

LESSON ASSIGNMENT

LESSON 5

Aeromedical Evacuation.

LESSON ASSIGNMENT

Paragraphs 5-1 through 5-33.

LESSON OBJECTIVES

After completing this lesson, you should be able to:

- 5-1. Identify the normal casualty loads for air ambulances (Blackhawk, Iroquois, and Chinook).
- 5-2. Identify the procedures for loading casualties into air ambulances.
- 5-3. Identify procedures for evacuating a casualty using a hoist.
- 5-4. Identify the information contained in an evacuation request.
- 5-5. Identify procedures for transmitting an evacuation request over radio, including the use of brevity codes.
- 5-6. Identify procedures preparing and marking a helicopter landing site.
- 5-7. Identify procedures for guiding a helicopter to a landing site.

SUGGESTIONS

After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

Additional information on electronic communications can be found in FM 24-1, Combat Communications.

LESSON 5

AEROMEDICAL EVACUATION

Section I. AIR AMBULANCES

5-1. MISSIONS OF AIR AMBULANCES

Helicopters are used as air ambulances for aeromedical evacuation in forward areas. Although they are mainly used to evacuate patients from medical treatment facilities, they can also be used to evacuate casualties from far-forward areas, especially if the distance to be traveled is great or the location is hard to reach by ground vehicle. Although the primary mission of Army air ambulance units is the evacuation of selected patients, they have secondary missions of moving medical personnel, providing air crash rescue, and transporting medical supplies, whole blood, and biologicals.

5-2. ADVANTAGES AND DISADVANTAGES OF AEROMEDICAL EVACUATION

a. **Advantages.** Some advantages of aeromedical evacuation are given below.

(1) Speed. Air ambulances travel faster than ground ambulances.

(2) Terrain. Air ambulances can fly over terrain that makes ground evacuation difficult or impossible.

(3) Range. Air ambulances can continue to more distant medical treatment facilities if nearby facilities are overcrowded or if the facilities are in the process of being moved.

(4) Flexibility. Air ambulances can easily change their destinations to take casualties directly to facilities equipped to provide specialized treatment, thus reducing the time and number of transfers needed to deliver casualties to the appropriate treatment facility.

b. **Disadvantages.** Some disadvantages of aeromedical evacuation are given below.

(1) Overevacuation. A casualty should be evacuated to a medical treatment facility as far forward as possible that is equipped to adequately treat the casualty and return him to duty. The use of aeromedical evacuation sometimes results in casualties being evacuated too far to the rear, which can interfere with their return to duty.

(2) Weather. Helicopter evacuation operations may be limited by fog, snow, low ceiling, sleet, high winds, lightning, sandstorms, and/or turbulence.

(3) Enemy action. Enemy aircraft or enemy ground fire can result in a helicopter being disabled, especially while casualties are being loaded.

(4) Friendly action. Artillery barrages and friendly air strikes can interfere with evacuation attempts.

5-3. GENERAL RULES FOR LOADING AND UNLOADING AIR AMBULANCES

Helicopters are used as air ambulances for evacuation in forward areas. Each air ambulance has a medical specialist to take care of the casualties during evacuation. Follow the flight crew's instructions for loading, securing, and unloading casualties. Some general rules pertaining to the litter bearers who load and unload casualties are given below.

- a. Remain at least 50 feet from the helicopter until signaled to approach the helicopter by a member of the helicopter crew.
- b. Do not smoke anywhere near the helicopter.
- c. Secure loose objects (remove caps, blankets, I.V. tubing, radio antennae, and so forth) before approaching the helicopter.
- d. Approach the aircraft from the front at a 45° angle so you are in full view of the pilot.
- e. Keep a low silhouette when approaching the helicopter.
- f. Approach and leave the helicopter quickly, but do not run.
- g. Carry the litter parallel to the ground.
- h. Avoid the area near the tail rotor of the helicopter. If you must go from one side of the helicopter to the other, go around the front of the helicopter. Never go around the rear.
- i. When casualties are placed lengthwise (other than a mixed load on an Iroquois), position the casualties so their heads point forward (toward the front of the helicopter).
- j. Secure each litter casualty to his litter.
- k. Secure each litter to the aircraft.
- l. Load the litter casualty which will occupy the upper pan (tier) before loading the litter casualty occupying the lower pan (tier). This will keep a casualty from accidentally falling onto another casualty should his litter drop before it is secured.

m. Load the most seriously injured casualty last.

n. If a casualty has a special requirement, place him in the most appropriate location.

(1) If the casualty will require in-flight emergency medical care, such as cardiopulmonary resuscitation, place the casualty in an upper pan (tier) rather than a bottom pan (tier) to facilitate access to the casualty.

(2) If the casualty has a traction splint and is being evacuated in a Blackhawk helicopter, place the casualty in a bottom pan.

(3) If the casualty has a traction splint applied and is being evacuated in an Iroquois helicopter, place the casualty directly on the floor.

(4) If the casualty has an I.V. in place and is being evacuated in an Iroquois helicopter, place the casualty as low as possible (not in an upper tier).

(5) Above all, follow instructions of the flight crew and flight medic.

o. Unload litter casualties in the reverse order from the order in which they were loaded. The most seriously injured casualty is unloaded first.

5-4. UH-60A BLACKHAWK AIR AMBULANCE

The Blackhawk utility helicopter (figure 5-1) is the primary air ambulance used in combat. The crew normally consists of a pilot, copilot, crew chief, and medical attendant. The normal patient loads for Blackhawk helicopters are given in the following paragraphs. However, the ultimate decision for the patient load rests with the pilot who must also consider weather and terrain.

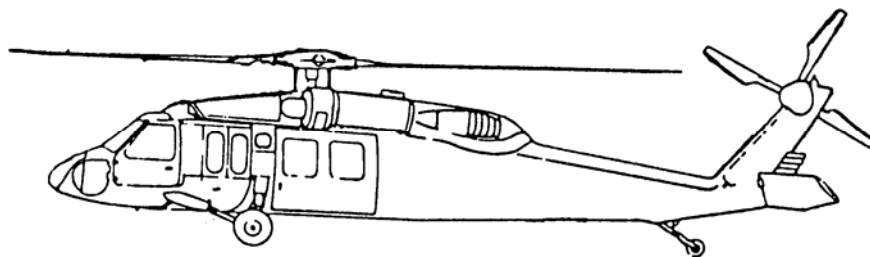


Figure 5-1. UH-60A Blackhawk.

a. **Medical Evacuation Kit.** A medical evacuation (MEDEVAC) kit allows the Blackhawk helicopter to carry litter casualties. FM 8-10-6, Medical Evacuation in a Theater of Operations, gives directions for installing the kit. The litter support unit has a central pedestal that can be rotated 90° when loading and unloading litters.

(1) The Blackhawk with MEDEVAC kit installed normally transports four litter casualties (two on each side) and one ambulatory casualty or seven ambulatory casualties or a mixed load of two litter casualties and four ambulatory casualties. In the four-litter configuration, the top litter pan on each side can be tilted to make loading and unloading litters easier.

(2) The MEDEVAC kit also allows for additional litter casualties when needed. This configuration allows for six litter casualties (three on each side) and one ambulatory casualty or a mixed load of three litter casualties and four ambulatory casualties. In the six-litter configuration, the litter pans cannot be tilted.

b. **Medical Evacuation Kit with Internal Rescue Hoist.** When an internal rescue hoist is used with the MEDEVAC kit, the casualty holding capacity of the air ambulance is reduced. The use of the internal rescue hoist is discussed in Section IV of this lesson.

(1) The normal (four-litter) configuration is reduced to two litter casualties and one ambulatory casualty or four ambulatory casualties.

(2) The six-litter configuration is reduced to three litter casualties and one ambulatory casualty or four ambulatory casualties.

5-5. LOADING LITTER CASUALTIES INTO THE BLACKHAWK AIR AMBULANCE

a. **Four-Litter Configuration.** Use a four-man litter squad to load litter casualties. If one squad is used, load the upper right pan first, then the upper left pan, then the lower right pan, and finally the lower left pan (most seriously injured casualty). If two litter squads are available, litter casualties can be loaded on both sides simultaneously, beginning with the upper pan and then the lower pan. Some general instructions for loading casualties are given below.

(1) Rotate the litter support unit 90° clockwise to make loading litters easier. (This action is normally performed by the helicopter flight crew.)

(2) Lower the top litter pan on each side (figure 5-2). (This action is normally performed by the flight crew.)

(3) Carry the litter casualty to the helicopter using a four-man carry.

(4) Raise the litter to the level of the upper litter pan and place the stirrups at the end of the litter on the litter pan. Make sure the casualty is loaded so the casualty's head will be toward the front of the helicopter when the litter support assembly is returned to its normal position.

(5) Slide the litter forward until the litter stirrups of both ends are secured on the litter pan. (The flight crew can help guide the litter and secure the litter as illustrated in figure 5-3.)

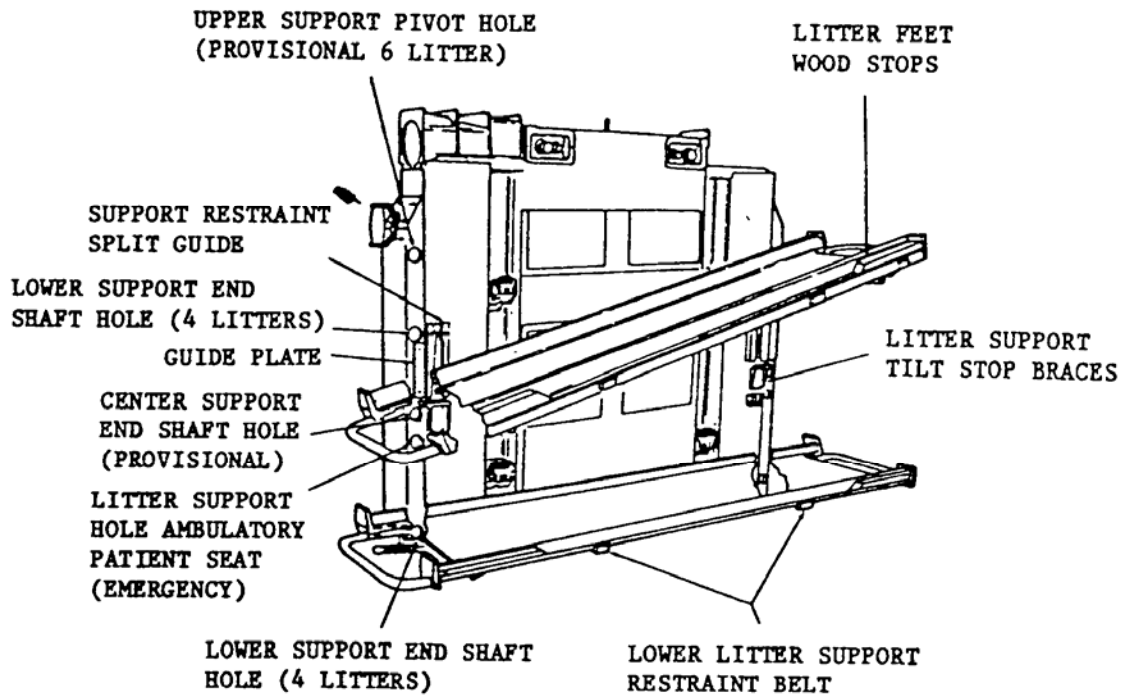


Figure 5-2. Four-litter configuration (Blackhawk) with upper litter pan in tilt position.



Figure 5-3. Member of a Blackhawk flight crew helping to load a litter casualty.

(6) Raise the top litter pan and secure the pan in position. (This action is normally performed by the helicopter flight crew.)

(7) Secure the litter to the litter support assembly with the litter straps attached to the assembly. (This action is normally performed by the helicopter flight crew.)

(8) Leave the helicopter as a team and obtain the next litter.

(9) Continue to load and secure the casualties using the same general procedures. When a casualty is loaded into a lower position, the litter pan does not tilt.

(10) After all four litters have been loaded, rotate the litter support unit 90° counterclockwise, lock the unit into the in-flight position, and close the cargo doors. (These actions are normally performed by the helicopter flight crew.)

b. Six-Litter Configuration. Use a four-man litter squad to carry the litter casualties. If one squad is used, load the upper right pan first, then the upper left pan, then the middle right pan, then the middle left pan. Rotate the pedestal back to the locked position. The lower right pan and finally the lower left pan (most seriously injured casualty) are then loaded. If two litter squads are available, litter casualties can be loaded on both sides simultaneously, beginning with the upper pan. Some general instructions for loading casualties are given below.

(1) Rotate the litter support unit 90° clockwise. (This action is normally performed by the helicopter flight crew.)

(2) Carry the litter casualty to the helicopter using a four-man carry.

(3) Raise the litter to the level of the upper litter pan and place the stirrups at the end of the litter on the litter pan. (The litter pan does not tilt in the six-litter configuration, so the overhead carry may be needed to load the upper pans.) Make sure the casualty's head will be in the direction of travel when the litter support assembly is returned to its normal position.

(4) Slide the litter forward until the litter stirrups of both ends are secured on the litter pan. (The flight crew can help guide and secure the litter.)

(5) Secure the litter to the litter support assembly with the litter straps attached to the assembly. (This action is normally performed by the helicopter flight crew.)

(6) Leave the helicopter as a team and obtain the next litter.

(7) Continue to load and secure the casualties using the same general procedures until the upper and middle pans have been filled.

(8) After both top litter pans and both middle litter pans have been filled, rotate the litter support unit 90° counterclockwise and lock the unit into the in-flight position. (These actions are normally performed by the helicopter flight crew.)

(9) Install the restraint assembly and tube assembly modification kits on each side of the litter support. (The pedestal cannot rotate with these kits in place.)

(10) Load the two remaining litters between the restraints with the casualties' head toward the front of the helicopter.

(11) Secure the last two litters to the helicopter. (This action is normally performed by the flight crew.)

(12) Close the cargo doors. (This action is normally performed by the helicopter flight crew.)

c. **Mixed Load.** If only two or three litter casualties are to be evacuated, load one side using the procedures given in paragraph a or b above, as appropriate. Remove the upper litter pan on the side not used to hold litters and reposition it just above the bottom pan on the same side. Three ambulatory casualties can sit on the litter support unit and a fourth ambulatory casualty can sit on a troop seat. Secure the ambulatory casualties with straps. Once all litter and ambulatory casualties have been loaded and secured, close and secure the cargo doors.

5-6. UH-1H/V IROQUOIS AIR AMBULANCE

The Iroquois utility helicopter (figure 5-4), also called the Huey, is an older type of air ambulance. The Iroquois air ambulance can transport six litter casualties (three on each side) or nine ambulatory casualties or a mixed load of three litter casualties (placed crosswise at rear) and four ambulatory casualties (two on each side).

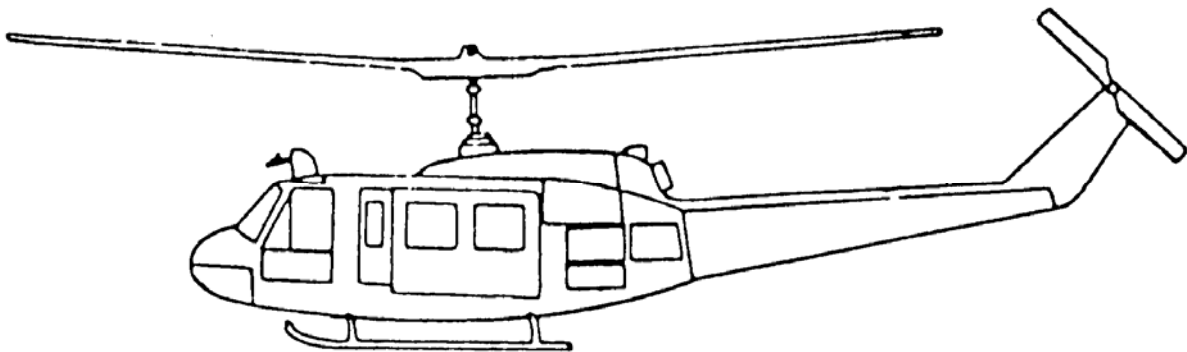


Figure 5-4. UH-1H/V Iroquois.

5-7. LOADING LITTER CASUALTIES INTO THE IROQUOIS AIR AMBULANCE

a. **Six Litter Configuration.** Use two four-man litter squads to load litter casualties when possible. If only one squad is used, load the upper right tier first, then the middle right tier, the lower right tier, the upper left tier, the middle left tier, and finally the lower left tier (most seriously injured casualty). If two litter squads are available, load litter casualties into both sides simultaneously, beginning with the upper tier. Some general instructions for loading casualties are given below.

- (1) Carry the litter casualty to helicopter using a four-man carry.
- (2) Turn so the casualty is even and parallel to the cargo compartment of the helicopter and his head is toward the front of the helicopter (figure 5-5).

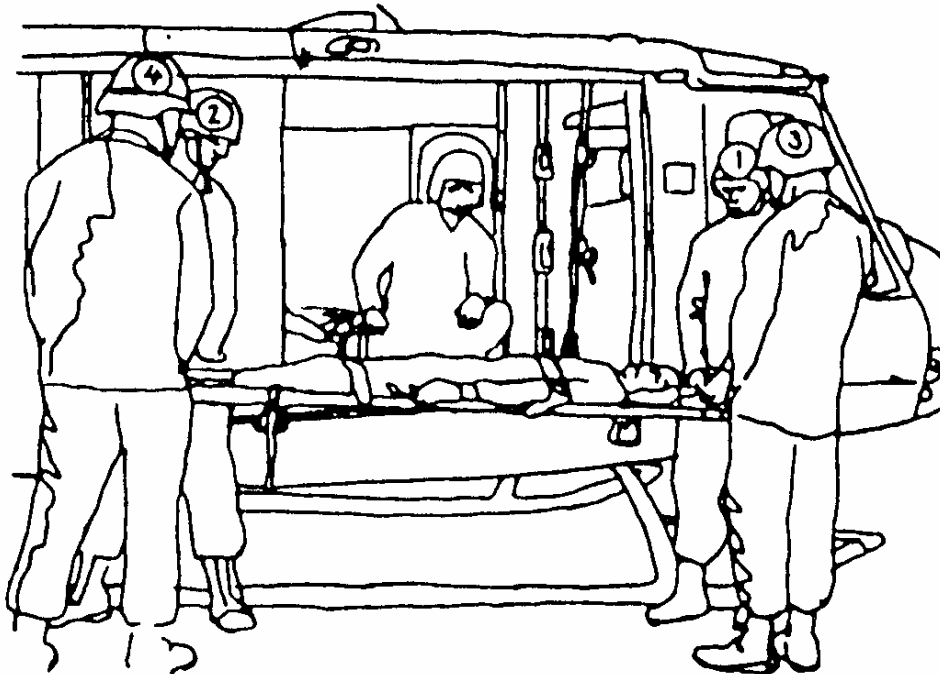


Figure 5-5. Preparing to load the first casualty (right side) into an Iroquois air ambulance with crewman ready to assist.

- (3) Lift the litter until the litter handles are even with the brackets that will support the litter handles.
- (4) The bearer at the casualty's inside shoulder (bearer between the helicopter and the casualty's head) gives his handle to a crew member, moves around the front of the litter, and takes the outside front litter handle.
- (5) The litter bearer who releases the outside front litter handle then moves his hands down the litter pole to the middle of the litter to help steady and support the litter.

(6) The litter bearer at the casualty's inside foot (bearer between the helicopter and the casualty's feet) moves inside the cargo compartment while continuing to support his rear litter handle.

(7) The litter bearer inside the helicopter and the assisting crewman holding the inside front handle place their handles in the inner litter support brackets while the litter bearers outside the helicopter at the front and rear of the litter slide their litter handles into the outer litter support brackets (figure 5-6).

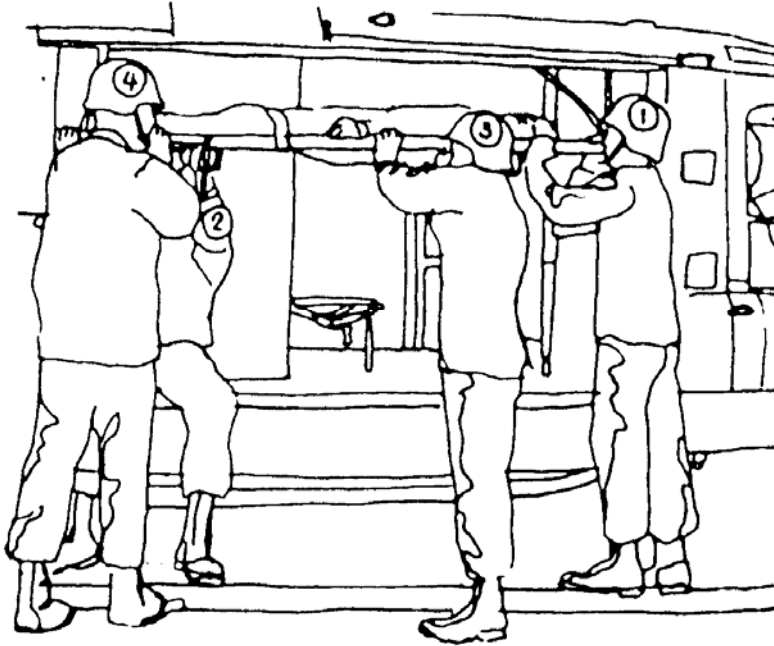


Figure 5-6. Loading the first litter (right side) into an Iroquois air ambulance.

(8) The bearers and crewman make sure the litter handles are secured (locked) in the brackets and further secure the litter handles with the litter retaining straps found near each bracket.

(9) The litter squad leaves the helicopter as a unit and obtains the next litter to be loaded.

(10) The middle litter is loaded using the same procedures.

(11) The lowest litter is loaded using similar procedures. The inside rear bearer cannot enter the cargo compartment, so he remains outside the helicopter while assisting the crew member in placing the litter in the brackets and securing the litter handles with litter retaining straps.

(12) The other side is loaded using the same procedures. Figure 5-7 shows a casualty being loaded into the left side of the cargo compartment. Figure 5-8 shows an Iroquois air ambulance with all six litter casualties loaded.

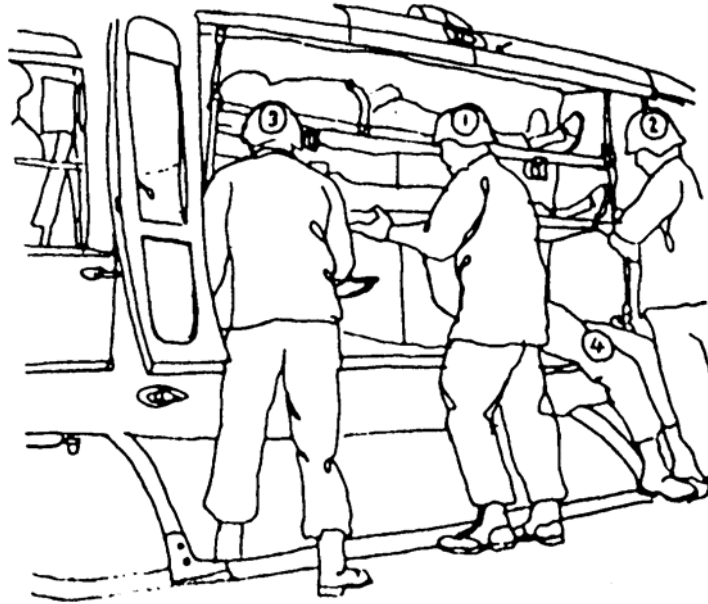


Figure 5-7. Loading the second litter (left side) into an Iroquois air ambulance.

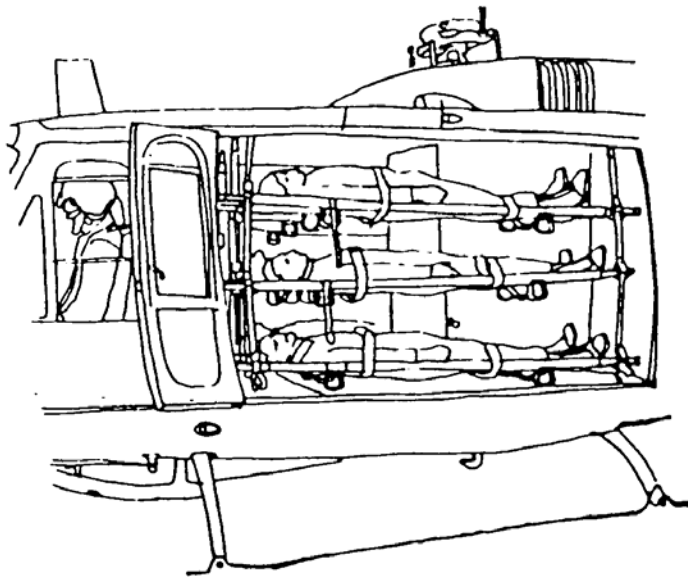


Figure 5-8. Iroquois air ambulance with six litter casualties loaded.

b. **Mixed Load Configuration.** Use a four-man litter squad to load litter casualties. Load the upper tier first, then the middle tier, and finally the lower tier (most seriously injured casualty). Note that the casualties are loaded crosswise, not with their head toward the front of the helicopter. Some general instructions for loading casualties are given in the following paragraphs.

- (1) Carry the litter casualty to helicopter using a four-man carry.
- (2) Turn so the casualty is perpendicular to the cargo compartment with the casualty's head toward the rear of the compartment.
- (3) Lift the litter until the litter handles at the casualty's head can be easily grasped by two crewmen in the rear of the cargo compartment.
- (4) The two crewmembers take the handles from the front bearers and guide the litter into the compartment (figure 5-9). The front bearers can move around the front of the helicopter to the opposite side and assist in supporting the litter and placing the litter handles in the brackets. If crewmembers cannot assist, the front bearers set the front stirrups on the floor of the helicopter, move around the front of the helicopter to the other side, and lift and secure the front litter handles.

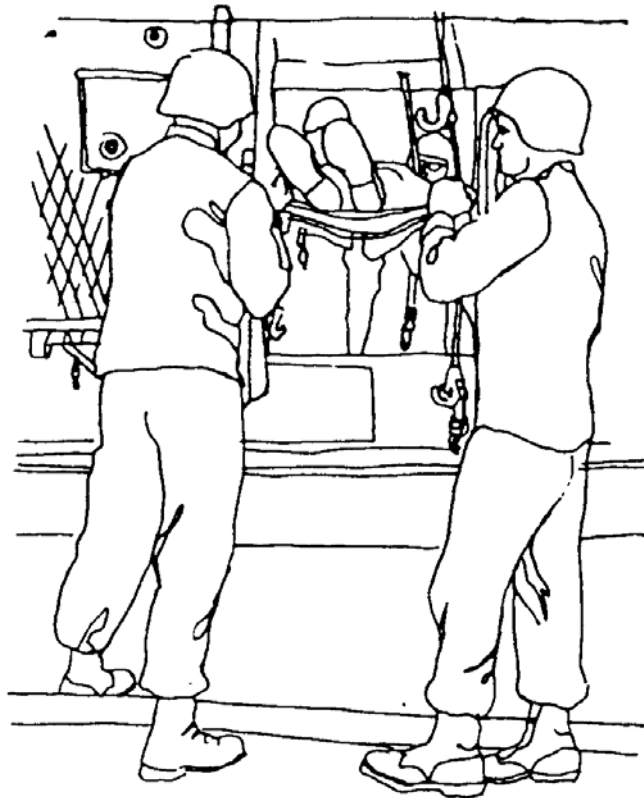


Figure 5-9. Loading a litter into an Iroquois air ambulance (mixed load).

(5) The rear bearers and crewmen raise and position the litter until the litter handles are even with the litter support brackets.

(6) The crewmen or front bearers place the litter handles near the casualty's head in the litter support brackets and make sure the handles are locked in place. At the same time, the bearers at the rear of the litter place their handles in the litter support brackets near the casualty's feet and make sure the handles are locked in place.

(7) The bearers/crewmen secure all four handles with the litter retaining straps found near each bracket.

(8) The bearers leave the helicopter as a unit and obtain the next litter to be loaded.

(9) The middle litter is loaded using the same procedures.

(10) The lowest litter is loaded using the same procedures.

(11) The bearers assist the ambulatory casualties to their seats (two on each side near the front of the compartment) and make sure the ambulatory casualties are secured to the aircraft. Figure 5-10 shows a Huey air ambulance with a mixed load.

(12) The cargo compartment doors are closed and secured (usually done by crew members).

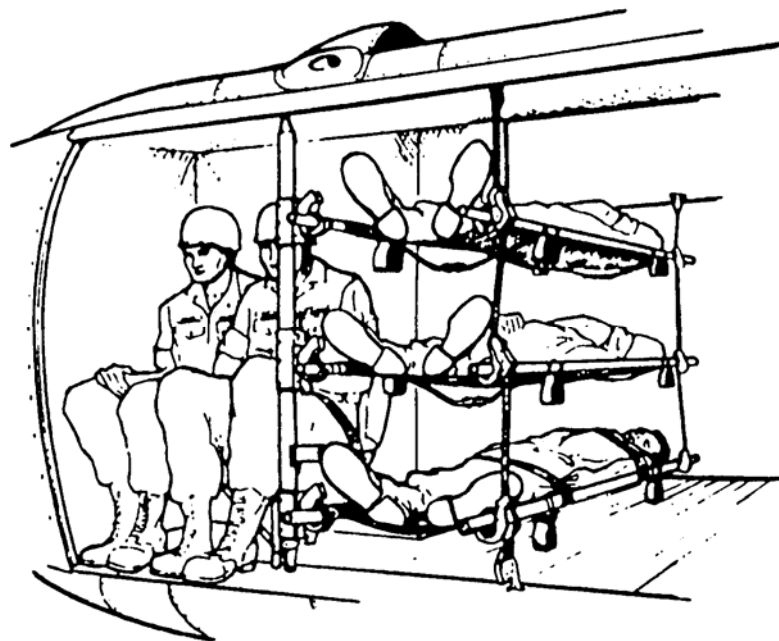


Figure 5-10. Iroquois air ambulance with a mixed load.

5-8. CH-47 CHINOOK AIR AMBULANCE

The Chinook (figure 5-11) is a cargo/transport helicopter that can be used to transport casualties. The Chinook's larger size allows it to transport more casualties at one time, but makes it unsuitable for use in smaller, more confined areas. The Chinook can carry up to 24 litter casualties or 33 ambulatory casualties or various combinations of mixed casualties. The aircraft is prepared for carrying litter casualties by folding the seats and installing litter poles similar to those in the Iroquois. Litter casualties are carried inside the aircraft through the lowered rear ramp and placed in the litter support brackets.

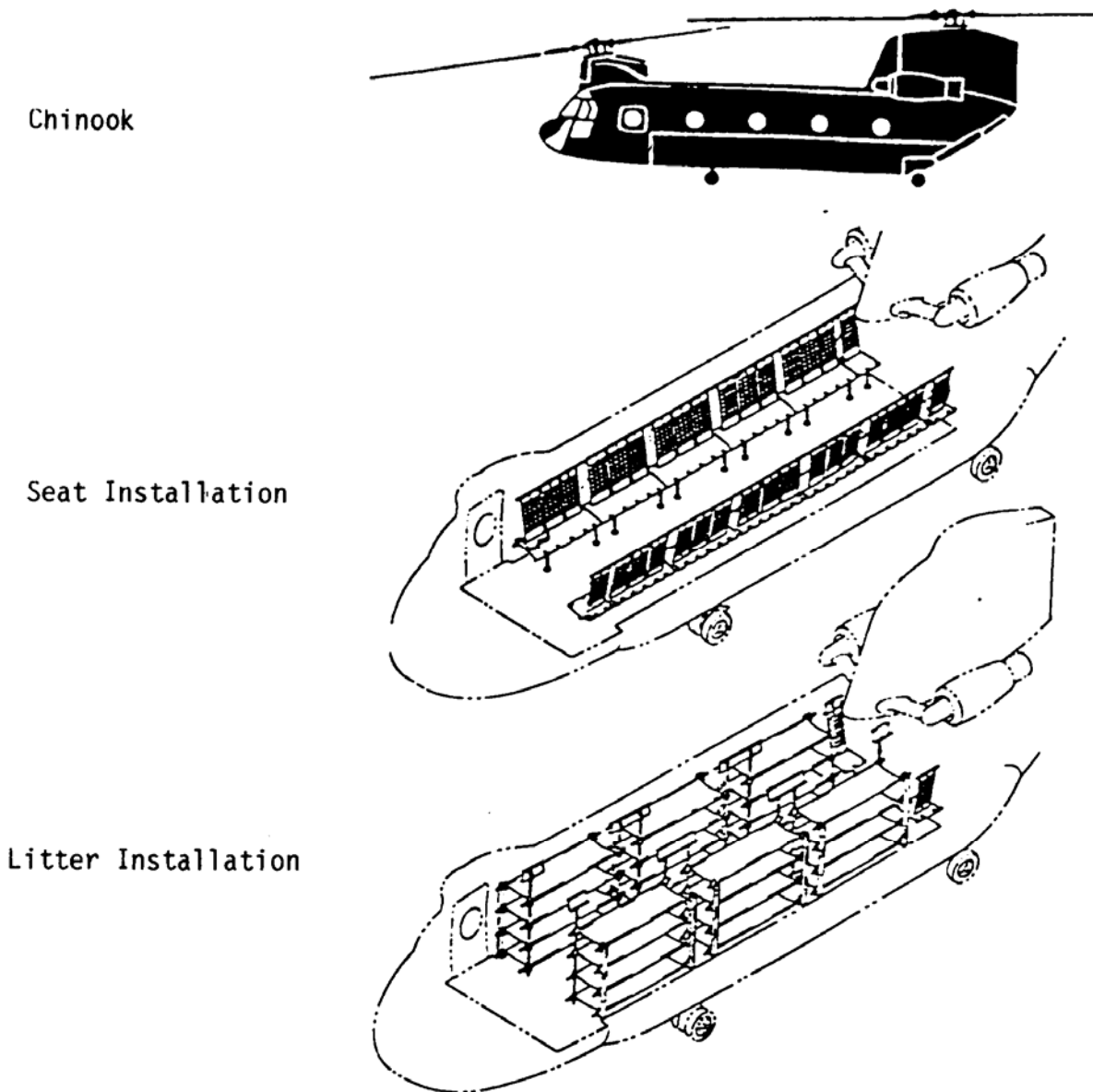


Figure 5-11. Chinook.

Section II. HIGH PERFORMANCE HOIST OPERATIONS

5-9. THE HIGH PERFORMANCE HOIST

The high performance utility hoist (figure 5-12) is usually internally mounted (mounted inside the helicopter), but can sometimes be mounted externally. The hoist basically consists of a 256-foot hoist cable (1/4 inch in diameter) with hook, an electric winch used to reel-out and reel-in the cable, a boom, and control devices. The hoist is used to lift casualties to the helicopter when a landing is not possible. The hoist can lift up to 600 pounds, depending upon the weather. Because there is a high degree of risk involved in a hoist operation, it should be used only when there is no other option. Hoist rescue may be required when casualties are in water, in a jungle, or in a mountainous area. The last 50 feet of the cable are color-coded.

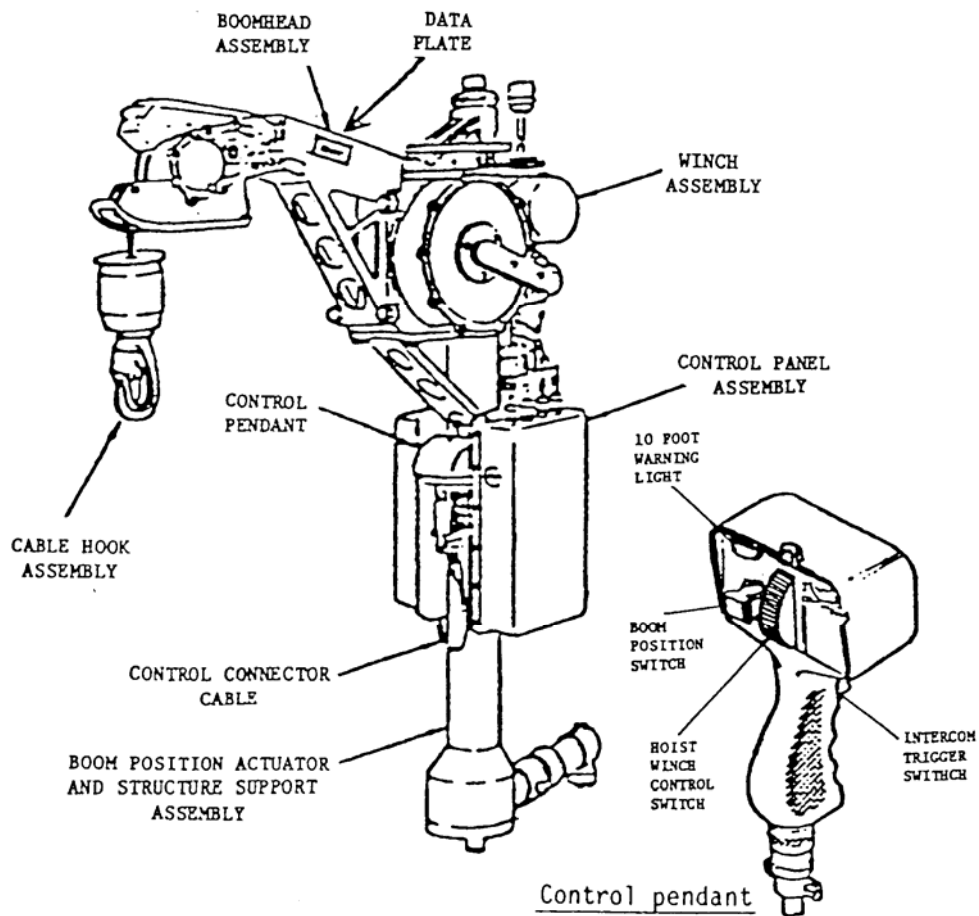


Figure 5-12. The hoist system.

WARNING

The hoist operator must always wear a safety harness and lifeline when performing hoist operations.

5-10. RESCUE DEVICES

The high performance hoist has a hook that attaches to various rescue devices used to raise the casualty. These devices include the forest penetrator (sometimes called a jungle penetrator), Stokes litter, semirigid litter, and survivor's sling. When the casualty has an injury of the neck, spine, or pelvis, the Stokes litter is used to hoist the casualty. Once the casualty is ready to be hoisted, the helicopter will rise and lift the casualty off of the ground. The hoist operator does the rest.

5-11. STATIC ELECTRICITY

Static electricity builds up on the hoist cable. If ground personnel grab the cable or lowered rescue device before the electrical charge is discharged, they could be shocked. Discharge the static electricity by allowing the cable or hook or the rescue device (if lowered with the cable) to touch the ground before attempting to touch the cable, hook, or device.

5-12. FOREST PENETRATOR

The forest penetrator (figure 5-13) can be used to rescue casualties from land or from water. If the casualty is in water, a flotation device is attached to the penetrator. The forest penetrator is about 34 inches in length. It contains three seats (4.75 inches wide and 11.5 inches long) that are kept in the retracted positions by springs. The forest penetrator can lift up to three casualties at once, but it is more common to lift one at a time. It is not used for casualties with neck, spinal, or pelvic injuries.

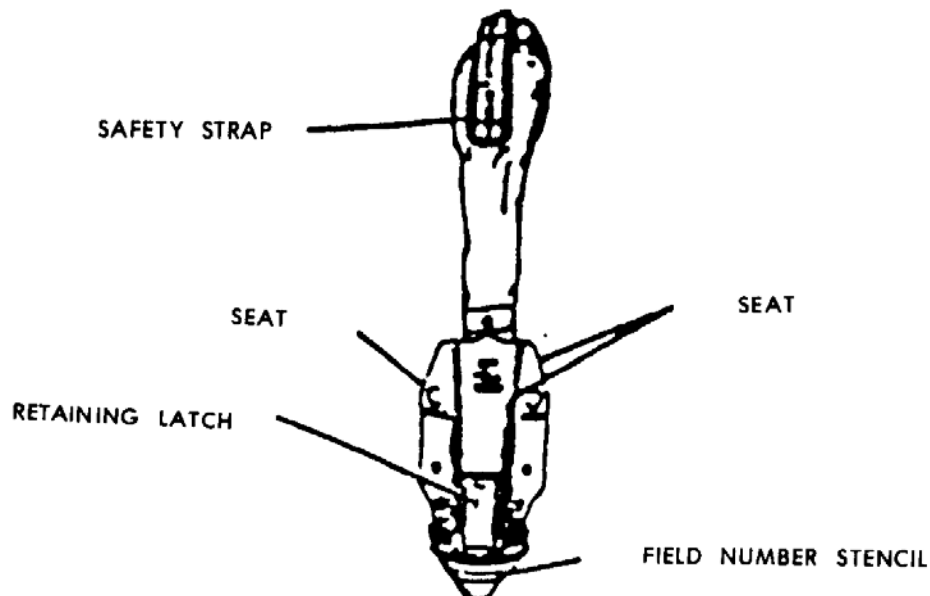


Figure 5-13. Forest penetrator.

a. The hoist operator in the helicopter attaches the forest penetrator to the hoist hook and lowers the forest penetrator to the ground.

b. After the accumulated static electricity is discharged, the medic on the ground extends the seats, positions the casualty on a wing seat, secures the casualty with straps contained in the penetrator, and notifies the hoist operator that the casualty is ready to be lifted.

c. After the hoist operator has raised the casualty, the operator places one arm around the casualty and penetrator. He then rotates the casualty so the casualty is facing away from the helicopter.

d. The operator pulls the casualty into the helicopter compartment and lowers the penetrator so the support fluke rests on the deck (figure 5-14). The operator continues to lower the penetrator until the casualty is lying on his back on the deck.

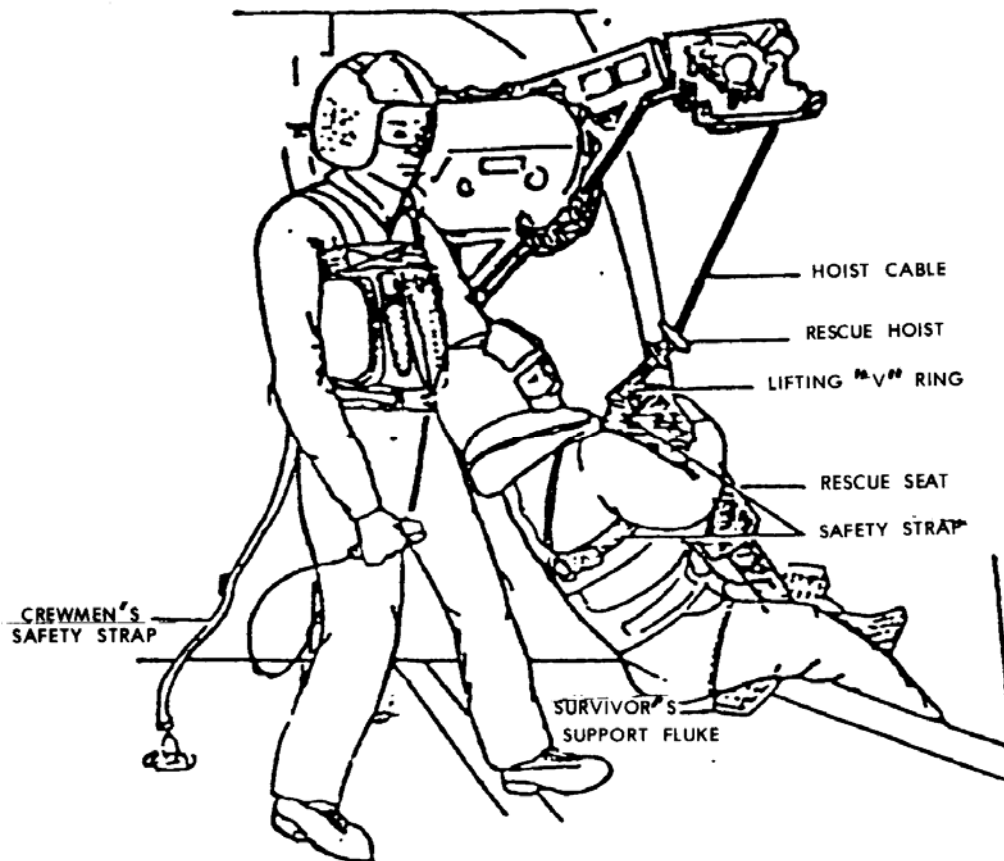


Figure 5-14. Pulling the casualty inside the helicopter

e. The operator then releases the safety straps, lifts the penetrator off the casualty (figure 5-15), pulls the casualty completely inside the compartment, and secures the casualty.

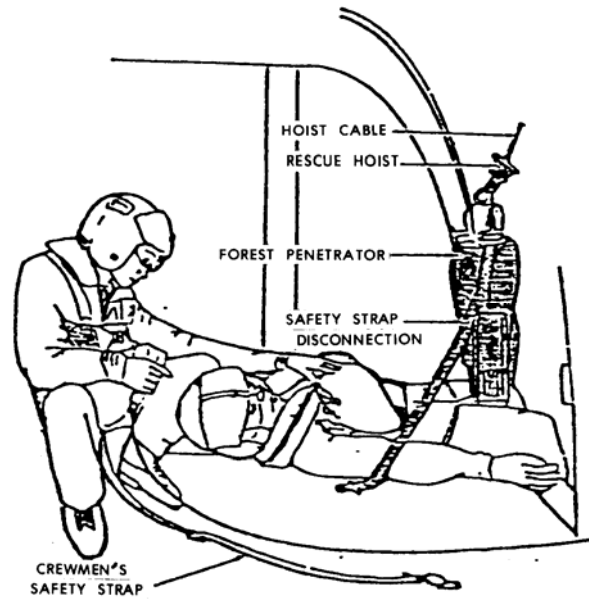


Figure 5-15. Releasing the casualty from the forest penetrator.

5-13. STOKES LITTER

The Stokes (rescue) litter discussed in paragraph 3-6 can be used to lift a casualty with a suspected spinal injury. A flotation kit is attached to the litter if the casualty is in the water. The following procedures are used to lower and raise the Stokes litter.

- a. The hoist operator in the helicopter attaches the four hoist straps to the litter and attaches the other ends of the straps to the hoist hook.
- b. The operator attaches a tag (trailer) line to the litter and lowers the tag line to ground personnel below. The tag line is held by personnel on the ground to keep the litter from twisting and swinging while being lowered or raised.
- c. Once the ground personnel have the tag line, the operator lowers the Stokes litter (figure 5-16).
- d. After the litter touches the ground and the accumulated static electricity is discharged, the personnel on the ground disconnect the hoist straps from the hook (figure 5-17), place the casualty into the litter, secure the casualty to the litter, reconnect the hoist straps, and notify the hoist operator that the casualty is ready to be lifted.

NOTE: Once the litter has been unhooked, the helicopter pilot usually raises the helicopter, repositions the helicopter so he can see the ground personnel, and lowers the helicopter until the hook is in position again.)

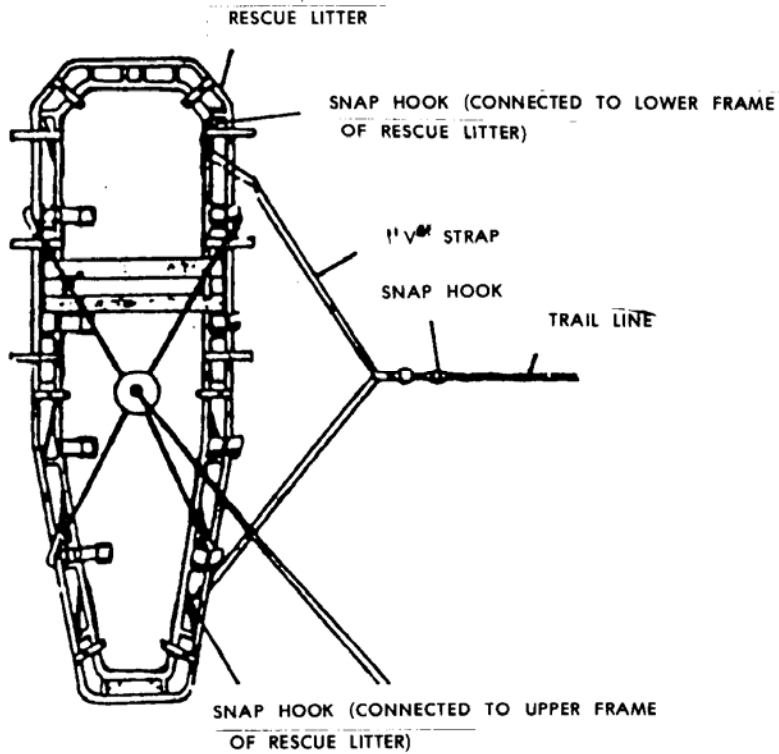


Figure 5-16. Tag line keeping Stokes litter steady.

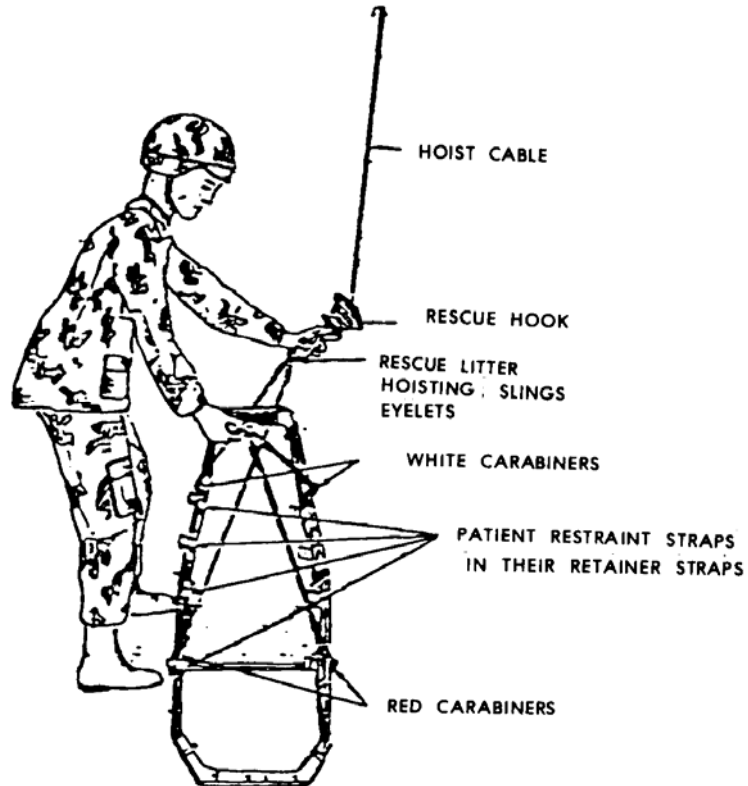


Figure 5-17. Detaching hoist straps of Stokes litter from the hoist hook.

e. As the litter is being hoisted, ground personnel use the tag line to keep the litter steady. Once the litter is at the opening, the ground personnel use the tag line to turn the litter so the casualty's head is toward the opening.

f. The hoist operator lowers and guides the litter into the helicopter, secures the casualty inside the helicopter, and recovers the tag line.

5-14. SEMIRIGID LITTER

The semirigid litter discussed in paragraph 3-4 can be used to lift a casualty. A spine board must be used if the casualty has a suspected spinal injury or a shoulder injury. If the casualty is in the water, a flotation device is attached to the litter.

a. The hoist operator in the helicopter attaches the hoist hook to the ring at the top of the litter and a tag line to the ring at the bottom of the litter.

b. The operator lowers the tag line and the litter to ground personnel below.

c. After the litter and hook touches the ground and the accumulated static electricity is discharged, the personnel on the ground disconnect the litter from the hook, place the casualty into the litter, secure the casualty to the litter, reconnect the hoist hook, and notify the hoist operator that the casualty is ready to be lifted.

NOTE: The helicopter pilot usually repositions the helicopter so he can see ground personnel while the litter is unhooked.)

d. The casualty is raised in a vertical position. As the litter is being hoisted, ground personnel use the tag line to keep the litter steady.

e. Once the litter is at the opening, the hoist operator lowers and guides the litter into the helicopter, secures the casualty inside the helicopter, and recovers the tag line.

5-15. SURVIVOR'S SLING

The survivor's sling (figure 5-18) is also called the horse collar. It is a buoyant device that can be used over land or water. The device can also be used to lower the helicopter's medic to the ground or water when necessary.

a. The hoist operator in the helicopter attaches the V rings at the ends of the webbing strap running through the cover of the sling to the hoist hook.

b. The operator lowers the sling to ground personnel below.

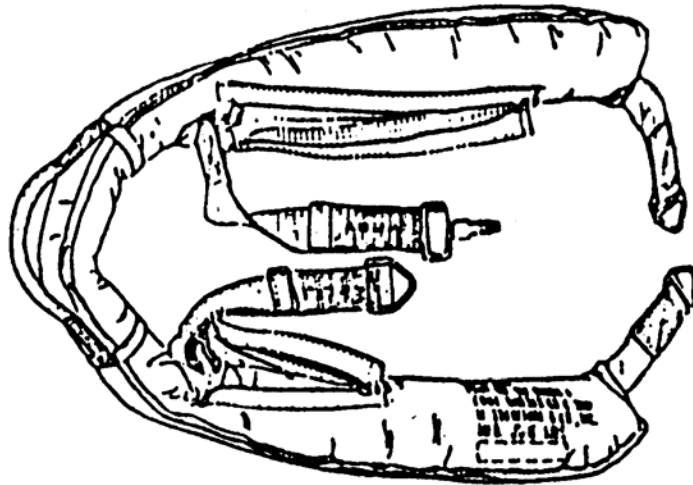


Figure 5-18. Survivor's sling with retainer straps pulled out.

c. After the sling and hook touches the ground and the accumulated static electricity is discharged, the personnel on the ground pull the retaining straps from the sling, place the casualty in the sling (sling is under casualty's arms), fasten the retaining straps to secure the casualty, and notify the hoist operator that the casualty is ready to be hoisted.

d. After the casualty is raised, the hoist operator lowers and guides the casualty into the helicopter, being careful to not grasp the webbing handle on the sling.

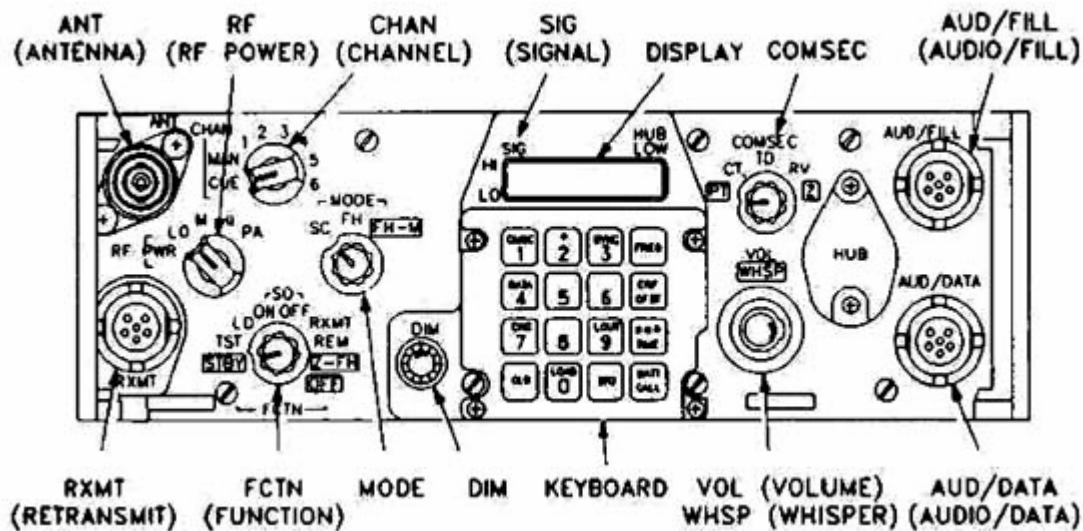
NOTE: Grabbing the webbing handle may raise the casualty's arms which could cause him to slip from the sling prematurely.

e. The operator releases the safety strap and secures the casualty inside the helicopter.

Section III. AEROMEDICAL EVACUATION REQUEST

5-16. RADIO COMMUNICATION

The field radio (usually an AN/PRC-119) is a common means through which an evacuation request is transmitted and through which personnel on the ground communicate with the air ambulance. Actual communication may be transmitted by a soldier trained in radio operation and procedures, but the medic should also know how to use the communications system. Figure 5-19 shows a sketch of an AN/PRC-119 with condensed operating instructions.



1. Install battery(ies).
2. Connect TSEC/KY-57 or ANCD to radio (non-ICOM only).
3. Install antenna.
4. Connect handset H-250.
5. Record battery life condition on side of battery.

Figure 5-19. Field radio set AN/PRC-119 with instructions.

a. **Advantages of Radio Communications.** The radio provides communications over bodies of water, impassable terrain, and from ground-to-air. Field radio sets are mobile and wireless. The AN/PRC-119 radio is capable of encrypted secure communications to prevent the enemy from intercepting messages.

b. **Disadvantages of Radio Communications.** Radio communications are subject to natural interference (such as electrical storms) and manmade interference (jamming).

5-17. TERMINOLOGY

Some terms used in electronic communication are defined below. Understanding the terms used and the cipher system is still important in the event COMSEC is compromised or unavailable.

a. **Net.** A net is composed of those stations communicating together on the same frequency or channel.

b. **Net Control Station.** The net control station opens the net and controls transmissions within the net, including entering the net (requesting permission to transmit) and leaving the net (signing off).

c. **Call Sign.** Each station within a radio net has an individual call sign that identifies the station to other members of the net. A call sign consists of a letter-number-letter combination and is usually followed by a suffix, such as A2D-28. Sometimes an abbreviated call sign consisting of the last letter of the call sign and the suffix is used, such as D-28.

d. **Authentication.** Authentication systems are used as a security precaution to determine if the receiving or transmitting station is actually a friendly station. The challenging party transmits a code to which the challenged party must give a proper reply. Authentication is performed in accordance with communications-electronics operation instructions (CEOI) procedures.

e. **COMMUNICATIONS-ELECTRONICS OPERATION INSTRUCTIONS.** Communications-electronics operation instructions are a series of orders issued for the technical control and coordination of the signal communications of a command.

f. **COMMUNICATIONS-ELECTRONICS STANDING INSTRUCTION.** Communications-electronics standing instruction is a series of instructions explaining the use of items included in the CEOI plus any other technical instructions required to coordinate and control the communications-electronics operations of the command.

g. **DRYAD.** DRYAD is the unclassified term used to describe the numerical cipher/authentication system.

h. **Cipher System.** A cipher system is any crypto system that, by means of a key, converts plain text into an unintelligible form and converts encrypted text back to plain text.

i. **In the Clear.** Information transmitted in the clear is transmitted as plain text, not encoded or encrypted.

j. **AUTOMATED NET CONTROL DEVICE.** Automated net control device (ANCD).

5-18. GENERAL RULES

The following are some general rules for communicating over a radio.

a. Preplan messages. Know what you are going to say before you begin to speak into the microphone.

b. Listen before you transmit to make sure no conversation is already in progress on the net.

- c. Use communications security (COMSEC) procedures, such as DRYAD, when needed.
- d. Wait 3 seconds after pushing the transmit switch on the microphone before beginning the message.
- e. Speak slowly and distinctly at a normal voice level directly into the microphone, just as you would speak into a conventional telephone.
- f. Use appropriate prowords and phonetics (paragraph 5-19).
- g. Wait for the other station to acknowledge receipt of your message.
- h. Do not violate radio silence unless an emergency exists and the enemy knows you are in the area.
- i. Do not transmit coordinate locations or a person's name and rank unless the communication is secure or the information is encoded.
- j. Do not conduct unofficial conversations between operators, use profane or obscene language, employ unofficial ("C.B.") jargon, or transmit at speeds so rapid the receiving operator cannot write down the information.

5-19. PROWORDS AND PHONETICS

Proper communication over a radio requires a knowledge of common prowords and how letters and numbers are communicated phonetically.

a. **Prowords.** Procedure words (prowords) are pronounceable words or phrases that have been assigned specific meanings. They shorten messages and, thereby, reduce transmission time. Some frequently used prowords are given in Table 5-1.

b. **Phonetic Alphabet.** The phonetic alphabet is used to clarify the spelling of difficult words and to clarify letter groups within the text of a message, such as giving a call signal. The words "bravo" and "delta," for example, are much less likely to be misunderstood than the letters "b" and "d" when pronounced. The standard phonetic alphabet is shown in Table 5-2. The underlined syllables are accented.

c. **Phonetic Numerals.** Numerals are pronounced phonetically as given in Table 5-3. The underlined syllables are accented. Numbers are usually transmitted digit by digit, but exact multiples of one thousand may be spoken as such (numeral "tousand"). If the number is a decimal, the decimal point is pronounced as "day-see-mal."

NOTE: Sometimes the decimal is called "point."

<u>PROWORD</u>	<u>MEANING</u>
ALL (or WORD)	The portion of the message to which I have reference is AFTER all (or the word) which follows _____.
ALL (or WORD) BEFORE	The portion of the message to which I have reference is all (or the word) which precedes _____.
BREAK	I hereby indicate the separation of the text from other portions of the message.
CALL SIGN	The group that follows is a call sign.
CORRECT	You are correct, or what you have transmitted is correct.
CORRECTION	An error has been made in this transmission. Transmission will continue with the last word correctly transmitted (or the correct version is ____).
DISREGARD THIS TRANSMISSION-OUT	This transmission is in error. Disregard it. (Not used to cancel any message that has been completely transmitted and acknowledgment has been received.)
FIGURES	Numerals or numbers follow.
FROM	The originator of this message is indicated by the address designation immediately following.
I READ BACK	The following is my response to your instruction to read back.
I SAY AGAIN	I am repeating transmission or portion indicated.
I SPELL	I shall spell the next word phonetically.
OUT	This is the end of my transmission to you and no answer is required or expected.
OVER	This is the end of my transmission to you and a response is necessary. Go ahead and transmit.

Table 5-1 Commonly used prowords. (continued)

<u>PROWORD</u>	<u>MEANING</u>
READ BACK	Repeat this entire transmission back to me exactly as received.
RELAY (TO)	Transmit this message to addressees immediately following this proword.
ROGER	I have received your last transmission satisfactorily.
SAY AGAIN	Repeat all of your last transmission. (If followed by identification data, repeat portion indicated.)
SILENCE SILENCE SILENCE	Cease transmission immediately. Silence will be maintained until instructed to resume. (When an authentication system is in force, the transmission imposing silence is to be authenticated.)
SILENCE LIFTED	Silence is lifted. (When an authentication system is in force, the transmission lifting silence is to be authenticated.)
THIS IS	This transmission is from the station whose designation immediately follows.
TIME	That which immediately follows is the time or date/time group of this message.
TO	The addressee(s) immediately following is (are) addressed for action.
VERIFY	Verify entire message (or portion indicated) with the originator and send correct version.
WAIT	I must pause for a few seconds.
WAIT-OUT	I must pause longer than a few seconds.
WILCO	I have received your message, understand it, and will comply. (Used only by the addressee. Since the meaning of ROGER is included in that of WILCO, the two prowords are never used together.)
WRONG	Your last transmission was incorrect. The correct version is _____.

Table 5-1. Commonly used prowords. (concluded)

<u>LETTER</u>	<u>WORD</u>	<u>SPOKEN AS</u>
A	ALPHA	<u>AL</u> -FAH
B	BRAVO	BRAH-VOH
C	CHARLIE	<u>CHAR</u> -LEE
D	DELTA	<u>DELL</u> -TAH
E	ECHO	<u>ECK</u> -OH
F	FOXTROT	<u>FOKS</u> -TROT
G	GOLF	GOLF
H	HOTEL	HOH-TELL
I	INDIA	<u>IN</u> -DEE-AH
J	JULIETT	JEW-LEE- <u>ETT</u>
K	KILO	<u>KEY</u> -LOH
L	LIMA	<u>LEE</u> -MAH
M	MIKE	MIKE
N	NOVEMBER	NO- <u>VEM</u> -BER
O	OSCAR	<u>OSS</u> -CAH
P	PAPA	PAH- <u>PAH</u>
Q	QUEBEC	KEH- <u>BECK</u>
R	ROMEO	ROW-ME-OH
S	SIERRA	SEE- <u>AIR</u> -RAH
T	TANGO	<u>TANG</u> -GO
U	UNIFORM	<u>YOU</u> -NEE-FORM
V	VICTOR	VICK- <u>TOR</u>
W	WHISKEY	<u>WISS</u> -KEY
X	X-RAY	<u>ECKS</u> -RAY
Y	YANKEE	<u>YANG</u> -KEY
Z	ZULU	<u>ZOO</u> -LOO

Table 5-2. Phonetic alphabet.

<u>NUMBER</u>	<u>SPOKEN AS</u>
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	<u>FO</u> -WER
5	FIFE
6	SIX
7	<u>SEV</u> -EN
8	AIT
9	<u>NIN</u> -ER

Table 5-3. Phonetic numerals.

d. **Examples.** Paragraph 5-17c gives an example of a call sign. If this was the call sign of your station, you would identify yourself using prowords and phonetics as follows: "This is al-fah too dell-tah too ait." If abbreviated call signs were being used, you would say, "This is dell-tah too ait." Some other examples are given below.

- (1) 44 is pronounced as "fo-wer fo-wer."
- (2) 1957 is pronounced as "wun nin-er fife sev-en."
- (3) 400 is pronounced as "fo-wer ze-ro ze-ro."
- (4) 13,000 is pronounced as "wun tree tou-sand."
- (5) 268.5 is pronounced as "too six ait day-see-mal fife."

5-20. EVACUATION REQUEST INFORMATION

Before you request an air ambulance to evacuate casualties, you need to obtain certain information that the air ambulance personnel must have before they begin their mission. Items "a" through "e" below must be known by air ambulance personnel before they begin their mission. Items "f" through "i" can be transmitted after the helicopter is airborne, but should be transmitted with the other information when known. The information needed for wartime and peacetime evacuation requests is described in the following paragraphs.

a. **Location of Pickup Site (Line 1).** Using a map, determine the grid coordinates (eight digits) of the site where the helicopter will pick up the casualties. This information can often be obtained from your unit leader. This information allows the unit coordinating aeromedical evacuation to plan the helicopter's route so it can pick up casualties from more than one site if appropriate.

b. **Radio Frequency, Call Sign, and Suffix (Line 2).** Your radio frequency, call signal, and suffix can be obtained from your radio operator, from the Signal Operating Instruction (SOI), or from the Automated Net Control Device (ANCD). This information is needed so the ambulance personnel can contact you while en route to obtain additional information (verify pick-up site marking, and so forth).

c. **Number of Patients by Precedence (Line 3).** Based upon the actual evaluation of the casualties, determine how many are urgent, how many are urgent surgical, how many are priority, how many are routine, and how many are convenient. This information is used by the unit controlling evacuation to prioritize missions when more than one request is received. Definitions of these categories are given below.

(1) Urgent. Emergency case that should be evacuated as soon as possible and within a maximum of 2 hours in order to save live, limb, or eyesight.

(2) Urgent Surgical. Emergency case that should be evacuated within 2 hours to the nearest surgical unit.

(3) Priority. Sick or wounded person requiring prompt medical care and who should be evacuated within 4 hours or his medical condition could deteriorate to such a degree that he could become an urgent precedence.

(4) Routine. Sick or wounded person requiring evacuation, but whose condition is not expected to deteriorate significantly. Should be evacuated within 24 hours.

(5) Convenient. Person who is being medically evacuated for medical convenience rather than necessity.

d. **Special Equipment Required (Line 4)**. Based upon actual evaluation of the casualties, determine what special equipment, if any, will need. The most common items for an air ambulance are hoist, Stokes litter, and forest penetrator. Another common special equipment requirement is a ventilator. This information is required so that the equipment can be placed on board the air ambulance prior to the start of the mission.

e. **Number of Patients by Type (Line 5)**. Based upon actual evaluation of the casualties, determine the number of casualties that will be evacuated on a litter and the number of casualties that are able to sit (ambulatory). This information is needed to determine the appropriate number of air ambulances to be dispatched to the pickup site. The information is also needed to configure the vehicles to carry the casualties requiring evacuation.

f. **Security of Pickup Site/Number and Type (Line 6)**.

(1) Wartime operations. In wartime operations, determine whether proposed pickup site is secure. This information is normally obtained from your unit leader based upon his evaluation of the situation. The information will help the unit controlling aeromedical evacuation to determine whether assistance (escort) is required to accomplish the mission. The situation is categorized as one of the following:

- (a) No enemy troops in area.
- (b) Possibly enemy troops in area; approach with caution.
- (c) Enemy troops in area; approach with caution.
- (d) Enemy troops in area; armed escort required.

(2) Peacetime operation. In peacetime, collect information on the types of wounds (gunshot, shrapnel, and so forth), injuries (fractured leg, snakebite, and so forth), or

illnesses based upon an evaluation of the casualties. If any casualty has serious bleeding, determine the casualty's blood type, if known. The information will help the unit controlling aeromedical evacuation to determine what, if any, special equipment or special supplies are needed.

g. Method of Marking Pickup Site (Line 7). Determine how the pickup site is to be marked for identification by the helicopter pilot. The method is usually determined by your unit leader based upon the military situation and the materials available. Common methods of marking the pickup site are:

- (1) Panels.
- (2) Pyrotechnic signal.
- (3) Smoke signal.
- (4) Signal person.
- (5) Strips of fabric or parachute.
- (6) Tree branches, pieces of wood, or stones placed together.
- (7) Signal lamp or flashlight.
- (8) Vehicle lights.
- (9) Open flame.

NOTE: The information is required to assist the evacuation aircraft crew in identifying the specific location of the pickup site. The color of the panels, smoke, or other markings should not be transmitted until the air ambulance contacts the unit just prior to arrival. For security reasons, the air ambulance crew should identify the color of the markings or smoke and the person on the ground should verify the color.

h. Patient Nationality and Status (Line 8). Based upon information obtained from the casualties, determine which categories listed below are represented. The number of casualties in each category does not need to be determined. The information will help the unit coordinating the evacuation to identify which facilities should receive casualties and whether guards are needed. The categories are:

- (1) United States (US) military.
- (2) United States civilian.
- (3) Military other than US military.

- (4) Civilian other than US civilian.
- (5) Enemy prisoner of war (EPW).

i. Chemical, Biological, Radiological Contamination/Terrain Description (Line 9).

(1) Wartime operation. In wartime operations, determine if chemical contamination, biological contamination, and/or radiological contamination is present based upon the military situation. This information will assist the unit controlling aeromedical evacuation. If there is no chemical, biological, or radiological contamination present, this line is not transmitted.

(2) Peacetime operation. In peacetime, determine the general terrain (flat, hilly, wooded, open, sloping, and so forth). If possible, identify the relationship of the landing area to prominent terrain features (mountain, lake, tower, and so forth) around the pickup site. This information can help helicopter personnel assess the avenue of approach. This information can be obtained from personnel at the site or by an area survey.

5-21. MAKING AN EVACUATION REQUEST

Ensure that the radio transmission is sent by secure means on the AN/PRC-119. A special format (Table 5-4) has been developed to assist in requesting aeromedical evacuation. Rather than stating what type of information is being transmitted, a line number is given. Brevity codes are used to identify specific information being transmitted. The information is transmitted in sequence (line 1, then line 2, and so forth). Lines 1 through 5 must be transmitted before the evacuation mission begins. The remainder should be transmitted at the same time if possible, but can be transmitted to the helicopter en route. The request should be transmitted within 25 seconds. Procedures for making a MEDEVAC request are given in the following paragraphs.

- a. Gather the needed information (paragraph 5-20).
- b. Plan your message using the MEDEVAC format, including the proper encryption of the grid coordinates, radio frequency, and brevity information.
- c. Enter the radio net and make proper contact with the station controlling aeromedical evacuation.
- d. State, "I have a MEDEVAC request."
- e. Break for acknowledgment by the receiving station.
- f. Transmit the MEDEVAC request using proper procedures and proper letter and numeral pronunciation (paragraphs 5-18 and 5-19).

<i>TYPE OF INFORMATION</i>	<i>INFORMATION TRANSMITTED</i>	<i>TRANSMITTED REMARKS/SPECIAL INSTRUCTION</i>
Location of Pickup Site	Line 1 Letters included (Grid coordinates of pickup site)	To preclude misunderstanding, a statement should be made that grid zone letters are included in the message.
Radio Frequency, Call Sign and Suffix	Line 2 (Frequency of the radio at the pickup site) (Call sign and suffix)	The call sign and suffix is that of the person to be contacted at the pickup site.
Number of Casualties by Precedence	Line 3 (Number of casualties) (Brevity code)	Brevity Codes: A (Urgent--within 2 hours) B (Urgent surgical--within 2 hrs) C (Priority--within 4 hours) D (Routine--within 24 hours) E (Convenience) If two or more categories, insert the proword BREAK between each category. For example "Line tree, too char-lee, BREAK, wun dell-tah"
Special Equipment Required	Line 4 (Brevity code[s])	Brevity Codes: A (None) B (Hoist) C (Extraction equipment) D (Ventilator)
Number of Casualties by Type	Line 5 (Number of casualties) (Brevity code)	Brevity Codes: L (Litter) A (Ambulatory) If both types are included in the same request, insert the proword BREAK between the types. For example "Line fife, tree lee-mah, BREAK, wun al-fah"

Table 5-4. MEDEVAC request guide. (continued)

<i>TYPE OF INFORMATION</i>	<i>INFORMATION TRANSMITTED</i>	<i>TRANSMITTED REMARKS/SPECIAL INSTRUCTION</i>
Security of Pickup Site (wartime)	Line 6 (Brevity code)	Brevity Codes: N (No enemy troops in area) P (Possible enemy troops in area; approach with caution) E (Enemy troops in area; approach with caution) X (Enemy troops in area; armed escort required)
Methods of Marking Pickup Site	Line 7 (Brevity code)	Brevity Codes: A (Panels) B (Pyrotechnic signal) C (Smoke signal) D (None) E (Other)
Casualty Nationality and Status	Line 8 (Brevity code)	Brevity Codes: A (Military, US) B (Civilian, US) C (Military, non-US) D (Civilian, non-US) E (Enemy prisoner of war) The number of casualties in each category is not transmitted.
NBC Contamination (wartime)	Line 9 (Brevity code)	Brevity Codes: N (Nuclear) B (Biological) C (Chemical) This line is included only when applicable. Do not transmit line 9 if no CBR contamination is present

Table 5-4. MEDEVAC request guide. (concluded)

g. After transmitting the request, wait for acknowledgment of the transmission from the receiving station.

h. Monitor the frequency given in line two of the request. The air ambulance will contact you on this frequency when needed.

i. Prepare and mark the pickup site, if needed.

5-22. EXAMPLE OF A MEDICAL EVACUATION REQUEST

Suppose you have two casualties from an antipersonnel mine explosion. Both are US soldiers. One is a litter casualty who needs to be evacuated for surgery as soon as possible in order to save his leg (urgent surgical). The other is ambulatory with a fractured arm. His condition is not expected to deteriorate significantly within the next 24 hours (routine). No special equipment is needed. Enemy troops may be in the area, but their presence is not known for sure. The landing site will be indicated by colored smoke when the air ambulance arrives. Your call sign and suffix is Q7Z94 and the unit coordinating the MEDEVAC is F3D81. You are located at grid coordinates GH13344126, which is also the pickup site. You will communicate with the air ambulance using radio frequency FM38.50 megahertz. One possible transmission is given in figure 5-20.

Foks-trot tree dell-tah ait wun, THIS IS keh-beck sev-en zoo-loo nin-er fo-wer. I have a MEDEVAC request. OVER.
Keh-beck sev-en zoo-loo nin-er fo-wer, THIS IS foks-trot tree dell-tah ait wun. Send your request. OVER.
Foks-trot tree dell-tah ait wun, THIS IS keh-beck sev-en zoo-loo nin-er fo-wer.
Line wun letters included, golf hoh-tell wun tree tree fo-wer fo-wer wun too six
Line too, foks-trot mike tree ait day-see-mal fife ze-ro. keh-beck sev-en zoo-loo nin-er fo-wer.
Line tree wun brah-voh BREAK wun dell-tah
Line fo-wer al-fah
Line fife wun lee-mah BREAK wun al-fah
Line six pah-pah
Line sev-en char-lee
Line ait al-fah
OVER.
Keh-beck sev-en zoo-loo nin-er fo-wer, THIS IS Foks-trot tree dell-tah ait wun. ROGER. OUT.

Figure 5-20. Example of a MEDEVAC request.

5-23. FIELD TELEPHONE

This section has dealt primarily with the field radio. Sometimes, you may have access to a field telephone such as shown in figure 5-21.

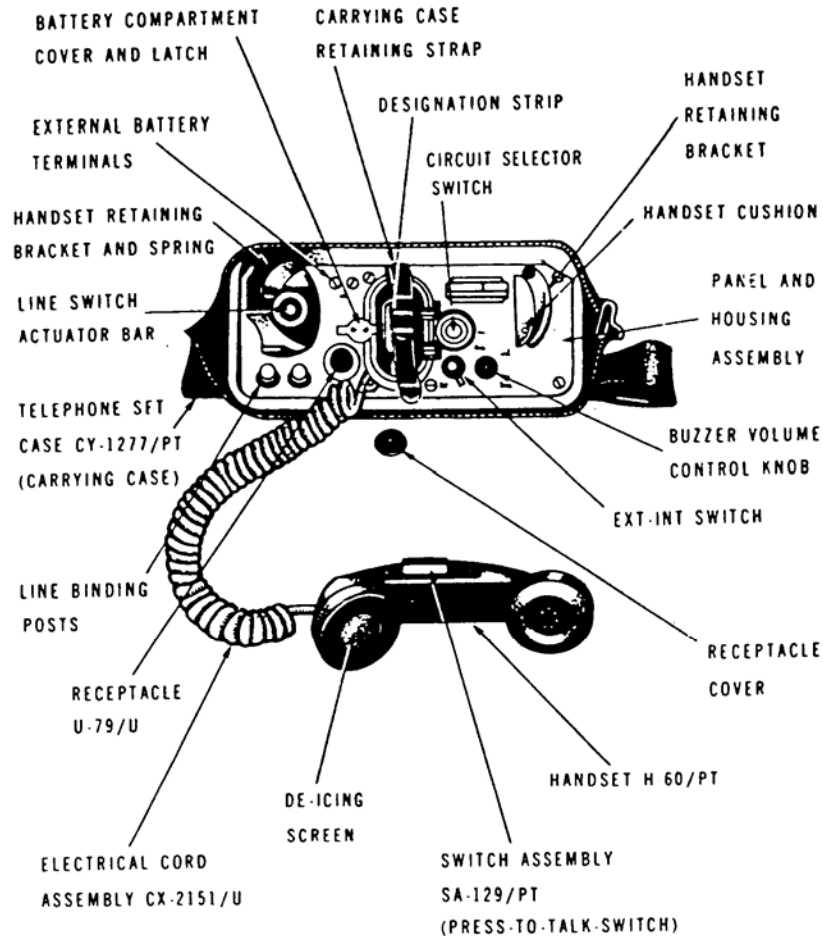


Figure 5-21. Field telephone set TA-312/PT.

a. **Installation.** If the field telephone needs to be connected, make sure the field wire will not pull out once it is attached to the phone.

(1) Remove about 1 inch of insulation from each of the field wires and fold back about 1/2 inch of the exposed wires.

(2) Push down on one of the line button posts, insert the bared end of one wire into the binding post slot, and release the pressure.

(3) Push down on the other line button post, insert the bared end of the remaining wire into the binding post slot, and release the pressure.

b. Operation.

(1) To make a call on the set, remove the handset, crank the handle equal to the appropriate number of rings (number of rings used instead of call signs) for the party to which you wish to speak.

(2) Depress the switch assembly of the handset to speak; release the switch assembly to listen.

(3) Replace the handset in the retaining bracket at the end of the transmission.

Section IV. PREPARING A LANDING SITE

5-24. GENERAL

The unit requesting aeromedical evacuation is responsible for selecting a landing site that is as firm, level, secure, and as free from obstacles and debris as possible. Once the site is selected, it must be marked so the pilot of the air ambulance can locate the site. A signalman can be used to help guide the pilot in landing at the selected site.

5-25. SURFACE CONDITIONS

Choose a firm surface as free from obstructions and debris as possible.

a. The ground must be firm enough for the helicopter to land, load, and take off without bogging down. If firm ground cannot be found, let the pilot know of the situation so he can hover over the site while casualties are being loaded.

b. Choose a landing site that is as free from tall trees, telephone and power lines, telephone poles, boulders, as possible. Anything that is over 18 inches high, wide, or deep that can not be removed from the area should be marked as an obstacle. The cleared area of the landing site cannot contain any obstacles. The site should be away from all living areas since the wash from the helicopter could blow over tents.

c. Avoid dusty, sandy, and snow-covered surfaces when possible. Rotor wash from the helicopter may stir up the sand or snow and cause the pilot to lose visual contact with the ground.

d. Remove loose debris and objects likely to be blown about by the wind from the rotor (cartons, tentage, and so forth) from the landing site. Loose debris kicked up by the rotor wash can cause damage to the blades or engines. Ensure that marker panels are either removed or adequately secured.

5-26. SIZE

Make sure there is sufficient space for the helicopter to land and take off.

a. No Obstacles Present.

(1) An Iroquois helicopter requires a relatively level landing area at least 35 meters in diameter.

(2) A Blackhawk helicopter requires a landing area of 50 meters in diameter if there are no obstacles.

(3) A CH-47 Chinook requires a landing site at least 80 meters in diameter if there are no obstacles.

(4) This does not mean that a loaded helicopter can land and take off from an area the size given above. Most helicopters cannot go straight up or down when fully loaded. Therefore, a larger site and appropriate approach and departure routes are required.

b. **Obstacles Present.** When obstacles are in the approach or departure route, a 10-to-1 ratio must be used to lay out the landing site. For example, during the approach and departure, if the helicopter must fly over trees that are 15 meters tall, then the landing site must be at least 150 meters long ($10 \times 15 = 150$). Figure 5-22 shows two other examples.

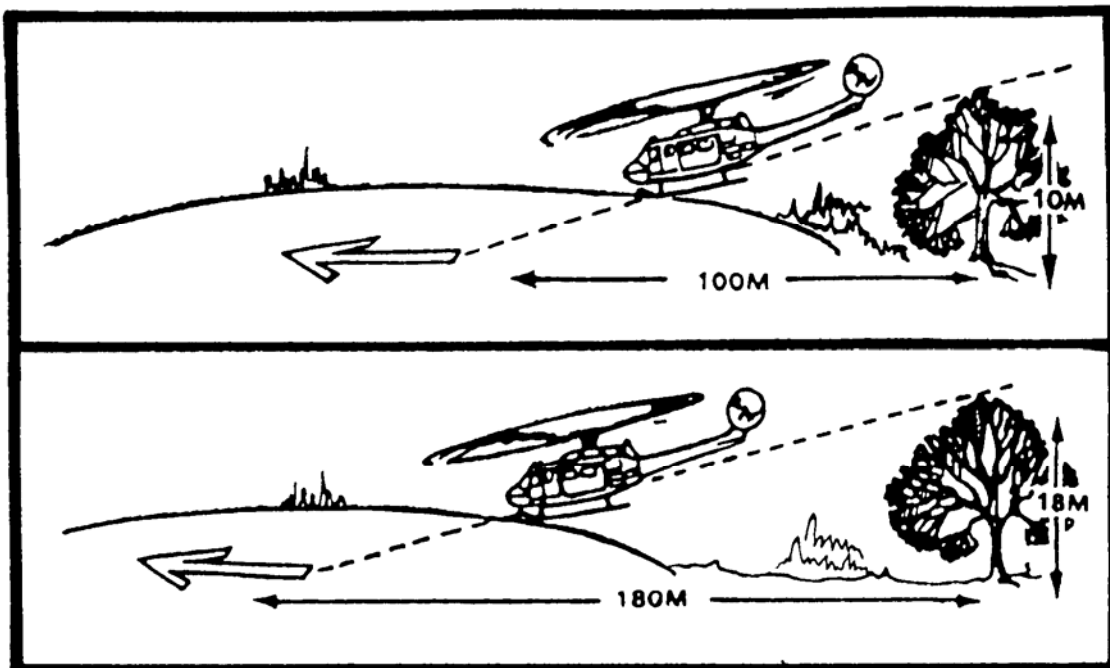


Figure 5-22. Landing site distance from obstacles.

5-27. SLOPE

Ground slope can be considered an obstacle. If the slope exceeds 7 degrees, observation and small utility helicopters (UH-1 Iroquois) will not be allowed to land and cargo aircraft will be issued an advisory. If the slope exceeds 15 degrees, no aircraft will be permitted to land. Always attempt to land the aircraft up-slope or side-slope (figures 5-23 and 5-24). Avoid landing an aircraft down-slope unless a last resort for a true emergency.



Figure 5-23. Helicopter landing up-slope.

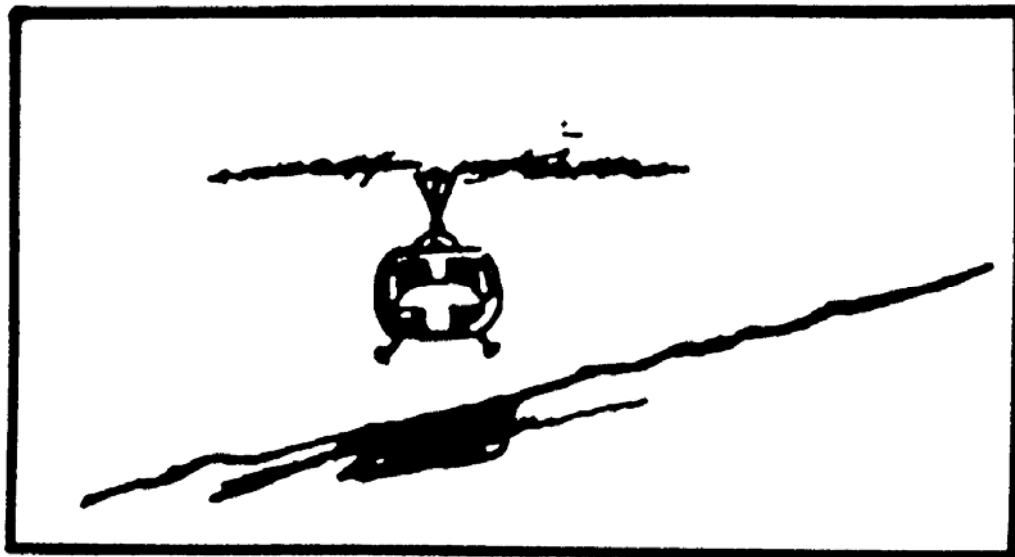


Figure 5-24. Helicopter landing side-slope.

5-28. SECURITY

The landing site should offer some security from enemy observation and direct fire. A good landing site allows the helicopter to land and depart without exposing the helicopter to unneeded risks. Security is normally established around the entire landing site.

5-29. MARKING THE LANDING SITE IN DAYLIGHT

The mission, capabilities, and situation of the unit requesting evacuation will determine when and how the landing site will be marked. Normally, the only mark or signals required are colored smoke and a signalman. VS-17 marker panels may be used to mark the landing site, but must be at least 50 feet from the touchdown point.

a. **Smoke.** Smoke grenades that emit colored smoke can be used in daytime to identify the landing area when the helicopter is sighted. The radio operator should not tell the pilot what color smoke is being used. Rather, he should radio the helicopter pilot and inform him that "smoke is out." The pilot then identifies the color of the smoke and the personnel at the pickup site verify the color. This helps to prevent an enemy in the area who is listening to the radio transmission from using the same color smoke to lure the helicopter into an enemy-held position.

b. **Panels.** When the tactical situation allows and materials are available, the landing site can be marked with the letter "H" made from identification panels or other appropriate marking material.

(1) Place the panels at least 50 feet away from the touchdown point, not on the touchdown point. The panels are used by the pilots to find the landing zone. The actual touchdown point is selected by the pilot after surveying the surface for holes and other hazards.

(2) Secure the panels to the ground to prevent them from being blown about by the rotor wash. Use firmly driven stakes to keep the panels taut. Piling rocks on the corners of the panels is not adequate.

c. **Wind Direction Indicator.** If the tactical situation permits, a small wind sock or a rag tied to the end of a stick in the vicinity of the landing area will help the helicopter pilot to judge wind direction at the landing site. Wind direction can also be indicated by a soldier standing at the upwind edge of the site with his back to the wind and his arms extended forward. Smoke grenades can also be used to show wind direction.

5-30. MARKING THE LANDING SITE AT NIGHT

At night, the landing site and the touchdown point are marked by an inverted "Y" composed of four lights visible to the helicopter pilot (figure 5-25). Two lights are placed seven meters from the touchdown site on opposite sides of the site. A third light is placed 14 meters from the touchdown site perpendicular to the line formed by the first two lights. A fourth light is placed seven meters beyond the third light and in line with the touchdown point.

- a. Strobe lights, flashlights, lanterns, or vehicle lights may also be used to mark the landing site. The marking system used can be fully explained to the pilot when contact is made.
- b. Flare pots and other types of open flames should be used only as a last resort. They are usually blown out by the rotor downwash, can create a hazardous glare or reflection on the helicopter windshield, and can be a fire hazard if blown over.
- c. Lights are displayed for a minimum time only and are turned off immediately after the helicopter lands or when ordered to do so by the pilot.

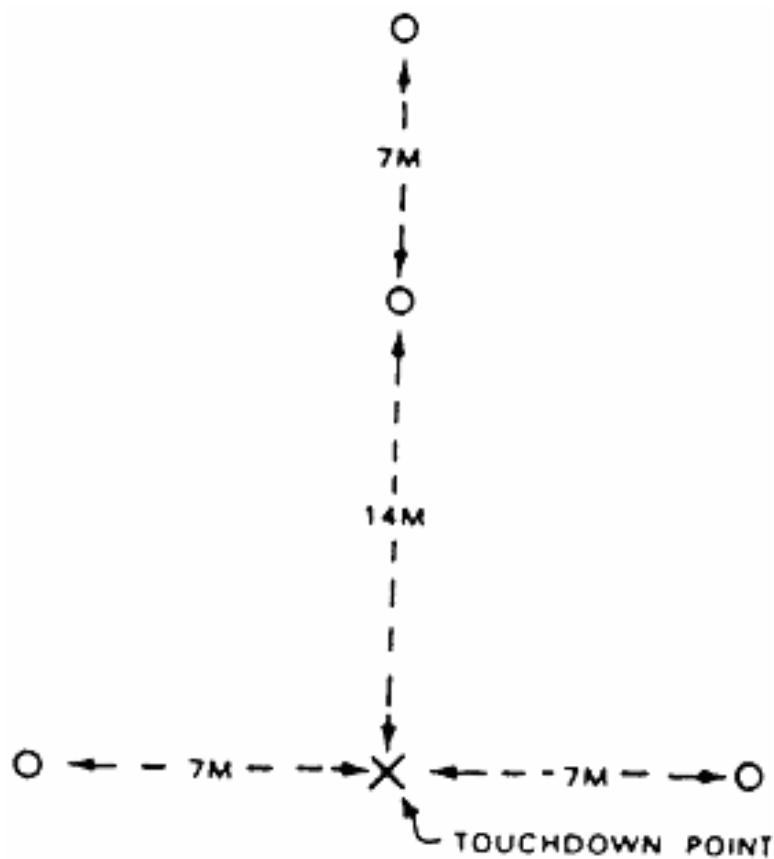


Figure 5-25. Marking a landing site at night with lights.

d. Unit SOP will determine what type of marking is used. In largely congested areas, the inverted Y touchdown marking may be indistinguishable from the abundance of other lights. In the tactical setting, it may be impractical and too time consuming to set up. Flashing lights and strobes may look like the muzzle flash from small arms fire under night vision conditions and may give away the location of the unit. A simple device like an infra-red chemical light on a string that can be spun over the head of the signal man may be the most effective method of signal.

5-31. MARKING OBSTACLES

Mark obstacles at or near the landing site that cannot be removed and that may not be readily seen by the pilot (cables, wires, antennas, large rocks, and so forth). If possible, place a red light on top of the obstruction or mark the obstacle with brightly-colored or fluorescent cloth. If the combat situation makes it impractical to mark the tops of the obstacles, advise the pilot of their existence by radio.

5-32. OTHER LANDING AIDS

As the air ambulance approaches, provide the pilot with tactical and security information and conditions that may affect the landing such as terrain, weather, landing site markings, and possible obstacles. Confirm information or answer any questions the pilot may have pertaining to the landing site. Continue to maintain communications with the pilot during the landing.

a. Once the helicopter is within your area, the pilot will establish radio contact to obtain positive identification. Orientate the pilot to the landing site using the 12 o'clock method. [Twelve o'clock is always in the direction of the helicopter's flight.] Tell the pilot the direction of the landing zone (LZ) from his location. For example, if the landing zone is directly to the pilot's right, you might transmit, "The LZ is now at 3 o'clock to your position."

b. The pilot can also use FM (frequency modulation) procedures to home in on a field radio transmitting between 30 and 70 megahertz. The FM field radio is limited to line of sight; therefore, the person using the field radio should remain as clear as possible of obstructions that could block the signal. If the pilot requests the operator to "key the microphone," the operator should depress the transmit button on the field radio for a period of 10 to 15 seconds.

c. When the helicopter is approaching the landing site at night, personnel on the ground can request the pilot to turn on his beacon briefly. The ground personnel can then confirm the helicopter's location in relation to the landing site and guide the helicopter to the landing site.

d. A soldier can stand on the upwind side of the landing site and use the directed beam of a signal lamp to flash a code to the incoming pilot. Once recognition is assured, the signal operator directs the beam of light downwind along the ground, bisecting the landing area.

5-33. ARM-AND-HAND SIGNALS

Once the pilot has located the landing area, a signalman can guide the pilot to the touchdown site using standard arm-and-hand signals. The following assumes you are giving guidance to a Blackhawk or Iroquois air ambulance.

a. If the landing is being done at night or in decreased visibility, use lighted batons or flashlights so the pilot can see your signals. A lighted wand can be made by attaching a plastic wand to the end of a flashlight. Figures 5-27 through 5-33 show lighted wands being used.

b. You should be to the right front of the helicopter so you can be easily seen by the pilot. The best position is 40 meters to the right front of the helicopter during day or night operations.

c. Extend your arms above your head (figure 5-26) to indicate you are going to give arm-and-hand guidance signals.

d. Use the hover signal (figure 5-27) when changing from one arm-and-hand signal to another. For example, suppose you are giving the helicopter pilot the "move ahead" signal. The helicopter is now in position directly over the landing area. Before giving the pilot the "move downward" signal, execute the "hover" signal to indicate a change in guidance instruction.

e. Use the speed of your arm movements to indicate the desired speed of aircraft compliance with the signal.

f. Execute the appropriate arm-and-hand signals (figures 5-27 through 5-33) as needed until the helicopter has landed.



Figure 5-26. Arm-and-hand signal for guidance.



Figure 5-27. Arm-and-hand signal for hover.

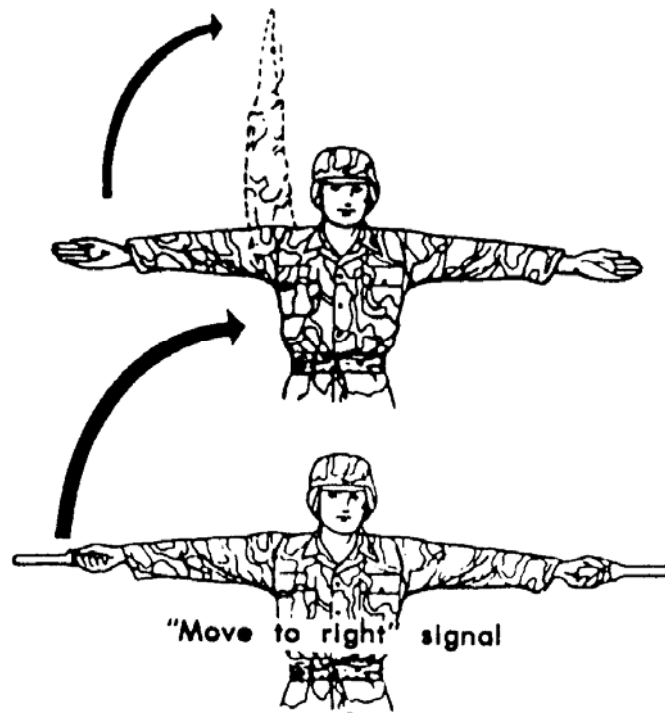


Figure 5-28. Arm-and-hand signal for moving to the right.

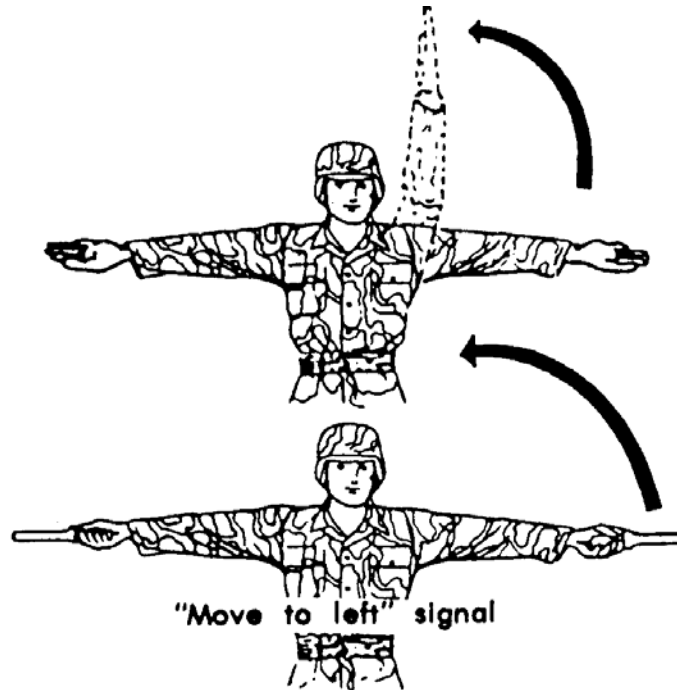


Figure 5-29. Arm-and-hand signal for moving to the left.

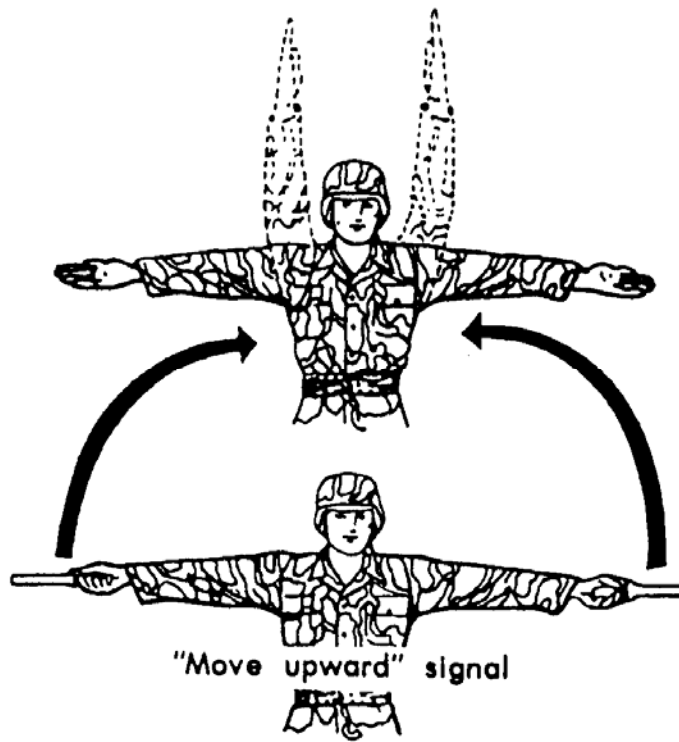


Figure 5-30. Arm-and-hand signal for moving upward.

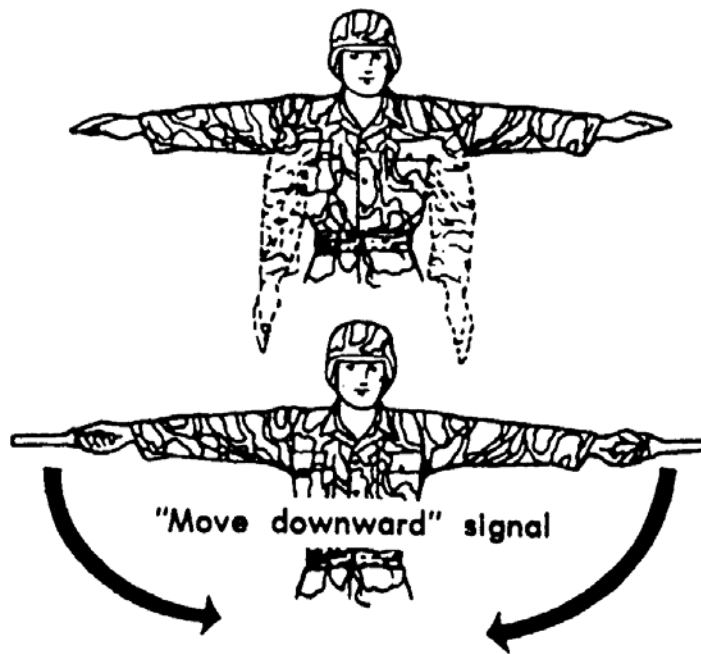


Figure 5-31. Arm-and-hand signal for moving downward.

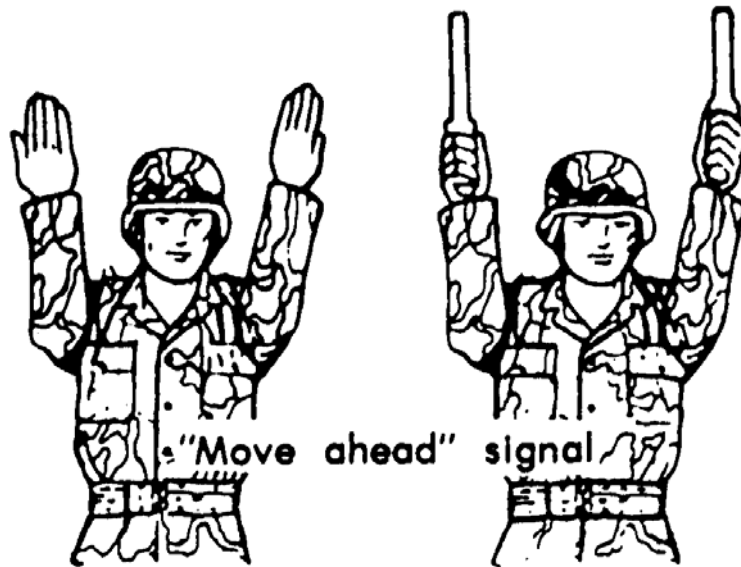


Figure 5-32. Arm-and-hand signal for moving ahead.

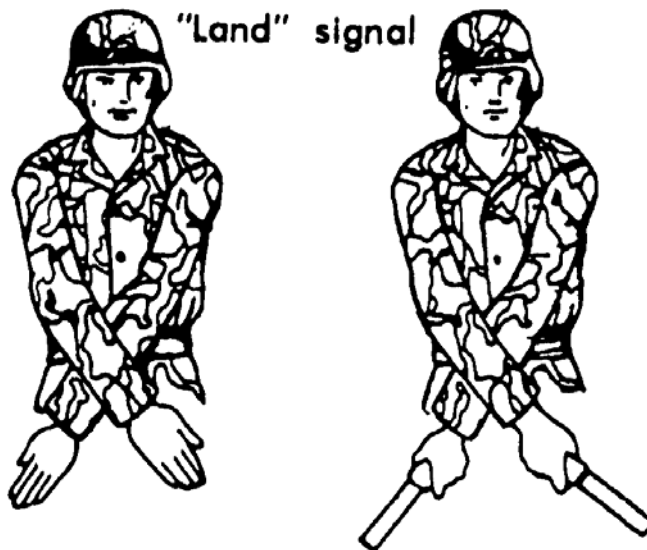


Figure 5-33. Arm-and-hand signal for landing.

[Continue with Exercises](#)

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EXERCISES, LESSON 5

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the question or best completes the incomplete statement or by writing the answer in the space provided at the end of the exercise.

After you have completed all the exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. You are loading litter casualties into an air ambulance. The most seriously injured casualty should be loaded:
 - a. First.
 - b. Last.

2. When loading a litter into a Blackhawk air ambulance, you should approach from the ____ of the helicopter.
 - a. Front.
 - b. Rear.

3. Which of the following is/are disadvantages of using air ambulances to evacuate casualties?
 - a. There is a tendency to evacuate the casualty farther to the rear than necessary.
 - b. There is danger to the helicopter and its crew from friendly artillery.
 - c. There is danger to the helicopter and its crew from enemy artillery.
 - d. There is danger to the helicopter and its crew from bad weather conditions.
 - e. All of the above.

4. How many litter casualties can a Blackhawk air ambulance normally evacuate (no internal hoist installed, no ambulatory casualties)?

5. An Iroquois air ambulance can normally carry _____ ambulatory casualties or _____ litter casualties or a mixed load of _____ litter casualties and _____ ambulatory casualties.

6. Which air ambulance, when configured for litter casualties, has a central pedestal that rotates 90° to help facilitate the loading of litter casualties?

- a. CH-47 Chinook.
- b. UH-1H/V Iroquois (Huey).
- c. UH-60A Blackhawk.

7. When evacuating a casualty using a hoist and forest penetrator, you should let the penetrator touch the ground before touching the penetrator or the cable. Why?

8. Of a Stokes litter, semirigid litter, and survivor's sling, which can be used with a hoist to rescue a casualty in the water?

- a. A survivor's sling.
- b. A semirigid litter.
- c. A Stokes litter.
- d. A survivor's sling and a semirigid litter.
- e. They can all be used to rescue a casualty in the water.

9. What proword means you have finished your transmission and a response from the receiving station is needed?

10. Of the nine lines of information in a wartime evacuation request, the first ____ lines must be transmitted before the helicopter begins its mission.

11. Assume you are calling in a MEDEVAC request using the MEDEVAC wartime guidelines given in this lesson. State what type of information is reported on each line of the request.

Line 1. _____

Line 2. _____

Line 3. _____

Line 4. _____

Line 5. _____

Line 6. _____

Line 7. _____

Line 8. _____

Line 9. _____

12. Of the nine lines of information in a wartime evacuation request, which line is omitted if it is not applicable?

13. A "priority" casualty should be evacuated within:
- a. 1 hour.
 - b. 2 hours.
 - c. 4 hours.
 - d. 8 hours.
 - e. 24 hours.
14. An Iroquois helicopter requires a landing area in the form of a circle that is at least _____ meters in diameter. A Blackhawk helicopter requires a landing area in the form of a circle that is at least _____ meters in diameter if no obstacles are present.
15. If obstacles are present, the approach or departure area for an Iroquois or Blackhawk must be at least _____ times longer than the obstruction is high.
16. The maximum degree of slope for a observation or small utility helicopter is _____ degrees. The maximum degree of slope for a larger utility helicopter is _____ degrees.
17. A common method of marking a landing area at night is to place _____ (number) lights in an inverted Y formation.
18. You are giving arm-and-hand signals to the pilot of an air ambulance. You are currently giving a "move right" signal and wish to change to a "move ahead" signal. What signal should you give just before the "move ahead" signal?
- _____

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 5

1. b (para 5-3m)
2. a (para 5-3d)
3. e (para 5-2b)
4. Four. (para 5-4a(1))
5. Nine; six; three, four (para 5-6)
6. c (para 5-4a)
7. To allow the static electricity to discharge into the ground. (para 5-11)
8. e (paras 5-13, 5-14, 5-15)
9. Over. (Table 5-1)
10. Five. (paras 5-21, 5-20)
11. Line 1. Grid coordinates of the pickup site.
Line 2. Frequency of radio and radio call sign at pickup site.
Line 3. Numbers of casualties grouped by categories of precedence.
Line 4. Special equipment needed.
Line 5. Number of litter casualties; number of ambulatory casualties.
Line 6. Security at the pickup site.
Line 7. How the pickup site will be marked.
Line 8. Nationality and status of casualties.
Line 9. Existence of chemical, biological, or radiation contamination.
(para 5-20, Table 5-4)
12. Line 9. (Table 5-4)
13. c (para 5-20c(2))
14. 35, 50 (paras 5-26a, a(1))
15. Ten (para 5-26b)
16. 7; 15 (para 5-27)
17. Four (para 5-30, fig 5-25)
18. Hover arm-and-hand signal (para 5-33d)

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