

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 useful 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.

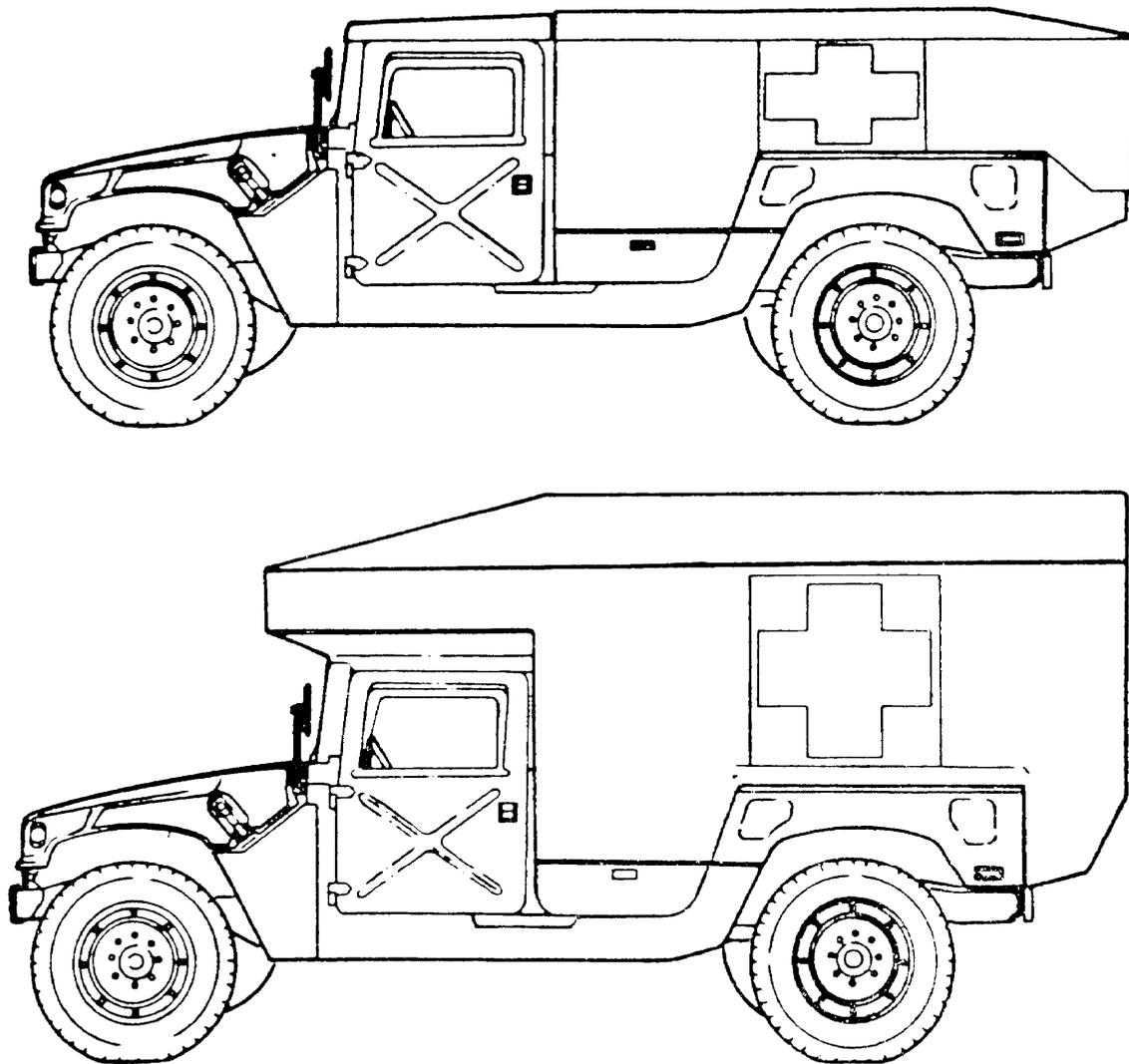


Figure 10-1. Trucks, ambulance, 4x4, armored, (M996 and M997).

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.

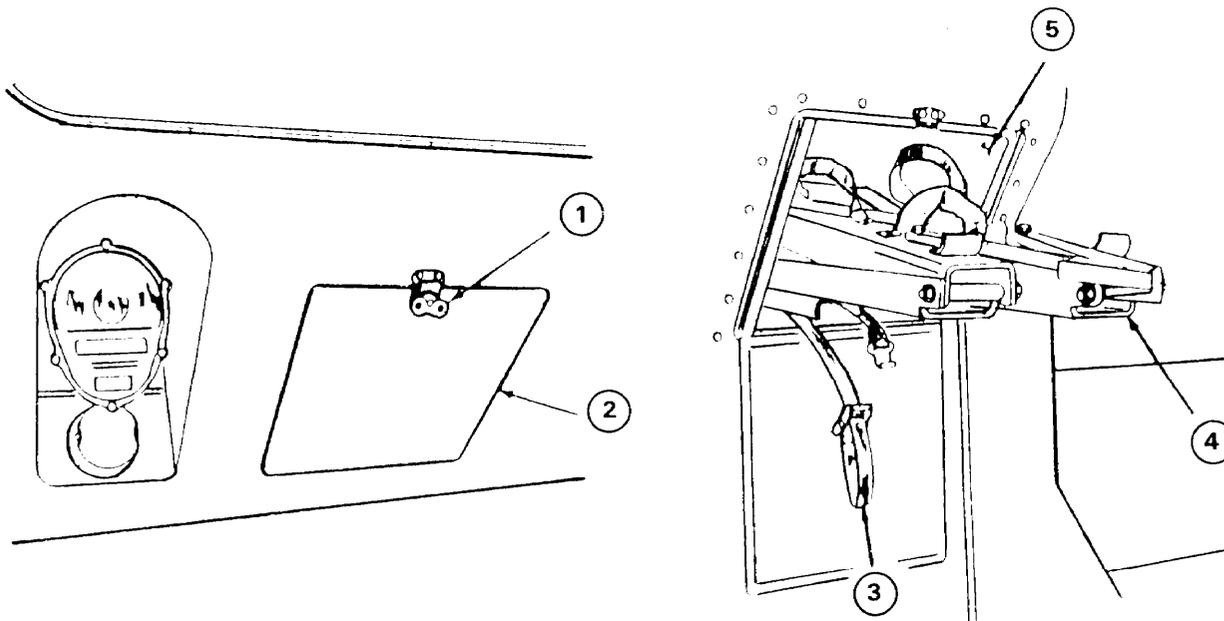


Figure 10-2. Litter rail extension stowage compartment, M996.

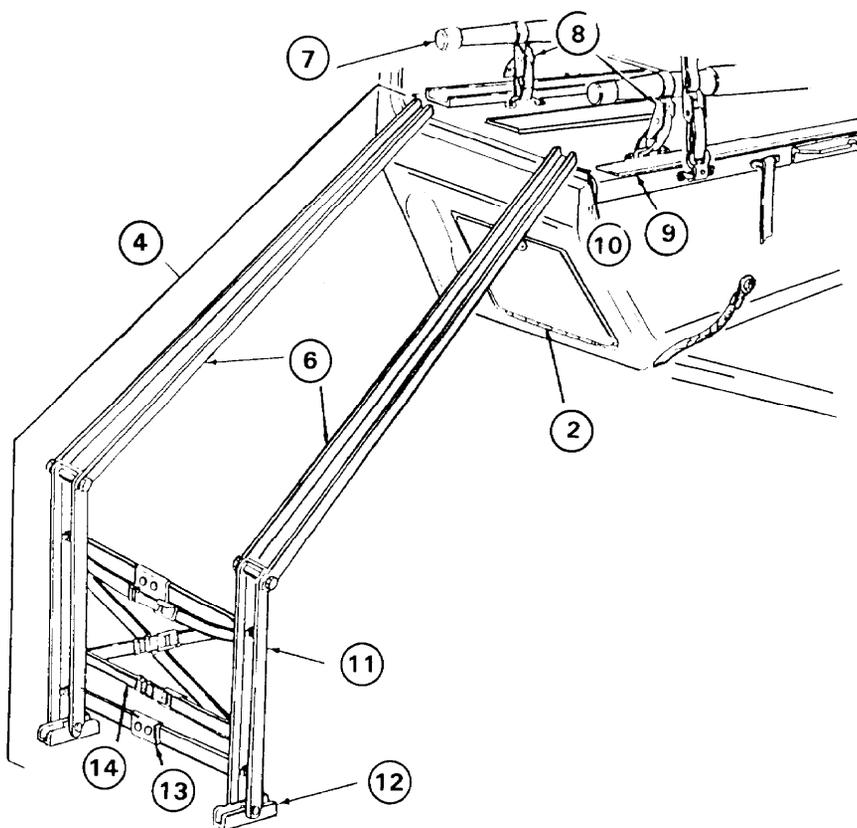


Figure 10-3. Litter rail extension.

(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 lower left*. The most seriously injured patients are loaded last so they are the first to be taken out of the

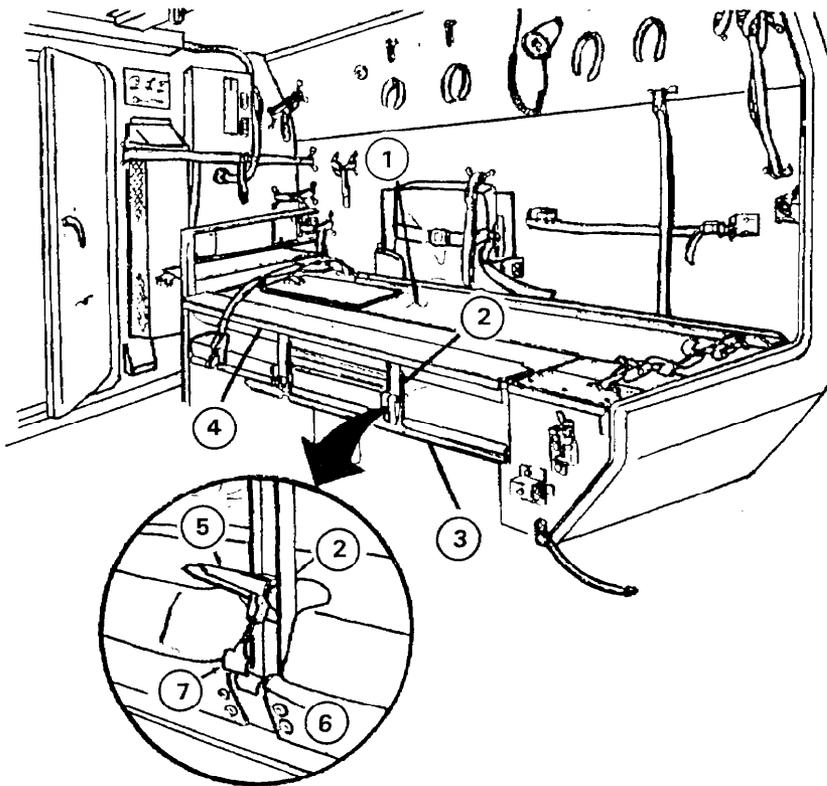


Figure 10-4. Litter rack (ambulatory patient seat down position).

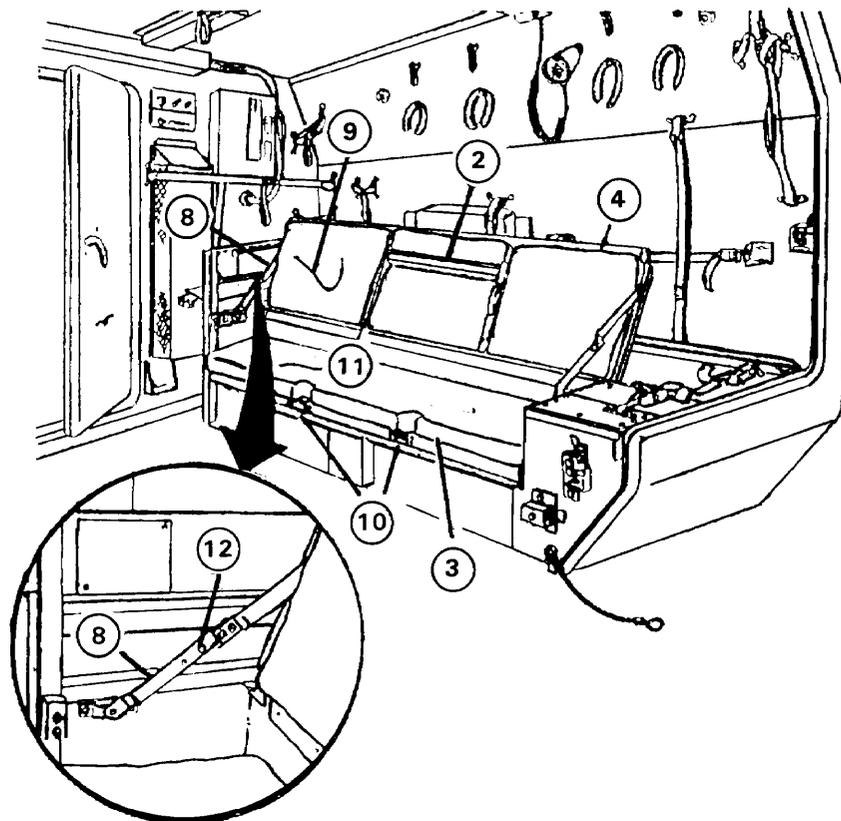


Figure 10-5. Litter rack (ambulatory patient seat open position).

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.

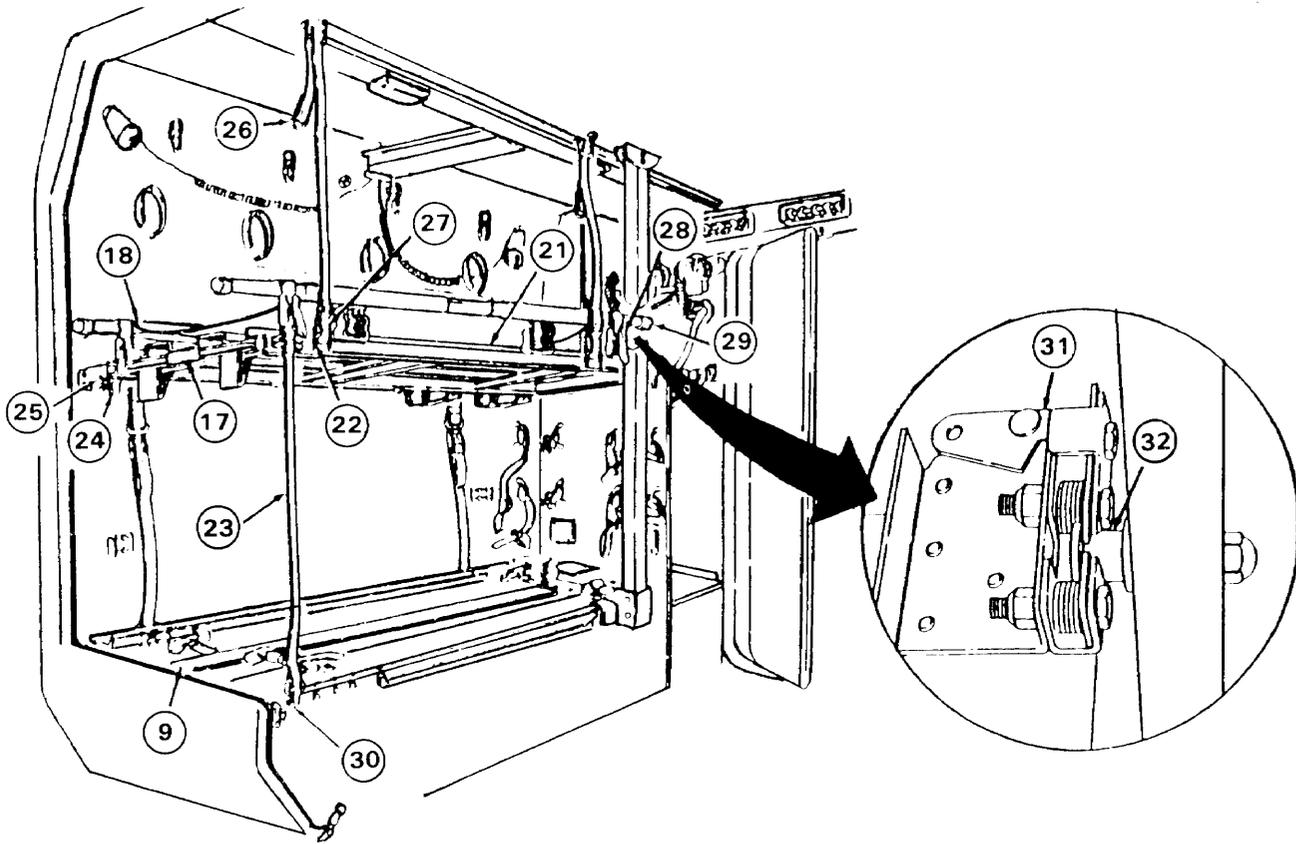


Figure 10-6. Interior, M997.

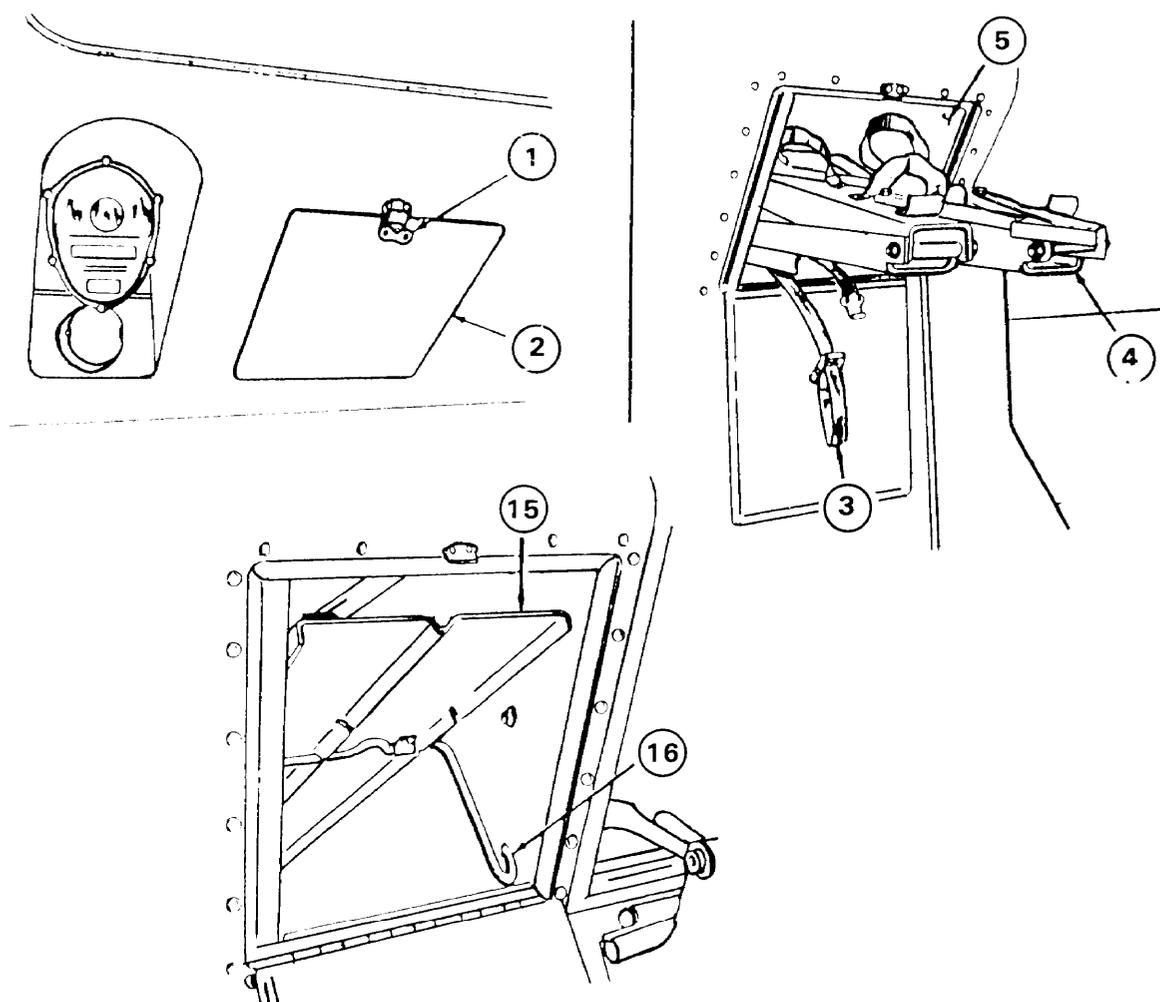


Figure 10-7. Litter rail extension stowage compartment, M997.

(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.

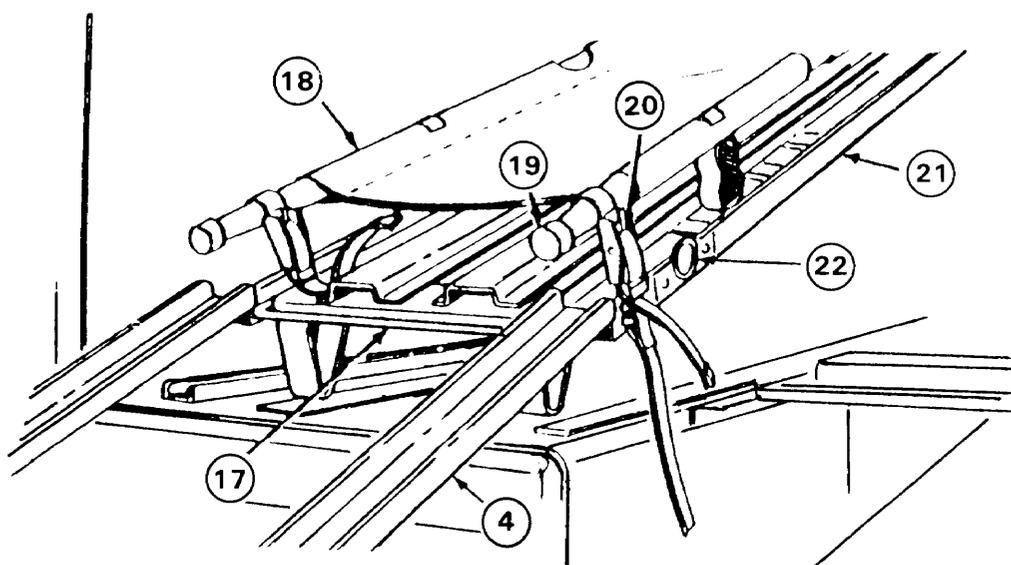


Figure 10-8. Upper litter rack.

10-7. Truck, Ambulance, 1 1/4 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.

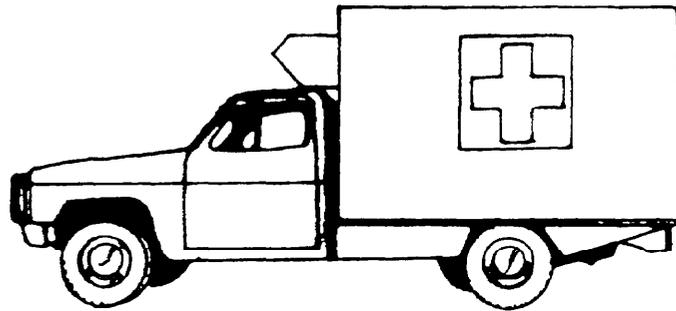


Figure 10-9. Truck, ambulance, 1 1/4 ton, 4x4, M1010.

10-8. Truck, Ambulance, 1 1/4 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.

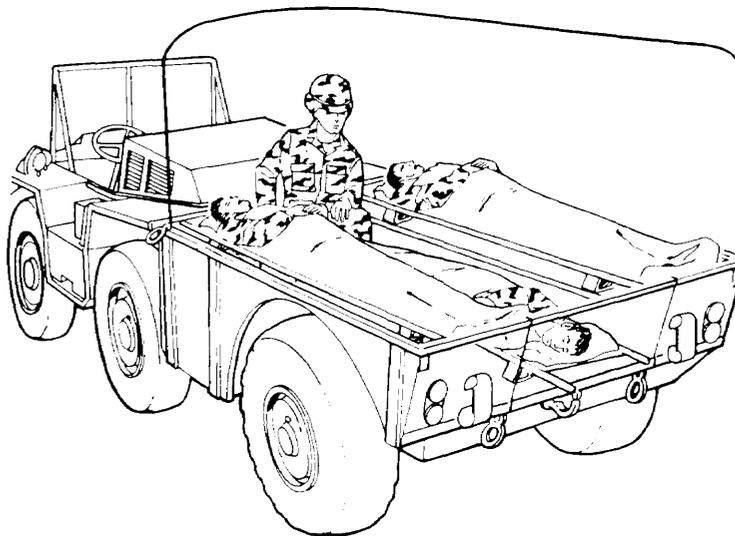


Figure 10-10. Truck, ambulance, 1 1/4 ton, 6x6, M792, with three litter patients and a medical attendant.

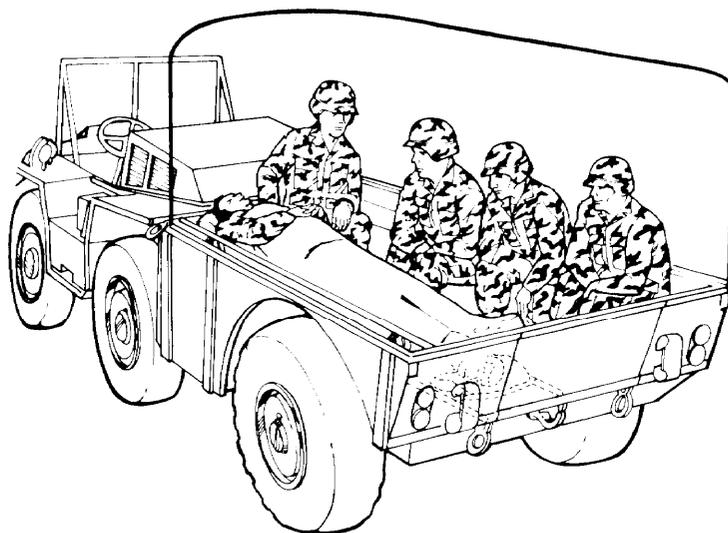


Figure 10-11. Truck, ambulance, 1 1/4 ton, 6x6, M792, with two litter patients, three ambulatory patients, and a medical attendant.

10-9. Truck, Ambulance, 1/4 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.

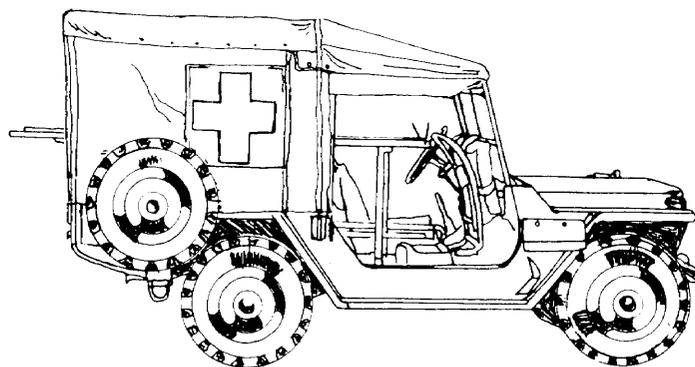


Figure 10-12. Truck, ambulance, 1/4 ton, 4x4, M718, frontline.

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 M151 utility vehicle and is not designed to carry heavy loads.

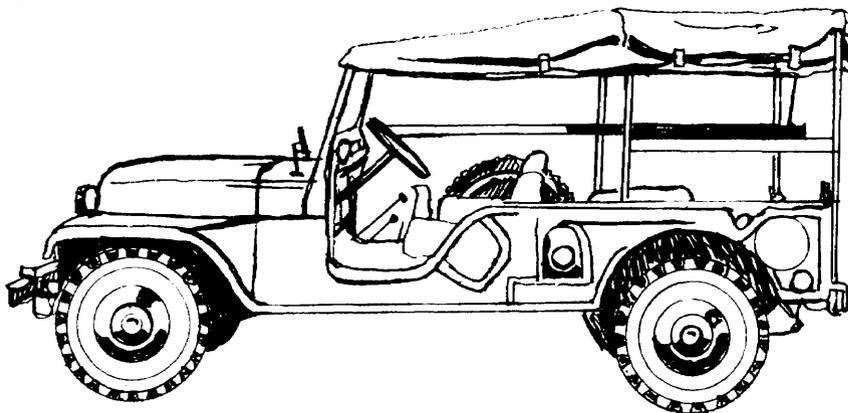


Figure 10-13. Truck, ambulance, 1/4 ton, 4x4, M170, frontline.

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 unloaded 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.

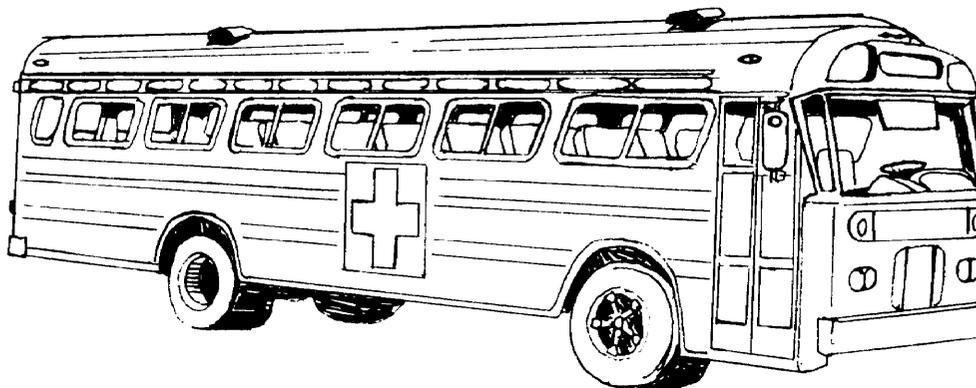


Figure 10-14. Bus ambulance, exterior view.

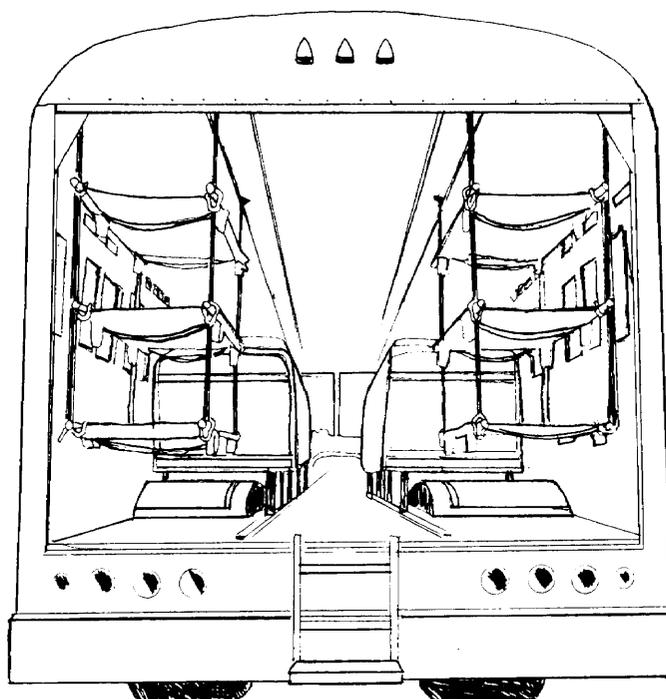


Figure 10-15. Bus ambulance, interior view, seats removed and litters installed.

10-12. Carrier, Personnel, Full-Track, Armored, M113, T113E2

The M1 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 M1 13 ambulance, the span liner must be removed. Litter patients *cannot* be safely moved if the litter suspension kit is not installed.

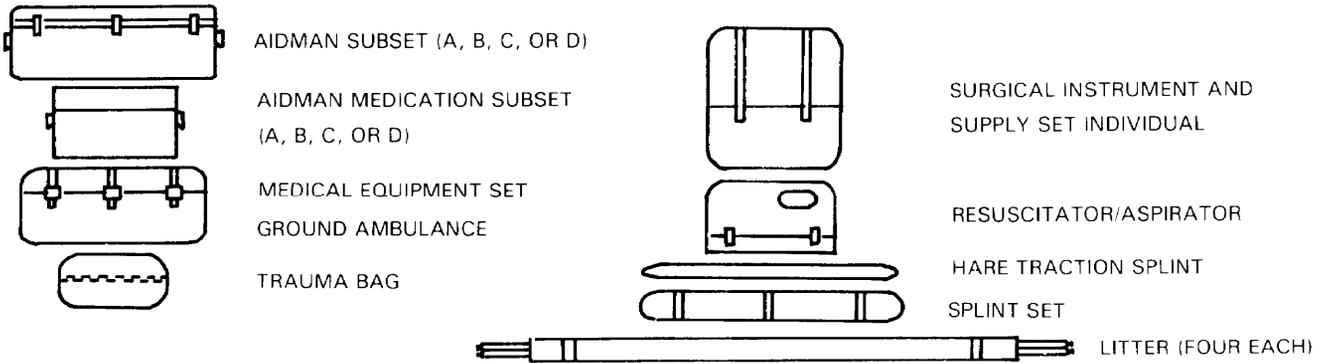
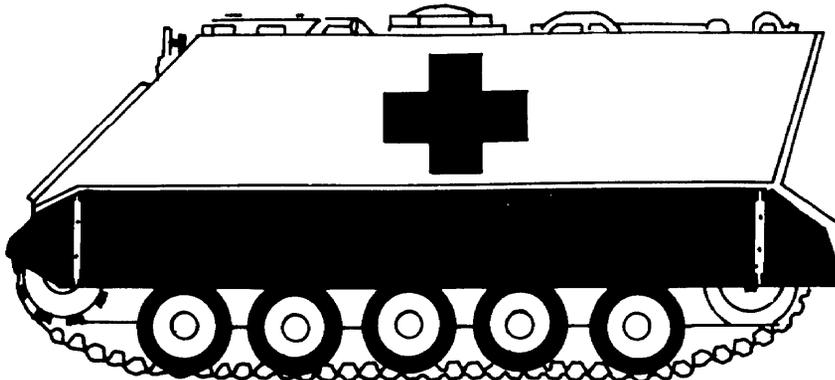


Figure 10-16. Carrier, personnel, full-tracked, armored, M113.

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 evac-

uation 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 *FSMC/*MSMC
	Air	G3 Air	
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	FSB:	forward support battalion
BSA:	brigade support area	FSMC:	forward support medical company
DSA:	division support area	MCO:	movement control officer
DMOC:	division medical operations center	MCT:	movement control team
DTO:	district transportation office	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.

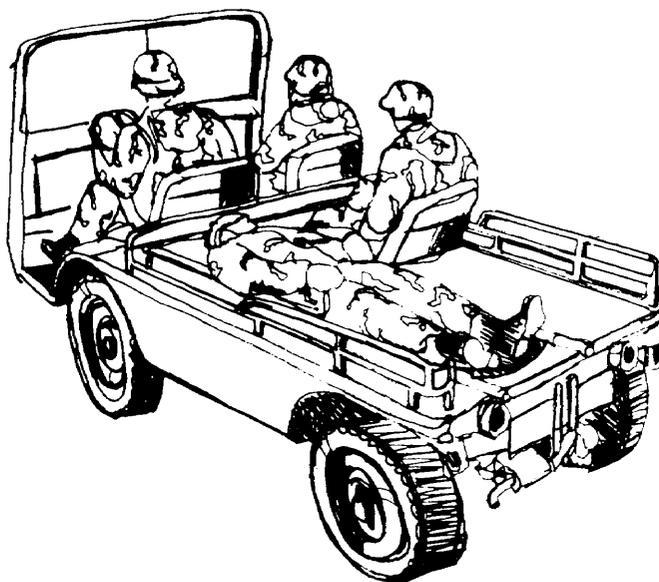


Figure 10-17. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting one patient.

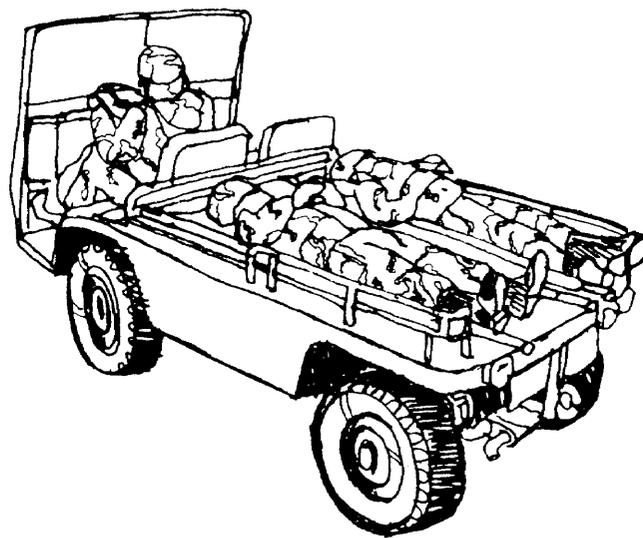


Figure 10-18. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting two patients.

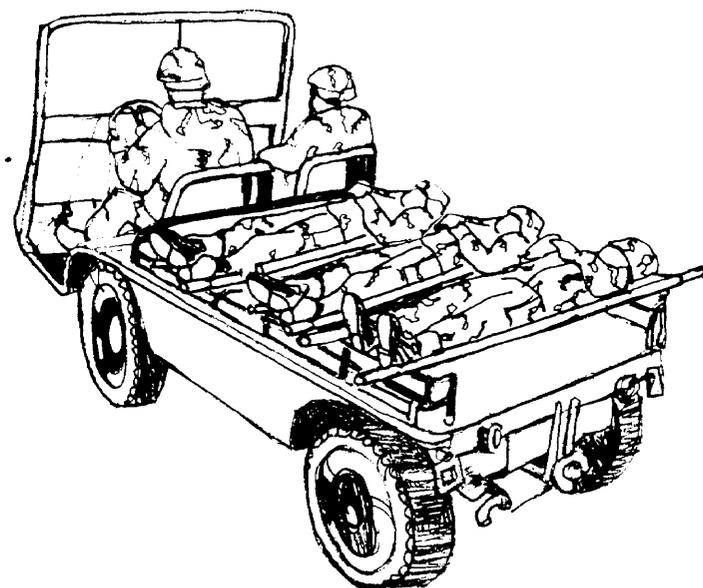


Figure 10-19. Carrier, light weapons, infantry, 1/2 ton, 4x4, M274, transporting three patients.

10-16. Truck, Utility, 1/4 Ton, 4x4, M151

This 1/4-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 1/4-ton, two-wheel trailer, M115, is designed for use with the 1/4-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.

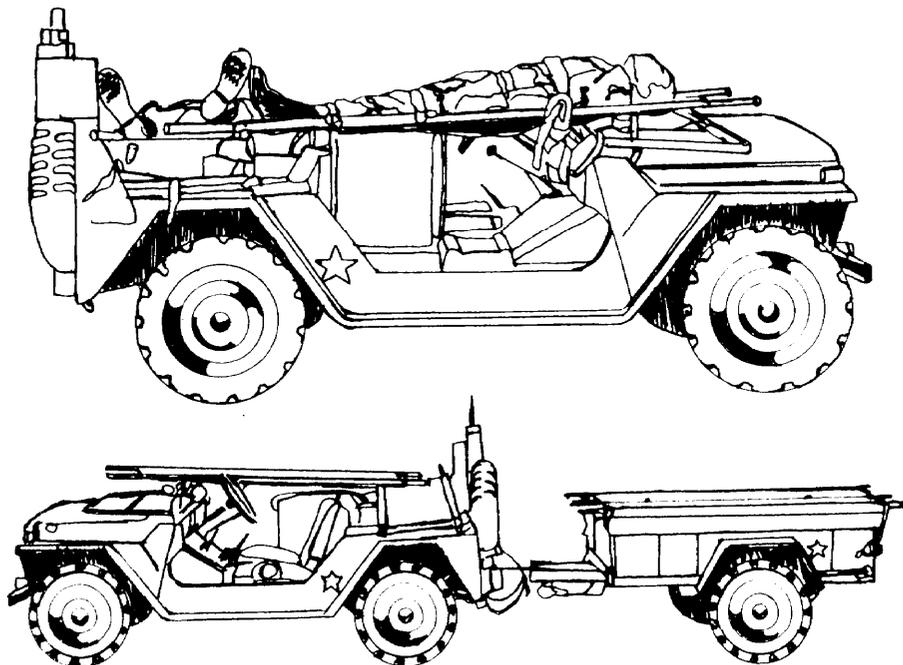


Figure 10-20. Truck, utility, 1/4 ton, 4x4, M151, with two litters, and trailer, 1/4 ton, two-wheel, with two litters.

10-17. Truck, Cargo, 1/4 Ton, 4x4/4x2, M880/890 and M1008

The 1/4-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.

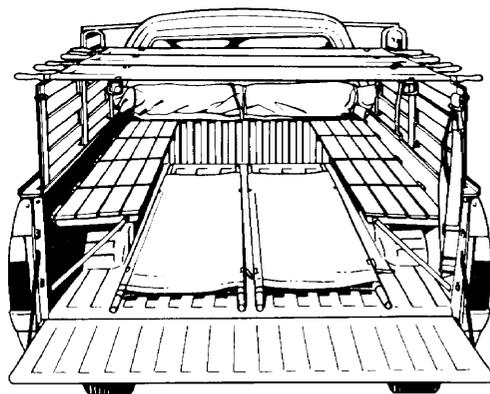


Figure 10-21. Truck, cargo, 1 1/4 ton, 4x4/4x2, M880/890 and M1008 with five litters.

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.

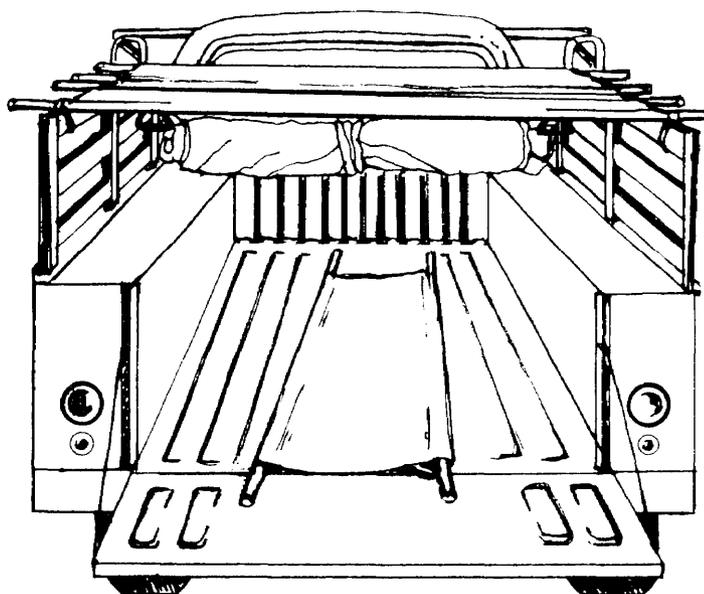


Figure 10-22. Truck, cargo/troop carrier, 1 ¼ ton, 4x4, M998, with three litters.

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.

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.

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.

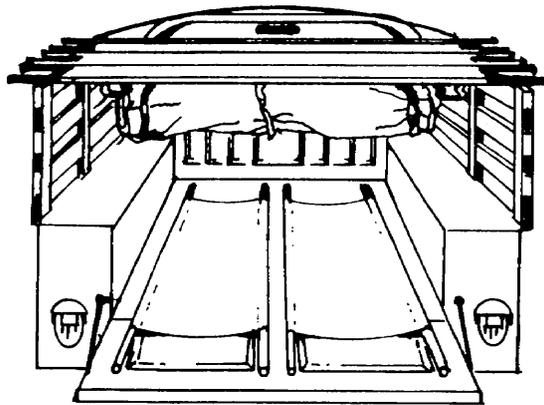


Figure 10-23. Truck, cargo/troop carrier, 1 1/4 ton, 4x4, M998, with five litters.

10-20. Truck, Cargo, 5 Ton, 6x6, Wide Bed, and Truck, Cargo 2 1/2 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.

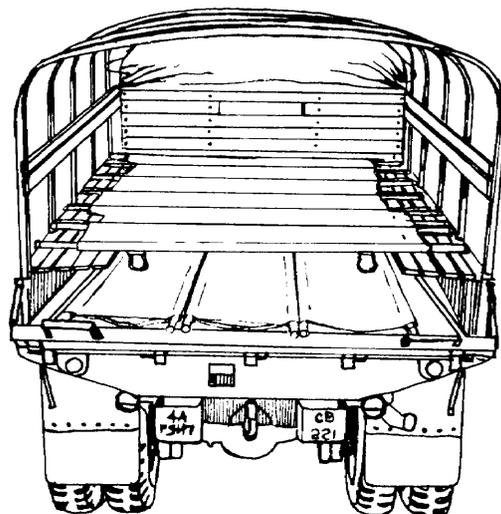
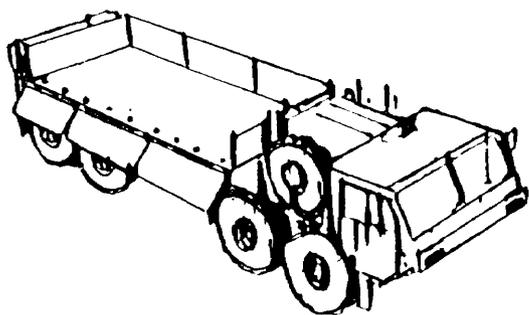
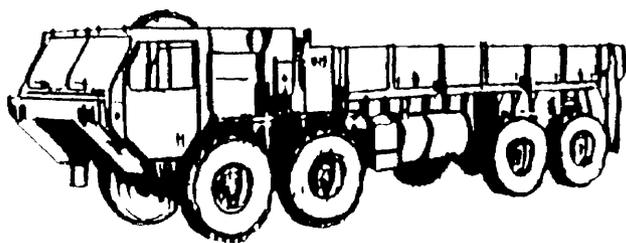


Figure 10-24. Truck, cargo, 2 1/2 ton, 6x6, wide bed, with 12 litters.

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.

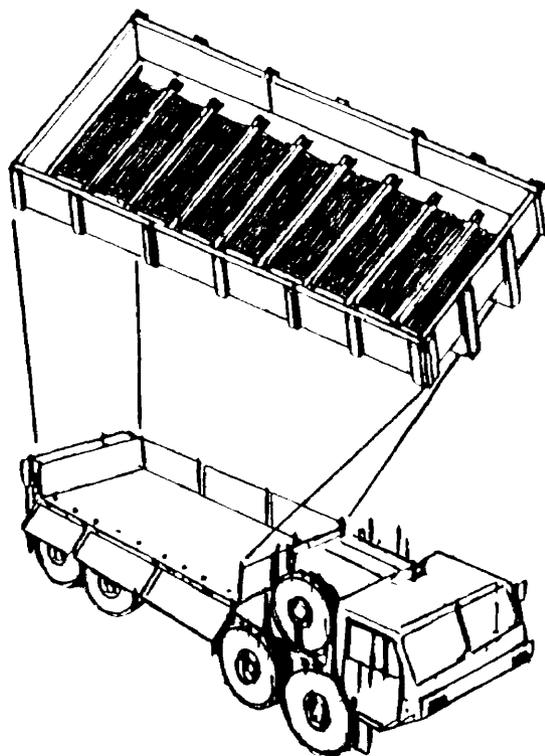


Figure 10-25. Heavy expanded mobility tactical truck, 8x8, cargo, M977.

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 ¼ of the way down, then secure the cover to protect the casualties.

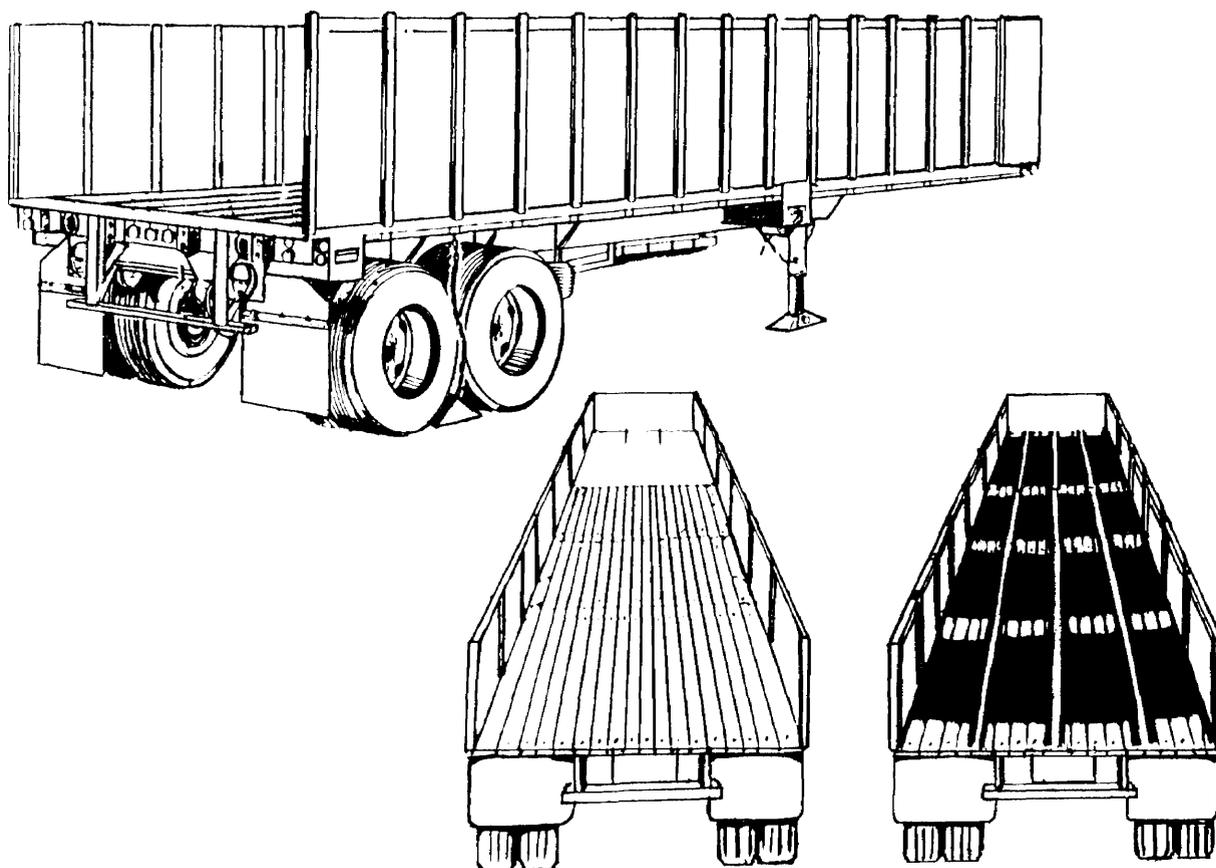


Figure 10-26. Semi-trailer, cargo, 22 1/2 ton, M871, loaded with litter.

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.

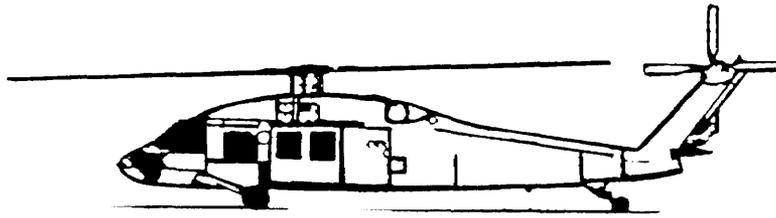


Figure 10-27. UH-60A Blackhawk.

b. The UH-1H/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.

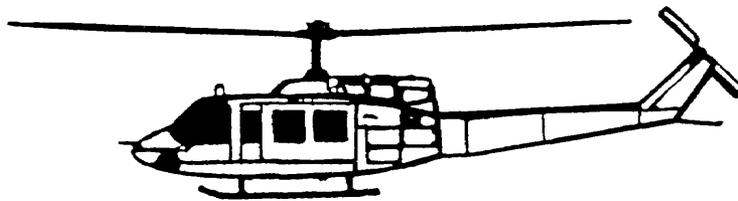


Figure 10-28. UH-1H/V Iroquois.

10-27. Helicopter Landing Sites

a. Responsibility. The unit requesting aeromedical evacuation support is responsible for selecting and properly marking the helicopter LZs.

b. Criteria 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 tempera-

ture, 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 homing, 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.

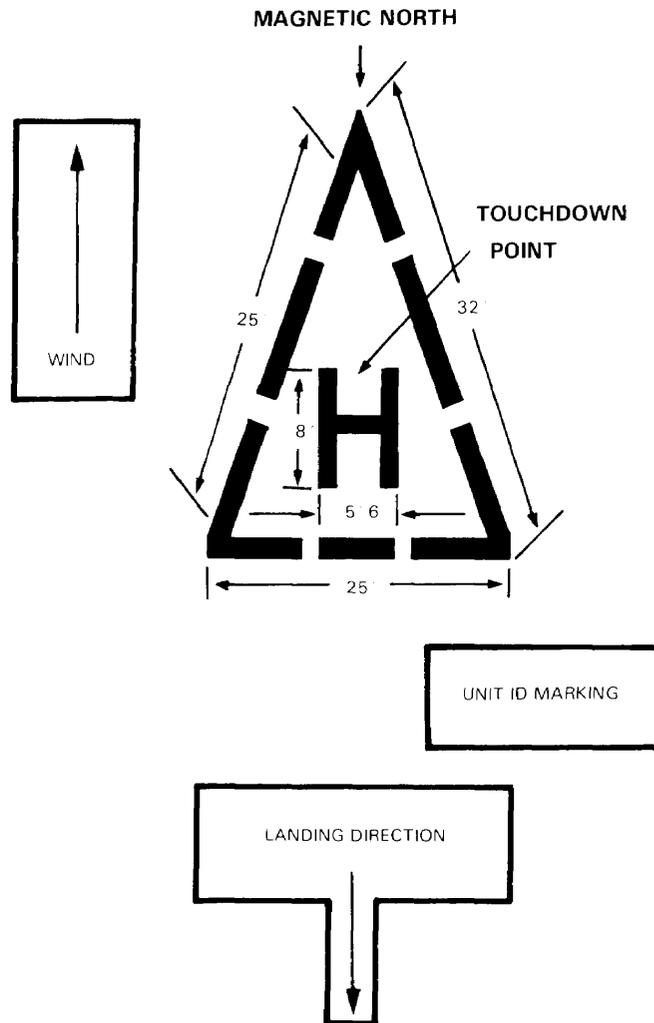


Figure 10-29. Semifixed base operations (day).

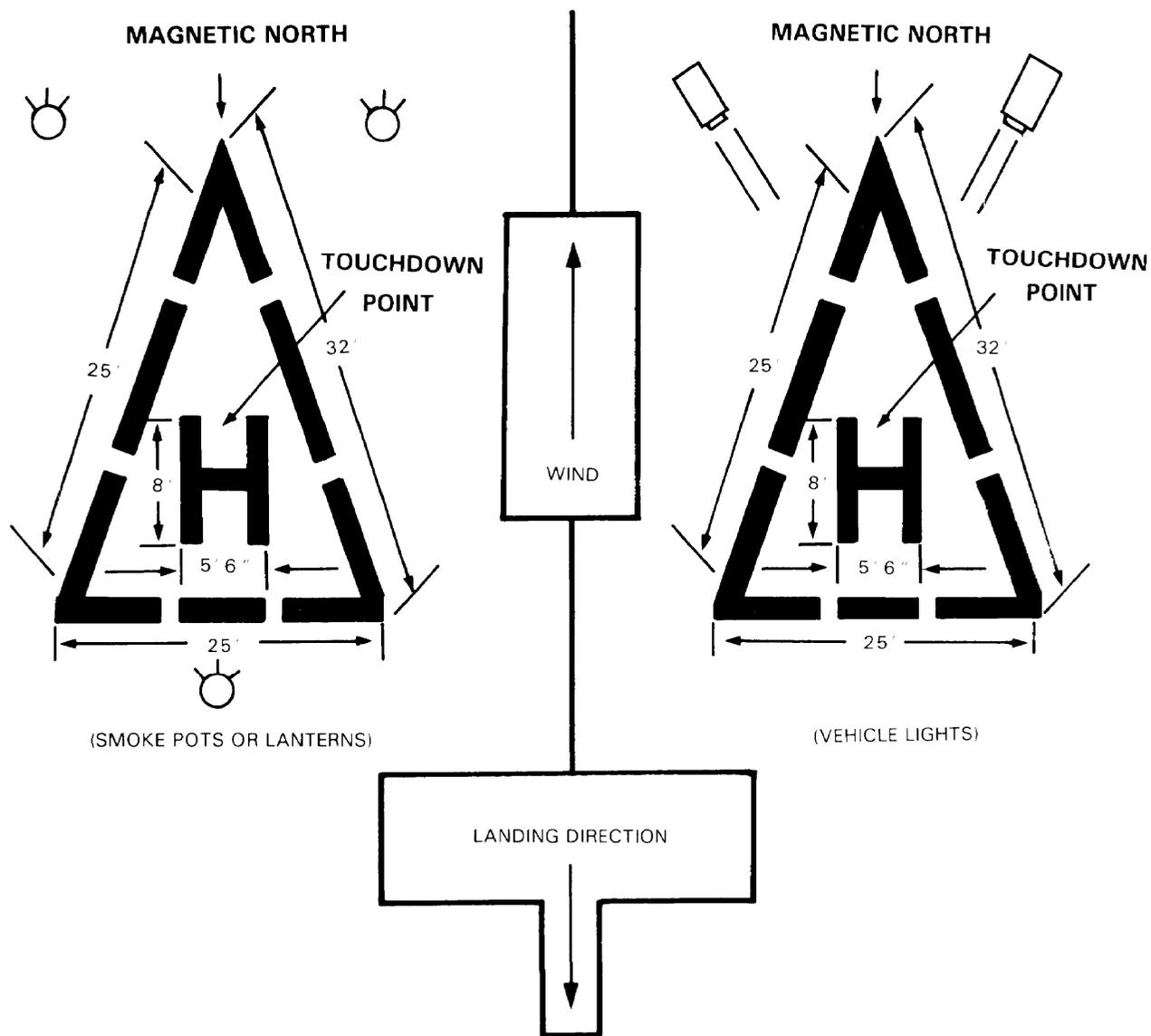


Figure 10-30. Semifixed base operations (night).

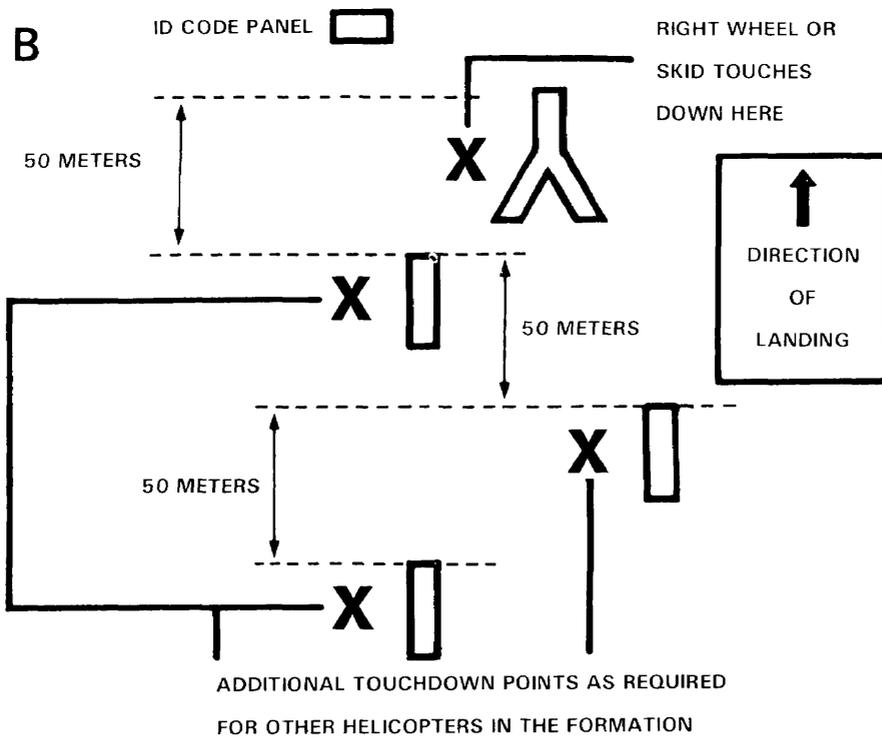
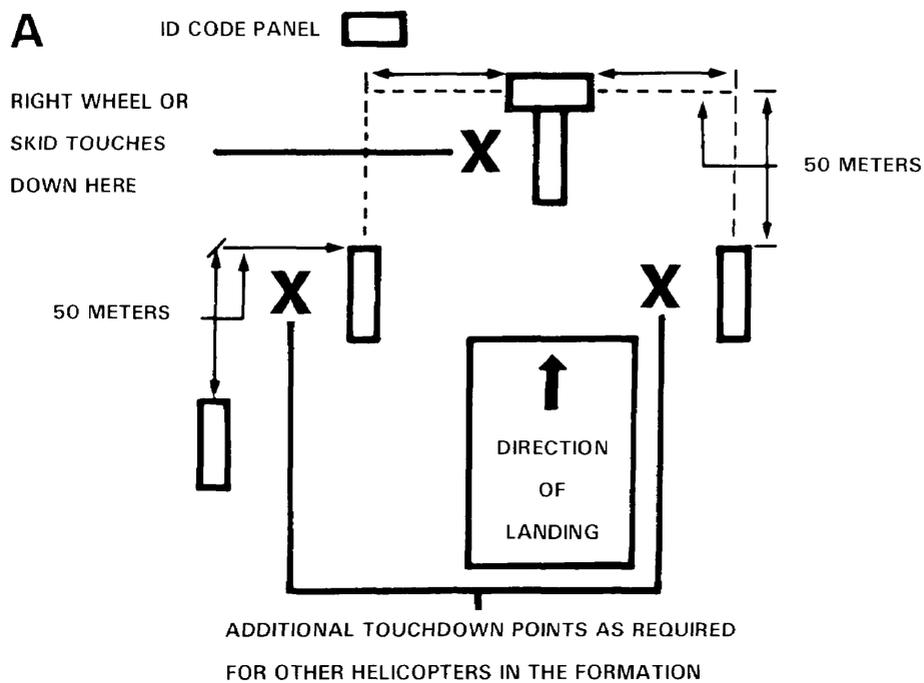


Figure 10-31. Field expedient landing zone (day).

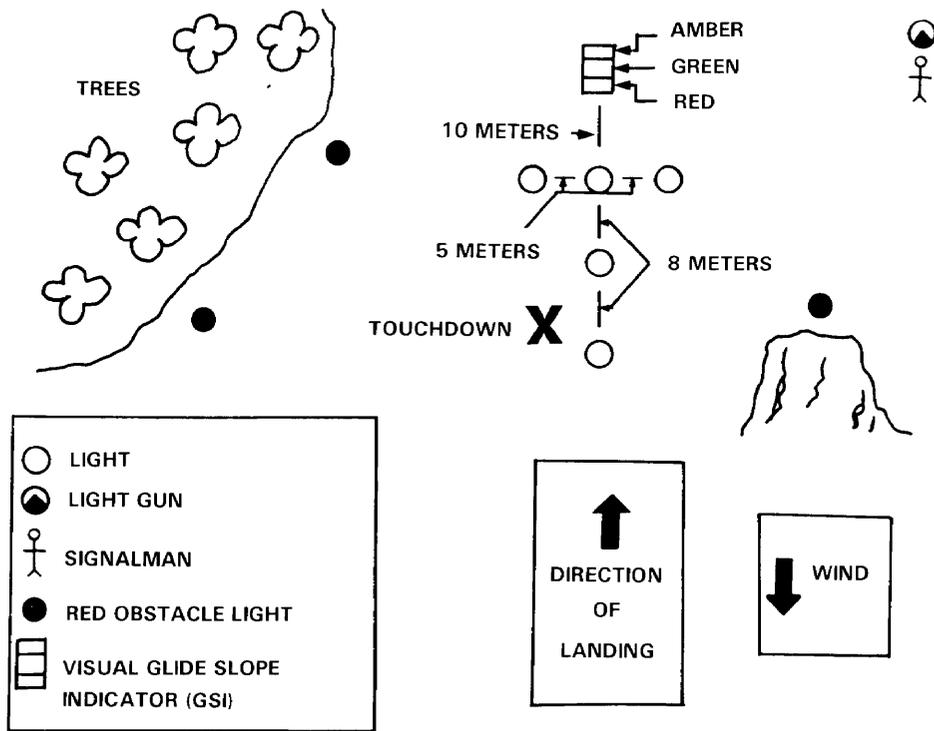


Figure 10-32. Field expedient (T) landing zone (night).

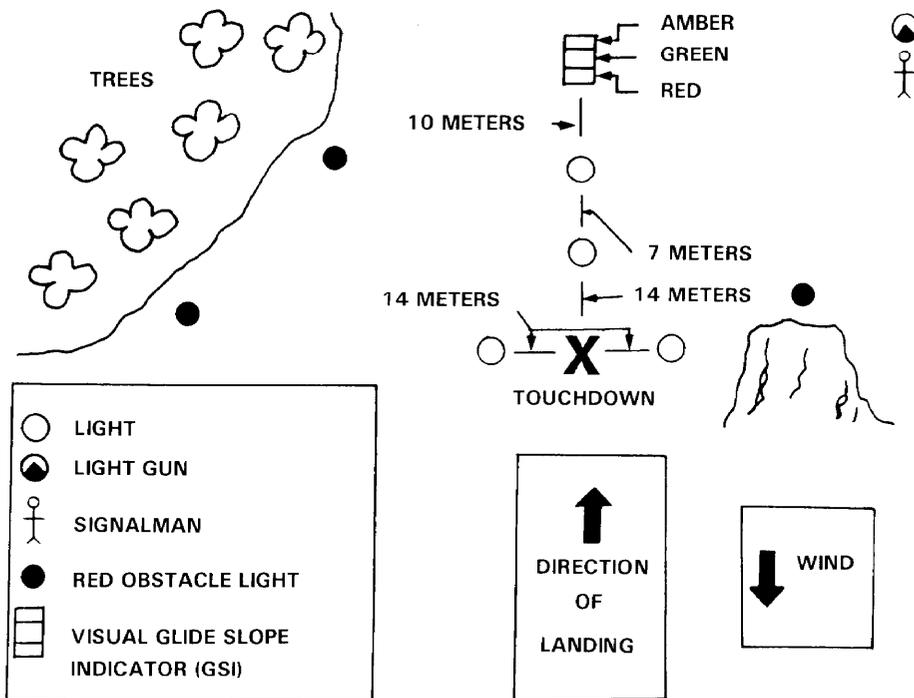


Figure 10-33. Field expedient (Y) landing zone (night).

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.

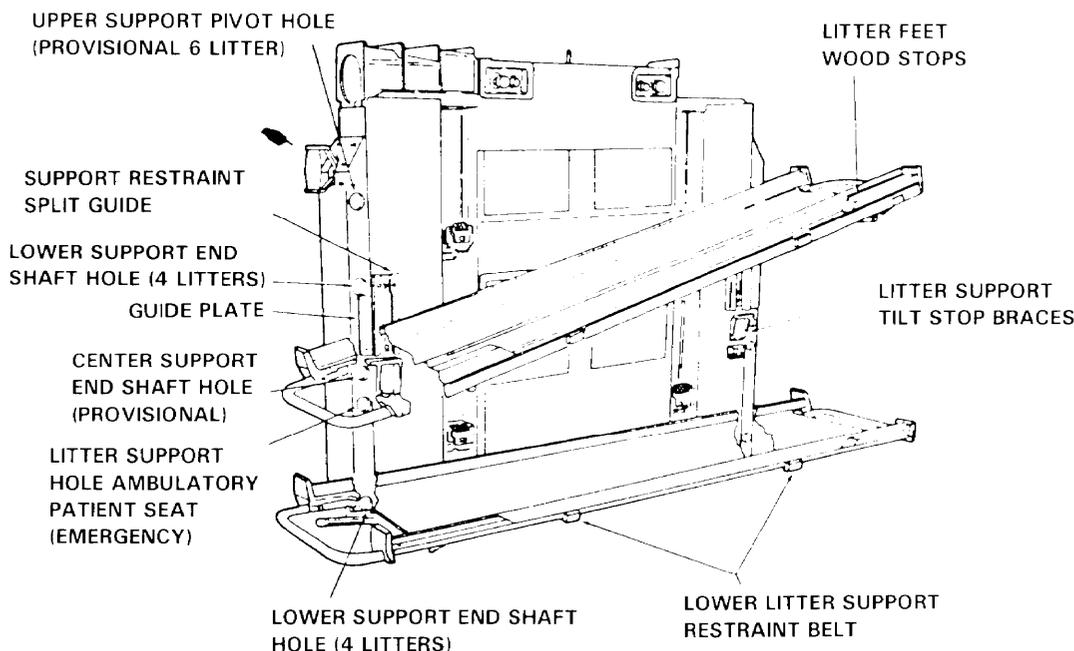


Figure 10-34. Litter pan in the load and unload (tilt) position(same at other side of pedestal).

(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.

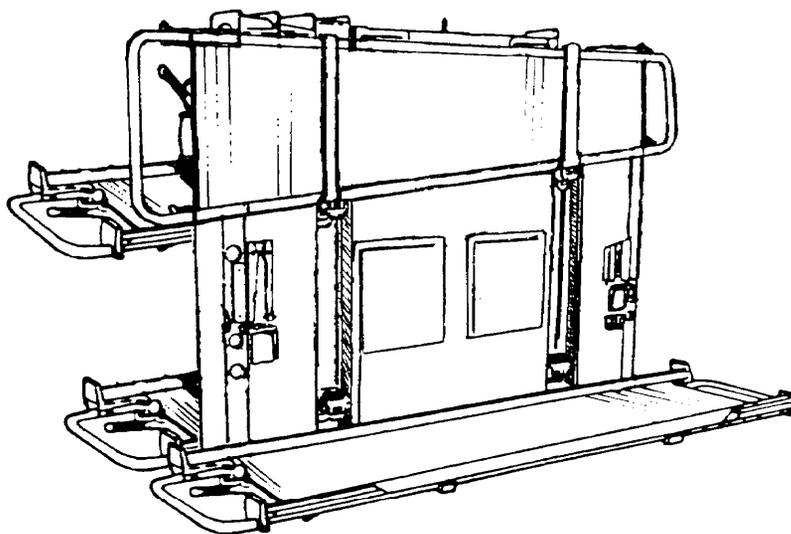


Figure 10-36. Litter support.

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-1H/V Iroquois Helicopter

a. Interior of the UH-1H/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.

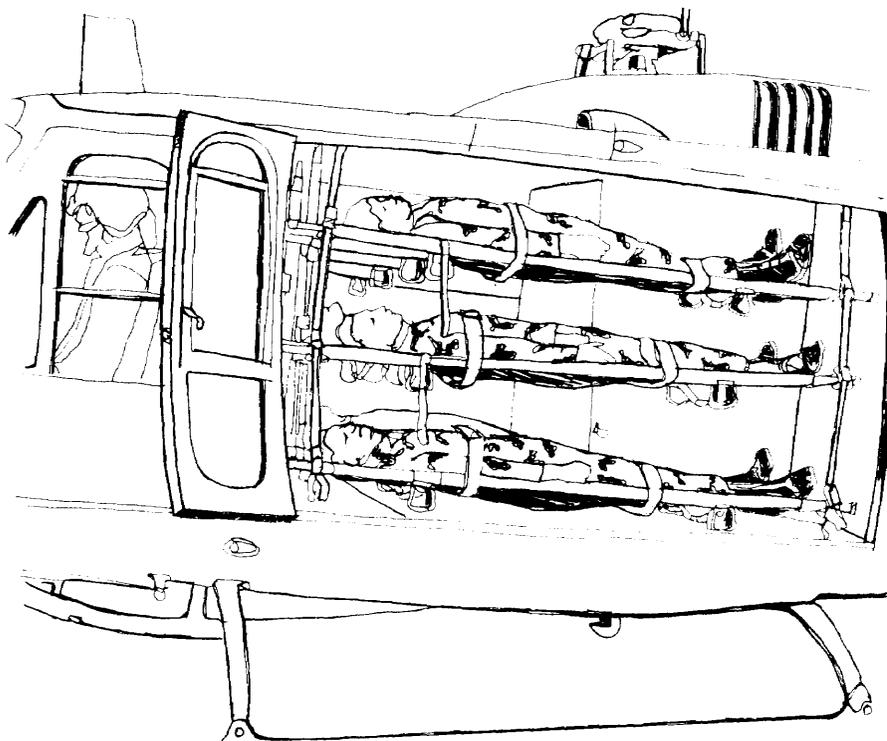


Figure 10-37. Interior view of UH-1H/V Iroquois helicopter, six-litter configuration.

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.

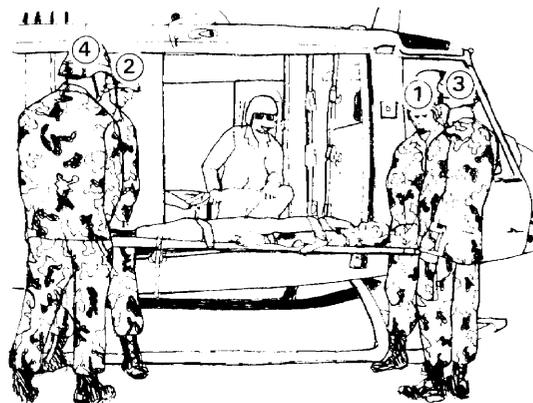


Figure 10-39. Loading air ambulance (UH-1H/V) from right side (step two).

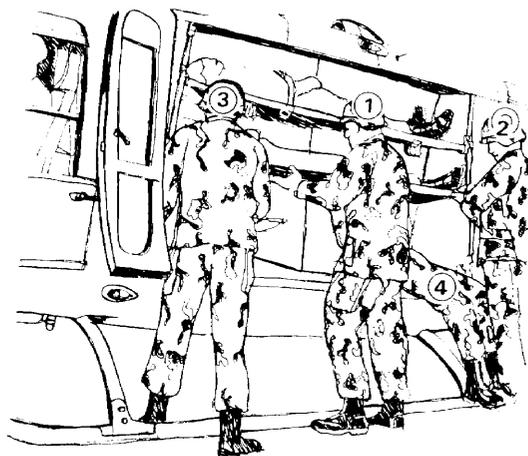


Figure 10-40. Loading air ambulance (UH-1H/V) from left side.

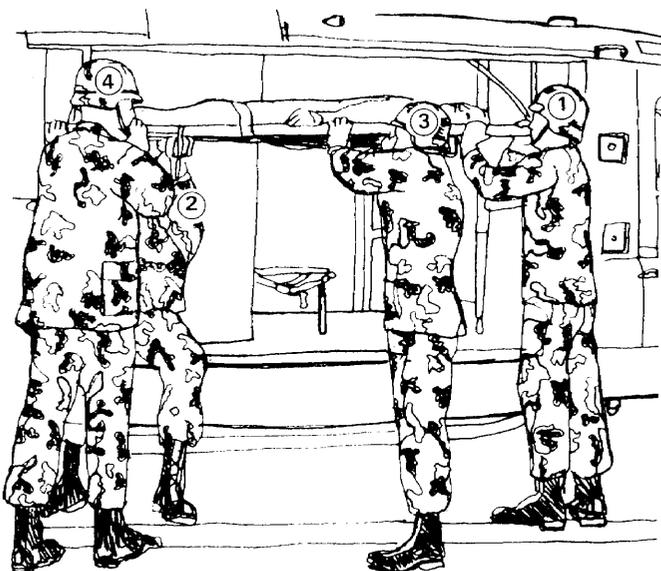
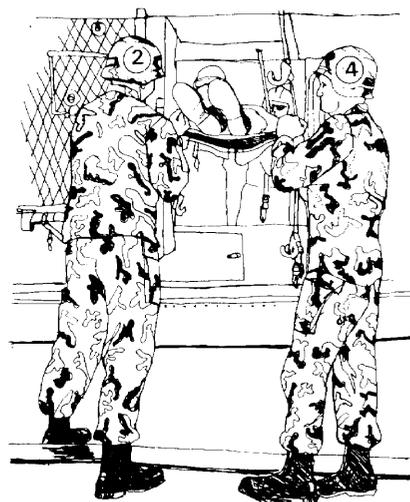


Figure 10-38. Loading air ambulance (UH-1H/V) from right side (step one).



Figures 10-41. Loading litter crosswise in air ambulance (UH-1H/V).

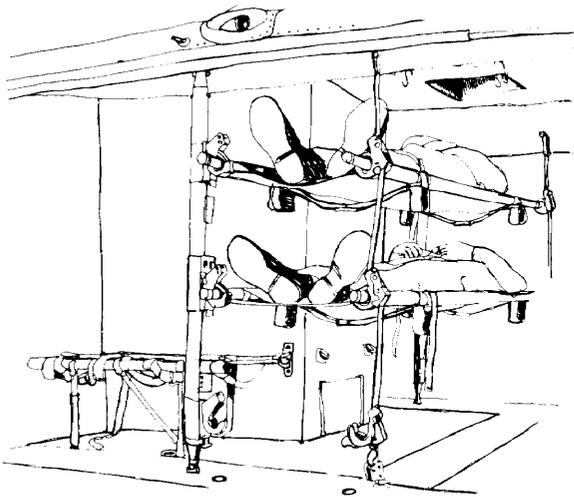


Figure 10-42. Air ambulance (UH-1H/V) with two litters loaded crosswise.

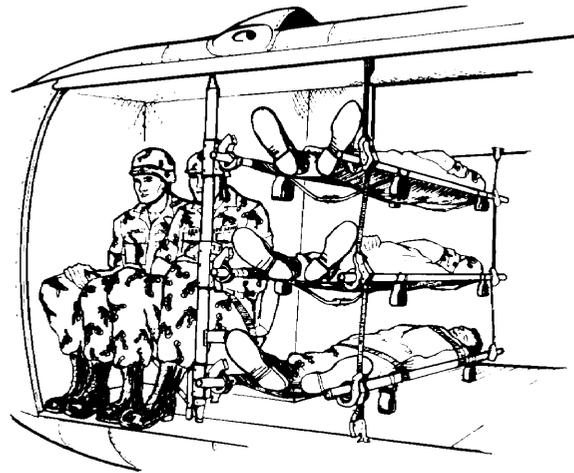


Figure 10-43. Air ambulance (UH-1H/V) with mixed load of litter and ambulatory patients.

Section IV. UNITED STATES ARMY NONMEDICAL AIRCRAFT

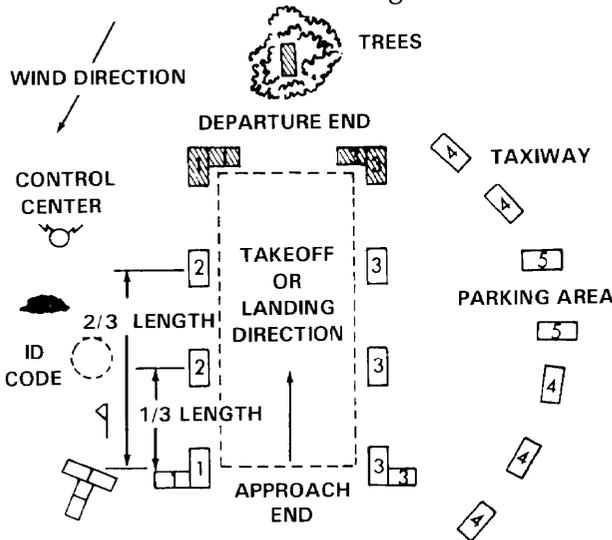
10-31. General

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.)



LEGEND

- WIND "1"
TWO PANEL HIGH
AND TWO PANELS WIDE
—TAIL OF "1" POINTED
DOWNWIND (IF USED)
- WIND SOCK
- SIGNAL PANEL—ORANGE
- SIGNAL PANEL—RED
- SMOKE
- GROUND-TO-AIR RADIO

NOTE: NUMBERS WITHIN PANELS INDICATE PRIORITY OF ESTABLISHMENT

Figure 10-44. Marking and lighting of airplane LZ (day).

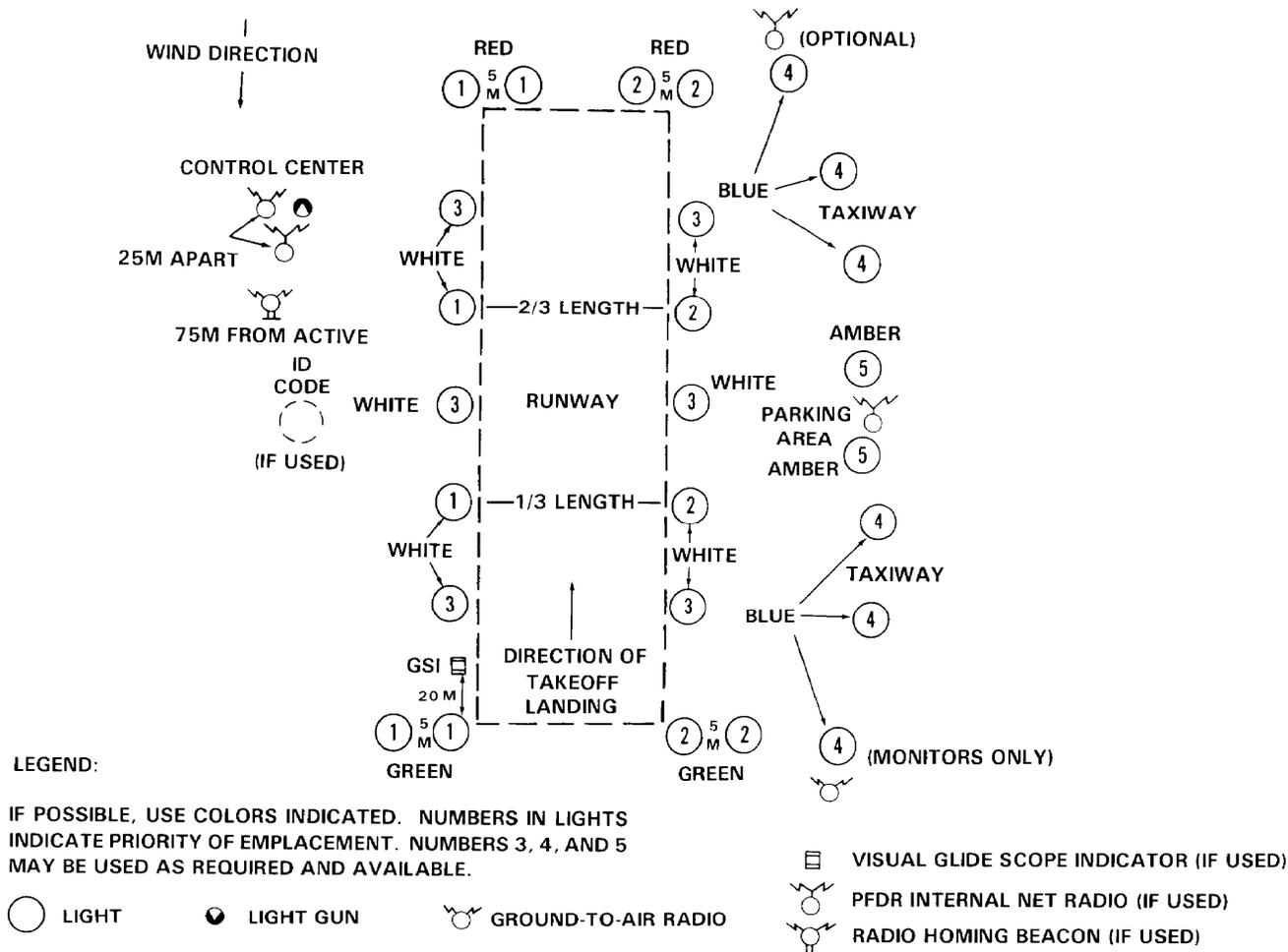


Figure 10-45. Marking and lighting of airplane LZ (night).

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.

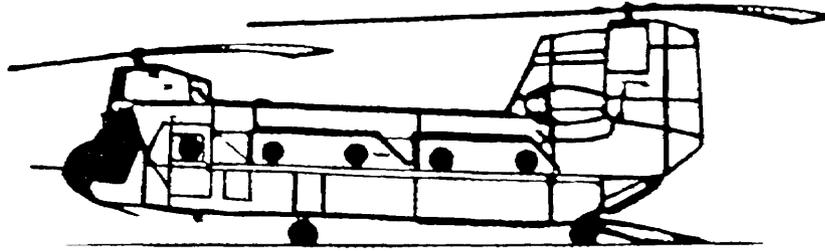


Figure 10-46. CH-47 (Chinook) helicopter.

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.

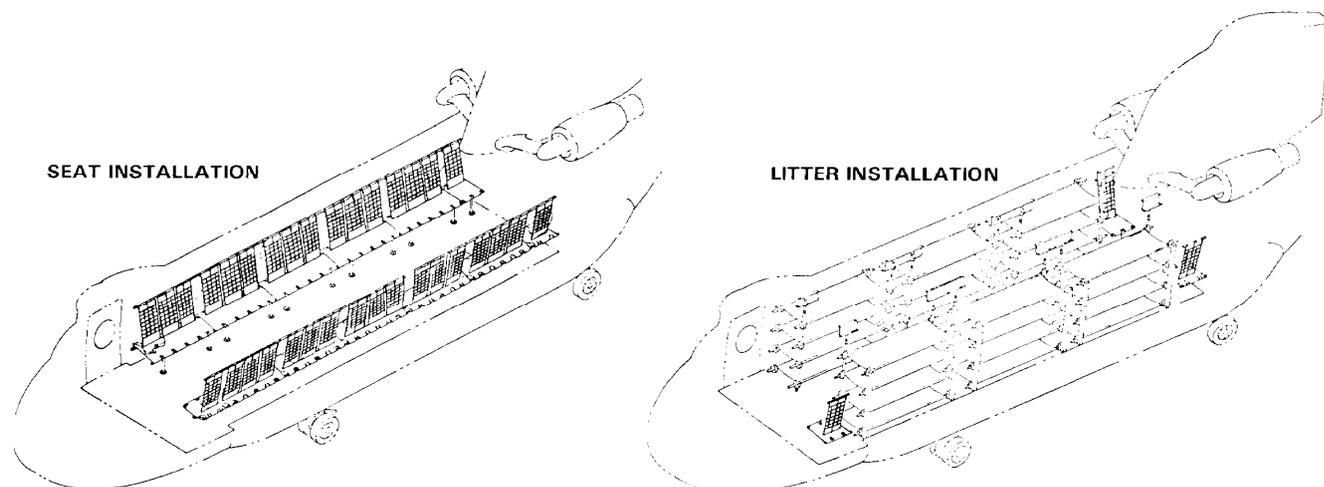


Figure 10-47. Interior view of CH-47 (Chinook) helicopter.

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.