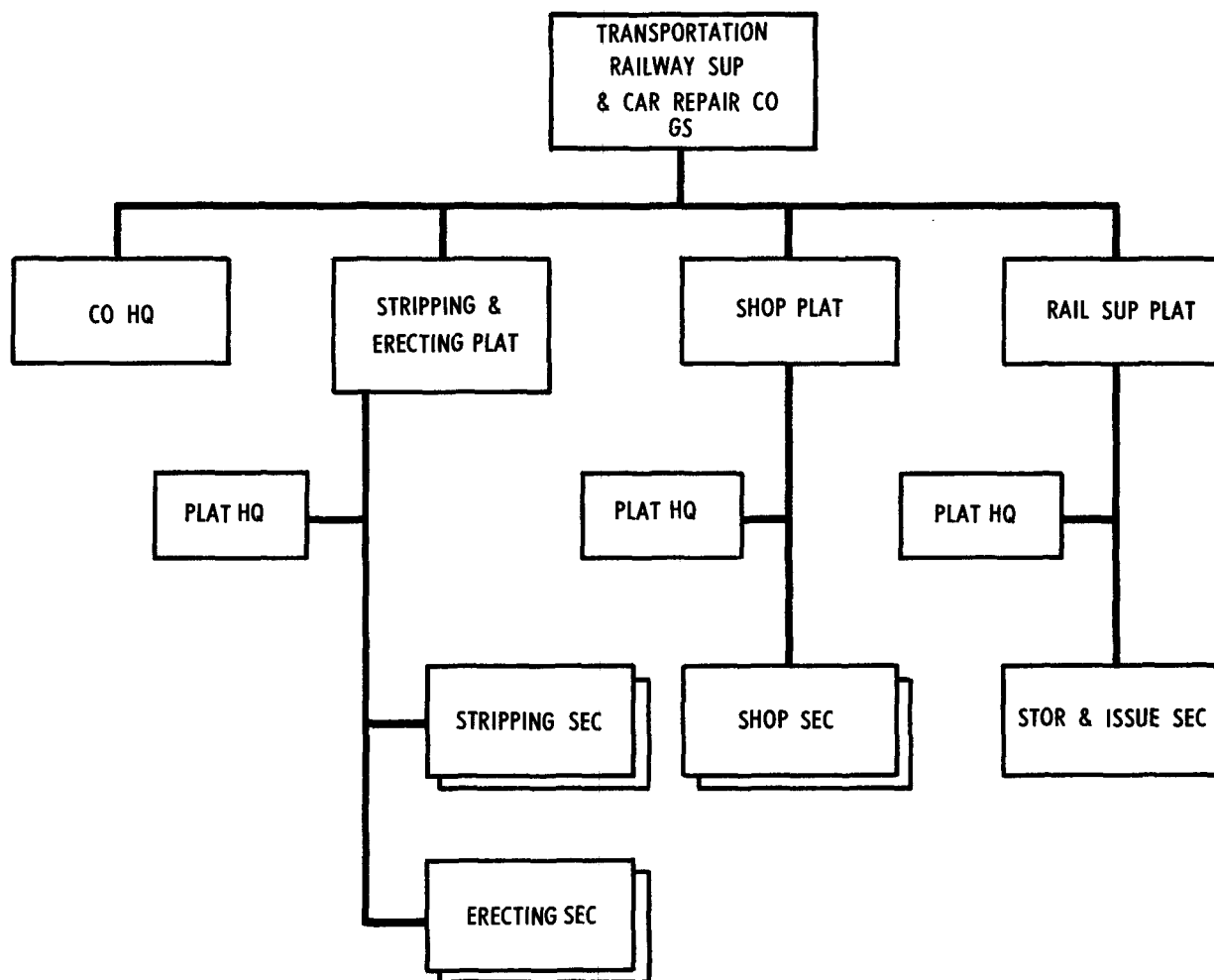


Figure 3-11. Transportation railway supply and car repair company (GS).

a. The company receives for repair and overhaul that rolling stock that is beyond the repair capability of maintenance companies of supported railway battalions. Repaired items are normally returned to the supported units.

b. Repair parts and maintenance supplies for railway equipment maintenance are provided to railway equipment maintenance companies of railway battalions and to the railway diesel-electric locomotive repair company.

Supply stocks are replenished by submitting requisitions to the SMC ICC. Shipment will be made from a field depot stocking railway supply items.

c. General operational guidance, maintenance policies, procedures and requirements for records and reports, guidance and directives on administrative matters, and guidance on repair parts stock levels are provided by the parent field depot of the SMC. Reports and data required by the SMC or TASCOC are

provided to the SMC MMC or its supporting ADP center, depending upon the type of report submitted.

3-14. Transportation Floating Craft GS Company

Company organization is depicted in figure 3-12. The company provides GS maintenance and supply for Army floating equipment such as amphibians, landing craft, and harbor craft.

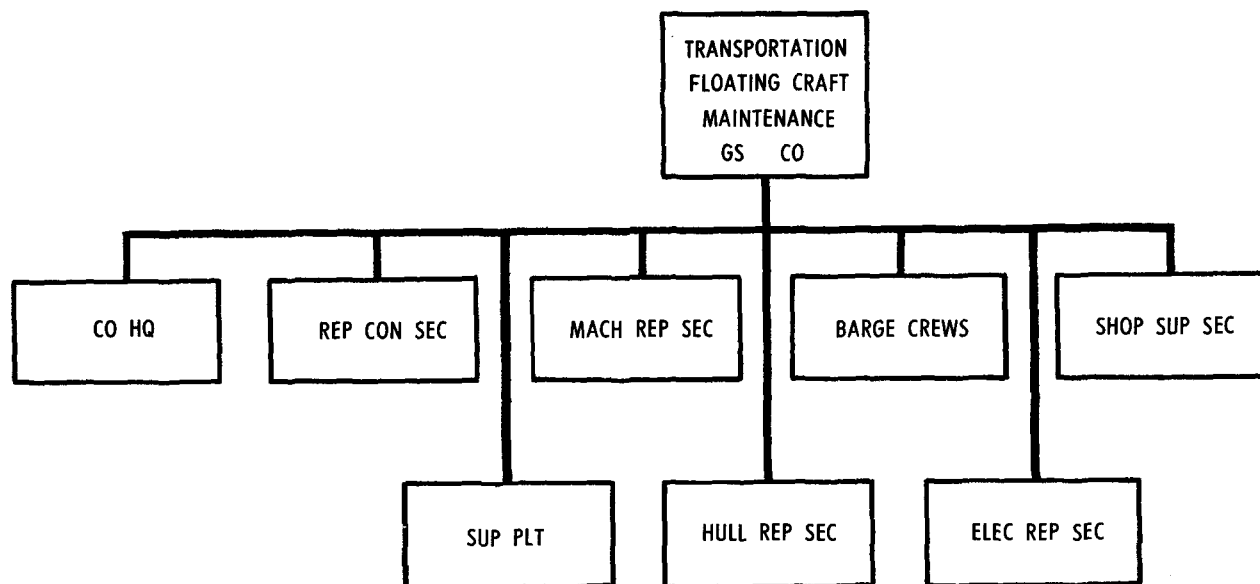


Figure 3-12. Transportation floating craft GS company.

a. The company is attached to a field depot of the supply and maintenance command, theater army support command. Normally it is further attached to the terminal group or brigade which it supports.

b. Although shore-based repair facilities may be established if required, the bulk of the unit's work is accomplished aboard a 210-foot, nonpropelled, floating machine shop (identified as (FMS) in this manual) which contains all of the shop facilities necessary to support the company mission. Three repair sections, a supply platoon, and a repair control section normally function aboard the FMS. The barge crew contains the necessary personnel to maintain and secure the FMS and to operate

on-board machinery. In addition to the repair shops, the FMS is also equipped with a 10-ton crane mounted on the center deckhouse and three internal monorails.

c. The unit is also authorized a 120-foot flat barge with a deck-inclosure kit and two LCM-8's. When fitted with the deck inclosure, the barge provides an additional sheltered working space and storage area for supplies, materials, and equipment. The LCM's are used to transport work teams and equipment about the port area or to tow floating equipment undergoing repairs when suitable tugs are not available.

d. Because of the requirement for a protected anchorage for the FMS, the floating craft GS company normally operates in an established

port terminal that is centrally located in relation to other terminals. In addition to its mission of providing GS maintenance support for all floating craft located within its area of responsibility, the floating craft GS company provides DS maintenance for all harbor craft operating in the same terminal. Disabled floating craft from other supported terminals are normally evacuated by land or water to the company, but emergency contact teams may be organized from the various shop sections and transported by LCM to outlying terminals to accomplish on-site repair.

e. The company performs maintenance on unserviceable stocks of marine equipment stored in field depots, to include modification of equipment. The capability of the company may be augmented by the attachment of Team IC or ID, TOE 55-550. The IC Team may also provide DS maintenance for isolated harbor craft units.

f. The company provides repair parts for organizational maintenance to those units being

provided DS maintenance. It provides the repair parts required by supported DS units. It also provides the repair parts required for its own maintenance operations. Requisitions for replenishment of its supply stocks are transmitted to the SMC ICC, which will direct shipment from the depot stocking the items.

g. Overall maintenance policies, operational guidance, reports criteria, and stockage levels of the company are provided by the parent field depot. The company's single-unit support function requires that control of its day-to-day operations be vested in the terminal group or brigade to which the supported units are assigned. A marine maintenance officer is provided on the staff of the terminal group and terminal brigade to exercise staff supervision over GS maintenance functions for the command. The commanders of the assigned GS units also act as special advisers on floating craft maintenance to the marine maintenance officer and to the terminal group and brigade commander.

CHAPTER 4

DEPOT SUPPORT AIRCRAFT MAINTENANCE (SEABORNE)

4-1. General

a. Certain contingency operations do not lend themselves to the establishment and operation of land-based aircraft maintenance support facilities. Aircraft maintenance support may be provided aboard a floating aircraft maintenance facility (identified as FAMF in this manual). The facility has a capability to inspect, adjust, repair, and overhaul aircraft components and to return these components to stock within the theater. It can provide DS, GS, or limited depot maintenance support. The floating aircraft facility provides a means of rapid deployment for personnel and equipment required to furnish the above services to a specified area. Upon arrival in an oversea area, its maintenance capability will be available for immediate use. The unit may be employed to provide direct and/or general support maintenance during base development stages in a theater of operations. Direct and general support work would be phased out and replaced by limited depot level maintenance when land based direct and general support maintenance units become established.

b. The personnel skills and equipment aboard the FAMF provide the capability for engine overhaul, component repair, production and quality control, machine shop operations, sheet metal fabrication, limited avionics and armament repair, flaw detection, calibration, micro-filming, electrical systems repair, and other associated repair activities. The FAMF provides an extensive engine overhaul and component repair that is not normally available in an oversea theater. The vessel is capable of accepting helicopters on the foredeck and the aft hanger deck. Therefore, aircraft, parts, and supplies can be flown on and off the ship.

c. Service shops and laboratories aboard the FAMF are manned and operated by career per-

sonnel. The skill levels of maintenance personnel are upgraded to depot level through an intensive training program. The training program includes on-the-job training (OJT) at AMC maintenance depots, military technical schools, and civilian contractor technical schools. The FAMF (a U.S. Navy vessel) is operated and maintained by the Military Sea Transport Service (MSTS) civilian crew. Shipboard space limitations preclude aircraft overhaul and rebuild. Operations are tailored toward component repair and overhaul.

4-2. Aircraft Depot Maintenance Battalion (Seaborne)

a. *Organization.* The organization of this unit is shown in figure 4-1.

b. *Mission.* The battalion provides depot maintenance on Army aircraft components, avionics equipment, aircraft armament systems, and parachutes. It provides direct and general support maintenance of Army aircraft, avionics equipment, aircraft armament systems, and parachutes in a combat zone where facilities of land-based service organizations are not immediately available. The battalion with its subordinate assigned units provides for inspection, test, classification, overhaul, and repair of items such as aircraft, turbine engines, and transmissions. The unit provides command, control, and supervision of up to two attached transportation aircraft maintenance units.

4-3. Headquarters and Headquarters Company Aircraft Depot Maintenance Battalion (Seaborne)

a. *Organization.* The organization of this unit is shown in figure 4-2.

b. *Mission.* The company provides command and control of assigned or attached transportation aircraft maintenance companies. It also

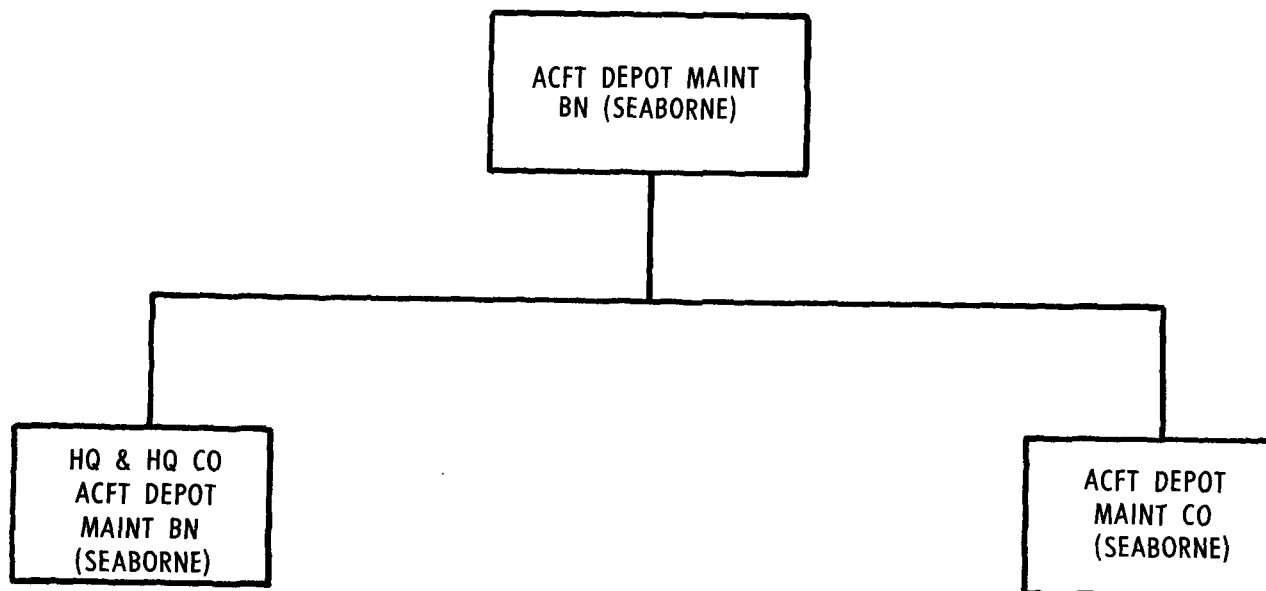


Figure 4-1. Aircraft depot maintenance battalion (seaborne).

provides technical laboratories for quality assurance and control of shop operations and mission supply support for subordinate units.

4-4. Aircraft Depot Maintenance Company (Seaborne)

a. *Organization.* The organization of this company is shown in figure 4-3.

b. *Mission.* The company provides depot maintenance support for Army aircraft components, avionics equipment, aircraft armament, and parachutes. It also provides backup direct support and/or general support as required. The unit is dependent upon the headquarters company of the aircraft depot maintenance battalion for mission and shop supply activities; maintenance and calibration of shop equipment; administrative transport from ship to shore; air and ground transport when engaged in direct support of land based units; personnel administrative support; and medical and dental services.

4-5. Operations

a. It is desirable to station the FAMF as close as possible to the supported activities. However, other factors must be taken into consideration, such as naval supplies, fueling, and

security. The aircraft maintenance shops can operate when the ship is anchored and when it is under way. However, maintenance operational efficiency is increased when the ship is positioned alongside a pier or in a relatively calm roadstead. Proximity to airlanding facilities also adds to operational efficiency by expediting air delivery of incoming repair parts, air evacuation of unserviceable items, and evacuation of serviceable items to using units.

b. The FAMF contains fixed-base type maintenance equipment that cannot normally be included in land-based shops because of size and weight, climatic control requirements, and power and other utility requirements. Shop and workload capacities are limited by the physical characteristics of the ship.

c. The repair support operation returns a high volume of components to a reconditioned status for reissue in the overseas area. The storage capacity of the ship is such that items, once repaired, must be evacuated to land-based facilities in order to make room for incoming unserviceable items.

d. In addition to aircraft component repair, shops provide for repair of avionics and aircraft armament. The FAMF shops can mold

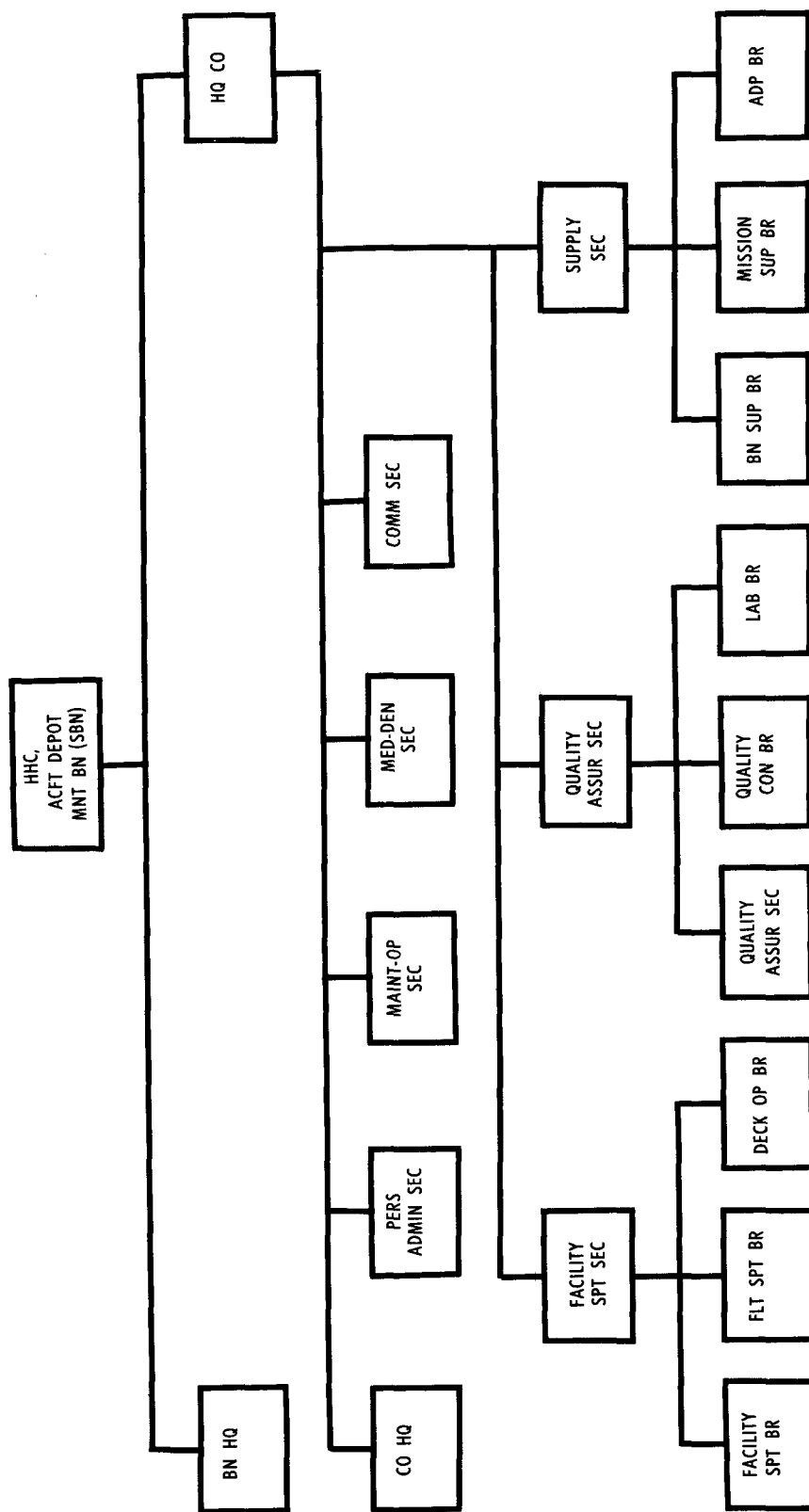


Figure 4-2. Headquarters and headquarters company aircraft depot maintenance battalion (seaborne).

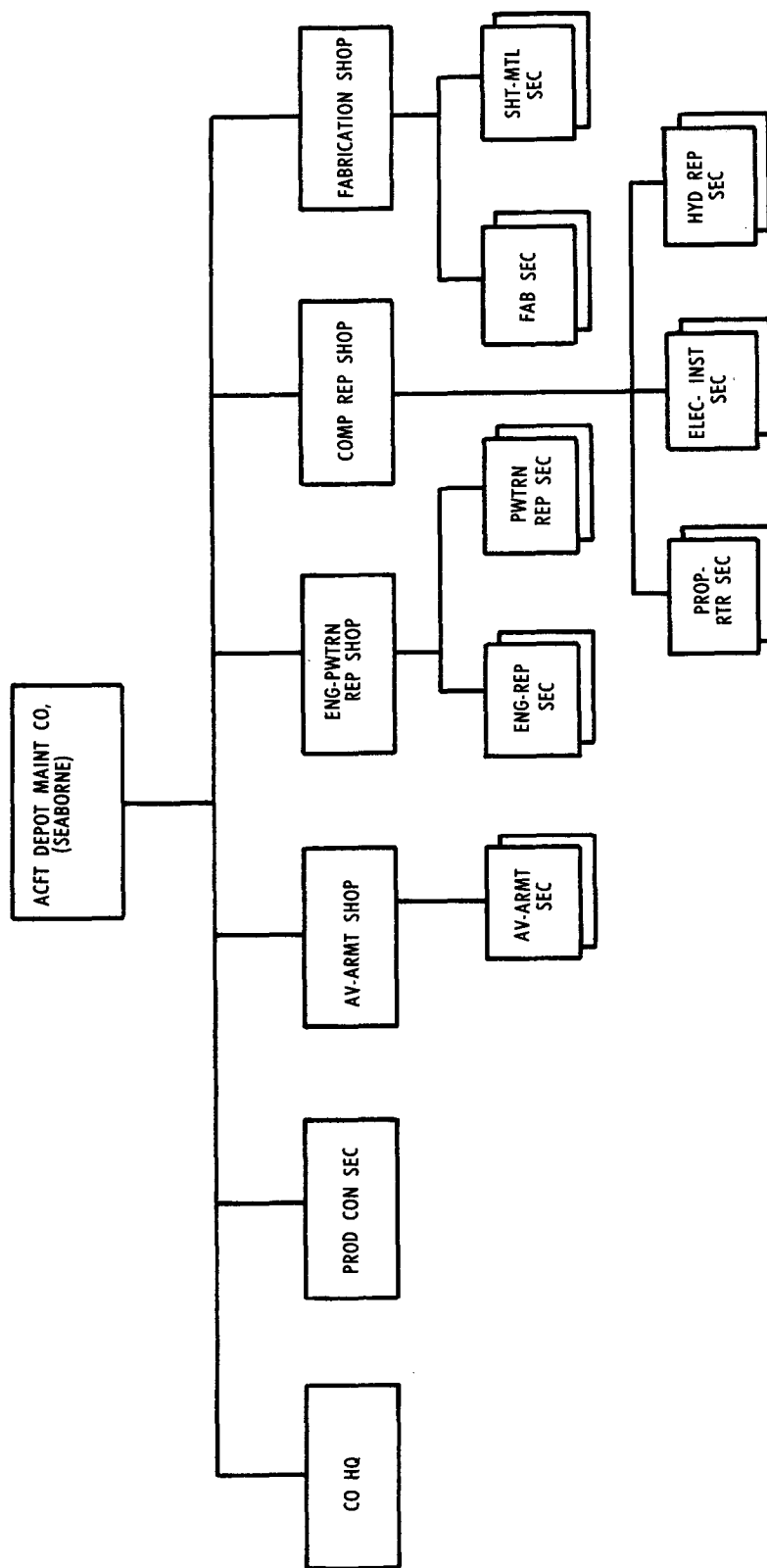


Figure 4-3. Aircraft depot maintenance company (seaborne).

plastics, extrude and form rubber, repair fabrics, heat treat and electroplate metals, braze, and electric weld. They repair and repack parachutes for personnel, ejection seats, and cargo.

e. The FAMF tests, inspects, and analyzes equipment and components. Test cells are provided for engine test and run-in; flow benches provide for test of fuel metering and regulating systems and of hydraulic, vacuum, and pressure systems. There are also stands for balancing blades and rotor systems and for strength testing of cables, metals, and fabrics, as well as stands for run-in of helicopter transmissions. Inspection devices include eddy-current, magnaflux, zyglo, and X-ray capabilities.

f. Sheet metal work is limited to the repair of such items as landing gears, cowlings, and control surfaces. There is a limited capability for the repair of airframes. Airframe capability is limited by space, which does not permit the use of large jigs and formers.

g. When authorized, the FAMF can provide limited direct exchange service to customer units. However, the FAMF is maintenance oriented and is not normally a source of or a depot for supplies.

h. Under normal circumstances, the resupply of emergency demands of repair parts stock are shipped direct by the parent unit, U.S. Army Aeronautical Depot Maintenance Center (USAADMAC). Therefore, the FAMF will not drain off repair parts programed for land-based facilities in the theater. An electric accounting machine (EAM) is provided the battalion for supply control and other accounting purposes. Ship-to-shore communications provided include voice, radioteletype, and continuous wave. In the absence of ship-to-shore circuits, supply requests are transmitted by radioteletype, using a format readily transferable to data cards. Transmissions are made over switching circuit automatic network (SCAN) facilities direct to USAADMAC for further action.

CHAPTER 5

MAINTENANCE MANAGEMENT BY THE BATTALION STAFF

Section I. GENERAL

5-1. Introduction

a. The term "management" embraces a process of establishing objectives and developing workable and flexible plans to carry out responsibilities. The objective of maintenance management is effective and timely accomplishment of organizational and support maintenance to assure maximum combat ready materiel in the hands of using units or supply organizations with the least expenditure of resources. The management objective is achieved by supervision, training, and motivation, and by developing and implementing managerial techniques that will improve efficiency and production and provide a ready source of accurate and timely information on maintenance requirements and status upon which planning and decisions may be based.

b. Maintenance management involves the application and control of all available resources in a manner best suited to mission accomplishment. It involves use of rapid and reliable communications facilities for the transmission of information, instructions, and decisions. It applies automatic data processing techniques when the necessary equipment is available. It develops and modifies operational procedures. It utilizes timely and complete information to enable continuous assessment of status, requirements, and problem areas. And, it realigns missions, as necessary, and supervises operations.

c. Although the MMC is the prime activity within the TASCOM and FASCOM support structure for the overall management and control of maintenance support operations, the

headquarters of the maintenance battalions manage and control the battalion maintenance operations. The management role is quite extensive at the direct support level, where DS units must be directly responsive to the support requirements of the units they support and the MMC only indirectly exercises control of DS unit workload. At the general support level, the maintenance management functions of battalion headquarters are more restricted, because of control of workload input and disposition by the MMC. Nevertheless, at either level the battalion headquarters exercises functions of management and control in accordance with mission assignments, policy guidance, directives, priorities, and procedural guidelines provided by higher headquarters.

5-2. Scope

This chapter provides information on the techniques and tools that may be used by the materiel sections of the DS and GS maintenance battalions. Maintenance management at the GS level must be viewed in a different perspective than at DS level. Differences in GS maintenance unit employment and deployment, missions, functions, and operational methods which require variations in the application of maintenance management techniques are discussed in paragraph 5-8*i*. For maintenance management information above battalion level, refer to FM 29-20. The material herein is based, primarily, on manual procedures of report preparation and processing. For details on maintenance management under automated procedures, see Chapter 9 of FM 29-20.

Section II. MAINTENANCE MANAGEMENT BY THE DS MAINTENANCE**BATTALION STAFF****5-3. General**

a. Battalion headquarters is the managing and controlling agency responsible for assuring the provision of adequate and responsive direct support to field army units (less divisions, unless substituting for a division maintenance battalion). This responsibility requires battalion headquarters to supervise, control, and direct the operations of battalion units in the areas of DS maintenance, evacuation, repair parts supply, operational readiness floats and direct exchange, and the provision of technical assistance. The battalion headquarters is also a key element in the maintenance data collection system since it must assure that battalion units prepare data and reports incident to their operations, convert this data into punch cards, and submit such data and reports for transmission to the ADP center or the MMC, depending on whether automated procedures are being used.

b. The battalion headquarters exercises control over the displacement, mission assignment, and operations of its units in accordance with policies and directives of higher headquarters. It provides direction and instructions, exercises supervision, provides assistance, and performs management and control functions to satisfy requirements of supported units and plans, policies, and directives of higher headquarters.

c. Battalion headquarters is responsible for advising support group headquarters on matters pertaining to maintenance and repair parts supply. Included are recommendations concerning personnel, facility and equipment requirements; maintenance and repair parts performance, requirements, and problem areas; the state of materiel readiness of battalion units; and the deployment and employment of battalion units.

d. Overall technical direction and control of battalion operations are exercised by the ACofS, maintenance, of support brigade headquarters. The maintenance management center attached to the ACofS, maintenance section, functions as the brigade MMC to provide guid-

ance, instructions, direction, and information, and to exercise control of maintenance operations of the brigade. Information, instructions, and direction provided by the MMC are disseminated through battalion headquarters. The support group headquarters performs administrative support but does not exercise operational control over the maintenance support operations of the group and its subordinate maintenance units. Most instructions and directives received by the maintenance battalion relative to disposition of workload requiring evacuation, for parts fabrication, priorities, controls for materiel readiness floats, repair status, and time limits to be observed in the performance of maintenance emanate from the MMC. Then instructions are sufficiently broad to provide flexibility to battalion headquarters in the organization and deployment of maintenance units and the management and control of their operations. Reports and data required by the MMC are provided directly to that activity or to its supporting ADP center, depending on whether the data is provided in punch card or hard copy format. Information copies of reports such as materiel readiness, workload and production recap, and production difficulties are required by battalion headquarters even though originals are sent directly to the MMC.

e. The MMC coordinates and controls the evacuation of unserviceable items that must be evacuated to higher category maintenance units or collection and classification companies. It also provides information and instructions on the application of modification work orders, provides information on priorities with respect to repairs of specific types of equipment or support of specific units, provides maintenance management information derived through analysis of maintenance data and reports, and, in coordination with the SCC, assures the availability of repair parts and operational readiness float stockage required for maintenance battalion operations. The MMC does not directly control workload input of DS maintenance units, as it does with GS maintenance

units; however, it can influence this workload and accomplish workload balancing by recommending, to the ACofS, maintenance, changes in mission assignments, changes in priorities, and changes in repair time limits.

f. Items being evacuated by units of the battalion are normally evacuated to either a collection and classification company or to a designated general support maintenance unit, as directed by the MMC. Normally, the MMC will publish evacuation instructions, applicable for a specified time period, to avoid the necessity for providing individual instructions for the disposition of all items requiring evacuation. Reports on certain critical or controlled items may be required by the MMC before evacuation instructions are issued. Under automated procedures, disposition instructions are provided by the ADP center and are based on instructions provided by the MMC.

g. Mission assignments for the maintenance battalion are determined and published by support brigade headquarters and provided through support group headquarters. Support group headquarters assigns areas of operation based on the mission assignments made by brigade. The battalion headquarters assigns missions to and deploys units of the battalion based on mission and areas assigned by support group.

5-4. Management Techniques and Tools

a. *Records and Reports.* A complete listing of all records and reports which are maintained or processed by the materiel section is impracticable. Variations will exist from battalion to battalion. These records and reports include those submitted routinely, and those submitted in response to specific requirements. This paragraph discusses those reports routinely maintained and processed by the materiel section. When maintenance management procedures are not automated, information requirements will be satisfied by the ADP center supporting the command. Requirements for preparation of detailed manual-type reports will be reduced considerably.

(1) *Materiel Readiness Report, DA Form 2406.*

(a) This report is required by Department of the Army (DA), but it may be used

by all levels of command. It has a direct and significant bearing on maintenance battalion operations. Arrangements should be made with the appropriate command element for supported units to provide their supporting DS maintenance units with copies of the reports. Analysis and subsequent action must be prompt so that problems may be identified and solved before they develop into serious situations.

(b) This report is prepared by all organizations that maintain a property book. It provides data on the readiness of selected items of equipment as designated by DA, and is prepared and submitted in accordance with the provisions of TM 38-750. Submission to DA on a quarterly basis, commands below DA level use this report for collection of materiel readiness data. Reports required by commands within the field army will be of greater frequency than those required by DA.

(c) The materiel readiness report indicates the period of the report; designation and address of the unit preparing the report; a listing of equipment together with the number of each item on hand and equipment serviceability; and reasons for equipment nonavailability. Figure 5-1 lists a few of the problem areas that may be detected by the supporting DS maintenance unit or by the materiel section through report analysis. Before action can be taken by the materiel section or the supporting DS maintenance units, specific causes for the indicated problem must be pinpointed. For any particular problem there may be a number of causes. Thus, careful analysis and thorough investigation are required. When the specific cause is known, action can be taken to eliminate, alleviate, or prevent development of a problem. Figure 5-1 also indicates some of the actions the materiel officer may recommend relative to specific problems.

(d) Figure 5-1 is not intended to present ready-made solutions for all problems that will arise. Nor does it indicate all problem areas. The purpose of the sample is to indicate that reports and records, if properly analyzed and followed up, are valuable tools for effective management. It is also emphasized that this method of report analysis and followup is not limited to the battalion headquarters materiel

PROBLEM INDICATOR	POSSIBLE CAUSE	ACTION REQUIRED
<p>1. Large number of nonavailable items because of failure of the same part.</p>	<p>a. Deficiency in material comprising part, design deficiency, deficiency in manufacture.</p> <p>b. Improper use of equipment.</p> <p>c. Improper organizational maintenance or lack of such maintenance.</p>	<p>a. Submit Equipment Improvement Report (EIR).</p> <p>b. Training through work parties or establishment of a school, or publication of operating instructions.</p> <p>c. Command action if due to neglect. Technical assistance if due to lack of knowledge, skilled personnel, or time.</p>
<p>2. High nonavailability rate in one unit as compared to other supported units.</p>	<p>a. Shortage of unit mechanics.</p> <p>b. Organizational mechanics lack required skills.</p> <p>c. Organizational motor or maintenance officers unfamiliar with or neglecting organizational maintenance responsibilities.</p> <p>d. Poor preventive maintenance program.</p> <p>e. Greater use of equipment because of mission activities, sustained operations, etc.</p>	<p>a. Assist in training mechanics. Utilize work parties to assist in the organizational maintenance area. Check to see if the supported unit is taking action to acquire the required mechanics.</p> <p>b. Training through work parties or establishment of a school.</p> <p>c. Conferences and technical assistance to develop capabilities and point out weaknesses. If this is not successful, bring facts to attention of the unit commander.</p> <p>d. Liaison with commanders to establish sound PM program. Technical assistance in development of such a program.</p> <p>e. Provide DS support to reduce organizational maintenance backlog. Maximize on-site support by work parties.</p>
<p>3. Excessive number of items not available because of nonavailability of repair parts.</p>	<p>a. Parts not available in supporting DS unit.</p> <p>b. Incorrect demand data, or clerical errors of DS technical supply elements. Failure to maintain stockage at proper levels at DS level or within the supported unit. Requisitioning errors on the part of the supported unit.</p> <p>c. Improper diagnosis during inspection failed to determine all parts requirements.</p> <p>d. Parts are fringe items.</p>	<p>a. Lateral transfer of parts within the battalion, priority request on GS supply source, fabrication, cannibalization.</p> <p>b. Examination of organizational supply procedures. Review of DS technical supply records and procedures. Technical assistance to supported unit if required. Training or modification of DS supply procedures if indicated.</p> <p>c. Technical assistance as required. Emphasis on use of organizational test equipment.</p> <p>d. Cannibalization. If demand warrants, take action to have items put on stockage list.</p>
<p>4. Jobs in direct support maintenance for excessive periods.</p>	<p>a. Jobs in DS shops require excessive correction of organizational maintenance deficiencies.</p> <p>b. Excessive workload in DS shop.</p> <p>c. Poor workmanship causing excessive rejections by final inspectors and rework by shops.</p> <p>d. Improper application of the IROAN (inspect, repair only as needed) technique resulting in unwarranted repairs. Incomplete initial inspection resulting in additional parts requirements after repairs have begun.</p> <p>e. Lack of repairmen, or excess of poorly trained repairmen.</p> <p>f. Time wasted installing poorly rebuilt or reconditioned assemblies or components.</p> <p>g. Shortage of repair parts.</p>	<p>a. Conference with supported unit commander. Emphasis on PM. Technical assistance if required. Arrangements for operators to accompany materiel to DS and perform organizational maintenance there while DS maintenance is being performed.</p> <p>b. Augment personnel or realign missions. If impracticable to do the foregoing, evacuate overload to GS. Determine whether DS is attempting to do GS work.</p> <p>c. Emphasis on in-process inspections. Emphasis on training of repairmen by competent supervisors. Replacement of repairmen or supervisors, if warranted.</p> <p>d. Provide additional training or replace with more competent inspectors. Closer command supervision.</p> <p>e. Additional training; augmentation, or requisition skilled mechanics. (If practicable, organize unit schools and take advantage of service school quotas.)</p> <p>f. Command action.</p> <p>g. See item 3.</p>

(NOTE: In all actions affecting supported units, coordination with the unit commander is mandatory.)

Figure 5-1. Sample analysis of materiel readiness status reports.

section, but applies equally to the commanders and shop officers of all maintenance units.

(2) *Daily status report.* This report (fig. 5-2) is a locally devised report that may be used to keep battalion abreast of the maintenance situation in the shops of attached units. The form may be used by the materiel officer to obtain a daily report on the number of maintenance requests received, shop workload, and shop production. It is emphasized that this is not a mandatory report; it is suggested only as a management tool to be employed at the discretion of battalion headquarters. Reports from the various units of the battalion will differ in construction, depending on the type of equipment supported by the unit submitting the report. The battalion commander may also require that end items in an "awaiting parts" status for an abnormal time period (e.g., 5 days) be listed in the "remarks" section together with the part description and the document number of the due-out. A day-by-day check of these reports will reveal trends or situations which require command or staff action, to include technical assistance to supported units, modification of internal operating procedures of battalion units, augmentation of overloaded units (e.g., light maintenance DS companies augmented by personnel of the main support company), realignment of missions to balance workloads, or increased evacuation (direct support maintenance overflow to GS). Specific problem areas which may be determined through analysis of daily status reports include—

(a) *Significant increase in shop input.* If this is sporadic, or lasts for only a short period, it may only reflect increased activity and equipment usage by supported units—a condition that may be expected from time to time. If the condition persists over an extended period, it may be indicative of lack of proper and timely organizational maintenance, equipment abuse, or insufficient emphasis on on-site maintenance. If workloads are balanced among units of the battalion and comparison of daily summaries indicates a sudden abnormal influx of work in one company, augmentation of the affected unit may be required. Additionally, if this situation affects all units of the battalion,

battalion may revise its evacuation policy by modifying repair time limitations for specific items. This would reduce the number of maintenance manhours that are to be spent in repair of a specific type item at the DS maintenance level, and result in more items being evacuated to GS maintenance.

(b) *Excessive number of items awaiting parts.* When reports indicate an excessive number of items awaiting parts, supply procedures and activities of attached units should be investigated to determine if the fault is within the battalion and to institute remedial action. Excessive delays for lack of parts may also require emphasis on cannibalization (if permitted by AR 750-50) or parts fabrication, reevaluation and revision of authorized stockage lists and supply levels, or may require coordination with supporting wholesale supply units to attempt to facilitate more responsive supply support. If it is found that lack of transportation from the GS wholesale supply source to the DS maintenance unit is a contributing factor, the materiel officer may consider utilizing battalion transport to pick up supplies by supply point distribution rather than depend on unit distribution.

(c) *Low volume of production.* If comparison of reports indicates one unit is consistently behind the others in volume of production and it always has a sizeable backlog, reasons should be determined and appropriate action taken. Potentials to be investigated are: poor production or quality control, inadequate supervision, misinterpretation and misapplication of the IROAN (Inspect and Repair Only as Needed) technique, lack of trained repairmen, lack of tools and test equipment, or misdirection of effort.

(3) *Reports, summaries, and listings provided by the maintenance data collection activity.* This activity (MMC) is a valuable source of data which should be exploited by the materiel officer. It possesses a vast amount of information gleaned from the processing of equipment records prepared and submitted in accordance with TM 38-750. (Machine processing is accomplished by the ADP center supporting the brigade.) Information provided by this source may be disseminated directly to

DAILY STATUS REPORT

ITEM	TYPE	ON HAND, START	RECEIVED	AWAITING PARTS	AWAITING SHOP	IN SHOP	COMPLETED, AWAITING PICKUP	DISPOSITION USER (VIC/SALV)	ON HAND, CLOSE	REMARKS
WHEELED VEH	2 1/2-TON	4	2	1	1	1	0	2	3	
	3/4-TON	3	1	1	1	0	0	2	2	
	1/4-TON	2	2	0	0	1	1	1	2	
TRACKED VEH	TANK REC	1	0	0	0	0	1		1	
	APC	2	1	1	0	1	1		3	
COMM-ELEC	RADIO SET AN/VRC 46	1	1	0	0	0	0	2	0	
	SYMBD. SB 22/PT	2	2	0	0	1	1	1	2	
	RADIACMETER MM-108/PD	2	0	0	0	0	2		2	
CHEMICAL	SMOKE GEN	3	1	0	0	1	1	2	2	
ENGINEER	GEN SET, 5 KW	1	0	0	0	0	0	1	0	
	GEN SET, 3 KW	2	1	1	0	0	0	2	1	
	LOADER, SCOOP	0	1	0	0	0	0	1	0	
ARTILLERY/ARMAMENT	8-IN HOW, SP	2	2	1	0	1	0	2	2	
QUARTERMASTER	TANK/PUMP UNIT	0	1	0	0	1	0	2	1	

NOTE: FIGURES ILLUSTRATED ON THIS REPORT AND TYPES OF ITEMS INDICATED ARE FOR ILLUSTRATIVE PURPOSES ONLY. SPECIFIC ITEMS TO BE REPORTED ON WILL BE DETERMINED BY BATTALION.

Figure 5-2. Sample daily status report.

battalion, or provided through command channels, depending on local policy. From this source, the materiel officer may obtain information on equipment density and location for use in preparing and updating equipment density charts. He may also be provided information on the density and location of items requiring MWO application by direct support. This information can be used to assist in programming MWO accomplishment and ordering the required kits or repair parts to accomplish the MWO. This is a sample of the information available to the maintenance manager; for a more thorough description, see FM 29-20 and TM 38-750-1.

(4) *Equipment density chart.* Based on equipment density listings provided by the maintenance data collection activity, the battalion materiel section may elect to design, construct, and maintain an equipment density chart to provide an indication of volume and type of equipment supported by each unit of the battalion. This chart normally indicates major items of equipment supported, the supported units possessing this equipment, and the unit of the battalion responsible for providing support. To be practical, the scope of such displays must be limited to selected equipment and supported units should be listed by battalion or larger force. Information of a classified nature should not be included on such charts.

b. Inspections. Inspections are tools of management that provide an indication of materiel readiness, proficiency of personnel, adequacy of operations, and effectiveness of maintenance and maintenance supply management. Inspections permit the inspector to see conditions as they actually exist, rather than only as represented in reports. If utilized properly, they provide indications of shortcomings, when they exist, and provide a basis for instituting corrective action. The materiel section will conduct inspections of battalion units as required by the battalion commander. The battalion will also be required periodically to provide personnel for the conduct of command maintenance management inspections (CMMI) of using units under the provisions of AR 750-8. The battalion may be required to conduct spotcheck inspections, or conduct in-

spections of supported units at the request of the supported unit commander.

c. Visits.

(1) A visit can be made as an informal inspection. It does not carry the stigma that is often associated with inspections. Unit personnel are more likely to talk freely with a visitor who expresses interest in their problems than with an inspector, and are more apt to discuss specific problems and discuss complaints on the support they are getting from supporting units.

(2) The battalion commander, executive officer, materiel officer, and other maintenance officers should make visits to units of the battalion as a matter of routine. They should also assure that battalion units conduct frequent visits to supported units, and that the battalion headquarters is informed of mission significant items revealed through such visits. The battalion commander and staff may also visit supported units; however, because of workloads, the number of supported units, and the time required, units of the battalion must be relied upon to maintain constant liaison with supported units. Subjects to be discussed or observed during such visits include:

(a) The satisfaction of the unit with the support it is receiving.

(b) Problems encountered in obtaining required support.

(c) Future operations of the unit that may place extraordinary demands on equipment and require increased maintenance and repair parts supply support.

(d) Requirements for technical assistance.

(e) Adequacy of the unit's maintenance program.

(f) Proper utilization of personnel.

(g) Adequacy of repair parts supply procedures.

d. Maintenance Letter/Bulletin. This publication can be used effectively as a tool of management and as a method of disseminating timely information on maintenance and repair parts supply matters to supported units. It is informal in nature and published on a periodic basis (usually monthly) to keep maintenance and supply personnel of supported units informed

on latest developments. The publication may contain information on stock number changes, changes to direct exchange lists, maintenance tips on new materiel, and similar items that will benefit recipients. This publication can establish and maintain good working relationships with supported units and provide advice and tips which can be implemented at using unit level with a resultant decrease in the direct support workload. Although prepared and disseminated by battalion, all attached units of the battalion should contribute to the content of the letter/bulletin.

5-5. Management of Direct Exchange

a. Direct exchange is an accelerated supply transaction by which a supported unit turns in an unserviceable item and receives a serviceable item in exchange. The transaction is simple and accelerated because documentation is reduced to a minimum. The direct exchange system is employed by all units of the battalion. Operation of the system is described in chapter 8.

b. Direct exchange is primarily intended for the exchange of recoverable or repairable repair parts, components, and assemblies. Direct exchange lists will be prepared by the transportation aircraft DS company, each of the light maintenance DS companies, and the main support company. The scope of the lists may be limited by higher headquarters. The inclusion of certain items is prohibited because of the critical nature of some components and the extent of repair required to place unserviceable items back in stock. Direct exchange lists are prepared by unit maintenance and supply officers and are submitted to the battalion for review and approval. After approval, these lists are published and distributed to supported units by the appropriate unit of the battalion. Guidance on the establishment of a direct exchange program is in AR 711-16. In addition to review and approval of direct exchange lists, the battalion materiel section insures that the lists are current and that they are revised to reflect new requirements, changes in supply status, and other conditions that may result in additions or deletions.

5-6. Management of Operational Readiness Floats

a. All units of the battalion maintain a float of selected end items and components. Though these floats are on hand in the units of the battalion, issue of the float items is controlled and supervised by the battalion headquarters.

b. Direct support float items are part of the army or theater reserve of end items. When float items are issued, float stocks are replenished by the repair of unserviceable like items and by requisitioning replacements for items that cannot be repaired.

c. The battalion headquarters, in establishing policies and procedures for control and issue of float items, will be guided by the policies and procedures established by FASCOM or the SMC. Since items in float stocks are controlled items, the supporting group and brigade or ASCOM headquarters will be informed of issues. However, reporting requirements are normally relaxed to the extent of requiring reports of float issues only when such issues result in the reduction of float stocks that cannot be rapidly replaced by prompt repair of the unserviceable item (e.g., when float issue is made on an emergency basis to replace an uneconomically repairable item).

d. The maintenance of an adequate float and the issue of items from it requires good management. It is necessary, at all levels from company through FASCOM or SMC, to assure that issues from float stock are not made when it would be more appropriate to obtain the items through supply channels (i.e., when the items being turned in cannot be repaired and returned to float stock by the DS maintenance unit). *However, despite the necessity for controls, over-control must be avoided if the float is to serve its intended purpose.* The management of float stock must be decentralized to the extent practical to permit responsiveness. The supporting unit will coordinate with the supported organizations to determine priorities for issue from float stock. Such priorities will be made known to battalion through the support group.

5-7. Management of Repair Parts Loads

a. The adequacy of repair parts stockage

has always been a concern of the maintenance manager. Maintaining an adequate stockage of the proper items is a problem in itself, because of fluctuations in demands; transfer of supported units to other areas; changes in mission assignment requiring the support of different units having more or different equipment, equipment age that affects repair and repair parts requirements; and the requirement to build in adequate safety levels to compensate for order and ship time that may, in itself, be of a fluctuating nature. Thus, while some units are overstocked, others experience a supply shortage. Additionally, overstockage can inhibit mobility when most needed and thus, must be considered in establishing supply levels.

b. Staff supervision and periodic inspection

of supply procedures of attached units, to include authorized stockage lists (AR 711-16 and 711-25), are prime management functions. The battalion policies should emphasize the requirement for review of the prescribed load lists (AR 735-35) of supported units to evaluate proposed additions or deletions and to screen supported unit repair parts requests to insure that requested items are authorized. Review of requests for issue can be useful in identifying trends (e.g., frequent failures of the same part) which may require increased supply levels and submission of equipment improvement recommendations, or may indicate the performance of unauthorized maintenance by lower categories of maintenance based on the type of parts requisitioned.

Section III. MAINTENANCE MANAGEMENT BY THE GS MAINTENANCE BATTALION STAFF

5-8. General

a. Battalion headquarters exercises command and control of attached units by publishing plans, policies, and directives; issuing instructions; reviewing and analyzing reports and data; conducting meetings, deploying attached units; tailoring the battalion structure to satisfy workload requirements; and inspecting and visiting attached units to observe operations.

b. Battalions are assigned specific areas of operation by the support group based on missions assigned by higher headquarters. The battalion is responsible for providing GS maintenance to DS units in the area and to such other DS units as may be designated (e.g., divisional maintenance battalions). In addition, for purposes of workload balancing in the event of temporary overloads in other areas, workload from other areas may be directed to units of the battalion from time to time. Further, specific units of the battalion may be assigned the missions of performing large-scale production-line maintenance in specific commodities.

c. Within the support area assigned to the battalion, battalion headquarters will assign specific areas to attached units based on the

recommendations of the unit commanders concerned, and will frequently assist in reconnoitering sites for new areas of operation. When attached units desire locations that are also desired by other units, battalion headquarters will attempt reconciliation with the battalion headquarters of the other unit involved, and will notify support group headquarters when such conflicts cannot be resolved. Support group headquarters is kept apprised of the locations of units attached to the battalion, deployment of such units, and problems and requirements that require the attention of group headquarters.

d. Battalion headquarters keeps track of workloads, problems, and production of attached units through analysis of reports, briefings, and visits, and analysis of printouts provided by the MMC that resulted from the data submitted to the ADP center by attached units. Although most hard copy reports and data developed by attached units are provided directly to the MMC or its supporting ADP center, information copies of certain reports such as "status or activity" reports that recap activity and "production difficulty" reports that highlight problem areas are provided to battalion headquarters. Information copies permit

battalion headquarters to take early action to resolve problem areas. Because of their volume, battalion headquarters can do little with reports and data provided by attached units in response to automated maintenance data collection system requirements except to transmit them to the ADP center supporting the brigade MMC. Exceptions to this are materiel readiness reports pertaining to attached units, which must also be provided to group headquarters.

e. Reports, summaries, and analyses of information generated at the MMC as a result of machine processing of maintenance and materiel readiness data are normally provided directly to the battalion headquarters. Battalion headquarters personnel will take any action indicated or directed to solve problems identified through reports analysis, and will provide data, instructions, and assistance to attached units, as appropriate.

f. Through group headquarters or the MMC, depending on the type information involved, battalion headquarters will also be informed of redeployment requirements, changes in mission assignment, prospective changes in workload as a result of redirection of work by the MMC, priorities for the processing of certain items of materiel, maintenance standards to be applied in the absence of published standards, repair time limits imposed for the repair of certain items by higher headquarters, requirements for fabrication of certain repair parts, programs for overhaul or production-line maintenance developed by the MMC, parts requirements for specific production runs as developed by the MMC, and related instructions.

g. When the workload becomes excessive, the battalion will make appropriate recommendations to the MMC relative to augmentation requirements or the necessity for redirection of workload. Such action is taken only when maintenance management and control within the battalion will not solve the problem. For example, if the battalion contains two units of the same type, and one of these units is overloaded, temporary augmentation of the capacity of the affected unit may be accomplished by temporarily attaching personnel and/or equipment from the other unit.

h. The battalion headquarters will make frequent checks to determine the adequacy of attached unit repair parts stockages. When the MMC directs repair of certain items on a production-line basis, the battalion will schedule repairs to start where all required repair parts are expected to be available. The battalion headquarters materiel section will assist units in establishing the most effective layout and processing procedures required for production-line operation and will monitor production to assure conformance with established schedules.

i. Maintenance management at the general support level must be viewed in a slightly different perspective than at direct support level. While many of the tools and techniques of management are similar at both levels, there are dissimilarities that must be recognized. They are:

(1) Direct support units perform a large portion of their work on site and specialize in the repair of end items by the removal and replacement of defective components. Production methods normally employed by DS maintenance units include the bay (or job shop) or the bench shop method. General support units will seldom, if ever, experience a requirement to perform on-site maintenance. They will, instead, be concerned with repairing those un-serviceable components generated through DS maintenance operations, which have been evacuated for GS maintenance. Although some end item repair by the job shop method will be accomplished at the GS maintenance level, repair of components will be accomplished on a production-line basis to the maximum extent permitted by equipment and facilities.

(2) The DS maintenance level effort directly supports the users of equipment while the GS level supports the supply system.

(3) At the DS level, maintenance planning and forecasting are geared to immediate requirements, and emphasis is placed on prompt repair of equipment and its return to the user. At the GS level, planning is more long-range, wherein components may be accumulated and stored until sufficient quantities are available to capitalize on the inherent efficiencies of production-line maintenance.

(4) At the GS level, parts fabrication can become a significant part of the maintenance effort.

(5) At DS level, the use of local civilian labor to augment the maintenance effort is generally impractical because of frequent movement requirements, proximity to combat areas, and the production methods used. On the other hand, at the GS level, especially in the rear of the field army service area and in the COMMZ, civilian labor may readily be trained to accomplish most of the simple and repetitive-type functions associated with production-line operations. Procurement and management of civilian labor must be coordinated with the civil affairs and procurement organization supporting the command.

5-9. Daily Status Report

The construction of this report may be patterned after that indicated in figure 5-2, except that it will be designed for the specific needs of the unit to which it applies. For battalion management, the report serves the same purposes at GS level as it does at DS level (para 5-3a(2)).

5-10. Report of Collection and Classification Activities

This report (fig. 5-3) is sent to the battalion materiel section daily (or less frequently, depending on reporting requirements of higher headquarters). A copy is sent from battalion to the support brigade MMC. It indicates receipts of materiel, its classification, disposition effected, and balances on hand. The support brigade MMC and SCC use information from this report to initiate disposition actions and to maximize use of resources available through collecting point operations (e.g., the SCC may request the MMC to direct removal of critical or fringe repair parts from end items earmarked for disposition as salvage to expedite the return of such items to supply channels).

5-11. Reports, Summaries, and Listings Provided by the Maintenance Management Center

The battalion materiel section will also utilize reports, summaries, and listings provided

by the support brigade MMC. The information derived from this source stems from the processing of equipment records prepared and submitted in accordance with TM 38-750 and prepared by the ADP center supporting the brigade. This information may be disseminated directly to the GS maintenance battalion, or provided through command channels, depending on local policy. From this source, the materiel officer may obtain such data as the average type and number of repair parts utilized in the performance of specific GS maintenance functions, average man-hours expended per type job and the number of jobs processed in a specific period. Such data is useful in programing maintenance and estimating repair parts requirements, especially for production-line operations. This is but a sampling of the information available. For additional details, see TM 38-750-1 and FM 29-20.

5-12. Inspections

The battalion commander conducts formal inspections of units of the battalion to determine unit and materiel readiness, proficiency of personnel, and the adequacy and efficiency of operations. He also conducts informal inspections. The materiel section conducts frequent inspections and visits as directed by the commander, or in the normal course of operations. Units of the battalion may also be required to provide personnel for command inspection teams.

5-13. Management of Repair Parts Loads

The materiel section periodically reviews authorized stockage lists of attached units to determine their adequacy. It evaluates proposed additions and deletions to authorized stockage lists, and maintains data on repair parts consumption for estimating future repair parts requirements. Such parts consumption data may be derived from several sources: Unit supply files, control copies of maintenance requests, or listings provided by the data collection activity as a result of records processing. The materiel section also coordinates with the supply and service battalion on repair parts requirements and stockage list additions and deletions.

SUMMARY OF COLLECTING POINT ACTIVITIES																									
UNIT DESIGNATION _____																									
PERIOD: FROM _____ TO _____	ITEM	RECEIVED LAST 24 HOURS						DISPOSED OF LAST 24 HOURS						BALANCE ON HAND											
		SERVICABLE	REPAIRABLE AT GS LEVEL	REPAIRABLE BY HIGHER ECHELON	*UNECONOMICALLY REPAIRABLE OR ECONOMICALLY CONTAINING SERVICABLE REPAIR PARTS	SALVAGE	TOTALS FOR TODAY	SERVICABLE	TURNED IN TO SUPPLY AND SERVICE BATTALION	TURNED IN TO MAINTENANCE UNITS	EVACUATED	**SALVAGED	TOTALS FOR TODAY	SERVICABLE	REPAIRABLE AT GS LEVEL	REPAIRABLE BY HIGHER ECHELON	*UNECONOMICALLY REPAIRABLE OR ECONOMICALLY CONTAINING SERVICABLE REPAIR PARTS	SALVAGE	TOTALS COLUMNS 13, 14, 15, 16, 17						
	1	SERVICABLE	REPAIRABLE AT GS LEVEL	REPAIRABLE BY HIGHER ECHELON	*UNECONOMICALLY REPAIRABLE OR ECONOMICALLY CONTAINING SERVICABLE REPAIR PARTS	SALVAGE	TOTALS FOR TODAY	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

NOTE:
 1. LIST ITEMS BY FUNCTIONAL GROUP; I. E., ARMAMENT, AUTOMOTIVE, CHEMICAL, COMMUNICATIONS/ELECTRONICS, QUARTERMASTER, ETC.
 2. LIST CAPTURED ENEMY MATERIEL BY NATIONALITY OF ORIGIN AND BY FUNCTIONAL GROUP.

REMARKS:
 *Servicable and economically repairable repair parts removed from uneconomically repairable materiel will be listed in the appropriate received column in the next report.
 **Includes residue as a result of removal of servicable or economically repairable repair parts from uneconomically repairable materiel.

Figure 5-3. Report of collection and classification activities.

5-14. Auxiliary Labor as a Source of Augmentation

a. General.

(1) Auxiliary labor may be employed to increase the productive capacity when support requirements exceed the capability or capacity of GS units. Additionally, type B TOE units, which integrate auxiliary labor in non-critical positions, may be organized.

(2) Auxiliary labor is subject to policies and general restrictions stated in FM 100-10. Limitations on employment of prisoners of war, and commitment of U.S. and allied troops to higher priority or sensitive tasks usually limit the availability of these types for labor tasks. Accordingly, the auxiliary labor available to GS units will normally consist of local-hire civilians. For details concerning rules of employment, policies, and limitations refer to FM 100-10, FM 27-10, and DA Pam 690-80.

(3) The employment of local civilian labor has the advantage of increasing the productive capacity of a unit without increasing troop requirements. It also aids the civilian economy of the area in which operations are being conducted and assists in establishing good relations with the civilian populace. Therefore, such laborers should be used where required and when permitted.

b. *Procurement.* Policies concerning the employment and utilization of local civilian labor are provided by theater headquarters. Civil affairs elements at all levels advise on the availability of civilian labor for military purposes and on the essential manpower needs of the local economy, and recommend policies appropriate to meet the various aspects of the commander's overall mission. Within the field army support command (FASCOM) or the theater army support command (TASCOM), policies and procedures regarding the use of local civilian labor are interpreted, supervised, and implemented by the ACofS, personnel, in coordination with the ACofS, civil affairs. Allocation of available labor to subordinate units is accomplished by the ACofS, personnel, in coordination with other principal staff sections. Procurement, administration, hiring and firing, classification, and related matters are the responsibility of the civilian personnel

officer, supervised by the ACofS, personnel. Units utilizing civilian labor are required to appoint a unit labor officer, who discharges unit responsibilities with regard to acceptance, supervision, time and attendance records, and similar tasks. Details are contained in FM 41-5 and FM 41-10; Section XIV, Army CPR M-100; and DA Pam 690-80.

c. *Problems and Limitations.* The effective utilization of local civilian labor depends on a thorough understanding and appreciation of the problems generated when such augmentation is deemed necessary. In addition to the fact that such laborers may not be dependable when there is a danger of enemy action, the effective utilization of such personnel may be complicated by language differences, local labor laws, union rules, or national customs. Therefore, the advice and assistance of civil affairs personnel should be sought before these laborers are employed and when problems arise after employment. Other problems that may arise when utilizing such labor include non-availability of the required skills, and additional security precautions required to prevent pilferage, especially in newly-occupied areas where the civilian economy has been crippled and there are shortages of food and civilian consumer goods.

5-15. Utilization of Local Civilian Labor by the GS Maintenance Battalion

a. Local civilian laborers may not be available to accompany the unit when it moves. Consequently, in the combat zone such laborers should not be employed in tasks that require extensive training, and the unit should not develop dependence on them in such skilled positions as welders, mechanics, machinists, etc., unless their continued availability can be assured. This does not preclude use of such local residents in housekeeping chores, and in such jobs as supply handlers; truck drivers; maintenance helpers; for packers, and craters; and cooks' helpers and kitchen police.

b. Availability of trained and skilled personnel, as well as common laborers, can be assured by the formation of mobile labor units. Such units are organized and administered in accordance with regulations of higher head-

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quarters, and are furnished such logistical support as may be required for their subsistence and protection. Such units can be made largely self-supporting, but requisitioned labor may not be mobilized into organizations of a military or semi-military character. See FM 100-10 and FM 27-10.

c. Units employing local civilian labor normally coordinate with army intelligence units for screening as a minimum key or sensitive personnel. The employing unit should closely supervise non-U.S. workers to deny opportunities for sabotage or pilferage.

(1) Military personnel must be made available particularly during wartime or emergency, to supervise the civilian labor force, and to provide necessary instruction and assure se-

curity. Civilian laborers employed as truck drivers, for instance, should not be given assignments that take them out of the unit area with valuable cargoes unless accompanied by U.S. personnel. Military surveillance is advisable.

(2) Direction of civilian laborers by appointment of leaders and supervisors from their own ranks is desirable and should be accomplished when practicable. Such foremen will understand their workers, know their customs and desires, be able to anticipate their actions and reactions, and avoid or counteract difficulties. Development, selection, and screening of such low-level managers should be practiced when the situation permits.

Section IV. MAINTENANCE MANAGEMENT BY THE TRANSPORTATION GS MAINTENANCE AND SUPPLY BATTALION STAFF

5-16. General

a. Maintenance management by this battalion headquarters is accomplished in the same manner as described for the GS maintenance battalion in paragraph 5-8, except that this battalion is concerned only with aircraft and aircraft-related items.

b. The increasing use of Army aircraft in combat support, and combat service support operations makes the effectiveness of aircraft repair support a major consideration in operational planning. Assuming that other elements of the situation are favorable, the commander's decision concerning use of aircraft in a specific operation may be dependent upon the ability of the supporting maintenance activity to keep the required number of aircraft operational. For this reason, careful planning for the maintenance support of the aircraft committed to an operation must be conducted concurrently with, and in the same detail and care as, the planning of the operation itself.

c. Once the supported operation is underway, there is a continuing need for a sound program of aircraft maintenance support, carried out in accordance with local and established (as set forth in FM 54-4 and AR 750-1 and AR 750-5) maintenance principles and

policies, applied in a manner that will most effectively meet the requirements developed during joint planning discussed in *b* above. To insure the establishment and effective operation of such a program, the maintenance battalion must employ an active program of aircraft maintenance management.

5-17. Battalion Responsibility and Functions

a. Aircraft maintenance management uses essentially the same principles as does management of other materiel. Although the MMC is the prime activity within the support structure for the broad management and control of maintenance support operations, the headquarters of the various maintenance battalions manage and control the internal operations.

(1) At the DS level, the battalion role is quite extensive. Here, DS aircraft maintenance units must be directly responsive to the support requirements of the units they support, and MMC exercises only indirect control of the DS workload.

(2) The maintenance management functions of the battalion headquarters at the GS level are sometimes restricted because of control of workload input and disposition by the MMC.

(3) At either level, the battalion head-

quarters exercises functions of management and control in accordance with mission assignments, policy guidance, directives, priorities, and procedural guidelines provided by higher headquarters.

b. Basically, the battalion's aircraft maintenance management responsibility involves day-to-day direction and control of available aircraft maintenance resources to insure their efficient and economical application. More specifically, the battalion's aircraft maintenance management responsibilities include:

(1) Determining the aircraft maintenance mission and workload.

(2) Establishing the requirements for personnel manhours.

(3) Planning and programing the use of available manhours.

(4) Providing technical supervision and

management control over the aircraft maintenance program and activities.

(5) Reviewing accomplishments as related to aircraft maintenance mission effectiveness and recommending appropriate corrective actions such as modifications to the organization, transfer of excessive workloads, or acceptance of additional workloads.

(6) Evaluating current policies and procedures and recommending changes.

(7) Planning, supervising, and controlling technical supply support and general supply activities.

(8) Assuring adequate and timely repair parts support for the battalion's mission and repair parts support to supported units.

(9) Coordinating with higher headquarters for the rapid and effective disposition of repaired items.

CHAPTER 6

DIRECT SUPPORT MAINTENANCE OPERATIONS

Section I. GENERAL

6-1. Introduction

a. Direct support maintenance is a key element in the system established to maintain the serviceability of equipment in the hands of troops. A using unit depends on its supporting DS maintenance unit for assistance when an unserviceable item of equipment requires maintenance beyond the organizational maintenance level, or when the organizational workload becomes greater than it can handle. The using unit also depends on its DS maintenance support for technical assistance on the performance of organizational maintenance and for the provision of repair parts for organizational maintenance.

b. This chapter deals with the maintenance operations prescribed for providing DS maintenance support to nondivisional using units in the corps, field army, and COMMZ, plus overflow DS maintenance support to division maintenance battalions. For information covering DS maintenance in the division, refer to FM's 29-30 and 54-2.

c. Maintenance discussed in this chapter is focused on the procedures necessary to perform the repair of materiel. These include the inspection of materiel to determine serviceability and extent of work required, shop organization and functions, on-site maintenance, provision of shop supply, and production and quality control. Technical assistance is also discussed.

d. Integral to the DS maintenance mission is the responsibility for providing repair parts supply support and recovery and evacuation assistance to supported units. These aspects of DS maintenance operations are covered in chapters 8 and 9.

6-2. Maintenance Responsibilities

a. The maintenance required to keep supported using unit equipment in top operating condition is a joint responsibility of the supported unit and its supporting DS unit. Supported units are responsible for performing the organizational maintenance prescribed in appropriate technical manuals, and for maintaining their prescribed load of repair parts supplies to perform this maintenance. When organizational maintenance is performed according to prescribed procedures, equipment failures are kept to a minimum and supporting DS maintenance units can concentrate on DS maintenance. When supported units neglect, or improperly perform organizational maintenance, the maintenance workload of the supporting DS unit increases in quantity. The number of repair operations and repair parts consumed increases and the number of items that have to be evacuated for overflow DS maintenance multiplies. This defeats the responsiveness and effectiveness of the maintenance system and has an adverse effect on using units since they are deprived of more of their equipment for longer periods. It also imposes an unwarranted strain on the supply system. DS units must devote a significant portion of their efforts to technical assistance in order to keep maintenance workload within its proper category. Repeated failures on the part of any supported using unit to perform its assigned portion of the total maintenance operation should be reported through command channels.

b. End items repaired by the DS unit are returned to the supported unit, except for those items repaired for return to float stock subsequent to issue of a float item to a sup-

ported unit. Items that cannot be repaired by the DS unit because they exceed its capacity (overflow direct support) or its capability (general or depot support) are evacuated in accordance with instructions provided by the support brigade MMC. Normally such instruc-

tions are provided in letters or similar media for a specific time period and generally direct the evacuation of economically repairable items, salvage, unidentified or foreign items, and items requiring depot maintenance are directed to a C&C company.

Section II. METHODS OF MAINTENANCE OPERATIONS OF THE DS MAINTENANCE BATTALION AND ITS SUBORDINATE ELEMENTS

6-3. Maintenance Battalion

a. The DS maintenance battalion normally provides support to all using units in a designated area, although it may operate in whole or in part in support of specifically designated units.

b. The battalion normally operates from multiple locations within its assigned area of operations. The headquarters and headquarters detachment and the main support company normally locate at the point of greatest equipment density in the battalion area of responsibility, and as centrally as possible within the area. The light DS maintenance companies locate in other parts of the area, oriented on equipment densities. The aircraft maintenance DS company operates in the vicinity of an airfield located in the battalion area of responsibility. Considerations affecting the location of battalion DS units include the tactical situation, road net in the area, the availability of suitable areas for the conduct of operations, security requirements, and the locations of other support activities in the area.

c. The main support company reinforces the light DS maintenance companies. Light DS maintenance companies may be attached to another DS maintenance battalion when the situation warrants, for example, where one DS battalion of the support group is not employed to the full extent of its productive capacity, while the other battalion in the group is overtaxed.

d. Units of the battalion repair, or arrange for the proper disposition of, unserviceable equipment that exceeds the repair capabilities or capacities of units they support. Thus, repair functions include direct support maintenance and assistance, as necessary, in the performance of organizational maintenance that

exceeds the repair capacities or capabilities of supported units. Maintenance is performed either in the company maintenance shops or on site, with on-site maintenance being preferred when such maintenance is both practical and of benefit to the user, or necessitated because of the bulk and location of unserviceable equipment and the ease of repairing it on site as opposed to its evacuation to a DS maintenance shop for repair. Technical assistance is utilized to the extent possible to instruct supported units in proper techniques of organizational maintenance and proper utilization of organizational test equipment so as to minimize requirements for DS maintenance units to perform organizational maintenance functions. Equipment beyond the repair capabilities or capacities of the light DS maintenance companies is evacuated to the main support company, provided the main support company has the capability to do the work. Equipment exceeding the repair capabilities or capacities of the main support company or the aircraft maintenance DS companies is evacuated to general support maintenance units or to a collection and classification company, in accordance with disposition instructions provided by the support brigade MMC. Scrap generated through DS maintenance unit operations is disposed of as directed by the SCC. Figures 9-1 and 9-2 depict the evacuation of unserviceable materiel in the field army area.

e. The direct support maintenance mission also includes the responsibility for assuring the accuracy of supported unit test and measuring equipment. This is accomplished by providing maintenance calibration (C-level calibration) support to supported units within the capabilities of the DS units, or by arranging for the provision of necessary support when

maintenance calibration exceeds the capabilities of the DS unit or when higher level calibration (A-level) is required. For details of calibration support, see FM 29-27.

6-4. Headquarters and Headquarters Detachment

a. Battalion headquarters exercises command and control of attached units by—publication of plans, policies, and directives; issuing instructions; review and analysis of reports and data; conduct of meetings and briefings; deployment and redeployment of attached units; internal tailoring of the battalion structure to satisfy workload requirements; inspections; and by frequent visits to attached units to observe operations.

b. The battalion is assigned specific areas of operation by the support group, based on mission assignments made by support brigade. It is responsible for providing maintenance and repair parts support to all units and activities operating in or passing through its assigned area. In addition, for purposes of workload balancing in the event of temporary overloads in other areas, units of the battalion or elements of these units may be attached to DS maintenance battalions in other areas. Within the support area assigned to the battalion, battalion headquarters will assign specific areas to attached units based on the recommendations of the unit commanders concerned, and will frequently assist in reconnoitering sites for new areas of operation. Support group headquarters is continually kept apprised of the locations of units attached to the battalion, redeployment of such units, and problems and requirements that require the attention of higher headquarters.

c. Battalion headquarters keeps track of workloads and problems of attached units and the production of these units through receipt of information copies of reports being submitted by attached units to the MMC; through visits, liaison, and briefings; and through receipt of printout information developed as a result of data collection and processing by the ADF center.

d. Through command channels, battalion

headquarters will be informed of redevelopment requirements and changes in mission assignment. It will be informed of prospective changes in workload as a result of known influx of new units to be supported, priorities for the processing of certain items of materiel, maintenance standards to be applied in the absence of published standards, repair time limits imposed for the repair of certain items, requirements for fabrication of certain repair parts, and related instructions provided by the MMC or support group headquarters. Battalion headquarters provides attached units with pertinent instructions governing operations, and performs maintenance management and staff supervision to assure adherence to established policies, priorities, and procedures.

e. When the workload becomes excessive, the battalion headquarters will make appropriate recommendations to the MMC relative to augmentation requirements. Such action is taken only when maintenance management and control within the battalion will not solve the problem. For example, since the battalion normally contains at least two light maintenance companies, when one of these becomes overloaded, battalion headquarters may augment the capacity of that unit by temporarily attaching personnel and equipment from the other unit.

f. Battalion headquarters will make frequent checks to determine the adequacy of attached unit repair parts stockages and will assure that attached units provide technical assistance to supported units with respect to development and maintenance of authorized and adequate PPL's.

★6-5. Maintenance Company, Rear, DS

a. General.

(1) The company establishes its base of operations in the area of greatest equipment density in the supported area, and as centrally located within the area as possible. The area selected for operations will be adjacent to a good road to facilitate easy access to supported units.

(2) The company provides direct support maintenance, repair parts supply, and technical assistance service to those units in the battal-

ion's area of responsibility that are not supported by light DS maintenance companies. Within its capabilities workload capacity, the company also provides backup support to the light maintenance companies by performing that portion of the direct support maintenance workload that is beyond their capabilities or capacities. It also provides assistance, as necessary, to supported units and the light DS maintenance companies in the recovery and evacuation of materiel.

b. Maintenance Operations.

(1) The company provides on-site maintenance service to supported units when the provision of such service is both practical and of benefit to supported units. On-site maintenance service is provided by the dispatch of properly manned and equipped contact teams to supported unit areas or to the site of equipment failure. All elements of the company will provide personnel for the performance of on-site maintenance, as directed by the shop office. The automotive maintenance platoon is particularly suited for the performance of on-site maintenance since it contains two identical automotive repair sections, one of which will normally operate at the company base area while the other may be utilized for the performance of on-site maintenance on an assigned-mission basis or may operate at a remote location for extended periods (e.g., for extended on-site maintenance or to perform maintenance at refueling points along roads in the battalion's area of responsibility).

(2) The maintenance shop of the maintenance company, rear, receives workload from units supported by the maintenance support company, rear, and from light DS maintenance companies. After receipt of equipment, those items whose characteristics permit inspection and fault diagnosis without disassembly are inspected by the shop office inspection personnel and are then scheduled into the shop, as shop workloads and availability of repair parts permit. Small items and items that require some disassembly or require diagnosis by use of vehicle-mounted test equipment (e.g., electronic items) are normally directed into the shop by the shop office after receipting for the item(s). Within the maintenance company, rear, DS re-

pairs consist of replacement of defective components with serviceable components, tightening and adjustment operations, welding operations, repair of minor components by use of repair kits. For the most part, components requiring repair are evacuated for general support maintenance. End items repaired by the company are returned to supported units (or to operational readiness floats if a float issue was made). Those components repaired at DS level (carburetors, fuel pumps, and similar direct exchange items) are returned to direct exchange stocks. Before items are returned to supported units, however, a final inspection is made to assure completeness of repairs and serviceability of equipment.

c. Technical Supply Functions.

(1) The company requisitions, stores, maintains in storage, and issues repair parts and those end items (replacements for operational readiness float stocks) required to support using units and to sustain the maintenance operations of the company maintenance shop. These functions are performed by the supply platoon, which maintains the company's authorized supply level of repair parts and maintenance supplies.

(2) A direct exchange activity will be established within or near the storage section. As necessary, personnel from the maintenance platoons/sections will be provided to the direct exchange section for the inspection of items being turned in by supported units for exchange (e.g., fuel-electrical systems repairman).

★(a) Stock control section. This section maintains stock accounting records and files; determines requisitioning objectives; edits requests for issue or turn-in; maintains a critical items list and fringe items records; assists the shop officer in compiling direct exchange lists; maintains demand data; and records the issue of supplies. It receives requests for issue from using units supported by the maintenance company, rear, and requests from the maintenance elements of the maintenance company, rear. It screens its stock records for availability, and accomplishes issue by directing the storage section to make issue. It exercises control over the operational readiness float; controls the evacuation of materiel; and prepares requests for

issue for replenishment of stocks of the maintenance company, rear. Such requests are submitted to the brigade SCC. It keeps current references on stock accounting and supply procedures, to include regulations, technical publications, SOP, and policy and procedural guidance and information; and provides personnel to satisfy inspection or technical assistance requirements as necessary.

(b) *Storage section.* This element physically receives, stores, maintains in storage, and issues maintenance supplies, including direct exchange and operational readiness float items. Supplies are issued in accordance with instructions from the stock control section. It is also responsible for safeguarding supplies, for proper storage, for preparing supplies for shipment, for maintaining records of balances, and for maintaining a locator system.

d. Maintenance Records and Reports.

(1) Most maintenance data and reports required by higher headquarters are submitted in punch card format. Battalion headquarters provides support for conversion of manual data to punch card format when equipment is not available at company level. Data submitted includes data pertaining to maintenance operations of the maintenance company, rear. Punch cards are transmitted by battalion headquarters directly to the ADP center supporting the brigade MMC.

(2) In addition to punch card data and reports, higher headquarters may require reports of a type that do not lend themselves to machine processing or are required so infrequently as not to justify machine processing. Such reports are provided directly to the brigade MMC in the format and the frequency desired, and containing the required information. Normally, information copies of such reports will be provided for the information of battalion headquarters.

e. Disposition of Workload. Items repaired by the company are normally returned to supported units, except for items repaired for return to direct exchange stocks or to the operational readiness float. Items repaired in a backup role for the light DS maintenance companies are returned to these units after repair. Workload exceeding the capacity or capability of the company is evacuated in accordance with

disposition instructions provided by the brigade MMC. In most instances, disposition will be in accordance with automatic disposition instructions provided by the MMC. The instructions will indicate that items of a certain type in a certain condition will be evacuated to a collection and classification company while other specific types of items, repairable at the general support level, will be evacuated to designated general support maintenance units. In the case of critical, controlled, or short supply items, the maintenance company, rear, may be required to report such items to the brigade MMC before evacuation.

★6-6. Light Maintenance Company (DS)

★a. Elements of the company operate similarly to their counterparts in the maintenance company, rear, DS. A maintenance shop in the company base area provides DS maintenance, DS maintenance supply, evacuation, and technical assistance to supported units. The company elements are smaller in size and have lesser productive capacities than counterpart elements of the maintenance company, rear. Certain repair skills and related equipment present in the maintenance company, rear, are not in the light DS maintenance company because the volume of some types of equipment to be supported does not justify placing the support capabilities in both types of units, and because certain repair functions can be performed more efficiently in the maintenance company, rear.

★b. The light maintenance company places emphasis on on-site maintenance. Repair of end items usually consists of replacement of unserviceable components. When it is not practical to make on-site repair, unserviceable items are evacuated to the company maintenance shop for repair. In some instances, items received for repair will not be within the repair capability or capacity of the light maintenance company, and the maintenance company, rear, will perform the repairs. In such cases, the items may be taken to the maintenance company, rear, for repair and return to the light maintenance company. Items requiring general support or higher category maintenance, DS maintenance overloads, as well as uneconomically repairable

items are evacuated in accordance with instructions provided by the brigade MMC.

c. Battalion headquarters may also augment the workload capacity of an overloaded light maintenance company by the temporary attachment of personnel and equipment from another maintenance company. If such overloads are of a continuing nature, battalion headquarters will normally take action to make changes in support missions or to obtain the services of another light maintenance company.

★d. Because of the limited evacuation capability of the light maintenance company, assistance from the maintenance company, rear, is required for recovery and evacuation operations. The light maintenance company does not have recovery vehicles or tank transporters.

e. Repair parts support to supported units is provided by supply point distribution. Contact teams visiting supported units may be used to deliver supplies. The supported units will normally be required to pick up their supplies at the supply section operating in the company base location. Vehicles being returned to supported units after repair are also used for the delivery of supplies.

★f. The authorized stockage list (ASL) of the light maintenance company will include types and quantities of repair parts authorized for use by organizational maintenance activities of supported units as well as those authorized for use in DS maintenance. (See AR 711-16.) When the light maintenance company is unable to satisfy a request for a repair part from a supported unit and requesting the item from the brigade SCC will not provide a timely supply action, the supply platoon of the maintenance company, rear, may be asked to satisfy the requirement by a lateral transfer of the item to the light maintenance company.

g. Replenishment of repair parts stocks is accomplished by submitting requests for issue to the brigade SCC, which will direct shipment from the appropriate GS supply source. Under automated procedures, such requests are submitted through the ADP center.

★h. The light maintenance company prepares and submits maintenance data and re-

ports in the same fashion as does the maintenance company, rear. In this regard, see paragraph 6-5d.

6-7. Aircraft Maintenance DS Company

a. *General.* This company provides DS maintenance and repair parts supply for Army aircraft and associated equipment of units operating in its area of responsibility. When required, it may operate on a unit basis or on a combined basis of unit and area support. It may also be employed in support of task force aircraft in a specific mission. Command, control, and direction of operations are exercised by maintenance battalion headquarters.

b. *Maintenance Responsibilities.* This company provides DS maintenance service to supported units. It will also provide support for aircraft of other units which may be downed in its operational area. The company performs its own organizational maintenance and assists supported units in the performance of aircraft organizational maintenance when supported units require such assistance. As an essential element of the maintenance mission, the company also provides technical assistance to the units it supports. When the DS workload of the company exceeds its capacity, augmentation may be provided or the overflow evacuated to a designated aircraft maintenance GS company. Jobs requiring GS or higher category maintenance are also evacuated to the aircraft maintenance GS company, as directed by the MMC. Aircraft evacuation is depicted in figure 9-2.

c. *Operational Limitations.*

(1) The maintenance capability of this company is reduced when working under blackout conditions. Although the mobile shop vans can be blacked out, these vans do not accommodate materiel other than that which can be completed in a relatively restricted area.

(2) The size and weight of certain essential equipment, such as the mobile shop vans, significantly limit the off-road trafficability of the company.

(3) Aerial evacuation of disabled aircraft is restricted to the lift capability of the company's organic aircraft. When lift requirements exceed this capability, assistance is re-

requested from the supported unit or from a heavy lift helicopter company. Assistance from a supported unit is normally arranged through direct contact between the units concerned. Assistance by heavy lift helicopter is requested through command channels.

d. Operational Techniques and Deployment.

(1) This company may operate in a single location or may dispatch DS platoons or portions of DS platoons to perform maintenance on a mission basis. In addition to their repair missions, these DS platoons also furnish limited maintenance supply support on an emergency basis, and provide technical assistance to organizational maintenance activities of supported units. When required, the shop platoon may assist the DS platoons as permitted by the workload of the shop platoon. The DS platoons obtain repair parts resupply from the company shop supply section.

(2) The company maintenance shop operated by the shop platoon, is established in the company area, usually adjacent to an air-landing site. If operating on a unit support basis, the shop is located on an airfield of the supported unit. The shop accomplishes the bulk of the aircraft support mission, performing DS maintenance that is not appropriate for on-site completion or that is beyond the capability of the DS platoons. The shop platoon may also assist the DS platoons with on-site maintenance by providing personnel, or special equipment. An additional function of the shop platoon is recovery and evacuation of unserviceable aircraft.

(3) On-site maintenance by the mobile DS platoons is practiced to the maximum within the limits of practicability. This maintenance is performed at the airfields of supported units as well as in areas where aircraft are downed. When airlift is necessary for access to downed aircraft, the support of the service and equipment section, which has the necessary aircraft, is obtained. Factors limiting the scope of on-site maintenance are accessibility of the area and weather conditions.

e. Supply Operations.

(1) The supply platoon operates at the company site and requests, receives, stores, accounts for, and issues maintenance supplies

required to support the shop platoon, the DS platoons, and the aircraft organizational maintenance activities of supported units. Items provided include aircraft supplies as well as avionics and armament items associated with aircraft or used in flight operations.

(2) Requests for issue are submitted to the supply platoon headquarters. Supported units, the shop platoon, and DS platoons obtain maintenance supplies from the shop supply section. Normally, the DS platoons do not issue maintenance supplies to supported units; however, in emergencies the supporting DS platoon may provide items from its maintenance stocks.

(3) Maximum use is made of direct exchange procedures to provide serviceable repair parts for like unserviceable items on an item-for-item basis.

(4) Normal replenishment of supply platoon stocks is accomplished by the supply platoon headquarters, which prepares and submits requisitions in accordance with requirements indicated in stock records. Requisitions are submitted to the brigade stock control center (SCC), which directs shipment from a repair parts company in the corps area or an aircraft and missile repair parts company in the army service area.

f. Relationships with Maintenance Battalion Headquarters.

(1) Overall supervision of company operations is exercised by the battalion headquarters, which is kept informed of workload, production, problem areas, support requirements, and other matters affecting operations through reports and direct contact. The battalion headquarters materiel section exercises staff supervision over aircraft maintenance support operations. The battalion headquarters assigns missions, conducts inspections, directs movement, and takes steps to obtain supplementary support.

(2) The battalion headquarters provides instructions and policy guidance relative to maintenance operations, support priorities, and disposition of materiel. It receives the instructions from higher headquarters or the MMC.

g. Maintenance Data and Reports. With respect to the preparation and submission of

maintenance data and reports, responsibilities and procedures are similar to those of the main support company (para 6-5d). Most data and reports will relate to aircraft, aerial weapons, and avionics repair operations, workloads, status, and problem areas.

6-8. Transportation Lighterage DS Company

a. The lighterage DS company normally is attached to the terminal battalion and is located in the rear of a beach complex where amphibians and landing craft are being employed in logistical beach operations. Contact teams may be organized and sent to a unit for on-site repair of disabled craft. Detachments may be organized from the service and equipment platoon, DS, for amphibian units dispatched to remote areas on special missions. After the missions are completed, the detachments are returned to the parent unit. Then so employed, these detachments are dependent upon the supported unit for mess and other administrative support, although they remain under the operational control of the parent unit. The IC team in TOE 55-550 may be used in this role, in addition to augmenting the capability of the DS company.

b. Operational readiness floats of selected end items and components are provided to the lighterage DS company. Float items are issued to DS units in the same priority as initial issues.

Unserviceable repairable items exchanged for float items are immediately repaired and returned to the float. Float items will normally not be used to replace items that have been lost, destroyed, or determined to be uneconomically repairable by DS and GS maintenance activities.

c. The DS company also stores and issues all marine-peculiar repair parts required for DS and organizational maintenance of the supported lighterage companies. The supply officer directs requisitioning, receipt, storage, issue, and accounting for supplies handled by the unit. The section chief is directly in charge of receipt and storage of supplies and is responsible for determining their location in the storage area. In addition, he directs inspections of supplies and equipment received, conducts periodic inventories, supervises stock accounting and records, and coordinates the function of supply specialists in the section, who inspect, count, and classify incoming shipments in accordance with the storage layout plan.

d. To insure transmission of recurring supply requirements and maintenance data, the DS unit requires a reliable communications system. The teletypewriters authorized in the supply section provide a recorded source for ready reference as requests are received and processed, aid in reducing errors in receiving and interpreting data, and reduce man-hour requirements for processing supply documents.

Section III. SHOP LAYOUT

6-9. General

a. *Objective.* The objective of a good layout is to facilitate operations. In a supply operation, the objective is to make all supplies readily available and to reduce handling to a minimum. In a maintenance operation, it is to facilitate the flow of work through the shop and to minimize the movement of repair parts, tools, and equipment. Some compromise must be made because of the necessity for defending the area. Field situations seldom permit a unit to operate under ideal conditions and the type layout and the area requirements for each DS

maintenance company will vary according to the terrain, tactical situation, proximity to forward areas, and the type and amount of equipment supported.

b. *Principles.* Principles to be observed when laying out the company area are:

(1) Work sections will be located to provide ready access to the external road net and to each other.

(2) Supply storage areas will be located sufficiently close to a road to permit easy access for trucks.

(3) The service section should be located

to provide easy access to all maintenance shops.

(4) Electronics and instrument repair should be accomplished in a dust-free area.

(5) Vehicle dispersion areas should be adjacent to the maintenance areas but in such a position that control and security are possible.

(6) The service and evacuation section should be located in the vicinity of the maintenance platoon/sections to facilitate allied trades support and the movement of vehicles.

(7) The shop office and the inspection section should be located near the entrance to the company area.

(8) The supply platoon or section should be located near an entrance to the company area to keep heavy traffic out of the company work area.

(9) Available cover and concealment should be utilized.

(10) The area should be capable of being defended.

6-10. Type Field Layout

a. The maintenance company area should be reasonably flat, should have good drainage, should have firm soil to permit the parking and movement of heavy vehicles, and should be accessible to supported units. Any terrain features in the area that facilitate defense of the unit must be considered in planning area layout. Streams or marshes should be considered for flank security. Hills that can provide observation and facilitate fire on avenues of approach to the area are an asset.

b. Area requirements depend on the style and tempo of combat which influence workload, security requirement, the volume of stocks carried, the risk the commander is willing to take, evacuation policy, and policies for volume of workload backlog permitted.

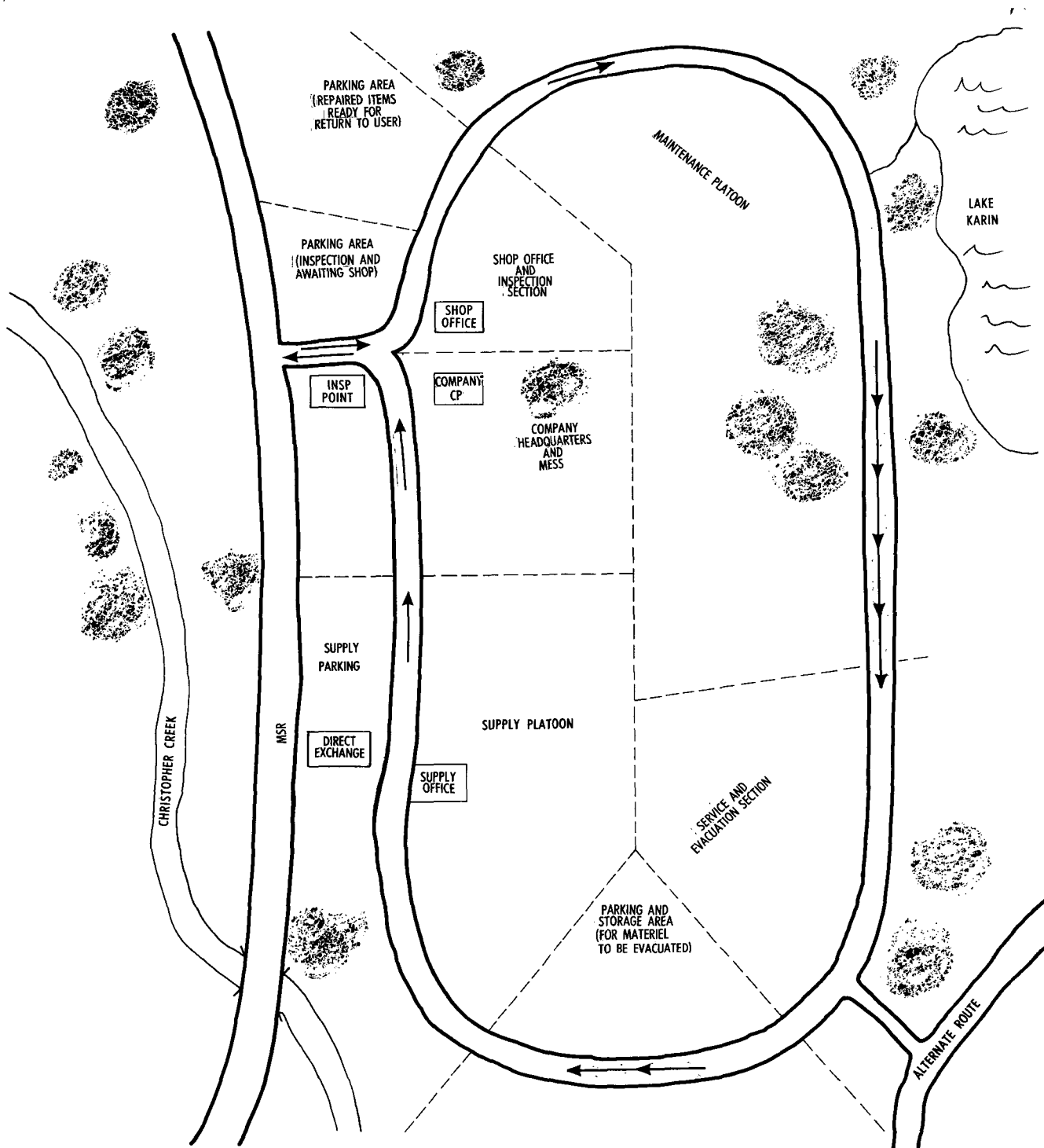
★*c.* Figure 6-1 depicts a type layout of a light maintenance company (DS) in a field environment. It is estimated that a minimum of 25,000 square meters and a maximum of 40,000 square meters of usable area are required for a light maintenance company. The minimum area would provide for vehicle dispersion of approximately 12 meters. The maximum area, from the standpoint of passive defense, is more desirable. It is the approximate maximum dispersion that can be attained without a degradation of unit efficiency and increased vulnerability to harassment by guerrilla-type activities. The maintenance company, rear, because of larger size, more vehicles, greater supply stockage, and more workload would require an area one and one-half to two times as large.

★6-11. Type Garrison Layout

a. Maintenance units operating in a garrison-type environment usually operate in buildings. These may be expressly designed as shop buildings, warehouses, aircraft hangars, or similar structures. In this type of operation, the size of the area and the number, types, and sizes of available buildings determine the area layout.

b. In laying out the area, the same considerations apply as in field operations. For example, the shop office, supply office, and the initial inspection section should be near the entrance to the area. Supply traffic should be kept out of the maintenance areas. Elements with related or complementary functions should be located near each other. And, although certain types of repair and parts fabrication are accomplished with equipment mounted on vehicles, these vehicles may be moved inside buildings.

c. Figure 6-2 depicts a type layout of a light maintenance DS company in a garrison environment.



★Figure 6-1. Type field layout, light maintenance company (DS).

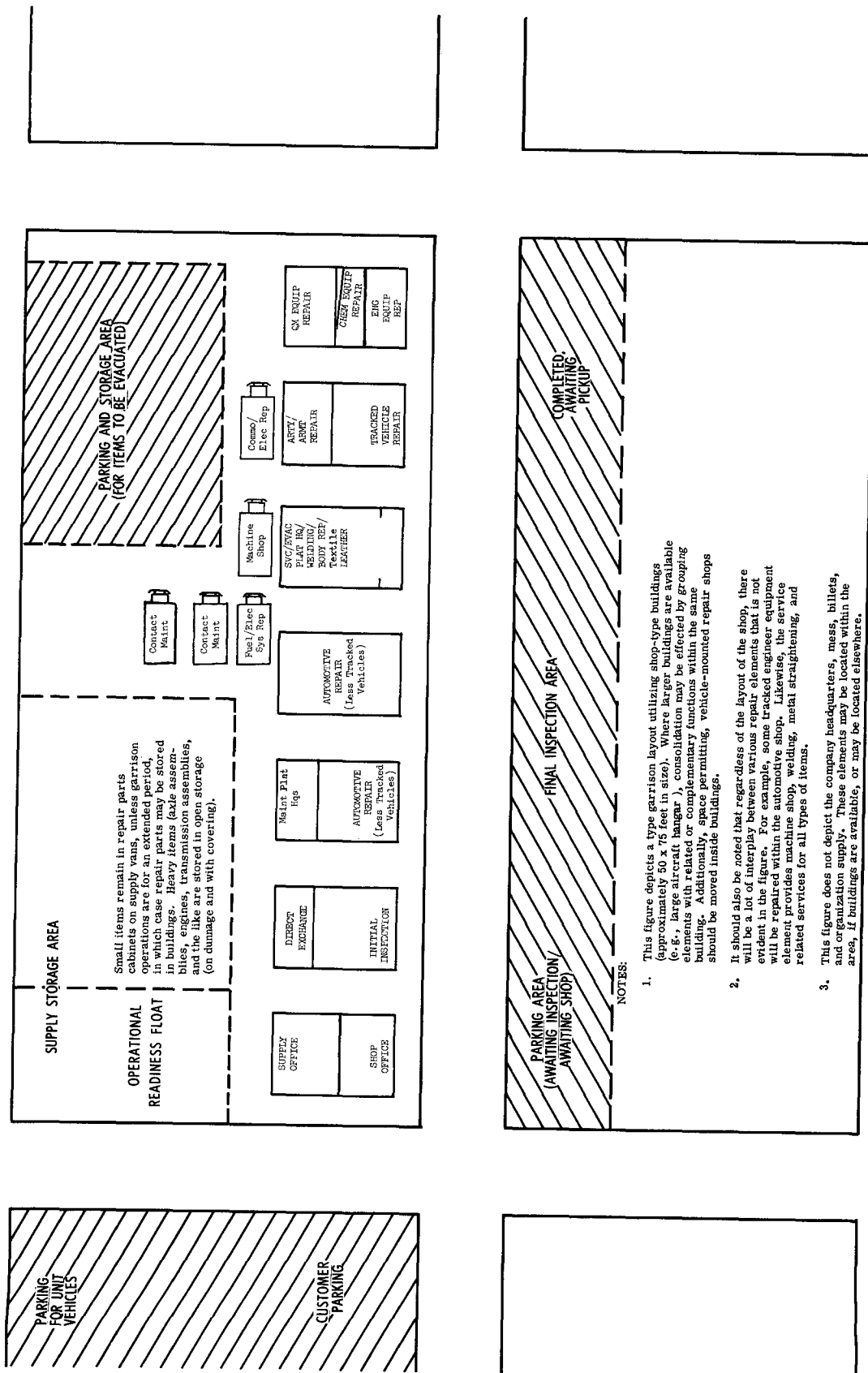


Figure 6-2. Type garrison layout, light maintenance DS company.

Section IV. COMMON MAINTENANCE FUNCTIONS

6-12. General

a. Regardless of the type of equipment maintained, there are many maintenance functions common to all maintenance units engaged in the performance of DS maintenance. Since no textbook can give answers to all problems that develop, and since it is impossible to foresee and plan for all contingencies, commanders and maintenance officers are expected to exercise judgment and apply experience in developing procedures to take care of situations not foreseen in development of this manual and to modify procedures contained herein when experience or operational conditions suggest more effective methods.

b. There are many factors which affect maintenance performance. These factors exert their influences, in varying degrees, at all levels of maintenance performance.

6-13. Production Methods

a. General. "Maintenance shop" is an all-inclusive term used to describe, collectively, all of the facilities of the unit that are directly involved in the control and performance of maintenance in the company area. The maintenance shop consists of various sections or platoons required to perform such functions as administration, planning, and control of the maintenance effort; repair of unserviceable equipment; determination of maintenance requirements; and evaluation of the quality of work performed. Production methods utilized in a DS maintenance shop include bay shop (job shop) and bench shop repair. The type of production method utilized is determined by the type of materiel to be repaired, and personnel, facilities and time available.

b. Bay Shop.

(1) The bay shop production method is used when a variety of jobs is performed in the shop or when the item being repaired is difficult to move. Under a bay shop method of operation, the equipment to be repaired remains in one shop location until the work has been completed. The men and facilities necessary to do

the work move to the equipment. Under a modified bay shop operation, personnel or equipment performing the same or similar jobs are grouped together in sections and the equipment to be repaired moves from one section to another at irregular intervals until the work has been completed. Bay shops are used for the repair of such items as aircraft, vehicles, artillery, construction equipment, and materials handling equipment. Assemblies and components and items of on-equipment materiel may be removed from an end item in a bay and sent to other shops (e.g., fuel and electrical shop) for repair.

(2) In most cases, bays are nothing more than physically-separated sections of the maintenance area, where work is performed in the open or under maintenance shelters (tents). If adequate covered space is available, buildings may be divided into bays (or stalls).

c. Bench Shops. Bench shops are used for the repair of small items, for the repair of items requiring a high degree of technical skill, or for the repair of items wherein repair requires the use of equipment mounted in a shop vehicle. Work performed at stands or benches under maintenance shelters or within shop vehicles is considered bench shop repair. Items repaired by this method include aircraft components and assemblies, small arms, instruments, fuel and electrical system components, electric motors, leather and textile items, communications/electronic items that must be repaired under controlled conditions, and items of a similar nature that can be moved without difficulty.

6-14. Production Control

a. Explanation.

(1) Production control is a key element of maintenance management. Within a maintenance shop, maximum output of work, effective utilization of personnel and facilities, and orderly progression of work depend on the efficiency and effectiveness of the production control element. All of the DS maintenance units discussed in this manual, with the exception of the transportation aircraft DS company, are provided a shop office for the accomplish-

ment of production control functions. Within the transportation aircraft DS maintenance company, production control is a function of the production control personnel assigned to company headquarters, who work closely with the shop platoon headquarters in controlling work of the base shop.

(2) Production control involves directing and controlling work flow. It requires the appli-

cation of common sense, effective planning, close supervision, prompt remedial action, and necessary managerial tools to direct and control the flow of work through a maintenance shop in a manner that results in a maximum output of quality work. Production control is accomplished by scheduling shop input and assignment of work to various shop sections to keep all shop elements working at capacity; by careful screening of maintenance requests

and inspection reports to effect local repair of a maximum number of items (this requires determination as to which jobs will be evacuated to GS maintenance facilities when shop capability or capacity is exceeded and may involve evacuation of an item within the scope of DS maintenance when the time to repair the item can be more profitably expended in the repair of several items requiring less maintenance effort); by keeping abreast of the status and quantity of work in each of the shop sections in order to foresee and prevent bottlenecks and to institute corrective action when necessary; and by improving operational procedures. Production control also requires effective coordination with the unit's technical supply element to assure prompt availability of maintenance supplies required for the performance of maintenance.

(3) One of the prime functions of production control is to take action to preclude or rectify overload conditions in any of the shop sections. While the maintenance shop should be working at or near capacity, it cannot afford to have its mobility restricted by a heavy overload of work. Supported units expect prompt repair and return of items that they have taken to DS maintenance. Overload conditions in any of the shop sections can seriously delay repair operations to the detriment of the unit's overall maintenance mission. An overload in one shop section often exists when there is not sufficient work to keep other shop sections working at capacity. Overload conditions can result from improper routing of work; the inability of repairmen to keep pace with the workload due to the influx of an abnormal number of tasks of the same type; the substantial reduction of the number of personnel in the section; or the acceptance of jobs that should have been evacuated. When overloads occur despite all efforts of production control to avoid them, corrective action must be immediate to eliminate both the overload and the factors contributing to it. To reduce the effect without eliminating the cause is merely a short term solution to a recurring problem.

(a) The prevention of overloads requires initial distribution of work among the various shop sections in such a manner that it

will keep all sections working at or near capacity. This is done by the careful routing of jobs entering the shop. Routing consists of the careful and planned direction of the sequence of individual repair operations in a manner that will most expeditiously result in complete repair of each item. Any interruption in the normal flow of such work should be dealt with immediately.

(b) When overloads or underloads develop, the problem may be resolved by rerouting work or by supplementing the capacity of the overloaded section with personnel from other sections that are working below capacity. In cases of chronic overloads, it is necessary to identify the cause and, if the problem cannot be remedied at company level, to notify battalion headquarters, which may then take action to realign missions, reduce workloads, or provide personnel augmentation. The shifting of personnel, however, must take into consideration their individual capabilities and the degree of training necessary to permit them to perform the functions required. When personnel of the unit are cross-trained in several specialties, this becomes less of a problem. Rerouting involves changing the sequence of repair operations. This may require movement of all items to another shop section, or if movement is impractical due to the partial disassembly of bulky equipment or other factors, repairmen from other sections may be moved to the job. If a vehicle needs engine repairs as well as body and fender work, normal routing would require the engine repairs to be performed first; however, if a number of engine repair jobs exceeds the capacities of available automotive repairmen, the body repair work can be done first.

(c) Overloads may also be caused by the discovery of additional parts requirements after maintenance has begun. When this occurs, immediate steps should be taken to expedite the supply of necessary parts. Normally, large, bulky items such as vehicles and artillery should not be allowed to enter the maintenance shop until shop supply verifies availability of all required parts as determined by initial inspection. However, some items are not inspected by the inspection section but go

directly to the unit element responsible for their repair. For such items of equipment as communications/electronics, the extent of repair required and the repair parts needed can only be determined after the equipment has been assigned to a repairman for detailed analysis.

(4) Production planning and control operations will vary from one DS maintenance unit to another. No one system can satisfy the requirements of maintenance shops operating under different conditions, supporting various types and quantities of materiel, and subject to different command policies. A DS maintenance unit in one support group may be required to retain and repair items that would be evacuated by a DS maintenance unit in another group because of differences in time limits imposed for repair of certain items at DS level by the commands concerned. However, the general procedures presented in this paragraph may be modified to suit individual unit requirements.

(5) If the production control operation is to be effective, the officer charged with production control responsibilities must have a thorough knowledge of the mission and functions of the entire company. He must be thoroughly familiar with the capabilities and capacities of the individual sections. He must assure that he is kept informed of the priorities assigned to supported units, expected workloads, shop progress, difficulties encountered, and maintenance supply status.

b. Tools of Production Control. Effective control demands prompt action based on information which is kept current and readily available. It requires a continuous flow of data from all maintenance elements of the company and the shop supply element. This information is funneled to the production control office (shop office, or shop platoon headquarters, depending on the organization of the DS company involved), which serves as the master control center for the production control process. Most information is presented in the form of records, forms, and reports, often preceded by telephonic communication so that the control process may proceed, uninterrupted, with

all the latest information on hand. The most important tools of production control are:

(1) *Production control board.*

(a) The production control board is a device used to present visual, up-to-date information on the status of jobs within the maintenance shop, the location of these jobs, and the load conditions of the various shop sections. It presents an accurate picture of the distribution of work within the maintenance shop and is extremely useful in answering queries pertaining to specific jobs and in determining when jobs should enter the shop and how work should be routed or rerouted due to conditions existing in the various shop sections.

(b) The board is constructed by the DS maintenance unit, and its design is dictated by unit requirements. It may be as simple or elaborate as desired. It may be as simple as a blackboard divided into columns; it may be a chart covered with acetate; or it may be a painted board equipped with pegs to accommodate tags used to represent job orders. Generally, boards are divided horizontally into sections for the various types of material maintained, and vertically into sections to indicate progress and location within the shop. A sample control board that might be used by the shop office of the main support company, maintenance DS battalion, is shown in figure 6-3. This sample may be used as a guide to design a specific board to meet any requirement.

(c) The status of jobs, the progress of each item, and the load condition of the various shop sections are indicated by the use of small tags, representing job orders, which are moved from one section of the control board to another as the status and location of the jobs change. With simplified boards, this information may be merely a written or chalk entry. The status of jobs reflected by the control board should always coincide with the status noted in the tub file and each of these tools should be used as a check on the other to assure that both are up-to-date.

(d) The proper use of the control board tag or entry enables the shop office to quickly check the status and location of work. Enough information should be included so that the job

PRODUCTION CONTROL BOARD																
AWAITING SHOP		IN PROCESS						FINAL INSPECTION	COMPLETE (AWAITING PICK-UP)							
INITIAL INSPECTION	AWAITING PARTS	AWAITING ENTRY	AUTOMOTIVE AND EQUIPMENT			ELECTRONICS			SERVICE							
MAJOR END ITEMS			AUTOMOTIVE AND MHE	ARTILLERY/ARMAMENT	ENGINEER (LESS AUTM)	OM (LESS MHE)	CHEMICAL	COMM	PHOTO	ELECTRONICS INST/DEVICES	MACHINE SHOP	BODY SHOP	WELDING	PAINTING	CANVAS/LEATHER	
SECONDARY ITEMS																
COMPONENTS																

EACH OF THESE BLOCKS WILL CONTAIN PEGS TO ACCOMMODATE THE TAGS USED TO REPRESENT JOB ORDERS. THE TAGS THEMSELVES CAN BE CON COORD TO INDICATE PRIORITY.

NOTE: IF DESIRED, A "FINAL DISPOSITION" COLUMN MAY BE ADDED.

PRIORITY: RED - CRITICAL
 YELLOW - NORMAL
 GREEN - DEFERRED

★ Figure 6-3. Type production control board, maintenance company, rear, maintenance DS battalion.

is readily identified. This information usually includes the job order number, designation of the unit initiating the maintenance request, and the date received. Different colors may be used to indicate priority jobs; YELLOW to designate jobs that are to proceed normally; and GREEN to identify jobs that are to proceed when the workload is light. Priority is determined in accordance with priorities established by higher headquarters and priority designators indicated on the maintenance request.

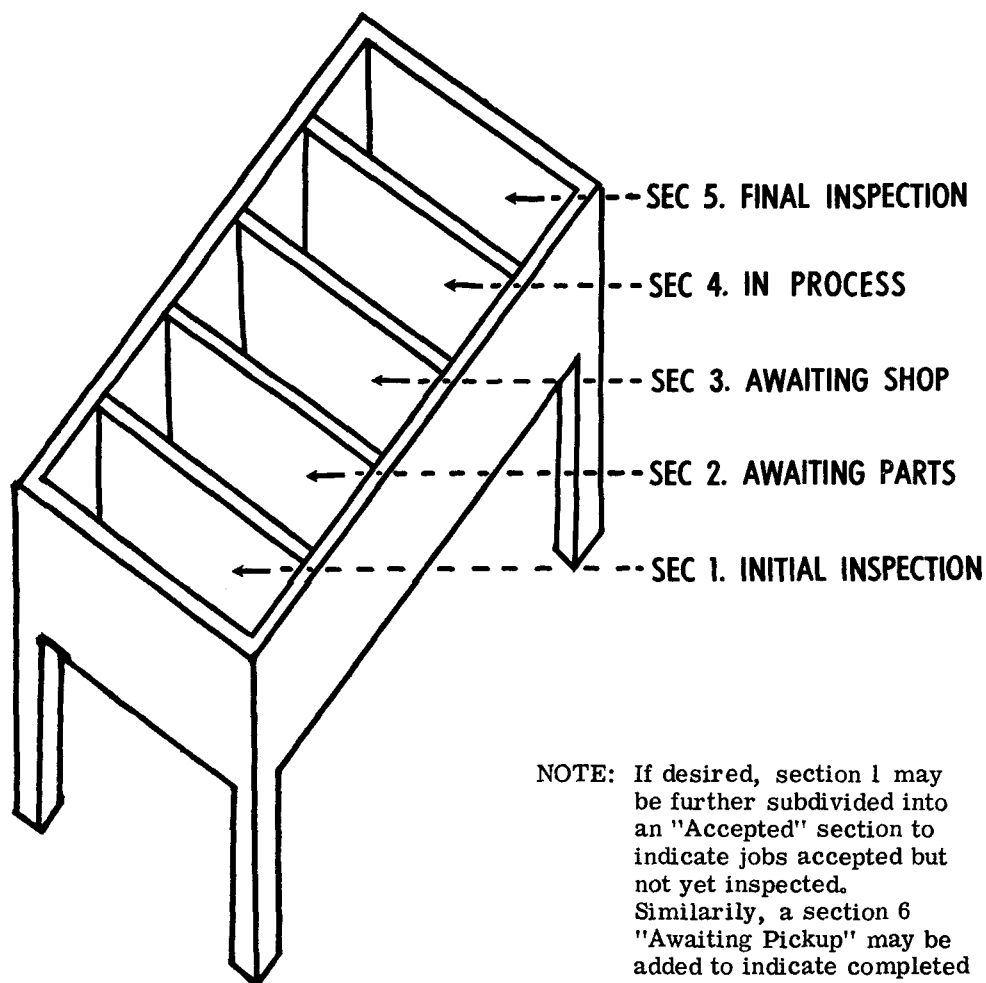
(2) *Tub file.*

(a) This file, like the control board, is constructed by the unit. Here again size and

design are dictated by unit requirements. It is used to house job order files (envelopes), which contain all active Maintenance Requests, DA Forms 2407, and the records pertinent to parts requisitions, continuation sheets, and inspection forms. Tub files are divided into sections and the job order files are moved from section to section as progress is made on a particular job. A type tub file is shown in figure 6-4. This may be modified to suit specific requirements.

(b) The sample tub file is divided into five sections:

1. *Initial inspection.* This section is designed to hold job order files on jobs that are



NOTE: If desired, section 1 may be further subdivided into an "Accepted" section to indicate jobs accepted but not yet inspected. Similarly, a section 6 "Awaiting Pickup" may be added to indicate completed and inspected jobs which have not yet been disposed of.

Figure 6-4. Tub file (sample).

awaiting inspection or which are being inspected. The job order envelopes remain in this section until parts have been requested.

2. *Awaiting parts.* This section must be of sufficient size to accommodate the job orders to be accomplished by the shops for which parts are not yet available. The files are moved to the next section when parts are available for the job.

3. *Awaiting shop.* This section may be divided into compartments with job orders being moved up one compartment each day until they enter the shop. Although this separation is not essential, it is a rapid means of determining how long each job has been awaiting shop entry. The shop officer should, at all times, be kept informed as to the length of time jobs are awaiting shop. The tub file should be properly maintained to provide this information. One method would be to mark each job order envelope with a notation as to the date parts became available. Job orders in this section then could be checked daily to determine unwarranted delays in shop entry.

4. *In-process.* This section is used to house job orders on which work is being performed. This section can also be divided with job order files moving forward on a daily basis until jobs change status. Controls and daily checks similar to those exercised while jobs were in an "awaiting shop" status are necessary to assure that job orders are being completed on schedule and to focus attention on unanticipated delays so that corrective action may be taken. For items that are routed to a repair section immediately upon receipt, job order files will be established in this section concurrently with the routing of the unserviceable to the responsible repair section.

5. *Final inspection.* This section is used to house job order files on work which has been completed and is awaiting pickup or final inspection.

(3) *Maintenance Request Register, DA Form 2405.*

(a) The maintenance request register is a managerial tool which is used to record and control work received and processes as a result of maintenance requests (DA Form 2407) and

component removal and repair/overhaul records (DA Form 2410). All requests are entered on this form, regardless of whether or not actual repair is accomplished locally. If, after inspection, evacuation action is decided upon, such disposition may be recorded in the remarks column. The form identifies each maintenance request, and indicates nomenclature of the item(s) and the requesting unit. It indicates data of receipt, and, when completed, indicates the dates that repairs were started and completed and the man-hours expended. When completed, this form may be used as a source document for information required by all levels of command (e.g., backlog, jobs in process, man-hours expended). For details on completion of this form, see TM 38-750.

(b) The register is maintained by the shop office. Local policy may require that all maintenance requests be entered on the same form. However, for management and control purposes, and for easy reference it may be preferable to use separate forms to record jobs of specific commodity types or groups. In the maintenance company, rear, one register may be used for mechanical repair, another for communications/electronic/electrical repair, and another for jobs assigned to the service section.

6-15. Operations Map and Equipment Density Chart

In addition to the tools of production control indicated in paragraph 6-14, a current operations map and an equipment density chart should be maintained in the shop office of each DS maintenance unit. There are many uses for the operations map. It may keep personnel informed as to the location of supported and supporting units; denote the location of adjacent units and supply distribution points; indicate aircraft landing areas; and denote the location of collecting points. The operations map is also useful for making strip maps for use by contact teams to assist them in arriving at the proper destination. An equipment density chart may be utilized to keep operations personnel up-to-date on what and how much equipment is supported and who has this equipment. Equipment of supported units whose TOE's are classified should

C 1, FM 29-22

not be included on equipment density charts; otherwise, these charts will have to be classified.

6-16. Quality Control

a. General. Inspection of materiel is one of the most important aspects of the DS maintenance function. Accurate initial, in-process, and final inspection are vital in maintaining efficient shop operations and assuring quality repairs.

b. Initial Inspections.

(1) Normally, large, bulky, or heavy items such as vehicles, artillery, and aircraft are inspected before shop entry to determine equipment faults, extent of work required, economical repairability, parts requirements, and whether all on-equipment materiel is present. This initial inspection or preliminary diagnosis is also useful in determining whether the using unit has been fulfilling its organizational maintenance responsibilities. It also provides a basis for recommending salvage or evacuation of the item.

(2) Other items such as instruments, electronic and electrical devices, generators and motors which do not present bulk or weight problems, or which require inspection at a bench or by use of special diagnostic equipment, are inspected within the shop section that is responsible for repair of the items. This also applies to items which require disassembly for determination of equipment fault.

(3) Diagnostic procedures are performed using the appropriate technical manual and equipment fault and parts requirements are recorded on a DA Form 2404 (Equipment Inspection and Maintenance Worksheet) (TM 38-750).

c. In-Process Inspection. In-process inspections of work in progress are necessary to assure that work is being performed properly. Such inspections are the responsibility of shop supervisory personnel and inspectors, but inspectors assigned to the shop office may be used to assist in this inspection.

d. Final Inspection. After work is completed, inspectors perform a final inspection. This inspection is to determine the adequacy of re-

pairs and requires a technical inspection of an item, including an operability test to determine serviceability and safety. It is recorded like the initial inspection. If a final inspection uncovers uncorrected faults or unsatisfactory repair, the item is returned to the responsible shop element and a Rejection Memorandum (DA Form 829) is used to indicate the cause for rejection. Inspectors may effect minor repairs and/or adjustments during the final inspection when such requirements do not warrant formal rejection of the item.

e. Inspection Personnel.

★(1) Within the maintenance company, rear, and the light maintenance company (DS), automotive inspectors are assigned to shop office for inspection of vehicles before shop entry. For the inspection of other items such as heavy construction equipment and artillery, the shop office calls upon the appropriate maintenance platoon/section to provide inspection personnel. Some of these platoons/sections have inspectors assigned; while in others, inspection functions are performed by supervisory personnel or senior repairmen.

(2) In the aircraft DS company, inspectors and a quality control technician are assigned to company headquarters.

(3) If the DS commander desires additional inspection capabilities in the shop office, highly qualified maintenance personnel from the maintenance elements may be utilized. These personnel become a part of the inspection element, when their use is no longer required they revert to their respective maintenance platoon or section.

(4) Personnel work closely with the shop office or production control element in the performance of initial and final inspections. Commanders must insure that inspectors are allowed to independently evaluate and determine, without shop influence or coercion, whether quality standards are being met.

f. Inspections of On-Site Maintenance Performance. The preceding subparagraphs have been devoted to inspections performed in the maintenance unit's area; but, inspections are also required in the performance of on-site maintenance. In the transportation aircraft DS

maintenance company, maintenance sections have an integral inspection capability for the on-the-spot inspection of aircraft to determine extent of repairs required and whether aircraft should be repaired on site, evacuated to the company shop platoon, or evacuated to a higher category maintenance unit. In the other DS maintenance units, on-site inspection is the responsibility of the team chief or supervisor of the team performing the on-site maintenance functions.

6-17. Expenditure Repair Limits and Serviceability Criteria

a. Before repairing an unserviceable item, economic repairability must be determined. Factors considered are the cost of replacing the item as compared to the cost of repairs. Also considered is the value, in terms of service life, that will be restored to the item if it is repaired. Value restored through repair may be measured by comparison of subsequent probable maintenance costs after repair as compared with probable maintenance costs of new equipment. When repair costs exceed maximum expenditure limits, cannibalization or disposal of the unserviceable item is undertaken, unless necessity dictates otherwise. In some cases, the criticality of the item and the difficulty to replace it require repair regardless of cost.

★b. Criteria have been established governing inspection and classification of materiel. Classification inspections are not performed when the materiel is obviously repairable. The classification inspection is not to be confused with the initial inspection. Classification inspection is performed when preliminary diagnosis or initial inspection indicates that the cost of repairs is likely to exceed one-half of the repair expenditure limit established in AR 750-27 and TB 750 series by FSC grouping. Expenditure repair limits and maintenance standards will be found in AR 750-27, TB AVN 23-8, and pertinent SB dealing with repair and serviceability criteria. Maintenance standards are also contained in technical publications pertinent to the item(s) of equipment involved.

c. During the stress of combat, the application of regulations must be relaxed to facilitate

operations. Expenditure repair limitations may not be applied in an overseas theater. Instead, repair limitations will be based on availability of the item in the theater, time and repair parts necessary for repair, ease of resupply, and shop workloads. See paragraph 6-19.

★6-18. Inspect and Repair Only as Necessary (IROAN)

★a. All DS maintenance efforts must be guided by this maintenance principle. The objective of IROAN is to maintain all equipment with due consideration to the economy of resources. It emphasizes contained use of parts, components, and assemblies to the limit of their designed service life. Proper application of IROAN will result in a saving in time and repair parts. In applying the IROAN principle, the quality of maintenance must not be sacrificed. IROAN requires proper inspection and complete repair to insure serviceability and safety.

★b. The key to successful application of the IROAN principle lies in the proper interpretation and application of the phrase "maintain all equipment with due consideration to the economy of resources." In a maintenance operation where the bulk of time is expended in disassembly to gain access to the unserviceable item, it is often worthwhile to replace other parts evidencing wear when these parts are readily accessible by disassembly and experience indicates that they may not last much longer or may not function efficiently in conjunction with the new part that is replaced. This saves the effort of later disassembly. For example, when replacing a muffler, the tailpipe should also be replaced. When replacing a worn or frayed fanbelt on an engine containing two such belts, it is more economical to replace both. When replacing a gear in a transfer case that has broken teeth or is extremely worn, it is more economical to replace other gears in the assembly evidencing wear to prevent mismatch, imbalance and subsequent failure.

6-19. Time Repair Limitations

a. The extent of maintenance performed on specific items is often restricted by time limita-

tion for the repair of specific items imposed by higher headquarters. Based on such factors as availability of items, time and repair parts necessary for repair, ease of resupply, and shop workloads, various headquarters establish time repair limitations for maintenance units under their control. In the field army, the overall repair criteria for the guidance of brigade, group, and battalion will be established by FASCOM. The TASCOM and/or the SMC establish such criteria for COMMZ maintenance units. Time limitations so established are subject to fluctuation, based on changes in conditions on which they were based.

b. Time limitations are influenced by heavy workloads resulting from the increased tempo of combat or mobility requirements which require the DS maintenance unit to move often to stay close to supported units. The DS maintenance unit cannot afford to have its mobility reduced by a large backlog of work, nor will such a situation be acceptable in terms of responsiveness of support. When DS maintenance units receive jobs that exceed their workload capacity or the time allotted for repair of specific items by higher headquarters, the DS unit concentrates on the repair of high priority jobs and those requiring the fewest man-hours. The remainder are evacuated as DS maintenance overflow to the appropriate supporting GS maintenance unit. This evacuation is accomplished even though the required repair is within the maintenance capability of the DS maintenance unit. The decision to evacuate must also consider the time and effort required for evacuation of the item and any necessary preservation and packaging incident to evacuation. In some cases the effort expended in evacuating an item could be better used in its repair. Items evacuated to GS maintenance units will normally consist of components rather than end items.

6-20. Records and Reports

a. The records utilized in maintenance operations are illustrated and explained in TM 38-750. TM 38-750 establishes a standard record system applicable to all Army equipment and provides detailed instructions on the preparation, use, and disposition of records integral

to the system. The TM indicates how these records are processed and utilized by field commands for the purposes of maintenance management. Also see FM 29-20.

b. Other records and/or reports may be required by battalion or higher headquarters on a periodic or a one-time basis. The "daily status report" is a sample of a report normally required by battalion on a daily basis.

6-21. Liaison Visits, and On-Site Maintenance

a. General.

(1) The DS maintenance battalion must develop and foster a cooperative and helpful attitude in all dealings with supported units, and must provide a maximum of assistance to these units. Service to supported units is the overriding principle upon which all DS maintenance operations are based. This service becomes more effective when on-site support is used. This procedure keeps the maximum amount of serviceable equipment in the hands of supported units, cuts operational downtime for certain types of equipment, provides supported units with on-the-spot instruction and advice which may improve supported unit operations. It also reduces maintenance unit workload requirements, and reduces handling and transportation requirements that would be necessary if all unserviceable equipment had to be evacuated to the supporting unit for repair.

(2) On-site support is the performance of maintenance at the site of equipment failure, delivery of repair parts directly to supported units, and the provision of technical assistance. It also includes liaison visits to determine problems and requirements of supported units and to inform them of the support available to them and the procedures by which it may be obtained. On-site support is provided by liaison teams and contact teams.

b. *Liaison Visits.* To provide adequate and effective support, the location of the supported unit, its equipment status, repair parts supply status, problems and requirements must be determined. Upon being assigned a support mission and arriving in the area where they are to operate, DS maintenance units dispatch liaison

teams to establish initial contact with supported using units. This initial contact should be made by the supporting unit commander, accompanied by one or more of his key personnel. The supported units will be informed of the location of the supporting unit, the services to be provided, and procedures for obtaining these services. Maintenance and repair parts problems and requirements will be discussed. After initial contact, liaison is maintained on a frequent basis by the dispatch of liaison teams consisting of an officer or noncommissioned officer who is thoroughly familiar with maintenance procedures and requirements, and a supply specialist. The DS unit commander should make additional visits to supported units to maintain good working relationships. Liaison teams are also utilized for the performance of technical assistance as indicated in paragraph 6-22.

c. On-Site Maintenance.

(1) Contact teams are used for the performance of on-site maintenance. They may also be used to assist supported units in determining the condition of supported equipment and the status of organizational repair parts supply. They may also be employed to accompany command maintenance management inspection (CMMI) teams to provide advice and assistance in correcting equipment failures noted in inspections.

(2) The employment of the contact teams depends on support requirements. Some teams are dispatched in response to a specific requirement in a specific area, and return to the DS unit upon completion of their mission. Other teams may operate away from the DS area for extended periods, visiting supported units on a scheduled basis. The actual mode of operation will be determined by the maintenance/shop officer, and will depend on the mission of the team concerned and known requirements for on-site support. On-site repair teams of the aircraft direct support company do not normally operate away from the DS area for extended periods.

(3) The organization of a contact team is variable. Contact teams are organized and equipped in accordance with the job to be done.

(4) Contact teams are not only dispatched as a result of requests from supported units, but to satisfy specific requirements such as defi-

ciencies noted in inspections or in response to requirements generated as a result of liaison team visits. In some cases it may be possible to anticipate requirements and dispatch teams accordingly. The environmental or tactical situation and reports from supported units often permit accurate forecasting of requirements. It is emphasized that caution and good judgment must be exercised when providing on-site maintenance. In many cases it is more advantageous and economical to the supported unit to evacuate unserviceable equipment to a shop because of the availability of better equipment, facilities, and operating conditions.

(5) Contact teams should be equipped only with the tools, equipment, and repair parts needed to do a specific job. When requesting on-site maintenance, supported units should be requested to report the nature of the malfunction, or any known symptoms, and any known parts requirements. This will assist in determining the proper composition and equipment of the contact team.

(6) When conditions warrant, personnel may be assigned to a contact team on a permanent basis, and the supervisor of the work team remains the same from job to job. This does not imply that all assigned personnel will go out on every job. This arrangement provides for simplified management, facilitates cooperation, and promotes better understanding of the job on the part of team personnel.

(7) Work accomplished by contact teams will be recorded on a Maintenance Request, DA Form 2407, and appropriate entries made in equipment logs (TM 38-750).

6-22. Technical Assistance

a. Definition and Objective. Technical assistance is the service of providing instruction and technical guidance to supported units to enable them to perform their mission in a more efficient manner. This instruction and guidance encompasses direct support maintenance and repair parts supply. Its objective is to insure the correct interpretation and uniform application of maintenance and repair parts supply procedures to improve operations and conserve materiel.

b. Implementation.

(1) Technical assistance may be provided as a result of a specific request made by a supported unit. It may be provided to satisfy requirements established by a liaison team. It may also be provided in the normal course of direct support operations or as a result of command direction.

(2) Equipment status and deadline reports submitted by supported units often reveal an unrecognized need for technical assistance, and will cause the MMC, the battalion headquarters, or higher headquarters to place a requirement for the supporting unit to provide the necessary technical assistance to the using unit concerned.

(3) The maintenance battalion headquarters provides staff supervision, planning and coordination of technical assistance rendered by its maintenance support units, including that related to associated repair parts supply procedures.

(4) The liaison team is the normal method of providing technical assistance. As a minimum, this team should consist of an officer (or senior noncommissioned officer) who is thoroughly familiar with maintenance procedures and requirements, and a qualified supply specialist. Visits by liaison teams are made as often as the situation permits. Emphasis is placed on visits to units receiving low inspection ratings in order to assist unit commanders in improving their organizational maintenance and repair parts supply operations.

(5) In some cases, the liaison team will be able to provide the supported unit with all of the instruction and guidance necessary. However, there will be occasions when the provision of adequate technical assistance will require more time and effort than can be expended during the liaison visit or by skills represented in

the team. In such cases, the liaison party will determine requirements and a contact team will be dispatched by the supporting company to provide the required assistance. This permits the liaison team to maintain its schedule of visits to other supported units.

★(6) A liaison visit will be made as directed by local command.

(7) A contact team is organized to provide assistance in resolving problems uncovered by a liaison team and which could not be resolved by the liaison team. Contact teams visit supported units as often as necessary to accomplish the work requirements determined by liaison teams. Contact teams may also be sent out upon the request of supported units for assistance in solving problems that arise between visits by the liaison team. They are utilized for such functions as instruction in proper organizational maintenance procedures, instruction in equipment operation, and advice and assistance in organizational repair parts procedures. As indicated previously, they are also employed to accomplish on-site maintenance in situations when it is impractical to return equipment to the direct support maintenance shop for repair.

c. Liaison Party Functions.

(1) Providing advice in the accomplishment of his organizational maintenance and repair parts supply functions.

(2) Advising on the efficient use/operation of materiel.

(3) Assuring that the unit is provided proper tools, repair parts, and cleaning and preserving materials authorized for organizational maintenance.

(4) Determining the scope of maintenance support required so that a properly manned and equipped contact team can be

sent to perform work that can be accomplished on site.

(5) Determining the technical instruction and training assistance required by unit maintenance and supply personnel to properly perform their organizational maintenance repair parts supply functions.

(6) Providing or arranging for required instruction and assistance.

d. Benefits.

(1) An efficient technical assistance program benefits supporting maintenance units as well as their supported units. It is imperative that maintenance support companies recognize the advantages of technical assistance and implement a vigorous and continuous program to provide efficient and effective technical assistance service to supported units.

(2) Technical assistance is used to provide information on new maintenance and supply techniques and procedures, the availability and use of publications, and the implementation of maintenance directives and orders such as modification work orders. When supported units are properly discharging their responsibilities with respect to organizational repair parts supply and organizational maintenance, the equipment in the hands of using units will remain operationally ready for longer periods. There will be less time lost due to awaiting repair or replacement of equipment. From the supporting unit standpoint, an effective technical assistance program will result in the maintenance workload being reduced. It permits the support unit to function more efficiently and effectively, and reduces the demands for repair parts and replacement items.

e. Technical assistance to the DS maintenance unit. The DS maintenance unit may itself occasionally require technical advice and/or assistance in the accomplishment of mission operations. In such instances, assistance is requested from the maintenance battalion headquarters to which it is attached, or directly from its supporting general support maintenance unit. The information gained by GS maintenance units during their technical assistance visits to supported DS units is used by the GS maintenance to assist the DS units in a manner similar to that employed by DS units in assisting supported using units.

6-23. Area Responsibility—Emergency Maintenance Service

a. General.

(1) In addition to providing direct support to specific units in a specific geographical area, each DS maintenance unit provides emergency maintenance support, for the types of equipment it supports, to all transients passing through the area and to all elements temporarily bivouaced in the area. This emergency service may be accomplished at the roadside in the DS shop, or on-site. The aircraft DS maintenance company may be called upon to provide maintenance for transient aircraft downed in the area.

(2) DS maintenance does not provide specific elements for the performance of emergency maintenance services. These services are performed as on-site maintenance by contact teams.

b. Emergency Roadside Service. Emergency roadside service may consist of recovery and evacuation of wrecked vehicles, or may involve simple repair jobs. The normal roadside repair involves a minimum of parts, tools, and time. Fuel system failures, overheated engines, and electrical failures are the usual malfunctions which occur. The form and scope of the emergency roadside service will be governed by the need, weather, tactical situation, and the amount of traffic. Emergency roadside service may be provided in the form of road patrols, wrecker service, or by the employment of "service stations."

(1) *Road patrols.* Road patrols consist of two or more automotive repairmen in a light vehicle, carrying a small stock of repair parts, repair kits, and tools. These patrols are dispatched and so routed to pass any given point on an MSR at least once every two hours. Emergency service is rendered on the spot to any disabled vehicle found along the route. When necessary, a wrecker crew is called by the patrol to haul disabled equipment to the DS maintenance shop.

(2) *Wrecker service.* A wrecker crew may be stationed at a convenient intersection along the route or may remain on call in the DS maintenance unit. The wrecker should not accompany a road patrol unless the requirement for its services is known beforehand.

(3) *Service stations.*

(a) A very practical method of providing efficient and economical roadside maintenance service is to provide service stations along heavily travelled routes. Mobile filling stations and DS maintenance units may be combined to provide service stations. Petroleum platoons provide mobile filling stations along roads for convoy refueling. These services can be extended to provide fuel to all vehicles using the route. At the same location, a small maintenance element may be located, consisting of 4 to 6 automotive repairmen equipped with a $\frac{3}{4}$ -ton truck and cargo trailer carrying small, easily replaceable repair parts and direct exchange items such as ignition points, sparkplugs, fan belts, batteries, and fuel pumps.

(b) While vehicles are being refueled, the maintenance element can perform a spot-check of the vehicle. Minor deficiencies can be corrected on-the-spot with available tools and repair parts. Other deficiencies, which do not keep the vehicle from running but which should be corrected to improve performance or preclude future failure, should be indicated on

a DA Form 2404. This form is given to the vehicle driver for action upon return to his unit. If the vehicle is considered unsafe to operate, it will be evacuated to the nearest DS maintenance unit.

(c) Wrecker service, if required by the service station, can be provided by the nearest DS maintenance unit. Normally, these service stations are located near another unit that can provide communications and mess support.

(d) If vehicles experience breakdowns along the road, the assistant driver can hitch-hike to the nearest service station where repairmen are notified of the problem and vehicle location, or a request is made for the services of a DS unit wrecker. If there is no assistant driver, the driver of the disabled vehicle should request another vehicle to report the vehicle location and trouble to the nearest service station or traffic control point.

c. Reports. Services performed by roadside repair crews will be recorded on DA Form 2407. The driver of a vehicle that has been serviced will sign the form signifying acceptance of the work accomplished.

CHAPTER 7

GENERAL SUPPORT MAINTENANCE OPERATIONS

Section I. GENERAL

7-1. Introduction

a. The GS maintenance battalion provides for rapid return of repaired items to supply outlets or DS units. The units battalion perform both DS and GS maintenance. Normally, GS maintenance is the highest category of maintenance performed in the theater, but when depot maintenance is authorized in the theater, it may be performed by GS maintenance units. Most items repaired by GS maintenance units are returned to the GS supply and service battalion. Items such as repaired generators, starters, or other components that will be utilized in maintenance operations may be returned to supply stocks of the maintenance battalion.

b. The distinction between DS and GS maintenance is largely one of more time and stable facilities being available at the GS level because of less frequent movement requirements. Because GS maintenance units remain in one location for longer periods, they are able to expend more time in the performance of maintenance tasks; stock greater varieties and quantities of repair parts; augment productive capacity by using civilian labor; use more elaborate structures, test equipment, and fixtures for shop operations; and use production

techniques such as assembly-line operations. At the DS level, maintenance units must retain the mobility and responsiveness essential to efficient and timely support of using units.

7-2. Maintenance Responsibilities

As with other categories of maintenance, specific repair functions authorized at the GS level are listed in Maintenance Allocation Charts (MAC's) published in technical manuals. General support maintenance units:

a. Repair end items of equipment and overhaul assemblies and components. When practicable, repair is accomplished by the use of assembly-line production.

b. Return repaired items to supply stocks or to using units when the unit also has a DS maintenance mission.

c. Receive workload from DS maintenance units, collection and classification companies, supply units of field depots, and occasionally from using units.

d. Provide backup and overflow support to DS units by accepting work that is beyond their capability.

e. Provide technical assistance to DS units. They may also provide such assistance to using units.

Section II. METHODS OF OPERATION OF THE GS MAINTENANCE BATTALION AND ITS SUBORDINATE ELEMENTS

7-3. Maintenance Battalion

a. When practicable, battalion headquarters will be centrally located within the battalion's area of responsibility. It will locate with one of the units of the battalion for messing support and mutual security purposes. Based on

the availability of space and facilities and the tactical situation light equipment maintenance companies and heavy equipment maintenance companies are centrally located with supported DS units that are supporting heavy densities of equipment. The tire repair company will be

centrally located within the army service area. Tire repair platoons of this company may be attached to C&C companies when the tire repair workload of any of the support brigades justifies such action. The C&C companies will be located within the areas served and if possible will be located adjacent to good roads and on main supply routes. The aircraft maintenance company (GS), when attached to the battalion, will be located on an airfield or heliport that provides ready access to the aircraft densities being supported.

b. The GS maintenance battalion is responsible for furnishing GS maintenance to field army units. The battalion headquarters exercises control over the displacement, mission assignment, and operations of attached companies, providing direction and instructions, exercising close supervision, and performing maintenance management functions to satisfy requirements imposed by plans, policies, and directives of higher headquarters.

c. GS maintenance companies attached to the battalion do not have repair parts supply missions, but will maintain up to a 15 day supply of repair parts for their own maintenance operations. When the overhaul of equipment on a production-line basis is being programmed, larger stocks of repair parts will be necessary. For production-line operations programmed and scheduled by the brigade MMC, the MMC may, through utilization of data available in the supporting ADP center, determine parts requirements and coordinate with the brigade stock control center (SCC) in satisfying these parts requirements.

d. Overall technical direction and control of the battalion operations are exercised by the ACofS, maintenance, of the support brigade. Most of this direction and control, especially that related to day-to-day operations, is exercised by the brigade MMC. The MMC, which is supported by the ADP center, functions on behalf of the brigade maintenance staff to control workload input and the disposition of repaired or unserviceable items; provide instructions and directions for maintenance and collection operations, priorities, and standards; program production-line maintenance; and collect, process, and analyze data and reports

required for maintenance management. The ADP center provides facilities for the receipt and machine-processing of punched-card data. Directions and guidance provided by the MMC are disseminated through battalion headquarters. For details on maintenance management and control, see chapter 5.

e. The support group headquarters does not exercise technical direction and control over the maintenance and collection operations of group units. It does exercise administrative control, provide administrative support, and is responsible for materiel readiness of group units. Instructions relative to maintenance and collection operations and workloads are provided directly by the MMC. Such instructions are sufficiently broad to provide flexibility to battalion headquarters in the organization and deployment of support units and the management and control of their operations.

f. Reports and data required by the MMC are provided directly to that activity, or to its supporting ADP center, depending on report format, by units of the battalion. Information copies of certain reports are provided to the battalion headquarters. Battalion headquarters provides facilities for the transmission of punch card data.

g. The MMC coordinates and controls the evacuation of unserviceable components and end items within its area of responsibility; determines overall priorities for repair; provides priority lists to guide reclamation actions of C&C companies; provides disposition instructions; directs the repair of items by production-line maintenance, and may recommend mission reassignment to establish the necessary organization for such operations. In coordination with the stock control center, it will assure the availability of repair parts to accomplish production-line maintenance. The MMC also provides group and battalion headquarters with data, reports, and other maintenance management information obtained through data processing and other analysis at brigade and higher levels. Unserviceable but repairable items requiring evacuation from DS maintenance units for higher level repair are reported to the MMC, which directs shipment to an appropriate GS maintenance unit

for repair or to a C&C company for processing and disposition. The MMC, by the publication of automatic disposition instructions or similar media, will accomplish routine evacuation to the extent practicable. This procedure will involve the MMC only in the evacuation of critical items requiring expeditious maintenance and high priority items requiring direction to specific units for repair.

h. Units of the battalion will routinely receive workloads from DS units that involve the performance of general support or overflow direct support maintenance. Items requiring depot-level maintenance and items which are not economically repairable but which contain needed serviceable or repairable repair parts, are routinely evacuated to a collection and classification company. Based on workloads of GS maintenance units (as indicated in status reports submitted to the MMC) the MMC will periodically revise its evacuation instructions to balance workloads or will take action to augment the capacity of overloaded units or to modify support missions.

i. Items received by the C&C company are reported to the SCC. The MMC is also informed of such workloads through receipt of data from the ADP center, or through the "Summary of Collection Point Activities" (ch 5), depending on whether reporting procedures are manual or automated. The MMC, in coordination with the SCC, determines requirements for reclamation and the disposition of serviceable items and scrap, and provides necessary instructions to the C&C company relative to processing and disposition of materiel. Equipment generated by the C&C company is directed to appropriate GS maintenance units in the field army for repair, evacuated to a field depot collecting point in the COMMZ, or returned to supply channels within the field army area. Scrap or excess materiel is disposed of as directed by the SCC. Disposition of specific items, or groups of items, depends on their condition, the GS maintenance unit's workload, and need for the items in the supply system.

j. Items repaired by GS maintenance units are also reported to the SCC for disposition

direction. Normally, equipment repaired at the GS maintenance level will be returned to supply channels at the GS level, shipped to a DS unit that has a requirement for the item, or issued to a supply element of a GS maintenance unit for repair parts stockage. Normally items repaired by a GS maintenance unit are transported from the repairing GS maintenance unit area within 48 hours of repair.

7-4. Headquarters and Headquarters Detachment

a. This is the same headquarters unit that is used throughout the corps, army service area, and COMMZ for command and direction of GS and DS maintenance units comprising a battalion-size organization. The mission, capabilities, and organization of this unit are the same as indicated in paragraph 2-3 and figure 2-2; however, the types of units comprising the battalions differ.

b. Because the types of units attached to the battalion and their missions differ, the functions of battalion headquarters also differ when the battalion headquarters functions in a GS role. Essentially, these differences are as follows:

(1) At the GS level, battalion headquarters does not become involved in the management of operational readiness floats and direct exchange.

(2) At the GS level, emphasis in maintenance is upon the repair of components by production-line techniques rather than repair of end items by component replacement as is done at the DS level. Consequently, battalion headquarters at the GS level becomes involved in providing assistance and supervising operations of attached units to assure proper scheduling of work, efficient layout for production-line operations, proper application of standards and priorities, quality control, determination of parts requirements for production runs, and other aspects of maintenance operations peculiar to the GS level.

(3) At the GS level, the MMC exercises more direction and control over individual unit maintenance operations than is done at the DS level. Maintenance units at the DS level serve

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the user of equipment, and battalion headquarters plays a significant role in assuring that direct support is timely, adequate, and responsive; the MMC enters the picture primarily to indicate standards and support priorities, and to provide instructions for items that must be evacuated for GS maintenance.

7-5. Light Equipment GS Maintenance Company

a. This company performs its mission on an area- or a unit-support basis. The flexibility in organization permits the detachment of personnel and equipment for emergency augmentation of DS or GS maintenance units for limited periods. This procedure may be used when all components of a specific type are diverted to the light GS maintenance company of another group for repair on a production-line basis and the productive capacity of that unit has to be augmented because of the workload and the number of personnel required.

b. Overflow DS maintenance will be received, as necessary, from divisional and non-divisional DS maintenance units. GS maintenance work is received from both divisional and non-divisional DS units. The light equipment GS maintenance company will also receive work from collecting points and may receive work from other light equipment GS maintenance companies as a result of workload cross-leveling. Workloads are directed into and out of the company by the brigade MMC, with automatic disposition instructions being used to the maximum by the MMC.

c. In addition to its primary mission of supporting DS maintenance units, the company will support supply units, as necessary, by testing, repairing, and classifying in-stock end items and components for return to stock, evacuation, or disposal.

d. Repair parts and maintenance materials required for company maintenance operations are requisitioned directly from the brigade SCC. Initial stockage is determined through application of repair parts allowances for GS maintenance as indicated in the repair parts sections of technical manuals and supply man-

uals, and based on the density of equipment supported or on experience data of similar units, which may be provided by maintenance management activities (MMC). Thereafter, stockage is based on consumption experience. Determination of requirements for production-line runs does not follow a simple formula. Each company must maintain accurate records of parts consumption for specific types of production-line runs for use in forecasting parts requirements for future runs of the same type. Since parts consumption is reflected in equipment records processed by the maintenance data processing activity, assistance in this area may be obtained from the brigade MMC.

e. When the MMC has sufficient historical data on quantities of repair parts used in the performance of GS maintenance for specific quantities and types of items repaired on a production-line basis, data relating to parts requirements may be provided by the brigade MMC. This provision should be at the time it directs repair of specific items by specific units using production-line procedures. Such direction will precede actual repair in time to facilitate requisitioning of needed repair parts and layout of the production line, or the MMC may coordinate with the SCC to provide the required parts without requisitioning action on the part of the company.

f. Maintenance data and reports relative to production or problems are submitted in punch card format to battalion headquarters for transmission to the ADP center supporting the MMC.

7-6. Heavy Equipment GS Maintenance Company

a. This company provides GS maintenance and overflow DS maintenance for heavy equipment end items and components thereof. This support is provided to DS maintenance units, both divisional and non-divisional. In addition the company supports supply units by testing, repairing, and classifying in-stock end items and components, to include army reserve stocks of end items, for return to stock, evacuation, or disposal.

b. Specific types of items supported by this

company include both end items and components of vehicle-mounted chemical equipment; bakery, laundry, and bath equipment; materials handling equipment; fire control instruments and nonintegrated fire control equipment; field artillery digital analogue computer (FADAC); small arms; conventional artillery; launching and guidance systems of anti-tank missile systems; ground vehicles of all types; and textiles and leather items associated with the type items supported. The company has a very limited capability for the repair of vehicle-mounted communications/electronics items, and repairs are accomplished only when they can be done readily, thus precluding the necessity for removing and sending such items to the light equipment GS maintenance company for repair.

c. Workload is received from both divisional and nondivisional DS maintenance units, collecting points, and from supply units. Workload may be received directly from units or through a collecting point, as directed by the brigade MMC. Work may also be received from supply elements of the group.

d. Production systems employed by the company include bay, bench, or production-line repair, or a combination thereof, depending on types and quantities of equipment supported. Components and small end items may also be processed on a production-line basis. The repair of large end items such as tanks, heavy construction equipment, and vehicles normally requires a bay (or job shop) type operation.

e. Much of the workload received by the company is programed and planned for by the MMC. The MMC works closely with the GS maintenance battalion materiel section in planning and programing maintenance operations and developing requirements, and with the brigade SCC is arranging for repair parts to support programed production-line operations. The MMC directs materiel into the company for repair. Disposition instructions relative to repaired materiel are provided by the SCC.

f. The company is neither designed nor equipped to perform overhaul of major end

items on a large scale, although such overhaul may be performed on a limited basis when other workloads permit. The company is primarily designed for the repair of components, on a production-line basis. The platoons of this company can be augmented or the platoons or elements thereof may be detached for temporary attachment to another heavy equipment GS maintenance company for the performance of production-line maintenance.

g. Repair parts and appropriate maintenance materials are requisitioned from the brigade SCC, which directs shipment from the supply unit(s) having the required items. The supply section keeps records on the types of repair parts that must be obtained through local fabrication and notifies the shop office of such requirements. The supply section also maintains informal records on the types, locations, and quantities of repair parts in stock; maintains data on parts requirements experience in production-line operations; provides information to other elements of the company on the interchangeability of repair parts; and prepares all documentation necessary to inform brigade of the receipt of unserviceables, changes in status after repair, and shipment confirmation.

7-7. Tire Repair Company

a. Except for normal organizational maintenance functions such as the repair of small punctures, the only source of tire repair in the field army area is the tire repair company. The company is designed to operate in the field army service area, but tire repair platoons are capable of operating independently in other areas. Since the major sources of workload for this company are collection and classification companies, tire repair platoons may be attached to maintenance battalion having a collection and classification mission when the quantity of tires generated by the C&C company of the battalion indicates such a requirement. Each tire repair platoon is capable of supporting a corps slice of the field army area, but the tire repair company's overall capability is reduced when the tire repair platoons operate independently.

b. The company performs sectional and spot-repairs of high-density size tires, as indicated above, and repairs tubes of all sizes. Low density tires and tubes requiring full circle repairs are evacuated to the COMMZ or disposed of as directed by the MMC. When possible, each tire repair section operates on a production-line basis by limiting specific production runs to the repair of tires or tubes of a particular size. Items repaired by the platoon become serviceable assets for the supply system.

c. The bulk of the tires and tubes received by this company for repair will be recovered through collection and classification operations of the C&C companies located within the field army area (e.g., removal of repairable tires from vehicles that are being salvaged). The C&C companies forward those tires that have been segregated and classified for repair within the field army capability. Upon completion of repair operations, serviceable assets are reported to the brigade SCC. The SCC provides the tire repair company with disposition instructions for repaired items.

d. Upon receipt of tires and tubes within the company, inspectors from the shop office inspect and classify the material to be repaired. Unserviceable but repairable tires that require recapping are disposed of according to instructions from higher headquarters. Normally, they are evacuated to a field depot collecting point if provisions have been made for their repair within the theater by contract with commercial facilities. Unserviceable but repairable items that are within the repair capability of the company are then scheduled for repair by the company. Programing and scheduling involve planned development of backlogs, as necessary, and the segregation and storage of items by size so that specific lots of a particular size may be scheduled for repair on a production-line basis.

e. In planning and programing shop input, the shop office is guided by repair priorities provided by the brigade MMC. These priorities stem from instructions provided by the FASCOM ICC. By use of status reports, the shop office informs the MMC of production.

Disposition instructions are provided through command channels. Most items will be covered by automatic disposition instructions. Normally, the company will be directed to ship repaired items to GS supply elements. In those instances where certain tires or tubes are classified "controlled items," shipments may be directed to DS units, thus bypassing the GS level.

7-8. Collection and Classification Company

a. Maintenance collecting points are facilities to which abandoned or unserviceable class VII and IX materiel is evacuated for classification, inspection, segregation, and proper disposition. Although primarily designed for the collection and processing of U.S. materiel of the type supported by DS and GS maintenance units, these collecting points will also receive, handle, and dispose of captured and abandoned items of foreign materiel in support of the technical intelligence effort. The evacuation and handling of foreign materiel, however, is in accordance with instructions from technical intelligence activities and the MMC. Maintenance collecting points may be required to process foreign materiel for technical intelligence evaluation. This handling will involve preservation, packaging, and shipment to technical intelligence facilities. When technical intelligence requirements for specific types of items have been satisfied, the C&C company may be directed to process foreign items for disposal or for use by U.S. or friendly forces. This processing would depend on condition, types of items, needs, and directions from the MMC.

b. The C&C company is not responsible for battlefield recovery of materiel; however, the company may be required to provide assistance in such efforts when the capabilities of recovering units have been exceeded. Such assistance will be limited to the recovery and evacuation of heavy items requiring use of the heavy lift capability of the company.

c. Maintenance collecting points operate, where needed, throughout the theater of operations. In the field army area, a collecting point operated by a collection and classifica-

tion company is provided for each support brigade. Maintenance collecting points operated by C&C companies are also found in certain COMMZ field depots.

d. Maintenance collecting points receive and process all types of US and foreign mechanical, electrical, and electronic materiel except ammunition, drones, aircraft, cryptographic and medical materiel, missile system materiel. Salvage points operated by field service companies receive and handle abandoned materiel and scrap. They return serviceable items to supply channels and send repairable items to GS maintenance units. They also remove serviceable and repairable components from unserviceable end items, as directed by the MMC, and transfer scrap to salvage collecting points.

e. There will be cases when salvage points receive items of the type normally evacuated through maintenance channels. When this occurs, such items (rifles, engines, generators, radios) are turned over to a maintenance unit or a C&C company for classification and disposition, depending on established disposition instructions. Similarly, the C&C company may receive items not within the scope of its mission. When this occurs, such items are shipped to the appropriate maintenance or salvage collection facility in accordance with instructions furnished by the MMC.

f. The C&C company operating a maintenance collecting point will receive materiel from forward collecting points, salvage points, direct and general support maintenance and supply units, and from the company's own limited recovery operations when it is required to provide recovery assistance. With respect to this materiel, the collecting point performs the following functions:

- (1) Receives, inspects, classifies, and segregates materiel.
- (2) Reports receipt of materiel to the MMC, by type, nomenclature, quantity, and condition.
- (3) Disassembles, preserves, packages, or crates materiel as required.
- (4) Disposes of materiel in accordance with special or automatic disposition instruc-

tions provided by the MMC/SCC. Normally—

(*a*) Serviceable items are returned to supply channels.

(*b*) Repairable end items and components are sent to appropriate maintenance units for repair.

(*c*) Foreign materiel is evacuated or disposed of as directed.

(*d*) Serviceable and repairable repair parts are removed from uneconomically repairable end items in accordance with lists of required items furnished by the MMC. Unserviceable, repairable repair parts are shipped to maintenance units for repair. Normally, serviceable repair parts are shipped to supply units; however, the MMC may direct shipment of some of these items to satisfy repair parts requirements of maintenance units. Disposition of materiel is determined by the MMC in coordination with the SCC.

(*e*) Other materiel such as scrap, items which are not to be processed because they are excess to supply system needs and repair is uneconomical is disposed of as directed by the SCC.

(*f*) Controlled cannibalization is performed as directed by higher headquarters.

g. Economically repairable items received at the maintenance collecting point are repaired by GS maintenance companies providing support to the operational area supported by the C&C company. Items requiring depot support maintenance and items which exceed the GS maintenance capacity of the GS maintenance structure supporting the corps are evacuated to another collecting point further to the rear (e.g., corps collecting points to COMMZ collecting point). Tires and tubes, however, are evacuated to the tire repair company operating in the army service area. When a particular maintenance collecting point is processing a large volume of tires, a tire repair platoon of the tire repair company may be attached to the C&C company.

h. When directed to operate a cannibalization point, the C&C company will maintain a small stockage of designated, uneconomically repairable end items for this purpose. Controlled cannibalization is a valuable source of low-mortality repair parts and applies, primarily, to parts, components, and assemblies not within the

major command stockage list and which cannot be furnished by the supply system in a reasonable time to satisfy a critical need. Controlled cannibalization is performed at the collecting point in conjunction with routine collection and classification operations. In accomplishing this function, a small stockage of designated quantities and types of uneconomically repairable end items is stored in a separate location by the temporary storage and shipping section of the storage and shipping platoon. When the MMC indicates a requirement, based on SCC requirements, to strip components or parts from these end items, the disassembly platoon performs disassembly. Maintenance units may also be authorized to visit the cannibalization point and remove needed items; however, items so removed must be reported to the SCC so that demand data may be maintained. The battalion materiel section will provide guidance on controlled cannibalization in the form of SOP and directives which are based on and conform to the policies and directives of higher headquarters.

i. Evacuation channels for unserviceable materiel are depicted in figures 9-1 and 9-2.

7-9. Transportation Aircraft Maintenance GS Company

★*a.* This company provides GS and overflow DS maintenance for army aircraft, avionics, and aircraft armament. Maintenance workload beyond the capability or authorized level of repair of the company is evacuated to an aircraft maintenance GS company in the COMMZ.

b. Aircraft maintenance GS companies operating in the corps areas are attached to the GS maintenance battalion; those operating in the army service area are attached to a transportation aircraft maintenance GS battalion. The battalion headquarters exercises command and operational control over the company and provides staff supervision of its activities.

c. Each aircraft maintenance GS company provides support to two or three divisional or nondivisional aircraft maintenance DS companies. This support consists of general support and overflow DS maintenance, on-site technical

assistance to supported units, and evacuation of aircraft downed in the field at close proximity to this company.

d. This unit is located at or adjacent to an airfield. If the airfield is not operated by a tenant aviation company, this unit must be augmented by airfield operations and service elements.

e. The aircraft maintenance GS company gets most of its work from aircraft maintenance DS companies assigned to division support commands, or attached to nondivisional maintenance battalions. The company operates on a combination unit and area support basis; that is, it will provide support to designated DS units in its area of operations and to aircraft downed within its immediate area.

f. The company provides technical assistance to supported units as required. A limited amount of on-site maintenance is also provided (at emergency landing and crash sites in the area of the company and in supported unit areas when such service can be accomplished expeditiously and will negate the necessity for evacuation). However, most of the company's maintenance mission is accomplished at the company maintenance site.

g. Supported units normally evacuate overflow DS maintenance work and items requiring GS maintenance directly to a designated aircraft maintenance GS company. In cases where an aircraft requiring GS maintenance is capable of flying, it is flown to the aircraft maintenance. After repair, the brigade MMC directs the disposition of repaired items. Items repaired by the company are shipped to a designated aircraft unit or to a unit having an aircraft supply mission as directed by the brigade MMC. In some cases, items may be returned to a supported aircraft maintenance DS company.

h. Repair parts and maintenance materials for shop operations are obtained by submitting requests to the SCC which directs shipments from a repair parts company of the supply and service battalion or an aircraft and missile repair parts company (depending on area of operation).

i. Items repaired by the company are returned to repair parts companies, aircraft and missile repair parts companies, or other aircraft maintenance units, as directed by the SCC. Items repaired in a DS role may be returned to aircraft maintenance DS units when necessary to satisfy user requirements (e.g., items job-ordered to the GS maintenance unit by a DS maintenance unit for repair and return to the DS maintenance unit).

j. Maintenance data and reports relative to production, workload, problem areas, and the like are submitted to the MMC or the ADP center supporting the MMC, depending on whether these reports and data are in hard copy format or punch card. Report and data requirements will be determined by the MMC and indicated to battalion headquarters, which will pass on requirements to companies of the battalion. To the extent possible, reports and data submitted to higher headquarters will be in punch card format. Cards will be punched at company level and delivered to battalion headquarters for transmission to the ADP center supporting the MMC. For those reports submitted in hard copy format, information copies will be provided, as required, for battalion and group headquarters use.

7-10. Marine and Rail Equipment Support Units

a. Units that provide GS maintenance for marine and rail equipment (ch 3) operate in a manner similar to units providing GS maintenance for most other items. The units are assigned to a field depot and operate in accordance with instructions and policy guidance provided by the SMC through field depot headquarters. As with other GS maintenance units, maintenance data and reports are submitted to the SMC MMC or its supporting

ADP center, depending on whether the data is provided in hard copy format or punch card. Repair parts are obtained by requisitioning on the SMC ICC.

b. Rail and marine equipment is concentrated in specific portions of the theater. Types of units supported are limited to marine and railway DS units and operating units. Therefore, support is a singleuser function. Within the structure established for general support of marine and rail equipment, there are significant differences in organizational patterns and operational procedures in comparison with those established for support of most other commodities. Differences are—

(1) General support rail and marine units may have a combined GS maintenance and supply mission. They also provide repair parts support to supported DS units. Thus, transportation DS rail and marine units requisition repair parts and maintenance materiel from a supporting GS maintenance and supply unit, rather than from the ICC as do other types of DS maintenance units. The marine and rail GS units replenish their stocks by submitting requisitions to the ICC.

(2) End items repaired by marine and rail maintenance units are normally returned to direct support or operating units.

(3) Although assigned to a field depot, GS marine and rail units are normally attached to the organization to which they are providing support. The attachment order should clearly specify the administrative, logistical, and operational control responsibilities involved. Generally, attachment will be complete except for retention by the field depot of administrative control with respect to GS maintenance policies and procedures, requirements for maintenance records and reports and stock levels.

Section III. SHOP LAYOUT AND CONTROL

7-11. Production Methods

a. General.

(1) The type of production control method used by GS maintenance is determined by the type and quantity of materiel to be repaired and direction from higher headquar-

ters. Consideration must be given to personnel, time, and facilities available. Consideration must also be given to the extent of dispersion, cover, and concealment from enemy air and missile threats. The bay shop (job shop), bench shop, and assembly-line methods

are all employed, depending upon circumstances. All three methods are often employed by the same unit at the same time. The production line may be used for processing a large volume of similar components. The bench shop method may be used for small end items or for items in quantities that do not justify the establishment of a line. The bay shop is normally used for the repair of large end items.

(2) General support maintenance companies operating in the field army service area or the COMMZ may operate as indicated in (1) above. However, in this area the companies will encounter fewer heavy and bulky end items such as tanks, will receive less DS maintenance overflow, are more secure and operate in a more stable environment. They may also have civilian labor available for unit augmentation. Such companies perform a greater amount of production-line maintenance and may also be required to perform rebuild of components. Rebuild operations usually require personnel and equipment augmentation. This maintenance technique requires complete disassembly of the item, inspection of all parts and components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances or specifications, and subsequent reassembly of the item.

b. Bay Shop Operations. See paragraph 6-12b.

c. Bench Shops. See paragraph 6-12c.

d. Production-Line Operations.

(1) This method is used when a large volume of like items must be reconditioned, overhauled, or rebuilt and the procedure can be broken down into a series of independent operations. The technique has little application at the DS maintenance level, but is the most efficient and economical method for the processing of a large volume of similar items wherein the individual operations involved in the processing are not too complicated or time-consuming and the items can be moved easily.

(2) The production line consists of a series of work stations through which each item is passed, with the same operation being performed by a given station on each piece of equipment passed through it. Depending on

facility, personnel, and equipment availability, the production line may be an elaborate one utilizing long roller conveyor lines or monorails; or it may be as simple as a series of work benches aligned end-to-end with a station at each, and with equipment being handed or pushed from one station to another in the line. Time permitting, the service section can construct many fixtures which may be utilized in production-line operations, to include workbenches, parts bins, trestles for conveyor lines, dipping tanks for cleaning components, pallets or metal baskets to hold components during movement or cleaning operations. Cleaning operations may also require axle stands, swinging booms, and racks of various types.

(3) At GS level, production line should be used whenever possible, because this is the most efficient method for processing large quantities of like items such as small arms, engines, generators, transmissions. In this type of operation, workers such as civilians with limited capabilities may be trained to skillfully perform a specific job at a particular station. Parts requirements are computed for a production run on the basis of inspection or by a known mortality rate.

(4) Inherent in production-line operations are proper division of labor, utilization of lower skills to perform repetitive and easily-learned operations, careful planning of layout and parts requirements, centralization of work to establish a predictable workload for economy of assembly-line operations, and the maintenance of a backlog of work to assure steady operation.

(5) Before production begins, a detailed SOP is developed, laying out the exact sequence of operations and the time required at each station in the line. The line is balanced by the assignment of a proper number of workers at each station so that the same number of items can be processed at all stations in the same time period, consistent with the planned production schedule. Repair parts availability is also ascertained before production and parts are spotted along the line in accordance with the needs of the various sta-

tions. The line may also have to be tested with a pilot run to discover any imbalances between stations, improperly located feeder lines, or other potential points of delay.

(6) For additional details on establishment and operation of production line, see FM 38-5. Although the production lines discussed in the referenced publication are particularly applicable to a depot rebuild operation, the basic procedures and layouts may be modified to fit operations at the GS maintenance level.

(7) It should be noted that many of the advantages of production-line operations may be realized without resorting to a moving line. In cases where equipment cannot be moved, it may remain in place and workers move from one piece of equipment to another, performing the same operation on each piece of equipment. Each team is followed by another team performing a different operation. It is similar to the normal production-line method except that the various stations move to the equipment rather than the equipment to the stations.

7-12. The Role of Higher Headquarters in Production-Line Operations

a. Production-line maintenance cannot be performed efficiently and economically without careful planning, direction, supervision, and management. In addition to such efforts on the part of the maintenance company commander, the battalion headquarters and the maintenance management center apply staff supervision, management and control over the unit's maintenance operations.

b. Battalion assists subordinate units in determining parts requirements and line layout, supervises operations, and coordinates with the maintenance management center on maintenance scheduling; personnel, facility, and equipment requirements; and the establishment of priorities.

c. The MMC determines what items are to be repaired on production line basis. It will direct input into the various maintenance units to assure sufficient quantities of material to justify application of production-line techniques. It will balance workloads between

maintenance battalions, and establish work schedules and ensure conformance with such schedules. It will establish priorities and coordinate with the SCC to assure availability of repair parts for scheduled production runs.

d. Because of the variety of items supported by GS maintenance companies and variations in workload, higher headquarters may temporarily augment the productive capability of one particular section or platoon in one company with a similar section or platoon from another. It may also direct all items of a specific type to the augmented section or platoon. Similar type arrangements may be made for the production-line maintenance of other items. This provides maximum utilization of resources, and serves to improve production and efficiency while reducing handling and administrative requirements.

7-13. Shop Layout

a. General. Many of the principles relating to layout of a maintenance shop area are similar at both DS (para 6-9 through 6-11) and GS maintenance levels. At the GS level, facilities may be more elaborate and the area more extensive because of the nature of the maintenance operation, the possibility that the operation may be augmented by civilian labor, and the tendency of GS maintenance units to remain in one location for extended periods. The performance of GS production-line operations may require more space than at DS level because of space requirements for production lines and related functions; space requirements for storage of large quantities of unserviceable items by type preparatory to initiation of a production run; and requirements for storage of repair parts for large production runs. In production-line operations, inspection personnel will normally be found in the location where such production-line operations are being conducted rather than elsewhere in the shop area. Because of increased area requirements for GS maintenance operations, defense of the unit becomes a greater problem and operations are more difficult to conceal.

b. Field Operations.

(1) GS maintenance units operating in the field will locate on or near good roads to

facilitate receipt of materiel. They will normally occupy a centralized location with respect to supported units. They will use areas vacated by other logistical-type units that have displaced forward, when such areas are available. Such areas can usually be adapted to GS maintenance operations with a minimum of area preparation.

(2) Although GS maintenance units are provided maintenance shelters such as tents and vehicle-mounted shelters, repair facilities mounted on vehicles, and warehouses or shop buildings will also be utilized if available and large enough. Although some items of equipment will be repaired within vehicle-mounted repair facilities because repair equipment is mounted thereon, available buildings can easily be laid out to facilitate production-line maintenance of many items of supported materiel. Such buildings may contain fixtures and equipment such as heating and lighting systems, benches, or monorails to enhance production-line operations.

(3) When buildings are not available, GS maintenance units will use organic equipment, supplemented by local fabrication of fixtures. Layout of the area will be generally in accordance with the principles employed for DS maintenance units, except that the supply section will be more centrally located to facilitate support of maintenance operations. Larger storage areas may be required to store items being stored by type in preparation for production-line production runs, and inspection personnel will be located within the maintenance facility for the inspection of items being repaired on a production line. For production-line operations, two or more tents may be connected to provide more length for an assembly line.

7-14. Controls

a. General.

(1) Production and quality control as well as limitations on the scope of maintenance performed and time expended in the maintenance effort are applicable to both the DS and GS maintenance level. The application of such controls is more exacting and demanding at the GS level because of greater num-

bers of items handled, increased scope of maintenance performed, and more extensive disassembly of items. Many of the tools and techniques of control used by DS maintenance activities (chapter 6) can be applied to GS maintenance activities as well. At the GS level, variations are necessary because:

(a) Backlogs are purposely developed to capitalize on the efficiency and economy of production-line maintenance operations.

(b) Production techniques differ. GS maintenance units deal with large quantities of components, and the tools of control must be modified in accordance with mission requirements.

(c) Quality control in a production-line operation may necessitate inspection by selective sampling rather than inspection of each item because of the volume involved.

(d) Maintenance activities deal, primarily, with supply activities in the disposition of repaired items. This causes variation in the preparation and disposition of records associated with maintenance operations.

(e) Programing and scheduling of maintenance operations are more of a problem, especially when production-line production techniques are employed.

(f) Depending on their location and the attitudes and loyalties of the civilian populace, GS units are more likely to use civilian labor as augmentation. This poses additional control problems, increases administrative requirements, and requires coordination with civil affairs activities.

(2) The control element of the GS maintenance company interprets and applies controls of higher commands in the form of directives, regulations, SOP's, and technical publications. The control element also develops and implements such controls as are necessary because of the mission and operational peculiarities of the particular unit concerned. The control element contains both production and quality-control personnel. Within the tire repair, light equipment GS maintenance, and heavy equipment GS maintenance companies, this control element is organized as a separate TOE organizational element, identified as a

shop office. Within the transportation aircraft maintenance GS company, production and quality control are functions of the production and quality control personnel of company headquarters who closely coordinate with the shop platoon headquarters.

b. Production Control.

(1) The basic principles and tools of production control discussed in chapter 6 are also applicable to GS maintenance activities, with modifications as required by operational considerations. A GS maintenance unit using the bench-shop or bay-type methods of production can apply the same tools and techniques discussed in chapter 6 with little modification except to vary production control boards in accordance with the type materiel supported and the internal organization and processing steps used by the shop, and to consolidate quantities of like federal stock numbers items one one maintenance request under one job order number.

(2) When performing maintenance on a production-line basis, the control office may desire to supplement its tools of control with production graphs and charts and production difficulty reports.

(a) Production graphs and charts may be used to plot actual production progress against planned or scheduled progress. Work completion data is obtained from information on completed maintenance requests, or locally-developed production summary reports prepared by shop activities. The work completion data will indicate production when a large number of items are being processed on one maintenance request and repair of the entire lot has not been completed. In large-scale production-line operations, production graphs and charts may be used in lieu of production control boards, or as supplements.

(b) Within GS maintenance companies, production difficulty reports may be used by internal shop elements to inform the control office of difficulties which impede, or threaten to impede, scheduled progress. Shop supply may initiate them to indicate stocks of parts that are in short supply or are exhausted. Inspectors may initiate such reports to call attention to

excessive rejections and rework requirements. The purpose of this report is to identify problems and to facilitate action necessary to correct impending or actual shortages or bottlenecks. Use of these reports should be specified in the unit SOP.

c. Quality Control.

(1) Inspections performed by GS maintenance units include the classification, initial, in-process, and final inspections. Quality control personnel (inspectors) are provided to the control element of the company.

(a) *Initial inspection of components.* At the GS level, initial inspection is more of a problem than at the DS level. At DS level the cause of unserviceability is determined by identification of unserviceable components, and repairs, for the most part, consist of replacement of unserviceable components. These unserviceable items or components are then evacuated to GS maintenance for repair. At the GS level, the cause of unserviceability of these same components must be determined. Such determination involves operability checks using test equipment, and determination of condition and tolerances of internal working parts. The latter cannot be accomplished until the major component is disassembled to permit access to internal parts and assemblies. Consequently, initial inspection of components quite often occurs after disassembly. In a production-line operation, an inspection station is established at a point in the line after cleaning and disassembly operations.

(b) *In-process inspection.* The purpose of in-process inspection is to reveal defective workmanship which may be covered up by later work and which cannot be readily seen during the final inspection. When end items or major components of end items are involved, all items are subject to in-process inspection. When a large number of components are to be repaired on a production-line basis, a 100 percent inspection may prove too costly and time-consuming. To preclude this, a selective-sampling technique is used. Inspection is conducted at critical points in the line. Inspection of components will be conducted before assembly. Inspection will be made on complex assembly operations where

mistakes are more likely to occur. There are many ways to conduct selective-sampling inspection. Recommended methods are:

★1. Every 10th or 20th (or other selected frequency) items are examined. All defectives are rejected and no action is taken with respect to uninspected items that have already passed through production.

2. Items are inspected in the sequence indicated above, but when a defective item is found, all items between the defective one and the next item normally falling within the sequence of inspection are inspected. If additional defects are found, all items are inspected until the cause of the defect is isolated and remedial action taken.

3. Total production for a given time period is divided into lots and samples from each lot are inspected. If the quality of the samples does not vary from established standards, the entire lot is accepted; if variations exist, the entire lot is rejected.

(c) *Final inspection.* A final inspection is conducted to determine whether repairs have been performed satisfactorily. This inspection involves visual checks, checks with test instruments, operational checks, safety checks, or any combination thereof. When inspecting end items and major components, the final inspection involves inspection of all items. In a final inspection of components processed on a production-line basis, the selective-sampling technique may be employed as indicated above.

(2) Aircraft maintenance employs the same inspections for the same purposes and in essentially the same manner. One exception is the in-process inspection. Safety-of-flight implications do not permit random inspections, but require inspections of aircraft repair as the technical inspector considers necessary. Following the final inspection of aircraft repairs, the aircraft is test flown to assure that the aircraft are airworthy.

d. *Expenditure Repair Limits and Serviceability Criteria.*

(1) Cost expenditures in the repair of equipment are governed by economic repair limits prescribed in Army regulations and technical publications, as interpreted and imple-

mented by policies and procedures of the major commander. Similar limits or standards for components are seldom used, except for major components such as engines. This presents a difficulty in determining whether a component should be repaired or salvaged, or whether the integral assemblies or parts of a component should be repaired or replaced. This determination is the job of the inspector, or other personnel performing inspection functions (shop foreman, section chief) and, in many cases, must occur after disassembly of the component. Such determination is based on the criticality of the item, the availability of replacements in the supply system, and the judgment of the inspector. Judgment is often the critical factor, especially when inspection and repair are being performed under the IROAN technique. Under IROAN, repair parts are not replaced merely because of wear, with the objective of realizing maximum service life of these parts. However, the inspector must consider the effect on the component of mating a new part with a worn but serviceable part, for often such mismatches can result in improper mating or unnecessary wear on the new part which may result in premature failure of the component involved. An experienced inspector is a partial solution to this problem. However, where standards and limits are not documented, the battalion headquarters in coordination with the group materiel management section should provide guidance.

(2) In determining economic repairability of end items, age of the item and previous repair expenditures have a bearing on the decision. Much of this necessary information can be obtained from the equipment logbook.

(3) During wartime, expenditure repair limitations may not be applied in an overseas theater. Department of the Army will normally remove such limitations deemed unnecessary.

e. *Standards.*

(1) Standards and specifications for inspection and repair are contained in such publications as technical manuals, technical bulletins, supply bulletins, operating manuals, handbooks, drawings, data prepared by the equipment manufacturer, and technical instruc-

tions issued by the appropriate DA or oversea command.

★(2) The standard established for each situation must be based on such factors as the requirement for materiel, availability of personnel and supplies, and the ability of the enemy to interfere with maintenance operations.

(a) Materiel may be dismantled for detection and repair of all deficiencies. All parts, assemblies, and components which do not meet minimum serviceability standards are replaced, providing the operations involved can be performed without cutting or grinding the basic parts.

(b) Repair operations may include resizing of basic parts, such as reboring of engine cylinders to specified oversize dimensions. TOE tool and equipment sets do not include equip-

ment for this type of operation, and the special tools must be obtained.

(c) Materiel may be rebuilt to standards approximately equal to new condition. Such operations require extensive facilities which could not be installed or defended in a theater where modern weapons such as missiles and tactical nuclear devices are extensively employed.

(d) Limitations on supplies, facilities, personnel, and time may restrict repairs to those necessary to restore materiel to service. In this case, extensive dismantling is not undertaken.

7-15. Records and Reports

Records and reports common to DS maintenance operations (chap 6) are, for the most part, applicable to GS maintenance operations.

Section IV. MAINTENANCE IN THE FIELD DEPOT

7-16. General

a. The primary function of the GS maintenance units of the SMC is the support of the supply system. This function includes in-storage maintenance and inspection of depot stocks to insure a constant ready-for-issue status; repair of unserviceable components, assemblies, and small end items returned from users through evacuation channels and return to stock for reissue; and application of directed modification for maximum modernization of equipment for combat.

b. Some depots may not have a maintenance mission, in which case maintenance units are not assigned to the depot. Others may have a small maintenance mission, requiring the assignment of only one or two maintenance units. In such situations, a command headquarters for the maintenance organization of the depot is not used; instead, command and technical supervision of depot maintenance units is exercised directly by the field depot headquarters director of maintenance. When the depot composition includes three or more maintenance companies, a headquarters and headquarters detachment of the GS maintenance battalion is employed for command, control, administration,

coordination of efforts, and technical supervision of GS maintenance units.

NOTE. The headquarters and headquarters detachment is the same headquarters unit used throughout the theater for command and control of DS and GS functionalized maintenance battalions.

c. As secondary functions, maintenance units assigned or attached to the field depots will provide backup GS maintenance to the maintenance support companies, (COMMZ) of the area support groups, and in some instances may provide support to units passing through the depot area. It is emphasized that the maintenance management center (MMC) of the SMC must constantly review the status of maintenance with a view toward reallocation of priorities, revision of maintenance missions, balancing workloads and recommending assignment of additional maintenance units, to preclude the buildup of an unmanageable maintenance backlog in field depots and collection and classification companies.

d. GS maintenance units of the field depots will not ordinarily be assigned an area support mission. They may be directed to provide backup support to specific maintenance support companies, (COMMZ) located in their vicinity.

Direct support, if furnished, will be only on an emergency basis or when directed by higher headquarters for limited and specific periods of time.

e. Types of maintenance units that may be assigned to a field depot include any combination of the units listed below, depending upon the maintenance mission assigned the SMC. The GS maintenance units employed in this operation are organizationally the same as those GS maintenance units employed in the GS maintenance battalion of the FASCOM. With the exception of those units indicated in (7) through (9) below, the maintenance units are attached to the headquarters and headquarters detachment, GS maintenance battalion, when a battalion headquarters is used.

(1) Army calibration company.

(2) Light equipment GS maintenance company.

(3) Heavy equipment GS maintenance company.

(4) Collection and classification company.

(5) Tire repair company.

(6) Aircraft maintenance GS company.

(7) Floating craft company (GS). This unit is normally attached to the terminal group or brigade which it supports.

(8) Diesel-electric locomotive repair company. Depending on its operational location, this unit may or may not be attached to the maintenance battalion headquarters. If operating away from the depot complex, it is normally attached to the transportation railway service.

(9) Railway supply and car repair company (GS). Depending on its operational location, this unit may or may not be attached to the maintenance battalion headquarters. If operating away from the field depot complex, it is normally attached to the transportation railway service.

7-17. GS Maintenance Operations in a Field Depot

★*a.* GS maintenance battalions are assigned missions by the SMC headquarters. To each battalion headquarters and headquarters detachment are attached GS maintenance units in specific types and numbers to accomplish the mis-

sion as assigned by higher headquarters. Thus, the SMC is able to develop a capability within one depot for maintenance of a wide variety of items on a limited production scale, or may, through utilization of multiples of units of the same type, concentrate efforts of a particular field depot on maintenance of a limited number of items of a specific type. Thus, the capability of one field depot may be designed primarily for the maintenance, on a production-line basis, of heavy equipment items, while another depot may specialize in the repair of light equipment items. Additionally, specific elements of GS maintenance units may be withdrawn and attached to another maintenance unit to bolster productive capacity for specific types of items. Normally, the organization of the most forward field depots will depend on the densities and types of items being evacuated from the field army area for overflow GS maintenance. In most cases, the maintenance organization of a field depot will consist of a headquarters and headquarters detachment GS maintenance battalion and at least one light equipment GS maintenance company and one heavy equipment GS maintenance company and other assigned units.

b. Not all field depots will contain a collection and classification company. These units will be assigned to field depots and attached to GS maintenance battalions operating in areas where great densities of unserviceable equipment are being received. Thus, those forward field depots operating near army rear boundaries and situated near principal evacuation routes would contain a C&C company to receive and process materiel being evacuated from the field army area. Unserviceable, economically repairable materiel received by C&C companies may be directed to other units of the parent field depot for repair, or may be directed to other field depots. Other maintenance units of the battalion may, when required, operate collecting points for the type materiel they support. Tire repair companies will normally be deployed in the vicinity of collecting points operated by C&C companies.

c. The army calibration company is assigned on the basis of one per field army sup-

ported. This unit is assigned to the SMC for operational control and attached to a maintenance battalion of a field depot for administrative support only. The army calibration company, then, will be found in a field depot operating close to the army rear boundary, since its mission requires calibration support of both field army and COMMZ troops. To the extent possible, its location should be in a midway position somewhere in the proximity of the army rear boundary; however, the availability of required facilities for secondary reference calibration will be the deciding factor in its location. Since the company is capable of operating two secondary reference facilities, it may operate from two separate locations in two field depots, the availability of facilities permitting. For details on the operation of this company, see FM 29-27.

d. The headquarters and headquarters detachment of the GS maintenance battalion is the managing and controlling agency responsible for the command, direction, and technical supervision of GS maintenance units and the collection and classification company attached to the battalion. With respect to the army calibration company, control and direction are limited to non-technical mission activities such as administrative matters, unit security, and the like. The battalion headquarters provides units of the battalion with facilities for the transmission of punch cards to the ADP center supporting the MMC/ICC.

e. GS maintenance companies attached to the maintenance battalion headquarters have no repair parts missions. These units will only stock repair parts to support their maintenance operations. There will be occasions when the MMC will program and schedule maintenance of specific types of items to be accomplished on a production-line basis, will designate a specific unit or units to accomplish this work, and will direct all unserviceables of a specific type or group to a particular unit for repair. Large-scale programmed operations such as this require the programmed input of repair parts to satisfy production requirements. In such situations, the MMC, in coordination with the ICC, develops repair parts requirements for planned production runs and the

ICC directs shipments, into the responsible maintenance unit(s), of the required repair parts. Repair parts requisitions of maintenance units will, for the most part, relate to requirements for organizational maintenance, requirements to satisfy maintenance operations that have not been programmed by the MMC, requirements for common hardware and maintenance materials, and requirements for GS level repair parts that were not foreseen in developing parts requirements for scheduled production runs.

f. Overall direction and control of field depot maintenance operations are exercised by the ACofS, maintenance, SMC. The MMC attached to the SMC, ACofS, maintenance section, performs routine, day-to-day maintenance management functions for the SMC. The MMC is supported by an ADP center for machine processing of collected maintenance data; its consolidation, as necessary; the extraction of required information; the storage of data; and the preparation of machine printouts, reports, and summaries. The director of maintenance of the field depot exercises technical supervision and direction over operations of the maintenance battalion assigned to the depot in accordance with plans, policies, and programs of SMC headquarters. Thus, while most instructions received by GS maintenance units and the collection and classification company relative to input of workload, priorities, standards, requirements for production-line type maintenance, and parts fabrication requirements, emanate from the SMC MMC. Such instructions are normally provided through field depot and battalion headquarters. Normally such instructions are sufficiently broad to provide sufficient flexibility to field depot and battalion headquarters in the organization, management, and control of operations. Reports and other data required by the MMC are provided directly to that activity (or through the ADP center if reports are automated) by the GS maintenance battalion, with information copies of certain reports being provided to depot headquarters.

g. The MMC, through liaison with other major commands (TASCOM, ASCOM, FASCOM), through the publication of evacuation

instructions, and through the receipt of workload data provided by subordinate maintenance units, controls and manages the workload coming into the field depots of the SMC, and directs repair to satisfy overall theater requirements. In coordination with the ICC, the MMC determines requirements for repair of equipment and the priorities to be applied in such repair. It directs input into various field depots assigned responsibility for repair of certain types of equipment. It publishes priority lists to guide reclamation actions of C&C companies. It directs the repair of items by production-line type maintenance, schedules such maintenance, and determines parts requirements for such maintenance. It also directs evacuation of such items to specific collection and classification companies or specific GS maintenance companies to assure the concentration of unserviceable equipment at specific locations in quantities required for efficiency of maintenance operations. It provides instructions and guidance to the army calibration company, to include determination of calibration requirements through liaison with FASCOM and ASCOM. It programs the application of modification work orders, as necessary. It keeps track of workloads of field depot maintenance battalions and balances workloads through redirection of work, changes in mission assignments, or redeployment of maintenance units. In addition, the MMC provides data, reports, and other maintenance management information obtained through data processing and analysis at the SMC level. Disposition instructions for repaired items and scrap are provided by the ICC.

h. Despite the emphasis on workload controls by the MMC, it must be realized that the maintenance job is too large and the area of the COMMZ too great to permit the MMC and ICC to control the input and disposition of maintenance unit work on an individual item basis. Evacuation or standing disposition instructions must be established and coordinated with other principal commands. Instructions must provide collecting points and maintenance units information on where to ship materiel still requiring maintenance, items repaired, or scrap. These instructions are modified frequently as workloads, requirements, or priorities change. The MMC keeps track of workloads and performance through receipt and analysis of status or performance reports and completed maintenance requests. All maintenance at the GS level will not be programed and scheduled by the MMC. The MMC will concentrate on the management of bulk lots of unserviceable materiel and provide maintenance direction for items which are command-controlled or in short supply. It will also direct and supervise depot maintenance (rebuild) of end items if such maintenance is authorized within the theater. There will be many other items evacuated on a routine basis, in accordance with existing evacuation policy, to maintenance battalions of field depots wherein scheduling, maintenance management, the type of production method utilized, and the obtaining of required repair parts will be left to the discretion of the maintenance battalion and field depot headquarters concerned. The MMC will receive reports on such workload inputs and will be informed when repairs are completed.

Section V. CRYPTOLOGISTICS SUPPORT

7-18. General

a. Cryptologistics support platoons will be assigned at the various support levels throughout the theater army. The platoons perform storage, issue, accounting, distribution, recording, reproduction, and maintenance of crypto devices and aids. The division cryptologic support platoon represents the lowest level at which DS cryptologic maintenance is afforded to users. At higher support levels

(corps, army, and COMMZ) the cryptologic support platoons afford both DS and GS maintenance.

b. To facilitate the maintenance operation, all crypto maintenance teams are 100-percent mobile for on-site repair and/or replacement of defective equipment. Teams at every echelon may require special tailoring to accommodate variations in the cryptomaterial workload.

c. At each level of command, division support command through TASCOM, a cryptologic management element will be set up. Normally, above division, the element will provide an ADP commodity control service to a specified cryptologic support platoon or platoons. For more detailed information on the above crypto support, refer to FM 29-11 (TEST).

7-19. Maintenance Team Allocations and Functions

a. In the division, four DS maintenance teams are provided. Three of these teams support the three brigades while the fourth team services other division units including division artillery. The division signal battalion has an organic DS crypto maintenance capability.

b. Six GS and four DS teams are provided at the corps level for a four division corps. Each division is supported by one GS maintenance team; the remaining two GS teams provide crypto maintenance to other corps users. The four DS teams insure timely DS crypto maintenance to nondivisional corps users. The corps signal battalion has an organic DS crypto maintenance capability.

c. Eight GS and ten DS teams are provided for crypto maintenance support for field army/

FASCOM units in the army service area as well as backup support for corps units. GS crypto maintenance teams will carry the combat-ready, crypto, reserve stocks. In this application, a two-corps, eight-division force structure is applied. The army signal brigade has an organic DS crypto maintenance capability.

d. Each area support group in the COMMZ is authorized one GS and one DS crypto maintenance support team in the crypto support platoons of each area support group. These teams, deployed on an area basis throughout the COMMZ, will provide GS and DS maintenance for COMMZ units. In addition, the teams will provide GS maintenance to signal units of the theater operations signal command. The signal units of this command have an organic DS crypto maintenance capability.

e. Each of the two field depot platoons of the supply and maintenance command will have two GS crypto maintenance teams. The teams may be deployed to theater sites where an overflow maintenance problem develops. Each team will maintain a portion of the combat-ready reserve stock of COMSEC devices allocated for COMMZ units. Also, the teams serve as backup to the field army as required.

CHAPTER 8

DIRECT SUPPORT MAINTENANCE OPERATIONS

8-1. General

a. The units of the DS maintenance battalion carry up to a 15-day level of designated and fast-moving repair parts required for battalion maintenance operations and to satisfy requirements of supported units. Quantities stocked are based on demand experience, and modification are required as experience factors change. Supported units place demands for repair parts on the battalion unit assigned for their support. Normally, repair parts are distributed by supply point distribution. Unit distribution is also used. Unit distribution may be accomplished by having contact teams deliver repair parts to supported units at the time they are performing on-site maintenance. Personnel of supported units delivering materiel requiring DS maintenance or picking up items on which maintenance has been completed, may also take repair parts back to their units.

b. Battalion headquarters may also arrange for the supply of items to supported units on a throughput basis, which is the delivery of supplies from GS supply sources directly to the supported unit. When practicable, repair parts and assemblies are provided to supported units on a direct exchange basis.

★*c.* Units of the battalion maintain an operational readiness float of selected end items and components. The bulk of the float is carried by the maintenance company, rear, or maintenance support company except for aircraft and aircraft associated items. When authorized, operational readiness float aircraft are carried by the transportation aircraft maintenance company (DS). End items and components of equipment carried in operational readiness floats are used to provide supported units with immediate replacements for selected, unserviceable end items

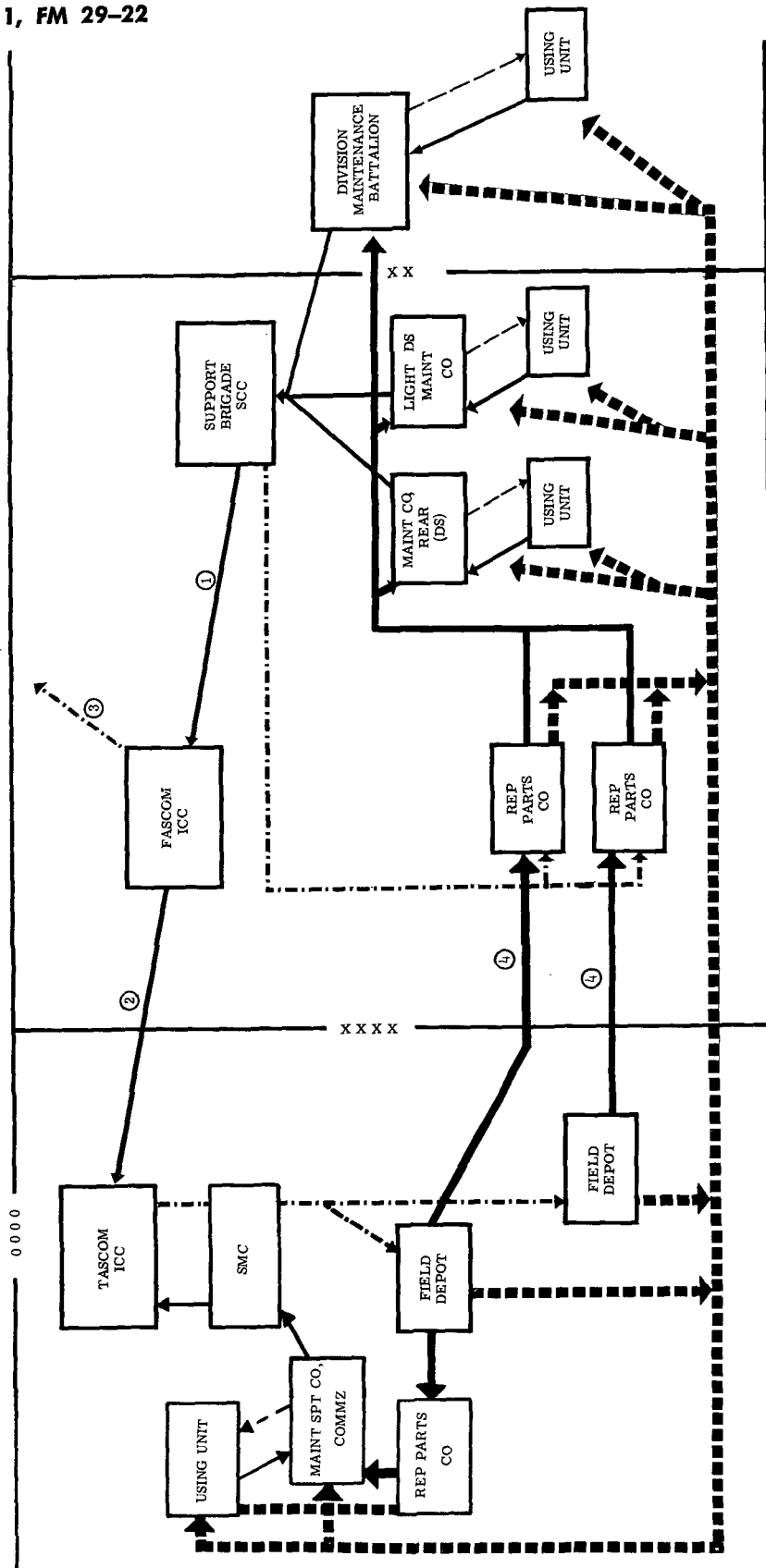
or components on an item-for-item basis. This type service is provided when the item can be repaired at direct support level, but the time required for repair and return to the supported unit would be excessive. Policies for the control of operational readiness floats are established by theater army and implemented by FASCOM and TASCUM. Generally, the operational readiness float will not be used to replace unserviceable items that are beyond the repair capabilities of DS units. Supported units turn in unserviceable items to their supporting maintenance units and requisition replacements from the supply and service battalion.

d. Units of the battalion do not provide initial issue end items or replacement issues to cover equipment losses. These items are provided through the supply and service battalion, although actual delivery may be made by units of the maintenance battalion since such items will normally require preissue inspections and processing. Arrangements are made through coordination between the DS maintenance battalion and the supply and service battalion headquarters.

e. Replenishment of repair parts and operational readiness float stocks is obtained by submitting requisitions to the support brigade stock control center which will direct shipment from a repair parts company or an aircraft and missile repair parts company. See figures 8-1 and 8-2.

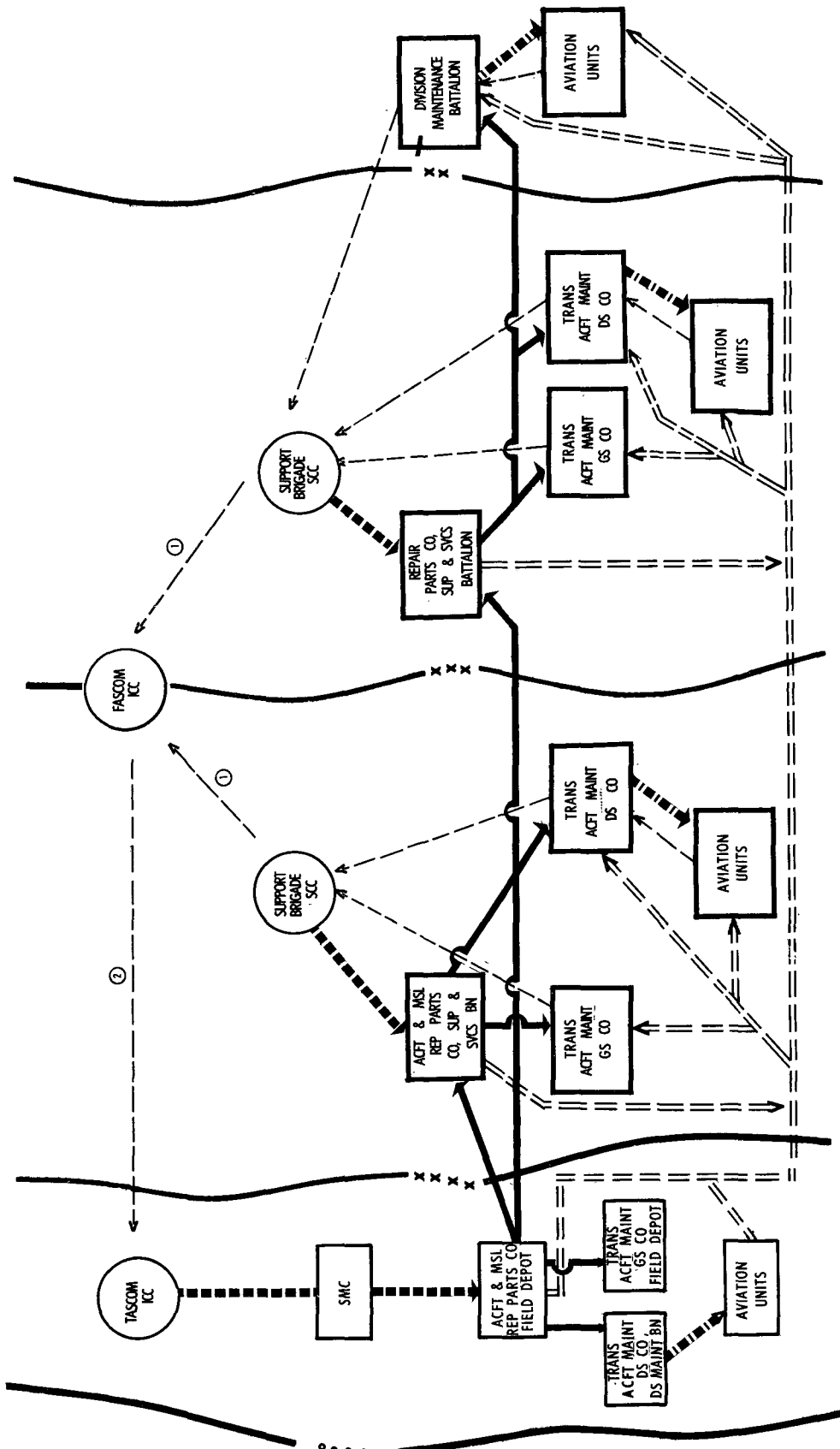
8-2. Types of Supply Operations in Maintenance Units

a. The supply function within maintenance units may be grouped under three headings—organizational supply (common to most types of military organization), shop supply, and



- ↑ Requests for repair parts.
 - - - Normal issue to using unit by supply point distribution or unit distribution.
 - - - Shipping instructions to appropriate GS supply units.
 ↑ Normal flow of shipments.
 - - - Throughput, when practicable; e.g., tank track to using units, engines to DS maintenance units.
- NOTES:
 1. Brigade stock replenishment requests.
 2. FASCOM stock replenishment requests.
 3. Instructions to the SCC of another support brigade to make shipment from resources under its control.
 4. Replenishment of field army supply stocks.

★ Figure 8-1. Repair parts flow (DS level) less aircraft, aircraft components, medical, missile, and cryptographic items.



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- NOTES:
- Requests for repair parts.
 - Shipping instructions to appropriate GS supply units.
 - Normal flow of repair parts shipments.
 - When practicable, shipments are made by "throughput," bypassing intermediate supply and/or maintenance support activities.
 - Normal issue to using units by supply point distribution or unit distribution.
- Figure depicts specific maintenance and supply support units in the area to the rear of division rear boundary. Figure illustrates types of units; it does not depict specific numbers of units of each type.
- ① Brigade stock replenishment requests. Also requests that cannot be satisfied from brigade stocks.
 - ② FASCOM stock replenishment requests.

Figure 8-2. Aircraft repair parts flow.

technical supply. Shop and technical supply are defined briefly as follows:

(1) *Shop supply.*

(a) This is the function of providing repair parts, assemblies, components, and other supplies needed by the DS company's maintenance and repair elements in the accomplishment of their respective portions of the maintenance mission of the company. Although the internal source of these supplies is the company's technical supply element (platoon or section), the shop supply activity directly serves the maintenance shop. It expedites the supply of repair parts, holds parts issued for a specific job until all needed parts are on hand and the work commences, and maintains a small stockage of frequently needed small items consisting mainly of common hardware and expendable maintenance supplies.

★(b) Neither the maintenance company, rear, nor the light maintenance DS companies have an organic shop supply element per se; however, this function is performed by the principal operating platoons, using available maintenance personnel. The transportation aircraft DS maintenance company has an organic shop supply section.

(2) *Technical supply.* Included are those operations required to obtain, account for, store, and issue repair parts and certain end items needed by supported units and by the company maintenance shops. Each of the DS units has an organic supply platoon or section to perform the technical supply mission. In the performance of DS technical supply functions, the procedures and forms prescribed by AR 711-16 and AR 725-50 are applicable.

b. Operational Readiness Floats.

(1) *General.*

(a) DS maintenance companies maintain an operational readiness float of selected end items and components for issue to supported units in accordance with policies established for the control and issue of float stocks. Except for aircraft, these float items remain a part of the field army reserve of end items and distribution and control policies and procedures will be determined and implemented by FASCOM for the field army commander, and by the TASCOM (through SMC) for the theater army com-

mander. Normally, field army reserve of aircraft is not authorized.

(b) Float items fall into the controlled category, and all elements of the command structure, from company through FASCOM and TASCOM, become involved in the establishment and control of float stocks. At company level, approval of battalion may be required before items are provided from float stocks. Normally, such approval is not required if the unserviceable item being turned in can be repaired and returned to float stock.

(2) *Control.*

(a) Float items are normally issued to supported units for the replacement of unserviceable items which cannot be repaired and returned to supported units within allowable time limits. The time limits will be published by the command echelons exercising control over float stocks. Normally, a float item is not provided unless the unserviceable item is repairable by the supporting DS unit.

(b) Brigade (or ASCOM) headquarters is the key element in the establishment of policies and publication of directives for control of float stock in conformance with policies established by FASCOM (or TASCOM). Priorities will be provided to guide battalion in control of float issues. The battalion materiel section monitors float issues and implements policies and directives of higher headquarters.

(c) Within the companies of the battalion, the supply sections/platoons control the floats authorized the companies. Float issue to supported units and turn-in of a like unserviceable item is effected by utilizing DA Form 2765-1, Request for Issue of Turn-In (AR 711-16). When end items are so exchanged, the procedures listed in TM 38-750 must be followed.

(3) *Replacement of float stocks.* Units of the battalion will effect replenishment of their float stocks through the repair of the unserviceable items that were turned in. The supply platoon/section initiates repair by preparation of a DA Form 2407. Float items are issued to supported units only on an emergency basis, to replace uneconomically repairable end items. The supply platoon/section will requisition float replacement items from the SCC or ICC, depending on location in the theater.

(4) *Supply transactions.* The turn-in of unserviceable end items and the issue of float items are supply transactions and are subject to the provisions of AR 711-16. For details on operational readiness float criteria for various commodity groupings, see SB's 3-34, 5-83, 9-140, 11-244, and 55-33.

c. Direct Exchange.

(1) Direct exchange is primarily intended for the immediate exchange of repairable or recoverable repair parts, components, and assemblies. The DS maintenance unit replaces these stocks by repairing the unserviceable items to the extent possible and requisitioning replacements from the SCC or ICC, as appropriate.

(2) Items authorized for direct exchange will normally be limited to repair parts and assemblies annotated with the code "R" in the recoverability column of the applicable DA technical manual or appropriate supply manuals and minor secondary items authorized for use by supported units (AR 711-16). Items on such lists may also be limited by command policies established for the control of certain items.

(3) All of the DS units of the nondivisional maintenance DS battalion maximize use of direct exchange procedures for the issue of maintenance supplies associated with the types of materiel each unit supports.

(4) Supply personnel will be utilized for the actual performance of direct exchange functions. The direct exchange list will be prepared jointly by the supply officer and the maintenance/shop officer. Direct exchange lists of individual units will be submitted to battalion headquarters for review and approval. After approval, copies of these lists will be provided to supported units.

(5) In addition to providing direct exchange within the DS unit's maintenance area, contact teams may be provided direct exchange items for issue to supported units in conjunction with on-site maintenance operations.

(6) Direct exchange between the DS unit and supported units is accomplished by use of the Exchange Tag, DA Form 2402. TM 38-750 provides details on use and completion of this form. AR 711-16 should be used as a guide

for establishing direct exchange procedures in the DS unit.

8-3. Assistance to Supported Units on Supply Matters

Direct support units do not merely react to supply requirements of supported units; they assist in determining these requirements; verify these requirements; and take action to satisfy them. DS units having a maintenance supply mission assist in the planning and management of supported units' repair parts stockages. This is accomplished as follows:

a. Technical Assistance. Supported units are provided technical assistance in all phases of organizational repair parts supply procedures (AR 735-35). The assistance embraces advice and assistance on determination and modification of prescribed load lists (PLL's), advice on the preparation and maintenance of repair parts records, and advice on the determination of stock levels.

b. Review of PLL's. Repair parts stockage at the DS level is based largely on the PLL stockage of supported units. The supporting DS supply activity reviews PLL's of supported units, including proposed additions or deletions from such lists, and maintains a copy of the approved PLL of each supported unit. Review of recommendations for additions to PLL's of supported units is necessary to assure that the supporting supply activity is able to satisfy requirements for additions to stockage lists.

c. Items Authorized but not Stocked at Supported Unit Level. The supporting DS unit stocks and provides mission essential support items and other repair parts that are authorized for use by supported units but are not stocked at organizational level. Stockage of supplies at the DS level is based primarily on the frequency of demands for items. Items not demand-supported but required to insure continued operation of an essential end item, are stocked as mission essential (AR 711-16).

8-4. Augmentation of Supply Stocks

a. Parts Fabrication. Although fabrication of parts is not a supply procedure it can often be used to keep equipment operating when re-

pair parts are not available. Both supply and maintenance personnel should remain conscious of their unit capability for fabricating parts and should be indoctrinated in the importance of doing so. Supply personnel should annotate supply records to indicate those parts that can be locally fabricated.

b. Cannibalization.

(1) Cannibalization involves the removal of serviceable or economically repairable repair parts uneconomically repairable end items, or components thereof, and making them available for reissue. Cannibalization provides many needed repair parts that are not included on stockage lists, is a source of low mortality parts supply, and serves as an economy measure by the removal and use of repair parts and components from end items which are unserviceable and useful only as salvage.

(2) The practice of cannibalization will be limited to those end items and components that would be disposed of through salvage channels as uneconomically repairable. Normally, repair parts *will not* be removed from items destined for evacuation to GS repair facilities except in emergencies when the serviceable item so removed is necessary to effect repair of a critically needed item and the required repair part is not readily available through other sources. In those instances where cannibalization of an item to be evacuated is justified, the serviceable part or component removed from the unserviceable end item must be replaced with a like unserviceable component or part.

(3) Cannibalization policies will be established and procedures supervised by the battalion headquarters of the DS maintenance unit. Cannibalization will be performed under the supervision of inspectors who determine the serviceability of each repair part or component. Individual repairmen will not be permitted to remove repair parts for the completion of routine repair jobs.

(4) When an end item has been cannibalized to the extent that retention is not economical, disposition will be made to the nearest salvage disposal facility in accordance with prescribed procedures.

(5) Overall direction of cannibalization operations is exercised by the FASCOM ICC for the field army area, and by the SMC for COMMZ.

(6) Controlled cannibalization may be performed in accordance with the provisions of AR 750-50. When an item is cannibalized, equipment records are annotated as prescribed in TM 38-750.

8-5. Supply Levels

a. Companies of the maintenance DS battalion will maintain supply levels of up to 15 days. These levels may be modified downward for all, or certain items, as directed by the inventory control center and based on such factors as mobility requirements, availability of supplies, average resupply time, and characteristics of the particular items involved.

b. Supply levels of light maintenance DS companies and the aircraft maintenance DS company are based on the requirements of their supported units plus requirements of their maintenance elements. The supply level of the main support company is based on the requirements of units directly supported by the main support company and requirements of the main support company maintenance shop.

c. Initial stockage levels are based upon authorizations for specific items listed in technical manuals of the 30P and 34P-series and supply manuals of the 7- and 8-series. Levels will be based on demand factors.

d. For details on stockage criteria, compilation of authorized stockage lists, stockage list revisions, and determination of requisition objectives, see AR 711-16.

8-6. Storage

a. Supplies that are correctly stored and maintained can be issued safely, speedily, and in a serviceable condition. To assure proper storage, a storage plan must be developed and executed for all stocks. Space available to the storage operation, and types and sizes of items which are to be stored as well as quantities of these items are principal factors in the formulation of this plan. Items will be stored under conditions best suited to each item.

b. In order to facilitate mobility, and because of the nature of the items stored by the various companies, most repair parts supplies at the DS level will be stored in vehicles organic to the companies.

c. Except for glass items such as windshields and sediment bowls, which are subject to breakage in transit, all items received in original packages should be accepted and not opened until necessary. A schedule should be established for the inspection of stored stock. Items should be examined for rust, corrosion, and broken packs. Particular inspection emphasis must be placed on items with an established shelf life. Shelf life items include rubber gaskets, neoprene seals, and batteries. Deficiencies noted require prompt correction. TM's 743-200 and 743-200-1 cover the storage, care, preservation, and protection of supplies.

8-7. Supply Management

The supply mission and operations of the DS maintenance companies are controlled, coordinated, and supervised by the parent battalion materiel section. See chapter 2 for information concerning the DS maintenance battalion headquarters role in the supervision and management of supply operations of attached DS maintenance companies.

8-8. FASCOM Direct Support Maintenance Units

a. *The Main Support Company.*

(1) *General.* The main support company of a direct support maintenance battalion (fig. 2-3) maintains a shop stock of repair parts (shop supply) for the accomplishment of its DS maintenance support operations. It also provides organizational maintenance repair parts to using units it supports. In addition, recoverable repair parts are furnished to supported units on a direct exchange (DX) basis. This company maintains an operational readiness float of selected end items. Unserviceable components generated as a result of direct exchange or shop repair operations, and repaired by the main support company are normally placed into their direct exchange stock or returned to the supply system.

(2) *The supply platoon.* Maintenance

supply functions of the main support company are carried out by its supply platoon.

(a) This platoon serves as the company's requisitioning activity for all maintenance supply requisitions being submitted to the supply system for the purpose of obtaining repair parts and related expendable maintenance materials for the shop supply activity and for technical supply requirements.

(b) It receives, stores, and issues the bulk of the supplies handled by the company.

(3) *Organization for supply operations.* The supply platoon is normally organized into a stock control unit and a storage and issue unit. A direct exchange activity will usually be established within the storage and issue unit.

(a) *Stock control section.* The company's technical supply officer, who is responsible for all operations of the supply platoon, locates his office within the stock control section. The section contains the specialists needed for performance of stock accounting functions. It maintains stock accounting records and files; determines requisitioning objectives; edits requests for issue or turn-in; maintains a critical-items list and fringe item records; assists the shop officer in compiling direct exchange lists; coordinates with battalion regarding the crossleveling of supplies within the battalion; maintains demand data; and records the issue of supplies (AR 711-16). It receives requests for issue (Request for Issue or Turn-In, DA Form 2765) from using units supported by the main support company, and urgent requests from the light maintenance DS companies. It screens its stock records for availability, and effects issue action by directing the storage and issue element to make issue. It exercises control over the main support company's operational readiness float; controls the evacuation of materiel; and prepares requisitions for replenishment of stocks of the main support company. It keeps current references on stock accounting and supply procedures, to include regulations, technical publications, SOP's and policy and procedural guidance and information; and provides personnel to satisfy inspection or technical assistance requirements.

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(b) *Storage section.* This element receives, stores, maintains in storage, and issues maintenance supplies, including direct exchange and operational readiness float items. Supplies are issued in accordance with instructions from the stock control element. It is also responsible for safeguarding supplies, for preparing supplies for shipment, for maintaining records of balances, and for maintaining a locator system (AR 711-16). This element is manned with shipping-receiving specialists, storage specialists, supply handlers, and wrecker operators.

(c) *Supply administration.* For detailed information on specific procedures and forms involved in the requisitioning receipt, issue, and accounting for supplies, see AR 711-16 and AR 725-50.

(4) *Supply to supported units.*

(a) The main support company provides maintenance supplies to designated units operating within its area of operations. Requests for issue from supported units will be received on DA Form 2765 from supply officers of separate companies or battalion S4's, as appropriate. Normally, stock replenishment requisitions will be submitted in accordance with a schedule established by the stock control element of the main support company, except for requests for items to repair deadlined equipment, which may be submitted at any time.

(b) Requests for issue are handled as speedily as possible, in accordance with the urgency of need of the requested items and the importance of the mission of the unit initiating the request (AR 711-16 and AR 735-35). If the item requested is not immediately available and a suitable substitute cannot be provided, a due-out or passing action is effected, as appropriate (AR 711-16). Processing of requisitions is the responsibility of the stock accounting element of the supply platoon; issue of the required item is effected by the storage and issue element in accordance with instructions provided by the stock accounting element.

(c) AR 711-16 provides detailed information on the preparation and processing of DA Forms 2765 by a supporting supply activity.

(5) *Supply to the main support company maintenance shop.* The supply platoon also provides the maintenance supplies needed by the company maintenance shop. Such requirements will be received from the shop office and from shop supply activities and will be indicated on either DA Form 9-79, or DA Form 2765, depending on local procedures. Supplies are issued to the appropriate repair platoon through its shop supply activity.

(6) *Distribution of supplies.*

(a) The method used to distribute maintenance supplies will depend on the tactical situation, the urgency with which the supplies are required, transportation available, and locally-established operating procedures. Supply point distribution is normal. Supported units are informed when shipments are ready, and dispatch vehicles to pick up these supplies. To the extent possible, such supply pickup missions are combined with other missions to maximize use of transportation. Repaired vehicles being returned to supported units may be similarly employed. In the event such distribution is not possible and organic transportation is not available, arrangements may be made for delivery of maintenance supplies to supported units by requesting transportation from supporting transportation sources. In some cases, however, delivery may be made by the main support company using organic transportation.

(b) Contact teams may also be used to deliver small quantities of lightweight items and direct exchange items to supported units in conjunction with their normal maintenance missions.

(7) *Replenishment of supply platoon stocks.*

(a) To properly supply supported units and the company maintenance shop, the supply platoon must have sufficient quantities of maintenance supplies on hand and on order to sustain operations. To determine what is to be requested and in what quantity, the stock control element reviews its stock accounting records as prescribed in AR 711-16, and prepares requisitions based on the information contained therein. Requisitions are submitted to the SCC or ICC, as appropriate.

(b) Requests for maintenance supplies are transmitted to the next higher supply source by transceiver (if facilities are available) or by utilizing the supporting messenger service.

b. Light DS Maintenance Company

(1) *General.* Direct support maintenance supply functions of the light maintenance company (fig. 2-6) are similar to those outlined above for the main support company. It supports its own maintenance shop and designated using units. Supply stockage is smaller in terms of variety and quantity. Stock accounting and supply administration are performed as indicated in *a(3)(c)* above.

(2) *The supply section.* The organizational element of the light maintenance company which accomplishes the company's maintenance supply functions is the supply section. This section operates essentially as follows:

(a) Supply to supported units and the company shop elements is accomplished in the same manner as in the main support company (*a* above).

(b) Except for items on the direct exchange list, supported units are provided maintenance supplies in response to requirements indicated on DA Form 2765. Issue of direct exchange items is effected as indicated in paragraph 8-2*c* above. If supply requests from supported units cannot be filled by the supply section and the need is urgent, the supply section coordinates the problem with other DS units of the battalion in an attempt to obtain the items. In emergencies, items may be obtained immediately from the main support company, supporting requests for issue being prepared by the headquarters and main support company stock control unit, or the light maintenance company at a later time. In routine cases, the items are backordered.

(c) In response to supported unit requests for issue, the supply section performs the following actions:

1. Handles emergency requests by telephone.
2. Processes requests for immediate issue for all ASL-type items in stock.
3. Processes requests for other items

by contacting the main support company or other possible sources.

4. Edits requisitions.

5. Posts issues to its stock records.

6. Attempts to provide suitable substitute items before forwarding requests to the headquarters and main support company for issue action.

7. Maintains demand data.

8. Makes other issues as directed by the stock control unit of the headquarters and main support company, such as requirements that could not be satisfied by another light maintenance DS company.

c. The aircraft maintenance DS company.

(1) *General.*

(a) The aircraft maintenance DS company (fig. 2-4) support mission includes responsibility for accounting for, and issuing DS repair parts and related materiel required to support the shop platoon, the DS platoons, and the aircraft organizational maintenance activities of supported nondivisional units. Items provided include aircraft supplies as well as avionics and armament items associated with the aircraft or used in flight operations.

(b) Original stockage is in accordance with applicable supply manuals and with -34P technical manuals pertaining to the aircraft supported. Stockage is adjusted in accordance with recorded demand data.

(2) *Supply platoon organization and functions.* The supply platoon conducts the company's maintenance supply activities. Organization and function is as follows:

(a) *Supply platoon headquarters.* The platoon headquarters processes all requests for issue received from supported units or company elements, performs stock accounting functions, directs shipment of maintenance supplies, and assists in preparation of direct exchange lists. Stock accounting is performed as indicated in AR 711-16. When an aircraft operational readiness float is authorized, battalion headquarters controls the use of the float stocks.

(b) *Storage and issue section.* This section receives, stores, and issues aircraft, aircraft avionics, and aircraft armament items

required for technical supply operations. It also maintains the operational readiness float and direct exchange stocks. Operating methods are similar to those discussed above with relation to the main support company and the light maintenance company.

(c) *Shop supply section.* This section handles all repair parts and related expendable supplies consumed by the shop platoon in the accomplishment of maintenance activities. Maintenance supplies are obtained from the storage and issue section by placing demands on the platoon headquarters.

(d) The supply platoon normally operates at the company's main site.

(3) *Requisitioning and issue procedures.*

(a) Supported units submit requests for issue of aircraft repair parts to the supply platoon headquarters of the aircraft DS maintenance company, utilizing DA Form 2765. Issue is effected as prescribed by AR 711-16. The shop platoon and DS platoons obtain maintenance supplies through the shop supply section. Normally, the DS platoons do not effect direct issue maintenance supplies to supported units; however, in emergencies the supporting DS platoon may provide items from its maintenance stocks.

(b) Maximum use is made of direct exchange procedures to provide serviceable repair parts for like unserviceable items on an item-for-item basis.

(c) Normal replenishment of supply platoon stocks is effected by supply platoon headquarters, which prepares and submits requisitions in accordance with requirements indicated in stock records. These requisitions are submitted to the support brigade.

8-9. COMMZ Direct Support Maintenance Units

a. *The Maintenance Company, (DS) COMMZ.*

(1) *General.* The maintenance company (DS) (COMMZ) is the only type of functionalized DS maintenance unit normally employed within the COMMZ. It is normally attached to a headquarters and headquarters detachment, DS maintenance battalion, sub-

ordinate to an ASCOM support group headquarters. This company (fig. 2-8) provides direct support maintenance and maintenance supply support to supported units.

(2) *Supply platoon.* This element of the company is responsible for performing all DS maintenance supply support functions, to include the requisitioning, receipt, storage, protection, and issue of DS repair parts supply items required for—

(a) Providing a system of direct exchange of unserviceable, recoverable components turned in by supported units in accordance with applicable controls.

(b) Providing shop supply stocks for the operation of the company's three maintenance platoons.

(c) Operation of a technical supply activity for the issue of required repair parts and related maintenance materials to the supported units of the company for the purpose of conducting organizational maintenance on organic equipment supported.

(d) Operates the company's operational readiness float of selected items.

(3) *Organization for supply operations.* The supply platoon operates a stock control activity and a storage and issue activity, both of which operate in essentially the same manner as do their counterparts within the supply element of the main support company or the light DS maintenance company discussed in preceding paragraphs.

b. *The Aircraft Maintenance DS Company.* This company's responsibility for the provision of direct support aircraft maintenance includes the requirement for providing direct support aircraft maintenance supply service to the units which it supports. Details concerning the performance of the various supply functions mentioned above, together with applicable regulations and other operating guidance are similar to those presented in the discussion of this same type unit (paragraph 8-8c above) when employed in a field army support role. When employed in the COMMZ role this unit's regular source of supply support is a supply and service battalion controlled by the SMC, with requisitions being placed on the ICC.

CHAPTER 9
RECOVERY, EVACUATION, AND COLLECTING POINT OPERATIONS
(SOLOG-75)
(STANAG-2113)

Section I. DIRECT SUPPORT RECOVERY AND EVACUATION

9-1. Introduction

a. Except for aircraft, the primary responsibility for recovery and evacuation rests with the unit possessing equipment that must be recovered or evacuated, or units in whose areas such equipment is found. This responsibility encompasses both US materiel as well as abandoned items of foreign materiel.

b. Using units evacuate to their supporting DS maintenance unit those items of organic equipment requiring repair, unless arrangements are made for on-site repair. Normally, items of US materiel found in their areas of responsibility which have been abandoned or discarded by other units are also evacuated to the supporting DS maintenance company. The DS maintenance company identifies the items, determines serviceability, returns serviceable items to supply channels, and processes unserviceable items for repair or further evacuation. Foreign materiel that does not have to remain in place for technical intelligence evaluation may also be evacuated to the DS maintenance unit.

c. Recovered items are classified according to condition in accordance with SOLOG Agreement 75 (app G), and evacuated or disposed of in accordance with condition classification. When recovery and evacuation to DS facilities are beyond the capabilities of using units, they request assistance from the supporting DS maintenance unit. The light maintenance DS companies, transportation aircraft maintenance DS company, and maintenance company, rear,

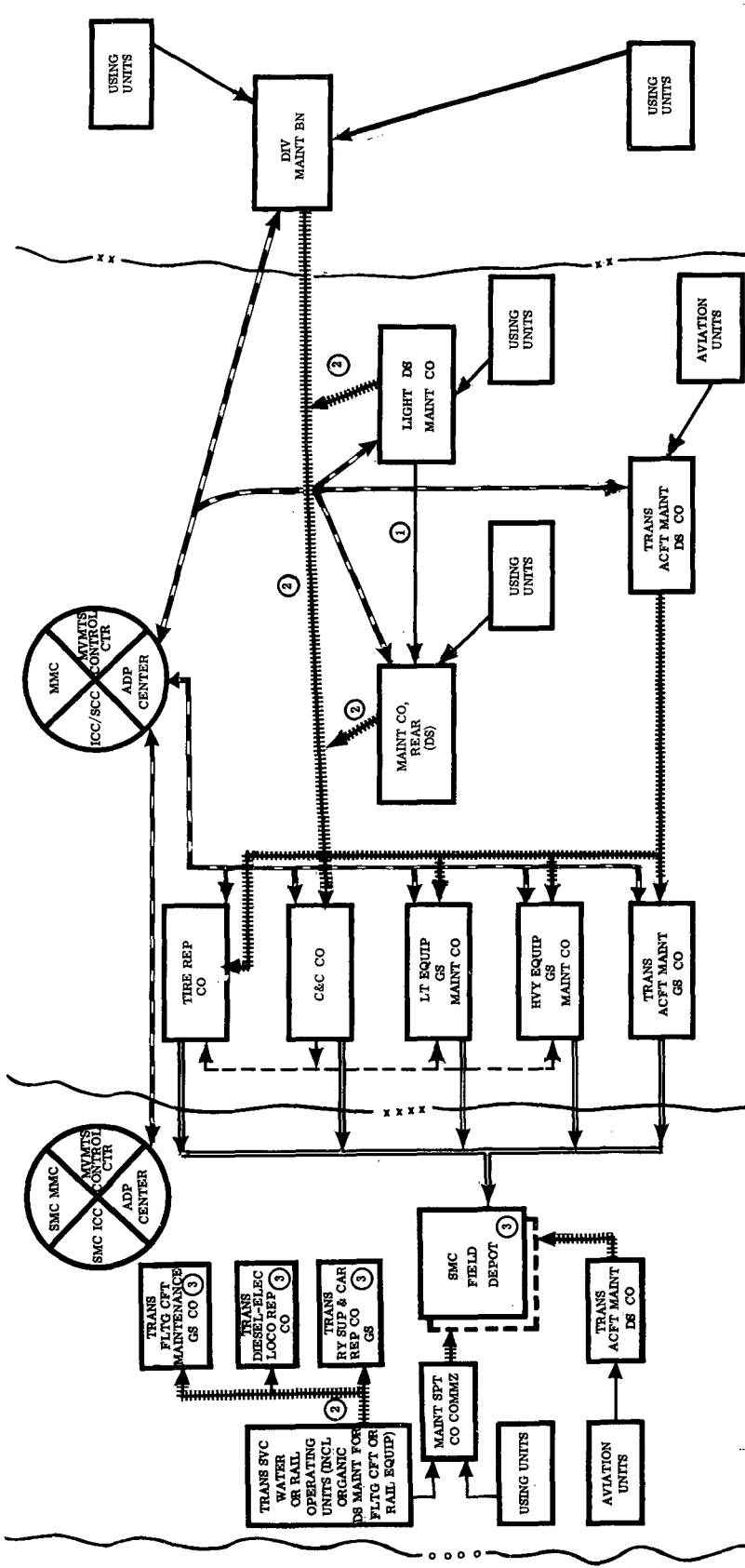
of the DS maintenance battalion provide such assistance within the limits of their capabilities and seek the assistance of supporting GS units when requirements exceed DS capabilities.

d. In fast-moving situations, the recovery and evacuation workload of nondivisional DS units will often be extensive. In such situations, compromises are made for tactical units as the tactical missions become more demanding, and evacuation may be made to temporary collecting points or to locations along main supply routes, with such locations being reported to supporting units. In other situations, tactical units may leave unserviceable or abandoned materiel in place, and nondivisional DS maintenance units may be required to police the battlefield.

e. Items evacuated to DS maintenance units are disposed of as follows:

(1) Supported unit organic equipment is repaired and returned as described in chapter 6, provided the DS maintenance unit has the required capability and capacity.

(2) Abandoned items of serviceable US equipment of the type normally supported by the DS maintenance unit are returned to supply stocks, after being inspected to assure serviceability. Items falling into the category of "repair parts" are turned over to the mission supply element of the unit; end items are normally turned over to the unit responsible for end item supply. Such items may be used to replenish the operational readiness float, but only if reported to and approved by the inventory control

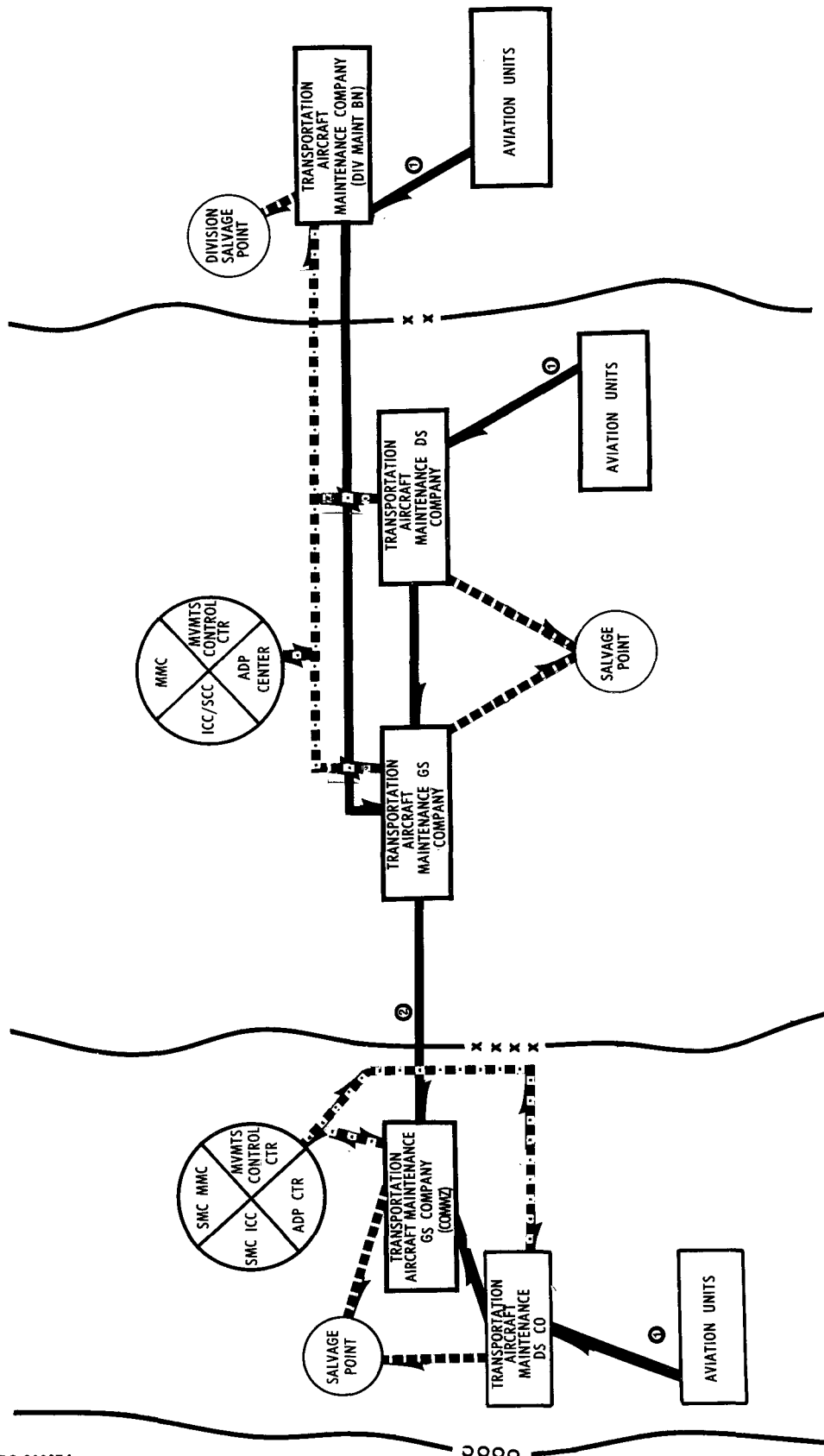


This illustration depicts only the evacuation of unserviceable class VII and IX materiel supported by DS and GS maintenance units. It does not show evacuation channels of scrap and other salvage items, ammunition and missile system items, medical, crypto, or foreign materiel which is evacuated as directed after coordination with technical intelligence agencies.

NOTES:

- KEY:**
- ➔ Evacuation from using units to DS maintenance units, and from DS maintenance units to DS backup.
 - ➔ Evacuation of items beyond repair capability or capacity of DS maintenance units to GS maintenance or collection facilities. Evacuation destinations are provided by the control centers, based on types of items being evacuated and workloads of GS maintenance units.
 - ➔ Flow of information and instructions relative to types of items requiring evacuation to a higher support category, condition of materiel, and disposition instructions.
 - ➔ Overflow general support and items requiring depot maintenance.
 - ➔ Flow of repairable materiel from the C&C company to maintenance units.
- 1** Evacuation for backup direct support maintenance.
- 2** In general, items directed to the C&C company consist of economically repairable end items (except aircraft, small instruments) requiring general or depot support maintenance, and those economically repairable end items containing serviceable or repairable components/parts which are to be reclaimed. The bulk of the items requiring GS maintenance units consists of unserviceable components which will normally be repaired at the appropriate GS maintenance unit. The items requiring GS maintenance units are usually evacuated directly to the appropriate GS maintenance unit.
- 3** Within the communications zone portion of above diagram, the box titled SMC Field Depot represents all of the various types of individual GS maintenance units normally found as part of a COMMZ (SMC) field depot complex or under control of a field depot, plus various supply and service-oriented units and other related organizations. Included among the maintenance-oriented units may be cellular maintenance teams or detachments to perform specialized support functions or to augment the support capability of company-sized maintenance units. Rail and marine GS maintenance units, while usually under control of an SMC field depot, are shown separately inasmuch as they are frequently found located at or near the rail or port facility of the transportation service unit which they support.

★ Figure 9-1. Evacuation flow of unserviceable class VII and IX items supported by DS or GS maintenance battalions.



- ① Aircraft, components, aerial armament, and avionics.
- ② Field army overflow to COMMZ

Evacuation flow economically repairable materiel requiring direct support, general support, or depot maintenance (Includes overflow DS or GS workload).

Scrap Disposition as directed.

Flow of information and instructions on workload, condition of materiel, and disposition of materiel requiring evacuation to higher support category.



★ Figure 9-2. Army aircraft evacuation channels in the theater of operations.

center. The receipt of critical or controlled items is reported to higher headquarters by the receiving stock control element.

(3) Abandoned items of US equipment which are unserviceable are repaired and returned to supply stocks as indicated above, provided the DS maintenance unit has the required capacity to effect repair and the items are of the type normally supported by the company.

(4) US equipment, such as medical and cryptographic, not supported by the DS unit is shipped to the unit or activity responsible for the support of it.

(5) Unserviceable items of equipment of the type supported by the DS unit which cannot be repaired because of lack of capacity or capability (DS maintenance overload, or general or depot support maintenance required) are evacuated to a collection and classification company or to a maintenance company of the support group, as directed by the group materiel management section.

(6) Items of foreign materiel are reported, through command channels, to brigade and are held until disposition instructions are provided or responsibility is assumed by the technical intelligence element of the military intelligence battalion.

(7) Items that are obviously of no use except as scrap are reported and may be evacuated to the nearest salvage collecting point.

(8) Items that are obviously uneconomically repairable are also evacuated to the salvage collecting point. Needed usable repair parts and components are reclaimed before evacuation.

f. Although transportation elements usually provide vehicles for the hauling of materiel being evacuated from DS maintenance units, supporting GS maintenance units and the collection and classification company may assist in this evacuation when necessary. Backhaul transportation should be used to the maximum to effect evacuation. Vehicles that require GS maintenance but that still run should be driven back, provided their operation will not result in further serious damage, and their cargo space should be utilized to evacuate smaller items.

g. For details on recovery and evacuation in the division area, see FM 29-30. Note that although the division maintenance battalion is responsible for recovery and evacuation support within the division area, additional support from nondivisional units may be required, especially in such conditions as indicated in *d* above.

h. The evacuation and disposition of unserviceable material is depicted in figures 9-1 and 9-2.

9-2. Operations for Recovery and Evacuation of US Materiel

a. General. Policy and instructions on evacuation are established and disseminated by brigade and/or by support groups. Implementing policies, SOP, guidelines, and directives are prepared and disseminated by battalion headquarters, with the materiel officer exercising staff supervision. In supervising and directing battalion evacuation operations, battalion headquarters maintains liaison with the support group materiel management section to maintain up-to-date information on destinations for evacuated materiel and to obtain assistance, as necessary. Battalion also coordinates with the transportation movement of items being evacuated by DS maintenance units.

b. Vehicles, Artillery, and Other Heavy Items.

(1) Using unit maintenance elements recover disabled vehicles, artillery, and other heavy items; classify items in accordance with SOLOG Agreement 75 (app G); and perform repairs that are within their capability and the time available. The remaining items are delivered to the supporting DS maintenance unit, except in fast-moving situations where movement requirements of the using unit do not permit. In the latter case, items will be moved to a designated location along the road, at which point the supporting unit will pick them up and haul them back to the maintenance shop.

★(2) Light DS maintenance companies repair those items that are within their capability and capacity and return them to the using unit or to supply channels. Items that cannot be repaired are evacuated to the maintenance company, rear, if it is known that the company has

the required capacity and capability. If the maintenance company, rear, cannot repair, items are evacuated to the responsible maintenance unit or collecting point of the support group in accordance with instructions provided by the materiel management center of the support brigade. When a using unit's end item is evacuated to the maintenance company, rear, and necessary repairs are effected, the item is returned to the using unit. If the item must be evacuated for higher echelon repair, a supply turn-in must be effected and equipment records required by TM 38-750 must be completed.

(3) Uneconomically repairable items and obvious scrap are reported and may be evacuated to a salvage collecting point.

(4) Recovery and evacuation functions of the light maintenance DS companies are performed by the service and evacuation section. Recovery operations are limited by the capacity of the wreckers provided for this function. When the recovery or evacuation mission exceeds section capabilities, assistance of the maintenance company, rear, service and evacuation platoon is requested. This platoon is equipped with a tank transporter, a tank recovery vehicle, and wreckers.

c. Instruments, Small Generators, Electronic Items, Items Susceptible to Damage by Weather or Handling, and Critical Items. Because of their nature, such items must be safeguarded, protected, and handled to preclude damage or loss. Using units will be required to deliver such items directly to the supporting maintenance company. If contact teams from the supporting maintenance unit are in the area, these teams may be utilized to take such items back to the supporting company, subject to the transportation capability of the party. The supporting company accomplishes maximum repair of such items, consistent with its capacity and capabilities and arranges for the evacuation of the remainder of economically repairable items as outlined in *b* above. The transportation of such items between a using unit and its supporting maintenance unit, and between the supporting maintenance unit and backup repair or collection facilities requires that they be properly packaged to prevent damage during shipment.

d. Aircraft and Associated Items.

(1) Recovery of nonflyable aircraft and evacuation to appropriate maintenance facilities is a responsibility of the supporting aircraft DS maintenance company, and is accomplished by personnel and equipment of the direct support of shop platoon and the service and equipment section. Normally the commander of the DS platoon decides whether recovery is indicated. The aircraft GS maintenance company may assist in such operations. Requests for assistance are made through command channels.

★(2) Aircraft components, avionics items, and aircraft armament items will be evacuated as indicated in *c* above, except that items beyond the repair capability or capacity of the aircraft DS maintenance company are evacuated to the supporting GS aircraft maintenance unit.

(3) Since improper recovery procedures may result in more damage to aircraft than originally existed, field recovery of aircraft is held to a minimum. Such recovery is undertaken only after it is determined that on-site repair to permit a one-time flight to more adequate repair facilities is not practicable. The recovery of disabled aircraft may be accomplished by ground means or aerial lift. The latter method is preferred.

e. Explosive Items. Recovery and evacuation operations are often complicated by the presence in or on the equipment, of items of ammunition. The possibility that abandoned items may have been boobytrapped must always be considered. Personnel engaged in recovery and evacuation operations must be constantly on the alert for explosive items. Extreme care must be taken by all personnel to prevent explosions, fires, and the accidental discharge of weapons. The assistance of explosive disposal personnel may be requested when mines are encountered and boobytraps are suspected. However, this does not change the responsibility of units to perform normal operations identified with minefield clearance. Combat service support units are responsible for clearing landmines and boobytraps to the extent necessary for their own bivouac and work areas.

f. Contaminated Materiel. Before an attempt is made to recover or evacuate materiel that has been subjected to chemical, biological, or radiological contamination, a check will be made to determine the practicality of such action. Supported units as well as DS maintenance units are provided detection kits and radiological monitoring devices to detect such contamination and to measure the intensity of radiation. If practicable, decontamination will be accomplished (TM 3-220) and the disabled or abandoned equipment will be evacuated as indicated previously. If the contamination is such as to prevent recovery and evacuation, the location of the contaminated materiel will be noted and battalion headquarters notified so that advice and assistance on decontamination or disposal may be obtained. Instructions pertaining to the recovery and evacuation of contaminated materiel will be published in SOP's.

9-3. Recovery and Evacuation of Foreign Materiel

a. Foreign materiel will also be recovered and evacuated in accordance with policies and procedures established for the handling of such materiel, which may be of value for technical intelligence purposes, or it may provide materiel which may be utilized by friendly forces. It is also important to clear such items from the battlefield to prevent their recapture or reclamation by the enemy.

b. The technical intelligence elements of the military intelligence battalion and the intelligence elements of all commands will be interested in captured or abandoned items of foreign materiel. Procedures will be established for the screening and evacuation of such items, with implementing instructions being published by subordinate commands in the form of directives and SOP's.

c. Responsibilities for recovery and evacuation at various levels are similar to those for US materiel, wherein the unit finding the item will, in accordance with instructions provided by its command element, either evacuate the item or leave it in place for on-the-spot screening by technical intelligence personnel. The supporting

DS maintenance unit will assist in such evacuation. Evacuation may be to the DS unit, to a collecting point, or to the technical intelligence element.

d. Pertinent references concerning captured enemy equipment and other foreign materiel include AR 381-9, 600-23, 633-50, 643-20, 711-16, 735-35, 755-1, 755-20, 755-21, 755-26, and 870-5; FM 30-16; TB 381-5-4; and TB ORD 412.

9-4. Destruction of Materiel

a. Destruction of supplies and equipment to prevent their capture by the enemy must be thoroughly planned by the battalion. Materiel that may require destruction includes unserviceable equipment that cannot be recovered and evacuated because of the tactical situation, as well as serviceable items that cannot be evacuated when the unit has to move hurriedly.

b. Within the areas of operation of the battalion and its attached units, rapid and unexpected advances of enemy ground forces, pressure from large-scale guerrilla action which cannot be countered, and enemy airborne or airlanded assault may occur at any time. Any of these situations may require the battalion or its attached units to vacate their areas. Since units of the battalion carry large quantities of supplies, and will have many pieces of heavy equipment in their areas, both serviceable and unserviceable materiel may have to be destroyed to permit rapid evacuation and to preclude its capture by enemy forces.

c. Procedures to effect destruction of materiel and priorities of destruction should be published as part of the battalion SOP. Unit SOP's must be prepared by subordinate units, based on the battalion SOP. Battalion headquarters must review all unit destruction plans to insure effectiveness and conformity with policies. Destruction is accomplished only when capture is likely, and recapture unlikely. Equipment and supplies should be evacuated in accordance with established priorities.

d. Information on which to base destruction plans may be obtained from the following publi-

cations and should be covered in each unit's SOP.

(1) Equipment technical manuals provide specific information for destruction.

(2) FM 5-25 contains information of destruction of equipment and supplies to prevent capture by the enemy.

(3) Field manuals of the 23-series contain information on the destruction of small arms.

(4) TM 750-5-15 provides information on

the types of chemical munitions available to destroy equipment and files and describes the use of these munitions.

(5) After equipment is destroyed, the debris may be boobytrapped if time permits. Boobytrap techniques may be found in FM 5-31.

(6) Procedures for destruction of military technical equipment can be found in STANAG 2113, included as appendix H.

Section II. GENERAL SUPPORT RECOVERY AND EVACUATION

9-5. Introduction

a. As indicated in paragraphs 9-1 through 9-4, GS units may assist DS units in recovery and evacuation operations by providing backup recovery and evacuation support. Such support by GS units must be of an emergency and limited nature. The maintenance missions of GS units must not suffer through the dissipation of effort in recovery and evacuation.

★*b.* At the GS maintenance level, most of the workload is received as a result of the evacuation process. Workload may be received directly from DS maintenance units or through a collecting point. Normally, aircraft items are evacuated through aircraft maintenance channels. In all cases, the support group materiel management section is informed of the materiel to be evacuated and its conditions so that disposition instructions may be provided, and to facilitate planning of the GS maintenance workload. Depending on the materiel involved, the scope of maintenance required, and the workloads of GS maintenance units, such instructions may be provided on an individual basis or through evacuation instructions effective for a specified period. Instructions may be very specific, for instance, they may indicate that for the period 10 to 14 December all aircraft are to be evacuated directly to the 347th transportation aircraft GS maintenance company, all $\frac{3}{4}$ -ton truck engines are to be evacuated to the 339th heavy equipment GS maintenance company, and all uneconomically repairable end items are to be evacuated to the 318th collection and classification company.

9-6. Collecting Point Functions

a. Collecting points are facilities to which unserviceable or abandoned materiel, both US and foreign, is evacuated for classification, segregation, and proper disposition. Collecting points operate throughout the theater of operations. In the field army area, one or more collecting points is provided for each corps area and for the field army service area. In the division areas, collecting points are operated by the division maintenance battalion. Operations of division collecting points are discussed in FM 29-30. This chapter concerns itself primarily with collecting points operated in the corps and army service areas.

b. The unit specifically designed to operate the collecting point is the collection and classification company (fig 3-6). When the C&C company is not available, collecting points in the forward portions of the corps areas may be operated by heavy equipment GS maintenance companies (fig 3-4). These collecting points receive and process all types of materiel except ammunition, drones, aircraft, cryptographic and medical materiel, and items associated with large missile systems. Although items not within the scope of the collecting point mission may be received, such items are then sent to the responsible maintenance unit.

c. The collecting point performs the following functions:

(1) Receives, inspects, classifies, and segregates unserviceable or abandoned US and foreign class VII materiel, except aircraft, ammu-

dition, missiles, and textiles. Performs any decontamination that may be required. Decontamination is performed by the emergency decontamination squad of the company. Explosive removal and disposal service, if required, is provided by EOD units serving the area.

(2) Returns serviceable items to supply channels.

(3) Sends repairable end items and components to maintenance units for repair, based on instructions from the MMC.

(4) Evacuates foreign materiel of intelligence value as directed.

(5) Disposes of foreign materiel, for which there is no technical intelligence need, as directed by the SCC.

(6) Removes needed serviceable and repairable repair parts from uneconomically repairable end items in accordance with lists of required items furnished by the MMC. Such lists are based on requirements within the brigade as indicated by the SCC and instructions from the FASCOM or SMC ICC.

(7) Returns serviceable repair parts to supply channels.

(8) Submits reports on collecting point activities to battalion headquarters for further transmission to the MMC.

(9) Performs controlled cannibalization as directed by higher headquarters.

d. Most economically repairable items received at the collecting point are repaired by GS maintenance companies attached to the battalion, except for tires and tubes, which are evacuated to a tire repair company (fig 3-5). When these companies are overloaded, evacuation to GS maintenance companies in other battalions, or to collecting points further to the rear is accomplished. In the case of a heavy equipment GS maintenance company operating a collecting point, some of the maintenance required may be performed by elements of the company not required for operation of the collecting point.

e. Although the recovery and disposition of class V items does not fall within the assigned responsibility of the C&C company, such items

may be received at the collecting point either in or on other materiel. Battlefield recovery crews may encounter items that have been booby-trapped or contain class V items. Quantities of class V items discovered during recovery operations should be reported to the nearest ammunition battalion.

9-7. Controlled Cannibalization of Ground Equipment

a. Controlled cannibalization is a valuable source of low mortality repair parts supply and applies, primarily, to parts, components, and assemblies not within the major command stockage list and which cannot be furnished by the supply system in a reasonable time to satisfy a critical need.

b. Controlled cannibalization is performed at the collecting point in conjunction with routine collection, identification, and classification operations. The battalion materiel section provides guidance on controlled cannibalization in the form of SOP's and directives which are based on and conform to the policies and directives of higher headquarters.

c. At the collecting point, end items, components, and assemblies that are not economically repairable and that are to be disposed of as scrap are routinely stripped of high mortality-type stockage list items that are serviceable or economically repairable. As directed by battalion or higher headquarters, the following items will be removed for return to supply stocks.

(1) Nonstockage list fringe parts.

(2) Mandatory recoverable items.

(3) Stockage list parts temporarily unavailable through supply channels for which an immediate need exists.

(4) Parts authorized to be obtained through local purchase or fabrication.

(5) Parts for which the source code (in TM parts list) is through salvage.

d. Procedures and policies for utilizing controlled cannibalization are prescribed in AR 750-50. These will be amplified by the support brigade.

9-8. Controlled Cannibalization of Aircraft

a. Repairable Aircraft. Cannibalization of repairable aircraft is the removal of serviceable parts from an unserviceable aircraft in order to install them on another aircraft. It is accomplished by aircraft maintenance units. It does not substitute for normal supply procedures but is an emergency measure used to obtain parts required to return an aircraft to serviceability when the need for the aircraft justifies the action and the necessary repair parts are not readily available through other sources (AR 750-1500-8). When an aircraft is cannibalized, records are annotated as prescribed in TM 38-750. Cannibalization is approved by the MMC when all of the following criteria are met:

(1) The aircraft from which the serviceable parts are to be removed is otherwise deadlined for parts or is undergoing extensive, time-consuming maintenance.

(2) Any resultant delay in returning the cannibalization aircraft to serviceability is compatible with its established maintenance priority.

(3) The aircraft upon which the cannibalized parts are to be used is currently deadlined for parts.

(4) All possible alternative actions such as lateral supply, local procurement, and fabrication have been explored without success.

(5) Established maintenance priorities justify preferential treatment for the aircraft upon which the cannibalized parts are to be used.

b. Uneconomically Repairable Aircraft. When an aircraft is damaged beyond economical repair or has crashed under circumstances in which recovery is impossible or impractical, all serviceable parts are promptly removed for return to supply channels. Usable portions of the airframe are recovered when appropriate. The following procedural guides are observed in cannibalizing an uneconomically repairable aircraft.

(1) Cannibalization is systematic and complete and is performed only under the supervision of technical inspectors who determine the serviceability of each part. Under no circumstances are individual repairmen permitted to remove parts for their own use in completing a repair job.

(2) Determination of serviceability of cannibalized parts, components, and assemblies is in accordance with criteria established by AR 750-1500-8 and applicable technical publications.

(3) Action is taken to secure release of the aircraft from the accident investigating board as soon as possible. Permission is obtained to preserve engines and other components, assemblies, or parts that are subject to rapid deterioration.

(4) Serviceable parts resulting from cannibalization are returned to supply for issue through normal supply channels. Unserviceable items which are repairable are repaired and returned to supply channels. Scrap is turned over to the nearest salvage point.

Section III. COLLECTING POINT OPERATIONS**9-9. Receipt of Materiel**

Materiel received by the collecting point will include serviceable and unserviceable end items and components of U.S. materiel and similar items of foreign materiel. This materiel will come from forward collecting points, direct and general support maintenance units, turn-in by local using units, and from the company's own limited recovery operations.

9-10. Materiel Inspection and Classification

a. All materiel received by the C&C com-

pany is identified by inspectors of the inspection, and identification, and classification section. This classification differs from the condition classification indicated in SOLOG Agreement 75 (app G) since it is more extensive and determines processing of particular items within the C&C company. These inspectors also determine condition of materiel, segregate and classify materiel, and recommend disposition. Each item is segregated and classified into one of the following categories:

(1) Serviceable.

(a) U.S. materiel.

(b) Foreign materiel.

(2) Economically repairable at the GS maintenance level.

(3) Economically repairable, but not within the capability of DS or GS maintenance facilities.

(4) Uneconomically repairable, but contains serviceable or economically repairable repair parts.

(5) Surplus or excess materiel (both U.S. and foreign).

b. The battalion materiel section, in coordination with stock control and maintenance management elements of higher headquarters will develop guidelines for use by inspectors in making these classifications. The following guidelines will be taken into consideration:

(1) The time required to restore materiel to a serviceable condition.

(2) The supply status of the end item or repair parts. It should be pointed out that, because of a critical shortage of certain items within a given area, such items will be repaired regardless of the time and cost involved. Some uneconomically repairable end items will not be processed for reclamation or repair parts because of the work involved and the ability of the supply system to more economically provide replacements. Such items will be disposed of through salvage disposal action.

(3) The workload of support group GS maintenance units often require certain items to be evacuated to other support groups. Items may be evacuated to the COMMZ for repair because of priorities established for the repair of other items.

c. Results of the inspection and classification are recorded on an Equipment Inspection and Maintenance Worksheet, DA Form 2404, which is prepared for each item or for a group of similar items, and which is submitted to the shop office to facilitate the reporting of materiel received and to assist in effecting proper disposition and processing.

d. Foreign materiel is inspected, then referred to technical intelligence activities for

evaluation. That which is not needed for intelligence purposes may be considered for use by U.S. forces or allied forces, or otherwise disposed of, dependent upon instructions from higher headquarters.

9-11. Reporting, Processing and Disposing of Materiel

a. Shop Office Functions.

(1) The shop office exercised operational control over all mission activities of the company, establishes and implements control procedures, and prepares and maintains required records and reports. It provides, through battalion headquarters to the support brigade MMC reports on materiel received, processed, and disposed of by the company. This office determines processing and disposition of materiel, and expedites the processing of critical or short-supply items. Processing and disposition of materiel are based on the following:

(a) Inspection and classification reports.

(b) Information obtained from equipment records that accompanied the item(s). Equipment log book records provide information on equipment age, use, and previous maintenance actions that could have a bearing on whether the item is repaired or salvaged.

(c) Disposition instructions, lists of items in short supply, lists of items to be obtained through cannibalization, lists of items that must be repaired regardless of the costs involved, received from higher headquarters.

(d) Estimated cost or repairs in terms of time and materials.

(2) In accordance with the above, materiel is routed as follows:

(a) Materiel classified as serviceable will be routed to the storage and shipping platoon for preservation, packing, marking, and temporary storage pending shipment instructions from the SCC.

(b) Materiel declared economically repairable, and that does not require disassembly, is also sent to the storage and shipping platoon for processing and temporary storage as indicated above.

(c) Uneconomically repairable mate-

riel containing needed serviceable or economically repairable repair parts is routed to the disassembly platoon for reclamation of needed items. Reclaimed items are then sent to the materiel processing platoon. The residue is sent to the salvage activity.

(d) Salvage is routed to the nearest salvage activity. Material included in this classification includes scrap metals, heavy textile items that are not repairable, other materials having value only because of basic material content, and uneconomically repairable end items, components, or repair parts from which all needed serviceable or repairable components or repair parts have been removed.

(e) Surplus or excess materiel such as quantities of captured enemy equipment not needed for intelligence purposes, and obsolete items of U.S. equipment no longer required by the supply system is routed to the materiel processing platoon for temporary storage pending disposal action.

(3) Record-keeping and report preparation activities of the shop office include informing the MMC of collecting point activities; reporting receipts of unserviceable assets to the SCC; preparing those records and reports required by TM 38-750 to initiate processing of work, to indicate removal of components from end items, and to indicate the salvage of materiel or its transfer to another unit; and preparing or processing those reports required by AR 755-20, AR 755-21, and AR 755-25 or higher headquarters relative to the collection of excess, surplus, or salvage materiel which is to be disposed of through salvage or property disposal action.

9-12. Disassembly Platoon Operations

a. The equipment and armament disassembly sections of this platoon disassemble materiel received through the inspection, identification and classification section. Disassembly is accomplished as directed by the shop office. Normally, the shop office will utilize a DA Form 2407-1, Maintenance Request Continuation Sheet, as a worksheet to indicate routing and other instructions. Although the shop of-

fice will initiate a DA Form 2407, Maintenance Request, for the processing of individual items or groups of like items, Form 2407 is retained in the shop office and, if completed, as necessary, upon the return of the annotated 2407-1, after processing has been completed.

b. Disassembly is accomplished only to the extent necessary to remove designated parts safely and without damage. The disassembly sections may work from lists of needed parts provided previously by the shop office, or specific disassembly instructions may be indicated on the DA Form 2407-1.

c. Serviceable and economically repairable repair parts are cleaned, classified, and routed to the packing and crating section of the materiel processing platoon. If such items require further inspection or identification of correct nomenclature and stock number, they are routed through the inspection, identification, and classification section. Normally, the latter section will provide the services of inspectors to identify items within the disassembly section area to reduce movement requirements.

9-13. Storage and Shipping Operations Platoon

a. Serviceable and economically repairable items that do not require disassembly are routed directly to the packing and crating section of the platoon. Items resulting from disassembly operations are also routed to the packing and crating section after first being tagged as to serviceability, nomenclature, and stock number by inspectors of the inspection, identification, and classification section. Items received by the packing and crating section are preserved; packaged, boxed, or crated, as appropriate; identified by stock number, and nomenclature; and identified as to serviceability. The packaged items are then routed to the temporary storage and shipping section where they are stored pending disposition.

b. The temporary storage and shipping section maintains stock records on items it receives, following informal stock accounting procedures in AR 711-16. Serviceable and unserviceable records are maintained. Materiel is stored until ordered shipped. When items

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are shipped from the company, this section prepares shipping documentation in accordance with AR 725-50. The section also coordinates with the shop office to assure the preparation and proper disposition of equipment records that must be initiated and forwarded concurrently with the transfer of equipment. Equipment Transfer Report, DA Form 2408-7, Equipment Log Books, and other forms required by TM 38-750 will be initiated.

9-14. Heavy Lift and Evacuation Platoon

This platoon provides the company with the personnel and equipment required for lifting and moving heavy materiel. It is equipped with cranes, tank transporters, tank recovery vehicles, wreckers, and forklift trucks. It performs limited recovery and evacuation operations for the company, including assistance to DS units as necessary. The efforts of the platoon are required for the movement of heavy materiel within the collecting point, the performing of heavy lift operations required for disassembly, and the loading and unloading of heavy materiel.

9-15. Battalion Controls

To facilitate control and direction of collecting point operations, the maintenance battalion headquarters—

a. Establishes policies and procedures for collection and classification operations. These policies and procedures must be in consonance with instructions from the support brigade MMC and command evacuation policy. Routine procedures are published as SOP's, which will be elaborated upon in SOP's prepared by the unit operating the collecting point.

b. Provides direction for the handling of contaminated or explosive materiel and ar-

ranges for any assistance that may be necessary.

c. Keeps track of materiel within and processed by the collecting point by requiring periodic reports on collecting point operations.

d. Provides the MMC with reports of collection point activities, as required.

e. Exercises supervision of collecting point operations through reports, staff visits, and inspections.

f. Designates the general location of the collecting point within the area assigned to the battalion and approves the specific location selected by the commander of the unit operating the collecting point.

g. Plan and coordinates movement requirements of the collecting point, to include arranging for necessary transportation assistance.

h. Directs movement of the collecting point, as necessary, and makes arrangement for another unit to take over the materiel at the collecting point when the collecting point is to be moved.

i. Determines or establishes standards to guide inspectors in making proper classifications of materiel at the collecting point.

j. Supervises the collection and evacuation and the disposition or destruction of foreign materiel as required, in accordance with guidance provided by technical intelligence activities, and provides guidance on these matters to the unit operating the collecting point.

k. Obtains instructions from the MMC relative to supply items that are to be provided through collecting point operations.

l. Maintains liaison with supported units to determine extent of recovery and evacuation assistance required.

CHAPTER 10

MOVEMENT, SECURITY, AND COMMUNICATIONS

Section I. MOVEMENT

10-1. Introduction

a. Reasons for Movement. The functioning of the army and accomplishment of its mission requires frequent displacement and maneuver of all of its components. The principal reason for the movement of the maintenance units discussed in this manual is to permit sustained and effective support of the combat effort.

(1) *Direct support maintenance units.* When the distance to supported units becomes too great to permit timely and efficient support, DS units are required to move. The non-divisional DS maintenance battalion may move as a unit. However, within a theater of operations, traffic density on roads, the tactical situation, or support requirements affecting only one of the battalion units often dictate the movement of individual units of the battalion.

(2) *General support maintenance units.* General support units are not required to move as often as DS units. The mission of the GS maintenance units, the heavy equipment used, production methods employed, and the requirement for more extensive maintenance precludes frequent movement if mission performance is to be effective. GS maintenance units are not as mobile as the DS units and will require transportation augmentation.

b. Movement Preparation.

(1) Movement of maintenance units requires that technical operations be closed out and reestablished in new areas with a minimum interruption to mission activities. This involves detailed planning to provide for the conduct of movement operations, careful site selection, proper area preparation, notification

to supported units of the change, and making provisions for other maintenance units to take over unfinished workloads. Maintenance units provide for their own security and defense, both on the march and while operating in established locations. They participate in rear area security and area damage control operations. These aspects of operations and the manner in which they are conducted have a profound effect on technical operations. Therefore, movement, security, and defense require proper and continuing emphasis.

(2) The battalion prepares movement, security, and defense plans and keeps them current based on changes to operational requirements or factors affecting mission performance. Most of the detailed planning is accomplished by the battalion operations officer. At company level, planning is accomplished by the company commander, assisted by other company officers and key noncommissioned officers. Plans at each level must be simple, workable, and flexible. The plans must be known by all personnel and be thoroughly understood.

10-2. Scope of Section Coverage

This section discusses movement and defense in terms of a maintenance battalion and its attached units. Since it is impractical to discuss all variations in mobility, mission, type of individual unit, and area of operations, the user of the manual is expected to modify or expand on the procedures. When a unit moves independently, it will have to perform some of those functions performed by battalion headquarters.

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10-3. Classification of Movements

Movements may be classified as tactical or administrative. They can be further classified in accordance with type transportation employed (e.g., motor, rail, ship, and aircraft).

a. Tactical. In tactical movements, unit integrity for tactical control, combat loading for ready availability on contact, and speed of movement are of greater importance than economy of cargo capacities.

b. Administrative. Administrative movements make maximum use of available transport. Tactical considerations in administrative movements are of less importance than economical use of cargo capacities and operating personnel.

10-4. Plans

Detailed plans are necessary for unit movements. Units are given timely notification of impending movements to permit proper preparation. Factors that must be thoroughly evaluated include—

a. Organization of the unit and equipment to meet the requirements of the tactical situation.

b. Assembly of unit and transportation.

c. Packing and marking of equipment.

d. Loading of personnel and equipment.

e. Control and logistical support en route and at destination.

f. Adequate security en route and at destination.

g. Influence of the weather and adequacy of the transportation net.

h. Nature and extent of possible enemy interference.

10-5. Movement

When the maintenance battalion receives movement orders, mission assignments, and the assignment of a general area for operations, it will issue warning orders to the units of the battalion. Individual units will alert their personnel. Plans are made for the movement on a battalion basis or by company, depending on how the move is to be made. Some of the movement functions of battalion include—

a. Warning subordinate units of the movement.

b. Preparing movement orders.

c. Conducting a briefing for the battalion staff and unit commanders on the situation, movement plan, logistics matters, security requirements, and intelligence and counterintelligence information.

d. Organizing a reconnaissance party to reconnoiter the route of march and to select areas and alternate areas for battalion headquarters and subordinate units. When the entire battalion moves, this party will include representatives from subordinate units.

e. Forming of an advance party to prepare the selected area for operations and to secure the area. Individual units may dispatch their own advance parties. The battalion headquarters advance party will be formed by the battalion adjutant who will select the specific area for the battalion headquarters in coordination with the commander of the main support company.

f. Obtaining route clearance for the move.

g. Arranging for additional transportation requirements.

h. Obtaining and distributing maps.

i. Preparing a road movement graph. See FM 101-10-1 for details.

j. Preparing a road movement table. For a road movement table, see FM 101-10-1.

k. Notifying higher headquarters and supported units of the time of closeout of operations in old areas and the renewal of mission activities in new areas.

l. Designating general areas to be occupied by attached units.

m. Arranging for other units to take over unfinished work of DS maintenance units.

n. Arranging for the turnover of the site and that materiel not to be moved to the new location. Normally, every effort is made to dry up a collecting point or to evacuate unserviceable workloads before the unit is required to move.

o. Reviewing movement orders and exercising staff supervision over moves.

p. Coordinating with the army area signal center for discontinuance of communications

at old locations. Upon arrival at the new location, coordinating with the nearest army area signal center for communications and to effect changes in directory and routing service.

10-6. Motor Marches

Some of the conditions affecting motor movement are—

a. Civilian controls on motor movements in the territory of a friendly nation make it necessary to have proper clearances by the transportation officer before movements are executed.

b. Conditions of terrain and climate may restrict the mobility of motor vehicles.

c. Although basic military road networks are designated in the defense plans of NATO nations in some areas, road nets with highways and bridges suitable for all classes of military traffic may not have been established. Under these conditions, a route reconnaissance must be conducted. See FM 5-36.

d. Motor movements are vulnerable to ambush.

10-7. Movement by Rail

Rail is an economical form of transportation for moving large bodies of troops in long distances and should be used to the extent possible. When rail facilities are limited, tracked, heavy, and oversized vehicles should receive priority for rail movement.

10-8. Movement by Water

Water transportation is the primary means by which overseas operations are established and maintained. It has a large capacity for personnel and tonnage, great range, comparatively slow speed, but a high rate of movement. The advantages of moving by water where extensive canal systems exist should not be overlooked. Waterborne movements are vulnerable to attack by hostile air, surface, and undersea movements.

10-9. Movement by Air

Air movement provides rapid transportation for troops, supplies, or equipment to a secured objective area or into an area inaccessible to

other means of transportation. Movements may be either administrative or tactical, or a combination thereof, depending upon the employment of the force being moved. Air movement capitalizes on the capability of the aircraft to fly great distances and overfly geographical barriers. It is limited in its employment by low tonnage and cubage capacity, adverse weather, inadequate air-landing facilities, and enemy counter-air activities. Tactical movement by air is covered in FM 57-10 and FM 57-35 and TM 55-601 and TM 57-210.

10-10. Frequency and Conditions Determining Movement

a. The frequency of movement of a DS maintenance unit is governed by its assigned mission, the tactical situation, and support requirements of the area in which it is operating. Supporting units will be required to move when supported units move. They will also move when work at a specific location is completed, or for defensive purposes.

b. Moves should be made in only one trip when possible. This allows for rapid reestablishment in a new location and speedy renewal of mission operations. When organic transportation is not sufficient to permit movement of an entire unit at one time, additional transportation must be requested. Requests should include such information as date of move, routes, destination, time and place vehicles are required, number of personnel to be moved, and the quantity, type, and cubage of materiel to be moved. If additional transportation is not available, the unit will have to use a shuttle system to complete the move.

10-11. Reconnaissance and Area Layout

a. *Reconnaissance.* The route to be taken to the new area and the new area itself should be reconnoitered. When time does not permit, a detailed study will be made of the route classification overlay and traffic circulation map overlay issued by the area highway traffic headquarters (FM 55-9). Security measures must be taken. Reconnaissance and advance parties will precede the main body. When possible, the commander should make a personal reconnaissance of the route and the new area.

Route reconnaissance details are covered in FM 5-36. Normally, the commander will have a party composed of members from each unit or element accompany him on his reconnaissance. On reconnaissance, the following are accomplished:

(1) The route, surrounding terrain, and road net in the new area are evaluated. The strength and clearance of bridges, the clearance of underpasses, the durability and capacity of roads, and terrain characteristics that would favor ambush of the convoy en route are noted. The results of this reconnaissance will affect the planning for defense of the column en route, and may dictate the use of alternate routes.

(2) An area is selected for unit operations. This area should be capable of being defended, and yet suitable for technical operations. These considerations often are not compatible and defensive risks must be weighed against operational considerations. The factors to be considered when selecting an area are listed in *b* below.

(3) An alternate area is selected to be used if the unit's position becomes untenable due to enemy action or the effect of weather on the terrain.

(4) A preliminary layout of the area is planned.

(5) Coordination is effected with adjacent units. This is extremely vital to defense planning.

(6) An overlay of the new area is prepared for use by the unit and the advance party, and for submission to battalion headquarters.

b. Factors Governing Selection of an Area.

(1) Availability of good roads is important, since many of the items handled by maintenance units are heavy and bulky. Good roads permit better service to supported units, make movement easier, ease the strain on transportation, and reduce the transportation problems associated with resupply and evacuation. A good internal road net is also required; if not available, one must be constructed. Hardstand, if available, should be used; otherwise, the ground must be suffi-

ciently firm to withstand heavy traffic. Areas for parking vehicles are required.

(2) Accessibility to supported units is a determining factor.

(3) Units should locate as close as practicable to available railways and waterways. These are highly useful for evacuation of heavy and bulky items and in cases where weather curtails the movement of supply by road.

(4) The area must be considered for defensive characteristics.

(5) Units should locate close to area signal centers to facilitate communications support.

c. Area Layout. A good layout is one that will facilitate the flow of work; minimize the movement of repair parts, tools, and equipment; facilitate ease of entry and exit for heavy traffic; and provide for ease of control of unit operations, while at the same time permitting all-around defense of the area. Field situations seldom allow a unit to operate under ideal conditions, and the type of layout and the area requirements for each unit will vary according to the tactical situation and the type and amount of materiel handled. When planning layout, in addition to technical operations requirements, the commander must consider proper positioning of weapons, the construction of defensive works and obstacles, and the organization of his defense works and security. For information on layout for mission operations, see chapter 6. For details on defense of the area, see paragraphs 10-17 through 10-19.

10-12. Movement SOP's

The preparation of an SOP to cover movement operations relieves the commander of repeated planning and issuing of directives. The commander can then concentrate on other operations that must be planned and directed as requirements develop. SOP's may include—

a. Organization of march units.

b. Organization and duties of advance party, follow-up party, and reconnaissance element.

c. Densities and speeds for normal movements.

d. Control measures.

e. Actions against enemy attack.

f. Maintenance, accident, refueling, and messing procedures.

g. Communications.

10-13. Loading Plans

a. Movement planning also requires loading plans. Plans for the loading of personnel and equipment must be made for every type of transport that may be used in the move. Plans must be made in advance to provide the lead time on requests for support to be provided by transportation units. Plans are based on the type transport to be used, the number of men involved, and the type, size, weight, and quantity of supplies and equipment to be moved. Loading plans save time and eliminate confusion in loading and unloading of supplies and equipment.

b. Most moves of a maintenance unit in an oversea theater will be made by motor transport. Initially, loading plans will be made for those vehicles organic to the unit, and these will be made part of the movement SOP. If a move requires transportation augmentation, loading plans can be completed after the number and types of additional vehicles to be provided becomes known.

★*c.* Loading plans indicate the personnel assigned to ride on the vehicle, and the equipment to be loaded on each truck and trailer. A loading diagram will be prepared for each vehicle in duplicate. One copy is carried on the vehicle and the other remains with unit headquarters records. The diagram will indicate vehicle type and number; trailer type and number; section or platoon assignment of the vehicle, driver, and assistant driver; passengers by section and job title; and equipment to be loaded on the truck or trailer. The exact position of each person and large item of equipment is shown.

d. Consideration must be given to placing and safeguarding equipment and supplies in transit, and the seating of individuals with or near their personal equipment. Personnel should not be loaded in the cargo space of any vehicle in which heavy parts or equipment are being carried. Plans must be designed to permit rapid

and orderly detrucking of personnel and unloading of equipment. These plans can be used by members of the advance party to spot vehicles arriving in the new area and eliminate the confusion of internal movement. They may also be used in the sorting and segregating of supplies. Detailed instructions on packing, boxing, and loading materiel are contained in appropriate technical bulletins that are indexed in DA Pam 310-4 and in pertinent military specifications.

10-14. Conduct of the Motor March

a. General. Planning of the motor march is completed after the new unit layout is made and provisions are made to inform each element of the site it will occupy in the new location. Men and equipment are assigned to definite march units and loading plans are implemented. The move is coordinated with higher headquarters, or scheduled by higher headquarters to assure that it will not conflict with other traffic using the same route. Highway clearances for convoy movements should be obtained by the battalion from the local transportation movements office or highway regulation unit. The move should be carefully planned, with each march unit given a definite time at which it is to cross the start point (SP). The movement should be so controlled that each march unit arrives at the new area at a predesignated time. This will permit control of the column and provide a smooth and orderly reestablishment in the new area since those march units which arrive first will begin to establish themselves in the new area while the remainder of the unit arrives. If the move is a long one, movement plans will provide for rest stops, feeding of personnel, and refueling of vehicles. For details on movement planning and control, see FM 55-30.

b. Movement Order. The movement order contains the instructions issued for the movement of units from one location to another within a stated period of time. This order normally is prepared after the completion of the necessary reconnaissance and an estimate of the situation. On occasion, the time available and the existing tactical conditions will not permit detailed planning or reconnaissance. Consequently, it is advisable for a division to have

several march plans prepared in the form of an SOP. These plans can then be modified by fragmentary orders to fit the given situation. Conditions and time permitting, information in the operation order includes destination, routes, rate of march, maximum speeds, order of march, SP's, time of crossing the SP's, details of air and ground alert guards, scheduled halts, vehicle distances, RP's, communications, location of the commander during the march, and strip maps. Additional details, such as route or unit markers to be used, control or checkpoints, and location of road guides, may be included if necessary. Certain items listed above often are standardized and included in the unit SOP. Items so included are not repeated in the movement order.

10-15. Night Marches

A unit must be able to conduct night marches

under all conditions. The importance of route reconnaissance and the proper use of road guides and markers increases in night marches. These marches are characterized by decreased speed, decreased intervals between vehicles and march units, and increased reconnaissance and security requirements.

10-16. Movement by Infiltration

In such a movement, vehicles are dispatched in small groups at a rate that will keep the average traffic density down and prevent the undue massing of vehicles. Maintaining formations is not attempted. Infiltration provides passive defense against hostile observation and attack, but a great deal of time is required to complete such a movement. Internal control is also more difficult. For details on movement by infiltration, see FM 55-30.

Section II. SECURITY

10-17. General

a. A maintenance unit must defend itself against all types of attack, and must assist in the coordinated defense of the entire rear area. Normally, the battalion SOP will assign an area defense responsibility to the company.

b. Attack by aircraft, missiles, airborne troops, guerrillas, or elements of organized enemy ground forces is possible, and must be considered in defense planning. Disruption of the combat service support system may well be an objective of the enemy. Because of the supplies and equipment it carries, a maintenance unit is a particularly attractive target for guerrillas seeking technical supplies. Pilferage may also become a problem as guerrilla forces seek their supplies through a black market operation.

c. Defense of a maintenance unit must be at the expense of mission activities. In establishing the unit's defensive system, limited numbers of personnel are employed to man outposts, to provide warning, and to provide the time necessary to mobilize those personnel engaged in mission activity. The unit commander must

recognize these limitations and offset them by training, planning, and preparation.

d. A ground attack on a maintenance unit will be characterized by stealth and surprise. Such attacks may be made by irregular forces. The objective of a ground attack may be to obtain supplies and equipment. Precautions must be taken to reduce the accessibility of supplies and to make their evacuation from the unit difficult. Supplies should be guarded. Small items should be centrally located. Vehicles in operable condition should not be positioned for easy theft. Provision must be made to provide a defensive force within easy reach of escape routes that must be taken by attackers. Such precautions reduce the mobility of the attacker.

e. Security planning should consider both defensive characteristics, location of supplies, and mission requirements. Plans to meet attack of any type for which the enemy is capable are made part of the unit SOP. These plans are revised as necessary and are rehearsed regularly to assure that all individuals know their duties and responsibilities. Defense plans include both active and passive measures.

f. In security planning, cover, concealment, and control are stressed. Maximum terrain features that aid in defense of the unit will be used. Dispersion is practiced to the extent consistent with command, security, and control. Warning systems, defensive positions, outpost and guard systems, and obstacles are established. Liaison is established with adjacent units for mutual defense purposes.

g. In order to plan the security of his unit, the commander must keep abreast of the tactical situation and the enemy's capabilities. He must be given warnings of probable enemy attacks. Most intelligence information will be provided by battalion or higher level intelligence personnel or activities. Military police can also provide information. Additional information may be provided by supported units, but such information must be checked for reliability. Air attack warnings will be broadcasted over air warning nets.

h. The following paragraphs provide general information on security and defense of a maintenance unit. In addition, the following publications will assist the unit commander in developing unit defense plans and in training his unit: FM 5-15, FM 5-20, FM 5-22, FM 5-23, FM 5-31, FM 21-15, FM 21-40, FM 21-41, FM 21-48, FM 21-75, FM 31-16, and pertinent Army Subject Schedules, which are indexed in DA Pam 310-3.

10-18. Security and Defense Measures

a. General.

(1) Defense of a maintenance unit requires adequate dispersion and defense of the unit area consistent with the capabilities of the unit. Dispersion complicates the problem of control, makes mutual defense more difficult, and affords opportune targets for guerrilla or airborne attackers. A solution to the problem lies in the establishment of an effective outpost and warning system. The system makes use of natural terrain and artificial obstacles; an effective communications system, to include positioning of telephones at outposts during periods of darkness, and runners in the event wire communication is disrupted; and interior and perimeter guards.

The defensive system can include a reserve force that is centrally located and able to converge rapidly on any sector where enemy attack is developing or a breakthrough is likely. A maintenance unit must normally conduct defensive operations until reinforcements arrive, and plans must be made with this in mind. The battalion headquarters must be informed immediately of the location, type, and strength of any attack, so that aid may be provided and other units alerted.

(2) The defense plan of a maintenance unit must include the establishment of outposts at key locations where observation is good. Automatic weapons must be placed along the perimeter in positions offering good fields of fire and cover and concealment to the weapons crew. Automatic weapons in adjacent sectors should be mutually supporting. Anti-armor weapons will cover avenues of approach that may be used by armored vehicles. Roving guards will be used on the perimeter and to check shop areas. At least one machine gun will be kept with the centrally-located reserve force.

(3) In the conduct of the defense, elements of the unit will not counterattack outside the limits of the company area.

b. Defense Plan.

(1) The defense plan will be published as part of the unit SOP. The plan will include measures to carry out the unit's rear area security responsibility and to insure an effective unit defense. All activities that can be made routine are made part of the plan. It should include:

- (a) A warning system.
- (b) Primary and alternate means of communication.
- (c) Delegation of specific responsibilities to each element of the unit with alternate personnel designated for each key position.
- (d) Designation of defense areas for unit elements.
- (e) Destruction of materiel and records.
- (f) Active and passive defense measures.
- (g) Ammunition resupply and maintenance of weapons.

(h) Training and rehearsals.

(i) Procedures for use of weapons that are being maintained but that which are sufficiently functional to be integrated into the unit defense structure. These will include training of personnel to man weapons. The armament repair personnel may be used for this purpose.

(2) The defense plan must incorporate the features described in *a* above. The shop and supply areas should be treated as prime targets. Unit layout should be such that each element helps to defend adjacent elements. Defense is coordinated from a centrally-located command post. Provisions should be made for the use of available vehicles, either as obstacles or because of their armament. Weapons capable of destroying armored vehicles should cover all probable avenues of approach. Crew-served weapons should be placed to afford maximum fields of fire and observation, and maximum concealment and protection for the crews.

(3) An attacking force will often attempt to set fire to the installation. Guerrillas may start fires in one area to divert attention from specific objectives. All defense plans should include an armed firefighting crew. Provision must be made for the treatment and evacuation of casualties.

(4) The unit commander will set up perimeter and internal guards. Perimeter guards are responsible for patrolling the unit's outer limits, for sounding the alarm in the event of enemy activity in their areas, and for preventing a breach of these limits. Internal guards will check all internal areas and shops. The commander uses natural and man-made obstacles to augment security and defense measures.

(5) The defense plan of the unit may be coordinated with defense of the rear area. A unit may be required to provide personnel for the rear area protection force.

c. Chemical, Biological, and Radiological (CBR).

(1) The overall defense plan will include steps to be taken in event of CBR attack. The unit commander insures that unit CBR officers and noncommissioned officers (AR 220-

58) are trained. Procedures and standards should be established by unit commanders to—

(a) Indicate the individual's part in unit CBR defense measures.

(b) List the individual's responsibilities for his personal protection against CBR attack.

(c) Stress the measures needed for the care and maintenance of individual protective equipment.

(2) CBR agents can be delivered by missiles, aircraft, artillery, or ground troops. Personnel must be trained to recognize these attacks and be familiar with measures needed to minimize the effects of the agents. CBR plans will include—

(a) Unit organization for CBR defense. See appendix E.

(b) Duties and responsibilities.

(c) Alarms and alarm systems.

(d) Procedures in case of attack.

(e) Measures of individual protection.

(f) Measures of collective protection.

(g) Tactical protection.

(h) Decontamination.

(i) Supply.

(j) Training.

(3) For details on CBR planning and training for CBR defense, see FM 21-40, FM 21-41, and FM 21-48.

10-19. Rear Area Protection

a. As part of the unit defense plan, the commander will develop a rear area protection plan. This plan will list those measures to be taken by the unit before, during, and after a mass destruction attack or natural disaster. The object of this plan is to minimize casualties and destruction resulting from mass attack or natural disaster, and to facilitate recovery and reestablishment of support.

b. In developing this plan, the commander will consider its impact and relation to other unit defensive operations. Such functions as dispersion, camouflage, and concealment are equally applicable to defense against CBR attack. Foxholes and fortifications provide protection against the initial effects of nuclear attack. The best protection against nuclear attack is well-constructed underground shelters

and these may be constructed if time and the situation permit. Any caves or mines in the unit area may be utilized for the protection of personnel and supplies.

c. Measures taken prior to attack or natural disaster include planning, training, and practice alerts. During the attack or disaster, emphasis is on survival and assistance to the injured. After the attack, the emphasis is on those actions necessary to resume operations, to include restoring control, damage assessment, treatment and evacuation of casualties, clearance or isolation of contaminated areas; conducting radiological monitoring and survey and the reporting of results, (see app F, and FM 3-12 FM and 21-40); performing salvage operations, providing emergency resupply, and reestablishing communications.

d. After a CBR attack or disaster, the unit must remain alert to the possibility of a follow-up attack by enemy airborne troops, air-landed forces, or guerrillas.

e. Company plans for rear area protection are part of the battalion plan, which is coordinated with other units by an area security controller. This controller is responsible for preparation and implementation of plans for a

specific area. Instructions on submission of unit plans and modifications will be provided by battalion headquarters. For additional information on rear area protection, see FM 19-45-1 (TEST).

f. In addition to making plans for protection of his unit, the unit commander will be required to provide trained teams and equipment to assist in rear area protection operations in other areas. Each maintenance company will organize, train, and equip an emergency decontamination squad and two heavy rescue squads. These squads will be equipped and organized in accordance with the mission to be performed and operational procedures of the command. See appendix F.

(1) *Emergency decontamination squad.* This squad provides emergency decontamination of personnel and equipment and prevents the spread of contamination and production of additional casualties. The squad may be directed by the rear area operations center to a damaged area to assist in rescue work.

(2) *Heavy rescue squads.* Heavy rescue squads will remove trapped casualties when the use of heavy equipment is required. They will also conduct debris clearance and salvage operations.

Section III. COMMUNICATIONS

10-20. Introduction

a. Dependable communications are vital to the successful mission accomplishment of maintenance units. Communications means available to the various units discussed in this manual include radio, telephone, radioteletypewriter, landline teletypewriter, messenger, visual, and sound. All of these communications means are not available to all units. For specifics on the types and quantities of communications equipment provided each unit, see the appropriate TOE.

b. To obtain maximum benefit from the communications system, it is essential that all communications users and operators of equipment know the peculiarities, capabilities, and limitations of organic communications equipment. Communications traffic must be con-

trolled to gain the benefits of communications system. It is imperative that personnel using this equipment be properly trained in organizational maintenance and that the maintenance be performed. Radio operators, teletypewriter operators, and switchboard operators are assigned by MOS, and should be school trained in the specialty that they will perform as a primary duty. However, many of the radios are operated by personnel whose primary duties and functions lie in another area (e.g., light vehicle drivers). These personnel should receive formal and on-the-job training in the care, operation, and operator maintenance of the communications equipment that they will be using. Unit commanders must initiate action when there is need for such training.

c. Another inherent responsibility of the

battalion headquarters and the company is the appointment of a communications officer. This function is performed as an additional duty and involves:

- (1) Keeping the commander informed on the communications situation.
- (2) Coordinating communications with higher, adjacent and subordinate units.
- (3) Preparing communications plans.
- (4) Assisting in the selection of the site for the unit command post.
- (5) Supervising the installation, operation, and maintenance of the unit's communication system.
- (6) Determining communications equipment and supply requirements.
- (7) Supervising or arranging for the training of communications personnel, to include the training of alternate operators.
- (8) Preparing extracts of current signal operation instructions (SOI) and standing signal instructions (SSI) for use by communications personnel.
- (9) Maintaining liaison with the Army area signal center supporting the area. FM 24-16 will assist unit communications officers in preparing orders, records, and reports pertaining to communications.
- (10) Preparing radio net and wire system diagrams based on organic communications equipment and its employment, and nets outside the unit which the unit monitors or is part of.

10-21. Messengers

The army area signal messenger service serving the command will be used for the delivery of most messages between signal centers. Personnel of the battalion will be used for message pickup and delivery to the nearest signal center. The routing of messenger traffic is important so that time of delivery can be estimated, and pickup time can be published. When practicable, and depending on message content, the delivery of messages by messenger should be confirmed by other communications or a follow-up message. Messenger service has some limitations. It is vulnerable to enemy action and does not afford person-to-person conversation.

10-22. Wire Communication

a. The battalion elements install, operate, and maintain wire communications systems. Telephonic communication is the normal method of internal communication used by elements of the battalion, and is the normal method of contact between companies of the battalion and supported and supporting units, higher headquarters, and adjacent units. Each unit is equipped with a switchboard to which all unit telephones are connected. Unit switchboards are connected to an army area signal center by army signal troops to provide telephonic communication with supported and supporting units, higher headquarters, and adjacent units. Some of the units discussed in this manual are also equipped with landline teletypewriters that are incorporated into the wire communications system, and that facilitate communication with higher headquarters through the area communications system.

b. Only a limited number of telephones are made available to a unit by its TOE. It is important that the best possible use be made of them. Regardless of assignment of the telephones by the TOE, some phones must be borrowed from the operating sections for security use at guard posts or listening posts in a tactical situation. During the hours of darkness, it may be necessary to place all phones except those of the commanding officer and the shop office on the perimeter for use by outposts or gun positions. Upon arrival in an area, emphasis must be placed upon immediate installation of phone lines. First priority should go to the commander's phone, followed by the outposts, then the operating sections.

10-23. Radio Communication

a. Although maintenance units depend primarily on telephones, landline teletypewriters, and facilities of the area communications system for communications, these facilities are supplemented by short-range, frequency modulated (FM) radio sets that are used when other means are not available. Units may also be provided amplitude-modulated (AM) ground radio receivers and amplitude-modulated, radioteletypewriter (AM-RATT) sets. The type and extent of radio facilities pro-

vided each unit depend on the communications requirements of the unit mission. For specific types and quantities of radio equipment provided see the appropriate TOE.

b. Companies are normally provided FM-voice radio sets to supplement organic wire systems. These sets are used for control of road movements, for command and control of company elements operating away from the company area, and for communication with higher headquarters, when distances permit. Companies may also be provided AM ground radio receivers to monitor air warning nets for the receipt of air alerts, CBR attack warnings, radiological safety data, and fallout warnings. If companies are not provided an AM set to monitor the air warning net, battalion headquarters will disseminate such warnings over the battalion command radio net or by telephone.

c. Battalion headquarters operates FM-voice radio sets in a battalion command net for the issuing of orders, directives, and information to subordinate units and for the receipt of information and requests from subordinate units. Battalion headquarters also operates a station in the group command net (FM-voice), as well as an AM ground-radio receiver for monitoring the air warning net. The battalion may also be provided an AM-RATT set for long-range AM-voice and radioteletypewriter communications within the command administrative/logistics net.

d. Weather, terrain, dispersion, and electronic warfare as well as crowded frequencies will have an adverse effect upon FM radio communications. Therefore, landline telephone will continue to be the primary means of communications available to the maintenance battalions and their attached maintenance companies once the lines are installed.

10-24. Visual Communication

Maintenance units are also provided panel sets. These sets are used for communication with friendly aircraft to preclude attack during movement. They are also used as a warning to friendly aircraft attacking guerrillas operating near a battalion area or its subordi-

nate elements. They are also used to indicate drop or landing zones. The panel system and panel recognition code for communication with aircraft will be published in the SOI. For details on the use of panels and other visual signals, see FM 21-60.

10-25. Sound

Sound is a supplementary means of communication. Sound signals are kept simple to prevent misunderstanding, and are transmitted by whistles, horns, klaxons, weapons, and other noise making devices. They are used chiefly to attract attention, to transmit pre-arranged messages, and to spread alarms. Sound signals are vulnerable to interception, and their use may be prohibited for security reasons. Such signals and their meanings are assigned by commanders. Warning of air, ground, and CBR attacks is usually given by this means.

10-26. Communication Instructions

a. The installation and operation of communication facilities will be in conformance with the SOI and SSI of the command. The SOI contains items for the technical control and coordination of signal communication. SOI items are for daily use and are subject to frequent change. The SSI contains items, regulatory in nature, which give instructions for the use of SOI items as well as other instructions. SSI items are not subject to frequent change. SSI, SOI, and other detailed operational instructions and directives are prepared by the field army signal brigade.

b. SOI's and SSI's are distributed in sufficient copies to be available to communications personnel down to battalion level. The battalion communications officer will make extracts of the SOI and SSI for use by companies of the battalion, limiting the extent of material extracted and the number of copies made to the minimum essential for unit communications. SOI's are classified, and copies of SOI's or extracts therefrom must be accounted for. The loss of an SOI or extract must be reported immediately to the responsible signal officer.

c. Within the battalion and the units of the battalion, communication procedures that can be standardized are made part of the SOP.

10-27. Communication Security

For details on communications security, see FM 32-5. For cryptographic security, see AR 380-41.

10-28. Communication Responsibilities and Policies*a. General.*

(1) The army signal organization installs and operates the army area communications system. This system consists of a network of army area signal centers, which are spaced throughout the army service area and corps service area. High capacity trunking systems inter-connect the army area signal centers. Each army area signal center operates a telephone central, a teletypewriter central, and a communications center, which will transmit and receive messages for units in its area. Messenger service is provided among area signal centers, but local messenger service to and from the area signal center must be provided by the unit. The area signal center installs wire lines (telephone and teletypewriter) to units within its area. It also operates a radio-wire integration (RWI) station, which inter-connects FM radios with the common user telephone system on a push-to-talk basis.

(2) The distance between a battalion headquarters and its companies will often exceed the organic wire laying capability, and may exceed the range of organic radios. Therefore, the army area communications system will provide the only available communications. Also, communications between a maintenance unit and units it supports can be provided through the army area communications system. It is essential that each battalion headquarters and company be connected to an area signal center.

(3) The signal unit operating an army area signal center is equipped to install wire lines to all units in its area of responsibility on a priority basis. Normally, a maximum radius of service from an army area signal center will be specified by higher authority, and units outside this radius will not be afforded wire service.

(4) The number of telephone and teletypewriter circuits between an army area sig-

nal center and a battalion or company will normally be specified by the army signal SOP. This number of circuits will be installed upon receipt, by the army area signal center, of notification of the move of a unit into its area. When moves are planned, notification must be given to the army signal center as far as possible in advance of the move in order to insure that communications requirements can be met at the new location.

(5) Communications officers of battalion headquarters and companies must maintain close liaison with army area signal center personnel in order to insure effective use of available services.

b. Policies.

(1) The signal officer of each major command has the responsibility for allocating the type and extent of common-user communications to be provided to using units, based on indicated requirements, availability of facilities, and priorities. This allocation will normally be exercised by the commander of each army area signal center based on its capability.

(2) Army area signal centers will be discontinued when the number and type of units supported makes the continued use of these signal centers uneconomical. Commanders of signal centers being discontinued will coordinate technical arrangements with local commanders to provide communications service for units and activities remaining in the area.

(3) Point-to-point circuits will be established as required to support the military operation. The bases of these circuits will depend on the traffic precedence and volume and the tactical necessity.

(4) Non-signal units are forbidden to use indigenous communications facilities unless approved by the major command.

(5) Radio relay and microwave systems constitute the primary means of long-range communications in the theater, and will have priority on site selection subordinate only to the requirements of combat units.

(6) Frequency interference which cannot be cleared within the jurisdiction of subordinate commands will be reported to the signal officer of the major command.

c. Security and Intelligence.

(1) All units will take necessary steps to protect captured enemy communications and electronics installations and equipment from unnecessary damage and will report the locations of these installations and equipment by the most expeditious means to the command intelligence officer.

(2) Classified information will not be transmitted in the clear by electrical means unless directed by the commander.

(3) Suspected or confirmed enemy attempts to employ communications intelligence techniques against friendly communications

systems will be reported immediately to the nearest command signal officer. Typical incidents that will be reported are:

(a) Receipt of a large volume of non-authenticated or suspected false messages.

(b) Jamming of radio circuits.

(c) Discovered or suspected "taps" on wire systems.

(d) Missing messengers.

(e) Loss, suspected loss, or compromise of communications documents, including classified clear-text messages.

★APPENDIX A

REFERENCES

The following references should be used in conjunction with related material covered in this manual. Department of the Army Pamphlet 310-series should be check frequently for latest changes or revisions thereto.

1. Army Regulations

1-200	Inspections and Staff Visits.
11-14	Logistic Readiness.
11-25	The Management Process for Development of Army Systems.
71-6	Type Classification/Reclassification of Army Materiel.
220-1	Unit Readiness.
220-10	Preparation for Oversea Movement of Units (POM).
220-58	Organization and Training for Chemical, Biological, and Radiological Operations.
310-25	Dictionary of United States Army Terms.
310-50	Authorized Abbreviations and Brevity Codes.
380-41	Control of COMSEC Materiel.
700-4	Supply and Maintenance Technical Assistance Program.
700-16	Distribution Planning for Principal Items of Equipment.
700-17	Component Items of Equipment Assemblages.
700-18	Repair Parts Allocation and Allowances.
700-19	Provisioning of Army Materiel.
700-46	Unsatisfactory Material Reports.
700-58	Report of Packaging and Handling Deficiencies.
700-70	Distribution of Support Items for New Equipment.
710-12	Army Aircraft Inventory, Status, and Flying Time.
710-45	Policies and Procedures for Secondary Items.
710-60	Replacement Requirements for PEMA Major End Items.
711-16	DSU/Installation Stock Control and Supply Procedures.
711-25	Stockage of Supplies and Maintenance of Authorized Stockage Lists.
711-45	Management of Selected Aviation Repairable Components.
725-50	Requisitioning, Receipt, and Issue System.
735-5	Property Accountability: General Principles and Policies and Basic Procedures.
735-10	Principles and Policies: Accounting for Lost, Damaged, and Destroyed Property.
735-11	Accounting for Lost, Damaged, and Destroyed Property.
735-35	Supply Procedures for TOE and TDA Units or Activities.
740-12	Covered and Open Storage of Supplies.

C 1, FM 29-22

742-301	Determination of Servicability of Chemical, Biological, and Radiological Materiel.
750-1	Maintenance Concepts.
750-4	The Army Materiel Plan Part II Depot Materiel Maintenance and Support Activities.
750-5	Organization, Policies, and Responsibilities for Maintenance Operations.
750-6	Maintenance Support Planning.
750-7	Support Maintenance Shops and Missions.
750-8	Command Maintenance Management Inspections (CMMI).
750-12	Cooperative Logistics Maintenance Support and Service Arrangements.
750-19	Maintenance Float Support of Army Materiel.
750-22	Technical Assistance Program.
750-27	Repair Cost Estimates and Maintenance Expenditure Limits.
750-50	Use of Controlled Cannibalization as a Source of Repair for Supply Augmentation.
755-20	Disposal of Unwanted Radioactive Material.
755-21	Excess, Surplus, and Foreign Excess Personal Property at Disposal Activities.

2. Field Manuals

3-8	Chemical Reference Handbook.
3-12	Operational Aspects of Radiological Defense.
5-15	Field Fortifications.
5-20	Camouflage.
5-25	Explosives and Demolitions.
5-31	Boobytraps.
7-20	The Infantry Battalions.
8-10	Medical Service, Theater of Operations.
9-38	Conventional Ammunition Unit Operations.
9-59	Missile Support Unit Operations.
10-8	Air Drop of Supplies and Equipment in the Theater of Operations.
11-50	Signal Battalion Armored, Infantry, and Infantry (Mechanized) and Air-mobile Divisions.
19-25	Military Police Traffic Control.
19-45-1 (TEST)	Rear Area Protection.
21-15	Care and Use of Individual Clothing and Equipment.
21-40	Chemical, Biological, and Nuclear Defense.
21-48	Chemical, Biological, and Radiological (CBR), and Nuclear Defense Training Exercises.
21-60	Visual Signals.
21-75	Combat Training of the Individual Soldier and Patrolling.
24-1	Tactical Communications Doctrine.
24-16	Signal Orders, Records, and Reports.
27-10	The Law of Land Warfare.
29-3	Direct Support Supply and Service in the Field Army.
29-10	Supply Management in the Field Army.
29-11 (TEST)	Cryptologistics Support to the Army in the Field (1965-70).
29-20	Maintenance Management in Theaters of Operation.
29-30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades.

29-45	General Support Supply and Service in the Field Army.
30-5	Combat Intelligence.
30-9	Military Intelligence Battalion, Field Army.
30-16	Technical Intelligence.
31-16	Counter guerrilla Operations.
31-22	US Army Counterinsurgency Operations.
31-23	Stability Operations—US Army Doctrine.
31-73	Advisor Handbook for Stability Operations.
(C)32-5	Communications Security (U).
38-5	Logistics Maintenance Management.
38-6	Logistics Management Controls.
41-5	Joint Manual for Civil Affairs.
41-10	Civil Affairs Operations.
54-2	The Division Support Command and Separate Brigade Support Battalion.
54-3	The Field Army Support Command.
54-4	The Support Brigade.
54-5-1 (TEST)	The Supply and Maintenance Command.
54-6	The Area Support Command.
54-7	The Theater Army Support Command.
55-9	Transportation Services and the Transportation Brigade in the Field Army.
55-20	Army Rail Transport Operations.
55-50-1 (TEST)	Transportation Amphibian Operations.
55-57	Transportation Harbor Craft Units and Marine Maintenance Units.
55-58	Transportation Board Operations.
57-35	Airmobile Operations.
61-100	The Division.
100-5	Operations of Army Forces in the Field.
100-10	Combat Service Support.
101-5	Staff Officers' Field Manual, Staff Organization and Procedures.
101-10-1	Staff Officers' Field Manual, Staff Organization and Procedure.
101-10-2	Officers' Field Manual: Organizational, Technical, and Logistical Data— Extracts of Nondivisional Tables of Organization and Equipment.

3. Technical Manuals

3-220	Chemical, Biological, and Radiological (CBR) Decontamination.
9-1870-1	Care and Maintenance of Pneumatic Tires.
9-1871	Field and Depot Maintenance: Repair and Rebuild of Pneumatic Tires and Tubes.
38-750	The Army Maintenance Management System (TAMMS).
38-750-1	The Army Maintenance Management System (TAMMS) Field Command Procedures.
38-750-2	Maintenance Management, National Agency Procedures.
55-403	Fundamentals of Army Helicopter Maintenance.
55-410	Aircraft Maintenance Servicing and Ground Handling Under Extreme Environment Conditions.
55-450-15	Air Movement of Troops and Equipment (Administrative).
55-601	Troop Movement Guide.
743-200	Storage and Materials Handling.

743-200-1 Storage and Materials Handling.
750-5-15 Army Equipment Data Sheet, Chemical Weapons and Defense Equipment.

4. Supply Bulletins

3-30 Serviceability Standard for CBR Materiel.
3-34 Maintenance Float CBR Equipment.
3-38 Cannibalization as a Source of Low Mortality Repair Parts.
5-83 Corps of Engineers Maintenance Float Criteria.
5-106 Use of Controlled Cannibalization as a Source of Low Mortality Engineer Repair Parts.
9-140 Field Maintenance Floats: Major Items of Equipment Authorized for Stockage in both Peacetime and Wartime.
11-244 Stockage of Signal Items for Use as Maintenance Float (Exchange).
11-478 Cannibalization as a Source of Supply for Signal Parts.
700-20 Adopted Items of Materiel and Army Reportable Items.

5. Technical Bulletins

AVN 23-8 Reporting Criteria and Instructions for Processing Damaged or Deteriorated Aircraft.
55-1500-30-25 Army Aircraft Preventive Maintenance Inspection Procedures.
750 series Maintenance of Supplies and Equipment.

6. Department of the Army Pamphlets

310-1 Index of Administrative Publications.
310-2 Index of Blank Forms.
310-3 Index of Doctrinal, Training, and Organizational Publications.
310-4 Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, and Lubrication Orders.
310-7 US Army Equipment Index of Modification Work Orders.
310-6 Index of Supply Catalogs and Supply Manuals (Excluding Types 7, 8, and 9).
310-35 Index of International Standardization Agreements.
690-80 Administration of Foreign Labor During Hostilities.
750-1 Preventive Maintenance Guide for Commanders.
750-7 The Army Maintenance Management System; Materiel Readiness Guidance and Techniques for Commanders.
750-38 TAMMS Equipment Historical Records with Selected Maintenance Forms.

APPENDIX B

GUIDE TO UNITS PROVIDING MAINTENANCE AND/OR REPAIR PARTS SUPPLY SUPPORT OF ARMY MATERIEL

B-1. Introduction

This appendix provides a ready reference to most types of equipment used and the units involved in providing maintenance and/or repair parts support for this equipment. Each unit has been identified to indicate whether its mission is one of direct or general support. For details on general supply support and the supply of end items, see the appropriate field manuals referenced in appendix A.

B-2. Support Capability Key

End items of equipment are indicated across the top of tables B-1 and B-2. Units providing support are indicated on the left side of the table, together with an indication of their support role (DS or GS). To determine which unit(s) provide(s) support for a specific commodity of materiel, read across top of table to column containing the commodity of inter-

est, then down that column until an entry (or entries) is found. Look to the left side of the table on the same line corresponding to the entry(ies) to determine the unit(s) involved in providing support.

Table B-1. Guide to Units Providing Maintenance and/or Repair Parts Supply Support of Army Missiles.

Table B-2. Guide to Units Providing Maintenance and/or Repair Parts Support of Army Materiel.

(Located in back of manual)

B-3. Maintenance for Divisions

Although the scope of this manual does not encompass maintenance support within the divisions, table B-2 includes division-level maintenance support units in order to illustrate the interface experienced when providing general support or backup direct support maintenance for divisions.

APPENDIX C

EMPLOYMENT OF NONAIR-DEFENSE WEAPONS AGAINST AIRCRAFT

C-1. General

a. The substantial low altitude air threat faced by units in the combat theater may be partially countered by aggressive use of the large volume of fire which nonair-defense weapons can place against the threat.

b. Exercise of the individual and collective right of self defense against hostile aircraft must be exercised. Hostile aircraft include all attacking aircraft and those positively identified enemy aircraft that impose a threat to the unit. The requirement for exercise of this right has not been adequately emphasized in the past. Large volumes of fire from nonair-defense weapons have proven capable of destroying both high- and low-speed aircraft or disrupting their attack. Normally, such action will be governed by rules and procedures established by the air-defense commander.

c. Indiscriminate use of nonair-defense weapons must be prevented due to the resulting danger to friendly aircraft and troops and the requirement to place in proper perspective the technique of withholding fire to preclude disclosure of positions. Engagement of hostile aircraft in immediate self defense will be most frequent and training emphasis should reflect this.

d. Situations may arise wherein the exercise of the right of self defense should be temporarily suppressed, or when free use of nonair-defense weapons against aircraft should be encouraged. The former case involves a local decision that prevention of position disclosure is paramount. Notice of such restriction is disseminated through command channels. The later case should be based on a theater-level decision.

e. The single rule for engagement of hostile aircraft is based on the knowledge that common-sense interpretations of the rule will be

correct. For example, all aircraft attacking the unit and enemy aircraft performing operations such as forward air control, reconnaissance, surveillance, or dropping or landing troops are clearly "hostile aircraft."

C-2. Rule for Engagement

In the absence of orders to the contrary, individual weapons operators will engage attacking aircraft. Engagement of all other hostile aircraft will be on orders issued through the unit chain of command and will be supervised by unit leaders. Nothing in this rule is to be taken as requiring actions-prejudicial to accomplishment of the primary mission of the unit.

C-3. Techniques

The following techniques should maximize the destructive and/or deterrent effect against aircraft. Aircraft may be divided into two categories: low-speed and high-speed. Low-speed aircraft include helicopters and liaison, reconnaissance, and observation fixed-wing propeller aircraft. High-speed aircraft include all other propeller aircraft and all jet fixed-wing aircraft. This distinction will result in simplified engagement procedures.

a. *Engagement of Low-Speed Aircraft.* In accordance with the rule for engagement, engage low-speed enemy aircraft with aimed fire, employing the maximum weapon rate of fire. Aerial gunnery techniques (less lead) generally applicable to all small arms and automatic weapons are given in FM 23-67.

b. *Engagement of High-Speed Aircraft.* In accordance with the rule of engagement, engage high-speed enemy aircraft with maximum fire aimed well in front of the aircraft, and above its flight path, in order to force it to fly through a pattern of fire. This tech-

nique is not unaimed barrage fire, but requires a degree of aimed fire. It does not, however, call for careful estimation of aircraft speed and required lead.

c. Use of Tracer Ammunition. The highest practical proportion of tracer ammunition should be used in automatic weapons to enhance the deterrent or disruptive effect and to assist in correcting aim.

d. Massed Fire. Units should employ a massed fire technique when using small arms and automatic weapons in an air defense role.

C-4. SOP Items

An SOP should cover, but not be limited to, the following items relevant to engagement of aircraft with nonair-defense weapons:

a. Applicability. (Operators of designated weapons.)

b. Relation to primary mission. (Primary mission is never prejudiced.)

c. Relation to passive air defense. (The necessity for aggressively engaging hostile aircraft is balanced with the requirement to

place in proper perspective the tactic of withholding fire to preclude disclosure of position.)

d. Authority to engage. (Authority to engage attacking aircraft delegated to individual weapons operators and to engage all other hostile aircraft on orders through chain of command, subject to the rule for engagement and rules for withholding fire.)

e. Rule for engagement. (Normally self defense only against all attacking aircraft and those positively-identified enemy aircraft that pose a threat to the unit.)

f. Rules for withholding fire. (When ordered. When not positive that aircraft are actually attacking or otherwise hostile. When friendly aircraft or troops are endangered.)

g. Position selection. (See FM 44-1. Applicable only to weapons specifically assigned on air defense role; e.g., designated single barrel caliber .50 machineguns.)

h. Firing techniques. (Lead and superelevation. Massed fire. Maximum use of tracer ammunition.)

i. Unit training requirements. (Motivation and discipline. Gunnery. Aircraft recognition.)

APPENDIX D

STABILITY OPERATIONS

D-1. General

Stability operations is that portion of internal defense and internal development operations provided Armed Forces to maintain, restore, or establish a climate of order within which a responsible government can function effectively, and without which progress cannot be achieved.

D-2. Technical Assistance

a. Technical-assistance techniques and methods to increase maintenance productivity can be taught. Care must be taken to assure that the techniques to be applied are in consonance with physical conditions, resources, social environment, economic organization, and the cultural pattern of the people. Technical knowledge can rarely be transferred, unadapted, from a developed to an undeveloped country. Although it has been recognized in research and development and in the training problems encountered by technical assistance personnel, the scope of American research and training effort is still too limited and the tours of duty of technical assistance experts frequently too short.

b. Technical assistance will develop human resources of the country receiving the assistance. This goal can be achieved partly by assisting formal education programs. Teaching should animate all technical-assistance activities, even those having no explicit training component. Through our personnel's behavior in the foreign society, technical assistance experts may not only transmit technical skills and expertise to those with whom they are working but also, in subtle ways, influence motivations, attitudes toward change and innovation, and perceptions of attitudes.

c. Technical assistance should be taught or

employed to convey an image of American purposes, intentions, and modes of operation which will lay an effective basis for future cooperation. This image will be conveyed by the day-to-day behavior of the many kinds of technicians dispatched for technical assistance. To accomplish this objective, technical-assistance personnel must acquire a subtle and sophisticated understanding of the problems and sensitivities of the people with whom they are dealing.

D-3. Training

a. Military assistance can make a major contribution in training and education. A period of military training affords the opportunity to make the soldier literate, to teach him basic technical skills, and to instill in him such attitudes as the respect for authority and organization which are essential to modern life. The Army can be a highly significant training ground for large numbers of men, preparing them for new roles in society.

b. The training problem in each country is unique and must be examined with a view to the particular factors which can influence its success in that country. Where insurrection has not actually broken out, the objective is to promote greater stabilization. Civic action programs by our military forces constitute one of the powerful tools available to meet this objective. Training teams consisting of specially qualified US military and civilian personnel have proved highly effective in assisting underdeveloped nations to plan and execute civic action programs.

D-4. Civil Affairs Effort

There are many activities that may be undertaken by maintenance units to assist in

the civil affairs effort. These efforts may be directed or voluntary. The efforts are limited in scope and variety only by requirements and the ingenuity of units. Although maintenance units are adaptable for certain types of activities because of the nature of their missions and the types of equipment and skills they employ, there are many other areas in which units may contribute because of the particular civilian education and experience of unit personnel. A platoon leader may have been a plant foreman or a business executive. A clerk typist may have had farming experience. Civilian skills in such trades as forestry, engineering, and pest control may be found. Teachers are an asset. Such personnel either directed or on voluntary off-duty time can do much to assist in social and economic improvement of the civilian community. A partial list of these efforts may include—

a. Providing assistance in construction projects by providing advice and equipment.

b. Providing assistance and equipment for land clearance and debris clearance.

c. Assisting in crop harvesting.

d. Repairing machinery and transport equipment.

e. Training personnel in skills useful to the local economy.

f. Providing teachers for schools and adult technical training.

g. Sponsoring community projects such as orphanages, schools, and civic centers.

h. Providing labor, material, and transport assistance for disaster relief.

i. Providing instruction, advice, and assistance in professional areas such as engineering, if these skills are available in the unit.

j. Motivating the populace to help themselves by showing them how to get the most out of locally-available tools and materials.

D-5. References

For more specific details on stability operations and programs, see FM 31-23, FM 31-73, FM 41-10, FM 100-10, FM 100-15, and FM 100-20.

APPENDIX E
SAMPLE CBR DEFENSE ANNEX TO COMPANY SOP

_____ COMPANY
(PREPARATION GUIDE)
DATE _____
SUBJECT: CBR DEFENSE
TO: All Personnel
_____ Company

1. References

- a. AR 220-58.
- b. FM 3-12, FM 21-11, FM 21-40, FM 21-41, and FM 21-48.
- c. Maps and overlays.
- d. Orders and related documents.
- e. SOP's of higher headquarters.

2. Purpose

This annex will establish organization for company CBR defense, delineate responsibilities of company personnel, and describe procedures to be followed in the event of CBR attack. It will assure mission accomplishment during chemical, biological, or nuclear attack with a minimum loss of personnel, time, and equipment.

3. Organization

- a. *Personnel.* The following additional duties are delegated to personnel indicated, by order of the company commander.
 - (1) *CBR officer.* Operations officer.
 - (2) *CBR NCO's.* Section chiefs.
 - (3) *Chemical detection parties.* A minimum of one primary party and one alternate party will be organized and trained for each chemical agent detection kit authorized the company. Each party will consist of one NCO or specialist party leader and one EM assistant (driver when necessary). Personnel assigned to these parties will be designated by the company commander.
 - (4) *Radiological-monitoring and survey parties.* A minimum of one primary and one alternate monitoring and survey party will be appointed for each survey meter authorized this company. Each party will consist of one EM monitor and one EM assistant (driver when necessary). Personnel will be assigned to the radiological monitoring and survey parties by the company commander.

(5) *Emergency-decontamination parties.* These parties will consist of one NCO and 10 EM. Personnel comprising these parties will be selected by the CBR officer, with the approval of the company commander.

b. Equipment.

(1) *Individual.* Individual equipment includes individual protective clothing (not issued to every individual), field protective mask, and accessory items. Items carried in the mask's carrier include eyelens outserts, a chemical agency protection and treatment set or the individual decontaminating and reimpregnating kit, winterization kit, waterproofing bag, protective mask hood, and automatic atropine injectors.

(2) *Chemical-detection party.* The chemical detection party will be equipped with a chemical agent detector kit and individual protective clothing and equipment and vehicles as necessary to perform their mission.

(3) *Radiological-monitoring and survey party.* Each party will be equipped with a radiacmeter IM 174/PD, dosimeter IM 93/UD, protective clothing and equipment and vehicles as necessary to perform its mission. In addition, the primary and alternate parties will each be equipped with a 1/4-ton truck.

(4) *Emergency-decontamination party.* Decontamination equipment required to maintain essential operations of the unit will be obtained by the supply sergeant and issued upon orders from higher authority. Equipment required includes: shovels, brushes, brooms, rakes, rags, 16- and 32-gallon buckets, soap, rubber gloves, DANC solution units, DS2 units, decontaminating agent STB, axes, chemical agent detection kit, and radiation detection instruments.

4. Individual and Unit Responsibilities

a. Individual soldier. Each soldier must demonstrate ability to perform his mission in a CBR environment. To do so, he must know:

- (1) The characteristics of CBR agents and their effects.
- (2) How to recognize signs of CBR agents.
- (3) How to protect against CBR attack.
- (4) How to perform CBR first aid.
- (5) How to remove CBR agents from himself and his equipment.
- (6) The conditions for masking without alarm or command once chemical-biological attack has begun or is imminent.
- (7) The procedures for unmasking.
- (8) The standards of individual proficiency given in appendix II, FM 21-41 and FM 21-48.

b. Control Personnel.

(1) *Company commander.* The company commander is responsible for assuring that all personnel are trained in CBR procedures and defensive measures. He schedules training, assures that defensive measures are implemented, and insures that required supplies and equipment are on hand. He will control the dispatch of chemical detection parties, radiological-monitoring and survey parties, and a decontamination party when they are required to operate outside the company area. He is responsible for immediately informing, by flash report, the next higher headquarters and subordinate and adjacent units of a CBR attack.

(2) *CBR Officer.* The CBR officer will closely supervise and conduct CBR training, will inspect CBR supplies and equipment, and will make recommendations to the commanding officer concerning CBR-defense measures. He will dispatch and control the operations of chemical-detection parties, radiological-survey parties, and the emergency-decontamination party within the company area. The CBR officer will also supervise the maintenance of CBR equipment and the construction of protective shelters, and will assist the company commander in planning damage-control operations. The CBR officer will be school trained.

(3) *CBR NCO's.* CBR NCO's are the principal assistants to the CBR officer in the performance of his duties. When the CBR warning is sounded, or as otherwise directed, the CBR NCO's will report to the CP.

(4) *Supply sergeant.* The company supply sergeant will obtain, store, maintain in storage, and issue unit CBR supplies—including those decontamination supplies required by the local situation and authorized by higher headquarters.

c. Unit. The unit must be able to perform its mission in a CBR environment. To do so, the unit must be able to—

(1) Supervise and assist its CBR personnel and CBR teams in individual and unit CBR training.

(2) Provide maximum CBR integration into field exercises.

(3) Develop a detailed and practical CBR SOP based upon accomplishment of its primary mission.

(4) Perform the actions listed as specific objectives of unit proficiency in FM 21-40.

d. Parties.

(1) *Chemical-detection party.* The chemical detection party will obtain, maintain, and become proficient in the use of required equipment, and will conduct chemical-agent detection and identification operations as directed. When the CBR alarm sounds, or as otherwise directed, members of these parties will report to the CP with chemical-agent detection kits.

(2) *Radiological-monitoring and survey party.* The radiological-monitoring and survey party will obtain, maintain, and become proficient in the use of required equipment, and will conduct monitoring and survey operations as directed. The number of monitors or survey parties functioning at one time will depend on the size of the area to be monitored or surveyed, and the equipment available.

(3) *Emergency-decontamination party.* The emergency decontamination party will obtain, maintain, and become proficient in the use of equipment and supplies required for decontamination operations. Such operations will be conducted as directed by the CBR officer.

Note. The chemical-detection party, radiological-monitoring survey party, and the emergency-decontamination party will be unit trained.

5. Unit Protection

a. Alarms.

(1) *General alarm.* The general alarm (CBR attack considered imminent) will be announced by higher headquarters whenever advance warning is possible. Upon receipt of such a warning, all company personnel will be notified by the most expeditious means available.

(2) *Actual attack.* A warning of the actual attack (enemy CBR agent detected) will be sounded by the individual(s) observing the attack or detecting the agent. (Individual(s) should follow automatic masking procedure, then sound the alarm.)

(3) *All clear.* The ALL CLEAR will be initiated by the commanding officer only. In the event the company commander is killed or disabled, the officer assuming his duties will initiate the ALL CLEAR.

(4) *Standard alarm.* Percussion sounds, rapid and continuing, will be used to warn of a CBR attack. Percussion alarm may consist of iron pipe, iron triangle, rail, empty shell case, or bell. The alarm will be promptly relayed to higher headquarters, subordinate units, and adjacent units.

(5) *Friendly use of CBR agents.* Upon use of CBR agents by friendly forces, all platoon and section leaders will insure that all personnel of their respective organizations are informed and that proper protective measures are taken. Platoon and section leaders will report to the company commander after all personnel have been warned and protective measures have been taken.

b. Detection and Survey Parties.

(1) At the sound of the CBR alarm, the chemical-detection party and radiological-monitoring and survey parties will report to the company CP with their respective equipment. The CBR officer will order the conduct of sampling or survey operations as soon as the situation permits.

(2) In the event an unidentifiable chemical agent is encountered, samples of contamination will be forwarded by the CBR officer—through technical channels—to an appropriate technical unit for identification.

(3) As soon as the attack or CBR agent is detected, higher headquarters, subordinate units, and adjacent units will be notified. This report will be made with flash precedence by the most expeditious means available.

(4) Following a radiological attack, monitors will conduct ground surveys as directed and record the required information on the Data Sheet for Radiological Surveys (Ground), DA Form 1971-R. This information will be relayed, as directed, to the Chemical, Biological, and Radiological Element (CBRE) or control party directing the survey. In most cases, this information will be of high intelligence value, and proper security safeguard will be observed.

c. Biological Attack. Normally the presence of biological agents will be difficult to detect in the initial phase of an attack. However, early recognition of biological agents is essential so that proper countermeasures may be taken; thus, all personnel must be alert to detect indications of the use of these agents. When the presence of biological agents is suspected, the CBR officer will be notified immediately, and the CBR alarm sounded. The following may indicate the presence of biological agents:

(1) Enemy aircraft dropping unidentifiable material or spraying unidentifiable substances.

(2) Unusual types of shells or bombs, particularly those that burst with little or no blast.

(3) Smokes or mists of unknown source or type.

(4) Unusual substances, or glass bottles or other containers lying on the ground in the area.

(5) Unusual increase in insects such as mosquitoes, fleas, or ticks.

(6) Sick or dead animals.

(7) Ill personnel.

(8) Parachutes or other devices that can be used for disseminating animals or insects.

(9) Unusual taste or appearance of food, water, and beverages.

(10) Widespread damage to crops and other vegetation in the area.

Note. When it is suspected that a biological attack has occurred, specially trained personnel will be dispatched to the area by higher headquarters to collect samples.

d. Protection of Personnel.

(1) *General.* Personnel will mask immediately when the CBR attack is suspected or the alarm is sounded, and will remain masked until the ALL CLEAR is sounded.

(2) *Aerosol agent.*

(a) In the event an aerosol agent is employed, personnel will utilize any available cover to protect themselves from contamination.

(b) Gloves, or other available clothing that offers protection to the individual will be put on.

(c) Personnel working or taking shelter in buildings, tents, etc., will close doors, windows, and flaps. Unventilated buildings, however, will be avoided.

(d) Low areas, damp areas, and those covered by thick vegetation will be avoided, if possible.

(3) *Nuclear attack.*

(a) In the case of a nuclear attack, the first indication you will have may be a bright light. If caught in the open, drop to the ground instantly and curl up to protect hands, neck, and face from flash heat.

(b) If warning is received before the attack, get into a foxhole, slit trench, or protective shelter. Whenever possible, utilize overhead cover.

(c) Remain under cover for at least 90 seconds after the explosion.

(d) Following the blast, all personnel will resume their mission operations unless instructed otherwise.

(4) *Evacuation.* If the area is heavily contaminated by a radioactive, chemical, or biological agent, or is in the path of radioactive fallout, personnel must prepare to evacuate the area. The company will move upon order of the commander.

e. Protection of Supplies and Materiel. In the event of CBR attack, as much supplies and materiel as possible should be covered with tarps, tentage, or other suitable material. Priority will be given to food and other mess supplies and equipment.

f. Marking. Platoon and section leaders are responsible for assuring that CBR personnel mark contaminated places in their respective areas with proper signs (FM 21-40).

6. Decontamination

a. Decontamination will be accomplished by company personnel as soon after a CBR attack as the situation permits. Priorities for decontamination are as follows:

(1) Personnel.

(2) Crew-served and individual weapons.

(3) Food and water supplies.

(4) Tools, equipment, and vehicles.

- (5) Personal equipment.
- b. CBR personnel will supervise the decontamination operations.
- c. The decontamination team will conduct decontamination operations only when directed by the company commander and only in the areas he designates. This team may be employed in the company area, or may be utilized in other areas, as directed by higher headquarters.

7. CBR Intelligence

a. All personnel have a responsibility for CBR intelligence. It is essential that all information concerning the use, or possible use, of CBR agents by the enemy be reported to the company commander immediately.

b. The company commander is responsible for forwarding all CBR information to battalion headquarters. Reports may be routine, special, or immediate.

(1) Routine reports will be made on such matters as current status of contaminated areas, progress of decontamination, status of protective shelters in areas subjected to enemy attack, and status of CBR protective equipment and supplies.

(2) Special reports will be submitted as requested by higher headquarters.

(3) Immediate reports will be prepared immediately following an enemy CBR attack. This report will be forwarded to higher headquarters by the most rapid means available.

8. Training

a. The company CBR officer and CBR NCO's will provide technical assistance to their unit commander in CBR and nuclear training and operations. Company CBR personnel will—

(1) Give CBR-nuclear instruction to achieve minimum standards of CBR and nuclear proficiency.

(2) Assist in preparation of the unit's CBR-nuclear SOP, and assure that all of the unit's personnel are trained to implement this section of the unit SOP.

(3) Train unit CBR teams.

(4) Supervise operation and maintenance of CBR detection instruments.

(5) Supervise use and maintenance of CBR protective equipment.

(6) Insure that all personnel are trained in correct first aid for CBR and nuclear casualties.

(7) Insure that unit is able to perform its own CBR decontamination.

(8) Report CBR and nuclear intelligence to higher headquarters.

(9) Make an immediate estimate of potential fallout hazard upon receipt of effective wind messages, using the radiological fallout predictor.

(10) Calculate entry and stay times, future dose rates, and optimum time for evacuation of radiological contaminated areas.

(11) Maintain unit's accumulated radiation dose and forward to higher headquarters as directed.

(12) Supervise reconnaissance and advise commander on the best route to cross or bypass CBR contaminated area.

(13) Inspect unit shelters to insure maximum protection against CBR agents and initial and residual radiation.

(14) Organize and train CBR survey parties within the unit's CBR teams to conduct chemical and radiological survey.

(15) Train CBR teams on the techniques of observing enemy nuclear burst data and forwarding data to higher headquarters.

(16) Assist in flame and screening-smoke training and operations.

(17) Plan, supervise, and conduct integrated CBR-nuclear training.

(18) Inform the unit commander, officers, and NCO's on new CBR-nuclear doctrine and techniques.

b. For nuclear defense, each soldier should be trained to know the following:

(1) The characteristics of the initial effects of nuclear weapons blast and thermal radiation.

(2) Actions to be taken in a nuclear attack that comes without warning.

(3) How to construct field fortifications that give maximum protection consistent with mission performance and construction material available.

(4) Why complete coverage of the body prior to a nuclear detonation is essential to protect against thermal radiation.

(5) How to perform individual protective measures given in FM 21-41.

c. The company should be trained to perform its mission under nuclear attack. Training should enable the unit to:

(1) Obtain maximum cover and dispersion in consonance with its mission.

(2) Assist in rear area protection as directed by higher headquarters.

(3) Perform specific actions and techniques given in FM 21-40.

d. The company should schedule a minimum of 10 hours of CBR training and five hours of nuclear training annually. School-trained unit CBR officers and NCO's should give the instruction. Upon completion of the 15-hour CBR and nuclear training, the unit should be given a CBR-nuclear training test using FM 21-48 as a guide. The training should be recorded on each individual's training record.

E. J. RICHARDS
CPT, OrdC
Commanding

APPENDIX F

SAMPLE REAR AREA PROTECTION ANNEX TO COMPANY SOP

_____ COMPANY
(PREPARATION GUIDE)

DATE _____

SUBJECT: Rear Area Protection
TO: All Personnel

_____ Company

1. References

- a. FM 19-45-1 (Test).
- b. FM 101-5.
- c. Maps and overlays.
- d. Orders and related documents.
- e. SOP's from higher headquarters.

2. Purpose

This annex is to establish an organization for rear area protection, delineate the responsibilities of personnel, and describe the procedures to be followed in the event the unit is subjected to an enemy attack or damage by natural disaster. The material contained herein should be used as a guide and should be adjustable to the local situation.

3. Organization

a. *Personnel.* The following additional duties are delegated to the personnel indicated:

- (1) *Officer in charge.* Company commander.
- (2) *Rear area protection NCO.* First sergeant.
- (3) *Heavy-rescue squad(s).* One or more heavy rescue squads will be organized as needed. Each will consist of a squad leader, a heavy lift equipment operator and nine additional squad members. Personnel comprising each heavy rescue squad will be designated by company orders.
- (4) *Light-rescue squad(s).* One or more light rescue squads will be organized. Each will be composed of a squad leader and 10 squad members. Personnel comprising each light rescue squad will be designated by company orders.
- (5) *Labor party (ies).* One or more labor parties will be organized. Each will consist of an NCO and 20 additional EM. Personnel will be assigned to the labor parties as directed by the company commander.

b. *Equipment.*

- (1) *Heavy-rescue squad.* The heavy rescue squad will be equipped as indicated below. When additional heavy-rescue squads are organized, they will be similarly equipped.

<i>Item</i>	<i>Quantity</i>
5-ton wrecker	1
5-ton truck tractor, w/e, w/winch	1
12-ton stake semitrailer	1
2 1/2-ton truck, w/winch	1
3/4-ton truck	1
Blanket	50
Carpenter tool kit	1
Ax	3
Wrecking bar	1
Mattock	3
Shovel	3
Goggles	4

(2) *Light-rescue squad.* The light rescue squad will be equipped as indicated below. When additional light rescue squads are organized, they will be similarly equipped.

<i>Item</i>	<i>Quantity</i>
1/4-ton truck	1
2 1/2-ton truck	1
Blanket	50
Ax	3
Wrecking bar	1
Mattock	3
Shovel	3
Goggles	4

(3) *Labor party.* The labor party will be equipped as indicated below. When additional labor parties are organized, they will be similarly equipped.

<i>Item</i>	<i>Quantity</i>
1/4-ton truck	1
2 1/2-ton truck	2

4. Duties and Responsibilities

a. Company Commander. The company commander is responsible for assuring that rescue squads and labor parties are properly manned, trained, and equipped. In the event of an enemy attack or natural disaster, he will supervise, control, and direct the operations of these squads and parties, and any other units that may be assigned to his area for rear area protection purposes. When so directed by higher headquarters, he will dispatch these squads and parties to assist in rear area protection operations outside the company area.

b. Individuals. Following an enemy attack or damage by natural disaster, individuals not assigned to rescue squads, labor parties, or other teams or parties, will continue with their missions unless otherwise directed.

c. Rear-Area Protection NCO. This NCO is the principal assistant to the commanding officer in the performance of his duties concerning area damage control.

d. Supply Sergeant. The supply sergeant will obtain, store, maintain in storage, and issue such tools, equipment, and supplies as are required for accomplishment of rear-area-protection operations.

e. Equipment Operators. Operators of equipment assigned to rescue squads of labor parties are responsible for the maintenance of their equipment and for assuring that this equipment is operational at all times.

f. Rescue Squad and Labor Parties. Following an enemy attack, or in the event of a natural disaster, NCO's in charge of these squads and parties will report to the CP for instructions. Other personnel assigned to these squads and parties—unless otherwise directed—will remain at their posts and continue with their normal duties until instructed otherwise by the NCO in charge, company commander, or other authorized individuals.

(1) *Heavy-rescue squads.* Heavy-rescue squads will conduct the removal of trapped casualties when the use of heavy equipment is required, and will accomplish such debris clearances and salvage operations as may be required.

(2) *Light-rescue squads.* Light-rescue squads will conduct the removal of casualties (when such removal does not require the use of heavy equipment) and will render first aid when necessary. In addition, these squads will conduct such debris clearance and salvage operations as directed.

(3) *Labor parties.* Labor parties will engage in removing debris, cordoning the disaster area, salvaging military supplies, and assisting in the control of traffic. In addition, labor party personnel will perform such other duties as assigned.

5. Supplies and Transportation

a. Supplies.

(1) Supplies and equipment in excess of TOE and TA required for rear area protection operations will be requisitioned through normal supply channels citing the special authority for the requisition.

(2) Supplies required by this company when operating in a damaged area will be obtained from the nearest available source.

b. Transportation. Only vehicles engaged in or supporting rear area protection activities, or engaged in tactical operations within the area will be permitted to enter or operate in the affected area.

WILLIAM V. CUTLER
CPT, OrdC
Commanding

APPENDIX G
SOLOG AGREEMENT 75, PROCEDURES FOR REPAIR AND
RECOVERY OF MILITARY TECHNICAL EQUIPMENT

Note. The SOLOG (Standardization of Certain Aspects of Operations and Logistics) agreement is reproduced on the following pages. It will be noted that the agreement makes reference to "echelons of maintenance." Subsequent to the publication of this SOLOG, "echelons" of maintenance have been deleted from U.S. Army maintenance terminology (AR 750-1). The Army maintenance system uses only "categories" to indicate the scope of maintenance performed at various levels. Echelons, as indicated in the SOLOG agreement, can be correlated to categories of maintenance as follows:

Echelons	Categories
First and second	Organizational
Third	Direct support
Fourth	General support
Fifth	Depot support

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SOLOG AGREEMENT 75

UNITED STATES—
 UNITED KINGDOM—
 CANADIAN ARMIES

NON-MATERIEL
 STANDARDIZATION
 PROGRAM

TITLE OF AGREEMENT
 PROCEDURES FOR REPAIR AND
 RECOVERY OF MILITARY
 TECHNICAL EQUIPMENT
 (Study C11)

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SOLOG AGREEMENT 75

DECLARATION OF AGREEMENT

1. Object

The purpose of this agreement is to standardize the procedures of the Armies of the United States, United Kingdom, and Canada for the repair and recovery of military technical equipment.

2. Effective Date

The terms of this agreement will be effective three months from the date the agreement is signed.

3. Release to NATO and SEATO

This agreement will be released to the North Atlantic Treaty Organization and the Southeast Asia Treaty Organization by the United States Army.

4. Promulgation of Agreement

National promulgation will be effected by incorporation, or revision when necessary, in national military directives.

5. Implementation

The dates on which this agreement has been implemented are—

US 30 September 1960

UK 30 September 1960

CDA 30 September 1960

(Holders are requested to complete these details when notified in the Minutes of the Non-Materiel Committee.)

6. Reference

This agreement is the result of SOLOG Study C11 initiated by Canada.

7. National Ratifying Reference

United States OPS OT DC 3 dated 14 July 1960.

United Kingdom .. 0160/3178 Q(D and T) dated 27 May 1960.

Canada HQS 8921-2 (DEP 2c) dated 15 July 1960.

8. Other Service Interests

In the United States, the US Navy and the US Air Force have no objection.

In the United Kingdom, the Royal Navy and the Royal Air Force do not subscribe.

In Canada, the Royal Canadian Navy and the Royal Canadian Air Force have no objection.

9. Amendments

No amendment to procedures agreed upon herein will be undertaken by any of the three armies without having the sanction of the other two. Any amendments proposed will be processed in accordance with the Basic

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SOLOG AGREEMENT 75

Standardization Agreement among the armies of the United States, United Kingdom, and Canada.

10. Agreement

The provisions stated on succeeding pages are hereby agreed upon in accordance with the terms stated above.

BY THE WASHINGTON STANDARDIZATION OFFICERS:

WILLIAM W. DICK, Jr	J. M. McNEILL	T. G. GIBSON
Major General	Major General	Brigadier
United States Army	United Kingdom Army	Canadian Army

DATE SIGNED

30 September 1960

DETAILS OF AGREEMENT

PROCEDURES FOR REPAIR AND RECOVERY
OF MILITARY TECHNICAL EQUIPMENT
(Study C11)

The armies of the United States, the United Kingdom, and Canada agree that standardized procedures for some aspects of repair and recovery of military technical equipment are required to facilitate joint operations in war. These aspects and procedures are referred to in Annex A to this Agreement.

The armies further agree that in certain other cases their organizations and procedures are sufficiently compatible to render unnecessary further standardization. These cases are referred to in Annex B to this Agreement.

Annex A to
SOLOG AGREEMENT 75

ITEMS ON WHICH AGREEMENT HAS BEEN REACHED

- a. (1) ITEM—military technical equipment condition classification.
- (2) AGREE THAT: the Canadian and United Kingdom condition classification code be adopted for use by all armies. The United States will adopt it for use only within the Field Army.
- (3) This code is referred to in appendix 1 hereto.
- b. (1) ITEM—type and extent of information on military technical equipment which must be reported for:
 - (a) recovery purposes.
 - (b) repair purposes.
- (2) AGREE THAT: the information covered in the Canadian and United Kingdom system be adopted by all armies.
- (3) This information is referred to in appendix 2 hereto.

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SOLOG AGREEMENT 75

Appendix 1 to Annex A to
SOLOG AGREEMENT 75CONDITION CLASSIFICATION CODE
MILITARY TECHNICAL EQUIPMENT

- a. SERVICEABLE—abbreviated S—available for immediate use.
- b. "X" CASUALTY—requires repair up to unit capability.
- c. "Y" CASUALTY—requires repair up to the capability of second and third line workshops in the Canadian and United Kingdom organization and up to the capability of third and fourth echelon in the United States organization.
- d. "Z" CASUALTY—requires repair up to the capability of base workshops in the Canadian and United Kingdom organization and fifth echelon in the United States organization.
- e. "BR" CASUALTY—beyond economical repair.

Appendix 2 to Annex A to
SOLOG AGREEMENT 75TYPE AND EXTENT OF INFORMATION TO BE REPORTED
FOR REPAIR AND RECOVERY PURPOSES

- a. Identification of the unit to which the equipment belongs.
- b. The type and make of the equipment, and army registered number.
- c. Condition classification assigned to the equipment.
 - (1) Serviceable
 - (2) "X" Casualty
 - (3) "Y" Casualty
 - (4) "Z" Casualty
- d. Whether or not the equipment can be moved by direct tow or suspended tow or if it can move under its own power.
- e. The grid reference of its location.
- f. Extent of assistance required.
- g. Details of the location, minefield, marsh, available approaches, etc.
- h. Whether or not the crew has remained with the equipment.

Annex B to
SOLOG AGREEMENT 75ITEMS ON WHICH ORGANIZATIONS AND PROCEDURES
ARE COMPATIBLE

- a. Operational procedures for reporting casualties to military technical equipment.
- b. Authorization of replacement issues.
- c. Procedure for recovery and backloading of unserviceable military technical equipment between echelons of repair.
- d. Permissive repair effected at each echelon (or stage) of repair.
Levels of repair can be equated as follows:

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SOLOG AGREEMENT 75

<i>United States</i>	<i>Canada/United Kingdom</i>
2nd echelon -----	1st line
3d echelon -----	2nd line
4th echelon -----	3d line
5th echelon -----	4th line

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APPENDIX H

STANAG 2113, DESTRUCTION OF MILITARY TECHNICAL EQUIPMENT

DETAILS OF AGREEMENT (Dof A)
DESTRUCTION OF MILITARY TECHNICAL EQUIPMENT
Annex: A (DofA), Priorities for Destructions of Parts of Military
Technical Equipment.

AGREEMENT

1. The NATO Army Forces agree:
 - a. That it is essential to destroy to the maximum degree possible military technical equipment, abandoned in wartime operations, to prevent its eventual repair and use by the enemy.
 - b. To follow the principles and priorities, set forth in this Agreement, in the destruction of their own equipment, when required.

PRINCIPLES AND PRIORITIES

2. Detailed Methods. Detailed methods of destroying individual items of equipment are to be included in the applicable technical publications, user handbooks and drill manuals.
3. Means of Destruction. Nations are to provide for the means of destruction for their own equipment.
4. Degree of Damage.
 - a. General. Methods of destruction should achieve such damage to equipment and essential spare parts that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or cannibalization.
 - b. Classified Equipment. Classified equipment must be destroyed in such degree as to prevent duplication by, or revealing means of operation or function, whenever possible, to the enemy.
 - c. Associated Classified Documents. Any classified documents, notes, instructions, or other written material pertaining to function, operation, maintenance, or employment, including drawings or parts lists, must be destroyed in a manner to render them useless to the enemy.
5. Priorities for Destruction.
 - a. Priority must always be given to the destruction of classified equipment and associated documents.
 - b. When lack of time and/or stores prevents complete destruction of equipment, priority is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment.
 - c. A guide to priorities for destruction of parts for various groups of equipment is contained in Annex A (DofA) to this STANAG.
6. Equipment Installed in Vehicles. Equipment installed in vehicles should be destroyed in accordance with the priorities for the equipment itself, taking into account the relative importance of the installed equipment and the vehicle itself.

7. Spare Parts. The same priority, for destruction of component parts of a major item necessary to render that item inoperable, must be given to the destruction of similar components in spare parts storage areas.
8. Cryptographic Equipment and Material. The detailed destruction procedure to be followed in order to insure the rapid and effective destruction of all types of cryptographic equipment and material is to be specified in instructions issued by the appropriate communication security authority.
9. Authorization. The authority for ordering the destruction of equipment is to be vested in the divisional and higher commanders, who may delegate authority to subordinate commanders when the situation requires.
10. Reporting. The reporting of the destruction of equipment is to be done through command channels.

IMPLEMENTATION OF THE AGREEMENT

11. This STANAG will be considered to have been implemented when the priorities indicated therein have been incorporated in national documents detailing the method required for destroying the equipment concerned.

ANNEX A(Dofa) to
STANAG 2113

PRIORITIES FOR DESTRUCTION OF PARTS OF MILITARY
TECHNICAL EQUIPMENT

<u>EQUIPMENT</u>	<u>PRIORITY</u>	<u>PARTS</u>
1. <u>VEHICLES (INCLUDING TANKS AND ENGINEER EQUIPMENT)</u>	1	Carburetor/fuel pump/injector distributor.
	2	Engine block and cooling system.
	3	Tires/tracks and suspensions.
	4	Mechanical or hydraulic systems (where applicable).
	5	Differentials.
	6	Frame.
2. <u>GUNS</u>	1	Breech, breech mechanism, and spares.
	2	Recoil mechanism.
	3	Tube.
	4	Sighting and fire control equipment (Priority 1 for Anti-Aircraft guns).
	5	Carriage and tires.
3. <u>SMALL ARMS</u>	1	Breech mechanism.
	2	Barrel.
	3	Sighting equipment (including Infra-Red).
	4	Mounts.
4. <u>OPTICAL EQUIPMENT</u>	1	Optical parts.
	2	Mechanical components.
5. <u>RADIO.</u>	1	Transmitter (oscillators and frequency generators).

<u>EQUIPMENT</u>	<u>PRIORITY</u>	<u>PARTS</u>
	2	Receiver.
	3	Remote control units or switchboards (exchanges) and operating terminals.
	4	Power supply and/or generator set.
	5	Antennae.
	6	Tuning heads.
6. <u>RADAR AND OTHER ELECTRONIC EQUIPMENT</u>	1	Frequency determining components, records, operating instructions, which are subject to security regulations, and identification material (Identification Friend or Foe (IFF)).
	2	Antennae and associated components such as radiators, reflectors and optics.
	3	Transmission lines and waveguides.
	4	Transmitter high voltage components.
	5	Control consoles, displays, plotting boards.
	6	Cable systems.
	7	Automatic devices.
	8	Other control panels and generators.
	9	Carriage and tires.
7. <u>GUIDED MISSILE SYSTEMS</u>	1	Battery control centers.
	2	Missile guidance equipment (including homing systems).
	3	Launchers including control circuits.
	4	Missiles.
	5	Measuring and test equipment.
	6	Generators and cable systems.
8. <u>AIRCRAFT AND SURVEILLANCE DRONES</u>	1	Identification (IFF) equipment, other classified electronic equipment, publications and documents pertaining thereto, and other materiel as defined by the national government concerned.

<u>EQUIPMENT</u>	<u>PRIORITY</u>	<u>PARTS</u>
	2	Installed armament (Use sub-priorities for Group 2, Guns, Group 3, Small Arms, as appropriate).
	3	Engine Assembly (Priorities for destruction of magnetos, carburetors, compressors, turbines, and other engine subassemblies to be determined by national governments, depending on type of aircraft involved and time available for destruction).
	4	Airframe/control surfaces/undercarriage (Priorities for destruction of propellers, hubrotor blades, gear boxes, drive shafts, transmissions, and other subassemblies (not already destroyed in priority 3) to be determined by national governments, depending on type of aircraft involved and time available for destruction).
	5	Instruments, radios, and electronic equipment (not included in priority 1).
	6	Electrical, fuel, and hydraulic systems.
9. <u>ROCKETS</u>	1	Launcher.
	2	Rocket.
	3	Sights and fire control equipment.

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By Order of the Secretary of the Army:

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Distribution:

To be distributed in accordance with DA Form 12-11 requirements for Maintenance Operations in the Field Army.

TABLE A
GUIDE TO UNITS PROVIDING MAINTENANCE AND/OR REPAIR PARTS SUPPLY SUPPORT OF ARMY MISSILES

UNIT	SPT ROLE	SERGEANT	PERSHING	HAWK	NIKE	HEAVY ROCKET	LAND COMBAT SUPPORT SYSTEM	SHILLELAGH	REDEYE	LANCER	LEGEND
GUIDED MSL MAINT CO (GS)											CR COMPONENT REPAIR OF MISSILE AND SYSTEM ASSOCIATED GROUND GUIDANCE HANDLING, LAUNCHING TEST EQUIPMENT AND MAINTENANCE
VARIATION (1)	GS	CR/RO		CR/RO	CR/RO						CALIBRATION FOR RETURN TO SUPPLY (LESS NUCLEAR COMPONENTS AUTOMOTIVE, SIGNAL AND POWER GENERATION)
(2)					CR/RO						RO REPAIR ONLY NO PARTS ISSUED
SERGEANT GENERAL SUPPORT CO	GS	CR/RO									PO PARTS ONLY NO REPAIR
PERSHING GENERAL SUPPORT CO	GS		CR/RO								MR MAINTENANCE AND REPAIR PARTS SUPPORT
HAWK GENERAL SUPPORT CO	GS			CR/RO							TR TEST & REPAIR
NIKE GENERAL SUPPORT CO	GS				CR/RO						CC COMMAND & CONTROL
ROCKET AND MISSILE SUPPORT (CO, DET, OR PLT, BASED ON DETACHMENT COMBINATIONS)											TC TECHNICAL CONTROL
DETACHMENT EA-ROCKET	DS/GS					MR (1) (2)	CC	CC	CC	CC	
EB-HQ SMALL MSL	DS/GS										
EC SECTION	DS/GS						TR				
ED SECTION HQ MSL MAINT	DS/GS							TC	TC	TC	
EE SECTION	DS/GS							MR(2)			DS DIRECT SUPPORT ROLE
EF SECTION	DS/GS								MR(2)		GS GENERAL SUPPORT ROLE
EG SECTION	DS/GS										
EH-CONTACT TEAM	DS/GS							MR(2)			(1) WHEN REQUIRED ONE PER AMMUNITION, SPECIAL AMMUNITION DS OR GS COMPANIES OR TO AN INDEPENDENT CORPS OR SEPARATE TASK FORCE
EI-CONTACT TEAM	DS/GS								MR(2)		
EJ-CONTACT TEAM	DS/GS									MR(2)	
AIRCRAFT & MSL REPAIR PARTS SUPPLY CO	GS	PO	PO	PO	PO	PO	PO	PO	PO	PO	(2) REPAIR PARTS SUPPORT IN DIRECT SUPPORT ROLE ONLY

Table B-1. Guide to Units Providing Maintenance and/or Repair Parts Supply Support of Army Missiles.

