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DEPARTMENT OF THE ARMY
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MEDICAL EVACUATION IN A THEATER OF OPERATIONS TACTICS, TECHNIQUES, AND PROCEDURES

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1. Change FM 8-10-6, 31 October 1991, as follows:

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PREFACE

This field manual provides the philosophy of and doctrine for medical evacuation in a theater of operations (TO). Tactics, techniques, and procedures for accomplishing the medical evacuation of sick, injured, or wounded soldiers are included. Medical evacuation, with the provision of en route medical care, is a vital link in the continuum of care from the point of injury through the health service support (HSS) system to medical treatment facilities (MTFs) with the required definitive or restorative medical treatment capabilities. This manual further discusses the coordination requirements for and use of nonmedical transportation assets to accomplish the medical evacuation mission. These nonmedical assets may be used in a mass casualty situation or other circumstances when the available medical evacuation assets are overwhelmed. In discussing aeromedical evacuation, definitive guidance for the performance of hoist rescue missions is also provided. The information in this publication on manual and litter carries may be used to instruct personnel in the proper methods of handling and moving casualties. This manual is intended for use by medical and nonmedical unit commanders and their staffs.

For the purpose of this manual, pilots are identified as:

- Pilot in command (PC).
- Copilot (PI).
- Pilot (if either pilot can perform the function).

Echelon is a North Atlantic Treaty Organization (NATO) term used to describe levels of medical care. For the purposes of this manual, the terms "level" and "echelon" are interchangeable.

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

This publications implements the following International Standardization Agreements (STANAGs), American, British, Canadian, and Australian (ABCA) Quadripartite Standardization Agreements (QSTAGs), and Air Standards (AIR STDs):

Title	STANAG	QSTAG	AIR STD
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CHAPTER 1

INTRODUCTION

Section I. SUPPORTING THE BATTLE

1-1. General

a. Warfare has changed significantly since World War II (WW II). The range, accuracy, and lethality of the modern tank gun makes it about ten times as effective as the tank gun of WW II. The antitank-guided missile has appeared on the modern battlefield in large numbers. Its accuracy and range of up to 5,000 meters make it a lethal weapon. Today's artillery ammunition is five to ten times more lethal than that used in WW II. Helicopters armed with antitank-guided missiles are common. Highly accurate, long-range mobile air defense gun missile systems have also appeared in great numbers to dominate the space above the battlefield. The long-range, high-velocity tank cannon and long-range antitank missile systems control the modern battlefield. With this sophisticated weaponry, anything that can be seen can be hit and killed.

b. Medical commanders must effectively use their resources to treat, evacuate, and, when possible, return to duty (RTD) sick, injured, and wounded soldiers. In the initial phases of battle, the soldiers who are treated and returned to duty provide the tactical commanders with the only source of trained combat replacements.

c. The term *return to duty soldiers* denotes the sick, injured, or wounded soldiers who have been medically treated within the theater and returned to active service. These soldiers have not been evacuated out of the communications zone (COMMZ), The majority of patients able to RTD within the stated theater evacuation policy will be disease and nonbattle injuries (DNBIs) rather than combat wounded.

d. The Army's basic operational concept is the AirLand Battle. It emphasizes success on the modern battlefield centered around four basic tenets—initiative, depth, agility, and synchronization. Refer to FM 100-5 for a detailed discussion.

1-2. General Threat Situation

a. The threat to medical evacuation units and other medical assets varies according to the intensity and location of the conflict. A European or Southwest Asian scenario would most likely be a high-intensity environment characterized by broad frontages, deep targets, and enemy penetrations of varying depths. Low intensity conflict (LIC), usually associated with the Third World, is characterized by poorly defined frontages, semiautonomous dismounted operations conducted at varying depths, and rear area security problems. Each environment stresses friendly logistics—including medical—in terms of distances and quantities required. Each environment also provides opportunities for deep strikes, long-range unconventional operations, and terrorism. Prepared airfields, permanent bases, and fixed support facilities (some hospitals) can be expected to become primary targets for threat forces. In the high-intensity conflict environment, such facilities may not survive. In the LIC environment, logistical and command centers may have to be highly centralized for defense, thus lengthening already long lines of communication (LOC).

b. Medical evacuation units operating in a TO will be exposed to a hostile environment of multiple threats including—

- Air defense weapons.
- Directed-energy (DE) weapons.
- Conventional artillery.
- Armored combat vehicles.
- Radio-electronic combat (REC).
- Fixed- and rotary-wing tactical aircraft.

- Nuclear, biological, and chemical (NBC) weapons.
- Unconventional warfare (UW).
- Environmental conditions.

c. Air defense, REC, and tactical aircraft will present continuous hazards for air ambulance crews. Long-range fire support systems including tube artillery, multiple rocket launchers, and armored cavalry vehicles threaten ground support operations in the forward areas. Nuclear, biological, and chemical weapons constitute a threat throughout the battle area, while UW operations are expected to be concentrated in the rear areas. Lasers and other DE weapons are anticipated on future battlefields.

d. For a discussion of medical operations in LIC, refer to FM 8-42.

1-3. Medical Evacuation

Medical evacuation is the timely, efficient movement and en route care by medical personnel of the wounded, injured, or ill persons from the battlefield and other locations to MTFs. The gaining MTF is responsible for arranging for evacuation of patients from the lower echelon of care. For example, Level (Echelon) II HSS units are responsible for evacuating patients from Level (Echelon) I HSS units. Evacuation begins when medical personnel receive the injured or ill soldier and continues as far rearward as the patient's medical condition warrants or the military situation requires.

1-4. Theater Evacuation Policy

a. The theater evacuation policy is established by the Secretary of Defense, with the advice of the Joint Chiefs of Staff, and upon the recommendation of the theater commander. The policy establishes, in number of days, the maximum period of noneffectiveness (hospitalization and convalescence) that patients may be held within the theater for treatment, This policy does not mean that a patient is held in the TO for the entire period of noneffectiveness. A patient who is not expected to be ready for RTD within the number of days established in the theater evacuation policy is evacuated to the continental United States (CONUS) or some other safe haven. This is done providing that the treating physician determines that such evacuation will not aggravate the patient's disabilities or medical condition. For example, a theater evacuation policy of 60 days does not mean that a patient is held in the theater for 59 days and then evacuated. Instead, it means that a patient is evacuated as soon as possible after the determination is made that he cannot be returned to duty within 60 days following admission.

b. To the degree that unplanned for increases in patients occur (due perhaps to an epidemic or heavy combat casualties), a temporary reduction in the policy may be necessary. This reduction is used to adjust the volume of patients being held in the TO hospital system. A reduction in the evacuation policy increases the number of patients requiring evacuation out-of-theater, and it increases the requirement for evacuation assets. This action is necessary to relieve the congestion caused by the patient increases. A decrease in the theater evacuation policy increases the evacuation asset requirements.

c. The time period established in the theater evacuation policy starts on the date the patient is admitted to the first hospital (combat zone [CZ] or COMMZ). The total time a patient is hospitalized in the theater (including transit time between MTFs) for a single, uninterrupted episode of illness or injury should not exceed the number of days stated in the theater evacuation policy. Though guided by the evacuation policy, the actual selection of a patient for evacuation will be based on clinical judgment as to the patient's ability to tolerate and survive the movement to the next level of hospitalization.

1-5. Planning for Health Service Support

a. In the AirLand Battle, the extended battlefield stretches HSS capabilities to the maximum. It presents an unprecedented challenge to the HSS planner as well as to the tactical commander. While the *responsibility* for what is or is not done is the tactical commander's alone, he must rely on his staff and his subordinate commanders to execute his decisions. It is imperative that the HSS planner be involved in the initial stages of the planning process. A thorough understanding of the tactical commander's plan is necessary for medical commanders to maintain HSS to sustain the tactical commander during the absence of orders and communications. Health service support planning is an intense and demanding process (FM 8-55), The planner must know—

- What each supported element will do.
- When it will be done.
- How it will be done.
- What the organic medical capability is of the supported units.

b. The planner must foresee actions beforehand to be able to plan for positive and responsive support to each element supported. He must be prepared to meet the requirements for—

- Evacuation.
- Hospitalization.
- Health service logistics.
- Laboratory services.
- Blood management.
- Dental services.
- Veterinary services.
- Preventive medicine (PVNTMED) services.
- Combat stress control.
- Command, control, and communications.

c. Planning must be proactive rather than reactive. Commanders must be able to allocate medical resources as the tactical situations change.

d. On the integrated battlefield, medical units can anticipate situations in which large numbers of patients are produced in a relatively short period of time. These mass casualty situations will exceed local HSS capabilities.

(1) Key factors for effective mass casualty management are on-site triage and emergency medical treatment (EMT), effective communications, and skillful evacuation by ground and air resources.

(a) The objective of providing the greatest good for the greatest number is achieved by medical units maximizing the use of available resources and prioritizing missions.

(b) To free medical personnel from nontreatment duties, nonmedical personnel may have to serve as litter bearers, perform rescue operations, or other nonmedical tasks, as required.

(2) Mass casualty situations require that all personnel *unite their efforts* to bridge the gap between casualties and medical capabilities. Effective self-aid, buddy aid, and combat lifesaver functions are critical factors that enhance the survivability of the wounded soldier.

1-6. Focus of Health Service Support

The successful execution of the AirLand Battle offers significant challenges to the commander and the planner. As the battlefield becomes increasingly lethal, sustaining the health of the fighting forces becomes a critical factor in the success or failure of the mission. Comprehensive planning enhances the capability of medical units to provide effective HSS and ultimately increases the chances for survival of the wounded soldier. Forward support characterizes the role that HSS must assume. The thrust of HSS is to maximize the RTD rate. This conserves the human component of the tactical commander's weapons system.

Section II. HEALTH SERVICE SUPPORT

1-7. General

a. A TO is that area of land, sea, and air necessary to conduct and sustain combat operations. United States forces deployed to the TO may range from a relatively small task force to a full array of large land, sea, and air forces. The theater is normally divided into a CZ and a COMMZ. The CZ begins at the corps rear boundary and extends forward to the extent of the corps commander's area of influence. The COMMZ begins at the corps rear boundary and extends rearward to include areas necessary to provide support to forces in the CZ. Those units situated within the COMMZ sustain the fighting base of troops by providing administrative and logistical support to the CZ and area support to the forces in the COMMZ.

b. The HSS mission–to conserve the fighting strength—dictates that patients be collected, triaged, treated, and returned to duty as far forward as possible.

c. The multifunctional HSS system operates as a single integrated system that extends from the forward areas of the CZ to the zone of interior (ZI) or CONUS. This system is dependent upon effective medical regulating and the evacuation of sick, injured, and wounded soldiers in the shortest possible time, The patients are evacuated to MTFs capable of providing the required treatment.

1-8. Modular Medical Support

a. Health service support in the division is provided by a modular support system that standardizes all medical subelements, The HSS modular design enables the medical resources manager to rapidly tailor, augment, reinforce, or reconstitute the HSS units as needed. This system is designed to acquire, receive, and triage patients, and to provide EMT and advanced trauma management (ATM). Health service support originates in the forward areas with the combat lifesaver and combat medic (aidman) supporting each combat team. From this point, the patient is evacuated to the battalion medical platoon or section treatment squad (battalion aid station [BAS]), and then to the medical company treatment platoon (division clearing station).

b. The modular medical support system is built around six modules. These modules are oriented to casualty collection, treatment, and RTD or evacuation.

(1) *Combat medic.* The combat medic module consists of one combat medical specialist and his prescribed load of medical supplies and equipment. Combat medics are organic to the medical platoons or sections of combat and combat support (CS) battalions and are attached to the companies of the battalions.

(2) *Ambulance squad.* An ambulance squad is comprised of four medical specialists and two ambulances. This squad provides patient evacuation throughout the division and provides en route care. Ambulance squads are organic to the medical platoons or sections in maneuver battalions, and to the medical companies of the division support command (DISCOM). Medical company ambulance squads are located in both the brigade support area (BSA) and the division support area (DSA). The medical platoon's ambulance squads are collocated with the BAS and further attached to the companies of the maneuver battalions.

(3) *Treatment squad.* This squad consists of a primary care physician, a physician assistant (PA), and six medical specialists. The squad is trained and equipped to provide ATM to the battlefield casualty. Advanced trauma management is physician- or PA-directed emergency medical care designed to resuscitate and stabilize the patient for evacuation to the next level of medical care, or to treat and RTD. Advanced trauma management provides maximum benefit if received within 60 minutes of injury. To maintain contact with the combat maneuver elements, each squad has two emergency treatment vehicles. Each squad can split into two treatment teams. These

squads are organic to medical platoons or sections in maneuver battalions and designated CS units, as well as being the basic building block of the medical company.

(4) *Area support squad.* This squad is comprised of one dentist trained in ATM, a dental specialist, an x-ray specialist, and a medical laboratory specialist. The squad is organic to the medical companies within the BSA and DSA.

(5) *Patient holding squad.* This squad consists of two practical nurses and two medical specialists. It is capable of holding and providing minimal care for up to 40 RTD patients. This squad is organic to the medical companies within the BSA and DSA.

NOTE

When a treatment squad, an area support squad, and a patient holding squad are collocated, they form an *area support section*. This section provides HSS on an area basis to all forces within a geographical area of responsibility (clearing station). The area support section normally operates in the BSA and the DSA. The area support and patient holding squads are incapable of independent operations.

(6) *Surgical squad/detachment.* This module is comprised of two surgeons, two nurse anesthetists, two operating room specialists, one medical/surgical nurse, and two practical nurses. It is organized to provide early resuscitative surgery for seriously wounded or injured patients, to save life, and to preserve physical function. Early surgery is performed whenever a likely delay in the evacuation of a patient threatens life or the quality of recovery. Postsurgical patients awaiting evacuation are held by the patient holding squad. This squad collocates with the surgical modules. The surgical squad provides the required nursing care. Surgical squads are organic to the medical battalions of the airborne and air assault divisions. All other surgical modules are called detachments. These detachments are not organic to divisions. They normally are employed in the DSA but may be employed in the BSA during brigade task force operations.

1-9. Levels of Health Service Support

There are four levels of HSS that have a direct impact on patients as they are treated and evacuated from the forward line of own troops (FLOT) to the CONUS base.

a. Level I. Care is provided by designated individuals or elements organic to combat and CS units, and elements of the area support medical battalion (ASMB). Major emphasis is placed on those measures (maintain airway, stop bleeding, prevent shock) necessary to stabilize the patient and allow for evacuation to the next level of care.

(1) *Individual.* Immediate far forward care consists of those lifesaving steps that do not require the knowledge and skill of a physician. Three different skill levels of personnel provide the care required in the forward area and form a major source of RTDs.

(a) Self-aid and buddy aid. The individual soldier is trained to be proficient in a variety of specific first-aid procedures with particular emphasis on lifesaving tasks. This training enables the soldier, or a buddy, to apply immediate care to alleviate a life-threatening situation.

(b) Combat lifesaver. Enhanced medical training is provided to selected individuals who are called *combat lifesavers.* These individuals are *nonmedical* unit members selected by their commander for additional training to increase medical skills beyond basic first-aid procedures. A minimum of one individual per squad, crew, team, or equivalent-sized unit is trained. All combat units and some CS and combat service support (CSS) units have combat lifesavers. The primary duty of these individuals does not change. The additional duties of combat lifesavers are performed when the tactical situation permits. These individuals assist the combat medics by providing immediate care for

injuries. The training is normally provided by medical personnel assigned or attached to the unit. The training program is managed by a senior medical person designated by the commander.

(c) *Combat medic.* This is the first individual in the HSS chain who makes medically-substantiated decisions based on medical military occupational specialty (MOS)-specific training.

(2) *Treatment squad (battalion aid station).* Personnel are trained and equipped to provide ATM to the battlefield casualty. Like-elements provide this level of care in the division, corps, and COMMZ. Level I care for units not having organic Level I capability is provided on an area basis by the organization responsible in the sector.

b. Level II. At this level, care is rendered at the clearing station (division or corps). Here the casualty is examined and his wounds and general status are evaluated to determine his treatment and evacuation precedences, as a single casualty among other casualties. Emergency medical treatment, including beginning *resuscitation,* is continued, and, if necessary, additional emergency measures are instituted, but they do not go beyond the measures dictated by the immediate necessities. The division clearing station has a whole blood capability and limited x-ray and ambulatory services. Division-level HSS also includes PVNTMED and combat stress control. Those patients who can RTD within 1 to 3 days are held for treatment. These functions are performed typically by company-size medical units organic to brigades, divisions, and ASMBs.

c. Level III. At this level, the patient is treated in an MTF staffed and equipped to provide resuscitation, initial wound surgery, and post-operative treatment. Patients who are nontransportable due to their medical condition may receive immediate surgical care in a hospital in the division rear area (mobile army surgical hospital [MASH]). Those patients whose injuries permit further movement without detriment to their condition receive surgical care in a hospital farther to the rear. Those patients who are expected to RTD are regulated to a facility that has the capability for reconditioning and rehabilitation.

d. Level IV. In Level IV of medical care, the patient is treated in a hospital staffed and equipped for general and specialized medical and surgical care and reconditioning and rehabilitation for RTD.

e. Continental United States Base Support. Although the CONUS base is not a level of medical care, further HSS is found in CONUS hospitals. Mobilization requires expansion of military hospital capacities and the inclusion of Veterans Administration and civilian hospital beds in the HSS system to meet the increased demands created by the evacuation of patients from the TO. The CONUS-based hospitals represent the most definitive medical care available within the HSS system.

1-10. Principles of Health Service Support Operations

a. Conformity. Conformity with the tactical plan is the most fundamental element for effectively providing HSS. Only by participating in the development of the operational plan (OPLAN) can the HSS planner ensure adequate HSS at the right time and place.

b. Continuity. Health service support must be continuous since an interruption of treatment may cause an increase in morbidity and mortality. Procedures are standardized at each organizational level to ensure that all required medical treatment at that level is accomplished. *No patient is evacuated any farther to the rear than his physical condition or the military situation requires.*

c. Control. Control of medical resources must rest with the medical commander. Health service support staff officers must be proactive and keep their commanders apprised of the impact of future operations on HSS assets. The HSS system must be responsive to a rapidly changing battlefield and must support the tactical plan in an effective manner. The medical commander must be able to tailor medical organizations and direct them to focal points of demand throughout his area of operations (AO). For this reason, HSS units normally maintain unit integrity for command and control. Treatment performed at each level of the HSS system must be commensurate with available HSS resources. Since these resources are limited, it is essential that their control be retained at the highest HSS level consistent with the tactical situation.

d. Proximity. The location of HSS assets in support of combat operations is dictated by the tactical situation (mission, enemy, terrain, troops, and time available [METT-T] factors), the time and distance factor, and the availability of evacuation resources. The speed with which medical treatment is initiated is extremely important in reducing morbidity and mortality. Medical evacuation time must be minimized by the efficient allocation of resources and the judicious location of MTFs. The MTF cannot be located so far forward that it interferes with the conduct of combat operations or is subjected to enemy interference. Conversely, it must not be located so far to the rear that medical treatment is delayed due to the lengthened evacuation time.

e. Flexibility. Since a change in tactical plans or operations may require redistribution or relocation of medical resources, the HSS plan must be flexible. The medical commander must be able to shift medical resources to meet the changing requirements. No more medical resources should be committed nor MTFs established than are required to support expected patient densities. When the patient load exceeds the means available for treatment, it may be necessary to give priority to those patients who can be returned to duty the soonest rather than those who are more seriously injured. This ensures the manning of the tactical commander's weapons systems.

f. Mobility. Since contact with supported units must be maintained, HSS elements must have mobility comparable to that of the units they support. Mobility is measured by the extent to which a unit can move its personnel and equipment with organic transportation. When totally committed to patient care, a HSS unit can regain its mobility only by immediate patient evacuation. When the mobility of the unit is jeopardized by the accumulation of patients, it may be necessary to leave a small holding element with the patients.

1-11. Capabilities of Health Service Support

a. The HSS capabilities of each level are designed to meet the characteristics of the operational environment. They play a specific part in the phased treatment, hospitalization, and evacuation of the sick, injured, or wounded soldier. Each successive level of HSS has the capability to perform functions of the lower level and has additional capabilities that cannot be located farther forward. This allows higher HSS levels to reconstitute lower levels and to provide HSS on an area basis.

b. Prevention begins with the individual soldier's awareness of the means to protect himself against disease through health and personal hygiene education, stress management, proper nutrition, physical fitness, and other similar measures. This awareness is further enhanced through—

- Expanded self-aid, buddy aid, and combat lifesaver training programs.
- Continuous interface with unit- and division-level medics.
- Preventive medicine programs.
- Combat stress control training.
- Leadership emphasis at all levels of command.

NOTE

Prevention is the most effective, least expensive method of providing the commander with sustained combat power.

c. Medical elements within the division require flexibility and responsiveness if they are to provide effective and timely HSS. Effective HSS enables rapid treatment and RTD for those casualties who are either sick or suffering from minor wounds or injury. More seriously wounded patients can be provided with prompt stabilizing treatment and evacuated to a hospital equipped to provide for their needs.

CHAPTER 2

UNIT AND DIVISION MEDICAL EVACUATION

2-1. General

a. Medical evacuation support within the division is provided by an element of the modular medical support system. This system standardizes the HSS subunits within the division.

b. The ambulance squad is the basic module for evacuation. This squad provides casualty evacuation throughout the division and ensures continuity of care en route. Ambulance squads are organic to the medical platoon or section in maneuver battalions and to DISCOM medical companies. Medical company ambulance squads are collocated with MTFs in both the BSA and the DSA. The medical platoon ambulance squads are collocated with the BAS for support. Ambulance teams are positioned forward with maneuver elements. This facilitates evacuation and decreases response time.

c. Area medical support is provided to those units operating in the division AO which do not have organic resources. To ensure that adequate HSS is provided, prior planning and coordination must be accomplished.

2-2. Level I Medical Evacuation

a. The medical platoon organic to the headquarters and headquarters company of the combat maneuver battalion provides medical evacuation support for the unit. Their mission is to provide this support for subordinate elements of the battalion. They also provide support to other elements in the sector providing CS to their unit. The medical platoon leader is a physician and also serves as the battalion surgeon. He is assisted by the medical operations officer in the operational, administrative, and logistical support aspects of the platoon. The ambulance section of the medical platoon is organized into ambulance squads and is supervised by the platoon sergeant. Each squad contains a noncommissioned officer (NCO) squad leader, three medical specialists/ambulance drivers, and two ambulances (Figure 2-1).

b. The number of ambulance squads in a section varies and is based on the type of parent organization. The infantry, airborne, and air assault battalions' ambulance sections have two ambulance squads equipped with high mobility multi-purpose wheeled vehicle (HMMWV) ambulances. The mechanized infantry and armor combat maneuver battalions' ambulance sections have four ambulance squads equipped with M-113 track ambulances.

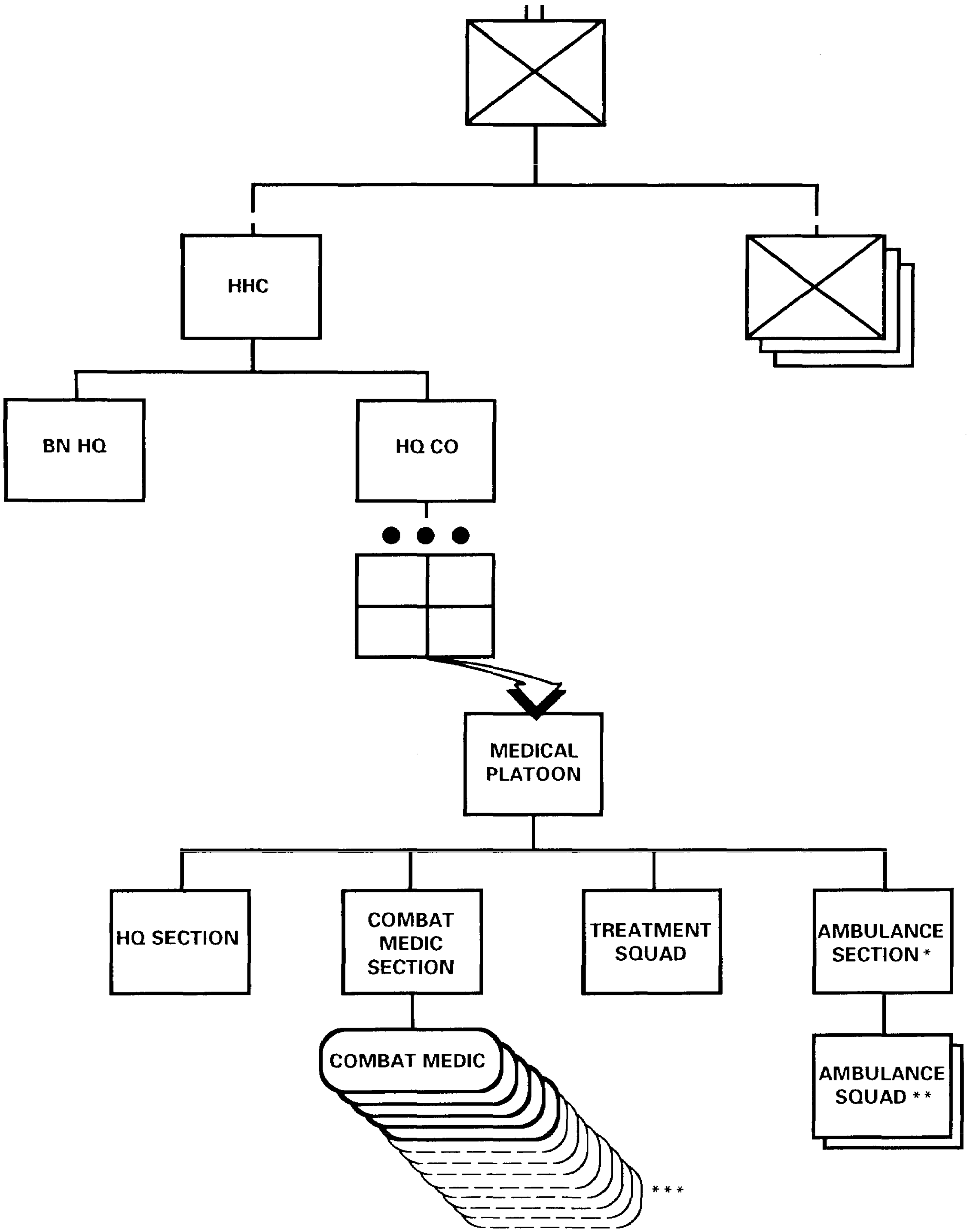
c. Each ambulance team consists of one vehicle and two medics (aide/evacuation NCOs and medical aidmen). Specific duties of the ambulance team are to—

- Maintain contact with supported elements.
- Find and collect the wounded.
- Perform triage when necessary.
- Administer EMT as required.
- Initiate or complete the field medical card (FMC).
- Evacuate litter patients to the BAS.
- Direct or guide ambulatory patients to the BAS.
- Resupply combat medics with Class VIII supplies.
- Serve as messengers within medical channels.

d. Under the modular medical system, the ambulance squad consists of two ambulance teams.

(1) The aide/evacuation NCO–

- Collects casualties.
- Performs triage and EMT procedures in the care and management of trauma patients.
- Assists in the care and management of combat stress patients.



NOTE:
* MECHANIZED INFANTRY AND ARMOR UNITS HAVE 4 AMBULANCE SQUADS.
** TWO AMBULANCE TEAMS.
*** AIRBORNE OR AIR ASSAULT UNITS HAVE 12, ARMOR UNITS HAVE 5, AND MECHANIZED INFANTRY UNITS HAVE 13.

Figure 2-1. Medical platoon.

- Prepares patients for movement.
- Provides en route patient care.
- Acts as vehicle commander and navigator.
- Maintains contact with supported units.
- Performs NBC detection procedures.
- Assists the platoon leader and platoon sergeant in selecting medical evacuation routes.
- Regulates the backhaul of medical supplies for his squad.

(2) The medical specialist/ambulance driver is trained in EMT procedures. He operates and maintains the ambulance and all of its on-board equipment. He also assists the aide/evacuation NCO in the care and handling of patients.

e. The ambulance team is essentially a mobile combat medic team. Its principal function is to collect and treat the sick, injured, and wounded on the battlefield and to safely evacuate them. The patients may be evacuated to the nearest patient collecting point, ambulance exchange point (AXP), or to the BAS site. For communications, the ambulance team employs vehicular-mounted tactical radios on its assigned ambulance. The ambulances will be equipped with navigational aids (NAVAIDS). In the future, the ambulances will be equipped with the Global Positioning System (GPS). The GPS has the capability of instantly providing ambulance crews with their location by eight-digit grid coordinates. It also provides correct route selection for traveling to a designated point. The team normally operates in the same net as the BASS.

2-3. Medical Evacuation in the Division

a. The ambulance platoon of the medical companies organic to the division (Figures 2-2 and 2-3) provides—

- Level I evacuation support on an area support basis for all units without organic evacuation assets operating within the division AO.
- Level II medical evacuation support for the entire division.

b. The mission of the ambulance platoon is to–

- Provide ground evacuation and en route medical care for patients from the BAS, from the supported units in the BSA and DSA, and, when necessary, from the forward support medical company (FSMC) in the BSA to the medical company in the DSA.
- Reinforce and reconstitute ambulance support forward.
- Provide medical resupply through the backhaul method using returning ground ambulances.

c. Under the modular medical system, the ambulance platoon consists of a platoon headquarters module and multiple ambulance squad modules.

(1) *Platoon leader.* This officer directs, coordinates, and supervises the platoon and plans for its employment. Further, he—

- Establishes and maintains contact with supported treatment squads.
- Makes route reconnaissances.
- Develops and issues strip maps.
- Allocates mission requirements based on priority.
- Designates patient collecting points, AXPs, and develops medical-specific situational overlays.

(2) *Platoon sergeant.* This NCO assists the platoon leader in planning the employment of platoon assets. He provides direct supervision and

training of enlisted personnel to include operator maintenance.

(3) *Aide/evacuation NCOs.* These NCOs supervise ambulance squads and serve as ambulance team leaders. They perform triage, provide EMT, and assist in evacuating patients.

(4) *Aide/ambulance drivers.* They provide EMT necessary to prepare patients for movement and operate ambulances. They also perform preventive maintenance on their assigned ambulances and associated equipment.

d. The ambulance platoon headquarters normally collocates with the treatment platoon headquarters for mutual support and area support taskings. The ambulance platoon may be totally deployed at one time. The platoon of the DSA medical company normally places one ambulance team in support of each FSMC and in support of units in the division rear area. The remaining teams are used for task force operations, augmentation, or establishment of an ambulance shuttle. The FSMC ambulance platoon establishes contact and may locate one ambulance team with the medical platoon of each maneuver battalion.

e. The number of ambulance squads in a platoon varies and is based on the type of parent division. The infantry and airborne medical companies each have ambulance platoons with four ambulance squads (only three squads in the air assault division) equipped with HMMWV ambulances. The mechanized infantry and armor divisions' medical companies also have five squads per platoon, but two squads are equipped with HMMWV ambulances and three squads with M-113 ambulances.

f. For communications, the ambulance platoon employs vehicular-mounted tactical radios in the platoon headquarters vehicle and each ground ambulance. The platoon operates on the medical evacuation frequency and monitors the company's operations net.

2-4. Level I Medical Evacuation in the Corps

a. Unit-level medical evacuation support to the corps is provided by the medical companies of the corps ASMB (Figure 2-4). The area support medical company (ASMC) is structured like the division medical companies with its ambulance platoon providing evacuation support on an area basis to all corps units in the corps support area (CSA).

b. The mission of the ambulance platoon is to–

- Provide ground evacuation and en route medical care for patients from the site of injury to an ASMC.

- Provide medical resupply through the backhaul method using returning ambulances.

- Act as a carrier of medical records and resupply requests.

- Provide transportation of medical personnel and equipment.

c. The organization and staffing of the ASMC ambulance platoon is similar to the ambulance platoon in the division-level medical companies. The platoon has four ambulance squads equipped with commercial utility cargo vehicle (CUCV) wheeled ambulances. The ambulance platoon collocates with the clearing station. The ambulance teams are collocated with MTFs and hospitals, as required.

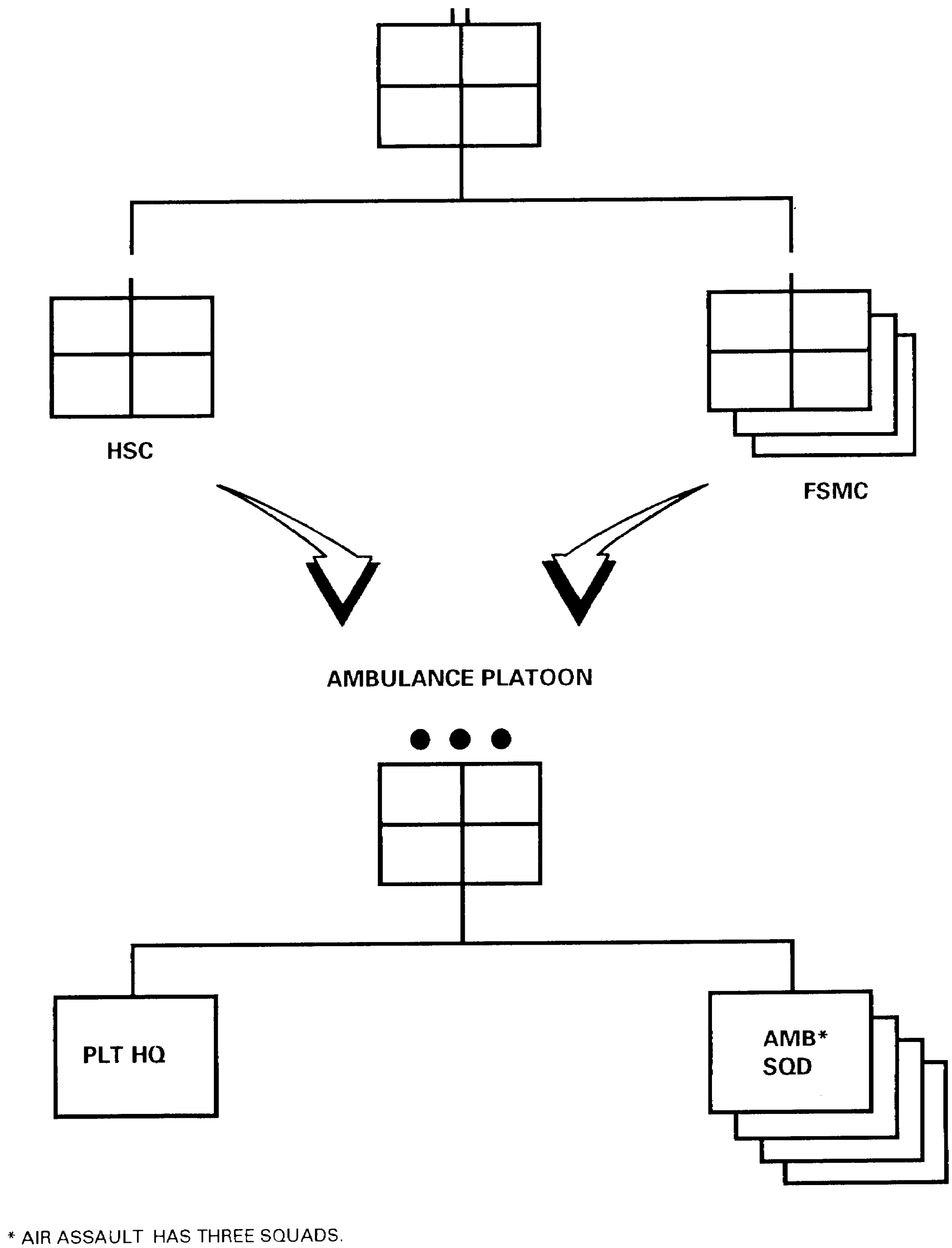
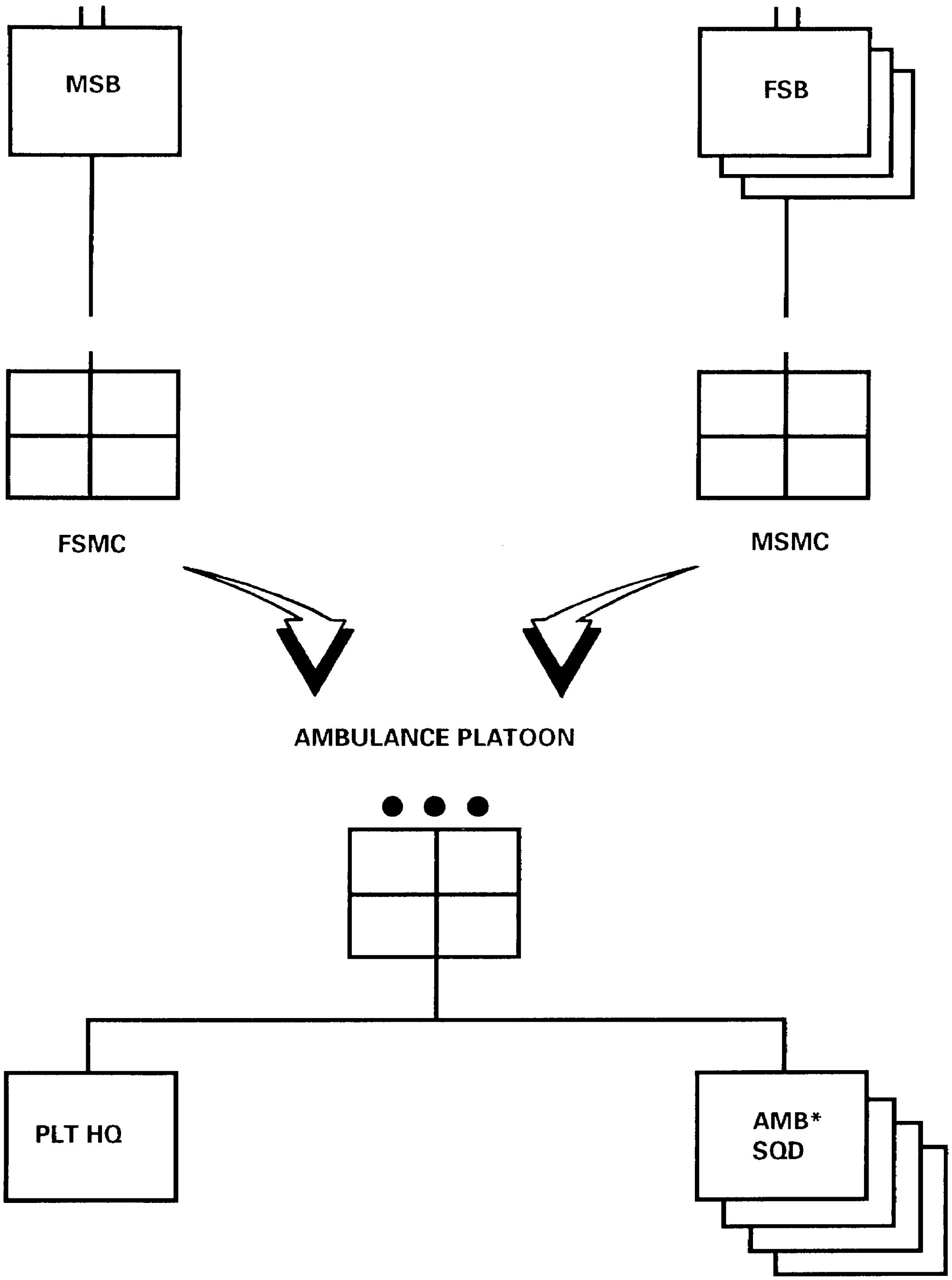


Figure 2-2. Ambulance platoon (airborne, air assault, and light infantry divisions).



* MAIN SUPPORT BATTALION (MSB) HAS FIVE AMBULANCE SQUADS WITH WHEELED VEHICLES.
FORWARD SUPPORT BATTALION (FSB) HAS FIVE AMBULANCE SQUADS WITH TWO SQUADS OF WHEELED VEHICLES AND THREE SQUADS OF TRACK VEHICLES.

Figure 2-3. Ambulance platoon (mechanized infantry and armor divisions).

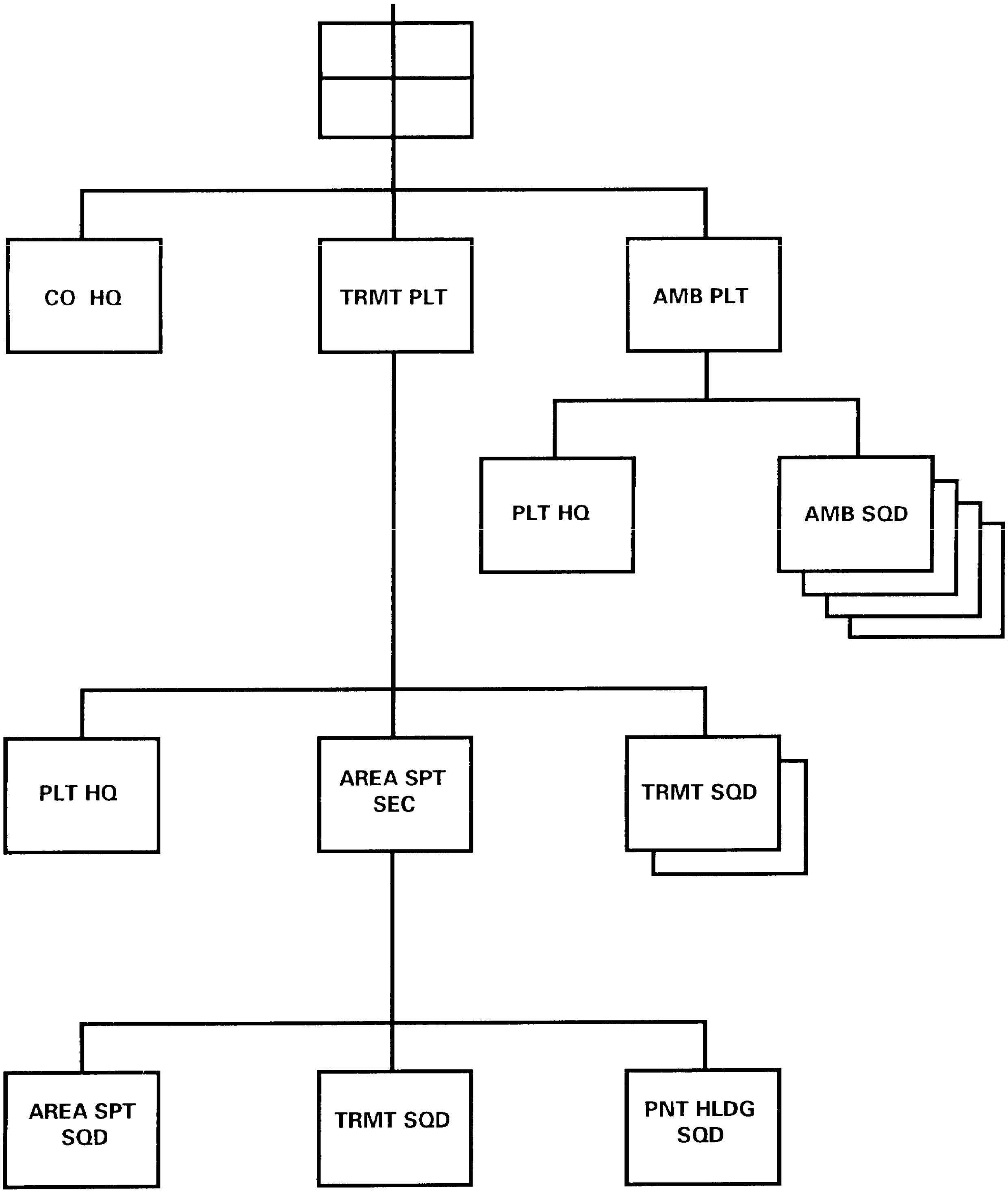


Figure 2-4. Area support medical company.

CHAPTER 3

CORPS AND COMMUNICATIONS ZONE MEDICAL EVACUATION UNITS

Section I. MEDICAL EVACUATION BATTALION

3-1. General

The headquarters and headquarters detachment (HHD), medical evacuation battalion, serves as the central manager of ground and air evacuation assets within the corps and COMMZ.

3-2. Assignment

a. The medical evacuation battalion is assigned to the medical command (MEDCOM) in the COMMZ or to the medical brigade in the corps. It is normally further assigned to a medical group for command and control.

b. Air and ground ambulance companies assigned to the MEDCOM or medical brigade are attached to the medical evacuation battalion for command and control.

c. The basis of allocation is one medical evacuation battalion per a combination of three to seven of the following units:

- Medical companies, air ambulance.
- Medical companies, ground ambulance.
- Medical detachments, air ambulance.

3-3. Mission and Capabilities

a. The mission of the medical evacuation battalion is to provide command and control of air and ground medical evacuation units within the TO. It tactically locates in the area where it can best control subordinate air and ground ambulance companics/detachments.

b. The medical evacuation battalion is designed to focus on command and control, planning, patient evacuation, subordinate unit support, and vehicle management. Specific capabilities are—

- Command and control, planning and supervision of operations and training, and administration of a combination of air and ground ambulance companies and detachments.
- Staff and technical supervision of aviation operations, safety, standardization, and aviation unit maintenance (AVUM)-level maintenance within the attached air ambulance companies and detachments.
- Coordination of medical evacuation operations and communications functions.
- Coordination of logistics and service support to attached units.
- Aviation medicine and unit-level HSS.

c. This unit is dependent upon appropriate elements of the corps or theater army for—

- Personnel service support.
- Hospitalization.
- Mortuary services.
- Bath and clothing exchange.
- Communications security (COMSEC) equipment maintenance.
- Military police support.

3-4. Organization and Functions

a. Medical Evacuation Battalion (Figure 3-1). The HHD, medical evacuation battalion, is organized into a—

- Battalion headquarters section.

- S1 (Adjutant [U.S. Army]) section.

- S2/S3 (Intelligence Officer [U.S. Army] and Operations and Training Officer [U.S. Army]) section.

- S4 (Supply Officer [U.S. Army]) section.

- Detachment headquarters and treatment team.

b. Battalion Headquarters Section. This section provides command and control of the assigned and attached air and ground ambulance companies.

- The assigned and attached subordinate companies are under the command and control of the battalion. The battalion commander is also responsible for the training of individual soldier skills.

- The executive officer primarily directs, supervises, and coordinates the work of the staff.

- The S2/S3 is the principle staff assistant to the commander on all military intelligence matters, organization, training, operations, and planning.

- The battalion surgeon advises the commander on the health of the command. (A flight surgeon is required to provide aviation medicine expertise for assigned and attached air ambulance units.)

- The S1 is primarily responsible for planning and coordinating personnel service support for the battalion.

- The S4 is responsible for planning and coordinating logistics support.

- The flight safety technician exercises staff supervision over technical and flight

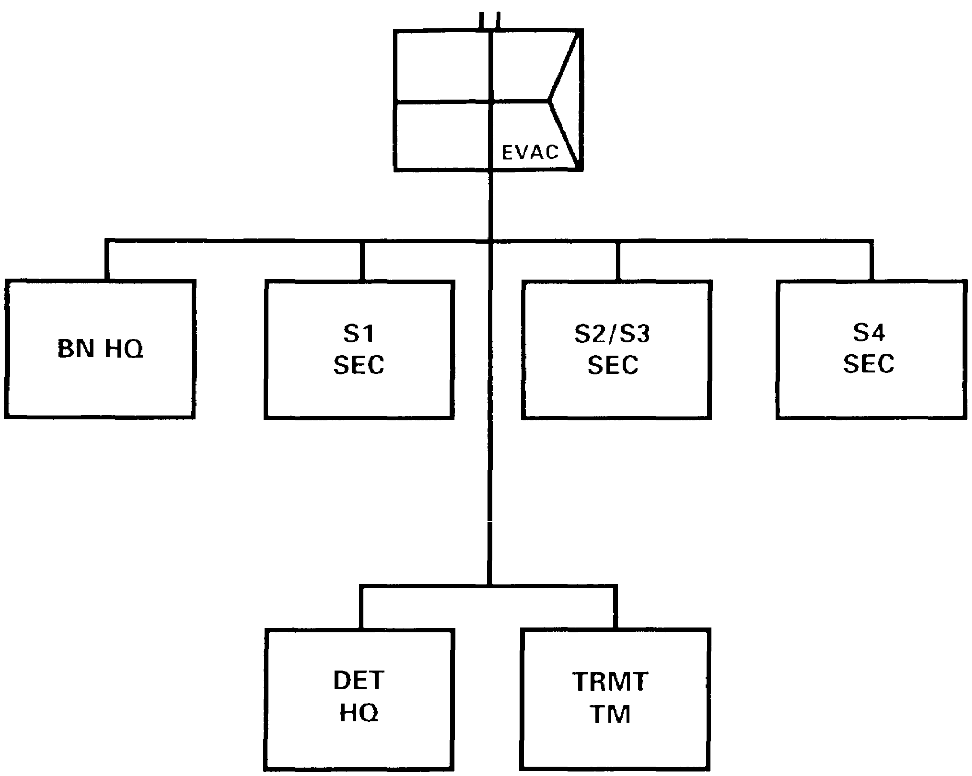


Figure 3-1. Medical evacuation battalion.

aspects of administration, training, and safety within subordinate aviation units.

- The vehicle driver operates and maintains the battalion commander's vehicle and radio.

- The command sergeant major, as the senior NCO, assists the commander with enlisted personnel matters.

c. S1 Section. This section assists the S1 in the execution of his duties.

- The personnel staff noncommissioned officer (PSNCO) is responsible for the operational and technical supervision of personnel and administrative duties to include—

  - Strength accounting, casualty reporting, and replacement operations.

  - Personnel actions.

  - Forms management.

  - Other personnel and administrative service functions.

- The clerk-typist types reports and correspondence, files documents, and performs other administrative duties.

- The legal specialist supports the commander and provides the administrative support required to maintain good order and discipline. Legal support includes the preparation of documents to dispose of disciplinary infractions through nonjudicial (Article 15, Uniform Code of Military Justice), judicial (courts-martial), and administrative (investigations under Army Regulation [AR] 15-6 or other regulatory guidance) procedures.

d. S2/S3 Section. The S2/S3 section assists the operations and intelligence officer in the execution of his duties. It is capable of sustained 24-hour operations.

- The medical operations officer is responsible for staying abreast of the tactical situation and determining future medical evacuation support requirements. He coordinates with the medical group headquarters and the supported division medical operations centers (DMOCs). He assists the S3 in planning and monitoring medical evacuation support, helps coordinate command post (CP) operations, and keeps subordinate units appraised of the tactical situation.

- The flight operations officer maintains the status of the air evacuation units, plans for their employment, and assigns missions to subordinate air ambulance companies or detachments. He also serves as the battalion airspace coordination officer. In this capacity, he is responsible for coordinating with the corps Army airspace command and control (A^2C^2) element and each supported divisional A^2C^2 element.

- The operations sergeant assists the S3 in planning and monitoring medical evacuation support. He maintains the availability status of ground evacuation units and assigns missions to subordinate ground ambulance companies. As a senior NCO, he supervises subordinates in the execution of their assigned duties.

- The flight operations sergeant assists the flight operations officer.

- The NBC NCO is responsible for NBC training, advising the commander on NBC defensive measures, plotting and reporting NBC hazard areas, and supervising subordinate unit NBC personnel.

- The intelligence NCO assists the S3 and medical operations officer in planning future medical evacuation support operations by analyzing opposing force and friendly intelligence and determining future force movements. He coordinates with the medical group headquarters and supported DMOCs to determine future requirements. He also coordinates with the movement control center (MCC) for main supply route (MSR) and vehicle routing information. He monitors intelligence traffic, provides medical intelligence reports, and prepares orders and overlays for subordinate ambulance companies, as required.

- The tactical communications (TACOMM) chief supervises the operations of the communications nets (medical group, subordinate ambulance companies, and supported DMOC).

- The flight operations specialist assists the flight operations officer and sergeant, as well as prepares reports and maintains records.

- The radio operators, the TACOMM systems operator, and the mechanic operate radio equipment for communications with the medical group, subordinate ambulance companies, and supported units on a 24-hour basis. Additionally, the TACOMM systems operator performs unit-level maintenance on all HHD communications equipment.

- The combat signaler lays the battalion headquarters internal wire net and ties into the corps wire system at designated drops. In conjunction with the switchboard operator, he operates the battalion switchboard for internal communications. He also accesses the corps system for external communications.

e. S4 Section. The S4 section assists the S4 officer in the execution of his duties.

- The health services materiel officer plans, coordinates, and supervises the requisitioning, receipt, storage, issue, and accounting for all classes of supply. He coordinates for services for subordinate units. He also monitors and keeps the commander informed on all matters pertaining to maintenance on assigned aircraft, ground vehicles, and medical equipment. He serves as the interface with the supporting medical battalion, logistics (forward/rear) (formerly the medical supply, optical, and maintenance [MEDSOM] battalion) for medical nonexpendable and durable item supply transactions.

- The aviation maintenance technician—
  - Provides technical expertise to subordinate air ambulance companies.
  - Supervises the battalion aircraft maintenance program.
  - Ensures quality control.
  - Establishes maintenance priorities.
  - Maintains aircraft readiness status.
  - Coordinates for aviation intermediate maintenance (AVIM) support for subordinate units.

- The unit maintenance technician—
  - Provides technical expertise to subordinate companies.
  - Supervises the battalion maintenance program (less aircraft and cryptography equipment).
  - Ensures quality control.
  - Establishes maintenance priorities.
  - Coordinates for direct support maintenance for subordinate units.
  - Maintains vehicle readiness status.

- The supply sergeant assists the S4 in planning and coordinating matters pertaining to supply, maintenance, movements, services, and miscellaneous logistics support of the battalion.

- The medical supply specialist assists the health services materiel officer plan and coordinate medical resupply support.

- The two supply specialists perform administrative duties such as typing, filing, and report preparation.

f. Detachment Headquarters Section. The detachment headquarters section provides command, control, administration, and logistics support for assigned personnel.

- The detachment commander and detachment first sergeant perform normal company command and control functions.

- The supply sergeant (armorer) performs company supply and armament functions.

- The food service sergeant, first cook, and cook operate the field food service for organic and attached units collocated with the headquarters.

- The maintenance supervisor, vehicle mechanic, generator repairman, and equipment records and parts specialist provide organizational maintenance for the assigned vehicles, trailers, and generators.

- The unit clerk performs administrative duties normally accomplished in the battalion personnel administration center (PAC). The medical evacuation battalion is organized without a PAC because of the diverse locations of its assigned and attached units.

g. Treatment Team. The treatment team provides unit-level HSS to assigned and attached elements collocated with the detachment headquarters and to adjacent units on an area support basis. The physician is a flight surgeon and provides staff assistance to the battalion commander on all matters pertaining to aviation medicine. The flight surgeon provides care and treatment for all assigned and attached aircrew members. This physician is dual-hatted as the battalion surgeon.

Section II. MEDICAL COMPANY, GROUND AMBULANCE

3-5. General

The HSS system to sustain the US Army in war is a continuum of increasing levels of care extending from the FLOT through the CONUS base. Patients must be moved through the system quickly to maintain their physiology and prevent needless loss of life or function. Ground ambulances serve as one of the primary means of evacuating patients from the battlefield.

3-6. Assignment

a. The medical company, ground ambulance, is normally assigned or attached to a medical evacuation battalion, HHD, for command and control.

b. The basis of allocation within the CZ is one per division supported, and within the COMMZ, one per two divisions within the theater.

3-7. Mission, Capabilities, and Limitations

a. The mission of the medical company, ground ambulance, is to provide ground evacuation within the TO. The medical company, ground ambulance, is employed in both the corps and COMMZ. It is tactically located where it can best control its assets and execute its patient evacuation mission.

b. The unit capabilities are–

- A single-lift capability for evacuation of 160 litter patients, or 320 ambulatory patients.

- Medical evacuation from division medical companies to CZ hospitals.

- Medical evacuation from the ASMC to supporting hospitals.

- Augmentation of division medical company evacuation assets.

- Augmentation of covering force and deep operations medical evacuation assets.

- Movement of patients between hospitals or aeromedical staging facilities (ASFs), mobile aeromedical staging facilities (MASFs), railheads, seaports, and hospitals in both the corps and COMMZ.

- Area evacuation support beyond the capabilities of the ASMB.

- Emergency movement of medical personnel and supplies.

c. Effective operation of this unit is dependent upon viable communications systems for command and control and adequate road networks. Employment in severe arctic or primitive jungle conditions seriously impairs the capabilities of the ground ambulance company.

d. This unit is dependent upon appropriate elements of the corps, COMMZ, or theater army for–

- Religious, financial, legal, personnel, and administrative services.
- Laundry and bath.
- Generator equipment maintenance.
- Health service support.

3-8. Organization and Functions

a. Medical Company, Ground Ambulance. The medical company, ground ambulance, is organized into a company headquarters section and four ambulance platoons. Each ambulance platoon consists of a platoon headquarters and five ambulance squads of two ambulances each (Figure 3-2).

b. Company Headquarters. This element provides command, control, communications, administration, and logistical support for the subordinate ambulance platoons.

- The maintenance personnel and equipment records (prescribed load list [PLL]) clerks maintain the unit vehicles and trailers.

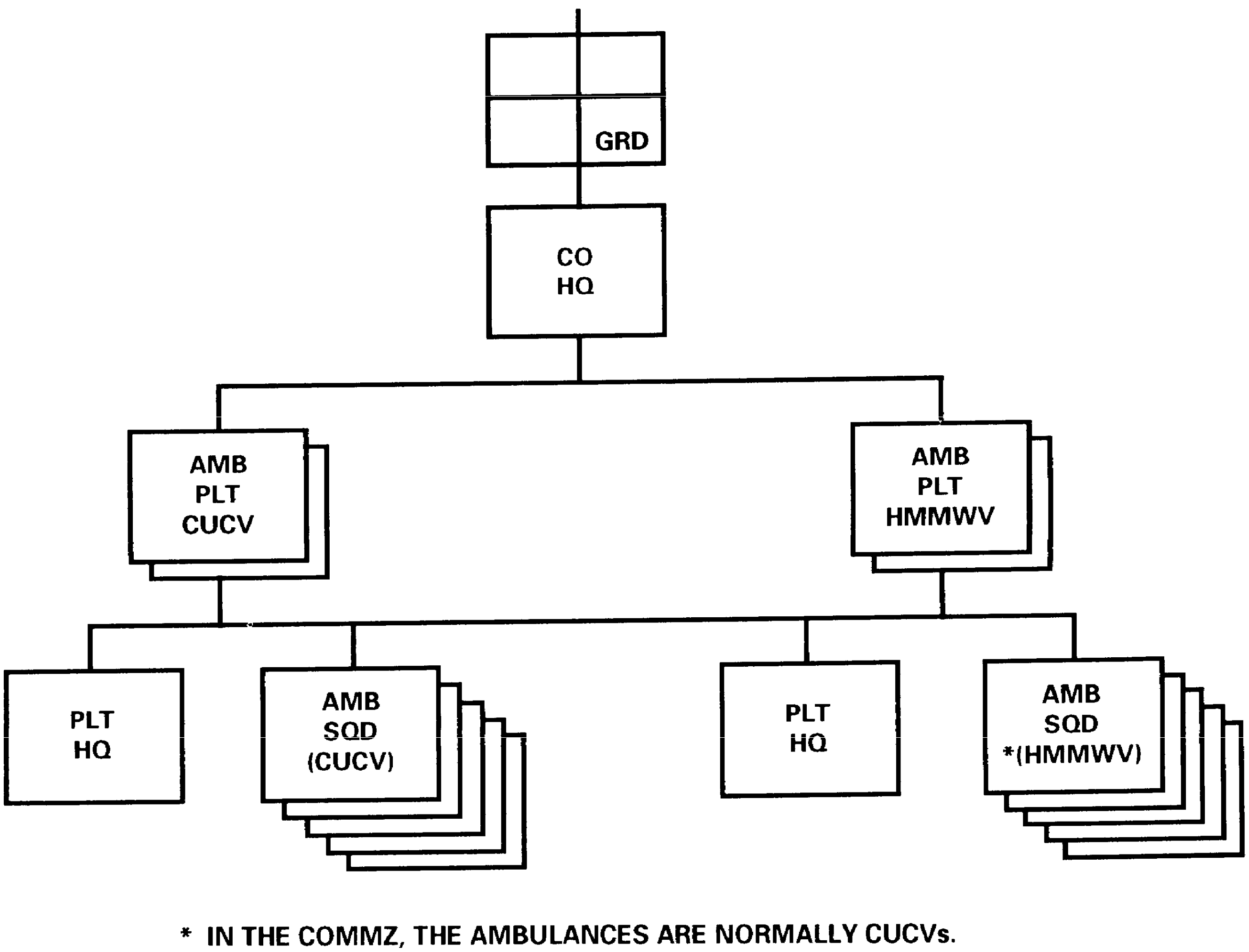


Figure 3-2. Medical company, ground ambulance.

- The signal personnel maintain communications with the medical evacuation battalion operations section and subordinate ambulance platoons on a 24-hour basis. They also perform unit-level maintenance on communications equipment.

- The food service personnel operate the company field food service.

- The unit clerk performs personnel and administrative service functions.

- The supply sergeant and unit armorer perform company supply and armament functions. Further, they process requisitions for Class VIII supplies with the ASMB medical supply office.

- The commander and first sergeant perform company command and control functions.

- The NBC NCO is responsible for NBC training and advises the commander on NBC defensive measures.

c. Ambulance Platoon Headquarters. Each of the four ambulance platoon headquarters provides command and control for five subordinate ambulance squads (10 ambulances).

(1) The platoon leader and platoon sergeant perform command and control functions in the employment of their platoon. They control the platoon on a 24-hour operational basis and make liaison visits with supported units and inspect dispatched ambulances.

(2) The vehicle driver operates and maintains the platoon leader's vehicle and operates its radio and related communications equipment.

d. Ambulance Squad. Each ambulance squad consists of two ambulances with a two-man crew.

(1) The aide/evacuation NCOs provide en route medical care and supervise ambulance drivers. As NCOs, they assist the platoon leader and platoon sergeant in accomplishing the mission. This is especially critical when platoon assets are employed over a large area, or in multiple locations.

(2) Ambulance drivers or aidmen may provide en route medical care if operating the ambulance without the presence of the aide/evacuation NCO. Further, they maintain the level of expendable Class VIII supplies in the ambulance medical equipment set (MES) by reconstituting supplies from medical companies or hospitals when they pick up or drop off patients. They are also responsible for performing operator maintenance on assigned vehicles.

(3) When employed in the CZ, the company is organized with a mix of 20 CUCV and 20 HMMWV ambulances. When employed in the COMMZ, the company normally uses all CUCV ambulances.

- Two platoons of HMMWV ambulances are stationed forward in the division to provide medical evacuation support from the division to the corps and to act as augmentation.

- Two platoons of CUCV ambulances may be employed in the corps to provide medical evacuation support for interhospital and hospital to MASF (or other embarkation points) transfers.

Section III. MEDICAL COMPANY, AIR AMBULANCE

3-9. General

The medical company, air ambulance, provide aeromedical evacuation to all categories of patient consistent with evacuation precedences and other operational considerations. Medical evacuation is effected from as far forward as possible in the tactical AO to division- and corps-level MTFs.

3-10. Assignment

a. The medical company, air ambulance, is normally assigned to the MEDCOM or medical brigade and attached to the medical evacuation battalion for command and control.

b. The basis of allocation is one unit in support of each division or equivalent force supported. Further, one unit is in general support in the corps per two division or fraction thereof; or .333 units per separate brigades or armored cavalry regiments (ACRs).

3-11. Mission and Capabilities

a. The mission of the medical company, air ambulance, is to provide—

- Aeromedical evacuation support within the TO, either direct support to the divisions or general support to the corps.

- Emergency movement of medical personnel, equipment, and supplies including whole blood, blood products, and biological.

b. Specific capabilities of this unit are to—

- Operate on a 24-hour a day basis.

- Evacuate patients based on operational capability (dependent on type of aircraft).

- *Operate fifteen air ambulances (UH-60A).* These ambulances are each capable of carrying six litter patients and one ambulatory patient, or seven ambulatory patients, or some combination thereof. Single patient lift capability is 90 litter patients, or 105 ambulatory patients, or some combination thereof. In-flight medical treatment and surveillance of patients is provided by a flight medic. OR

- *Operate fifteen air ambulances (UH-1H/V).* These ambulances are capable of carrying six litter, or nine ambulatory patients, or some combination thereof. Single patient lift capability is 90 litter, 135 ambulatory, or some combination thereof. In-flight medical treatment and patient surveillance are provided by a flight medic.

- Provide internal/external load capability for the movement of medical personnel and equipment.

- Perform AVUM on all organic aircraft and organizational maintenance on all organic avionics equipment. It also performs unit-level maintenance on all organic equipment less medical.

- Provide air crash rescue support and forced entry, less fire suppression.

- Provide rescue of downed aircrews.

- Operate as an area support medical evacuation (MEDEVAC) section and three forward support MEDEVAC teams to provide flexibility in supporting division, brigade, or brigade task force equivalent operations.

c. This unit is dependent upon–

(1) Support elements of corps or theater army for—

- Personnel services.
- Logistics.
- Hospitalization.
- Medical supply and equipment.
- Food service support.
- Communications security equipment maintenance.
- Mortuary services.
- Military police support.
- Clothing exchange and bath.

(2) The supporting AVIM organization for aviation intermediate maintenance support.

3-12. Organization and Functions

The medical company, air ambulance (Figure 3-3), is organized into—

- Company headquarters.

- Flight operations platoon consisting of a platoon headquarters, flight operations section, and airfield service section.

- Aircraft maintenance platoon consisting of a platoon headquarters, component repair section, and maintenance section.
- Air ambulance platoon consisting of a platoon headquarters, area support MEDEVAC section, and three forward support MEDEVAC teams.

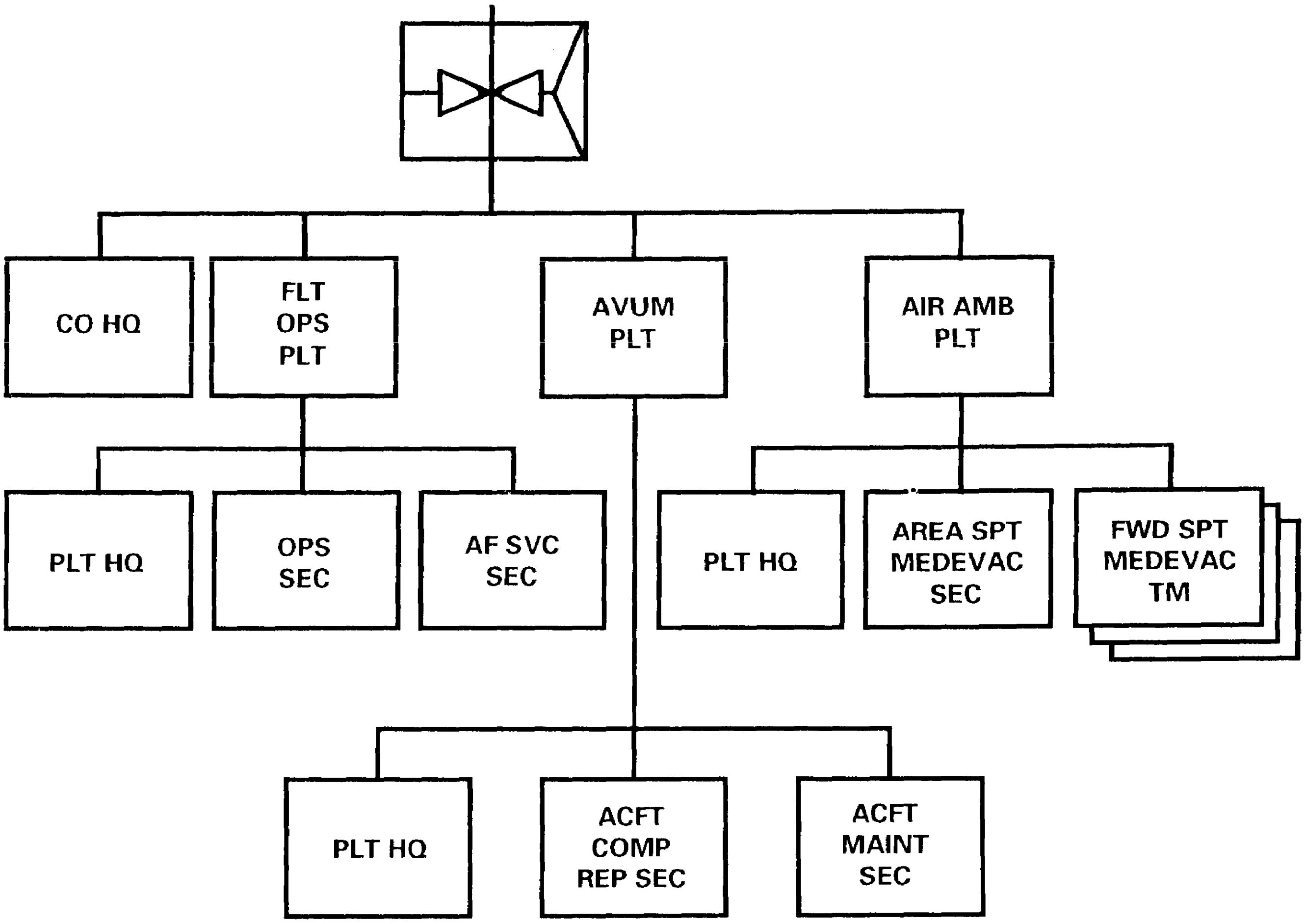


Figure 3-3. Medical company, air ambulance.

a. Company Headquarters. The headquarters provides—

- Command and control of the company and its assigned personnel.
- Limited administrative services.
- Monitoring of the aviation safety program during flight- and ground-related activities.
- Unit-level maintenance for assigned vehicles and power generation equipment.
- Unit supply functions.
- Unit NBC functions.

b. Flight Operations Platoon.

(1) *Flight operations platoon headquarters.* This headquarters—

- Provides command and control for the flight operations platoon.
- Supervises the flight operations and airfield service sections to ensure a

coordinated effort exists between these sections and the overall mission.

(2) *Flight operations section.*

(a) The flight operations section plans and coordinates all flight operations in the unit including—

- Operational planning.
- Flight dispatch.
- Maintenance of flight records.
- Tactical communications support for the unit.
- Continuous monitoring of communications equipment for aeromedical evacuation requests.

(b) This section is also responsible for coordinating with the air ambulance platoon for–

- Assigning aircraft and crews to specific missions.
- Receiving, processing, and filing flight plans.
- Maintaining a current situation map, weather status, and records and reports.
- Supervising all other activities incident to flight operations including the flight standardization program.

(3) *Airfield service section.* This section provides multiple-site aircraft refueling for 15 UH-60A aircraft on a 24-hour basis, and maintains bulk and packaged petroleum, oils, and lubricants (POL) for the company. This section conducts aircraft refueling operations as necessary. The airfield service section sets up and maintains the unit heliport or airfield under the direction of the flight operations officer and provides for the installation of the unit heliport lighting equipment.

c. Aircraft Maintenance Platoon.

(1) *Platoon headquarters.* This headquarters provides AVUM for organic aircraft and avionics equipment and coordinates with the supporting AVIM for additional maintenance support of organic aircraft and avionics equipment. Further, this headquarters coordinates with the air ambulance platoon and flight operations section for the use and maintenance scheduling of aircraft based on mission requirements.

(2) *Component repair section.* This section provides AVUM-level maintenance support for assigned aircraft in the following major areas:

- Avionics.
- Power plant.
- Electrical.
- Power train.
- Structural.

(3) *Aircraft maintenance section.* This section provides AVUM-level maintenance including—

- Aircraft inspections.
- Scheduled phase maintenance.
- Unscheduled maintenance.
- Services and lubrication.
- Maintenance operational checks.
- Test flights.
- Entry and removal from storage.
- Preparation of aircraft for shipment by surface and air.

d. Air Ambulance Platoon.

(1) *Air ambulance platoon headquarters.* This headquarters—

- Provides command and control for the air ambulance platoon.

- Supervises the area support MEDEVAC section and the three forward support MEDEVAC teams.

- Provides a point of contact for the operations officer and maintenance officer in the execution of the unit day-to-day operations.

(2) *Area support MEDEVAC section.* The area support MEDEVAC section consists of six UH-60A aircraft with appropriate crew and provides area aeromedical evacuation support in the vicinity of the unit headquarters. It is habitually located near the corps hospital when assigned to corps, or with the headquarters and support company, medical battalion, or main support medical company (MSMC), MSB, in the DISCOM when in direct support of a divisional unit. Aircraft assets of this section can be used to reinforce or reconstitute the forward support MEDEVAC teams.

(3) *Forward support MEDEVAC teams.* The air ambulance platoon has three forward support MEDEVAC teams which provide the means to task-organize medical evacuation assets. These teams are usually collocated with the headquarters and headquarters detachment, forward support battalion (FSB), or the FSMC within the BSA when in support of a division. The air ambulance teams provide the aeromedical evacuation of patients from the forward areas to division- or corps-level MTFs. The teams provide in-flight medical care and surveillance of patients. These teams also make aerial delivery of medical personnel and emergency delivery of blood products and medical supplies and equipment. Each forward support MEDEVAC team consists of three UH-60A aircraft, each with a four-man crew. Each team can operate independently for the purpose of aeromedical evacuation missions. These teams are dependent upon the supported unit for food service, communications support, and security.

Section IV. MEDICAL DETACHMENT, AIR AMBULANCE (RG)

3-13. General

The medical detachment, air ambulance (RG), provides a small, flexible aeromedical evacuation capability in the TO.

3-14. Assignment

The medical detachment, air ambulance (RG), is assigned to a MEDCOM or to a medical brigade. It can be further attached to other medical command and control units (medical evacuation battalion) as required.

3-15. Mission and Capabilities

a. This detachment provides immediate aeromedical evacuation of all categories of patients from far forward in the CZ to the division clearing station, or further rearward, as required.

b. In the COMMZ, this unit provides aeromedical evacuation support between Levels III and IV MTFs, and from hospitals to points of embarkation, such as airheads.

c. This unit operates six air ambulances, each normally configured to carry 6 litter patients and 1 ambulatory patient. The single-lift capability of this unit is 36 litter and 6 ambulatory patients. Depending on the configuration and rigging, these ambulances can carry either 4 litter, or 7 ambulatory patients, with a single-lift capability ranging from 24 litter patients, 42 ambulatory patients, or some combination thereof.

d. The medical personnel assigned to this unit provide in-flight medical care and surveillance of patients.

e. The aircrew provides air crash rescue support, extricates personnel from downed aircraft, and provides EMT at the crash site. These patients are then aeromedically evacuated to an MTF.

f. The unit provides expeditious movement and delivery of whole blood, biological, and other medical supplies to meet recurring and critical requirements. Further, this unit rapidly transports medical personnel and equipment when required.

g. The flight operations section is staffed for 24-hour continuous operations to receive and coordinate aeromedical evacuation requests.

h. This unit can perform limited AVUM on organic aircraft and organizational maintenance on all avionics equipment.

i. This unit is dependent upon the supporting AVIM company for supplementing AVUM support and providing AVIM support.

3-16. Organization and Functions

The medical detachment, air ambulance (RG), is organized with a detachment headquarters, flight operations section, maintenance section, and two air ambulance sections (Figure 3-4).

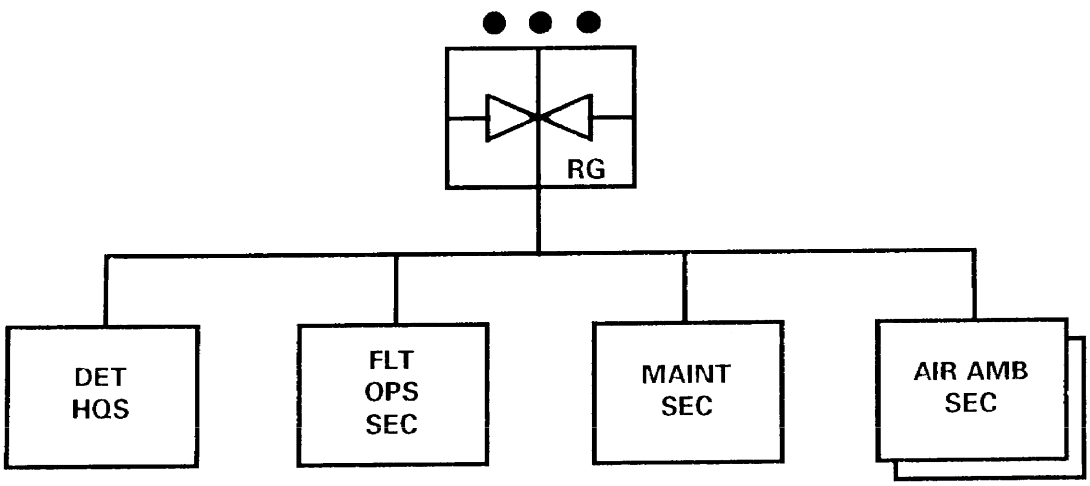


Figure 3-4. Medical detachment, air ambulance (RG).

a. Detachment Headquarters. This headquarters provides—

- Command and control of the unit and its assigned personnel.
- Limited administrative services.
- Monitoring of the aviation safety program during flight- and ground-related activities.
- Unit-level maintenance on assigned vehicle and power generation equipment.
- Unit supply functions.
- Food service.

b. Flight Operations Section. The flight operations section plans and coordinates all flight operations in the detachment, including—

- Operational planning.
- Flight dispatch.
- Maintenance of flight records.
- Tactical communications support.
- Monitoring of communications equipment for aeromedical evacuation mission requests.

c. Maintenance Section. This section provides AVUM for organic aircraft and avionics equipment and coordinates with the supporting AVIM unit for additional maintenance support.

d. Air Ambulance Sections. These sections each have three aircraft and appropriate crews. They provide 24-hour continuous aeromedical evacuation support to corps or COMMZ units. The flight medic provides en route medical surveillance and care of patients. These sections also provide delivery of blood products and other medical supplies, as well as providing expeditious movement of medical personnel and equipment.

Section V. MEDICAL DETACHMENT, RAIL AMBULANCE (EUROPEAN THEATER ONLY)

3-17. General

The medical detachment, rail ambulance, provides ground evacuation of a large number of patients from hospitals or patient holding units located in the CZ to hospitals or patient holding units in the COMMZ. It also provides ground evacuation of patients between MTFs in the COMMZ or to aerial or water ports of embarkation. This unit operates only in the European Theater. The medical detachment, rail ambulance, will use wartime host-nation (HN) support of one locomotive, one command car, one dining car, one treatment car, five bed cars, and three seat cars.

3-18. Assignment

The medical detachment, rail ambulance, is assigned to the MEDCOM. It may be further attached to a medical brigade located in the COMMZ.

3-19. Mission and Capabilities

a. The mission of this detachment is to provide—

- Rail evacuation of patients from hospitals or patient holding units located in the CZ to hospitals or patient holding units in the COMMZ (European Theater).
- Rail evacuation of patients between MTFs in the COMMZ, or to aerial or water ports of embarkation {European Theater).

b. Specific capabilities of this unit are to provide–

- Rail evacuation for a maximum of 176 litter and 171 ambulatory patients.
- En route medical care and unit-level HSS for organic personnel.

c. This unit is dependent upon—

- Appropriate elements of the theater army for legal, finance, laundry, personnel and administrative services, transportation support (when relocation of this organization is required), and security, to include enemy prisoner of war (EPW) security during processing and evacuation.
- Wartime HN support for locomotive, railroad cars, and railway support.

3-20. Organization and Functions

The medical detachment, rail ambulance, is organized into a detachment headquarters, treatment squad, five holding sections, and three ambulance sections (Figure 3-5). Each section or squad is assigned to an individual railcar. Wartime HN support is used for food service support.

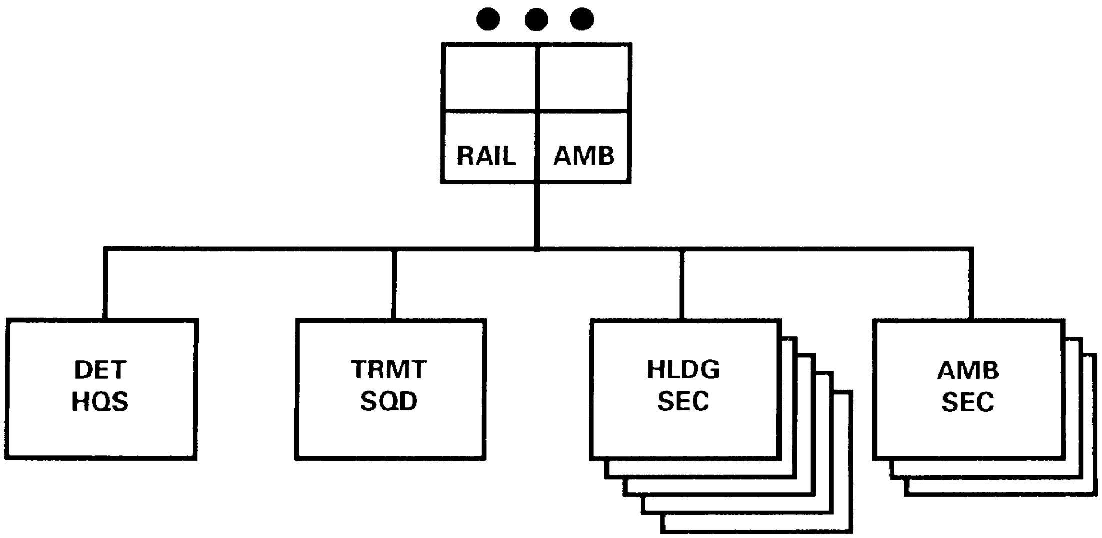


Figure 3-5. Medical detachment, rail ambulance (European Theater only).

CHAPTER 4

THE MEDICAL EVACUATION SYSTEM

4-1. General

a. The current medical evacuation doctrine and organizations are the result of an evolutionary process. This process includes both trial and error and the assimilation of lessons learned on the battlefield.

b. Medical evacuation encompasses—

- Collecting the wounded.
- Sorting (triage).
- Providing an evacuation mode (transport).
- Providing medical care en route.
- Anticipating complications and being ready to perform emergency medical intervention.

c. The increase in the speed and lethality of combat formations has served to increase the importance of medical evacuation as the key link in the continuum of care. The air and ground evacuation assets currently used to perform battlefield evacuation have both strengths and limitations. To be effective they must be employed in a synchronized system, each complementing the capabilities of the other.

This paragraph implements STANAG 3204 and Air STD 44/36A.

d. The initial decision of treatment level required is made by the treatment element (squad, team, or treatment platoon). Soldiers are evacuated by the most expeditious means of evacuation dependent on their medical condition and assigned evacuation precedence.

- Priority I, URGENT.
- Priority IA, URGENT-SURG.
- Priority II, PRIORITY.
- Priority III, ROUTINE.
- PRIORITY IV, CONVENIENCE.

(A detailed discussion on evacuation priorities is provided in Chapter 7.)

(1) The medical evacuation battalion maximizes the effectiveness of corps ground and air ambulance resources. This unit exercises command and control over assigned and attached ground or air evacuation companies and detachments. It also provides the required evacuation out of division areas, between hospitals in the corps and echelons above corps (EAC), and from ASMBs in the corps and EAC. The medical evacuation battalion provides the flexibility and capability for task organizing to support close, deep, and rear operations. It can be modified to support all aspects of the operational continuum. The ASMB ambulance platoon and the ambulance squad in the division medical company provide evacuation within their assigned AO. To ensure that patients are evacuated to the appropriate treatment elements, MROs are organic to the medical group and medical brigade.

(2) A matrix of evacuation patient flow and medical regulating is provided in Table 4-1. The overriding consideration as to the evacuation platform and destination facility is the patient's medical condition. The air ambulance operates wherever needed on the battlefield, dependent on risk and METT-T factors. The crew of the air ambulance, assisted by on-board patient monitoring and diagnostic equipment, is trained in aeromedical procedures to provide optimum en route patient care. It is the platform of choice for most categories of patients. However, insufficient numbers of air ambulances are available to evacuate all patients expected in a corps. To conserve these valuable resources, medical planners should only use air ambulances to move Priority 1, URGENT and Priority IA, URGENT-SURG patients with other categories on a space available basis only.

e. On the integrated battlefield, a significant number of evacuation assets will be destroyed. While of major concern, this does not mean that evacuation cannot be accomplished from tactical formations. Commanders must employ their available evacuation resources to accomplish the mission while maximizing survivability. The enemy's ability to fire on exposed elements may be inhibited by the clever use of cover, concealment, and available defilade. We must minimize our vulnerabilities while exploiting those of the enemy. We must be as well trained and knowledgeable of US, allied, and threat forces capabilities and operational doctrine as possible.

Table 4-1. Evacuation Patient Flow

EVACUATED FROM/TO	EVACUATION MEANS	RESPONSIBILITY	REGULATED BY
Point of injury/patient collecting point to BAS	Litter/Ground Ambulance	Maneuver Battalion Medical Platoon	BN Surgeon or PA
BAS to Medical Company	Ground/Air	Medical Company	Med Co Cdr
Med Co to Med Co	Ground/Air	Medical Company	DMOC
Med Co to MASH* (in Division Rear)	Air (Preferred)	Air Amb Co (DS)	DMOC
Medical Company to CSH/FLD	Ground/Air	Evacuation Battalion	DMOC and Group MRO
CSH to/from FLD	Ground/Air	Evacuation Battalion	GRP/BDE MRO
Area Spt Med Bn to CSH/FLD	Ground/Air	Evacuation Battalion	GRP/BDE MRO
CSH to GH	Air	Evacuation Battalion/USAF	GRP/BDE MRO, JMRO, or MEDCOM MRO
FLD to GH	Ground/Air	Evacuation Battalion	MEDCOM MRO
Area Spt Med Bn to GH	Air/Ground	Evacuation Battalion	BDE/MEDCOM MRO
GH to CONUS	Air/Surface	USAF/USN	BDE MRO/ ASMRO

*Once stabilized, patient is MEDEVAC by air for definitive treatment.

NOTE: If available, wartime host nation transportation assets (rail ambulances, buses, aircraft, watercraft) may be used to evacuate patients from corps to corps, or corps to COMMZ.

f. In LIC, the force composition and availability of evacuation resources will be determined by the mission, the anticipated duration of the operation, and the potential for violence. For a discussion of medical operations in LIC, refer to FM 8-42.

4-2. Medical Evacuation

An efficient medical evacuation system—

- Minimizes mortality by rapidly and efficiently moving the sick, injured, and wounded to an MTF.

- Clears the battlefield enabling the tactical commander to continue his mission.

- Builds the morale of the soldiers by demonstrating that care is quickly available if they are wounded.

- Provides en route medical care which is essential for optimum success.

a. Evacuation is performed by the higher echelon of medical care going forward and evacuating from the lower level.

b. Evacuation assets must have equal or greater mobility as the troops supported.

c. The HSS commander responsible for the medical evacuation mission is the primary manager of the medical evacuation assets. A single, dedicated medical command authority must manage all evacuation assets. The medical manager ensures that the optimum evacuation mode is used based upon—

- Patient's medical condition.
- Availability of resources.
- Destination MTF.
- Tactical situation.

d. The evacuation of patients in nonmedical ground and air assets must be considered in mass casualty situations. Nonmedical assets will be augmented, whenever possible, with medical personnel to provide en route medical care. With prior coordination, augmentation medical personnel may be obtained from within the division medical company or the ASMB. When augmentation of medical personnel is not possible, the transportation of casualties can still be accomplished using nonmedical vehicles and aircraft. The planning for this requirement is the responsibility of the DMOC or battalion S3.

e. Routinely bypassing levels of care is detrimental to the wounded soldier and the HSS system. Bypassing levels of care—

- Negates the effectiveness of medical resources.

- Risks further injury to the patient,

- Causes overevacuation of less critically injured soldiers; thereby, resulting in a delay of potential RTD soldiers.

- Removes the evacuation asset from its supporting position for longer periods of time.

4-3. Basic Considerations in Medical Evacuation Operations

a. General. As METT-T factors affect the employment of all units, the medical evacuation commander must consider the basic tenets which influence the employment of medical evacuation assets. These factors include—

- Tactical commander's plan for employment of combat forces.
- Anticipated patient load.
- Expected areas of patient density.
- Patient condition.
- Availability of medical evacuation resources.
- Availability of location and type of MTFs.
- Protection afforded medical personnel, patients, and medical units, vehicles, and aircraft under the provisions of the Geneva Conventions.
- Army airspace command and control plan.
- Engineer barrier plans.
- Road network.
- Weather conditions.

b. Patient Acquisition. Units with organic medical evacuation assets have the primary responsibility for patient acquisition. Methods of emplo-yment and evacuation techniques differ depending upon the nature of the operation.

c. Medical Platoon, Treatment Squad Forward.

(1) The medical platoon leader (a physician) should be included in all battalion tactical planning. He must keep himself knowledgeable of the concept of operations, commander's intent, and the anticipated HSS requirements. He develops his HSS plan (FM 8-55) and provides HSS overlays with preplanned evacuation routes, patient collecting points, and AXPs to the ambulance squads or teams (Figure 4-1) for inclusion in the battalion OPLAN. He also provides strip maps to the ambulance drivers, if needed. He requests augmentation support from the supporting medical company in advance of the operation, if required. When elements of a maneuver battalion are attached to a task force, the medical platoon leader ensures that adequate medical elements are included in the support package. He further ensures that orientation and support are provided for his medical personnel. This precludes taxing the medical elements of the receiving unit. These responsibilities are normally delegated to the medical operations officer (field medical assistant).

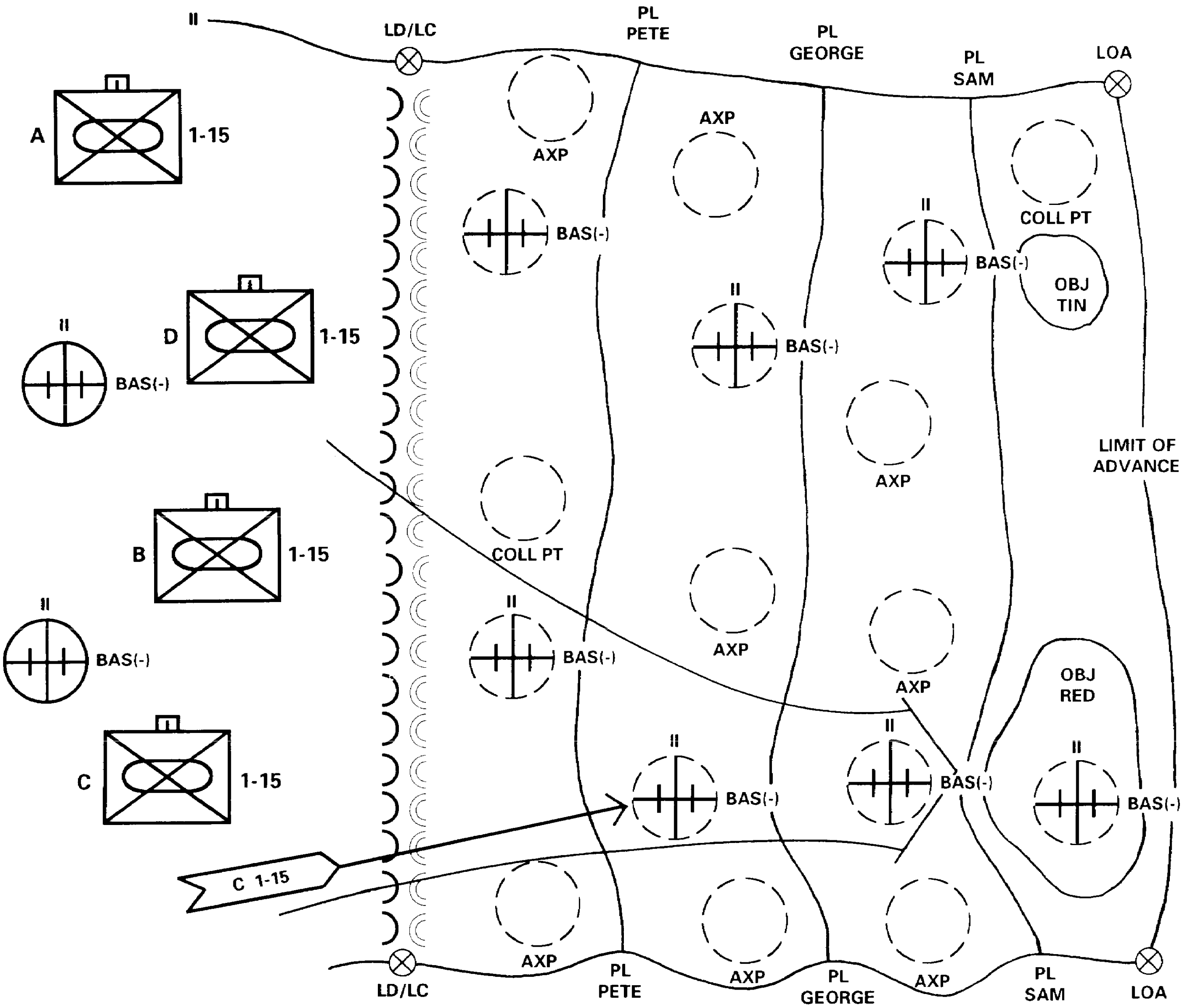


Figure 4-1. Typical evacuation overlay.

(2) The ambulance section NCO must have a working knowledge of the terrain features in the AO. Whenever possible, he familiarizes himself with primary and secondary medical evacuation routes through route reconnaissance. This NCO manages the employment of the ambulance teams and monitors the communications net to remain abreast of the tactical situation.

(3) The following factors should be considered when selecting ambulance routes:

- Tactical mission.
- Coordinating evacuation plans and operations with the unit movement officer.
- Availability of routes.
- Physical characteristics of roads and cross-country routes.
- Traffic density.
- Time and distance factors.
- Proximity of possible routes to areas that may be subject to enemy fire.
- Lines of patient drift.
- Cover, concealment, and available defilade for moving and stationary vehicles.
- Engineer barrier plans.

(4) Depending upon the combat situation, the modes of evacuation may include walking wounded, manual and litter carries, and medical evacuation or nonmedical transportation assets. Evacuation in the battalion area normally depends on the organic ambulances assigned. Evacuation by air ambulance is dependent upon the availability of air assets, patient's medical condition, tactical situation, air superiority, and weather.

(a) The ambulance team or squad routinely deploys with the company trains (forward trains). It operates, however, as far forward as the tactical situation permits. This team, when operating in a maneuver company AO, is normally under the tactical control of the maneuver company executive officer or first sergeant. The team, however, remains under the technical and operational control (OPCON) of the medical platoon.

(b) The medical operations officer ensures that the ambulances are located close to the anticipated patient load. An ambulance team consists of one ambulance and two medical specialists. One or two of these teams serve in direct support of a maneuver company. To become familiar with the specific terrain and battlefield situation, the team maintains contact with the company during most combat operations. The remaining ambulance assets are positioned strategically throughout the battalion area or are sited at the BAS to—

- Evacuate patients from the company aid posts, patient collecting points, or AXPs to the BAS.
- Reinforce the forward teams.
- Support the combat forces held in reserve.

(c) Another employment option is to forward site the additional ambulance teams at company aid posts or patient collecting points, as well as at the BASs.

(d) Many times the ambulance team finds battlefield casualties who have not been seen by a combat medic. In these cases, the team members dismount and leave their vehicle, and find, treat, and evacuate the patient.

(e) Ambulance teams not specifically dedicated to support combat elements can be used as messengers in medical channels and to transport medical personnel, equipment, and supplies.

(5) During static situations where the maneuver company is not in enemy contact or is in reserve, the ambulance team returns to the BAS to serve as reinforcement to other elements in contact. However, during movement to contact, the ambulance team immediately deploys with its supported unit. In moving patients back to the collecting point, the team may be assisted by nonmedical

personnel. Specific duties of the ambulance team are to—

- Maintain contact with supported elements.
- Find and collect the wounded.
- Administer EMT.
- Initiate or complete the FMC.
- Evacuate patients to the BAS.
- Direct or guide ambulatory patients to the BAS.
- Resupply combat medics.
- Serve as messengers in medical channels.

(6) During offensive operations, patient collecting points may be used to avoid hampering the movement of the maneuver elements. In fast-moving situations, preplanned patient collecting points are included in the HSS plan and activated based on the crossing of phase lines or upon the occurrence of predetermined events. It may be necessary to set up multiple patient collecting points for each phase of the operation. Rotating the use of these points precludes the enemy from using them to pinpoint maneuver elements or from attracting enemy fires. When the situation permits, patient evacuation from collecting points or AXPs may be accomplished by air ambulances.

(7) Ambulance teams move using available terrain features for cover and concealment. They avoid prominent terrain features and likely targets. When stationary, the ambulance crew should conceal the vehicle as much as possible.

(8) When a casualty occurs in a tank or a Bradley infantry fighting vehicle (BIFV), the ambulance team moves as close to the armored vehicle as possible. Assisted by the armored crew, if possible, the casualty is extracted from the vehicle and then administered EMT. The ambulance team moves the patient to the BAS, or to a patient collecting point to await further evacuation. The combat medic normally remains with the company combat trains, but may be used anywhere in the company area, even assisting the ambulance teams in some situations. He may be used to direct ambulance teams to locations where vehicle crews need assistance, or where injured or wounded crew members have been left. In some situations, crew members may have to rely on self-aid or buddy aid until the combat lifesaver or the combat medic arrives.

(9) Medical evacuation on an area basis is required at all levels in the HSS system. Divisional units, without organic evacuation resources such as combat engineers, will require evacuation support on an area basis. To ensure that these elements receive adequate HSS, the medical planner must include their requirements into the OPLAN. Prior coordination is essential to ensure that the locations of patient collecting points, AXPs, and BASs are disseminated to these elements and that any unique support requirements are included.

d. Medical Platoon Treatment Squad or Team to Forward Support Medical Company.

(1) Evacuation from the treatment squad or team is normally provided by the FSMC ambulance platoon and the forward air ambulance team of the direct support air ambulance company. Further, these ambulance assets provide evacuation support on an area basis to other units in the brigade AO.

(2) The elements of the ambulance platoon are normally collocated with the FSMC treatment platoon for mutual support. They establish contact and locate one ambulance team with the medical platoon of each maneuver battalion. The remaining ambulances are used for brigade task force operations and area support. The ambulances are pre-positioned at AXPs or patient collecting points, or are field-sited at the FSMC.

(3) An air ambulance team of the corps air ambulance company is normally forward deployed to the BSA and collocated with the FSB headquarters, or FSMC (Table 4-2). The team may be attached in direct support, or under the OPCON of the FSMC or the FSB headquarters. The OPCON relationship provides authority to the FSMC to direct the integrated air and ground evacuation

system. Administrative and logistics responsibilities, along with discipline, internal organization, and training, remain the responsibility of the parent unit. The section leader of the forward MEDEVAC team must be included in the brigade tactical planning process. His involvement ensures the effective employment of the air evacuation assets and assists him in obtaining essential A^2C^2 information. Coordination for aviation support requirements and A^2C^2 matters is accomplished with the maneuver brigade S3 (air). The air ambulance team evacuates Priority I, URGENT patients from as far forward as possible to the BAS or FSMC. Further, when a MASH is deployed in the division rear area, air ambulances may evacuate Priority IA, URGENT-SURG to this corps facility. Medical regulating to the MASH is accomplished informally by either the DMOC or division medical battalion. External lift capabilities of aeromedical evacuation helicopters adds an important dimension to its role on the battlefield. It provides the FSMC commander flexibility and agility in the movement of treatment teams and equipment to the forward battle area. It also provide the capability to rapidly resupply Class VIII supplies to combat units.

(a) Corps air evacuation elements may operate from the DSA and BSAs providing around-the-clock, immediate response, evacuation aircraft. To accomplish this, elements must maintain a close tie with the division A^2C^2 system. The A^2C^2 element provides an airspace plan through the division operations order (OPORD)/OPLAN A^2C^2 annex. The DMOC provides the necessary planning information to the division A^2C^2 element for all division and corps aeromedical evacuation units operating within the division area. This information includes, but is not limited to the following:

- The air ambulance units operating in the area and the number of aircraft in each unit.
- The location of medical aviation and HSS units.
- The forward area refueling equipment (FARE) and helipad locations.
- Any liaison requirements which medical units may have.
- Recommended evacuation air corridors in the division.

(b) Air evacuation flight crews execute A^2C^2 plans through the division air traffic service (ATS) element. The ATS element is normally located behind the brigade rear boundaries. Air evacuation elements operating forward of the BSA will execute the A^2C^2 plan through the brigade S3. The FSB support operations can provide planning and coordination between air ambulance elements in the BSA and the maneuver brigade S3. Since the support operations section is not staffed for this mission, the forward support flight teams should plan to provide the FSB support operations cell with a flight operation specialist to assist in A^2C^2 planning and coordination. Forward support flight teams, through the FSB support operations, provide the necessary information to the maneuver brigade S3. It should include, but not be limited to the following:

- Location of MTFs and AXPs.
- Number and location of aircraft in the team.
- Location of the FAREs.
- Liaison requirements.
- Recommended evacuation air corridors.

Table 4-2. Tactical Missions and Command Relationships for Air Ambulance Elements

An air ambulance unit with a tactical mission	Receives missions and tasks from—	Is under command and control of—	Establishes liaison with—	Is task organized by—	Receives combat service support through—	Can be given further status/ tactical mission of—
TACTICAL MISSION RELATIONSHIPS						
General support (GS)	Ground unit supported with priorities assigned by ground unit receiving GS	Evacuation battalion commander	As directed by HQ receiving GS	Air ambulance unit commander	Normal CSS channels	NA
Direct support (DS)	Ground unit supported	Evacuation battalion commander	Unit being supported	Air ambulance unit commander	Normal CSS channels	NA
COMMAND RELATIONSHIPS						
OPCON	Unit to which OPCON	Unit commander to which OPCON	As directed by HQ exercising OPCON	Unit commander to which OPCON	Normal CSS channels	OPCON DS GS
Attachment	Unit to which attached	Unit commander to which attached	As directed by HQ to which attached	Unit commander to which attached	Unit to which attached, unless otherwise stated in attachment order	Attachment OPCON DS GS

(c) The brigade S3 provides his A^2C^2 plan which includes the air corridors, air control points, and communications check points, back to the division A^2C^2 element for approval. Once approved, it is provided to the FSB support operations for implementation (Figure 4-2). The forward flight teams, prior to each mission, select the corridors, plan and execute missions and flight, and follow through the maneuver brigade S3 when necessary. The brigade S3 updates the A^2C^2 information as the tactical situation changes.

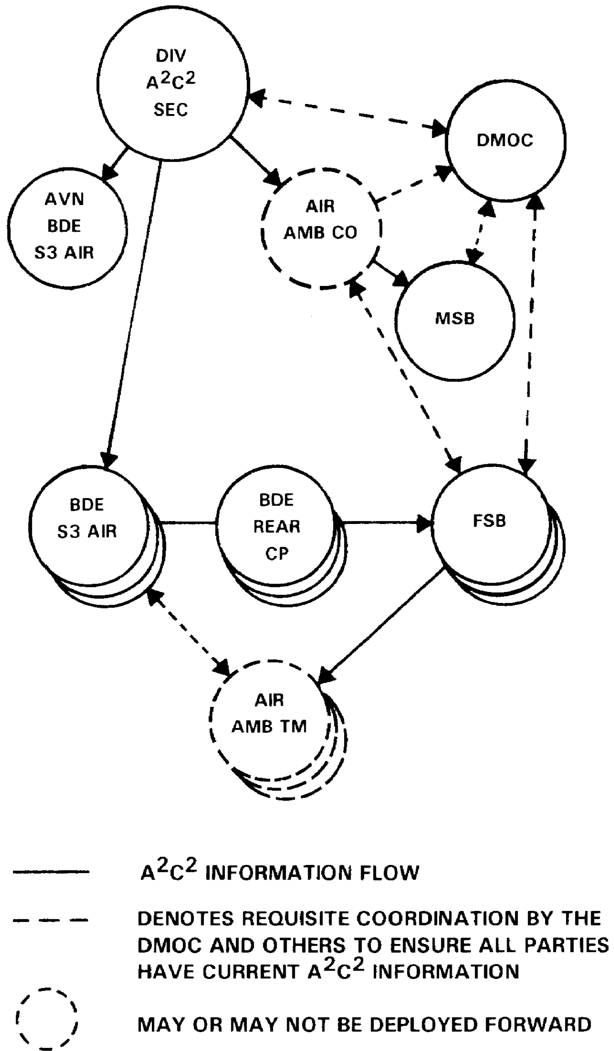


Figure 4-2. Medical A^2C^2 information flow.

(4) In the FSMC, the executive officer is the principal assistant to the commander for the tactical employment of the company assets. He should be included in all brigade tactical planning. He needs to be prepared to reinforce or reconstitute forward HSS elements and to request augmentation from the medical battalion or DMOC, if required. The air ambulance MEDEVAC team leader keeps the FSMC executive officer appraised of his operational capability. This enables the executive officer to effect timely reinforcement or augmentation. The FSMC executive officer must be familiar with the specific terrain and battlefield situation. Further, he should have a thorough understanding of the division and brigade commanders ground tactical plan.

e. Forward Support Medical Company to the Medical Company in the Division Support Area.

(1) In Vietnam, with the virtually unrestricted availability of aeromedical evacuation, it became a common practice to overfly levels of HSS. Patients were evacuated directly to a corps level hospital. A return to a more systematic approach to patient evacuation is dictated by the—

- Potentially greater distances involved.
- Necessity for the integration into the various levels of A^2C^2.
- Threat.

(2) Evacuation from the FSMC is normally provided by ground and air assets from the corps medical evacuation battalion. The ambulance platoon of the DSA medical company does not possess sufficient assets to move the anticipated number of patients from the FSMCs. It usually moves only those patients who will RTD within 72 hours. These RTD patients are held in the MSMC holding squad.

(3) The MSMC ambulance platoon normally collocates with the treatment platoon for mutual support and area taskings. It performs ground evacuation and en route patient care for supported units in the division rear. It may also evacuate patients from the FSMC in the BSA as necessary. The ambulance platoon is mobile in operations as its assets may be totally deployed at one time. The platoon normally forward stations a portion of its teams in support of those units in the division rear. The remaining teams are used for task force operations, reinforcing support, or ambulance shuttles. Platoons or squads from the corps ground ambulance company will be in direct support, or OPCON to, and collocated with the medical company in the DSA or BSA. These assets evacuate patients from the forward medical treating elements.

(4) A corps air ambulance company designated to support a division may be deployed as OPCON, attached, or in direct support of the division. For aeromedical evacuation when OPCON

or attached, the air ambulance company is normally under the control of the DISCOM. The air ambulance company collocates with the DSA medical company and forward deploys air ambulance teams or crews to the FSMCs. Air ambulance teams deployed to the FSMC will have the minimum number of aircraft required to accomplish the mission. The remaining aircraft are located with the company headquarters for reinforcement of the FSMC and evacuation of patients to the medical company in the DSA or to corps hospitals.

f. Evacuation from Division Support Area Medical Company to Levels III and IV Hospitals.

(1) The mission of the hospital system is two-fold. First, it is designed to maximize the RTD of patients. Secondly, it provides the necessary treatment to stabilize, for evacuation, those patients who are not expected to RTD within the limits of the theater evacuation policy.

(2) Hospitalization in the theater is provided at Levels III and IV of the HSS system.

(a) The MASH normally located in the division rear provides lifesaving surgical intervention. Patients are further stabilized and evacuated to other Levels III and IV hospitals.

(b) Forward-oriented combat support hospitals (CSHs) are capable of treating all classes of patients; however, their primary mission is that of providing—

- Resuscitative surgery and trauma treatment.
- Returning patients to duty within prescribed CZ policies.

(c) Field hospitals (FLDs) are designed to focus on RTD patients and specialize in reconditioning and rehabilitation. These hospitals may be located in either the corps or EAC.

(d) General hospitals (GHs) are oriented toward the trauma patient but have sufficient balance to fulfill their area support role for all classes of patients. They are normally located in the COMMZ.

(3) Elements of the medical evacuation battalion are also tasked with corps interhospital transfer responsibilities and the movement of patients to United States Air Force (USAF) MASFs. Corps area ground evacuation support is provided by the ASMB with its organic ambulance assets. This allows the medical evacuation battalion to focus its entire ground effort forward on the supported divisions and the movement of patients between corps hospitals.

(4) The organic ground evacuation assets of the DSA medical company provide evacuation support on an area basis.

4-4. Property Exchange

a. Whenever a patient is evacuated from one MTF to another or is transferred from one ambulance to another, medical items of equipment (casualty evacuation bags [cold weather-type bags], blankets, litters, and splints) remain with the patient. To prevent rapid and unnecessary depletion of supplies and equipment, the receiving Army agency exchanges like property with the transferring agency. This reciprocal procedure will be practiced to the fullest extent possible through all phases of evacuation from the most forward element through the most rearward hospital.

This paragraph implements STANAG 2128.

b. Medical property accompanying patients of allied nations will be returned to the allied nation at once, if possible. If it is not possible, like items will be exchanged as in paragraph a above.

c. There is limited equipment available at a MASF. There is no property exchange of equipment with the USAF.

4-5. Overview of Medical Evacuation Support of Offensive Operations

a. The offense is the decisive form of war, the commander’s only means of attaining a positive goal or of completely destroying an enemy force (FM 100-5). The offense is characterized by rapid movement, deep penetrations, aggressive action, and the ability to sustain momentum regardless of counterfires and countermeasures.

b. When considering the evacuation plans to support an offensive action, the HSS planner must consider many factors (FM 8-55). The forms of maneuver, as well as the enemy's capabilities, influence the character of the patient work load and its time and space distribution. The analysis of this work load determines the allocation of medical resources and the location or relocation of MTFs.

c. Evacuation support of offensive operations must be responsive to several essential characteristics. As operations achieve success, the areas of casualty density move away from the support facilities. This causes the routes of medical evacuation to lengthen. Heaviest patient loads occur during disruption of enemy main defenses, at terrain or tactical barriers, during the assault on final objectives, and during enemy counterattacks. The accurate prediction of these work-load points by the HSS planner is essential if medical evacuation operations are to be successful.

d. The major casualty area of the division is normally the zone of the main attack. As the main attack accomplishes the primary task of the division, it receives first priority in the allocation of combat power. The allocation of combat forces dictates roughly the areas which are likely to have the greatest casualty density. As a general rule, all division MTFs are located initially as far forward as combat operations permit. This allows the maximum use of these facilities before lengthening evacuation lines force their displacement forward.

e. As advancing combat formations extend control of the battle area forward, supporting medical elements overtake patients. This facilitates the acquisition of the battle wounded and reduces the vital time elapsed between wounding and treatment. In offensive operations, two basic problems confront the supporting evacuation units. First, contact with the supported unit must be maintained. Responsibility for the contact follows the normal HSS pattern—rear to front. The contact is maintained by forward deployed air and ground evacuation resources. Secondly, the mobility of the MTFs supporting the combat formations must be maintained. Periodically, division medical companies, MASHs, and CSHs are cleared so that they may move forward. This requirement for prompt evacuation of patients from forward MTFs requires available ambulances to be echeloned well forward from the outset. The requirement for periodic movement of large numbers of patients from divisional and corps facilities further stresses the evacuation system.

f. It is essential that the evacuation plan for all combat operations be well conceived, planned, coordinated, and disseminated. In designing the medical plan, the HSS planner uses of the following tools:

(1) *Patient collecting points.* In fast-moving situations, patient collecting points normally are predesignated along the axis of advance or evacuation routes. Forward of the BAS, combat medics, combat lifesavers, and combat troops take casualties to the patient collecting points. These points facilitate acquisition by supporting ambulance teams and reduce evacuation time. When used by the BAS, patient collecting points help preserve BAS mobility, preclude carrying casualties forward, and reduce evacuation time to the rear. Patient collecting points designated by the division level of HSS concentrate patients along evacuation routes, increasing the efficiency of each ambulance mission to the treatment station. They also provide those units lacking organic medical support with a forward area for patient disposition. When designating a patient collecting point, the designating authority makes a decision whether or not to provide medical staff at the location. This decision is based upon the assessment of risk versus the availability of personnel. Normally, the level of HSS designating the point is responsible for staffing. Medical personnel may not be available to staff these points, and ambulatory patients may be required to perform self-aid or buddy aid. Patient collecting points should be identified on operational overlays (Figure 4-1).

(2) *Ambulance exchange points.* A position where patients are exchanged from one evacuation platform to another is designated as an AXP.

(a) These points are normally preplanned and are a part of the HSS annex to the OPLAN. In the forward area, the threat of enemy ground activities, large concentrations of lethal weapons systems, and effective use of antiaircraft

weapons may dictate that the AXP be a predetermined rendezvous point for the rapid transfer of patients from one evacuation platform to another. The location of AXPs should be frequently changed to preclude attracting enemy fires.

(b) Ambulance exchange points are established for many different reasons. For example, the ambulance platoon of the heavy division medical companies now possess a mixture of wheel and track ambulances. The track vehicles are provided so that they may keep up with maneuver elements. These vehicles carry the patients from the BAS to an AXP where the divisional wheel ambulances take over for the relatively longer trip to the rear. Ambulance exchange points are not limited to ground evacuation assets. Another example is a situation where the threat air defense artillery capability is such that air ambulances cannot fly as far forward as the BASs. However, an AXP could be established a few kilometers to the rear, still well forward of the BSA. The divisional track or wheel ambulances could then transfer the patients to the air assets, thereby realizing a significant time savings.

(c) By using AXPs, evacuation assets are returned to their supporting positions faster. This facilitates evacuation as the returning crews are familiar with the road network and the supported units tactical situation. In the case of air evacuation assets, it is important because of the requirements for integration into the A^2C^2 system at each level and the enhancement to survivability provided by current threat and friendly air defense information.

(3) *Ambulance shuttle system (Figure 4-3).* The ambulance shuttle system is an effective and flexible method of employing ambulances during combat. It consists of one or more ambulance loading points, relay points, and when necessary, ambulance control points, all echeloned forward from the principal group of ambulances, the company location, or basic relay points as tactically required.

(a) Ambulance loading point. This is a point in the shuttle system where one or more ambulances are stationed ready to receive patients for evacuation.

(b) Ambulance relay point. This is a point in the shuttle system where one or more empty ambulances are stationed. They are ready to advance to a loading point or to the next relay post to replace an ambulance that has moved from it. As a control measure, relay points are generally numbered from front to rear.

(c) Ambulance control point. The ambulance control point consists of a soldier (from the ambulance company or platoon) stationed at a crossroad or road junction where ambulances may take one of two or more directions to reach loading points. The soldier, knowing from which location each loaded ambulance has come, directs empty ambulances returning from the rear. The need for control points is dictated by the situation. Generally, they are more necessary in forward areas.

(d) Establishment of the ambulance shuttle. Once the relay points are designated, the required number of ambulances are stationed at each point. If the tactical situation permits, the ambulances may be delivered to the relay points by convoy.

(e) Staffing of relay, loading, and ambulance control points. Important points may be manned to supervise the blanket, litter, and splint exchange (paragraph 4-4) and to ensure that messages and medical supplies to be forwarded are expedited.

(f) Advantages of the ambulance shuttle system. This system—

- Places ambulances at patient collecting points and BASs as needed.
- Permits a steady flow of patients through the system to MTFs.
- Avoids unnecessary massing of transport in forward areas.
- Minimizes the danger of damage to ambulances by the enemy.
- Permits the commander or platoon leader to control his element and enables him to extend its activity without advancing the headquarters.

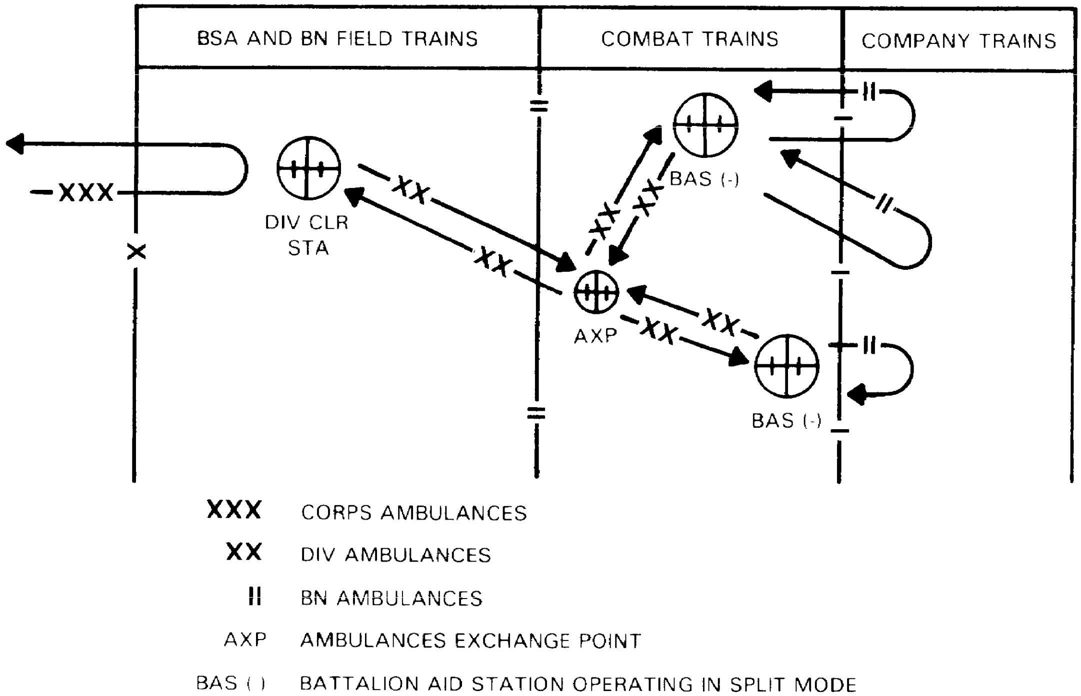


Figure 4-3. Ambulance shuttle system.

- Facilitates administration and maintenance.

- Maximizes the use of small command and control elements (sections or platoons) to operate the ambulance shuttle without employing the entire parent unit.

- Provides for flexible use of other ambulance assets for specific situations.

4-6. Medical Evacuation Support for Specific Offensive Forms of Maneuver and Combat Forces

a. Movement to Contact. Medical evacuation support in movement to contact is keyed to the tactical plan. Prior deployment of evacuation resources with parent and supported units permits uninterrupted and effective evacuation support (Figure 4-4).

b. Covering Forces. These forces are dependent upon organic resources found in the maneuver battalion medical platoon for initial support. The level of command for the covering force (division or corps) determines the responsibility for the subsequent evacuation plan. In a corps covering force, for example, the corps HSS structure has the responsibility for establishing and operating the medical evacuation system to support the forward deployed corps forces. This is done to prevent the divisions following the covering forces from becoming overloaded with patients prior to the hand off and passage of lines. The use of patient collecting points, AXPs, and nonmedical transportation assets to move the wounded is essential. The covering force battle may be extremely violent. Patient loads will be high and the distance to MTFs may be much longer than usual. The effectiveness of the medical evacuation system depends upon the forward positioning of a number of ground ambulances and the effective integration of corps air ambulances into the evacuation plan.

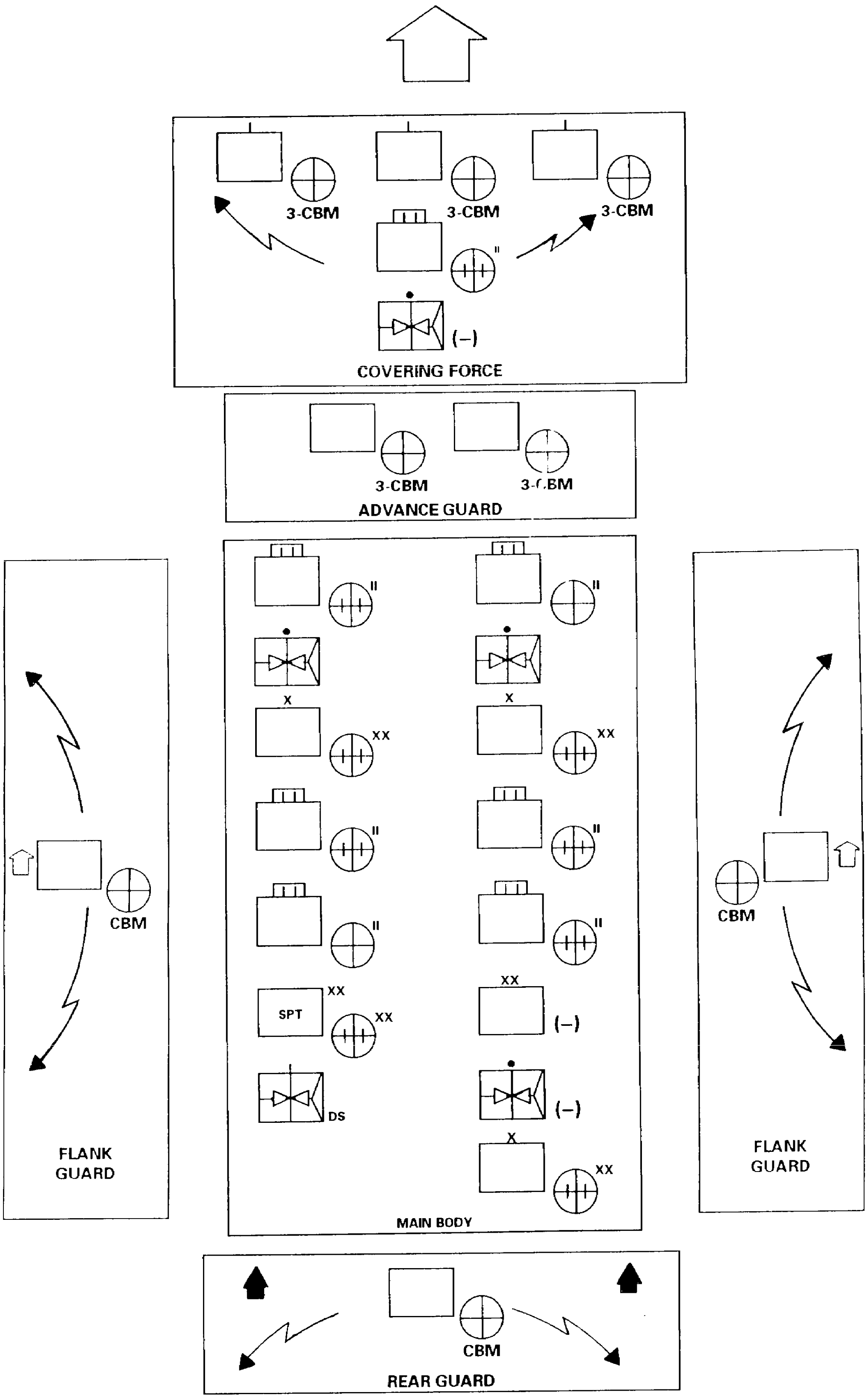


Figure 4-4. Division movement to contact.

c. Advance, Flank and Rear Guards. These forces normally receive medical evacuation support through the attachment of evacuation teams. The teams evacuate patients to predesignated patient collecting points along a main axis of advance or to the nearest treatment element providing area support. Employment of air ambulances provide a measure of agility and flexibility.

d. Passage of Lines. This situation presents a challenge for the HSS planner. There will be a number of medical evacuation units using the same air and road net works. Coordination and synchronization are essential if confusion and overevacuation are to be avoided. The information required to operate in the division AO includes—

- Radio frequencies and call signs.
- Operations plans and standing operating procedures (SOPs).
- Location of MTFs.
- Location of patient collecting points and AXPs.
- Main supply route, forward arming and refueling points (FARP), and A^2C^2 data.

e. Penetration. In this tactic, the attack passes through the enemy's principal defensive position, ruptures it, and neutralizes or destroys the enemy forces. Of all forms of offensive maneuver, the penetration of main enemy defenses normally produces the heaviest medical evacuation work load. Patient acquisition starts slowly, but becomes more rapid as the attack progresses. The evacuation routes lengthen as the operation progresses. The penetration maneuver is often preceded by heavy preparatory fires which may evoke heavy return fire. These enemy fires may modify the decision to place evacuation assets as far forward as possible. Patient evacuation may be slow and difficult due to damage to roads or the inaccessibility of patients. Evacuation support problems multiply when some combat units remain near the point of original penetration. This is done to hold or widen the gap in enemy defenses while the bulk of division forces exploit or pursue the enemy. Treatment elements are placed near each shoulder of the penetration; ground evacuation cannot take place across an avenue of heavy combat traffic. Besides the heavy traffic, the area of the penetration is normally a target for both conventional and NBC weapons.

f. Envelopment. In the envelopment, the main or enveloping attack passes around or over the enemy's principal defensive positions. The purpose is to seize objectives which cut his escape routes and subject him to destruction in place from flank to rear. Since the envelopment maneuver involves no direct breach of the enemy's principal defensive positions, the medical evacuation system is not confronted with a heavy work load in the opening phase. Ambulances are echeloned well forward in all levels of HSS to quickly evacuate the patients generated by suddenly occurring contact. Medical treatment facilities moving with their respective formations overtake patients during evacuation and reduce delays in treatment. After triage and treatment, the patients are evacuated to corps level facilities by accompanying corps assets. When the isolated nature of the envelopment maneuver precludes prompt evacuation, the patients are carried forward with the treatment element. Again, nonmedical vehicles may be pressed into emergency use for this purpose. When patients must be carried forward with the enveloping forces, HSS commanders use halts at assembly areas and phase lines to arrrange combat protection for ground ambulance convoys through unsecured areas. Further, the commander may take advantage of friendly fires arid suppression of enemy air defenses to call for prearranged air ambulance support missions, or emergency use of medium-lift helicopter backhaul capabilities.

g. Exploitation and Pursuit. Evacuation support of exploitation and pursuit maneuvers resemble those discussed for the envelopment. Since exploitation and pursuit operations can rarely be planned in detail, evacuation operations must adhere to SOPs and innovative command and control. These actions are often characterized by—

- Decentralized operations.
- Unsecured ground evacuation routes.
- Exceptionally long distances for evacuation.
- Increased reliance on convoys and air ambulances.

h. Brigade Offensive Operation. A sample overlay of a brigade offensive operation is depicted in Figure 4-5.

4-7. Medical Evacuation Support of Defensive Operations

Support is generally more difficult to provide in defensive operations. The patient load reflects lower casualty rates, but forward area patient acquisition is complicated by enemy actions and the maneuver of combat forces. Medical personnel are permitted much less time to reach the patient, complete vital EMT, and remove him from the battle site. Increased casualties among exposed medical personnel further reduce the medical treatment and evacuation capabilities. Heaviest patient work loads, including those produced by enemy artillery and NBC weapons, may be expected during the preparation or initial phase of the enemy attack and in the counterattack phase. The enemy attack may disrupt ground and air routes and delay evacuation of patients to and from treatment elements. The depth and dispersion of the defense create significant time and distance problems for evacuation assets. Combat elements may be forced to withdraw while carrying their remaining patients to the rear. The enemy exercises the initiative early in the operation which may preclude accurate prediction of initial areas of casualty density. This makes the effective integration of air assets into the evacuation plan essential. The use of air ambulances must not only be integrated into the HSS annex to the OPORD, but also into the A^2C^2 annex. A medical overlay for a defensive operation is depicted in Figure 4-6.

4-8. Medical Evacuation Support of Retrograde Operations

The support requirements for this type of action may vary widely depending upon the tactical plan, the enemy reaction, and the METT-T factors. Firm rules that apply equally to all types of retrograde operations are not feasible, but considerations include—

- Requirement for maximum security and secrecy in movement.

- Influence of refugee movement which may impede military medical movements conducted in friendly territory.

- Integration of evacuation routes; obstacle and barriers plans should be accomplished.

- Difficulties in controlling and coordinating movements of the force which may produce lucrative targets for the enemy.

- Movements at night or during periods of limited visibility.

- Time and means available to remove patients from the battlefield. In stable situations and in the advance, time is important only as it affects the physical well-being of the wounded. In retrograde operations, time is more important. As available time decreases, medical managers at all levels closely evaluate the capability to collect, treat, and evacuate all patients.

- Medical evacuation routes will also be required for the movement of troops and materiel. This causes patient evacuation in retrograde movements to be more difficult than in any other type of operation. Command, control, and communications may be disrupted by the enemy. Successful medical evacuation requires including ambulances on the priority list for movement; providing for the transportation of the slightly wounded in cargo vehicles; and providing guidance to subordinate commanders defining their responsibilities in collecting and evacuating patients. Special emphasis must be placed on the triage of patients and consideration given to the type of transportation assets available for evacuation.

- When the patient load exceeds the means to move them, the tactical commander must make the decision as to whether patients are to be left behind. The medical staff officer keeps the tactical commander informed in order that he may make a timely decision. Medical personnel and supplies must be left with patients who cannot be evacuated. (Refer to FM 8-10 for additional information.)

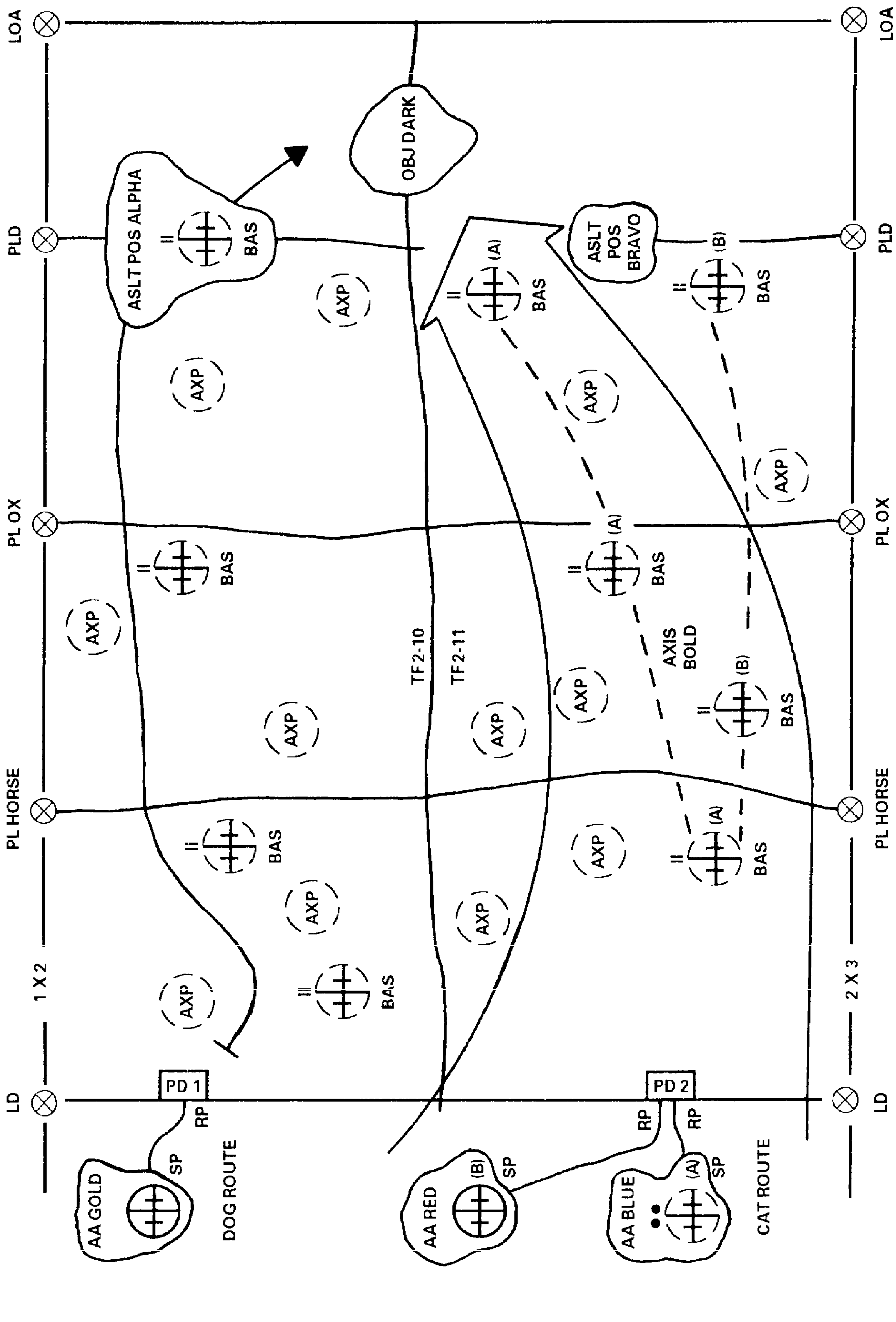


Figure 4-5. Medical overlay to brigade attack.

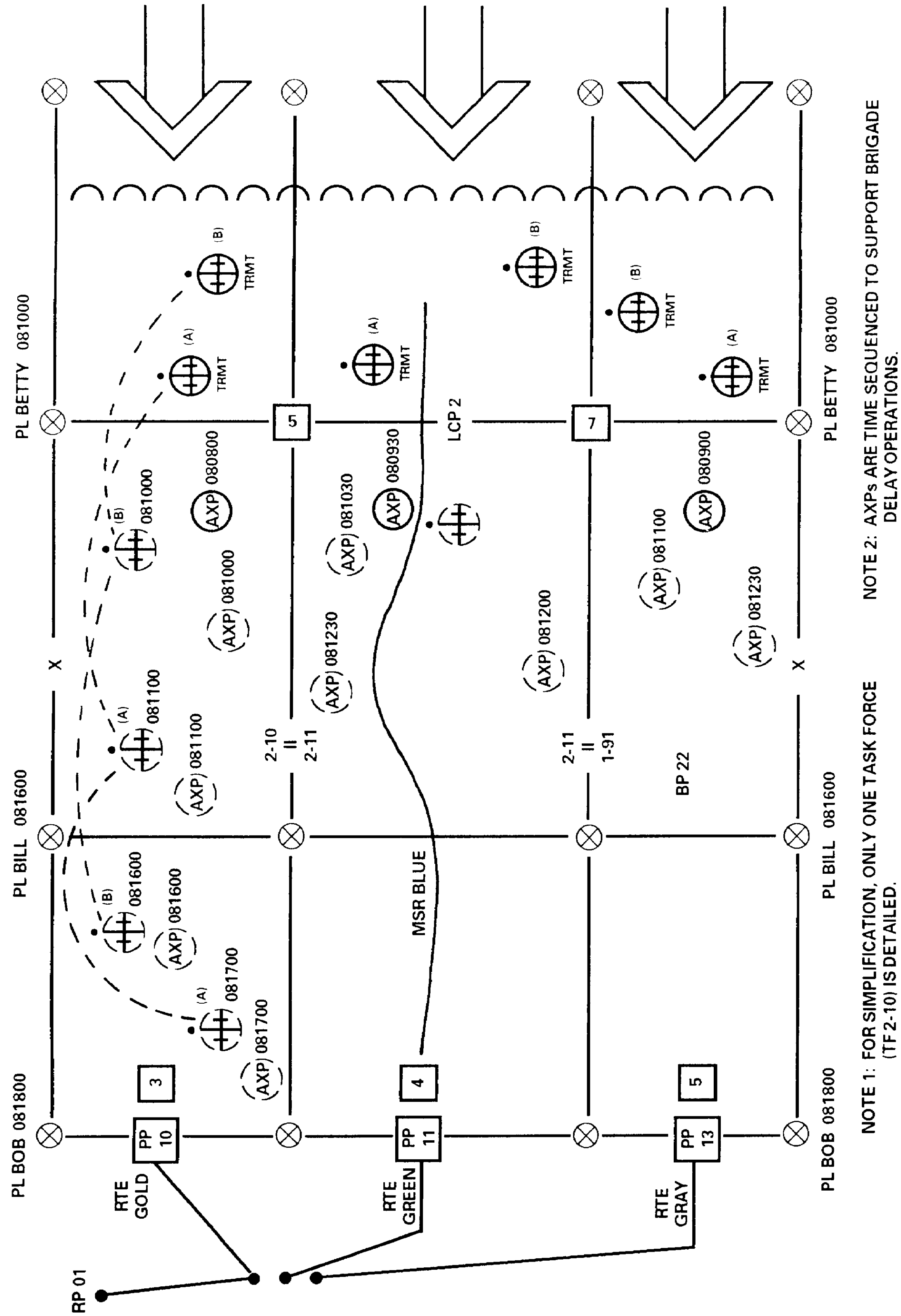


Figure 4-6. Medical overlay to brigade delay.

4-9. Medical Evacuation of Enemy Prisoners of War

Sick, injured, and wounded EPWs are treated and evacuated in regular channels when possible. They must be physically segregated from US and allied patients. Guards for these prisoners are provided in accordance with the division or corps SOP and are from other than medical resources. Refer to Appendix A for additional information.

4-10. Aeromedical Evacuation Operations

a. The effectiveness and efficiency of the Army Medical Department (AMEDD) is enhanced by the air ambulances capabilities to—

- Remove patients from otherwise inaccessible areas.
- Circumvent fixed defenses and natural obstacles.
- Deliver medical supplies and blood products.
- Provide a rapid evacuation means.
- Airlift medical personnel and equipment.

b. Individual medical evacuation mission requests are processed through communications channels designated in the HSS annex of the OPLAN or OPORD. Mission control is retained by the appropriate medical headquarters commander.

c. Medical evacuation missions are based upon requests from units within the CZ requiring HSS. Requests for augmentation or reinforcement of aeromedical evacuation capabilities are made by the controlling medical headquarters. Since the majority of requests for medical evacuation originate in the division, the basic concept of mission control is oriented on this requirement. Mission requests are processed through the fastest and most reliable means available. A sole-user channel is desirable for the expedient transmission of medical evacuation requests. Within their area of responsibility, surgeons at various levels of command may monitor requests and recommend priorities for patient evacuation.

d. Direct aeromedical evacuation support is normally provided to each division (from the corps) by one medical company, air ambulance (fifteen helicopters). It is the mission of this company to—

- Evacuate selected patients within the division.
- Transport medical elements to areas where they are critically needed.
- Ensure the uninterrupted delivery of blood, blood products, biologicals, and medical supplies.
- Provide for air crash rescue (less fire suppression).
- Rescue downed aircrews.

(1) The air ambulance company is modular in design. Each company has three forward support MEDEVAC teams (FSMT), and an area support MEDEVAC section (ASMS). The FSMTs, with three helicopters each, may be field sited in the BSA. The FSMT must become familiar with the—

- Brigade A^2C^2 plan.
- Current threat.
- Terrain.
- Location of friendly fires.
- Restrictive airspace measures.

(2) In the brigade area, there is no requirement to file a *visual flight rules* flight plan with the flight coordination center. Aviators are under the procedural control of the brigade commander. Forward air traffic control tactical teams may provide NAVAIDS, terminal, or advisory service. The concept of effective A^2C^2 at the maneuver unit level is dependent on procedures that will work in a degraded command, control, and communications environment. While the aeromedical evacuation mission is conducted on logistical or medical communications nets, the aircraft must monitor the tactical A^2C^2 net. (Refer to FM 100-103 for a detailed discussion of airspace management and

Army air traffic in a CZ.) The ASMS are normally employed with the medical company in the DSA. Their primary mission is to provide augmentation to the FSMTs. They also provide aeromedical evacuation support on an area basis. The ASMS, with six helicopters, will move selected RTD patients from the BSAs to the DSA medical company for holding, or under certain circumstances, to corps hospitals as medically indicated. The structure of this unit allows for task organization to meet situational tactical demands. Additional teams may be attached or assigned by the corps medical evacuation battalion if needed for divisional support.

e. In addition to the air ambulance company (direct support) operating in the division area, aeromedical evacuation support is provided by one or more air ambulance companies (general support) or detachments in the corps. Their primary mission is to augment and reinforce forward deployed air ambulances units. To accomplish this mission, they—

- Evacuate patients from FSMC, MSMC, and MASH to corps hospitals.
- Evacuate patients from combat, CS, and CSS units operating between division rear and corps rear boundaries.
- Evacuate patients between corps level hospitals and intermediate staging points (MASFs, railheads, seaports).
- Transport medical teams and squads, as required.
- Deliver blood and blood products, medical supplies, and biological.
- Rescue downed aircrews.

f. The aeromedical evacuation mission requests are referred to the air ambulance unit or team supporting the particular level of health care. Proper flight clearance is obtained as the mission is accepted. If the mission cannot be accepted, the commander will coordinate with either lateral or rear supporting air ambulance units. The air ambulance unit/team coordinates routes, flight recognition, and airspace clearance with the A^2C^2 element. Depending upon the level of the mission, this could entail contacting the brigade A^2C^2 manager on the command net, or contacting the Flight Control Center (FCC) designated to provide air traffic control (ATC) service support for each division. The FCC serves as the primary ATC facility for Army ATC in the tactical operations area. It is usually located to permit optimum air-ground communications and to provide a radio communications link between the terminal facilities of the division airfields, other airfields located nearby, the division main command post, and the corps flight operations center (FOC). The medical company, air ambulance, operations section must also maintain close coordination with the FCC, the division main, and the S2/S3 of the medical evacuation battalion to provide current tactical information to aircraft crews.

g. Within the corps, missions will be referred to the appropriate ASMC. The aircraft providing support to the ASMC will enter the corps ATC system which is serviced by an FCC organic to an ATC unit. These facilities are in direct communication with the FOC which is collocated with the USAF control and reporting center. The FOC will serve as the primary agency for en route control of Army air traffic and monitor the corps/division en route system.

h. Aeromedical evacuation support, which exceeds the capabilities of the assets available at division, becomes the responsibility of the medical evacuation battalion commander. He adjusts evacuation capabilities between supported divisions through his unit commanders based on the tactical situation and patient densities. The air evacuation unit commanders coordinate and receive flight missions, as appropriate. The requesting unit is notified, if possible, as to the estimated time of arrival for the support. If evacuation requirements overwhelm available medical evacuation battalion assets, the medical evacuation battalion coordinates for additional corps level assets. When nonmedical aircraft are used to meet the requirements for peak periods of patient evacuation, every attempt should be made to furnish medical personnel and equipment for en route medical care. The use of nonmedical assets requires intensive preplanning to ensure availability of assets when needed (Table 4-1). One source of personnel and equipment may be from the additional treatment teams of the MSMC. In instances when the evacuation system becomes overwhelmed, every available space on general purpose aircraft may be used to transport those less severely injured without provisions for en route medical care. Regardless of the method used, control of nonmedical assets is maintained through medical channels regarding the designation of the point of origin, the casualties to be carried, and the destination.

i. It is essential that the maximum number of evacuation aircraft are available and mission capable each day. As a company sized aviation unit, the medical company, air ambulance, has its own organic AVUM capability. This allows the unit to perform maintenance. These unit tasks consist primarily of—

- Preventive maintenance.
- Maintenance repair.
- Replacement functions associated with sustaining a high level of aircraft operational readiness.

(1) Aviation intermediate maintenance companies provide the next level of maintenance support. The AVIM company provides mobile, responsive "one-stop" maintenance support. It combines what was formerly direct support and general support. The AVIM units can also provide backup AVUM support when an excessive backlogs exist in the supported unit. Aviation intermediate maintenance units are located in both the division and corps. Generally, the medical company, air ambulance, supporting a division may receive its AVIM support from the divisional AVIM company or the supporting nondivisional AVIM unit as situationally dictated. Normally, the aviation maintenance company within the division will perform AVIM functions consistent with mobility requirements and conservation of personnel and equipment resources. Additional intermediate maintenance support will be provided by the corps AVIM unit. In the main battle area maintenance and service actions will be limited to emergency maintenance and minor adjustments. The AVIM support for a division is provided by the aircraft maintenance company which will be positioned as far to the rear in the DSA as possible. The AVIM unit will make maximum use of forward support teams at unit AVUM sites where the emphasis will be on component replacement and the direct exchange program.

(2) The medical evacuation battalion and the medical company, air ambulance, commanders must ensure that support arrangements are planned and coordinated from the out set. It must be recognized that the AVIM support of nondivisional assets is not the responsibility of the division AVIM, unless the air ambulance company is attached. This attachment places an additional burden on the divisional system. Maximum effort must be made to accomplish phased maintenance and other possible AVIM tasks through the use of nondivisional assets, to reduce this burden. An attachment relationship may be necessary at times to establish a formal support agreement.

j. The air ambulance forward MEDEVAC team is the smallest deployable element within the air ambulance company. It can provide a continuous 24-hour operation capability. It is designed to be a light and mobile element which is capable of relocating frequently with its supported units. When task organized, it will normally be augmented with a flight operations clerk and a FARE team from the operations platoon. If required, a technical inspector can also be included. When deployed forward in the BSA, this team collocates with either the FSB headquarters or the FSMC. The mobility of this unit is enhanced by sling loading its equipment (common table of allowances and table of organization and equipment) under the organic aircraft.

(1) The ability to effectively communicate is essential for the successful accomplishment of the medical evacuation mission. As this team has no organic communications capability, it is dependent upon the supported unit for this vital function.

(a) Medical evacuation requests are received either on the administrative/logistics net or a dedicated HSS net. In addition to specific mission requirements, the team requires both friendly and enemy forces intelligence. This intelligence data includes, but is not limited to–

- Air defense measures and capabilities.

- Artillery availability and capabilities.
- Air threats.
- Current and projected weather conditions.
- Army airspace command and control information.
- Medical regulating information and guidance.
- Logistical support locations to include refueling points.
- Fire mission support.

(b) This team is most efficiently deployed when collocated with the FSB headquarters support operations cell. The information required to conduct the medical evacuation mission is available in the operations cell. The forward support MEDEVAC team augments the support operations staff with their flight operations specialist to handle the increased support

(2) Medical regulating remains the responsibility of the corps medical brigade or group. However, coordination for the medical evacuation of patients to the MASH or CSH from the FSMC or MSMC is accomplished by the DMOC. Medical regulating out of the division is accomplished procedurally and must be preplanned to ensure proper pre-mission planning by both ground and air units.

CHAPTER 5

MEDICAL EVACUATION IN SPECIFIC ENVIRONMENTS

5-1. General

This chapter addresses medical evacuation in specific environments or under special circumstances. The medical evacuation effort must be well planned and its execution synchronized to be effective. Further, medical evacuation personnel must be flexible and ready to improvise, if needed, to meet the demands of unique situations.

5-2. Mountain Operations

a. In the past, armies have experienced great difficulty in evacuating patients from mountainous areas. Mountain environments are extremely diverse in nature. Some mountains are dry and barren with temperatures ranging from extreme heat in the summer to extreme cold in the winter. In tropical regions, mountains are frequently covered by lush jungles and heavy seasonal rains occur. Many areas display high rocky crags with glaciated peaks and year-round snow cover. Elevations can also vary from as little as 1,000 feet to over 16,000 feet with drastic and rapidly occurring weather changes.

b. Operations in mountainous terrain require some procedure modifications. This is due to the environmental impact on personnel and equipment. Important physical characteristics and considerations which influence medical evacuation are—

- Rugged peaks, steep ridges, and deep valleys.
- Limited number of trafficable roads.
- Reduced communications ranges.
- Unpredictability of and severe changes in weather.
- Decreased partial pressure of oxygen.
- Limited availability of landing zones (LZs).

c. In order to effectively support the tactical plan, the HSS plan must provide maximum flexibility. The HSS planner should consider using all means of evacuation. Due to the length of evacuation times and the limited means of ground evacuation, it is important to prioritize and triage (FM 8-230) patients prior to movement.

(1) The availability of improved, hard-surfaced roads is extremely limited, if they exist at all. Usually, improved roads are only found in valley corridors. Such roads are often dependent upon a system of narrow bridges spanning mountain streams and ravines. They often twist along ridgelines and cling to steep shoulders.

(2) Secondary roads and trails are often primitive and scarce. However, they may provide the only routes capable of vehicular traffic. Cross-compartment travel between adjacent valleys is often impossible by ground vehicle. Off-road travel requires detailed planning, even for short distances.

(3) Because of rough terrain, the medical company may not be able to reach the BAS by ground vehicle. An ambulance shuttle system is established with an AXP for air and ground evacuation vehicles to meet litter bearers. Litter bearers and beasts of burden may be the only means of evacuation available. Any available personnel may be used as litter bearers. Close coordination between medical companies and BASs in establishing patient collecting points or AXPs is necessary to—

- Reduce distance traveled by litter bearers.
- Reduce evacuation time.
- Conserve personnel.
- Locate the best potential LZs for air ambulances.

(4) In mountainous areas, evacuation of patients by air is the preferred means. Air ambulances permit the rapid movement of patients

over rugged terrain. For example, to travel a distance of only 6 kilometers on foot could take up to 2 hours, while flying time could be less than 2 minutes.

(5) Frequency-modulated (FM) radios are the principal means of communication in this environment. The ability to transmit is hampered by the limitations of line of sight transmissions.

(6) The briefing of ambulance drivers needs to be extensive including detailed strip maps and overlays. Further, specific instructions on what to do in various situations should be covered (such as if the vehicle breaks down or the unit moves).

d. The mountain environment, with its severe and rapidly changing weather, impacts on aircraft performance capabilities; accelerates crew fatigue; and requires special flying techniques. Having to rely on continuous aviation support for a successful mountain operation is risky.

(1) Flying in mountainous areas requires special training. Both the terrain and the weather influence basic flying techniques and operational planning. Rugged, mountainous terrain complicates flight route selection. Direct routes can seldom be flown without exposing the aircraft to detection and destruction by the enemy.

(2) Important considerations for aeromedical operations in mountainous areas are—

(a) Density altitude. Density altitude is the most important factor affecting aircraft performance. Density altitude combines temperature, humidity, and pressure altitude, and provides the basis for lift capability. Density altitude can vary significantly between the pickup point and the LZ because of the time of day and changes in elevation. Frequent performance planning updates are essential.

(b) Wind. Unpredictable winds can produce significant turbulence, wind sheers, updrafts, and down drafts. This further increases the risk of a catastrophe in a seemingly routine mission. Adverse winds along with high density altitude demand current and accurate performance planning. Pilots must plan for greater margins of safety.

(c) Icing. Ice can clog intake ports, thus starving the engine of air, or it can collect on rotor blades resulting in a significant loss of lift. Asymmetrical shedding can cause severe out of balance rotor conditions.

(d) Visibility. Low clouds or fog greatly decrease the ability to navigate or to avoid obstacles.

(e) Lack of landing zones. The characteristics of mountain terrain do not usually afford adequate LZs. The terrain may only allow the aircraft to hover while loading patients on board.

(f) Hoist operations. Use of the internal rescue hoist can be expected in mountainous terrain. Mounting the rescue hoist in the aircraft as standard equipment in mountain operations may be required. When possible, orientation and training sessions with supported troops should be conducted to help minimize the difficulty of such missions. Depending on the terrain, the forest penetrator may also be needed to accomplish the mission. Refer to Chapter 11 for more information on hoist operations.

(g) Enemy air defenses. When enemy air defense capabilities preclude using air ambulances in forward areas, they should be used to evacuate patients from AXPs or from division clearing stations.

(h) Ambulatory patients. Some ambulatory patients may be reported as litter patients in mountainous terrain. These patients are unable to walk through the rugged ground. Once placed on the air ambulance, their status may be upgraded.

(i) Crew training. Ground and air evacuation crews should receive additional training and orientation in mountaineering skills, handling casualties, and survival skills; for example—

- Cold weather survival training, including cold injury prevention.
- Mountain (rock) climbing.
- Use of ropes and vertical rescue techniques.

- Individual and unit movement at high altitudes.

- Care and treatment of patients suffering high altitude illnesses and cold weather injuries.

- Techniques of patient evacuation by litter, emphasizing the use of pack animals (if available from the host country), and the improvised travois and tramway litter.

(j) Patient loading. Care must be taken when loading patients where there is a great deal of slope to the LZ. Emphasis on approaching and loading the aircraft from the down-slope side of the aircraft must be reinforced.

CAUTION

Approaching the aircraft from the up-slope side is hazardous.

e. Troops operating in mountainous areas are exposed to other injuries and illnesses that frequently occur in this environment. These conditions include—

- An increased rate of fracture, sprain, and dislocation injuries.

- Incidents of acute mountain sickness, high-altitude pulmonary edema, and cerebral edema caused by rapid ascent to heights over 7,500 feet.

- Cold weather injuries.

- Dehydration and heat exhaustion.

- Sunburns and snow blindness.

- Aggravated sickle cell anemia. Although this condition is not considered a mountain illness, personnel with sickle cell traits can be seriously affected by the decrease in barometric pressure and lower oxygen levels found at high altitudes.

f. The proportion of litter cases to ambulatory cases is increased in mountainous terrain, for even the slightly wounded may be unable to move unassisted over rough terrain. Litter relay stations may be required along the evacuation route to conserve the energy of litter bearers and to speed evacuation.

g. It is important to be able to predict the number of patients that can be evacuated with available personnel. When the average terrain grade exceeds 20 degrees, the four-man litter team is no longer efficient and should be replaced by a six-man team. The average mountain litter team should be capable of climbing 120 to 150 vertical meters of average mountain terrain and return with a patient in approximately 1 hour.

h. Mountain operations may require medical personnel to carry additional equipment. Items such as ropes, pulleys, pitons, piton hammers, and snap links are all necessary for evacuating patients and establishing BASS. All unnecessary items of equipment including those for which substitutes or improvisations can be made should be left behind. Heavy tentage, bulky chests, extra splint sets, excess litters, and nice-to-have medical supplies should be stored. Such medical supplies, if stored, should be readily available for airdrop or other means of transport. Medical items that are subject to freezing should be safeguarded. They should not be exposed to the low temperatures experienced in mountainous areas.

i. Evacuation times may be extended when using litter teams with AXPs. Therefore, shelter for patients must be improvised if tentage is not available to prevent undue exposure. In the summer or in warm climates, improvisation may not be necessary; however, since there is a close relationship between extreme cold and shock, medical personnel must be conscious of the need to provide adequate shelter for patients. Satisfactory shelter may be found in caves, under overhanging cliffs, behind clumps of thick bushes, and in ruins. Shelters may be built using a few saplings, evergreen boughs, shelter halves, or similar items. The time a patient is to be held influences the type of shelter used. When patients are to be kept overnight, a weather-proofed shelter should be constructed.

j. For further information on mountain operations, refer to FM 90-6. For aviation-specific information, refer to FMs 1-202 and 1-400.

5-3. Jungle Operations

a. Health service support elements in a jungle environment retain the same basic capabilities as in other environments. Jungle operations, however, subject personnel and equipment to effects not found in other environments. The jungle environment degrades the ability to maneuver. Security problems are also increased and affect medical evacuation operations as much as they do the combat forces.

b. In jungle operations a combination of air and ground evacuation units are used to maximize the patient evacuation potential. Using this dual system of evacuation ensures that the inherent limitations of one system can be compensated for by the other. Jungle variations affect the organizing, positioning, and securing of HSS. Due to the terrain, aerial resupply is usually a common practice. The responsiveness provided by aerial resupply requires fewer supplies to be stockpiled in the combat trains.

c. Jungle combat operations are characterized by ambushes and other guerrilla-type operations. The security threat caused by infiltrators requires that LOCs be patrolled often and that convoys be escorted. It is, therefore, essential that HSS be performed as far forward as the tactical situation permits. Positioning assets forward—

- Improves response time.
- Reduces road movement.
- Allows the HSS elements to take the advantage of security offered by combat units.

d. The thick foliage often makes evacuation by ground more difficult than in other types of terrain. Factors such as the threat, limited road network, and reliance on nonmedical personnel for convoy security make air evacuation the preferred means. By using the ambulance shuttle system, patients can be transferred from forward operating ground ambulances to either ground or air ambulances operating further to the rear. In situations where evacuation assets are delayed by various factors (weather, terrain, or enemy air superiority), patients are held for longer periods of time at forward locations. This will dictate the need for additional medical supplies. Health service support planners must try to anticipate these delays whenever possible. The increased disease and infection incidence associated with the jungle environment may worsen the patient's condition; therefore, timely evacuation is essential.

e. In some remote and densely foliaged jungles, the only means of evacuation may be by litter. Ambulances may not be practical on trails, unimproved muddy roads, or in swamps. As in mountain operations, there is a higher proportion of litter cases than usual. In the jungle even a slightly wounded soldier may find it impossible to walk through dense undergrowth. At best, litter teams can carry patients only a few hundred meters over rough jungle terrain before needing rest or relief. Litter carries should be kept as short as possible and medical elements kept far forward.

f. Other special planning considerations in jungle operations include—

(1) *Water.* Water is vital in the jungle and is plentiful. Water from natural sources, however, should be considered contaminated. *Water purification procedures must be taught to all soldiers.*

(2) *Clothing.* Due to the tropical climate, units should pack hot weather clothing when deploying to jungle areas. Jungle fatigues and boots are recommended. The insect (mosquito) net, insect repellent, and sunscreen should be issued to all soldiers operating in this environment.

(3) *Disease and nonbattle injuries.* The jungle environment is ideal for the transmission of a large number of diseases. The rate of DNBI casualties is potentially the highest in this climate. The heat, humidity, and terrain places the troops at high risk for dehydration, heat injury, skin diseases, endemic diseases, and immersion foot. Small wounds can rapidly become infected and lead to loss of effectiveness and possibly require evacuation. High standards of personal hygiene must be taught, encouraged, and maintained by the command. Mos-

quitoes and other arthropods that carry disease flourish under jungle conditions. Use of all possible personal protective measures must be ensured. Food- and waterborne diseases leading to diarrhea or other symptoms will abound. Food service sanitation measures must be strictly followed. The potential for contamination of food and water increases with each time they are handled, stored, or transported. Soldiers must be encouraged to consume adequate amounts of water that has been purified and to eat only approved foods. In the jungle it is necessary for the commander to pay meticulous attention to the details of PVNTMED measures to maintain an effective fighting force. For additional information on PVNTMED measures, refer to FM 21-10 and FM 21-10-1.

(4) *Training.* Health service support personnel should be trained in survival and support techniques in jungle environments. For example, training should be conducted in—

- Hot weather acclimatization and survival.
- Prevention, early detection, and treatment of arthropod-, food-, and waterborne diseases.
- Land navigation in a jungle environment.
- Field sanitation and other PVNTMED measures.
- Care and maintenance of equipment and supplies.

(5) *Equipment.* Due to the increased heat and humidity, vehicles and equipment require additional maintenance. Equipment tends to rust quickly and must be cleaned and oiled more frequently. Canvas items rot and rubber deteriorates much faster than in more temperate climates.

(6) *Communications.* The range of FM communications in the jungie is significantly reduced due to the dense undergrowth, heavy rains, and hilly terrain. The range of a radio set operated in the jungle may be reduced by 10 to 25 percent. The heavy rain and high humidity of the tropics also reduce the range (about 20 percent) and reliability of wire communications. The transmission range can be extended by using additional radio relays and field expedient antennas.

(7) *Aircraft performance.* Utility helicopters are not able to lift the same size loads that can be lifted in more temperate areas. This results in a reduced patient load in some evacuation aircraft. Again, frequent and accurate performance planning is essential for mission accomplishment.

(8) *Landing zones.* There may be few suitable LZs. Many LZs will only be large enough to support one or two helicopters at a time.

(9) *Hoist operations.* Hoist operations may be required more frequently in the thick jungle vegetation where LZs are not available. The forest penetrator should be carried on all operations. For additional information on hoist operations, refer to Chapter 11.

g. For additional information on jungle operations, refer to FM 90-5. For aviation-specific information, refer to FMs 1-202 and 1-400.

5-4. Desert Operations

a. The Environment.

{1) Deserts are arid, barren regions of the earth incapable of supporting normal life due to a lack of fresh water (FM 90-3). Although deserts are often thought of as hot climates, it is important to note that temperatures range from over 136° Fahrenheit (F) in some deserts, to bitter cold in others. Day to night fluctuations in temperature can exceed 70°F. Desert terrain can have mountains, rocky plateaus, or sandy dunes; some desert areas may contain all of these characteristics. Rain, when it falls, often causes flooding in low-lying areas. Winds can have a devastating effect upon HSS operations by destroying equipment and supplies and causing dust storms. Dust storms make navigation and patient treatment difficult. Since deserts vary considerably in the type of terrain and temperature, and in their cultural makeup, current medical intelligence should be obtained prior to desert operations.

(2) People have lived and fought in desert areas for thousands of years. However, the

environmental effects on personnel can be extreme, especially for soldiers not prepared for these operations.

- *Acclimatization.* To be effective, soldiers must be properly acclimatized to the desert. Two weeks are usually required to satisfactorily acclimatize troops to hot environments, using progressive degrees of heat exposure and physical exertion. Other potential acclimatization problems that may be encountered are the effects of dry air and altitude on the respiratory system. Since many desert areas are located in mountainous terrain, soldiers must be acclimatized for both the altitude and the temperature. In some areas of the world, such as the Gobi Desert in East Asia, people must be acclimatized to the cold, in addition to the dryness. (For additional information, refer to FM 21-10, FM 8-250, and TB MED 507.)

- *Discipline.* Units deployed in desert areas typically have long LOCs and are widely dispersed. This necessitates a greater reliance on the junior leaders as commanders are required to decentralize operations. For a unit to be effective, a high level of discipline must exist at all levels of the organization.

- *Water.* Water is the most basic need in a desert. Without it, soldiers cannot function effectively for more than a few hours.

  - Thirst is not an adequate indicator of the need for water. *It is necessary for each commander to establish and enforce a supervised drinking program.* Experience has shown many times that soldiers do not drink enough fluids unless forced to do so. It is important to cool the water, if at all possible, to make it more appealing. Water supplies should be carefully guarded against accidental loss, sabotage, or contamination.

  - Extra water must be carried by medical vehicles for patients to drink and to cool heat casualties.

- *Endemic disease and environmental injuries.* Soldiers deployed in the desert are susceptible to endemic diseases and environmental injuries.

  - Proper water discipline, vaccines, prophylactic measures, field sanitation measures, personal hygiene, and other PVNTMED measures can reduce these risks.

  - Cold weather injuries, heat injuries, and respiratory disease can also be prevalent. Proper clothing, equipment, and a water-discipline program must have command emphasis in desert operations.

- *Winds.* Winds may very easily damage material such as aircraft, antennas, and tents. Equipment is protected by using covers, tie-downs, and shelters. Terrain helps shield equipment from the wind if site selection is done carefully. In some cases, special tools, such as extra long metal tent stakes, are necessary.

- *Wind and sand.* The effects of wind and sand are interrelated. Desert sand starts to become airborne when the wind reaches about 20 knots. Sandstorms—

  - Restrict visibility.

  - Pose a hazard to eyes (especially for soldiers wearing contact lenses).

  - Can contaminate water supplies, if they are not protected.

  - Make navigation difficult.

- *Sun.* The sun may cause sunburn of the skin and eyes if protection is not used.

(3) Eight characteristics of the desert environment that may adversely affect equipment are—

- *Terrain.* Trafficability varies with the type of terrain covered. Open, flat, and rocky terrain affords higher trafficability than do mountainous areas, lava beds, or salt marshes. Drivers must be well trained in judging the terrain over which they are driving to select the best alternative.

  - Tracked vehicles are best suited for desert operations. However, they can throw tracks when traversing a rocky area. Their use is also limited in rough terrain with steep slopes.

- Wheeled vehicles may be used in desert operations; however, they normally have a lower average speed than tracked vehicles and a higher incidence of damage and malfunction. Wheeled vehicles often bog down in sandy areas and cannot traverse many of the rougher areas.

- In planning for desert operations, vehicles should carry extra repair parts (fan belts, tires, and other items apt to malfunction).

- *Heat.*

  - Excessive heat causes vehicles to overheat, leading to greater than normal wear. The frequency of leaks on vehicles and aircraft is greater than in some other environments. Engine and transmission seals tend to dry out and crack; fuel lines wear out quickly; and water requirements for cooling vehicle engines are greater. Loss of water, through evaporation, must be included in logistical planning. Aircraft temperature limitations may be reached quickly, resulting in limited use during the hotter parts of the day. Aircraft performance is greatly reduced by the heat combined with the effects of ground elevation. This may result in the limited use of some LZs, reduced patient carrying capacity, and reduced fuel load. There may not be sufficient out-of-ground-effect hover power available for landing in confined areas or on pinnacles, for using the hoist, or for nap-of-the-earth (NOE) flights. Using vehicle and aircraft covers reduce the effects of heat while vehicles and aircraft are not in use.

  - Batteries do not hold their charge efficiently in intense heat. Dry battery supplies should be increased to compensate for a higher usage rate.

  - Communications equipment must be protected from the heat in the desert. Dust covers are used on this type of equipment. If the equipment has ventilating ports, these should be cleaned regularly to avoid clogging.

  - Medical supplies must be protected from the heat to prevent deterioration. The shelf life of some medical supplies decreases when stored in hot climates.

- *Radiant light.*

  - The sun burns unprotected skin and it may damage unprotected eyes. Soldiers should dress in loosely fitting clothing, use sunburn cream or oils to protect exposed skin, and wear sunglasses or goggles to protect their eyes. Soldiers should remain fully clothed. Removing clothing increases direct exposure of the skin to the sun and eliminates the beneficial cooling effects of the moisture trapped in clothing.

  - Radiant light or its heat effects may be detrimental to plastics, lubricants, pressurized gasses, rubber, and other fluids. All vehicles and aircraft should be kept well ventilated, and windshields should be covered to reduce heat buildup inside. Supplies of all types should be stored in a well ventilated, shady area. Placing supplies in covered holes in the ground may reduce adverse heat effects.

- *Dust and sand.*

  - Dust and sand present one of the greatest dangers to the proper functioning of equipment. Sand mixed with lubricants forms an abrasive paste. Lubrication fittings, bearings, and filters should be inspected frequently and changed when required.

  - Aircraft should not be exposed to dust and sand any more than is absolutely necessary. Ground handling instead of hovering reduces sand ingestion. Dust and sand increase failure of microphone switches, signal distribution panels, and circuit breakers, and cause electrical motors and generators to burn out. Wheel and flight control bearings require more frequent cleaning; engines should be flushed frequently.

  - Communications equipment may be adversely affected by dust and sand. Over a period of time, electrical insulation is damaged by wind-blown sand. When combined with the effects of lubricants on the insulation, dust and sand can become a major communications problem. Special care should be taken to brush dust off of radio equipment and to keep ventilating ports and channels clear.

- Sand can accumulate in airframes, on the bottom of armored vehicles, and in bearings on all types of equipment. This accumulation, combined with oil and condensation, adds extra weight to aircraft and vehicles as well as jamming their control linkages. Sand and grease buildups must be removed from bearings to ensure safe operation and control of aircraft and vehicles.

- Dust trails created by hovering aircraft or ground vehicles can be seen in excess of 10 miles on a relatively flat desert. This exposes these assets to direct and indirect enemy fires. Ground vehicles should reduce their speed to the point that they do not create a dust signature.

- *Humidity.* Humidity is a factor in some desert areas of the world, especially in the Middle East. Humidity can become a problem for short periods of time in other desert areas. Light coats of lubrication can help prevent rust; however, these benefits should be weighed against the dust-gathering qualities of oil. Demisting equipment is used on optics and night vision equipment to combat the effects of humidity.

- *Temperature variation.* Temperature variation can cause condensation in humid desert areas affecting optics, fuel lines, air tanks, and weapons. Expansion and contraction of air and fluids cause tires to overinflate during the day and underinflate at night. Fuel tanks may overflow during the day causing a fire hazard. Oil fluid levels become overfull and cause leaks during the clay, or insufficient lubrication occurs when the oil cools. Vehicle operators and crew chiefs must ensure that the effects of temperature variations do not become a significant problem.

- *Static electricity.* Static electricity is prevalent in the desert. This is important to remember during refueling operations and when oxygen is being used on board vehicles or aircraft. Proper refueling procedures must be followed. Static electricity also causes severe shock to ground personnel in sling load and hoist operations. The load must touch the ground before the ground crew can handle it. (For additional information on hoist operations, refer to Chapter 11.)

b. Preparation for Desert Operations.

(1) To ensure success in desert operations, detailed planning is required. Factors to consider include—

- *Water.* Additional quantities of water are required for HSS operations for the survival of both medical personnel and their patients. Load plans for all vehicles and aircraft must include water. *Water is as mission essential as any piece of unit equipment.* It should be a priority item when loading plans are developed.

- *Prescribed load lists* (PLL). These lists are expanded to carry sufficient quantities of repair parts easily degraded by the environmental factors. For example, rubber and plastic fittings and tubes, or spare parts for communications equipment.

- *Wind, sand, and sun.* Plan for the effects of wind, sand, and sun. All plastic and glass surfaces on vehicles, aircraft, and other equipment should be covered when not in use. Covers should be ordered or fabricated prior to deployment.

- *Fuel.* Fuel planning is critical due to power limitations, extended range requirements, and increased vulnerability of refueling sites in the relatively open desert terrain. Careful planning of forward arming and refueling points (FARPs) is essential for mission accomplishment.

- *Clothing.* Units should plan to pack both hot and cold weather clothing when deploying.

- *Petroleum, oils, and lubricants.* These products should be of the proper viscosity for desert operations. Maintenance services are also performed more frequently on ground vehicles and aircraft, thus requiring a larger amount of POL than normal.

- *Filters.* Extra filters of all types are planned for due to a higher consumption rate.

- *Pre-positioning of equipment.* Pre-positioning of camouflage materials and personal equipment the aircrews cannot carry on the aircraft is planned for each unit move.

(2) Training for desert operations is not significantly different than training for operations in other areas except for the following:

- *Mountain training.* Because many desert areas are in mountainous terrain and because high temperatures increase density altitude, aeromedical evacuation units should conduct mountain training to prepare for contingencies in desert areas. Further, procedures and techniques for evacuation in mountainous terrain must be practiced by all HSS personnel. Special equipment requirements (paragraph 5-2 *f*) must also be considered.

- *Navigation.* Navigation in desert terrain varies from simple to extremely difficult. Factors affecting navigation are the type of desert and the scale and quality of the available navigational charts. At times, aircraft may have to use dead-reckoning navigational techniques (time, distance, heading). Ground vehicles must have compasses available, as they have to rely on compass headings and odometer readings to navigate. Ground and air ambulance crews should be able to interpret navigational charts and maps of all types and scales. Use of convoys is a viable technique to improve security and to ensure that ground vehicles do not get lost. Aircraft may be used to assist in navigation by convoys in those areas in which there are poor road networks and the terrain offers no distinctive features by which to navigate.

c. Medical Evacuation Operations in the Desert. In principle, medical evacuation operations in the desert do not differ greatly from these operations in other environments. However, techniques exist which may increase the effective use of medical resources.

(1) Helicopter landing sites should be chosen with care. Common mistakes made by many units when establishing the LZ are—

- Locating the pad relative to the patient, tents, vehicles, and other obstacles. A common tendency is to locate the helipad downwind of MTFs so that approaches may be made into the wind towards the facility. In high winds, the helicopter must make its take-off over the facility or go around it. This not only endangers personnel on the ground, but also the crew of the aircraft. It forces the pilot to take off with a strong crosswind or tailwind if he does not have the power to clear the obstacles in front of him. At times, crosswind take-offs are not possible because of higher terrain on either side of the landing area. In mountainous deserts, winds normally channel down the valleys and are more predictable along valley floors. A better site selection for a LZ is with the MTF along side the approach and take off zone. Thus, the landing direction is up or down the valley depending on the airflow, and MTF is not overflown.

- Situating landing sites in washes, small confined areas between large rocks, or close to moving tracked vehicles. Map coordinates are rarely accurate unless the site is beside a major terrain feature. Therefore, LZs should be located next to major terrain features or on higher ground where they can be seen from the air at a distance of 2 to 3 kilometers, if possible. Lack of distinctive features in the open desert and on large scale maps makes pinpoint navigation difficult, especially at night.

- Marking of helicopter LZs is done so that the pad can be seen from the air, but the markings should not be a hazard in themselves. If engineer tape is used, it should be firmly secured to prevent it from blowing loose. Panel markers are not a good tool to use as they are difficult to see. If panel markers are used, they need to be secured. If used, flares or marker smoke should not be deployed on or directly upwind from the pad. Smoke grenades or flares should not be thrown under the aircraft as it lands. Avoid using white smoke to mark the LZ. Colored smoke is probably the best daylight marking method. It is difficult to detect a smoke grenade more than 2 to 3 kilometers away, but an aircraft in the general vicinity can normally see it. Radios are used to guide aircraft to the LZs, but this creates an electronic signature. Units requesting medical evacuation must be prepared to signal the evacuation aircraft upon its arrival. Normally, map coordinates will guide the aircraft to within 2 to 3 kilometers of the LZ. Even from NOE altitudes, the aircrew may be able to see several units in the area. The requesting unit must signal the aircraft to ensure the designated LZ is used.

(2) Considerations for night flight include the following:

(a) Moonlight aids the medical evacuation pilot by providing him with the light to see with either unaided vision or night vision goggles (NVG). When adequate ambient light exists, medical evacuation crews function almost as effectively at night as they do during daylight. The small arms threat is somewhat reduced at night, although it still exists from radar-guided weapons, infrared-sited weapons, and passive night vision device equipped weapons systems. Flying into a bright moon with NVG on can be compared to flying into the sun during the day. The goggles darken and visibility becomes extremely poor. Flight routes should not be planned directly into bright moon if NVG are used.

(b) Flight at dusk or dawn presents severe visual problems. The threat cannot be detected until it is too close to avoid. Missions should be carefully planned or even delayed if the visibility is inadequate.

(c) The lack of visual cues over sand is similar to that over water. It is very easy for pilots to become disoriented and fly into the ground. Reliance on radar altimeters is a must over flat sandy areas of the desert.

(d) Frequently, desert areas do not have sufficient ambient light to allow adequate night vision, even with the aid of NVG. A pilot wearing NVG is often unable to see the ground at an altitude of 100 feet using a landing light equipped with a pink light filter. Under these conditions, dead reckoning is the only effective navigation method unless Doppler equipment or NAVAIDS are available. Unfiltered light can be used with or without NVG; however, this increases the risk of exposing the aircraft's position to the enemy.

(3) Desert warfare is usually characterized by extended battle zones which increase evacuation distance and time. Health service support units are located further to the rear in the desert. Establishing an ambulance shuttle system or patient collecting points is useful. Health service support units require a greater number of vehicles for operating in deserts than in other environments. Air evacuation by fixed- and rotary-wing aircraft is the preferred method due to their speed and range. Further, using aircraft reduces the load on ground vehicles. Augmentation from higher echelon HSS may also be required to meet the extended evacuation needs.

(4) Smoke is used extensively on the modern battlefield by both sides. It can be effectively used to mask friendly actions to include medical evacuation. (Refer to Appendix B for further information.)

- Smoke can be a major hazard, especially to medical evacuation helicopters. Smoke reduces visibility and forces an aircraft higher where it can be acquired by threat weapons systems. The phenomenon of inversion occurs often in the desert. When this happens, medical evacuation vehicles and aircraft may be able to work underneath the smoke using the smoke layer for overhead concealment.

- Medical units must coordinate closely with supported organizations on smoke operations. Smoke can either help or hinder the evacuation mission, depending upon how it is used.

(5) Communications in the desert are affected by a number of factors. Atmospheric interference and the skip of signals occur frequently. Mineral deposits in the desert may unexpectedly disrupt communications. Many of these problems can be overcome by using additional radio relays, preestablished control measures, and visual signals.

(6) Artificial lights may be used at times in the desert. They are very easily detected. Even with blackout, vehicles using lights can be detected for miles with NVG. Serious consideration should be given to driving without using lights when the tactical situation dictates. Ground guides are used to help vehicles navigate through areas that are not clearly marked.

(7) Wind is one of the most significant environmental factors affecting medical evacuation in the desert. Wind can be destructive to both structures and equipment; tents, antennas, and aircraft can be easily damaged. Wind direction and speed vary greatly within the space of a few miles. Velocity is substantially increased when wind

channels between hills and direction changes due to interference of terrain features. The wind frequently makes aeromedical evacuation impossible by exceeding the operating limitations of the aircraft. At other times, it may limit the use of some potential LZs. Blowing sand and dust can slow down the evacuation system by making navigation by either ground or air ambulance difficult, if not impossible. High winds are predictable to a certain extent. For example, at certain times of the year in the Mojave Desert high winds occur every day at dusk and last for 3 to 4 hours. At other times high winds, based on frontal weather patterns, can remain for several days at a time. These factors should be taken into account by medical planners and medical evacuation assets should be massed or relocated accordingly.

(8) The desert provides little or no protection from enemy air defenses except in mountainous terrain. Aircraft may have to be flown above NOE altitudes to prevent dust signature. These factors cause increased exposure and vulnerability of air ambulances to enemy air defenses and may limit their employment.

d. Further Information. Refer to FM 90-3 for additional information on desert operations. For aviation-specific information, refer to FMs 1-202 and 1-400.

5-5. Extreme Cold Weather Operations

a. Operations in the extreme cold have many of the limiting factors found in desert operations. The tundra and glacial areas are harsh, arid, and barren. Temperatures may reach lows of -80°F to -100°F which, combined with gale force winds, make exposure unsurvivable.

b. The greatest environmental detriment to operations is blowing snow. This results in a loss of depth perception from total white conditions. Blowing snow is caused by the wind or can be caused by the rotorwash of helicopters which reduces visibility to zero.

c. Other environmental considerations are as extreme but easier to circumvent. Solid footing is suspect in both the dead of winter and in the summer. Snow and ice cover crevasses, holes, and otherwise unstable ground. In traversing suspect ground situations, consider linking soldiers by rope. During the summer, ground transportation is more restricted than in any other environment due to the marsh and muskeg composition of the arctic tundra. Patients must be sustained for a longer duration due to terrain delays and the lack of direct lines of evacuation.

d. Greater responsibility has to be placed on each soldier, especially for maintenance of food and water consumption. It is imperative to stress that leadership and training are important in the prevention of cold weather injury. Strict adherence to the guidelines found in FMs 21-10 and 31-70 assures an effective fighting force. Water conservation is essential; however, adequate consumption by the individual should be enforced.

e. Factors to consider for conducting evacuation in arctic operations include the following:

- Arctic warfare is usually characterized by extended battle zones which increase evacuation distance and time. Establishing an ambulance shuttle system or patient collecting points is useful. Augmentation from higher echelon HSS may also be required to meet the extended evacuation needs.

- Additional supplies of water should be carried by ambulances and maintained at patient collecting points.

- Due to the decreased temperature and frozen environment, ambulance maintenance requirements are increased. Lubricants must be of the correct viscosity for the temperature. In extreme cold, batteries perform less efficiently. The use of a 28-volt nickel cadmium battery with two additional cells is recommended for aircraft. Batteries may need to be removed from the aircraft and kept in a warm area so that the aircraft can be promptly started. Engines may have to be left running to avoid freezeups or long warmup periods. *All ambulances are considered deadlined without a functional heater for the patient compartment.*

- The proper storage of medical supplies is essential to prevent loss from freezing.

- There are few terrain features or road networks; therefore, evacuation routes must be surveyed and marked over open terrain. At extreme latitudes, operations during the winter months are conducted in extended hours of darkness. The use of NVGs may be required. Compass accuracy is inconsistent due to a geomagnetic phenomenon. Beacons and homing devices are essential for air navigation.

- Weather is extremely unpredictable. There are few observers to allow for accurate assessment of weather patterns. Unfavorable weather conditions cause unexpected delays; therefore, medical personnel must be prepared to provide survival measures for their patients and themselves.

- Landing zones must be chosen with extreme care in both winter and summer. Blowing snow mandates instrument-assisted takeoffs and running landings. Landing areas must be correspondingly larger. The full weight of the aircraft cannot be allowed to settle on the skis until after firm ground conditions are established. Movement of patients to and from the aircraft is difficult. Where an aircraft lands is where it stays. A rocking motion, to free the skis prior to lift off, is performed using the cyclic and antitorque controls.

f. Thorough planning and strict preparation are the keys to survival. Factors to consider include the following:

- Mud obstacles at noon may become an avenue of approach at midnight.

- Snow complicates all work. Snow-covered terrain hampers reinforcements, muffles noise, makes cross-country driving hazardous, and creates different camouflage requirements.

- Because of thermal sights, a complete reappraisal of concealment is required.

- Tracks in the snow destroy concealment.

- No soldier is assigned to any job alone. The buddy system is used at all times.

- Anticipate that all maintenance tasks will take twice as long.

- Bare metal can stick to skin or wet garments in subfreezing temperatures.

- Fuel spilled on skin or garments increases the freezing factor; it is one of the greatest causes of injury in winter operations.

- When operating in the cold, anticipate increased POL needs. Fuel consumption can rise as much as 25 percent for vehicles operating in deep snow, slush, or mud.

- The recommended fuel for Yukon stoves is motor gasoline (MOGAS).

- Make every effort to warm gear boxes and engines before starting.

- A higher paraffin content is contained in JP-5 fuel. At extremely cold temperatures, the aircraft fuel controls are likely not to work even with preheating.

- The first consideration in the AO is heat; followed by shelter for sustained work.

- Soldiers need to stand clear of taut cables; steel tends to be brittle and breaks in extremely cold temperature.

- Fire extinguishers are winterized by adding 15 percent nitrogen to the carbon dioxide.

- Degradation of battery life requires changes as much as six times more frequently than in a more temperate environment.

- Radio sets are warmed up prior to transmission. The sets may be turned on but should not transmit for at least one-half hour.

- Frost shields (such as using the plastic bag in which the batteries are packed) should be placed over microphones.

- Grounding rods have to be buried horizontally instead of pounded in vertically. Recovery of stakes and rods placed in the ground is significantly more difficult.

- Flooring is needed in heated areas because of the thawing of the tundra.

- Soldiers must take breaks for water and warmth.

- Static electricity presents a serious safety hazard especially around flammable materials.

g. For additional information, refer to FM 31-70. For aviation-specific information, refer to FMs 1-202 and 1-400.

5-6. Medical Evacuation in a Nuclear, Biological, or Chemical Environment

a. Evacuation of patients in an NBC environment forces the commander to consider to what extent he will commit evacuation assets to actually enter the contaminated area. Since the combinations of evacuation methods are nearly endless, the commander has greater flexibility in tailoring an evacuation system to meet his particular tactical situation and to deal with the NBC environment.

b. On the modern battlefield there are three basic modes of evacuating patients (personnel, ground vehicles, and aircraft).

(1) In using personnel to physically carry the casualties, the commander must realize the inherent stress involved. Cumbersome mission-oriented protection posture (MOPP) gear needed in a contaminated environment (added to climate, increased work loads, and the fatigue of battle) greatly reduces the effectiveness of unit personnel.

(2) If the commander must send evacuation personnel into a radiologically contaminated area, he must establish operational exposure guidance for the medical evacuation operation. Radiation exposure records are maintained by the battalion NBC NCO and are made available to the commander, staff, and surgeon. Based on operational exposure guidance, the commander decides which medical evacuation unit to send into the contaminated environment.

c. Commanders should make every effort to limit the number of evacuation assets which are contaminated.

(1) It is expected that a certain number of both ground and air ambulances will become contaminated in the course of battle. The commander can, therefore, segregate the contaminated ones. This results in the smallest impact on his available assets and the greatest possibility for continuing the patient evacuation mission. *Optimize the use of resources, medical or nonmedical, which are already contaminated before employing uncontaminated resources.*

(2) Once a vehicle or aircraft has entered a contaminated area, it is highly unlikely that it will be able to be spared long enough to undergo a complete decontamination. This depends upon the contaminant, the tempo of the battle, and the resources available. Normally, contaminated vehicles (air and ground) have restricted use and are confined to dirty environments.

(3) Introducing uncontaminated aircraft into a contaminated area should be avoided. Ground ambulances should be used instead of air ambulances. Ground ambulances are more plentiful and can be more easily decontaminated or replaced. This does not, however, preclude using aircraft in a contaminated environment or in the evacuation of contaminated patients.

(4) The relative positions of the contaminated area, FLOT, and threat air defense systems determine if and where helicopters are to be used. The commander may choose to restrict one or more helicopters to the contaminated areas and use ground vehicles to cross the line separating contaminated and clean areas. The ground ambulance can proceed to a personnel decontamination station. The patient can then be transferred to a clean ground or air ambulance if further evacuation is required. The routes used by ground vehicles to cross between contaminated and clean areas are considered dirty routes and should not be crossed by clean vehicles. The effects of wind and time upon the contaminants must be considered.

(5) The rotorwash of the helicopters must always be kept in mind when evacuating contaminated casualties. The intense winds disturb the contaminants in the area and further aggravate the condition by additionally spreading the contaminants. Ideally, the aircraft must be allowed to land and reduce to flat pitch prior to bringing any patients near. This will be dictated by the tactical situation, but allows some reduction in the effects of the downwash. Further, a helicopter must not land too close to a decontamination station (especially

upwind) because any trace of contaminants in the rotorwash will compromise the decontamination procedure.

d. Hasty decontamination of aircraft and ground vehicles should be accomplished to minimize crew exposure. Units should develop their own procedures for deliberate decontamination and document them in their SOPs. A sample aircraft decontamination station that may be tailored to a particular unit's needs (ground and air assets) is provided in FM 1-102 and FM 3-5.

e. Evacuation of patients must continue even in a contaminated environment. The commander must recognize the constraints placed upon him by resources and plan and train to overcome deficiencies.

5-7. Naval Operations

a. It is imperative that Army aeromedical evacuation units be able to interface on the first day of battle with US Navy air-capable ships. Lessons learned from past operations, such as Vietnam and Grenada, have shown that US Army helicopters should be able to operate to and from US Navy air-capable ships. An interservice agreement between the Army and the Navy allows for deck-landing qualification of Army pilots.

(1) It is important that units having contingency missions requiring Navy support establish training requirements to obtain naval-operations orientation, water egress training, water survival, and deck-landing qualification. This enhances the successful accomplishment of the aeromedical evacuation mission to naval vessels.

(2) In past joint operations, communications have been burdensome for both Army and Navy elements. Commonality of communication requirements should be established during training exercises. Communication equipment and frequencies for medical evacuation to Navy vessels must be established. This will provide smooth integration of Army helicopters into the Navy airspace management system during actual operations.

(3) As the Navy vessels may operate relatively long distances from the ground combat operations, Army aeromedical evacuation units need to be proficient in over-water navigation. The use of NAVAIDS from the Navy element in support of the operation is the first priority for over-water navigation. Basic dead-reckoning remains a secondary measure.

(4) Detailed information on amphibious operations can be found in FM 31-11.

b. Another important aspect of joint operations is the medical capabilities of Navy vessels servicing the CZ. Knowledge of ship's medical capabilities assists the medical regulator to direct patients to proper treatment sites. There are many classes of ships which can meet the medical needs of ground forces. Destroyer tenders, battleships (BB), and aircraft carriers (CV or CVN) have helicopter landing areas, one operating room and, at a minimum, one medical officer. Amphibious ships have the most extensive medical facilities of any Navy combat ship. The Navy has fifty-nine amphibious ships in active commission plus two tank landing ships (LST), which are operated by the Navy Reserve Force. The primary mission of the amphibious ships is to transport and support the Fleet Marine Force. The ships have the additional duty of casualty receiving and treatment ships (CRTS). During normal operations, the medical staff is kept to a minimum. The medical staff is augmented when expanded capabilities are needed. Current information regarding landing requirements and medical capabilities should be obtained during training periods with the Navy. Casualty care is secondary to the combat mission of all US combat ships.

(1) Amphibious assault ships "WASP" class are designated by the Navy as LHD (followed by a number) and have the largest patient care facilities on any US combat ship. The WASP class ships have six main operating rooms, four dental operating rooms, bed capacity which can be expanded to 600, and it carries 1,500 pints of frozen blood. This ship can receive casualties from helicopters or landing craft.

(2) Amphibious assault ships "TARAWA" class are designated by the Navy as LHA (followed by a number). The TARAWA class ships have three main operating rooms, two dental operating rooms, an overflow bed capacity of 300, and carries 1,500 pints of frozen blood. The ship can receive casualties from helicopters or landing craft.

(3) Amphibious assault ships "IWO JIMA" class predesignated by the Navy as LPH (followed by a number). These ships were specifically designed to operate helicopters. The IWO JIMA class ships have two operating rooms and an overflow bed capacity of 200.

(4) The amphibious transport dock is designated LPD (followed by a number) and has less medical capabilities than the LHD, LHA, or LPH ships. It can be designated as secondary casualty receiving ship.

(5) The older dock landing ship is designated LSD (followed by a number). It can be used as a secondary casualty receiving and treatment ship when augmented. The newer class of LSD currently under construction can be used as a casualty receiving ship with a capacity for 50 wounded.

(6) The tank landing ship is designated LST (followed by a number). It is another type of ship used in amphibious operations. It is designed with a helicopter platform and a stern ramp. Patients can be delivered by air or boat when required by tactical or mass casualty situations. When the LST is augmented with medical personnel and materiel, it can be used for the emergency treatment and evacuation of patients.

(7) The troop transport, designated AP (followed by a number), is not in active service. When available, the troop transport can be outfitted with special medical facilities and carry sick, injured, and wounded personnel.

c. The Military Sealift Command operates two hospital ships. The USNS MERCY T-AH 19 and the USNS COMFORT T-AH 20. One ship is based on each coast and, when needed, will be assigned medical staffs from military hospitals, getting underway within 5 days. The MTF on the MERCY class hospital ships were designed for a total capacity of 1,000 casualties, including 500 acute care beds and 500 recuperation beds. The hospital ships have 50 trauma stations in the casualty receiving area; 12 operating rooms; a 20-bed recovery room; 80 intensive care beds; and 16 intermediate, light, limited care wards. The maximum patient flow rate, for which the helicopter facility and the casualty reception area were designed, is 300 patients per 24 hours. There is a limited capability to receive casualties from boats.

5-8. Airborne and Air Assault Operations

a. The airborne and air assault operational forces are specialized forces employed to maximize their design characteristics. Airborne units are a flexible force that can be strategically or tactically deployed. They can be inserted rapidly anywhere in the world as either a deterrent or strike force. Air assault units are flexible and lethal fighting organizations. They are ideally suited for rapid employment to critical areas beyond the reach of ground forces.

b. After airborne forces have landed in the objective area, they reorganize and maneuver to seize objectives. When it is necessary for assault aircraft to land in the drop zone, they are parked and unloaded rapidly. Then, they may be used to transport soldiers injured during the parachute assault. It must be understood that organic medical units may experience an overload of patients during the early phases of an airborne assault. These units have to hold the patients until either ground link-up is made or evacuation can be established at airheads. Aeromedical evacuation from the airhead is accomplished using tactical and strategic USAF aircraft.

c. The air assault division's organic aircraft have the ability to attack from any direction, overfly obstacles, and bypass enemy positions. Evacuation of patients in the assault phase is accomplished by division air ambulances. Air ambulances may accompany the air assault task force (AATF) (Figure 5-1) or respond from larger sites once the initial assault has taken place. If air ambulances are providing on-call support, it will be necessary to fly secure air avenues of approach.

d. When both airborne and air assault divisions have been employed and become a part of other conventional forces, their operations are similar to that of light infantry forces. During initial deployment, division medical evacuation assets may be used to evacuate patients to the airhead for air evacuation directly to corps hospitals.

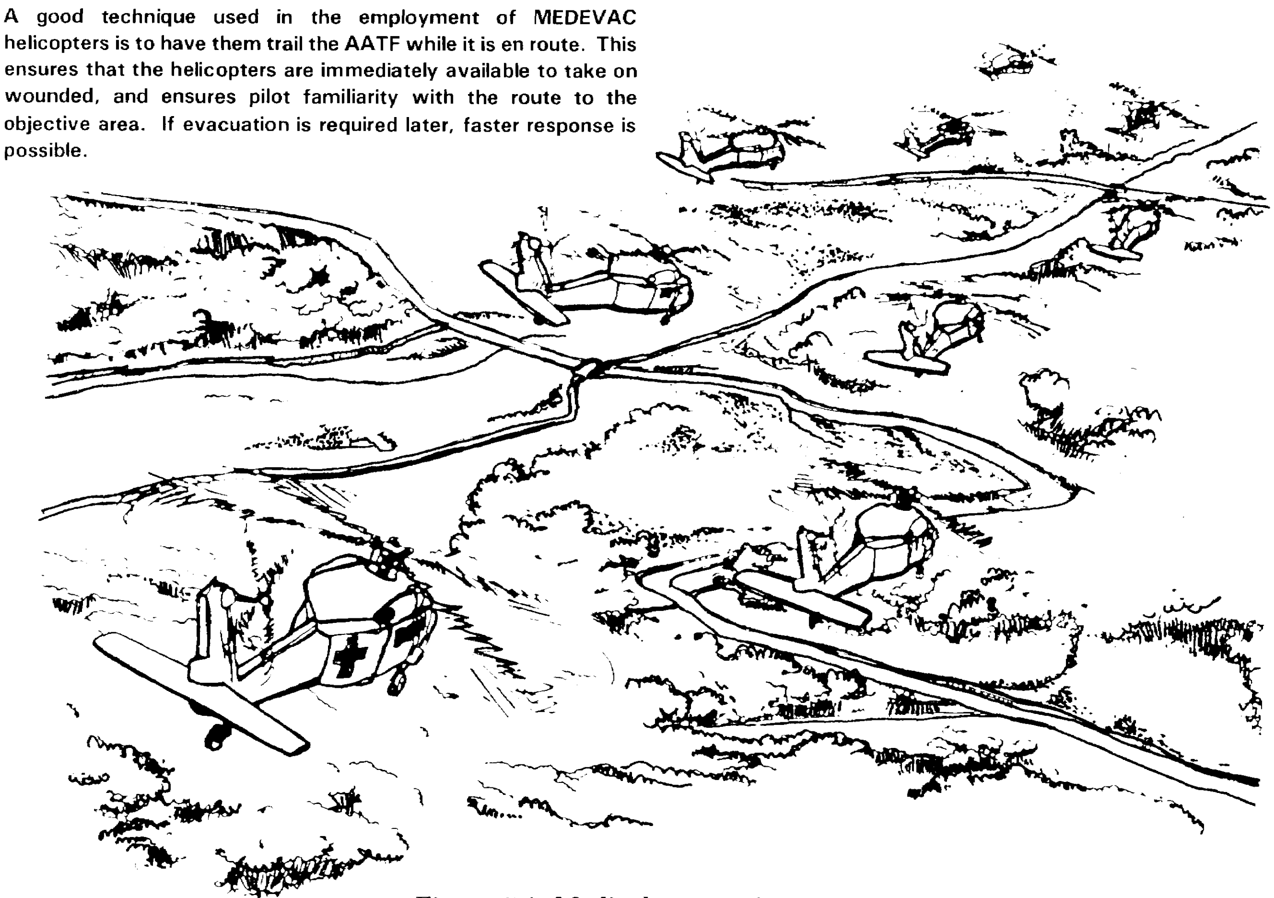


Figure 5-1. Medical evacuation support.

(1) Organic to the medical battalion, air assault division is a medical company (air ambulance). The headquarters element of the air ambulance company is usually positioned in the DSA, collocated with the medical battalion, headquarters and support company. Ambulance crews are deployed forward in direct support of maneuver brigades or AATFs. When deployed in this mode, they are collocated with the supporting FSMC in the BSA, or as an element of the AATF. In either case, it is important to employ the minimal number of aircraft to accomplish the mission. The remaining aircraft are field sited in the DSA for support of other areas in the division requiring immediate evacuation support.

(2) Aeromedical evacuation to the airborne division is provided by a medical company (air ambulance) assigned to the corps medical evacuation battalion. Employment characteristics of this unit are similar to that of the medical company (air ambulance) organic to the air assault division.

e. For a discussion of using patient collecting points in airborne or air assault operations, refer to Appendix C.

5-9. Special Operations Forces

a. Army Special Operations Forces (ARSOF) often operate far removed from conventional HSS and must be more self-reliant and sustaining than conventional forces. Accordingly, Special Forces (SF) medical personnel receive enhanced medical training above that provided for a combat medic. The SOF medic is trained as an independent care practitioner and is qualified to provide ATM to combat casualties. When deployed on independent operations, the two SF medics are the sole source of medical care for their operational detachment and the indigenous forces (and their families) that the detachment supports. They can train the indigenous populace in basic medical skills and set up an austere HSS system. Nonmedical

ARSOF personnel receive medical training at the combat lifesaver level.

b. Although the ARSOF health care provider receives enhanced medical training exceeding the level and scope found in conventional forces, he depends heavily on the conventional HSS system to conserve the combat strength of the ARSOF (particularly in the area of medical evacuation where the ARSOF does not have a dedicated system). Ideally, medical evacuation for ARSOF personnel should follow the doctrinal flow sequence. The ARSOF HSS planner must be innovative and follow the tenets of immediate far forward stabilization. He directs evacuation to the appropriate MTF when the condition of the patient warrants it, with whatever means of transportation are available. Medical evacuation of ARSOF casualties is an operational matter. That is, it must reflect the commander's concept of the operation. It can only succeed when the HSS planner integrates the medical evacuation plan with the tactical plan and logistics air flow.

5-10. Military Operations on Urbanized Terrain

a. Throughout history, battles have been fought on urbanized terrain. Some recent examples include Hue, Beirut, and Panama City. Military operations on urbanized terrain (MOUT) are those military actions planned and conducted on a terrain where man-made structures impact on the tactical options available to the commander. This terrain is characterized by a three-dimensional battlefield, having considerable rubble, ready-made fortified fighting positions, and an isolating effect on all combat, CS, and CSS units. In this environment, the requirement for a sound and understandable evacuation plan cannot be overstated. Of concern to HSS and tactical planners is the need to plan, train, prepare, and equip for evacuation from under, above, and at ground level.

b. Conducting medical evacuation operations in the MOUT environment challenges the HSS planner. He must ensure that the HSS plan includes special or unique materiel requirements or improvised use of standard equipment. The plan must be sufficiently flexible to support unanticipated situations.

(1) Special equipment requirements include, but are not be limited to—

- Axes, crowbars, and other tools used to break through barriers.

- Special harnesses; portable block and tackle equipment; grappling hooks; collapsible litters; lightweight, collapsible ladders; heavy gloves; and casualty blankets with shielding. This equipment, using pulleys, is for lowering casualties from buildings or moving them from one building to another at some distance above the ground.

- Equipment for the safe and quick retrieval from craters, basements, sewers, and subways. Casualties may have to be extracted from beneath rubble and debris.

(2) Air ambulances equipped with a rescue hoist may be able to evacuate casualties from the roofs of buildings or may be able to insert needed medical personnel and supplies.

(3) Effective communications will be degraded in the MOUT environment. Line of sight radios will be ineffective and individual soldiers will not have access to radio equipment. The task-organized medical evacuation teams will have difficult y in locating injured or wounded soldiers due to their isolation within buildings, or by being hidden by rubble and debris. Alternate forms of communications, such as markers, panels, or field expedients (fatigue jackets or T-shirts) can be displayed by the wounded or injured soldiers indicating where they may be found.

c. Patient collecting points must be preplanned and established at relatively secure areas accessible to both ground and air ambulances. The location of these points should be indicated on the medical overlay to the OPLAN. Patient collecting points should—

- Offer cover from enemy fires.

- Be located as far forward as the tactical situation permits.

- Be identified by an unmistakable feature (natural or man-made).

- Allow rapid turn around of ambulances.

d. Route markings to the MTF and display of the Geneva Red Cross at the facility must be approved by the tactical commander. (Camouflaging or not displaying the Geneva Red Cross can forfeit the protections, for both medical personnel and their patients, afforded under the Geneva Conventions. Refer to Appendix A and FM 8-10 for additional information.) The location of the MTF must be as accessible as possible, but well separated from fuel and ammunition depots, motor pools, reserve forces, or other lucrative enemy targets, as well as civilian hazards such as gas stations or chemical factories.

e. Medical evacuation in the MOUT environment is a labor-intensive effort. Due to rubble, debris, barricades, and destroyed roadways, much of the evacuation effort must be accomplished by manual litter teams. When this occurs, an ambulance shuttle system or litter shuttle should be established. The shuttle system reduces the distance that the wounded or injured soldiers have to be carried by the litter teams. This enhances the litter teams effectiveness by providing brief respites and reducing fatigue. Further, the litter teams are retained in the forward areas. They are familiar with the geography of the AO and what areas have or have not been searched for casualties. In moving patients by litter, you should–

- Use covered evacuation routes such as sewers and subways.
- Use easily identifiable points for navigation and collecting points.
- Rest frequently by alternating litter teams.

(1) When using ground evacuation assets in support of MOUT, the HSS planner must be aware that built-up areas will have significant obstacles to vehicular movement. Factors requiring consideration include the following:

- Transportation operations within the urban terrain are complicated and highly canalized by rubble and other battle damage.
- Bypassed pockets of resistance and ambushes pose a constant threat along evacuation routes.
- Land navigation with most tactical maps proves to be difficult. Using commercial city maps when available can aid in establishing evacuation routes.
- Ambulance teams must dismount from the ambulance, search for, and rescue casualties.
- Movement of patients becomes a personnel intensive effort. There are insufficient medical personnel to search for, collect, and treat the wounded. Assistance in the form of litter bearers and search teams is required from supported units, as the tactical situation permits.
- Refugees may hamper movement into and around urban areas.
- Civilian personnel, detainees, and enemy prisoners of war are provided medical treatment in accordance with the command policy and the Geneva Conventions.

(2) When using aeromedical evacuation assets in support of MOUT, the HSS planner must consider enemy air defense capabilities and terrain features, both natural and man-made, within and adjacent to the built-up areas. Aeromedical evacuation (helicopters) is the preferred means of evacuation in MOUT. Considerations in the use of air ambulances include the following:

- Movement is highly restricted and is canalized over secured areas, down wide roads, and open areas.
- Telephone and electrical wire and communications antennas hinder aircraft movement.
- Secure LZs must be available.
- Landing zones may include buildings with helipads on their roofs or sturdy buildings, such as parking garages.
- Snipers with air defense capabilities may occupy upper stories of the urban area's taller buildings.

f. Medical personnel require special training in the tactics, techniques, and procedures required to operate in a MOUT environment. If they are to survive in this environment, they must know how to–

- Cross open areas safely.
- Avoid barricades and mines.
- Enter and depart safely from buildings.
- Recognize situations where booby traps or ambushes are likely and would be advantageous to the enemy.

Detailed information on the conduct of combat operations in the urban environment is contained in FMs 90-10 and 90-10-1.

NOTE

Medical personnel do not engage in offensive-type actions. They must rely on the supported unit to provide covering fires and to clear rooms and buildings prior to entry.

(1) Many of the techniques used in a mountainous terrain for the extraction and evacuation of patients can be modified and applied to medical evacuation in an urbanized terrain (paragraphs 9-11 through 9-15).

(2) Health service support personnel must practice and become proficient in using a grappling hook, scaling walls, and rappelling. Rappelling techniques can be used to gain entry into upper levels of buildings as well as accompanying the patient during vertical extraction and evacuation. By using the SKED litter, the patient can be secured inside the litter for ease in vertical extractions and evacuations.

(a) When using a grappling hook, care must be taken to select a suitable grappling hook and rope. The grappling hook should be sturdy, portable, and easily thrown, and be equipped with hooks that can hold inside a window. The scaling rope should be 5/8 to 1 inch in diameter and long enough to reach the objective window. Knots are tied in the rope at 1-foot intervals to make climbing easier.

- When throwing the grappling hook, stand as close to the building as possible (Figure 5-2). The closer you stand, the less the exposure to enemy fires. The closer the range, the less horizontal distance the hook must be thrown.
- Allow the rope to play (pay) out freely. Make sure you have enough rope to reach the target. Hold the hook and a few coils of rope in your throwing hand. The remainder of the rope, in loose coils, should be in your other hand. The throw should be a gentle, even, upward lob of the hook, with the other hand releasing the rope as it plays (pays) out.
- Ensure that the grappling hook has a solid hold before beginning to climb. Once the grappling hook is inside the window (or on the roof), pull on the rope to obtain a good hold. When using a window, pull the hook into one corner to ensure the chances of a good "bite" and to reduce exposure to lower windows during the climb.

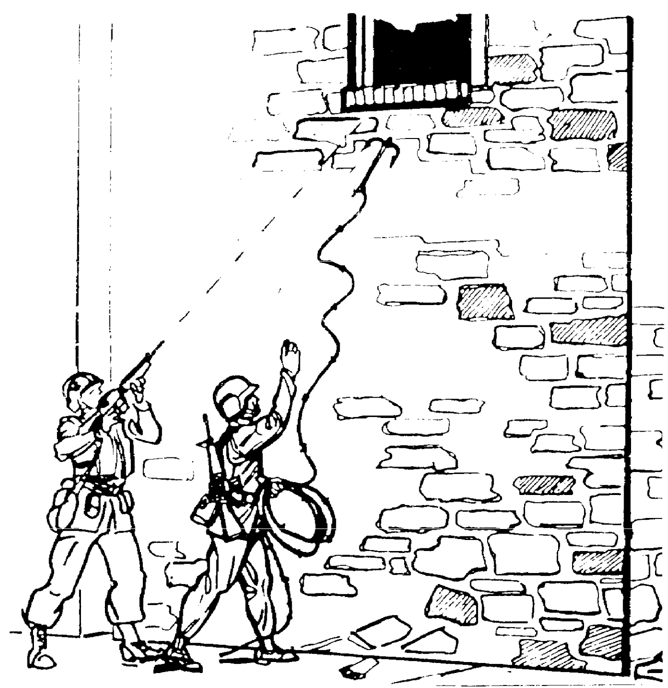


Figure 5-2. Hook thrown at close range.

(b) When forced to scale a wall during exposure to enemy fire, all available concealment must be used. The employment of smoke and diversionary measures improve the chances of a successful exposed movement. When using smoke for concealment, soldiers must plan for wind direction and the tactical use of smoke (Appendix B).

- A soldier scaling a wall with a rope should avoid silhouetting himself in windows of uncleared rooms and avoid exposing himself to enemy fires from lower windows. Combat medics will require support from the combat elements to provide covering fires and precede the medic to clear rooms which must be bypassed to reach the casualty.

- The soldier enters the objective window with a low silhouette (Figure 5-3). Entry can be head first; however, the preferred method is to hook a leg over the windowsill and enter sideways, straddling the ledge.

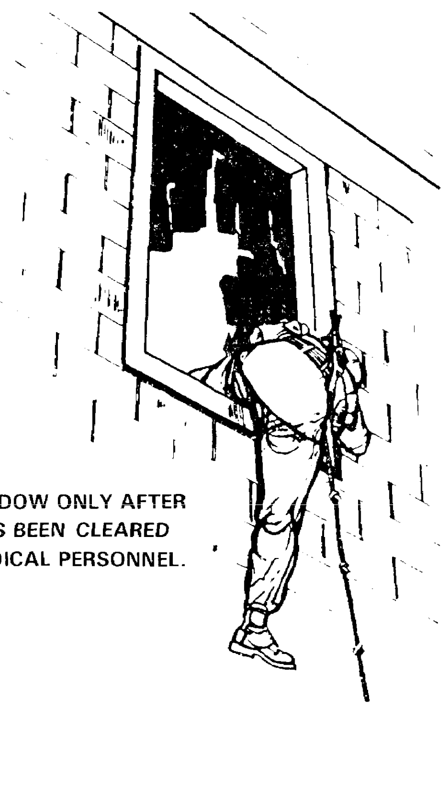


Figure 5-3. Medic entering the objective window.

(c) Rappelling is a combat technique soldiers can use to descend from the rooftop of a tall building into a window. Soldiers conducting operations on urbanized terrain should learn the basic seat-hip rappel. When using this technique to lower a litter, one or two soldiers rappel down along the sides of the litter patient. By escorting the litter, the soldiers can ensure that the patient is not further injured by slamming into the wall as he is lowered. When the patient is safely on the ground, the individual who lowered the patient rappels down.

g. The scenario presented in this subparagraph is provided to illustrate a way in which evacuation operations can be conducted in MOUT.

(1) The following information is provided as a basis for this scenario:

(a) In preparation for the upcoming battle, the tactical planners determine that the battlefield will include combat within the confines of a city with a population of approximately 750,000. The medical planners are involved early-on in the planning process. The medical evacuation mission is complicated by the terrain features and will require special equipment to satisfactorily accomplish the mission.

(b) The enemy has already entered the city and is preparing defensive positions.

(c) Preparatory fires and bombing runs made on key industrial targets within the city have disrupted sanitation efforts by destroying sewer lines, breaking water mains, and canceling garbage pick up and disposal.

(d) The downtown area of the city has numerous multistoried buildings. Further, a number of parking garages are within the downtown area. Residential housing consists of apartment complexes and low-cost housing projects. There are a few small parks; however, the downtown area is considered quite crowded.

(e) Residential and small business suburbs spread out from the downtown area.

- North of the city is an industrial park and most of the city's heavy industry is located in this area. The major heavy industries are fertilizer, ammunition, and plastic manufacturing.

- East of the downtown area is comprised of some larger residential estates, track housing, parks, golf courses, small businesses, and some multifamily dwellings. A river flows along the eastern border of the city which has commercial interests in transportation of commodities and fishing.

- West of the downtown area is the largest residential population with middle income housing, duplexes, and large apartment complexes. Small businesses which support the population density are also found here. Numerous schools, parks, and churches are contained in this sector. There is also some light industry, such as clothing manufacturers, located here. The western limits of the city are bordered by high mountains. This eliminates access to the northern section of the city from this direction.

- South of the downtown area is mainly residential with a gradual shift from single family homes and apartment complexes to small farms, landfills, and junkyards.

(f) The friendly forces are approaching the city from the southwest. Intelligence reports indicate that enemy concentrations are within the downtown area and to the north. Due to the natural terrain features of the city, friendly forces will be required to fight through residential and the downtown areas to reach the mission objective of neutralizing the ammunition plants in the northern sect or.

(2) Prior to actual deployment of combat forces, the evacuation elements—

- Train nonmedical personnel on litter carrying techniques.

- Obtain necessary nonmedical equipment for extraction and evacuation.

- Provide instructions on alternate forms of communications for indicating where wounded soldiers are located.

- Predesignate patient collecting points and AXPs and include these positions on the medical overlay.

- Prepare strip maps of evacuation routes, if applicable.

(3) The medical evacuation mission is undertaken by—

- Establishing the initial BAS in an elementary school playground and gymnasium. The playground area provides sufficient space to establish an LZ for aeromedical evacuation assets and turnaround for ground ambulances. Site selection for the BAS is important as it must be easily accessible by both ground and air and not close to lucrative enemy targets or civilian hazards, such as gas stations.

- Echeloning the medical treatment element. This enables the HSS to maintain contact with and be accessible to the combat forces. A portion of the evacuation resources are deployed with the medical treatment element to assist in quickly clearing the battlefield of wounded.

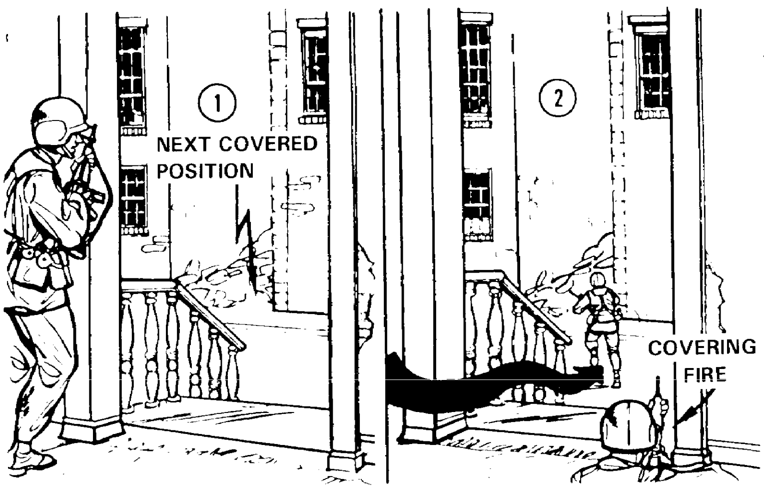
(4) Fighting is light through the residential area; however, caution must be used as the combat elements bypass pockets of resistance and pose a threat to medical treatment elements and evacuation assets.

(5) Entering the downtown area, the fighting intensifies. As the downtown area has not been secured, the threat to air ambulances is too great during the initial phase of the battle. When the roads become impassable due to rubble, debris, barricades, or artillery damage, the ambulance crews dismount from their vehicles, search for, and administer EMT to the wounded. During the heat of the battle, combat soldiers will be unable to serve as litter bearers. Ambulance crews, therefore, are responsible for evacuating litter patients, directing ambulatory patients to patient collecting points, and administering EMT if the casualty has not already been treated by the combat medic.

(6) A shuttle system is established to enable litter teams to carry the wounded to the fringes of the downtown area. Ground ambulances can evacuate the wounded to the BAS site where air ambulances can evacuate those patients requiring

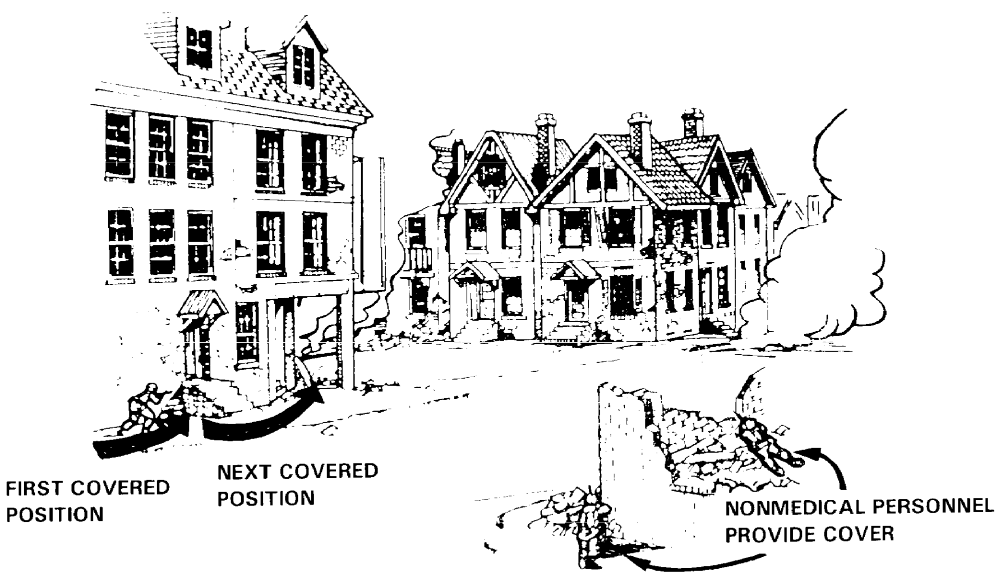
further evacuation to the rear. As the tactical mission evolves and control of the various sectors is gained by friendly forces, aeromedical evacuation resources can be deployed farther forward. However, caution must be exercised because bypassed and isolated pockets of resistance still remain a threat to evacuation assets.

- Combat medics maintain contact with the combat elements and employ techniques necessary to operate in this environment, such as using doorways, moving parallel to buildings, selecting his next position, and crossing open areas (Figures 5-4 through 5-6).



Doorways should not routinely be used as entrances and exits since they are normally covered by enemy fire. If a medic must use a doorway as an exit, he should move quickly through it to his next position, staying as low as possible to avoid silhouetting himself. Before exiting the building, the soldier selects his next covered position. He quickly exits the doorway, keeping as low as possible, and moves quickly to his next position. Preselection of positions, speed, a low silhouette, and use of covering fires by nonmedical personnel must be emphasized in exiting doorways. If possible, litters should be vertically lowered from windows, rather than attempting to exit through a doorway. However, if it becomes necessary to exit through a doorway, the supported unit should provide covering fire for the litter team.

Figure 5-4. Use of doorways.



Medics may not always be able to use the inside of buildings for an evacuation route. Therefore, they may have to move on the outside of the buildings. Smoke and covering fires provided by the supported unit should be used to hide movement. In correctly moving on the outside of a building, the medic hugs the side of the building, stays in the shade, presents a low silhouette, and moves rapidly to his next position.

Figure 5-5. Moving outside of building.

Doorways should not routinely be used as entrances and exits since they are normally covered by enemy fire. If a medic must use a doorway as an exit, he should move quickly through it to his next position, staying as low as possible to avoid silhouetting himself. Before exiting the building, the soldier selects his next covered position. He quickly exits the doorway, keeping as low as possible, and moves quickly to his next position. Preselection of positions, speed, a low silhouette, and use of covering fires by nonmedical personnel must be emphasized in exiting doorways. If possible, litters should be vertically lowered from windows, rather than attempting to exit through a doorway. However, if it becomes necessary to exit through a doorway, the supported unit should provide covering fire for the litter team.

Figure 5-6. Crossing of open area.

- Combat medics and ambulance crews will encounter obstruction, barricades, and booby traps which will detract from the accomplishment of the evacuation mission. Medics must be familiar with these antipersonnel devices (Figure 5-7) and know how to circumvent or neutralize them.

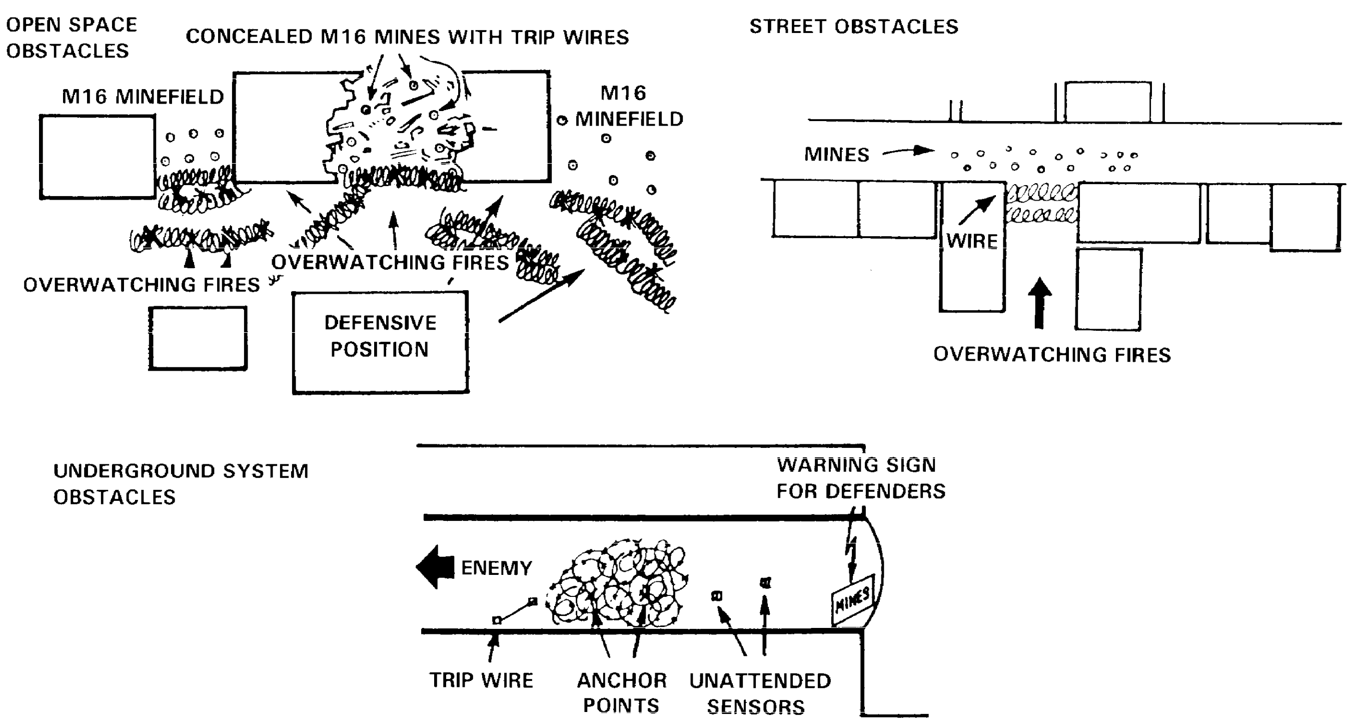
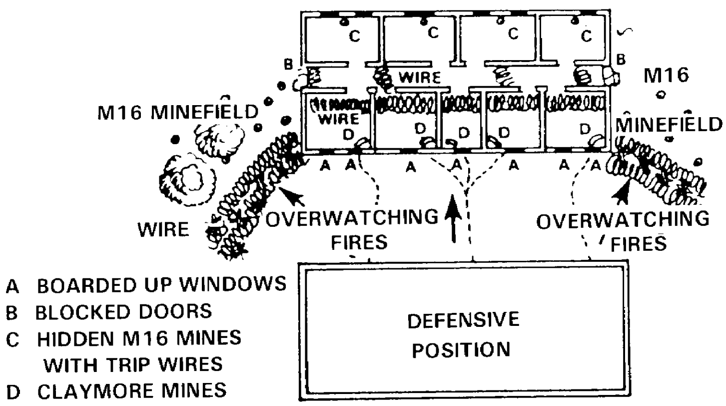


Figure 5-7. Antipersonnel obstacles.



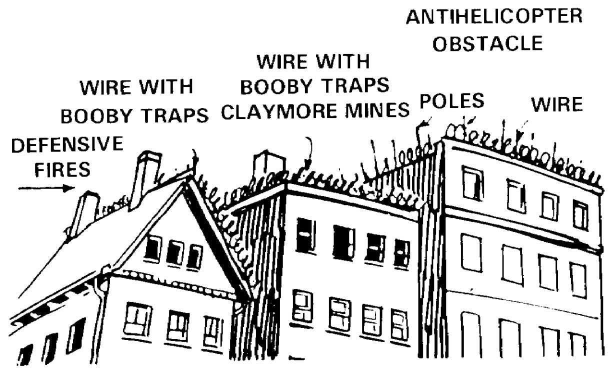


Figure 5-7. Antipersonnel obstacles (continued).

- Combat medics and ambulance crews will also need to be familiar with lower-level entry techniques (Figure 5-8) to gain access to areas where casualties have occurred.

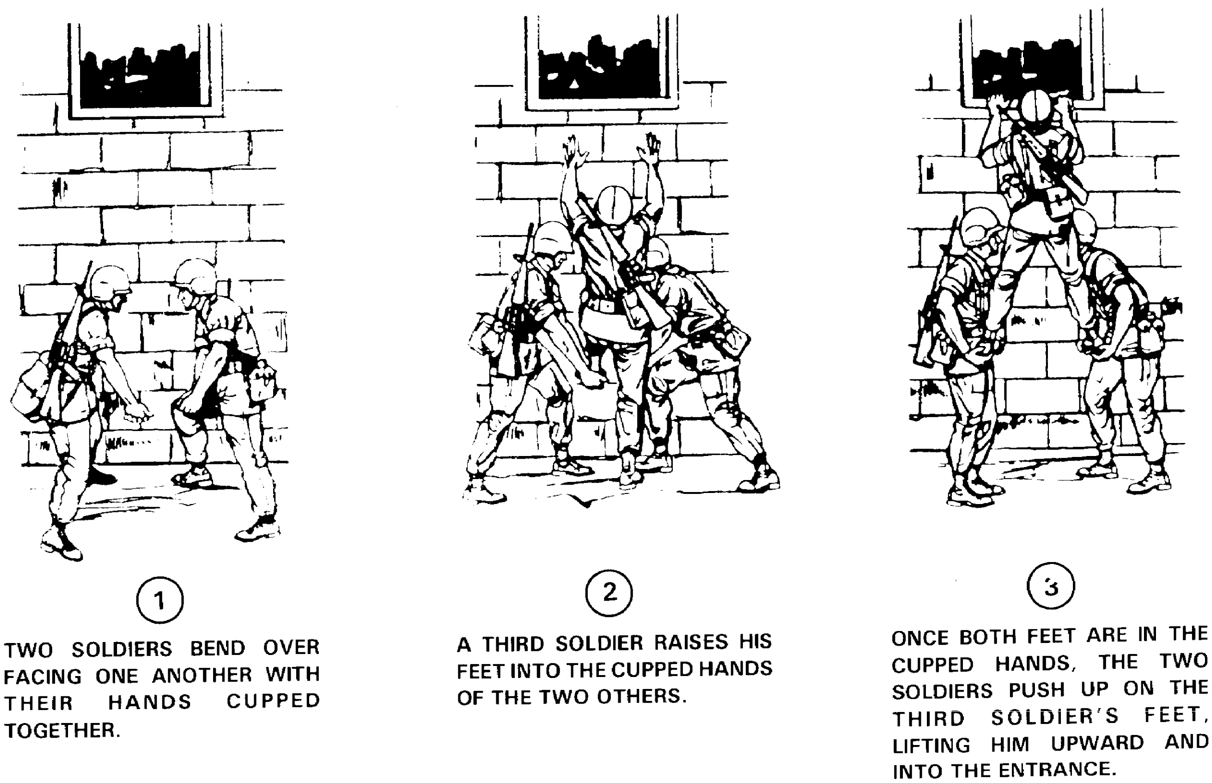
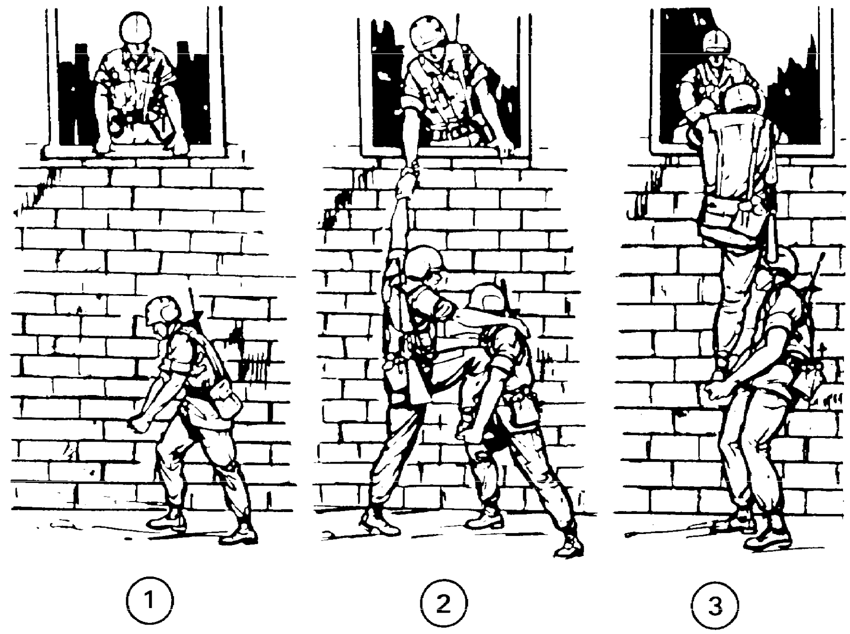


Figure 5-8. Lower-level entry techniques.

THE ONE-MAN LIFT

ONE SOLDIER, WITH HIS BACK OR SIDE BRACED AGAINST THE BUILDING AND WITH HIS HANDS CUPPED, ALLOWS ANOTHER SOLDIER TO RAISE ONE FOOT UP INTO HIS CUPPED HANDS, AND THEN LIFTS HIM UP AND INTO THE ENTRANCE.



THE TWO-MAN LIFT

WHEN THE FIRST TWO SOLDIERS ARE INSIDE THE BUILDING AND ANOTHER SOLDIER SEEKS ENTRANCE, THE TWO ALREADY INSIDE MAY ASSIST THE OTHER BY PULLING HIM UP INTO THE BUILDING.

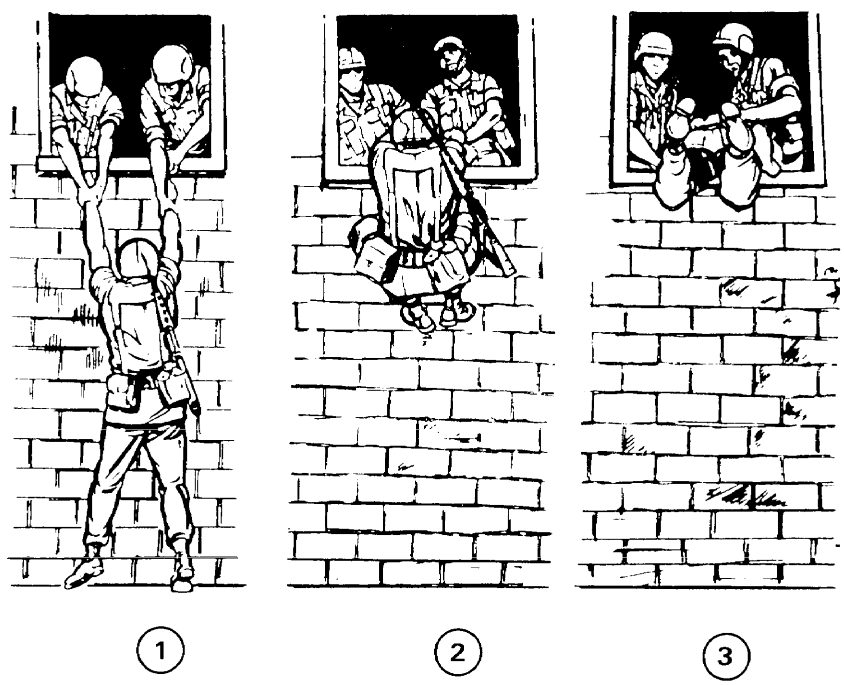


Figure 5-8. Lower-level entry techniques (continued).

- Once the main battle pushes through the downtown area and friendly forces gain control of this terrain, air ambulances can be employed to hasten the evacuation effort. Air ambulances can be used to rescue wounded personnel from on top of buildings or downtown parking garages.

- As control over the terrain is gained, the BAS can be echeloned further forward, thereby reducing the distance required for evacuation. If possible, the medical treatment element should be housed in a structure, as parks within the city area may not be secure from sniper fire.

- On those roads which remain passable, a control problem may be encountered as refugees will be using these roads to escape the battle. Evacuation vehicles and crews should be prepared for these delays and have sufficient supplies to care for the patient being evacuated.

- As troops are relieved of their combat, CS, and CSS duties, they can be used as litter bearers. The distance that the patients are required to be moved by litter teams will determine the number of relay points established in the litter shuttle. The relay points should be spaced so that the litter bearers are not overly fatigued nor taken too far away from the terrain in which they are familiar.

- Medical evacuation teams will need to systematically search the battle area for casualties. Those casualties who can provide a signal for their location (paragraph *b* (3) above) will hasten their rescue and evacuation. The special equipment needs for the extraction and evacuation of casualties become evident during this phase of the evacuation effort. Some casualties will need to be evacuated from upper floors of buildings where access from ground level is not possible. Entry to some locations will be from the roof going down to lower floors, or from neighboring buildings across the intervening space. Techniques and procedures for these extractions must be practiced before the actual operation.

- The initiation of intravenous (IV) fluids by combat lifesavers, combat medics, and evacuation crews will enhance the casualties chances of survival with the delayed evacuation process existing on urbanized terrain.

- As the main battle enters the industrialized sector of the city, the number of multifloored buildings decreases. However, many of the same obstacles face the medical personnel responsible for evacuation. Added to the types of injuries incurred during MOUT, the increased chance of fire, explosion, and toxic fumes or vapors are present in the industrial sector. Medical resources and evacuation assets must be positioned to decrease the vulnerability to these types of hazards.

- Medical personnel must be familiar with their responsibilities in regards to the Geneva Conventions and civilian refugees, detained persons, and EPWs (Appendix A). Procedures should be established in the unit SOP.

5-11. Cross-FLOT Operations

Medical evacuation support of cross-FLOT operations is a difficult mission requiring detailed planning. Although there are a number of different types of cross-FLOT operations, only two will be discussed in this paragraph. Medical evacuation support for these operations is normally provided by a corps air ambulance company (GS) working in concert with the corps aviation brigade. A medical evacuation team will be task-organized to provide this support.

a. Deep Attack/Raid. This operation is normally the responsibility of an attack helicopter battalion in the corps aviation brigade. While it is feasible that air ambulances could accompany the attack helicopters to the objective, it is more likely that the evacuation team will be field sited in a larger site. The larger site (hide position) is located in the vicinity of the FLOT. By forward stationing the air ambulances, the risk and possible compromise of the operation is lessened. The medical evacuation team provides downed aircrew rescue, EMT, and evacuation support. The air ambulances should be equipped with the rescue hoist, extraction equipment, personnel locator system (PLS), and enhanced position location and reporting system (EPLRS). The air ambulances remain in the hide position, with only passive systems turned on, tracking the process of the raid via limited secure communications. The attack team should report, in the blind, only at prearranged communications check points, or upon the downing of an aircraft. If the wingman is able to retrieve the downed crew, they are taken to a preplanned patient collecting point for transfer to an air ambulance. If there are injured crew members or the terrain precludes landing, the wingman requests medical evacuation support. The wingman should provide cover and armed escort for the air ambulances during the rescue and back across the FLOT. The patients are evacuated to the nearest Level II treatment facility in the brigade sector.

b. Brigade Task Force Cross-FLOT Operations. This type of operation employs airborne or air assault insertions into the objective, followed by a penetration and linkup. Medical evacuation teams are normally attached directly to the task force to provide medical treatment and evacuation support, both en route and at the objective. Air ambulances accompany the assault aircraft, carrying the treatment teams and medical supplies and equipment; this enables the assault aircraft to carry more combat troops. Following the assault aircraft into the landing zone, the medical evacuation team provides immediate evacuation support during the insertion and consolidation. Ground ambulances normally do not accompany the assault forces, thereby limiting the medical evacuation assets to air ambulances. The tactical commander may determine that casualties will be held until linkup rather than being evacuated out. The commander's decision is influenced by the expected duration of the operation, casualty density, METT-T, and acceptable risk in evacuating URGENT or URGENT-SURG patients from the objective area. Once linkup is achieved, ground evacuation assets will become available.

c. Planning Considerations and Factors. The planning considerations and factors for cross-FLOT operations include, but are not limited to—

- Expected duration of the operation.
- Casualty estimates.
- Evacuation distances and time factors.
- Location of preplanned patient collecting points.
- Location of AXPs.
- Requirements for Class VIII supply/resupply.
- Requirements for medical equipment.
- Aircraft operational readiness (maintenance support will not be available; aircraft, therefore, must have sufficient bank time available to support the entire mission).
- Aircraft configuration requirements.
- Evacuation routes/air corridors.
- Signal operating instructions.
- Equipment (less medical) destruction procedures and policies.
- Nuclear, biological, and chemical decontamination procedures.

CHAPTER 6

MEDICAL REGLUATING

6-1. General

Medical regulating is the coordination and control of moving patients to MTFs which are best able to provide the required specialty care. This system is designed to ensure the efficient and safe movement of patients.

6-2. Purposes of Medical Regulating

a. Medical regulating entails identifying the patients awaiting evacuation, locating the available beds, and coordinating the transportation means for movement. Careful control of patient evacuation to appropriate hospitals is necessary to—

- Effect an even distribution of cases.
- Ensure adequate beds are available for current and anticipated needs.
- Route patients requiring specialized treatment to the appropriate MTF.

b. The factors which influence the scheduling of patient movement include the following:

- Patient's medical condition (stabilized to withstand evacuation).
- Tactical situation.
- Availability of evacuation means.
- Locations of MTFs with special capabilities or resources.
- Current bed status of MTFs.
- Surgical backlogs.
- Number and location of patients by diagnostic category.
- Location of airfields, seaports, and other transportation hubs.
- Communications capabilities to include radio silence procedures.

6-3. Medical Regulating Terminology

As medical regulating may include coordination with other services, it is necessary to use the correct terminology. These terms include—

a. Intracorps Medical Regulating (Figure 6-1). This is the system by which patients are transferred or evacuated from an FSB or main support battalion (MSB) to a corps hospital (MASH or CSH).

b. Intratheater Medical Regulating {Figure 6-2). This is the system by which patients are transferred or evacuated from one hospital to another within the TO. This includes evacuations between CZ hospitals, between COMMZ hospitals, or from CZ hospitals to COMMZ hospitals.

c. Intertheater Medical Regulating (Figure 6-3). This is the system by which patients are evacuated from hospitals located in the TO to hospitals located in the ZI.

d. Patient Adrninistrator. The patient administrator (PAD) accomplishes the medical regulating function at the hospital level in addition to his normal duties. His medical regulating functions include consolidating all evacuation requests within the hospital and forwarding an evacuation request to his next higher headquarters for action. The PAD is also responsible for keeping his next higher MRO apprised of current beds available and operating room (OR) status.

e. Medical Regulating Officer. The MRO functions as the responsible individual at command and control headquarters for receiving and consolidating evacuation requests. These requests are initiated by the DMOCs, medical battalions, or subordinate hospitals. The MRO also maintains the current patient status, bed status, and the surgical backlog at subordinate hospitals. His duties include—

- Managing what patient classes are regulated into his facility.
- Determining what resources are available to move the patients and coordinating for the use of these assets.
- Maintaining accountability of patients within the MTFs.
- Preparing reports as required.

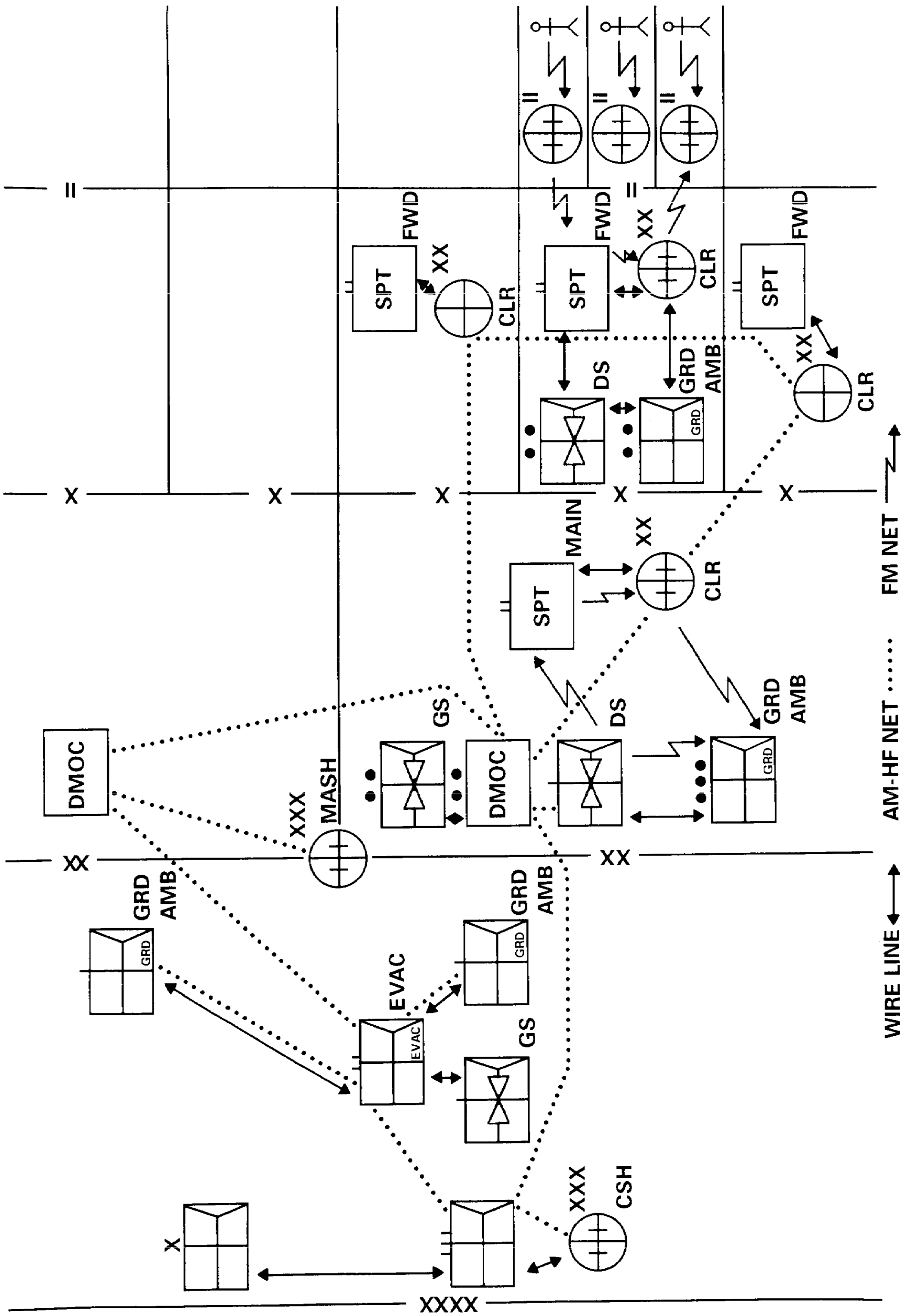


Figure 6-1. Intracorps medical regulating.

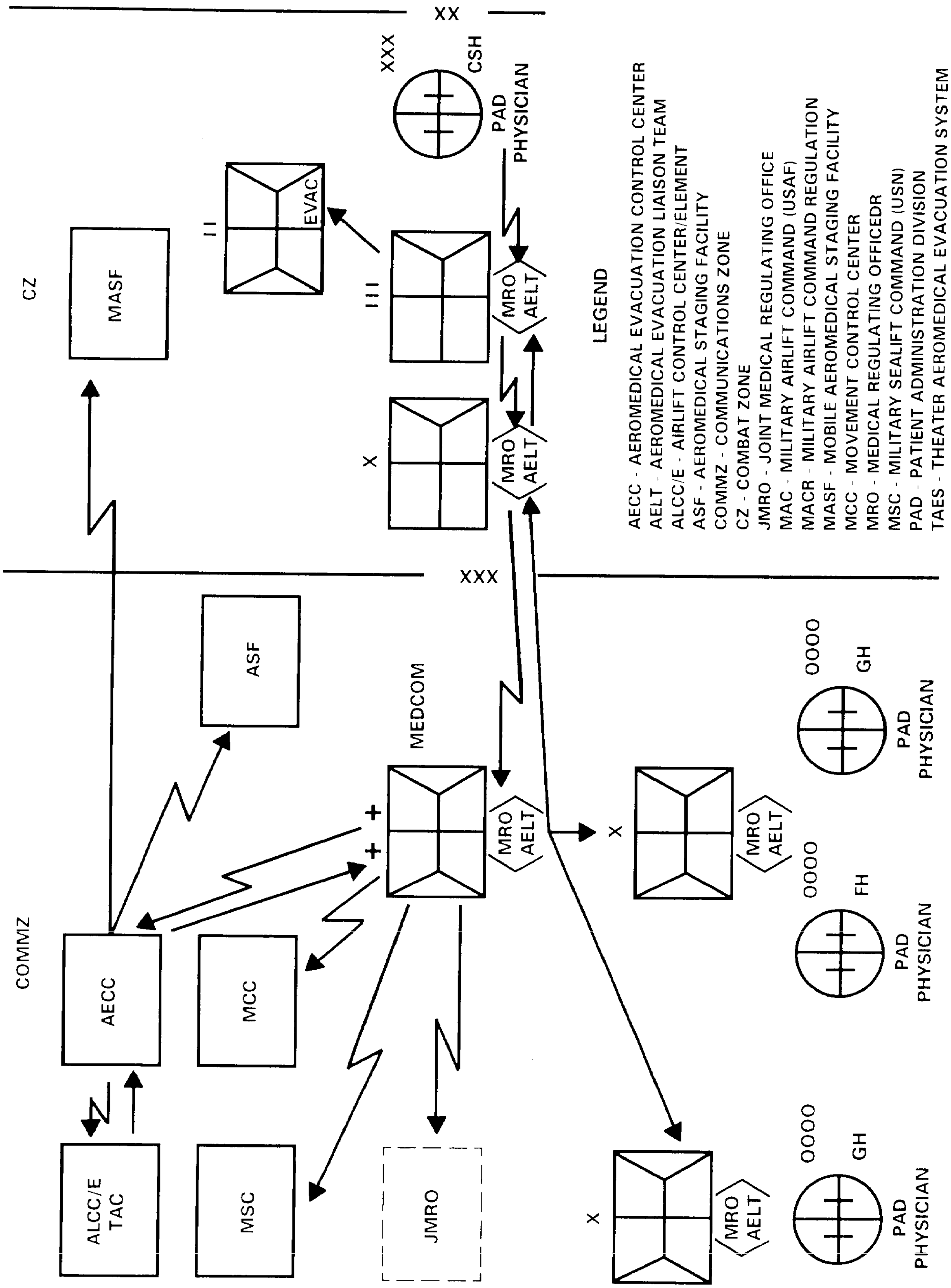


Figure 6-2. Intratheater medical regulating.

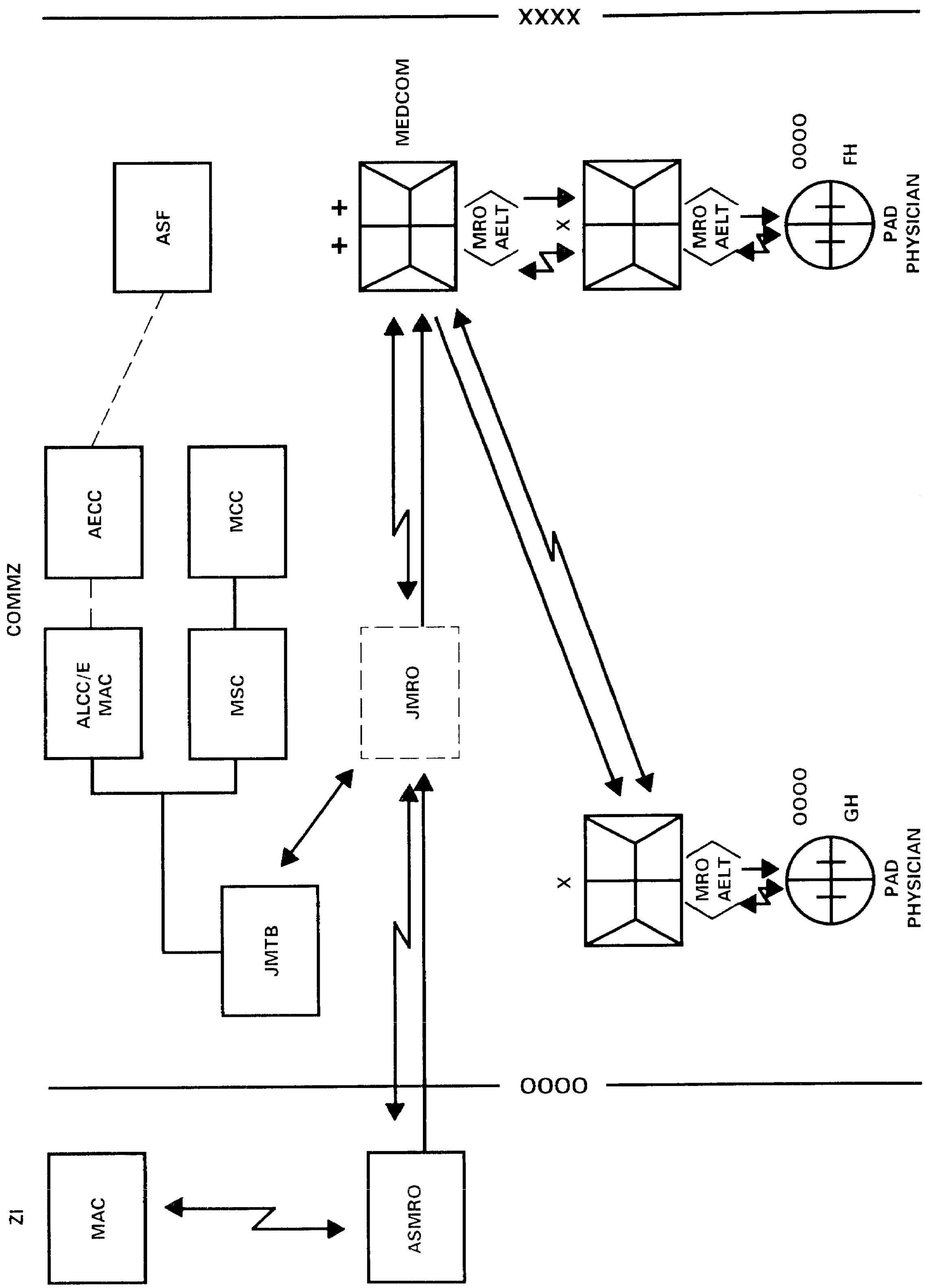


Figure 6-3. Intertheater medical regulating.

f. Joint Medical Regulating Office. The Joint Medical Regulating Office (JMRO) is a joint agency normally located at or near the theater headquarters. The theater surgeon supervises the functions of this office. These functions include—

- Maintaining direct liaison with the Armed Services Medical Regulating Office (ASMRO), MROs of component services, and the transportation agencies which furnish evacuation transportation.

- Obtaining periodic reports of available beds from the services' MROs providing hospitalization.

- Selecting hospitals based on the reported bed availability to receive patients within the COMMZ.

g. Armed Services Medical Regulating Office. The ASMRO is a joint agency which receives requests from the JMRO or MEDCOM MRO for evacuations from the COMMZ to ZI. The ASMRO authorizes patient transfers by providing ZI hospital destinations for designated patients. The destination hospital determination is based upon the patient's medical needs. Wherever possible, the hospital closest to the patient's home is selected.

h. Theater Aeromedical Evacuation System. The theater aeromedical evacuation system (TAES) is a functional organization which is provided by the USAF and performs the mission of theater aeromedical evacuation. It is composed of the following:

- Aeromedical evacuation control center (AECC).

- Mobile aeromedical staging facility.

- Aeromedical evacuation liaison team (AELT).

- Aeromedical evacuation crews.

i. Aeromedical Evacuation Control Center. The AECC is a USAF element and is responsible for the USAF aeromedical evacuation mission within the TO. The AECC also coordinates for evacuation from the COMMZ to ZI. The AECC is a component of the Military Airlift Command (MAC) and is normally collocated with the Airlift Control Center (ALCC) which coordinates intertheater and intratheater logistical and personnel movements by USAF aircraft.

j. Military Sealift Command. The Military Sealift Command (M SC) is the US Navy element responsible for coordinating movement of supplies, equipment, and personnel into the TO by Navy ships. Further, it coordinates through the JMRO medical evacuation of patients by ship from the TO to the ZI, as required.

k. Movement Control Center. The MCC is the Army unit which coordinates and controls the movement of Army aircraft and ground transportation within the theater. When USAF capabilities are exceeded, the MCC coordinates requests for additional air and ground resources. It also obtains the necessary clearances to support the evacuation mission from the CZ.

l. Movement Control Agency. The Movement Control Agency (MCA) provides the theater with movement management services and highway traffic regulations. The MCA coordinates with allied and host-nation movement control agencies. It also coordinates with the transportation component commands (such as MAC and MSC) and prepares movement and port clearance plans and programs.

m. Mobile Aeromedical Staging Facility. The MASF is a USAF holding facility employed at forward airfields in the CZ to provide a temporary holding capability for preparation of patients being evacuated from corps to COMMZ hospitals.

n. Aeromedical Staging Facility. The ASF is a USAF holding facility employed at or near airfields in the COMMZ and CZ. It also provides a temporary holding capability for patients being evacuated from the COMMZ or another theater to CONUS.

o. Joint Military Transportation Board. The Joint Military Transportation Board (JMTB) is a joint staff composed of members of the Army, Air Force, and Navy that coordinates transportation requirements for patients requiring intertheater evacuation.

p. Defense Medical Regulating Information System. The Defense Medical Regulating Information System (DMRIS) is an on-line interactive

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computer system for reporting patients requiring evacuation (Appendix D).

q. Automated Patient Evacuation System. The Automated Patient Evacuation System (APES) is the system that automates the patient movement portion of medical evacuation (Appendix D).

6-4. Medical Regulating from the Division

a. Medical regulating in and from the division is the responsibility of the DMOC (the patient disposition and reports branch). Medical regulating in the division is not as formalized as the rest of the HSS system. It is usually operated procedurally so as not to depend solely on communications to effect rapid evacuation. The medical regulating function in the DMOC is concerned primarily with—

- Tracking the movement of patients throughout the division MTFs and into the corps facilities.
- Monitoring the use of ambulance assets.
- Coordinating with the corps medical evacuation battalion when it becomes obvious that more assets are needed.

b. Corps air and ground ambulances placed in general support of the division are usually field sited in the division rear and tasked by the DMOC. When these assets go forward to the FSMC or the MSMC to evacuate patients to corps MTFs, they have corps MTF destinations predetermined (blocks of beds). The DMOC, in coordination with the medical group MRO, establishes the number of patients a supporting corps hospital can accept during a particular period of time. These blocks of available beds are then provided to the general support ambulances prior to the call for missions.

(1) Once an evacuation mission is completed, the originating division MTF contacts the patient disposition section of the DMOC and provides—

- Patient numbers by category and precedence.
- Departure times.
- Modes of transportation.
- Destination MTFs.
- Any other information required by SOP.

(2) The DMOC, in turn, notifies the medical group MRO via the patient administration net which is monitored by the corps MTFs. Since corps ground ambulances have no on-board communications ability and air ambulances have no amplitude-modulated—high-frequency (AM-HF) capability at present, all patient information is passed to the gaining MTFs via the patient administration nets. To reduce the turnaround time for ground ambulances and to move more serious patients to the CSHs in the corps rear—

- Air ambulances are given blocks of beds in the corps hospitals farther to the rear.
- Ground ambulances are normally given blocks of beds in the more forward deployed CSHs.

c. Patient regulating from the FSMC directly to the MASH will normally be accomplished by the DMOC directly to the PAD at the supporting MASH.

d. Medical evacuation can be effected immediately, procedurally, and under conditions of communications silence without interrupting the continuum of care by—

- Preparing casualty estimates.
- Prioritizing and task-organizing ambulance support.
- Assigning blocks of hospital bed designations prior to the start of the mission.

6-5. Medical Regulating Within the Combat Zone

a. The requirement to transfer patients from one hospital to another within the CZ occurs. This results from—

- Surgical backlogs.
- Mass casualty situations.
- Specialty care requirements.
- Planned movement of an MTF.

b. When it is necessary to transfer a patient, the attending physician notifies the hospital PAD. The PAD consolidates all such requests from the hospital and requests movement authority from the medical group MRO.

c. If the medical group MRO can transfer the patient or patients to its subordinate hospitals, he designates the hospitals to receive the patients and notifies both the requesting and receiving hospitals of the transfer. The medical group MRO also tasks subordinate medical evacuation units for the assets to transfer the patients.

d. If the medical group cannot provide the needed hospitalization within its own resources, the MRO forwards the request to the medical brigade MRO for action. The medical brigade MRO then designates the receiving hospitals and notifies the subordinate MROs. The medical group MROs disseminate the information to the hospital PADs and coordinate the evacuation resources for the transfer. The MRO also coordinates the regulation of patients to—

- Other US military service hospitals and naval hospital ships.
- Allied nations' military hospitals.
- Host-nation support hospitals.

6-6. Medical Regulating from the Combat Zone to the Communications Zone

a. Hospital attending physicians and oral and maxillofacial surgeons submit daily reports to the hospital PAD listing the patients requiring evacuation. The PAD assembles this information and transmits the report to the medical group headquarters. This report is a request for transportation, as well as a notification of the number of patients requiring evacuation. The report classifies the patients according to—

- Diagnostic category.
- Desired on-load points.
- When the patients will be available for evacuation.

b. The medical group MRO consolidates these reports from each hospital attached to the medical group and forwards his report to the medical brigade MRO. The medical brigade MRO consolidates the reports and transmits the data to the MEDCOM MRO.

c. If a JMRO has been activated within the theater, the MEDCOM MRO consolidates all reports from the CZ medical brigades and forwards them to the JMRO. The JMRO designates hospitals in the COMMZ to receive the patients. The designation is based on the previously received bed status reports from all service components. The JMRO then notifies the MEDCOM MRO of designated hospitals. The MEDCOM MRO accomplishes this task if the JMRO is not activated.

d. The primary means of moving patients from the CZ to the COMMZ is USAF aircraft. With the elements of the TAES deployed, it is possible to find AELTs/NCOs at each level and as far forward as the corps hospitals. The AELT monitors the MRO patient evacuation requests. At the same time he uses his organic communications capabilities to pass the requirements through the TAES to the ALCC, seeking an aircraft to perform the evacuation mission. The AELT at the MEDCOM level requests the AECC to move patients. Included in the request are the originating medical facility (OMF) and the destination airfields. The airfields selected are those serving the hospitals designated to receive patients.

e. The AECC is a component of the TAES and performs the mission of coordinating the movement of and providing in-flight medical care to patients while under the USAF control. The AECC forwards the request to the ALCC.

f. The ALCC coordinates the forward movement of cargo and personnel aboard USAF aircraft with other USAF units, Army transportation representatives, and Navy agencies. Certain of these aircraft are scheduled to evacuate patients on their return trips. These aircraft seldom go forward solely to evacuate patients.

g. After the schedules have been arranged, the AECC returns the detailed flight schedule to the MEDCOM AELT and the parent aeromedical evacuation squadron. The MEDCOM MRO can then determine whether or not USAF resources are sufficient to evacuate all patients from the CZ. If the request exceeds USAF capabilities, the MRO coordinates additional ground or air resources and movement clearances from the MCC.

h. The MEDCOM MRO issues these instructions to both the medical brigade MROs (with the authority to move patients in Army CZ facilities) and the receiving hospitals. The hospitals must prepare to receive the patients at the destination airfields. The patients are sorted by destination hospital and moved by Army medical evacuation means. The instructions mentioned above include, as a minimum, the—

- Number of patients to be moved.
- On-load airfield.
- Destination airfield.
- United States Air Force aircraft mission number.
- Estimated time of arrival at the destination airfield.

i. The medical brigade MRO issues the flight and movement instructions to its subordinate medical group MROs. The medical group MROs then direct the evacuation units and hospitals within their AOs to move the patients to the on-load airfield according to the arrival time of the aircraft. This movement must be closely controlled, as a MASF can accommodate only a limited number of patients. The patients cannot be delivered to the MASF earlier than 3 hours prior to arrival of the aircraft and no later than 1 hour prior to arrival.

6-7. Medical Regulating Within the Communications Zone

a. Medical regulating within the COMMZ is similar to the system used within the CZ. Attending physicians or oral and maxillofacial surgeons within the Level III hospitals notify the hospital PAD of patients requiring evacuation to GHs. The PAD then consolidates the requests from the hospitals and forwards the consolidated request to the medical group MRO. He, in turn, consolidates the requests and forwards them to the MEDCOM MRO.

b. The MEDCOM MRO, based on periodic bed status and availability reports from subordinate hospitals, designates specific hospitals to receive the patients. The hospitals are designated based on bed availability, to include specialty beds, to support the specific patient. The MEDCOM MRO then notifies the requesting medical group MRO of the designated hospitals and, in turn, notifies the designated hospitals.

6-8. Intertheater Medical Regulating

a. The patients who are evacuated to the COMMZ are treated there and then further evacuated to the ZI. The attending physicians or oral and maxillofacial surgeons at the hospital notify the PAD. The PAD then consolidates these requests and forwards them to the MRO at the medical brigade. This MRO forwards the consolidated request to the MEDCOM MRO who, in turn, consolidates and forwards a request to the JMRO (if established) or to the ASMRO.

b. Upon request of the JMRO for authority to evacuate patients to the ZI, the ASMRO directs the distribution of these patients into hospitals throughout the CONUS; advises the JMRO of the destination hospital; and provides the authority for such movement. As a rule, the destination hospitals are military facilities. Civilian national disaster medical system member hospitals and other federal hospitals may also receive patients. The Veterans Administration hospitals, for example, may receive patients who are expected to be discharged from service. The ASMRO continues to coordinate with and inform MAC concerning future movement of patients.

c. When the JMRO receives the authorization to move patients, it notifies the MEDCOM MRO of destination hospitals in CONUS. The MEDCOM MRO coordinates with the JMTB to arrange movement of CONUS-bound patients. The

MEDCOM MRO then authorizes the movement to ASFs which are collocated on or near air bases or airstrips capable of handling long-range aircraft. Transportation is arranged, within Army channels, to move patients from the hospitals to the staging facilities. The medical brigade then notifies the subordinate GHs of the flight schedule and the evacuation arrangements for movement to MAC terminals. At MAC terminals, there is an established ASF. When the patients are delivered to the USAF, the responsibility for those patients is transferred from the Army hospital to the MAC aeromedical evacuation system. Upon arrival in CONUS, the ASMRO assumes control, but further movement is the responsibility of the USAF.

d. All patients may not be able to be moved by air from the theater to CONUS. In that event, the MSC is used to move them by surface means. The movement authority also comes from the JMRO or MEDCOM MRO which has arranged with the theater Navy for the movement of patients by hospital ships. When the patients are moved by ships, the MEDCOM has to provide holding facilities at the port. Patients are delivered to these holding facilities and held there until loaded aboard the ships.

6-9. Mobile Aeromedical Staging Facilities

a. Mobile aeromedical staging facilities are air transportable temporary holding facilities. These units are equipped and staffed to receive patients, sustain life, and administratively process patients who are to be moved in the TAES.

b. This theater system is used to evacuate patients from—

- United States Air Force operational locations within the CZ to hospital facilities outside the CZ.
- Airhead or airborne objective areas where airborne operations include USAF forward logistics support.

c. Bases used for aeromedical staging are designated by the area or theater commander. Theater aeromedical evacuation crews—

- Provide supportive medical care.
- Prepare patients for evacuation.
- Ensure patient evacuation manifests are completed.
- Identify patient baggage tags.
- Fly aeromedical airlift missions to provide in-flight patient care.

d. Upon deployment, the originating MTF provides a minimum of 3 days supply of the patient's medication.

e. Units have an authorized strength of twenty-three personnel when deployed. Flight nurses, aeromedical technicians, and ground ramp operators constitute the unit. Each MASF has a 50-patient capacity with an average patient holding time of 3 to 5 hours. (Patients should be brought to the MASF no sooner than 3 hours and no later than 1 hour prior to the departure time of the designated aircraft.) One hundred patients per day can normally be processed and moved by each MASF; however, a surge capability to move 150 patients per day exists.

f. The MASF staff must also establish liaison with OMF. The liaison team (LT) is composed of the air evacuation liaison officer and two communications specialists. The team provides the initial interface between the user service and the TAES. The LT is located at any level of the combat forces' medical regulating chain that is required to ensure a smooth patient flow into the tactical aeromedical system.

6-10. Limitations of the United States Air Force Theater Aeromedical Evacuation System

There are a number of limitations which are inherent in the current system. These include the following:

a. There are no physicians assigned or attached to any element of the TAES.

b. Patients must be in a stable condition prior to being transported to the MASF.

c. There is limited equipment available and there is *no exchange of equipment* with the user service.

d. The MASF cannot hold patients in excess of 6 hours.

e. The MASF does not have the capability to provide patient meals.

f. The abbreviated information available on the patient, due to the restrictions of the tactical environment, limits the amount and extent of patient care.

g. Aircraft are not normally dedicated for aeromedical evacuation missions. Evacuation is accomplished through backhaul on logistical aircraft. The availability of aircraft fluctuates due to the demand for higher priority flights.

h. The logistical aircraft which are available are not equipped for patient comforts (latrine facilities, galleys).

i. The AECC ensures the initial 55-day medical resupply package arrives at the MASF. The MASF relies on the user service for all other logistical support.

j. The AELTs depend directly upon the user service for their logistical support. It is the Army's responsibility to provide quarters, food, and other logistical support required to include moving patients back to Army facilities should USAF aeromedical evacuation support be cancelled or otherwise delayed.

6-11. Originating Medical Facility's Responsibilities

Once the authorization to move the patient has been given, the OMF must complete the following administrative procedures prior to entering the patient into the TAES:

a. The baggage tag, patient manifest, and patient evacuation tag are the specified evacuation forms for all services and will be completed as required by tri-service regulation. (Refer to Appendix E for instructions on completing these forms.)

b. All of the patient's medical records must be collected together and packaged. The dental records are forwarded separately in the event they are needed for identification.

c. At the appropriate time, the OMF provides transportation to the MASF and assists in the offload.

d. The OMF must provide the necessary medications, medical supplies, and equipment to support the patient for a minimum of 3 days.

e. Any requirements for armed guards or attendants must also be met by the OMF.

f. A limited amount of personal baggage is authorized if each piece is properly tagged and delivered to the MASF with the patient. Patients will always be evacuated with NBC-protective equipment, less the protective overgarment.

g. Each patient must be clearly identified with a wrist band or equivalent identification, and properly classified as to his medical condition.

h. The OMF must ensure that each patient is properly briefed and is in stable condition prior to his arrival at the MASF.

6-12. Medical Regulation of Special Operations Forces

a. As in medical evacuation, the medical regulating plan must be integrated with the ARSOF operational and logistic plan. Maximum use of opportune (operational and logistics) aircraft and command and logistics communications nets must be coordinated to expedite mission requests and ensure success.

b. The ARSOF medical planner must constantly coordinate with the battalion or group operations and logistics sections to obtain up-to-date information of opportune transportation assets to be used for evacuation. In a deep operation, or when the theater is not sufficiently developed to allow the TAES to be used effectively, the primary means of air evacuation will be those Special Operations Aviation (SOA) or USAF SOF airframes conducting the clandestine mission. It is essential that coordination is made through the theater Special Operations Command (SOC) or the highest command and control element for flight medics or para-rescuemen (PJs) to accompany the flight when backhauling the casualties. Otherwise, a medic from the SOF unit being supported may have to accompany the casualty, leaving the mission without proper medical support, or the casualty may have to be transported without en route care.

c. For all other special operations, the supporting medical evacuation unit provides air and ground ambulances in accordance with standard doctrinal procedures. United States Air Force MASFs or AELTs may be collocated at SOF support bases, or command and control bases, particularly during contingency operations where the build-up phase allows for pre-positioning of assets.

d. During sustained special operations missions, the theater SOC cannot afford to lose the services of ARSOF soldiers who become casualties, but who can be treated and returned to duty at hospitals within the COMMZ. As an exception to the theater evacuation policy, the Commander in Chief (CINC) retains these soldiers in the theater where they can be returned to their units for limited duty. There they can assume the support duties performed by other ARSOF soldiers, freeing the latter for operational duties.

CHAPTER 7

EVACUATION REQUEST PROCEDURES

7-1. General

Procedures for requesting medical evacuation support must be institutionalized down to the unit level. Procedural guidance and standardization of request procedures are provided in this chapter. *The same format used to request aeromedical evacuation is also used for requesting ground evacuation.*

7-2. Unit Evacuation Plan

Before initiating any operation, a unit must have an evacuation plan in effect. The plan may be a standard SOP or it may be designed for a particular operation. It can be published in various ways depending on the level of headquarters and the amount of detail required. For example, it may be in the form of verbal instructions at the squad or platoon level, a comment in the signal operation instructions (SOI), or a paragraph in the unit OPORD. The unit evacuation plan is essential to requesting evacuation because it identifies—

- Primary and alternate channels to be used in submitting the medical evacuation request.
- Primary and alternate evacuation routes to be used.
- Means of evacuation (type of transport such as litter, ground ambulance, or air ambulance) to be used.
- Location of the destination MTF, if predesignated.

This paragraph implements STANAGs 2087 and 3204, QSTAG 529, and Air STDs 44/36A and 61/71.

7-3. Determination to Request Medical Evacuation and Assignment of Medical Evacuation Precedence

The determination to request medical evacuation and assignment of a precedence is made by the senior military person present. This decision is based on the advice of the senior medical person at the scene, the patient's condition, and the tactical situation. Assignment of a medical evacuation precedence is necessary. The precedence provides the supporting medical unit and controlling headquarters with information that is used in determining priorities for committing their evacuation assets. For this reason, correct assignment of precedence cannot be overemphasized; *overclassification remains a continuing problem.* Patients will be picked up as soon as possible, consistent with available resources and pending missions. The following are categories of precedence and the criteria used in their assignment:

a. Priority I— URGENT is assigned to emergency cases that should be evacuated as soon as possible and within a maximum of 2 hours in order to save life, limb, or eyesight, to prevent complications of serious illness, or to avoid permanent disability.

b. Priority IA– URGENT-SURG is assigned to patients who must receive far forward surgical intervention to save life and stabilize for further evacuation.

c. Priority II—PRIORITY is assigned to sick and wounded personnel requiring prompt medical care. This precedence is used when the individual should be evacuated within 4 hours or his medical condition could deteriorate to such a degree that he will become an URGENT precedence, or whose requirements for special treatment are not available locally, or who will suffer unnecessary pain or disability.

d. Priority III—ROUTINE is assigned to sick and wounded personnel requiring evacuation but whose condition is not expected to deteriorate significantly. The sick and wounded in this category should be evacuated within 24 hours.

e. Priority IV–CONVENIENCE is assigned to patients for whom evacuation by medical vehicle is a matter of medical convenience rather than necessity.

7-4. Unit Responsibilities in Evacuation

A decision to request medical evacuation places certain responsibilities on the requesting unit in the overall evacuation effort. To prepare for and assist during evacuation, the unit must—

a. Ensure that the tactical situation permits successful evacuation.

b. Have an English-speaking representative at the pickup site when evacuation is requested for non-US personnel.

c. Ensure that patients are ready for pickup when the request is submitted and provide patient information, as required.

d. Receive backhauled medical supplies and report the type, quantity, and where they were delivered.

e. Move patients to the safest aircraft approach and departure point or AXP if they are to be evacuated by air. Ensure that ground personnel are familiar with the principles of helicopter operations. The ground crew—

- Selects and prepares the landing site.
- Loads and unloads the helicopter according to the pilot's instructions.
- Briefs the pilot on the position of enemy troops and directs him to other units in the area if asked.
- Guides the helicopter using hand signals during landing and takeoff when the tactical situation permits.
- Marks friendly positions when armed helicopter escort is provided.

7-5. Types of Medical Evacuation Request Formats and Procedures

a. The medical evacuation request is used for requesting evacuation support for both air and ground ambulances.

b. There are two established medical evacuation formats and procedures: one for wartime use and one used in peacetime.

c. Several differences exist between the wartime and peacetime medical evacuation request formats and procedures. The wartime request format is shown in Table 7-1. The peacetime request form differs in two line item areas.

(1) Line 6–changed to number and type of wound, injury, or illness (two gunshot wounds and one compound fracture). If serious bleeding is reported, the patient's blood type should be given, if known.

(2) Line 9–changed to description of terrain (flat, open, sloping, wooded). If possible, include relationship of landing area to prominent terrain features.

d. Security is another basic difference between wartime and peacetime requesting procedures. Under all nonwar conditions, the safety of US military and civilian personnel outweighs the need for security, and clear text transmissions of medical evacuation requests are authorized. During wartime, the rapid evacuation of patients must be weighed against the importance of unit survivability. Accordingly, wartime medical evacuation requests are transmitted by secure means only.

e. An after-action medical evacuation format is provided in Appendix G.

7-6. Collection of Medical Evacuation Information

The medical evacuation information collected for the wartime medical evacuation request, line numbers 3 through 9, is subject to brevity codes. This information is limited to the specific remarks provided in Table 7-1. For example: The information to be collected for Line 4 pertains to special equipment to be placed on board the evacuation vehicle or aircraft. The limiting remarks restrict identification to none required, hoist, extraction equipment, and ventilator. No other remarks are authorized for Line 4.

7-7. Preparation of the Medical Evacuation Request

Table 7-1 provides the procedures for preparation of the medical evacuation request, to include information requirements and sources.

a. During wartime, brevity codes must be used in preparing all medical evacuation requests. The authorized codes are provided in Table 7-1; they are also provided in the SOI. Use of locally devised brevity codes is not authorized. If the unit preparing the request does not have access to secure communications, the medical evacuation request must be prepared in encrypted form. Encrypting is required for all information on the request with the exception of—

(1) The medical evacuation line number identifier. This information is always transmitted in clear text.

(2) The call sign and suffix (Line 2) which can be transmitted in clear text.

b. During peacetime, two line number items (Lines 6 and 9) will change. Details for the collection of information and request preparation are shown in Table 7-1. More detailed procedures for use of the peacetime request format must be developed by each local command to meet specific requirements.

Table 7-1. Procedures for Information Collection and MEDEVAC Request Preparation.

LINE	ITEM	EXPLANATION	WHERE/HOW OBTAINED	WHO NORMALLY PROVIDES	REASON
1	Location of Pickup Site.	Encrypt the grid coordinates of the pickup site. When using the DRYAD Numeral Cipher, the same "SET" line will be used to encrypt the grid zone letters and the coordinates. To preclude misunderstanding, a statement is made that grid zone letters are included in the message (unless unit SOP specifies its use at all times).	From Map	Unit Leader(s)	Required so evacuation vehicle knows where to pickup patient. Also, so that the unit coordinating the evacuation mission can plan the route for the evacuation vehicle (if the evacuation vehicle must pick up from more than one location).
2	Radio Frequency, Call Sign, and Suffix	Encrypt the frequency of the radio at the pickup site, not a relay frequency. The call sign (and suffix if used) of person to be contacted at the pickup site may be transmitted in the clear.	From SOI	RTO	Required so that evacuation vehicle can contact requesting unit while en route (obtain additional information or change in situation or directions).
3	Number of Patients by Precedence	Report only applicable information and encrypt the brevity codes. A - URGENT. B - URGENT-SURG. C - PRIORITY. D - ROUTINE. E - CONVENIENCE. If two or more categories must be reported in the same request, insert the word "BREAK" between each category.	From Evaluation of Patient(s)	Medic or Senior Person Present	Required by unit controlling the evacuation vehicles to assist in prioritizing missions.

Table 7-1. Procedures for Information Collection and MEDEVAC Request Preparation (Continued)

LINE	ITEM	EXPLANATION	WHERE/HOW OBTAINED	WHO NORMALLY PROVIDES	REASON
4	Special Equipment Required	Encrypt the applicable brevity codes. A - None. B - Hoist. C - Extraction equipment. D - Ventilator.	From Evaluation of Patient/ Situation	Medic or Senior Person Present	Required so that the equipment can be placed on board the evacuation vehicle prior to the start of the mission.
5	Number of Patients by Type	Report only applicable information and encrypt the brevity code. If requesting MEDEVAC for both types, insert the word "BREAK" between the litter entry and ambulatory entry L + # of Pnt - Litter A + # of Pnt - Ambulatory (sitting)	From Evaluation of Patient(s)	Medic or Senior Person Present	Required so that the appropriate number of evacuation vehicles may be dispatched to the pickup site. They should be configured to carry the patients requiring evacuation.
6	Security of Pick-up Site (Wartime)	N - No enemy troops in area. P - Possibly enemy troops in area (approach with caution). E - Enemy troops in area (approach with caution). X - Enemy troops in area (armed escort required).	From Evaluation of Situation	Unit Leader	Required to assist the evacuation crew in assessing the situation and determining if assistance is required. More definitive guidance can be furnished the evacuation vehicle while it is en route (specific location of enemy to assist an aircraft in planning its approach).
6	Number and Type of Wound, Injury, or Illness (Peacetime)	Specific information regarding patient wounds by type (gunshot or shrapnel). Report serious bleeding, along with patient blood type, if known.	From Evaluation of Patient	Medic or Senior Person Present	Required to assist evacuation personnel in determining treatment and special equipment needed.
7	Method of Marking Pickup Site	Encrypt the brevity codes. A - Panels. B - Pyrotechnic signal. C - Smoke signal. D - None. E - Other.	Based on Situation and Availability of Materials	Medic or Senior Person Present	Required to assist the evacuation crew in identifying the specific location of the pick up. Note that the color of the panels or smoke should not be transmitted until the evacuation vehicle contacts the unit (just prior to its arrival). For security, the crew should identify the color and the unit verify it.

Table 7-1. Procedures for Information Collection and MEDEVAC Request Preparation (Continued)

LINE	ITEM	EXPLANATION	WHERE/HOW OBTAINED	WHO NORMALLY PROVIDES	REASON
8	Patient Nationality and Status	The number of patients in each category need not be transmitted. Encrypt only the applicable brevity codes. A - US military. B - US civilian. C - Non-US military. D - Non-US civilian. E - EPW.	From Evaluation of Patient	Medic or Senior Person Present	Required to assist in planning for destination facilities and need for guards. Unit requesting support should ensure that there is an English-speaking representative at the pickup site.
9	NBC Contamination (Wartime)	Include this line only when applicable. Encrypt the applicable brevity codes. N - Nuclear. B - Biological. C - Chemical.	From Situation	Medic or Senior Person Present	Required to assist in planning for the mission. (Determine which evacuation vehicle will accomplish the mission and when it will be accomplished.)
9	Terrain Description (Peacetime)	Include details of terrain features in and around proposed landing site. If possible, describe relationship of site to prominent terrain feature (lake, mountain, tower).	From Area Survey	Personnel at Site	Required to allow evacuation personnel to assess route/avenue of approach into area. Of particular importance if hoist operation is required.

7-8. Transmission of the Request

The medical evacuation request should be made by the most direct communications means to the medical unit that controls evacuation assets. The communications means and channels used depend on the situation (organization, communication means available, location on the battlefield, distance between units). The primary and alternate channels to be used are specified in the unit evacuation plan.

a. Secure Transmissions. Under all wartime conditions, these requests are transmitted by *SECURE MEANS* only. Therefore, the use of nonsecure communications dictates that the request be transmitted in *ENCRYPTED FORM.* Regardless of the type (secure or nonsecure) of communications equipment used in transmission, it is necessary to—

- Make proper contact with the intended receiver.
- Use the effective call sign and frequency assignments from the SOI.
- Use the proper radio procedure.
- Ensure that transmission time is kept to a minimum (20 to 25 seconds maximum).
- Provide the opening statement: "I HAVE A MEDEVAC REQUEST."

b. Receiver Acknowledgment. After the appropriate opening statement is made, the transmitting operator breaks for acknowledgment. Authentication by the receiving or transmitting unit should be done in accordance with the tactical SOP.

c. Clear Text and Encrypted Transmissions. If secure communications equipment is used in transmission, the request will be transmitted in *CLEAR TEXT*. However, if the communications equipment used in transmission is not secure, the request must be transmitted in encrypted form with the exception of the following:

(1) The medical evacuation line number identifier (Line 1, Line 2, Line 3, and so forth). This information is always transmitted in clear text.

(2) The call sign and suffix (Line 2) which can be transmitted in clear text.

NOTE

When using DRYAD Numeral Cipher, the same "SET" line is used to encrypt both the grid zone letters and the coordinates (Line 1 of the request). To avoid misunderstanding, a statement should be made that the grid zone letters are included in the message. This must be accomplished unless the unit SOP specifies that the DRYAD Numeral Cipher is to be used at all times.

d. Letter and Numeral Pronunciation. The letters and numerals that make up the request are pronounced according to standard radio procedures. In transmission of the request, the medical evacuation request line number identifier will be given followed by the applicable evacuation information (example: Line One. TANGO PAPA FOUR SIX FIVE THREE SEVEN NINER).

e. Medical Evacuation Request Line Numbers 1 Through 5. The medical evacuation request line numbers 1 through 5 must always be transmitted first. The information enables the evacuation unit to begin the mission and avoids unnecessary delay if the remaining information is not immediately available. The information for Lines 6 through 9 should be transmitted as soon as it is available.

f. Monitoring Requirement. After transmission and acknowledgment are accomplished, the transmitting operator must monitor the frequency (Line 2 of the request) to wait for additional instructions or contact from the evacuation vehicle.

7-9. Relaying Requests

If the unit receiving the request does not control the evacuation means, it must relay the request to the headquarters or unit that has control, or to another relaying unit. When the relaying unit does not have access to secure communications equipment, the request must be transmitted in encrypted form. The method of transmission and specific units involved depends on the situation. Regardless of the method of transmission, the unit relaying the request must ensure that it relays the exact information originally received and that it is transmitted by secure means only. The radio call sign and frequency relayed (Line 2 of the request) should be that of the requesting unit and not that of the relaying unit. If possible, intermediate headquarters or units relaying requests will monitor the frequency specified in Line 2. This is necessary in the event contact is not established by the medical evacuation unit, vehicle, or aircraft with the requesting unit.

CHAPTER 8

MANUAL EVACUATION

8-1. General

Manual evacuation is the process of transporting casualties by manual carries. It is accomplished without the aid of a litter or other forms of transport. It is intended to end at the point where a more sophisticated means of evacuation becomes available. For example, manual evacuation ends when either a litter or a vehicle becomes available.

8-2. Casualty Handling

Casualties evacuated by manual means must be carefully handled. Rough or improper handling may cause further injury to the patient. The evacuation effort should be organized and performed methodically. Each movement made in lifting or moving casualties should be performed as deliberately and gently as possible. Casualties should not be moved before the type and extent of their injuries are evaluated and the required EMT is administered.

NOTE

> The exception to this occurs when the situation dictates immediate movement for safety reasons. For example, if a casualty is on the ground near a burning vehicle, it may be necessary to move him a safe distance away from the vehicle. This situation dictates that the urgency of casualty movement outweighs the need to administer EMT. Even when immediate movement of casualties is required, they should be moved only far enough to be out of danger.

8-3. Casualty Treatment

a. Many lifesaving and life-preserving measures are carried out before evacuating injured or wounded soldiers. Except in extreme emergencies, the type and extent of injuries must be evaluated before any movement of the casualty is attempted. Measures are taken, as needed, to—

- Open the airway and restore breathing and heartbeat.
- Stop bleeding.
- Prevent or control shock.
- Protect the wound from further contamination.

b. When a fracture is evident or suspected, the injured part must be immobilized. Every precaution must be taken to prevent broken ends of bone from cutting through muscle, blood vessels, nerves, and skin.

c. When a casualty has a serious wound, the dressing over the wound should be reinforced to provide additional protection during manual evacuation.

8-4. General Rules for Bearers

a. In manual evacuation, individuals performing the evacuation are referred to as bearers. Improper handling of a casualty can result in injury to the bearers as well as to the casualty. To minimize disabling injuries (muscle strain, sprains, or other injuries) that could hamper the evacuation effort, the following rules should be followed:

- Use the body's natural system of levers when lifting and moving a casualty.
- Know your physical capabilities and limitations.
- Maintain solid footing when lifting and transporting a casualty.
- Use the leg muscles (not the back muscles) when lifting or lowering a casualty.
- Use the shoulder and leg muscles (not the back muscles) when carrying or standing with a casualty.
- Keep the back straight; use arms and shoulders when pulling a casualty.
- Work in unison with other bearers, using deliberate, gradual movements.

- Slide or roll, rather than lift, heavy objects that must be moved.

- Rest frequently, or whenever possible, while transporting a casualty.

b. Normally, a casualty's individual weapon is not moved through the evacuation chain with him. Weapons are turned in at the first available MTF (BAS or division clearing station) to be returned through supply channels. Individual equipment, to include protective clothing and mask, remains with the casualty and is evacuated with him.

8-5. Manual Carries

Manual carries are tiring for the bearers and involve the risk of increasing the severity of the casualty's injuries. In some instances, however, they are essential to save the casualty's life. When a litter is not available or when the terrain or the combat situation makes other forms of casualty transport impractical, a manual carry may be the only means to transport a casualty to where a medic can treat him. The distance a casualty can be transported by a manual carry depends upon many factors, such as—

- Strength and endurance of the bearers.

- Weight of the casualty.

- Nature of the injuries.

- Obstacles encountered during transport.

8-6. Casualty Positioning

The first step in any manual carry is to position the casualty to be lifted. If he is conscious, he should be told how he is to be positioned and transported. This helps to lessen his fear of movement and to gain his cooperation. It may be necessary to roll the casualty onto his abdomen, or his back, depending upon the position in which he is lying and the particular carry to be used.

a. To roll a casualty onto his abdomen, kneel at the casualty's uninjured side.

(1) Place his arms above his head; cross his ankle which is farther from you over the one that is closer to you.

(2) Place one of your hands on the shoulder which is farther from you; place your other hand in the area of his hip or thigh.

(3) Roll him gently toward you onto his abdomen (Figure 8-1).

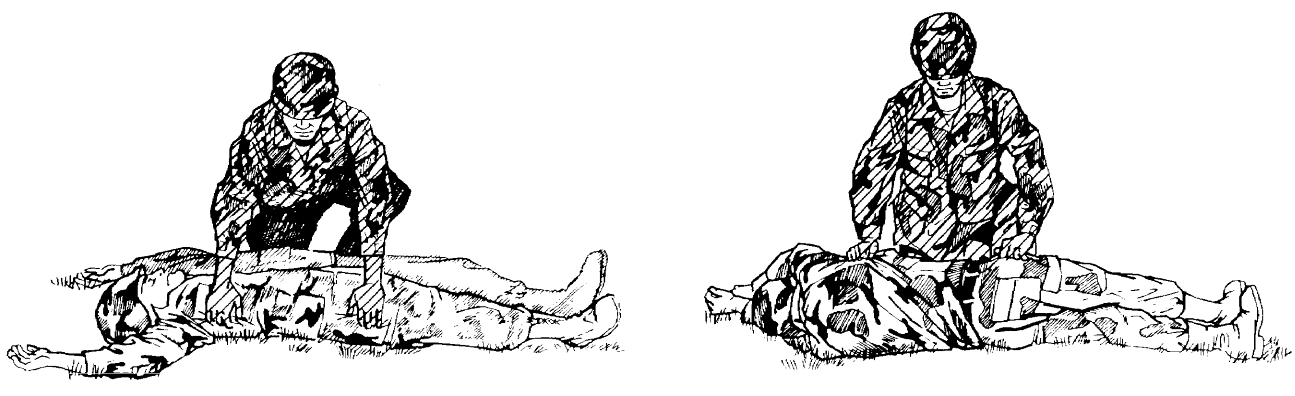


Figure 8-1. Positioning the casualty (on his abdomen).

b. To roll a casualty onto his back, follow the same procedure described in *a* above, except gently roll the casualty onto his back, rather than onto his abdomen (Figure 8-2).

Figure 8-2. Positioning the casualty on his back.

8-7. Categories of Manual Carries

a. One-Man Carries. These carries should be used when only one bearer is available to transport the casualty.

(1) The *fireman's carry* (Figure 8-3) is one of the easiest ways for one individual to carry another. After an unconscious or disabled casualty has been properly positioned (Figure 8-1), he is raised from the ground, then supported and placed in the carrying position.

(a) After rolling the casualty onto his abdomen, straddle him. Extend your hands under his chest and lock them together.

(b) Lift the patient to his knees as you move backwards.

(c) Continue to move backward, thus straightening the casualty's legs and locking his knees.

(d) Walk forward, bringing the casualty to a standing position; tilt him slightly backward to prevent his knees from buckling.

(e) As you maintain constant support of the casualty with one arm, free your other arm, quickly grasp his wrist, and raise his arm high. Instantly pass your head under his raised arm, releasing it as you pass under it.

(f) Move swiftly to face the casualty and secure your arms around his waist. Immediately place your foot between his feet and spread them apart (approximately 6 to 8 inches).

(g) Grasp the casualty's wrist and raise his arm high over your head.

(h) Bend down and pull the casualty's arm over and down on your shoulder, bringing his body across your shoulders. At the same time, pass your arm between his legs.

(i) Grasp the casualty's wrist with one hand, and place your other hand on your knee for support.

(j) Rise with the casualty positioned correctly. Your other hand is free for use.

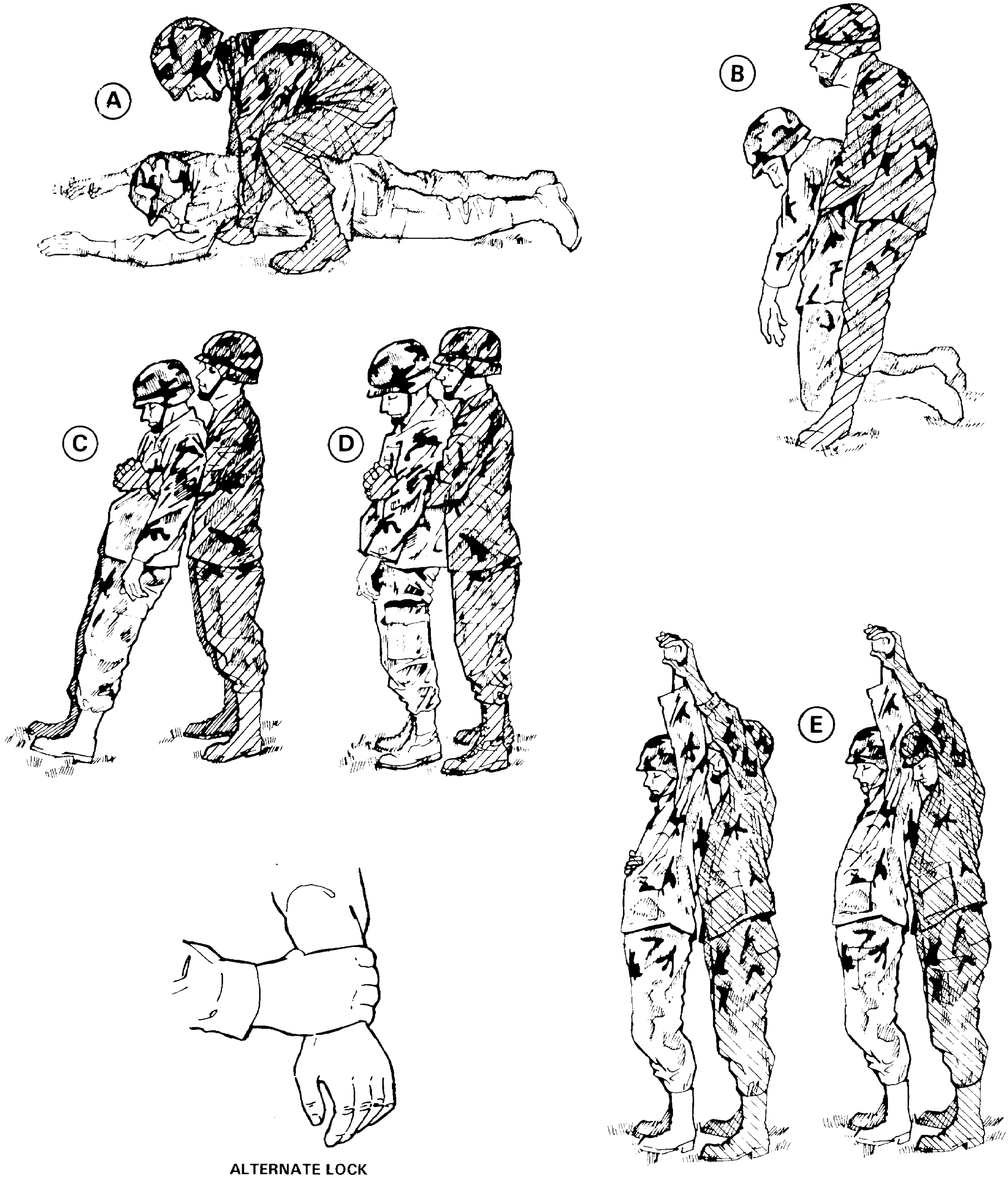


Figure 8-3. Fireman's carry.

Figure 8-3. Fireman's carry (continued).

(2) The alternate method of the *fireman's carry* for raising a casualty from the ground is illustrated in Figure 8-4; however, it should be used only when the bearer believes it to be safer for the casualty because of the location of his wounds. When the alternate method is used, care must be taken to prevent the casualty's head from snapping back and causing a neck injury. The steps for raising a casualty from the ground for the fireman's carry are also used in other one-man carries.

(*a*) Kneel on one knee at the casualty's head and face his feet. Extend your hands under his armpits, down his sides, and across his back.

(*b*) As you rise, lift the casualty to his knees. Then secure a lower hold and raise him to a standing position with his knees locked.

Figure 8-4. Fireman's carry (alternate method for lifting the patient to a standing position.

(3) In the *supporting carry* (Figure 8-5), the casualty must be able to walk, or at least hop, on one leg, using the bearer as a crutch. This carry can be used to transport a casualty as far as he is able to walk or hop.

(a) Raise the casualty from the ground to a standing position by using the fireman's carry.

(b) Grasp the casualty's wrist and draw his arm around your neck.

(c) Place your arm around his waist. The casualty is now able to walk or hop, using you as a support.

Figure 8-5. Supporting carry.

(4) The *arms carry* (Figure 8-6) is useful in carrying a casualty for a short distance (up to 50 meters) and for placing a casualty on a litter.

(a) Raise or lift the casualty from the ground to a standing position, as in the fireman's carry.

(b) Place one arm under the casualty's knees and your other arm around his back.

(c) Lift the casualty.

(d) Carry the casualty high to lessen fatigue.

Figure 8-6. Arms carry.

(5) Only a conscious casualty can be transported by the *saddleback carry* (Figure 8-7) because he must be able to hold onto the bearer's neck. To use this technique—

(a) Raise the casualty to an upright position, as in the fireman's carry.

(b) Support the casualty by placing an arm around his waist. Move to the casualty's side. Have the casualty put his arm around your neck and move in front of him with your back to him.

(c) Have the casualty encircle his arms around your neck.

(d) Stoop, raise him on your back, and clasp your hands together beneath his thighs, if possible.

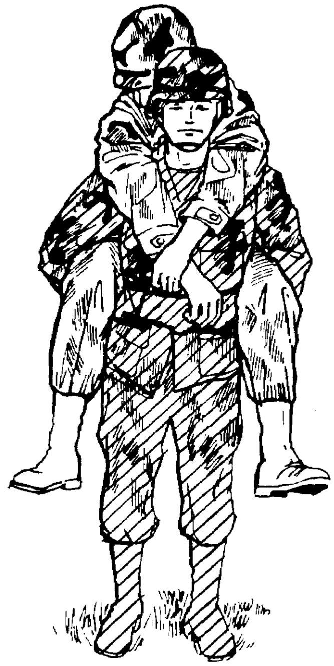


Figure 8-7. Saddleback carry.

(6) In the *pack-strap carry* (Figure 8-8), the casualty's weight rests high on your back. This makes it easier for you to carry the casualty a moderate distance (50 to 300 meters). To eliminate the possibility of injury to the casualty's arms, you must hold the casualty's arms in a palms-down position.

(a) Lift the casualty from the ground to a standing position, as in the fireman's carry.

(b) Support the casualty with your arms around him and grasp his wrist closer to you.

(c) Place his arm over your head and across your shoulders.

(d) Move in front of him while still supporting his weight against your back.

(e) Grasp his other wrist and place this arm over your shoulder.

(f) Bend forward and raise or hoist the casualty as high on your back as possible so that his weight is resting on your back.

NOTE

Once the casualty is positioned on the bearer's back, the bearer remains as erect as possible to prevent straining or injuring his back.

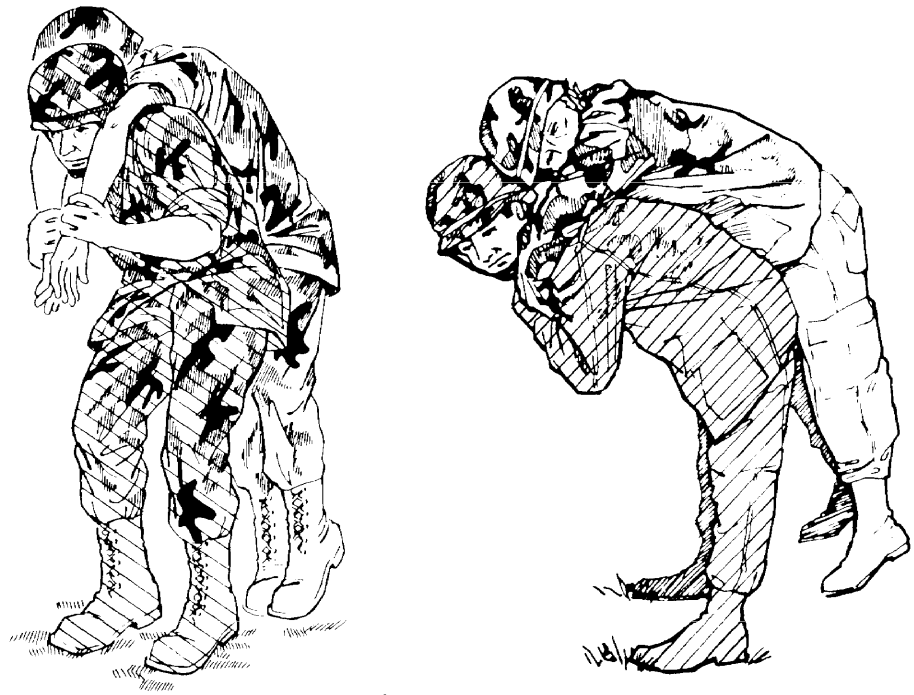


Figure 8-8. Pack-strap carry.

(7) The *pistol-belt carry* (Figure 8-9) is the best one-man carry for a long distance (over 300 meters). The casualty is securely supported upon your shoulders by a belt. Both your hands and the casualty's (if conscious) are free for carrying a weapon, equipment, or climbing obstacles. With your hands free and the casualty secured in place, you are also able to creep through shrubs and under low-hanging branches.

(a) Link two pistol belts (or three, if necessary) together to form a sling. Place the sling under the casualty's thighs and lower back so that a loop extends from each side.

NOTE

If pistol belts are not available for use, other items such as a rifle sling, two cravat bandages, two litter straps, or any other suitable material which will not cut or bind the casualty may be used.

(b) Lie face up between the casualty's out stretched legs. Thrust your arms through the loops and grasp his hands and trouser leg on his injured side.

(c) Roll toward the casualty's uninjured side onto your abdomen, bringing him onto your back. Adjust the sling, if necessary.

(d) Rise to a kneeling position. The belt will hold the casualty in place.

(e) Place one hand on your knee for support and rise to an upright position. (The casualty is supported on your shoulders.)

(f) Carry the casualty with your hands free for use in rifle firing, climbing, or surmounting obstacles.

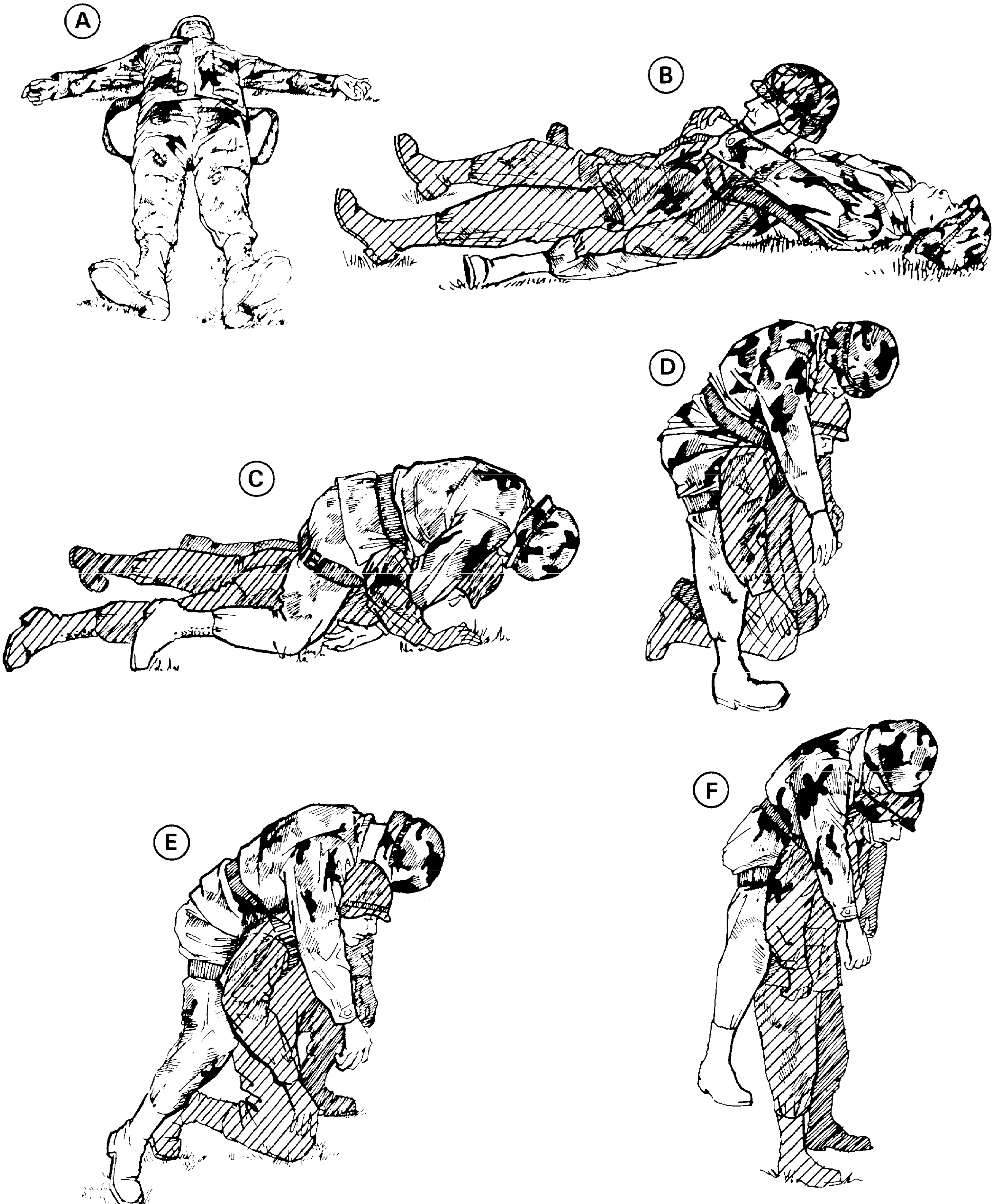


Figure 8-9. Pistol-belt carry.

(8) The *pistol-belt drag* (Figure 8-10), as well as other drags, is generally used for short distances (up to 50 meters). This drag is useful in combat, since both the bearer and the casualty can remain closer to the ground than in other drags.

(a) Extend two pistol belts or similar objects to their full length and join them together to make a continuous loop.

(b) Roll the casualty onto his back, as in the fireman's carry.

(c) Pass the loop over the casualty's head, and position it across his chest and under his armpits. Then cross the remaining portion of the loop, thus forming a figure eight.

(d) Lie on your side facing the casualty.

(e) Slip the loop over your head and turn onto your abdomen. This enables you to drag the casualty as you crawl.

Figure 8-10. Pistol-belt drag.

(9) The *neck drag* (Figure 8-11) is useful in combat because the bearer can transport the casualty as he creeps behind a low wall or shrubbery, under a vehicle, or through a culvert. If the casualty is unconscious, his head must be protected from the ground. The neck drag cannot be used if the casualty has a broken arm.

NOTE

If the casualty is conscious, he may clasp his hands together around your neck.

(a) Tie the casualty's hands together at the wrists.

(b) Straddle the casualty in a kneeling face-to-face position.

(c) Loop the casualty's tied hands over and around your neck

(d) Crawl forward dragging the casualty with you.

NOTE

If the casualty is unconscious, protect his head from the ground.

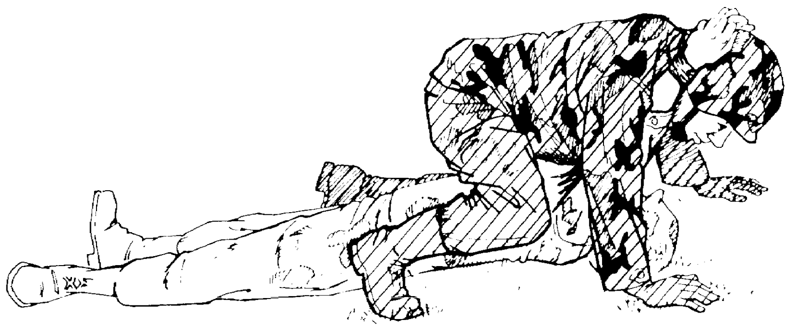


Figure 8-11. Neck drag.

(10) The *cradledrop drag* (Figure 8-12) is effective in moving a casualty up or down steps.

(a) Kneel at the casualty's head (with him lying on his back). Slide your hands, with palms up, under the casualty's shoulders and get a firm hold under his armpits.

(b) Rise (partially), supporting the casualty's head on one of your forearms. (You may bring your elbows together and let the casualty's head rest on both of your forearms.)

(c) Rise and drag the casualty backward. (The casualty is in a semisitting position.)

(d) Back down the steps, supporting the casualty's head and body and letting his hips and legs drop from step to step.

NOTE

If the casualty needs to be moved up the steps, you should back up the steps, using the same procedure.

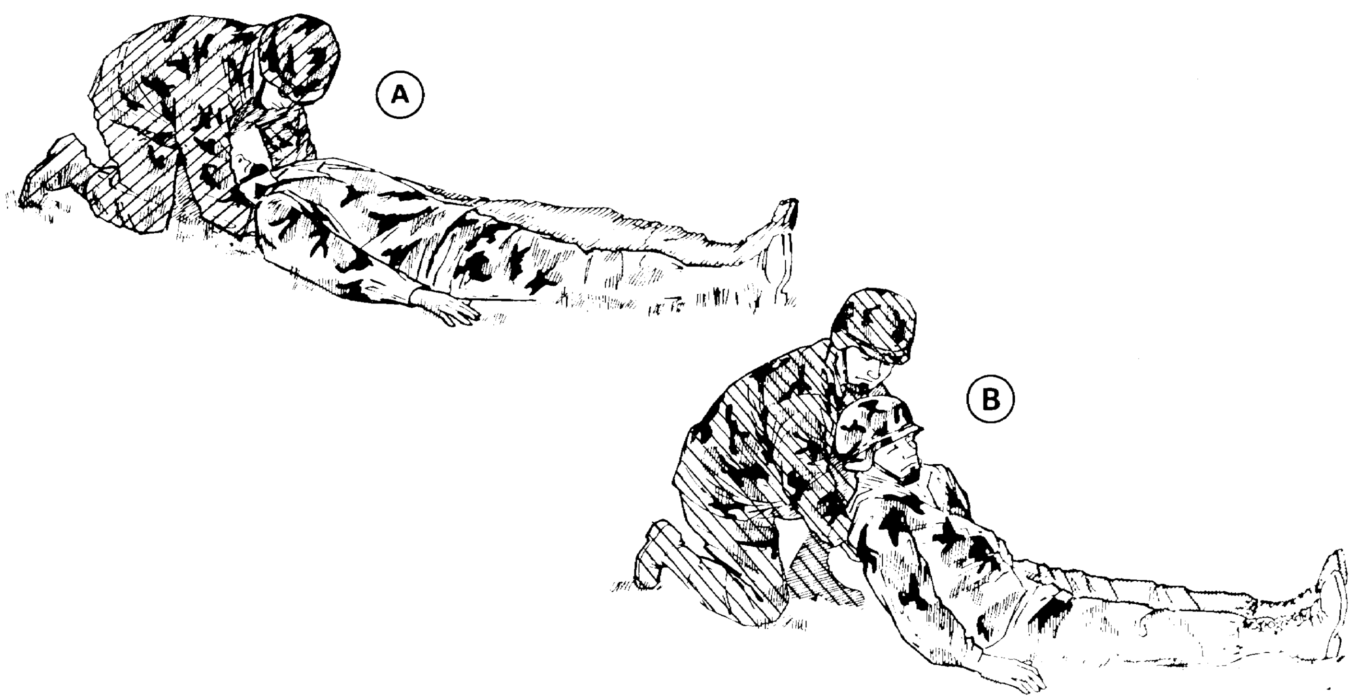


Figure 8-12. Cradle-drop drag.

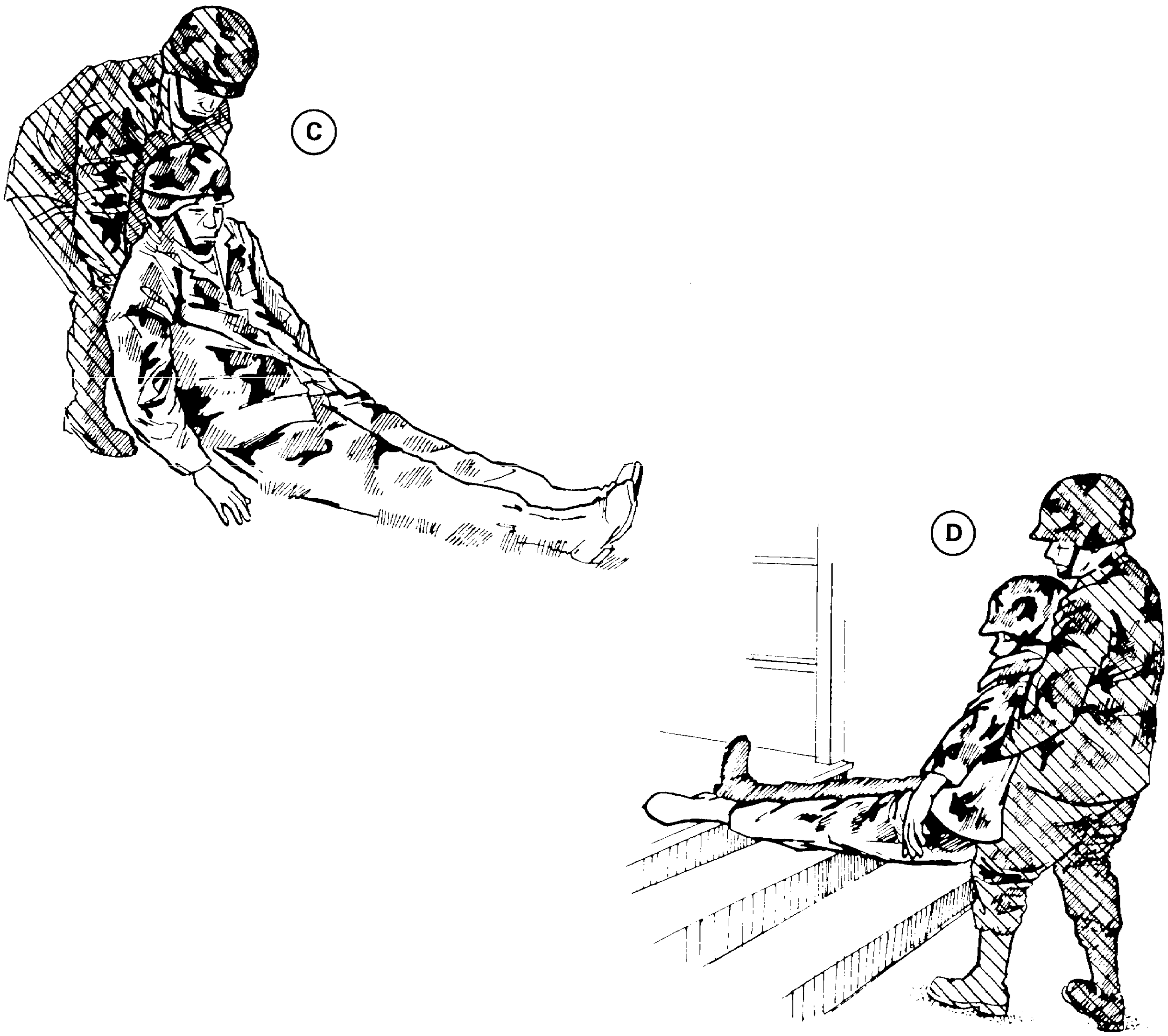


Figure 8-12. Cradle-drop drag (continued).

(11) The *load bearing equipment (LBE) carry using the bearer's LBE* can be used with a conscious casualty (Figure 8-13).

(a) Loosen all suspenders on your LBE.

(b) Have the casualty place one leg into the loop formed by your suspenders and pistol belt.

(c) Squat in front of the standing casualty. Have him place his other leg into the loop, also.

(d) Have the casualty place his arms over your shoulders, lean forward onto your back, and lock his hands together.

(e) Stand up and lean forward into a comfortable position.

(f) Continue mission.

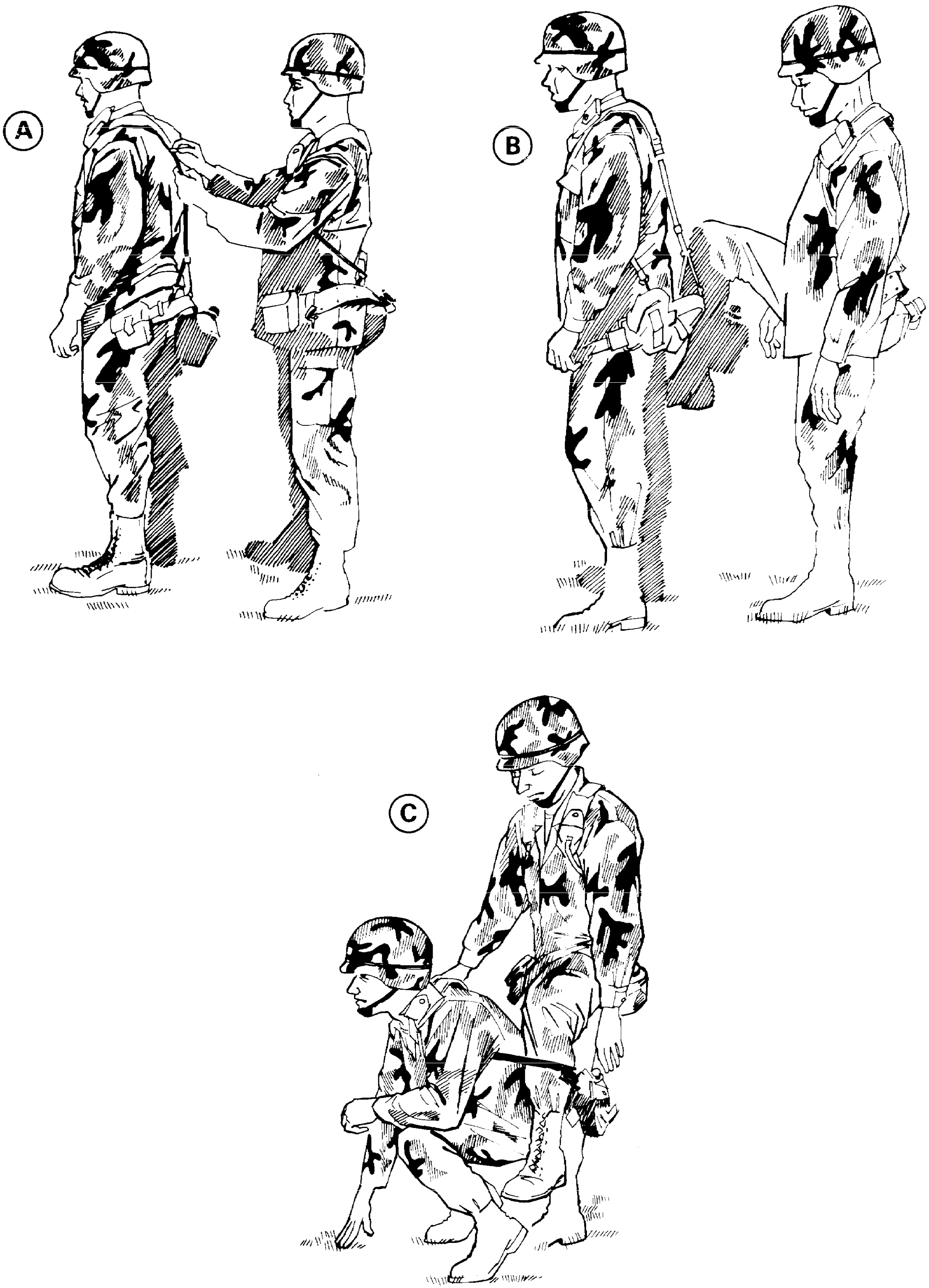


Figure 8-13. LBE carry using bearer's LBE (conscious casualty).

Figure 8-13. LBE carry using bearer's LBE (conscious casualty) (continued).

(12) The *LBE carry using the bearer's LBE* can be used with an unconscious casualty or one who cannot stand (Figure 8-14).

(a) Position the casualty on the flat of his back.

(b) Remove your LBE and loosen all suspender straps.

(c) Lift the casualty's leg and place it through the loop formed by your suspenders and pistol belt. Then place the other leg. The LBE is moved up until the pistol belt is behind the casualty's thighs.

(d) Lay between the casualty's legs; work his arms though his LBE suspenders.

(e) Grasp the casualty's hand (on the injured side), and roll the casualty (on his uninjured side) onto his back.

(f) Rise to one knee and then push into a standing position.

(g) Bring the casualty's arms over your shoulders. Grasp his hands and secure them if the casualty in unconscious. If the casualty is conscious, have him lock his hands in front if he is able to do so.

(h) Lean forward into a comfortable position and continue the mission.

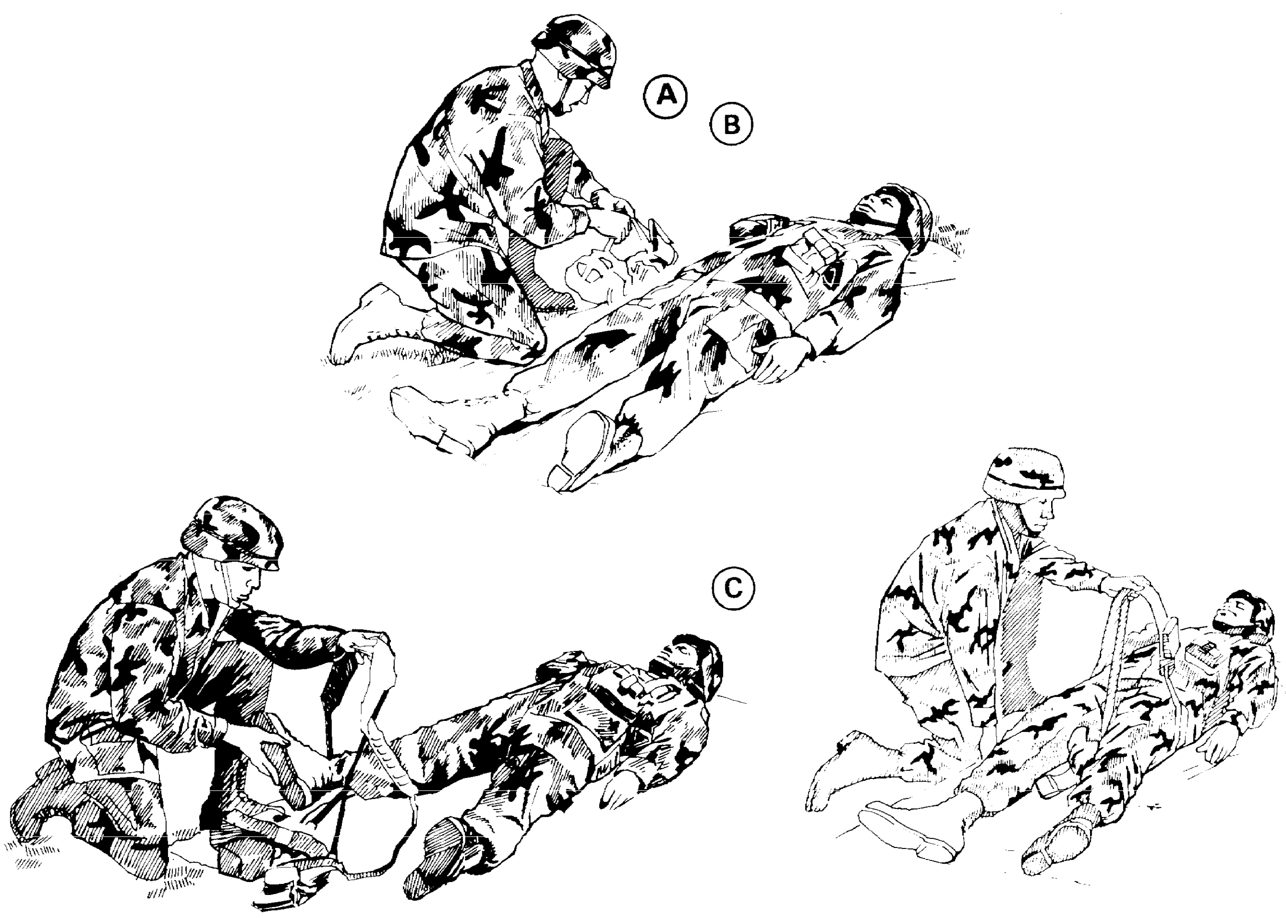


Figure 8-14. LBE carry using bearer's LBE (unconscious casualty or one that cannot stand).

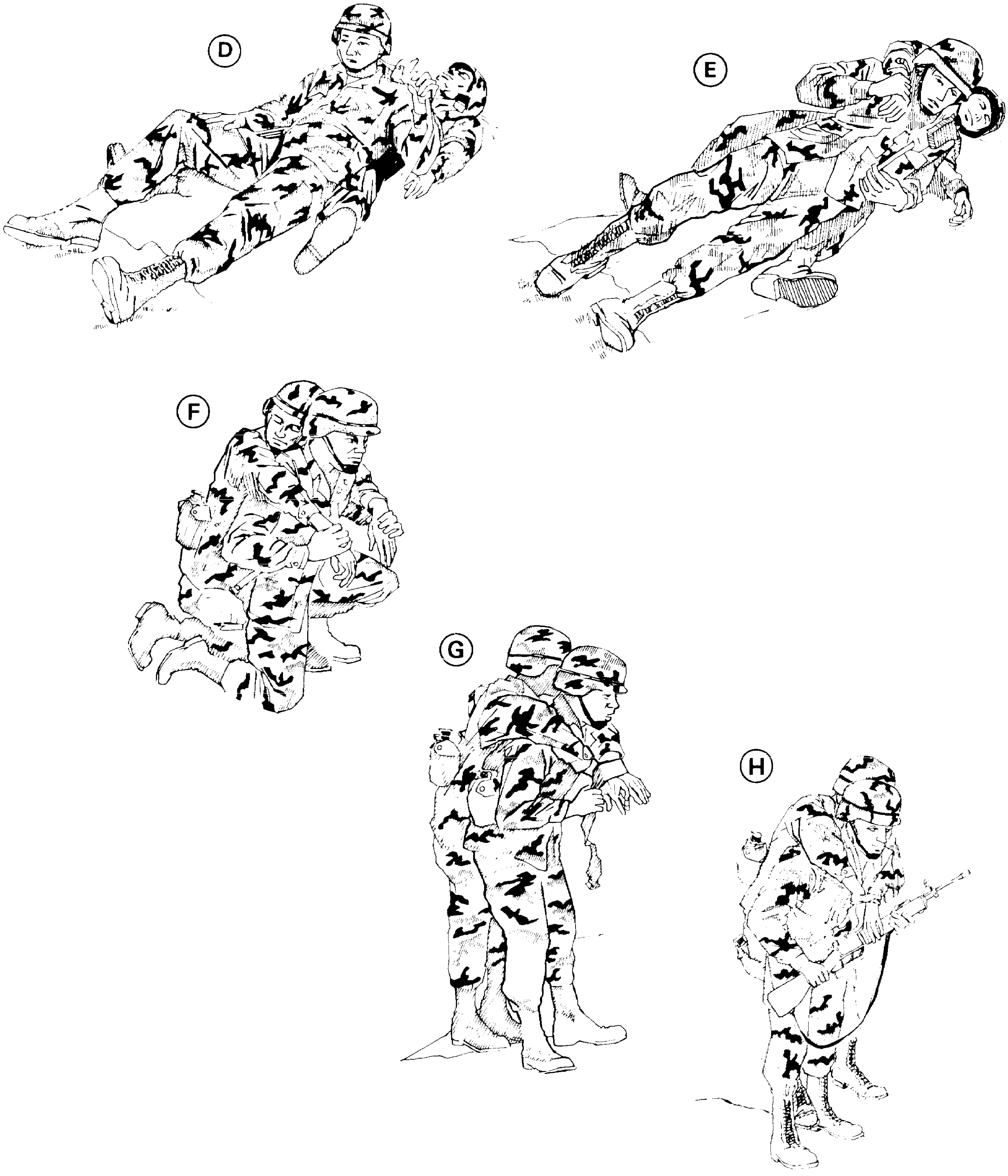


Figure 8-14. LBE carry using bearer's LBE (unconscious casualty or one that cannot stand) (continued).

(13) The *LBE carry using the casualty's LBE* (Figure 8-15) can be used with a conscious or unconscious casualty.

(a) Position the casualty on his back with his LBE on.

(b) Loosen the casualty's two front suspenders.

(c) Position yourself between the casualty's legs, and slip your arms into the casualty's two front suspenders (up to his shoulders).

(d) Work his arms out of his LBE suspenders.

(e) Grasp the casualty's hand (on the injured side, and roll him (on his uninjured side) onto his back.

(f) Rise to one knee, then into a standing position.

(g) Grasp the casualty's hands and secure them, if the casualty is unconsciouss. Have the casualty lock his hands in front of you, if he is conscious.

(h) Lean forward into a comfortable position and continue the mission.

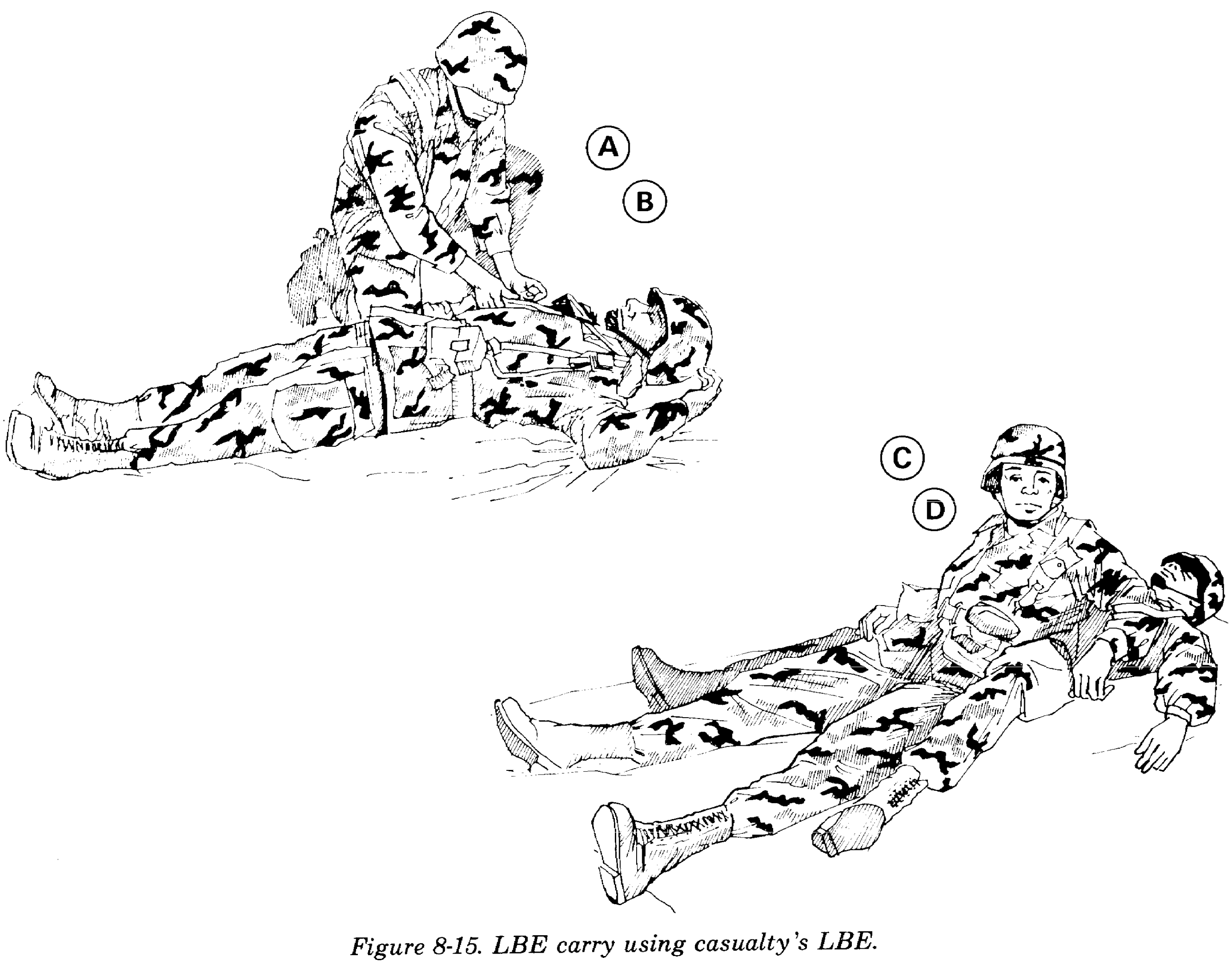


Figure 8-15. LBE carry using casualty's LBE.

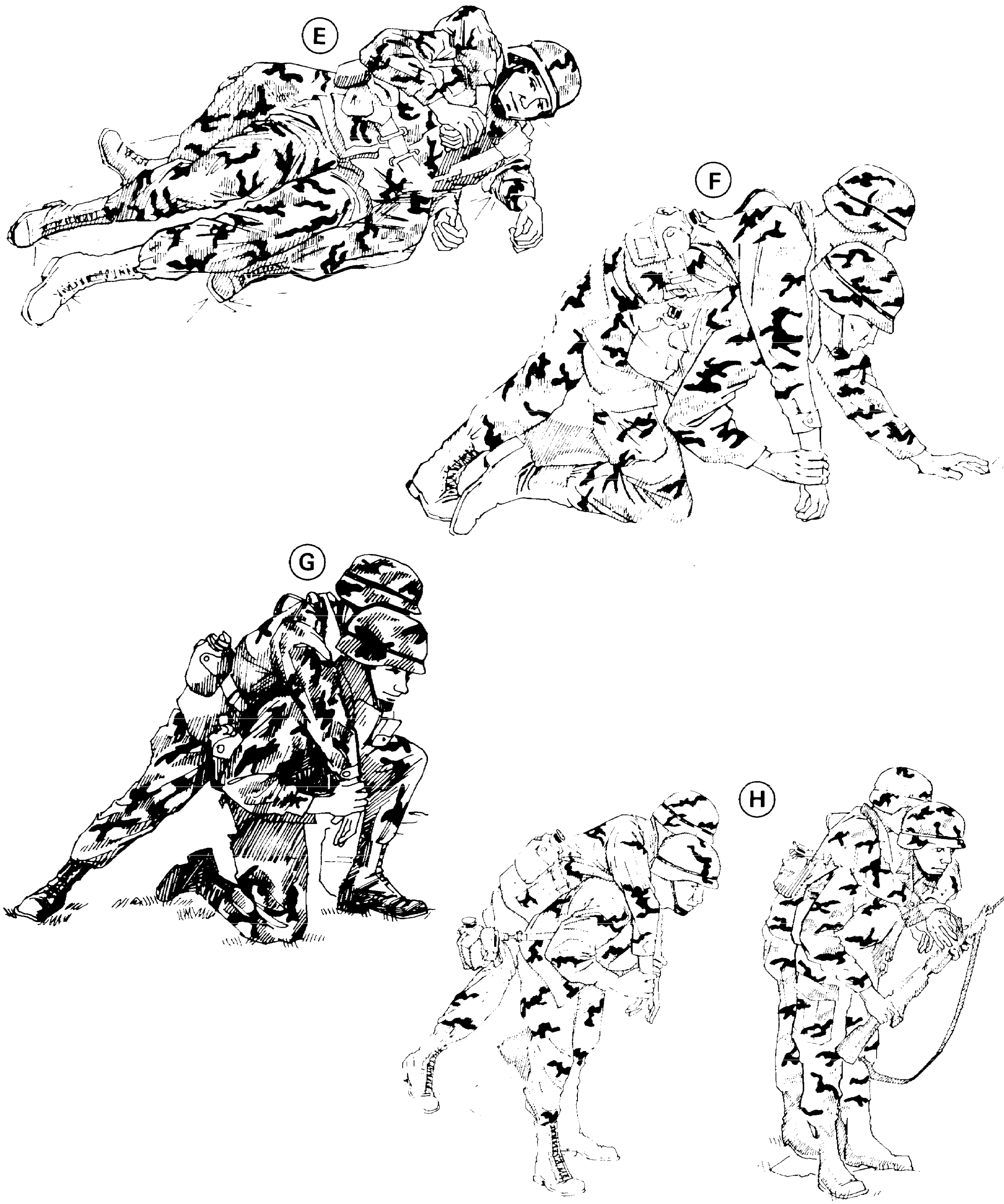


Figure 8-15. LBE carry using casualty's LBE (continued).

b. Two-Man Carries. These carries should be used whenever possible. They provide more casualty comfort, are less likely to aggravate injuries, and are less tiring for the bearers. Five different two-man carries can be used.

(1) The *two-man supporting carry* (Figure 8-16) can be used in transporting both conscious and unconscious casualties. If the casualty is taller than the bearers, it may be necessary for the bearers to lift the casualty's legs and let them rest on their forearms. The bearers—

(a) Help the casualty to his feet and support him with their arms around his waist.

(b) Grasp the casualty's wrists and draw his arms around their necks.

Figure 8-16. Two-man supporting carry.

(2) The *two-man arms carry (Figure* 8-17) is useful in carrying a casualty for a moderate distance (50 to 300 meters) and placing him on a litter. To lessen fatigue, the bearers should carry the casualty high and as close to their chests as possible. In extreme emergencies when there is not time to obtain a spine board, this carry is the safest one for transporting a casualty with a back injury. If possible, two additional bearers should be used to keep the casualty's head and legs in alignment with his body. The bearers—

(a) Kneel at one side of the casualty and extend his arms above his head; then they place their arms beneath the casualty's back, waist, hips, and knees.

(b) Lift the casualty while rising to their knees.

(c) Turn the casualty toward their chests, while rising to a standing position. Carry the casualty high to lessen fatigue.

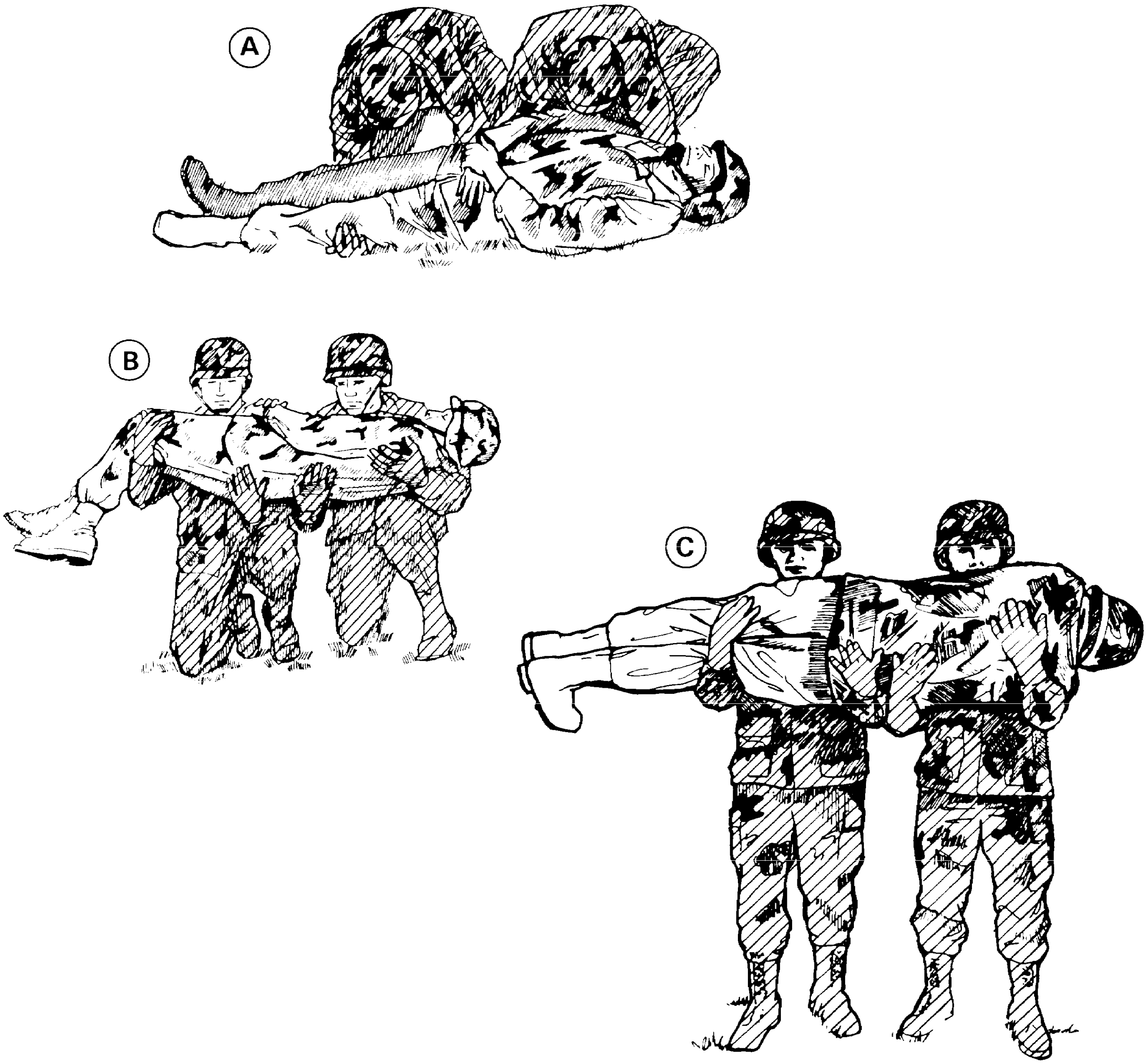


Figure 8-17. Two-man arms carry.

(3) The *two-man fore-and-aft carry* (Figure 8-18) is a useful two-man carry for transporting the casualty over a long distance (over 300 meters). The taller of the two bearers should position himself at the casualty's head. By altering this carry so that both bearers face the casualty, it is useful for placing a casualty on a litter.

(a) One bearer spreads the casualty 's legs and kneels between them with his back to the casualty. He positions his hands behind the casualty's knees. The other bearer kneels at the casualty's head, slides his hands under the arms, across the chest, and locks his hands together.

(b) The two bearers rise together, lifting the casualty.

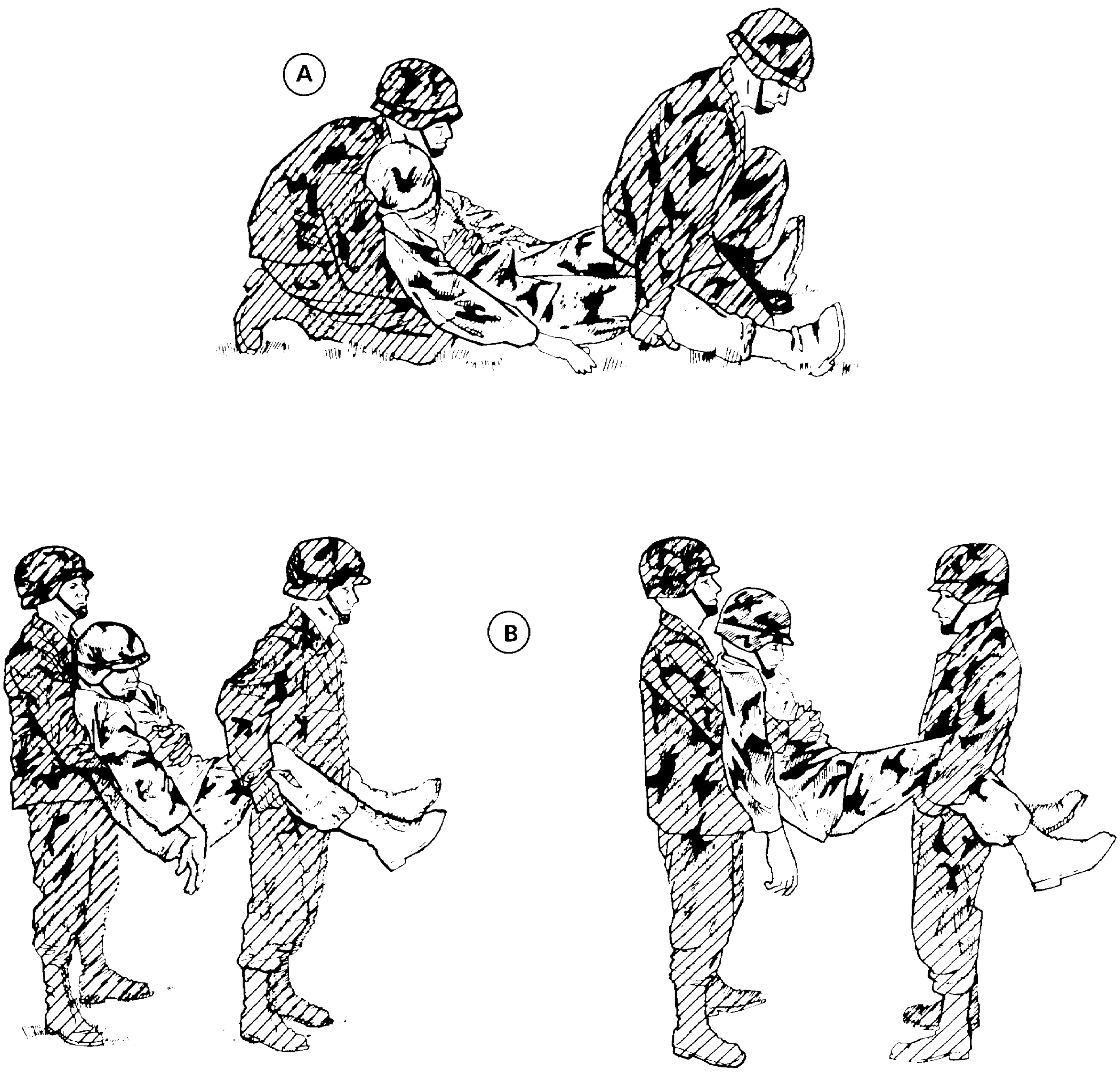


Figure 8-18. Two-man fore-and-aft carry.

(4) Only a conscious casualty can be transported with the *four-hand seat carry* (Figure 8-19) since he must help support himself by placing his arms around the bearers' shoulders. This carry is especially useful in transporting a casualty with a head or foot injury for a moderate distance (50 to 300 meters). It is also useful in placing a casualty on a litter.

(a) Each bearer grasps one of his wrists and one of the other bearer's wrists, thus forming a packsaddle.

(b) The two bearers lower themselves sufficiently for the casualty to sit on the packsaddle; then, they have the casualty place his arms around their shoulders for support. The bearers then rise to an upright position.

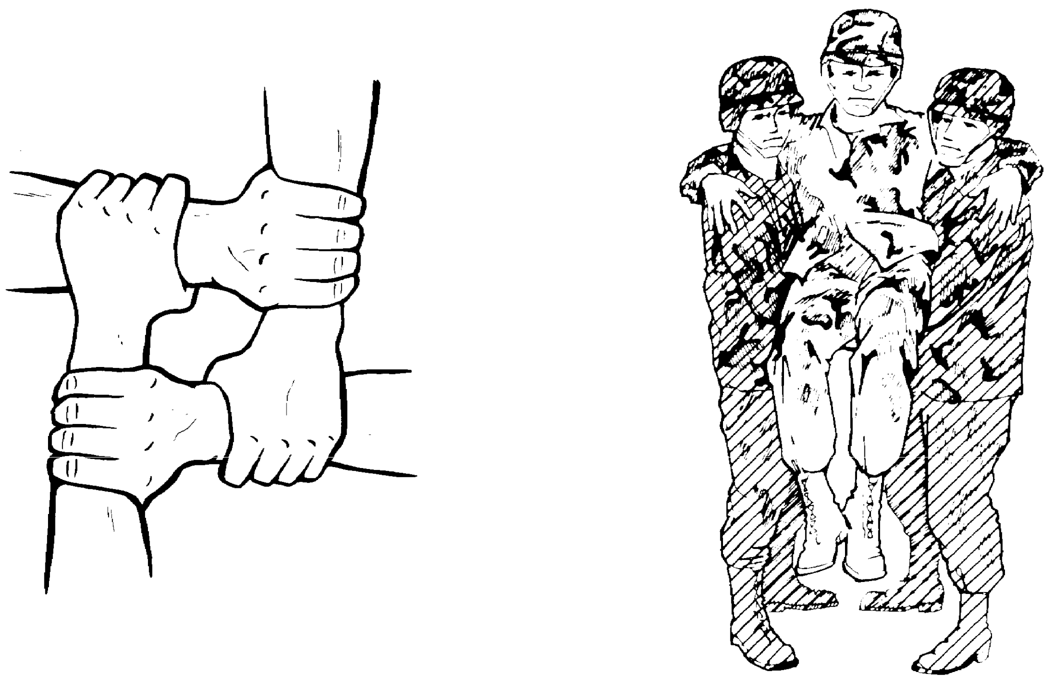


Figure 8-19. Four-hand seat carry.

(5) The *two-hand seat carry* (Figure 8-20) is used when carrying a casualty for a short distance (up to 50 meters) and in placing a casualty on a litter. With the casualty lying on his back, a bearer kneels on each side of the casualty at his hips. Each bearer passes his arms under the casualty’ thighs and back, and grasps the other bearer’s wrists. The bearers rise lifting the casualty.

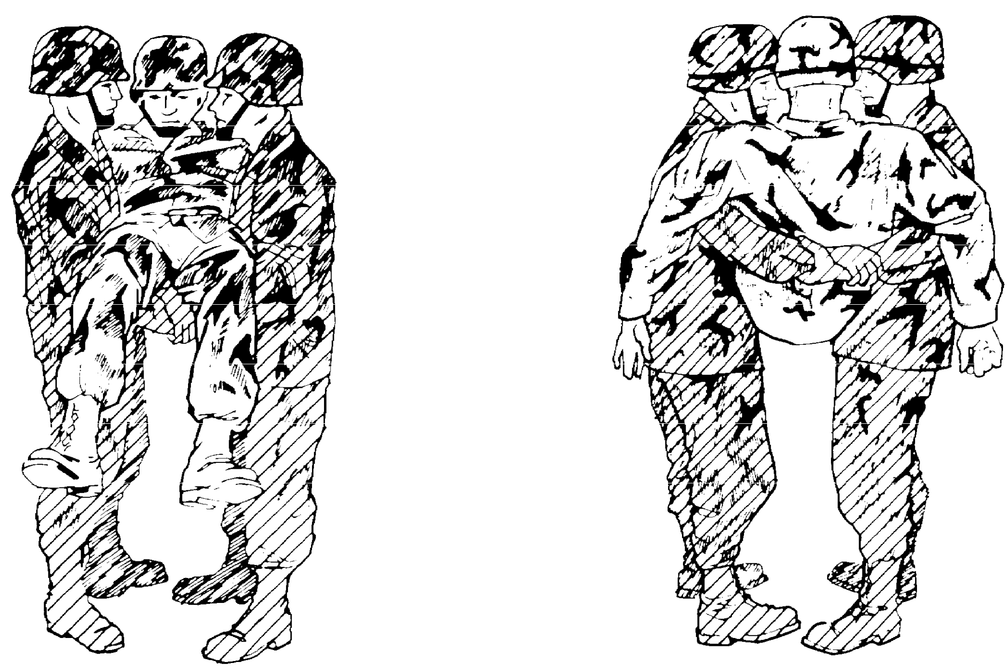


Figure 8-20. Two-hand seat carry.

8-8. Special Manual Evacuation Techniques

The use of special techniques is required to remove injured soldiers from tanks, other armored vehicles, motor vehicles, or from other limited-access positions. The procedures for extracting a casualty include—

- Observing the vehicle for fire.

WARNING

DO NOT approach a burning vehicle.

- Gaining access to the casualty.
- Administering lifesaving measures.
- Freeing the casualty from the vehicle or other limited-access positions.
- Preparing the casualty for removal.
- Transporting the casualty from the site.

NOTE

Removing a wounded soldier from the interior of a tank is difficult and requires speed (stationary tanks are lucrative targets; all disabled armored vehicles may explode). Two soldiers should be used to extract a casualty.

a. Removing an Injured Soldier from a Tank Turret (Figure 8-21).

(1) One soldier goes into the tank and supports the casualty from below. The second soldier stands on top of the turret and lifts the casualty through the hatch.

NOTE

If only one soldier is available, he uses a pistol belt or similar device to lift the injured soldier from the tank.

(2) The second soldier holds the casualty in place on the hatch rim, while stepping onto the fender or stowage chest of the tank. He supports the casualty until the first soldier can get out of the tank and jump to the ground. The second soldier then lowers the casualty into the arms of the first soldier.

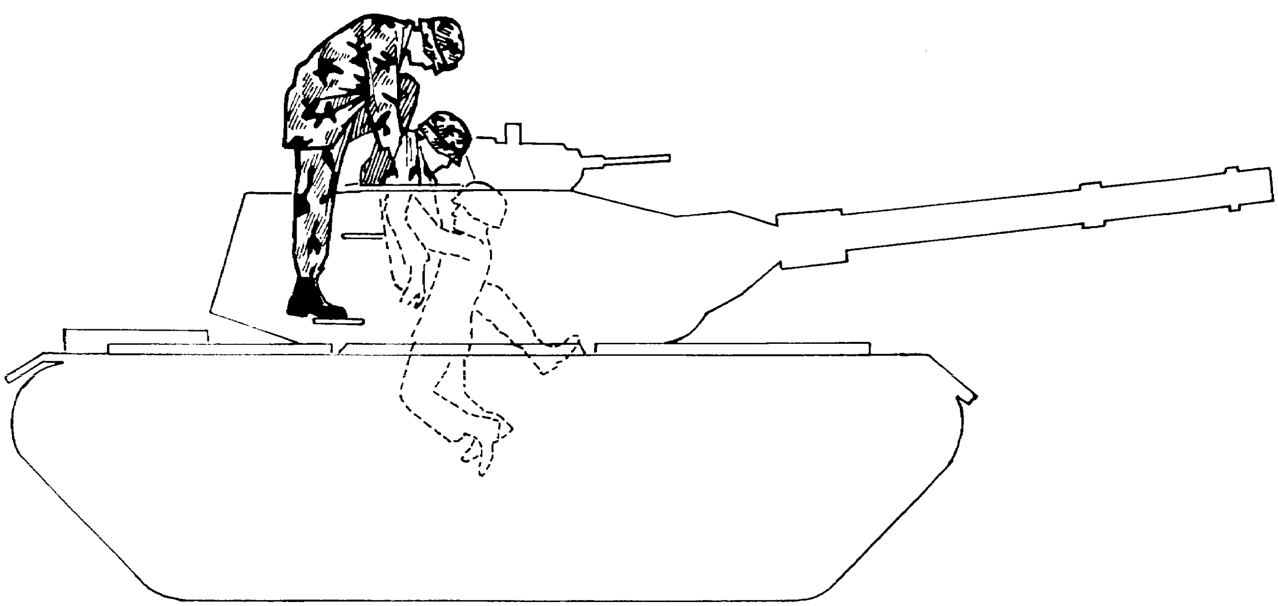


Figure 8-21. Removing an injured soldier from a tank turret.

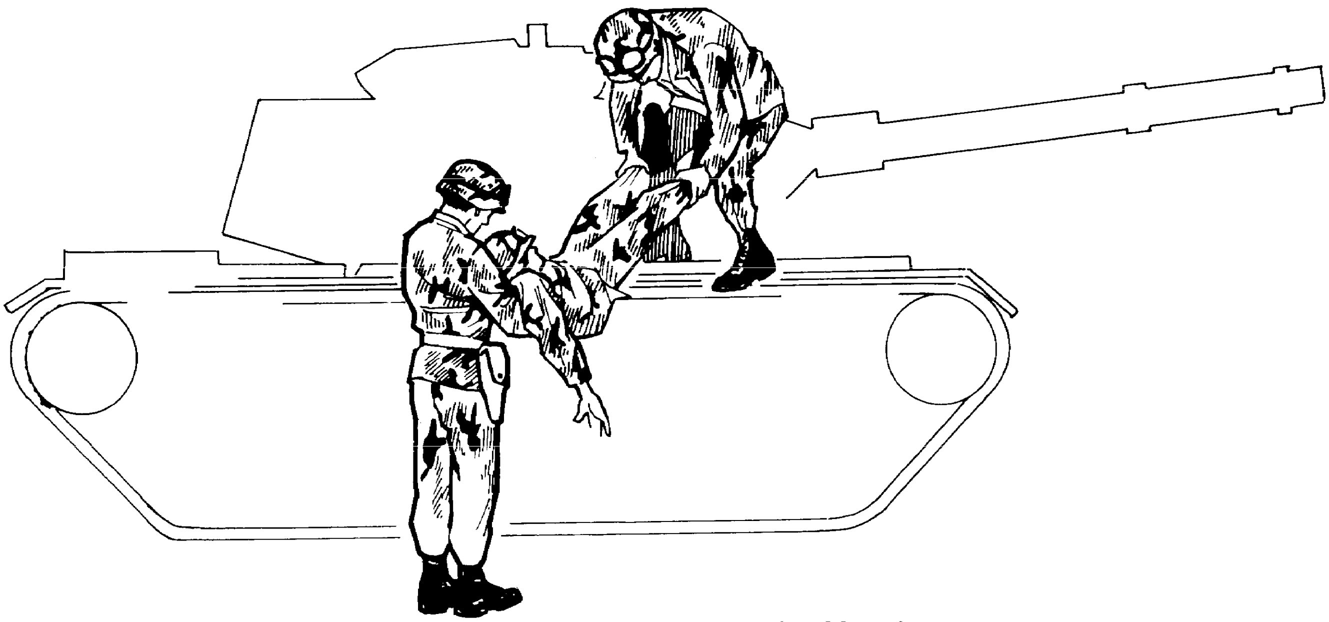


Figure 8-21. Removing an injured soldier from a tank turret (continued).

b. Removing an Injured Soldier from the Driving Compartment (Figure 8-22).

(1) The two soldiers open the hatch, reach down, fold the casualty's arms across his chest, and turn him until he faces the rear. With one soldier standing on each side of the hatch, they lift the casualty until he is sitting on the hatch rim.

(2) One soldier jumps to the ground, while the other lowers the casualty down the front slope plate.

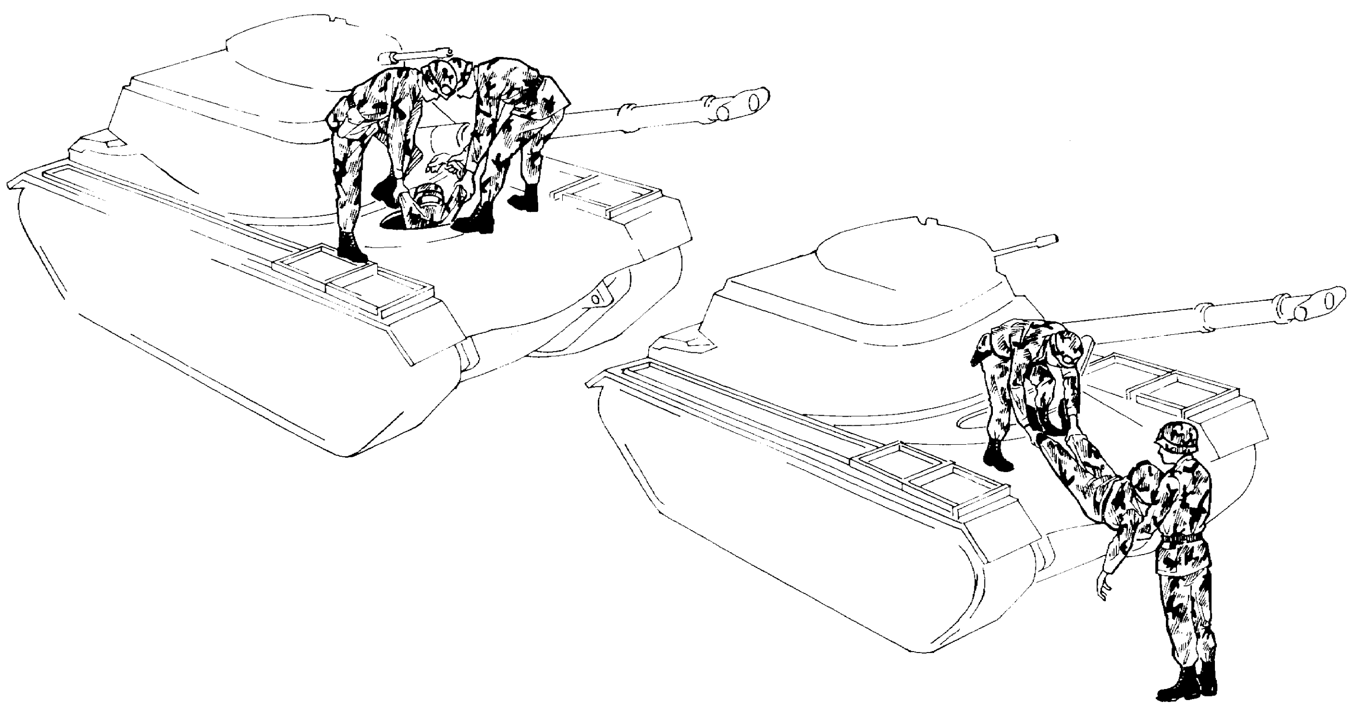


Figure 8-22. Removing an injured soldier from the driving compartment.

8-9. Evacuation from the Bradley Infantry Fighting Vehicle

a. Steps in Casualty Evacuation.

(1) Observe the vehicle for fire.

(2) Extract the casualty from the vehicle.

(3) Check and treat casualty.

(4) Evacuate casualty.

b. Vehicle Exit Procedures.

(1) The M2 BIFV is equipped with six exits (Figure 8-23). Some of these exits are used to evacuate specific crew members while others are used to evacuate any of the crew. The exits are—

- Commander's hatch.
- Gunner's hatch.
- Driver's hatch.
- Cargo hatch.
- Ramp door.
- Ramp.

(2) When possible, the commander's, gunner's, and driver's hatches are the evacuation exits for personnel from each of these three positions. If any or all of these exits are blocked, or if the tactical situation prevents their use, casualties from these three positions are evacuated through the troop compartment and out the ramp door or the ramp.

(3) The ramp is the main exit used to evacuate casualties from the troop compartment. The ramp door is used if the ramp is inoperative and cannot be opened. Because of the difficulty in evacuating casualties through the cargo hatch, it should be used only as a last resort.

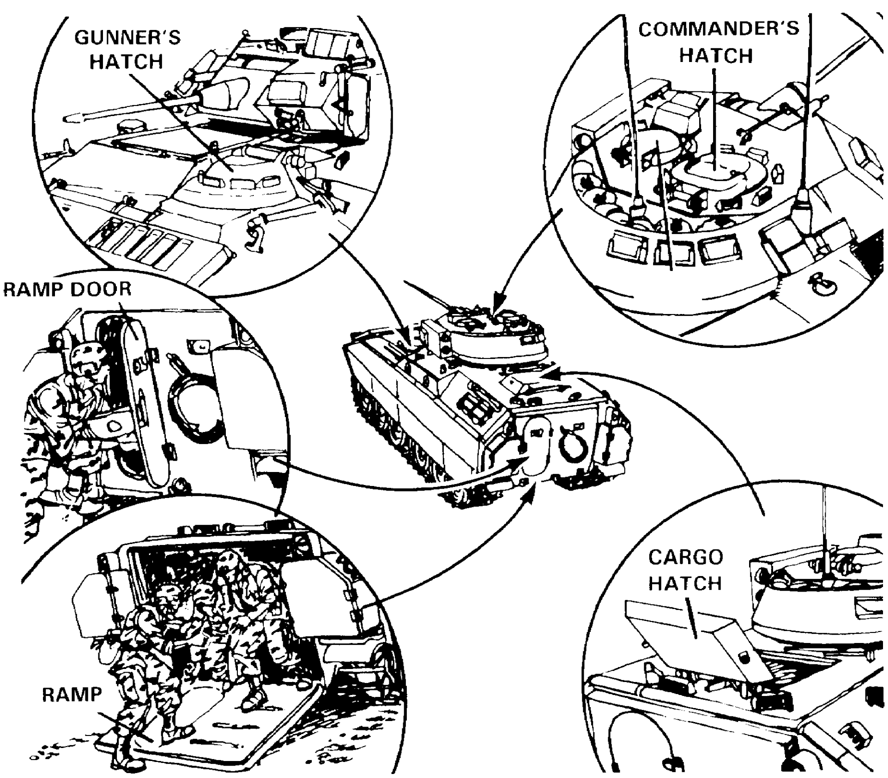


Figure 8-23. BIFV exit points.

c. Casualty Evacuation Procedures.

(1) *Driver.* When possible, the driver is evacuated through the driver's hatch. After the hatch is unlocked and opened from the outside, one member of the evacuation squad leans, head first, into the hatch to ensure that the engine is off, range selector is in gear, and hand brake is set. The squad member raises the driver's seat to the full upright position, unbuckles the driver's seat belt, and removes his helmet. Depending on the driver's injuries, he is lifted out of the vehicle by two individuals (helped by another from inside the vehicle when possible). A pistol belt placed around the driver's chest can be used to help pull him from the vehicle (Figure 8-24).

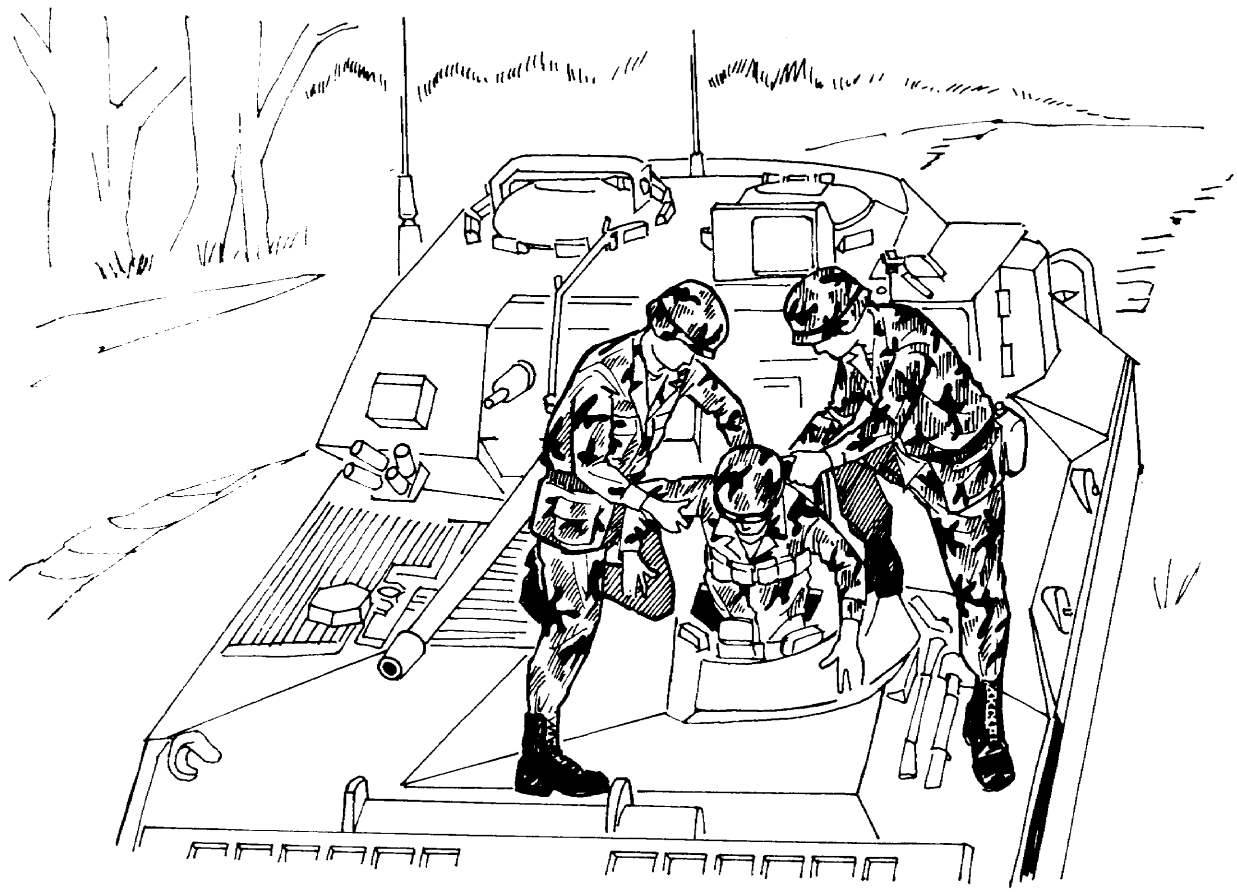


Figure 8-24. Evacuating BIFV driver.

(a) If the driver's hatch is inoperative or the vehicle is receiving enemy fire, it may be necessary to evacuate the driver through the troop compartment and out the ramp. The driver's seat back is lowered, his seat belt is unbuckled, and his helmet removed. The evacuation team then pulls him over the vehicle seats taking care not to further injure the driver.

(b) If the vehicle is on its side, the driver must be further supported during the evacuation process to prevent further injury. If the vehicle is on its left side, it requires two people to remove the driver because the hatch opening will be next to the ground. If the vehicle is on its right side, four people will be required to remove the driver and pass him down from the vehicle to the ground (Figure 8-25).

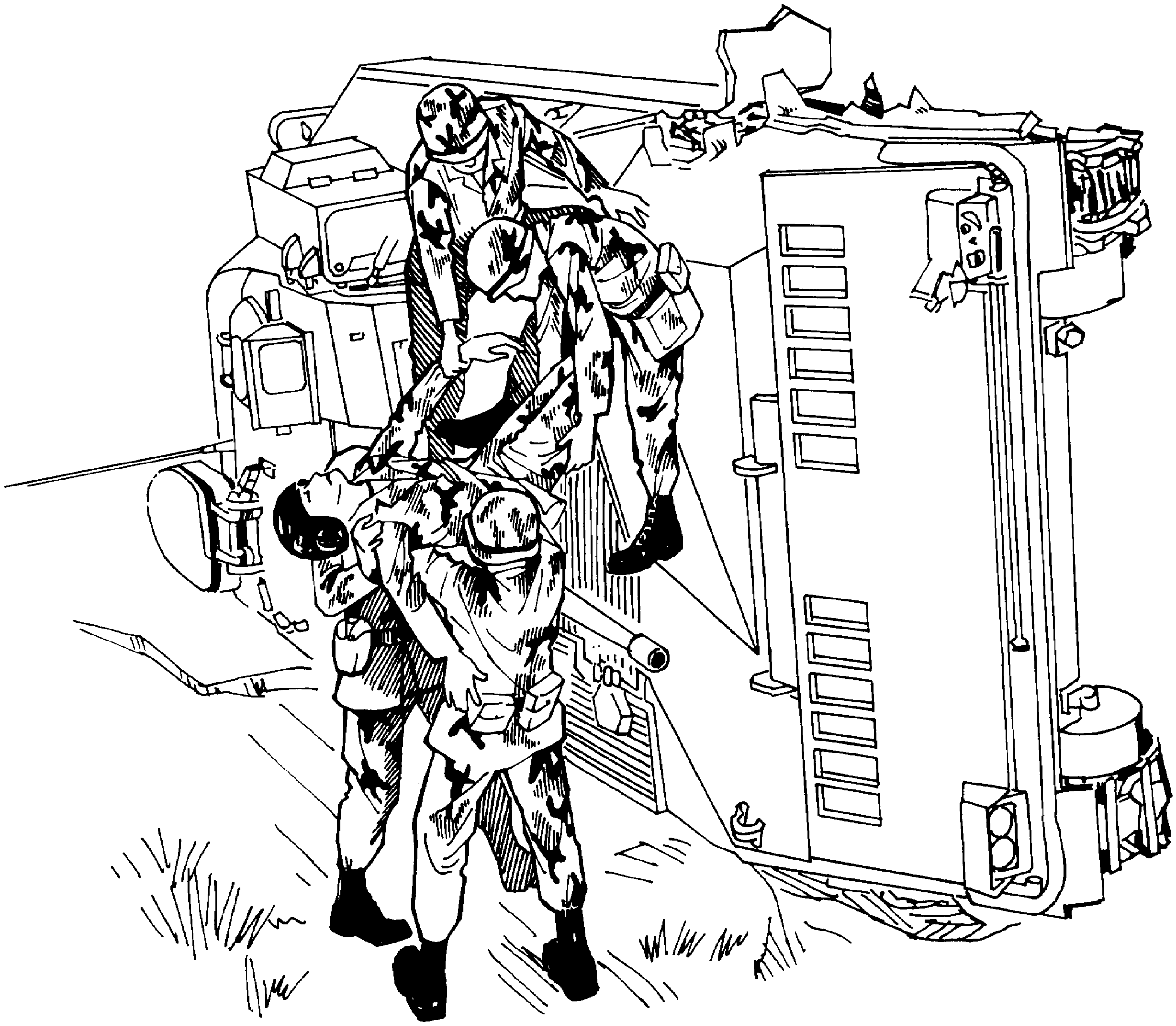


Figure 8-25. BIFV driver evacuation, vehicle on side.

(2) *Vehicle commander and gunner.* The methods of evacuating the vehicle commander and the gunner depend upon whether one or both are casualties and whether or not the turret is operational.

(a) If the turret is operational and only one soldier is injured, the uninjured soldier rotates the turret to the 6400 mil position. This action aligns the turret opening with the turret shield door. The turret power drive should then be turned off to prevent the turret from moving during the evacuation. The injured soldier is rotated to the center of the turret and pulled from his seat. He is guided through the turret shield opening, moved into the troop compartment, and out the ramp. If the turret cannot be rotated, the evacuation must be accomplished through the turret hatches.

(b) If the turret hatch cover does not function, the hatch will have to be opened from the top of the vehicle. A crowbar and mattock head are used to pry open the gunner's hatch, with the mattock head as a pivot for the crowbar. The hatch can be opened by prying between the gunner's right periscope and the vehicle commander's left periscope (Figure 8-26).

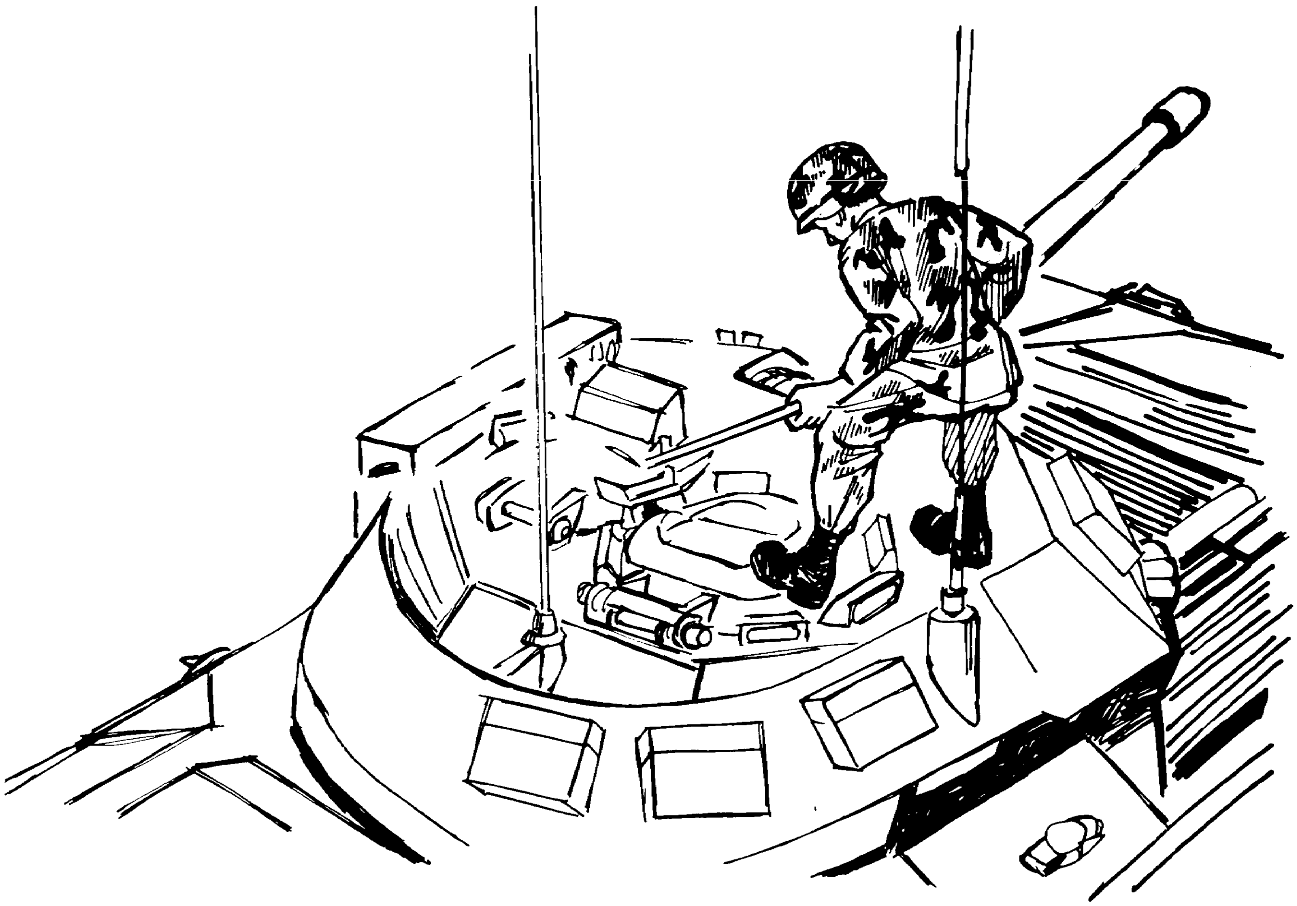


Figure 8-26. Opening gunner's hatch from outside vehicle.

(3) *Soldiers in the troop compartment.* Injured soldiers in the troop compartment will be evacuated through the ramp, ramp door, or cargo hatch. The casualties' seat belts must be unbuckled and their helmets disconnected or headsets removed. They will then be evacuated through the most con-venient exit.

NOTE

During peacetime training and whenever possible, the Kendricks Extrication Device (KED) can be used to remove a casualty from a tank to more effectively stabilize the spine.

CHAPTER 9

LITTER EVACUATION

Section I. TYPES OF LITTERS

9-1. General

After patients are picked up in a forward area by litter bearers, they may be moved by surface or air assets to points as far to the rear as required by their medical condition. The patient who must be transported on a litter is referred to as a litter patient.

This paragraph implements STANAG 2040 and QSTAG 519.

9-2. Types of Litters

A litter may be prefabricated or may be improvised from available materials. The Armed Forces use several types of standard litters. This standardization allows a patient to travel in various vehicles on the same litter; thereby, minimizing the possibility of further injury and saving valuable time.

a. Standard Litters. Standard litters are prefabricated and may have accessories to be used with them.

(1) The standard collapsible litter is the most widely used (Figure 9-1). It folds along the long axis only.

(a) The basic components of the litter and their functions are provided below:

- Two straight, rigid, lightweight aluminum poles.
- A cover (bed) of cotton duck.
- Four wooden handles attached to the poles.
- Four stirrups (one bolted near the end of each pole). The stirrups support the litter when it is placed on the ground.
- Two spreader bars (one near each end of the litter). These bars are extended crosswise at the stirrups to hold the cover taut when the litter is open.
- Two litter securing straps (one attached to each pole at the stirrup bolts). These straps are used to secure the litter when it is closed.
- Accessories such as patient securing straps.

(b) Dimensions of the standard collapsible litters are as follows:

- Overall length is 90 inches.
- Overall width is 22 7/8 inches.
- Bed length is 72 inches.
- Bed width is 22 7/8 inches.
- Weight is 15 pounds.

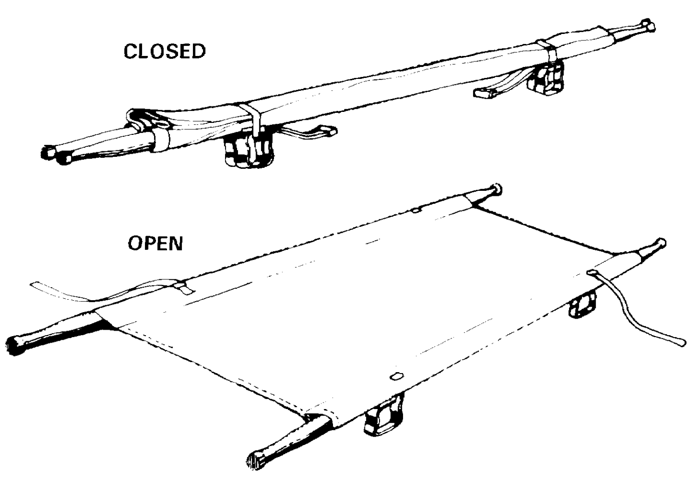


Figure 9-1. Standard collapsible litter.

(2) The patient securing strap (Figure 9-2) is used to hold the patient in position on the litter. It is designed to fit the straight and folding aluminum litters as well as other standard litters. It is available in quantities of four per litter. This strap can also be used with an improvised litter and as a patient restraint, if required. It is made from a 6-foot length of 2-inch webbing and a buckle with a locking device and spring.

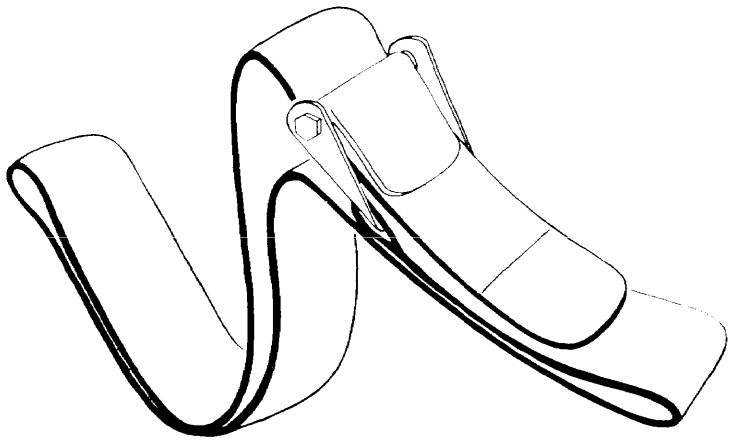


Figure 9-2. Patient securing strap.

(3) Another standard litter, with the same general dimensions when open, is the folding aluminum litter. It has folding lightweight aluminum poles (Figure 9-3). The poles can be folded to one-half their length when the litter is not in use.

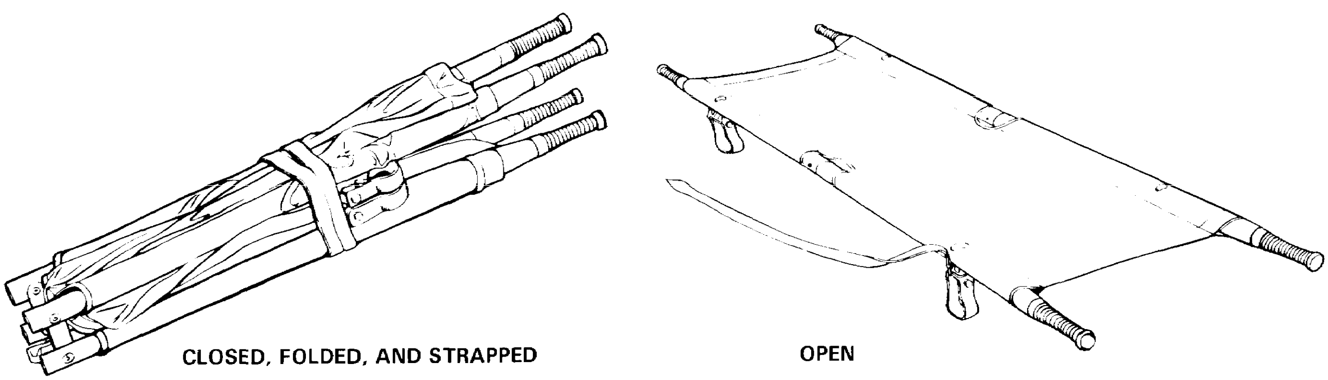


Figure 9-3. Folding aluminum litter.

(4) The poleless semirigid litter (Figure 9-4) is useful in evacuating patients from ships and in mountainous areas. It holds the patient securely in position and facilitates the movement of the patient in a vertical position. The dimensions of this litter are overall length, 83¾ inches; overall width, 22¾ inches; and its weight is 18¾ pounds. The basic components and their functions are—

- Semirigid cotton duck with wooden supports.

- Four webbing handles (two at each end). These straps can be used when the litter is carried by four bearers.

- Four loops. These loops are used to insert the poles for carrying.

- Headpiece. This is used to support the patient's head.

- Seven patient securing straps. These straps are used to secure the patient to the litter.

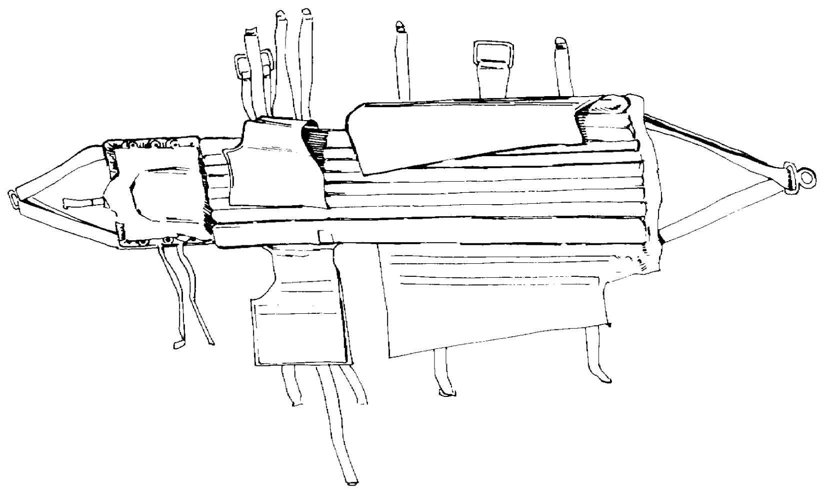


Figure 9-4. Poleless semirigid litter.

(5) The poleless nonrigid litter (Figure 9-5) can be folded and carried by the combat medic. It has folds into which improvised poles can be inserted for evacuation over long distances. It also has slings for hoisting, lowering, and carrying, and patient securing straps to secure the patient to the litter.

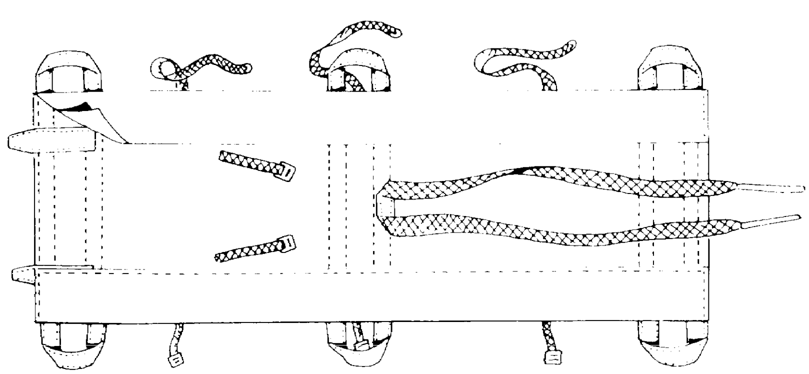


Figure 9-5. Poleless nonrigid litter.

(6) The Stokes litter (Figure 9-6) affords maximum security for the patient when the litter is tilted. (For additional information, refer to paragraph 11-32.) The basic components of the litter and their functions, and its dimensions are provided below.

- It is composed of a steel or aluminum tubular frame supporting a bed of wire mesh netting. It also has wooden support slats to support the patient's back.
- The lower half is divided into two compartments to accommodate the patient's legs.
- It has four webbing patient securing straps for use in securing the patients.
- It has ropes, cables, or steel rings which can be attached to the litter as required for vertical recoveries.
- Its dimensions are length, 84 inches; width, 23 inches; and weight, 31½ pounds.

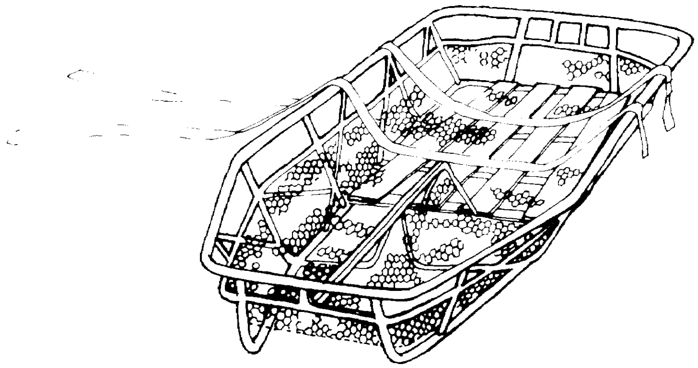


Figure 9-6. Stokes litter.

(7) The SKED litter (Figure 9-7) is a compact and lightweight transport system used to evacuate a patient over land. It may also be used to rescue a patient in the water. Detailed information on this system is contained in paragraphs 11-27 through 11-30.

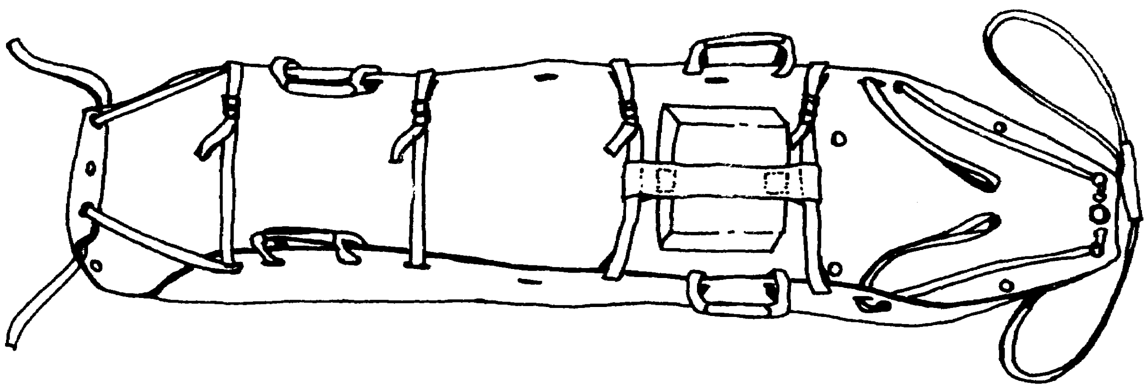


Figure 9-7. SKED litter.

b. Improvised Litters. Improvised litters are those made from various materials normally available in the forward area.

(1) There are times when a patient may have to be moved and a standard litter is not available. The distance may be too great for manual carries, or the patient may have an injury (such as a fractured neck, back, hip, or thigh) that would be aggravated by manual transportation. In these situations, litters can be improvised from materials at hand. Improvised litters must be as well constructed as possible to avoid the risk of dropping or further injuring the patient. Improvised litters are emergency measures and must be replaced by standard litters at the first opportunity.

(2) Many different types of litters can be improvised, depending upon the materials available. A satisfactory litter can be made by securing poles inside such items as a blanket (Figure 9-8), poncho, shelter half, tarpaulin, mattress cover, jacket, shirts (Figure 9-9), or bed ticks, bags, and sacks (Figure 9-10). Poles can be improvised from strong branches, tent poles, skis, lengths of pipe, and other objects. If objects for improvising poles are not available, a blanket, poncho, or similar item can be rolled from both sides toward the center so the rolls can be gripped for carrying a patient (Figure 9-11). Most flat-surface objects of suitable size can be used as litters. Such objects include doors, boards, window shutters, benches, ladders, cots, and chairs. If possible, these objects should be padded for patient comfort.

(a) To improvise a litter using a blanket and poles, the following steps should be used:

- Open the blanket and lay one pole lengthwise across the center; then fold the blanket over the pole.
- Place the second pole across the center of the folded blanket.
- Fold the free edges of the blanket over the second pole and across to the first pole.

Figure 9-8. Litter made with blanket and poles.

(b) To improvise a litter using shirts or jackets, button the shirt or jacket and turn it inside out, leaving sleeves inside, then pass pole through the sleeves.

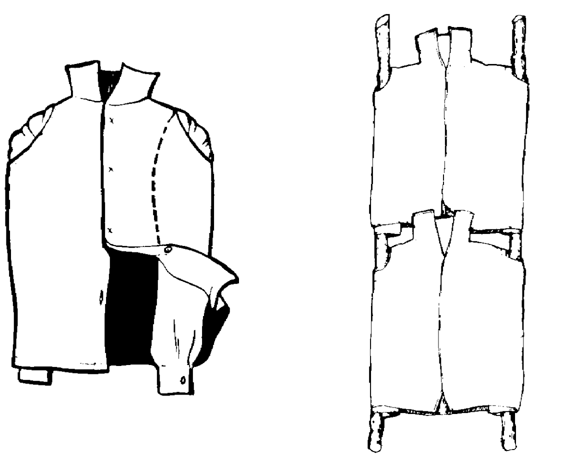


Figure 9-9. Litter improvised from jackets and poles.

(c) To improvise a litter from bed sacks and poles, rip open the corners of bed ticks, bags, or sacks; then pass the poles through them.

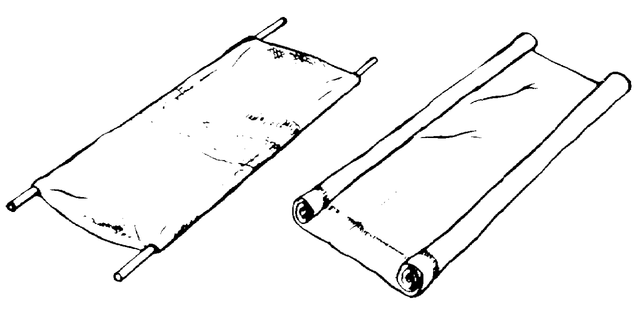


Figure 9-10. Litter improvised from bed sacks and poles.

(d) If no poles are available, roll a blanket, shelter half, tarpaulin, or similar item from both sides toward the center. Grip the rolls to carry the patient.

Figure 9-11. Rolled blanket used as litter.

9-3. Dressed Litter

A litter is dressed with one, two, or three blankets (Figures 9-12 through 9-14) to reduce the danger of shock and to afford warmth and comfort during transport. In an NBC environment, the litter should be dressed with an impermeable cover (rubber poncho or similar material). This cover is folded over the patient to prevent additional exposure to contaminants. If an impermeable cover is not available, a blanket can be used.

a. To dress a litter with one blanket (Figure 9-12), place the blanket diagonally over the litter. After the patient is placed on the litter, bring the sides of the blanket over the patient and tuck in the edges at his head and feet.

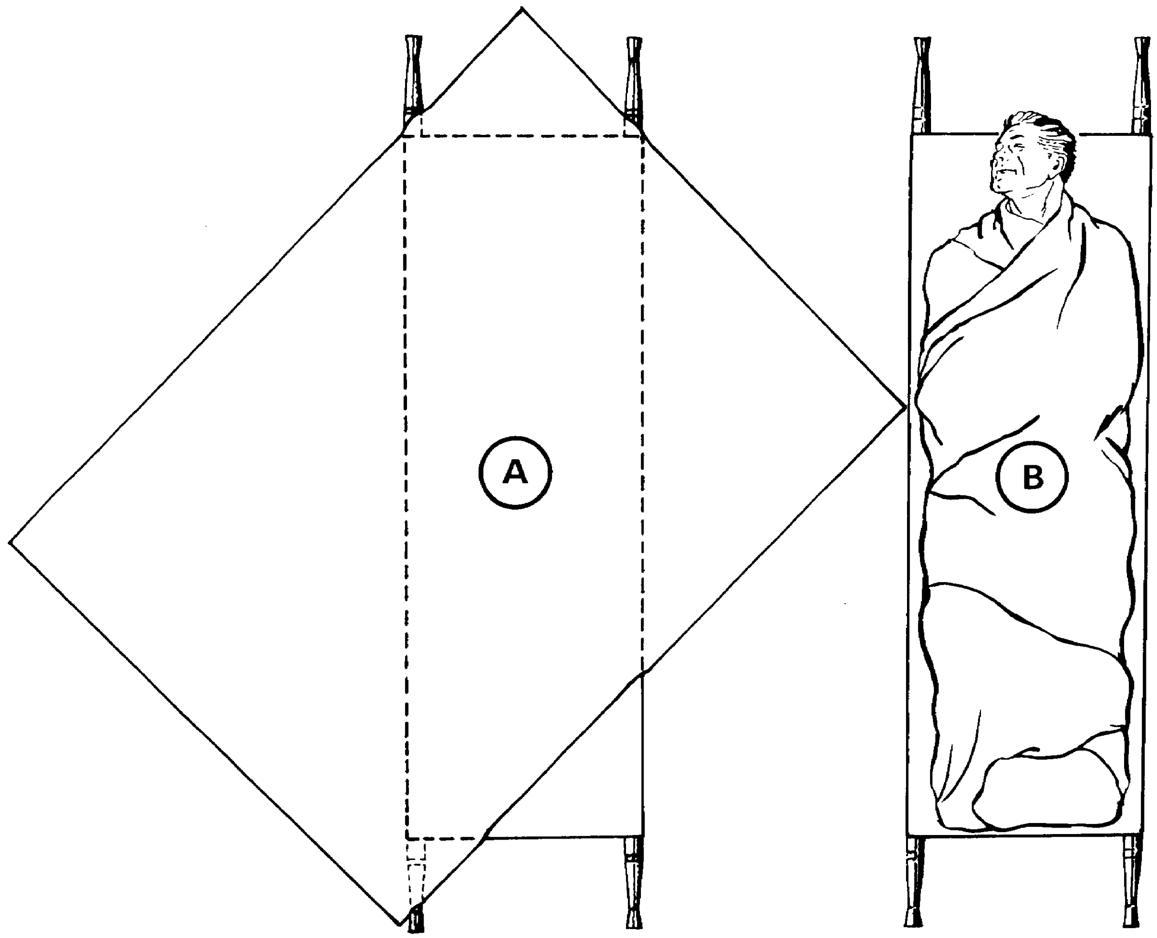


Figure 9-12. Dressing the litter with one blanket.

b. To dress a litter with two blankets (Figure 9-13), place the first blanket lengthwise across the litter with the blanket edge just beyond the head end of the litter. The second blanket is folded in thirds, lengthwise, and placed over the first blanket. Let the upper edge of the second blanket drop about 10 inches below the upper edge of the first one. Open the folds on the second blanket about 2 feet from the foot end. After the patient is placed on the litter, bring the bottom of the blanket up and over the patient's feet. Leave a small fold between his feet. Tuck the two folds closely over and around his feet and ankles. Finally, wrap the patient with one side and then the opposite side of the first blanket.

NOTE

If the patient to be placed on the litter is tall, the blanket should be placed lower on the litter.

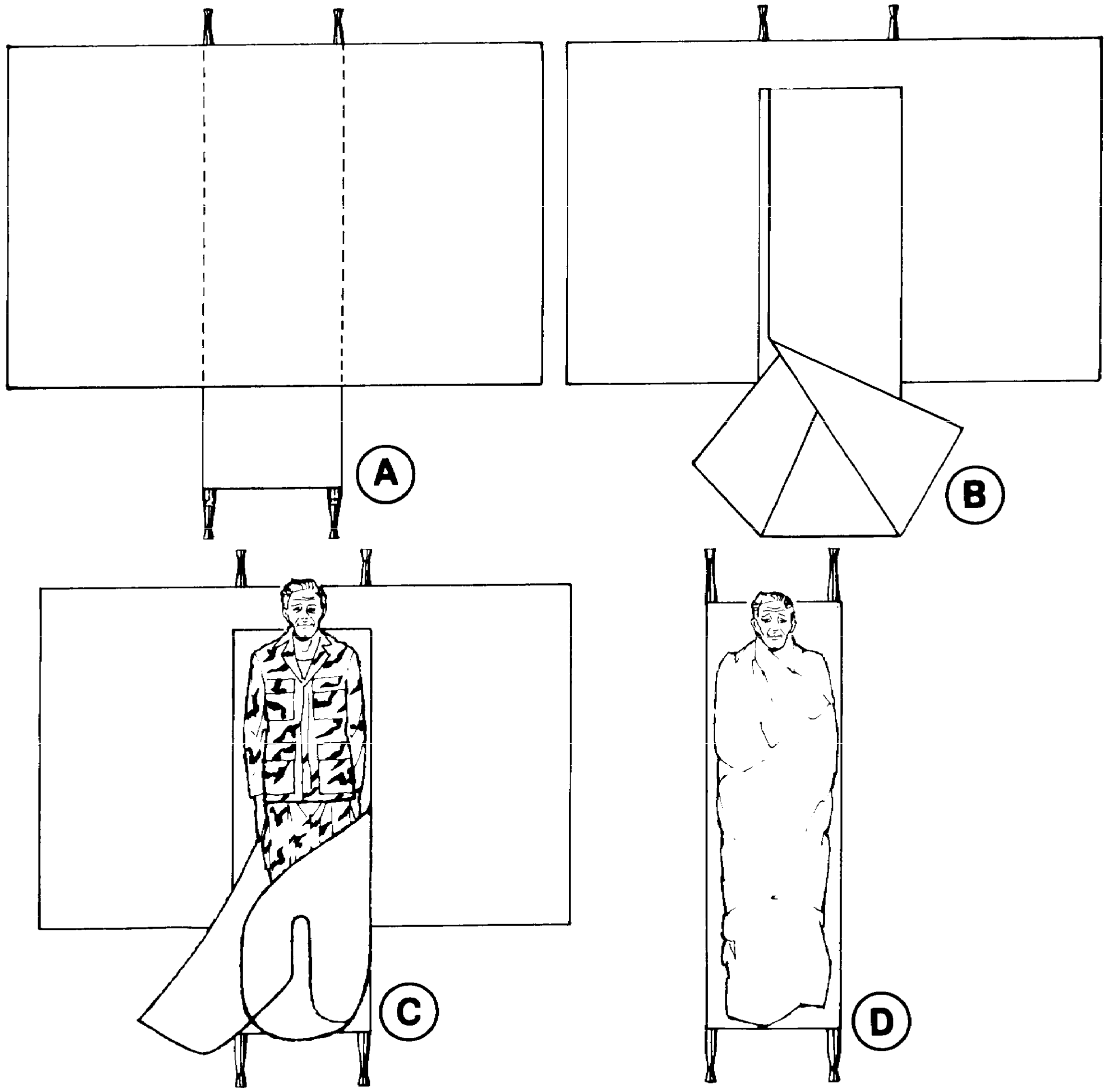


Figure 9-13. Dressing the litter with two blankets.

c. To dress a litter with three blankets (Figure 9-14), place the first blanket on the litter lengthwise so that one edge is even with the litter pole farthest from you. The upper end of the blanket is even with the head of the canvas. Fold the blanket back upon itself once, so that the folded edge is along the litter pole nearer you and the outer edge of the blanket overhangs the other pole. Place the second blanket lengthwise over the first one as described above, except start with the opposite litter pole so that the blanket overhang is on the opposite side of the first blanket. After the patient is placed on the litter, fold the third blanket once lengthwise and place it over the patient with one end under his chin. Fold the overhanging edges of the first two blankets over the third blanket and secure them in place with safety pins or patient securing straps.

NOTE

This method of dressing the litter gives four thicknesses of blanket over and under the patient. This provides additional warmth and will help in preventing shock.

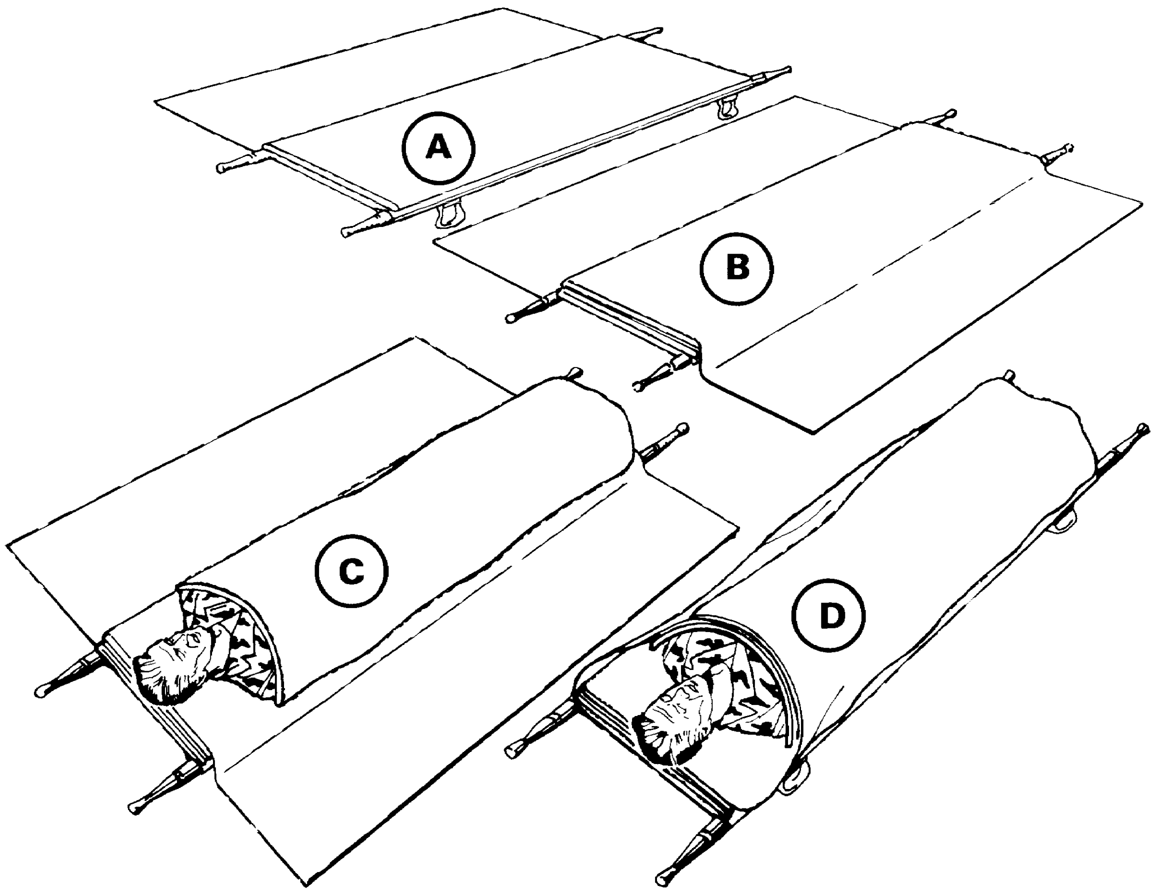


Figure 9-14. Dressing the litter with three blankets.

9-4. Using Patient Securing Straps

After the patient is placed on the dressed litter and covered, the patient securing straps are used to hold him in position. The number of straps and the body parts over which they should be placed depend upon the type of terrain over which the patient is to be carried (Figure 9-15).

- If only two straps are necessary, put one strap across the chest and one across the legs, just below the knees. Extend the straps under the litter and buckle them against the litter pole.

- If the terrain is rough, apply two additional straps. One is placed across the waist and the other acress the thighs. Again, extend them under the litter and buckle them against the litter pole.

- If the patient is being carried either up or down steep slopes, use the two additional straps to secure each thigh to the litter separately. Take one strap over one thigh, under the other thigh, then under the litter, and buckle it against the litter pole. Take the remaining strap and secure the opposite thigh in the same manner.

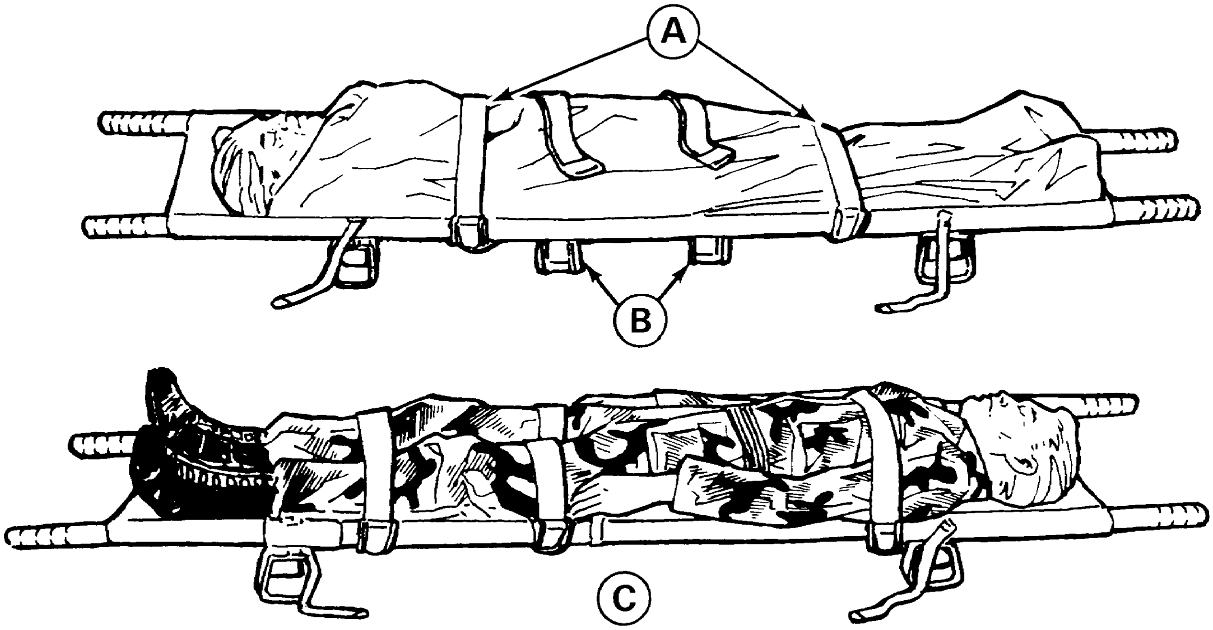


Figure 9-15. Using patient securing straps.

9-5. General Rules for Litter Bearers

In addition to the bearer rules addressed in paragraph 8-4, the following rules also apply:

a. In moving a patient, the litter bearers must make every movement deliberately and as gently as possible. The command STEADY should be used to prevent undue haste.

b. The rear bearers should watch the movements of the front bearers and time their movements accordingly to ensure a smooth and steady action.

c. The litter must be kept as level as possible at all times, particularly when crossing obstacles, such as ditches.

d. Normally, the patient should be carried on the litter feet first, except when going uphill or upstairs; his head should then be forward. If the patient has a fracture of a lower extremity, he should be carried uphill or upstairs feet first and downhill or downstairs head first to prevent the weight of the body from pressing upon the injured part.

e. When the patient is loaded on a litter, his individual equipment is carried by two of the bearers or placed on the litter.

9-6. Use of Spine Boards and the Kendricks Extrication Device

Spine boards and the KED aid in rescuing and immobilizing patients with known or suspected spinal fractures. Spine boards can be prefabricated from plywood or any suitable material {Figure 9-16).

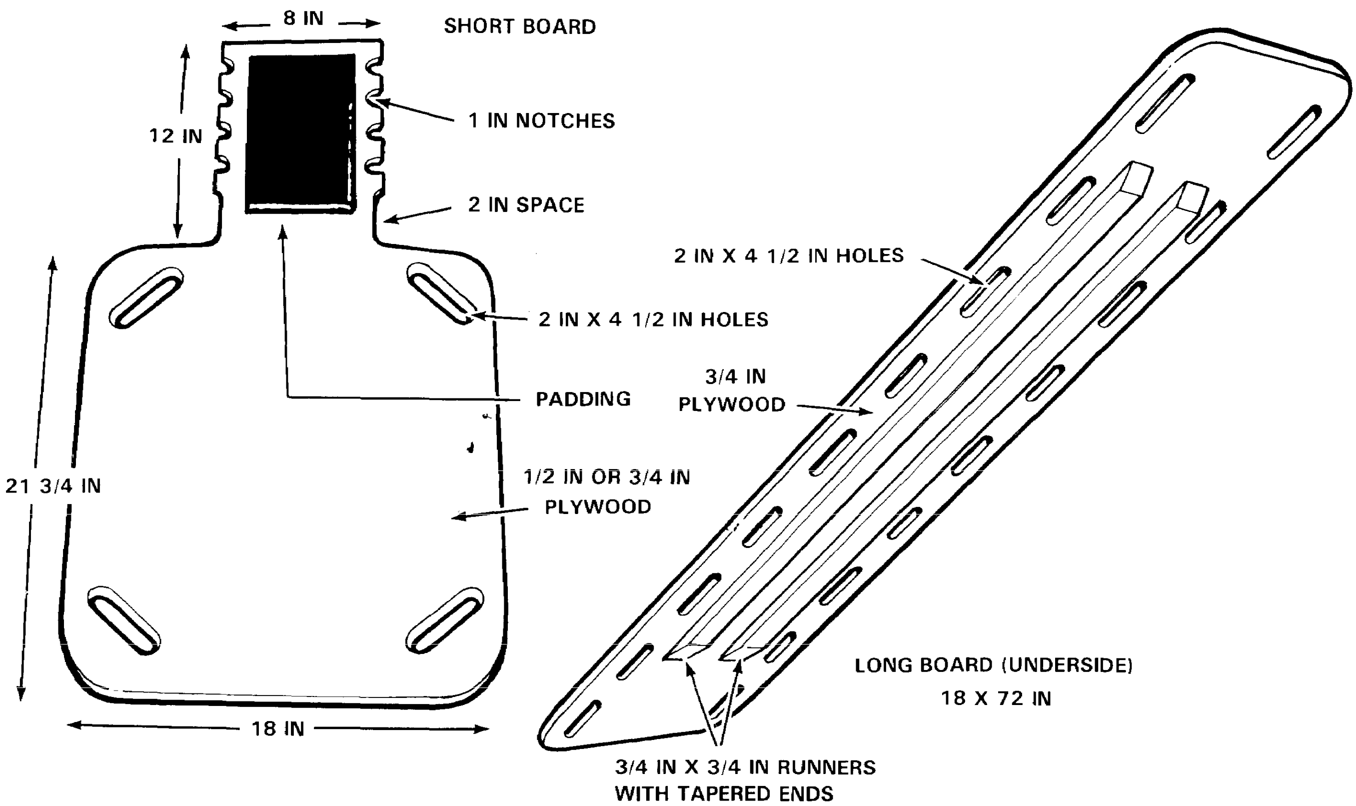


Figure 9-16. Prefabricated spine boards (short and long).

a. Short Spine Board. When a patient has a fracture or suspected fracture of the neck, the short spine board is applied from the waist up to immobilize the upper spine before moving him (Figure 9-17). The patient is then lifted onto a long spine board (c below). To apply the short spine board, the bearers assemble the required items: a short spine board, a cervical collar, two 6-foot patient securing straps, and a cravat. If an item is not available, the bearers should improvise it from any available material.

(1) Bearer number 1 places his hands on each side of the patient's head and jaws. He then applies slight upward traction to the neck while bearer number 2 inserts a cervical collar around the patient's neck.

(2) Bearer number 1 maintains a slight upward traction while bearer number 2 inserts the short spine board behind the patient's back, He then applies the cravat and the two patient securing straps (Figure 9-17) in the following order:

(a) Cravat. The center of the cravat is placed across the patient's forehead with the middle of the cravat covering the hairline. The ends are inserted into the bottom notches of the board and are tied in the back.

(b) First strap. The buckle of the first patient securing strap is placed in the patient's lap and the other end is passed through the lower hole in the board. It is brought up the back of the board, through the top hole, under the armpit, over the shoulder, and across the back of the board at the neck. The end is then attached to the second strap.

(c) Second strap. The second patient securing strap is buckled to the first one, letting the buckle rest on the side of the board at the neck. The other end of the second strap is passed over the shoulder, under the armpit, through the top hole in the board, down the back of the board, and through the lower hole. It is then taken across the patient's lap, where it is secured in place by buckling it to the first strap.

Figure 9-17. Application of short spine board.

NOTE

If available, bearer number 2 will apply a rigid cervical collar.

b. Kendricks Extrication Device. The KED (Figure 9-18) is a prefabricated flexible type of short spine board. It is useful in extricating a patient suspected of having spinal injuries, especially if the patient is in the sitting position.

(1) Bearer number 1 maintains cervical traction until the KED has been completely applied.

(2) Bearer number 2 applies a rigid cervical collar, places the KED behind the patient, puts a cushion behind the patient's head to align the KED, fastens the trunk straps, then the leg/hip straps, and then the forehead strap and chin strap.

(3) Bearer number 3 ties the hands of the patient together and places the patient on the long board.

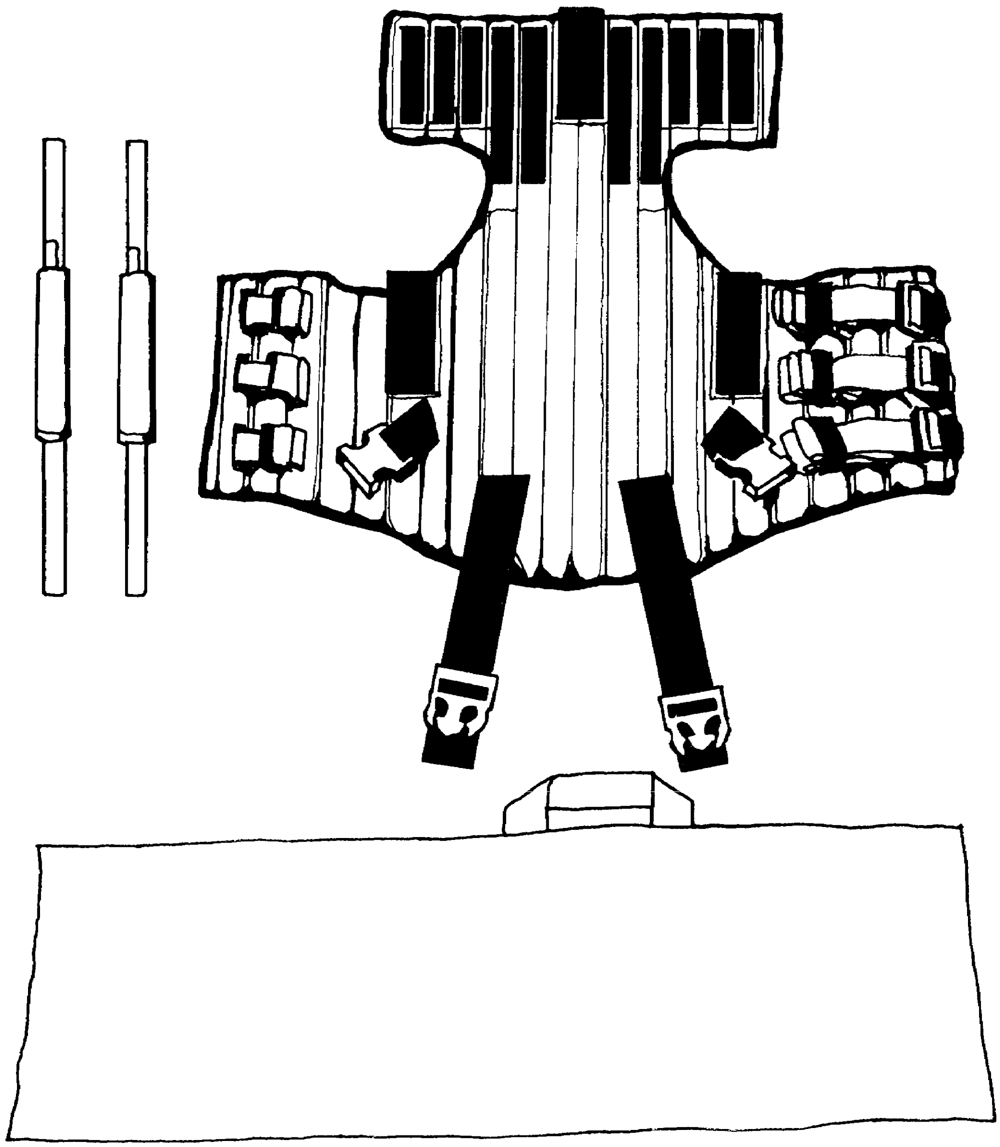


Figure 9-18 Kendricks Extrication Device.

c. Long Spine Board. When a patient has a fracture or suspected fracture of the back as well as the neck (*a* above), he is placed on a long spine board (Figures 9-19 and 9-21). To apply the long spine board, the bearers assemble the required items: a long spine board, four 6-foot patient securing straps, a cravat, and four pieces of padding. If an item is not available, the bearers should improvise it from any available material.

(1) The bearers place the spine board beside the patient. They align it with his body. They then place padding on the board at the points where the patient's neck, small of the back, knees, and ankles will rest.

(2) Bearer number 1 kneels at the patient's head. He places his hands on each side of the patient's head and jaws, immobilizing the head and neck and applying slight traction (Figure 9-19). Bearers numbers 2, 3, and 4 kneel on one side of the patient and place their hands on the opposite side at the patient's shoulder and waist, hip and thigh, knee and ankle (Figure 9-20).

Figure 9-19. Positioning of hands.

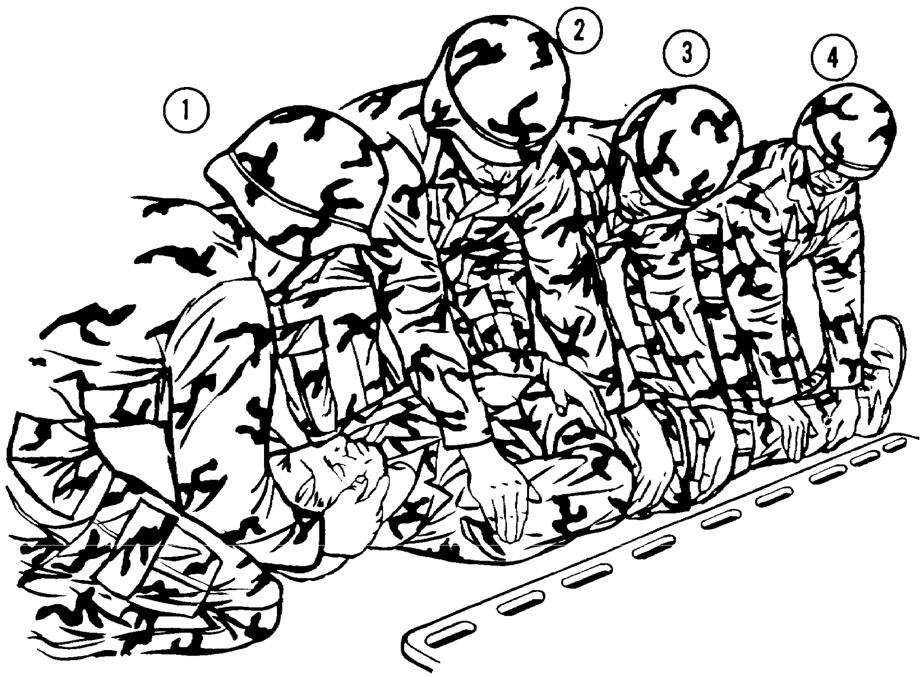


Figure 9-20. Positioning of litter bearers.

(3) Bearers numbers 2, 3, and 4 roll the patient's body slightly toward them as bearer number 1 turns the patient's head, keeping it in a straight line with the spine.

(4) Bearer number 3 reaches across the patient's body with one hand, grasps the board at the nearer edge and slides it against the patient. Bearer number 3, with the same hand, reaches across the board to the farther edge and holds the board in place. All the bearers then slowly roll the patient backward onto the board, keeping the head and spine in a straight line.

(5) While bearer number 1 continues to apply slight traction to the neck, bearers numbers 2, 3, and 4 immobilize the patient by applying the cravat and four patient securing straps (Figure 9-21) in the following order:

(a) Cravat. The center of the cravat is placed over the patient's forehead with the

middle of the cravat covering the hairline. The ends are then extended straight across and inserted through the nearest holes on each side of the board.

(b) First strap. One end of the first patient securing strap is inserted through the board hole near the chest, across the chest, and through the hole on the opposite side. It is then brought back across the arms and buckled to the other end of the strap. The buckle rests on the top of the board, not against the patient.

(c) Remaining straps. The three remaining straps are applied: one across the hips, one above the knees (not over the knee caps), and one above the ankles. One end of each strap is inserted through the board hole near the body part and buckled to the other end of the strap. The buckle rests on the top of the board, not against the patient.

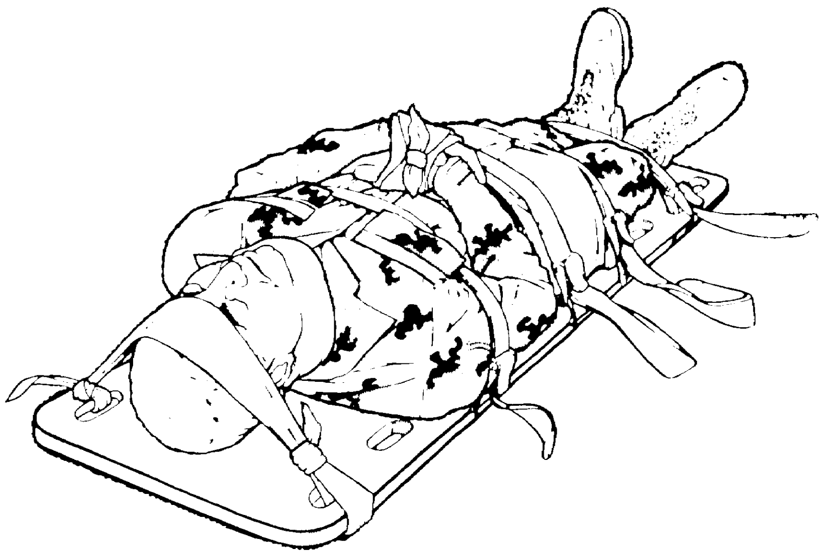


Figure 9-21. Patient secured on a long spine board.

9-7. Travois

A travois is a crude sled lashed to a horse or similar animal and dragged along the ground. It can also be lashed between two animals in single file and carried level. The sled is made from two long poles fastened together by two crossbars and a litter bed fastened to the poles and crossbars. The patient is secured on the litter bed. If the sled is pulled by only one animal, the bearers lift the dragging end from the ground when going uphill, fording streams, or crossing obstacles. To make a travois—

a. Cut two poles about 16-feet long (one pole should be 8- to 10-inches longer than the other). Ensure that the small ends are at least 2 inches in diameter. Then cut two crossbars which are about 3-feet long.

b. Lay the poles parallel to each other. They should be placed about 2 ½ feet apart with the larger ends to the front. If only one animal is used, let the smaller ends spread apart about 3 feet and have one of the small ends project 8 to 10 inches beyond the other one. This results in a rocking motion, rather than a jolting motion to the patient.

c. Notch the poles and the crossbars so that the poles can be connected with one crossbar about 6 feet from the front end and the other crossbar about 6 feet to the rear of the first one. Fit the notches in the crossbars and poles together and lace them securely in place.

d. Make a litter bed 6-feet long between the crossbars. This is done by fastening a blanket, canvas, or similar material securely to the poles and crossbars.

NOTE

A rope or strap may be stretched diagonally from pole-to-pole, letting it cross many times to form a base for an improvised bed. A litter or cot may also be fastened between the poles for the same purpose.

e. If only one animal is used, securely fasten the front ends of the poles to the saddle of the animal. Leave the other ends of the poles on the ground (Figure 9-22).

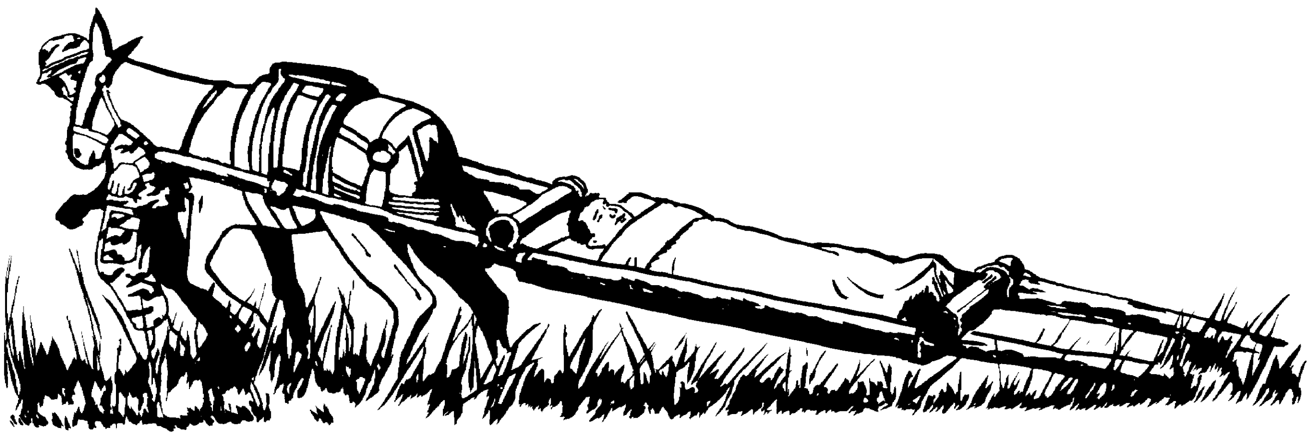


Figure 9-22. Travois used with only one animal.

f. If two animals are used, securely fasten the front ends of the poles to the saddle of the lead animal and the other end of the poles to the saddle of the animal which follows (Figure 9-23).

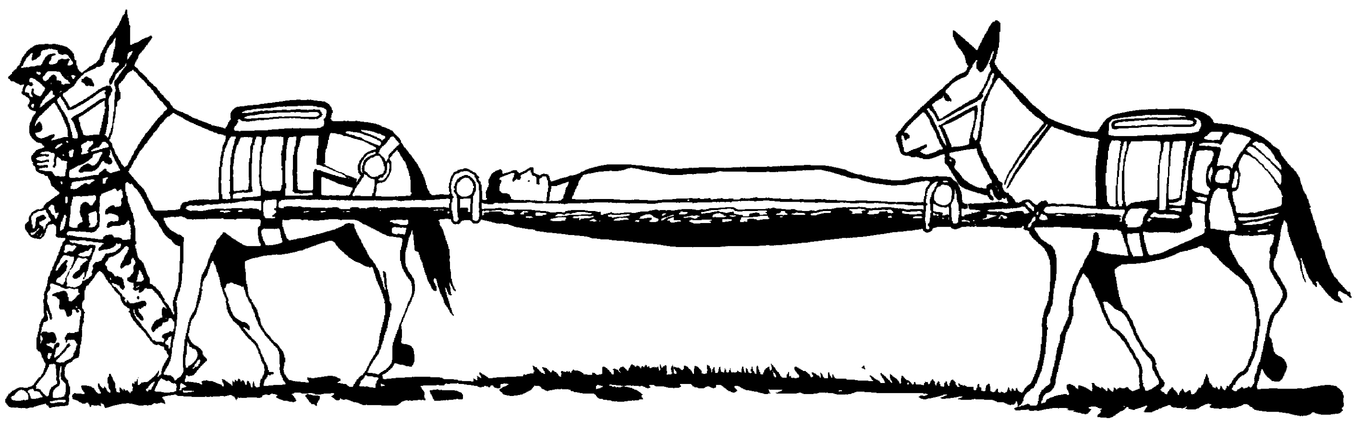


Figure 9-23. Travois used with two animals.

9-8. Packsaddle Litter

A packsaddle litter can be improvised by fitting a suitable litter onto the packsaddle of a mule or other animal (Figure 9-24). This technique is particularity useful in jungle and mountain areas where it may be necessary to carry a litter patient for a long distance.

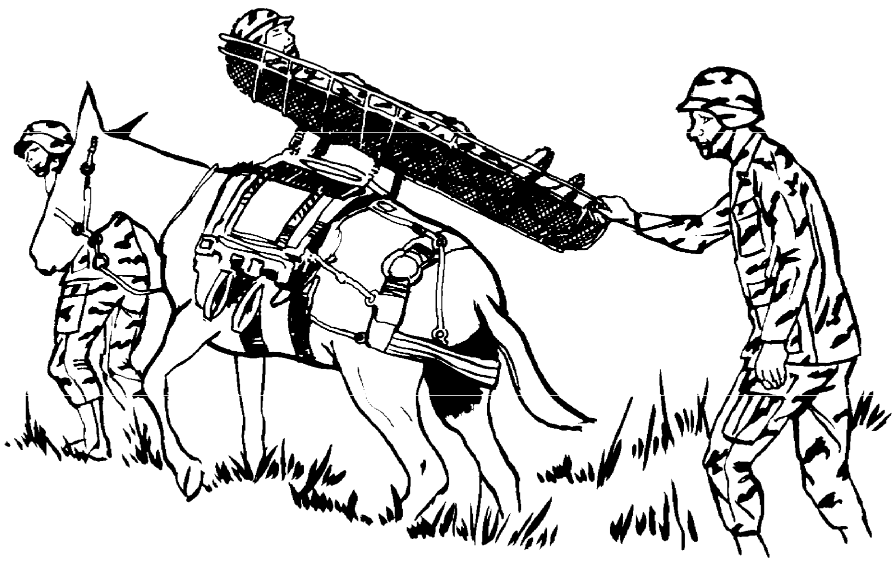


Figure 9-24. Packsaddle litter.

9-9. Litter Evacuation in Extreme Cold Weather Operations

Patient treatment and handling under conditions of extreme cold and deep snow equates to—

- Prompt collection of patients.
- Emergency medical treatment.
- Prevention of shock.
- Rapid evacuation to locations where they can be kept warm.

a. Emergency Medical Treatment. Treatment is limited to controlling hemorrhage, clearing the airway, preventing and treating infection, and splinting fractures. This treatment is modified depending on the weather, the type of clothing worn by the patient, and the judgment of the person giving the treatment.

b. Preventing Shock. Cold hastens the progress of shock and lessens the chances of recovery if a patient is exposed to a cold environment for any length of time. It is particularly important to guard against shock by conserving body heat. Therefore, at the earliest possible moment, patients must be placed in specially constructed evacuation bags. When evacuation bags are not available, arctic sleeping bags or other similar articles may be used.

9-10. Aids to Litter Evacuation in Extreme Cold Weather Operations

Litter evacuation is difficult under conditions of extreme cold and deep snow. Litter bearers are subject to excessive fatigue and possible cold injury. For this reason, litter aids which are either hand-drawn by litter bearers, animal-drawn, or vehicle-towed should be used whenever possible.

a. Litter Kit, Ski Sled. The litter kit, ski sled is used for converting a pair of skis and ski poles to a sled for transporting patients. It consists of one canvas platform, four brackets, two cross braces, two 2.13-meter and two 8.23-meter lengths of rope, and two patient securing straps.

b. Ski Adapters (Figure 9-25). Two ski adapters are attached to each of two skis; then the adapters are clamped onto the litter stirrups of a standard litter. With ropes attached to the converted litter, a litter patient can be easily pulled over the surface of the snow.

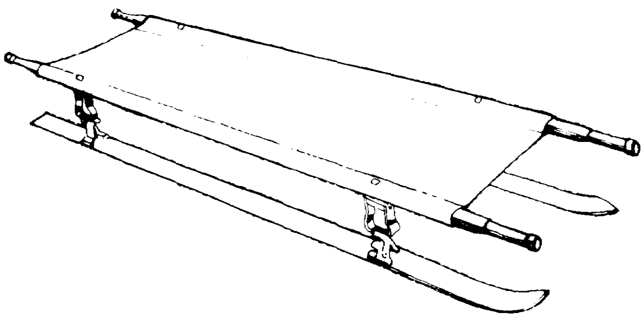


Figure 9-25. Ski adapters attached to skis and litter.

c. Ahkio (Figures 9-26). The Ahkio (Alaskan sled) is particularly useful where patients must be evacuated through deep snow.

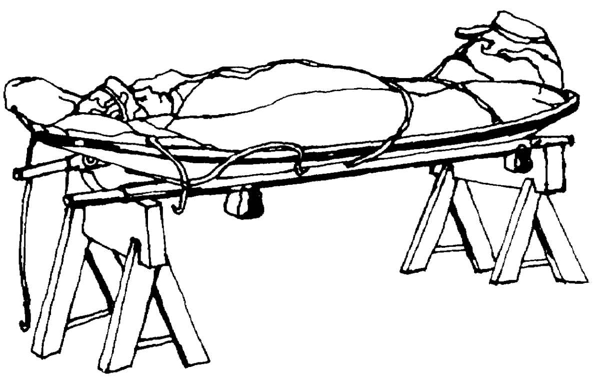


Figure 9-26. Patient placed on an Ahkio.

d. Evacuation Bag, Casualty. The casualty evacuation bag is issued in cold climates to keep the patient warm. It zips up to protect the entire patient. Blankets may also be used inside the evacuation bag for added protection.

9-11. Litter Evacuation in Mountain Operations

a. Personnel assigned to litter squads for mountain service must be trained in—

- Rock climbing.
- Use of ropes.
- Individual and unit movements at high altitudes.

b. Because of the conditions in mountain operations, a litter squad is normally increased from four to six men.

c. For additional information on medical evacuation over mountainous terrain, refer to paragraphs 5-2, 9-12 through 9-14, and 11-15.

9-12. Techniques for Litter Evacuation in Mountain Operations

The evacuation techniques used in mountain operations are well proven. They are, however, subject to improvement and should be modified as better methods of patient handling are developed. When evacuating a patient from mountainous areas—

a. Select the smoothest available route.

b. Keep the patient as warm as possible and avoid unnecessary handling.

c. Place the patient's helmet on his head for protection from falling rocks.

d. If the evacuation route is long and difficult to travel, a series of litter relay points or warming stations should be established. Warming stations, if established, should be staffed with medical personnel to permit proper treatment of shock, hemorrhage, or other emergency conditions.

e. If a patient develops new or increased signs of shock while being evacuated, he should be treated and retained at one of the warming stations until his condition permits further evacuation.

9-13. Types of Litters for Mountain Operations

There are four types of litters available for evacuation of casualties over rough mountain terrain. They are the standard collapsible litter (Figure 9-1); the poleless semirigid litter (Figure 9-4); the Stokes litter (Figure 9-6); and the SKED litter (Figure 9-7). When using the standard collapsible litter and patient securing straps are not available, it is necessary to secure a patient to the litter with a rope.

9-14. Methods of Litter Evacuation in Mountain Operations

Several litter evacuation methods that are adaptable to mountain terrain and climatic conditions are discussed.

a. Modified Travois (Descending) (Figure 9-27). This method is used when descending relatively smooth slopes. Considerable speed can be made on slopes and cliff faces which are 4- to 6-feet high. These areas can be passed without much difficulty.

(1) Two poles about 18-feet long and about 3 inches in diameter at the large end are cut. These poles are fastened to the litter stirrups. About 5 to 10 feet of these poles should extend beyond the litter to serve as runners.

(2) One bearer supports the foot of the litter by a rope sling and guides the litter downhill. Another bearer uses a rope to lower the patient and the litter. A third bearer assists the soldier holding the rope and relieves him at frequent intervals.

Figure 9-27. Modified travois (descending).

b. Modified Travois (Ascending Steep Slope (Figure 9-28). The litter is prepared as a modified travois.

(1) A thin sapling is passed through the litter stirrups at the head of the litter. The poles should extend about 18 inches on each side of the litter. The use of poles affords a more secure grip for the bearers at the head of the litter.

(2) Two bearers take their places at the head of the litter. A third bearer, using an improvised rope sling, takes his place at the foot of the litter.

(3) The fourth and fifth bearers take their positions along the rope extending from the head of the litter. The sixth bearer handles the end of the rope.

(4) At the command UP ROPE, the fourth, fifth, and sixth bearers pull on the rope while the first, second, and third bearers lift the litter and climb slowly. The bearers carrying the litter should not try to do all the work. They should allow themselves to be pulled up the slope as they hold the litter off the ground and climb. The position of the bearers should be rotated at each halt to lessen fatigue.

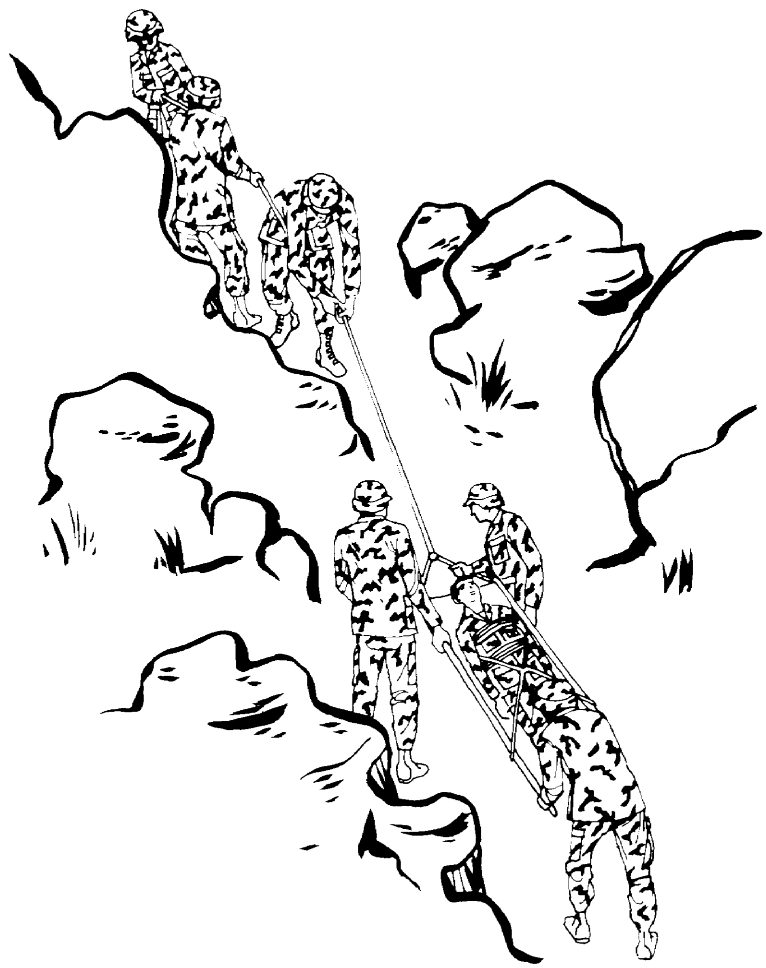


Figure 9-28. Modified travois (ascending steep slope).

c. Modified Travois (Descending Steep Slope) (Figure 9-29). In making a descent, the most direct passage should be taken. The litter is prepared as a modified travois.

(1) Two bearers hold the rope to assist in lowering the litter.

(2) Three bearers take positions at the litter: two at the head and one at the foot.

(3) The sixth bearer may assist with the foot of the litter, or he may precede the team to—

- Pick out a trail, thus preventing the squad from having to retrace its steps should there be a cliff ahead.

- Make the passage more negotiable by clearing away shrubs and vines.

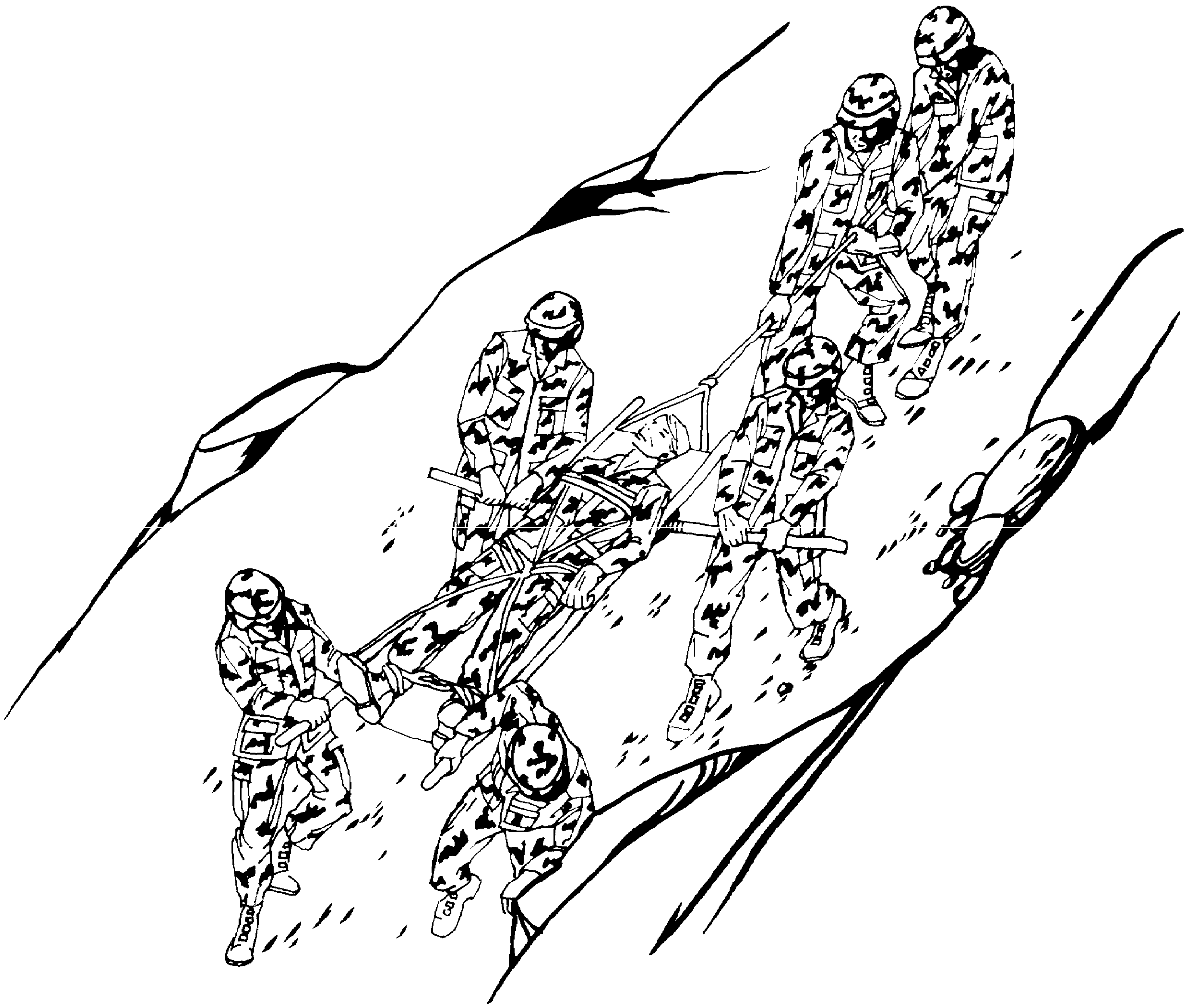


Figure 9-29. Modified travois (descending steep slope).

d. Modified Travois (Lowered from Cliff) (Figure 9-30). If a cliff is too extensive to bypass, the portion with the smoothest face is selected for descending. The litter is prepared as a modified travois. (If using a SKED litter, follow manufacturer's instructions for lacing the litter.)

(1) Notches are cut in the poles to provide an indentation for tying the ropes, thus preventing them from becoming frayed by the stone cliff.

(2) Ropes are lashed to the stirrups at the foot of the litter to serve as guys in keeping the litter from revolving.

(3) After one bearer secures the rope around a tree or large boulder, two bearers lower the litter over the cliff's edge.

(4) One bearer descends the cliff's face on a rope, moving parallel to the litter and assisting the litter over any projections.

(5) The two remaining bearers hold the guy ropes and guide the litter from the foot of the cliff. When the litter has almost reached the base of the cliff, they ease it to the ground.

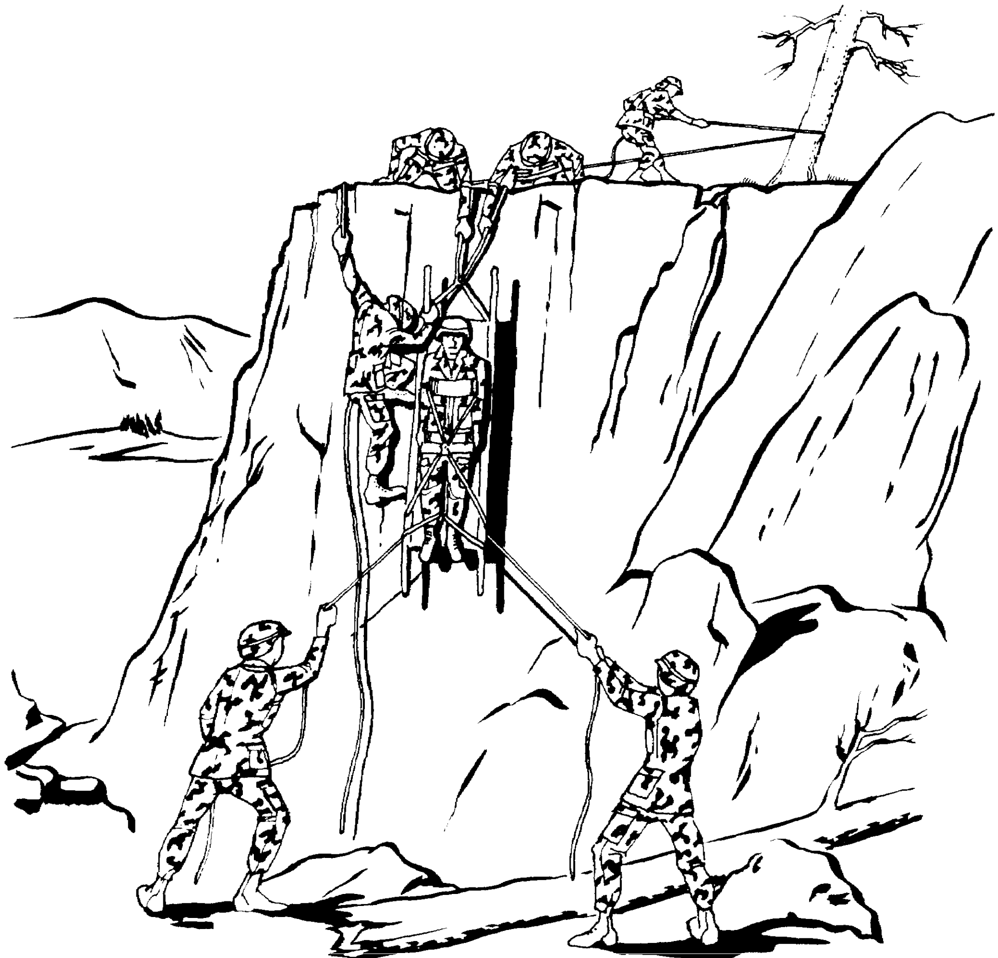


Figure 9-30. Modified travois (lowered from cliff).

9-15. Horizontal Hauling Line

The horizontal hauling line (Figure 9-31) is also a method of evacuation. It is addressed in a separate paragraph because of its complexity. The horizontal hauling line is used in those cases where a steep slope or cliff must be scaled and where, at the same time, there is an intervening obstacle such as a swiftly running mountain stream. It can also be used to span a chasm when a bridge has been demolished. This method should be used only where there will be a considerable number of patients (a warming station or collecting point) and should not be installed for the evacuation of only one or two patients. It can also be used to lower or to raise patients over obstacles. The installation and operation of the hauling line is addressed below.

- This apparatus is a continuous rope cableway secured by a system of snaplinks spanning a maximum of 1,000 feet between terminals. A slope of at least 10 degrees is required for proper operation.

- A Stokes litter containing the patient is suspended from the top of the cable at the upper terminal, and an empty litter is suspended from the bottom of the cable at the lower terminal.

- The litter patient at the upper terminal is lowered by gravity to the lower terminal. A relay line attached to the litter prevents it from rapidly and uncontrollably descending. At the same time, the empty litter at the lower terminal is raised to the upper terminal ready to receive the next patient.

- One bearer stands at the upper terminal to control the relay line and another bearer stands at the lower terminal ready to receive the patient.

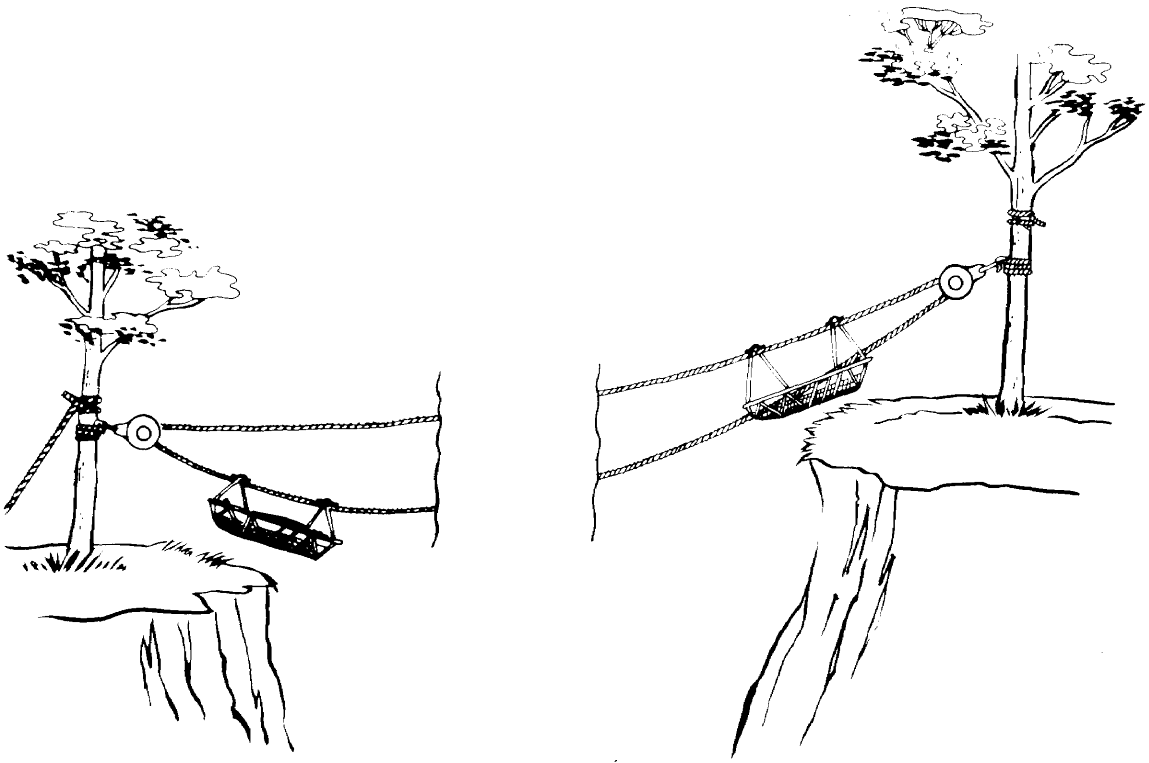


Figure 9-31. Evacuation by horizontal hauling line.

a. Installation. The horizontal hauling line is installed in four steps:

(1) By means of a bowline, secure a 10-centimeter manila rope to a tree far enough from the edge of the cliff (2 to 3 meters) to permit freedom of movement by the medical personnel.

(2) On the opposite side, pass the other end of the rope around another fixed point (tree, boulder, or vehicle), and make a transport knot to pull the rope as taut as necessary. All traverse ropes should have a certain amount of slack. When manila or sisal rope is used, a 5-percent sag should be allowed to avoid undue fatigue in the rope.

(3) To suspend the litter, place two snaplinks on the traverse rope and attach one long litter carrying strap to each. Attach an upper and lower retrieving rope to either the litter stirrup or to the respective snaplinks. In the latter case, the loose ends of each rope are tied together above the center of the litter so that, when drawn up or down, both snaplinks move simultaneously.

(4) After the patient has been secured to the litter, the litter is raised, and the litter carrying straps or suspension ropes are passed through the stirrups and fastened together or else secured to the opposite stirrup.

b. Operation. The horizontal hauling line is operated as follows:

(1) For the ascent, three men can easily raise the litter along the traverse by pulling on the upper retrieving rope. The pull should be steady and smooth in order to prevent jolting and swaying.

(2) For the descent, a gentle pull on the lower retrieving rope is enough to break the inertia and let gravity do the rest. During the descent, the men on the upper side should control the speed of the descent through their retrieving rope. It may be necessary to pull the patient the last few meters when the litter nears the low point of the slack in the traverse rope.

c. Refer to TC 90-6-1 for additional information on the construction of a horizontal hauling system.

Section II. PROCEDURES FOR LITTER EVACUATION TRAINING

9-16. General

To safely transport a patient by litter and to ensure litter bearers are not injured by using incorrect lifting procedures, training is required for litter bearers. This section provides the techniques and procedures necessary to accomplish litter evacuation.

9-17. Basic Guides for Training Litter Bearers

Litter bearers are normally grouped into squads of four to carry patients. For this reason, litter procedures for squads of four are effective in training individuals to be litter bearers. The following guides promote uniformity and accuracy in training methods:

- Several squads may be trained at the same time by one individual, or each squad may be instructed separately by an instructor or trained squad leader.
- For the initial training procedures, a litter without a patient on it can be used to simulate a loaded litter.
- For later training, some personnel can be designated as ''patients." These individuals should be frequently rotated with the ones carrying the litters so that all may participate in each phase of instruction.
- For more realistic training in the handling of the different types of injuries, "patients" may wear moulages, bandages, and splints to simulate actual wounds or injuries.
- The persons designated as "patients" may be positioned on the ground at suitable intervals near a line of litters, first with the head and later with the feet toward the litters. As the instruction progresses, their positions may be varied. Lastly, they may be dispersed or concealed to simulate positions that the wounded might occupy on a battlefield.

9-18. Litter Commands

Litter procedures are not to be considered precision drills; however, certain preparatory commands and commands of execution are used to facilitate instruction. A preparatory command states the movement or formation to be carried out and mentally prepares the individual for its execution. A command of execution tells when the command is to be carried out. The use of these commands in actual operations is not contemplated. For purposes of identification in the discussion of the different types of procedures, preparatory commands will be in lower case with initial capital letters and commands of execution will be in capital letters.

9-19. Formation for Instruction

First, align the trainees into four ranks; then give the commands to form litter squads. This is accomplished as follows:

a. The trainees count off from front to rear, one through four, thus forming the litter squads and designating each trainees's position in the litter squad by number. Each number carries with it specific responsibilities in the litter squad. The trainee designated number 1 is the squad leader.

b. The squad leaders count off from right to left, designating a number for each litter squad.

c. The formation is then opened to provide each squad adequate space for performance.

d. Since exceptional circumstances may make it necessary to use two-bearer litter squads, the instruction should include procedures for these reduced squads, using bearers 2 and 3 of the four-bearer squad.

9-20. Procedures to Procure, Ground, Open, Close, and Return the Litter

a. To Procure Litter. Upon the command of Procure, LITTER, the squad leader (bearer number 1) steps forward, goes to the source of supply, picks up the litter, and returns to his original position covered by bearers numbers 2, 3, and 4.

(1) The closed litter is carried at high port except near helicopters where it is kept level with the ground to avoid contacting the rotor blades. At high port, the litter is carried diagonally across the body with the left wrist in front of the left shoulder and the right wrist near the right hip (Figure 9-32).

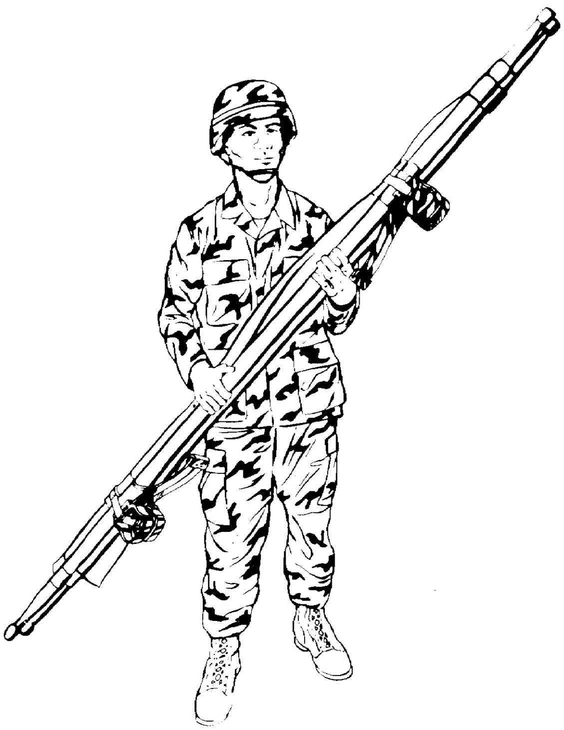


Figure 9-32. Carrying litter at high port.

(2) After bearer number 1 reurns to his original position in the squad, he holds the litter in an uprght position on his left side with the metal stirrups away from his body (Figure 9-33).

Figure 9-33. Litter squad with litter.

b. To Ground Litter. Upon command of Ground, LITTER, bearer number 1 lowers the litter to the ground. With the litter squad in formation, bearer number 1 places his left foot beside the litter handles, steps forward with his right foot, and lowers the litter to the ground so that it rests on the stirrups (Figure 9-34). Then upon command of Litter, POSTS, the other three bearers move into their positions at the sides of the litter. Bearer number 2 moves to the right front, bearer number 3 moves to the left rear, and bearer number 4 moves to the left front (Figure 9-35).

Figure 9-34. Grounding litter (step one).

Figure 9-35. Grounding litter (step two) (position of Litter, POSTS).

c. To Open Litter. Upon command of Open, LITTER, all bearers face the litter and execute the command. With all bearers facing the litter, bearers numbers 2 and 3 pick up the litter from the ground and support it, while bearers numbers 1 and 4 unfasten the litter straps. (Figures 9-36). Bearers numbers 2 and 3 extend the litter by pulling the handles apart with the canvas up. Then bearer number 2 lowers his end of the litter to the ground and bearer number 3 raises his end of the litter until it is in a vertical position. Using his foot, bearer number 3 extends the lower spreader bar to a locked position, reverses the litter, and extends the other spreader bar. Bearer number 3 then lowers the litter to the ground with the canvas in the up position (Figure 9-37).

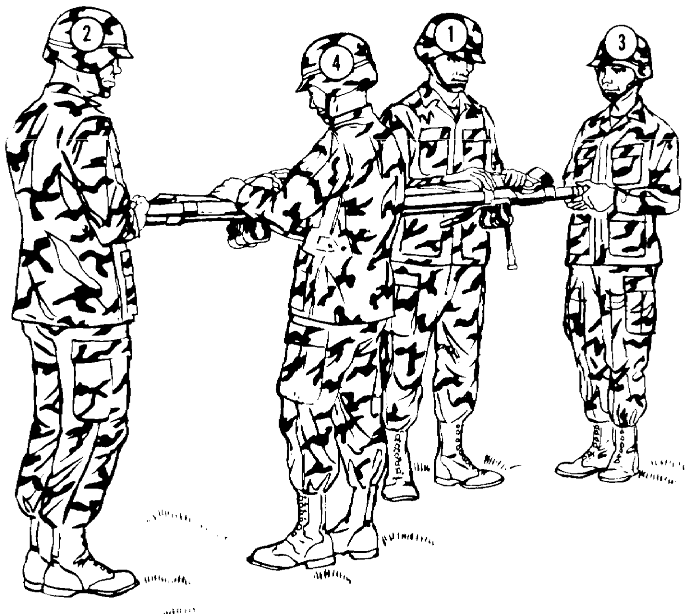


Figure 9-36. Opening litter (step one).

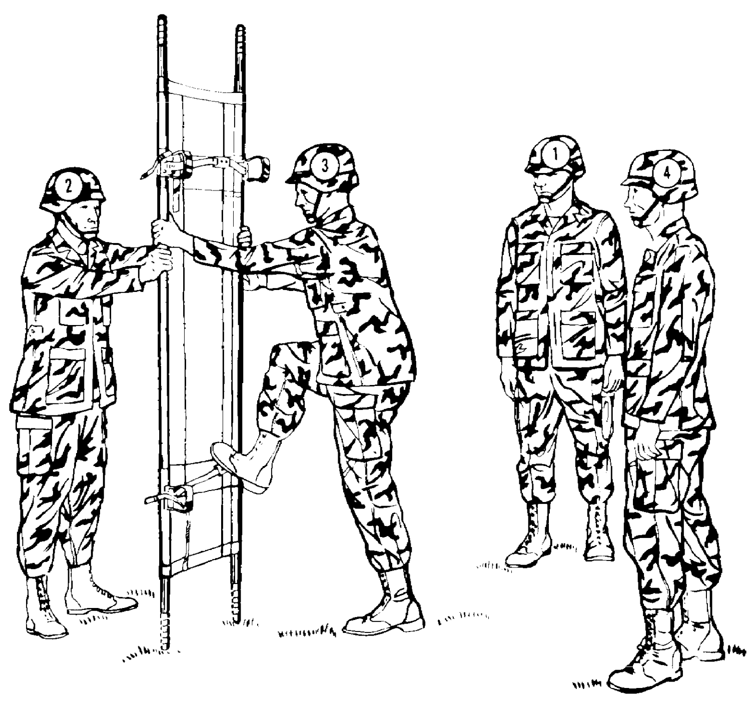


Figure 9-37. Opening litter (step two).

d. To Close Litter. Upon command of Close, LITTER, bearer number 2 supports the litter while bearer number 3 releases the spreader bars and turns the bars against the litter poles. Bearers numbers 2 and 3 then lift the litter, move the poles together, and support the litter. Bearers numbers 1 and 4 fold the canvas smoothly on top of the poles and secure the canvas and the poles in place with the litter straps.

e. To Return Litter. At the completion of the instruction and upon command of Return, LITTER, bearer number 1 returns the litter to supply.

9-21. Procedures for Loading a Patient onto a Litter

After the patient has been located, the general nature of his wounds determined, emergency treatment given, and the litter opened and positioned, the bearers load the patient onto the litter.

a. To Load a Litter (Four Bearers). Upon the following commands, the bearers position themselves, lift the patient, position the litter, and lower the patient onto the litter:

(1) At the command, Right (Left) Side, POSTS, the bearers take the following positions facing the patient: bearer number 2 at the right (left) ankle; bearer number 3 at the right (left) shoulder; bearers numbers 4 and 1 at the right and left hips, respectively (Figure 9-38).

(2) At the command, Lift, PATIENT, each bearer kneels on his knee that is nearest the patient's feet. Bearer number 2 passes his forearms under the patient's legs, carefully supporting any

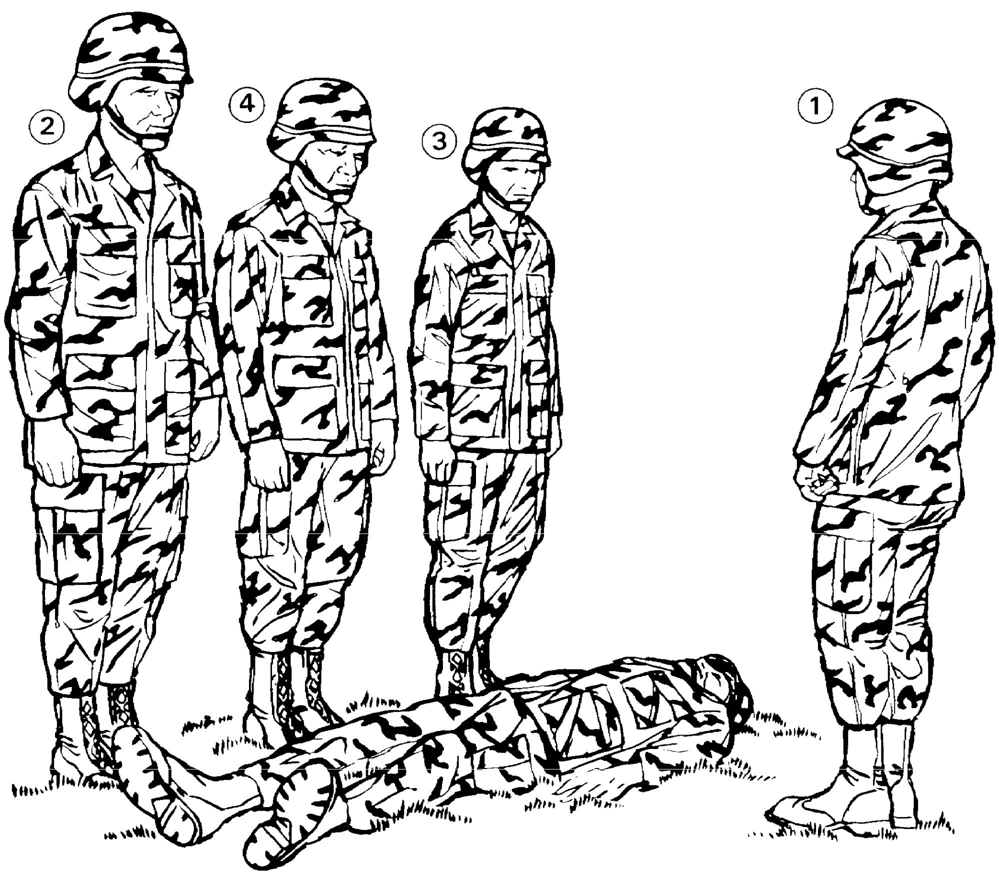


Figure 9-38. Squad at right side, POSTS.

fracture, if required. Bearers numbers 1 and 4 place their arms under the small of the patient's back and thighs without locking hands. Bearer number 3 passes one hand under the patient's neck to the farther armpit and uses the other hand to support the nearer shoulder. All bearers lift the patient slowly and carefully and place him upon the knees of the three bearers who are on the same side (Figure 9-39).

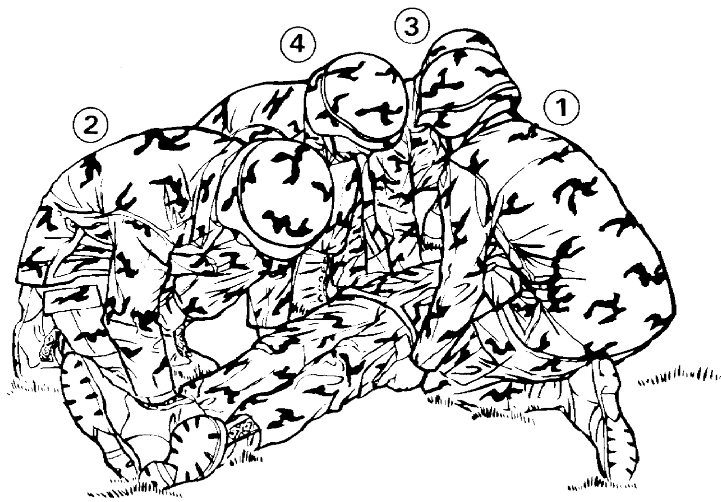


Figure 9-39. Lifting patient to load litter (step one).

(3) At the preparatory command Lower, bearer number 1 resumes his former kneeling position opposite the other three bearers and prepares to assist in lowering the patient. As soon as the patient is firmly supported on the knees of the three bearers, the bearer on the opposite side (bearer number 1) relinquishes his hold and reaches for the litter (Figure 9-40). He places the litter under the patient and against the ankles of the other bearers. At the command of execution, PATIENT, the patient is lowered gently onto the litter (Figure 9-41). Without further orders, all bearers rise and resume their positions at Litter, POSTS.

Figure 9-40. Lifting patient to load litter (step two).

Figure 9-41. Lifting patient to load litter (step three).

b. To Load Litter (Three Bearers). In the absence of one man from the litter squad, bearers numbers 2 and 3 with the assistance of bearer number 1, lift the patient and lower him onto the litter. To lift the patient with three bearers, bearer number 2 places his arms under the legs and thighs of the patient. Bearer number 3 places his arms under the small of the back and shoulders of the patient. Bearer number 1, on the opposite side of the litter, places his arms under the patient's knees and back. The patient is supported on the knees of bearers numbers 2 and 3, while bearer number 1 places the litter in position (Figure 9-42). All three bearers lower the patient unto the litter (Figure 9-43). The procedures are performed upon the commands cited in paragraph *a* above.

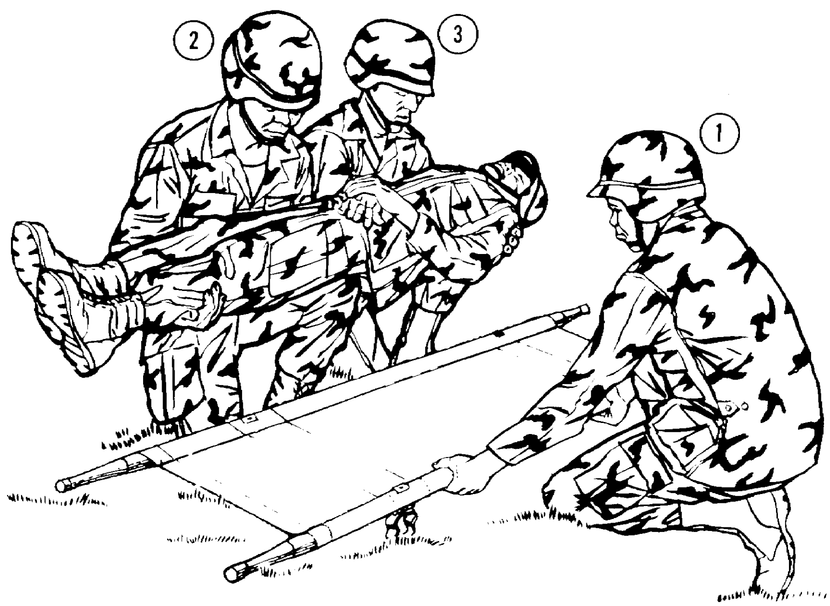


Figure 9-42. Lifting patient to load litter (three bearers).

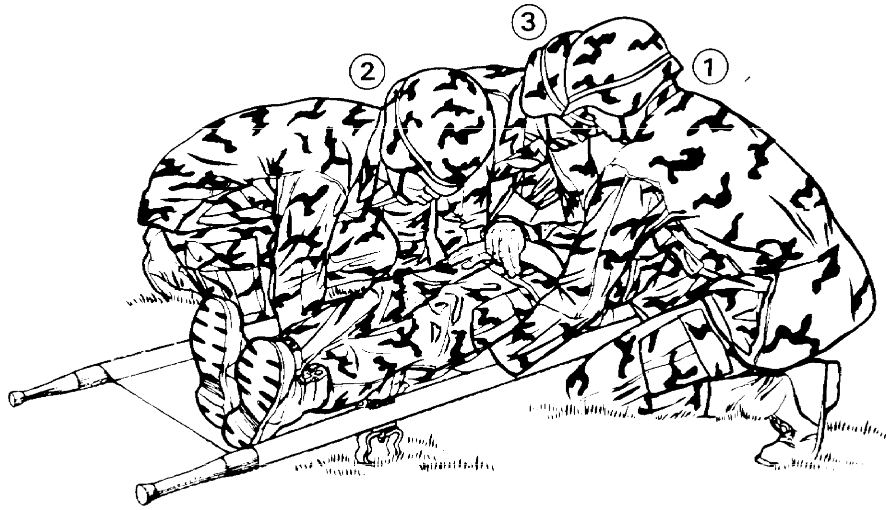


Figure 9-43. Lowering patient onto litter (three bearers).

c. To Load Litter (Two Bearers). The procedures for loading litters with the two bearers on the same side are illustrated in Figures 9-44 through 9-47.

(1) At the command to Right Side, POSTS, bearers numbers 1 and 2 take positions at the patient's right thigh and shoulder, respectively (Figure 9-44).

Figure 9-44. Two bearers at right side, POSTS.

(2) At the preparatory command, Lift, each bearer kneels on his knee nearer the patient's feet. Bearer number 1 passes his arms beneath the patient's hips and knees. Bearer number 2 passes his arms beneath the small of the patient's back (Figure 9-45).

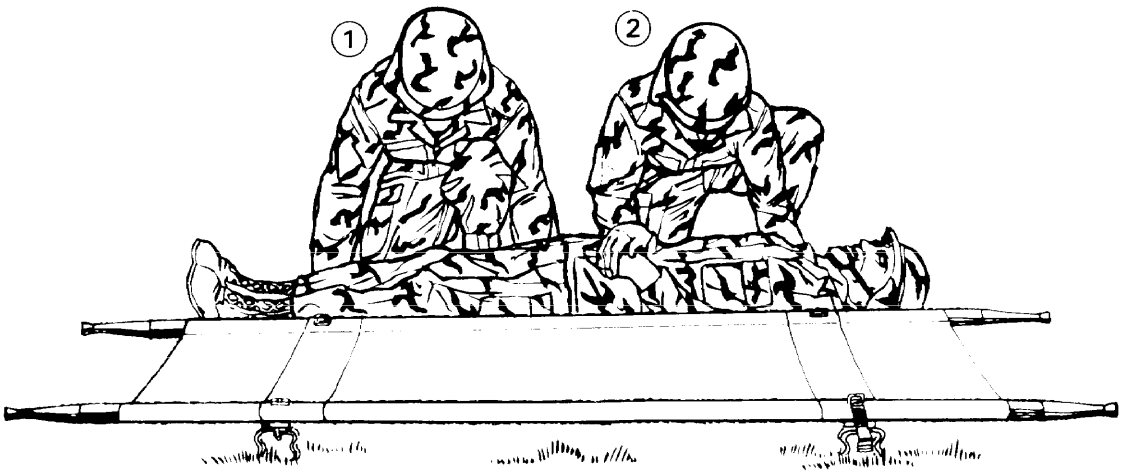


Figure 9-45. Lifting patient with two bearers on the same side (step one).

(3) At the command of execution, PATIENT, the bearers lift together, raising the patient upon their knees. Readjusting their hold, they rise to their feet and move as close as possible to the side of the litter (Figure 9-46).

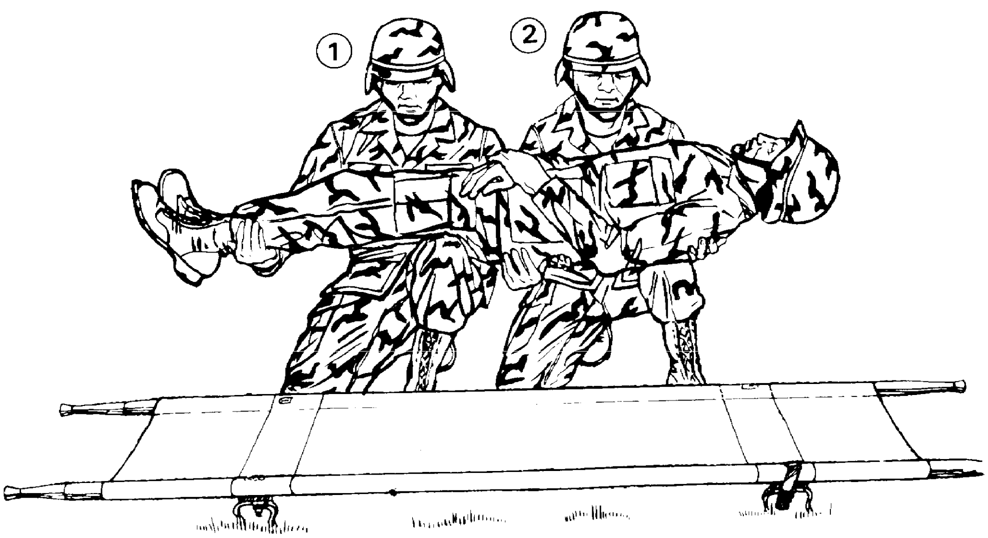


Figure 9-46. Lifting patient with two bearers on the same side (step two).

(4) At the preparatory command, Lower, the bearers kneel and place the patient on their knees. At the command of execution, PATIENT, the bearers gently place the patient onto the litter (Fgure 9-47). They then rise and resume the position of Litter, POSTS, without command.

Figure 9-47. Lowering patient onto litter with two bearers on the same side.

d. To Load Litter with Conscious Patient (Two Bearers). If the patient is conscious and able to hold onto the bearers, the following procedure is used:

(1) At the command, On Each Side, POSTS, bearers numbers 1 and 2 face the patient and take positions at the patient's right and left hips, respectively (Figure 9-48).

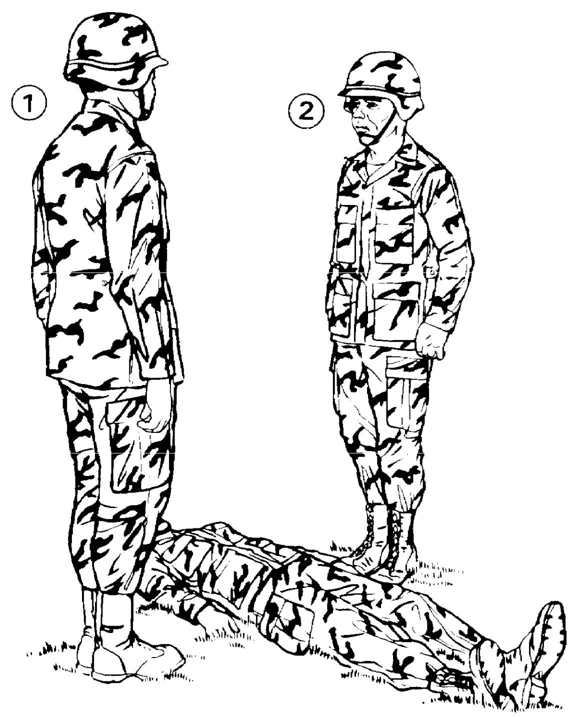


Figure 9-48. Two bearers, one on each side, POSTS.

(2) At the command of execution, PATIENT, the bearers lift the patient, both rising together, and carry him to the center of the litter (Figures 9-49 and 9-50).

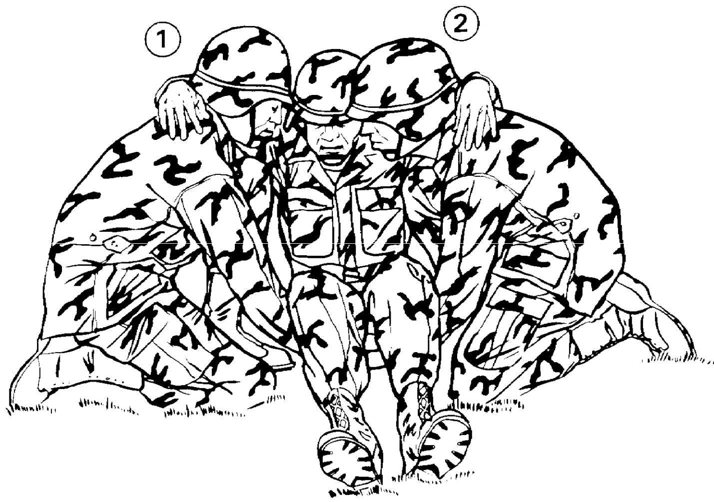


Figure 9-49. Lifting patient with two bearers, one on each side (step one).

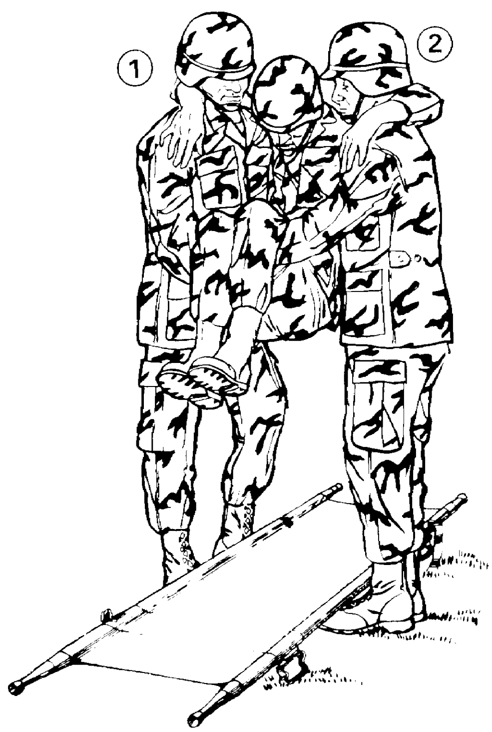


Figure 9-50. Lifting patient with two bearers, one on each side (step two).

(3) At the command, Lower, PATIENT, the bearers stoop and lower the patient onto the litter in a sitting position. The patient then releases his hold on the bearers' necks. Both bearers assist the patient to lie down. They then resume the position of Litter, POSTS, without commands (Figure 9-51).

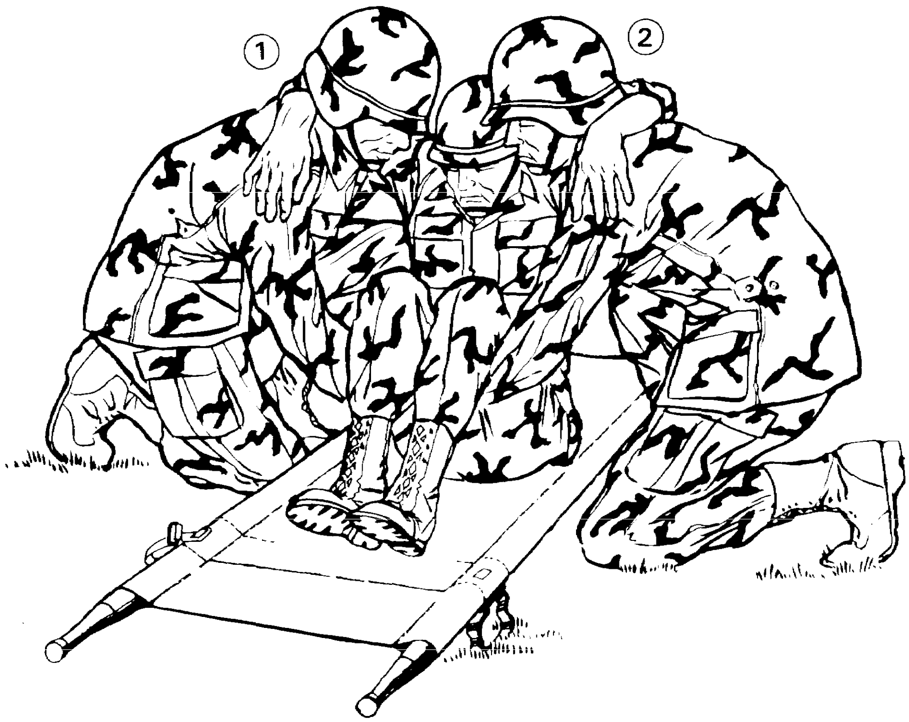


Figure 9-51. Lowering patient onto litter (two bearers, one on each side).

e. To Load Patient with Back Injury. To avoid aggravating the condition of a patient with an actual or suspected back injury, the bearers proceed as follows (Figure 9-52):

(1) Each bearer kneels on his knee nearer the patient's feet. (If the patient is unable to hold his arms in front of him, his wrists should be tied loosely before placing him on the litter. This will prevent injury to his arms.)

(2) Bearer number 1 places a blanket, coat, or jacket in a firm roll or in a position to support the arch of the patient's back. Bearer number 3 places one hand under the patient's head arid the other hand under his shoulders. Bearer number 4 places his hands under the small of the back and buttocks. Bearer number 2 places his hands under the thighs and calves. Bearer number 1 assists bearer number 4 in supporting the small of the patient's back.

(3) At the command, Lift, PATIENT, all bearers gently lift the patient off the ground about 8 inches. Bearers ensure that proper alignment is maintained. Bearer number 1 places the litter under the patient and adjusts the roll under the patient's back.

(4) At the command, Lower, PATIENT, the three bearers lean forward and with the aid of bearer number 1, lower the patient onto the litter.

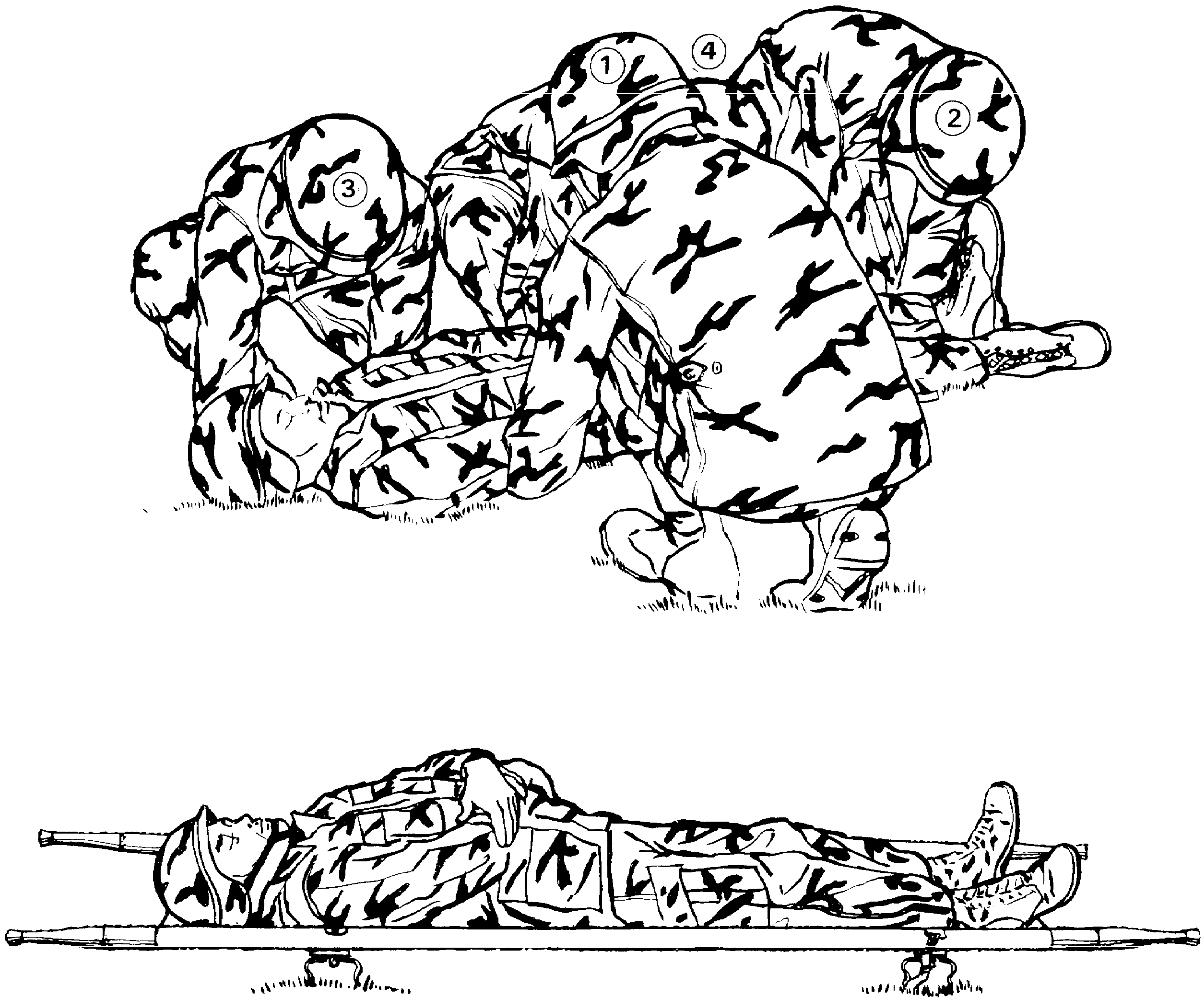


Figure 9-52. Lifting patient with back injury.

9-22. Procedures for Carrying a Loaded Litter

After the patient has been loaded onto the litter, the litter is lifted and carried as described below.

a. To Lift Loaded Litter. Resuming the position of Litter, POSTS, and facing in the direction of travel, the bearers lift the loaded litter upon the command Prepare to Lift, LIFT (Figure 9-53).

(1) At the preparatory command, Prepare to Lift, each bearer kneels on his knee closest to the litter. He grasps the litter handle with the hand nearest the litter and places his other hand on his raised knee.

(2) At the command of execution, LIFT, all bearers rise together keeping the litter level. When lifting, bearers should use leg muscles, not their back muscles.

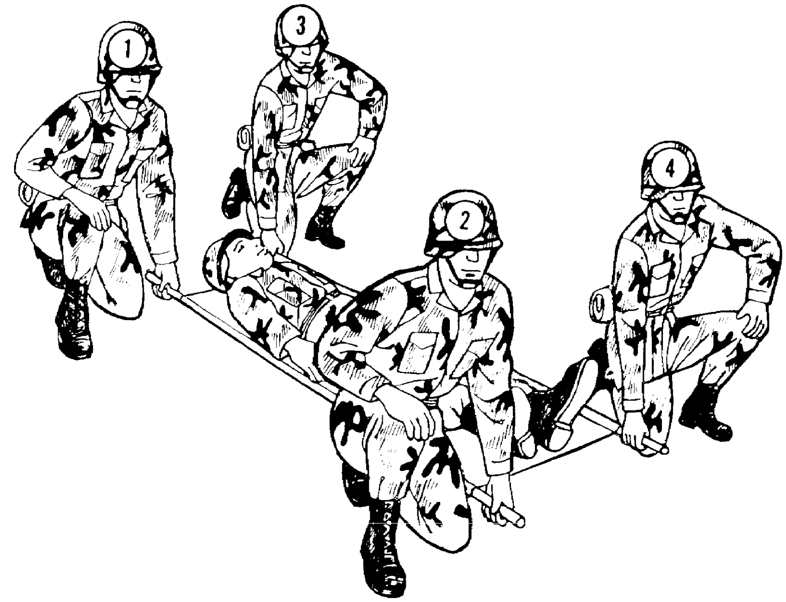


Figure 9-53. Lifting the loaded litter.

b. To Carry a Loaded Litter. The type of carry used in transporting a litter patient depends upon the type of terrain as well as the obstacles involved. It may be necessary to use several types of carries.

(1) After the bearers lift the loaded litter, they are in position for the four-man carry (Figure 9-54) which is used when the terrain is smooth and level. The command to proceed is Four-Man Carry, MOVE. With modifications, this carry is also used to pass under low obstacles.

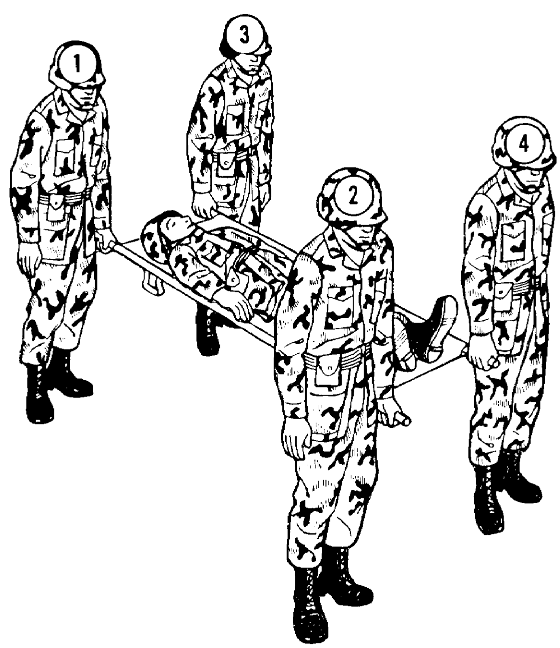


Figure 9-54. Four-man carry for smooth, level terrain.

(2) The command Two-Man Carry, MOVE, is given to enable the litter squad in a four-man carry to pass through or over narrow passages such as trails, bridges, gangplanks, and catwalks (Figure 9-55). After the litter bearers reach the end of such passages, they change back to the four-man carry. With modification, this carry can also be used to pass through such obstacles as culverts or tunnels. Both bearers carrying the litter face the patient and crawl on their knees through these obstacles. This requires one bearer to crawl backwards.

(a) With the litter squad in the position of the four-man carry, the preparatory command, Two-Man Carry, is given. Bearers numbers 2 and 3 change their holds on the litter handles to the other hand, step between the handles, and take the full support of the litter as bearers numbers 1 and 4 release their holds.

(b) Bearer number 1 steps one pace in front of the squad to lead, and bearer number 4 falls one pace to the rear to follow.

(c) At the command of execution, MOVE, the four bearers proceed through the passage.

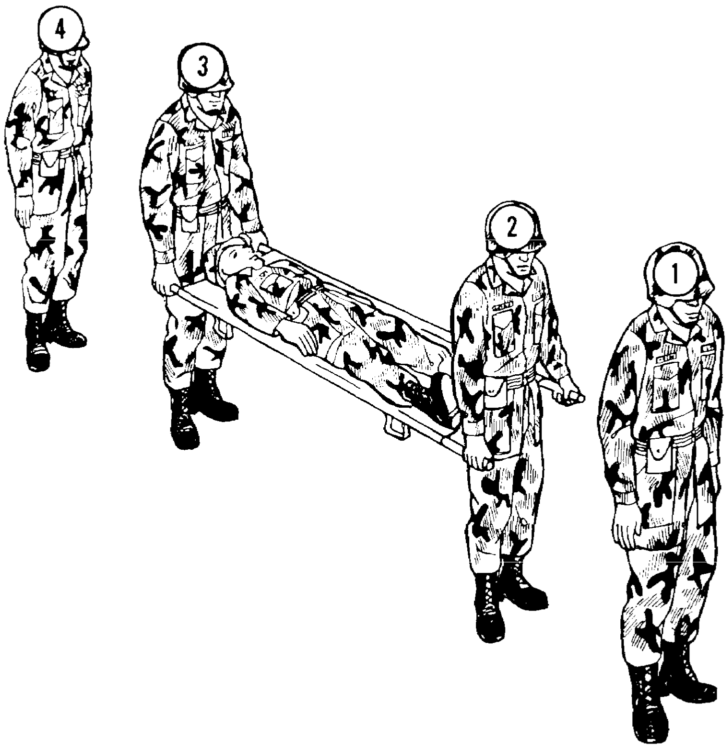


Figure 9-55. Two-man carry for narrow trails and passages.

(3) The command Litter Post Carry, MOVE, is given to enable the litter squad in a four-man carry to move over rough terrain (Figure 9-56).

(a) With the litter squad in position of the four-man carry, the preparatory command, Litter Post Carry, is given. Bearers numbers 2 and 3 step between the handles of the litter and take hold of the handles. Bearers numbers 1 and 4 then release their holds.

(b) Bearers numbers 1 and 4 move to the sides of the litter and grasp the litter poles.

(c) At the command of execution, MOVE, the four bearers proceed carefully over the rough terrain.

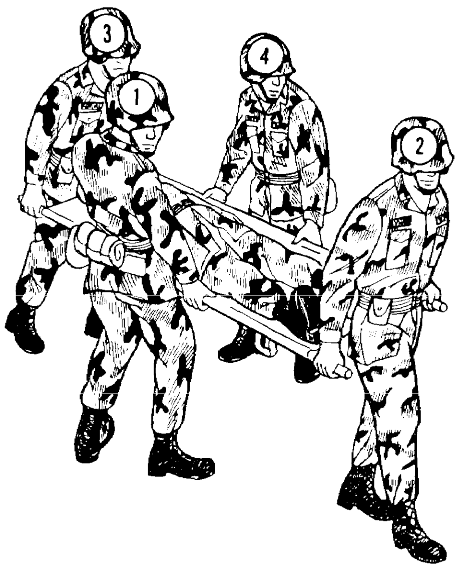


Figure 9-56. Litter post carry for rough terrain.

(4) Except when the patient has a fracture of a lower extremity, the litter is carried up hiil or upstairs with the patient's head forward. Therefore, before proceeding with the uphill carry, the litter must first be turned correctly. From the position of four-man carry (Figure 9-54), the litter squad first moves into the position of litter post carry (Figure 9-56); then the command Prepare to Rotate, ROTATE (Figure 9-57) is given and followed by command, Uphill (Upstairs) Carry, MOVE (Figure 9-58).

(a) With the litter squad in the position of litter post carry, the preparatory command, Prepare to Rotate, is given. Bearers numbers 2 and 3 release the litter handles and step one pace away, allowing bearers numbers 1 and 4 to support the litter at its sides.

(b) At the command of execution, ROTATE, bearers numbers 1 and 4 move 180 degrees counterclockwise, thus placing the patient's head in the direction of travel with bearer number 1 still on the patient's right side.

(c) As soon as bearers numbers 2 and 3 observe that the rotation has been completed, they resume their positions at the litter handles. The rotation of the litter places bearer number 2 at the patient's head.

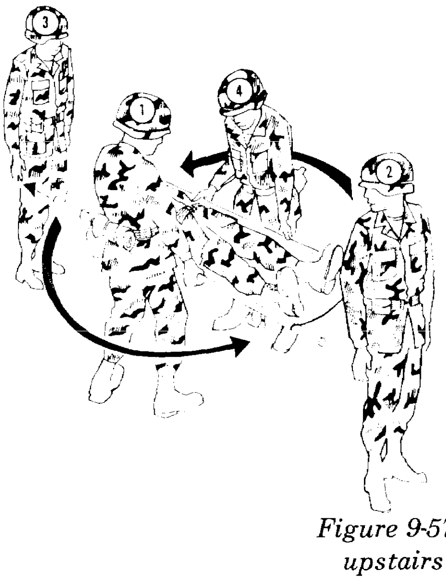


Figure 9-57. Rotation of the litter for uphill or upstairs carry and for ambulance loading.

(d) After the litter is rotated so that the patient's head is in the direction of travel, the squad halts.

(e) At the preparatory command, Uphill (Upstairs) Carry, bearer number 4 moves to the foot of the litter and takes hold of the litter handle released by bearer number 3. Bearer number 1 moves in front of the squad.

(f) At the command of execution, MOVE, the squad proceeds uphill (upstairs) with bearer number 1 preceding the squad. Bearers numbers 3 and 4 keep the litter level.

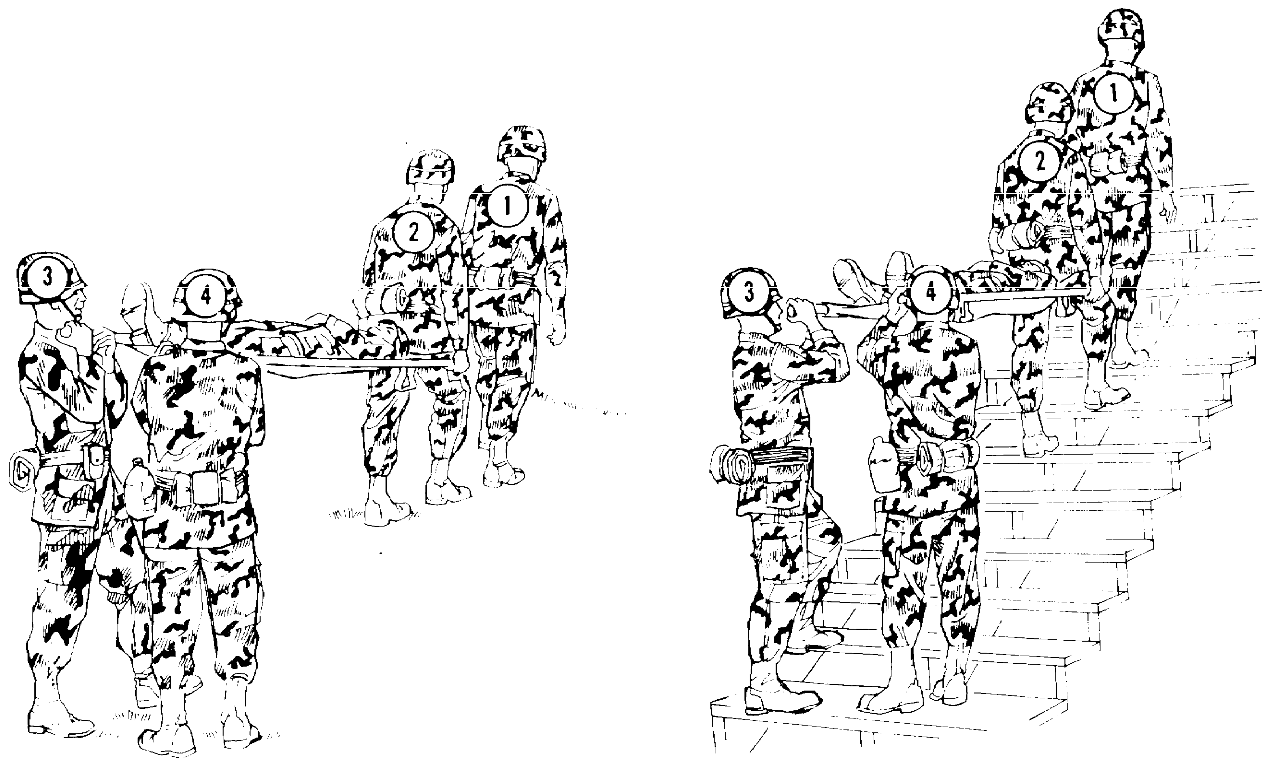


Figure 9-58. Uphill and upstairs carry.

(5) Except when the patient has a fracture of a lower extremity, the litter should be carried downhill or downstairs with the patient's feet forward. The command Downhill (Downstairs) Carry, MOVE (Figure 9-59) is given when the litter squad is in the position of four-man carry (Figure 9-54) or in the position of litter post carry (Figure 9-56) provided it has been used to rotate the loaded litter or to move it over rough terrain just prior to carrying it downhill (downstairs).

(a) With the litter squad in the position of the four-man carry, the preparatory command, Downhill (Downstairs) Carry, is given. Bearer number 3 takes the full support of the litter at the patient's head, and bearers numbers 2 and 4 remain in their positions at the patient's feet.

(b) Bearer number 1 moves to the front, facing the squad. He supports bearers

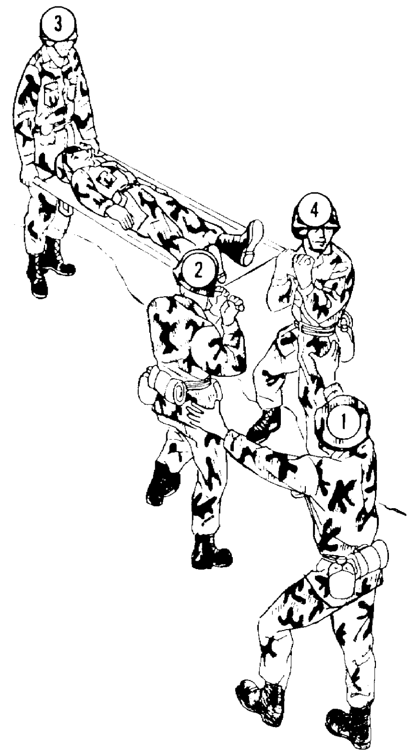


Figure 9-59. Downhill or downstairs carry.

numbers 2 and 4 and ensures that they keep the litter level as they move downhill (downstairs).

c. To Lower Loaded Litter. Before lowering the litter to the ground, the bearers resume the position of four-man carry. At the preparatory command Lower, LITTER, each bearer slowly kneels on the knee closer to the litter and gently places the litter on the ground. The squad then stands without command. For balance and support when lowering the litter, each bearer places his free hand on his other knee which remains in an upright position.

9-23. Procedures for Surmounting Obstacles

In litter transportation, bearers must be able to surmount various artificial and natural obstacles such as fences, high walls, deep trenches, wide streams, and stairwells with small landings. Specific commands for surmounting these obstacles are neither necessary nor feasible, as they must be given in conjunction with the commands for the appropriate litter carry. Common sense must also be used in adapting specific procedures to individual situations.

a. Litter Obstacle Course. A litter obstacle course is a useful training tool for surmounting obstacles and for the physical conditioning of bearers. An obstacle course can be constructed to simulate most types of natural and artificial obstructions that litter bearers are likely to meet. Where construction of such a course is impracticable, many obstacles can be simulated from existing facilities.

b. Methods for Surmounting Obstacles. A number of methods, as well as modifications in litter carries, which enable the litter squad to surmount various obstacles, are discussed below.

(1) *Surmounting a fence or low wall.*

(a) With the litter squad in the position of Litter Post, CARRY, bearer number 2 releases his grasp of the front handles at the patient's feet and crosses the obstacle, maintaining a low silhouette. Bearers numbers 1, 3, and 4 then advance the litter until bearer number 2 can resume his grip of the front handles (Figure 9-60).

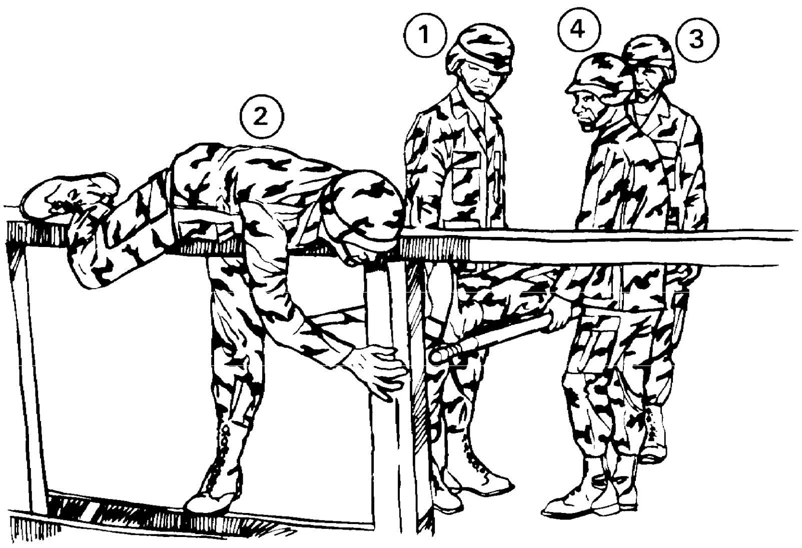


Figure 9-60. Surmounting a fence or low wall (step one).

(b) The litter is rested on the obstacle with the stirrups placed on the side of the obstacles in the direction of travel. Bearers numbers 2 and 3 support the litter by the front and rear handles, respectively, while bearers numbers 1 and 4 cross the obstacle maintaining a low silhouette. Having passed the obstacle, bearers number 1 and 4 grasp the litter poles near the rear handles held by bearer number 3. Bearer number 3 then releases his hold of the rear handles and crosses the obstacle, maintaining a low silhouette. Bearer number 3 resumes his grasp on the rear handles and bearers numbers 1 and 4 adjust the position of their holds (Figure 9-61).

NOTE

The litter should be lifted and not dragged across the top of the obstacle.

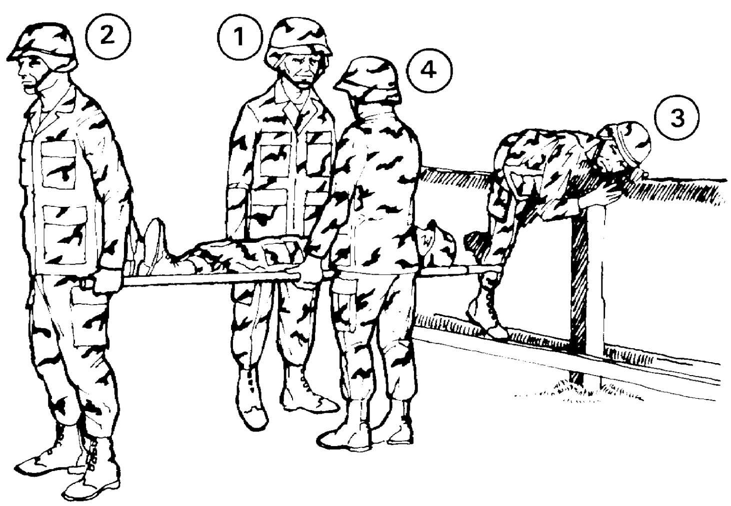


Figure 9-61. Surmounting a fence or low wall (step two).

(2) *Surmounting a high wall.* With the litter squad in the position of the four-man carry, the bearers turn and face each other. Together they raise the litter approximately chest high, step close to the litter, letting their bent elbows touch their chests. The front bearers place the front stirrups beyond the wall, scale the wall and drop to the other side. All four bearers move the litter forward until the rear stirrups are against the wall, taking care to avoid scraping the patients back. The rear bearers then scale the wall and drop to the other side and lift their end of the litter off the wall (Figure 9-62). The bearers then resume the four-man carry.

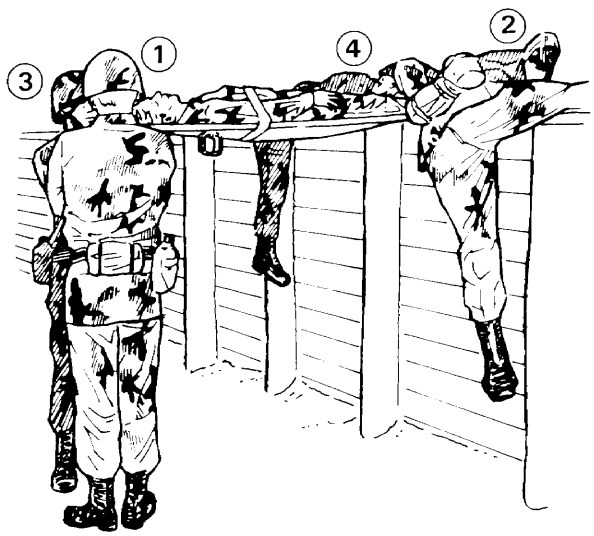


Figure 9-62. Surmounting a high wall.

(3) *Fording streams and crossing deep trenches.*

(a) With the litter squad in position for the four-man carry, the bearers turn and face each other, determining who is the taller of the two at each end of the litter. Together they raise the litter over their heads, keeping it level. If they are in trench, they lift the litter above the top of the trench (Figure 9-63).

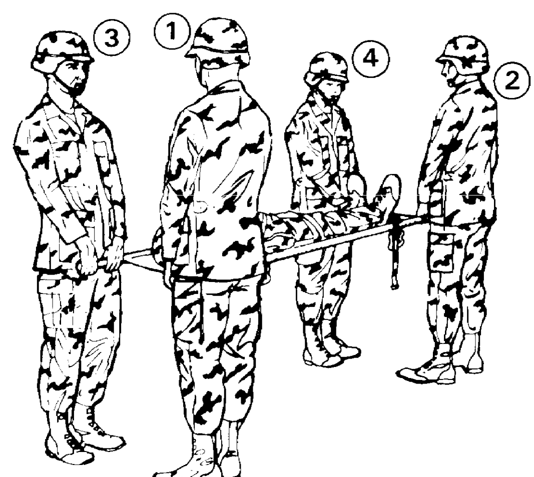


Figure 9-63. Fording streams and crossing deep trenches (overhead carry, step one).

(b) The taller bearer at each end of the litter moves between the handles, facing in the direction of travel and grasps the handles as close to the canvas as possible. The shorter bearer at each end moves under the litter, facing in the direction of travel and grasps the stirrups, which compensate for the differences in height. If all bearers are of equal height, the bearers under the litter grasp the litter poles to the side of the stirrups nearer the ends (Figure 9-64).

NOTE

Should the front bearer step into a hole as they proceed across the stream and release his hold, the other three bearers could keep the litter in position.

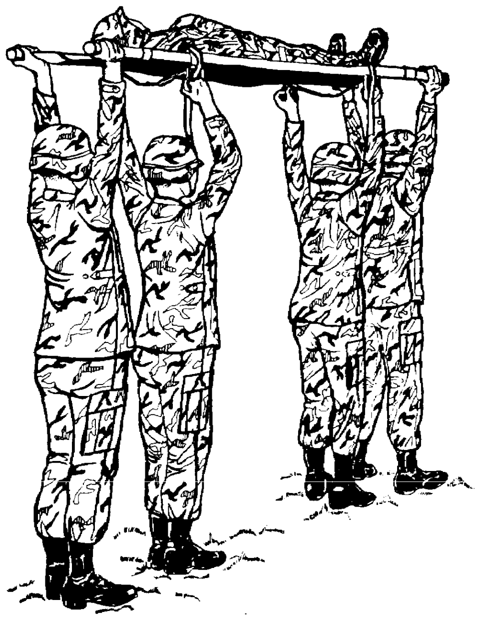


Figure 9-64. Fording streams and crossing deep trenches (overhead carry, step two).

(4) *Carrying a litter patient up a stairwell with small landings.* The steps for this procedure (Figure 9-65) are—

(a) The litter squad proceeds upstairs to the landing with bearers numbers 1 and 3 supporting the head of the litter and bearers numbers 2 and 4 supporting the foot of the litter.

(b) Upon arrival at the landing, bearer number 3 turns facing the head of the litter and supports it while bearer number 1 proceeds several steps up the next flight of stairs. Bearers numbers 2 and 4 raise the foot of the litter until bearer number 1 can grasp the handle released by bearer number 2. Bearer number 2 then moves to the side of the litter.

(c) With bearer number 2 helping bearer number 1 to support the litter, bearer number 1 grasps the handle released by bearer number 4.

(d) Bearer number 4 continues to help support the litter on the side as he moves up the stairs.

(e) Bearer number 4 assists bearer number 3 in carrying the head of the litter while bearer number 2 advances and assists bearer number 1 in carrying the foot of the litter to the next landing.

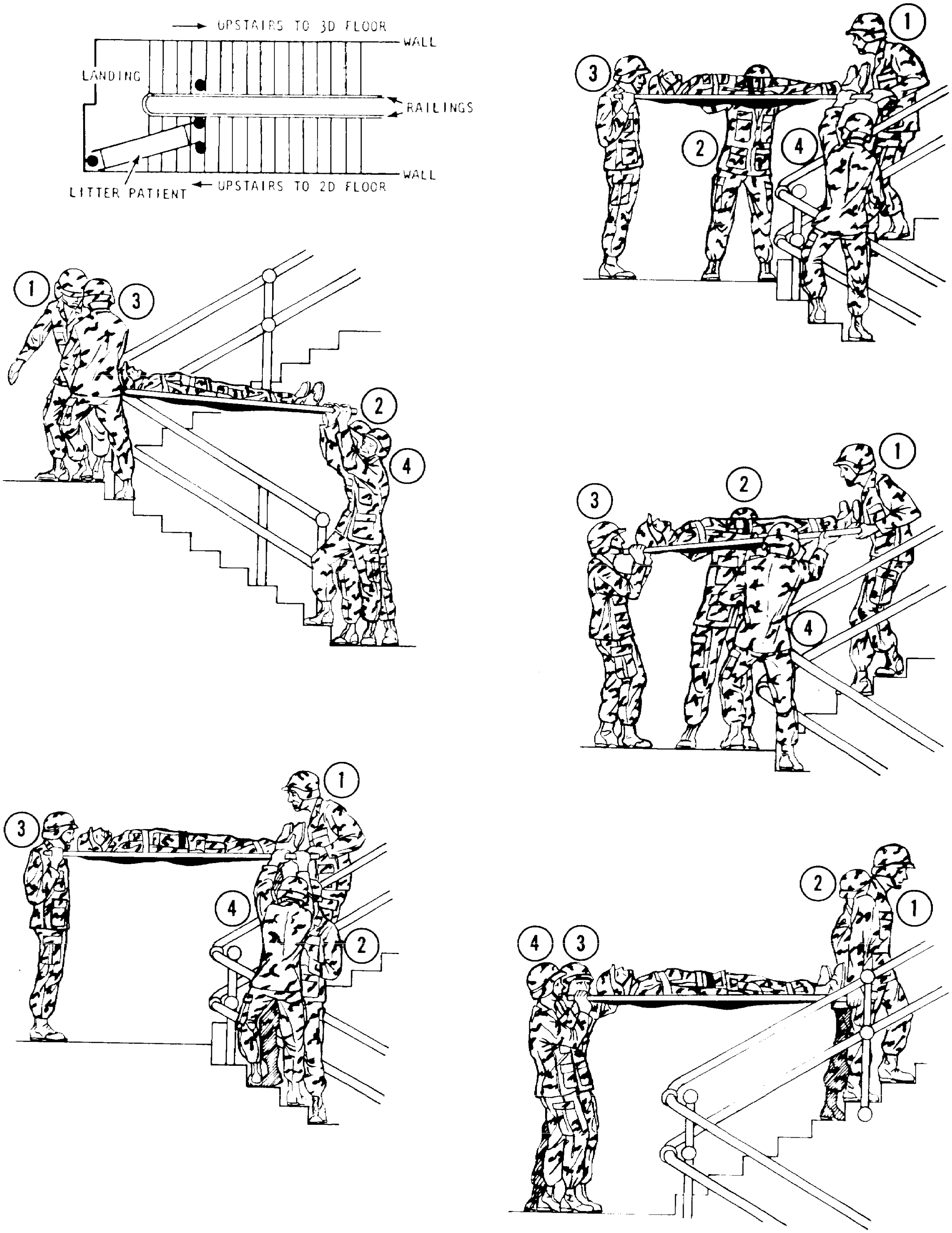


Figure 9-65. Carrying a litter patient up a stairwell with small landings.

(5) *Carrying a litter patient down a stairwell with a small landing.* The steps for this procedure (Figure 9-66) are—

(a) The litter squad proceeds down the steps to the first landing with bearers numbers 1 and 3 supporting the head of the litter and bearers numbers 2 and 4 supporting the foot of the litter.

(b) Upon arrival at the first landing, bearer number 4 turns and faces toward the litter and supports the foot of the litter while bearer number 3 supports the head of the litter. Bearers numbers 1 and 2 descend a few steps to the lower flight of stairs and receives the head of the litter from bearer number 3.

(c) Bearer number 3 moves to the foot of the litter to assist bearer number 4 while bearers numbers 1 and 2 support the head of the litter. They then move down the stairs to the next landing.

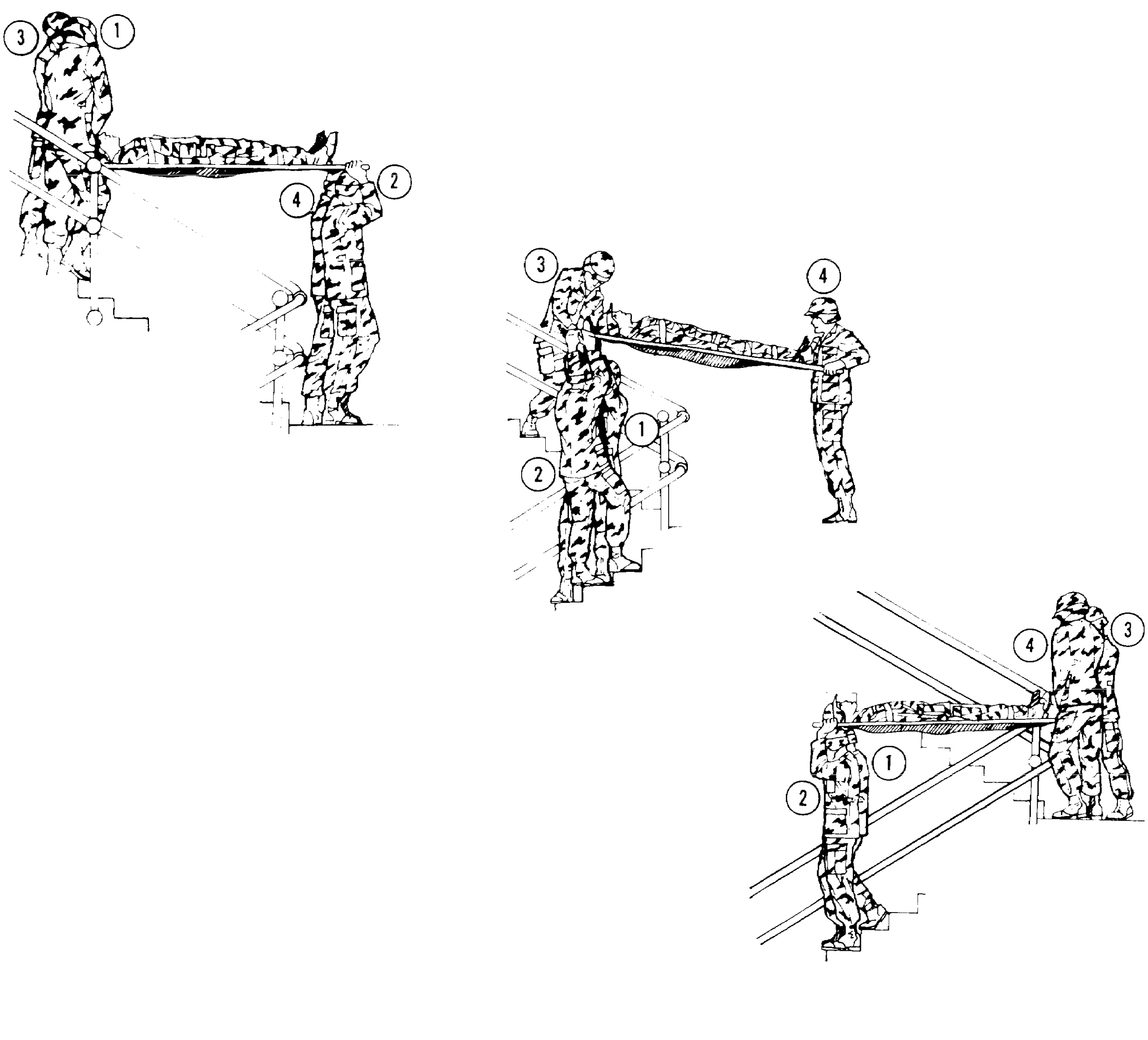


Figure 9-66. Carrying a litter patient down a stairwell with small landings.

CHAPTER 10

EVACUATION PLATFORMS

Section I. ARMY GROUND AMBULANCES

10-1. General

a. Ground ambulances are vehicles designed for or converted to carrying patients. They are organic to HSS units which evacuate sick, injured, and wounded soldiers by ground ambulance. These vehicles are equipped with an MES designed for use in these ambulances.

b. They are staffed with a driver/medical aidman and an additional medical aidman who are both qualified in basic EMT procedures.

c. The Geneva Conventions stipulate that ground ambulances be clearly marked with the distinctive emblem (red cross on a white background). To camouflage or not display this emblem will result in the loss of the protections afforded under these conventions. Guidance on the camouflage of medical units, vehicles, and aircraft on the ground is contained in STANAG 2931 OP (paragraph B-2b).

10-2. Ground Ambulances

Vehicles designed as ambulances include field (wheeled) ambulances, the bus ambulance, and the M113 (track) armored personnel carrier.

a. Military field ambulances, designed for use by field units, operate on paved and secondary roads, trails, and cross-country terrain. Field ambulances operating in the forward areas of the CZ must possess mobility and survivability comparable to the units being supported. Current field ambulance variations include the M1010, HMMWV (M996 and M997), and M113. The M996 and M997 are normally used to evacuate patients from frontline units to BASs. The M792, M170, and M718 are being phased out of the inventory.

b. The bus ambulances are usefuI in transporting large numbers of patients within the COMMZ.

c. The M113, when configured with a litter kit, an NBC kit, and an MES, is classified as a standard evacuation vehicle and is therefore included in this section on ground ambulances.

10-3. Ambulance Driver

The ambulance driver/medical aidman is responsible for the ambulance at all times. He performs driver maintenance on the vehicle and is responsible for reporting major deficiencies to his section chief or supervisor. When an additional medical aidman is not assigned to the vehicle, the driver also performs aidman duties. The driver's responsibilities include—

- Providing maximum safety and welfare for the patients entrusted to his care. This includes ensuring that the patient is secured to the litter prior to loading.

- Ensuring operational readiness and responsiveness. This is accomplished by maintaining and being able to use the authorized equipment aboard the ambulance. This equipment includes—

  - Litters.
  - Blankets.
  - Splints.
  - Medical expendable.
  - Flashlights.
  - Auxiliary fuel.
  - Decontamination equipment.
  - Special medical materials and equipment.

- Preparing the ambulance for loading and unloading.

- Assisting the litter bearers in the loading and unloading of patients.

- Performing property exchange when patients are loaded or unloaded.

- Transporting medical supplies and authorized medical personnel.

- Acting as a messenger in medical channels.

10-4. Medical Aidman

The medical aidman acts as the assistant driver and his duties include—

- Becoming familiar with the condition of each patient being evacuated and reviewing the information on the FMC.

- Coordinating with the individual in charge for any special instructions in the care and treatment of the patients en route.

- Providing EMT as required.

- Making periodic checks of patients while en route.

- Supervising and assisting in the proper loading and unloading of the ambulance.

- Assisting the driver with land navigation and guiding the driver when backing or moving off roads, or when under blackout conditions.

10-5. Ambulance Loading and Unloading

In loading and unloading ambulances, litter patients are moved carefully. Details of the loading and unloading procedures vary slightly depending on the number of bearers, the presence or absence of a medical aidman, and the type of vehicle used.

a. General Procedures.

- Patients are normally loaded head first. The exception is if the nature of the patient's injuries make this inadvisable. They are less likely to experience motion sickness or nausea with the head in the direction of travel. They also experience less noise from the opening and closing of rear doors. There is less danger of injury to the patient if a rear-end collision occurs.

- When a patient requires en route care for an injury to one side of the body, it may be necessary to load him feet first to make the injured side readily accessible from the aisle. Patients with wounds of the chest or abdomen, or those receiving IV fluids are loaded in lower berths to provide gravity flow. For ease of loading and patient comfort, those patients wearing bulky splints should be placed on lower berths, if possible.

b. Instructional Procedures. For loading and unloading the ambulances, the litter bearers are numbered and formal commands are given so that each individual can learn his particular job and work as a team.

(1) *Loading procedures.* The sequence for loading four litter patients in the berths is *upper right, lower right, upper left*, and *lower left*. The most seriously injured are loaded last so they will be the first to be off-loaded. A three-man squad is required to load and unload the ambulance.

(2) *Unloading procedures.* The sequence for unloading the ambulance is the reverse of the loading procedures: *lower left, upper left, lower right*, and *upper right*. A three-man squad is needed to unload the ambulance.

10-6. Truck, Ambulances, 4x4, Armored, M996 and M997

The M996 and M997 armored ambulances are tactical vehicles designed for use over all types of roads, as well as cross-country terrain. It can also operate in all weather conditions (Figure 10-1). These ambulances are diesel-powered and equipped with four-wheel hydraulic service brakes. The ambulances can be heated and ventilated. Only the M997 can be air conditioned. Supplemental electrical power to operate the life support equipment is also available. For operations in an NBC environment, the M996 and M997 ambulances are equipped with a gas-particulate filter unit (GPFU).

a. Patient Carrying Capacities. Refer to Table 10-1 for the various patient carrying capacities.

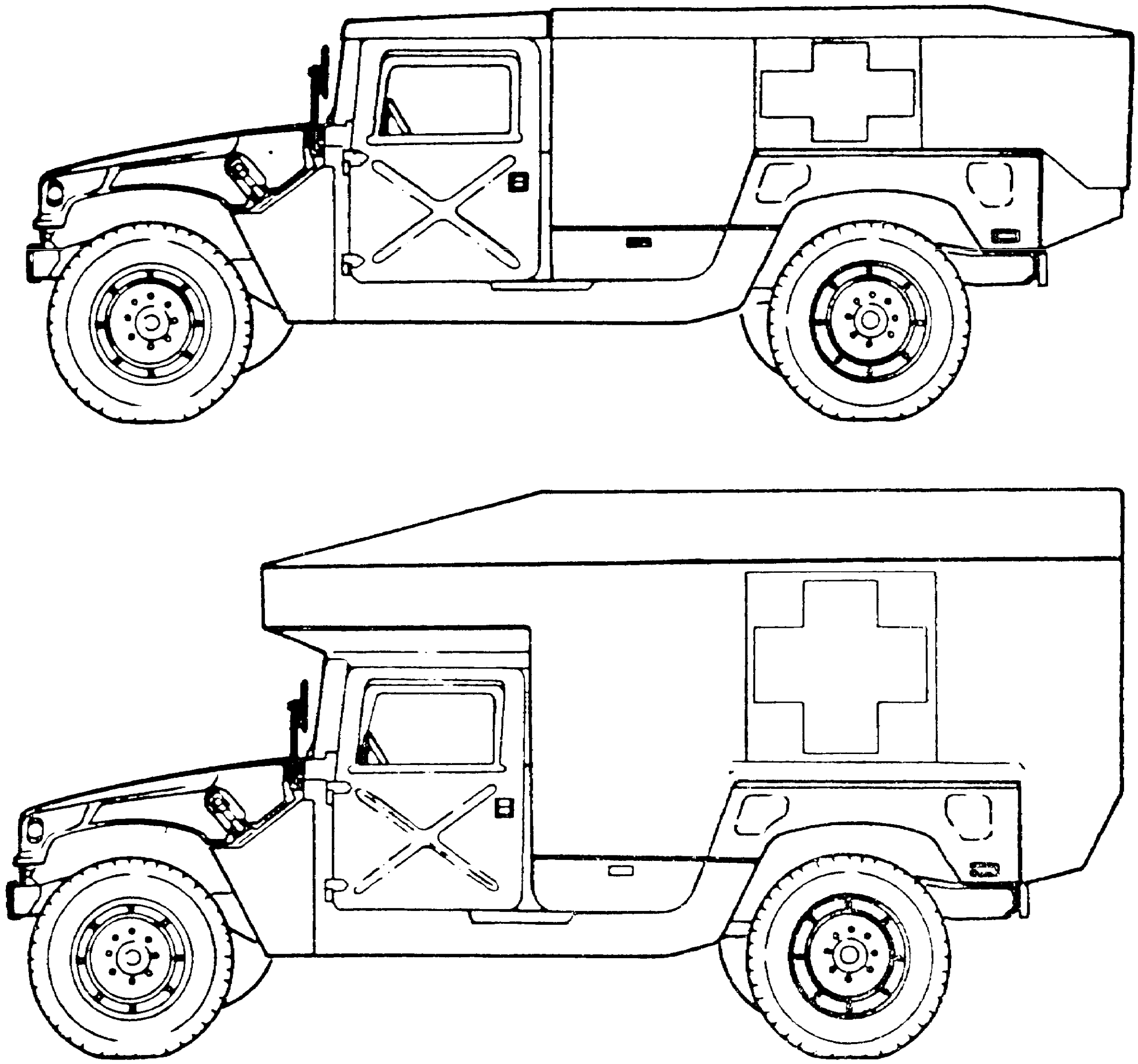


Figure 10-1. Trucks, ambulance, 4x4, armored, (M996 and M997).

Table 10-1. Patient Carrying Capacities.

Truck, Ambulance, 4x4, 2 Litter, Armored (M996)	Truck, Ambulance, 4x4, 4 Litter, Armored (M997)
2 Litter Patients	4 Litter Patients
6 Ambulatory Patients	8 Ambulatory Patients
1 Litter and 3 Ambulatory Patients	2 Litter and 4 Ambulatory Patients

b. Two-Litter Configuration, M996. The sequence for loading patients in the berths is right first then left. The most seriously injured patient is loaded last so that he is the first to be taken out of the ambulance. The sequence for unloading is the reverse of loading.

NOTE

The numbers used in the explanation of the figures correspond to the parts/equipment represented in the graphic.

(1) Assembling litter rail extension (Figures 10-2 and 10-3).

(a) Turn latch (1) counterclockwise and open stowage compartment door (2).

(b) Loosen and disconnect securing strap (3) and remove folded litter rail extension (4) from stowage compartment (5).

(c) Pull left and right rails (6) apart and let legs (11) drop down. Ensure feet (12) are flat on ground.

(d) Lock support braces (13) and adjust straps (14) as necessary.

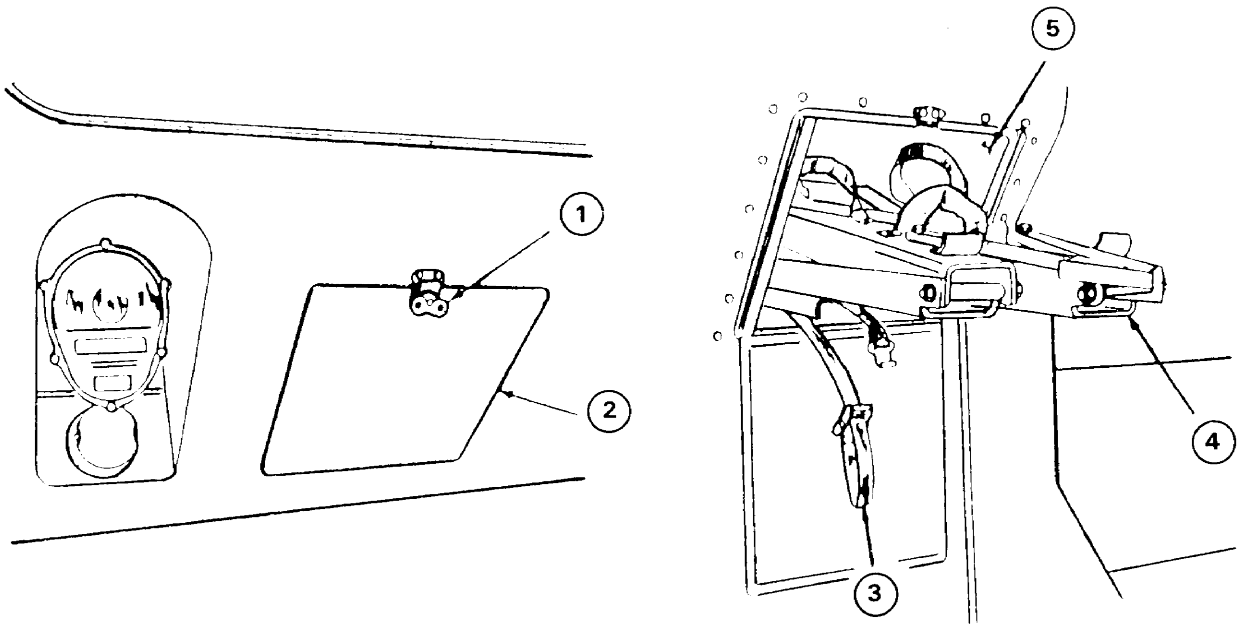


Figure 10-2. Litter rail extension stowage compartment, M996.

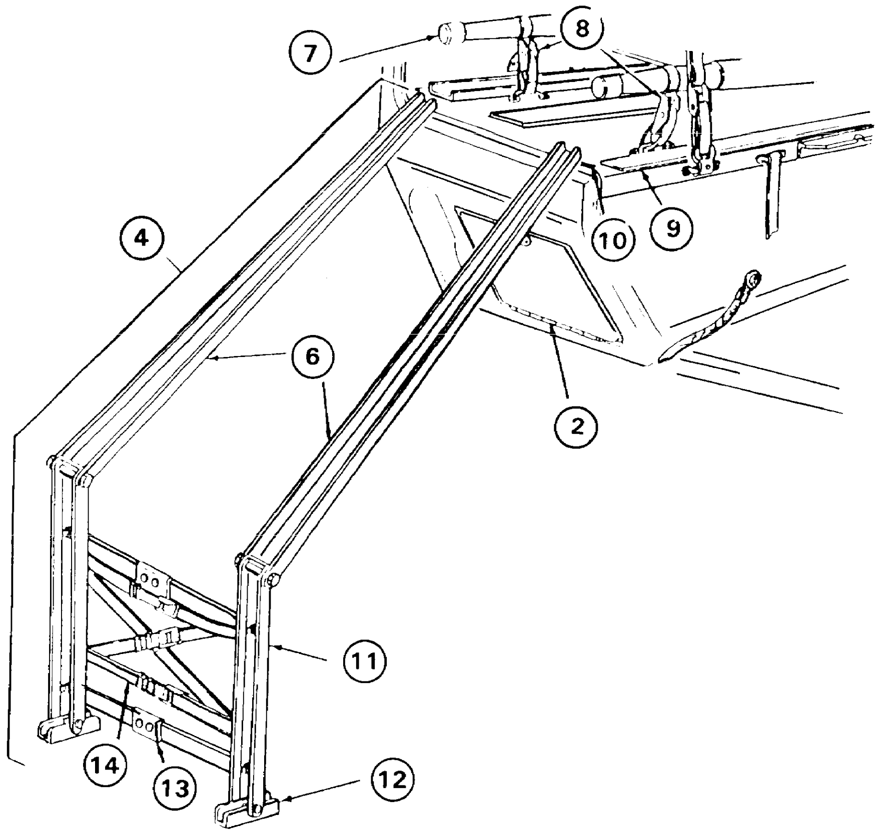


Figure 10-3. Litter rail extension.

(2) *Loading litters on litter rack (Figure 10-3).*

(a) Secure both rails (6) of litter rail extension (4) into slots (10) on litter rack (9).

(b) Place litter (7) on litter rail extension (4).

> **WARNING**
>
> **Ensure straps and equipment do not inhibit litter loading operations. Load litters carefully to prevent patient injury.**

(c) Slide litter (7) onto litter rack (9).

(d) Secure litter (7) to litter rack (9) with front and rear litter handle straps (8).

(3) *Unloading litters from the litter rack (Figure 10-3).*

(a) Release front and rear litter handle straps (8) securing litter (7) to litter rack (9).

(b) Secure both rails (6) of litter rail extension (4) into slots (10) on lower litter rack (9).

(c) Slide litter (7) from lower litter rack (9) onto litter rail extension (4). Lift up and remove litter (7) from litter rail extension (4).

(4) *Fold and stow litter rail extension (Figures 10-2 and 10-3).*

(a) Unlock support braces (13).

(b) Fold left and right rails (6) together.

(c) Fold left and right litter rail legs (11) and feet (12) against rails (6).

(d) Place folded litter rail extension (4) into stowage compartment (5) and secure with strap (3).

(e) Close door (2) and turn latch (1) clockwise to secure door (2).

(5) *Opening patient seat to accommodate ambulatory patients (Figures 10-4 and 10-5).*

(a) Ensure litters are in stowed position.

(b) Pull out and up on seat latch handle (5) and remove latch (7) from catch (6).

(c) Lift seat back (4) to open position and fold seat back support (2) into recesses between seat cushions (9).

(d) Ensure that seat braces (8) are fully extended and locked in position.

(6) *Closing the patient seat to accommodate litter patients (Figures 10-4 and 10-5).*

(a) Press lock buttons (12) on seat braces (8) and fold braces (8) toward seat back (4).

(b) Fold seat back support (2) outward and fold seat back (4) into closed position. Ensure that guide pins (11) on seat back support engage holes (10) in seat base (3).

(c) Install seat back (4) to seat base (3) with seat latch (7) and secure with latch handle (5). If necessary, to ensure security of seat back (4), adjust seat latch (7) to proper length by turning clockwise or counterclockwise.

c. Four-Litter Configuration, M997. The sequence for loading four litter patients in the berths is *upper right, lower right, upper left,* and *lozuer left.* The most seriously injured patients are loaded last so they are the first to be taken out of the

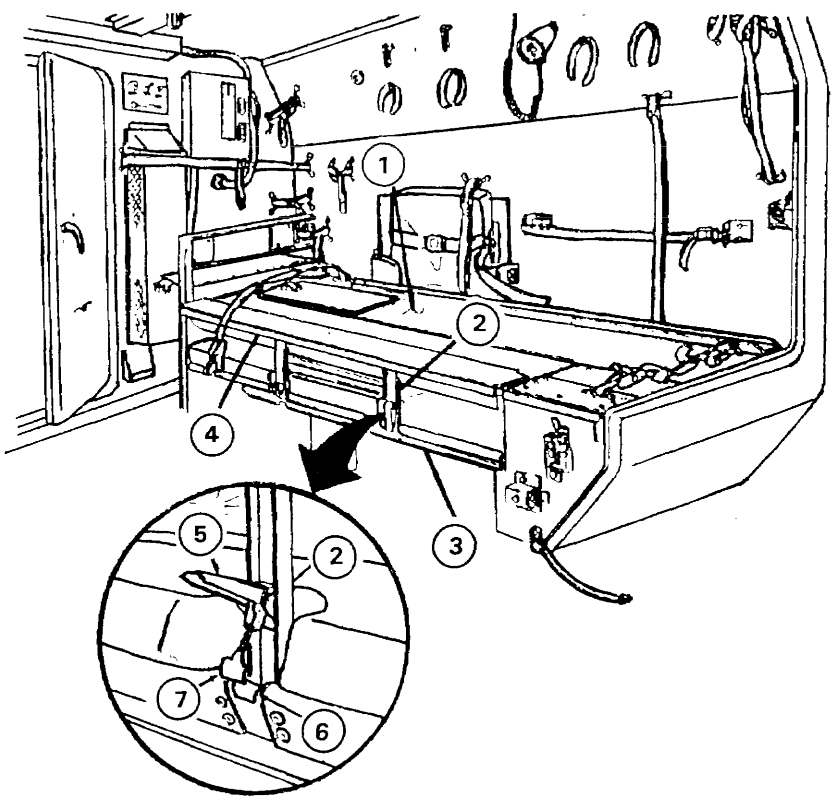


Figure 10-4. Litter rack (ambulatory patient seat down position).

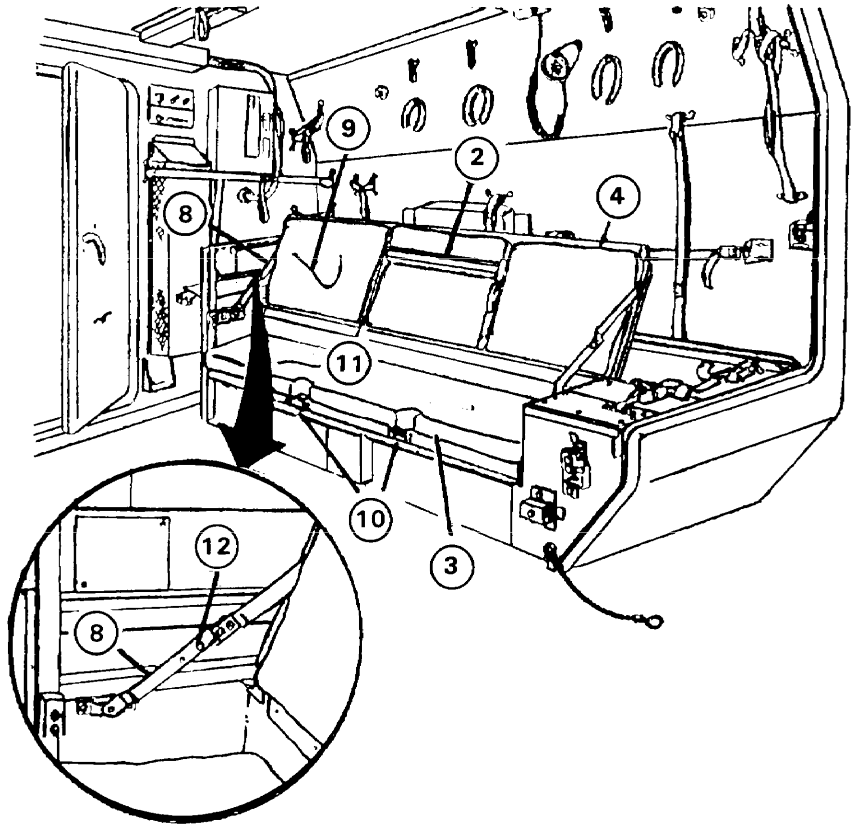


Figure 10-5. Litter rack (ambulatory patient seat open position).

ambulance. The sequence for unloading is the reverse of the loading procedure: lower *left, upper left, lower right,* and *upper right. When only two litter patients are to be loaded the upper and lower right side berths are used.* Using the two right side berths leaves the left side unoccupied for use in transporting ambulatory or *additional litter patients.*

NOTE

When patients are picked up from several locations, the loading sequence of least seriously injured patient to most seriously injured patient cannot always be applied. *A previously loaded patient should not be unloaded in order to maintain the loading sequence.* The receiving MTF must be made aware of the most seriously injured patients.

WARNING

When loading more than two litter patients, the upper litter rack patients must be loaded first. Injury may result if litter patients are loaded in lower rack first.

(1) *Preparing the upper litter rack (Figure 10-6).*

(a) Unhook tension strap (23) from footman loop (30) on lower litter rack (9).

(b) Pull out upper litter rack handle (17) and support weight of upper litter rack (21).

> **WARNING**
>
> **The rear end of the upper litter must be supported before releasing the suspension strap hook. Injury to personnel may result if rear end of upper litter is not supported.**

(c) Unhook rear suspension strap hook (27) from loop (22) on upper litter rack (21). Clip suspension strap hook (27) to eye (26).

(d) Release litter support latch stop (25), push latch (24) in, and lower upper litter rack (21) onto lower litter rack (9).

(e) Slide litter rack handle (17) into upper litter rack (21).

(2) *Assembling litter rail extension (Figures 10-3 and 10-7).*

(a) Turn latch (1) counterclockwise and open stowage compartment door (2).

(b) Loosen and disconnect securing strap (3) and remove folded litter rail extension (4) from stowage compartment (5).

(c) Lift tray (15) slightly and push in tray supports (16) to lower tray (15) for access to stowed litters.

(d) Pull left and right rails (6) apart and let legs (11) drop down. Ensure feet (12) are flat on ground.

(e) Lock support braces (13) and adjust straps (14) as necessary.

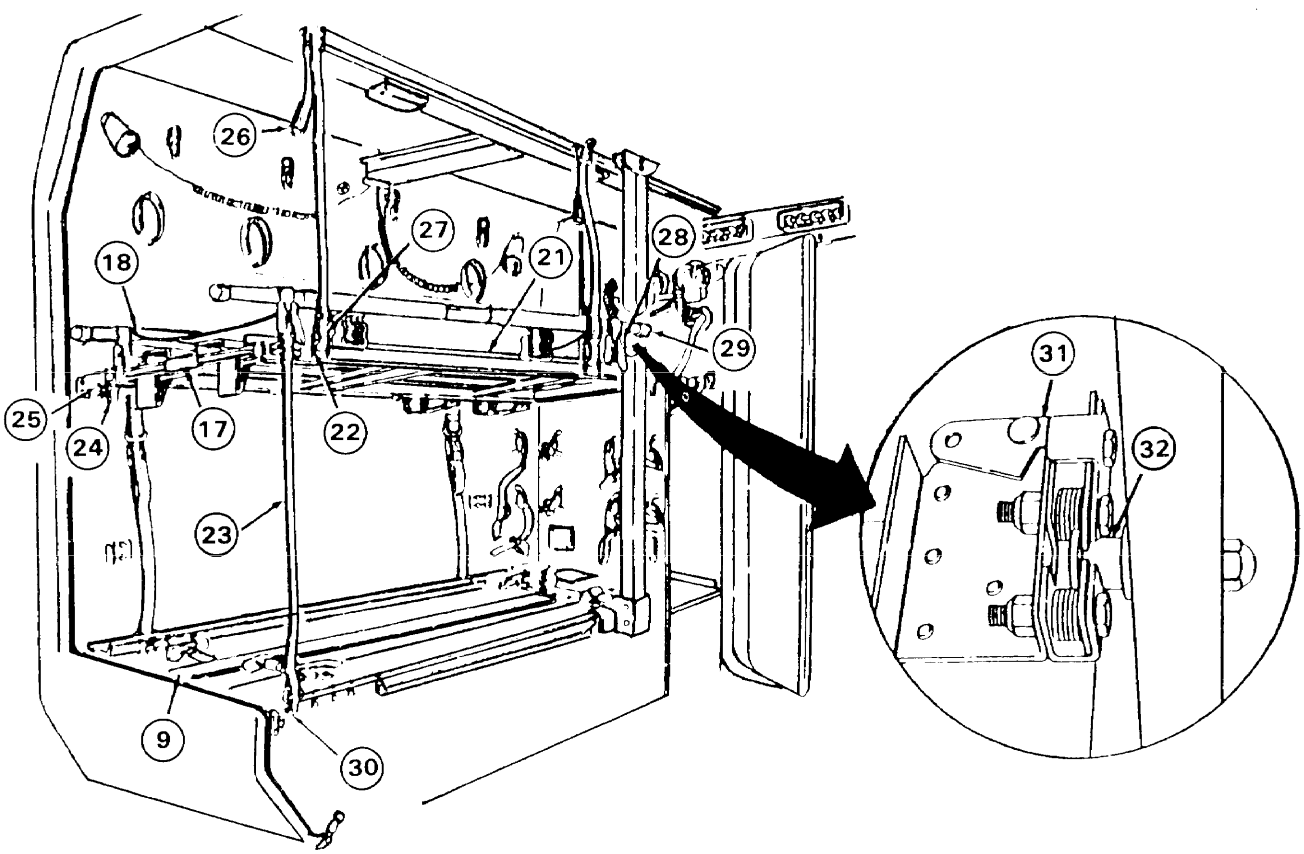


Figure 10-6. Interior, M997.

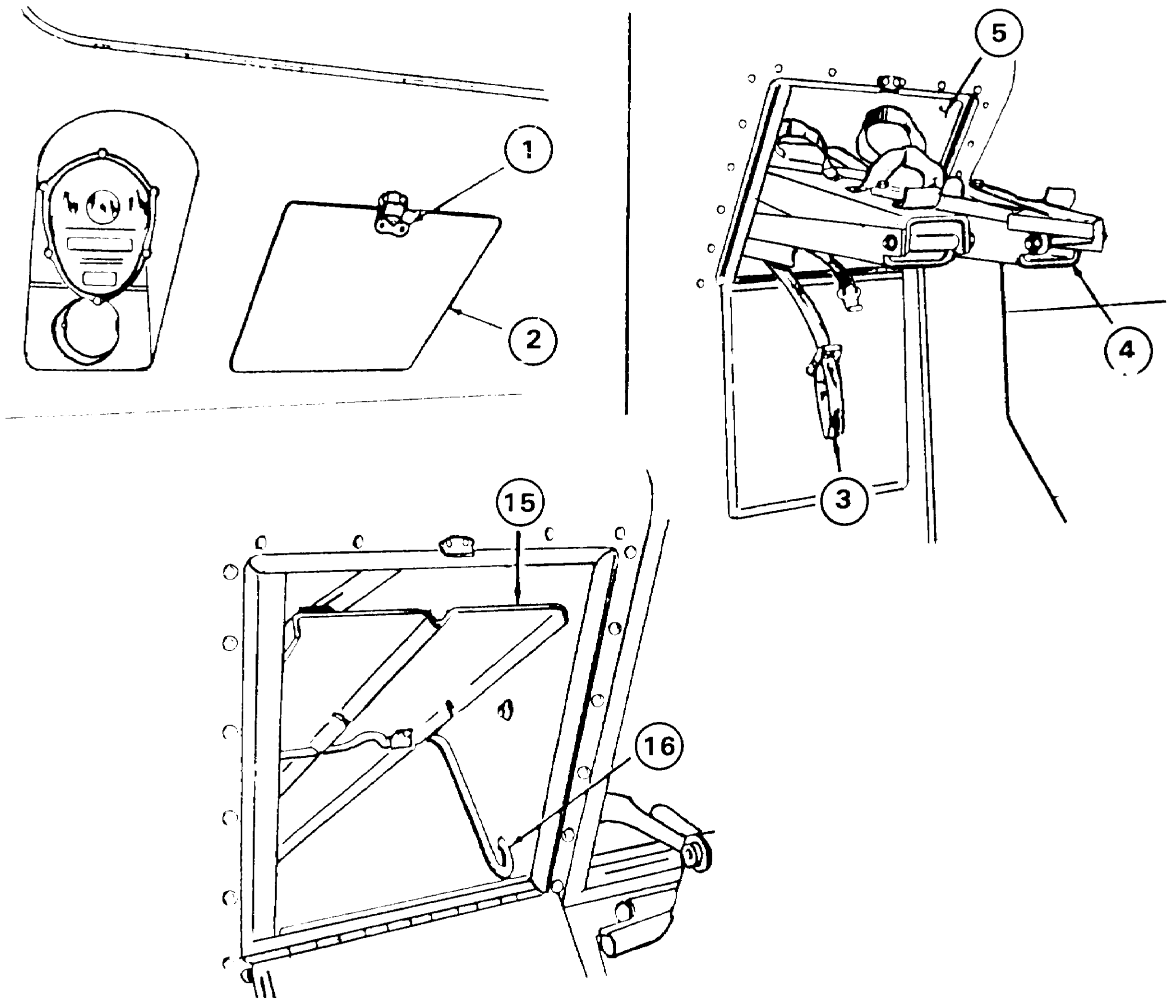


Figure 10-7. Litter rail extension stowage compartment, M997.

(3) *Loading litters on upper litter racks (Figures 10-6 and 10-8).*

(a) Secure both rails of litter extension (4) into slots in upper litter rack (21).

(b) Place litter (18) on litter rail extension (4).

(c) Slide litter (18) up rails (4) until litter (18) is clear of litter rail extension (4).

(d) Secure rear litter handles (19) to upper litter rack (21) with rear litter handle straps (20).

(e) Remove litter rail extension (4) from upper litter rack (21).

(f) Unhook suspension strap hook (27) from eye (26).

(g) Pull out upper litter rack handle (17).

(h) Raise upper litter rack (21), push into litter support latch (24), and secure with latch stop (25).

(i) Attach suspension strap hook (27) to loop (22) on upper litter rack (21).

(j) Secure front litter handles (29) to litter rack (21) with front litter handle straps (28).

(k) Hook tension strap (23) to footman loop (30) on lower litter rack (9) and adjust strap.

(l) Slide litter rack handle (17) into upper litter rack (21).

(4) *Loading litters on lower litter rack (Figure 10-3).*

(a) Secure both rails (6) of litter rail extension (4) into slots (1 O) on lower litter rack (9).

(b) Place litter (7) on litter rail extension (4).

(c) Slide litter (7) onto lower litter rack (9).

(d) Secure litter (7) to lower litter rack (9) with front and rear litter handle straps (8).

(5) *Unloading litters from the lower litter rack (Figure 10-3).*

WARNING

When unloading more than two litter patients, lower litter rack patients must be unloaded first.

Ensure that straps and equipment do not inhibit unloading operations. Unload litters carefully to prevent patient injury.

(a) Release front and rear litter handle straps (8) securing litter (7) to lower litter rack (9).

(b) Secure both rails (6) of litter rail extension (4) into slots (10) on lower litter rack (9).

(c) Slide litter (7) from lower litter rack (9) onto litter rail extension (4). Lift up and remove litter (7) from litter rail extension (4).

(6) *Unloading litters from upper litter racks (Figure 10-6 and 10-8).*

(a) Release front litter handle straps (28) from litter handles (29).

(b) Unhook tension strap (23) from footman loop (30) on lower litter rack (9).

(c) Pull out upper litter rack handle (17) and support weight of upper litter rack (21).

(d) Unhook rear suspension strap hook (27) from loop (22) on upper litter rack (21). Clip suspension strap hook (27) to eye (26).

(e) Release litter support latch stop (25), push latch (24) in, and lower upper litter rack (21) onto lower litter rack (9).

(f) Slide litter rack handle (17) into upper litter rack (21).

(g) Secure rails of litter rail extension (4) into slots in upper litter rack (21).

(h) Release rear litter handle straps (20) from litter handles (19).

(i) Slide litter (18) down litter rail extension (4) until litter (18) is clear of upper litter rack (21).

(j) Lift and remove litter (18) from litter rail extension (4).

(k) Remove litter rail extension (4) from upper litter rack (21).

(7) *Fold and stow litter rail extension (Figure 10-3 and 10-7).*

(a) Unlock support braces (13).

(b) Fold left and right rails (6) together.

(c) Fold left and right litter rail legs (11) and feet (12) against rail (6).

(d) Lift tray (15) and push tray supports (16) in, and lower tray (15).

(e) Slide litters into stowage compartment (5) on top of lift tray (15). Pull out supports (16) to place lift tray (15) in raised position.

(f) Place folded litter rail extension (4) into stowage compartment (5) and secure with strap (3).

(g) Close door (2) and turn latch (1) clockwise to secure door (2).

(8) *Folding upper litter rack to the backrest position (Figure 10-6).*

(a) Unhook litter rack tension strap (23) from lower litter rack footman loop (30).

(b) Unhook two upper litter rack suspension straps hooks (27) from loops (22) on upper litter rack (21) and reattach strap hooks (27) to eyes (26).

(c) Release upper litter rack latch (31) and disengage rack striker (32) from latch (31).

(d) Lower upper litter rack (21) onto the lower litter rack (9), forming a backrest.

(9) *Converting backrest to upper litter rack (Figure 10-6).*

(a) Raise upper litter rack (21) and engage rack striker (32) into upper litter rack latch (31). Ensure striker (32) is locked in latch (31).

(b) Unhook two upper litter rack suspension strap hooks (27) from eyes (26) and hook to loops (22) on upper litter rack (21).

(c) Hook upper litter rack tension strap (23) to footman loop (30) on lower litter rack (9).

(d) Adjust straps (23) and (27) for proper tension.

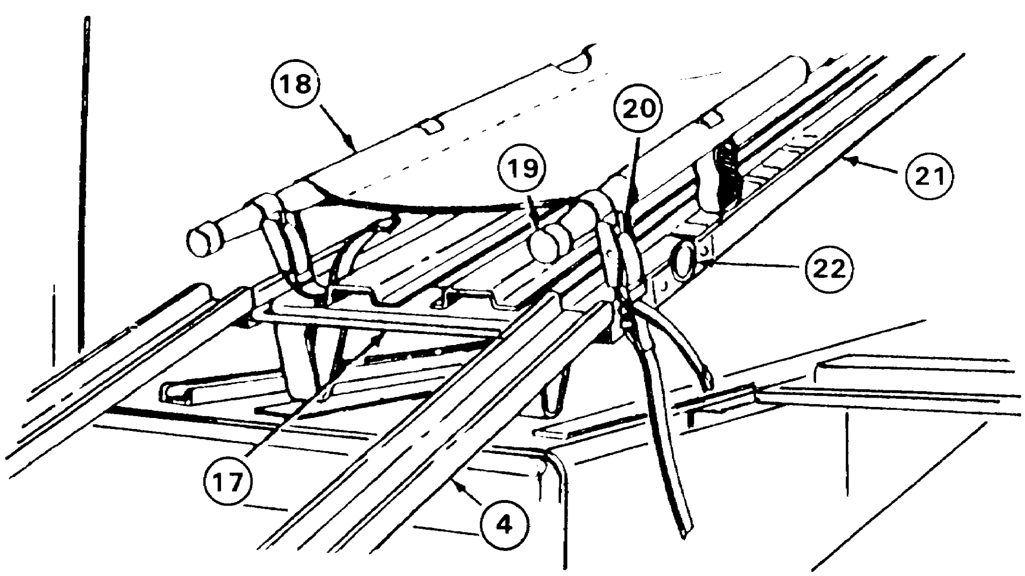


Figure 10-8. Upper litter rack.

10-7. Truck, Ambulance, 1¼ Ton, 4x4, M1010

The M1010 truck, ambulance, (Figure 10-9) is a diesel-powered vehicle equipped with power steering and brakes and automatic transmission. It can accommodate up to four litter or eight ambulatory patients, or a combination of each. The vehicle has a patient assist boom, and block and tackle for loading. An improved patient life support capability is provided by four additional focus-type lights, air conditioning, optional GPFU for NBC protection, and supplemental electrical power to operate the life support equipment. The M1010 also has additional storage space between the litter berths and vehicle cab. The loading sequence is *upper right, lower right, upper left,* and *lower left.* In an emergency or mass casualty situation, one additional litter can be placed in the center aisle.

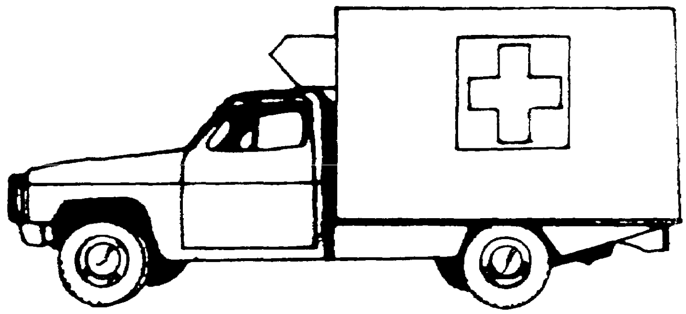


Figure 10-9. Truck, ambulance, 1 1/4 ton, 4x4, M1010.

10-8. Truck, Ambulance, 1¼ Ton, 6x6, M792

The M792 truck, ambulance, can accommodate three litter patients and a medical attendant (Figure 10-10), two litter patients, three ambulatory patients, and a medical attendant (Figure 10-11), or six ambulatory patients. Due to the ride characteristics of the vehicle, all litter patients must be securely strapped in place. The sequence for loading the berths is *upper right, upper left,* and *lower,* with the unloading sequence accomplished in reverse order. A two-man squad is required for loading and unloading the vehicle.

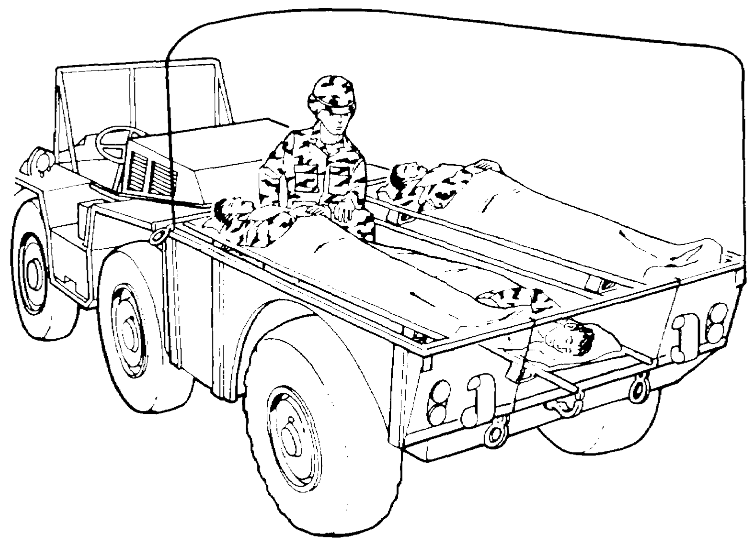


Figure 10-10. Truck, ambulance, 1 1/4 ton, 6x6, M792, with three litter patients and a medical attendant.

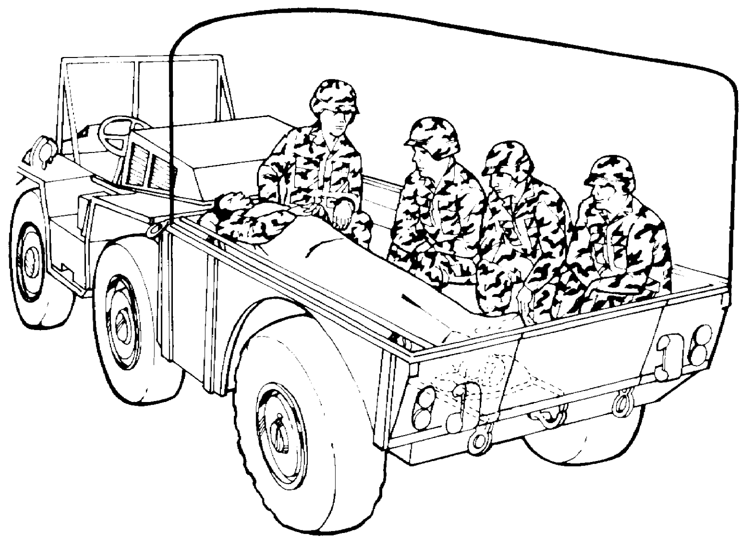


Figure 10-11. Truck, ambulance, 1 1/4 ton, 6x6, M792, with two litter patients, three ambulatory patients, and a medical attendant.

10-9. Truck, Ambulance, ¼ Ton, 4x4, M718, Frontline

The M718 truck ambulance (Figure 10-12), has no storage compartment, blackout curtains, or additional lights. A three-man squad is required for loading and unloading the vehicle, which can safely accommodate a driver and three or four other persons. This vehicle can be configured for—

a. Three litter patients in the upper left, upper right, and center berths. In this situation, the attendant must remain at the pickup site since the right front seat is placed against the instrument panel to make space for the upper right and center berths. This allows the driver to observe the most severe patients.

b. Two litter patients in the upper right and center berths and one ambulatory patient and the attendant seated on the left side. When the center berth (placed diagonally) is occupied, seating space on the left side is adequate for only two persons.

c. The attendant in right front seat and three ambulatory patients seated on the left side. The right side is used to store unused berths and litters.

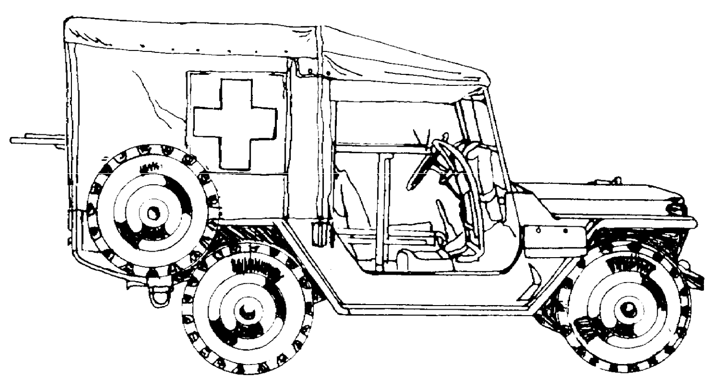


Figure 10-12. Truck, ambulance, 1/4 ton, 4x4, M718, frontline.

10-10. Truck, Ambulance, ¼ Ton, 4x4, M170, Frontline

The M170 ambulance (Figure 10-13) has no storage compartment, blackout curtains, or additional lighting. It can accommodate three litter patients, two litter patients and three ambulatory patients, or five ambulatory patients. A three-man squad is required for loading and unloading, The sequence for loading three litter patients in the berths is *upper right, lower right,* and *left.*

> **CAUTION**
>
> **Serious accidents can occur from overloading this ¼-ton vehicle. It is a modification of the Ml51 utility vehicle and is not designed to carry heavy loads.**

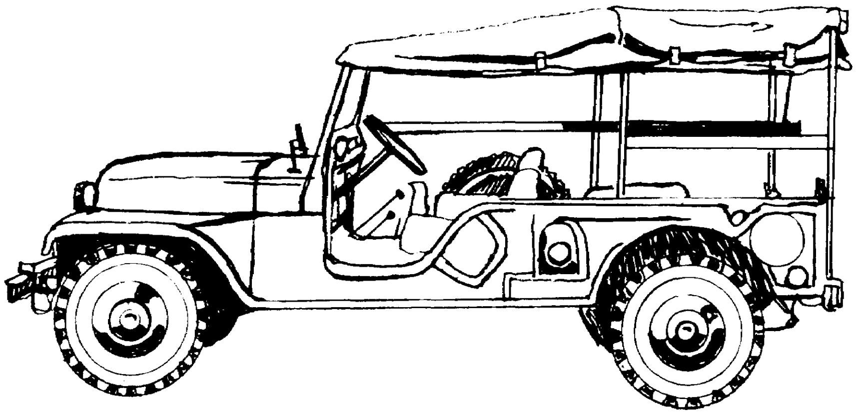


Figure 10-13. Truck, ambulance, 1/4 ton, 4x4, M170, frontline.

10-11. Buses (Ambulances)

These vehicles can be rapidly converted into ambulances (Figures 10-14 and 10-15). They can be used in support of the Army in the field as far forward as the road network and tactical situation permit. They are most useful in situations where a large number of patients are to be transported for relatively short distances over improved roads, such as transferring patients from hospitals to airheads and ports of embarkation.

a. Patient Carrying Capacity. Ambulance buses have various patient carrying capacities. Total capacity for litter and ambulatory patients depends on the size of the available bus. A kit containing the necessary accessories for conversion is located in the compartment on the right outside of the bus body.

b. Vehicle Conversion. To convert the bus to an ambulance, it may be necessary to remove all seats except those immediately behind the driver. The seats behind the driver are used for medical attendants or ambulatory patients, Litter support hooks are inserted in brackets located at the top and bottom on the interior of the body side. Litter support hangers are then suspended from the hooks in the ceiling rails. To return the vehicle to passenger operation, the procedure is reversed. In some buses, conversion can be done by folding down the seat backs.

c. Loading Procedures. Normally, two three-man litter squads are required to load and unload the bus ambulance. The vehicle is loaded from front to rear and from top to bottom. All patients are loaded into the bus with their heads toward the front of the vehicle unless the injury dictates using a different loading technique.

(1) *Loading from ramps or platforms.* Two litter teams are required to load the bus. One litter team enters the rear of the bus with a litter patient, loads the patient on the berth, and exits through the front as the second team enters through the rear with a litter patient. The second team loads its patient and exits through the front as the first team enters the rear with its second patient. Only one of the teams is in the bus at a time, thereby avoiding interference.

(2) *Loading without ramps or platforms.* Two litter teams are used to load the bus from the ground. One litter team remains in the bus. A second litter team loads patients onto the bus floor at the rear of the bus where they are picked up by the team in the bus and loaded onto berths.

d. Unloading Procedures. Patients are unloaded (in reverse order of loading procedure) *from rear to front* and *from bottom to top.* Two litter teams are also required to unload the bus.

(1) When the vehicle is to be unleaded from loading ramps or platforms, the two litter teams alternate in unloading.

(2) When the vehicle is to be unloaded without ramps, one litter team removes the litter patients from the berths in the bus and places them on the floor at the rear of the bus where they are picked up and unloaded by the second litter team.

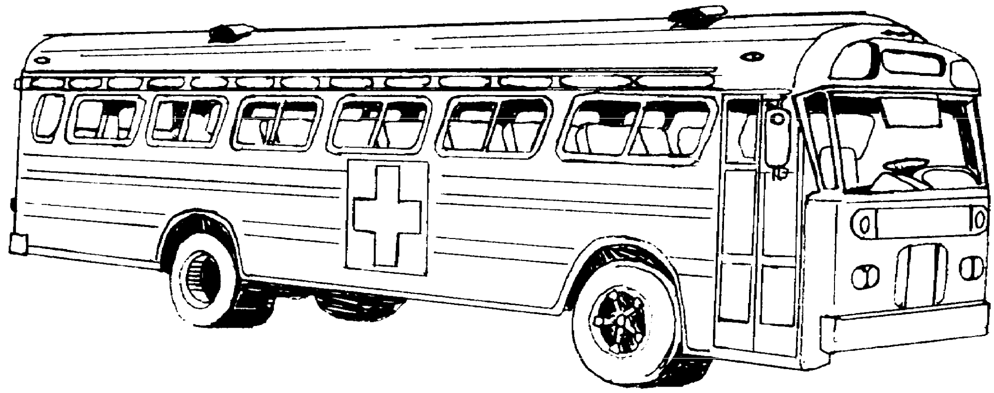


Figure 10-14. Bus ambulance, exterior view.

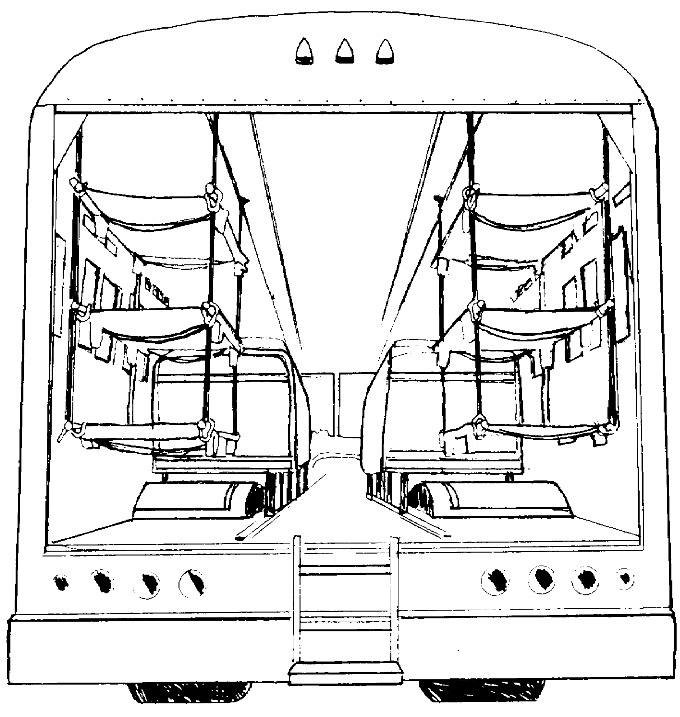


Figure 10-15. Bus ambulance, interior view, seats removed and litters installed.

10-12. Carrier, Personnel, Full-Tracked, Armored, M113, T113E2

The Ml 13 armored personnel carrier (Figure 10-16) is a standard evacuation vehicle. It is lightly armored to afford patient protection against small arms. Wearing the helmet inside the vehicle provides added protection, especially over rough terrain, due to the low silhouette. Movement of the tracks propels and steers the vehicle. It is highly maneuverable and capable of—

- Amphibious operations on inland lakes and streams.
- Extended cross-country travel over rough terrain.
- High-speed operations on improved roads and highways.

a. The vehicle can carry ten ambulatory patients and has a conversion kit which, when installed, gives a normal capacity of four litter patients.

b. A squad of four men is needed to load and unload the vehicle. The sequence for loading four litter patients is *upper right*, *lower right*, *upper left*, and *lower left*.

CAUTION

To install the litter suspension kit in the Ml 13 ambulance, the span liner must be removed. Litter patients *cannot* be safely moved if the litter suspension kit is not installed.

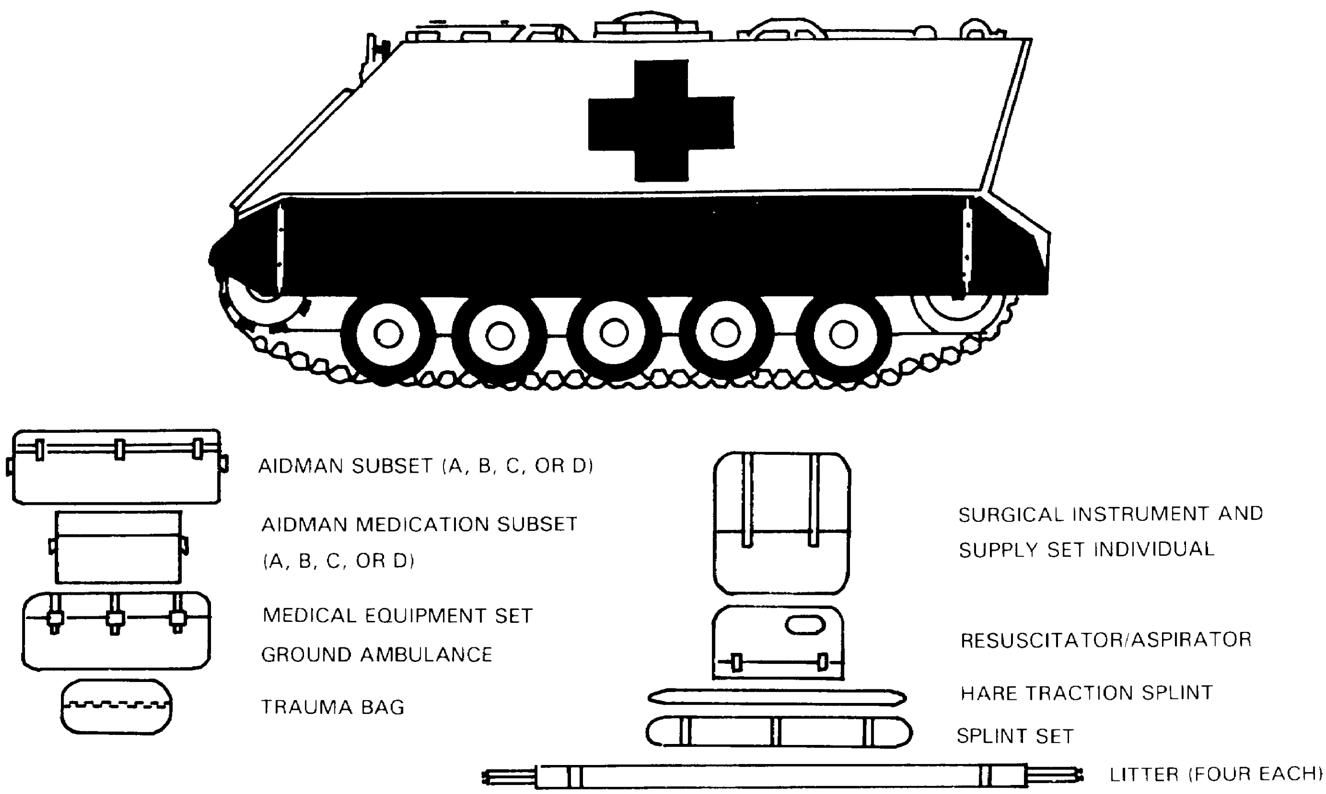


Figure 10-16. Carrier, personnel, full-tracked, armored, M113.

Section II. NONMEDICAL VEHICLES USED FOR CASUALTY TRANSPORT AND MEDICAL EVACUATION

10-13. General

a. In combat areas, ambulances are often unavailable, are too few in number, or are incapable of evacuating patients over certain types of terrain. In these instances, many vehicles available to most units can be used to transport casualties with little or no change in their configuration. Some amphibious cargo and personnel vessels can be used for this purpose; however, their patient-carrying capacity varies.

b. When casualties have entered the HSS system, they are classified as patients. Patient evacuation includes providing *en route medical care* to the patient being evacuated. However, if a casualty is moved on a nonmedical vehicle without en route medical care, he is considered to be *transported* not *evacuated.*

10-14. Casualty Transport and Patient Evacuation in a Mass Casualty Situation

To provide timely and responsive evacuation or casualty transport, HSS planners develop proactive OPLANs to meet the challenges of a mass casualty situation.

- Contingency plans should identify—
  - Nonmedical transportation resources.
  - Evacuation routes.
  - Ambulance exchange points.
  - Medical personnel resources to provide en route medical care on nonmedical vehicles.
  - Capabilities and locations of MTFs.
  - Communications frequencies and call signs for command and control.
  - Procedures for medical equipment exchanges.
- Key players in coordinating the use of nonmedical vehicles for medical evacuation or casualty transportation are contained in Table 4-2.

a. Ground nonmedical assets can be used for casualty transport when the medical evacuation system is overwhelmed. All available ground vehicles should be considered for augmenting medical evacuation assets in an emergency. The key to success is identifying the vehicles, drivers, and medical personnel or combat lifesavers who will accompany the casualties. Coordinating for the release of these assets upon demand rather than waiting for a mass casualty situation to occur is also crucial to the success of the operation. Vehicle types will differ depending upon the type of unit supported; however, some of the more common vehicles which may be used are the—

- Bradley infantry fighting vehicle, M2/3.
- Light weapons carrier, M274.
- Truck, cargo, 1¼ ton, M880/890 and M1008.
- Truck, cargo, 2½ ton, M35.
- Truck, cargo, heavy expanded, mobility tactical truck (HEMTT), 8x8, cargo, M977.
- Semi-trailer, cargo, 22½ ton, M871.
- Truck, cargo, 5 ton.
- Truck, utility, M151.
- Armored personnel carrier, M113.
- Tractor, 5 ton, with stake and platform trailer.
- High-mobility, multi-purpose wheeled vehicle, M998.

b. Depending on the theater of operations, host-nation support agreements may provide evacuation assets ranging from austere to extensive support. Coordination with the G5 can provide information on the availability of assets. This information should be included in the OPLANs. Some of the types of assets which might be available for support are—

- Buses.
- Ambulance railcars (Chapter 3).
- Barges and other watercraft (Chapter 5).
- Civilian cargo vehicles.

c. The staffing of nonmedical vehicles with medical personnel to provide en route medical care requires considerable planning and coordination. Since nonmedical vehicles are normally ones of opportunity, attendants, medical equipment, and transportation platforms must be carefully tracked if they are to be used. The modular medical system lends itself well to this form of task organizing by providing four-man trauma treatment teams with equipment organic to the FSMCs and MSMCs. These same treatment modules are also found in the corps ASMCs. Health service support managers should plan to use these assets in this temporary role. Also available within the CS and CSS units of the division are trained combat lifesavers and their MES (aid bags). These personnel can be used, if available, to provide en route surveillance of less seriously injured patients.

d. The management of patient evacuation using nonmedical evacuation assets is difficult to control. Overevacuation occurs routinely unless controls are implemented to manage the evacuees by patient category. Responsive evacuation is extremely important; however, if en route patient care and management by patient category are ignored, the end result will be an increase in the mortality rate and an overevacuation of RTD soldiers. URGENT and URGENT-SURG precedence patients should be evacuated before PRIORITY, ROUTINE, or CONVENIENCE precedence patients. Care must be taken to ensure lower precedence patients are evacuated before their medical condition begins to deteriorate resulting in upgrading their precedence to URGENT or URGENT-SURG, The preferred means of evacuating URGENT and URGENT-SURG precedence patients is by air ambulance, If ground ambulance is used for URGENT and URGENT-SURG patients, the patients must be checked frequently to ensure that their medical condition is not deteriorating and rendering them nontransportable. Planners should consider and incorporate into the OPLAN the use of nonmedical air assets and dedicated ground ambulances to move the PRIORITY patient, and nonmedical ground vehicles to move the ROUTINE precedence patients when dedicated medical vehicles are not available. Every effort should be made to staff and equip nonmedical vehicles used for patient evacuation with medical personnel, even if only to move the ROUTINE patient precedence category.

e. Coordination for the use of nonmedical transportation resources is depicted in Table 10-2.

Table 10-2. Coordination Requirements for Nonmedical Transportation and Medical Augmentation to Provide En Route Medical Care

ELEMENT REQUIRING SUPPORT	TYPE OF TRANSPORTATION	COORDINATE TRANSPORTATION WITH	MEDICAL AUGMENTATION FOR EN ROUTE MEDICAL CARE COORDINATED WITH
Company Aid Post	Ground	Company	Battalion Aid Station
Battalion Aid Station	Ground	Maneuver Battalion S4	*FSMC
Clearing Station (BSA)	Ground	DMOC-MCO DMOC	*MSMC *MSMC
	Air	G3 Air	
Clearing Station (DSA)	Ground	DMOC-MCO DMOC	*Corps Med Gp/Bde ASMB Unit
	Air	G3 Air	*Corps Med Gp/Bde ASMB Unit
Engineer Battalion Company	Ground	FSB Spt Ops FSB Spt Ops	*FSMC/*MSMC *FSMC/*MSMC
	Air	G3 Air	
Field Artillery Battalion/ Battery	Ground	FSB/MSB Spt Ops FSB/MSB Spt Ops	*FSMC/*MSMC
	Air	G3 Air	*FSMC/*MSMC
Other Units without organic medical support operating in division area	Ground	DMOC-MCO Corps MCT DMOC	*FSMC/*MSMC *FSMC/*MSMC
	Air	G3 Air	

*In coordination with DMOC, if applicable.

LEGEND:

ASMB:	area support medical battalion
BSA:	brigade support area
DSA:	division support area
DMOC:	division medical operations center
DTO:	district transportation office
FSB:	forward support battalion
FSMC:	forward support medical company
MCO:	movement control officer
MCT:	movement control team
MSB:	main support battalion
MSMC:	main support medical company

10-15. Carrier, Light Weapons, Infantry, ½ Ton, 4x4, M274

This vehicle is designed to carry light cargo over rough terrain at slow speeds. This vehicle has a very low silhouette. The vehicle consists of a platform on which the driver's seat is mounted. The small size and cross-country mobility of this vehicle make it a good choice for a casualty carrier for forward units (Figures 10-17 through 10-19). It is easily loaded with litters; however, the casualties must be lashed securely to the litters and the litters must be secured to the vehicle. The carrier can transport as many as three litter casualties, placed across the body of the vehicle. The most satisfactory method of using this vehicle for transporting casualties is to place two litters lengthwise on the vehicle. A two-man team is used for loading.

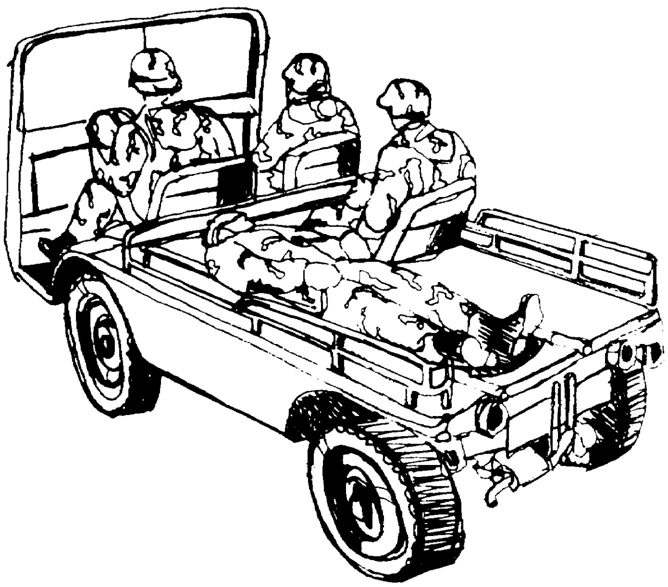


Figure 10-17. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting one patient.

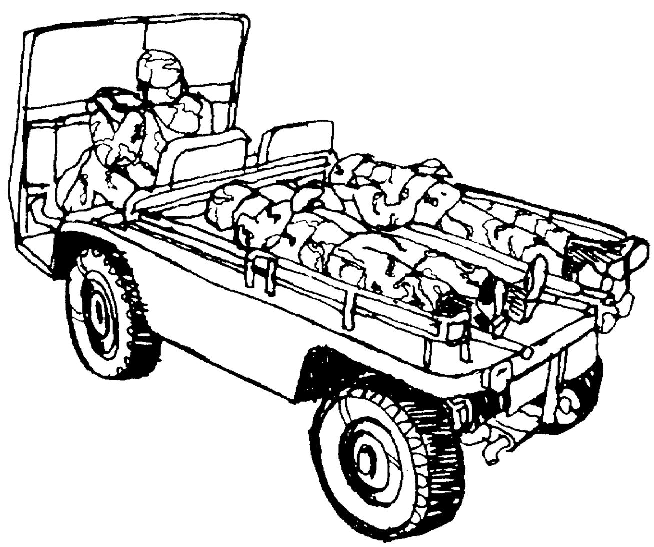


Figure 10-18. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting two patients.

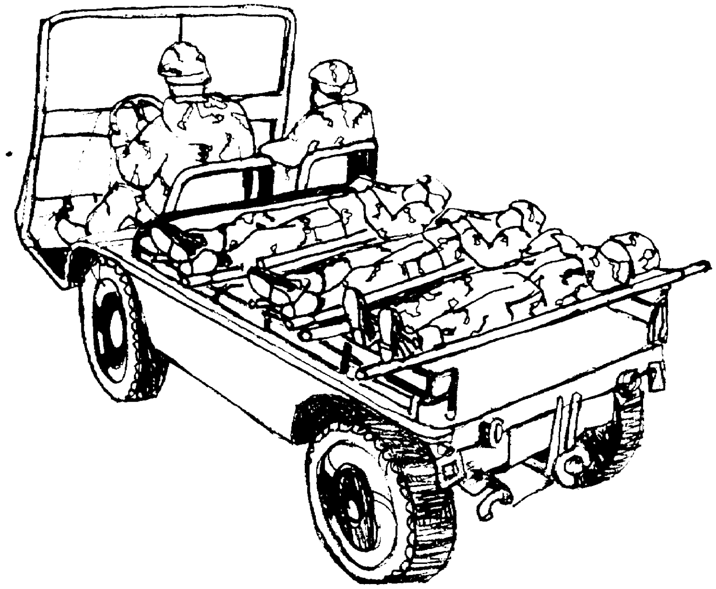


Figure 10-19. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting three patients.

10-16. Truck, Utility, ¼ Ton, 4x4, M151

This ¼-ton truck, designed for maneuverability and close support, is used in forward areas as a general purpose personnel or cargo carrier. It has an open-type body with four-passenger capacity. The ¼-ton, two-wheel trailer, Ml15, is designed for use with the ¼-ton truck. The truck and trailer are standard equipment in the medical company as well *as* many other units of the Army. They are usually readily available and can be easily converted to casualty carriers without alteration or additional equipment (Figure 10-20). Two litters can be transported on the truck and two on the trailer. The following procedures apply to the loading of this vehicle:

a. Place the first litter across the back of the truck with the litter handles resting on the sides of the truck.

b. Place the second litter lengthwise on the right side of the truck with the rear handles resting on the side of the first litter. The front stirrups fit into the groove below the windshield.

NOTE

When the route of evacuation is along narrow roads or trails, care must be taken to prevent the litter handles from catching on trees and bushes.

NOTE

The second litter may be placed so that the front handles rest on the windshield frame and the rear handles straddle the spare tire, thus positioning it above the first litter.

c. Securely lash the litters to the vehicle.

d. If a trailer is available, place two litters lengthwise on it and bind the handles of the litters to the small hooks on the sides of the trailer.

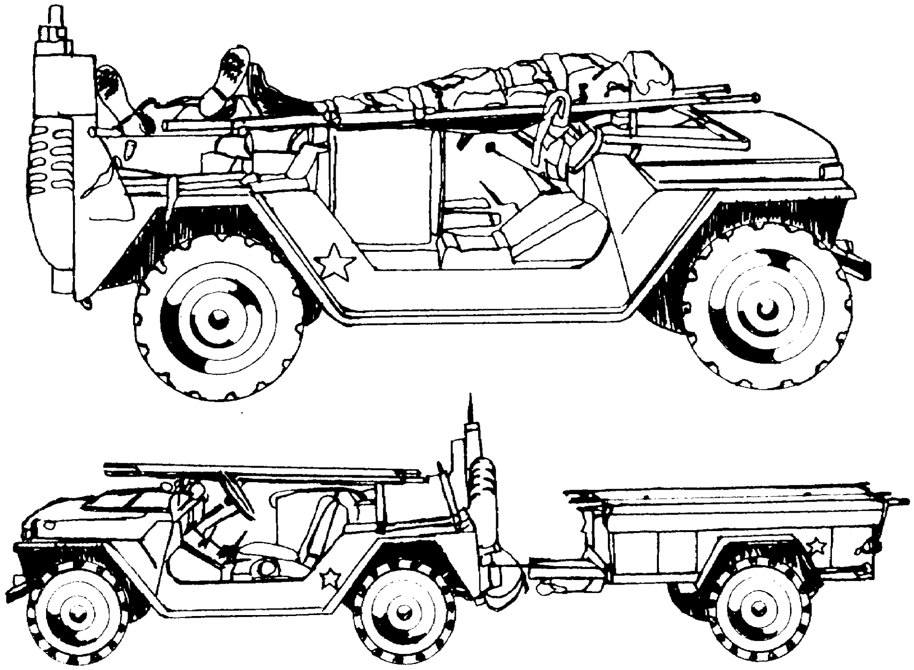


Figure 10-20. Truck, utility, 1/4 ton, 4x4, M151, with two litters, and trailer, 1/4 ton, two-wheel, with two litters.

10-17. Truck, Cargo, 1¼ Ton, 4x4/4x2, M880/890 and M1008

The 1¼-ton cargo truck (Figure 10-21) is a lightweight, open-top, cab-type vehicle used to transport personnel or light general cargo. It is a common vehicle for most units and can be easily adapted for transporting five litters. To adapt this vehicle for transporting casualties, the procedures listed below should be followed.

a. Fold the fabric cover and metal bows forward and together as an assembly. Secure them

b. Place three litters side-by-side across the side boards. Secure the litters in place.

c. Place two litters lengthwise, head first, in the bed of the truck. Secure these litters in place.

d. Close the tailgate.

e. Litters are unloaded in the reverse order of loading.

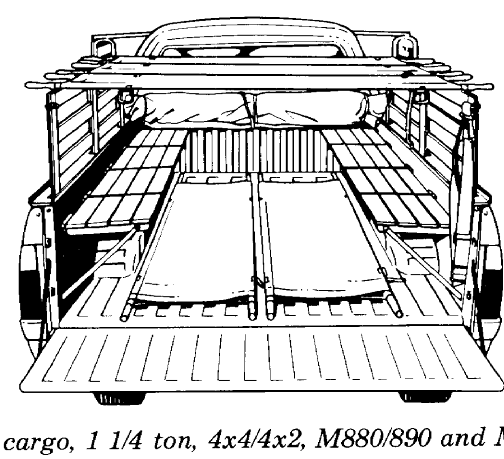


Figure 10-21. Truck, cargo, 1 1/4 ton, 4x4/4x2, M880/890 and M1008 with five litters.

10-18. Truck, Cargo/Troop Carrier, 1¼ Ton, 4x4, M998

The 1¼-ton cargo truck, four-man configuration (Figure 10-22) can be easily adapted for transporting three litters. To convert this vehicle for carrying litters, the procedures listed below should be followed.

a. Remove the cargo cover and metal bows. Secure them in place. Lower the tailgate.

b. Place two litters side-by-side across the back of the truck with the litter handles resting on the sides of the truck.

NOTE

When the route of evacuation is along narrow roads or trails, care must be taken to prevent the litter handles from catching on trees or bushes.

c. Secure the litters to the vehicle.

d. Place one litter lengthwise, head first, in the bed of the truck. Secure it in place.

e. Leave tailgate open. It is supported by the two tailgate chain hooks.

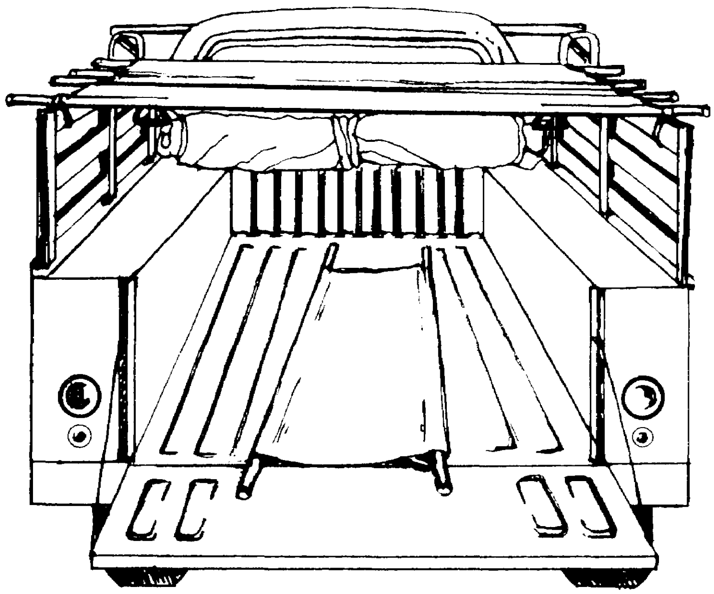


Figure 10-22. Truck, cargo/troop carrier, 1 1/4 ton, 4x4, M998, with three litters.

10-19. Truck, Cargo/Troop Carrier, 1¼ Ton, 4x4, M998

The 1¼-ton cargo truck, two-man configuration (Figure 10-23), can be easily adapted for transporting five litters. To convert this vehicle to carry patients, the procedures listed below should be followed.

a. Fold the fabric cover and metal bows forward and together as an assembly. Secure them in place. Lower the tailgate.

b. Place three litters side-by-side across the side boards. Secure them in place.

c. Place two litters lengthwise, head first, in the bed of the truck. Secure them in place.

d. Leave tailgate open. It is supported by the two tailgate chain hooks.

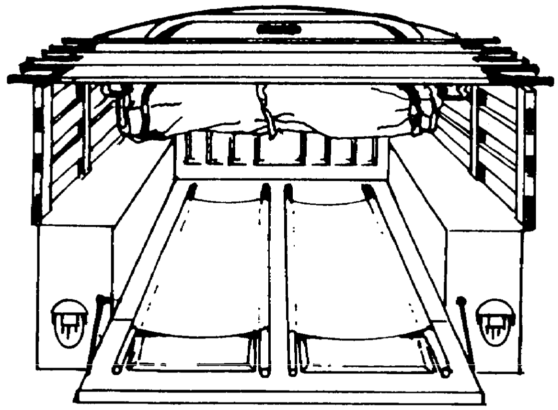


Figure 10-23. Truck, cargo/troop carrier, 1 1/4 ton, 4x4, M998, with five litters.

10-20. Truck, Cargo, 5 Ton, 6x6, Wide Bed, and Truck, Cargo 2½ Ton, 6x6, Wide Bed

These trucks (Figure 10-24) are normally used to transport general cargo as well as personnel. They have canvas-covered cabs and removable tarpaulin braces and sideboards. Both vehicles have a maximum capacity of 12 litters. These vehicles can be used for casualty transportation by—

a. Removing the canvas cover. (The cover can be rolled toward the front of the truck and secured.)

b. Lowering the seats.

c. Placing three litters crosswise on the seats as far forward as possible and three litters lengthwise in the bed of the truck as far as forward as possible.

d. Securing the litters individually to the seats.

e. Placing three additional litters crosswise on the seats and three additional litters lengthwise in the bed of the truck.

f. Securing these litters individually to the seats.

g. Raising and securing the tailgate as high as possible to help secure the litters in place.

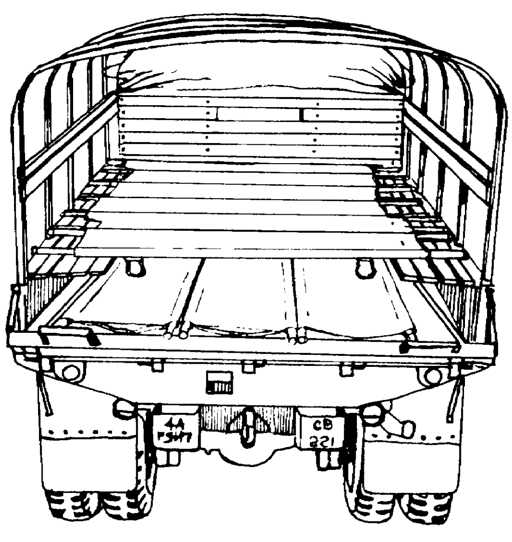


Figure 10-24. Truck, cargo, 2 1/2 ton, 6x6, wide bed, with 12 litters.

10-21. Heavy Expanded Mobility Tactical Truck, 8x8, Cargo, M977

The HEMTT is normally used to transport heavy cargo. It may or may not have the cargo cover kit consisting of the cover, stakes, and bows. The HEMTT has collapsible sides and can be used to transport the wounded in a mass casualty situation. It can be adapted to carry a maximum of nine litter patients on one lift. Instructions for the loading of this vehicle are to—

a. Start at the rear of the vehicle. Roll the cargo cover (if it is on the vehicle) toward the front of the vehicle. Remove the corner lockpins and raise the panel latches to lower the rear section of the cargo body. Remove the first two bows and drop one side of the cargo bed. This will be the side used for casualty loading.

WARNING

Side panels can slide off of the hinge pins when the vehicle is parked on a grade, This can cause injury.

b. Place one litter team in the back of the cargo bed to arrange and secure the litters. The second litter team will carry and place the litters into the cargo bed.

c. Load the litters from front to back, head to toe, and the less serious to the most serious based on casualty triage. The litters will be placed horizontally on the cargo bed (Figure 10-25).

d. Raise and secure the side panel to ensure litter stability and casualty safety. Replace the bows, and re-roll the canvas cover, if necessary, to provide protection from the elements.

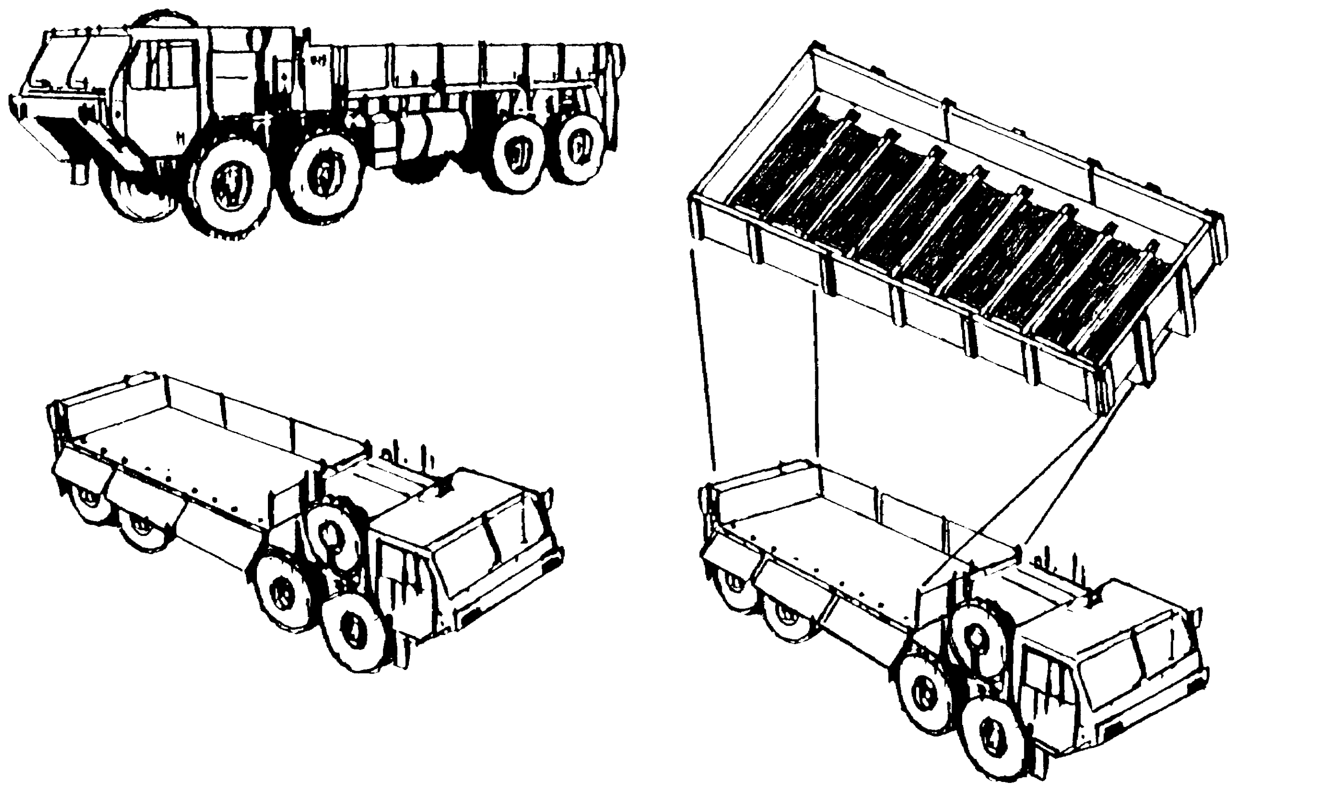


Figure 10-25. Heavy expanded mobility tactical truck, 8x8, cargo, M977.

10-22. Semi-Trailer, Cargo, 22½ Ton, M871

The 22½-ton cargo trailer (M871) (Figure 10-26) is attached to a prime mover such as a M800- or M900-series tractor for the transport of general cargo. (There are no major differences between the M871 and the M871A1 semi-trailers.) It has 4 1/3-foot high wooden sides with a canvas trailer cover. This trailer can be used to transport wounded in a mass casualty situation. It can be adapted to carry 16 litters in a single lift. Instructions for the loading of this trailer are to—

a. Remove the tie downs which secure the canvas cover and roll it forward toward the front of the trailer.

b. Remove the rear panels exposing the trailer bed.

c. Use one litter team in the cargo bed to arrange and secure the litters in the cargo area, while another litter team lifts the casualties to the bed of the trailer.

d. Load litters from *right* to *left*, *front* to *back*, based on casualty triage. The more seriously injured are loaded last so that they are unloaded first.

e. Place litters lengthwise, with casualties in a head-to-toe configuration.

f. Replace the rear doors to ensure the security of the litters.

g. Re-roll the cargo cover ¾ of the way down, then secure the cover to protect the casualties.

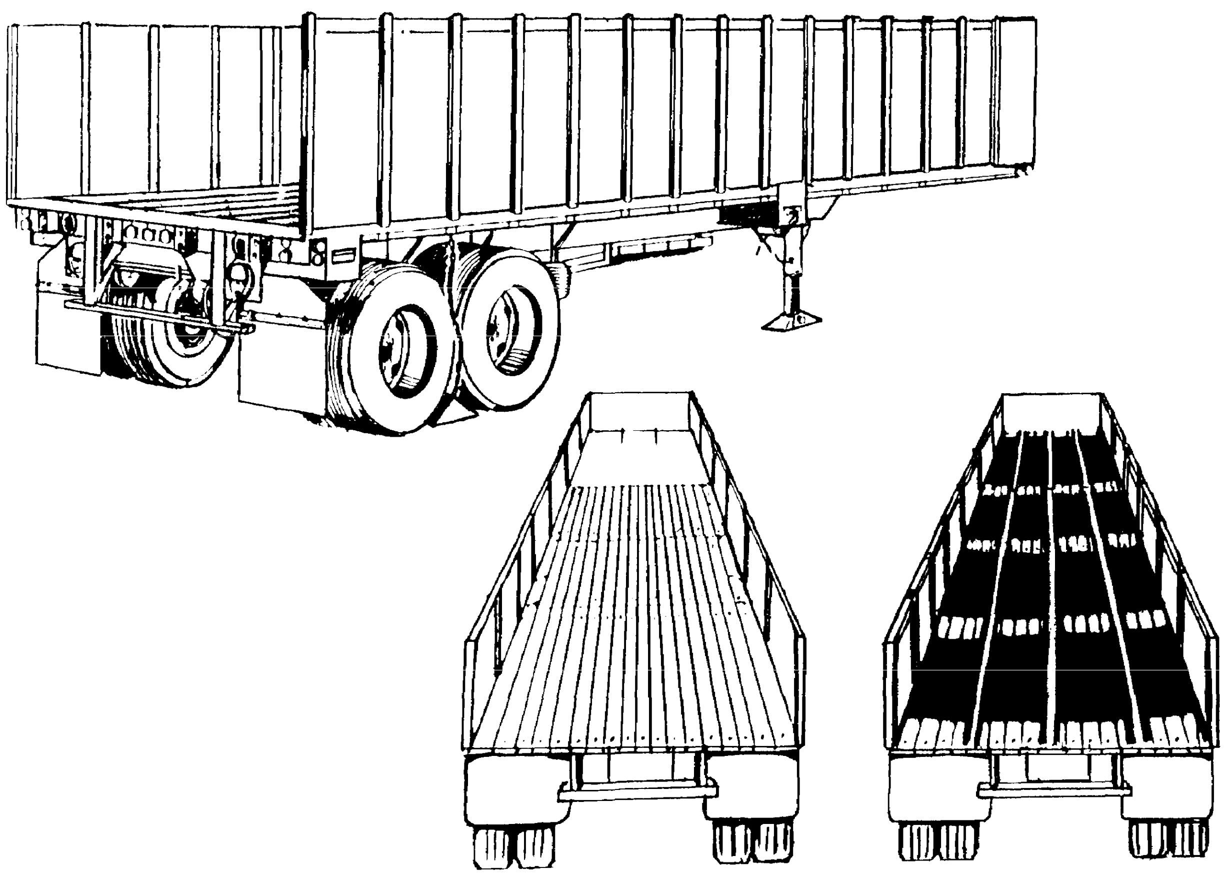


Figure 10-26. Semi-trailer, cargo, 22 1/2 ton, M871, loaded with litter.

Section III. EVACUATION BY MEDICAL AIR AMBULANCES

10-23. General

Aeromedical evacuation is accomplished by both and helicopter fixed-wing aircraft. Dedicated aeromedical evacuation assets permit en route patient care. This care minimizes further injury to the patient and decreases mortality.

10-24. Advantages of Aeromedical Evacuation

Evacuation by aircraft is considered advantageous for a variety of reasons.

a. The speed with which the patient can be evacuated by air to an MTF ensures the timeliness of treatment, thus contributing to—

- Saving lives.
- Reducing permanent disability.
- Increasing the number of patients returned to duty.

b. The range and speed of aircraft make it possible to evacuate patients by air over relatively long distances in short periods of time. This requires the less frequent displacement of MTFs.

c. Helicopters can move patients quickly over terrain where evacuation by other means would be difficult and perhaps impossible to accomplish. The minimum landing area required for helicopters and other vertical/short takeoff and landing (V/STOL) aircraft permits patients to be picked up well forward and delivered to the supporting MTFs.

d. Because of the speed, range, flexibility, and versatility of aeromedical evacuation, patients can be moved directly to the MTF best equipped to deal with their condition.

e. The selectivity in the use of MTFs made possible by aeromedical evacuation procedures permits economy in the use of these facilities. Fewer specialty treatment teams are required because of the capability to rapidly evacuate patients to hospitals with the required specialties. Hospitals are required to move less often, thereby reducing periods of noneffectiveness during movement and reestablishment.

10-25. Responsibilities for Loading

The commander who originates the patient evacuation request is responsible for delivering the patient to the landing site and for loading him aboard the aircraft. The actual loading is supervised by the aeromedical evacuation personnel. In airhead operations, patients are normally transported by vehicle or litter bearers to designated points within the perimeter of the airhead where evacuation aircraft may be available.

10-26. Army Air Ambulances

Helicopters are rotary-wing aircraft capable of horizontal, vertical, lateral, and hovering flight. Their ability to circumvent terrain and obstacles, and the minimum requirements for takeoff and landing enable them to operate from areas inaccessible to fixed-wing aircraft or surface vehicles. The helicopter's capability of flight at relatively slow speeds permits operations during periods of reduced ceiling and visibility. Helicopters are organic to the air ambulance units and aviation units of the division and corps. Military helicopters are designated by a combination of letters and numbers which are used to identify the basic mission and type: observation helicopter (OH), utility helicopter (UH), and cargo/transport helicopter (CH). The last two classes of helicopters can be used for the air evacuation of litter patients.

a. The UH-60A Blackhawk (Figure 10-27). This helicopter is used as the primary dedicated air ambulance. The normal configuration for aeromedical evacuation provides for four litter patients and one ambulatory patient. The maximum configuration provides for six litter patients and one ambulatory patient, or seven ambulatory patients.

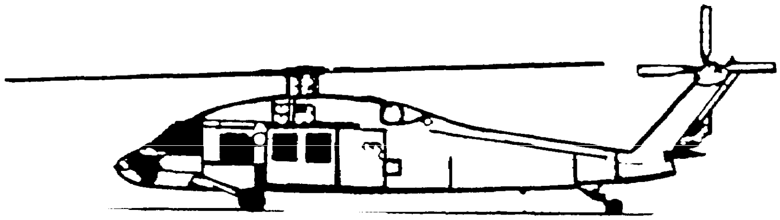


Figure 10-27. UH-60A Blackhawk.

b. The UH-lH/V Iroquois (Figure 10-28). This aircraft also is used as a dedicated air ambulance. The normal evacuation configuration provides for three litter and four ambulatory patients. The maximum patient configuration provides for six litter patients or nine ambulatory patients.

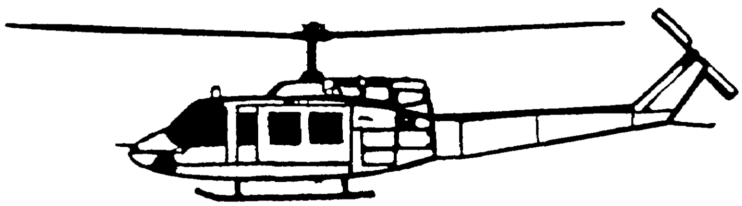


Figure 10-28. UH-1H/V Iroquois.

10-27. Helicopter Landing Sites

a. Responsibility. The unit requesting aeromedical evacuation support is responsible for selecting and properly marking the helicopter LZs.

b. Critetia for Landing Sites.

- The helicopter LZ and the approach zones to the area should be free of obstructions. Sufficient space must be provided for the hovering and maneuvering of the helicopter during landing and takeoff. The approach zones should permit the helicopter to land and take off into the prevailing wind whenever possible. It is desirable that landing sites afford helicopter pilots the opportunity to make shallow approaches.

- Definite measurements for LZs cannot be prescribed since they vary with temperature, altitude, wind, terrain, loading conditions, and individual helicopter characteristics. The minimum requirement for light helicopters is a cleared area of 30 meters in diameter with an approach and departure zone clear of obstructions.

c. Removing or Marking Obstructions. Any object (paper, cartons, ponchos, blankets, tentage, or parachutes) likely to be blown about by the wind from the rotor should be removed from the landing area. Obstacles, such as cables, wires, or antennas at or near LZs, which cannot be removed and may not be readily seen by a pilot, must be clearly marked. Red lights are normally used at night to mark all obstacles that cannot be easily eliminated within a LZ. In most combat situations, it is impractical for security reasons to mark the tops of obstacles at the approach and departure ends of a LZ. If obstacles or other hazards cannot be marked, pilots should be advised of existing conditions by radio.

NOTE

In a training situation or at a rear area LZ, red lights should be used whenever possible to mark obstructions.

d. Identifying the Landing Site (Figures 10-29 through 10-33).

(1) When the tactical situation permits, a landing site should be marked with the letter “H” or “Y,” using identification panels or other appropriate marking material. Special care must be taken to secure panels to the ground to prevent them from being blown about by the rotor wash. Firmly driven stakes will secure the panels tautly; rocks piled on the corners are not adequate.

(2) If the tactical situation permits, the wind direction may be indicated by a—

- Small wind sock or rag tied to the end of a stick in the vicinity of the LZ.
- Man standing at the upwind edge of the site with his back to the wind and his arm extended forward.
- Smoke grenades which emit colored smoke as soon as the helicopter is sighted. Smoke color should be identified by the aircrew and confirmed by ground personnel.

(3) In night operations, the following factors should be considered:

(a) One of the many ways to mark a landing site is to place a light, such as a chemical light, at each of the four corners of the usable LZ. These lights should be colored to distinguish them from other lights which may appear in the vicinity. A particular color can also serve as one element in identifying the LZ. Flare pots or other types of open lights should only be used as a last resort. They usually are blown out by the rotor downwash. Further, they often create a hazardous glare or reflection on the aircraft’s windshield. The site can be further identified using a coded signal flash to the pilot from a ground operator. This signal can be given with the directed beam of a signal lamp, flashlight, vehicle lights, or other means. When using open flames, ground personnel should advise the pilot before he lands. Burning material must be secured in such a way that it will not blow over and start a fire in the LZ. Precautions should be taken to ensure that open flames are not placed in a position where the pilot must hover over or be within 3 meters of them. The coded signal is continuously flashed to the pilot until recognition is assured. After recognition, the signal operator, from his position on the upwind side of the LZ, directs the beam of light downwind along the ground to bisect the landing area. The pilot makes his approach for landing in line with the beam of light and toward its source, landing at the center of the marked area. All lights are displayed for only a minimum time before arrival of the helicopter. The lights are turned off immediately after the aircraft lands.

(b) When standard lighting methods are not possible, pocket-sized white (for day) or blue (for night) strobe lights are excellent means to aid the pilot in identifying the LZ.

(c) During takeoff, only those lights requested by the pilot are displayed; they are turned off immediately after the aircraft’s departure.

(4) When the helicopter approaches the LZ, the ground contact team can ask the pilot to turn on his rotating beacon briefly. This enables the ground personnel to identify the aircraft and confirm its position in relation to the LZ (north, south, east, or west). The rotating beacon can be turned off as soon as the ground contact team has located and identified the aircraft. The ground contact team helps the pilot by informing him of his location in relation to the LZ, observing the aircraft’s silhouette, and guiding the aircraft toward the LZ. While the aircraft is maneuvering toward the LZ, two-way radio contact is maintained and the type of lighting or signal being displayed is described by the pilot and verified by ground personnel via radio. The signal should be continued until the aircraft touches down in the LZ.

(5) The use of FM homing procedures can prove to be a valuable asset, especially to troops in the field under adverse conditions. Through the

use of FM horning, the pilot can more accurately locate the ground personnel. The success of a homing operation depends upon the actions of the ground personnel. First, ground personnel must be operating an FM radio which is capable of transmitting within the frequency range of 30.0 to 69.95 megahertz; then they must be able to gain maximum performance from the radio (refer to appropriate technical manual for procedure). The range of FM radio communications is limited to line of sight; therefore, personnel should remain as clear as possible of obstructions and obstacles which could interfere with or totally block the radio signals. Ground personnel must have knowledge of the FM homing procedures. For example, when the pilot asks the radio operator to" key the microphone," he is simply asking that the transmit button be depressed for a period of 10 to 15 seconds. This gives the pilot an opportunity to determine the direction to the person using the radio.

NOTE

When using FM homing electronic countermeasures, the possible site detection of LZs by means of electronic triangulation presents a serious threat and must be considered.

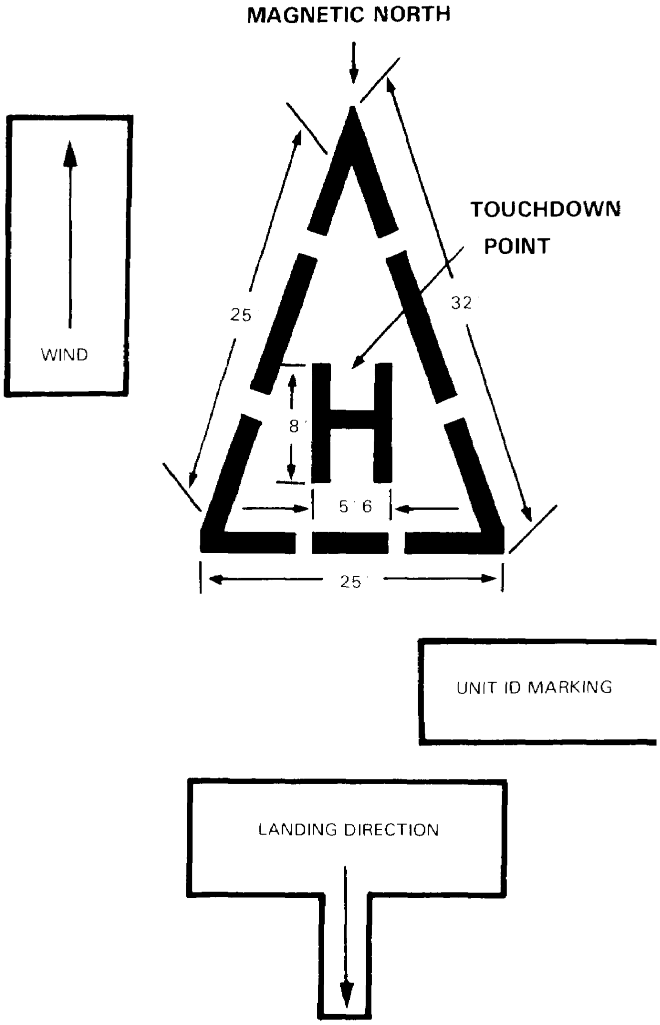


Figure 10-29. Semifixed base operations (day).

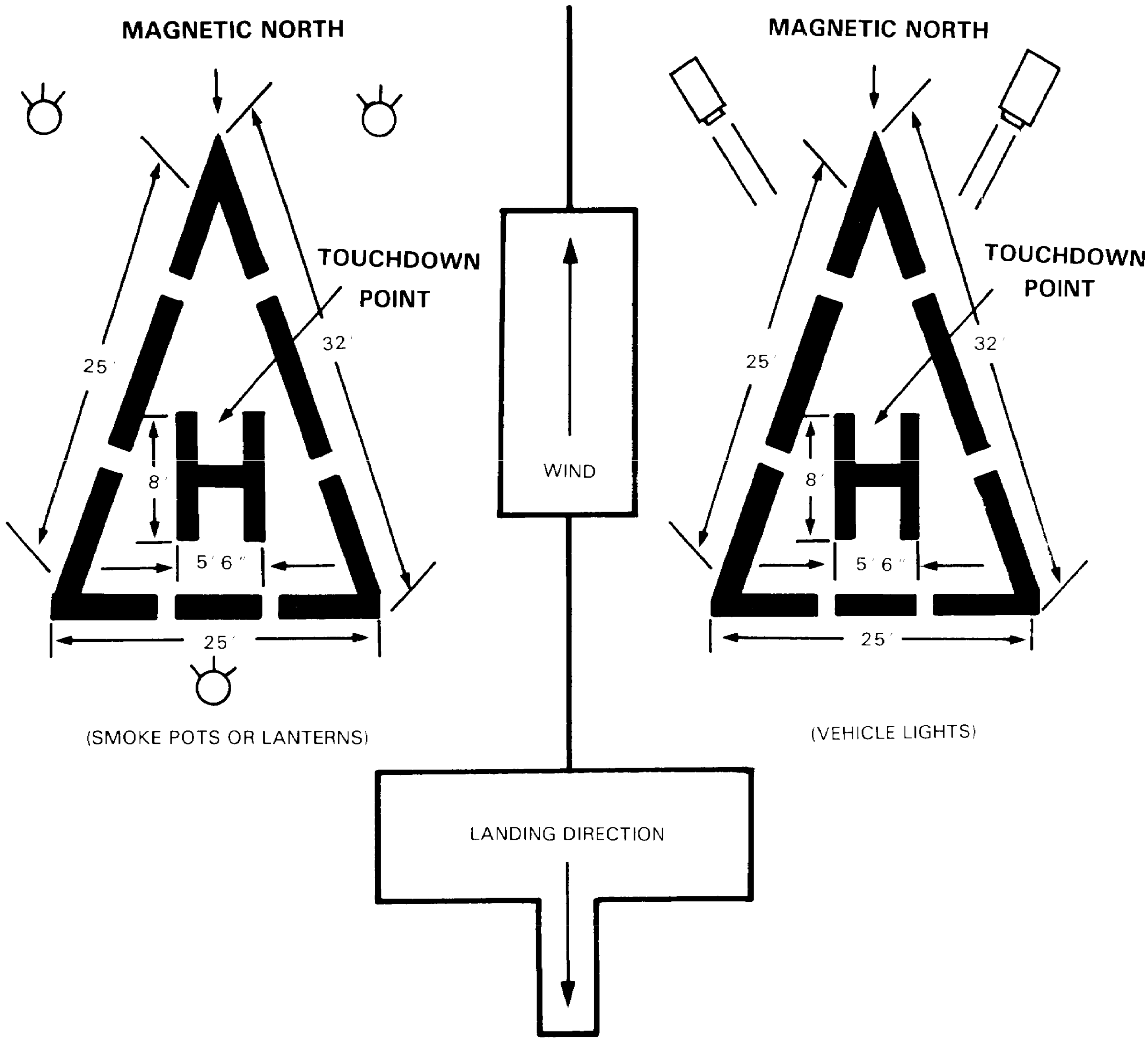


Figure 10-30. Semifixed base operations (night).

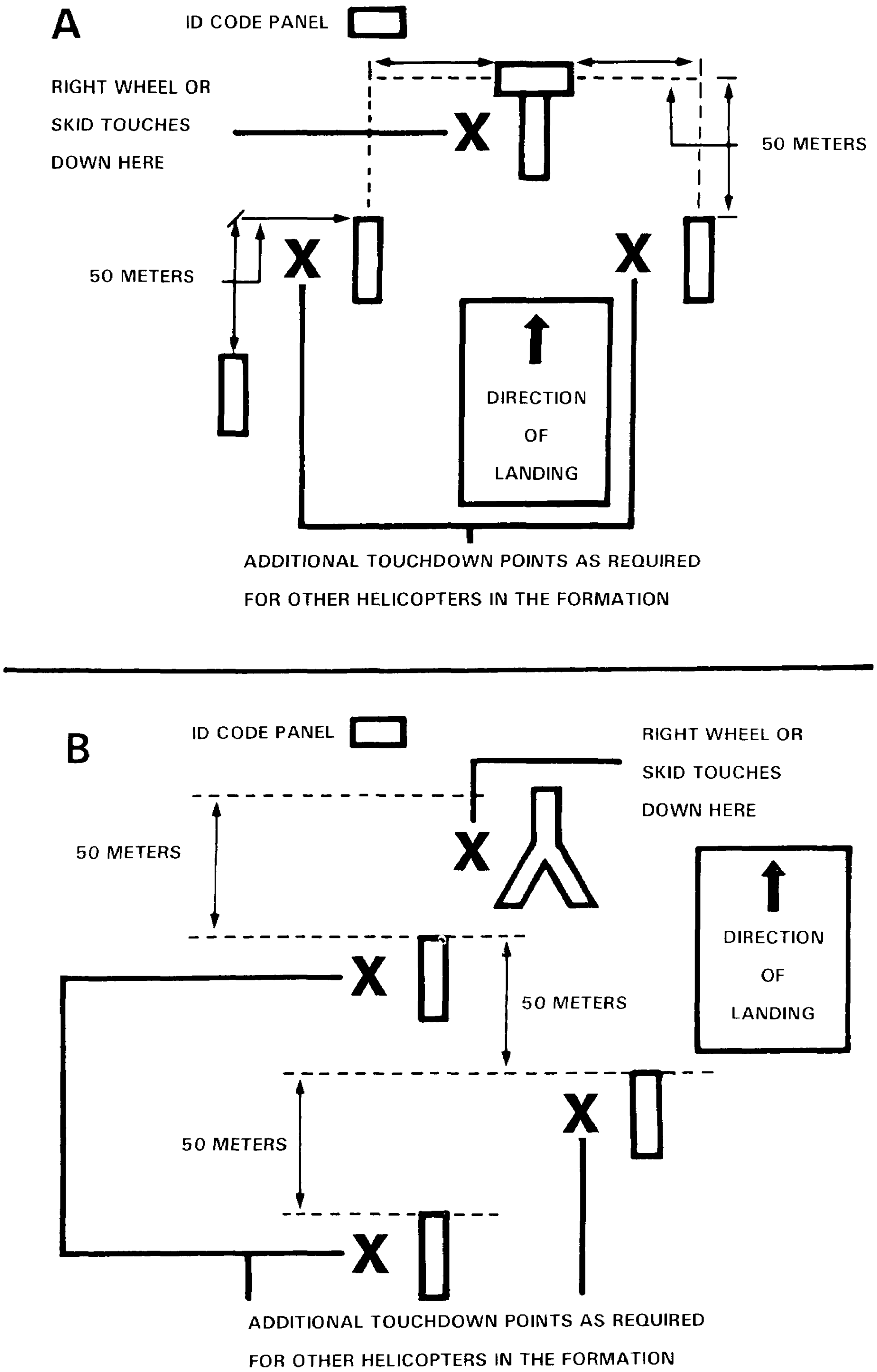


Figure 10-31. Field expedient landing zone (day).

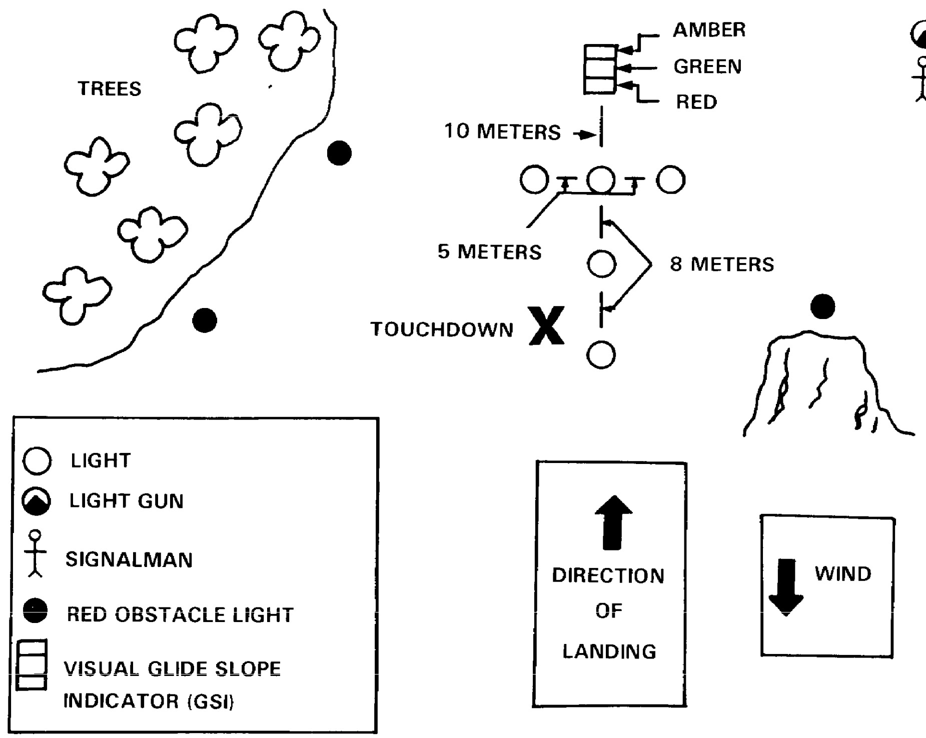


Figure 10-32. Field expedient (T) landing zone (night).

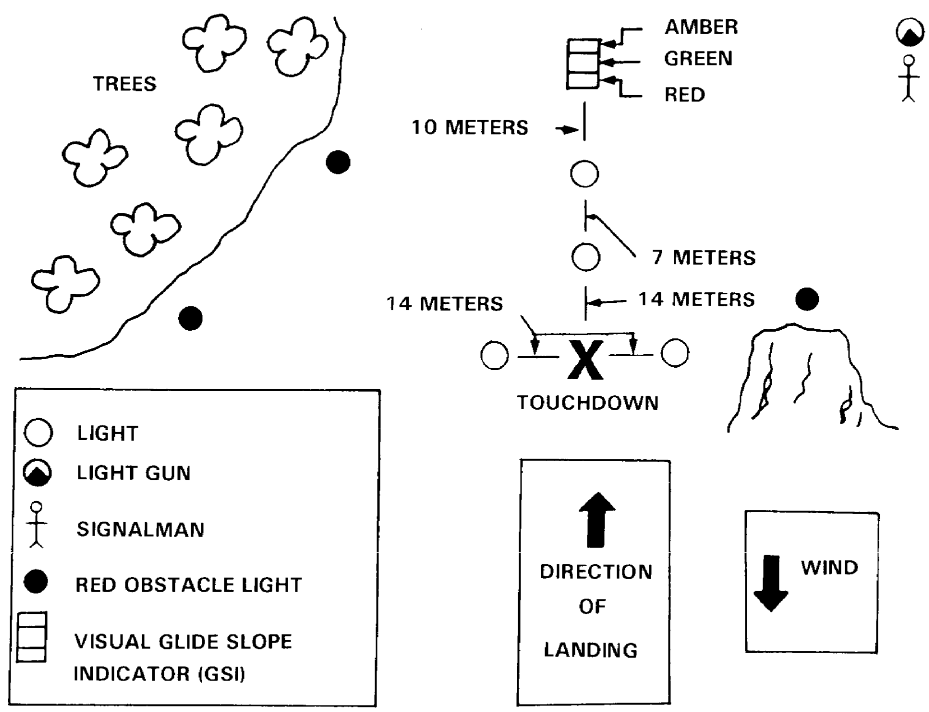


Figure 10-33. Field expendient (Y) landing zone (night).

10-28. Loading Patients Aboard Rotary-Wing Aircraft

a. Responsibility for Loading and Securing The pilot is responsible for ensuring that the litter squad follows the prescribed methods for loading and securing litters and related equipment. The final decision regarding how many patients may be safely loaded rests with the pilot.

b. Safety Measures. When loading and unloading a rotary-wing aircraft, certain precautionary measures must be observed. Litter bearers must present as low a silhouette as possible and must keep clear of the rotors at all times. The helicopter must not be approached until a crew member signals to do so. The litter bearers should approach the aircraft at a 45 degree angle from the front of the helicopter. If the helicopter is on a slope and conditions permit, loading personnel should approach the aircraft from the downhill side. Directions given by the crew *must* be followed, and litters *must* be carried parallel to the ground. Smoking is not permitted within 50 feet of the aircraft.

10-29. Loading Patients Aboard the UH-60A Blackhawk Helicopter

a. Interior of the UH-60A Blackhawk Helicopter. This helicopter, as with the UH-1H/V, has a number of possible seating or cargo configurations. A major difference in preparing the UH-60A to carry litters is that a medical evacuation kit must be installed. This kit consists of a seat/converter assembly unit and a litter support unit. The seat/converter assembly provides for three rear-facing seats which allows the medical attendant and crew chief to monitor patients. The litter support unit consists of a center pedestal which can be rotated 90 degrees about the vertical axis for the loading and unloading of patients. The litter support unit has a capacity of four to six litter patients. The patients can be loaded from either side of the aircraft. Only the upper litter supports in the four-litter configuration can be tilted for loading and unloading patients.

NOTE

When the six-litter modification kit is installed, the center pedestal can no longer be rotated.

If litter patients are not being evacuated, a maximum of six ambulatory patients can be seated on the litter support unit (three on each side). A seventh ambulatory patient can be seated on a troop seat.

NOTE

Only three litters can be loaded when using the internal rescue hoist.

When the medical evacuation kit is installed, a number of cabin configurations are possible. (See Tables 10-3 and 10-4.)

Table 10-3. Patient Configurations, UH-60A Medical Evacuation Kit

Four-Litter (Combat) Configuration	Six-Litter (High Capacity) Configuration
4 litter patients 1 ambulatory patient	6 litter patients 1 ambulatory patient
2 litter patients 4 ambulatory patients	3 litter patients 4 ambulatory patients
No litter patients 7 ambulatory patients	No litter patients 7 ambulatory patients

NOTE: With each configuration, there is sufficient room to carry a crew chief and a medical aidman.

Table 10-4. Patient Configurations, UH-60A Medical Evacuation Kit with Internal Rescue Hoist Installed

Four-Litter (Combat) Configuration with Internal Rescue Hoist Installed	Six-Litter (High Capacity) Configuration with Internal Rescue Hoist Installed
3 litter patients 1 ambulatory patient	4 litter patients 1 ambulatory patient
No litter patients 4 ambulatory patients	No litter patients 4 ambulatory patients

NOTE: With each configuration, there is sufficient room to carry a crew chief and a medical aidman.

b. Guides for Loading Patients.

(1) Litter patients should be positioned in the helicopter according to the nature of their injuries or condition. Personnel aboard the aircraft supervise the loading and positioning of the patients. Normally, the helicopter has a crew of four. The crew consists of a PC, PI, crew chief, and medical aidman.

(2) The most seriously injured patients are loaded last on the bottom pans of the litter support unit. A patient's condition, however, may require in-flight emergency medical care (such as cardiopulmonary resuscitation). To facilitate access to the patient, he should be loaded onto either of the top pans.

(3) The structuring of the litter support unit allows patients to receive IV fluids and oxygen in flight. Patients receiving IV fluids can be placed on any of the litter pans, depending on their injuries or condition.

(4) Patients in traction splints should be loaded last and on a bottom pan.

(5) The UH-60A has the capability to be loaded on both sides simultaneously. Patients should be loaded so that upon rotating the litter support, the patient's head will be forward in the cabin. To accomplish this, patients loaded on the left side of the aircraft should be loaded head first and patients loaded on the right side of the aircraft should be loaded feet first (left and right sides are determined from the position of the PC's seat, looking forward.) When the six-litter configuration is used, the fifth and sixth litter patients are loaded with the carousel in the fly position. The patients' heads should face toward the front of the aircraft.

c. Installing Litter Pan Supports. Each litter support is attached to the center pedestal by two end pivot shafts and by two T-shaped fittings. These fittings and shafts allow for the removal, interchange, or repositioning of the supports. There are five pivot shaft support holes at both ends on the right and left side of the center console. Behind the holes are support rollers for the pivot shafts. From top to bottom, the top hole is provided for the upper litter in the six litter configuration. The second hole is for the upper litter support of a four-litter configuration. These end holes line up with a central pivot hole, which accommodates a central pivot shaft on the litter support. Only this litter position allows midposition pivoting for loading or unloading. The third hole is for the center litter of the six-litter configuration. The fourth hole is used when installing the litter support as a seat for evacuating ambulatory patients. The fifth hole is used for the lower litter support in the four-litter configuration. The third, fourth, and fifth positions do not provide a tilt function.

(1) Lower litter support installation. Before installing, each center pivot shaft must be retracted and unlocked. The center pivot shaft handle must be secured in the handle retainer. End pivot handles must be in the tilt position.

(a) Engage T-bars on litter support with split retention fittings at the bottom of the pedestal.

(b) Line up the end pivot shafts with holes. Disengage the pivot shaft lever locks and move the end pivot shaft lever toward the pedestal. The pivot shaft is, then, fully inserted into the pivot shaft holes on the pedestal and the handle lock is engaged.

(c) Repeat step *(b)* for the other end of litter support.

(2) Upper litter support installation. Before installing, each center pivot pin must be unlocked and retracted. The handle is then disengaged from its retainer. The end pivot handles must be in the tilt position.

(a) Tilt the outer edge of litter support slightly down and engage the T-bars into split retention fittings at the second support hole from the top of pedestal.

(b) Raise the outer edge of the litter support until the support is level.

(c) Insert the end pivot shaft into the pedestal by pulling on the pivot shaft lever lock and moving the lever toward pedestal until end pivot shaft engages partway in end pivot support hole.

(d) Turn the center pivot shaft lock handle counterclockwise until it is horizontal.

(e) Push the center pivot shaft toward the pedestal until the shaft is fully inserted into the center pivot shaft hole. The opposite end of the litter support should be raised or lowered to align the center shaft on the support with the center hole on pedestal.

(f) Turn the center pivot lock lever clockwise to the horizontal position.

(g) Repeat step *(c)* above for the other end of litter support. Now slide both end pivot shafts in fully by moving the pivot lever lock handle to engaged position.

(3) Upper litter support relocation for six-litter configuration.

(a) Remove the litter support from the second support hole from the top of the pedestal. The removal of the litter support is the reverse of its installation. Before relocation, each center pivot pin must be locked and the handles must be secured in the handle retainer.

(b) Line up the end pivot shafts with the top support holes. Then fully insert and engage the handle lock.

(c) Repeat steps *(a)* and *(b)* above for other end of litter support.

(4) Middle litter support installation for six-litter configuration.

(a) Remove the litter support from the fifth (bottom) support hole. The removal of the litter support is the reverse of its installation.

(b) Align the end pivot shafts with third support hole from top of pedestal to relocate it. Then fully insert and engage handle lock.

(c) Repeat steps *(a)* and *(b)* above for other end of litter support.

(5) Bottom litter support installation for six-litter configuration. To complete the six-litter configuration, the modification kit is required. The kit consists of a tube assembly and a restraint assembly for each side.

(a) Insert the restraint assembly using the plate quick disconnect fittings into the proper quick attachment fittings on the cargo floor. Pull upon the restraint assembly to check for secure installation.

(b) Attach tube assembly longitudinally to the proper tie down restraint rings on the cargo floor. Ensure that the restraint rings are properly secured to the bracket tube support with the attached pin (Figure 10-34).

(c) Repeat steps *(a)* and *(b)* above for the other end of the litter support.

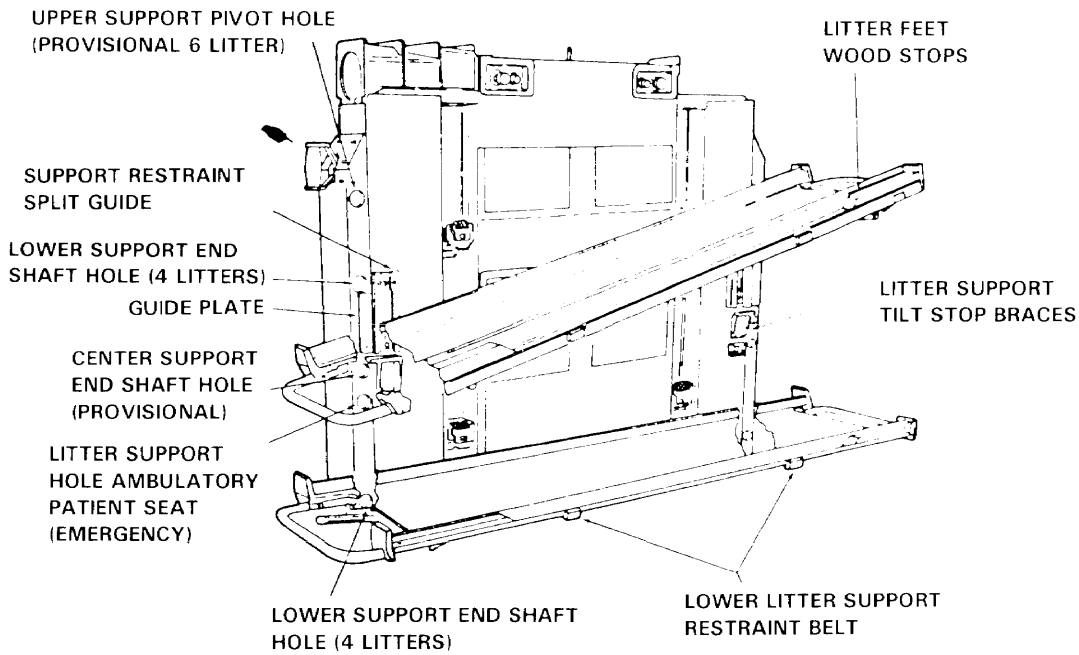


Figure 10-34. Litter pan in the load and unload (tilt) position(same at other side of pedestal).

(6) Litter support installation for ambulatory patient seating.

(a) prepare supports as in c(1) above.

(b) Engage the T-bar on the litter pan with the split retention brackets below the support tilt stop brackets.

(c) Position the litter support at the second from the bottom litter support end pivot hole on pedestal.

(d) Line up the end pivot shafts with the holes. Disengage pivot shaft lever lock and move pivot shaft lever toward pedestal. Fully insert the pivot shaft into pivot shaft hole on pedestal and engage handle lock.

(e) Repeat step *(c)* for the other end of litter support.

(7) Storage of litter pans.

(a) Lower stowage brackets to the horizontal position and insert the retaining pin through stowage bracket into pedestal.

WARNING

Improper positioning of the stowage bracket retaining pin reduces the holding capability of the stowage bracket and may cause it to shear the pivot bolt during a crash sequence.

(b) Place the litter pan in the stowed position against the center pedestal.

(c) Secure the litter pan to the center pedestal by routing the opposite web strap around the upper portion of the litter pan handle. Secure the metal clasp to the metal ring.

NOTE

The use of the opposite strap reduces excess movement of litter pan.

(d) Use opposite web strap to secure the upper side of the litter pan handle as

described in step *(c)* above, while the same side web strap is used to secure the bottom side of the stored litter pan handle.

(e) Remove the stowed litter pans by reversing steps *(a)–(d)* above.

d. Loading of Upper Litters. For ease of loading, the upper litter pans may be tilted. Upper litter pans are supported by a center pivot shaft and two end pivot shafts, one at each end of the litter pan. To tilt the upper support for the loading and unloading of litter patients, the center shaft remains locked to the pedestal and the end shafts are disengaged for support pivoting.

NOTE

This system was designed to pivot about the center shaft allowing either end to be tilted downward. Although the supports may be pivoted at either end, more effort is required when a loaded litter is installed.

e. *Loading and Securing Patients.*

(1) In loading four litter patients with a four-man litter squad, the litters are loaded from the top to bottom. The sequence for loading litters from one side of the aircraft with the carousel turned is *upper right*, *upper left*, *lower right*, and then *lower left*. To load litters from both sides of the aircraft simultaneously, the sequence is upper then lower (Figure 10-35).

(a) The litter support unit is rotated 90 degrees clockwise to receive the litter patients. The flight crew lowers the top pan to accept the litter and stands by to assist. This is accomplished as the litter squad approaches the aircraft.

(b) The litter squad moves into the semioverhead carry, lifting the litter just high enough for the litter stirrups of one end to slide onto the litter pan. The litter squad slides the litter forward. The flight crew member guides and assists the litter squad, until the litter stirrups of both ends are secured on the pan. The litter squad departs as the flight crew member raises the pan back to its upright position and secures it. The flight crew member fastens the litter straps attached to the litter support assembly.

(c) After the first litter is loaded, the squad leaves the aircraft as a team to obtain another litter patient. The second, third, and fourth litters are loaded in the same manner, except that the bottom pans are not tilted to receive patients.

(d) After having loaded four litter patients, the litter support unit is rotated 90 degrees counterclockwise and locked in the in-flight position. The cargo doors must be closed for flight.

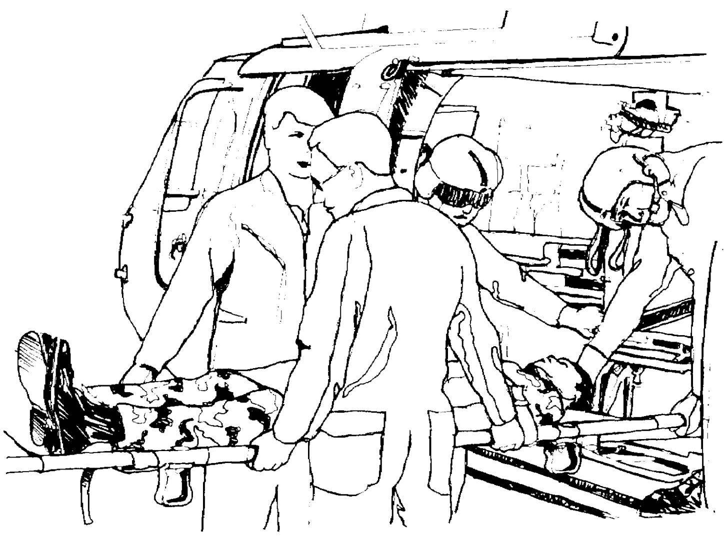


Figure 10-35. Loading litter into UH-60A.

(2) The loading of six litter patients requires the repositioning of the litter support prior to loading. The loading procedure remains the same as the four-litter configuration except for the following:

(a) The top litter support no longer tilts. This necessitates overhead loading and may require additional assistance.

(b) After four litters are loaded, the pedestal must be rotated back to the locked position. The restraint and tube assembly modification kit is then installed. The last two litters are side loaded between the restraints, with the patients' heads toward the front of the aircraft. They are secured.

(3) When the aircraft is to receive a mixed load of litter and ambulatory patients, one top pan of the litter support is removed and repositioned just above the bottom pan on the same side. The aircraft can now accommodate two or three litter and four ambulatory patients (Figure 10-36).

(a) The litter support unit is rotated clockwise to receive the litter patients, except for the third litter in the six-litter configuration. The litters are loaded as described in paragraph *e* (1) above. Upon loading and securing the litter patients, the litter support unit is rotated counterclockwise to the in-flight position. The third litter is then loaded when the six-litter configuration is used.

(b) Ambulatory patients are escorted to the aircraft by ground personnel. They are assisted into their seats and secured with the seat belts attached to the litter support unit.

(c) The cargo doors are now closed for flight.

WARNING

To prevent further injury to patients, all end support pins of the installed litter pans must be in the locked position for flight.

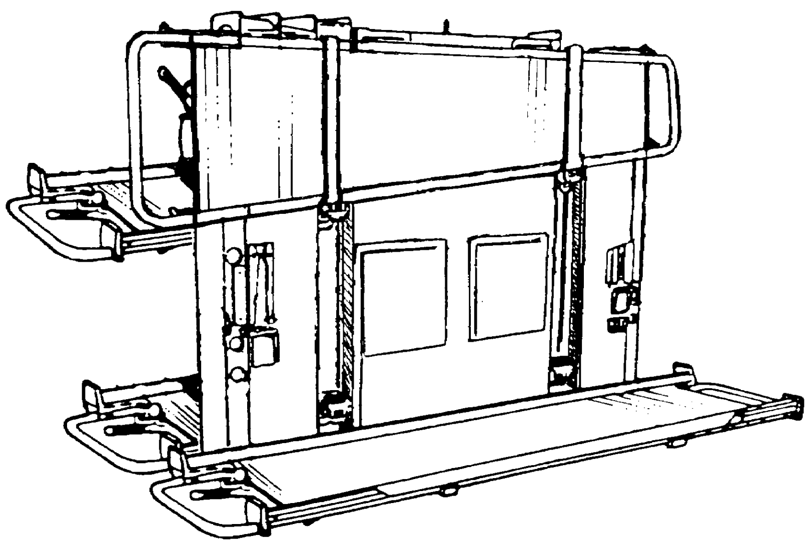


Figure 10-36. Litter support.

f. Unloading Patients. The aircraft is unloaded in the reverse order of the loading procedure. The pans are normally unloaded bottom pan first, then top, to ensure that the most seriously injured patients are unloaded first.

10-30. Loading Patients Aboard the UH-lH/V Iroquois Helicopter

a. Interior of the UH-IH/V Iroquois Helicopter. This helicopter has several litter and seating configurations. A change, to meet operational requirements, can be made from one configuration to another within a few minutes. Facilities for carrying a tier of three litters loaded lengthwise in the aircraft are located on each side of the helicopter cargo compartment (Figure 10-37). This gives the helicopter a maximum litter capacity of six or a total of nine ambulatory patients. This configuration is normally used in rear areas to move large numbers of stable patients. The normal configuration for the aircraft is three litter patients loaded crosswise and four ambulatory patients. The maximum load the helicopter can lift must be considered. This load capacity varies with the altitude and temperature. The pilot advises the personnel on the ground of his load capacity.

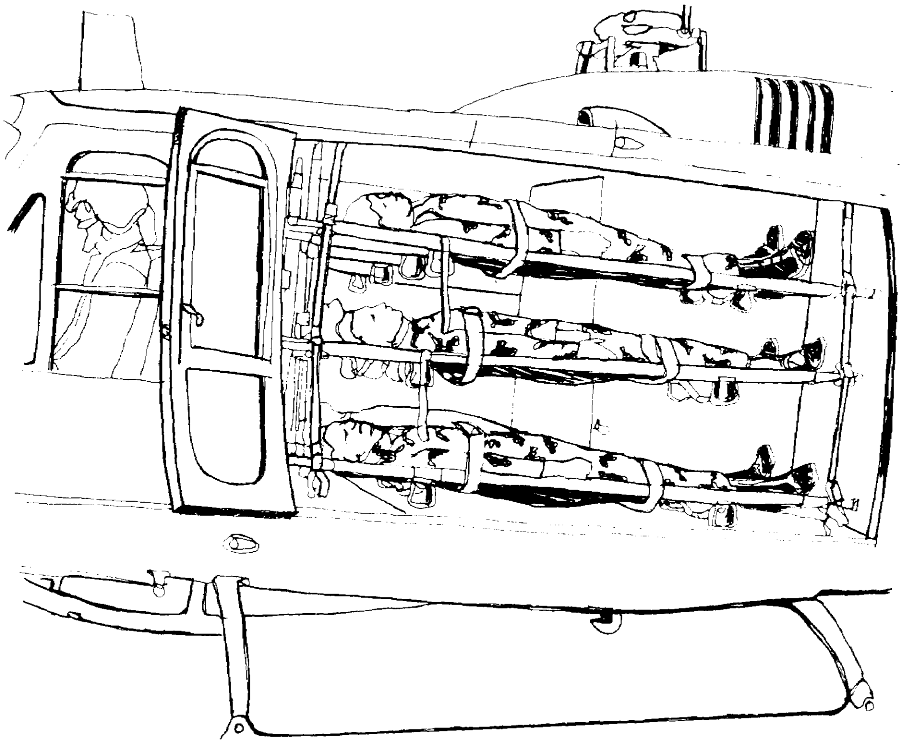


Figure 10-37. Interior view of UH-1H/V Iroquois helicopter, six-litter configuration.

b. Guides for Loading Patients. Patients are normally loaded from the top tier down to the bottom tier, with the most seriously injured loaded last.

(1) Litter patients should be positioned in the helicopter according to the nature of their injuries or condition. Personnel aboard the helicopter supervise the loading of the aircraft.

(2) The most seriously injured patients are placed in the bottom litter tiers to permit in-flight care.

(3) Litter patients receiving IV fluids should not be positioned on the top row of litter tiers but should be placed as low as possible in the litter rack.

(4) Patients in Hare traction splints with splint supports and footrests must be loaded last and placed directly on the floor of the helicopter.

c. Loading and Securing Patients.

(1) In loading six litter patients with a four-man litter squad, the litters are loaded from both sides of the aircraft and from top to bottom. Figures 10-38 and 10-39 illustrate procedures for loading the right side. Figure 10-40 illustrates procedures for loading the left side.

(2) When the helicopter is equipped for mixed loading (Figures 10-41 through 10-43), three litters are loaded crosswise and four ambulatory patients are loaded in the side seats.

(a) When loading from the left, the litter squad moves to the side of the helicopter with the litter perpendicular to the cargo compartment; then the squad moves into a litter post carry. Bearers numbers 1 and 3 give their litter handles to the crew members who place the handles in the litter support brackets on the far side of the aircraft. Bearers numbers 2 and 4 secure the foot of the litter.

(b) After the first litter is loaded, the squad leaves the helicopter to obtain another litter patient. The second and third litters are loaded in the same way as the first one. After the three litter patients are loaded, the ambulatory patients are taken to the aircraft and directed to their seats.

d. Unloading Patients. The aircraft is unloaded in the reverse order of loading. The tiers are unloaded from bottom to top on one side and then on the other side. At the unloading command, the litter squad moves to the helicopter and the bearers take their proper places at the litter. The squad then performs its duties in the reverse order of loading.

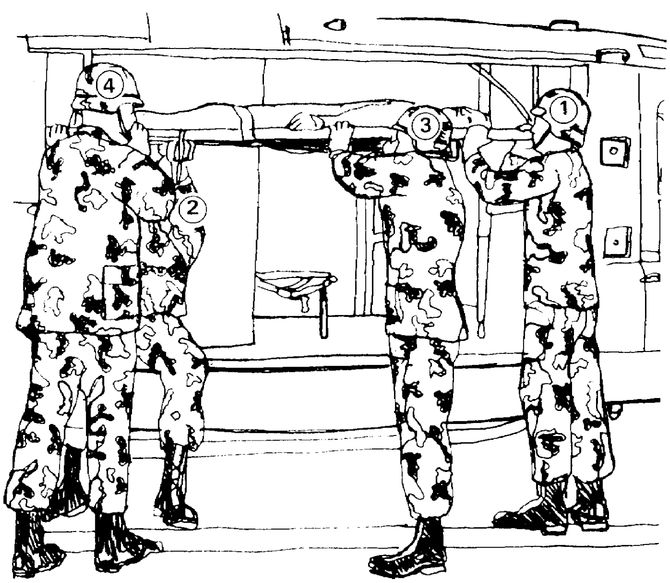


Figure 10-38. Loading air ambulance (UH-1H/V) from right side (step one).

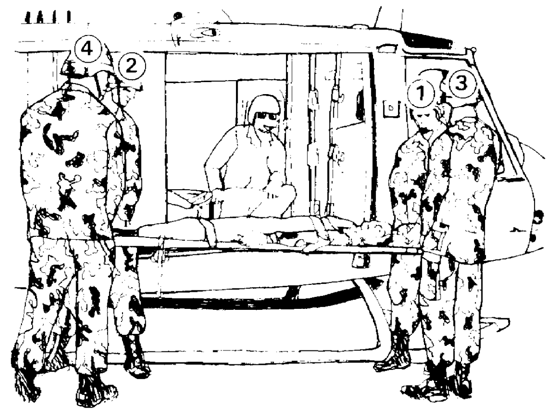


Figure 10-39. Loading air ambulance (UH-1H/V) from right side (step two).

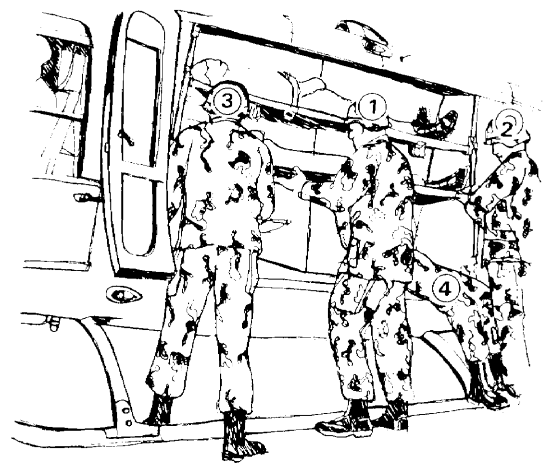
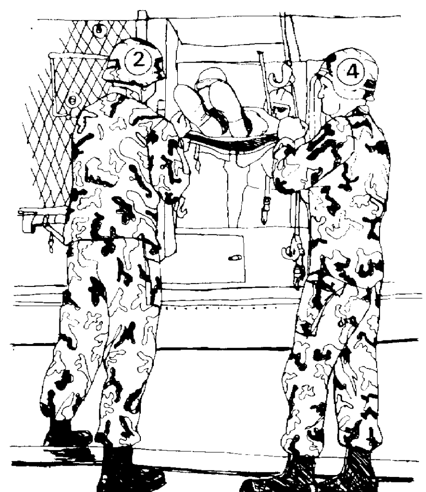


Figure 10-40. Loading air ambulance (UH-1H/V) from left side.



Figures 10-41. Loading litter crosswise in air ambulance (UH-1H/V).

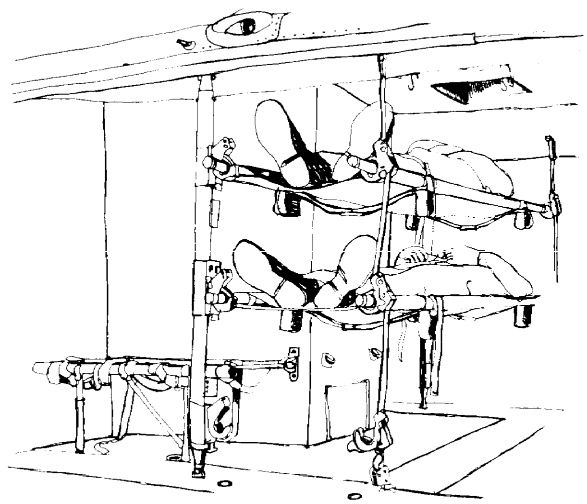


Figure 10-42. Air ambulance (UH-1H/V) with two litters loaded crosswise.

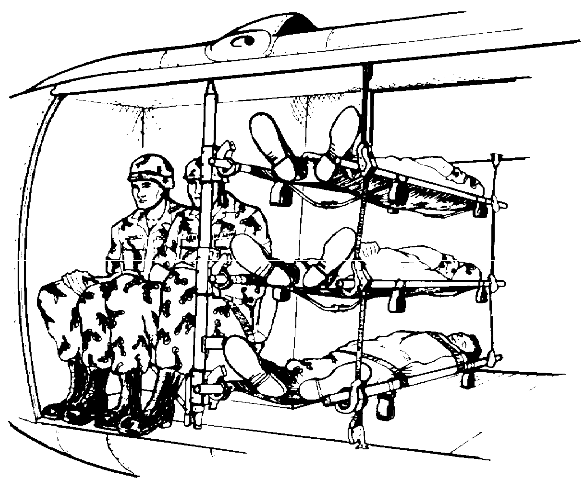


Figure 10-43. Air ambulance (UH-1H/V) with mixed load of litter and ambulatory patients.

Section IV. UNITED STATES ARMY NONMEDICAL AIRCRAFT

10-31. General

The US Army has both fixed-wing and rotary-wing aircraft. These aircraft are employed in both the CZ and COMMZ.

10-32. Army Fixed-Wing Aircraft

The capability of Army fixed-wing aircraft to land on and take off from selected small, unprepared areas permits the evacuation of patients from AOs which would be inaccessible to larger aircraft. These aircraft can fly slowly and maintain a high degree of maneuverability. This capability further enhances their value in forward areas under combat conditions. Army fixed-wing aircraft are limited in speed and range as compared with larger transport-type aircraft. When adequate airfields are available (Figures 10-44 and 10-45), fixed-wing aircraft may be used in forward areas for patient evacuation. This is a secondary mission for these aircraft which will be used only to augment dedicated air ambulance capabilities. (Field Manual 1-300 discusses airfield operations.)

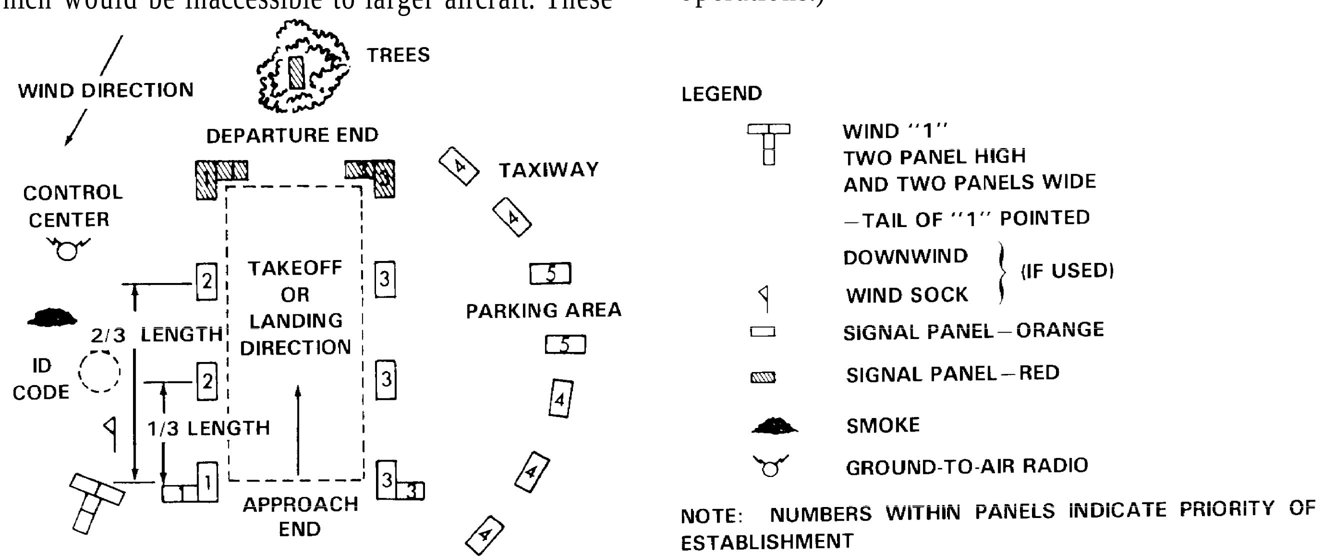


Figure 10-44. Marking and lighting of airplane LZ (day).

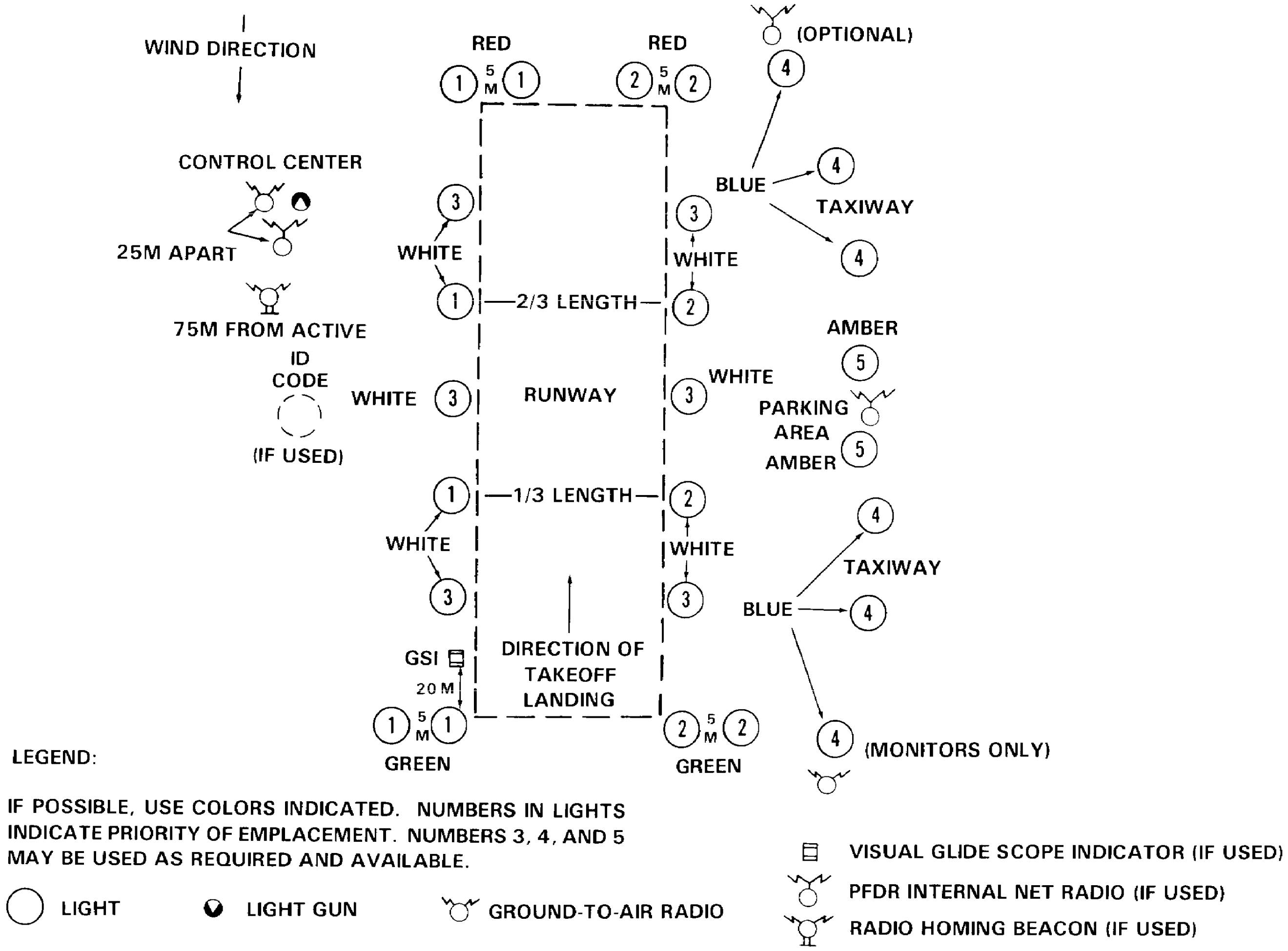


Figure 10-45. Marking and lighting of airplane LZ (night).

10-33. U-21/C-12 Aircraft

The U-21 Ute and C-12 Huron are used as utility (U-21) and passenger/cargo (C-12) aircraft. These aircraft are not normally employed as evacuation aircraft. In emergency situations, both of these aircraft can be configured to evacuate litter and ambulatory patients.

a. The *U-21 Ute is* a twin turbine, propeller-driven utility aircraft with a normal cruise speed of 210 knots and an endurance of over 5 hours flying time. It is capable of accommodating ten ambulatory patients, or three litter patients plus three ambulatory patients and a medic.

b. The *C-12 Huron* is the newest addition to the Army's fixed-wing aircraft inventory. Depending on the model, its normal cruise speed ranges from 240 to 260 knots with 5- to 6- hours endurance. It is capable of carrying eight ambulatory patients, or two litter and four ambulatory.

10-34. Loading Patients Aboard Army Fixed-Wing Aircraft

The personnel who transport patients to the landing strip load the patients aboard the aircraft. They may be required to assist in configuring the aircraft for litters. Litters are generally loaded from the top downward and from the front to the rear. The four-man litter squad plus the crew chief normally load these aircraft. The crew chief or another member of the aircraft crew supervises the loading of all patients. Bearer number 2 normally enters the aircraft to assist the crew chief in loading the litters.

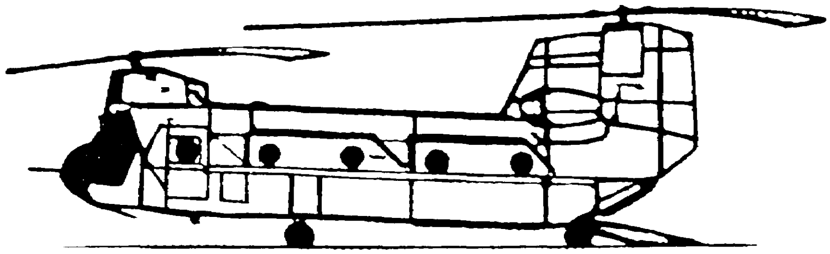


Figure 10-46. CH-47 (Chinook) helicopter.

10-35. The CH-47 (Chinook) Helicopter

a. The CH-47 (Chinook) helicopter (Figure 10-46), has a capacity of 24 litter patients, or 31 ambulatory patients, or a combination of litter and ambulatory patients. The aircraft's overall size and rotor blade diameter make it unsuitable for use in smaller or more confined areas.

b. The CH-47 helicopter should not be brought into a LZ that is smaller than 40 meters in diameter.

Table 10-4. Litter and Ambulatory Configuration of the CH-47 (Chinook) Helicopter

Ambulatory	Litter
31	0
25	4
19	8
16	12
10	16
4	20
1	24

10-36. Loading Patients Aboard the CH-47 (Chinook) Helicopter

a. Interior of the CH-47 (Chinook) Helicopter.

(1) This helicopter's maximum capacity is 24 litter patients or 31 ambulatory patients. The 31 ambulatory patients are seated in the ten three-man seats and the one one-man seat as shown in view A of Figure 10-47. The two one-man seats are used by crew members.

(2) When carrying 24 litter patients, the seats are replaced with six tiers of litters, four litters high. The two one-man seats in the rear section should remain in place for the crew members. The one-man seat at the left front may also be left in place provided it is needed.

(3) The combinations of litter and ambulatory patients the CH-47 helicopter is capable of accommodating are provided in Table 10-4.

b. Litter Support Kits. These kits are available for use in adapting the helicopter's interior to evacuate litter patients. These kits contain twelve litter poles, stored in the front of the cargo compartment and twelve litter straps, stored in overhead recesses. The poles contain safety attachments for securing them along the side walls of the compartment. The pull-down straps on the aisle side are secured to floor studs. Permanently attached to each litter pole and each strap are four litter support brackets with locking devices for securing litter handles in place. It is not necessary to remove the seats before adapting the compartment for litter patients. The seats can be folded against the wall and strapped in place.

c. Loading of Litter Patients. The loading of litter patients aboard the CH-47 helicopter is similar to loading patients aboard the UH-1H/V air ambulance except the litter squad is not assisted by the crew members. In a two-man carry, the litter squad carries each litter patient through the lowered rear door and ramp to the litter rack where he is to be placed. The squad then moves into a four-man carry and places the litter patient into the appropriate tier. The litter racks should be loaded from front to rear and from top to bottom. Litter patients requiring in-flight medical care should be positioned to facilitate this care. If the helicopter is to be loaded with a combination of litter and ambulatory patients, the litter patients should be positioned to the rear of the ambulatory patients whenever possible.

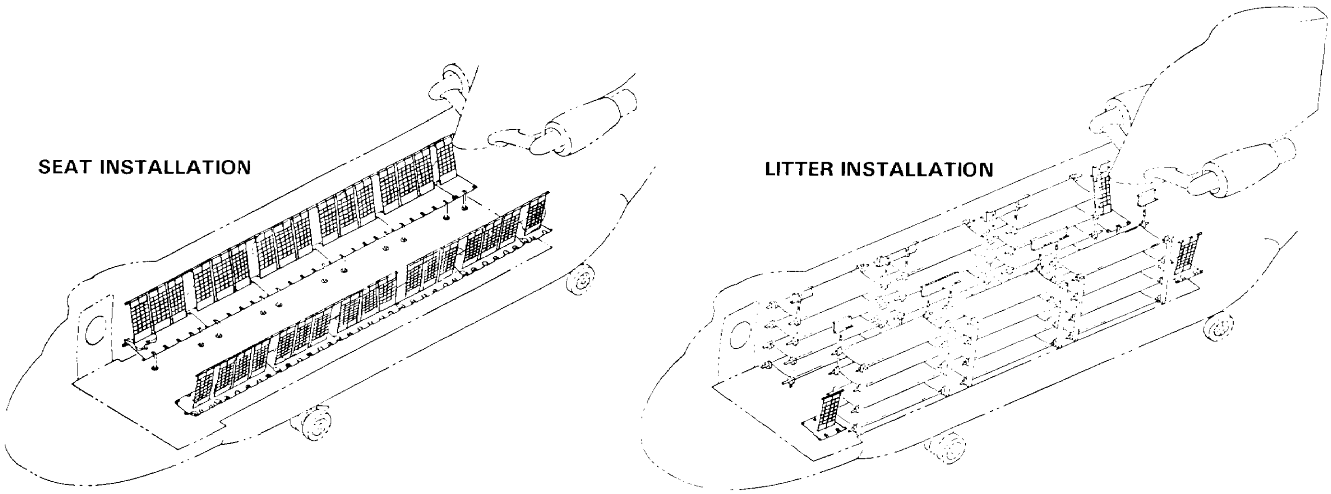


Figure 10-47. Interior view of CH-47 (Chinook) helicopter.

Section V. UNITED STATES AIR FORCE AIRCRAFT

10-37. General

Most USAF cargo aircraft can be used for aeromedical evacuation. The aircraft used for the forward airlift movement of troops and supplies may be reconfigured for the aeromedical evacuation mission on the return flight (provided proper equipment is available).

10-38. Types of Air Force Transport Aircraft and Units

a. The C-130 Hercules Transport. This aircraft is a four-engine, turbo-propeller driven aircraft with a pressurized, air-conditioned cabin and a self-contained loading ramp. In the normal patient configuration, this aircraft can accommodate 50 litter and 27 ambulatory patients. This can be varied for as many as 70 litters with no ambulatory patients, or 85 ambulatory patients with no litters. These figures represent maximum patient capacity and would not be used routinely. The medical crew is normally provided by the USAF. It consists of two flight nurses and three aeromedical evacuation technicians. The C-130 can land on and take off from short runways. It can also be used on landing strips such as those found in forward base operations. Its normal use is within a TO for tactical and assault airlift. The C-130 can also be used for strategic airlift missions, if required.

b. The C-9A Nightingale. This aircraft is a T-tailed aeromedical airlift with two jet engines and a pressurized, air-conditioned cabin. The Nightingale is the military version of the DC-9 airliner with an interior specifically designed for in-flight patient care. It is the only aircraft in the USAF inventory that is dedicated to the medical evacuation mission. It has a self-contained patient enplaning ramp and can accommodate 40 litter patients, 40 ambulatory patients, or a combination of both. The normal configuration is for 15 litter and 24 ambulatory patients. The medical crew normally consists of two flight nurses and three aeromedical evacuation technicians.

c. The C-141 Starlifter. This aircraft is a four-engine, jet cargo transport aircraft. The cabin is pressurized, heated, or cooled, as required. The ambulance bus may be backed to the ramp at the tail of the aircraft for easy enplaning of litter patients. The C-141 can accommodate 103 litter patients, 147 ambulatory patients, or a combination of both. Maximum capacity is not routinely used, as crowding detracts from patient comfort. The usual medical crew is two flight nurses and three aeromedical evacuation technicians. The C-141 is used for all missions of the MAC's Strategic Aeromedical Evacuation System. With the backhaul capacity, these intercontinental cargo aircraft provide aeromedical evacuation from a TO to CONUS.

d. The C-5 Galaxy. The C-5 is the United State's largest aircraft. The aircraft is normally a cargo mover, with a payload of over 200,000 pounds. If required, it could carry up to 70 ambulatory patients in its upper-aft passenger compartment in addition to its cargo load.

e. The C-17A. This aircraft will consist of wall seating with safety belts for ten medical personnel, 44 ambulatory patients, stanchion prototypes to accommodate 48 litter patients, and necessary medical equipment needed for in-flight patient treatment. Approximate position of oxygen recharger hoses will be marked on the internal cargo compartment wall.

f. Air Force. The USAF has functionally organized units specifically designed to perform aeromedical evacuation. There are two basic types of units. Either type of organization can provide for the operation of the AECC, ASFs, in-flight medical care teams, and liaison personnel.

(1) Aeromedical aircraft units (flights, squadrons, groups, or wings) combine personnel for operation of the aircraft and medical personnel in the same organization.

(2) Aeromedical evacuation units (flights, squadrons, or groups) are strictly medical organizations. These units possess no organic aircraft; they rely on the backhaul capability of cargo aircraft.

10-39. Aeromedical Evacuation (AE) Civil Reserve Air Fleet Aircraft (CRAF)

a. The Boeing-767 (B-767). The Boeing 767 is a wide-body, long-range, twin-engine aircraft. In times of national conflict, the aircraft can be modified with predesigned ship sets to accommodate up to 111 litters. Once configured, the aircraft will be flown in a strategic role, evacuating patients from the TO to CONUS. The medical crew composition will consist of two standard crews (four flight nurses and six aeromedical technicians).

b. The McDonnell Douglas-80 (MD-80). The MD-80 is a single-engine, short-range aircraft which will be used in CONUS for patient redistribution. When configured in an aeromedical role, the MD-80 will carry up to 45 litters. The medical crew compliment will consist of two nurses and three aeromedical technicians.

10-40. Preparing Aircraft to Receive Patients

The aircraft crew is responsible for preparations to receive litter patients. Before the patients are loaded, the medical crew director inspects the aircraft to ensure that the required supplies and equipment are available and in operating order. The items inspected include—

- Accessories, such as litter straps, clamps, stanchions, hot cups, and spare flashlights.
- Rigging to ensure security.
- Medical chests, water and coffee jugs, walk-around oxygen bottles, trash receivers, and other movable items to ensure that they are properly fastened to withstand flying conditions and that they constitute no hazard to occupants of the aircraft.

- Cabin-to-cockpit communications system to ensure that it is operative. This is accomplished by making a communications check with the pilot.

- Patients' survival and other equipment as it is loaded on the aircraft to ensure conformity with the existing instructions for the particular aircraft.

10-41. Developing the Loading Plan

a. The plan for loading patients aboard a large transport aircraft depends upon the capacity of the aircraft, the length of the flight, and the number of litter and ambulatory patients to be transported. Transport aircraft carry litters in tiers, normally three or four litters high. In developing a loading plan, the objective is to place each litter patient in the space which provides the most comfort for him without detracting from the comfort of other patients. It is necessary to consider—

- Diagnosis.

- Preflight preparation or medication to be given the patient.

- Point where he is to be unloaded.

- Amount of care required during flight.

b. The following factors should be considered when developing the loading plan:

- Patients in plaster casts or splints must be placed on the side of the aircraft which would make the injured limb accessible for treatment.

- Patients with certain conditions requiring travel in a sitting or semiprone position require the same amount of space as two litters.

- Female patients should be segregated as much as possible from male patients.

- Patients requiring bedpans, IV infusions, special treatment, or dressings during flight should be placed in the middle tier where they are more accessible for care.

- Patients who are unable to help themselves should, if possible, be located near the main cargo door to facilitate their exit in event of an emergency.

- Patients suffering mental disturbances should be located in positions that afford maximum observation.

- Patients with a diagnosis of tuberculosis or other communicable disease should be loaded in rear litter tiers.

- Patients who are restless, such as those with head injuries, or those who are unconscious must be placed on the bottom tiers.

- Patients with coughs and those subject to airsickness should be placed on the bottom tier and positioned at the downwind end of the normal ventilation flow.

- After the patients are loaded, their personal effects should be stowed in the baggage compartment or the rear portion of the cabin.

- A preflight briefing should be given to all patients. The medical crew director is responsible for ensuring that this briefing is conducted before each flight. The briefing should be complete and conducted in such a way as not to alarm patients who are flying for the first time.

CHAPTER 11

USE OF THE HIGH PERFORMANCE HOIST IN MEDICAL EVACUATION OPERATIONS

Section I. CREW RESPONSIBILITIES

11-1. General

a. The minimum number of crew members to execute a hoist rescue operation is four. This includes the PC, PI, crew chief (hoist operator), and medic. As crew coordination is the key to successful hoist operations, each crew member must thoroughly understand the duties of all persons involved in the effort. If the patient is disabled, the PC designates a crew member to descend on the hoist to assist the patient.

b. Throughout this chapter and Appendix I, the term "patient" denotes medical patient, casualty, or survivor.

11-2. Primary Crew Responsibilities

a. The PC has overall command and control of the operation. He supervises planning and preflight procedures as well as briefing the crew on all mission details. He coordinates crew activities and is responsible for their proficiency and performance. Although his primary duty is to fly the helicopter, the situation may require him to operate the hoist by using the cockpit controls.

b. The PI has the responsibility throughout the operation to remain oriented with the horizon and to assist both the PC and the hoist operator, if needed. If an emergency condition arises he will be directed by the PC to employ the hoist cable cutter. He must be familiar with all crew member tasks and be able to perform them. If the hoist operator is directed to leave the helicopter to aid a patient, the PI may be required to operate the hoist.

c. The hoist operator inspects the hoist and all other mission-essential equipment prior to takeoff. His most crucial task is to guide the PC over the patient. The hoist operator is responsible for deploying smoke and flare devices. He operates the hoist and assists in lifting the patient into the helicopter.

d. The medic provides medical treatment to the patient. He may be required to leave the helicopter to assist the patient. The medic should also be proficient in operating the hoist.

Section II. INTERCREW COMMUNICATIONS

11-3. General

To successfully accomplish hoist rescue operations, all members of the rescue team must be able to communicate accurately and concisely. All crew members must be able to communicate the necessary information even if voice communications are impossible or impractical.

11-4. Intercrew Communications

The primary means of communicating throughout the hoist operations is voice communications over the helicopter interphone system (hot mike); however, the PC or PI may elect to remain on the command radio and depress the interphone switch. If the interphone fails, hand signals are used.

a. Operational terminology. During the operation, communications between PC and hoist operator should be clear and concise. To avoid confusion, no more than one direction should be given at a time. The PC acknowledges each direction. The following terminology is recommended for use by the hoist operator and should be standardized in the unit SOP.

(1) Area is in sight.

(2) Patient is in sight _____ feet ahead—correct right (or left, as applicable).

(3) On course, patient is straight ahead—on course.

(4) Back _____ feet.

(5) Forward _____ feet.

(6) Up _____ feet.

(7) Down _____ feet.

(8) Left _____ feet.

(9) Right _____ feet.

(10) Hold. (Used when in position and centered over patient.)

NOTE

The word *STOP* should never be used.

(11) Hoist is halfway down.

(12) Hoist is on the ground (in the water, as applicable).

(13) Aircraft is clear of all obstacles.

(14) Patient is on hoist, ready for pickup.

(15) Ground personnel are clear.

(16) Cable is tight/slack is out.

(17) Pilot, lift the load.

(18) Load is off the ground.

(19) Give load height in 1-foot increments until the load is stabilized and at 10 feet.

(20) Load is clear of barriers.

(21) Load is 20 feet below the aircraft.

(22) Give load height in 5-foot increments until the load is stabilized 5 feet below the aircraft.

(23) Load is even with the skid tubes or wheels.

(24) Load is secure in the aircraft.

(25) Rear is ready and secure.

b. Hand signals.

(1) Hand signals should be preplanned and practiced before the operation. It is important that the hand signals not impair the crew's ability to fly the aircraft. When using hand signals, the PC and hoist operator should be positioned on opposite sides of the helicopter, or the PI can relay these signals to the PC.

(2) The following are examples of hand signals used during hoist operations to direct the PC:

(a) Movement of the helicopter can be indicated by moving the open hand in the desired direction with the palm facing in that direction.

(b) Hold in present position is indicated by a clenched fist.

(c) Movement of the hoist is indicated by extending the thumb either up or down from a clenched fist.

(d) Fingers are used to indicate numbers of feet.

Section III. EMPLOYMENT

11-5. General

Hoist rescue operations must be conducted in a systematic manner to ensure that the operation is handled in the safest possible way. All crew members must be aware of what phase the operation is in at any given time.

11-6. Hoist Rescue Operational Phases

Once the patient has been located, hoist rescue operations can be divided into four distinct phases. These phases are—

a. Visual Preparation. Upon sighting the patient, smoke is dropped to mark his position and to determine wind direction. If radio communications with the patient has been established, position marking may not be necessary. If the wind direction is known, other marking devices such as lights and panel markers, may be used.

b. Pattern Phase. A flight pattern is established during the second phase of the operation to bring the helicopter into position. The type of pattern to be flown is determined by the PC and is influenced by the PC's position in the cockpit. The left seat provides a greater field of vision. However, control of the hoist in the UH-1 cockpit is available in the right seat only. The unit SOP designates the seat for the PC.

c. Recovery Phase. This is the most critical phase of the operation and requires the highest degree of crew coordination. Recovery techniques vary depending upon the environmental factors in the AO.

d. Departure Phase. In this phase, the patient is secured in the aircraft and the equipment is positioned for departure from the hoist site. The aircraft is then prepared for departure.

Section IV. ENVIRONMENTAL FACTORS

11-7. General

Hoist operations are conducted over both water and land and in varying degrees of illumination such as daylight, overcast conditions, and at night. The crew must train in all types of environmental conditions to ensure they are able to accomplish their stated mission.

11-8. Water Recovery Operations

a. Visual Preparation.

(1) Upon the initial sighting of the patient, a marine locator marker is deployed in the immediate vicinity to mark the position and to determine the wind direction. The patient must be kept in sight until the initial smoke is dropped. The PC flies into the wind maneuvering over the patient so that the hoist operator can drop the smoke in the vicinity of the patient. If a marine locator marker is not available, fluorescein sea markers from the water survival kit are effective.

(2) Once the wind direction is determined, additional smoke may be employed to aid in spatial orientation. Smoke should be dropped at the lowest possible altitude and airspeed. The smoke must land in a spot close enough to the patient to provide adequate wind information, but should not obscure his position when approaching into the wind. The PC must keep the hoist operator continuously informed of their position in the pattern during the approach (on the downwind leg, on the base leg, and on the final approach). The hoist operator advises the PC when the smoke has been released.

b. Pattern Phase. Once the smoke is employed, the PC plans and establishes a flight pattern that places the helicopter in the position for the recovery.

(1) If the PC is in the right seat, a right-hand pattern should be flown so that the PC can keep the patient in sight.

(2) The final approach should permit the helicopter to arrive at a hover far enough from the patient so that the—

- Waves and rotor wash are not a hazard to the patient.
- Rescue device can be lowered into the water well clear of the patient.

(3) The PC advises the hoist operator of their position throughout the approach and advises when he has the patient in sight.

(4) The hoist operator acknowledges all calls and informs the PC when he has the patient in sight on the final approach.

(5) The PC and PI maintain the proper altitude and position once the final approach has been completed.

c. Recovery Phase.

(1) Once the hover has been established, the PI makes a *power-available* check to ensure that the helicopter has sufficient power to continue the operation. The check should be performed at the lowest altitude possible. When the PC is ready to continue with the recovery, he advises the hoist operator to lower the rescue device and directs the helicopter to the patient. The hoist operator then lowers the rescue device and gives directional instructions to the PC to move the helicopter on a straight course to the patient. Before he loses sight of the patient, the PC should transfer his hover reference to the smoke markers that have been placed upwind. He should not attempt to watch the pickup, as spatial disorientation may result. As the helicopter moves slowly toward the patient, the rescue device should be lowered. He ensures that the rescue device enters the water at least 20 to 30 feet before reaching the patient. This assures that the device does not strike and injure the patient. Flotation gear is provided for the patient at this time.

CAUTION

Static electricity built up on the hoist cable and the rescue device must be discharged by touching the device to the water before attempting the pickup.

(2) When the rescue device is in the water and easily accessible to the patient, the hoist operator directs the PC to hover to that position. When the patient is observed to be secure and ready for hoisting, the–

- Hoist operator takes up any slack in the cable and notifies the PC that the pickup is ready to proceed.
- Copilot makes a final power check to ensure that sufficient power is available for recovery.
- Pilot-in-command applies sufficient power to lift the patient clear of the water (approximately 10 feet).
- Hoist operator begins hoisting until the patient is in the helicopter cabin.

(3) During the pickup, the PC devotes his full attention to maintaining a steady hover using all available reference points and the hoist operator's instructions. The PI monitors the instruments and remains oriented with the horizon throughout the operation to assist the PC. The hoist operator's instructions to the PC must be clear and concise (refer to paragraph 11-4).

(4) The hoist operator advises the PC when the patient is safely inside the helicopter and secured in the cabin. The PC then transitions from a hover to forward flight.

CAUTION

The lateral center of gravity (CG) limits may be exceeded if all crew members and passengers are positioned on the same side of the **helicopter.**

11-9. Land Operations

a. Visual Preparation. Determining wind velocity and approximate distance is important to successful hoist operations. Although smoke may be used as a means for determining the approximate wind velocity and direction, observing vegetation in the area may be easily employed as an alternate means. If smoke is used, it should be deployed in an area that is open enough to be seen from anywhere in the hoist pattern. Care should be taken to select a nonflammable target area.

b. Pattern Phase.

(1) As in water operations, the pattern flown should allow the PC to maintain visual contact with the patient. Terrain factors and conditions encountered at the rescue site must be evaluated to determine the best approach to be used. The PC must keep the hoist operator informed at all times as to the type of pattern to be flown and the position of the helicopter in the pattern.

(2) The PC devotes his full attention to maintaining a steady hover by using all available references and the hoist operator's instructions. The PI monitors the engine instruments and remains oriented with the horizon. The presence of trees, wires, or other obstacles require extreme caution in approaching the patient. Since all crew members must aid the PC in rotor-tip clearance, all doors and ramps are open for maximum visibility. The hoist operator must give clear and concise instructions to the PC. He must also supply continual commentary on the progress of the pickup throughout the pattern phase.

CAUTION

Static electricity built up on the hoist cable and rescue device must be discharged by touching the device to the ground before attempting the pickup.

c. Recovery Phase. Prior to hoisting the patient, the hoist operator takes up any slack in the cable and notifies the PC that the patient is ready for pickup. The PC then makes a final determination that sufficient power is available to safely accomplish the recovery. The PC applies sufficient power to lift the patient clear of the ground (approximately 10 feet) or if the tactical situation requires, the hoist operator raises the patient while the helicopter remains in a stationary hover. Both techniques have proven acceptable; however, the aircraft lift is preferred. The PC decides which technique to apply depending on the given situation. The first procedure provides the PC better control of the aircraft as the patient is lifted off the ground which may be needed in confined areas. In tactical situations, however, the second method may be used to avoid unmasking the aircraft. The hoist operator advises the PC when the patient is safely inside the helicopter and secured in the cabin. The PC then transitions from a hover to forward flight.

11-10. Night Recovery Operations

Flying, especially hovering, at night is difficult because visual ground references are not easily distinguishable. When hovering over water or dense vegetation, ground contrast and reference points are virtually nonexistent. Without visual clues, the PC's ability to judge movement is severely impaired. Constant head movement and scanning are essential throughout the maneuver to maintain altitude and position. Because of this increased work load, it is recommended that the crew chief (hoist operator) operate the hoist rather than the PC.

a. Illumination.

(1) Chemical lights may be attached to rescue equipment to provide illumination. The lights aid the hoist operator, as well as the personnel on the surface, to determine the position of the equipment during the operation. To activate the chemical light, remove it from the foil package and bend the light stick until a pop is heard. Shake the chemical light stick vigorously to facilitate the chemical reaction.

(2) Due to spatial disorientation at night while flying or hovering over water, continuous flare illumination should be used whenever

possible. Flares improve depth perception and reference to the water. Multiple smoke or marking devices deployed on the water during water recoveries assists in determining wind direction and provides a visual reference for hovering. Caution must be used to prevent smoke from restricting visibility in the immediate recovery area.

(3) As in night water recoveries, flare illumination provides the best possible conditions for conducting land pickups at night. Flare illumination, however, is not absolutely necessary. Helicopter lights normally provide adequate lighting to safely accomplish the recovery.

b. Night Vision Goggles.

(1) In a tactical environment, the amount of illumination which can be used during the recovery operation should be considered. It may be necessary to use NVG in order to maintain adequate concealment.

(2) Infrared (IR) chemical lights, designed for use with the NVG, may be attached to rescue equipment to provide the hoist operator with visual clues during hoisting procedures. A 30-minute high-intensity light stick and a 12-hour low-intensity light stick are also available.

Section V. INERT PATIENT RECOVERIES

11-11. General

If it is determined that the patient is unconscious or unable to board the rescue device, the PC directs one of the crew members to prepare to exit the helicopter and another to act as the hoist operator. If the hoist operator is directed to leave the helicopter, the PI moves to operate the hoist. If a medic is available, he may exit the helicopter while the other crew members maintain their positions.

11-12. Procedural Guidance

a. The crew member performing the duties of hoist operator dons the safety harness over the hoist operator vest. He ensures that the crew member preparing to leave the helicopter is secured in the rescue device or hoisting vest. Flotation gear must be worn during all water recoveries, and if necessary, be provided to the patient. The PC is notified when the preparations are completed.

b. Once the crew member is ready to exit the helicopter, he is lowered to the surface where he leaves the rescue device and secures the patient for hoisting. The hoist operator then notifies the PC when ready to begin hoisting. The PC determines if adequate power is available to accomplish the recovery.

c. The PC applies sufficient power to lift the patient off the ground (approximately 10 feet) or the hoist operator raises the patient while the helicopter remains at a stationary hover. The hoist operator then hoists the patient, pulls him into the cabin, and removes the patient from the device. The crew member is then retrieved from the surface. The hoist operator must keep the PC informed of the progress of the recovery. When all personnel are safely inside the cabin, the PC is notified. The PC then transitions from a hover to forward flight. If the PI has served as hoist operator, he returns to his position in the cockpit.

Section VI. METEOROLOGICAL AND TERRAIN FACTORS

11-13. General

Hoist rescue operations are conducted over various types of terrain and in a number of weather conditions. The aircraft crew must be familiar with the unique requirements within their mission area and must train in these conditions to ensure the safety of the hoist operation.

11-14. Performance Planning

a. Prior to hoist operations, the PC must consult the appropriate operator's manual, specifically the performance charts. These charts correlate the effects of altitude, temperature, and gross weight on aircraft performance. Data is available for virtually all environmental conditions.

b. The performance planning card (PPC) enables the PC to determine if the aircraft can perform the mission under the current meteorological conditions. It is critical that the PC assess environmental conditions which can be expected at the rescue site, especially if they differ from those at the departure point. During high altitude missions, it is recommended that the PI continually update the PPC to compensate for gross weight changes and CG shifts.

(1) Under adverse conditions, the amount of weight that can be carried may be limited and the aircraft may be unable to sustain the high hover necessary for hoist operations. Wind direction and velocity must also be considered. For maximum control of the aircraft, the PC should avoid excessive tailwinds and right crosswinds. (Refer to the aircraft operator's manual for wind limitations.)

(2) The PC must manage fuel consumption to ensure sufficient fuel is available to complete the mission. Aircraft can be equipped to carry auxiliary fuel tanks to extend the range. However, these tanks reduce the cabin area (particularly in the UH-60A) and the added weight will limit the size of the load. The auxiliary tanks also affect the aircraft's CG.

11-15. Mountain Operations

The rugged terrain and dense forest characteristics of mountain environments often necessitates the use of hoists to extract personnel. Variable weather, wind, icing, and altitude adversely affect aircraft performance. These factors require precise aircraft control and detailed flight planning to prevent interruptions and delays.

a. Altitude.

(1) Density altitude is the most important meteorological factor affecting aircraft performance over mountainous terrain. Density altitude is dependent upon temperature, relative humidity, and pressure altitude. It provides the basis for determining lift capability. An increase in any of the three basic elements increases density altitude and decreases lift capability. As density altitude increases, increased torque or power is required.

(2) In the mountains, density altitude can vary significantly depending upon the time of day. Furthermore, the density altitude at the point of departure may be quite different from that at the pickup site. For example, density altitude normally peaks in the late afternoon and reaches its low point at dawn. The power available/power required margin must be large enough to absorb transient power requirements caused by turbulence, wind shifts, and patient weight. In a high-density altitude environment, power checks are critical. *Maintaining a minimum of 10 percent above required power is recommended.*

b. Wind. Wind is the principal weather hazard experienced in the mountains. Even moderate winds (11 to 20 knots) can produce significant turbulence as they pass over mountain ridges. Predicting wind conditions can be difficult due to the multitude of terrain variations. Each type has an effect on the flow of air. On the windward side of mountains, the direction of airflow is normally steady even though its strength may vary. On the leeward side of crests, wind is turbulent with strong vertical currents. The effects of turbulence may be alleviated by flying above terrain features and avoiding the lee side of all peaks and ridges. Ridges and saddles should be approached at the highest altitude possible and crossed at a 45 degree angle. Training and flying experience in these conditions minimize the hazards produced by wind and turbulence.

c. Icing. Icing can occur on aircraft in weather conditions such as low clouds and fog. In mountainous terrain, icing occurs when moist air is lifted over high peaks. Ice-producing areas are usually on the windward side of peaks to about 4,000 feet above the peak, and possibly higher when the air is unstable. Army helicopters are not capable of flight in severe icing conditions. As ice forms on rotor blades, it results in a significant decrease in lift and autorotational capabilities. Asymmetrical shedding can occur which causes a severe rotor blade imbalance.

d. Additional Information. For additional information on medical evacuation operations in mountainous terrain, refer to paragraphs 5-2 and 9-12 through 9-14.

11-16. Jungle Operations

Jungle terrain is often rugged and swampy with dense towering trees. Some jungles are composed of several canopies with trees more than 100-feet tall. There are few suitable LZs and thick jungle foliage complicates communications between ground and air resources.

a. Density Altitude. Jungle weather is generally hot, humid, and very unstable. In this environment, density altitude becomes an overriding consideration. As density altitude increases, engine efficiency decreases and the power required can become critical under high gross weight conditions.

b. Signals. Signals are difficult to see or hear from under dense tropical growth. In order to locate personnel on the ground, it may be necessary to use emergency signaling devices. A wide stream bed is a good place to signal from, especially where there are sandbars. Other open areas may also be used; however, caution must be exercised due to the increased vulnerability to sniper and small arms fire.

c. Additional information. For additional information on medical evacuation operations in jungle environments, refer to paragraph 5-3.

11-17. Extreme Cold Weather Operations

Cold weather flying conditions may be encountered in many parts of the world and severity varies with latitude and season. In this harsh environment, rapidly changing weather poses the greatest hazard to the flight crew. Terrain in the arctic and antarctic regions ranges from mountain peaks and glaciers, to flat plains. Although open areas are available, the surface may not be desirable for landing. It may be necessary to use the high performance hoist to extract the patient.

a. Environmental Considerations.

- Navigation in arctic regions may be hampered by the rapidly shifting landscape, snow-covered landmarks, and the lack of NAVAIDS. In addition, magnetic compasses become unreliable in the northern- and southern-most latitudes. Under these conditions, a combination of radio navigation, dead reckoning, and pilotage may have to be used to locate the patient.

- Radio communications are generally good, but may be temporarily disrupted by electrical disturbances (auroras). Some frequencies may be blocked for weeks.

- Static electricity creates a serious problem in cold weather. It can be generated by the movement of an aircraft through the air, by brushing snow or ice from the aircraft, or by dragging the steel cables over the ground. During hoist operations, pilots should key the mike immediately before load pickup. However, the charge will buildup again rapidly.

CAUTION

Before touching rescue equipment, ground personnel must either allow the equipment to hit the ground or use a grounding device to avoid an electrical shock.

b. Ambient Light Conditions.

- Summer in the polar regions produces almost continuous daylight. Conversely, during winter there are only 3 to 4 hours of daylight. During night operations, a solid snow cover reflects available light, making it much brighter than without snow. It may still be necessary to use aircraft lighting, NVG, or emergency lighting in order to complete a hoist mission.

- Lighting conditions in mountainous terrain can create hazards. Flight through mountain passes during overcast conditions, and combined with a solid snow cover, can be difficult. Visual references are easily lost and can result in vertigo. The PC should constantly check visual references with the aircraft altitude instruments.

c. Temperature. In polar regions, summer temperatures above 65°F are common except on glaciers and frozen seas. Winter temperatures sometimes drop to -70°F. Similar temperature extremes are experienced in subpolar regions.

d. Structural Icing. Aircraft performance is highly dependent upon temperature. Generally it improves as the temperature drops; that is, until icing becomes a factor. The most hazardous condition associated with the cold is aircraft structural icing. Army Regulation 95-1 prohibits Army aircraft from flying into known or forecasted severe icing conditions. Icing is most common when the temperature is between 32°F (0°C) and -4°F (-20°C) and when visible moisture such as clouds, drizzle, rain, or wet snow are present. Icing is rarely experienced in those areas which maintain temperatures of below -20°C.

e. Safety Considerations.

- Fly at altitudes below the freezing level, or clear of any visible moisture. Remain in visual meteorological conditions, and stay clear of clouds.

- Rotor-blade icing begins near the blade root. Ice buildup can cause loss of lift, resulting in an increase in power to maintain lift, and ultimately, an increase in engine temperature.

- Ice on the wire windscreen prevention device or wipers of the aircraft is the first sign of icing. The windows in the aircraft, even in the worst icing conditions, normally will not ice over.

- Asymmetrical ice shedding occurs when one rotor blade sheds ice, leaving the rotor out of balance. This condition of disequilibrium can lead to severe vibration. Ice shedding can also cause foreign object damage from ice ingested into the engine. When icing is encountered, descend to an altitude clear of clouds. Autorotational capability can be lost in a matter of minutes if ice is allowed to form on the rotor blades.

CAUTION

Shedding ice can be a hazard to ground personnel during start-up, hover, and shutdown.

f. Additional information. For additional information on medical evacuation operations in extreme cold conditions, refer to paragraph 5-5.

Section VII. SAFETY AND EMERGENCY PROCEDURES FOR HOIST MISSIONS

11-18. General

a. The information contained in this section is intended to supplement unit SOPs and operator manuals. The primary importance of this section is to ensure that rescue equipment can be safely used for the tasks for which it was developed.

b. Safety officers are responsible for—

- Ensuring that safety and rescue equipment is periodically tested.

- Determining the serviceability of the equipment in accordance with applicable technical manuals.

c. All unit-level maintenance will be completed including required testing, inspection, and maintenance.

11-19. Safety Factors

Only equipment tested and approved for use in military aircraft will be used during hoist rescue operations.

a. Hoist Cable.

- The hoist operator must ensure that the cable does not become tangled in objects on the ground or in the water. The entire length of the cable should be kept in view at all times. If the cable does become tangled, an attempt should be made to free it by letting out more slack and manipulating it.

- Extreme care should be used when applying tension to the cable.

★ **WARNING**

If the cable should break the whiplash action could cause injury to personnel, or damage the helicopter.

b. Pendulum Action. Extreme care should be taken when hoisting the patient. If the pendulum action and rotation of the patient are not stopped immediately, the movement may become uncontrollable. Pendulum action may be dampened by moving the cable in a 1- or 2-foot circle in the opposite direction of the patient's movement.

★ **WARNING**

If the pendulum action is not stopped, do not continue to raise the patient. Continuing to raise the patient while experiencing pendulum action will only worsen the effect.

c. Protective Gloves. These gloves should be worn by the hoist operator over the nomex flight gloves. The gloves should be made of heavy-duty leather and should prevent injury to the operator when manipulating the cable.

d. Vest, Hoist Operator, and Lifeline. The hoist operator vest, connected to the aircraft with a lifeline, is used both by the hoist operator and the medic during rescue operations. The vest and lifeline must be inspected regularly to ensure serviceability. While wearing the vest, avoid contact with moisture, hydraulic fluid, oil, grease, fuel, or acidic material.

WARNING

Always wear the safety harness on top of the hoist operator vest. This allows the craw member to quickly release the safety harness and exit the aircraft during emergency egress.

The hoist operator vest (Figure 11-1) consists of a Rachel Knit Vest with straps which crisscross the shoulders, waist, and hips. A D-ring, located at the center back of the vest, attaches the lifeline to the vest.

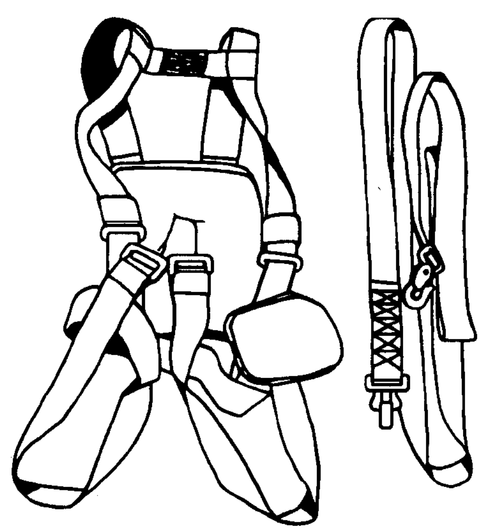
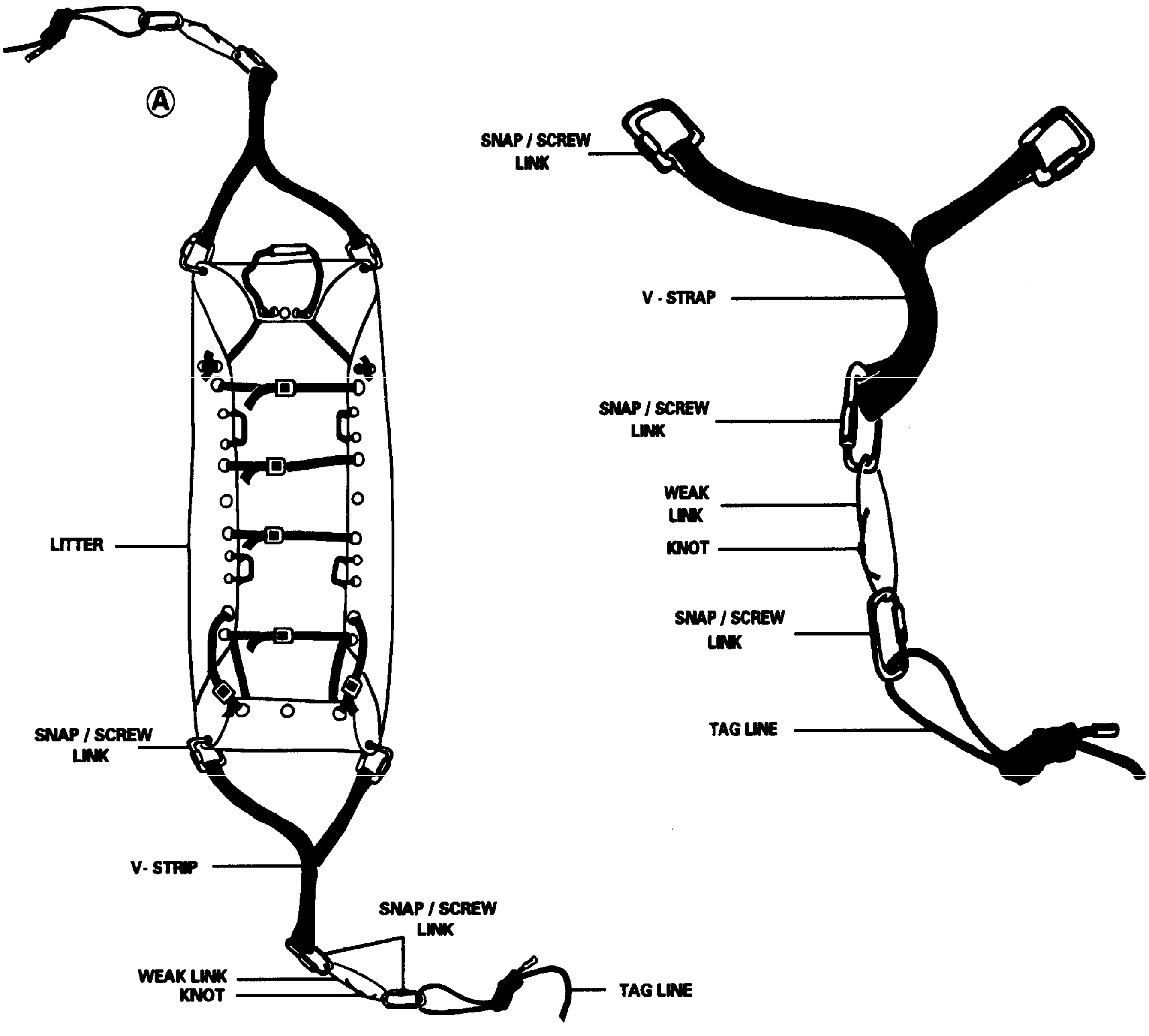


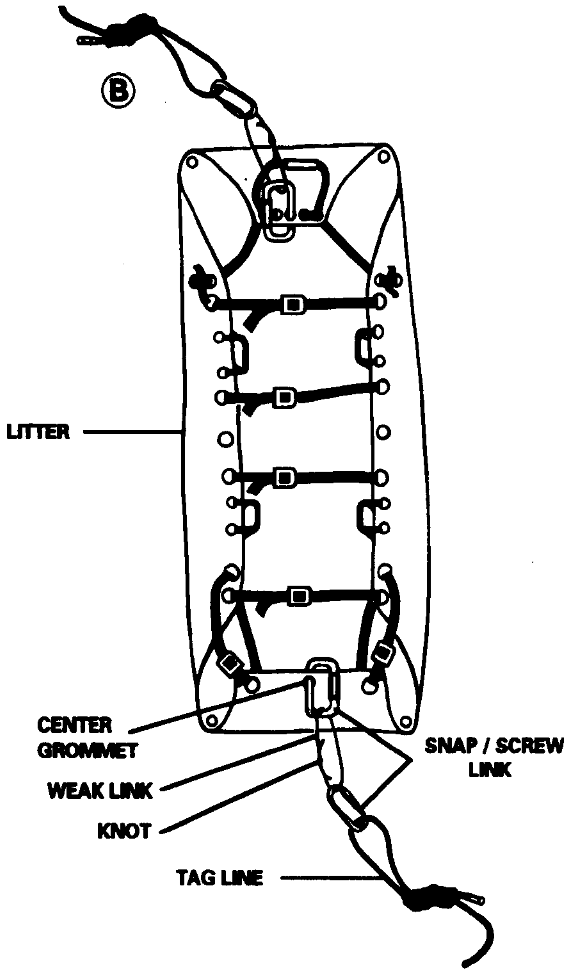
Figure 11-1. Vest, hoist operator, and lifeline.

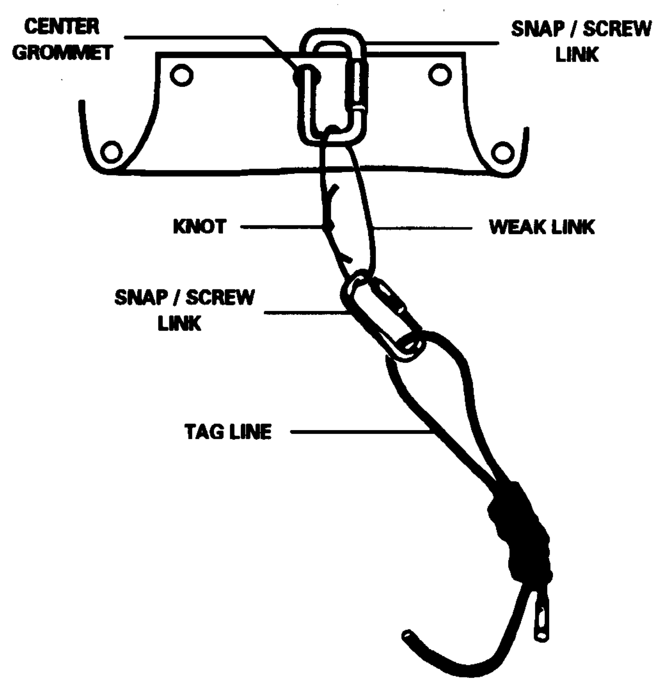
★ *e.* ***Tag Line and Weight Bag.***

- The use of a tag line and weak link is mandatory when hoisting patients in a horizontal or vertical position. If used properly, the tag line keeps the litter from spinning or swinging and provides positive control over the litter during hoisting operations. The tag line should be at least 250 feet in length and made of 3/8-inch diameter kernmantle style nylon rope with a polypropylene core and nylon sheath. See Figure 11-2 for proper connection of tag line. It is important that the tag line be equipped with a weight at the loose end. This weight prevents the tag line from being blown back up into the helicopter rotor system and provides a weight for lowering the rope back to the ground if necessary. A locally fabricated weight bag may be used to store the rope when not in use. The weight of a separate weight or weight and bag together should be at least 5 pounds. The weight bag may be manufactured of canvas or nylon and should have a weight securely fastened into the bottom of the bag.



★ *Figure 11-2. Connection of the weak link to SKED litter and tag line. (A—Method using V-strap.)*





★ *Figure 11-2. Connection of the weak link to SKED litter and tag line (continued). (B—Alternate method using center grommet.)*

WARNING

Do not allow a spin to start when using any flat surface litter system.

- The weak link is a device used to break away the tag line from the litter being hoisted. If the tag line should become entangled with an object, it will break away at the weak link when enough pull is asserted by ground personnel or the helicopter.

- To use the weak link, attach the tag line with a snap link or screw link to one end of the weak link an inch or more away from the weak link knot. Attach the other end of the weak link one inch away from the knot to another snap link or screw link attached to the V-strap which is attached to the litter (see Figure 11-2 **A**). An alternate method is to connect the weak link to a snap link or screw link which is attached to the center grommet of the SKED litter (see Figure 11-2 **B**).

WARNING

A new weak link must be used for each live hoist mission.

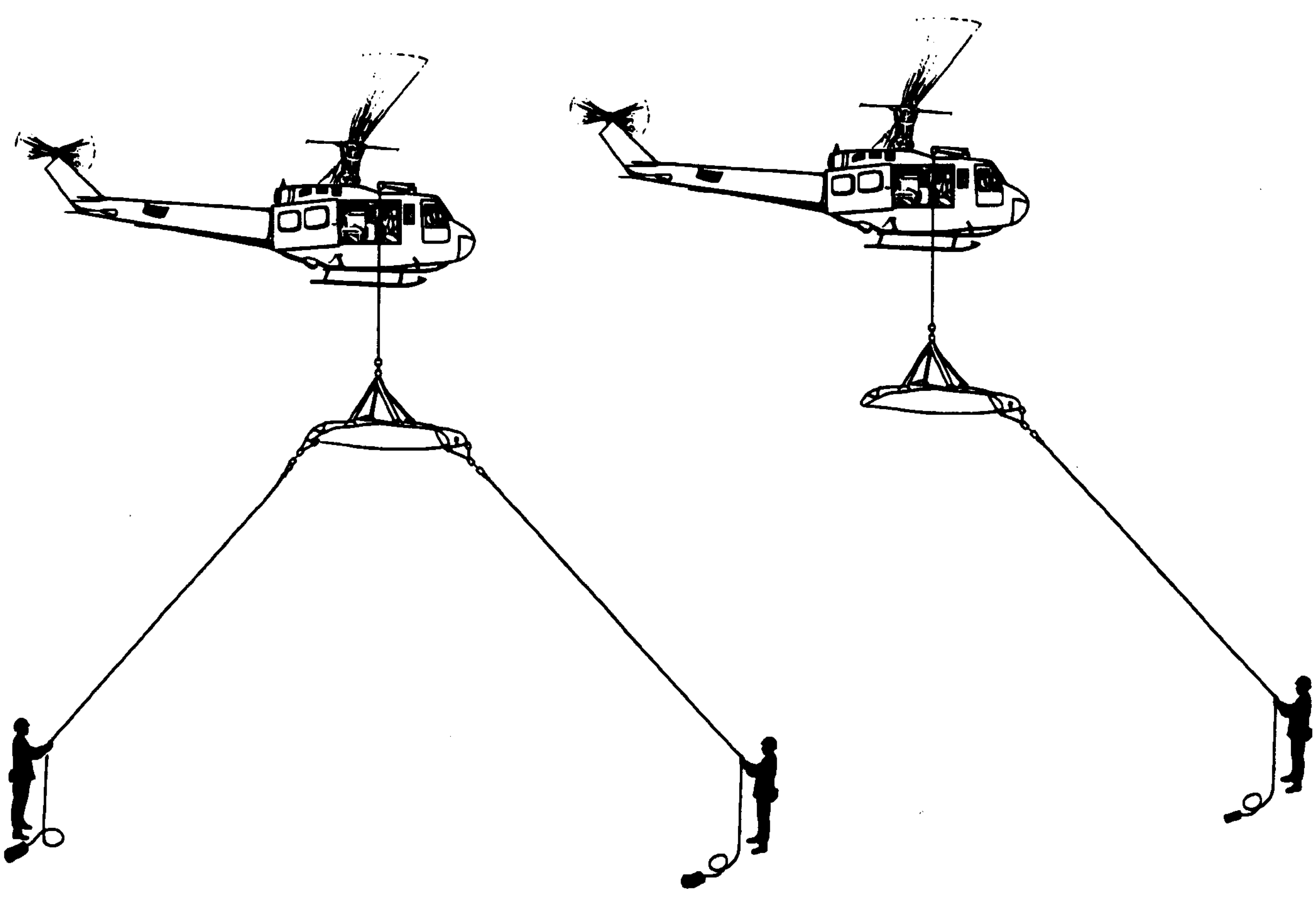
NOTE

During hoist training, multiple unmanned lifts may be made using the same weak link. The weak link should be disposed of properly.

- Proper placement for personnel during hoisting operations with any flat surface litter system is essential for prevention of litter spin. See Figure 11-3 for proper placement of tag line personnel.

Ⓐ PREFERRED PLACEMENT

Ⓑ ACCEPTABLE PLACEMENT

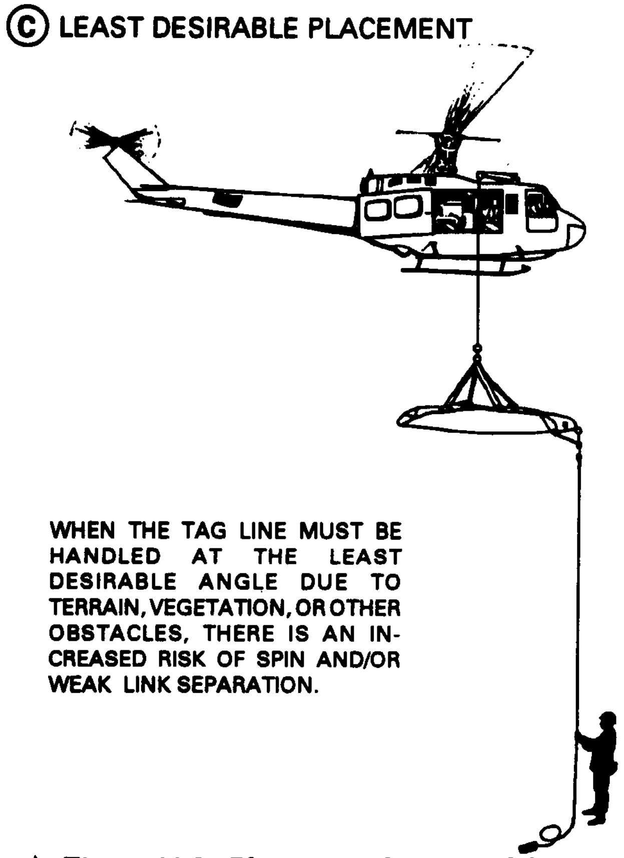


USE OF TWO TAG LINES IS THE SAFEST WAY TO PREVENT A LITTER FROM SPINNING. TWO TAG LINES SHOULD ALWAYS BE USED IN TRAINING AND NONHOSTILE SITUATIONS FOR BETTER CONTROL OF THE LITTER. THIS POSITIONING AFFORDS MAXIMUM VISIBILITY FOR THE PILOT AND BOTH AIR AND GROUND CREWS.

IF THERE IS ONLY ONE SOLDIER AVAILABLE ON THE GROUND TO ASSIST IN THE HOIST OPERATION, ONE TAG LINE MAY BE USED. TO OBTAIN ADEQUATE CONTROL OF THE LITTER, THE SOLDIER ON THE GROUND SHOULD BE POSITIONED TO AFFORD MAXIMUM VISIBILITY FOR THE PILOT AND AIRCREW.

NOTE: THE POSITIONING OF THE GROUND CREW AS SHOWN ABOVE IS AN IMPORTANT FACTOR IN MAINTAINING CONTROL OF THE LITTER. THIS POSITIONING PROVIDES THE PILOT AND AIRCREW MAXIMUM VISIBILITY AND THE ANGLE OF THE TAG LINE AFFORDS MAXIMUM CONTROL OF THE LITTER.

★ *Figure 11-3. Placement of personnel for hoisting flat surface litter systems.*



★ *Figure 11-3. Placement of personnel for hoisting flat surface litter systems (continued).*

11-20. Emergency Procedures

If a partial loss of power occurs while hoisting and the altitude cannot be maintained, the patient should be immediately lowered to the surface to lighten the helicopter. If the situation deteriorates to the point where further action is required to prevent settling to the surface, the following action must be taken:

a. If hoisting over land, the patient should first be lowered to the ground and freed from the hoist. It may be necessary to cut the cables as soon as the survivor is safely on the ground. Initiate the emergency procedures described in the applicable operator's manual. Should inadvertent landing occur, the PC attempts to maneuver away from ground personnel. The preflight briefing should cover the direction that ground personnel and crew members move in the event of such an emergency. All nonessential personnel on the ground should remain a safe distance from the operation.

b. If hoisting over water, the patient should be lowered into the water and the cable cut to avoid dragging him in the water as described above. Emergency actions are initiated according to the applicable technical manual. Should an inadvertent landing occur, the aircraft should be maneuvered clear of the patient in the water, if at all possible.

c. In the event of a sudden and complete loss of power, the PC performs an emergency autorotation maneuvering away from the patient, if possible.

d. A recovery may be continued if the hoist mechanism fails to raise or lower from the cable extended position. The patient should be advised of the problem by hand and arm signals and instructed to remain firmly attached to the recovery device. Before transitioning to forward flight, the helicopter should climb to an altitude which affords the patient clearance from all obstacles. With the patient suspended from the helicopter, the PC proceeds at a slow speed to a safe landing area.

WARNING

As pendulum action and rotation may become uncontrollable if airspeed is too great, care must be used when attempting forward flight with the hoist cable extended and a patient attached.

e. During landings, with the patient still suspended, care is exercised to prevent dragging the patient and tangling the cable in the tail rotor. The hoist operator or PC must maintain light tension on the cable during landing. After the patient has been gently lowered to the ground, the emergency cable cutter may be used to free the cable from the helicopter to permit landing. The helicopter may be hovered to the side of the patient and landed with the cable attached. After landing, the cable is detached from the patient and stored in the helicopter.

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11-21. Tactical Considerations

a. The focus of a hoist operation must change drastically in a combat rescue mission as opposed to a peacetime recovery. In a peacetime recovery, emphasis is on slow, decisive movements. The flight crew takes as much time as is necessary to effect the hoist operation giving priority to the safety of all concerned and patient comfort. Under combat conditions, the speed of the operation must be the primary focus to reduce exposure time. The following should be considered:

- Do not overfly pickup site.
- Look for the best hover location that offers cover and concealment.
- Prepare the aircraft for hoist operations prior to reaching the pickup site.
- Do not put aircrew members on the ground unless absolutely necessary for patient survival.
- Do not loiter near or circle the pickup site while awaiting patient preparation.
- Keep all aircraft active emitters turned off while on station, if possible.
- Use the forest penetrator or hoisting vest to hoist patients whenever conditions permit.
- Keep time on station to a minimum.
- Use all available passive aircraft survivability equipment (ASE).

b. The success of a combat hoist operation is dependent on—

- Undetected entry into the pickup area.
- Rapid completion of the hoist operation.
- Protected departure from the rescue site.

c. Hoist rescue operations are high-risk missions. Actions which support the safety and principles of hoist operations will reduce the risk and enhance the success of these missions.

Section VIII. FOREST PENETRATOR

11-22. General

The forest penetrator is a folding rescue seat designed for both land and water rescue operations. The forest penetrator is designed to penetrate thick foilage when lowered to the ground. This piece of equipment can accommodate up to three patients in a single lift. The flotation collar, when fastened around the forest penetrator, allows flotation of the complete assembly during water rescue operations.

11-23. Configuration of the Forest Penetrator

a. The forest penetrator (Figure 11-4) is a compact device weighing about 21 ½ pounds. The forest penetrator is 34-inches long and 8 inches in diameter when extended. Each seat is 4 ¾-inches wide and 11 ½-inches long. The seats on the forest penetrator are spring-loaded in the retracted position (flush against the shaft of the penetrator). A spring-loaded retaining latch is provided under each seat to secure the seat in the extended position. To release the seat, push down on the seat and pull down on the latch. The seat will snap back into the retracted position.

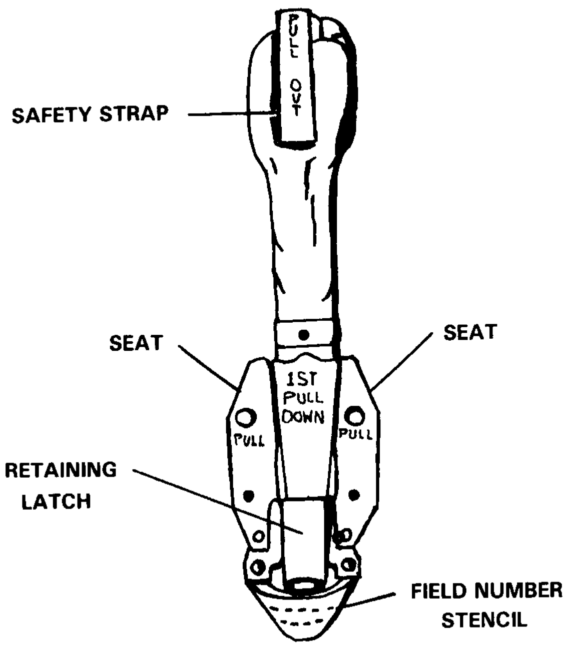


Figure 11-4. Forest penetrator.

b. Three webbed safety straps are provided to secure patients. Each strap extends 4 feet 9 ¼ inches, with an adjustable quick ejection snap hook attached to the upper section of the penetrator. The straps terminate with a yellow fabric, marked *TIGHTENED.* Yellow webbing tabs (with hook tape) marked *PULL OUT* are sewn to the safety straps for attachment to fabric cover storage openings. The yellow fabric cover has a 17-inch slide fastener and three storage openings (with pile tape) for securing safety straps.

c. The flotation collar (Figure 11-5) is made of bright orange foam rubber for high visibility and weighs 2.6 pounds. It is 20 ¼-inches long, with 7 ¾ inches in diameter at the top and a 4-inch diameter at the bottom. The flotation collar is 9 inches in diameter when installed on the forest penetrator and the seats are in the stowed position. In this configuration, the penetrator will float with its top approximately 6 inches above the water.

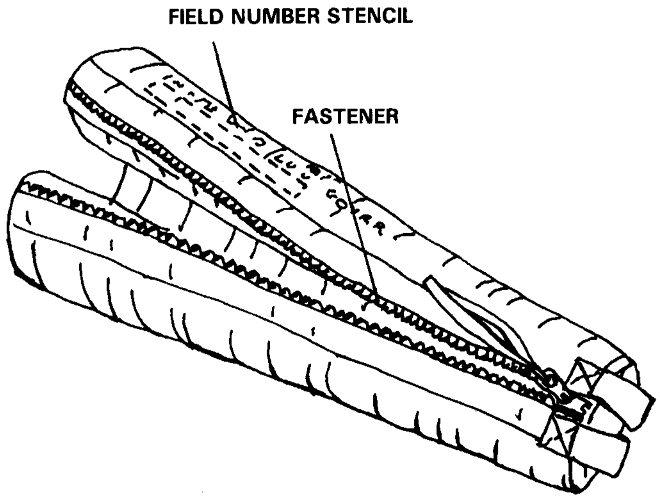


Figure 11-5. Flotation collar.

11-24. Application

When an LZ is unavailable, the forest penetrator can be attached to the rescue hoist to lift patients not requiring a hoisting litter. As many as three patients can be lifted at one time when conditions permit. The PC decides the number of patients to be lifted. The forest penetrator can be used with a hoist on the UH-1H/V, UH-60A, or the CH-47.

CAUTION

Patients with spinal, pelvic, or neck injuries, or who are unconscious will not be hoisted on the forest penetrator.

11-25. Employment of the Forest Penetrator

a. The hoist operator connects the forest penetrator to the hoist hook. He coordinates with the PC and proceeds to lower the assembly to the ground personnel.

b. Before handling the device, ground personnel allow the forest penetrator to touch the ground to discharge static electricity.

c. The necessary number of wing seats are extended.

d. Safety straps are removed from their protective cover. The straps are placed under the patient's arms, around his back, and fastened to the hook of the penetrator.

e. Once the hoist operator has been signaled that the patient is secure, the PC is notified and the patient is lifted into the helicopter.

f. Once the hoist has reached the fully raised position, the crew member, placing an arm around the patient and the forest penetrator, rotates the patient so he is facing away from the aircraft.

g. The crew member simultaneously pulls the patient into the aircraft and lowers him onto the deck (Figure 11-6).

h. The crew member continues to lower the penetrator until the edge of the support fluke is resting on the aircraft deck (Figure 11-7).

i. The crew member continues to lower the penetrator until the patient is lying on his back on the aircraft deck.

j. Once the patient is lying on his back with the penetrator on top of him, the crew member releases the safety straps and raises penetrator off the patient (Figure 11-8), secures the patient, and reports to the PC when ready for forward flight.

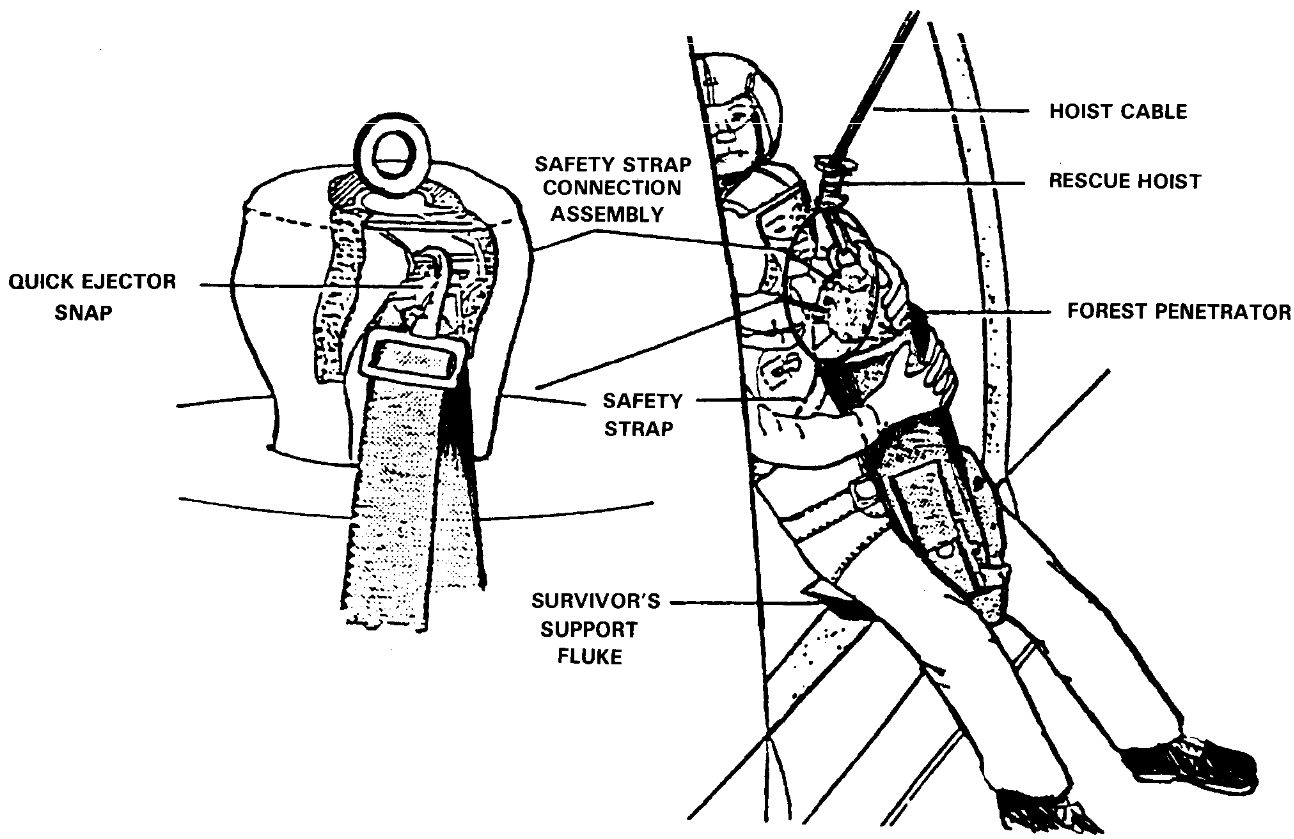


Figure 11-6. Crew member continues to lower

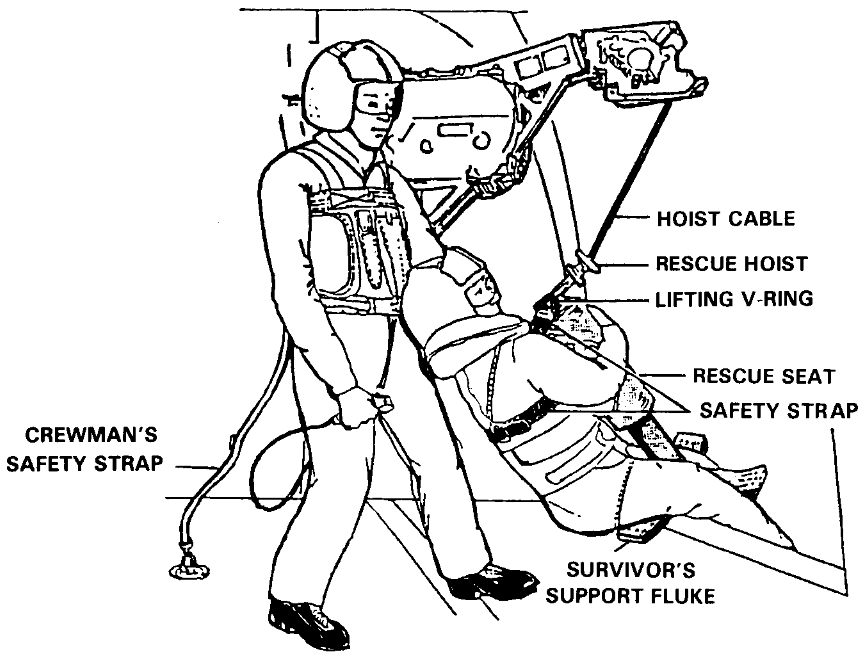


Figure 11-7. Crew member lowers the rescue seat until the edge of the patient's support fluke is resting on the aircraft deck.

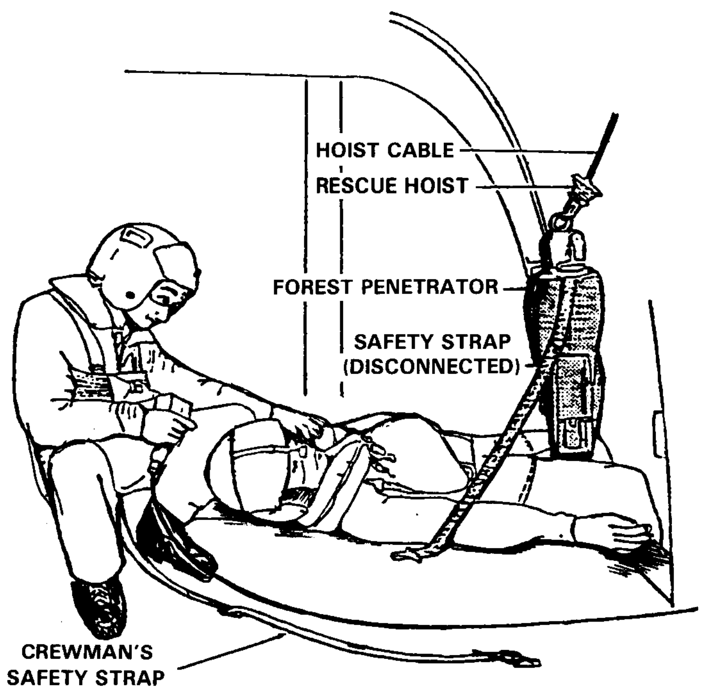


Figure 11-8. Crew member raises the forest penetrator off of the patient with the hoist.

11-26. Preventive Maintenance of the Forest Penetrator and Flotation Collar

Serviceability inspections and cleaning of the forest penetrator and flotation collar are performed at the unit level. All repairs or modifications are performed at the intermediate level or above.

a. Calendar Inspections.

(1) All forest penetrators and flotation collars are required to have calendar inspections (at the unit level) upon issue and each subsequent year. The calendar inspection consists of a visual inspection of the components and markings.

(2) The forest penetrator inspection proceeds in the following manner:

(a) Separate the flotation collar from the forest penetrator.

(b) Examine the fabric of the forest penetrator for cuts, tears, deterioration, and abrasions.

(c) Inspect the seams for broken stitching.

(d) Inspect the straps for security of the attachments and wear.

(e) Check the seat locking and retraction mechanism.

(f) Check all hardware for security of the attachment, corrosion, damage, wear, and ease of operation.

(g) Examine the cover for stains, dirt, and general condition.

(h) Inspect the seats and hooks for freedom of movement to all positions.

(3) The flotation collar inspection proceeds in the following manner:

(a) Check its floatability by installing the flotation collar on the seat and placing it in fresh water deep enough to support seat.

(b) Inspect the fabric for cuts, tears, deterioration, and abrasions.

b. Marking Inspection.

(1) Inspect all materials for faded markings.

(2) Restore or correct any faded markings. Use the information contained in Tables 11-1 and 11-2 to update markings.

Table 11-1. Flotation Collar Markings

MARKING	LOCATION	LETTER HEIGHT
STOCK NUMBER 4240-00-936-2795	Top of Flotation Collar	1/2 Inch
SAFETY STRAPS INSIDE YELLOW COVER	Right Side of Flotation Collar	1/2 Inch
REMOVE CHUTE	Left Side of Flotation Collar	1/2 Inch
(Field Number)	Side of Flotation Collar	1/2 Inch

Table 11-2. Forest Penetrator Markings

MARKING	LOCATION	LETTER HEIGHT
PULL OUT	End of Forest Penetrator Safety Strap	1/2 Inch
1ST PULL	Bottom of Forest Penetrator Seats	1/2 Inch
PULL	Sides of Forest Penetrator Seats	1/2 Inch
(Field Number)	Bottom of Forest Penetrator	1/2 Inch

c. *Storage.*

(1) If the flotation collar is to be packed with the forest penerator, place the collar on the penetrator and close the slide fastener.

(2) Place seat in the retracted position.

Section IX. SKED RESCUE SYSTEM

11-27. General

The SKED litter is a compact and lightweight patient transport system designed to evacuate one patient at a time. It is used for both land and water rescue. The SKED litter provides the patient with support and protection, but it is not designed as a spinal immobilization device. If a spinal injury is suspected, the patient is to be secured using a spinal backboard prior to being placed on the litter (paragraph 9-6). A backboard must be used in conjunction with the SKED litter on patients who have sustained shoulder injuries. When the SKED litter is used with the hoist operator vest, the medic can be hoisted simultaneously with the patient. This allows the medic to continue resuscitation or oxygen therapy during the hoist rescue operation.

11-28. Configuration

a. The SKED litter (Figure 9-18) is olive drab (OD) green and weighs approximately 16 pounds with accessories. It consists of a 3-foot by 8-foot sheet of low-density polyethylene plastic with rows of grommets along its edges. The patient is secured by enveloping him in the litter and securing him with lashing straps threaded through the grommets. Four nylon straps are used in hand-carrying the litter.

b. The SKED carrying case is used to transport the litter, spinal immobilize device, lift slings, tow straps, and the vertical lift rope.

c. For high-angle operations, the litter is used in a vertical configuration with two lift slings and a 3/8-inch static kernmantle rope as a bridle.

d. The SKED basic rescue system (Figure 11-9) includes the following:

- Litter.
- Backpack.

- Towing harness.
- Horizontal lift sling.
- Vertical lift sling.
- Large carabiner.
- Tow strap.

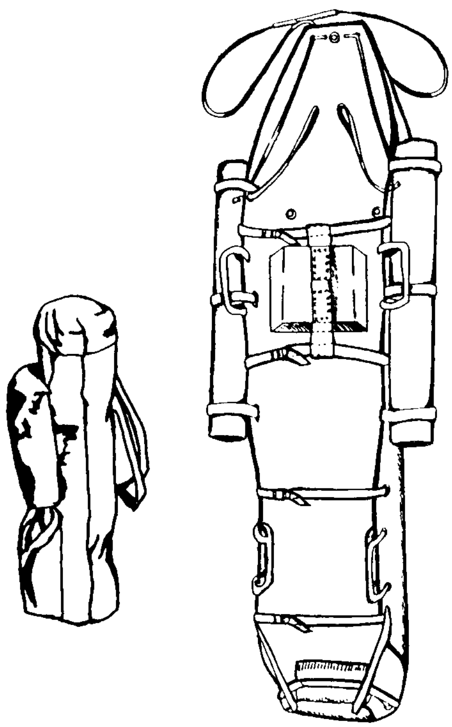


Figure 11-9. Components of the SKED litter.

e. For water operations the SKED litter can also be used with a flotation kit. The flotation system enables the SKED litter to float horizontally in the water providing enough positive flotation to support the patient and two rescuers. The inflatable logs are made of a nylon outer shell. They are equipped with a carbon dioxide (CO_2) rapid inflator, an oral inflator, and a quick dump valve which allows the float logs to deflate in seconds for rapid breakdown and storage. The quick dump valve also acts as an overpressure valve to prevent over-inflation.

11-29. Operation of the SKED Litter

a. Preparing the SKED Litter.

(1) Remove the litter from the carrying case and place it on the ground.

(2) Unfasten the chest strap, place one foot on the SKED, and unroll it completely.

(3) Bend the SKED litter in half (opposite way of curl) and back roll. Repeat with the opposite end of the litter. This will allow the SKED litter to lay flat.

b. Placing the Patient on the SKED Litter Using the Log Roll Method.

(1) Place the SKED litter next to the patient. Ensure that the head end of the litter is adjacent to the head of the patient. Place cross-straps under SKED.

(2) Log roll the patient away from the litter and slide the SKED litter as far under the patient as possible. Gently roll patient down onto the SKED litter.

(3) Slide the patient to the center of the litter. Be sure to keep the patient's spinal column as straight as possible.

(4) Pull straps out from under the SKED litter and fasten to the buckles.

c. Placing the Patient on the Litter Using the Slide Method.

(1) Position the foot end of the SKED litter at the head of the patient.

(2) Straddle the litter and support the patient's head, neck, and shoulders.

(3) Grasp the foot straps of the SKED litter and slide it under the patient.

(4) Center the patient on the SKED litter and fasten the straps with the buckles.

d. Positioning and Fastening the Straps with the Buckles.

(1) Lift the sides of the SKED litter and fasten the four cross-straps with the buckles directly opposite the straps.

(2) Feed the foot straps through the unused grommets at the foot end of the SKED litter and fasten with the buckles.

e. Lifting and Descending (Horizontal).

(1) Insert one end of the head strap through the lift slot at the head end of the litter.

NOTE

Two nylon webbing straps rated at 3,800 pounds each are used for horizontal lift or descent. The head strap is 4-inches shorter than the foot strap and is used at the head end of the litter only.

(2) Bring the strap under the SKED litter and through the lift slot on the opposite side.

(3) Equalize the strap and repeat the procedure with the other strap at the foot end of the litter.

(4) Equalize all four straps and secure them to the large steel locking carabiner.

(5) Before hoisting, hoist operator ensures that ground personnel have a tag line attached to the foot end of the litter and are ready for hoisting.

(6) While the litter is being lowered, or hoisted back up into the aircraft, ground personnel use the tag line to prevent the litter from swinging or spinning. The tag line is also used to keep the litter parallel to the aircraft and the patient's head toward the tail rotor.

f. Lifting or Descending (Vertical).

(1) Pass each end of the rope through the grommets at the head end of the litter. Leave approximately 1 to 2 feet between the knot and the litter.

NOTE

A 30-foot length of 3/8-inch static kernmantle rope with a figure eight knot tied in the center is used to configure the SKED litter for vertical lift or descent.

(2) Continue feeding the rope through all available grommets and carrying handles all the way to the foot end of the SKED litter. Ensure both ends of the rope are even.

(3) Pass the ends of the rope through the grommets at the foot end of the SKED litter. Tie the ends of the rope together with a square knot.

(4) Bring the ends of the rope up and over the end of the SKED. Pass the rope through the carrying handles and secure it with a square knot. For safety, add a half hitch knot.

g. Conducting Water Operations (Figure 11-10).

(1) Unroll the SKED litter and lay it flat.

(2) Fasten the two lower cross-straps and tighten them enough to pull the sides up and prevent the SKED litter from bending. Fasten the two foot straps bringing the foot end up to form a toboggan-like shape.

(3) Attach the ballast (lead weight) inside the foot end of the SKED litter by placing it between the two grommets at the foot end. Pass the

straps through the grommets from the inside out, and lay them across the Velcro on the ballast bag.

(4) Attach the two long webbing handles by passing them, from the outside in, through the unused grommets in the shoulder area.

(5) Attach the flotation logs to the SKED litter by passing one end of the retaining straps through the proper slots in the SKED litter and fasten them to their opposite ends using the buckles. It is critical that the straps go all the way around the logs and through the slots on the SKED litter.

(6) The SKED logs can be inflated either before or after attachment.

(7) Upper cross-straps pass through the loops on the chest pad. Cross-straps should then be fastened and left in a loose position.

h. Inflating the Flotation Log (Figure 11-11).

(1) Pull on the inflator tab to activate the CO_2. Do not remove the CO_2 cylinder from the detonator until you have a replacement cylinder. Removing the CO_2 cylinder allows the float to deflate.

(2) To use the oral inflator, turn the locking ring to allow the end to be depressed. Press the rubber tip against your teeth to open the valve and blow into it. When the desired amount of air is inside the float, release the inflator and secure the locking ring. The oral inflator has a spring-loaded safety valve which must be depressed to add or release air. The locking ring prevents the accidental release of air.

(3) To deflate the flotation log, pull the ball attached to the dump valve and squeeze the float until deflated.

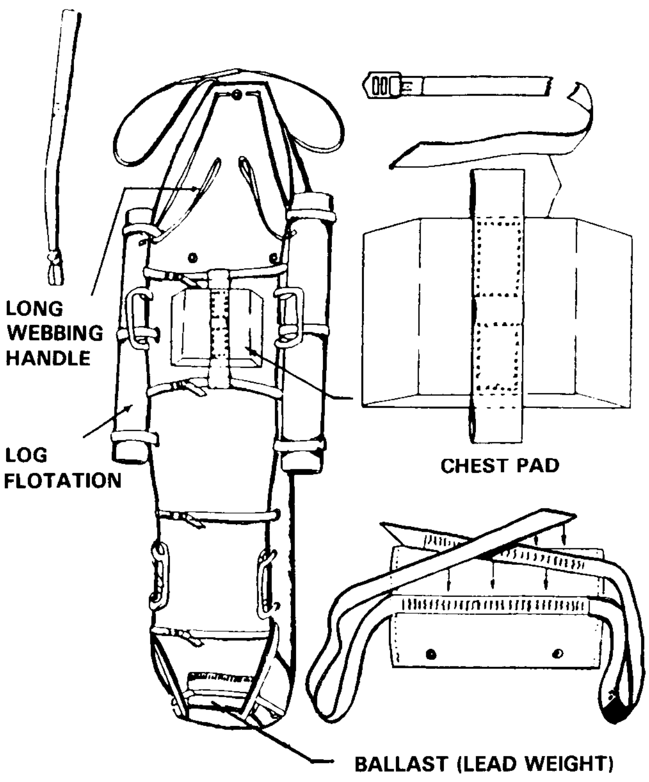


Figure 11-10. SKED litter configured for water operations.

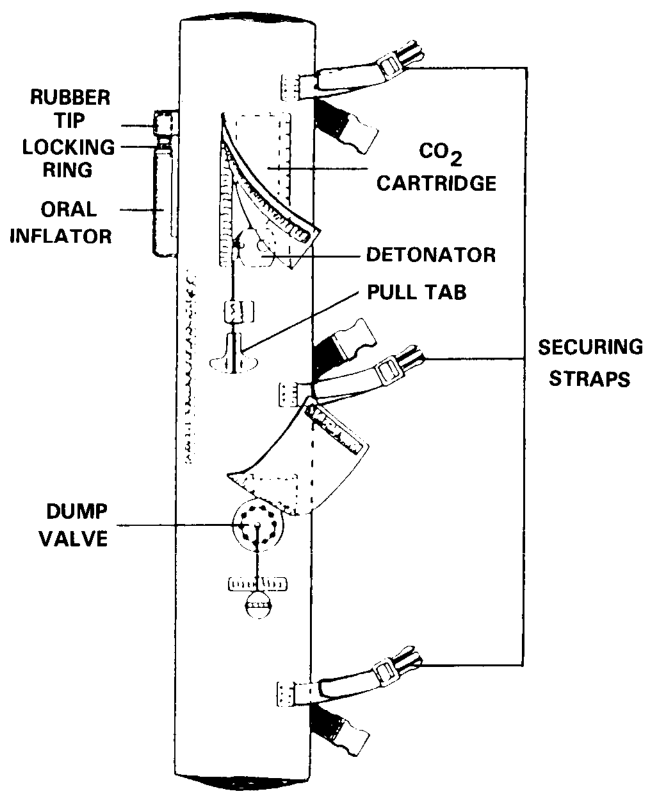


Figure 11-11. Inflating the flotation log.

11-30. Maintenance of the SKED Litter

a. All cleaning and preventive maintenance performed on the SKED litter and its components takes place at the unit level.

b. All SKED litters and accessories are subject to an inspection upon issue and a calendar inspection in each subsequent year. The SKED litter should also be inspected after every vertical or horizontal ascent or descent. All components used in saltwater rescue operations must be rinsed in fresh water as soon as possible.

(1) To perform a serviceability inspection on the SKED litter, complete the following steps:

(a) Remove all equipment from carrying case.

(b) Unroll the SKED litter and remove all ropes and straps.

(c) Inspect all ropes and straps for cuts, tears, and abrasions.

(d) Check all hardware for security of attachment, condition, and ease of operation.

(e) Check the litter for cuts, tears, and holes.

(f) Examine the carrying case for stains, dirt, and general condition.

(2) To repack the SKED litter, complete the following steps:

NOTE

When not in use, the SKED litter is stored in the carrying case.

(a) Lay the litter out and place the chest strap, buckle side down, under the foot end of the SKED.

(b) Starting at the head end, roll the SKED up as tight as possible.

(c) Continue to roll the SKED up using the knee to keep the litter from unrolling.

(d) Fasten the chest strap to the buckle and place the SKED litter in the backpack.

Section X. RESCUE (STOKES) LITTER

11-31. General

The Stokes litter and flotation kit are designed to perform helicopter rescue operations in areas not suitable for landing and where other evacuation means are not available or practical.

a. The Stokes litter carries one patient and can be used with the high performance hoist over land or water. The Stokes litter, when fitted with a backboard, can be used to immobilize a patient who has suffered a back injury.

b. For use overwater, a flotation kit must be installed in order to keep the litter upright and stable. This kit consists of flotation logs, lift inserts, ballast bar, and a two-piece rescue litter hoisting sling.

11-32. Configuration

The Stokes litter is a metal litter with wire mesh netting for the bed (paragraph 9-2 *(a)* (6)). The flotation kit for the Stokes litter is designed to support the upper half of the litter, keeping that portion of the litter high in the water while the chest pad keeps the patient's face out of the water and prevents the litter from overturning. A ballast bar is placed on the foot of the litter to assist in keeping the litter floating at the proper angle. Retaining straps are used to secure the patient to the litter.

Once secured to the Stokes litter, the patient requires no additional flotation devices.

11-33. Function

a. Once the aircraft has arrived at the rescue site, the hoist operator prepares the litter for hoisting and notifies the PC when ready to lower the litter. The PC then directs the hoist operator to begin lowering the litter, along with the tag line. Figure 11-12 depicts the proper attachment of the tag line. Before hoisting, the hoist operator ensures that ground personnel have the tag line and are ready for the litter to be raised.

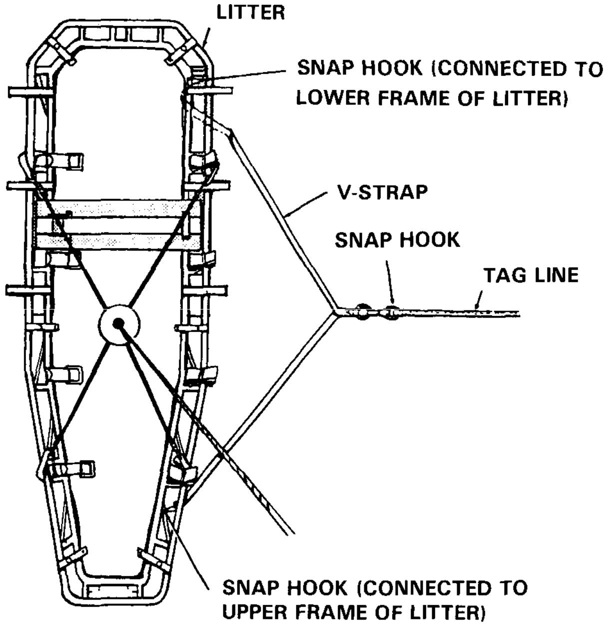


Figure 11-12. Tag line attached to Stokes litter.

b. While the litter is being lowered, or hoisted back up into the aircraft, the ground personnel use the tag line to prevent the litter from swinging. The tag line is also used to keep the litter parallel to the skids of the aircraft and the patient's head toward the tail rotor.

WARNING

Do not touch the litter until it contacts the ground and discharges the built-up static electricity.

c. The ground personnel disconnect the litter and signal to the hoist operator.

d. The hoist operator notifies the PC that the litter has been disconnected. Once the litter is disconnected, the PC repositions his aircraft to a tactically safe area to await instructions. Aircrews should never loiter in or circle around the pickup area while waiting.

CAUTION

Rifles, grenades, and radios must be removed from the patient before placing him in the litter.

e. Once the ground personnel have the patient secured in the litter, they signal for the helicopter to move into position and lower the rescue hook.

f. The ground personnel then connect the hoisting sling to the rescue hook and signal to the hoist operator that the litter is ready to be hoisted (Figure 11-13).

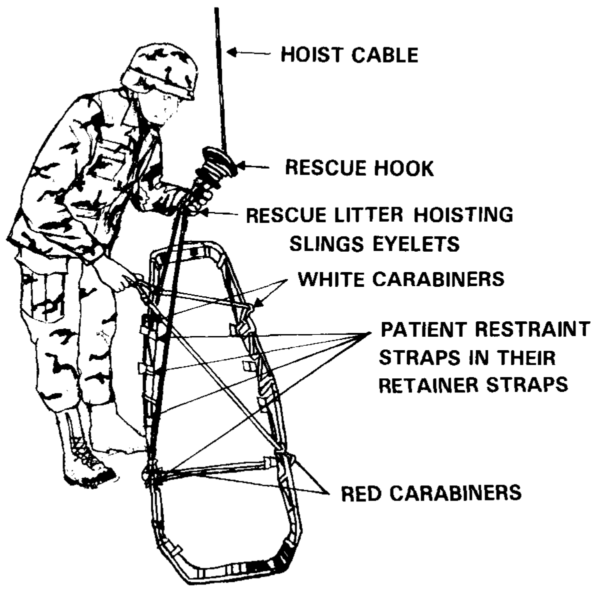


Figure 11-13. Attaching hoisting slings to the rescue hooks.

NOTE

Red carabiners and white carabiners can be used to distinguish the head and foot ends of the Stokes litter for attaching the hoisting cables. The Stokes litter should be marked with colored paint corresponding to the carabiners.

11-34. Maintenance

All serviceability inspections and cleaning of the Stokes litter are accomplished at the unit level.

a. Calendar Inspection. The calendar inspection includes a visual inspection for cracked welds and tubes, pinholes, security of mesh, and evidence of wear at the hoisting cable attaching points. The cables, carabiners, and hardware are visually inspected for wear and corrosion, and for signs of breakage, slippage, and fatigue.

b. Preflight Inspection. A preflight check is completed prior to each deployment of the Stokes litter to ensure safety. This visual inspection is done as a part of the overall preflight checks.

Section XI. POLELESS SEMIRIGID LITTER

11-35. General

a. The poleless semirigid litter is constructed of canvas reinforced by wood. It can easily be stored aboard the aircraft because it is lightweight. It can also be folded longitudinally into a manageable size.

b. The patient is secured on the litter by canvas flaps that are laid over the patient from either side with his arms outside. The flaps and, subsequently, the patient are secured by five seat belt-like straps. The patient's head is secured by a heavy canvas hood immobilize. The hood holds the head in place with two straps: one across the forehead, and one across the chin.

c. This litter is also discussed in paragraph 9-2 *(a)* (4).

11-36. Employment of the Poleless Semirigid Litter

To use the poleless semirigid litter, the following steps should be followed:

a. The patient is placed on the litter using the log roll method, if necessary.

b. The patient is secured to the litter using the straps across the body and head. The flaps are folded over the patient with arms on the outside, and the straps are firmly tightened, except in areas where serious injuries exist. The top four straps are routed over the body, and the bottom strap is routed under the feet for added support of the body weight.

c. Avoid strapping over or around injured extremities. For example, in the case of a fractured leg, the bottom strap would be routed under the foot of the uninjured leg to avoid worsening the injury.

d. The patient's head is secured by two straps (one under the chin and one over the forehead). The chin strap must be routed over the chin to avoid choking should the patient slide down in the litter slightly during hoisting. In the event of a serious head injury, the hood assembly is easily removed from the litter. This allows the medic to attend to the injury even after the patient has been secured to the litter. The hood can then be reattached to the litter and to the patient prior to hoisting.

e. The litter is hoisted in the upright position using the large ring at the head of the litter. The ring at the bottom of the litter is used for the tag line. The litter has a carrying handle at each corner of the litter for maneuvering the litter on the ground.

11-37. Function

a. Once the aircraft has arrived at the rescue site, the hoist operator prepares the litter for hoisting and notifies the PC when he is ready to lower the litter. The PC then directs the hoist operator to begin lowering the litter, along with the tag line. Before hoisting, the hoist operator ensures that the ground personnel have the tag line and are ready for the litter to be lowered.

b. As the litter is being lowered, or hoisted back to the aircraft, the ground personnel use the tag line to keep the litter from swinging.

WARNING

To avoid serious shock, do not touch the litter until the hoist hook touches the ground and discharges the static electricity.

c. The ground personnel disconnect the litter and signal to the hoist operator.

d. Once the hoist operator has notified the PC that the litter has been disconnected, the PC then repositions the aircraft to a tactically safe area to await instructions to return to complete the hoist operation. Aircrews should never loiter in or circle the pickup area.

e. All equipment, such as weapons, grenades, or radios, must be removed from the patient prior to placing him on the litter.

f. Once the ground personnel have the patient secured in the litter, they signal the helicopter to move into position and lower the rescue hook.

g. The ground personnel then hook the ring at the head of the litter.

h. The hoist operator guides the litter into the door.

i. Once the patient is secure in the aircraft, the hoist operator recovers the tag line.

j. The hoist operator readies the cabin for forward flight and reports to the PC.

11-38. Maintenance

Cleaning and serviceability inspections are to be accomplished at the unit level.

a. Inspection. The litter is inspected in a systematic method starting at the top lifting ring, moving downward and finishing with the bottom lifting ring.

(1) The top lifting ring is carefully inspected for any sign of corrosion, cracks, wear, or burrs. If any of these conditions are found, the litter is unserviceable until repaired.

(2) The lifting ring attachment straps are inspected for sign of any rips, tears, rotting, or loose stitching.

(3) On the head harness assembly, the inspection includes determining if all attachment clips are present and serviceable. The fabric portion of the harness is inspected for rips, tears, and rotting.

(4) The main body of the litter is inspected for tears, runs, or rips in the canvas. Ensure that the belt buckles fasten securely and have no rips or tears in the material. There should be no loose stitching or torn seams.

(5) The wood slats on the litter should be removed and visually inspected for cracked, broken, or splintered pieces.

b. Repairs and Modifications. Any repairs or modifications to the poleless semirigid litter are to be performed at echelons above the unit level.

Section XII. SURVIVOR'S SLING (HORSE COLLAR) AND CABLE WEIGHT COVER

11-39. General

The survivor's sling (horse collar) and cable weight cover are used in performing helicopter rescue operations where landing is impossible, either over land or water. It can be used to lower a rescuer as well as raise a patient to the helicopter. The cable weight cover is a cushioned cover device that envelopes the metal in the hoist cylinder.

11-40. Configuration

a. The horse collar is a buoyant device consisting of a kapok filling encased in a bright yellow, waterproof cover. Webbing, weaved through the cover with both ends terminating in two V-rings, is used to attach the sling to the helicopter rescue hook. Two retainer straps, one long with a quick-ejector snap and one short with a V-ring, are fastened to the webbing of the sling and are enclosed in slide fastener-secured envelopes (Figures 11-14 and 11-15).

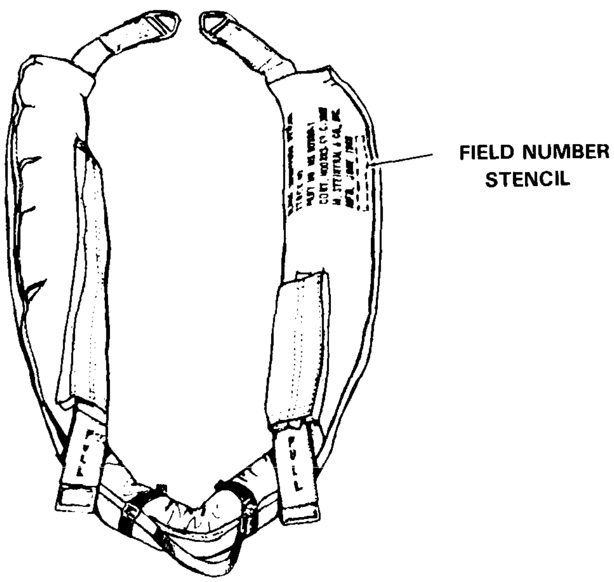


Figure 11-14. Survivor's sling.

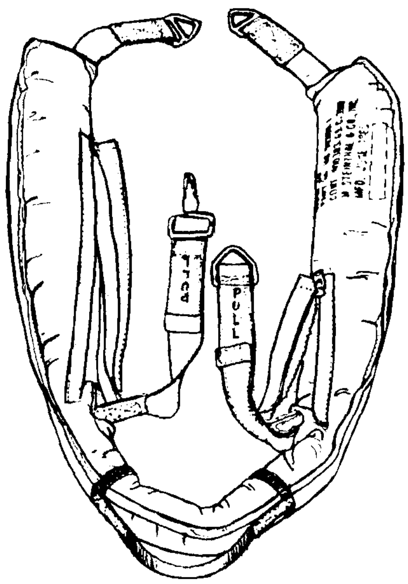


Figure 11-15. Survivor's sling with retainer straps pulled out.

b. The cable weight cover has four snap fasteners and a cord tie that keeps the cover secure around the cable weight. The cable weight cover protects the patient from injury that could result from accidental contact with the metal cable weight (Figure 11-16).

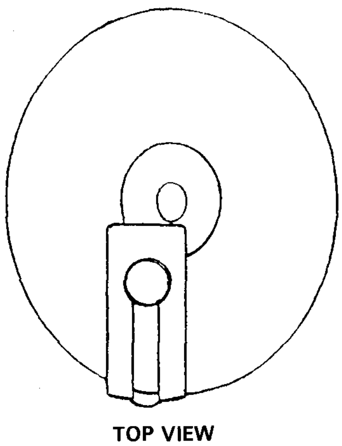


Figure 11-16. Cable weight cover.

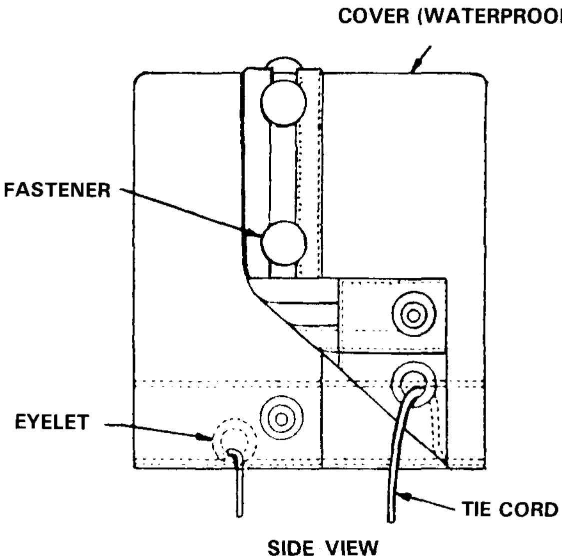


Figure 11-16. Cable weight cover (continued).

11-41. Function

a. A webbing strap running through the cover has a V-ring at both ends and is used for attaching to the double rescue hook on the cable. Two red retainer straps marked *PULL*, one with a quick ejector snap and the other with a V-ring, are provided with the sling and are enclosed in zippered pockets.

b. Once the aircraft is over the patient, the hoist operator readies the survivor's sling for use and advises the PC when the sling is ready to be lowered. The PC then directs the hoist operator to lower the sling to the patient or ground personnel.

WARNING

Do not grab the webbing handle on the survivor's sling. This may raise the patient's arms which could cause the patient to fall from the sling before entry into the aircraft.

c. The medic or ground personnel signal to the hoist operator once they have placed the patient in the survivor's sling and are ready for hoisting.

d. Once the patient has been hoisted to the aircraft door, the hoist operator lowers the patient while simultaneously pulling him into the aircraft.

e. Once inside the aircraft, the hoist operator—

(1) Releases the safety strap.

(2) Secures the patient in the aircraft.

(3) Disconnects the survivor's sling from the hoist.

(4) Reports to the PC when ready for forward flight.

11-42. Maintenance

Cleaning of the survivor's sling and cable weight cover is performed at the unit level. Component repairs or other maintenance actions required are performed at the intermediate level or higher.

a. Calendar Inspection.

(1) All survivor's slings and cable weight covers are inspected upon issue and then each subsequent year.

(2) This inspection consists of a visual inspection, marking inspection, and proof-loading testing.

b. Visual Inspection (Figure 11-17).

(1) Inspect the fabric for cuts, deterioration, and abrasion.

(2) Inspect the seams for proper adhesion and stitching.

(3) Inspect the retainer straps for security of attachment and wear.

(4) Inspect all hardware for security of attachment and wear.

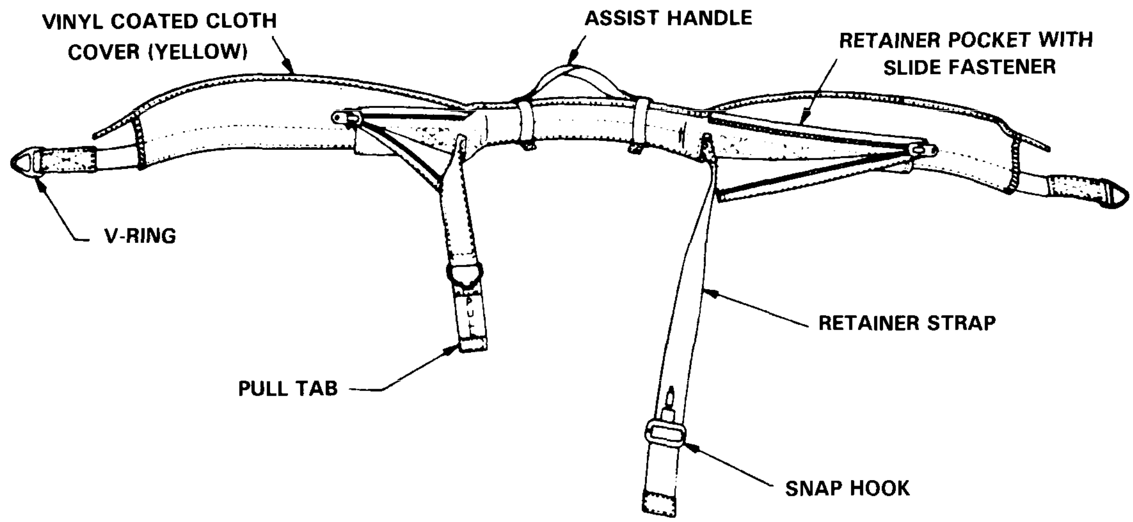


Figure 11-17. Survivor's sling.

c. Marking Inspection. Compare markings on sling and cover to markings listed in Tables 11-3 and 11-4. Restore faded markings. Correct any markings which do not agree with the tables.

Table 11-3. Survivor's Sling Markings

MARKING	LOCATION	LETTER HEIGHT
SLING-SURVIVOR'S RESCUE	On vinyl-coated cloth cover	1/2 Inch
STOCK NO	at bottom of slide	
PART NO	fastener	
CONTRACT NO (stencil applicable number)		
MANUFACTURER (stencil name of manufacturer)		
MFD DATE (stencil month and year of manufacture)		
(Field Number)		
PULL	On back of the red tabs	1/2 Inch

NOTE: All markings are to be stamped or stenciled with wash-proof black ink. All words enclosed by parentheses, in the column headed MARKING, are not to be stenciled on the equipment; they are to be regarded as instructions only.

Table 11-4. Cable Weight Cover Markings

MARKING	LOCATION	LETTER HEIGHT
COVER, CABLE WEIGHT, RESCUE EQUIPMENT	Top of cover	1/4 Inch
STOCK NO		
PART NO		
CONTRACT NO (stencil applicable number)		
MANUFACTURER (stencil name of manufacturer)		
MFD DATE (stencil month and year of manufacture)		

NOTE: All markings are to be stamped or stenciled with wash-proof black ink. All words enclosed by parentheses, in the column headed MARKING, are not to be stenciled on the equipment; they are to be regarded as instructions only.

11-43. Modifications

The only authorized modification at the unit level of maintenance is the fabrication of the assist handle.

a. Measure and cut two 9 ¾-inch pieces of nylon webbing for loops. Sear cut ends to prevent raveling.

b. Measure and cut one 19-inch piece of nylon webbing for the handle. Sear cut ends to prevent raveling.

NOTE

The looped webbing should fit snugly against the body of the survivor's sling.

c. Use size E nylon thread for sewing 8 to 10 stitches per inch. Fabricate handle as shown in Figure 11-18.

d. Attach fabricated handle to survivor's sling as shown in Figure 11-19.

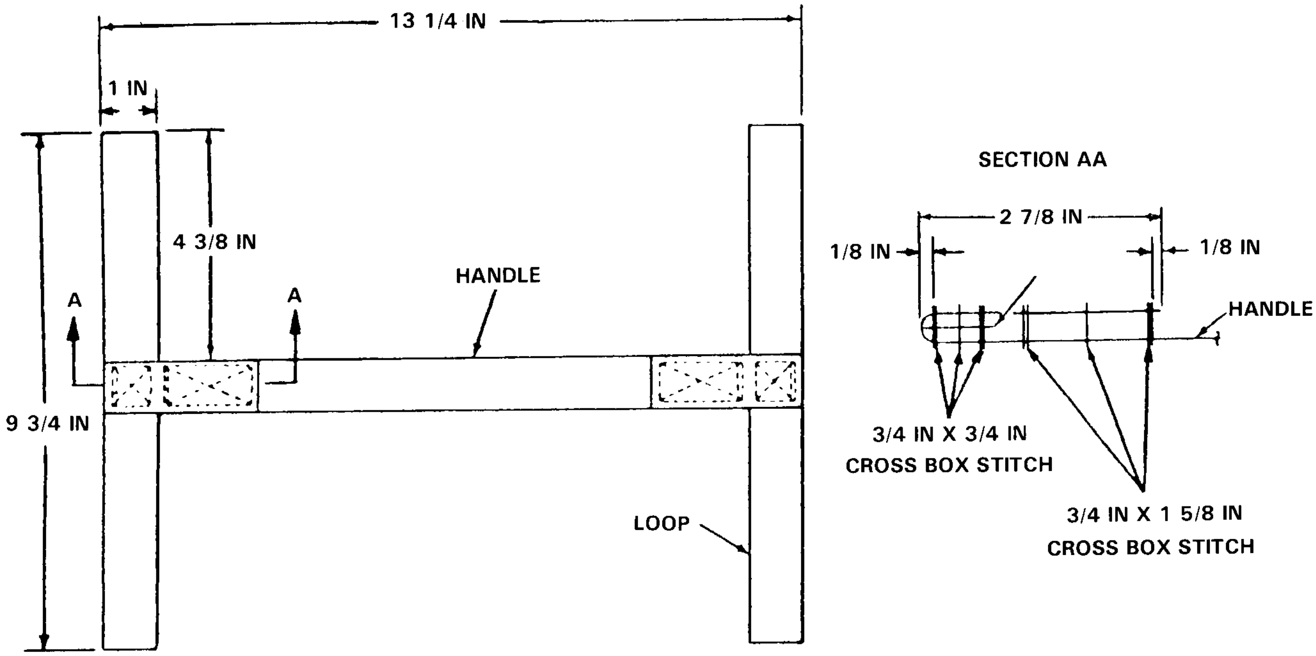


Figure 11-18. Fabrication of handle assembly.

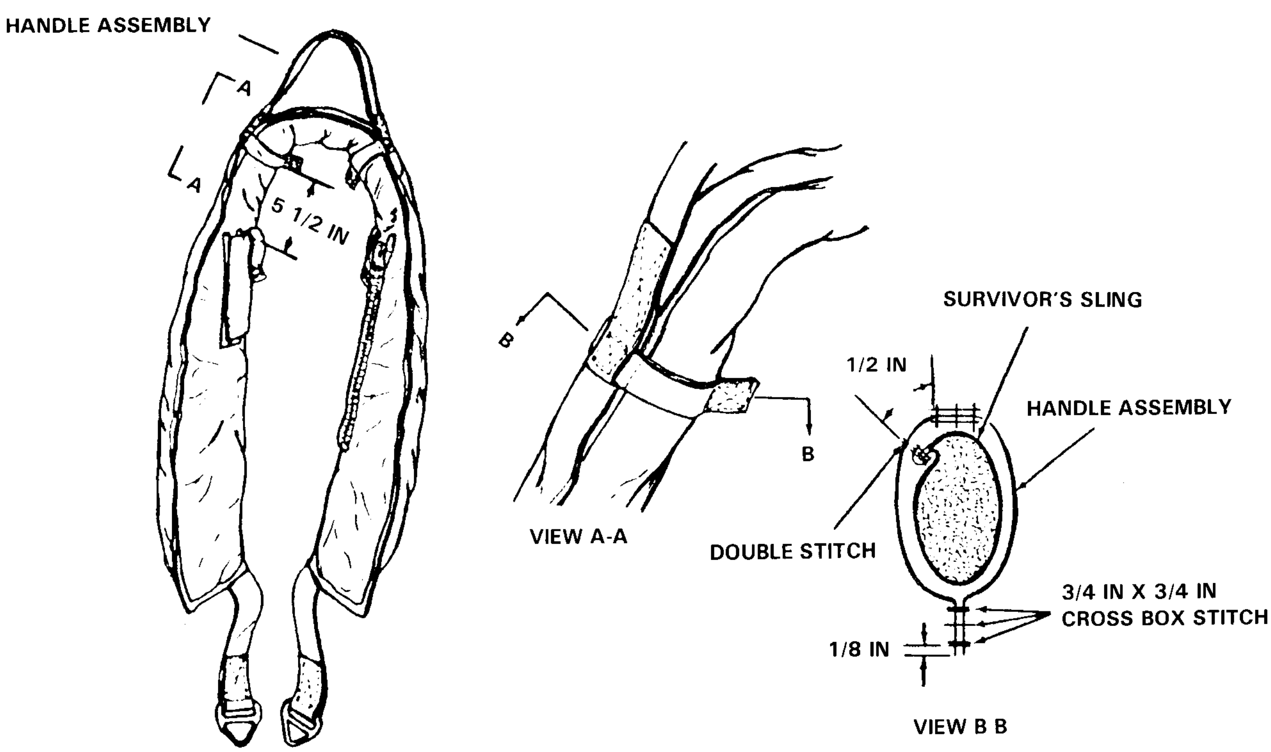


Figure 11-19. Attachment of assist handle to survivor's sling.

Section XIII. HOISTING VEST

11-44. General

The hoisting vest is sometimes referred to as *full body fishnet*. It is designed to evacuate one patient at a time. It is used for overland rescue and shipboard transfer of uninjured or ambulatory patients. If overwater hoisting is expected, a flotation device shall be worn over the hoisting vest.

11-45. Configuration

The hoisting vest is constructed of green lightweight nylon mesh material and is designed to accommodate one person. To facilitate donning and size adjustments of the vest, two rings are provided for each of the four snap hooks. Two adjustable chest straps shall be attached to the lifting V-ring for hoisting (Figure 11-20).

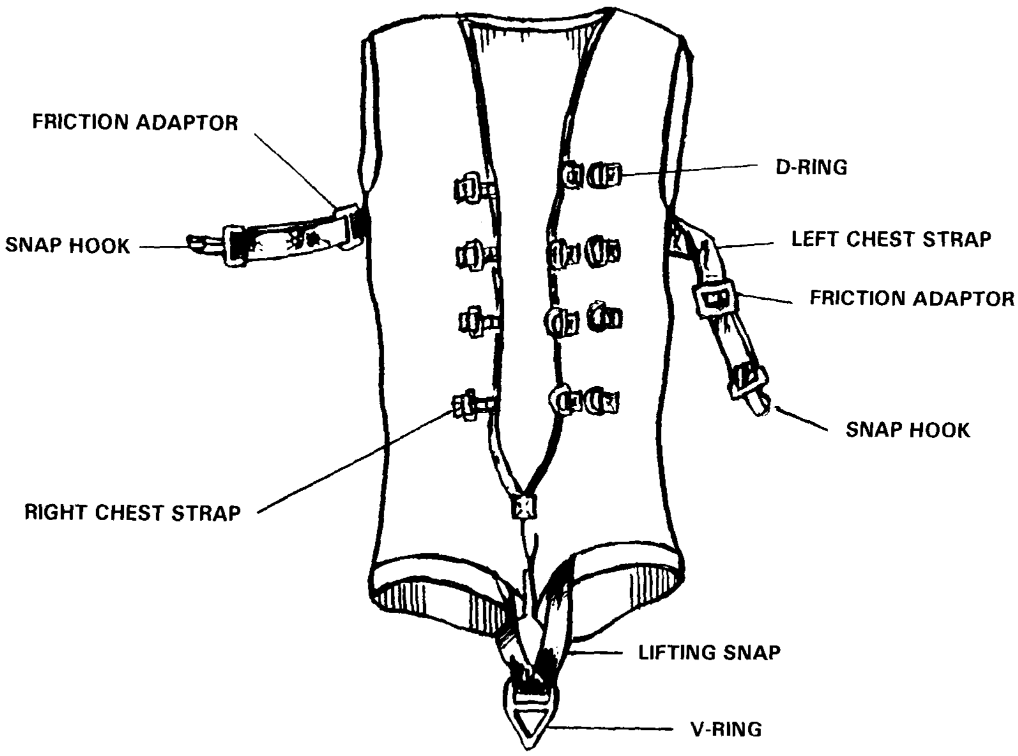


Figure 11-20. Hoisting vest.

11-46. Employment of the Hoisting Vest

a. Should the aircrew elect to use the hoisting vest for a personnel transfer from the aircraft to the ground, the following procedures should be followed:

(1) The crew member helps the transferee don the hoisting vest.

(2) The transferee steps through the leg openings and draws up the vest. He then places his arms through the openings (coat fashion) and pulls the vest over the shoulders with the opening in front.

(3) The crew member connects the snap hooks to the rings. He then attaches the back support straps with the snap hooks to the lifting V-ring (Figure 11-21). The crew member then connects the lifting V-ring to the rescue hook and signals the hoist operator to transfer the patient.

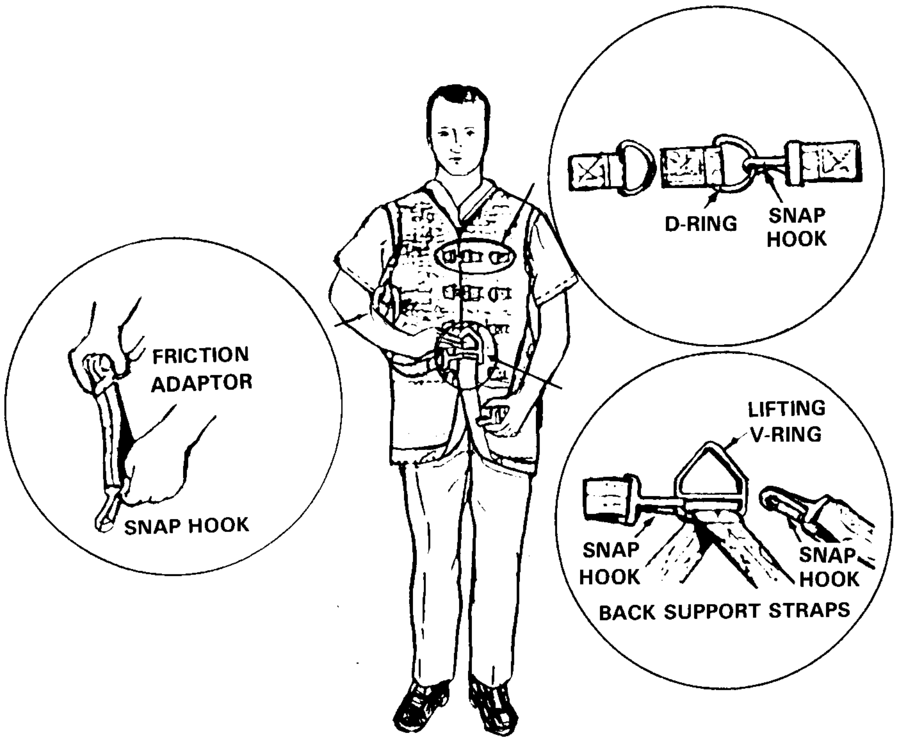


Figure 11-21. Hoisting vest donning procedures.

NOTE

The tag line procedures are used to increase the safety factor of the transfer.

b. When performing the single-man hoist recovery (Figure 11-22), place the patient in the hoisting vest and fasten the torso snaps. Attach the adjustable chest lifting straps to the lower portion of the V-ring on the leg lifting strap. Attach the rescue hook to the lifting V-ring of the hoisting vest. Adjust the hoisting vest chest straps as necessary to ensure a level or upright position. Ensure the knurled fitting on the locking carabiner is down and locked.

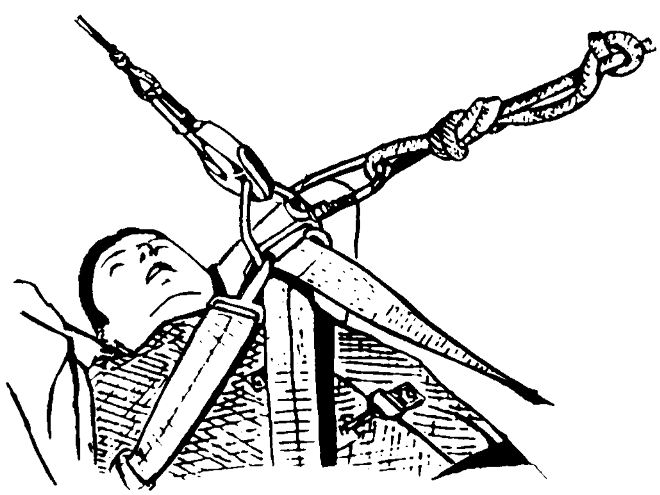


Figure 11-22. Single-man hoist to vest.

c. When performing the dual-man hoist recovery (Figure 11-23), attach the rescue hook to the locking carabiner of the crewman hoisting vest. Attach the locking carabiner of the belay line through the lifting V-ring of the hoisting vest. Route a locking carabiner between the lifting V-ring of the hoisting vest and attach to both locking carabiners. Connect the locking carabiner to the hoisting vest lifting the V-ring of the survivor's vest. Ensure the knurled fittings on the locking carabiners are down and locked.

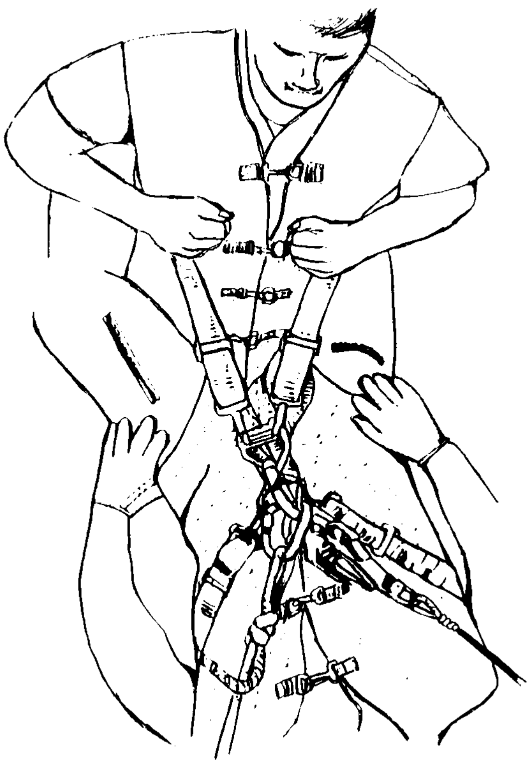


Figure 11-23. Dual-man hoist to vest.

11-47. Maintenance of the Hoisting Vest

a. All cleaning and preventive maintenance performed on the hoisting vest is done at the organizational level.

b. The hoisting vest should also be inspected after every ascent and descent. If the hoisting vest is used during saltwater rescue operations, the vest must be rinsed in fresh water as soon as possible after its use.

(1) A serviceability inspection on the hoisting vest is accomplished by—

- Inspecting the seams for broken stitching.
- Inspecting all straps for cuts, tears, and abrasions.
- Inspecting the nylon mesh material for cuts, tears, dirt, and general condition.
- Checking all hooks, rings, and friction adaptors for the security of attachment, corrosion, damage, wear, and ease of operation.

(2) If faults are found, do not use the hoisting vest until repairs are made.

(3) Any repairs to the hoisting vest are performed at echelons above the organizational level.

Section XIV. PERSONNEL LOCATOR SYSTEM

11-48. General

The Personnel Locator System (PLS) is designed to locate survivors in a combat environment. The system can be used in conjunction with the AN/PRC-112(V) survival radio, but has the capability to home in on any continuous source of an ultra high frequency (UHF) signal. Other capabilities include two-way voice communications and the ability to locate multiple survivors simultaneously.

11-49. Configuration

The PLS consists of four major components (Figure 11-24). The receiver-transmitter, which is the core of the system, provides direction and distance information to the survivor as well as two-way voice communications. The receiver-transmitter is normally located in the radio racks of the aircraft. The remote display unit (RDU), which is panel mounted, displays distance in feet or miles and direction in an easy to read bar code (Figure 11-25). The control display unit (CDU), which mounts in a current FM radio slot (Figure 11-26), displays output and controls the PLS by means of a standard keypad and two rotary switches which provide mode and frequency selection. The antenna group, currently consisting of the AT-450 blade antennas, is mounted on the underside of the aircraft.

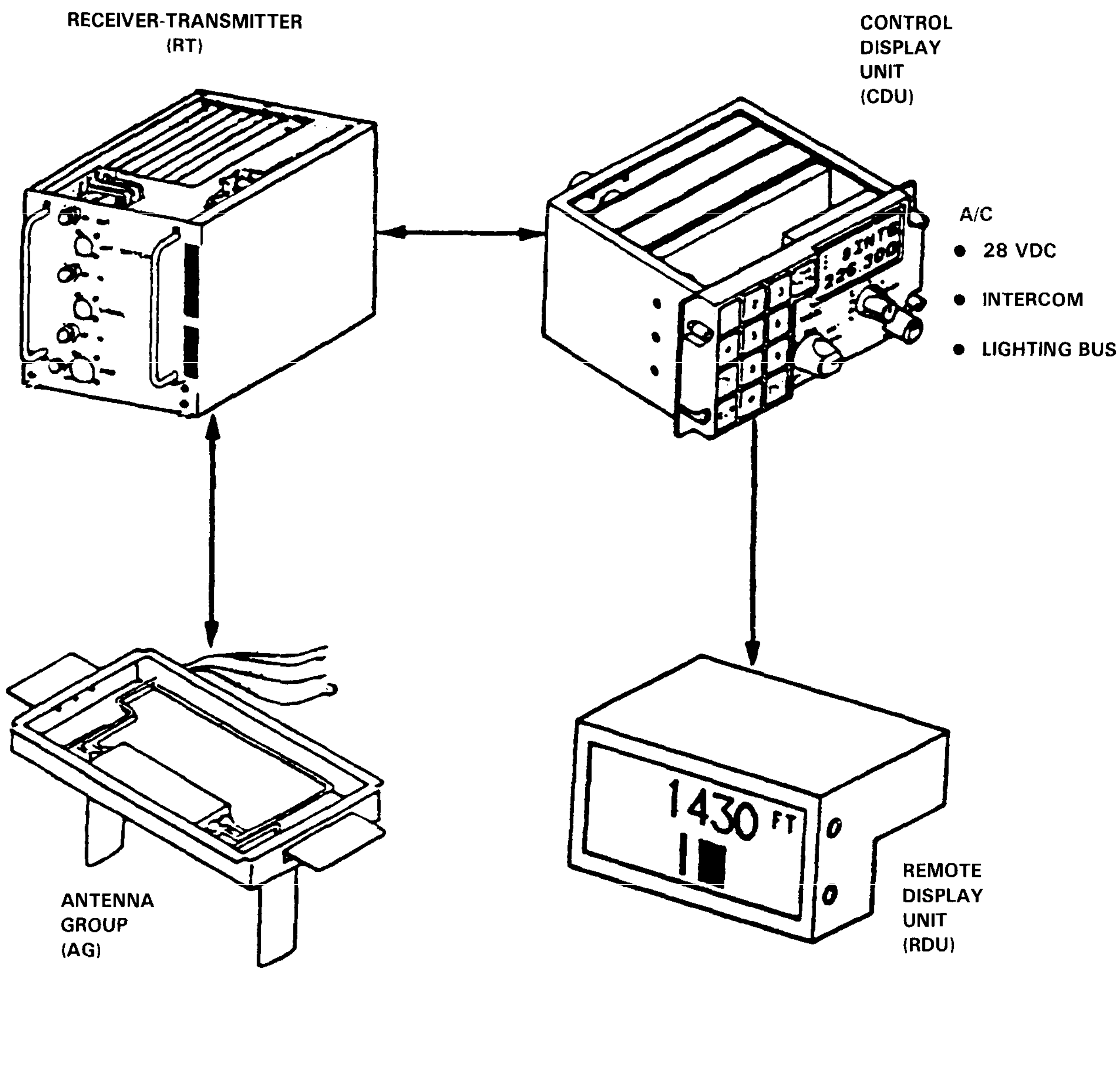
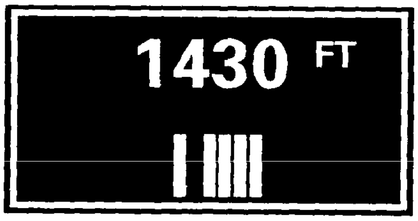


Figure 11-24. AN/ARS-6 PLS System.

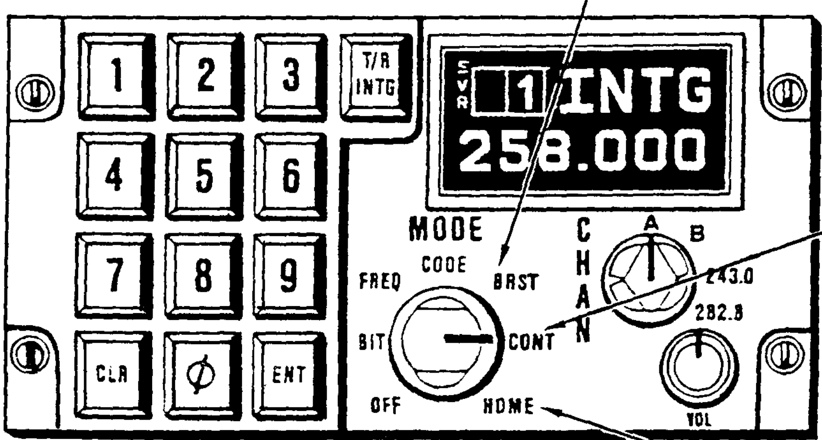


RDU GIVES RANGE IN NAUTICAL MILES OR FEET, PLUS SIMPLE, STABLE STEERING DISPLAY. THE DISPLAY INDICATES THAT THE SURVIVOR IS 1430 FEET AWAY AND TO THE RIGHT OF THE AIRCRAFT HEADING.

Figure 11-25. Remote display unit.

COVERT SEARCH

1. SET MODE SWITCH TO "BRST."
2. PRESS THE KEY (1 THROUGH 9) CORRESPONDING TO THE SURVIVOR.
3. PRESS "INTG" TO OBTAIN RANGE AND STEERING INFORMATION RELATIVE TO THE SURVIVOR'S AN/PRC 112 RADIO.
4. PRESS KEY CORRESPONDING TO NEXT SURVIVOR.



HIGH ACCURACY COMBAT RESCUE

1. SET MODE SWITCH TO "CONT."
2. PRESS "INTG" FOR CONTINUOUS INTERROGATION.

PRE-FLIGHT

1. SET MODE SWITCH TO "BIT." (15-SECOND SELF-TEST. LCD DISPLAY SHOWS "PASS" TO INDICATE PLS IS FULLY OPERATIONAL.)
2. SET MODE SITCH TO "FREQ" AND CHANNEL SWITCH TO "A" OR "B."
3. USING KEYPAD, ENTER SURVIVOR RADIO FREQUENCIES FOR CHANNELS A AND B.
4. SET MODE SWITCH TO "CODE."
5. USING KEYPAD, ENTER UP TO 9 SIX-DIGIT SURVIVOR CODES.

PEACETIME (OR PRC-90) HOMING

SET MODE SWITCH TO "HOME." (PLS PROVIDES STEERING TO ANY SIGNAL SOURCE ON SELECTED FREQUENCIES.)

NOTE: PLS PROVIDES 2-WAY VOICE COMMUNICATIONS IN ALL OPERATIONAL MODES.

Figure 11-26. Control display unit.

11-50. Application

a. The PLS is designed to be used with the AN/PRC-112(V) survival radio to locate survivors in any weather or altitude. The PLS is particularly well-suited to combat operations due to its burst method of survivor location. In this mode, the system uses a 300 millisecond artificial noise burst for both interrogation and response of the survival radio. When located close to the survivor, the system can be switched to the continuous mode, making interrogation continuous and allowing a pinpoint location to be established. The PLS has the memory to interrogate up to nine radio codes at one time when the radio is preceded during the preflight checks on the aircraft.

b. The PLS, when set in the *HOME* position, provides directional information to any UHF transmitter. The feature is normally used in peacetime.

11-51. Operation of the Personnel Locator System

a. The PLS operates much like a very high frequency (VHF) omnidirectional range station/tactical air navigation (VORTAC)—the PLS being the receiver and the survival radio being the VORTAC station. Its ability to remember up to nine survival radio codes at one time necessitates preceding the six digit codes assigned to each of the survivors' radios. Once the codes are entered into the PLS, they can be recalled by a single digit corresponding code. During operations, the PLS is transmitting the downlink message to all the survival radios, but receives an uplink response from the survival radio corresponding to the entered code, thus only using battery power from that radio and saving power on the others. Distance and direction to the survivor are displayed on the RDU. Figure 11-25 shows the survivor 1,430 feet away and to the right of the aircraft. Upon initiating the search in a combat environment, the system would be set on the burst mode (shown as *BRST* on the CDU) to avoid enemy detection. When closely approaching the survivor, the mode would be changed to continuous (shown as *CONT* on the CDU) for an exact location of the survivor. During the mission, the aircrew may use the systems voice capabilities to authenticate the survivor's identity.

b. The PLS can home in on any continuous source of transmission in a frequency range from 225 to 300 MHz (in 25 KHz increments), although no distance information is available in this mode. The unit has two preset frequencies–243.0 and 282.8–and two frequencies (A and B on the CDU) that can be set using the keypad. The range of the system is 100 nautical miles (line of sight) at 10,000 feet and has an accuracy of 50 feet from the target.

CHAPTER 12

TACTICAL STANDING OPERATING PROCEDURE

12-1. General

This chapter provides a sample tactical standing operating procedure (TSOP) for a medical evacuation battalion. It should not be considered as all-inclusive. It may be supplemented with the information and procedures required for operating within a specific command or special operation.

12-2. Purpose of the Tactical Standing Operating Procedure

The TSOP prescribes policy, guidance, and procedures for routine tactical operations of a specific unit. It should cover broad areas of unit operations, but be sufficiently detailed to provide newly assigned personnel with the guidance required for them to perform their mission. A TSOP may be modified by the TSOP and OPLANs/OPORDs of higher headquarters. It applies to a specific unit and all subordinate units assigned and attached. Should a TSOP not be in conformity with the TSOP of the higher headquarters, the higher headquarters' TSOP governs. The TSOP is periodically reviewed and updated as required.

12-3. Format for the Tactical Standing Operating Procedure

a. There is not a standard format for all TSOPs; however, it is recommended that a unit TSOP follow the format used by its higher headquarters. The TSOP can be divided into sections (specific functional areas or major operational areas) and further subdivided into annexes. An annex can be further subdivided into appendixes and then into tabs. Appendixes can be used to provide detailed information on major subdivisions of the annex, and tabs can be used to provide additional information (such as report formats or area layouts) addressed in the appendix.

b. Regardless of the format used, the TSOP follows a logical sequence in the presentation of material. It should discuss the chain of command, major functions and staff sections of the unit, operational requirements, required reports, necessary coordination with higher and subordinate elements for mission accomplishment, programs (such as command information, PVNTMED measures, and combat stress control) and other relevant topics.

c. Pagination of the TSOP can be accomplished by starting with page 1 and numbering the remaining pages sequentially. If the TSOP is subdivided into sections, annexes, appendixes, and tabs, a numbering system that clearly identifies the location of the page within the document can be used. Annexes are identified by letter and are listed alphabetically. Appendixes are identified by numbers and arranged sequentially within a specific annex. Tabs are identified by a letter and are listed alphabetically within a specific appendix. After numbering the initial sections using the standard numbering system (sequentially starting with page 1 through to the end of the sections), number the annexes and their subdivisions. They are numbered as the letter of the annex, the number of the appendix, the letter of the tab, and the page number. For example, page 4 of Annex D is written as "D-4"; page 2 of Appendix 3 to Annex D is written as "D-3-2"; page 5 of Tab A to Appendix 3 of Annex D is written as "D-3-A-5." This system of numbering makes the pages readily identifiable as to their place within the document as a whole.

d. In addition to using a numbering system to identify specific pages within the TSOP, descriptive headings should be used on all pages to identify the subordinate elements of the TSOP.

(1) The first page of the TSOP should be prepared on the unit's letterhead. The remaining pages of the major sections should include the unit identification in the upper right hand corner of the page (for example: "XXX Medical Evacuation Battalion").

(2) A sample heading for an Annex is: "ANNEX B (Command Post) to XXX Medical Evacuation Battalion."

(3) A sample heading for an Appendix to Annex B is: "APPENDIX 3 (Command Post

Security) to ANNEX B (Command Post) to XXX Medical Evacuation Battalion."

(4) A sample heading for a Tab to Appendix 3 to Annex B is: "TAB A (Tactical Operations Center [TOC] Security) to APPENDIX 3 (Command Post Security) to ANNEX B (Command Post) to XXX Medical Evacuation Battalion."

e. As the TSOP is developed there may be an overlap of material from one annex to another. This is due in part to similar functions that are common to two or more staff sections. Where overlaps occur, the material presented should not be contradictory. All discrepancies will be resolved prior to the authentication and publication of the TSOP. The TSOP is authenticated by the unit commander.

12-4. Sample Tactical Standing Operating Procedure (Sections)

The information contained in this paragraph can be supplemented. It is not intended to be an all-inclusive listing. Different commands will have unique requirements that need to be included.

a. The first section of the TSOP identifies the specific unit/headquarters that developed it.

(1) *Scope.* This document establishes and prescribes procedures to be followed by the unit identified and its assigned, attached, or OPCON units/elements.

(2) *Purpose.* This document provides policy and guidance for routine tactical operations of this headquarters and its assigned, attached, or OPCON units.

(3) *Applicability.* Except when modified by policy guidance, TSOP, or OPLANs/OPORDs of the higher headquarters, this document applies to this unit and to all units assigned, attached, or under OPCON for combat operations. These orders, however, do not replace judgment and common sense. In cases of nonconformity, the document of the higher headquarters governs. Each subordinate element will prepare a unit TSOP, conforming to the guidance herein.

(4) *References.* This paragraph can include any pertinent regulations, policy letters, higher headquarters TSOP, or any other appropriate documents.

(5) *General information.* This paragraph discusses the required state of readiness of the unit; primary, secondary, and contingency missions; procedures for operating within another command's AO; and procedures for resolution of conflicts with governing regulations, policies, and procedures.

b. The second section of the TSOP discusses the specific organization.

(1) *Organization.* This paragraph furnishes specific information concerning the authority for establishing the unit, such as applicable MTOE or other staffing documentation.

(2) *Succession of command.* The guidance for determining the succession of command is discussed.

(3) *Task organization.* Task organization is contingent on the mission and will be approved by the headquarters ordering deployment.

(4) *Organizational charts.* Contained in Annex A.

c. The third section of the TSOP discusses the unit functions.

(1) *Battalion headquarters.* This paragraph discusses the command and control of the assigned, attached, and OPCON units.

(2) *Headquarters detachment.* This paragraph discusses the functions of the headquarters detachment element, such as supervising movements, internal arrangements, area layout, physical security, and operation of the headquarters and staff.

(3) *Attached, assigned, and OPCON units.* This paragraph discusses the missions and functions of these units, such as providing medical evacuation of patients, emergency movement of whole blood, biological, and medical supplies, and transportation of medical personnel and equipment.

(4) *Staff responsibilities.* This paragraph lists the unit's key personnel and their duties as prescribed in FM 101-5 and any command-specific duties.

d. The fourth section of the TSOP pertains to staff operations and is subdivided into annexes.

12-5. Sample Tactical Standing Operating Procedure (Annexes)

Annexes are used to provide detailed information on a particular function or area of responsibility. The commander determines the level of specificity required for the TSOP. Depending upon the complexity of the material to be presented, the annex may be further subdivided into appendixes and tabs. If the annex contains broad guidance or does not provide formats for required reports, paragraphs may be used. The annex should not require further subdivision. However, as the material presented becomes more complex, prescribes formats, or contains graphic materials, the annex may require additional subdivision. This paragraph discusses the subdivision of the annex by appendixes. It does not contain examples of subdividing the information presented in the appendixes into tabs. Applicable references such as Army regulations, field manuals, and technical manuals should be provided in each annex. The number of annexes and their subdivisions presented below are not to be considered as an all-inclusive listing. Different commands will have unique requirements; therefore, supplementation of the information presented is permitted.

a. Annex A. (Organizational Charts).

b. Annex B. (Command Post).

(1) *General.* The battalion may operate main and/or forward CPs depending on the mission and tactical situation. Characteristics of the CPs include—

- Main CP. Normally located in the corps rear area. Personnel staffing is tailored to provide planning, coordinating, and command and control of assigned/attached/OPCON units. The area location for the main CP is selected by the battalion S3; the exact site is designated by the commander in coordination with the executive officer and battalion S3. The executive officer designates work areas within the main CP. The commander, HHD, serves as the headquarters commandant. His duties include coordinating for and obtaining construction, maintenance, and logistical services and support for the CP.

- Forward CP. Normally established in the objective area or at an intermediate staging base (ISB). The ISB is the forward designated staging base at which final preparation for assault operations are controlled and is generally a safe area for support operations. The forward CP is tailored to extend the commander's span of control and to better assess the situation on the ground and coordinate the arrival and subsequent activities of HSS organizations within the AO.

(2) *Battalion tactical operations center.*

- Definition. The TOC is the command element of the battalion containing communications and personnel required to command, control, and coordinate HSS operations. The TOC is located within a secure, controlled area whether at a main CP or forward CP.

- Purpose. The purpose of the TOC is to provide the commander, in a secure environment, current evaluated information and recommendations concerning HSS operations.

- Responsibilities. The battalion commander has overall supervision and control over the TOC. The battalion executive officer operates the TOC and has primary staff responsibility in the absence of the commander.

- Operations. The TOC will operate on a 24-hour basis. It is principally staffed by each primary staff section furnishing necessary manpower as required. Secure and nonsecure telephone communications connect the TOC to other staff sections within the CP area. Access to the TOC is strictly controlled by means of an access roster, and if available, security badges. Only essential personnel and authorized visitors are allowed to enter. Each staff section will maintain an SOP on the organization and operation of its element. All elements within the TOC will, when appropriate, maintain a current situational map of their specific operations. Discussion and portrayal of tactical plans outside of the security area is prohibited.

- Composition of the TOC. This is a listing of those personnel comprising the TOC. It normally includes the commander, executive officer, command sergeant major, principal staff members, and other specific staff members such as the S3 (air) or the battalion aviation maintenance officer.

- Tactical operations center configuration. This is a schematic representation of the physical layout of the TOC.

(3) *Responsibilities for the main CP services.* The HHD commander's main mission is to support the headquarters, medical evacuation battalion. He has the personnel and resources assigned to facilitate this mission. He plans and coordinates for providing shower, laundry, transportation, maintenance, and other required services. He is also responsible for: establishing and maintaining security; supplying fuel and other POL products; establishing the support area for the main CP (orderly room, supply room, motor pool, billets, and dining facilities); providing and operating generators to meet electrical requirements.

(4) *Camouflage.* This appendix discusses what camouflage procedures are required, to include type and amount of required camouflage materials (such as nets and shrubs); display of the Geneva Conventions distinctive emblem on facilities, vehicles, and aircraft on the ground (STANAG 2931 OP); and other pertinent policies, guidance, or procedures.

(5) *Message center.* This establishes procedures for the handling of classified messages; provides delivery and service of IMMEDIATE and FLASH messages to the appropriate staff section; establishes procedures for preparing outgoing messages; and establishes a delivery service to the servicing message center for transmission of outgoing messages.

c. Annex C. (Administration and Personnel). This annex outlines procedures relating to administrative and personnel matters and associated activities.

(1) *Personnel accountability.*

- Personnel Daily Summary (PDS). This provides the procedures for filling out and submitting a daily personnel status report. The instructions may include requirements for encrypting the report prior to transmission, specific guidance on time of submission, corrections, or other administrative requirements.

- Casualty Feeder Report. This report is submitted on DA Form 1156, Instructions on the completion of the form and submission requirements are included.

- Witness statements on individuals. These statements are completed only when the recovery of a body is not possible or cannot be identified. It is submitted to the S1 within 24 hours of the incident.

(2) *Personnel management.*

- Replacements. Individual replacements will not be readily available during the initial phases of operations. The S1 will automatically initiate replacement requests for personnel who are reported on the PDS report as wounded in action, missing in action, or killed in action.

- Personnel actions. All personnel actions will be channeled through the S1. Company executive officers and first sergeants will be the company points of contact. Actions will be handled expeditiously and meet suspense dates (tactical situation permitting).

- Efficiency reports. This paragraph provides pertinent information on the completion and submission of these reports.

- Award recommendations. This paragraph delineates the responsibilities for and guidance concerning submitting recommendations for awards and for scheduling and conducting award ceremonies.

- Promotions. This paragraph discusses the procedures for submitting recommendations for promotion and scheduling and conducting promotion ceremonies.

- Correspondence. All correspondence addressed to higher headquarters will be submitted through the S1. Requirements for submission, preparation, and approval are also provided.

- Personnel records. This paragraph discusses requirements for coordination for this support and the procedures for having correspondence included in the official military personnel records of personnel assigned and attached.

(3) *Personnel services.* Personnel services are those activities pertaining to soldiers as individuals. Unless prohibited by the tactical situation, the services listed below will be available to all assigned and attached units.

- Sporting activities and morale and welfare activities.

- American Red Cross.

- Finance. This service includes disbursements and currency control, payday activities, currency conversion, check cashing, and the appointment of Class A agents.

- Legal services. Information and specific guidance on administrative boards, courts-martial authority and jurisdiction, legal assistance, and general services should be provided.

- Religious activities. Religious activities include chaplain support, services available from different faiths, schedule of services, and hospital visitations.

- Postal services. This includes hours of operation and services available.

- Post exchange services. This includes hours of operation and availability.

- Distribution. Pick up and delivery schedules and any command-specific issues/procedures are provided.

(4) *Graves registration.* Commanders at all levels are responsible for the recovery, identification, and evacuation of US dead. This section discusses the responsibilities and procedures for unit-level graves registration (GRREG) activities for assigned and attached personnel.

- Responsibilities. This paragraph discusses both unit and battalion requirements.

- Disposition. Specific guidance on procedures, GRREG collection points, transportation requirements, and the handling of remains are provided.

- Hasty burials. Specific requirements for conducting hasty burials, marking, and reporting of grave sites is included.

- Personal effects. Guidance on accounting for personal effects and requirements for burial should a hasty burial be required is contained in this paragraph.

- Disposition of civilian and EPWs remains. The local civilian government is responsible for the burial of remains of its citizens. The remains of EPWs should be accomplished in separate cemeteries from US and allied personnel. If this is not possible, separate sections of the same cemetery should be used.

- Contaminated remains. This paragraph discusses handling and disposition requirements (to include protective clothing), procedures, and marking and reporting of burial site.

(5) *Public information.* This annex contains procedures for obtaining approval on the public release of information to include the hometown news release program.

(6) *Maintenance of law, order, and discipline.* This appendix should provide applicable regulations, policy, and command guidance on topics such as serious incident reports, notifications, and submission format, straggler control, confinement of military prisoners, and EPWs (also discussed in (7) below).

(7) *Enemy prisoners of war.* This appendix discusses the unit responsibilities of EPWs surrendered to the medical unit. These procedures do not pertain to EPW patients captured by other units. Medical personnel do not guard, search, or interrogate EPWs while in the HSS system; guards are provided by non-medical personnel designated by the tactical commander for these duties. Until EPW personnel can be evacuated to an EPW collection point, medical personnel should remember and enforce the basic skills: segregate, safeguard, silence, secure, and speed. (The speed portion of evacuating EPWs to designated collection points is of paramount importance to medical units.)

NOTE

The treatment of EPWs is governed by international and US law and the provisions of the Geneva Conventions. Personnel should be aware of these requirements and have ready access to the applicable regulations and policy guidance.

d. Annex D. (Intelligence and Security). This annex pertains to intelligence requirements and procedures and operational security considerations.

(1) *Intelligence.* The S2 has the responsibility of collecting information to assist the commander in reaching logical decisions as to the best courses of action to pursue. Essential elements of information (EEI) include, but are not limited to, the location, type, and strength of the air defense threat; location, type, and strength of enemy air defense radars; known or suspected NBC activity; and issues which the commander considers to be EEI. In addition to EEI, the commander's critical intelligence requirements (CCIR) are also considered.

(2) *Intelligence reports.* The S2 is responsible for disseminating all applicable estimates, analyses, periodic intelligence reports, and intelligence summaries generated within the battalion or received from higher headquarters. Information on submission of reports and suspenses on intelligence products and reports should also be addressed in this appendix.

(3) *Weather data.* As the battalion has air ambulance companies assigned or attached, weather data has significant impact. Additionally, weather conditions can disrupt ground evacuation efforts.

(4) *Reports.* These include information acquired during the routine performance of duty by pilots, ambulance drivers, and medics.

(5) *Counterintelligence.*

- Camouflage. When ordered or directed by the tactical commander, all units will initiate and continually strive to improve camouflage operations of positions, vehicles, and equipment. Noise and light discipline is emphasized at all times.

- Communications security. These measures will be enforced at all times. The specific requirements and considerations are included.

- Signs and countersigns. This paragraph lists the signs and countersigns to be used during hours of darkness. It also includes reporting requirements and procedures if the sign/countersign is lost or compromised.

- Signal operating instructions.

- Document security. This paragraph discusses the procedures for marking and safeguarding classified material, both work documents and completed documents. (Reporting requirements in the event of compromise are also included.)

(6) *Captured personnel, equipment, supplies, and documents.* This appendix provides specific guidance on the handling of captured personnel, equipment, supplies, and documents. The disposition of captured medical equipment and supplies is governed by the Geneva Conventions and is protected against intentional destruction.

(7) *Security.* This appendix discusses weapons security and checks, aircraft security, SOI

(communications) security, TOC security, Sensitive Item Status Report, and escape and evasion.

e. Annex E. (Operations). This annex establishes procedures for S3 operations within the medical evacuation battalion, and provides a basis for standardization of medical evacuation operations in a tactical environment. It is essential that these procedures be standardized to ensure common understanding, facilitate control and responsiveness, and enhance mission accomplishment. Information on readiness levels, threat levels, warning levels, camouflage, security, area damage control, and operations is also included.

(1) *Operational Situation Report.* Requirements for format, preparation, and submission of this report are discussed in this appendix.

(2) *Operations security.* This appendix provides the guidance and procedures for secure planning and conduct of combat operations.

- Essential elements of information and classification.

- Responsibilities. The commander is ultimately responsible for denying information to the enemy. The S3 is responsible to the commander for the overall planning and execution of operations. The S2 has the principle staff interest in assuming the required degree of operations security and has the primary staff responsibility for coordinating the efforts of all other staff elements in this regards. The operations security officer is responsible for the preparation of the EEI and providing classification guidance. Additionally, the operations security officer identifies the priorities for operations security analysis, develops operations security countermeasures, and plans and supervises deception operations. The S2 coordinates with the S3 in planning operations security analysis of operations, analyzes EEI and classification guidance received from the S3, provides all threat evaluation, and coordinates the development of deception operations.

- Hostile intelligence threat. The different sources of intelligence (human intelligence, signal intelligence, and so forth) are discussed.

- Operational security program. This includes physical security, information security, signal security, and deception.

- Document downgrading/declassification and classification authority.

(3) *Operations security and countermeasures.* This appendix discusses camouflage, light discipline, noise discipline, physical security, information security, and signal security.

(4) *Unit location update.* This appendix provides timely information on location of main and forward CPs, location of subordinate unit CPs, location of helipads, and location of POL points.

(5) *Flight operations.* This appendix provides information concerning Army aviation LZs throughout the corps area; required reports; airdrop information; and mission debriefing.

(6) *Communications-electronics.* This appendix establishes communications policies, procedures, and responsibilities for the installation, operation, and maintenance of communications-electronics equipment.

- Responsibilities of the battalion communications-electronics noncommissioned officer in charge (NCOIC).

- Concept of operations.

- Command and control.

- Radio communications.

- Radio teletypewriter communications.

- Message/communications center service.

- Message handling procedures.

- Wire communications.

- Switchboard operations.

- Communications security and operations.

- Intelligence security.

- Meaconing, intrusion, jamming, and interference (MLJI) reporting and electronic communications countermeasures.

- Security violations. This prescribes procedures for reporting any event of action which may have jeopardized the security of communications.

- Destruction of material.

- Daily shift inventory.

- Physical security.

- Transmission security.

- Security areas. This discusses access procedures and rosters, access approval requirements, and prohibited items.

- Inventory of classified materials.

- Communications security officers and custodians. The appointment procedures, orders requirements, and duties of personnel are described.

- Safety. This discusses requirements for grounding, handling, and storing COMSEC equipment.

- Power units.

(7) *Rear battle responsibilities.* This appendix discusses rear battle responsibilities, task organization, and support for reaction forces.

f. Annex F. (Nuclear, Biological, and Chemical Defense). This annex prescribes the policy, guidance, and procedures for NBC defensive operations.

(1) Responsibilities.

(2) Nuclear, biological, and chemical reporting requirements and procedures.

- *Contamination avoidance.*

- *Protection.* Protection pertains to those measures each soldier must take before, during, and after an NBC attack to survive and continue the mission.

- *Decontamination.* This discusses equipment requirements, procedures, and types of decontamination (such as hasty).

- *Mission-oriented protection posture.* This appendix provides guidance on the garments required for the different MOPP levels and identification procedures for personnel in MOPP.

- *Radiation exposure guide.* Establishes operational exposure guide (OEG). Discussion in this appendix includes, but is not limited to, determining what constitutes a radiologic hazard, prescribing acceptable limits of potential casualty-producing doses of radiation, minimizing exposure, and protecting against electromagnetic pulses.

- *Masking and unmasking procedures.*

- *Radiological monitoring and survey operations.*

g. Annex G. (Logistics). This annex establishes logistics procedures for subordinate units when operating in a field environment,

(1) *Supply and services.* A discussion of applicability, responsibilities, policy, classes of supply, requisition and delivery procedures, hours of operation, and other supply-relevant topics and available services (such as laundry and bath) can be addressed in this section.

(2) *Food service.* This appendix discusses responsibilities, hours of operation, Class I supplies, sanitation requirements, layout of field kitchen, fuel storage, maintenance, safety precautions, and administration such as headcounts, required reports, shift schedules, meals ready to eat, and inspections/visits of subordinate unit kitchens.

(3) *Transportation/movement requirements.* This appendix may cover the following areas: applicability; responsibilities; policies on speed, vehicle markings, transporting flammable materials, transporting ammunition and weapons,

and so on; convoy procedures; safety; and accident reporting.

(4) *Fire prevention and protection.* Guidance on the use of the tent stoves, flammable materials, use of cigarettes, matches, and lighters, electrical wiring and appliances, safety of tents and occupants, spacing of tents, stoves and ranges, installation of BTU heaters, and firefighting equipment are presented in this appendix.

(5) *Field hygiene and sanitation.* This appendix provides uniform guidance and procedures for the performance of functions related to field hygiene and sanitation. It includes policies, communicable disease control, field water supply, water containers and cans, water purification bags, food sanitation, latrines, liquid waste disposal, and garbage and rubbish disposal.

(6) *Conventional ammunition down/upload procedures.* This appendix delineates responsibilities and provides guidance and procedures for the requisition, storage, and distribution of ammunition and weapons, reporting requirements, and safety.

(7) *Petroleum, oils, and lubricants accounting.*

(8) *Medical logistics support.* The health service logistics concept of operations, requisition and distribution procedures, accountability, and reports are provided in this appendix.

(9) *Maintenance.* This appendix includes information on the maintenance requirements of the battalion and the location and hours of operation of maintenance units and collection points. Maintenance for medical equipment, vehicles, aircraft, and communications and other categories of equipment are discussed.

h. Annex H. (Safety). This annex establishes minimum essential safety guidance for commanders and units. It includes accident reporting, safety measures, emergency procedures, vehicle safety, ground guide procedures, fire prevention and protection, antennas, climate, survival training, animal and arthropod hazards, personal protective measures, hearing conservation, carbon monoxide poison, helicopter safety, and refueling operations.

i. Annex I. (Civil-Military Operations). This annex discusses participation in civil-military operations (CMO). Medical elements are often involved in CMO, humanitarian assistance, and disaster relief operations. The activities which may be covered include providing direct support for medical evacuation, providing guidance on developing a medical evacuation system in a HN, and providing training to a HN's medical infrastructure.

j. Annex J. (Mass Casualty Situations). This appendix discusses the procedures for providing medical evacuation support to mass casualty situations, to include coordination for nonmedical transportation assets and the augmentation of these assets with medical personnel to provide en route patient care.

APPENDIX A

EFFECTS OF GENEVA CONVENTIONS ON MEDICAL EVACUATION

A-1. General

a. The conduct of armed hostilities on land is regulated by both written and unwritten law. This land warfare law is derived from two principal sources—practiced and accepted customs as well as lawmaking treaties such as the Hague and Geneva Conventions. The rights and duties set forth in these Conventions are part of the supreme law of the land; a violation of any one of them is a serious offense.

b. An in-depth discussion of the provisions applicable to medical units and personnel is provided in FM 8-10. This appendix discusses only those articles or actions which affect medical evacuation operations.

A-2. Distinctive Markings and Camouflage of Medical Facilities and Evacuation Platforms

This paragraph implements STANAG 2027 and QSTAG 512.

a. All US medical facilities and units, except veterinary, display the distinctive flag of the Geneva Conventions. This flag consists of a red cross on a white background. It is displayed over the unit or facility and in other places as necessary to adequately identify the unit or facility as a medical facility.

This paragraph implements STANAG 2931 OP.

b. Camouflage of the Geneva Conventions emblem is authorized on medical facilities (medical units, medical vehicles, and medical aircraft on the ground) when the lack of camouflage might compromise tactical operations.

- If the failure to camouflage endangers or compromises tactical operations, the camouflage of medical facilities may be ordered by a NATO commander of at least brigade level or equivalent. Such an order is to be temporary and local in nature and is countermanded as soon as circumstances permit.

A-3. Self-Defense and Defense of Patients

When engaging in medical evacuation operations, medical personnel are entitled to defend themselves and their patients. They are only permitted to use individual small arms.

a. The mounting or use of offensive weapons on dedicated medical evacuation vehicles and aircraft jeopardizes the protections afforded by the Geneva Conventions. These offensive weapons can include, but are not limited to—

- Machine guns.
- Grenade launchers.
- Hand grenades.
- Light antitank weapons.

b. Medical personnel are only permitted to fire when they or their patients are under direct attack by marauders.

A-4. Enemy Prisoners of War

a. Sick, injured, or wounded EPWs are treated and evacuated through normal medical channels, but are physically segregated from US or allied patients. The EPW patient is evacuated from the CZ as soon as his medical condition permits.

b. Personnel resources to guard EPW patients are provided by the echelon commander. Medical personnel do not guard EPW patients.

A-5. Compliance with the Geneva Conventions

The US is a signatory to the Geneva Conventions. These Conventions afford protection for medical personnel, facilities, and evacuation platforms (to include aircraft on the ground). All medical personnel should thoroughly understand the provisions of the Geneva Conventions that apply to medical activities. Violation of these Conventions can result in the loss of the protection afforded by them. Medical personnel should inform the tactical commander of the consequences of violating the provisions of these Conventions. The consequences can include, but are not limited to, the following:

- Medical evacuation assets subjected to attack and destruction by the enemy.

- Health service support capability degraded.

- Captured medical personnel becoming prisoners of war rather than retained persons. They may not be permitted to treat fellow prisoners.

- Loss of protected status for medical unit, personnel, or evacuation platforms (to include aircraft on the ground).

APPENDIX B

THE USE OF SMOKE AND OBSCURANTS IN MEDICAL EVACUATION OPERATIONS

B-1. General

a. This appendix provides guidance for AMEDD personnel in the use of smoke and obscurants in medical evacuation operations.

b. The AirLand Battle extends from the rear area of friendly units, across the main battle area, deep into the enemy's territory. Throughout the battlefield, forces acquire and engage targets based on visual, IR, and millimeter wave technologies. Friendly and enemy units use smoke and obscurants across the battlefield as a combat multiplier. The use of smoke and obscurants to mask combat operations is dictated by the tactical commander. He normally provides the operational guidance for units or elements operating in an area requiring obscuration. Permission to employ smoke and obscurants solely to mask medical evacuation operations may not be approved. However, if the tactical commander's plan indicates that smoke operations are to be employed in a given AO, the HSS planner should consider both the advantages and disadvantages posed by their employment. Factors to consider are the—

- Phase of the tactical operation in which smoke and obscurants will be employed.
- Effect on ground and air evacuation routes when operating in an obscured environment (such as limited hours of use, checkpoints or convoy requirements, or the elimination of NOE approaches).
- Potential for exploiting the use of the cover and concealment provided for clearing the battlefield of casualties, especially in retrograde operations.
- Potential requirements for smoke generation to perform the medical evacuation mission which would not detract from the tactical capability and requirements.

c. Smoke can also be used to identify unit areas or LZs for which a medical evacuation request has been received. Further, smoke can indicate wind direction at a landing site for air ambulance operations.

d. For specific information on the employment of smoke and smoke generation equipment, refer to FM 3-50.

B-2. Operational Concept for the Emplyment of Smoke and Obscurants

Smoke and obscurants are employed to protect friendly forces from attack during offensive, defensive, and retrograde operations.

a. Smoke and obscurants disrupt enemy combat operations throughout the depth of the battlefield and across the operational continuum. They–

- Degrade the ability to see.
- Disrupt the ability to communicate.
- Conceal friendly forces.
- Deceive the enemy.
- Identify and signal.
- Defeat DE weapons.

b. The benefit to medical forces is derived through the tactical commander's use of smoke to obscure friendly tactical maneuvers. This obscuration—

- Prohibits the enemy from knowing how many casualties have been inflicted.
- Aids the movement of medical units and equipment.
- Enhances the ability to resupply forward deployed medical elements.
- Aids in the tactical deception plan.

B-3. Geneva Conventions and the Use of Smoke and Obscurants in Medical Evacuation Operations

a. The 1949 Geneva Conventions for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (GWS) provides protection of medical personnel and units from intentional attack so long as they carry out no duties harmful to the enemy (Article 21, GWS). In order to facilitate their identification so as to prevent their intentional attack, medical units, equipment, and personnel are authorized to display the distinctive emblem of the Red Cross (Article 42, GWS). Under tactical conditions, when requirements for concealment outweigh those for recognition, all distinctive emblems may be obscured or removed from medical equipment if ordered by competent military authority and authorized by Army regulations. Display of the distinctive emblem is not required to afford the right against intentional attack; attack of medical units, equipment, and personnel not displaying the distinctive emblem is prohibited if opposing forces realize that the forces about to be attacked are medical units performing humanitarian duties.

b. The use of smoke or obscurants in medical evacuation operations does not differ from the use of camouflage techniques and is not prohibited by the GWS. Its only effect will be to obscure the identity of units as they perform their humanitarian mission. Given the lethality of the modern battlefield, however, it would be difficult, if not impossible, to say that such obscuration of these units, equipment, and personnel would necessarily increase their risk from unintentional attack.

c. It is recognized that, with the advent of precision-guided munitions and electro-optical or laser target acquisition devices, there will be a substantial use of smoke and other obscurants on the modern battlefield as a result of normal combat operations. The legitimate use of obscurants by combatants to thwart the accuracy of precision-guided munitions may increase the risk to units and equipment not employing obscurants. This may possibly place medical units and equipment at greater risk if they fail to employ them. Further, medical evacuation operations will have to be carried out on the battlefield as medical personnel find it, which will include obscurants employed for normal combat operations.

d. For additional information on the protections afforded by the Geneva Conventions, refer to Appendix A and FM 8-10.

B-4. Use of Smoke in Aeromedical Evacuation and Hoist Rescue Operations

a. Smoke can be used effectively in aeromedical evacuation and overland hoist rescue operations to—

- Identify the landing site.
- Ensure the LZ is controlled by friendly forces.
- Determine surface wind direction.
- Provide cover and concealment.

(1) Colored smoke is an excellent daytime marking method. The smoke generated from a smoke grenade is difficult to detect more than 2 to 3 miles away, but an aircraft in the area should have little difficulty in noting its location. As more than one unit may be operating in a given area, it is important that the unit requesting an aeromedical evacuation mission be able to signal the aircraft as to the correct landing site to use. Radio communications produce an electronic signature. The electronic signature created from a prolonged transmission to guide an air ambulance to the landing site may not be an acceptable tactical risk.

(2) When a unit employs colored smoke to mark a landing site, the aircrew should identify the color and confirm it with the ground personnel. The transmission time required for this procedure is limited, thereby reducing the electronic signature.

(3) The employment of smoke at the landing site also enables the aircrew to determine the wind direction.

(4) In some environmental conditions (such as desert operations), the phenomenon of inversion occurs. When this occurs, the smoke and obscurants used in normal combat operations may

provide an upper layer of smoke under which the air ambulance can operate.

b. The use of smoke on aeromedical evacuation operations can be a disadvantage if incorrectly employed or if the smoke generated in the tactical operation interferes with the medical evacuation mission. Smoke can obscure the landing site and make NOE approaches unusable. Further, smoke on the battlefield can force aircraft to fly at higher than planned heights. This increases the risk of being acquired by the enemy.

c. In overwater hoist rescue operations, the employment of smoke for marking the patient pickup area, for determining surface wind conditions, and for spatial orientation is essential. The smoke employed by the aircrew must not interfere with the conduct of the operation or mask the location of the individual to be rescued. For additional information, refer to paragraph 11-8.

B-5. Employment of Smoke in Ground Medical Evacuation Missions

The employment of smoke during ground evacuation missions must be in consonance with the tactical commander's plan. Smoke can mask medical evacuation operations on the battlefield, but must not interfere with the tactical mission. In all combat operations, but especially in MOUT, smoke can be employed to cover and conceal—

- Movement across open areas.
- Extraction of casualties from vehicles.
- Entry and exit into/out of structures.

APPENDIX C

PATIENT COLLECTING POINT OPERATIONS FOR AIRBORNE AND AIR ASSAULT UNITS

C-1. General

This appendix provides examples of techniques for operating patient collecting points in airborne and air assault operations.

a. These techniques allow for the medical evacuation of casualties without disrupting the commander's tactical plan nor his airflow.

(1) They incorporate patient backhaul by tactical and logistical aircraft, in conjunction with dedicated aeromedical evacuation assets.

(2) These techniques require thorough coordination and planning between the combat medics, BASs, FSMCs, and aeromedical evacuation crews in the air mission brief. Ultimately, medical personnel are more deeply involved in the mission support planning process, thereby enabling them to better support the tactical mission.

b. They may be modified to meet specific unit requirements and procedures.

C-2. Airborne Medical Operations

Airborne medical operations are characterized by providing HSS prior to, during, and after deployment. Each phase presents different HSS requirements. A medical unit that is deploying cannot support its own deployment. It relies on HSS from the closest medical element with area medical support responsibilities. This could be an Army Medical Department Activity (MEDDAC) or the medical brigade of the corps support command.

a. Prior to the operation, the deploying forces are controlled by the major command marshaling area commander who coordinates with supporting medical units for sick call and the medical evacuation of sick or injured soldiers. Organic combat medics do not use their supplies or equipment during this time because it is rigged for delivery and is no longer accessible to them.

b. Organic medical personnel are positioned throughout the plane load to ensure they land dispersed across the drop zone. This also ensures that all medical personnel are not on one aircraft in the event the aircraft is lost.

c. The airdrop equipment is cross-loaded in the same fashion. Door bundles are prepared for packaged Class VIII supplies including IV solutions and bandages. These bundles are distributed among the aircraft.

d. To support the tactical commander's plan in peacetime training situations, the medical element is tasked to provide coverage at the drop zone.

NOTE

This element is part of the drop zone safety party and is pre-positioned on the drop zone prior to the drop time.

- The amount of medical coverage required is directly proportional to the number of paratroopers in the air at any given time. For approximately 250 paratroopers, a physician or a physician assistant should be present.
- Ground evacuation is used to sweep the drop zone after the last pass. Aeromedical evacuation resources are on an on-call basis. Air evacuation assets will be present at the drop zone on large jumps.
- Medical personnel spread out and fan the drop zone on foot.
- All casualties are collected at one central point which is referred to as the patient collecting point.

e. To support the tactical commander's plan in wartime, the HSS plan requires the organic HSS units and personnel deployed on the mission to establish a patient collecting point on the drop zone. The size of this collecting point is determined by the number of personnel participating in the drop. For example: A medical platoon would establish the collecting point if a battalion was jumping, while an FSMC would be present for a brigade jump.

- The patient collecting point may develop into a holding and treatment area since it is the final AO evacuation point. Evacuation does not go beyond the drop zone except for USAF C-130 aircraft providing backhaul of patients.

- After the drop is complete, the drop zone expands and develops into an airhead with follow-on elements moving to linkup. Patients transported from the BASs to the drop zone as the maneuver battalions extend the perimeter are treated and stabilized for further evacuation.

C-3. Air Assault Medical Operations

During air assault operations, a means of quickly evacuating wounded soldiers must be available to the ground task force commander. A means to accomplish this without disrupting the tactical commander's plan is by using two medical elements, one in the landing zone and one in the pickup zone (PZ), and by thoroughly coordinating and planning for the evacuation mission.

a. Task Organized Treatment Teams.

- One of the two medical elements used in this method is designated as the patient collecting point team. This team establishes a patient collecting point where casualties are stabilized and prepared for evacuation.

- The medical element which remains in the PZ is designated as the clearing station team. This team receives the casualties from the returning aircraft, completes further patient stabilization, if necessary, and evacuates the patients further back to the BSA.

b. Staffing, Functions, and Responsibilities.

(1) The recommended staffing for the patient collecting point team is (as a minimum) two EMT NCOs (91B30) and two medical aidmen (91A10). This team deploys on the last aircraft of the first lift with the following equipment in aviation kit bags or rucksacks:

- Mass casualty equipment (selected from the BAS MES).

- Aidbags.

- Poleless litters.

- PRC-77.

- VS-17 panels or chemical lights for nighttime operations.

(2) A BAS or division clearing station (minus) with ground evacuation capabilities is established at the right rear area of the PZ prior to the start of any air assault operation. This secondary MTF at the PZ is manned by BAS personnel, or if possible, by FSMC personnel.

(3) Prior to the start of the operation, coordination with the FSMC for medical personnel support at the PZ MTF and for dedicated aeromedical evacuation resources on station must be completed. Use of the FSMC personnel at this site enables the supported BAS to be ready to deploy forward to support troops in the LZ (objective area).

(4) The aeromedical evacuation support remains in the PZ and moves to the objective area only when URGENT and URGENT-SURG priority evacuation requests are received. These aircraft, once loaded with URGENT and URGENT-SURG priority patients, bypass the PZ MTF and proceed directly to the FSMC. These patients receive more definitive and timely resuscitative care at the supporting FSMC than they would at the PZ MTF. Further, this decreases the backlog of patients at the PZ MTF.

(5) Representatives from the patient collecting point team, clearing station team, FSMC, and the aeromedical evacuation team should be present at the air mission brief prior to the start of the operation. Subjects that should be covered in this planning session include, but are not limited to—

- Visual signs.

- Communications.

- Location of patients in LZ.

- Designated aircraft (last aircraft on all incoming flights).

- Destination (medical element in the PZ).

(6) Once the operation begins, the patient collecting point is established in the right trail area of the LZ (depending upon the direction of flight), and establishes FM communications with the flight lead of the arriving aircraft.

(7) The patient collecting point radio is set on the alternate PZ control net. When casualties are received, flight lead is contacted on this net and the number of casualties is given. Flight lead then directs the appropriate aircraft to land in the vicinity of the patient collecting point for evacuation.

(8) A VS-17 panel is displayed in the vicinity of the patient collecting point to facilitate the evacuation of patients on the incoming lifts. Aircraft should be briefed to land in the vicinity of the panel marker.

(9) Maneuver units will transport their casualties to the patient collecting point. If this is not possible, the patient collecting point should be contacted and the teams will evacuate the patients as the mission allows.

(10) Nonmedical personnel are used in the loading of patients at the LZ.

(11) Helicopters returning from the LZ with patients are met by medical personnel to off-load patients for further evacuation and treatment. These personnel should monitor FM communications so as to identify which lifts of returning aircraft are carrying patients. If possible, augmentation of medical resources should be coordinated to provide en route medical care when personnel are evacuated on nonmedical assets.

(12) Once the patients reach the PZ and are stabilized, they may be evacuated by BSA or FSMC ground assets. If the patient's condition warrants immediate evacuation, air ambulances may be used from the PZ to the FSMC.

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APPENDIX D

AUTOMATED MEDICAL REGULATING SYSTEMS

Section I. DEFENSE MEDICAL REGULATING INFORMATION SYSTEM

D-1. Purpose

The purpose of the DMRIS is to support the missions of the ASMRO and JMRO in regulating the movement of patients.

D-2. Background

The DMRIS is an on-line, interactive computer system designed to permit MTFs to report patients who require evacuation to other MTFs for specialized care. These reports are acted upon by the ASMRO at Scott Air Force Base (AFB), Illinois. The DMRIS links the ASMRO, MTFs, service headquarters, and the USAF Military Airlift Command aeromedical evacuation elements. This network also extends to overseas commands in Europe and the Pacific.

D-3. Operational Features

After the necessary patient data is entered by the MTF, the software program determines which receiving hospital (with the required capability) is the closest. It then displays this information for the ASMRO. After the ASMRO approves the computer selection, information concerning the patient and destination MTF are transmitted to the originating MTF, destination MTF, and the patient airlift center. The soft ware program considers special patient and physician requirements, such as humanitarian moves, destination preferences of the attending physician, and special drug and alcohol rehabilitation and weight reduction programs. Availability of medical specialties, as well as hospital bed availability, are also considered.

D-4. Related Features

The DMRIS exchanges patient movement data with the APES. This system automates the patient movement functions of the aeromedical evacuation system.

Section II. AUTOMATED PATIENT EVACUATION SYSTEM

D-5. Purpose

The purpose of APES is to support the mission of the USAF MAC in the movement of patients between MTFs within CONUS, within the European and Pacific theaters, and from the overseas theaters to CONUS.

D-6. Background

Medical evacuation at the USAF level consists of patient regulating and patient movement. The DMRIS automates the patient regulating portion of medical evacuation. The APES is an on-line, interactive microcomputer-based system designed to automate the patient movement functions of the aeromedical evacuation system and to integrate patient movement data with the DMRIS patient regulating data. Since APES uses patient information entered into the DMRIS, a patient must be reported to the ASMRO and regulated before APES can schedule a patient for movement. The APES provides the Patient Airlift Center at Scott AFB, Illinois, with the automated mission planning management reporting support, and provides MTFs with aeromedical evacuation mission flight data, such as estimated times of arrival and departure.

D-7. Operational Features

The APES is designed to—

- Generate proposed mission plans to effectively use aircrew and airlift resources for patient movement within 72 hours after a patient is reported to the ASMRO.

- Prepare mission operational and support documents.

- Enhance the visibility of missions-in-process to permit patient add-ons, cancellations, and changes.

- Ensure expeditious and positive control of URGENT and PRIORITY precedence patient movements.

APPENDIX E

PATIENT REGULATING FORMS
SAMPLE FORMAT

Section I. USE OF DD FORM 600, PATIENT'S BAGGAGE TAG

E-1. General

A DD Form 600, Patient's Baggage Tag, is prepared for and firmly affixed to each piece of baggage accompanying patients traveling by military common carrier. When a patient's journey is to be made in several stages, one tag will serve throughout the entire trip, even though the patient may be moved by more than one common carrier. A copy of the patient's travel orders should also be placed inside each piece of baggage to ensure the prompt return of misdirected items. Do not use DD Form 600 for baggage not moving aboard the train, aircraft, or vessel with the patient. Such items are moved as ordinary unaccompanied baggage in accordance with applicable service directives.

E2. Preparation of DD Form 600

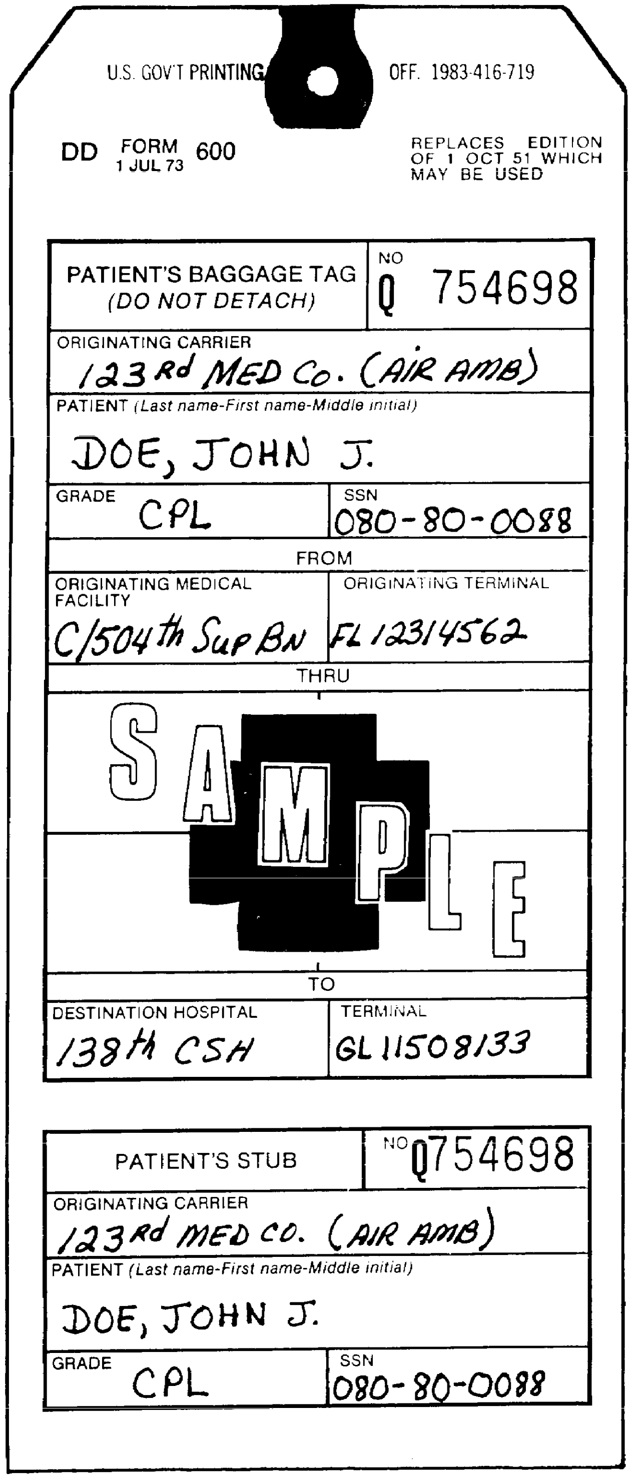
The OMF completes DD Form 600 (Figure E-1) and firmly attaches it to each piece of baggage accompanying the patient. All items except the en route staging facilities should be completed, prior to arriving at the MASF.

E-3. Receipt for Checked Baggage

Detach the patient's stub from the DD Form 600 and give it to the patient as his receipt for checked baggage. If the patient is unable to safeguard the stub, give it to the senior medical attendant accompanying the patient. As accompanying medical personnel are relieved, the patient's stub is turned over to the succeeding senior medical attendant. At the destination terminal, the accompanying medical attendant delivers the stub to the representative of the destination hospital accepting delivery of the patient.

E-4. Disposition of DD Form 600

The Patient's Baggage Tag and accompanying stub may be destroyed when baggage is returned to the patient or the DD Form 600 is replaced by a local baggage tag and stub at the destination hospital.


U.S. GOV'T PRINTING OFF. 1983-416-719

DD FORM 600, 1 JUL 73 — REPLACES EDITION OF 1 OCT 51 WHICH MAY BE USED

PATIENT'S BAGGAGE TAG (DO NOT DETACH) — NO 0 754698

ORIGINATING CARRIER: 123Rd MED Co. (AIR AMB)

PATIENT (Last name-First name-Middle initial): DOE, JOHN J.

GRADE: CPL — SSN: 080-80-0088

FROM

ORIGINATING MEDICAL FACILITY: C/504th Sup BN — ORIGINATING TERMINAL: FL 12314562

THRU

SAMPLE

TO

DESTINATION HOSPITAL: 138th CSH — TERMINAL: GL 11508133

PATIENT'S STUB — NO 0754698

ORIGINATING CARRIER: 123Rd MED CO. (AIR AMB)

PATIENT (Last name-First name-Middle initial): DOE, JOHN J.

GRADE: CPL — SSN: 080-80-0088

Figure E-1. Sample DD Form 600.

Section II. USE OF DD FORM 601, PATIENT EVACUATION MANIFEST

E-5. General

A DD Form 601 is prepared for each patient to be transferred. All patients destined for the same off-load terminal may be listed on the same manifest form. The off-load terminal may not be the patient's final destination. For example, the patient is evacuated by ground to a CSH. However, due to the seriousness of his condition, he is evacuated by air from the CSH to a general hospital in the COMMZ. Medical treatment facilities must maintain close liaison with local support elements or medical evacuation battalions to ensure proper coordination with corps is affected. Support elements may waive the requirements for preparation of DD Form 601 providing the support element prepares an adequate patient manifest and furnishes copies to the originating and destination MTFs.

E-6. Preparation of DD Form 601

The OMF prepares DD Form 601. The required number of copies is determined locally and should be included in the unit SOP. Complete this form in accordance with the directions contained on the form and the following instructions:

a. Number manifests by Julian date with a number consisting of the last digit of the calendar year and the serial number of the manifest on that day and separated by a hyphen. For example, the tenth manifest issued on 19 December 1989 is numbered "9353-10" with the "9" being the last digit of the calendar year, the ''353" being the Julian date for that day, and the "10" representing the number of manifests prepared so far on that day.

b. All attendants (medical and nonmedical) are identified on the DD Form 601 directly following the information on the patient they are attending. If the en route medical care and surveillance is being done by only one individual, his name and information should be included after the last patient entry. Do not list the patient's attendant as an emergency addressee.

c. Enter the term "prisoner" below the name of the OMF for patients in a prisoner status.

d. Enter the words "Under Investigation" to identify patients who are under investigation, but not formally charged with a serious crime.

e. Enter the term ''DA" to identify patients with a history of drug abuse.

f. When necessary, deletions and changes should be initialed by the individual who signed the manifest. If a patient is listed on the manifest who cannot be moved, line out all entries pertaining to that patient and initial the change. See Figure E-2 for a sample DD Form 601.

E-7. Disposition of DD Form 601

At the loading point give the DD Form 601 to the senior medical person present. He will check all patients and baggage listed on the manifest. He will note any changes and return a signed copy acknowledging receipt for all manifested patients and baggage. The OMF retains the signed copy of the form for 12 months, after which it may be destroyed.

> This paragraph implements STANAG 3204 and Air STD 61/71.

E-8. Considerations for Use of Aeromedical Evacuation

The medical assessment of a patient for aeromedical evacuation is made at the OMF.

a. The availability of suitable facilities, both in-flight and at staging stations en route, together with the proposed altitude and duration of the flight must be considered.

b. The clinical decision for choosing the method of evacuation is made by the attending physician. The following are clinical considerations *(applying to pressurized aircraft)* which may be used in this decision process:

(1) Experience has shown that there are no absolute contraindications to air movement. The

following classes of patients, however, should only be accepted when special arrangements have been made:

- Patients who are in the infectious stage of serious communicable disease; if they are accepted, special precautions are to be taken to protect other patients, passengers, and crew.

- Patients whose general condition is poor and there are overriding medical and social reasons for air movement.

(2) Patients with any of the following conditions require special considerations:

- Respiratory embarrassment.

- Cardiac failure or postmyocardial infarction, especially in the first 6 weeks.

- Severe anemia.

- Trapped gas within any body cavity, postlaparotomy patients, and patients who have had gas introduced into their body as a diagnostic procedure should not normally be moved within 10 days of the operation (21 days for a thoracotomy).

- Patients suffering from decompression sickness. Patients being transferred to a recompression treatment facility should not normally be flown with a cabin altitude in excess of 1,000 feet above sea level.

- Patients with an external fixation of the jaws must have a means of releasing the jaws immediately available or intermaxillary elastics used for fixation, and a competent escort to accompany the patient.

- Infectious patients.

- Patients in plaster of paris casts should be escorted since limbs may swell in flight necessitating bivalving of the cast. Casts applied less than 72 hours prior to the flight are to be of the GYPSONA type and are split (including all dressings) down to the skin level. Patients with lower limb plasters are normally to be stretcher cases unless the cast has been on for more than 7 days and there is no residual tissue swelling.

- Detached retina, intraocular hemorrhage, or any choroidal or retinal injury. Hypoxia can increase intraocular tension and cause meiosis.

- Patients with subarachoid hemorrhage should be moved either before 48 hours or after 6 weeks have elapsed.

- Patients with vascular anastomosis should not be subjected to aeromedical evacuation for 14 days.

c. Pregnant women who require aeromedical evacuation for reasons unconnected with their pregnancy may be accepted for air transport without special precautions up to the end of the 34th week of pregnacy, provided that the obstetrician or medical officer in charge certifes that the pregnancy is proceeding normally and that there is nothing in the obstetric history to suggest a premature onset of labor is likely.

d. The classifications for patients being aeromedically evacuated is contained in Appendix F.

SAMPLE FORMAT

PATIENT EVACUATION MANIFEST	MANIFEST NO. 9353-10	ESTIMATED TIME OF DEPARTURE AND DATE 1500 19 Dec 89	PAGE 1 OF 1 PAGES

MEDICAL FACILITY PREPARING MANIFEST	ORIGINATING TERMINAL
C Co. 504th FSB	C Co. 504th FSB
In this column list for each patient the following items in the order indicated: NAME--GRADE--SERVICE--SERVICE NUMBER DIAGNOSIS--CLASS OF PATIENT FROM (*Medical facility*)--TO (*Hospital*)	In this column list for each patient the following items in the order indicated: EMERGENCY ADDRESSEE--RELATIONSHIP ADDRESS--TOWN AND STATE DESTINATION TERMINAL--BAGGAGE TAG NUMBERS
DOUBLE SPACE BETWEEN PATIENTS' ENTRIES	DOUBLE SPACE BETWEEN PATIENTS' ENTRIES
Doe, John J. CPL, USA 080-80-0088 GSW to head 2A FROM: C/504th Sup Bn TO: 138th CSH	NOK Mrs. Linda Doe (Wife) 4030 Commercial Ave. San Antonio, Texas DEST: 138th CSH TAG# Q754698
Doeski, Herman A. SGT 01234-03 GSW to lower abdomen 2A FROM: C/504th Sup Bn "PRISONER" TO: 138th CSH	NOK Mr. Henry H. Doeski (Father) 123 Ramblewood Dr. Corpus Christi, Texas DEST: 138th CSH TAG# Q754697
Jones, John R. PFC, USA 173-24-5621 5B FROM: C/504th Sup Bn "DA" TO: 138th CSH	NOK Ms. Susan L. Jones (Sister) 333 Main Street Athens, Georgia DEST: 138th CSH TAG# Q754699
Lopez, Jasinto P. SPC, USA 002-00-8800 6B FROM: C/504th Sup Bn TO: 138th CSH	NOK Mrs. Celia Hernandez (Mother) 261 Castle Drive San Diego, California DEST: 138th CSH TAG# Q754696

CARRIER	FLIGHT NO.	TRIP	TRIP NO.	VOYAGE NO.	SIGNATURE

DD FORM 1 OCT 51 601

16 68670-1 U.S. GOVERNMENT PRINTING OFFICE

Figure E-2. Sample DD Form 601.

Section III. USE OF DD FORM 602, PATIENT EVACUATION TAG

This paragraph implements STANAG 2132.

E-9. General

a. Department of Defense Form 602 is the patient's intransit medical record. The attending physician prescribes en route medical care requirements on this form before the patient departs the OMF, and all en route treatments are noted on the form during the patient's journey. The tag consists of the "Ship's Record Office Tab," the "Embarkation Tab," and the "Debarkation Tab." Only the basic tag is normally required. The "Embarkation Tab" and "Debarkation Tab" may be completed and used locally.

b. All patients must wear a patient identification band while in the USAF aeromedical evacuation system. This is not required by the Army evacuation system.

E-10. Preparation of DD Form 602

The OMF prepares DD Form 602 (Figures E-3 and E-4), entering all pertinent information except "Cabin or Compartment No." and "Bunk No." This information, when required, is entered by the air ambulance aidman or medical attendant. If a battle casualty does not have a DD Form 1380 attached when picked up, the air ambulance aidman will initiate a DD Form 602 and attach it to the patient. If a patient's journey is in several stages, en route ASFs use the original tag for recording pertinent medical data and forward it with the patient when he departs for the next leg of his journey.

a. Enter all diagnoses, including only such detail as is useful in caring for the patient during his journey.

b. In the "Diagnosis" section, enter in red pencil the terms:

(1) "Prisoner" for patients in a prisoner status.

(2) "Under Investigation" for patients who are under investigation (but not formally charged) for a serious crime.

(3) "DA" for patients with a history of drug abuse.

c. Check the space "Battle Casualty" only if the patient actually falls into this category as defined in governing regulations of his service. Patients who are not battle casualties, but under treatment primarily for nonbattle wounds or other injuries are classed as "Injury."

d. Enter the same baggage tag numbers as shown on DD Form 600.

e. Enter treatment ream-mended en route in the space provided. En route medication, with dosage as prescribed by the attending physician, must be recorded in this section. If a patient requires tube feeding, a copy of the tube feeding formula must be attached to DD Form 602 to ensure that he receives the same tube feeding throughout his journey.

E-11. Continued Use of DD Form 602

a. While in the aeromedical evacuation system, the medical personnel providing en route medical care use the reverse side of the form to note patient examinations and treatments, where such information is not sufficient to justify opening the patient's clinical record. Further, treatments administered at en route medical facilities or ASPs are also annotated. All treatment entries include the time that the actual treatment was administered. This entry must be recorded in Greenwich mean time and indicated by use of the suffix "Z."

b. At all intermediate stops prior to arrival at the destination medical facility, the name of the facility and the dates of the patient's arrival and departure are annotated, such as Letterman Army Medical Center, 7 Feb—9 Feb 89.

E-12. Disposition of DD Form 602

The destination hospital staples the basic tag of DD Form 602 to the Standard Form 602 in the patient's health record. The "Embarkation Tab" and "Debarkation Tab" may be retained by the air ambulance unit or disposed of locally.

DD FORM 1 FEB 63 602

REPLACES DD FORM 602, 1 OCT 51
PREVIOUS EDITIONS ARE OBSOLETE
REMPLACE DD FORM 602, 1 er OCTOBRE 1951
LES EDITIONS PRECEDENTS SONT CADUQUES

SAMPLE FORMAT

PATIENT EVACUATION TAG—FICHE D'ÉVACUATION DE PATIENT
(Tie this tag to patient – Attacher cette fiche au patient)

FROM (Medical treatment facility)
ORIGINE (Installation de traitement médical)
C/504th SUP BN

NAME (Last—first—middle initial)
NOM (Nom de famille—premier prénom—initiale deuxième prénom)
DOE, JOHN J

SERVICE NUMBER / NUMÉRO MATRICULE	RANK/RATING/GRADE / GRADE	CATEGORY OF PERSONNEL (Service or employer and nationality) / CATÉGORIE DE PERSONNEL (Service ou employeur et nationalité)
080-80-0088	CPL	USA

DIAGNOSIS / DIAGNOSTIC: 8739 GSW to head

CLASS—CLASSE		DISEASE / MALADIE	BATTLE CASUALTY / BLESSÉ AU COMBAT	INJURY / BLESSURE
1A	2A X		XX	
1B	2B			
1C		CABIN OR COMPARTMENT NO. / NO. CABINE OU COMPARTIMENT		BUNK NUMBER / NUMÉRO COUCHETTE
3	4			
VSI / TRÈS GRAV. MAL: Yes / Oui ☐ No / Non ☐		BAGGAGE TAG NUMBER(S) / NUMÉROS ÉTIQUETTES BAGAGES: Q 754698		
DESTINATION / DESTINATION: 138th CSH		SHIP/AC (Identification) / NAVIRE/AVION (Matricule/type)		

TREATMENT RECOMMENDED EN ROUTE (If no treatment is required a notation to this effect is made)
TRAITEMENT RECOMMANDÉ EN ROUTE (Indiquer si aucun traitement n'est nécessaire)
MONITOR CASUALTY, START IV ONLY IF BLOOD PRESSURE IS DECREASING, RINGER'S LACTATE AT A TKO RATE.

SIGNATURE OF MEDICAL OFFICER / SIGNATURE DU MÉDECIN	DATE / DATE
s/ CHARLTON HESTON, MAJ, MC	19 DEC 89

REGULAR DIET / RÉGIME NORMAL	SPECIAL DIET (Describe) / RÉGIME SPÉCIAL (Description)
	NPO

SHIP'S RECORD OFFICE TAB—FICHE POUR ARCHIVES TRANSPORTS

FROM (Medical treatment facility)
ORIGINE (Installation de traitement médical)
C/504th SUP BN

NAME (Last—first—middle initial)
NOM (Nom de famille—premier prénom—initiale deuxième prénom)
DOE, JOHN J.

SERVICE NUMBER / NUMÉRO MATRICULE	RANK/RATING/GRADE / GRADE	CATEGORY OF PERSONNEL / CATÉGORIE DE PERSONNEL
080-80-0088	CPL	USA

BAGGAGE TAG NUMBER(S) / NUMERÓS ÉTIQUETTES BAGAGES	DATE OF SHIPMENT / DATE DÉPART
Q 754698	19 DECEMBER 1989
DESTINATION / DESTINATION: 138th CSH	**ARRIVAL DATE / DATE ARRIVÉE**

EMBARKATION TAB—FICHE D'EMBARQUEMENT

Figure E-3. Sample DD Form 602 (front side).

SAMPLE FORMAT

TREATMENT AND PROGRESS REPORT
TRAITEMENT ET EVOLUTION DE LA CONDITION.

VITAL SIGNS:
T 96.2°F (A)
P 104
R 10
BP 88/60

SIGNATURE SIGNATURE	DATE DATE
D. Jones, SSG, 91B	19 DEC 89

(DO NOT WRITE BELOW PERFORATION)
(NE PAS ECRIRE AU-DESSOUS DE LA PERFORATION)

Figure E-4. Sample DD Form 602 (back side).

This appendix implements STANAG 3204 and Air STD 61/71.

APPENDIX F

PATIENT CLASSIFICATION CODES

Table F-1 provides the patient classification codes used in comleting DD Form 601.

Table F-1. Patient Classification Codes

CODE	CLASSIFICATION
	Psychiatric Patients
1A	Stetcher patients who are frankly disturbed and inaccessible, requiring close supervision and sedation, or the use of restraint equipment.
1B	Patients who are not at the time of request grossly disturbed, but who may react badly to air travel, or who may commit acts likely to endanger themselves or the safety of the aircraft and its occupants.
1C	Sitting patients who are cooperative and have proved themselves to be reliable under pre-flight observation.
	Stretcher Patients Other than Psychiatric
2A	Patients who in an emergency would be unable to leave the aircraft without assistance.
2B	Patients who in an emergency would be able to leave the aircraft unaided.
2C	Patients who can walk onto an aircraft but on a long flight would benefit from a litter.
	Sitting Patients Other than Psychiatric
3A	Sitting patients, including handicapped persons, who may need medical or nursing attention en route and who, in an emergency, would require assistance to escape.
3B	Sitting patients who may need medical or nursing attention en route and who would be able to escape unassisted in an emergency.
	Sitting Patients Other than Psychiatric
4	Patients who will not need medical or nursing attention en route and are capable of traveling unescorted. Class 4 patients are normally required to make their own way from the deplaning airfield to their destination.

APPENDIX G

SAMPLE FORMAT FOR MEDICAL EVACUATION MISSION REQUEST AND AFTER-ACTION RECORD

G-1. General

Once the medical evacuation mission is completed, an after-action record of this mission should be maintained. The information contained in this sample record provides historical data and lessons learned information. This information can be used as a management tool for ensuring that medical evacuation missions are properly equipped and performed in a timely manner. Further, the record provides information on the patient's condition and procedures accomplished which may have bearing on either administrative or legal proceedings.

G-2. Sample Format for Medical Evacuation Mission Request and After-Action Record

The sample format depicted in Table G-1 may be revised to meet the needs of the command and included in the unit SOP.

SAMPLE FORMAT

Table G-1. Medical Evacuation Mission Request and After-Action Record

MEDICAL EVACUATION REQUEST/AFTER-ACTION RECORD

DTG RECEIVED	CALL SIGN	AIR/GROUND	UNIT MISSION/MISSION NUMBER

ITEM	CLEAR/DECRYPTED	ENCRYPTED	BREVITY CODE	ACTUAL INFORMATION
1 LOCATION OF PICKUP SITE				
2 FREQUENCY/ CALL SIGN SUFFIX AT PICKUP SITE				
3 NUMBER OF PATIENTS BY PRECEDENCE			A--URGENT B--URGENT SURG C--PRIORITY D--ROUTINE E--CONVENIENCE	
4 SPECIAL EQUIPMENT			A--NONE B--HOIST C--EXTRACTION EQUIPMENT D--VENTILATOR	
5 NUMBER OF PATIENTS BY TYPE			L + # OF PNT--LITTER A+ # OF PNT--AMBULATORY (SITTING)	
6 SECURITY OF PICKUP SITE*			N--NO ENEMY TROOPS P--POSSIBLE ENEMY TROOPS (CAUTION) E--ENEMY TROOPS IN AREA (CAUTION) X--ENEMY TROOPS IN AREA (ARMED ESCORT REQUIRED)	
7 METHOD OF MARKING PICKUP SITE			A--PANELS B--PYROTECHNIC SIGNAL C--SMOKE SIGNAL D--NONE E--OTHER	
8 PATIENT NATIONALITY AND STATUS			A--US MILITARY B--US CIVILIAN C--NON-US MILITARY D--NON-US CIVILIAN E--EPW	
9 NBC CONTAMINATION*			N--NUCLEAR B--BIOLOGICAL C--CHEMICAL	

NEAREST AXP	DESTINATION MTF	DEST FREQ/CALL SIGN	ETE

NOTES:
(EXPLAIN DELAYS)
(LIST MSRs OR AIR CORRIDORS)
(LIST EXCHANGE REQUIREMENTS)
*WARTIME

SAMPLE FORMAT

Table G-1. Medical Evacuation Mission Request and After-Action Record (Continued)

DTG REQUEST RECEIVED BY EVACUATION UNIT	DTG REQUEST RECEIVED BY EVACUATION CREW	EVAC VEHICLE/AIRCRAFT DESIGNATION (BUMPER NUMBER/AIRCRAFT NUMBER)
DTG ARRIVED AT PICKUP SITE	DTG DEPARTED PICKUP SITE	EVACUATION ORGANIZATION
DTG ARRIVE AT MTF 1	DESIGNATION OF MTF 1	LOCATION OF MTF 1
DTG ARRIVE AT MTF 2	DESIGNATION OF MTF 2	LOCATION OF MTF 2
DTG ARRIVE AT MTF 3	DESIGNATION OF MTF 3	LOCATION OF MTF 3
DTG ARRIVE AT MTF 4	DESIGNATION OF MTF 4	LOCATION OF MTF 4

PATIENT DATA

NAME	RANK	SSN/ID NUMBER	UNIT	MTF EVACUATED TO

MISSION NARRATIVE: CHRONOLOGICALLY COVER AS MUCH INFORMATION AS IS AVAILABLE.

EVACUATION CREW: INDIVIDUAL IN CHARGE:	SIGNATURE OF INDIVIDUAL IN CHARGE:
PILOT/DRIVER:	
MEDIC:	
CREW CHIEF:	

CONTINUATION OF INFORMATION:

APPENDIX H

USE OF THE US FIELD MEDICAL CARD SAMPLE FORMAT

This paragraph implements STANAG 2132.

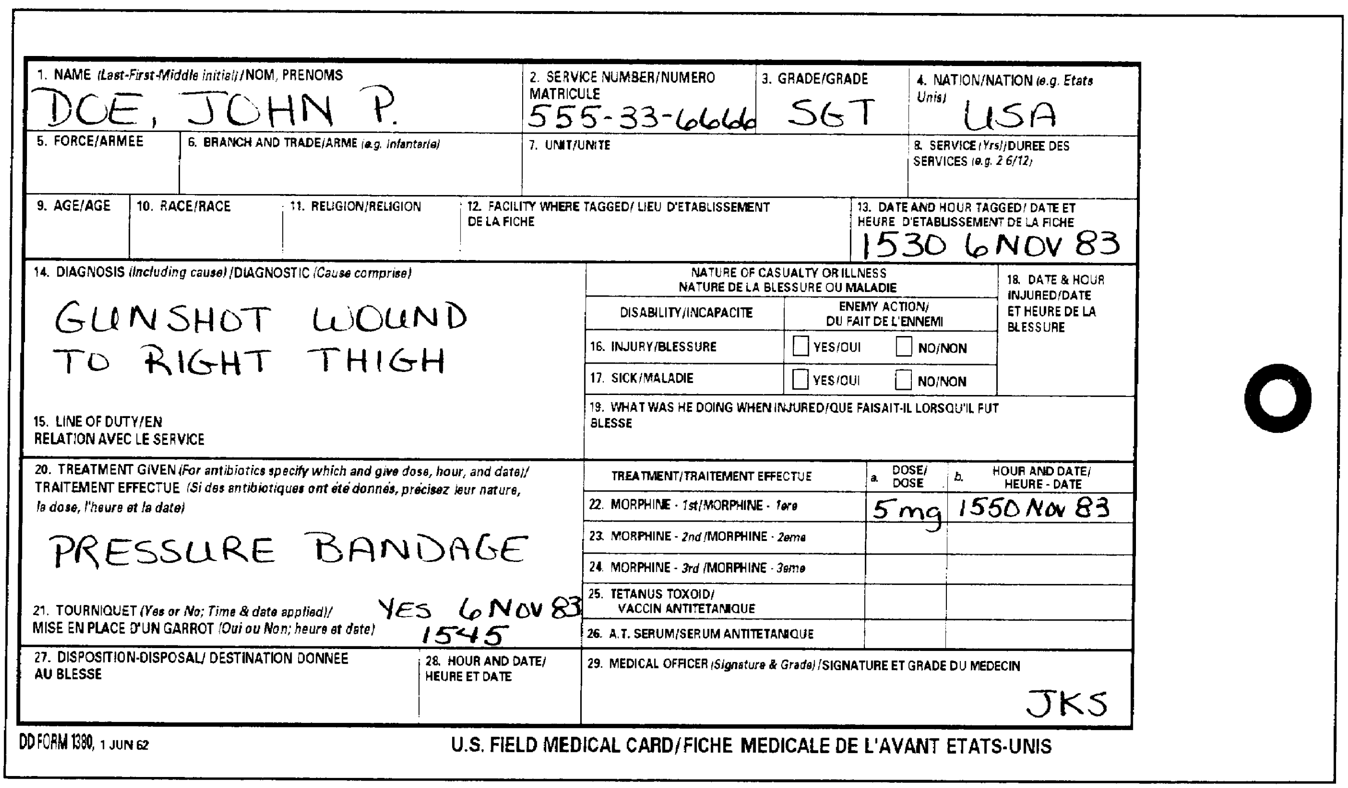
H-1. General

a. The US Field Medical Card (DD Form 1380) (AR 40-66) is used to record data similar to that recorded by the inpatient treatment record cover sheet (ITRCS). The FMC is used by BASs, clearing stations and nonfixed troop or health clinics working overseas, on maneuvers, or attached to commands moving between stations. It may also be used to record an outpatient visit when the health record is not readily available at an MTF. The FMC is used in the TO during time of hostilities. It also may be used to record *carded for record only* (CRO) cases.

b. The FMC is made so that it can be attached to the casualty. The cards are issued as a pad, with each pad consisting of an original card, a sheet of carbon paper, a carbon protective sheet, and a duplicate.

H-2. Preparation of the Field Medical Card

a. An MTF officer completes the FMC or supervises its completion. However, the combat medic first attending the casualty may initiate an FMC. To do this, he records the name, social security number (SSN), and grade of the patient. He also briefly describes the medical care or treatment given and enters as much information as time permits (Figure H-1). After doing this, he puts his initials in the far right side of the signature block (Item 29, Figure H-1). The supervising AMEDD officer then completes, reviews, and signs the FMC.


1. NAME (Last-First-Middle initial)/NOM, PRENOMS: DOE, JOHN P.
2. SERVICE NUMBER/NUMERO MATRICULE: 555-33-6666
3. GRADE/GRADE: SGT
4. NATION/NATION (e.g. Etats Unis): USA
5. FORCE/ARMEE
6. BRANCH AND TRADE/ARME (e.g. Infanterie)
7. UNIT/UNITE
8. SERVICE (Yrs)/DUREE DES SERVICES (e.g. 2 6/12)
9. AGE/AGE
10. RACE/RACE
11. RELIGION/RELIGION
12. FACILITY WHERE TAGGED/ LIEU D'ETABLISSEMENT DE LA FICHE
13. DATE AND HOUR TAGGED/ DATE ET HEURE D'ETABLISSEMENT DE LA FICHE: 1530 6 NOV 83
14. DIAGNOSIS (Including cause)/DIAGNOSTIC (Cause comprise): GUNSHOT WOUND TO RIGHT THIGH
NATURE OF CASUALTY OR ILLNESS / NATURE DE LA BLESSURE OU MALADIE
DISABILITY/INCAPACITE — ENEMY ACTION/ DU FAIT DE L'ENNEMI
16. INJURY/BLESSURE — YES/OUI — NO/NON
17. SICK/MALADIE — YES/OUI — NO/NON
18. DATE & HOUR INJURED/DATE ET HEURE DE LA BLESSURE
15. LINE OF DUTY/EN RELATION AVEC LE SERVICE
19. WHAT WAS HE DOING WHEN INJURED/QUE FAISAIT-IL LORSQU'IL FUT BLESSE
20. TREATMENT GIVEN (For antibiotics specify which and give dose, hour, and date)/ TRAITEMENT EFFECTUE (Si des antibiotiques ont été donnés, précisez leur nature, la dose, l'heure et la date): PRESSURE BANDAGE
21. TOURNIQUET (Yes or No; Time & date applied)/ MISE EN PLACE D'UN GARROT (Oui ou Non; heure et date): YES 6 NOV 83 1545

TREATMENT/TRAITEMENT EFFECTUE	a. DOSE/ DOSE	b. HOUR AND DATE/ HEURE - DATE
22. MORPHINE - 1st/MORPHINE - 1ere	5mg	1550 Nov 83
23. MORPHINE - 2nd/MORPHINE - 2eme		
24. MORPHINE - 3rd/MORPHINE - 3eme		
25. TETANUS TOXOID/ VACCIN ANTITETANIQUE		
26. A.T. SERUM/SERUM ANTITETANIQUE		

27. DISPOSITION-DISPOSAL/ DESTINATION DONNEE AU BLESSE
28. HOUR AND DATE/ HEURE ET DATE
29. MEDICAL OFFICER (Signature & Grade)/SIGNATURE ET GRADE DU MEDECIN: JKS

DD FORM 1380, 1 JUN 62 U.S. FIELD MEDICAL CARD/FICHE MEDICALE DE L'AVANT ETATS-UNIS

Figure H-1. Preparation of the Field Medical Card.

SAMPLE FORMAT

b. An FMC is prepared for any patient treated at an MTF. For transfer cases, the FMC is attached to the patient's clothing. It remains with him until his arrival at a hospital, his death and interment (burial), or his RTD. If a patient dies, the FMC remains attached to the body until interment when it then is removed. If the body cannot be identified when it is to be interred, the registration number given the remains by the Graves Registration Service is noted on the FMC.

c. Under combat conditions, the aidman may only partially complete the FMC for patients being treated. Otherwise, all entries are completed as fully as possible. The blocks that must be complete are 1, 2, 3, 4, 13, 14, 20, 21 (if a tourniquet is applied), 22, and 29. This also applies to the BAS when patients are being transferred to another MTF during a combat situation. Instructions for completing items on the ITRCS apply to similar items on the FMC; all abbreviations authorized for use on the cover sheet may also be used on the FMC. Except for those listed below, however, abbreviations may not be used for diagnostic terminology.

- Abr W—abraded wound.
- Cent W—contused wound.
- FC—fracture (compound) open.
- FCC—fracture (compound) open comminuted.
- FS—fracture simple (closed).
- LW—lacerated wound.
- MW—multiple wounds.
- Pen W—penetrating wound.
- Perf W—perforating wound.
- SL—slight.
- SV—severe.

d. The FMC may also be used for CRO cases. Certain cases not admitted to an MTF are CRO. For CRO cases, DA Form 3647 or the FMC is prepared and a register number assigned. When DA Form 3647 is used, Items 7, 10, 14, 24, 27, 30, and the name of the admitting officer need not be completed. When the FMC is used, Item 11 need not be completed.

H-3. Supplemental Field Medical Cards

When more space is needed, another FMC is attached to the original. This second one is labeled in the upper RIGHT corner "FMC #2" and shows the patient's name, grade, SSN, and nation (Figure H-2).

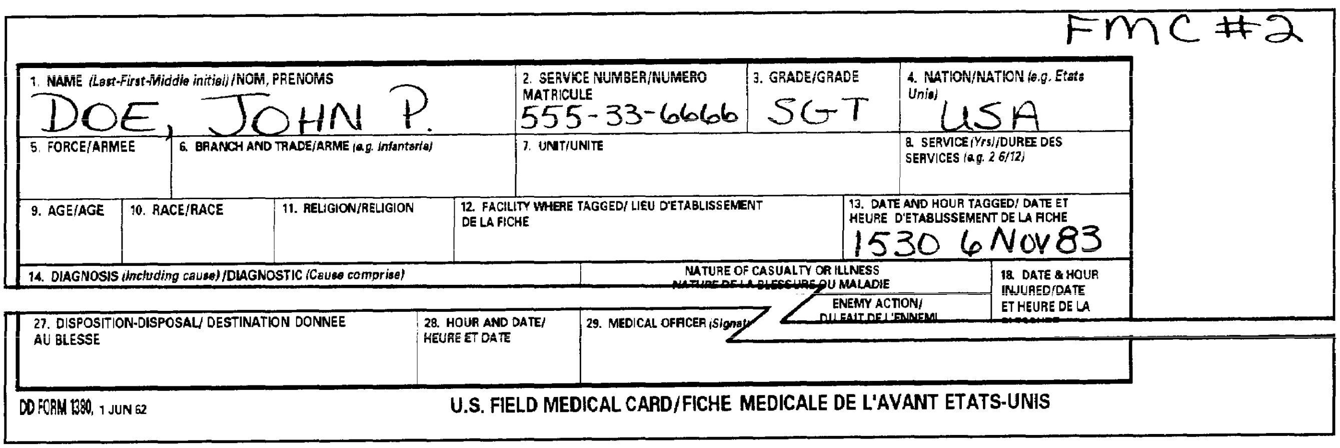

FMC #2
1. NAME (Last-First-Middle initial)/NOM, PRENOMS: DOE, JOHN P.
2. SERVICE NUMBER/NUMERO MATRICULE: 555-33-6666
3. GRADE/GRADE: SGT
4. NATION/NATION (e.g. Etats Unis): USA
5. FORCE/ARMEE
6. BRANCH AND TRADE/ARME (e.g. Infanterie)
7. UNIT/UNITE
8. SERVICE (Yrs)/DUREE DES SERVICES (e.g. 2 6/12)
9. AGE/AGE
10. RACE/RACE
11. RELIGION/RELIGION
12. FACILITY WHERE TAGGED/ LIEU D'ETABLISSEMENT DE LA FICHE
13. DATE AND HOUR TAGGED/ DATE ET HEURE D'ETABLISSEMENT DE LA FICHE: 1530 6NOV83
14. DIAGNOSIS (Including cause)/DIAGNOSTIC (Cause comprise)
NATURE OF CASUALTY OR ILLNESS
NATURE DE LA BLESSURE OU MALADIE
ENEMY ACTION/
DU FAIT DE L'ENNEMI
18. DATE & HOUR INJURED/DATE ET HEURE DE LA
27. DISPOSITION-DISPOSAL/ DESTINATION DONNEE AU BLESSE
28. HOUR AND DATE/ HEURE ET DATE
29. MEDICAL OFFICER (Signat
DD FORM 1380, 1 JUN 62
U.S. FIELD MEDICAL CARD/FICHE MEDICALE DE L'AVANT ETATS-UNIS

Figure H-2. "FMC #2."

H-4. Disposition of Field Medical Cards

a For Patients Admitted and Discharged and CRO Cases. The original FMC of CRO cases or of an admission with a disposition other than to a hospital is sent to higher headquarters within the command for coding.

b. For Transfer Patients. When a patient arrives at a hospital, his FMC is used to prepare his inpatient treatment record (ITR). This FMC then becomes part of his ITR.

c. For Outpatients. The original of an FMC used to record outpatient treatment is filed in the patient's health record or outpatient treatment record.

d. Carbon Copies. All carbon copies of an FMC are destroyed locally after 3 months.

H-5. Field Medical Record Jacket

The Field Medical Record Jacket (DA Form 4006) may be used as an envelope for the FMC. To keep the jacket from being opened while the patient is in transit, pertinent personnel and medical data on the patient may be recorded on the outside. The movement of the patient may also be recorded. When the jacket has been so used, it becomes a part of the ITR.

H-6. Instructions for Completing the Field Medical Card

a. Item 1 (Name).

b. Item 2 (Service Number). Enter the SSN for US military personnel. Enter service number for foreign military personnel (including prisoners of war). Leave blank for all others.

c. Item 3 (Grade). Enter patient's grade. Use abbreviations listed in Table H-1.

d. Item 4 (Nation). Enter country of whose armed forces the patient is a member (for example, enter "USA" for US Armed Forces).

e. Item 5 (Force). Enter specific armed service of patient.

f. Item 6 (Branch and Trade). Enter branch or corps for US officers. Enter area of concentration (AOC) or brief description of occupation (for example, "rifleman"; for foreign military, enter similar information).

g. Item 7 (Unit). Enter military unit. For civilian, enter enough information to identify patient (for example, "wife, Army SGT").

h. Item 8 (Service). Enter length of service for military personnel. Include all active duty during previous tours or reenlistment even if interrupted. Show length of service less than 1 month in days (for example, "23/365"); service less than 2 years in completed months (for example, "13/24' '); and service of more than 2 years in completed years (for example, ''3 YRS" for 3 years and 9 months).

i. Item 9 (Age). Enter patient's age.

j. Item 10 (Race). Enter "Cau" for Caucasian; "Neg" for Negroid; "Oth" for other races; "Unk" for unknown.

k. Item 11 (Religion). Enter patient's religious preference. If none, enter "None."

l. Item 12 (Facility Where Tagged). Enter MTF and location. Describe location in broad geographic terms (for example, "Near Mazaliji, Saudi Arabia").

m. Item 13 (Date and Hour Tagged). Enter date and time initial treatment was started. Enter time using the 24-hour system.

n. Item 14 (Diagnosis). Enter disease or injury requiring treatment.

(1) Punctured, penetrating, or missile wounds. Give point of entry and name organs, arteries, or nerves involved, if known.

(2) Injuries not incurred in combat. State the nature of the injury; the causative agent; the body parts affected; the circumstances causing the injury; if accidentally incurred, deliberately self-inflicted, or deliberately inflicted by another; and the place and date.

(3) Injuries incurred in combat. Add to the details described in (2) above that the injury was the result of enemy action. Also include causative agent and general geographical location (for example, "Near Seoul, Korea").

(4) Injuries or diseases caused by chemical or bacteriological agents, or by ionizing radiation. Add to the details described in (2) above, the name of the agent or type of ionizing radiation. If the name is not known, provide information that is known about the physical, chemical, or physiological properties of the agent (odor, color, physical state). Also state date, time, and place of contamination; time between contamination and treatment; and nature of treatment. For those affected by ionizing radiation, also report the approximate distance from the source; if exposure was to gamma rays, the actual or estimated dosage (for example, nest 150 rad" or "measured 200 rad"), and if exposed via airburst, ground burst, water surface burst, or underwater burst.

o. Item 15 (Line of Duty). Enter "Yes" or "No."

p. Item 16 (Injury). If injury, check Item 16 and indicate whether injury was caused by enemy action or not caused by enemy action; that is, if enemy action, check "Yes."

q. Item 17 (Sick). If disease (sick), check Item 17 and indicate whether disease was caused by enemy action or not caused by enemy action.

r. Item 18 (Date and Hour of Injury). Self-explanatory. If injury occurred prior to treatment, estimate as accurately as possible the date and time of injury.

s. Item 19 (What Patient Was Doing When Injured). Enter circumstances leading to injury.

t. Item 20 (Treatment Given). Enter any antibiotics, drugs, blood plasma, and other treatment given. Enter name of antibiotic and/or drugs, and each dose, hour, and date it was given. If more space is needed, use Item 32 on reverse side of the FMC.

u. Item 21 (Tourniquet). Enter "Yes" or "No." If yes, enter date and time applied.

v. Items 22 through 26. Enter the dose, time, and date if any of the drugs in Items 22 through 26 were given.

w. Item 27 (Disposition). Enter one of the following:

(1) "Transfer." When transferred to another MTF. When the MTF is not known, enter general destination and means of transportation.

(2) "Duty." Inpatient RTD.

(3) "Died." Died after admission.

(4) "CRO." For military patients CRO and returned to duty, enter "CRO—Duty." For deaths CRO, enter "CRO—Death." (Dead on Arrival (DOA).)

x. Item 28 (Hour and Date of Disposition). Self-explanatory.

y. Item 29 (Medical Officer). Enter signature, grade, and organization of the MTF commander, medical officer, or selected enlisted members authorized to sign the FMC.

z. Item 30 (Religious Information). Completed by chaplain.

aa. Item 31 (Diet). Check appropriate box.

bb. Item 32 (Remarks). Use this item to continue or expand any information given on the front of the form; cross-reference the item being continued. Use this item also to give any additional information that might be needed for a patient being evacuated through the MTF. For transfer cases, enter the date and hour of transfer. When additional treatment is given en route, state the nature of the treatment, where it was given, and the date and hour it was given. For deaths en route, state the date, hour, cause, and approximate place of death, as well as any other pertinent information. For patients returned to duty when they arrive at the MTF, enter that they were returned, the date, the MTF, and the hour returned. For these cases, no ITRCS is needed but IPDS (Individual Patient Data System) coding is required.

Table H-1. Officer and Enlisted Grade Structure

ARMY	MARINES	NAVY/ COAST GUARD	AIR FORCE	DATA CODES
GENERAL OF THE ARMY (GA)	—	FLEET ADMIRAL (FADM)	GENERAL OF THE AIR FORCE (GenAF)	G5
GENERAL (GEN)	GENERAL (GEN)	ADMIRAL (ADM)	GENERAL (GEN)	G4
LIEUTENANT GENERAL (LTG)	LIEUTENANT GENERAL (LtGen)	VICE ADMIRAL (VADM)	LIEUTENANT GENERAL (LtGen)	G3
MAJOR GENERAL (MG)	MAJOR GENERAL (MajGen)	REAR ADMIRAL (RADM)	MAJOR GENERAL (MajGen)	G2
BRIGADIER GENERAL (BG)	BRIGADIER GENERAL (BGen)	COMMODORE (COMO)	BRIGADIER GENERAL (Brig Gen)	G1
COLONEL (COL)	COLONEL (Col)	CAPTAIN (CAPT)	COLONEL (Col)	06
LIEUTENANT COLONEL (LTC)	LIEUTENANT COLONEL (LtCol)	COMMANDER (CDR)	LIEUTENANT COLONEL (LtCol)	05
MAJOR (MAJ)	MAJOR (Maj)	LIEUTENANT COMMANDER (LCDR)	MAJOR (MAJ)	04
CAPTAIN (CPT)	CAPTAIN (Capt)	LIEUTENANT (LT)	CAPTAIN (Capt)	03
FIRST LIEUTENANT (1LT)	FIRST LIEUTENANT (1stLt)	LIEUTENANT, JUNIOR GRADE (LTJG)	FIRST LIEUTENANT (1Lt)	02
SECOND LIEUTENANT (2LT)	SECOND LIEUTENANT (2ndLt)	ENSIGN (ENS)	SECOND LIEUTENANT (2Lt)	01
CHIEF WARRANT OFFICER (CW4)	CHIEF WARRANT OFFICER (CWO4)	CHIEF WARRANT OFFICER (CWO-4)	CHIEF WARRANT OFFICER (CWO-4)	W4
CHIEF WARRANT OFFICER (CW3)	CHIEF WARRANT OFFICER (CWO3)	CHIEF WARRANT OFFICER (CWO-3)	CHIEF WARRANT OFFICER (CWO-3)	W3
CHIEF WARRANT OFFICER (CW2)	CHIEF WARRANT OFFICER (CWO2)	CHIEF WARRANT OFFICER (CWO-2)	CHIEF WARRANT OFFICER (CWO-2)	W2
WARRANT OFFICER (WO1)	WARRANT OFFICER (WO)	WARRANT OFFICER (WO-1)	WARRANT OFFICER (WO)	W1
SERGEANT MAJOR OF THE ARMY (SMA)	SERGEANT MAJOR OF THE MARINE CORPS (SgtMajMC)	MASTER CHIEF PETTY OFFICER OF THE NAVY (MCPON)	CHIEF MASTER SERGEANT OF THE AIR FORCE (CMSAF)	E9
COMMAND SERGEANT MAJOR (CSM)	SERGEANT MAJOR (SgtMaj)	FLEET/COMMAND MASTER CHIEF PETTY OFFICER (MCPO)	CHIEF MASTER SERGEANT (MSgt)	E9

Table H-1. Officer and Enlisted Grade Structure (Continued)

ARMY	MARINES	NAVY/ COAST GUARD	AIR FORCE	DATA CODES
SERGEANT MAJOR (SGM)	MASTER GUNNERY SERGEANT (MGySgt)	—	FIRST SERGEANT (E-9)	E9
FIRST SERGEANT (1SG)	FIRST SERGEANT (1stSgt)	SENIOR CHIEF PETTY OFFICER (SCPO)	SENIOR MASTER SERGEANT (SMSgt)	E8
MASTER SERGEANT (MSG)	MASTER SERGEANT (MSgt)	—	FIRST SERGEANT (E-8)	E8
PLATOON SERGEANT (PSG) OR SERGEANT FIRST CLASS (SFC)	GUNNERY SERGEANT (GySgt)	CHIEF PETTY OFFICER (CPO)	MASTER SERGEANT (MSgt)	E7
STAFF SERGEANT (SSG)	STAFF SERGEANT (SSgt)	PETTY OFFICER FIRST CLASS (PO1)	TECHNICAL SERGEANT (TSgt)	E6
SERGEANT (SGT)	SERGEANT (Sgt)	PETTY OFFICER (PO2)	STAFF SERGEANT (SSgt)	E5
CORPORAL (CPL)	CORPORAL (Cpl)	PETTY OFFICER THIRD CLASS (PO3)	SERGEANT (Sgt)	E4
SPECIALIST 4 (SP4)	—	—	—	E4
PRIVATE FIRST CLASS (PFC)	LANCE CORPORAL (LCpl)	SEAMAN (Seaman)	AIRMAN FIRST CLASS (AIC)	E3
PRIVATE (PVT)	PRIVATE FIRST CLASS (PFC)	SEAMAN APPRENTICE (SA)	AIRMAN (Amn)	E2
PRIVATE (PVT)	PRIVATE (Pvt)	SEAMAN RECRUIT (SR)	AIRMAN BASIC (AB)	E1

APPENDIX I

HIGH PERFORMANCE UTILITY HOIST, FOREST PENETRATOR, AND FLOTATION DEVICE FOR STOKES LITTER

Section I. HIGH PERFORMANCE UTILITY HOIST

I-1. General

a. The high performance hoist is intended for use to assist helicopter rescue operations when a landing is not possible. This hoist is mounted internally, but may be mounted externally on the UH-60 helicopter. It is a two-speed hoist, post mounted in the cabin on the right side of the aircraft. The hoist has 256 feet of cable and a maximum lift capacity of 300 pounds at 250-feet per minute (fpm) (fast) and 600 pounds at 125 fpm (slow).

b. The high performance hoist is used in conjunction with the following equipment (dis cussed in Chapter 11):

- Forest penetrator (Section VIII).
- SKED litter (Section IX).
- Rescue (Stokes) litter (Section X).
- Poleless semirigid litter (Section XI).
- Survivor sling (horse collar) (Section XII).

c. There is a high degree of risk involved in a hoist rescue operation. It should, therefore, only be used when no other options are available. The patient to be hoisted should be placed in the area with the least amount of hazards (obstructions) to lessen the risks involved to both the patient and the aircrew. To ensure safe and efficient patient evacuation, ground personnel must precisely follow the crew's instructions.

d. The number of patients extracted at any one site depends on—

- Aircraft weight.
- Outside temperature.
- Altitude.
- Wind and weather conditions.
- Medical evacuation configuration kit for the aircraft.

e. Since a hoist is not routinely maintained on the air ambulance, it must be requested in the special equipment portion of the initial evacuation request and installed prior to takeoff.

I-2. Configuration

a. The hoist system consists of modular components (Figure I-1), which are electrically driven and controlled. A speed mode switch provides a selection of either slow speed (0-125 fpm) or fast speed (0-250 fpm). This switch is located on the back of the rescue hoist control panel assembly on the hoist support assembly. The hoist motor provides a selection from 125 or 250 fpm reel-in and reel-out drive of a 256-foot hoist cable. This motor is mounted on top of the pole. A fail safe mechanism limits the induced loading weight to the hoist to 1,200 pounds at all times. A circulating fan, which runs continuously, cools the hoist motor.

b. A rotary actuator is provided for swinging the boom in and out of the cabin door. The hoist is operated by means of a control pendant or by controls on the right-hand cyclic stick. The pilot's hoist control switch provides for boom positioning and reeling the rescue hoist cable up or down. The pilot's control mechanism has priority over the hoist operator's controls; however, the pilot has only a fixed, full-speed capability. The hoist operator's controls are located on the hoist control pendant (Figure I-2) and provide the following switches:

- A speed knob that is self-centering and provides variable speed control for reeling the cable up or down.

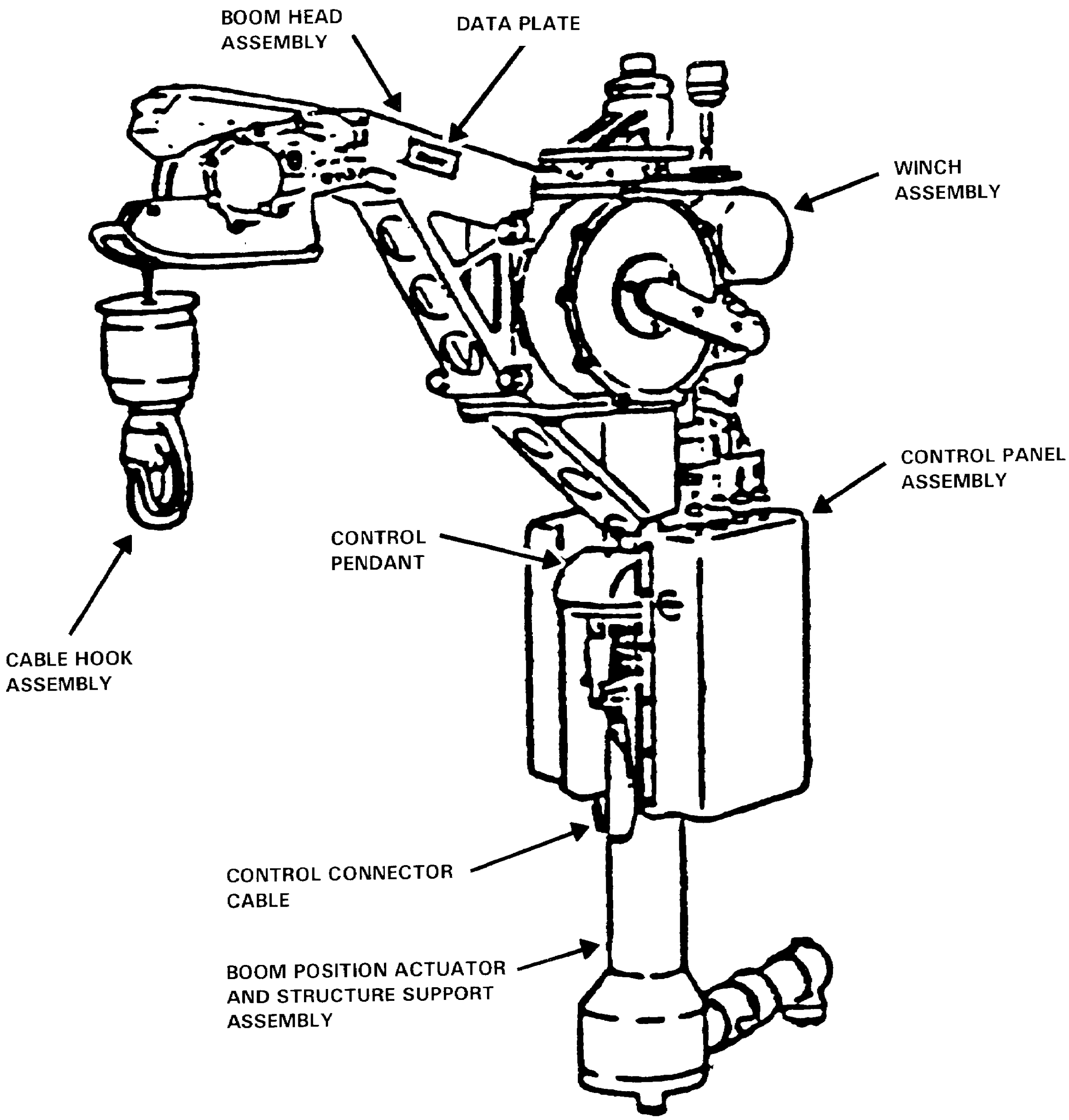


Figure I-1. The hoist system.

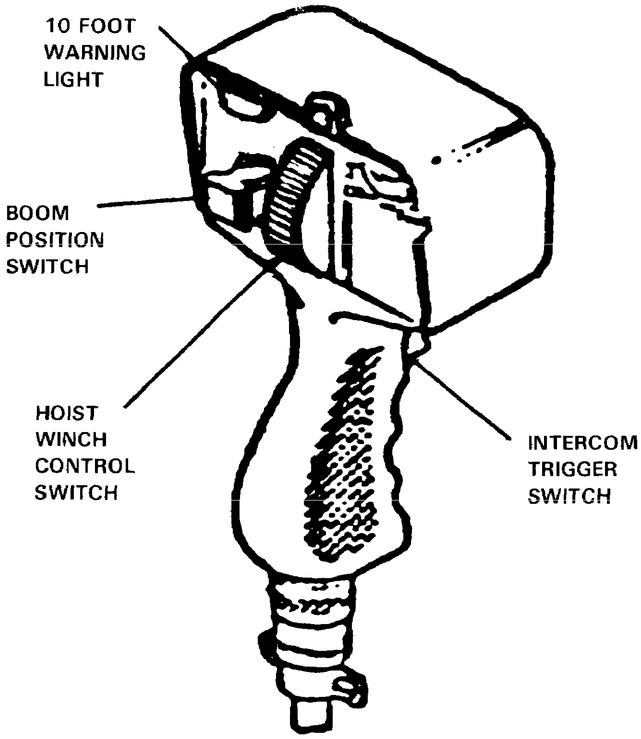


Figure I-2. Control pendant.

- A boom in and out switch and an intercom trigger switch that provide communications with the flight crew through the hoist operator's headset.

- A cable limit light and an over-temperature light.

c. The boom assembly includes a traction sheave, dual up-limit switches, and a cable guide. The installed boom head is designed to swivel 60 degrees about the boom cable axis and 30 degrees either side of center. In the event that the up-limit switch malfunctions the cable is protected from being overstressed by two cable deceleration switches and by the force absorbing capability built into the cable snubber and inertia dump of the wind assembly. One of the decelerating switches operates when the hook is 8 to 10 feet from full-up, and the other operates when the hook is 12 to 18 inches from full-up. A powered traction sheave assembly aids in lowering the hoist cable and prevents snarling of cable while being reeled out. The powered traction sheave assembly is mounted on the end of the hoist boom.

d. A cable-cutting assembly, employing a ballistic charge, provides a means of cutting the cable free of the helicopter in an emergency. The cutter is electrically activated by switches, protected by guards, located on the hoist control panel, and on the pilot's panel. The switches are sealed with breakaway wire.

I-3. Installation and Preflight Checks

a. Check for proper installation and security of the rescue hoist, ensuring that the vertical shaft for the ceiling attaching point is raised vertically to prevent the ceiling attaching device from disconnecting.

b. Check cargo hook for condition and security, and ensure that the explosive cartridge is installed.

c. Check oil level in hoist boom head.

d. Make sure rescue hoist power and rescue hoist cable cutter circuit breakers are in the **OUT** position.

e. Ensure that cable cutter switches (pilot and hoist operator) guards are down and secured.

f . Connect cable cutter.

g. Remove protective plastic sleeve at hood assembly.

h. Ensure that the rescue hoist control and rescue hoist power circuit breakers are installed. Blue power light and yellow caution light should be **ON** and the fan should be operating.

i. Rotate boom out and in using the boom switch, then out to test boom operation.

j. Rotate boom in and out using the hoist switch (pilot).

k. Reel cable out from boom head in line with the boom axis during the following test procedures. To avoid kinking the cable, care must be taken not to pull the cable taut around the cable guide/roller. Avoid damaging cable on rough surfaces.

l. Inspect the cable at the hook assembly before reeling the cable out to ensure that the 3- to 4-inch long protective plastic sleeve used during storage of the hoist has been removed.

CAUTION

It is important to inspect the boom sheave to ensure that the sleeve has not become entrapped as serious cable damage could result.

m. Place speed mode switch on **HIGH.**

n. Reel cable out using the hoist switch (pilot) until caution light is out on the control pendant (approximately 10 feet).

o. Reel in the cable using the hoist control switch (pilot) to ensure that cable speed slows when caution light comes on (approximately 10 feet).

p. Check the boom up limit switch actuator arm by pushing up on the arm while reeling in. Ensure that the hoist stops running when up-limit switches are actuated. With no load on the hoist, observe that the cable speed slows when hook is 12 to 18 inches from the full up position.

q. Repeat sequence *n* through *p* above on low speed.

r. Repeat sequence *n* through *p* with the hoist operator's control pendant. Check that cable speed can be regulated from 0 to 250 fpm when the cable is reeled out beyond the 10 foot caution limit.

s. Rotate boom to stowed position.

I-4. Prior to Takeoff Checks

a. Pull out, upon completion of preflight check, rescue hoist control, rescue hoist power, and rescue hoist cable cutter circuit breakers.

b. Ensure that the hoist operator is secure in the gunner's harness.

c. Open doors as required.

d. Move rescue hoist power, rescue hoist control, and cable cutter circuit to the **OUT** position.

NOTE

Refer to the applicable technical manual for instructions concerning inspections, assembly, disassembly, installation, and removal of high performance hoist.

I-5. Major Assemblages

Table I-1 contains a listing of the major assemblages of the high performance hoist. The table correponds to Figure I-3. Refer to the appropriate technical manual for further information.

Table I-1. Listing of Major Assemblages

INDEX	NOMENCLATURE
1	Control Connector Cable
2	Control Pendant Assembly
3	Clamp
4	Hook
5	Control Panel Assembly
6	Cable Hook Assembly
7	Boom Head Assembly
8	Limit Switch Cable
9	Upper Stanchion
10	Winch Assembly
11	Vertical Adjustment Detent
12	Quick Release Adapter
13	Input Power Cable Connector
14	Cable Cutter Harness
15	Winch Motor Cable
16	Boom Position Stanchion
17	Structure Support Assembly
18	Boom Head Cable
19	Pendant Control Cable
20	Boom Motor Cable
21	Input Power Cable
22	Reaction Arm Assembly
23	Quick Release Adapter
24	Release Assembly Pin
25	Release Assembly Pin
26	Quick Release Adapter
27	Boom
28	Cable Cutter
29	Carrier Lock Spring
30	Carrier Assembly
31	Carrier Assembly Retainer
32	Hook Assembly
33	Cap Seal
34	Retainers
35	Clamp
36	Air Duct Boot

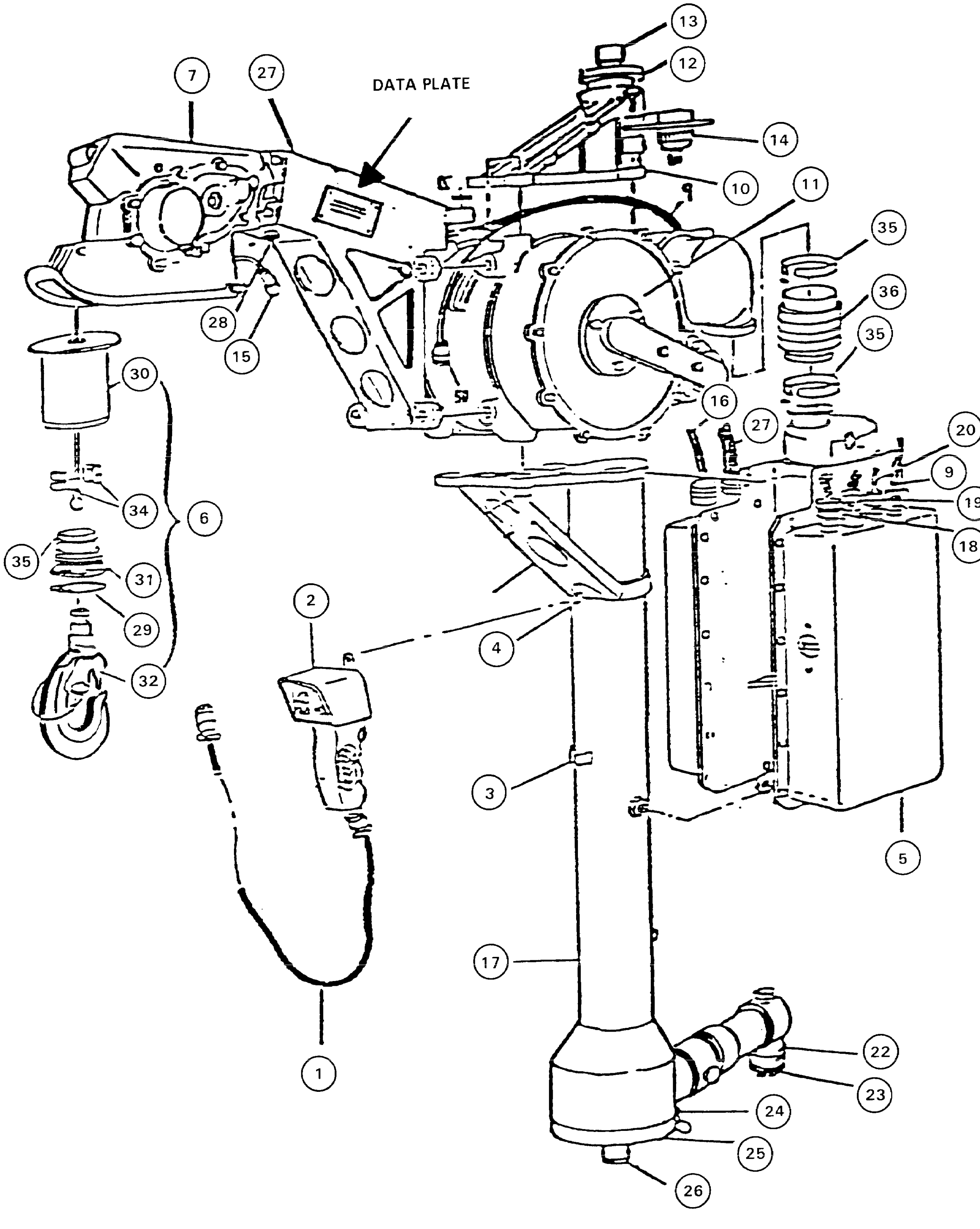


Figure I-3. Schematic of high performance hoist assemblages.

Section II. THE FOREST PENETRATOR

I-6. General

This section contains the illustrated parts list for the forest penetrator. The description and employment of this equipment is contained in Chapter 11, Section VIII.

I-7. Illustrated Parts List

Figure I-4 and Table I-2 list and illustrate the parts of the forest penetrator and flotation collar.

Table I-2. Parts Listing

Item No.	National Stock Number	MFR Code	Part Number	Nomenclature
	4240-00-199-7353	84955	K26-1000-9	Seat, Rescue Forest Penetrator
1	4240-00-829-9824	84955	K26-1021-1	Cover Assembly
2	5306-00-869-8984	84955	K26-1009-11	Eye Bolt
3			MIL-S-22499	Washer, Laminated
4	5310-00-184-9001	88044	AN960PD416L	Washer
5	5310-00-807-1475	96096	MS21042-L4	Nut, Self-Locking
6	4240-00-179-6531	84955	K26-1020-1	Safety Strap
7	5315-00-059-0494	96906	MS24665-379	Cotter Pin
8	5306-00-151-1411	88044	AN4-25A	Bolt
9	5305-00-068-0522	96906	MS24621-45	Screw, Self-Tapping
10	5310-00-167-0753	88044	AN960PD10L	Washer
11		84955	K26-1001-1	Body Assembly
12	5310-00-187-2400	88044	AN960PD616	Washer
13	1670-00-832-4221	84955	K26-1008-11	Spring, Torsion
14	5365-00-160-9520	80205	NAS43DD6-94	Spacer
15	5340-00-875-1861	96906	MS22018-1	Hook, Snap
16	5360-00-832-4224	84955	K26-1019-11	Spring, Torsion
17	4240-00-832-4220	84955	K26-1018-11	Hook
18	5310-00-807-1477	80205	MS21042-L6	Nut, Self-Locking
19		84955	K26-1010-11	Stop
20		84955	K26-1083-1	Nose
21	5306-00-427-6797	88044	AN26-54A	Bolt
22	5310-00-807-1476	96906	MS21042-L5	Nut, Self-Locking
23	5310-00-184-8980	88044	AN960PD516L	Washer
24	4240-00-443-1076	84955	K26-1042-3	Seat
25	5306-00-427-6756	88044	AN25-54A	Bolt
26	5310-00-407-9566	88044	AN935-516	Washer
27	5306-00-720-8557	96906	MS200074-05-05	Bolt
28	5340-00-664-0399	61864	SS51045	Button, Plug
29	4240-00-936-2795	84955	K26-1017-1	Collar, Floatation

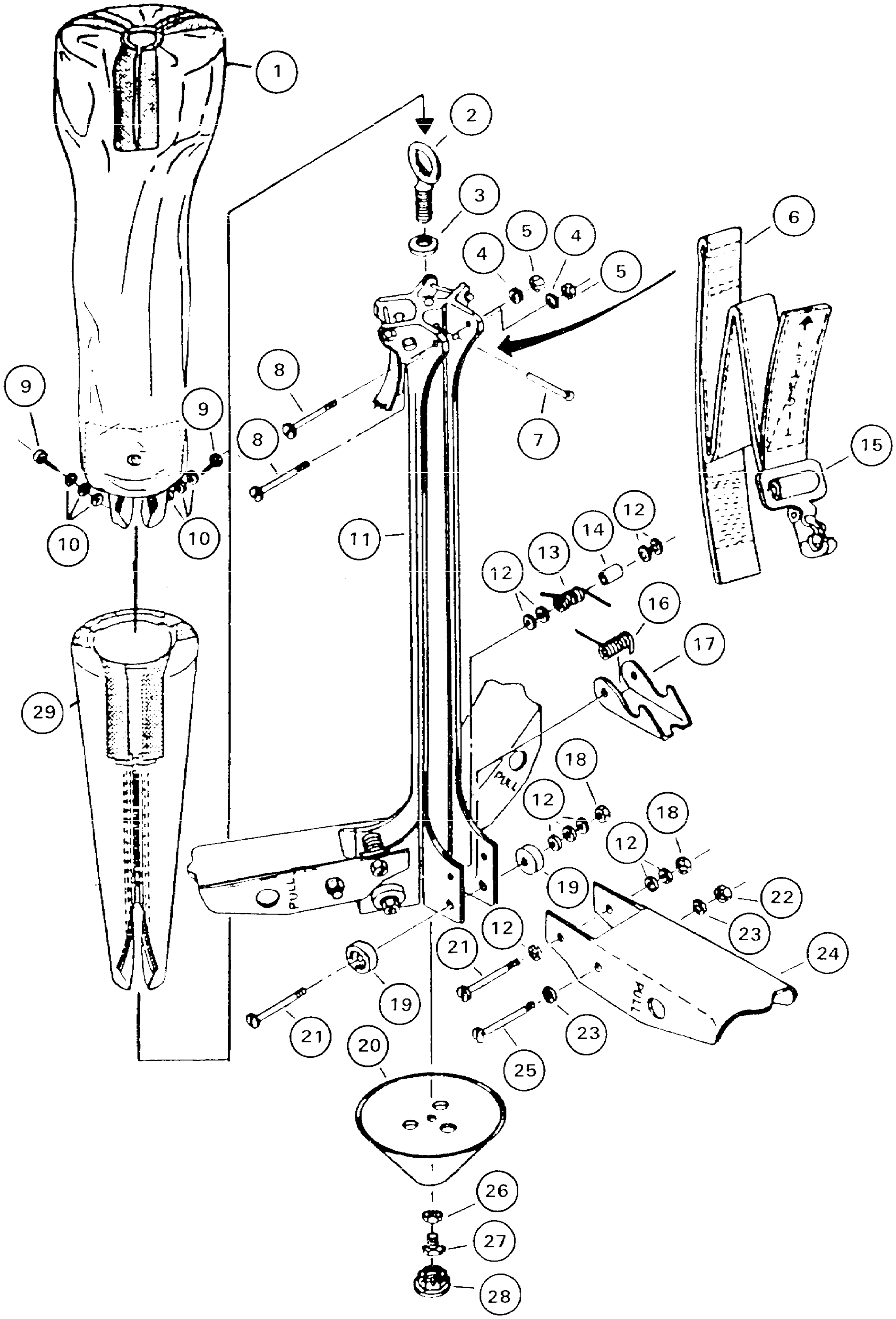


Figure I-4. Forest penetrator exploded view.

Section III. FLOTATION DEVICE FOR STOKES LITTER

I-8. General

In water rescues a device must be employed to keep the litter afloat and to keep the head of the casualty out of the water.

I-9. Flotation Device

The flotation collar for the Stokes litter is similar to a US Coast Guard collar and is designed to support a patient in the water. It is recommended that units having an AO that includes bodies of water have flotation devices on hand for use with this litter.

a. Fabrication. To fabricate a flotation collar, complete the following steps:

(1) Cut one piece of nylon duck fabric 18-inches wide and 9-feet, 3-inches long.

(2) Cut one piece of nylon duck fabric 18-inches wide and 3-feet, 9-inches long.

(3) Cut four circular end pieces of nylon duck fabric 8 inches in diameter.

(4) Cut tabs in the four end pieces as shown in Figure I-5.

(5) Cut twelve pieces of 9/16-inch webbing 32-inches long and heat sear the ends.

(6) Sew ½-inch seams on the long sides of sleeves and 1 ½-inch seams on the short ends.

NOTE

All stitching is done with size E nylon thread. Stitch spacing is 8 to 10 stitches per inch.

(7) Using the strap stitch pattern shown in Figure I-6, sew lengths of nylon webbing onto nylon duck (Figure I-7) for the long sleeve, and as shown in Figure I-8 for the short sleeve.

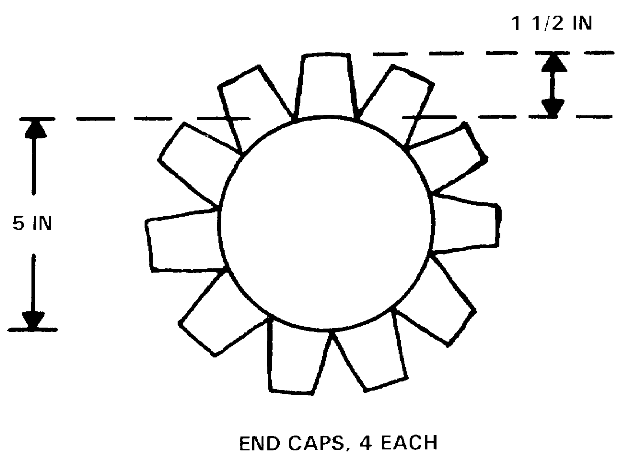


Figure I-5. End piece for flotation device.

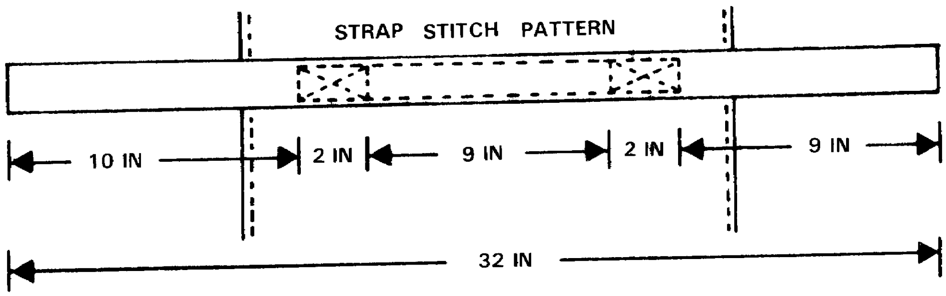


Figure I-6. Stitch pattern.

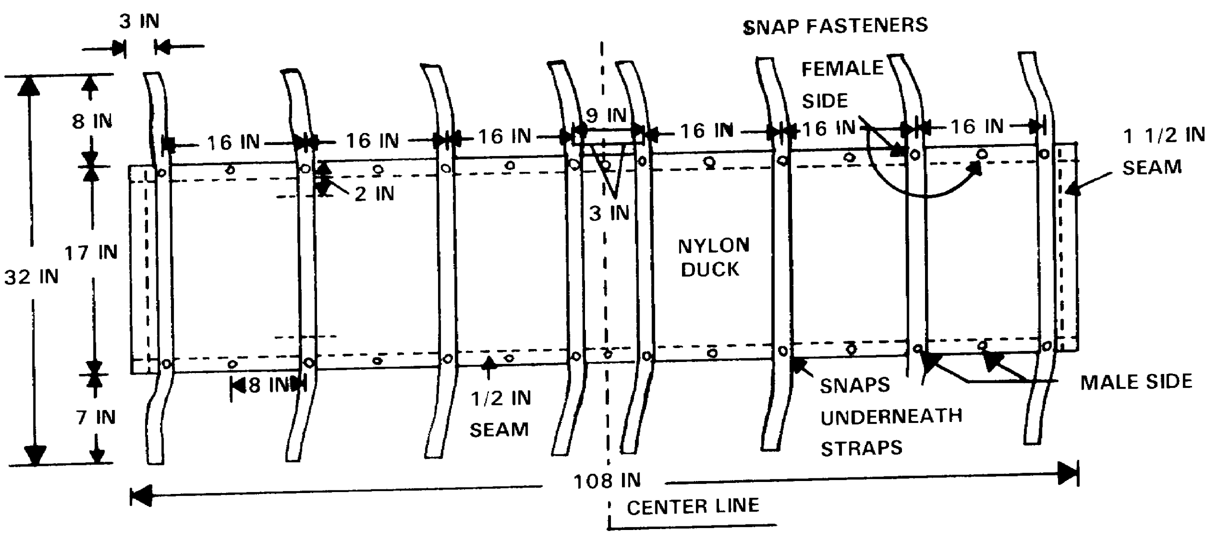


Figure I-7. Sew nylon webbing on long sleeve.

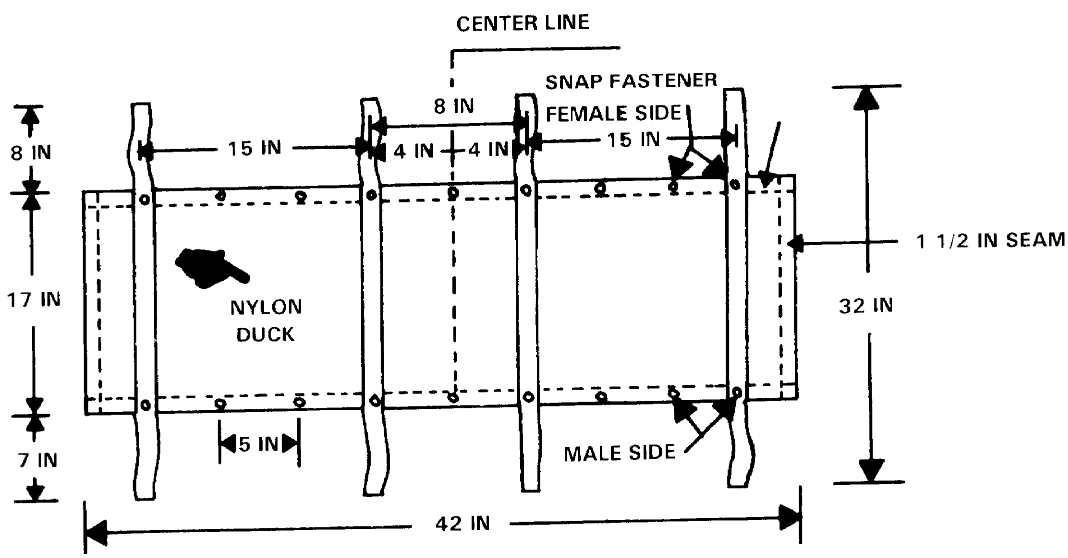


Figure I-8. Sew nylon webbing on short sleeve.

(8) Install snap fasteners as shown in Figures I-7 and I-8. Ensure snaps do not interfere with ties.

(9) Sew the circular end pieces to the inside of sleeve ends. Stitching follows the tab contours. Sew two rows of reinforcing stitching through all tabs. Where sleeve sides overlap at the end caps, sew several rows of reinforcing stitching.

(10) Cut one length of 5-inch diameter Ethafoam to 108 inches. Measure and cut wedges as shown in Figure I-9.

(11) Cut one length of 5-inch diameter Ethafoam to 42 inches. Then measure and cut out wedges as shown in Figure I-10.

(12) Insert the 5-inch diameter Ethafoam into sleeves ensuring that the cutout wedges are facing up and centered under snaps (Figure I-11). Snap sleeve edges together.

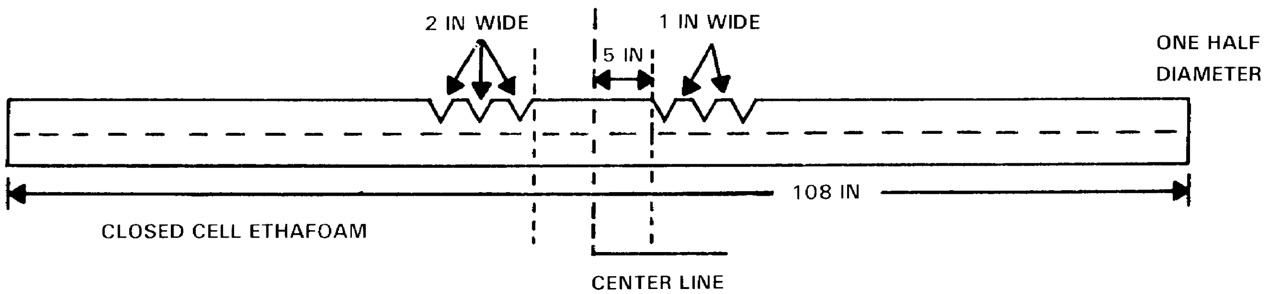


Figure I-9. Five-inch diameter Ethafoam—108 inches long.

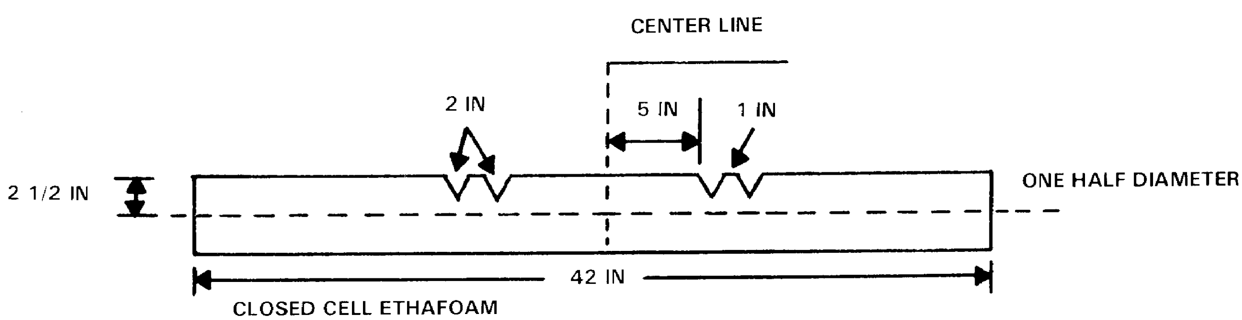
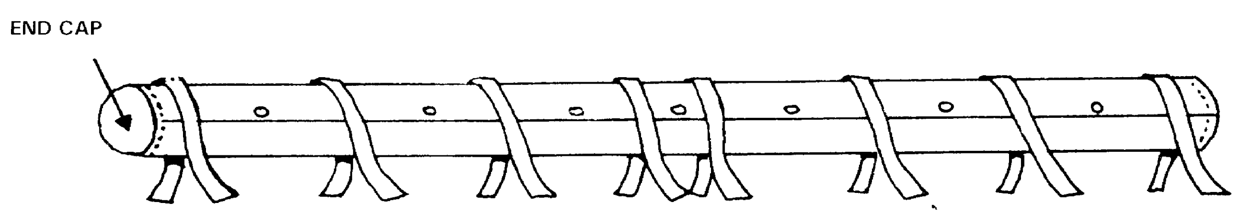


Figure I-10. Five-inch diameter Ethafoam—42 inches long.



NOTE: COLLAR IS 5-INCHES IN DIAMETER, 108-INCHES LONG, AND IS FILLED WITH FLEXIBLE CLOSED CELL ETHAFOAM.

Figure I-11. Inserting Ethafoam in sleeves.

b. Installation. Position the 108 inch flotation collar around the outside of the head of the Stokes litter (Figure I-12). Align the ties to the inside of the center horizontal brace and secure with ties using square knots. Repeat this procedure with the 42-inch flotation collar at the foot end of the litter.

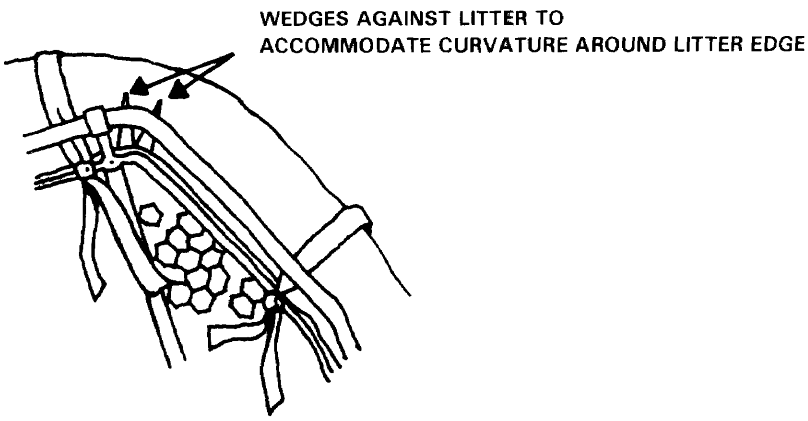


Figure I-12. Positioning flotation collar.

GLOSSARY

A^2C^2 Army airspace command and control

A axillary

AA axis of advance

AATF air assault task force

ABCA American, British, Canadian, and Australian

ACFT aircraft

ACR armored cavalry regiment

advanced trauma management (ATM) Resuscitative and stabilizing medical or surgical treatment provided to patients to save life or limb and to prepare them for further evacuation without jeopardizing their well-being or prolonging the state of their condition.

AE aeromedical evacuation (USAF acronym)

AECC aeromedical evacuation control center

AELT aeromedical evacuation liaison team

AF airfield

AFB Air Force Base

AG antenna group

Ahkio Alaskan sled used to transport patients through deep snow.

AIR STD air standard

ALCC airlift control center

ALCC/E TAC airlift control center/element, tactical

AM amplitude modulated

AMB ambulance

ambulance control point The ambulance control point consists of a soldier (from the ambulance company or platoon) stationed at a crossroad or road junction where ambulances may take one of two or more directions to reach loading points. The soldier, knowing from which location each loaded ambulance has come, directs empty ambulances returning from the rear. The need for control points is dictated by the situation. Generally, they are more necessary in forward areas.

ambulance exchange point (AXP) A location where a patient is transferred from one ambulance to another en route to an MTF. This may be an established point in an ambulance shuttle or it may be designated independently.

ambulance loading points This is a point in the shuttle system where one or more ambulances are stationed ready to receive patients for evacuation.

ambulance relay point This is a point in the shuttle system where one or more empty ambulances are stationed ready to advance to a loading point or to the next relay post to replace an ambulance that has moved from it. As a control measure, relay points are generally numbered from front to rear.

ambulance shuttle system The shuttle system is an effective and flexible method of employing ambulances during combat. It consists of one or more ambulance loading points, relay points, and when necessary, ambulance control points, all echeloned forward from the principal group of ambulances, the company location, or basic relay points as tactically required.

AMEDD Army Medical Department

AO area of operations

AOC area of concentration (officer personnel)

APES Automated Patient Evacuation System

AR Army regulation

ARSOF Army special operations forces

ASF aeromedical staging facility

ASLT assault

ASMB area support medical battalion

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ASMC area support medical company

ASMRO Armed Services Medical Regulating Office

ASMS area support ME DEVAC section

A.T. antitoxin

ATC air traffic control

ATM *See* advanced trauma management

ATS air traffic service

ATTN attention

augmentation The addition of specialized personnel and/or equipment to a unit, aircraft, or ship to supplement the medical evacuation mission.

Ave avenue

AVIM aviation intermediate maintenance

AVN aviation

AVUM aviation unit maintenance

AXP *See* ambulance exchange point

BAS battalion aid station

Bde brigade

BIFV Bradley infantry fighting vehicle

BN battalion

BP blood pressure

brigade support area (BSA) A designated area in which CSS elements from DISCOM and COSCOM provide logistic support to the brigade. The BSA normally is located 20 to 25 kilometers behind the forward edge of the battle area.

BRST burst

BSA *See* brigade support area

C Celsius

casualty Any person who is lost to his organization by reason of having been declared dead, wounded, injured, diseased, interned, captured, retained, missing, missing in action, beleaguered, besieged, or detained.

Cau Caucasian

CBM *See* combat medic

CBT combat

CCIR commander's critical intelligence requirements

CDR commander

CDU control display unit

CG center of gravity

CH cargo/transport helicopter

CHAN channel

CINC Commander in Chief

CLR clear

CMO civil-military operations

CO company

CO_2 carbon dioxide

collecting point (patient) A specific location where casualties are assembled to be transported to an MTF; for example, a company aid post.

Coll pt collecting point

combat medic (CBM) A medical specialist trained in EMT procedures and assigned or attached in support of a combat or combat support unit.

combat service support (CSS) The assistance provided to sustain combat forces, primarily in the fields of administration and logistics. It includes administrative services, chaplain services, civil affairs, food service, finance, legal services, maintenance, medical services, supply, transportation, and other logistical services.

combat support (CS) Fire support and operational assistance provided to combat elements. It includes artillery, air defense artillery, engineer, military police, signal, military intelligence, and chemical.

combat zone (CZ) That area required by combat forces for the conduct of operations. It is the territory forward of the Army rear area boundary.

communications zone (COMMZ) Rear area of the theater of operations (behind but contiguous to the combat zone) which contains the lines of communication, establishments for supply and evacuation, and other agencies required for the immediate support and maintenance of the field forces.

COMMZ *See* communications zone

COMP component

COMSEC communications security

concealment The protection from observation or surveillance.

CONT continuous

CONUS continental United States

COSCOM corps support command

cover Natural or artificial protection from enemy observation and fire.

CP command post

CRAF Civil Reserve Air Fleet

CRO carded for record only

CRTS casualty receiving and treatment ship

crypto cryptography

CS *See* combat support

CSA corps support area

CSH combat support hospital

CSS *See* combat service support

CUCV commercial utility cargo vehicle

CZ *See* combat zone

DA Department of the Army

DD Department of Defense

DE directed energy

Dec December

defilade Protection from hostile observation and fire provided by an obstacle such as a hill, ridge, or bank. To shield from enemy observation by using natural or artificial obstacles.

DEST destination

DET detachment

Dia diameter

DISCOM division support command

div division

division support area (DSA) An area normally located in the division rear positioned near airlanding facilities and along the MSR. The DSA contains the DISCOM CP, headquarters elements of the DISCOM battalions, and those DISCOM elements charged with providing back-up support to the CSS elements in the BSA and direct support to units located in the division rear. Selected COSCOM elements in the division may be located in the DSA to provide direct support backup and general support as required.

DMOC division medical operations center

DMRIS Defense Medical Regulating Information System

DMSO division medical supply officer

DNBI disease and nonbattle injury

DOA dead on arrival

dressed litter A litter provided with one, two, or three blankets to reduce the danger of shock and to afford warmth and comfort during transport.

DRYAD numeral system A random listing of numbers that can be used to encode a plain text message for radio transmission.

DS direct support

DSA *See* division support area

DTG date/time group

DTO district transportation office

EAC echelons above corps

EEI essential elements of information

e.g. for example

emergency medical treatment (EMT) The immediate application of medical procedures to the wounded, injured, or sick by specially trained medical personnel.

EMT *See* emergency medical treatment

ENT enter

EPW enemy prisoner of war

ETE estimated time en route

EVAC evacuation

evacuation policy A command decision indicating the length in days of the maximum period of noneffectiveness that patients may be held within the command for treatment. Patients who, in the opinion of responsible medical officers, cannot be returned to duty status within the period prescribed are evacuated by the first available means, provided the travel involved will not aggravate their disabilities.

F Fahrenheit

FARE forward area refueling equipment

FARP forward arming and refueling points

FCC flight control center

first aid (self-aid/buddy aid) Urgent and immediate lifesaving and other measures which can be performed for casualties (or performed by the victim himself) by nonmedical personnel when medical personnel are not immediately available.

FLD field hospital

FLOT forward line of own troops

FLT flight

FM field manual; frequency modulation

FMC US Field Medical Card

FOC flight operations center

fpm feet per minute

FREQ frequency

FSB forward support battalion

FSMC forward support medical company

FSMT forward support MEDEVAC team

FT feet

fwd forward

GH general hospital

GPFU gas particulate filter unit

GPS global positioning system

GRD ground

GRP/Grp group

GS general support

GSI glide slope indicator

GSW gun shot wound

GWS Geneva– Wounded and Sick

health service support (HSS) This term is used in current doctrine to include all support services performed, provided, or arranged by the AMEDD to promote, improve, conserve, or restore the mental or physical well-being of personnel in the Army and, as directed, in other services, agencies, and organizations.

hematocrit The percentage of a whole blood sample occupied by red blood cells.

HEMMT truck, cargo, heavy expanded, mobility tactical, 8x8

HF high frequency

HHC headquarters and headquarters company

HHD headquarters and headquarters detachment

HLDG holding

HMMWV high mobility multi-purpose wheel vehicle

HN host nation

HOME homing

HQ headquarters

HSC headquarters and support company

HSS *See* health service support

ID identification

IN inch

initial point of treatment Any point within the health service support system at which a soldier is seen and treated by trained medical personnel.

INTG interrogation

IPDS individual patient data system

IR infrared

ISB intermediate staging base

ITR inpatient treatment record

ITRCS inpatient treatment record cover sheet

IV intravenous

JMRO Joint Medical Regulating Office

JMTB Joint Military Transportation Board

KED Kendricks Extrication Device

KHz kilohertz

LBE load bearing equipment

LC line of contact

LCD liquid crystal display

LD line of departure

LIC low intensity conflict

lines of patient drift Natural routes along which wounded soldiers may be expected to go back for medical care from a combat position.

litter patient A patient whose physical condition requires transportation by a litter. Some ambulatory patients may require to be transported by litter when traveling over rough terrain.

LOA limit of advance

LOC lines of communication

LP loading point

LT liaison team

LZ landing zone

MAC Military Airlift Command

Maint maintenance

manual evacuation Process of transporting patients by manual carries without the aid of a litter or other means of transportation.

MASF mobile aeromedical staging facility

MASH mobile army surgical hospital

MCA Movement Control Agency

MCC movement control center

MCO movement control office

MCT movement control team

MED medical

MED BDE medical brigade

MEDCOM medical command

MEDDAC Army Medical Department Activity

MEDEVAC medical evacuation

medical equipment set (MES) A chest containing medical instruments and supplies designed for specific table of organization and equipment units or specific missions.

medical treatment facility (MTF) Any facility established for the purpose of providing medical treatment. This includes battalion aid stations, division clearing stations, dispensaries, clinics, and hospitals.

MEDLOG BN medical battalion, logistics (forward/rear) (Medical Force 2000 unit)

MEDSOM medical supply, optical, and maintenance

MES *See* medical equipment set

METT-T mission, enemy, terrain, troops and time available

MFD manufactured

MFR manufacturer

mg milligram

MHz megahertz

MIJI meaconing, intrusion, jamming, and interference

MOGAS motor gasoline

MOS Military Occupational Specialty (enlisted personnel)

MOPP mission-oriented protection posture

MOUT military operations on urbanized terrain

MRO medical regulating office(r)

MSB main support battalion

MSC Military Sealift Command

MSMC main support medical company

MSR main supply route

MTF *See* medical treatment facility

NA not applicable

NATO North Atlantic Treaty Organization

NAVAIDS navigational aids

NBC nuclear, biological, and chemical

NCO noncommissioned officer

NCOIC noncommissioned officer in charge

Neg Negroid

No number

NOE nap-of-the-earth

Nov November

NPO nothing by mouth

NVG night vision goggles

OBJ objective

OD olive drab

OEG operational exposure guide

OH observation helicopter

OMF originating medical facility

OPCON *See* operational control

operational control The authority delegated to a commander to direct forces provided him so he can accomplish specific missions or tasks that are usually limited by function, time, or location; to deploy units concerned; and to retain or assign tactical control of these units. It does not include authority to assign separate employment of components of the units concerned, nor does it, of itself, include administrative or logistics control.

OPLAN operation plan

OPORD operation order

OPS/Ops operations

OPSEC operations security

OR operating room

Oth other

P pulse

PA physician assistant

PAC personnel administration center

PAD patient administrator

passage of lines Passing one unit through the position of another, as when elements of a covering force withdraw through the forward edge of the main battle area, or when an exploiting force moves through elements of the force that conducted the initial attack. A passage may be designated as a forward or rearward passage of lines.

patient (PNT) A sick, injured or wounded soldier who receives medical care or treatment from medically trained personnel

PC pilot in command

PD point of departure

PDS Personnel Daily Summary

PI copilot

PJ para-rescuemen

PL phase line

PLD probable line of departure

PLL prescribed load list

PLS personnel locator system

PLT platoon

PNT *See* patient

POI point of injury

POL petroleum, oils, and lubricants

POS position

PP passage point

PPC performance planning card

PSNCO Personnel Staff Noncommissioned Officer

PVNTMED preventive medicine

PZ pickup zone

QSTAG Quadripartite Standardization Agreement

R respiration

rad radiation

RDU remote display unit

REC radio electronic combat

reconstitution The total process of keeping the force supplied with various supply classes, services, and replacement personnel and equipment required to maintain the desired level of combat effectiveness and of restoring units that are not combat effective to the desired level of combat effectiveness through the replacement of critical personnel and equipment. Reconstitution encompasses unit regeneration and sustaining support.

REP repair

RP relay point

RT receiver-transmitter

RTD return to duty

RTE route

RTO radiotelephone operator

RVN Republic of Vietnam

S1 Adjutant (US Army)

S2 Intelligence Officer (US Army)

S3/G3 Operations and Training Officer (US Army)

S4 Supply Officer (US Army)

SEC section

SF Special Forces

SOA special operations aviation

SOC special operations command

SOF special operations forces

SOI signal operating instructions

SOP standing operating procedure

SP start point

special evacuation techniques Those techniques and / or procedures required to remove injured persons from tanks and armored vehicles, motor vehicles, or from other limited access positions.

SPT support

SQD/SQDS squad / squads

SSN social security number

Sta station

STANAG The acronym for North Atlantic Treaty Organization (NATO) standardization agreement. NATO consists of 15 member nations allied together for military interoperability in both equipment and methods of operations. As each STANAG is adopted, it becomes part of each nation's unilateral procedures and is incorporated into national doctrinal and procedural publications,

Strategic Aeromedical Evacuation System The United States Air Force element that evacuates patients over extended distances; for example, from the theater of operations to the United States.

SUP supply

SURG surgical

Svc service

T temperature

TACOMM tactical communications

TAES Theater Aeromedical Evacuation System

theater of operations (TO) That portion of an area of conflict necessary for the conduct of military operations, either offensive or defensive, to include administration and logistical support.

Theater Tactical/Assault Airlift Force The operational element of the US Air Force that provides airlift support as far forward as possible in the combat zone. These aircraft are then used to evacuate patients on a backhaul basis.

TKO to keep open

TM team

TO *See* theater of operations

TOC tactical operations center

TOE table(s) of organization and equipment

TRADOC US Army Training and Doctrine Command

travois An evacuation device pulled by either one or two horses or similar animals.

triage The medical sorting of patients according to type and seriousness of injury, likelihood of survival, and the establishment of priority for treatment and/or evacuation to assure medical care of the greatest benefit to the largest number. The categories are: *minimal*— those who require limited treatment and can be returned to duty; *immediate*— patients requiring immediate care to save life or limb; *delayed*— patients who, after emergency treatment, incur little additional risk by delay or further treatment; and *expectant*— patients so critically injured that only complicated and prolonged treatment will improve life expectancy.

TRMT treatment

TSOP tactical standing operating procedure

UH utility helicopter

UHF ultra high frequency

UNK unknown

US United States

USAF United States Air Force

UW unconventional warfare

VHF very high frequency

VORTAC very high frequency omnidirectional range station/tactical air navigation

V/STOL vertical/short takeoff and landing

WW II World War II

Yrs years

ZI zone of interior

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