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DEPARTMENT OF THE ARMY FIELD MANUAL

AIR DELIVERY OF SUPPLIES AND EQUIPMENT IN THE FIELD ARMY

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Purpose

a. This manual provides guidance for U. S. Army units concerned with the air delivery of supplies and equipment in a theater of operations, and particularly in support of an army in the field. It neither presents a set of rules which, if followed, will guarantee successful completion of assigned missions nor prescribes procedures that are mandatory or restrictive. It intends, rather, to suggest direction and guidance which may be applied to specific situations and conditions of employment. The information presented is applicable to nuclear and conventional environments, unless otherwise indicated.

b. This chapter contains general background information. Chapter 2 deals generally with air delivery operations. It discusses the types of airdrop and the characteristics of quartermaster airdrop equipment. It identifies the quartermaster units normally engaged in air delivery operations. It deals with the supply support aspects of administrative air movements and of airborne and airmobile operations. Chapter 3 discusses the mission, capabilities, organization, and employment of the Quartermaster Air Delivery Company. The Quartermaster Air Equipment Repair and Depot Company is similarly covered in chapter 4. Chapter 5 deals with the Airborne Division Quartermaster Air Equipment Support Company.

2. Modification

It is anticipated that change or revision will be necessary as policies and organizational structures are modified. Field experience may also suggest changes or corrections. Users are therefore requested to submit recommendations for change or improvement direct to the Commanding Officer, United States Army Combat Developments Command Quartermaster Agency, Fort Lee, Va. Comments should be keyed to the specific page, paragraph, and line of text to which change is recommended. Reasons should be provided for each comment to assure understanding and complete evaluation.

Section II. ORIENTATION TO TERMS

3. General

Air movement is a general term covering all transport of units, personnel, supplies, and equipment by air. It includes air landing and air delivery and covers both tactical and administrative air movements.

a. Air Landing. Air landing is the method of delivery by which aircraft are landed and unloaded on the ground. Air landing is the preferred method since cargo is delivered with the least chance of loss or breakage and requires a minimum of handling both in preparation for delivery and recovery. It is also desirable because it makes the most efficient use of available cargo space. Air landing includes helicopter sling loads. There is a requirement for construction of landing facilities or rehabilitation of existing facilities in operations involving the air landed method of delivery.

b. Air Delivery. Air delivery is the unloading of supplies from aircraft in flight. The term is synonymous with airdrops (see ch. 2).

c. Rigging. Rigging is a general term used to describe the processes and procedures by which a specific item or load of supplies is prepared for air delivery. It includes the assembly, loading, and makeup of air delivery containers, air delivery platforms and platform assemblies, and the attachment of parachutes to loads prepared for air delivery.

4. Tactical Air Movements

There are three main types of tactical air movements—

a. Airborne Operations. Airborne operations are those involving the movement and delivery by air, into an objective area of combat forces and their logistics support for execution of a tactical or a strategic mission. The means employed may be any combination of airborne units, air transportable units, and types of transport aircraft, depending on the mission and the overall situation.

b. Airmobile Operations. Airmobile operations are those in which combat forces and their equipment move about the battlefield in air vehicles under the control of a ground force commander to engage in ground combat. While there are many similarities between airborne and airmobile operations so far as organization, training, and planning are concerned, most airmobile operations are accomplished using Army aircraft for the air movement of troops and supplies. In addition, most airmobile operations involve forces of brigade (or battle group) size or less which conduct airmobile operations as a routine part of the ground combat effort.

c. Air Assault Operations. Air assault operations are those tactical operations characterized by great speed and shock action conducted against enemy forces by air assault units utilizing organic or attached Army aviation for movement and fire support. Air assault operations are planned for rapid execution and timely withdrawal. The air assault division and the air cavalry brigade are the forces organized and equipped to conduct air assault operations.

5. Administrative Air Movements

An administrative air movement is one in which personnel, supplies, and equipment are transported by air for purposes other than the immediate accomplishment of a tactical mission. An administrative air movement is not termed an airborne operation, although some of the techniques employed in an airborne operation may be applicable. So far as combat service support operations are concerned, the movement of supplies and equipment by air is a principal method of supply and one that is integrated with other means at theater level.

CHAPTER 2

AIR DELIVERY

Section I. GENERAL

6. Importance

The increased emphasis placed on mobility and dispersion on the battlefield requires increased flexibility in the combat service support system operating in support of combat forces. One of the ways increased flexibility is attained is through air transportation for delivery of supplies and equipment. As a result, air delivery will no longer be limited to emergency use. It is essential in certain types of operations and desirable in others. It has significant advantages over air landing where evacuation is not a consideration as it offers reductions in the vulnerability of aircraft, turnaround time, and requirements for forward landing facilities. It also presents certain disadvantages and limitations. The more common of these include weather, availability of suitable drop zones, possible enemy control of air, and the availability and capacity of cargo aircraft.

7. Types and Methods

a. There are three types of airdrop—high velocity drop, low-velocity drop, and free drop (fig. 1).

(1) High-velocity drop is the delivery of supplies and equipment from aircraft in flight by the use of a parachute or other stabilizing device to keep the load in an upright position during drop and cushioning material to absorb the shock upon impact. The stabilizing device, usually a ring-slot parachute or similar item, limits the rate of descent to about 60–90 feet per second. This method is used for the delivery of such items as subsistence, packaged petroleum products, and ammunition.

(2) Low-velocity drop is the delivery of supplies and equipment from aircraft in flight by the use of parachutes to retard the rate of descent and material to dissipate shock on impact. The parachute or parachutes retard the rate of descent to about 30–40 feet per second. Loads to be delivered by this means are specially prepared for drop either by placing them in air delivery containers, or by rigging them to platforms. This method is used chiefly for fragile items and for such heavy items of equipment as vehicles and field pieces.

(3) Free drop is the delivery of supplies and equipment from aircraft in flight without the use of parachutes or other retarding devices. Cushioning and shock absorbing materials are used when necessary. It is used for fortification material, baled clothing, and other items which will not be appreciably damaged on impact. Free drop deliveries are made from the lowest safe altitude.

b. There are six methods of releasing loads from aircraft. They are described in detail in TM 10–500 and summarized below:

(1) *Door loads.* The door load method is the technique by which the load to be airdropped is pushed or skidded out of the door (or cargo compartment) of the aircraft. The door load method is applicable to all three types of airdrop and to most aircraft.

(2) *Wing load.* The wing load method is the technique by which loads are rigged in containers and attached to

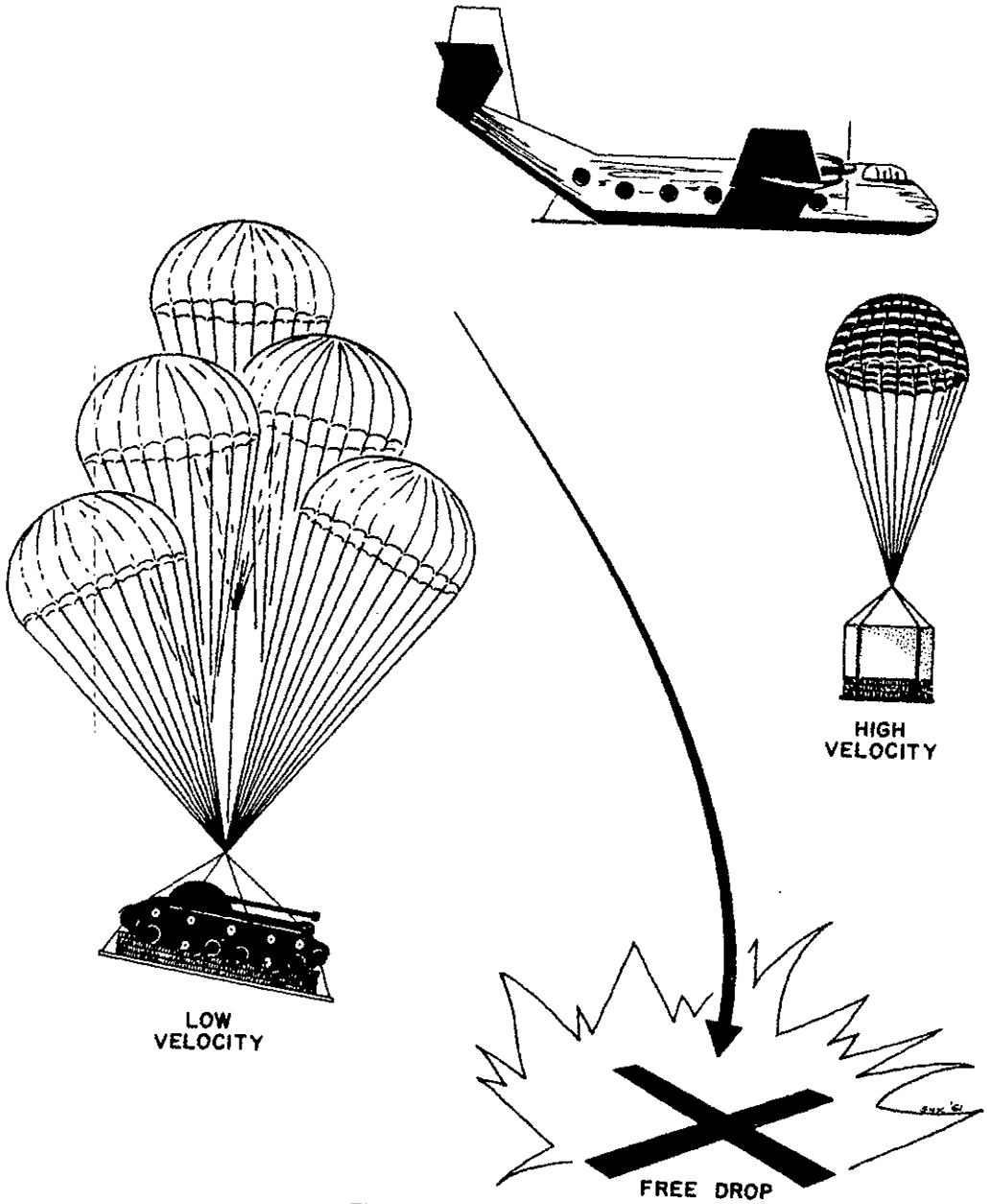


Figure 1. Types of airdrop.

wings of aircraft by bomb shackles or other devices. The wing load method is also adaptable to all three types of airdrop. It applies to certain types of Army aircraft.

(3) *Monorail.* The monorail method is the technique which uses an overhead trolley system built into the ceiling of the aircraft and permits automatic release of the loads at evenly spaced intervals by mechanical control. It applies primarily to Air Force aircraft of the C–119 class.

(4) *Gravity.* The gravity method is the technique whereby load-restraining ties are released by a release parachute allowing the load to roll out of the cargo compartment. This system also applies to all rear-loading cargo aircraft.

(5) *Extraction.* The extraction method is the technique whereby an extraction parachute pulls the load from the cargo compartment of the aircraft. This method is used for such items as artillery pieces, vehicles, special-purpose equipment, and bulk ammunition and supplies rigged on air delivery platforms.

(6) *Helicopter hookload.* In this method loads are suspended from a hook clevis on the helicopter, transported to the designated area, and airdropped by parachute.

8. Equipment

The term *quartermaster airdrop equipment* is generally applied to materials, devices, hardware, and other equipment used to prepare loads for airdrop. As a general classification, quartermaster airdrop items fall within the category of quartermaster class II and IV supplies. They are not distributed, however, through installations and facilities that normally handle these classes of supply. They are supplied to specialized quartermaster units organized and equipped for air delivery missions. The maintenance of quartermaster airdrop items is also a responsibility of these units.

a. Quartermaster airdrop equipment can be divided into three major categories:

(1) *Rigging items.* This category includes air delivery containers, air delivery platform and platform assemblies, cushioning materials, and other supplies and equipment used to prepare loads for airdrop. Specific items within this category are air delivery cargo slings, air delivery bags, and platform assemblies. Detailed descriptions on the use and employment of these items are contained in technical manuals and technical bulletins of the 10–500 series.

(2) *Parachute assemblies.* This category includes personnel and cargo parachutes. The principal personnel parachutes are the 35-foot diameter type T–10 worn by airborne troops in all types of airborne operations; the 24-foot reserve parachute used by airborne troops in conjunction with the T–10; and parachutes worn by passengers and crew members of aircraft. The main cargo parachutes are the type G–13 used for loads up to 500 pounds, the type G–12D used singly for loads up to 2,200 pounds or in clusters for certain heavy drop loads, and the type G–11 and G–11A used singly for loads up to 3,500 pounds or in clusters for platform assemblies weighing more than 3,500 pounds. There are also extraction parachutes and cargo-type pilot parachutes. Detailed descriptions of these parachutes, their use and maintenance are contained in technical manuals and technical bulletins of the 10–500, 10–501, and 10–1670 series.

(3) *Maintenance items.* This category includes parachute packing tables, parachute inspection tables, parachute line separators, flyers kit bags, parachute packing weights, and fans.

b. In addition to the quartermaster airdrop equipment, quartermaster units involved in air delivery operations are provided with such general-purpose equipment as medium-heavy duty sewing machines, general industrial sew-

ing machines, and zig-zag sewing machines. For the handling of supplies, they are equipped with forklift trucks, warehouse tractors and trailers, and cranes, in some instances. Unit vehicles range from ¼-ton utility trucks to 5-ton tractors.

9. Units

a. There are three major Army units concerned with, and involved in, supply support of air delivery operations. These are the—

(1) *Airborne Division Quartermaster Air Equipment Support Company (TOE 10–337E).* This company is organic to and supports an airborne division by providing parachutes and other items used for the air delivery of personnel, supplies, and equipment during the assault phase of an airborne operation. Additional information on the company is contained in chapter 5.

(2) *Quartermaster Air Delivery Company (TOE 10–407E).* This company prepares materiel of all technical services for air delivery. It prepares this materiel at depots or other rigging areas for direct movement to airfields. It is the principal source of resupply for the airborne division after the assault phase of the operation. It also supports the field army in both emergency and planned airdrop requirements. It can be employed in the Army service area or in the communications zone to rig supplies for airdrop. The company replaces the Quartermaster Aerial Supply Company (TOE 10–407D). Additional information on the company is contained in chapter 3.

(3) *Quartermaster Air Equipment Repair and Depot Company (TOE 10–417).* This company provides for the receipt, storage, issue of operating supplies and reclamation of airdrop equipment which is returned to the supply system. Additional information on the company is contained in chapter 4.

b. Specialized or additional air delivery and maintenance support also can be obtained through the use of teams and detachments from from the Quartermaster Service Organization (TOE 10–500). Team EA, for example, provides personnel to supervise the packaging, temporary storage, and loading in aircraft of 50 tons of supplies for delivery by parachute or free fall. Another team provides personnel for the repair of parachutes for a force equivalent to an airborne division and supporting troops. A special forces parachute rigging detachment (Team EG) provides personnel for the parachute maintenance support of special and security forces. The composition, capabilities, and equipment of these and other air supply and maintenance detachments are specified in TOE 10–500.

Section II. SUPPLY SUPPORT BY INTRATHEATER AIR TRANSPORTATION

10. General

As previously stated, administrative air movements are not classified as airborne operations. Command and staff procedures, joint Army-Air Force responsibilities, and planning and techniques used in the execution of airborne operations are covered in FM 57–10. AR 59–106/AFR 76–7 delineates the responsibilities between the Army and the Air Force at oversea Air Force air terminals. A brief discussion of the supply support aspects of airborne operations appears in the next section of this manual. For administrative air movements, the delineation of responsibilities set forth in paragraphs 11 through 13 apply.

11. Army Responsibilities

a. In an oversea theater of operations, the theater commander may establish a joint military transportation board (JMTB) to fulfill his responsibilities in the disposition of transportation space allocated by the Joint Chiefs of Staff, and to perform such other functions as may be directed. A discussion of the JMTB is contained in FM 55–4.

b. The theater army transportation officer, under the general staff supervision of the theater army G4, recommends the utilization of air transportation within the theater army. Allocations of available airlift are made to major subordinate theater army commands by the theater army commander on a priority basis and in accordance with requests previously submitted to him. Allocations of air transportation to the field armies are made through army groups, if present, because of the influence of airlift upon tactical operations.

c. The transportation officer at theater army logistical command (TALOG) headquarters, under the staff supervision of the director of services, is responsible to the TALOG commander for movement planning and coordination of airlift allocated to TALOG. Airlift allocated to TALOG is used for cargo movement both within the communications zone and from the communications zone to the field armies. Theater army may direct that a portion of the airlift allocated to the TALOG be used to support each field army. When this is done, the field army commander may establish priorities for airlift within TALOG's support mission. Requirements for airlift within the communications zone and requirements for airlift in support of the field armies are consolidated by the TALOG transportation officer.

d. The field army commander normally assigns to the commander of the Field Army Support Command (FASCOM) responsibility of determining requirements for, and coordinating and administering the use of, TALOG airlift allocated to the field army. Allocations of airlift to the field army normally are expressed as tonnage for air delivery. Within this allocation for sustained operations, the FASCOM commander specifies the type of material to be delivered, the times for delivery, and destinations. In addition, an allocation for oncall tonnages will be maintained. Allocations of available airlift are made to subordinate elements of the field army based on requirements of these elements previously submitted to field army.

e. When conditions do not permit air delivery from the communications zone, the field army may be provided capability for accomplishing air delivery by attachment of appropriate units from TALOG. FASCOM is also assigned responsibility for conducting Army air transport operations in support of the field army combat service support system.

12. Air Force Responsibilities

a. Air Force airlift units assigned to the theater of operations are commanded by the theater commander through the theater Air Force commander. Maximum use of aircraft is obtained by central control and scheduled flights to which the bulk of the intratheater airlift is allocated. The responsibilities of the airlift force commander include—

(1) Scheduling of flights.

(2) Control of Air Force transportation operations.

(3) Operation of Air Force terminals.

(4) Coordination with the using service.

(5) Timely delivery.

b. The airlift commander controls airlift operations through his air transport movement control center (ATMC). This center schedules flights and monitors operations, including such special missions as parachute delivery. The ATMC receives requests for airlift, processes them, and schedules the aircraft. It also consolidates requirements for forward movement of cargo with rearward air evacuation, notifies air terminals concerned, and directs and monitors the flight throughout the mission. The responsibilities of the Air Force and using services for the operation of terminals are contained in AR 59–106.

13. Coordinative Responsibilities

a. Theater army establishes coordination with the airlift forces through an Airlift Liaison Coordinating Officer (ALCO) stationed at the ATMC. This officer represents the TALOG transportation officer at air terminals in the communications zone. The FASCOM commander designates ALCO representatives at air terminals in the field army area. The ALCO—

(1) Coordinates the movement of Army personnel, supplies, and equipment to and from the air terminal.

(2) Maintains liaison with depots and other installations to insure that cargo arrives at the terminal on schedule.

b. Limited communications facilities are organic to quartermaster units involved in air delivery operations. Organic communications capabilities of the quartermaster air delivery company and the quartermaster air equipment repair and depot company are supplemented by the area signal center responsible for providing signal support to units within the geographical area in which these units operate. Organic communications capabilities of the airborne division quartermaster air equipment support company are supplemented by the division signal battalion.

Section III. SUPPLY SUPPORT ASPECTS OF AIRBORNE OPERATIONS

14. General

In an airborne operation, the conduct of combat service support operations is influenced and determined by factors and considerations inherent in the tactical mission. Because an airborne operation is usually a joint enterprise, all participating forces must be completely integrated and authoritatively directed. Extensive and detailed planning and continuous coordination are essential to insure availability of required airborne forces, control and direction of the combined ground-airborne effort, and provision of the necessary combat service support. Much of this planning is concerned with, and results in, the procedures by which troops, equipment, and supplies are assembled and readied for the operation. This overall process of preparation is known as mounting and makes up the first of three phases (FM 57–10) by which an airborne operation is conducted.

15. Mounting

The theater army logistical command supports an airborne operation mounted in or supported from the communications zone.

a. FM 57–10 indicates the services, facilities, and support that must be provided by the command mounting the operation. The command, among other things, must—

(1) Develop and allocate the facilities in the mounting area, to include training sites, airfields, and other air landing facilities, and marshaling camps.

(2) Obtain, prepare, and maintain supplies required by the airborne force for the operation, except that airborne units are responsible for preparing their accompanying supplies (see *b*, below). Preparation may include prepackaging in air delivery containers, palletization, and similar measures.

b. Marshaling is the phase of the mounting operation during which units move to temporary camps, if necessary, where final preparations for combat are completed; move to loading areas or departure airfields; and load for takeoff.* It thus concludes the mounting process. Two measures are essential:

(1) The actual marshaling process must be accomplished in the shortest possible time. For example, it should not exceed 48 hours for units of division size.

(2) Most of the preparation for the operation must be completed prior to the marshaling. For instance, units should obtain as early as practical in the mounting process the supplies and equipment that are to accompany them into the objective area.

16. Phases of Supply

a. Insofar as supply operations are concerned, the delivery of the accompanying supplies is the first of the phases by which supply is accomplished in the airborne operation. To be more specific, accompanying supplies are classified as unit prescribed load and as additional supplies. Unit prescribed loads are delivered to the airhead on individuals, on organic vehicles, and in heavy drop or air landed loads. The quantity of supplies should be sufficient to

* Whenever possible, units should be so located during or prior to mounting as to preclude the necessity for movement to marshaling camps.

sustain operations until resupply can be effected. Units in both the assault and follow-up echelons carry accompanying supplies into the airhead. Additional supplies consist of the force reserve of class III, selected class II and IV items, and repair parts. They are sent into the airhead by the force support command.

b. The second phase is the followup supply phase during which supplies are air landed or airdropped to resupply units until routine supply procedures can be instituted. There are two types of followup supply—automatic and oncall.

(1) Automatic followup supplies are brought into the objective area on predetermined delivery schedules. They are based upon estimated daily expenditures and requirements needed to buildup reserve stocks. The types and quantities of items included in automatic followup supply are determined by the force commander.

(2) Oncall followup supplies are held in readiness in the departure area for immediate delivery to units on a specific request basis. These supplies consist of additional quantities of items included in the automatic followup supply category, essential major items of equipment, and supplies that are not consumed at a predictable rate. The quantities and types are determined by the commander of the airborne force. Depending on the situation, oncall supplies may be segregated or prepackaged into type loads or may be maintained in bulk pending emergency requests for specific types and amounts.

c. The third phase is the routine supply phase. During this phase supplies are delivered according to supply procedures; to replace supplies which have been expended or to buildup reserve stocks. The source of supply may be the supporting logistical agencies or the supply points established subsequent to linkup.

17. Supply Policies

The quantities and types of equipment carried by assault airborne forces are dictated by the initial combat requirements. They are influenced by the capability of the airborne unit to handle them, the availability and carrying capacity of aircraft, the projected time of force linkup or withdrawal, weather, and enemy capabilities. Normally, any available space in aircraft can be used to carry additional supplies for forces already in the objective area. Documentation of supplies delivered to the airhead facilitates allocation and shifting of means of support to meet unexpected situations.

a. Based on the above considerations, the Army commander normally determines the levels of supply for a particular operation. Generally, a three-day level of supply in the airhead is desirable at all times, except on raid and relift operations. Generally, a two-day level of supply is considered the minimum safe level within the airhead.

b. Assault and individual combat rations are carried by all airborne units entering the objective area. Combat rations are used for the followup supply phase. Filled water containers are carried, both for use en route and for consumption in the objective area. Location of possible water supply points is predetermined. Water purification units are brought into the objective area as early as possible.

c. Limited amounts of essential class II items are included in accompanying supplies. Minimum stocks of individual clothing and equipment are included in followup and routine supply. Major items of equipment normally are included in additional and oncall followup supply, as required by the situation.

d. Vehicles and machinery are enplaned with fuel tanks filled to a safe level. The maximum is three-fourths full. Each vehicle carries additional fuel and lubricants. The main reliance for class III and class IIIA supply and resupply is placed on packaged products. This is particularly true during the initial stages of the operation when automotive fuels may be delivered in 5-gallon cans. During later phases of the operation, fuel may be delivered to the objective area in bulk. Prescribed resources of automotive and aviation fuels are maintained in the objective area by supply and service units of the force, the aviation fuel is maintained at or as near airlanding facilities as possible.

e. The amount of class IV supply brought into the objective area is usually limited. Local resources are exploited to the maximum extent. Class IV supplies necessary to support the operation can be reduced by careful selection of drop and landing zone to minimize the requirement for heavy construction equipment and material.

f. The amounts and types of class V supplies vary with almost every situation. Accordingly, unit prescribed loads must be designated for each operation. Required types of class V supply to allow continuity of combat operations are included in followup supply. The tactical situation in the objective area may cause frequent changes, however, in types and amounts planned for delivery.

Section IV. SUPPLY SUPPORT BY ARMY AVIATION

18. Air LOC Operations

In addition to other air transport vehicles, army transport aircraft units are employed as an integral part of the FASCOM army-wide transportation service to provide sustained air lines of communications (air LOC). The field army air LOC extends between air terminal points in the field army service area and to terminal points in supported division/brigade bases of operations. When required by tactical considerations, the air LOC extends beyond division/brigade bases of operations to points as far forward as possible.

a. The FASCOM commander controls the nature and extent of FASCOM Army air transport operations by assigning missions and establishing support priorities. Additionally, he controls through the FASCOM movement program the allocation and use of the air transport capabilities assigned to provide the army-wide air LOC service. In exercising this centralized control, he establishes policies to insure the necessary exercise of authority by transport unit commanders in carrying out their responsibility for effective execution of requirements.

(1) When operating a sustained air LOC service, reliable and timely service is combined with maximum utilization of aircraft by centralized control of commitments and scheduled flight operations. The airlift commander establishes policies for air LOC flight operations and assigns operational missions to his subordinate commanders. In turn, these commanders furnish current availability and operational data. Based upon these data, the airlift commander prepares the periodic airlift capability forecast for use in developing the FASCOM movement program. This capability commitment is forwarded to the FASCOM central movements management headquarters in accordance with established procedures.

(2) When mission-basis airlift is required and directed by FASCOM, the airlift commander coordinates and directs the commitment of necessary aircraft and aircraft support elements in a direct support role. Aircraft normally operate under control of the supporting force commander and upon completion of the mission, the airlift elements return to their parent units.

(3) Scheduled air LOC operations require timing and precision in loading and unloading aircraft. Both the cargo and aircraft are critical items. To insure timely movement of cargo and personnel as well as to facilitate efficient use of aircraft, the action of shippers, terminal transfer personnel, and aircraft operators must be closely coordinated. The accomplishment of this essential objective is the primary task of transportation movements officers at Army air terminals. The duties and functions of these offices are discussed in FM 55–4.

b. The quartermaster air delivery company rigs supplies and equipment for airdrop from Army aircraft. In this connection, the cargo-transport-type Army fixed-wing aircraft offer the greatest advantages. The principal aircraft of this type is the CV–2 Caribou. This aircraft

is so designed that supplies and equipment rigged on platforms or in containers may be dropped by extraction, gravity, or manual ejection methods from the rear of the cargo compartment. Detailed technical instructions on rigging items for airdrop from the Caribou and on preparing the Caribou for airdrop are contained in technical manuals of the 10–500-series. Former aircraft designations are contained in AR 700–26.

(1) Certain fixed-wing utility aircraft may also be adapted for air delivery purposes. One such model is the U–6A. This aircraft may be adapted for the door load or wing load method of air delivery. Observation fixed-wing aircraft like the O–1A also can be adapted for air delivery purposes. These usually employ the wing load method. The O1–A is capable, for example, of supporting a 250-pound load under each wing. The range and carrying capacity of these aircraft limit their use for air delivery to mission-basis operations.

(2) Rotary-wing and fixed wing aircraft are classified as to type. The types are observation (or reconnaissance), utility, and cargo/transport. The word *armed* is added as the last element of classification as to type when aircraft are armed. For example, when classifying the armed OV–1 Mohawk the classifications as to type are the "medium observation airplane, armed." Observation helicopters have design and use characteristics which limit their air delivery capabilities. Helicopters of the utility type—the UH–1 and UH–19, for instance, are suitable, with some modification, for air delivery purposes. It is the cargo/transport helicopter, however, and particularly craft like the CH–47, the CH–37, the CH–34, and the CH–21 that pay dividends. As in the case of fixed wing aircraft, technical instructions for preparation of loads for airdrop from helicopters are contained in technical manuals of the 10–500 series.

c. An air terminal is visualized as more than an airfield. It consists of transfer points; in-transit or temporary storage areas; traffic control facilities; and, as necessary, aircraft maintenance installations. Army air terminals in the army service area may be located adjacent to or near Air Force terminals and/or supply installations. Army air terminals in the corps areas may be located at or near support brigade supply installations. Elements of the quartermaster air delivery company may be included among the combat service support units employed at the terminal. A more detailed discussion on the location of rigging sites appears in paragraph 25.

(1) Army-Air Force responsibilities at jointly used air terminals are delineated in AR 59–106/AFR 76–7. Generally speaking, responsibilities of Army aviation units, transportation terminal transfer units, and quartermaster air delivery elements at Army air terminals follow a similar pattern.

(2) The aircraft commander is responsible for seeing that the loads are not in excess of lift capacity; that loads are properly placed, lashed, and secured; and that the aircraft is safe for flight.

(3) Transportation terminal transfer units perform functions which involve loading and unloading of aircraft; transfer of cargo from one mode of transport to another, to include necessary rearrangement of cargo modules; and in transit storage while supplies are being transferred. The attachment of external loads to helicopters (FM 1–100) for air-landed delivery is a terminal transfer unit function. Quartermaster air delivery elements prepare loads for airdrop from fixed wing aircraft and helicopters and may assist, by direction or local agreement, in loading of rigged supplies and equipment. Consignment and distribution point activities at terminals are functions of supply units.

19. Airmobile and Air Assault Operations

A second vital mission of Army transport aircraft units is the augmentation of field army tactical air capabilities. Airmobile and air

assault operations permit the commander to take advantage of the speed and flexibility of aircraft to accomplish a variety of tactical missions.

a. Airmobile Operations. The characteristics and execution of airmobile operations are discussed in FM 57–35.

(1) The tactical characteristics that influence supply support are summarized as follows:

(*a*) Airmobile forces are employed in furtherance of ground combat efforts.

(*b*) The types and amounts of heavy equipment that can be brought into the objective area are limited.

(*c*) Army aviation units at corps and field army must be used to support operations that are beyond the capability of army aviation assigned to divisions, air cavalry combat brigades, and air cavalry combat squadrons or air cavalry troops employed as separate units.

(2) The logistic characteristics that influence supply support are as follows:

(*a*) The quantity and types of supplies and equipment carried depend directly upon the initial combat requirements; the availability and carrying capacity of aircraft; the projected time between the assault and the linkup at which time normal resupply can be resumed; weather; and enemy capabilities.

(*b*) Before linkup, airmobile forces are dependent upon air lines of communications.

(*c*) The commander of the transported unit is responsible for preparing his organic equipment and for its loading, under the direct supervision of the aircraft commander.

(*d*) All cargo adaptable to unitization should be so prepared for ease of handling.

(*e*) Loads should not be prepared for a specific method of airdrop by a particular type aircraft until the type aircraft is known to be available and its capacity and physical characteristics are known.

b. Air Assault Operations.

(1) Supply and support in air assault operations is unique in that aircraft are the primary means of movement and are supported by a minimum of ground vehicles. For example, there are fewer than 1,200 ground vehicles in the air assault division, and most of them are ¼-, ½-, and 2½-ton trucks, the bulk of which are used in the division base of operations. Air assault forces utilize organic aircraft to conduct their operations. In addition, an air LOC will provide the majority of the transport requirements in support of the committed force. FM 1–100 contains information on ground crew training and ground crew procedures for cargo loading of rotary-wing and fixed-wing aircraft that should be made part of the training program for personnel assigned to an air assault division or an air cavalry combat brigade.

(2) As in any supply system, supply and support of air assault operations involve requirements, requisition, distribution and flow of supplies, and controls. In air assault operations these elements are affected by the operational characteristics of the division. The most important characteristic is the reliance that is placed on the air LOC to deliver supplies to the farthest point possible within the division. The characteristics of supply and support of air assault operations have made two objectives necessary insofar as supply support is concerned. The number of handlings necessary to break shipments down to consumer portions must be kept to a minimum; supplies must be received in such a manner that they can be easily handled by materials handling equipment or other mechanical means.

CHAPTER 3

QUARTERMASTER AIR DELIVERY COMPANY

Section I. GENERAL

20. Organization

Company organization is illustrated in figure 2. It divides the company into two basic elements—a command and control element and an operating element. Company headquarters and the air delivery office make up the command and control element.

a. Control Elements. Company headquarters provides the necessary command and supervision for the company. It consists of the company commander and personnel who assist him with the administration, supply, maintenance, and housekeeping functions necessary for the support of the company. The air delivery office is the technical control center for the company.

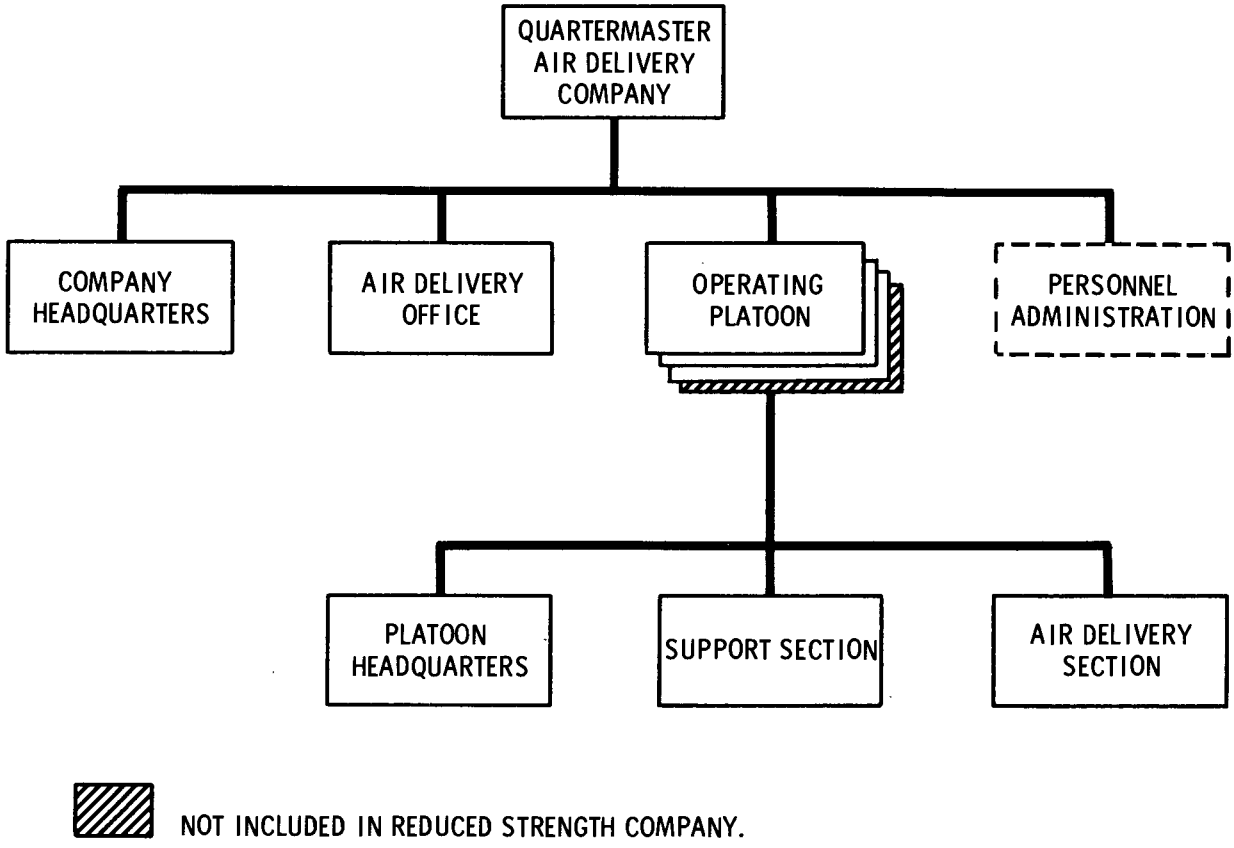


Figure 2. Organizational chart of the quartermaster air delivery company.

b. Operating Platoons. Each of the four operating platoons consists of a platoon headquarters, a support section, and an air delivery section. Each platoon can operate independently when necessary administrative and combat service support is provided. This support must include messing facilities, organizational supply and maintenance, and operational supply support. When the platoons are so employed, they operate on a single shift. The company may also be employed at a single location, in which case it is designed to operate with two 10-hour shifts.

(1) Each support section receives, stores, and issues quartermaster airdrop equipment used in air delivery operations. The sections pack cargo and personnel parachutes. They provide direct exchange for personnel parachutes used in Army aircraft. When the company is employed in an army area, the section stores personnel parachutes for emergency issue to the Fixed Wing Aviation Company (Medium) (para. 29). They inspect, fabricate, and assemble rigging components and related equipment. They perform organizational maintenance on quartermaster air delivery equipment.

(2) Each air delivery section rigs platform loads and air delivery containers. The sections receive, store, and issue supplies and equipment to be rigged for airdrop. They may provide technical assistance to nondivisional airborne units in preparing supplies and unit equipment for airdrop. Such assistance includes the supply of equipment required for airdrop of personnel, supplies, and equipment and technical assistance in packing and rigging of the supplies and equipment.

21. Capabilities

The company, at full strength, can—

a. Requisition, receive, store, and prepare (including parachute packing and load rigging) 200 tons daily of selected items of all classes of supplies and equipment for airdrop by free, high-velocity, or low-velocity drop techniques.

b. Maintain prescribed levels of airdrop equipment and selected items of all classes of supplies and equipment required for airdrop operations.

c. Perform organizational maintenance or airdrop equipment and provide direct exchange for personnel parachutes used in Army aircraft.

d. Assist, as required, in loading supplies in aircraft for airdrop, and ejecting supplies from aircraft in flight.

e. Supplement, when necessary, the capabilities of other units engaged in parachute packing, parachute maintenance, and airdrop support operations.

f. Provide technical assistance in the recovery and evacuation of airdrop equipment.

22. Assignment and Allocation

The company may be assigned to a theater, an army, a communications zone, logistical command, or an independent corps. When the company is assigned in the communications zone, it is normally attached to Headquarters and Headquarters Detachment, Quartermaster Battalion (TOE 10–536). When it is assigned to a type field army, the company is normally attached to Headquarters and Headquarters Company, Support Brigade. Assignment to the communications zone is on an as-required basis. Each type field army is assigned one reduced-strength company.

23. Duties of Personnel

The duties of company personnel are generally apparent from job titles listed in TOE 10–407 and the corresponding descriptions set forth in AR 611–101 and AR 611–201. Special notice should be taken that all company officers and warrant officers and all enlisted personnel directly concerned with the maintenance and operation of quartermaster airdrop equipment are qualified parachute riggers on parachute duty.

a. Command Personnel.

(1) The company commander directs and supervises the operation and employment of the unit. He is responsible for the administration, training, discip-

line, and supply of the company. He must plan, direct, and manage the company to accomplish its assigned mission; perform its own administration; maintain standards of discipline, proficiency, and training; and defend itself and its facilities against enemy attack.

(2) Platoon leaders are responsible to the company commander for the technical performance and military control of platoon personnel, the state of training of the platoon, and for the proper performance of assigned tasks. They perform such other duties as may be assigned by the company commander.

b. Supervisory Personnel.

(1) The air delivery officer, who heads the air delivery office, is the company commander's principal technical assistant. He is responsible to the company commander for coordinating the requisition, receipt, and storage of quartermaster airdrop equipment and supplies and equipment to be rigged for air delivery; the packing of parachutes and organizational maintenance of quartermaster airdrop equipment; and the rigging and loading of supplies and equipment for airdrop. His chief assistants are the airdrop equipment technician and the air delivery chief, who is the immediate supervisor of the noncommissioned and enlisted personnel assigned to the office. One of these is the stock control supervisor, who directs and supervises the stock control specialists in each of the operating platoons. These specialists may be pooled at the air delivery office and operate directly under the stock control supervisor when the company is employed at one location.

(2) The airdrop equipment technicians of the support sections and the chiefs of the air delivery sections are the principal supervisors at platoon level. They plan work assignments and assign personnel and equipment to specific tasks as required to accomplish the assigned workload. A parachute packer-supervisor assigned to each support section directs activities on one shift when the platoon operates on a shift basis. Each air delivery section contains an ammunition storage inspector, a petroleum storage supervisor and a storage supervisor. These noncommissioned officers direct the receipt, storage, and issue of supplies and equipment to be rigged for airdrop. They also supervise the specialists, equipment operators, and supply handlers who physically handle the supplies within the storage area. There is also a senior air delivery specialist who supervises the personnel who rig and load supplies and equipment on air delivery platforms and in air delivery containers and attach parachutes to the rigged loads. He may direct activities on one shift when the platoon operates on a shift basis.

(3) The motor sergeant, mess steward, and supply sergeant are the principal supervisory personnel within the company headquarters. The motor sergeant supervises the mechanics and mechanics' helpers who perform organizational maintenance on the vehicles, materials handling equipment, communications equipment, and power-generating equipment provided to the company. The mess steward is responsible for the efficient operation of the company mess. He supervises cooks and other mess personnel in the preparation and serving of company meals. The supply sergeant is charged with the receipt, storage, and issue of company supplies and the operation of the company supply room. He is assisted by the armorer.

Section II. COMPANY OPERATIONS

24. General

Such company activities as the inspecting, packing, storage, and repair of parachutes; the rigging of air delivery containers; and the rigging of platforms and platform assemblies are performed according to standing operating procedures developed on the basis of approved techniques and definite procedures contained in technical publications listed in appendix I and in DA Pam 310–4. These activities are generally treated in other sections of this manual. There are, however, a number of company operations which must be adapted to specific situations and missions and to requirements imposed by other special considerations. For these activities, which include selection of rigging areas and company layout, only the broadest operational guidance can be provided. Individual line items required to deliver 200 tons of supplies (one day's workload) by modular platforms are contained in TM 10–500–12–3.

25. Selecting Rigging Areas

The command to which the company is assigned designates the general area in which the company is to operate. Ordinarily, the area designated is centrally located both in regard to the airfields or terminals at which the supplies are outloaded and the depots which contain the supplies and equipment to be rigged and packaged for airdrop. Within this general area, the company commander selects the specific sites for company elements.

a. Unless tactical considerations or directives from higher headquarters prevent it, rigging should be performed at or near the departure airfield. There are several reasons for this—

(1) It eliminates the multiple handlings that would be necessary if supplies were moved from depots to rigging sites and then moved again as rigged loads to the air terminal.

(2) It reduces the requirement to have materials handling equipment available at the depot to handle supplies being rigged and to have duplicate equipment available to handle the rigged loads at the terminal.

(3) Rigging supplies and equipment for air drop increases their size and weight to the point that they cannot be transported in standard 2½-ton cargo trucks, and the development of special equipment for the sole purpose of moving rigged supplies to air terminals cannot be justified. This is especially true of most heavy self-propelled items, which can be moved to the rigging area under their own power.

b. There will be circumstances, however, under which rigging must be performed at locations other than the airfield or air terminal. In such cases, first consideration should be given to rigging at the depot where the supplies and equipment to be prepared for airdrop are received. If the distance between the depot and departure airfield is excessive, the commander of the air delivery unit will select a suitable rigging site as close to the departure airfield as conditions permit.

26. Layout and Space Requirements

a. Layout. The company commander should develop a plan for the layout of the company. Temporary buildings should be erected when permanent buildings are not available, if possible. Failing this, tents should be requisitioned to provide shelter for operations requiring protection from the weather. A suggested layout appears as figure 3.

b. Space Requirements. Exact space requirements for the company must be determined on the basis of assigned mission, prescribed stock levels, and other logistics considerations. The quantities of equipment and supplies required to be stored and the working space necessary for packing, maintenance, and rigging operations demand a relatively large operating site. Based on the quantities of material authorized by the TOE, estimated minimum requirements total approximately 380,000 square feet. Suggested procedures for space computation and reporting are contained in FM 101–10 and TM 743–200.

(1) Level ground adjacent to the company working area is necessary for bivouac, parking, and temporary storage. The

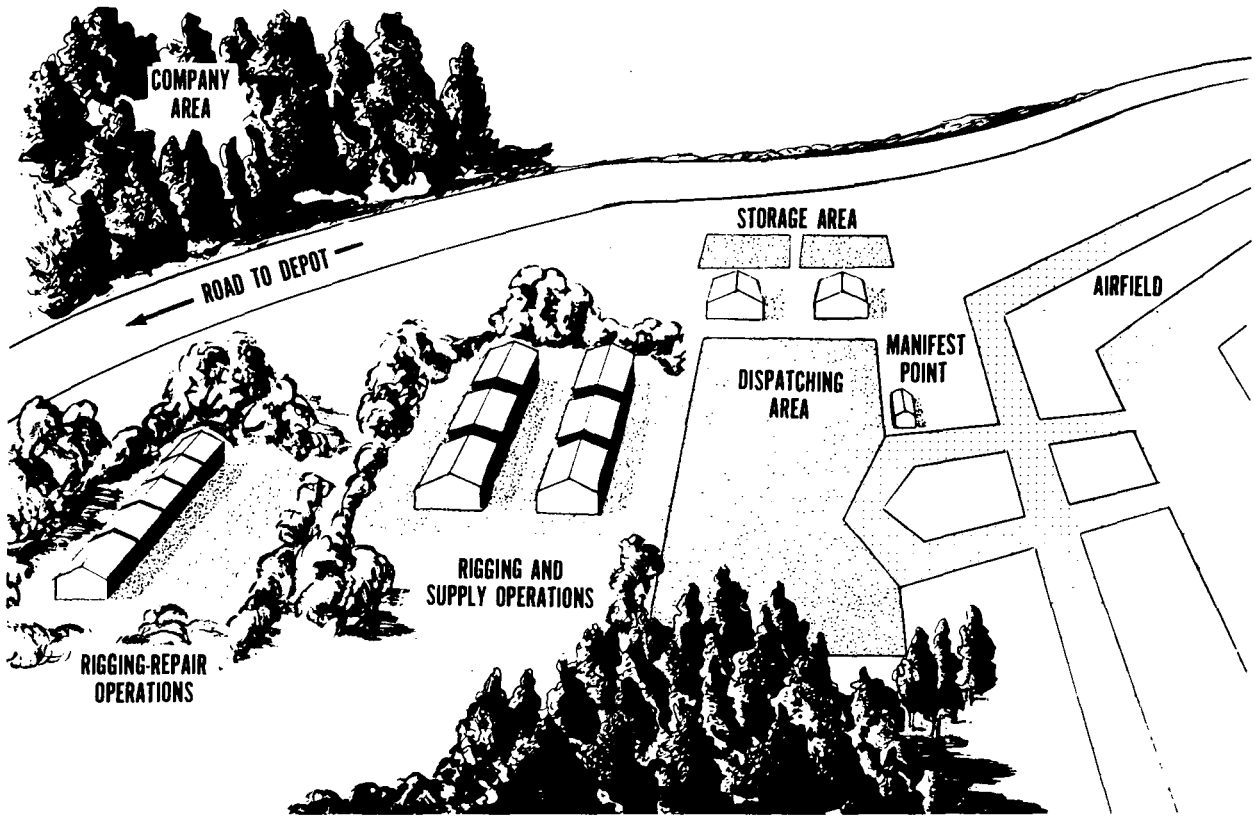


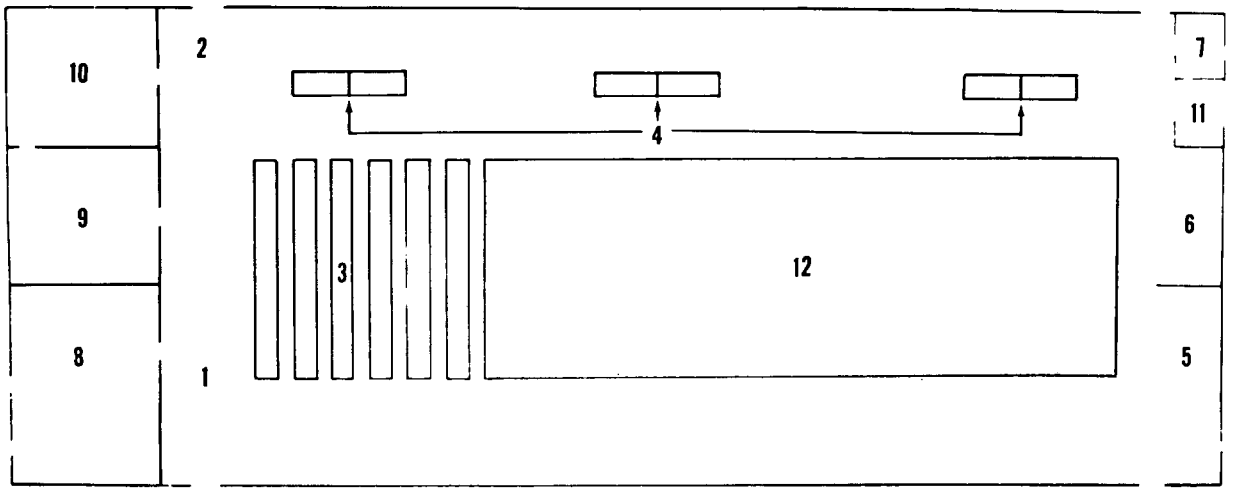
Figure 3. Layout of air delivery company (suggested).

ground should be reasonably high, with slopes affording good drainage. Gravel should be used, if possible, since even the best terrain may become muddy under heavy truck traffic in rainy weather. In cold weather, the company should be located in an area in which natural protection is provided against wind and cold. In hot weather the location should provide as much air circulation as possible.

(2) Company headquarters should be as close to the operating area as possible. For planning purposes, an estimated 80,000 square feet is required for the company headquarters layout.

(3) Maintenance and packing operations will require the equivalent of several buildings with approximately 20,000 square feet of floorspace. Considerable floorspace will be occupied by packing tables arranged in 48- or 60-foot lengths. Normally large cargo parachutes are packed on the floor; sufficient floorspace must be made available for such packing operations. Provision must be made for issuing maintenance supplies. A suggested layout for a packing shed is shown in figure 4.

(4) Air delivery operations will require at least 80,000 square feet of covered space for organizational equipment and for operating supplies requiring protective storage. In addition, approximately 200,000 square feet of outside space will be needed for rigging operations and for the receipt and storage of airdroppable supplies not requiring indoor storage.



LEGEND

1 and 2	Receiving Point (Parachutes from Supply)	7	Latrine
3	Parachute Packing Tables	8	Boiler Room
4	Final Inspection Tables	9	Packing Section Office
5	Pickup Point (Packed Parachutes to Supply)	10	Deployment Bag and Static Line Inspection
6	Pickup Point (Damaged Parachutes to Maintenance Shed)	11	Expendable Supply Room
		12	Heavy Cargo Parachute Packing

Figure 4. Layout for parachute packing shed (suggested).

(5) A manifest shed or tent should be erected near the dispatching area and loading strip, where the rigged supplies and equipment may be grouped into assigned aircraft loads.

(6) Temporary outdoor storage areas may be necessary for certain phases of company operations. Rigged supplies for an air delivery mission may require storage overnight or even for days, depending on weather conditions, tactical situations, and logistical requirements. In such cases, the dispatching area or adjacent storage areas may be used. Supplies and equipment should be stored in such a manner as to be protected against weather, vermin, theft, sabotage, fire, and enemy observation. The company is provided with tarpaulins to protect supplies and equipment in open storage.

Section III. SUPPORT SECTION OPERATIONS

27. General

The support sections of the operating platoons are the elements of the company concerned with the inspection, packing, organizational maintenance, and storage of parachutes and related equipment. To the extent possible, the section leader should so employ personnel that each packer and repairman becomes familiar with all section activities. Unless local conditions require some other arrangements, the activities of the sections should be directed, controlled, and coordinated by the air delivery office. Personnel from those sections may paradrop with supplies and equipment to provide technical assistance in recovery and evacuation of quartermaster airdrop equipment.

a. Airdrop equipment required for operations is supplied by the quartermaster air equipment repair and depot company or comparable supporting organization. The quantity of airdrop equipment included in the TOE represents a training allowance. Items required

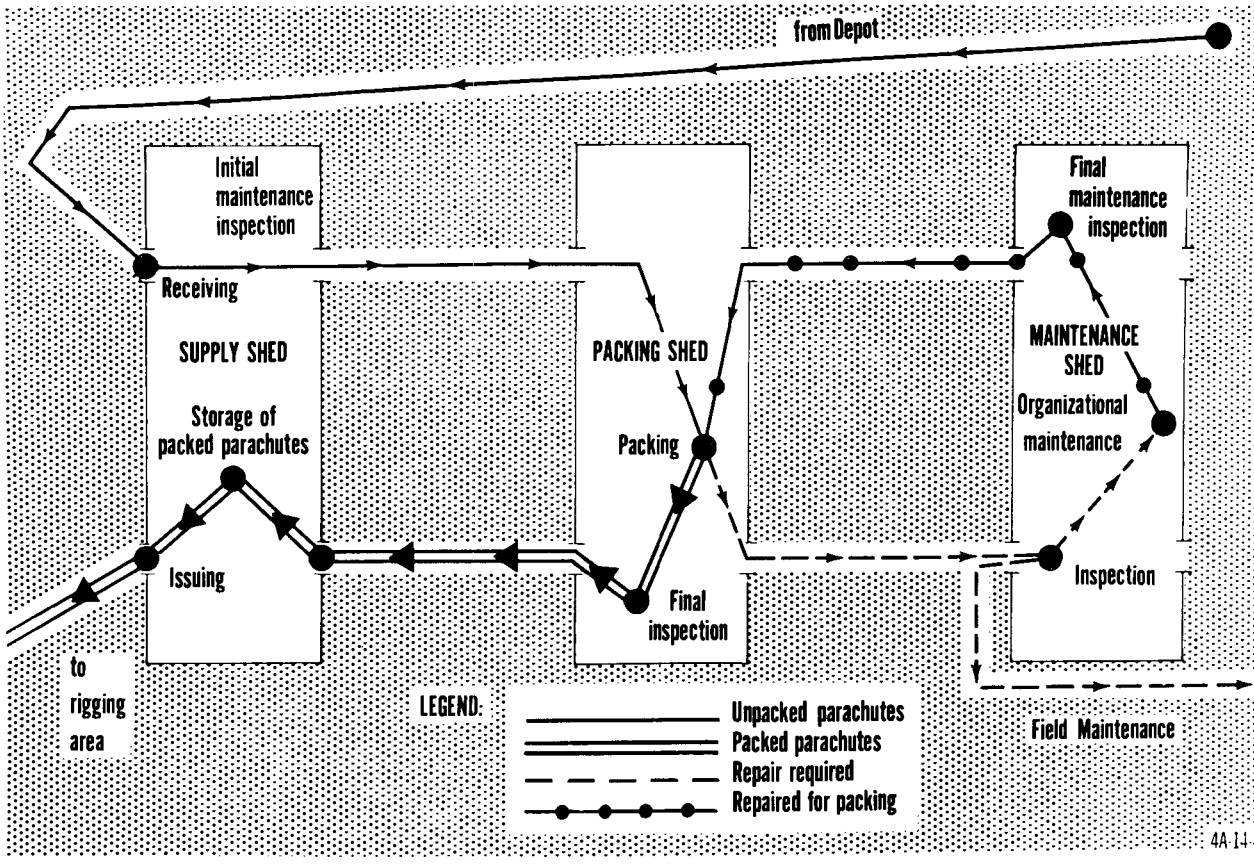


Figure 5. Flow of parachutes through sheds (suggested).

for conduct of airdrop operations are considered class IV items. They are requisitioned in the quantities and types required by assigned missions and/or projected workload.

b. The support sections include sufficient personnel to inspect, classify, and perform limited organizational maintenance on quartermaster airdrop equipment that is organic to the company or that may have been damaged in transit from the depot supplying such equipment. Maintenance personnel inspect all damaged airdrop equipment to determine the extent of repairs required. If within the criteria for organizational maintenance and the workload capabilities of the unit, these items are repaired and placed in stock. Other items are evacuated to the supporting air equipment maintenance facility for necessary maintenance.

c. As one of their responsibilities, support sections of companies employed in the army area store personnel parachutes (other than T–10) for issue to Fixed Wing Aviation Companies (Medium). Each of these aviation companies is organically provided with enough personnel parachutes to equip 2 of its 16 aircraft for carrying passengers (64 parachutes). Personnel parachutes to equip the remaining aircraft for troop transport are drawn, if required, from the quartermaster air delivery company. Based on a 25 percent requirement for the 5 aviation companies in the field army, the quartermaster air delivery company maintains 560 parachutes for this purpose.

28. Workflow

The flow of work through the packing and repair sheds is typical of those activities which depend largely upon the situation under which the company must operate. When buildings are available, the development of a workflow pat-

tern such as that suggested in figure 5 is a relatively simple matter. If, on the other hand, buildings are unavailable or widely separated, considerable planning and improvisation are required to produce the best possible workflow plan.

Section IV. AIR DELIVERY SECTION OPERATIONS

29. General

The air delivery sections of the operating platoons are responsible for rigging supplies in air delivery containers and for rigging vehicles and other equipment for airdrop on platforms and platform assemblies. Loads so rigged may be delivered by United States Air Force or Army aircraft or by carrier made available from other sources. There is, consequently, a requirement for coordination between the company and the appropriate carrier agency, particularly in regard to time schedules, weight and space limitations, and the need for company personnel to accompany the load. Not only does this coordination result in the interchange of information necessary to determine the manner in which individual loads must be rigged, but it also allows the company to make use of load association data which indicates elements of loads that should be dropped together and loads that may be dropped separately. An artillery piece and its prime mover, for example, must be used together on the ground. They represent, therefore, an associated load which should, all conditions permitting, be dropped from the same aircraft.

a. The inventory control center maintains prescribed levels of supplies and equipment which the unit prepares for airdrop. When operating apart from a depot, the unit may maintain a 3 to 5 day level of class I, III, and V supplies, and selected items of class II and IV supplies. When operating at or adjacent to a depot, the levels of supplies maintained are reduced to the minimum compatible with efficient operations.

b. To the extent practicable, predetermined quantities or type loads of class I, III and V supplies are rigged beforehand to meet scheduled or emergency airdrop requirements. When airdrop requests are received, rigged loads are taken from storage, parachutes attached, and the loads transported to aircraft for loading. Action is taken to replenish the items shipped. The incoming supplies are then rigged and placed in storage to meet further airdrop requirements.

30. Factors and Considerations

Detailed information on the makeup of air delivery container and platform loads, weight limitations for air delivery containers, types of items to be rigged in containers and on platforms, and parachute and cushioning material requirements is contained in TM 10–500-series. They also indicate, in general, the factors and considerations to be taken into account by personnel included in the planning of load preparation operations.

a. The company has the capability, as discussed in paragraph 21 to prepare 200 tons of supplies daily for delivery by air. Without knowledge of the specific requirements, any breakdown of this tonnage into types and numbers of loads is at best an estimate. It is reasonable to assume for purposes of discussion, however, that approximately 65 percent or 130 of the 200 tons prepared daily will be bulk supplies of all classes. The balance of the loads rigged, about 70 tons, will be individual items such as ¾-ton trucks, 2½-ton trucks, howitzers, and 90-mm guns. On this basis, the average daily workload for the company may consist of 50 loads, 30 loads of bulk supplies and 20 loads of individual items. The number of loads which must be rigged in support of the assault echelon of an airborne division will give, however, some appreciation of the degree to which specific requirements can change these estimates. On the basis of current planning factors, the supplies accompanying the assault echelon would represent a total of 1,408 rigged loads, of which only 36 would be bulk supplies. And of these 36 loads, 24 would be ammunition.

b. It is primarily for these reasons that the air delivery officer prepares a load breakdown chart which serves as the basic control docu-

LOAD BREAKDOWN CHART (AERIAL DELIVERY)

Page 1 of 1 Pages

Date 30 January 1959

Mission No. 172 Grids B559091 Estimated Drop (Date and Time) 0840 - 31 January

	Quantity Requested	Item	Quantity per Package	Required No. of Packages	Total Quantity Packed	Item Wt. per Package	Total Item Weight	Type of Conts.	Packs. per Cont.	Load Wt. in Cont.	Total Cont. Wt.	No. of Conts.
1	5,000 r	.30 carbine ammo	2,700	2	5,400	91	182	L/B	2	/	/	1/3 A
2	1,500 r	.50 m/g ammo	265	6	1,590	97.4	584	L/B	6	/	/	1/3 A
3	1,300 r	105 mm ammo	3	30	90	171	5,130	L/B	30	5,896	7,500	1/3 A
4	/	/	/	407	1,221	171	69,597	A-22	11	1,881	2,065	37
5	900	combat rations	6	150	900	40	6,000	L/B	150	6,000	7,600	1
6	200 g	86 A gasoline	50	4	200 g	378	1,512	A-22	4	1,512	1,702	1
7	1	3/4-ton truck	1	1	1	5,800	5,800	Assy	1	5,800	7,772	1
8	1	105 mm how.	1	1	1	5,000	5,000	Assy	1	5,000	6,525	1
9												
10												
11												
12												
13												
14												
15												

Signature E. G. Carlin, WOJG

4A-14

Figure 6. Load breakdown chart (suggested).

ment for the rigging operation. The chart should be locally reproduced and should contain as a minimum the information contained on the form suggested in figure 6. The number of copies required for each operation depends upon specific conditions. There must be enough, in any case, for the team or teams rigging the load and there must be one copy for the reports clerk at platoon headquarters. His copy becomes the worksheet for the preparation of the flight manifest for each aircraft. For this purpose, aircraft identification must be provided by the Air Force or Army unit providing the carrier.

c. Special considerations must be observed in handling packaged bulk petroleum. Containers of less than 55-gallon capacity should be palletized when shipped to air terminals for subsequent air-landed delivery. For air-landed deliveries to airheads not equipped with suitable MHE, the 5-gallon military gasoline can should be unitized by strapping five cans together. Shipments that will terminate with an air-landed delivery by Army aircraft may require the palletized loads to be broken down in the transfer area for those aircraft not large enough to accept pallets. External sling delivery by helicopter may offer an alternate method as in most cases pallet size will limit movement rather than weight. Filled 55-gallon drums will normally not be palletized for air shipment due to high individual weight. Load spreaders, such as plywood sheets, will be required for loading unpalletized 55-gallon drums in most utility/tactical transport helicopters.

CHAPTER 4

QUARTERMASTER AIR EQUIPMENT REPAIR AND DEPOT COMPANY

Section I. GENERAL

31. Organization

The company (fig. 7) is organized into company headquarters, an air equipment maintenance platoon, and an air supply and service platoon. The air equipment maintenance platoon is composed of a platoon headquarters, three parachute and textile repair sections, and a platform repair section. The air supply and service platoon is composed of a platoon headquarters, a service and classification section, and an air supply section.

a. Company headquarters is the command element of the company. It is responsible for the effectiveness of company operations; preparation and transmission of required report data; supply, mess, training, and billeting of company personnel; and maintenance of organic equipment and weapons.

b. The air equipment maintenance platoon repairs parachutes, wood and metal items, and related quartermaster air delivery equipment. It normally operates on a production-line basis but may, when required, move personnel and equipment to perform on-the-spot maintenance or modification. Items repaired by the platoon are inspected and, if serviceable, picked up by the air supply and service platoon for return to stock. Personnel of the platoon maintain rigging proficiency by packing personnel parachutes used by the unit for training jumps and by drop-testing repaired parachutes.

c. The air supply and service platoon is responsible for the requisition, receipt, storage, and issue of quartermaster airdrop equipment, and provides for the receipt, classification and disposal of unserviceable equipment. In addition, the platoon is responsible for providing organizational maintenance on sewing machines, vehicles, generators, and other equipment organic to the company.

(1) *Air supply section.* The air supply section computes requirements for this equipment and submits them to the appropriate theater agency for transmission to the zone of interior. It receives the incoming supplies, stores, and issues them.

(2) *Service and classification section.* The service and classification section receives and classifies all quartermaster airdrop equipment turned in by supported units. All equipment is inspected when received. Serviceable items are placed in stock for reissue. Economically repairable items are delivered to the appropriate sections of the maintenance platoons for repair. Scrap and items that cannot be economically repaired are salvaged or cannibalized.

32. Capabilities

The company, at full strength, is capable of—

a. Receiving, classifying, and performing field maintenance on quartermaster airdrop equipment, as specified in its mission.

b. Requisitioning, receiving, storing, and issuing quartermaster airdrop equipment.

c. Supplementing the maintenance activities

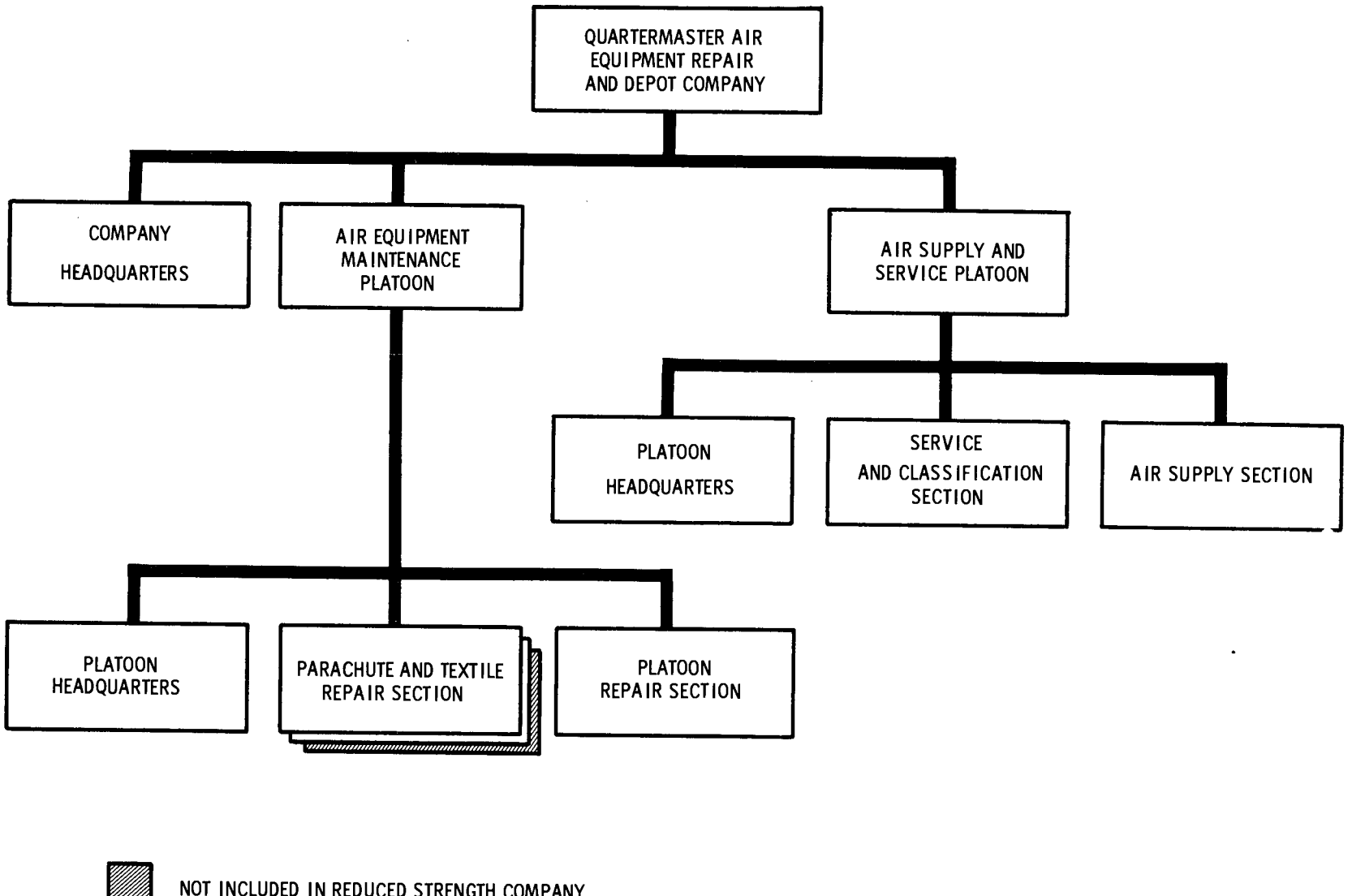


Figure 7. Quartermaster air equipment repair and depot company.

of other units engaged in air delivery of personnel and equipment.

33. Assignment

Normally the company is assigned to the theater army logistical command. It may be assigned to a field army or an independent corps if a communications zone is not established. It is normally attached to a Headquarters and Headquarters Detachment, Quartermaster Battalion (TOE 10–536).

34. Duties of Personnel

a. Company Headquarters. The company commander directs and supervises the operation and employment of the unit. He is responsible for the administration, training, discipline, and supply of the company. He must plan, direct and manage the company to—

(1) Perform its assigned mission in the field.

(2) Accomplish its own administration.

(3) Maintain standards of discipline.

(4) Maintain standards of proficiency and training.

(5) Defend itself and its installations against enemy attack.

b. Air Equipment Maintenance Platoon. Platoon headquarters consists of the air equipment maintenance officer, maintenance supervisor, and inspector-tester foreman. The air equipment maintenance officer supervises operations on the platoon. The maintenance supervisor assists him in the development of production schedules and maintenance procedures for platoon operations in the allocation and assignment of work to sections of the platoon, and in the coordination of platoon operations with other elements of the company. The inspector-tester foreman supervises and directs the inspection activities of air delivery equipment repaired by the platoon.

(1) The section chief of the parachute and textile repair section, under direction of the air equipment maintenance officer, supervises the inspection and repair of parachutes and textile components of air delivery containers. He plans work assignments, determines additional requirements for personnel and equipment, and assigns personnel and equipment to accomplish the assigned workloads.

(*a*) The inspector-testers and their assistants perform initial and final inspections and tests on parachutes and textile components of air delivery equipment.

(*b*) The parachute maintenance foreman directs and supervises the parachute repairmen and helpers, who perform the required maintenance on parachutes and textile components of air delivery equipment.

(2) The section chief of the platform repair section directs and supervises the maintenance and repair of wood and metal components required to rig platform loads for air delivery. He estimates the requirements for operating supplies, and assigns personnel, supplies, and equipment as required to accomplish the assigned workload.

(*a*) The machinist and the metal repairmen fabricate and repair metal parts and components of platform load rigging equipment. The welder-blacksmith fabricates and repairs metal platform load rigging components.

(*b*) The quartermaster light equipment repair foreman supervises the quartermaster light equipment repairmen, who perform mechanical repair and maintenance on wood and metal platform load rigging components.

(*c*) The carpenters construct and repair wooden rigging components as required. The painter paints newly constructed or repaired wood and metal components.

c. Air Supply and Service Platoon. The air supply officer commands the platoon. He supervises the service and classification activities of the platoon and the computation of requirements for air delivery equipment, as well as the requisitioning, receipt, storage, and issue of supplies. He is assisted by the platoon sergeant

in planning, coordinating, and supervising platoon operations.

(1) The service-classification officer supervises the service, classification, and disposal activities of the service and classification section. He also supervises the organizational maintenance of equipment organic to the company.

(*a*) The section chief assists the service-classification officer in planning work assignments and determining requirements for personnel and equipment. He assists in assigning personnel and equipment to provide maximum support for the supply and maintenance activities of the company.

(*b*) The quartermaster heavy equipment repair foreman assists the service-classification officer in the maintenance of sewing machines, materials handling equipment, generators, and other organic equipment. He supervises the activities of repair personnel of the section.

(*c*) The classifiers perform maintenance classification inspections of all air delivery equipment received for repairs. They check all damaged items and determine the degree and type of maintenance required for each item.

(*d*) The electrician installs and maintains the electrical system providing power for the operation of sewing machines and other equipment. The powerman installs, operates, and performs organizational maintenance on motors, generators, and allied control and starting equipment organic to the company.

(*e*) The quartermaster light equipment repairman and his helper, the materials handling equipment repairman, and wheel vehicle mechanic perform organizational maintenance on quartermaster equipment as well as vehicles assigned to the company.

(*f*) The salvage handlers, packer-crater, and forklift operators assist in the inspection, classification, and disposal of quartermaster airdrop equipment. They deliver items to be repaired to the maintenance sections and assist the air supply section in receiving and shipping activities.

(2) The air supply officer, assisted by the air supply section chief, directs and supervises the requisition, receipt, storage, and shipment or issue of quartermaster airdrop equipment. He also supervises personnel engaged in computing the requirements for airdrop equipment and operating supplies.

(*a*) The air supply specialist identifies and coordinates the requisitioning, classification, and issue of quartermaster airdrop repair parts and maintenance operating supplies.

(*b*) The receiving-shipping specialist and clerk supervises the receipt and shipment of supplies and equipment handled by the section.

(*c*) The quartermaster supply specialists and supply clerk prepare requisitions, and maintain stock accounting and control records, as required.

(*d*) The warehouse specialist coordinates and supervises storage activities and directs the heavy truck driver, forklift operator, warehouse equipment operator, and warehousemen in the mechanical and physical handling of supplies and equipment.

Section II. COMPANY OPERATIONS

35. Site Selection

The general operating area for the company is normally designated by the controlling headquarters to conform with the overall operational plan of the command. Within this general area, specific sites for company headquarters and operating elements of the company are determined by the company commander.

Factors influencing the decision are terrain, defensibility, and existing conditions in the general area designated for the company.

a. More important is the mission of the company and the special requirements that characterize company operations. Because the company employs equipment that imposes a requirement for buildings, the condition and availability of existing facilities are prime considerations. It may be necessary to construct temporary buildings if existing ones cannot be modified or rehabilitated. Tents can be requisitioned to provide shelter for operations and supplies that require protection from the elements. Availability and capability of facilities for providing power must also be taken into account.

b. The availability of transportation facilities is another major consideration. The company should be located as close to main road and rail nets as dispersion factors will permit.

36. Space Requirements

Space requirements for the company should be based upon the full capabilities indicated in TOE 10–417. Calculated upon that basis as well as upon factors developed for the space needed to set up and operate organic company equipment, it is estimated that all company operations can be performed in an area of approximately 40,000 square feet. This figure is presented for guidance only and is based on the calculated space requirements for the operating elements of the company only. Expressed in terms of building requirements, these figures indicate that the operating elements of the company would require six 48′ by 112′ buildings.

37. Layout

The layout for the company is determined by the company commander. It is based on the specific mission to be performed, size and characteristics of the operating site, and the type of operation (fig. 8). The following considerations are generally applicable:

a. Company headquarters area should be located as close as possible to the operating area. It should contain the company supply room, orderly room, messhall, living quarters, and vehicle parking area.

b. Within the air supply section area, warehouses and buildings should be located next to a railroad siding and be surrounded by hardtop surfaces. An open storage area may be maintained for items not affected by exposure to the elements.

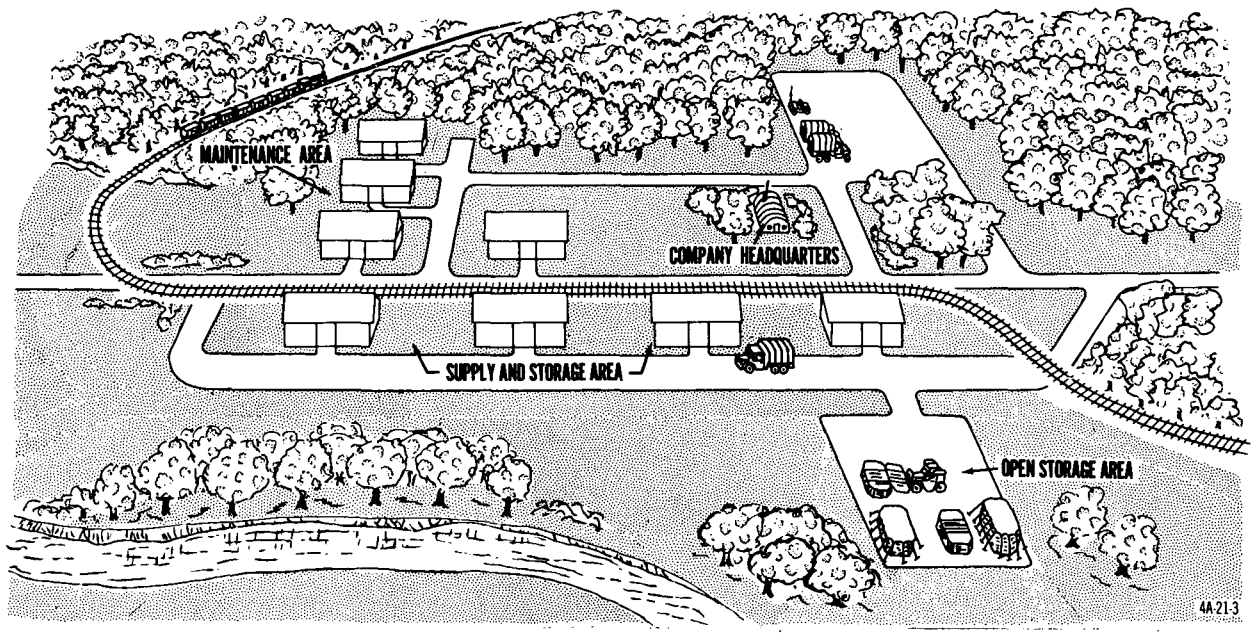
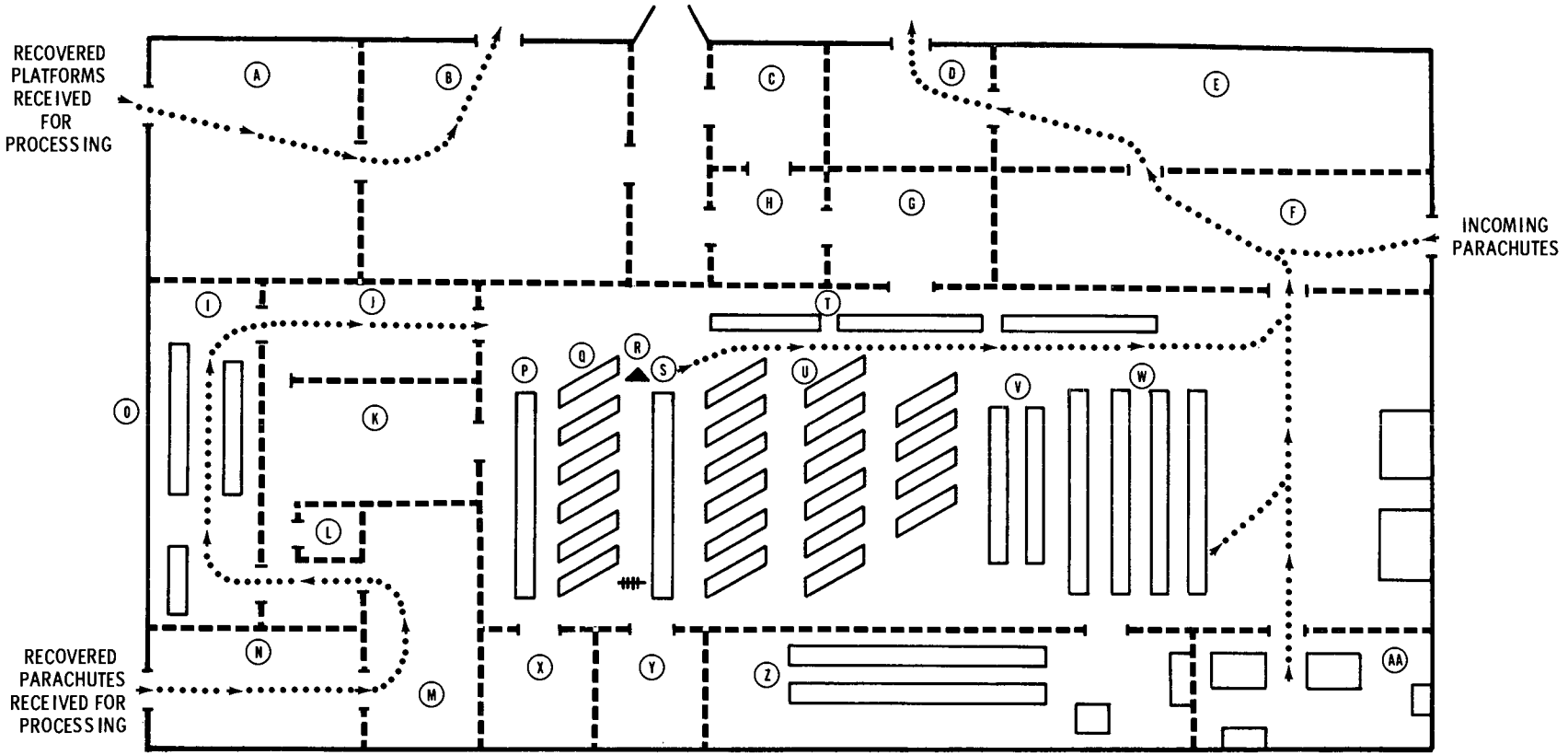


Figure 8. Layout of quartermaster air equipment repair and depot company (suggested).



A - PLATFORM REPAIR
B - PLATFORM STORAGE AND ISSUE
C - SHOP MAINTENANCE
D - PARACHUTE ISSUE
E - PARACHUTE STORAGE PRIOR TO ISSUE
F - PARACHUTE RECEIPT
G - ADMINISTRATIVE OFFICE
H - SHOP OFFICE
I - CLASSIFICATION AND DEMILITARIZATION
J - PERSONNEL PARACHUTE BACKLOG
K - CARGO PARACHUTE BACKLOG
L - SALVAGE
M - INDOOR SHAKEOUT TOWER
N - INCOMING STORAGE (AWAITING SHAKEOUT AND/OR CLASSIFICATION)
O - OUTDOOR SHAKEOUT TOWER
P - CARGO PARACHUTE INITIAL INSPECTION
Q - CARGO PARACHUTE REPAIR
R - CARGO PARACHUTE LINE REPLACEMENT
S - CARGO PARACHUTE FINAL INSPECTION
T - PERSONNEL PARACHUTE INITIAL INSPECTION
U - PERSONNEL PARACHUTE REPAIR
V - PERSONNEL PARACHUTE LINE REPLACEMENT
W - PERSONNEL PARACHUTE FINAL INSPECTION
X - PERSONNEL LOCKER ROOM
Y - TOE GENERAL SUPPLIES
Z - PARACHUTE PACKING AREA (PARTITIONED)
AA - COMPONENT REPAIR

Figure 9. Suggested shop layout and workflow plan, quartermaster equipment repair and depot company.

c. The maintenance area should be arranged to provide for the most effective repair procedures. It must be set up to accomodate parachute, textile, and wood and metal repair activities.

d. The parachute and textile repair shop may be set up in a separate building or in a designated part of one building that accommodates the company's entire maintenance operation. Parachute and textile items should be kept in covered facilities preceding, during and following repair activities. The parachute and textile repair shop should include—

(1) *Bins for items received.* These bins should be constructed with a smooth finish and labelled for storage and segregation of air delivery equipment.

(2) *Shakeout area.* For personnel, extraction, and cargo parachutes, a shakeout area is provided. This may be an indoor shakeout room or an outdoor shakeout tower.

(3) *Initial inspection area.* This area should include a shadow inspection table for the inspection of parachute canopies and a worktable for the layout of parachutes. Four packing tables should be used for inspection of other textile and fabric items to be repaired. The shadow inspection table should be convenient to parachute storage bins in order to decrease handling requirements.

(4) *Machine and work area.* This area contains sewing machines, tables, and bins. All machines except one in the special machines area should be located adjacent to a worktable. In the work area, a table is used for grommet setting and other light hardware repairs. Items of equipment awaiting final inspection are put in smooth-finished bins near the final inspection table. The bins are marked for convenient and accurate sorting of items.

(5) *Final inspection area.* This includes tables for the inspection of parachutes and loose items. A copy of the operating procedure for final inspection should be attached to each table. Loose items that have received final inspection should be sent to storage. Personnel parachutes that have received final inspection are rigger-rolled and sent to storage. After final inspection, cargo parachutes are rigger-rolled, inserted in deployment bags and then sent to storage.

e. A platform repair shop should be located indoors so that repair operations may be performed in covered space. Items awaiting repairs may be stored in open or covered facilities, as necessary.

(1) Items are removed from the storage area and inspected, tested, and repaired in areas used for the repair of metal, wood, and webbing assembly components. Nonrepairable items are put in salvage bins.

(2) Following final inspection, items are stored in open or covered facilities as necessary, for issue to organizations.

38. Workflow

The company commander plans the workflow to gain the most effective results from available facilities. He should make a real effort to design his workflow and layout at the same time since the workflow will depend upon the type and condition of the facilities the company uses in performing its operations. If, for example, it is possible to locate the operating elements in a single building, he may design a workflow similar to that shown in figure 9. If, on the other hand, the platoons or section must work in separate buildings, it will be necessary for him to plan the flow of work to fit the type and numbers of buildings and to take the distances between buildings into account.

Section III. MAINTENANCE OPERATIONS

39. General

The company employs two production methods. These are the production-line or assembly-line method and the job shop method. The method used depends upon the materiel to be repaired and the personnel, facilities, and time

available. Frequently, a combination of both methods may be employed.

a. In an operating situation, the air equipment maintenance platoon headquarters administers and controls the maintenance operations performed by the platoon. It can be regarded, therefore, as a shop office. In this capacity, its specific functions may include the following:

(1) Assigning work to and coordinating activities of the repair sections.

(2) Routing and controlling the flow of work to the repair sections.

(3) Employing the tools of production control to—

(*a*) Reroute work, when necessary, to utilize the capabilities of all repair sections.

(*b*) Temporarily reassign personnel to meet workload demands.

(*c*) Take appropriate action to expedite the delivery of maintenance operating supplies to meet demands.

(*d*) Arrange for the prompt evacuation of materiel as required.

(4) Maintaining production records and reports.

(5) Maintaining required reports on all maintenance operations.

b. Within the repair sections, a section chief is responsible for the proper movement, control, and performance of work. They perform, or supervise the performance of, the following:

(1) Equalizing workloads by the assignment of jobs to the various teams within the section.

(2) Coordinating the work of the various teams of the section.

(3) Reassigning personnel from one job to another to obtain the best productive effort, and maintaining a system of cross-training to facilitate such reassignment.

(4) Conducting inprocess inspections to assure that maintenance is being performed properly.

(5) Keeping the shop office informed of the progress of each job, changes in the status of each job, and any bottlenecks.

(6) Ordering parts that are required for specific jobs when the requirements for such parts were not determined by individual inspection.

40. Production Control

a. General. Production control is the application of common sense, good judgment, and necessary managerial tools to direct and control the flow of work in a manner that results in a maximum output of quality work. This is accomplished by balancing the workload within the company to eliminate overloads or underloads, by keeping abreast of the status and quantity of work in order to prevent bottlenecks, by controlling the quality of work performed by repairmen, and by improving operational procedures.

(1) Overload conditions can result from initial improper routing of work, inability of repairmen to keep pace due to the number of repair tasks of the same type, a substantial reduction of the number of personnel for any reason, or from acceptance of jobs that should have been evacuated.

(2) Overloading may be prevented by the distribution of work so that all sections are working at or near capacity. This requires carefully planned routing of jobs entering the shop.

(3) When overloads and underloads develop despite careful planning, the problem may be resolved by rerouting work. This may involve movement of the item 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. Temporarily adding personnel from sections which have less than capacity workloads is one solution; but individual capabilities must be considered in the shifting of personnel from one section to another. When personnel of a unit are cross-trained in several specialties, the shifting of personnel becomes less of a problem.

(4) If a lack of maintenance operating supplies creates backlogs, immediate steps should be taken to expedite the supply of the necessary supplies. In the meantime, those maintenance operations which do not require parts or for which supplies are available should be performed.

b. Procedure. Production planning and control operations vary from one quartermaster air equipment repair and depot company to another, for no one system can satisfy the requirements of all conditions. General procedures that can be used as a guide to develop practices to meet any requirement are as follows:

(1) Exercise management control and stock accounting for all maintenance operating supplies used by the company.

(2) Maintain complete and current supply publications and other administrative or policy directives affecting quartermaster air delivery item supply, maintenance, and service activities.

(3) Prepare production schedules and establish procedures in order to provide for an efficient flow of work and maintenance operating supplies to the repair sections.

(4) Provide for centralized control for the flow of incoming items requiring maintenance.

c. Devices. Effective production control demands prompt action based on current and readily available information. It requires a continuous flow of current data from all sections of the unit. Such data can be maintained by means of—

(1) A *production control board,* which is a device used to present visually current information on the status of jobs, locations of jobs within the company, and the job conditions of the repair sections. It presents an accurate picture of the distribution of work within the company and is extremely useful in promptly answering queries pertaining to specific jobs and in determining how work should be routed or rerouted. The board may be of any design that meets the requirements of the unit. It should, however, indicate the repair sections involved in the maintenance operation, the status of jobs, the progress of each item through the section, and the workload condition of the sections.

(2) A *control file,* which is used to house job orders. Here again, design will be governed by the requirements of the unit. The files should be divided into sections and the job orders moved from section to section as progress is made on a particular job. The file may, for example, be divided into one section for job orders to be accomplished but for which parts are not yet available; a second for job orders as they enter the repair sections; a third for job orders on which work is being performed; a fourth for job orders which have been completed, have passed the final inspection, and are awaiting pickup; and orders on work that has been completed and picked up but for which pertinent records, such as timesheets and parts requisitions, are incomplete.

(3) *Maintenance request register,* which is a multiple-purpose managerial tool used to record all work requests and job orders received, whether the repair is accomplished in the repair sections. It also indicates the types of equipment being repaired in each section and the number of job orders assigned to each, and identifies the type of repair operation required, the time expended, and the disposition of the item. As with the other tools of control, the design and use of the register may vary.

(*a*) Local policy may require all work requests and job orders to be entered on the same form, regardless of the type of repair required. In this case the maintenance request register will contain columns for each principal repair section. It

may be preferable, however, to sectionalize the register by job title. The register would then contain sections for each principal repair section of the unit.

(*b*) The maintenance request number should identify the section responsible for accomplishing the major portion of the work and the organization or activity initiating the work request. The final inspection column is not completed until the work performed by each of the repair sections involved is determined to be satisfactory.

(*c*) Maintenance request numbers are assigned to work requests in numerical sequence within each section.

d. Implementation. Section chiefs and supervisors are responsible for seeing that production control measures are properly implemented within the repair sections. To do this—

(1) They must see that the sections are divided into teams, as appropriate; maintain a proper balance of skills among teams so that each will be able to perform required operations; provide sufficient space and equipment for each team; and assign work within the limits of team capabilities.

(2) Upon receipt of a job from the production control and supply platoon, the section chief should assign the job to a team having space available to complete the job within the allowable time limits. Each team chief thereafter must closely supervise each job being accomplished by his personnel.

41. Quality Control

Inspection constitutes one of the most important aspects of the maintenance function. It is the means by which the commander can control the quality of the work done in the platoon. Personnel selected for inspection duty should be highly skilled repairmen able to diagnose deficiencies in a piece of equipment, prescribe necessary repairs, and accurately determine the adequacy of the repairs performed.

a. Material should be thoroughly inspected upon receipt to determine whether it is repairable or should be salvaged. If an item is to be repaired, all essential repairs must be specified on the job order. The inspector decides whether defective components or assemblies will be replaced or repaired. His determination is based upon the time and equipment necessary for each operation and the availability of maintenance supplies.

b. Inprocess inspection is extremely important. Emphasizing such inspections will significantly reduce the frequency of rejections by final inspectors. It is often easier to detect potential deficiencies while the repair of equipment is in progress than to find them after the work has been completed. Often, when equipment is dismantled, deficiencies can be noted which may not be detected at any other time.

c. Every piece of material must be inspected prior to its release from the company. The final inspection is the most important means of controlling the quality of the work. Defective repair jobs should be returned for correction.

Section IV. SUPPLY AND STORAGE OPERATIONS

42. General

In addition to its maintenance mission, the quartermaster air equipment repair and depot company has a supply responsibility. The supply operations in which the company is engaged can be classified as organizational supply, shop supply, and technical supply. Organizational supply includes the operations concerned with obtaining and replenishing individual and organizational clothing and equipment for the individual and organizational supplies and equipment organic to the company. Shop supply includes all the functions required to obtain, store, and issue maintenance operating supplies that the company requires to perform its maintenance mission. Technical supply includes the functions required to obtain, store, account

for, and issue quartermaster airdrop items required by supported units.

43. Technical Supplies

The company operates a facility which is, in reality, a small depot, the operational and administrative procedures of which are similar to those of larger field depots. The primary differences are types and quantities of items handled. Another difference is that fact that the company is its own main source of supply, that is, most of the equipment that it supplies are the items it has repaired for return to stock and reissue.

a. The sections of the air supply and service platoon may be regarded as the stock control element and the storage element of the depot. The extent to which the company is involved in stock control functions depends primarily upon theater army policy, command directives, and other guidance and instructions prescribed by higher headquarters.

(1) The company may, under certain circumstances, be assigned a mission that requires it to transmit requirements for quartermaster airdrop equipment to a designated supply agency in the United States. In such an event, the company would have an extensive stock control function that would require attachment of teams or detachments of stock control specialists and technicians from the Quartermaster Service Organization (TOE 10–500). It might also require that the company be furnished, or have access to, automatic data processing equipment such as transceivers and machines to prepare and duplicate prepunched cards.

(2) Under other circumstances, requisitions for quartermaster airdrop items might flow through channels established for quartermaster class II and IV supplies. Under these conditions, the stock control functions of the quartermaster air equipment repair and depot company would be limited to the following:

(*a*) Maintenance of records concerning airdrop equipment received, stocked and issued, and the status and location of stocks.

(*b*) Preparation of reports required by battalion or higher headquarters.

(*c*) Maintenance of a system of controls to insure effective operation of the company's supply functions.

b. Company personnel handling quartermaster airdrop items must be familiar with Army storage practices. Time and spacesaving storage methods must be used. Procedures for storage are contained in TM 743–200. Inspections must be made frequently to reveal and correct supply deterioration, faulty warehousing, fire hazards, and other deficiencies. Regular inventories are required to determine what equipment is on hand and what is required.

CHAPTER 5

AIRBORNE DIVISION QUARTERMASTER AIR EQUIPMENT SUPPORT COMPANY

Section I. GENERAL

44. Organization

The airborne division quartermaster air equipment support company (fig. 10) has a functional platoon organization covering supply and maintenance, packing, and air delivery activities. The company consists of a division parachute office, company headquarters, a supply and maintenance platoon, a packing platoon, and an air delivery platoon. Each platoon is composed of a platoon headquarters and three sections. This vertical functional organization is especially suitable when the unit is employed in a single location. The company may, however, be organized horizontally into operating (composite) platoons on a provisional basis to operate independently in support of separate tactical elements engaged in mounting or marshaling activities in multiple areas or already committed to the assault. Figure 11 illustrates a suggested organization of the company for support of division units located in multiple areas.

a. Division Parachute Office. The division parachute officer exercises operational control and technical supervision of the company through the division parachute office. This office provides the necessary liaison means between the company headquarters and the office of the commander of the airborne division support command for all matters pertaining to supply and maintenance of parachutes and other airdrop equipment, parachute packing, and air delivery operations in support of division elements.

b. Company Headquarters. Company headquarters provides the administrative support required to implement the plans and policies of the division parachute office. Under the immediate direction of the division parachute office, it supervises and coordinates the activities of the platoons (app. II). Company headquarters also provides the necessary command and supervision relative to company administration, mess, communications, organizational maintenance, security, and training activities.

c. Supply and Maintenance Platoon. The supply and maintenance platoon consists of three supply and maintenance sections which are responsible for—

(1) Requisition, receipt, storage, and issue of quartermaster airdrop equipment required by the airborne division.

(2) Maintenance of supply records for airdrop equipment.

(3) Inspection, fabrication, and assembly of rigging components and related equipment.

(4) Supervision of shakeout and drying of parachutes after an airdrop.

(5) Organizational maintenance of quartermaster airdrop equipment.

(6) Attaching parachute assemblies to cargo that is to be dropped and/or assisting in the packing of personnel parachutes and cargo parachute assemblies, when required.

d. Packing Platoon. The packing platoon consists of three sections which are responsible for—

(1) Inspection and packing of personnel and cargo parachutes.

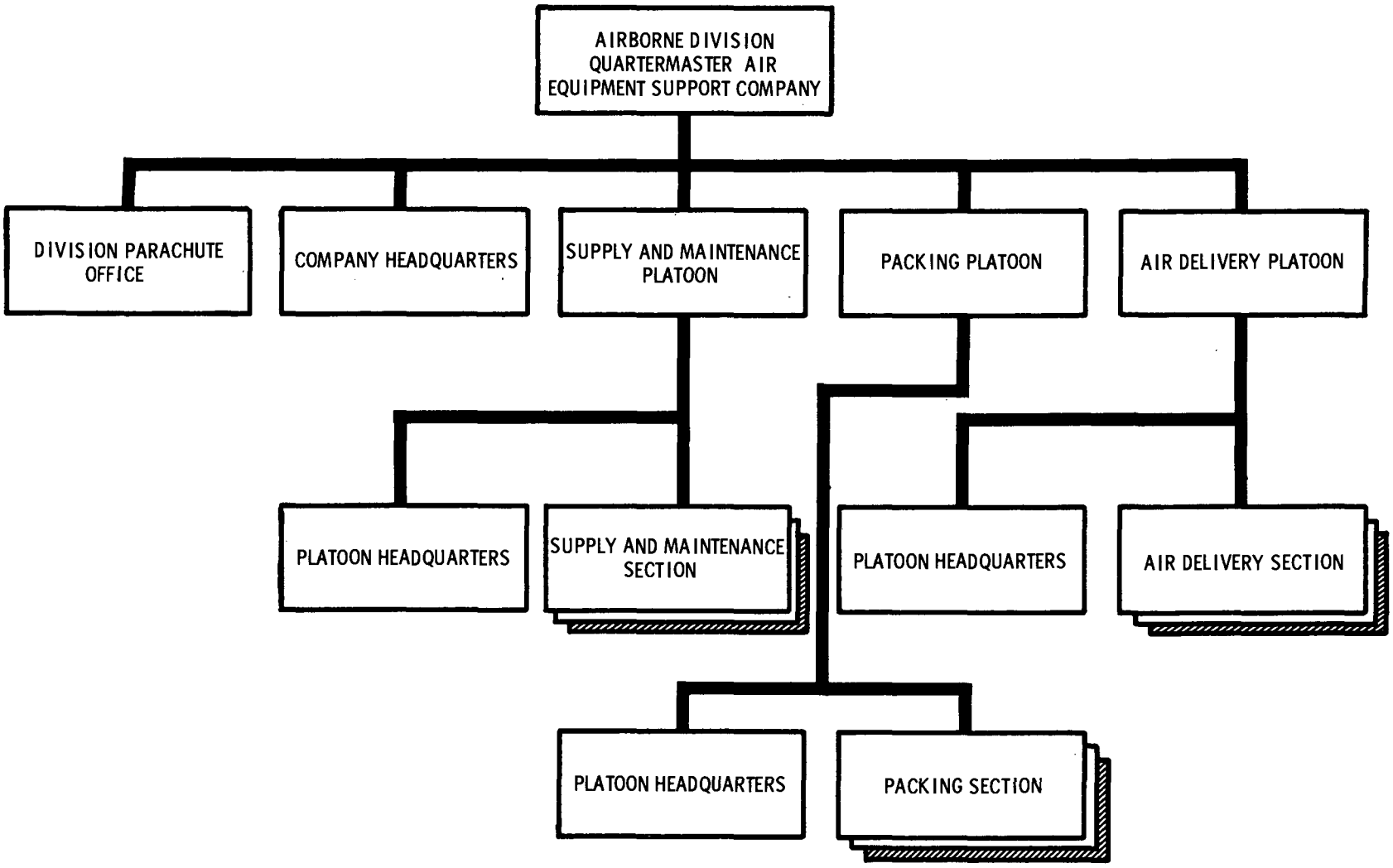
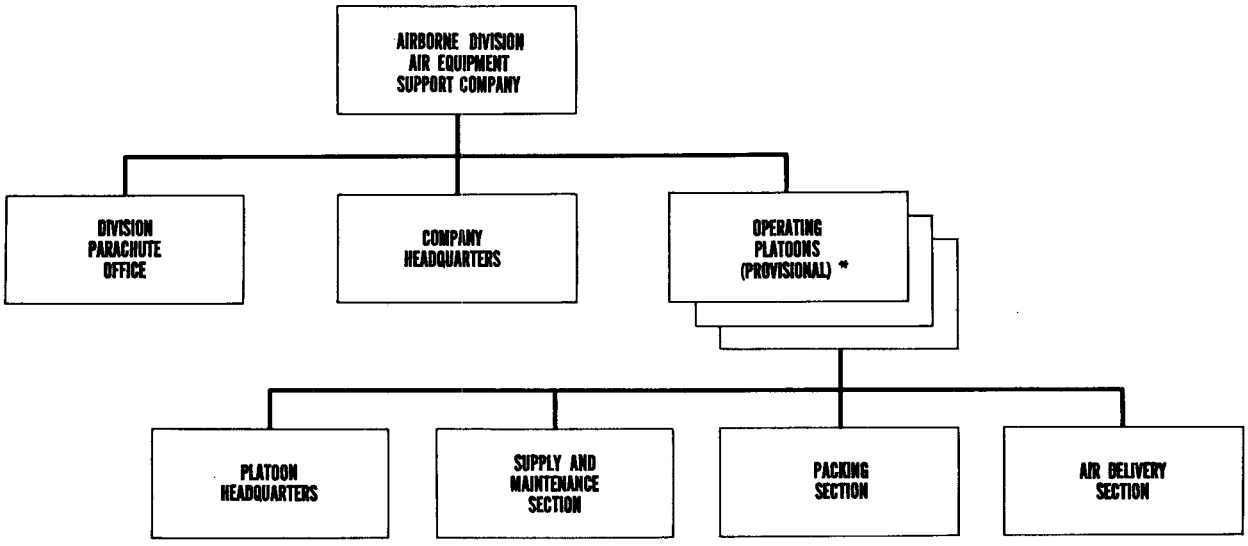


Figure 10. Airborne division quartermaster air equipment support company.



* Temporarily organized to operate independently to accomplish a specific mission.

Figure 11. Airborne division quartermaster air equipment support company organized for support of division units located in multiple areas.

(2) Inspecting and, as required, fitting and adjusting parachutes to wearers.

(3) Providing technical assistance to division personnel in the recovery and evacuation of quartermaster airdrop equipment.

e. Air Delivery Platoon. The air delivery platoon consists of three air delivery sections which are responsible for—

(1) Rigging platform loads and air delivery containers.

(2) Providing technical assistance to units of the division in the preparation of supplies and equipment for air delivery.

(3) Providing personnel to establish a training program for training division personnel in the techniques of rigging and loading equipment and other supplies required in an airborne operation as well as in proper recovery procedures.

(4) Assisting in packing cargo parachutes as required.

45. Capabilities

The company, at full strength, can—

a. Requisition, receive, store, and issue quartermaster airdrop equipment.

b. Inspect and pack parachutes.

c. Inspect and provide technical assistance, as required, in packing, rigging, and loading supplies and equipment.

d. Provide organizational maintenance for quartermaster airdrop equipment.

e. Supervise and assist in the recovery and evacuation of quartermaster airdrop equipment.

f. Support major elements of the airborne division.

46. Assignment

The company is organic to an airborne division.

47. Duties of Personnel

With the exception of the company armorer, all personnel of the quartermaster air equipment support company are qualified parachutists. The primary duties of most enlisted personnel are apparent from the job titles and military occupational specialty numbers listed in TOE 10–337 and explained in AR 611–201. As a general rule, the TOE serves as the basis for the assignment of specific duties within the sections as well as secondary duties such as those of light truck drivers and forklift truck

operators. The total workload and the nature of the company's operations will make necessary, however, a wide latitude of duty assignments among personnel assigned to the nine sections of the company. A parachute rigger is qualified to pack parachutes, perform maintenance on quartermaster airdrop equipment, and rig air delivery containers and platform loads. Personnel are interchangeable in their duty assignments within the company when it is organized on a composite platoon basis. For example, supply and maintenance personnel are qualified by MOS training to perform duties in the packing platoon or air delivery platoon.

a. Division Parachute Office.

(1) The division parachute officer has full responsibility for the company's mission performance in support of the airborne division. He performs the following specific duties:

(*a*) Plans, directs, coordinates, and supervises the parachute supply, maintenance, and air delivery operations performed by the company.

(*b*) Plans, prepares, and issues operational orders and instructions.

(*c*) Coordinates with tactical planners to determine quartermaster airdrop equipment required to support airborne operations.

(*d*) Inspects and provides supported units with technical assistance in packing, rigging, and loading supplies and equipment for air delivery.

(*e*) Advises the division support command commander regarding the capability of the company.

(2) The parachute operations chief assists the division parachute officer in planning, coordinating, and supervising all technical operations necessary for the accomplishment of the company mission. The parachute operations chief is qualified to perform all the duties of a parachute rigger outlined in AR 611–201. His duties include—

(*a*) Assisting the division parachute officer in the planning, preparation, and issuance of operational orders and instructions.

(*b*) Making a continuous study of the company's operational requirements and capabilities to assist the division parachute officer in the preparation of estimates and plans for the successful performance of the company's support mission.

(*c*) Working in close cooperation with division air liaison groups and airfield control groups on such air delivery functions as rigging, loading, and preparation time deadlines; presenting briefings on weights, cubages, and other technical data pertaining to rigged loads.

(*d*) Technically directing and coordinating the activities of available company personnel during an air supply operation.

(*e*) Assisting in the inspection of technical operations.

(*f*) Making certain that sufficient airdrop equipment is requisitioned, received, stored, issued, and shipped to fulfill the mission of the company.

(*g*) Assisting the division parachute officer in the coodination of the technical activities of the supply and maintenance, packing, and air delivery platoons.

(*h*) Reviewing training programs to insure adequate training of personnel.

(*i*) Coordinating company activities with other units and organizations requiring support by the company.

(3) The parachute operations chief is assisted by the air delivery expediter who, by virtue of his specialist training in the use and care of the company's organic air delivery equipment, provides technical advice and assistance to the operators. In addition to his MOS duties as a parachute rigger, the air delivery expediter is a technical specialist in—

(*a*) Nomenclature and construction of personnel and cargo parachutes and all other items of quartermaster air delivery equipment.

(*b*) Breaking strength, texture, moisture content, and weave of all textiles, ropes, thread, cord, and hardware needed in parachute maintenance.

(*c*) Inspection of parachutes and other air delivery equipment.

(*d*) Methods and techniques employed in recovery of parachutes and heavy drop equipment.

(*e*) Techniques of rigging platform loads and air delivery containers.

(*f*) Repair of parachutes, including operation, adjustment, and essential maintenance of sewing machines.

(*g*) Techniques and methods for the care and preservation of textiles.

b. Company Headquarters. The company commander is responsible for the establishment of the company command post and the performance of unit administrative and support activities. He maintains close liaison with the division parachute officer to insure adequate and timely planning for training missions and for actual operations. He establishes requirements and planning for company quarters, mess, and operational facilities. He directs the training of the company. He makes recommendations for suitable employment of the company when supporting separate units or organizations of the division.

c. Platoon Headquarters. Each platoon leader is responsible for the performance of all duties necessary for efficient operation of his platoon. These include supervising and coordinating platoon functions, training his platoon, supervising the preparation of records and reports relative to platoon operations, and advising the division parachute officer on the status of platoon operations, equipment, and personnel. Platoon leaders of the quartermaster air equipment support company have the following specific responsibilities related to the technical activities of their platoons.

(1) The supply and maintenance platoon leader is responsible for the proper performance of all activities of his platoon to include requisitioning, storage, and issue of quartermaster airdrop equipment required by the airborne division; maintenance of supply records; inspection, fabrication, and assembly of rigging components and related equipment; provision of personnel who supervise the shakeout and drying of parachutes after an airdrop; organizational maintenance of quartermaster airdrop equipment; and attaching parachutes to cargo that is to be dropped, and/or assistance in the packing of personnel and cargo parachutes.

(2) The packing platoon leader is responsible for the activities of his platoon in the inspection and packing of personnel and cargo parachutes and assistance to parachutists in the fitting and adjusting of parachutes. He is also responsible for the duties performed by personnel of the company who give technical assistance to troops engaged in recovery and evacuation of quartermaster airdrop equipment.

(3) The air delivery platoon leader is responsible for the activities of the platoon in rigging platform loads and air delivery containers; and providing technical assistance to units of the division in the preparation of supplies and equipment for air delivery. He is responsible for providing personnel to establish a training program for the training of division personnel in the techniques of rigging and loading supplies and equipment required in an airborne operation. He also employs air delivery personnel, as required, to assist in the packing of cargo parachutes.

d. Section Level. Section supervisors and section leaders are responsible for supervising the activities of their sections. They must assure that their sections accomplish work in accordance with established schedules and standards of proficiency. They stand ready to reorganize their sections to accomodate specific operations. Section leaders should have a thorough knowledge of quartermaster airdrop equipment items so that they may acquire the

flexibility required to supervise various work assignments. For example, section supervisors in the supply and maintenance platoon, who are specially trained and qualified in all activities performed by their platoons, should also be qualified riggers and have a working knowledge of parachute inspection and packing.

(1) *Supply and maintenance sections.*

(*a*) The section supervisors are responble for the efficient operation of their sections. They regulate and maintain production, check each parachute log record, and inspect all parachutes before and after repairs are made. They requisition, receive, store, and issue all quartermaster airdrop items and supplies required to support division elements. Also, they are responsible for the performance of the company's internal supply functions.

(*b*) The senior parachute repairman, parachute repairmen, and parachute repair assistants must be familiar with all aspects of parachute maintenance including detection of damaged or weak spots. Parachute repairmen may be employed to assist parachute packers.

(2) *Packing sections.*

(*a*) The section chiefs of the packing sections are responsible for the efficient operation of their sections. They are assisted by the senior noncommissioned officers of their sections including the parachute packer supervisors and senior parachute packers. Two parachute packer supervisors are assigned to each packing section and serve as squad leaders (subordinate supervisors).

(*b*) Key operating personnel include the parachute packers and their assistants who perform their duties under the immediate guidance of the senior parachute packers. Parachute packers and their assistants may be divided into teams before being assigned duties such as laying out, packing, or adjusting parachutes. Parachute packers are responsible for inspecting and packing all types of parachutes for jump or drop. They must be able to recognize defects in and damage to parachutes while inspecting and packing in order that unserviceable parachutes may be transferred to the supply and maintenance sections for repair. Parachute packers should be capable of repairing parachutes.

(3) *Air delivery sections.*

(*a*) The section supervisors are charged with the efficient operation of their sections. They coordinate with platoon headquarters personnel in expediting the supply of parachutes, platforms, air delivery containers, and related equipment required by the sections to complete their operations. They supervise the loading and rigging of air delivery equipment and the packing of cargo parachutes, as required. They also conduct training programs for units of the division in the preparation of supplies and equipment for air delivery.

(*b*) Senior air delivery specialists, air delivery specialists, and air delivery assistants comprise the key operating personnel assigned to the sections. Under the immediate guidance of the senior air delivery specialists, the air delivery specialists and their assistants rig platform loads and air delivery containers. As they are also qualified packers, air delivery specialists are capable of packing cargo parachutes used in the preparation of rigged loads.

Section II. COMPANY OPERATIONS

48. Concept

The airborne division quartermaster air equipment support company is normally located with the airborne division in the communications zone as a part of theater army reserves. It may be located in the zone of the interior

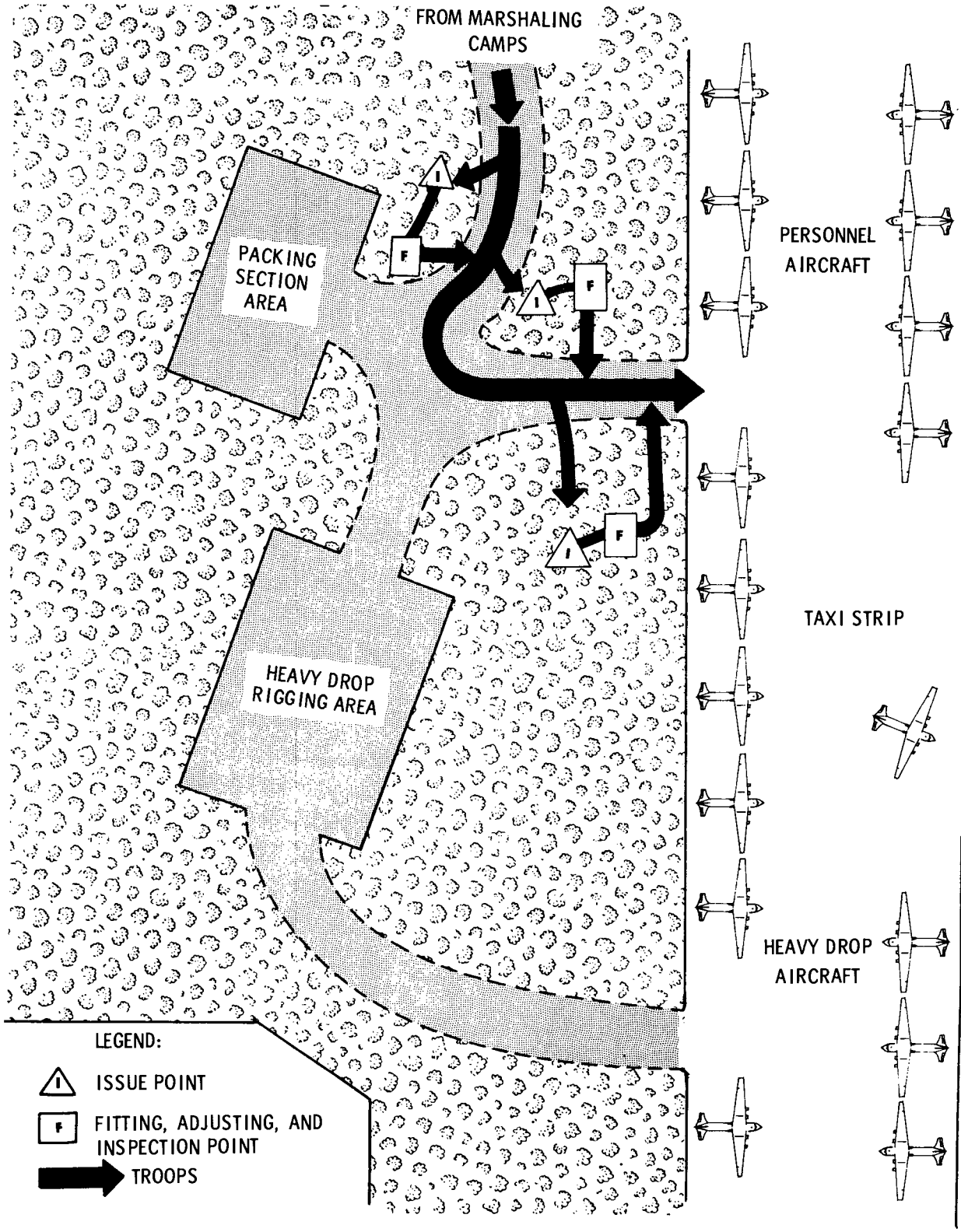


Figure 12. Suggested layout for airborne division quartermaster air equipment support company activities in the marshaling area.

as a strategic reserve. Normally it operates in support of the division in mounting and marshaling areas in the communications zone. It also supports the division in the zone of the interior when division units are in a training status or on standby for commitment to a theater of operations.

a. Mounting Area Operations. In the mounting area, the company provides technical assistance to divisional units preparing for an airborne operation. Supply and maintenance platoon personnel issue personnel parachutes to all division troops. Personnel of the air delivery platoon assist and/or supervise combat elements in the rigging and loading of supplies and equipment. Maximum preparation for the airborne assault is made in the mounting area including the designation of teams to accompany the divisional elements committed to the assault.

b. Marshaling Area Operations. In the marshaling area (fig. 12), the divisional elements committed to an assault complete final preparations for airborne attack. The team of parachute packers, repairmen, and air delivery specialists assigned to each tactical element assist wearers with the fitting and adjusting of their parachutes as required. They will assist with the attaching of cargo parachute to cargo loads.

49. Method

The company stores and maintains sufficient quartermaster airdrop equipment to support the airborne division in garrison or during field or combat operations. It issues this equipment to division units engaged in packing, rigging, and loading supplies prior to the assault, including the first 3 day's supplies to be delivered with the assault echelon. After the division has been committed, continuing daily air delivery support must be provided by nondivisional theater army support units such as the quartermaster air delivery company.

a. In a tactical operation, selected personnel of the company, organized as teams, may accompany the assault echelon to provide divisional units technical assistance and supervision in the recovery and evacuation of quartermaster airdrop equipment.

b. Requirements for quartermaster airdrop equipment including supply and maintenance materials, that exceed the organic capabilities of the company must be provided by the quartermaster air equipment repair and depot company.

50. Types of Operations

The company engages in the following overall operations:

a. Supply and Maintenance Operations. Supply and maintenance operations are concerned with—

(1) Procurement of the supplies and equipment required by the company to accomplish its organizational maintenance mission.

(2) Receipt, storage, and issue of quartermaster airdrop equipment.

(3) Recovery of parachutes and related quartermaster airdrop equipment.

(4) Methods and procedures used to maintain the division's quartermaster airdrop equipment in top operating condition.

b. Air Delivery Operations. Air delivery operations are concerned with the methods and procedures used to pack and rig cargo loads for air delivery.

c. Packing Operations. Packing operations are concerned with the inspection and packing of the parachutes utilized by the division.

51. Coordination

Coordination among the division parachute officer, the commander of the airborne division support command, division air liaison personnel, and the S3 officers of the organizations with which the company is associated is of the greatest importance in planning for and executing air delivery operations. In the execution of these operations, the company is called upon to provide technical assistance in rigging, dispatching, manifesting, and loading procedures. Although weight and balance information are compiled by the unit being moved, the parachute operations chief of the quartermaster air equipment support company may assist in the compilation of these data.

52. Reconnaissance

The general area in which the company operates is designated by the commander of the airborne division support command. After the general area is designated, the division parachute officer, with the assistance of the parachute operations chief and the company commander, makes a reconnaissance to select the most desirable site within the general area.

53. Site Selection

The principal factors to be considered in site selection are the following:

a. Location. The company should be located as close as possible to road and rail nets leading to sources of supply and to air delivery preparation areas and marshaling areas on or near the airfield, so far as dispersion factors permit. It should also fit into the pattern of operations established for the staging of the airborne division. Under combat conditions requiring extensive dispersion, division units (such as brigades and/or battalions) marshal in two or more base camps. Two elements of the division should be separated from each other and from departure airfields by a distance that precludes destruction of two elements by a single nominal-yield nuclear weapon.

b. Space Requirements. With the exception of requirements for barracks, messhall, and motor pool, the company can operate effectively in an area of about 200,000 square feet—48,000 square feet for inspection and packing operations; 117,000 feet for supply, maintenance, and storage operations; and 35,000 square feet for air delivery operations. The number of buildings required depends upon the extent and condition of facilities at the operating site and existing operating conditions. It may be necessary to use some outdoor space if the number or condition of the available buildings is inadequate. Parking and turn-around space for vehicles must be available.

c. Terrain. Level ground adjacent to the company working area is necessary for the quarters, parking space, and temporary storage area. The ground should be reasonably high with slopes affording good drainage.

54. Layout

The division parachute officer, in coordination with the company commander, should develop a plan for the layout of the company (fig. 13). Permanent buildings, when available, should be used by the platoons in performing their operations. However, a layout plan should be made for either buildings or tents for the division parachute office and company headquarters. Among the factors to be considered in planning the layout are the following:

a. Division Parachute Office and Company Headquarters. Company headquarters, which is normally located in close proximity to the division parachute office, and the tents or buildings comprising the company area should be located as close as possible to platoon operating areas. The company area should contain the company supply room, orderly room, messhall, recreation room, living quarters, and vehicle parking area.

b. Supply and Maintenance Sections. The supply and maintenance sections can operate effectively with approximately 117,000 square feet of floor space, which includes warehouse space required for the storage of quartermaster airdrop equipment when the company is operating as a unit. In this case, *ideal* warehouse facilities for parachute supply, maintenance, and storage operations should afford approximately 25,000 square feet of floor space, have a cement floor and concrete loading platforms, be located next to a railroad siding, and be surrounded by a hardtop surface such as cement or asphalt. The warehouses and storage facilities are normally separate from, but readily accessible to, the operating and company areas. The sections will require a storage shed in the main operating area for the troop-type parachutes and related equipment that the company receives, stores, issues, packs, and maintains. All airdrop items do not require closed storage. Air delivery platforms, for example, can be stored under tarpaulins in the open. If possible, a shakeout room and a drying tower should be built into one of the buildings used for parachute storage. If the shakeout areas and drying towers are outdoors, they should be located so that they are readily accessible to supply and maintenance and packing personnel.

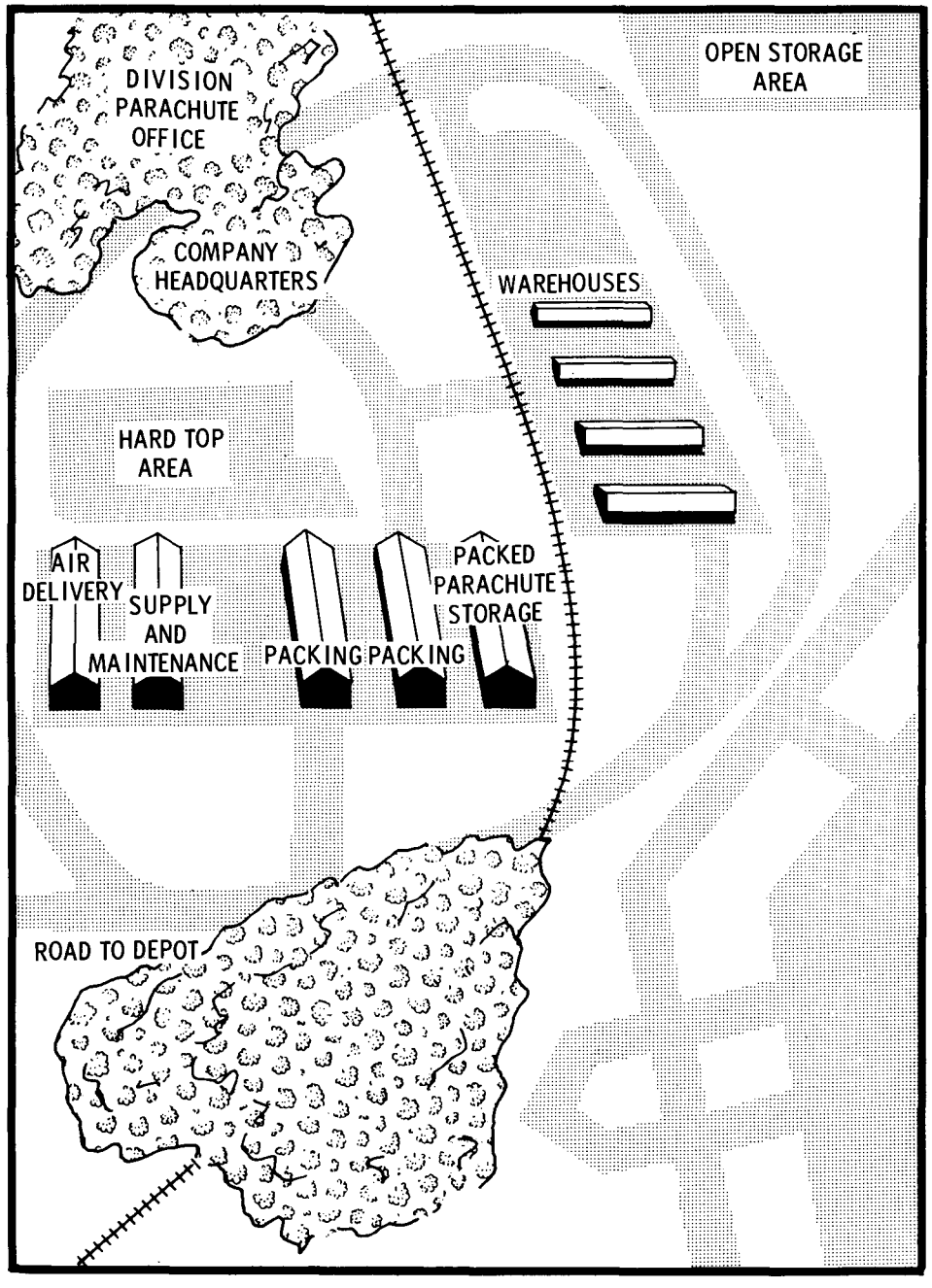


Figure 13. Suggested layout of airborne division quartermaster air equipment support company.

c. Packing Sections. Normally, the packing sections will require buildings with a total floor space of approximately 48,000 square feet when the company is operating as a unit. Most of the floor space will be occupied by the packing tables. A suggested layout for a packing shed is shown in figure 14.

d. Air Delivery Sections. The air delivery sections will require approximately 35,000 square feet of smooth floor space. Most of the floor space will be left clear to accomodate the servicing of medium and heavy cargo parachutes. Facilities should be available to anchor the apex and riser loops when packing the

LEGEND;

- (A) STORAGE AREA (UNPACKED PARACHUTES)
- (B) INDOOR DRYING AND SHAKEOUT TOWER
- (C) RECEIVING POINT (PARACHUTES FROM DRYING AND SHAKEOUT TOWERS)
- (D) RECEIVING POINT (PARACHUTES FROM SUPPLY AND MAINTENANCE SHED OR FROM DROP ZONE)
- (E) PARACHUTE PACKING TABLES
- (F) PACK-CLOSING AND FINAL INSPECTION TABLES
- (G) PICKUP POINT (DAMAGED PARACHUTES TO SUPPLY AND MAINTENANCE SHED)
- (H) PICKUP POINT (PACKED PARACHUTES TO STORAGE)

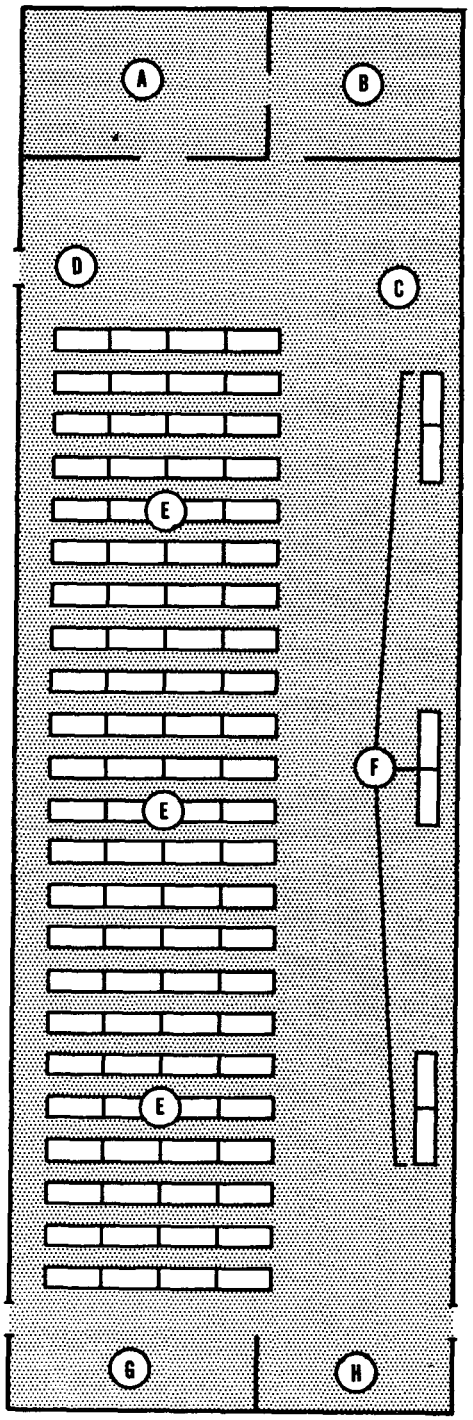


Figure 14. Layout of packing shed (suggested).

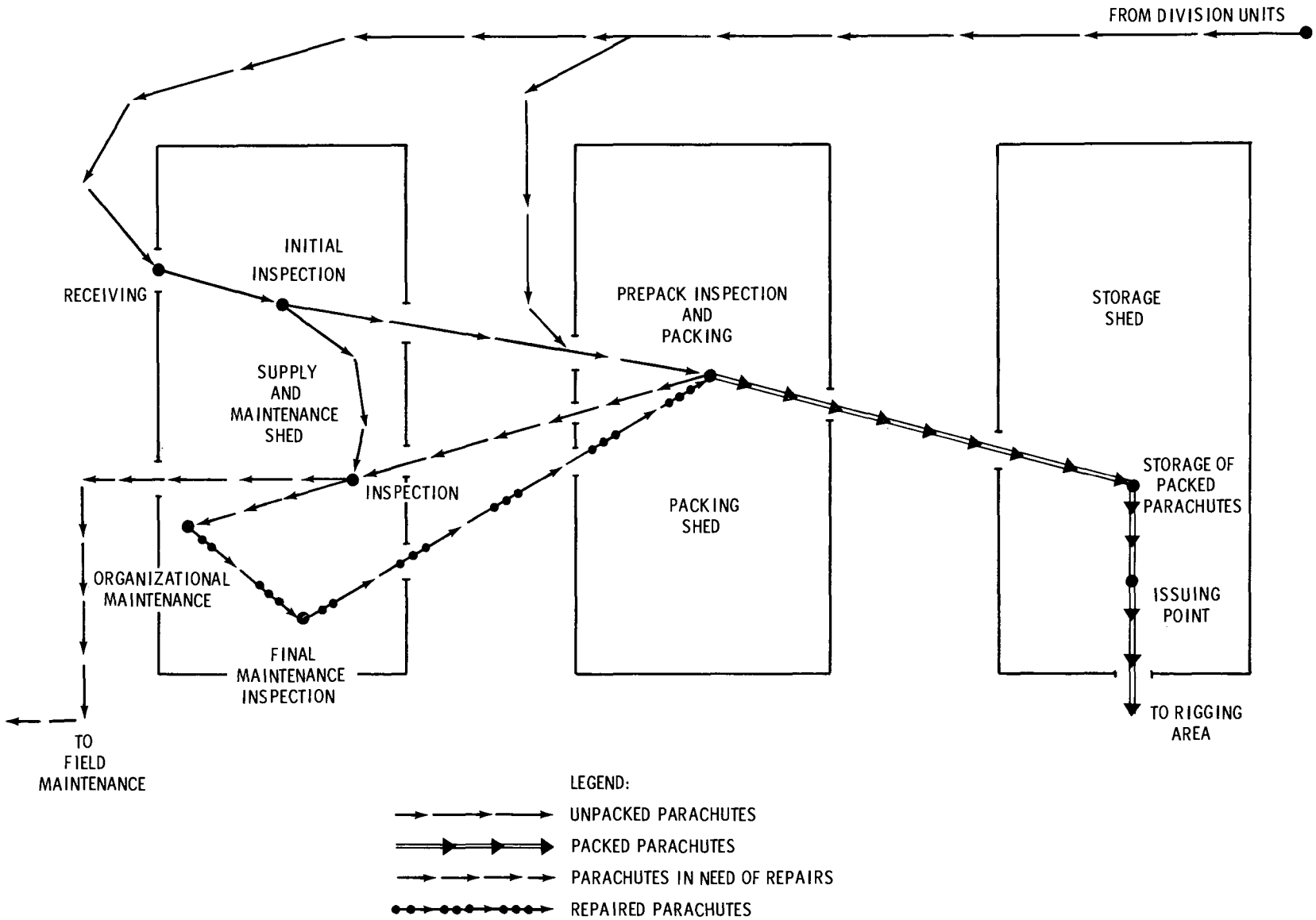


Figure 15. Flow of parachutes through sheds (suggested).

G–11A and G–12D cargo parachutes. In addition, the open floor space may be used for training in air delivery packing and rigging techniques.

55. Workflow

Simultaneously with planning the company layout, the company commander must plan the company workflow considering the following factors.

a. Workflow is largely dependent on the type and location of the facilities the company uses in performing its operations. When buildings are used, it will be necessary to plan the workflow to conform to the building locations. Buildings located close together make it an easy matter to draw up a workable, efficient workflow plan. When buildings are widely separated, considerable planning, foresight, and improvision are required in order to produce the best possible workflow plan. Suggested workflow of parachutes through supply and maintenance, packing, and storage sheds is illustrated in figure 15.

b. The layout of equipment and facilities within each platoon's operating area should be planned to establish, so far as possible, a straightline workflow.

56. Manifesting and Dispatching Cargo Loads

Each unit involved in an air movement will normally prepare its own manifests and will furnish Air Force personnel with a copy of the manifest. In a division air movement involving the quartermaster air equipment support company, personnel of the company will manifest and dispatch the company's equipment included in the operation.

a. Manifesting procedures will be performed as outlined in AR 55–10.

b. Dispatching consists of assembling the various air delivery containers and rigged loads at the marshaling areas and arranging them by airplane loads as determined by the manifests. For this purpose, control points at loading sites and inspection points at loading zones should be established. Transportation is then assigned to the various loads to insure their delivery to the airplane as expeditiously as possible. The air delivery equipment should be placed on trucks or trailers equipped with heavy-duty conveyors.

Section III. SUPPLY AND MAINTENANCE OPERATIONS

57. Responsibility

When the company is operating as a unit, activities of the supply and maintenance platoon are the direct responsibility of the platoon leader. The supply and maintenance sections, under the immediate supervision of the section supervisors, are responsible for—

a. Requisition, storage, and issue of supplies and equipment included in the categories described in paragraph 50*a*.

b. Periodic inspections and organizational maintenance of parachutes and related airdrop equipment held in storage.

c. Effective coordination with other company elements for technical assistance in processing and repair of damaged equipment.

d. Inspection, fabrication, and assembly of rigging components and related equipment.

e. Maintenance of supply records for airdrop equipment.

f. Establishment and operation of an effective shop system to insure that each piece of equipment received for inspection and/or repair is subjected to a comprehensive series of checks to render it in top operating condition. (Maintenance methods and systems used will be determined by the nature and volume of the company's total workload.)

58. Storage

Personnel of the supply and maintenance sections charged with storage duties must be familiar with standard Department of the Army storage practices (TM 743–200). Storage practices will be guided also by division standing operating procedures and directives from higher headquarters. Because of the diversity of supplies stored by the quartermaster

air equipment support company, time- and space-saving methods must be employed. Inspections must be made at frequent intervals to make certain that supply deterioration, faulty warehousing, fire hazards, and other deficiencies are kept to a minimum. Frequent inventories should be taken to enable the company commander to see at a glance what equipment is on hand for a particular mission and what equipment is required.

59. Issue

The issue of supplies and equipment must follow standard Department of the Army policies and principles and must be based on the directives of the commander of the airborne division support command and higher headquarters. Personnel of the supply and maintenance sections charged with issuing supplies must make certain that a receipt is executed for each issue.

a. Service Mission Supplies. Supplies required for the accomplishment of the company's service mission are issued to the using elements of the company in conformance with current standing operating procedures.

(1) Expendable items, such as cord, wax, webbing, and tape, may be issued from a stockroom located in the supply and maintenance shed or in the parachute issue shed. One of several methods may be used. A daily issue may be made in response to requests submitted by the company operating elements. Another method is to make issues to individuals as needed.

(2) Nonexpendable items, such as sewing machines and packing tables, are issued to the section leaders involved. The supply and maintenance officer should make informal checks from time to time to make certain that nonexpendable items are serviceable.

b. Division Support Supplies. Items of quartermaster airdrop equipment, such as air delivery containers, platforms, and platform assemblies, and free-type personnel parachutes, are issued to divisional units upon approval of requisitions submitted to the division parachute officer by the units. Troop-type parachutes may be issued to individuals or units on the basis of flight manifests prepared and submitted in advance by unit personnel officers. The issue of parachutes is effected most expeditiously by the establishment of "at plane" supply points, when possible, so that jumpers may move directly from issue point to the inspection point. In issuing troop-type personnel parachutes to divisional units the following factors must be considered:

(1) In training jumps, when the situation permits, parachutes are issued to troops lined up at the issue point according to stick and planeload. Each man calls out his name as he approaches the issue point to receive a parachute.

(2) For combat jumps, if the time element permits, parachutes may be issued in the same manner as prescribed for training jumps above. If the time elements will not permit issue of parachutes as described above, parachutes may be issued from trucks parked at designated issue points on the departure airfield.

(3) After the departure of the parachutist's aircraft, the officer or noncommissioned officer in charge of the issue detail makes certain that all extra parachutes, equipment, and supplies are recovered from the issue points and returned to the company. He assigns certain men to remain at the airfield to recover static lines and other equipment that return with the aircraft.

Section IV. PACKING OPERATIONS

60. Responsibility

Personnel of the packing sections inspect and pack personnel and cargo parachutes assigned to their sections for servicing. A rigger-assistance team, normally consisting of packing or other rigger-qualified personnel, is responsible for assisting in the fitting, adjusting, and inspection of parachutes of wearers prior to their

enplaning. Recovery teams which may accompany airborne division tactical elements in the assault are responsible for rendering supervisory and technical assistance in the recovery and evacuation of quartermaster airdrop equipment from the objective area.

61. Packing

Parachute packing is organized in accordance with local conditions. Parachutes must be completely dry before they are packed. The packing procedures for each type of parachute are discussed in detail in appropriate publications listed in appendix I.

62. Inspection

Parachutes, because of their use and nature, must be carefully and systematically inspected. In some cases, the inspection may be a visual check of the packed parachute to make certain that it is ready for issue. In other cases, the inspection may be a complete physical check of all components. The first type inspection may be either an instorage or a routine inspection; the second, a repack inspection or a drop test. The routine and repack inspections have been singled out, incidentally, for these are the ones which are ordinarily conducted on a periodic basis. Others that are performed, as part of packing and maintenance operations, include in-process packing and final packing inspections and maintenance classification and final maintenance inspections. There is also a rigger-assistance inspection performed by this platoon. This inspection (rigger check) is the routine inspection performed on the parachutes of jump personnel immediately prior to enplaning.

Section V. AIR DELIVERY OPERATIONS

63. Responsibility

The air delivery sections rig air delivery containers and platform loads in preparation for airdrop. They provide technical assistance to division units engaged in preparing supplies and equipment for airdrop. The sections are responsible, as well, for inspection and, as required, for assistance in the packing of the company's medium and heavy-cargo parachutes. They also provide personnel to establish and conduct training programs for division personnel in the techniques of rigging and loading equipment and supplies needed in support of an airborne operation.

64. Packing Air Delivery Containers

Division units pack their own air delivery containers. The personnel of the air delivery sections, together with personnel of other sections as required, provide technical assistance during the packing of air delivery containers. The types of air delivery containers normally used by the quartermaster air equipment support company are discussed in paragraph 8. Complete instructions for packing all types of containers are contained in the TM 10–500 series.

65. Rigging Platform Assemblies

Division units rig their own heavy equipment, such as trucks, trailers, and large weapons, with technical assistance from qualified personnel of the air delivery sections and personnel of other sections as required. The types of platforms and platform assemblies normally used by the company are discussed in paragraph 8. Complete instructions for rigging various assemblies are contained in appropriate manuals and technical bulletins. The methods employed in rigging a large number of platform assemblies will vary with the number and types of assemblies required for the mission.

66. Servicing Parachutes

Personnel of the air delivery sections may assist, as required, in the servicing of cargo parachutes to include packing, drying, and inspection. Repacking, inprocess packing, and final packing inspection will be performed as outlined in paragraph 61.

APPENDIX I

REFERENCES

1. Army Regulations (AR)

55–10	Military Standard Transportation and Movements Procedures (MILSTAMP).
59–106	Operation of Air Force Terminals
220–346	Journals and Journal Files
310–3	Department of the Army Publications: Preparation, Coordination, and Approval
320–5	Dictionary of United States Army Terms
320–50	Authorized Abbreviations and Brevity Codes
335–60	Morning Report
380–5	Safeguarding Defense Information
600–20	Army Command Policies and Procedures
611–101	Manual of Commissioned Officer Military Occupational Specialties
611–201	Manual of Enlisted Military Occupational Specialties
643–55	Disposition of Personal Effects—Military Operations
700–26	Designating, Redesignating, and Naming Military Aircraft.
700–2300–1	Motor Vehicles
711–16	Installation Stock Control and Supply Procedures
711–25	Stockage of Supplies and Maintenance of Authorized Stockage Lists
725–50	Military Standard Requisitioning, Receipt, and Issue Procedures
735–5	Receipt, Shipment, and Issue of Property
735–10	Principles and Policies: Accounting for Lost, Damaged, and Destroyed Property.
735–35	Supply Procedures for TOE Units, Organizations, and Non-TOE Activities
740–20	Preparation for Shipment
746–5	Color and Marking of Army Materiel

2. Department of the Army Pamphlets (DA Pam)

108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings
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 Bulletins, Lubrication Orders, and Modification Work Orders.
310–5	Index of Graphic Training Aids and Devices
JCS Pub.–1	Dictionary of United States Military Terms for Joint Usage
508–2	The Army Personnel Affairs Handbook

3. Field Manuals (FM)

1–100	Army Aviation
3–85	Chemical Service Units

5–20	Camouflage: Basic Principles and Field Camouflage
5–31	Use and Installation of Boobytraps
5–36	Route Reconnaissance and Classification
10–4	Quartermaster General Support Battalion
10–60	Supply of Subsistence in a Theater of Operations
10–63	Handling of Deceased Personnel in Theaters of Operations
10–64	Quartermaster Class II and IV Supply in Theaters of Operations
20–15	Tents and Tent Pitching
21–5	Military Training
21–6	Techniques of Military Instruction
21–10	Military Sanitation
21–11	First Aid for Soldiers
21–15	Care and Use of Individual Clothing and Equipment
21–20	Physical Training
21–26	Map Reading
21–30	Military Symbols
21–40	Small Unit Procedures in Chemical, Biological, and Radiological (CBR) Operations.
21–41	Soldier's Handbook for Nuclear, Biological, and Chemical Warfare
21–48	Chemical, Biological, and Nuclear Training Exercises and Integrated Training.
21–75	Combat Training of the Individual Soldier and Patrolling
24–16	Signal Orders, Records, and Reports
31–15	Operations Against Irregular Forces
31–25	Desert Operations
31–70	Basic Cold Weather Manual
31–71	Northern Operations
31–72	Mountain Operations
55–4	Transportation Movements in Theaters of Operations
55–30	Motor Transportation, Operations
57–10	Army Forces in Joint Airborne Operations
72–30	Jungle Operations
100–5	Field Service Regulations: Operations
100–10	Field Service Regulations: Administration
101–5	Staff Officers' Field Manual: Staff Organization and Procedure
101–10	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data (Part I).

4. Technical Manuals (TM)

3–220	CBR Decontamination
10–405	Army Mess Operations
10–412	Recipes
10–500 series	Air Delivery of Supplies and Equipment
10–500–12–3	Airdrop of Supplies and Equipment: Rigging Typical Mass Loads on Modular Platform.
10–501 series	Army Parachutes
10–1101	Petroleum Handling Operations
10–1103	Quartermaster Petroleum Handling Equipment
10–1107	Petroleum Handling Operations for Aviation Fuel
10–1113	Petroleum Tank Vehicle Operation
10–1670 series	Organization, Field, and Depot Maintenance, Air Delivery Equipment

10–8110–201–15	Operator, Organizational, Field, and Depot Maintenance Manual: Drum, Fabric, Collapsible, Liquid-Fuel, 500-gallon Capacity (Nonvented).
21–305	Manual for the Wheeled Vehicle Driver
38–230	Preservation, Packaging, and Packing of Military Supplies and Equipment
38–250	Packing and Handling of Dangerous Materials for Transportation by Military Aircraft.
38–750	Army Equipment Record Procedures
57–210	Air Movement of Troops and Equipment
57–220	Technical Training of Parachutists
743–200	Storage and Materials Handling
743–200–1	Storage and Materials Handling

5. Technical Bulletins (TB) Quartermaster

10–501 series	Parachutes
10–1610–1	Utilization of Materials Handling Equipment: Accessories and Aids

APPENDIX II

SUPPLY HANDLING CAPABILITIES, QUARTERMASTER AIR DELIVERY COMPANY

Air delivery item	Payload (each)	Number required	Payload (total)	Weight (each)	Weight (total)
A–22 Container	1 Ton	180	180 Tons	58 lbs	10,440 lbs
Platform Types All Modular*	4 Tons	3	12 Tons	581 lbs	1,743 lbs
6000 LBP	3 Tons	2	6 Tons	640 lbs	1,280 lbs
A–21 Container	¼-Ton	5	1¼ Tons	31 lbs	155 lbs
A–7A Container	¼-Ton	5	1¼ Tons	8 lbs	40 lbs
Subtotals			200.5 Tons		13,658 lbs
G–12D Parachute		180		130 lbs	23,400 lbs
T–7A or G–13 Parachute		10		25 lbs	250 lbs
G–11A Parachute		10		250 lbs	2,500 lbs
15 ft Extr Prcht		20		26 lbs	520 lbs
Subtotal					26,694 lbs
Grand Total Equipment Weight:					40,352 lbs (20.17 Tons)

Daily tonnage requirements: 200 tons to be dropped
20 tons equipment to drop
220 tons daily total tonnage

Assumptions: 1 supply handler can handle .50 tons/hr
1 supply handler can handle 5.0 tons/10-hour day
220 tons × 2 handlings = 440 tons/day = 88 men/day

* 6000 LBP—Not needed unless theater has USAF C–119.

APPENDIX III

PARACHUTE PACKING CAPABILITIES, QUARTERMASTER AIR DELIVERY COMPANY

Type of Parachute	1 Day Rqmt	30 Day Rqmt	Nr Prcht Packed Per Man-Hour	Prod Man Hrs Avail Per Man Per Month*	Nr Prcht Packed Per Month	Nr Prcht Packers Rqd Based on 30 Day Rqmt
T–10	10	300	2.77	204	565	.53
G–11A**	10	300	0.342	204	69.77	64.50
Extr 22 Ft	50	1500	2.59	204	779	1.93
Total Packers Required						66.96
Packers/Platoons (4 Platoons)						19

* Standards for parachute packing and criteria in productive man-hours were extracted from Quartermaster School Manpower Authorization Studies on parachute packing submitted during March and May 1961.

** Reference: TM 10–500–12–3, Rigging Typical Mass Loads on Modular Platforms, dated November 1962. A cluster of 3 parachutes G–12D may be substituted for loads from 2270 to 3500 pounds. Number of G–12D parachutes per man-hour*—164. In rigging these smaller loads, overall labor and equipment requirements increase, while aircraft utilization decreases.

APPENDIX IV

AIR DELIVERY RIGGING CAPABILITIES, QUARTERMASTER AIR DELIVERY COMPANY

Air delivery item	Payload (each)	Number required	Payload (total)	Rigging time (each)	Total rigging time 1 day requirement
A–22 Container	1 Ton	180	180 Tons	1½ Man Hours[c] [a]	270.0 Man Hours
Platform Modular	4 Tons	3	12 Tons	4 Man Hours[c] [b]	12.0 Man Hours
6000 LBP	3 Tons	2	6 Tons	3½ Man Hours [b]	7.0 Man Hours
A–21 Container	¼ Ton	5	1¼ Tons	¼ Man Hour [a]	1.25 Man Hours
A–7A Container	¼ Ton	5	1¼ Tons	¼ Man Hour	1.25 Man Hours
Total					291.50 Man Hours
Man Hours/Day					10
Total Men/Day					29.1

a Two man team required.

b Five man team required.

c After the platform has been assembled.

APPENDIX V

REQUIREMENTS FOR MAINTENANCE PERSONNEL FOR SUPPORT OF AN AIRBORNE FORCE EQUIVALENT TO ONE AIRBORNE DIVISION

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Equipment	TOE 10-337E (Draft)	Org Maint Equiv. Per Item	Fld Maint Equiv. Per Item	Org Maint Workload (2) x (3)	Fld Maint Workload (2) x (4)	Total Workload Per/Co (5) + (6)	Equiv. Supported Per Man @	No Maint Pers Rqd (7) ÷ (8)
1. Air Drop Equipment-Textiles								
a. Parachute Assembly								
Personnel T-10[a]	14124	.01	.01	141.24	141.24	282.48	36	7.85
Personnel Back 28 ft dia	12	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Cargo 100 ft dia Canopy	924	.05	.48	46.20	443.52	489.72	36	13.60
Cargo 500 lb Cap Type G-13[b]	2625	.03	.09	78.75	236.25	315.00	36	8.75
Cargo 64 ft dia (G-12D)	1374	.03	.34	41.22	467.16	508.38	36	14.12
Cargo Extraction 15 ft	939	.02	.08	18.78	75.12	93.90	36	2.61
Cargo Extraction 22 ft	27	.02	.08	.54	2.16	2.70	36	.08
Pilot Chute Cargo Type	1176	.02	.02	23.52	23.52	47.04	36	1.31
Subtotal								[d] 48.32
b. Containers								
A-7A	801	.01	.01	8.01	8.01	16.02	36	.44
A-21	1701	.01	.01	17.01	17.01	34.02	36	.94
A-22	267	.01	.01	2.67	2.67	5.34	36	.15
Subtotal								[e] 1.53
Total								[f] 49.85 or 50
2. Air Drop Equipment-Platform								
Platform 11 ft	150	.01	.30	1.50	45.00	46.50	36	1.29
Platform 15 ft	237	.01	.42	2.37	99.54	101.91	36	2.83
Platform 22 ft	27	.01	.48	.27	12.96	13.23	36	.37
Platform 6000 lb	756	.01	.36	7.56	272.16	279.72	36	7.77
Total								[g] 12.26 or 13

a Also includes 24 ft reserve parachute.

b All colors.

c Equivalents supported per man are based on a 45-day operations cycle.

d Non-Supervisory Personnel Rqd for Parachute Repair.

e Non-Supervisory Personnel Rqd for Container Repair.

f Non-Supervisory Personnel Rqd for Parachute and Container Repair.

g Non-Supervisory Personnel Rqd for Repair of Platforms.

Note: All maint equiv are based on manpower authorization criteria for quartermaster equiv maint dtd Feb 1963.

APPENDIX VI

REQUIREMENTS FOR MAINTENANCE PERSONNEL FOR SUPPORT OF A QUARTERMASTER AIR DELIVERY COMPANY TOE 10–407E

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Type of Equipment	No Items Rqd for 1 Days opns	Org Maint Equiv. Per Item	Fld Maint Equiv. Per Item	Org Maint Workload (2) × (3)	Fld Maint Workload (2) × (4)	Total Workload Per Co (5) + (6)	Equiv. Supported Per Man	No Maint. Pers Rqd (7) ÷ (8)
1. Air Drop Equipment-Textile								
a. Parachute Assembly								
Personnel Back 28 ft	10	Neg	Neg	Neg	Neg	Neg	36	Neg
Cargo 100 ft Dia Canopy	10	2.25	21.60	22.50	216.00	238.50	36	6.62
Cargo Type 64 ft Dia G–12D	180	1.35	15.30	243.00	2754.00	2997.50	36	83.26
Cargo Extraction 15 ft	20	.90	3.60	18.00	72.00	90.00	36	2.50
Personnel Trp 35 ft[c]	272	.45	.45	122.40	122.40	244.80	36	6.80
Pilot Chute Cargo Type	2	.90	.90	1.80	1.80	3.60	36	.10
Pers (Army Aircraft)	109	.45	.45	49.05	49.05	98.10	36	2.72
Subtotal								[a]102.00
b. Containers								
A–7A	5	.45	.45	2.25	2.25	5.50	36	.15
A–21	5	.45	.45	2.25	2.25	5.50	36	.15
A–22	180	.45	.45	81.00	31.00	162.00	36	4.50
Subtotal								[b]4.80
Total								106.80 or [c]107
2. Air Drop Equipment-Platform								
Platform 6000 lb	2	.90	16.20	1.80	32.40	34.20	36	.95
Platform Modular	3	1.35	16.20	4.05	48.60	52.65	36	1.46
Total								2.41 or [d]3

a Non-Supervisory Personnel Required for Parachute Repair.

b Non-Supervisory Personnel Required for Container Repair.

c Total Non-Supervisory Personnel Required for Parachute and Co ntainer Repair.

d Non-Supervisory Personnel Required for Platform Repair.

APPENDIX VII

QUANTITY AND WEIGHT OF QUARTERMASTER AIR TYPE EQUIPMENT REQUIRED FOR SUPPORT OF ONE AIRBORNE DIVISION TOE 10–57E

Type of Equipment	Number	Approx Wt/ Item (lbs)	Total Weight	Wt of Revd Items (60%) (lbs)	Wt of Repl Items (40%) (lbs)
1. Parachute—Textile					
a. Parachute Assembly					
Personnel Back 28 ft dia	12	28	Neg	Neg	Neg
Cargo 100 ft dia Canopy	924	250	231,000	138,600	92,400
Cargo Type G-13 (all colors)	2,625	45	118,125	70,875	47,250
Cargo Type 64 ft dia	1,374	126	173,124	103,874	69,250
Cargo Extraction 15 ft	939	26	24,414	14,648	9,766
Cargo Extraction 22 ft	27	42	1,134	680	454
Personnel (Trp 35 Dia Main)*	14,124	38.5	543,774	326,264	217,510
Pilot Chute Cargo Type	1,176	12	14,112	8,467	5,645
Subtotal			(1,105,683)	(663,408)	(442,275
b. Air Delivery Containers					
A–7A	801	8	6,408	3,845	2,563
A–21	1,701	31	52,731	31,639	21,092
A–22	267	58	15,486	9,292	6,194
Subtotal			(74,625)	(44,776)	(29,849)
2. Platform Repair					
Platform 11 ft	150	780	117,000	70,200	46,800
Platform 15 ft	237	1,270	300,990	180,594	120,396
Platform 22 ft	27	2,587	69,849	41,909	27,940
Platform 6000 lb	756	640	483,840	290,304	193,536
Subtotal			(971,679)	(583,007)	(388,672)
Agg Total (Lbs)			2,151,987	1,291,191	860,796
Agg Total (S/Tons)			1,075.99	645.56	430.40

* Also includes 24 ft reserve parachute.

APPENDIX VIII

MAJOR ITEMS OF QUARTERMASTER AIR TYPE EQUIPMENT REQUIRED FOR SUPPORT OF A QUARTERMASTER AIR DELIVERY COMPANY (TOE 10–407E)[d]

Type of Equipment	No. items rqd for 1 day's opn a	Wt (lbs) indiv item	Agg wt (lbs) type of eq/day
1. Parachute Assembly			
Personnel Back 28-ft dia[a]	10	28	280
Cargo, 100-ft dia Canopy	10	250	2,500
Cargo Type 64-ft dia	180	126	22,680
Cargo Extraction 15-ft	20	26	520
Personnel Trp 35-ft dia Main [b] [c]	272	38.5	4,736
Pilot Chute Cargo Type	2	12	24
Personnel (Army Aircraft)[a]	109	28	3,052
Subtotal			(33,792)
2. Air Delivery Container			
A–7A	5	8	40
A–21	5	31	155
A–22	180	58	10,440
Subtotal			(10,635)
3. Platform Equipment			
Platform Modular	3	300	900
Platform 6000-lb	2	640	1,280
Subtotal			(2,180)
Total			46,607 Lbs or 23.3 Tons

a Maintenance workload is based on a 60-day mandatory repack cycle.

b Maintenance workload is based on a 120-day mandatory repack cycle.

c T–10 Parachutes are authorized on the basis of 1.1 parachutes per jump-qualified individual assigned to the unit. Also includes 24-ft reserve parachute.

d Selected items only.

APPENDIX IX

AIR DELIVERY SECTION MANUFACTURING TASKS

Air delivery item	Payload	No. required	Daily total payload	Mfr time ea total mfr	Total mfr time per day
1. Modulator Platform Air Delvr, 8–12	4 tons	25	200 tons	1 man-hour	25 man-hours
2. Alternate:*					
a. Combat Exp Platform	3 tons	6	18 tons	2 man-hours	12 man-hours
b. Skid Boards 48″ x 48″	1 ton	180	180 tons	0.25 man-hours	45 man-hours
3. Paper Honeycomb	16 linear ft per ton	3200 linear ft	200 tons	30 linear ft per man-hour	106.67 man-hours
TOTAL					131.67 or 163.67 man-hours*

Notes:

Man-hours/Day	10
Total Man/Day	13.167—16.367
Per Platoon	4 Men/Day/Platoon
4 Platoons Per Company	16 Men/Day/Task

*** Required when modular equipment is not used.**

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DCSPER (2)
ACSI (2)
DCSLOG (10)
ORC (2)
CRD (1)
COA (1)
CINFO (1)
TIG (1)
TJAG (1)
TSG (1)
TPMG (1)
Cof Engrs (1)
CofCH (1)
OPO (10)
USAMC (15)
USCONARC (10)
USACDC (10)
ARADCOM (1)
ARADCOM Rgn (1)
USACDCCSSG (5)
USACDCCAG (5)
USACDCOA (5)
USACDCAGA (1)
USACDCCHA (1)
USACDCAA (5)
USACDCTA (5)
USACDQMA (10)
USACDCMSA (1)
USACDCADA (1)
USACDCARMA (1)
USACDCARTY (1)
USACDCAVNA (1)
USACDCCEA (5)
USACDEA (5)
USACDCCARMSA (1)
USACDCIA (1)
USACDCINTA (1)
USACDCCBRA (1)
USALMC (2)
LOGCOMD (5)
Armies (25) except
Seventh USA (500)
Eighth USA (100)
Corps (15)
Div (2)
USAMB (1)
Br Svc Sch (5)
USMA (30)
USAWC (15)

NG: TOE: 7, 17 (2); 10–22 (4); 10–417 (1).

USAR: Same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320–50.

☆ U.S. Government Printing Office: 1964—750-504/6040A