CHAPTER 6

INFILTRATION AND EXFILTRATION

LRSU teams must be prepared to conduct several means of infiltration and exfiltration to accomplish a vareity of LRSU missions. A team that is prepared to conduct these operations increases its chances of survival and successful mission accomplishment. The methods used to accomplish these missions are waterborne, helicopter airborne, stay-behind, vehicle, and foot movement operations.

Section I. WATERBORNE OPERATIONS

The use of inland and coastal waterways may aid in flexibility, stealth, and speed for the infiltration and exfiltration of a LRSU team. The types of water infiltration and exfiltration may include small boat, surface swimming, helocasting, surface craft, or a combination thereof.

6-1. PLANNING CONSIDERATIONS

Before selecting a waterborne infiltration method, the LRS team examines the objective, the beach landing site, the shipping assets available, and the air assets available. The team makes the needed coordination for mission accomplishment. The beach landing site is critical, because it facilitates and supports the inland objective. Some of the factors that determine the feasibility of a beach landing site are hydrography, enemy situation, navigation aids, distance from debarkation point to beach landing site, beach vegetation and conditions, and exit routes from the objective. The infiltration normally takes place during darkness to provide the stealth needed by an LRS team. Also, the environmental factors produced by tides and currents must be suitable for infiltration to be successful. Some other planning considerations include—

- **Time schedule.** A reverse planning sequence of all events of the operation is used as a planning guide. This is included in the initial time schedule.
- **Beach landing site.** The beaching point.
- **Drop site.** Where the team is transported from larger transporting craft into a smaller craft or helocasting site.
- **Embarkation point.** The point where the team is initially loaded onto the transporting craft (going from a mother craft to smaller craft to get to the landing site).

- **Loading.** Loads and lashings, with emphasis on waterproofing, are in accordance with the unit SOP. Inspections by supervisors area must.

6-2. F470 ZODIAC BOAT

The LRSU team uses the F470 Zodiac boat for small boat operations. It is inflatable with foot pumps, using four separate valves on the inside of the buoyancy tubes. Each of the valves are used to section off the Zodiac boat into eight separate airtight compartments. The overall length is 15 feet, 15 inches; overall width is 6 foot, 3 inches; weight is 265 pounds; and maximum payload is 2,710 pounds. The crew consists of a coxswain, four paddlers, and a navigator. The boat can be powered by a 40-horsepower short-shaft outboard motor. The team is positioned as shown in Figure 6-1.

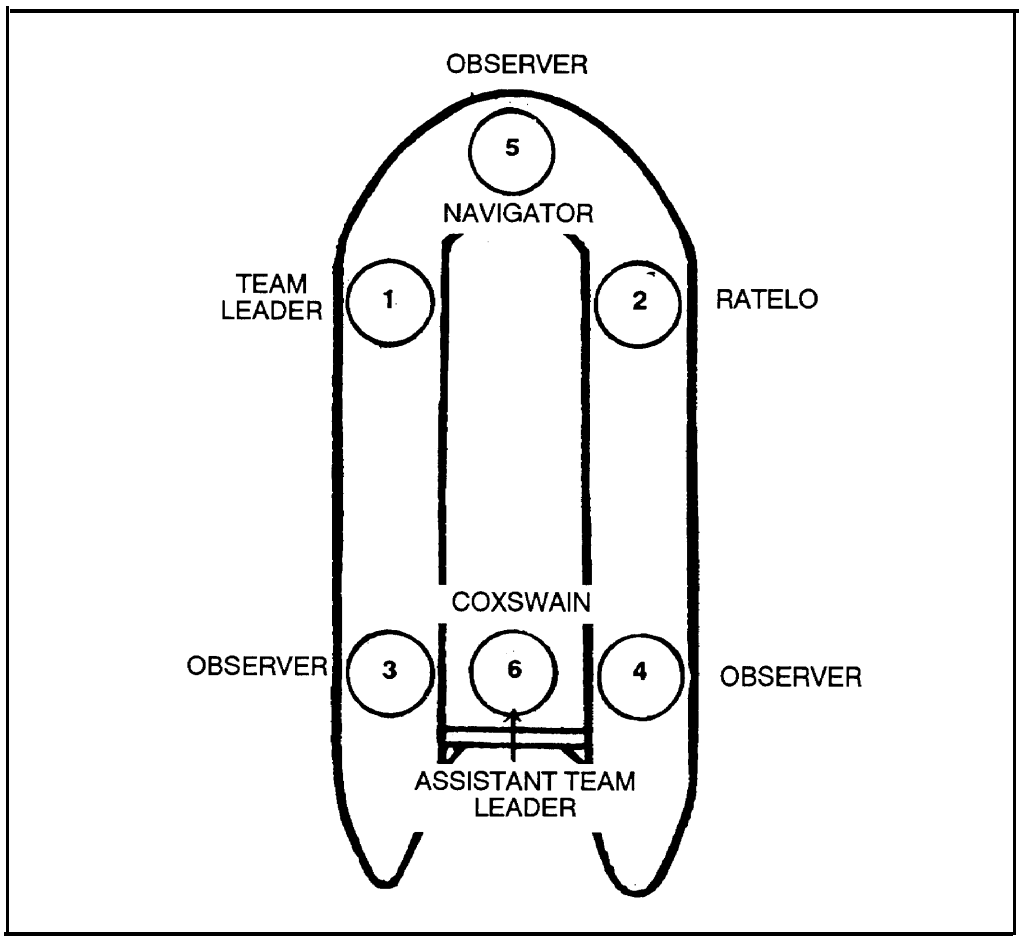


Figure 6-1. Zodiac configuration.

- The coxswain (assistant team leader) is responsible for control of the boat and action of the crew. He supervises the loading, lashing, and distribution of equipment. He also maintains the course and speed of the boat and gives all commands.
- The No. 1 paddler (team leader) is the observer. He is responsible for the storage and use of the bowline.
- The No. 2 paddler (RATELO) is responsible for setting the stroke.
- The No. 3 and No. 4 paddlers (observers) are responsible for paddling and flank and rear security.
- The navigator (observer) assists the coxswain; he does not paddle.

a. **Preparation of Personnel and Equipment.** Each person puts on a work vest and a life preserver with harness unbuckled at the waist. The rifle is slung over the life preserver, opposite the inboard side, muzzle down. Radios, ammunition, and other bulk equipment must be lashed securely to the boat to prevent loss if the boat should overturn.

(1) An anchor line bowline is tied with a sling rope into the last V-ring closest to the transom on the floor.

(2) Each team member's rucksack has a snap link attached to the top portion of the rucksack frame to be used as an anchor point to tie down rucksacks.

(3) The coxswain's rucksack is positioned frame forward and behind the last V-ring.

(4) The sling rope is then tied to the front V-ring with a round turn and two half hitches with a quick release.

b. **Launching in Surf.** The coxswain observes surf conditions and considers the intervals of the breakers to time of the boat launching. The coxswain orders the number one and two paddlers to board the boat when they are about thigh deep in the water. As soon as they are aboard, they begin to paddle. The procedure is repeated for the number three and four paddlers. As soon as a wave breaks and the time is favorable, the coxswain gives the boat a final push and embarks.

NOTE: The crew leans well forward to keep their weight forward in the bow. This helps prevent the boat from capsizing and assists in forward momentum.

c. **Beaching in Surf.** The coxswain observes the surf to consider the time to enter. Before entering the surf zone, the coxswain orders the crew to shift their weight to the rear (stern) of the boat to reduce the possibilities of capsizing.

(1) The coxswain and the paddlers keep the boat perpendicular to the waves as the boat enters the surf zone. The coxswain observes the surf and gives the commands to the paddlers to vary the speed of the boat and to avoid plunging into breakers. The coxswain periodically looks seaward to observe the surf. The paddlers never look seaward, because they may lose their cadence and fail to observe the surf to their front. As each wave rises, the paddlers take advantage of the wave's momentum by paddling vigorously.

(2) Upon reaching shallow water, the coxswain orders the paddlers out of the boat in pairs; for example (short count), "Ones, out; twos, out." (See Figure 6-2.) Each pair, on disembarking, immediately grabs the boat handles and begins pulling the boat to the beach.

(3) The coxswain collects the paddles and directs the crew to empty the water from the boat and carry it to higher ground, while the two crewmen provide security.

(4) Once the team has reached the beach landing site, the team searches the area for a suitable cache site for the boat. The team, if properly equipped, may elect to conceal the boat by either subsurface cache, surface cache, or submerge the equipment if possible.

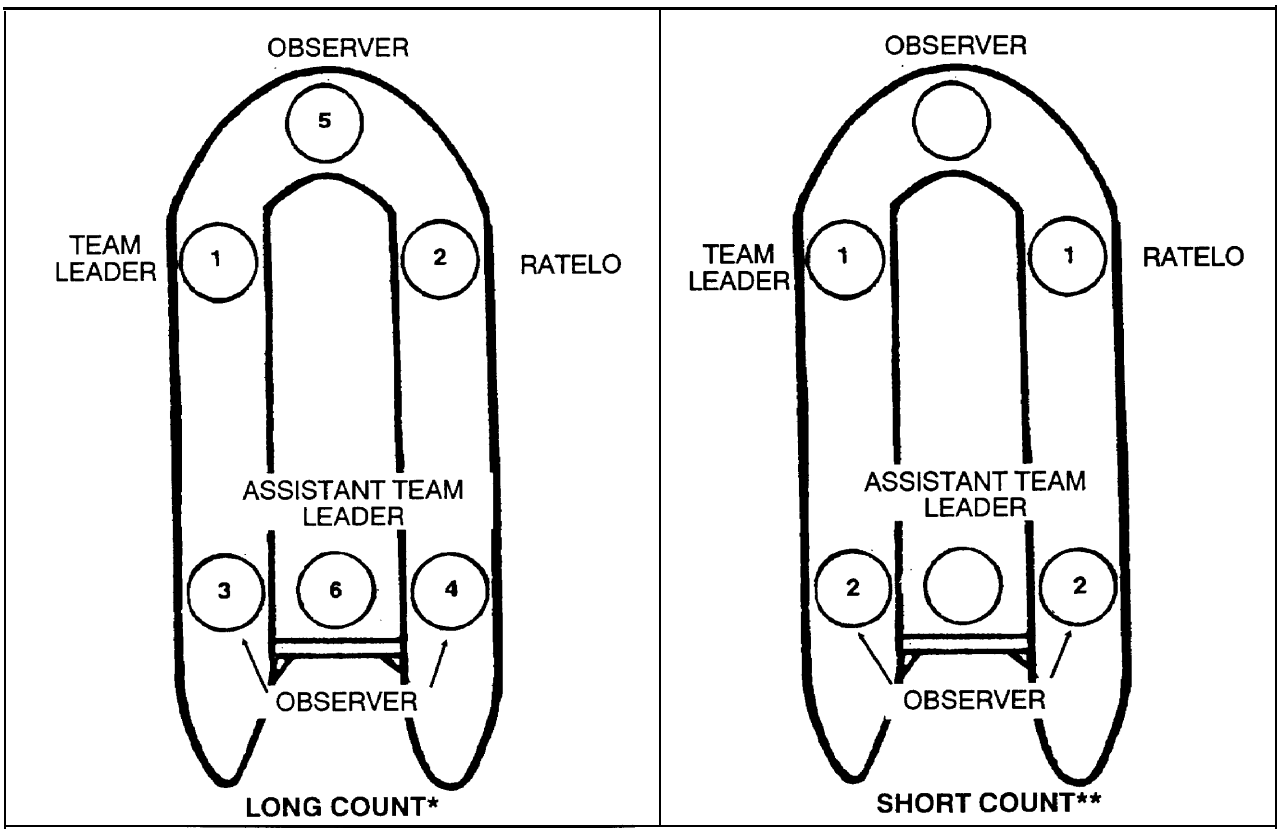
d. **Offshore Navigation.** Offshore navigation may be needed if a team is inserted by going from a larger vessel to their small boat. This type of navigation is confirmed by experienced naval personnel on board the larger vessel. Conventional navigation methods are suitable for conducting boat operations inshore and along streams or in small lakes. During infiltration operations in large lakes and large rivers, supplementary navigation equipment may be required. This is especially true when operations are conducted at night or during other limited visibility. In areas where there is significant marine traffic, buoys and other navigational devices mark the limits of channels and turning points. All of these are marked on charts of the area. These charts may be obtained from marine supply stores, the US Coast Guard, or the US Navy, Such charts should be procured in enough time to allow for translation if necessary.

(1) There may be occasions when precise navigation is essential for mission accomplishment, but the enemy has moved or removed local navigational aids. Aerial reconnaissance, including photographs of the entire area to be traveled, should be requested if time and situation permit.

(2) In areas where currents area factor, offset navigation techniques may be used. Criticality of currents depends on the distance to shore from the launch point.

- For launches within 460 meters of the beach, currents of .5 knots or greater are critical.
- For launches in excess of 460 meters, a .2-knot current is critical.

NOTE: The speed of a current can be measured by using a bottle partially filled with sand. This moves well and the wind does not affect it. A l-knot current moves an object 100 feet in 1 minute.



*Long count is used if the boat capsizes. Coxswain commands sound off with long count. All personnel count off.
**Short count is used during launching and beaching procedures or to give the team a rest period; for example, "Ones, rest; twos, give way; ones, load; twos load or off-load."

Figure 6-2. Long and short count configuration.

The tidal current offset must be computed as follows. This method produces a minimum offset. (See Figure 6-3, page 6-7; the following numbers are keyed to the figure.)

1. From tables 1, 2, and 3 of the National Ocean Survey current tables (furnished by US Navy), the set and drift of the tidal current are computed for the planned launch time at the subordinate station nearest the launch point.
2. On the chart or map that includes the landing point, a line parallel to the coastline is drawn. This line represents the track of the transporting vessel. The track is normally 2 miles offshore (the limit of horizontal visibility for an observer 3 feet above the surface of the water). The distance from the shoreline must be measured to scale. The scale on the map or chart is used.
3. A perpendicular line is drawn from the landing point to the track. This line represents the course of a boat unaffected by a current. The intersection of this line and the track is called the uncompensated launch point.
4. The time required for passage from the uncompensated launch point to the landing point is calculated.

$$T \text{ (time)} = \frac{D \text{ (distance)}}{S \text{ (speed)}}$$

Example: D = 2 nautical miles; S = 2.5 knots

T = 2 divided by 2.5

T = 0.8 hour

NOTE: A seven-man crew of an inflatable boat can maintain a speed of 3.7 kilometers (2 knots) per hour using paddles. If speeds in kilometers per hour are used, then distances must be in kilometers.

5. From the landing point, a line (azimuth) representing the set of the current is protracted. The direction of the set of the current is listed as degrees true as listed in table 2 of the current tables.
6. To compute the effect of the current on the boat, the passage time (step 4) by the drift (speed) of the current is multiplied.

Example: Passage time = 0.8 hour

Drift (speed) = 2.0 knots

0.8 x 2.0 = 1.6 nautical miles (effect of current)

7. This value (effect of the current) is measured along the set line (step 5) using the same scale used in step 2.
8. A line is drawn connecting the uncompensated launch point and the set of the current value on the set line. This represents the course determined by the exposure to the current.

9. The effect of the current on the set line is the factor that must be compensated for by offsetting an equal value on the up current side of the track.

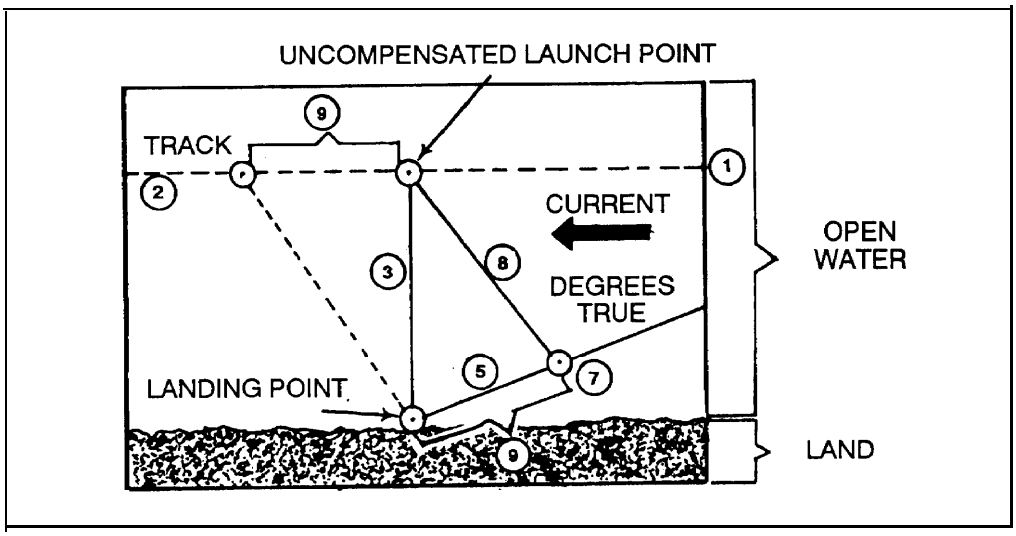


Figure 6-3. Offset navigation.

e. **Inshore Navigation.** The LRSU team leader is responsible for navigation. There are two acceptable methods of river navigation.

(1) Checkpoint and general route. This method is used when the drop site is marked by a well-defined checkpoint and the waterway does not have many branches and tributaries. It is best used during daylight hours and for short distances.

(2) Navigator-observer methods. This is the most accurate means of river navigation and can be used effectively in all light conditions. Equipment needed to do this is a compass, photo map (first choice), topography map (second choice), poncho (for night use), and pencil and flashlight (for night use).

(a) The navigator is positioned in the front of the boat and does not paddle. The navigator keeps his map and compass oriented at all times. To check the map during darkness, he uses his flashlight under a poncho.

(b) The navigator keeps the observer informed of the configuration of the river by announcing bends, sloughs, reaches, and stream junctions as shown on the map.

(c) The observer compares this information with the bends, sloughs, reaches, and stream junctions he sees. When these are confirmed, the navigator confirms the boat's location on his map.

(d) The navigator also keeps the observer informed of the general azimuths of reaches as shown on his map. The observer confirms these with actual compass readings of the river.

(e) The navigator announces only one configuration at a time to the observer. He does not announce another until the first is confirmed and completed.

(f) A strip map drawn on clear acetate, backed by luminous tape, may be used. The drawing may be to scale or a schematic. It should show all curves and the azimuth and distance of all reaches. It may also show terrain features, stream junctions, and sloughs.

f. **River Movement.** The characteristics of the river must be known before embarking on river movement. The coxswain, navigator, and No. 1 paddler must watch the water for obstacles, overlapping vegetation, and projections from the bank.

(1) A bend is a turn in the river course.

(2) A reach is a straight portion of river between two curves.

(3) A slough is a dead-end branch from a river. They are normally quite deep and can be distinguished from the river by the lack of current.

(4) Dead water has no current because of erosion and changes in the river course. Dead water is characterized by an increase in snags and debris.

(5) An island is usually a pear-shaped land mass in the main current of the river. Upstream portions of islands usually catch debris and should be avoided.

(6) Sandbars are at those points where a tributary feeds into the main body of a river or stream.

(7) The current in a narrow part of a reach is normally greater than in the wide portion. The current is greatest on the outside of a curve. Sandbars and shallow water are on the inside of the curve.

g. **Maintenance and Storage of F470.** The boat must be washed with fresh water after use in salt or muddy water.

(1) Inflation and deflation valves must be kept lubricated with silicone to prevent rusting and freezing.

(2) The boat must not be left fully inflated for long periods in the sun.

(3) All parts and accessories must be inspected. The boat should be repacked after inspection.

(4) The boat should be stored in a cool dry place out of direct sunlight. It must be stored away from furnaces, steam pipes, boilers, oil, oil contaminated areas, grease, and solvents.

6-3. SCOUT SWIMMER

Scout swimmers reconnoiter and secure the beach landing site before committing the entire team on the beach. They are normally employed in pairs. In addition to locating a suitable beach landing site, they must also locate an assembly area, look for suitable cache sites, and locate a position to signal the team.

a. Normally, scout swimmers are launched from a small boat outside of the surf zone. Scout swimmers are equipped with the following:

(1) *Life vest.*

(a) Use: Flotation device for tired or injured swimmer, aides in buoyancy, worn under all equipment except wet suit, no quick-release, never ditched.

(b) Serviceability: Check oral inflation tube; inflate, check for leaks; check CO_2 inflation mechanism.

(c) Preventive maintenance: Freshwater wash after use; clean, lubricate CO_2 mechanism, replace if used; partially inflate and store in dry, cool area.

(2) *Swim fins.*

(a) Use: Aids in swimmer propulsion.

(b) Serviceability: Check for proper fit, check for broken straps.

(c) Preventive maintenance: Fresh water wash.

(3) *Dive tool.*

(a) Use: A tool or knife, prevents entanglements, should not be jettisoned.

(b) Serviceability: Check for rust or corrosion, check for cracked or broken blade, sharpness.

(c) Preventive maintenance: Wash with fresh water, sharpen, and lubricate.

(4) *MK13 day or night flare.*

(a) Use: Emergency signal device.

(b) Serviceability: Check seals (if broken do not use), check pull ring and lanyard.

(c) Preventive maintenance: Fresh water wash, store according to the SOP.

(5) *Coral shoes or booties.*

(a) Use: When working in coral or rocky waters, protection for feet when wearing fins.

(b) Serviceability: Check for rips or holes, check for proper fit.

(c) Preventive maintenance: Fresh water wash, dry out of direct sunlight.

b. Movement to the launch point from debarkation point is normally done by the use of inflatable boats with engines. A launch point is where scout swimmers enter the water and begin their infiltration swim. The launch

point should be no closer than 400 meters to the beach, outside of small-arms weapons range. To accomplish long-distance small boat movement, the infiltration team must be highly skilled in the use of nautical charts and dead-reckoning techniques. Additionally, the team must compute for a compensated launch point using offset navigation to take advantage of tides and current (see paragraph G-1f). Strict noise and light discipline must be maintained throughout the operation.

c. Once the team reaches the launch point, which is outside of the surf zone and small-arms weapons fire, the team leader sends out a scout swim team to reconnoiter the beach landing site.

d. Before leaving the main body, the scout swimmers receive last-minute instructions or adjustments to the original plan based on observations made during the infiltration thus far. The scout swimmers' rucksacks are left with the main body (in the inflatable boat). To keep their direction, the scout swimmers use a dive compass or guide on prominent terrain features or lights on the beach. Scout swimmers use the sidestroke to allow all-round observation while approaching the surf zone or the beach landing site. Swimmers face each other using opposite sidestrokes and observe the area beyond the other swimmer.

e. As the scout swimmers reach the surf zone or when they get close to the beach landing site, they use the breaststroke to observe the beach. The scout swimmers must use stealth and caution while approaching the beach and keep a low profile in the water as well as when on the beach. One scout swimmer should periodically keep watch to the rear to warn of large waves that may injure the swimmers or separate them from their equipment. When the scout swimmers reach shallow enough water and when they determine that the situation is safe enough, they remove their fins. There are two methods the scouts may use to move across the beach to begin their reconnaissance and secure the beach landing site.

(1) If the wood line can be seen easily from the waterline, one scout remains in the water just at the waterline and covers the movement of the other scout as he moves quickly across the beach. Once the inland scout has moved to the edge of the wood line, he covers his partner while he moves across the beach to the same position.

(2) If the beach topography is such that the wood line cannot easily be observed from the waterline, the above method can be modified to include successive bounds.

f. Once both scouts have moved inland, they employ a modified box pattern to reconnoiter and secure the beach. The scouts agree on a suitable assembly and cache site when they finish their reconnaissance. One scout then positions himself at the edge of the wood line to provide security for

the main body's landing and from which he can guide the main body to the assembly area. The other scout positions himself where he can signal the main body. As soon as he sees the main body, he moves to the waterline.

g. When the main body reaches the beach landing site, the scout at the waterline directs them to the other scout who guides them to the assembly area. After the last team member has passed him, the scout at the waterline disguises any tracks left in the sand and then rejoins the main body.

h. If at all possible, the cache site and the assembly area should be different locations. If the enemy discovers and follows the tracks or trails from the beach to the assembly area, he can easily determine the number of personnel involved in the operation by counting the swim gear. Additionally, the cached equipment maybe needed to support exfiltration at another location.

6-4. HELOCASTING OPERATIONS

Helocasting can be an effective means of inserting and extracting LRS teams and equipment. The speed, range, and lift capability of rotary-wing aircraft make them excellent waterborne delivery and recovery vehicles. Helocast preparation considerations are as follows.

a. When planning for the number of personnel per type of aircraft, the leader uses the standard troop-loading planning figures. These figures are adjusted depending on aircraft configuration, type of equipment, and casting or recovery procedures. These items are coordinated in advance with the aircrew.

b. A rehearsal of the operation is conducted to include all jumpers, the crew, the accompanying equipment, and support personnel. The leader emphasizes body exit position, exit timing, commands, and water entry position during live casting rehearsals.

c. All equipment is attached to the jumper using l/4-inch 80-pound test cotton webbing. This normally includes masks, fins, web belts with knives, and flares. The leader ensures all jumpers wear life vests.

d. The team applies the following procedures to rubber boat operations.

(1) Tie down and secure all equipment inside the boat.

(2) Secure the motor in the floor of the boat and pad it with honeycomb cardboard.

(3) Securely attach and isolate the gas can.

(4) Secure the paddles under the gunwales, out of the way of the rest of the gear.

(5) Secure the rucksacks as tightly as possible to the deck of the boat.

(6) Waterproof all equipment in the boat as if it was to be taken subsurface.

(a) Regardless of the type of aircraft used, tie down or secure all loose or unnecessary equipment. Tape or pad all sharp edges or items.

(b) If using side doors for casting (UH-60 or UH-1H), secure the doors in the open position, and tape all edges.

(c) With a CH-46 or CH-47, ensure the ramp is secured in the open or casting position (10 degrees below horizontal).

(d) If a wire ladder is to be used for recovery, secure it on the floor to a "wire donut" (must be 5/8-inch wire and secured in at least five points with snap links).

(e) For effective communications, ensure all personnel use the same frequency. (Cast master, pilots, and safety boats).

(f) Ensure the casting area is clear of all surface and subsurface obstacles.

e. When helocasting from a ramp, such as a CH-47, the cast master gives the following commands: "Get ready," "Stand up," "Check equipment," "Sound off with equipment check," and "Go." When using UH-60 or UH-lH, delete "Stand up."

(1) If using an F470, the team moves it to the end of the ramp. Just before the command GO, the F470 should be pushed out until about half of the boat is past the edge of the ramp. When the command GO is given, it will be easy to push the boat off the ramp.

(2) The cast master ensures jumpers do not remove seat belts until the command GET READY is given.

(3) The cast master ensures the pilot does not exceed 10 feet of altitude (above ground level) and 10 knots of speed when dropping personnel.

(4) When casting from the ramp, jumpers assume a normal prepare to land attitude.

(5) When casting from a side door, jumpers cast from a seated door position. On the cast master's command, jumpers push off and face the direction of flight, assuring a normal prepare to land attitude.

(6) Bundles or rucksacks are thrown before the jumper exists on the command GO.

(7) Upon entering the water, the jumper gives an "okay" signal to the cast master and safety boat.

f. When using a single rotor aircraft for recovery operations, a wire ladder is lowered to the swimmers who are on-line at 50-meter intervals in the recovery area.

(1) As the aircraft flies over, the swimmers hook the lowest rung on the ladder with their leading arm and to a designated height where they hook up (with snap link and rope seat) to the ladder.

(2) CH-46 or CH-47 aircraft will land in the water.

(a) If using a rubber boat with motor, the team drives the boat up to the ramp.

(b) When not using a motor, a rope hooked to the aircraft's winch that has a-10-pound padded weight attached is lowered. The rope is lowered behind the boat and dragged over it. The swimmers secure the rope and the winch pulls the boat in.

(3) When recovering only swimmers, they either go up a ladder or, if the aircraft is on the water, they swim up to the ramp.

(4) Swimmers put on their harnesses before the helicopter's arrival if being recovered by SPIES (paragraph 6-6.). The helicopter hovers over the group of swimmers as they attach their harnesses to the D-ring.

g. Due to the hazards involved, the leader emphasizes safety in all aspects of planning and executing helicopter casting and recovery operations.

(1) Immediately before a helocast and recovery operation, the leader physically reconnoiters the casting area to verify water depth and the absence of obstacles and debris.

(2) He ensures water depth is not less than 15 feet.

(3) He ensures motorized safety boats are in the water with motors running to conduct helocasting and recovery operations.

(4) He establishes radio voice communications between the safety boats and the drop aircraft.

(5) He has one standby diver, with complete scuba gear, in the safety boat.

(6) He ensures the cast master has voice communications with the pilot.

(7) He ensures drop altitude does not exceed 10 feet above surface of the water.

(8) He ensures drop speed does not exceed 10 knots indicated airspeed.

(9) He ensures there is a qualified aidman in one of the safety boats.

(10) In the event of an injured swimmer, he ceases helocasting and recovery operations until the cause and extent of the injury are determined.

Section II. HELICOPTER OPERATIONS

Helicopters provide a variety of methods for infiltrating and extracting teams.

6-5. RAPPELLING

Rappelling can provide a team a means of quick insertion with or without an LZ. It can be done regardless of terrain or the availability of LZs. (See TC 21-24 for more information.)

6-6. SPECIAL PATROL INFILTRATION/EXFILTRATION SYSTEM

The SPIES can provide an excellent form of exfiltration for LRS teams over short distances. SPIES is not recommended for infiltration because team members are exposed the entire time. The nature of SPIES operations is such that a thorough briefing is required for all participants before the operation is conducted. For personnel being extracted, they must receive extensive training in the SPIES extraction before infiltration. For the other personnel involved, a complete preoperations briefing is held before the operation starts. This is especially crucial in a situation where additional assets are involved, other than the extraction helicopter (gunships, aerial observers, artillery support, and so on). (See TC 21-24 for more information.)

a. **Familiarization.** As in all training conducted by LRS units, all operations using the SPIES must be preceded by a safety briefing. The briefing should consist of but not be restricted to a review of—

- All of the equipment associated with the SPIES and its characteristics.
- How to inspect it before use.
- Proper donning of the harness.
- Methods of extraction and insertion used.
- Emergency signals that all personnel are required to know.

When time and situation permit, personnel who are not familiar with SPIES are encouraged to watch or take part in the rigging of the helicopter. This not only builds personnel confidence in the equipment, but it assists in a more comprehensive training of new SPIES masters. All individuals not familiar with SPIES use it the first time without combat equipment to instill confidence and to become familiar with SPIES procedures.

b. **Communications.** Because of the noise associated in all helicopter operations, radios must be used to communicate. Radios are used to communicate before the arrival of the helicopter. Precise arm-and-hand signals must be established in the event of radio failure or poor communications. During the first part of the operations, the SPIES master must observe (daytime) or know that a definite procedure is taking place (night or jungle) while the teams are hooking up to the SPIES rope for extraction.

(1) When it is possible, headsets and voice suppressors should replace the handset for better radio procedures. This allows the radio operator on

the ground to use both hands while the helicopter comes to a hover for a faster and safer hookup.

(2) If radio communications are hampered in anyway, a specific set of procedures and hand-or-light signals are followed.

c. **Extraction.** After the team has been located, the SPIES master must assist the pilot in directing the helicopter to the proper distance over the team. At this point, the team leader should be in a position to move and approach the rope as it is dropped by the SPIES master. Once the rope is clear of any obstacles, the team leader signals the team to their assigned positions along the 10 hookup points. Using the primary, or harness snap link, each team member hooks to the D-ring on his side of the line. This is the primary hookup. Once this is done, he then hooks into the alternate or second hookup point, using the safety line and snap link. Then, he should face forward along the line so that he is heading in the direction he is traveling when the aircraft starts its assent. The SPIES rope should be held up and routed over the shoulder closest to the rope. With the other hand, he gives a thumbs-up signal to allow both the team leader and the SPIES master to see he is ready to go. Once all the team members have done this task, the team leader physically inspects (if time and situation permits) or hooks himself in on the lowest point along with the radio operator to ensure the running end is clear of all obstacles and gives the thumbs-up signal to the SPIES master. This thumbs-up signal, at night an arranged light signal, will continue until a safe altitude is reached. The helicopter may start a transition in a horizontal direction on its return flight.

d. **Emergency Procedures.** During the flight, from extraction until the team is safely and quickly detached from the SPIES rope, there should be a conscientious effort on the part of each team member to be aware of any problem which may arise from above or below. The soldier above checks the soldier below. At the first sign of danger or if there is an emergency, the team leader or a team member places his freehand on his head. The SPIES master, on observing anyone on the SPIES rope with his hand on his head, instructs the pilot to make an emergency landing in the nearest and safest area.

e. **Dismounting Procedures.** The familiarization training phase is the time to ensure all members are aware that when the terrain allows, and on reaching the ground, they should immediately head in the direction of the nose or 12 o'clock of the aircraft. This allows the pilot to see that the team is out from under the aircraft. If an emergency situation with the helicopter arises at this point, the pilot can make a better appraisal of the situation if he can see all the members of the team at the 12 o'clock position. If the helicopter is making a scheduled landing at this time, the team ensures that

the SPIES rope does not interfere with the aircraft and ensures that the aircraft does not land on the rope.

f. **Operational Training.** In preparing for an operation, if the situation, mission, and or terrain suggests the possibility of a SPIES extraction, the leader should include the SPIES harness in each individual's equipment list. If the mission or insertion precludes the wearing of the harness during the mission, it should be carried inside the pack being used. Once the extraction helicopter has been requested, the harness may be retrieved and donned before extraction.

g. **Land Extraction Procedures.** The SPIES should be used only in those cases where the team requires immediate extraction or cannot move to a clear (open) position suitable for helicopter landing.

(1) The extraction helicopter(s) proceeds to the area and radio or visual contact with the team is established. The backup helicopter equipped with the SPIES remains aloft and away from the area, but maintains visual contact with the LZ and monitors radio communications.

(2) The SPIES master deploys the rope; then notifies the pilot the rope is out. The pilot can neither see the team nor determine the most suitable position for the aircraft. Above the extraction site, the SPIES master gives the pilot vertical and lateral corrections until the aircraft is in the desired position. These commands are given as follows: left, right, forward, rear with the estimated distance; for example, "left, 10 feet." The SPIES master then counts down (as the pilot responds); for example, "ten, nine, eight, seven, six hover, hold, ropes out." The SPIES master informs the pilot of any unexpected drift occurring that could cause the team to be pulled through an obstruction. These commands or directives are given in conjunction with the crew chief, whose primary attention is to the safety of the aircraft, and any possible interference of the tail rotor.

(3) The team should hookup the same as in familiarization procedures and sling individual weapons over the shoulders. Weapons and equipment are secured to withstand the wind. Rifles should have a safety line attached to prevent a lost weapon during SPIES operations. The team leader gives the thumbs-up signal.

(4) During the extraction, the team radio operator maintains communications with the extraction helicopter. He gives an oral backup to the thumbs-up signal and also relays any other information during the flight. His location should be near or at the bottom hookup point to assist in giving accurate information about the extraction, the clearing of obstacles, and the descent.

(5) Liftoff of the extraction aircraft must be vertical until the SPIES rope has cleared all obstacles. Team members can fire their individual weapons,

using the hip position and with the barrel directed downward at a 45-degree angle and outward.

(6) Once the aircraft has cleared vertical obstacles, the RATELO, who is the lowest man on the SPIES rope gives the signal to the pilot that the team has cleared the obstacle. This is especially important during limited visibility even when the pilot is using night vision goggles, because of the difficulty in determining depth perception 120 feet below the aircraft.

(7) On descent, the RATELO along with the SPIES master communicates to the pilot the altitude, drift, forward speed and whether or not oscillation of the rope is great enough to cause injury on impact. The RATELO should use the countdown method in 10-foot increments ("fifty, forty, thirty, twenty, ten, nine, eight . . . one; one man down, two . ..") until the team is down. During limited visibility, the SPIES master may not be able to see this action.

(8) The SPIES master must monitor drift once the team is on the ground. Sudden lateral shifts may drag team members before they can disconnect from the rope.

h. **Water Extraction Procedure.** The SPIES is also suitable for extracting LRS teams from the water. For this procedure, three inflatable life vests or any type of flotation device is tied to the SPIES. A flotation device is tied to each end of the attachment points; one flotation device is tied in the middle of the attachment point area, just above the middle two sets of D-rings. Each team member should wear his SPIES harness under his life vest. He may also wear swimming fins, mask, and snorkel (amphibious operations) to ease hooking up to the SPIES rope within the spray area beneath the hovering helicopter.

(1) After the extraction aircraft has attained a stable hover above the team member's, the SPIES master drops the SPIES rope (with flotation attached) on order from the pilot.

(2) When the team members have completed hookup to the SPIES rope, the team leader signals the SPIES master to start liftoff.

(3) Aircraft liftoff must be vertical until all team members and the bottom end of the rope have cleared the water. During the initial liftoff, team members must know that they are going to be dragged through the water. They should be prepared to roll on their backs until clear of the water.

(4) Flight speed and altitude should be the same as over land. The dismounting procedures also remain the same, except when landing on a ship. Once on board, all members must take their orders from personnel in charge of the deck.

i. **SPIES Master Qualifications.** The commanding officer must ensure that this qualification is entered on the soldier's record. To be a SPIES master the soldier must have the following qualifications.

(1) Be at least a sergeant or above (may be waived by the commanding officer).

(2) Must have participated in at least three SPIES operations. For example, have hooked up the helicopter and assisted in preparation of an operation and conducted successful operations under the supervision of a qualified SPIES master.

(3) Know all aspects of a SPIES operation.

(4) Be able to give an effective pilot's brief.

(5) Be able to use aircraft communications equipment and understand aviation terminology.

j. **SPIES Master Duties.** The SPIES master is responsible for the safe conduct of the SPIES operation. Preflight duties of the SPIES master are—

(1) Inventory and inspect all SPIES equipment.

(2) Brief pilots and other concerned personnel about details of the operation, especially the extraction and dismounting procedures.

(3) Ensure that he has an Interagency Communication System helmet and gunner's belt or sling rope if no belt is available. Connect and check the operation of the Interagency Communication System to be used. (Interagency Communication System communications must be established between the SPIES master and pilots on all SPIES operations.)

(4) Attach the SPIES rope to the helicopter in accordance with the guidance in this chapter.

(5) Ensure that there is nothing adrift in the aircraft that may fall on a team member later.

(6) Check the location of the emergency axe. Ensure it is readily available, yet secured enough so as not to endanger the soldiers on the SPIES rope. (The axe should be inspected to ensure that it is sharp.)

k. **Extraction Duties of the SPIES Master.** On arrival at the team's estimated position, the SPIES master assists the pilot to determine the exact location of the team members.

(1) As the aircraft approaches the team's location, he aids the pilot (using the clock system) in placing the aircraft directly above the team.

(2) He requests permission from the pilot to drop the SPIES rope when the aircraft is hovering above the team.

(3) He drops the rope, taking care to avoid striking team members on the ground.

(4) He notifies the pilot when the rope is down, and reports any altitude corrections necessary to ensure that all SPIES attachment points can be reached by the team members.

(5) He watches for the thumbs-up signal from the team leader.

(6) On receipt of the thumbs-up signal, he advises the pilot that the team is ready for extraction and requests a vertical liftoff.

(7) He advises the pilot of the team's approximate position, the location of any potential obstacles, and the avoidance of horizontal movement.

(8) If a team member becomes entangled with an obstacle during the extraction, he notifies the pilot immediately and requests that the vertical lift be stopped. If the situation is critical, he is prepared to cut the SPIES rope (the anchor point or cargo straps) after team members are secured to the obstacle or on the ground.

(9) When he is sure that all obstructions have been cleared, he advises the pilot. The pilot obtains a safe altitude (about 500 feet above ground level for training purposes or as the situation dictates in combat) or transitions into forward flight.

(10) At frequent intervals during the flight, he advises the pilot on the safety status of all team members. He constantly watches the team and checks the security of the SPIES attachments often.

1. **Dismounting Duties.** On arrival at the dismounting area, the SPIES master informs the pilot the approximate height of the lower rope end from the ground.

(1) Once the pilot starts the vertical descent, he continually informs the pilot the approximate distance the lower rope end is above the ground.

(2) He informs the pilot of any horizontal drift that may occur and any obstructions near the SPIES rope. Also, he keeps the pilot informed of any swinging or rotating that may occur.

(3) He informs the pilot when the rope is about 25 feet above the ground and again when it is 10 feet above the ground. He ensures that the rate of descent is slow enough to enable the team members to land and get out from under team members safely.

(4) He reports initial touchdown of the rope, when the last team member has safely started to move away from under the helicopter, and when all team members are disconnected.

(5) On order of the pilot, he either retrieves the SPIES rope back into the helicopter or disconnects the SPIES rope and drops it to the ground. While using the UH-lH helicopter, the only way to retrieve the SPIES rope while in the air is by having an arranged recovery rope attached. This can be done with a 12-foot sling rope. In some cases, two

6-foot-long sling ropes joined together can be used to haul the SPIES rope aboard. The rope may be attached about 5 or 6 feet below the cargo hook or cargo strap hookup point. The type of knot used to connect the sling (or recovery) rope to the SPIES rope must be self-tightening in nature; for example, the Prussik knot. The standing end of the sling rope may be fastened to the deck tie-down or by using a snap link. Although the line should be kept out of the way, the primary consideration should be its length. It must be long enough for any swinging or rotating in the SPIES during flight.

m. **Inspection.** The SPIES is inspected by a certified rigger when serviceability is questioned by the SPIES master and at six-month intervals. Outdated, spliced, abraded, or cut rope is removed from service. The SPIES master performs the following inspection.

(1) Inspects harness and suspension sling webbing for signs of contamination from oil, grease, acid, rust at points of contact with metal parts, cuts, twists, fading, excessive wear, or fusing (indicated by unusual hardening or softening of webbing fibers), fraying, burns, abrasions, and loose or broken stitching (in excess of three stitches). Removes damaged harness or suspension sling. Returns damaged equipment to supply for appropriate disposition.

(a) Inspects all hardware for signs of corrosion, pitting, ease of operation, security of attachment, bends, dents, nicks, burrs, and sharp edges. (Replacement of hardware [except chest strap adapter] that requires unstitching of webbing makes the harness unserviceable.)

(b) Replaces the V-ring by cutting the strap above the stitching. Folds and stitches a new end section of the leg strap. If damaged, returns harness or suspension sling to supply for appropriate disposition.

(2) Checks rope, harness, and suspension slings for expiration: 7 years of service (opening manufacturer's package) or 15 years from date of manufacture, whichever occurs first.

(3) Ensures rope is free of splices.

(4) Inspects the rope surfaces for cuts, excessive abrasions, and snags. (Cuts on the rope are excessive when there are four or more cut strands in any 5-inch length. The 2-1 braided rope has 12 pairs or 24 strands around the circumference. Abrasion is extensive when torn yarns are equivalent to that of four strands of any 5-inch length. Rope that has been subjected to heavy loads may display glazed areas where it has worked against hard surfaces. This condition may be caused by paint or the fusing of fibers. Also, after long use, the rope may become fuzzy on the surface

[although this should be minimized with the surface coating]. In either case, the effect on the rope's strength is negligible.)

(5) Inspects rope for signs of contamination by acid, alkaline compounds, salt water, fire extinguishing solutions, and petroleum based solvents. (Although the ropes in use gradually change color, such changes do not indicate a decrease in strength, unless the change is due to contact with strong chemicals. Changes in color caused by chemicals, however, probably will be spotty. Changes that occur because of use will be uniform throughout the length of the rope.)

(6) Ensures the eye loop at the end of the SPIES rope is not broken, frayed, or loose.

n. **Repairs and Cleaning.** To repair and clean the SPIES, the SPIES master performs the following:

NOTE: Loose or broken stitching in excess of three stitches will not be repaired.

(1) Washes contaminated ropes with a mild detergent (such as liquid dish soap) and cold water, followed by a rinse in clean, fresh water. Dries at a temperature not to exceed 140 degrees F.

(2) Removes stubborn oil, grease, hydraulic fluid, and other petroleum stains with the cleaning agent xylene (Grade A or B, TT-X 916). Uses the cleaning agent as directed.

WARNING

ACID CONTAMINATION, CUTS, OR FRAYING OF HARNESS OR SLING WEBBING CONSTITUTE NONREPARABLE DAMAGE.

o. **Storage.** The SPIES master stows the SPIES as follows:

(1) Protects nylon materials from direct sunlight as much as possible to avoid ultraviolet deterioration.

(2) Stows the SPIES rope in an aviator's kit bag for protection when not in use.

(3) Uses bins or similar facilities for storage of SPIES equipment. (Shelves used for storage should be at least 4 inches from the walls and 12 inches from the floor. Areas used for storage should be well ventilated and free of oil, acid, cleaning compounds, and other contaminants. Equipment must not be stowed above or near hot water pipes, heating apparatus, or in direct sunlight.)

p. **Organization for SPIES Extraction.** The SPIES master—

(1) Issues harnesses.

(2) Ensures soldiers don harnesses.

(3) Inspects soldiers wearing harnesses.

(4) Inspects the secondary safety line bowline around the chest with an end-of-line bowline.

(5) Organizes sticks with up to six soldiers.

q. **Rigging a UH-lH Helicopter for SPIES Operation.** The UH-lH may or may not have a cargo hook. The following equipment is required:

- SPIES rope.
- Two 11-foot 3-loop cargo slings (type 26)(four without a hook).
- Two 9-foot 3-loop cargo slings (type 26)(four without a hook).
- Two Type IV connector links (four without a hook).
- One 120-foot rope.
- Four locking snap links.
- One 12-foot sling rope.

(1) The primary attachment point for the SPIES rope is the cargo hook. The end of the SPIES rope having a polyurethane encapsulated eye is attached to the cargo hook. The two, 9- or 1l-foot-long, cargo suspension slings are joined together to form one continuous sling, using a Type IV link. This sling is then stretched out on the helicopter deck. One end is taken under the helicopter and through the eye of the SPIES rope and connected on the other end of the sling using a Type IV link assembly. The sling must pass between the helicopter skids and the fuselage. Locally procured padding may be used to protect the sling from damage.

(2) Once the SPIES rope and cargo straps are in place, the straps running across the deck of the helicopter must be secured in place by at least four and as many as eight snap links. These are to be evenly spaced across the deck and alternated from one side of the strap to the other and top and bottom so that the first snap link will be to the rear of the strap and going around the bottom two straps and the next snap link will be in the front of the cargo strap and go around the top two sections of the strap. This is continued until at least four points have been established. If eight snap links are available, then each tie-down will have two reversed.

(3) If there is no hook or if it is not working properly, it is safe to use the SPIES by doubling up on the cargo slings and Type IV links, so that there will be two cargo straps side-by-side or a total of four slings and four Type IV links.

(4) The team must use caution when using the UH-lH helicopter because of the ways in which it may be outfitted. Some may have a step attached. This is an added obstruction not only during installation, but during the operation as

well. Others may have rocket pods or machine guns mounted. Not all of the UH-1's are hooked up exactly the same way every time.

r. **Rigging a UH-60 Helicopter for SPIES Operation.** UH-60 may or may not have a cargo hook. The following equipment is required:

- One 120-foot SPIES rope.
- Two 1l-foot 3-loop cargo slings (four without a hook).
- Two 9-foot 3-loop cargo slings (four without a hook).
- Two Type IV connector links (four without a hook).
- One 120-foot rope.
- Four locking snap links.
- One 12-foot sling rope.

(1) The primary attachment point for the SPIES rope is the cargo hook. The end of the SPIES rope having a polyurethane encapsulated eye is attached to the cargo hook. The two 9- or 1l-foot cargo suspension slings are then joined together to form one continuous sling using a Type IV link. This sling is stretched out on the helicopter deck and one end is taken under the helicopter and through the eye of the SPIES rope. It is then connected on the other end of the sling using a Type IV link assembly. Locally procured padding may be used to protect the sling from damage.

(2) Once the SPIES rope and cargo straps are in place, the straps running across the deck of the helicopter must be secured in place by at least four and as many as eight snap links. These are to be spaced evenly across the deck and alternated from one side of the strap to the other and top and bottom, so that the first snap link maybe to the rear of the strap and going around the bottom two straps and the next snap link may be in the front of the cargo strap and go around the top two sections of the strap. This is continued until at least four points have been established. If eight snap links are available, then each tie-down will have two snap links connecting the same spot and the swing gates are reversed.

(3) If there is no hook or if it is not working properly, it is safe to use the SPIES by doubling up on the cargo slings and Type IV links. There will be two cargo straps side-by-side or a total of four slings and four Type IV links.

s. **Rigging a CH-46 or CH-47 for SPIES Operation.** The CH-47 does not have a cargo hook. (See Figure 6-4, page 6-24.) The following equipment is required:

- Two 1l-foot 3-loop slings.
- Two 9-foot 3-loop cargo slings.
- Four Type IV connectors.
- One 13-foot sling rope.

(1) The SPIES rope is attached using two 9- or 11-foot cargo suspension slings and four Type IV links. The cargo slings are passed through the encapsulated eye of the SPIES rope and attached to the outboard cargo tie-down rings on the aircraft floor. Two tie-down rings are used for each sling. Locally procured padding may be used around the edge of the cargo hatch to protect slings from damage.

(2) Not all of the tie-down rings are going to be in the exact same position on all helicopters. This will be one of the main considerations in deviating from the prescribed installation procedures. However, when it is possible, the cargo straps should be placed to form two U-shapes. One is placed forward of the cargo hole in the center of the aircraft floor and one aft or toward the rear of the helicopter. The cargo straps hold the SPIES rope comfortably in the center of and slightly below the opening of the cargo hatch. The use of snap links attached close to all four tie-down points not only ensure a backup in case of a faulty tie-down ring, they also reduce the amount of movement in the cargo suspension straps. A total of eight snap links should be used. Two at each point with the swing gates are reversed for added security.

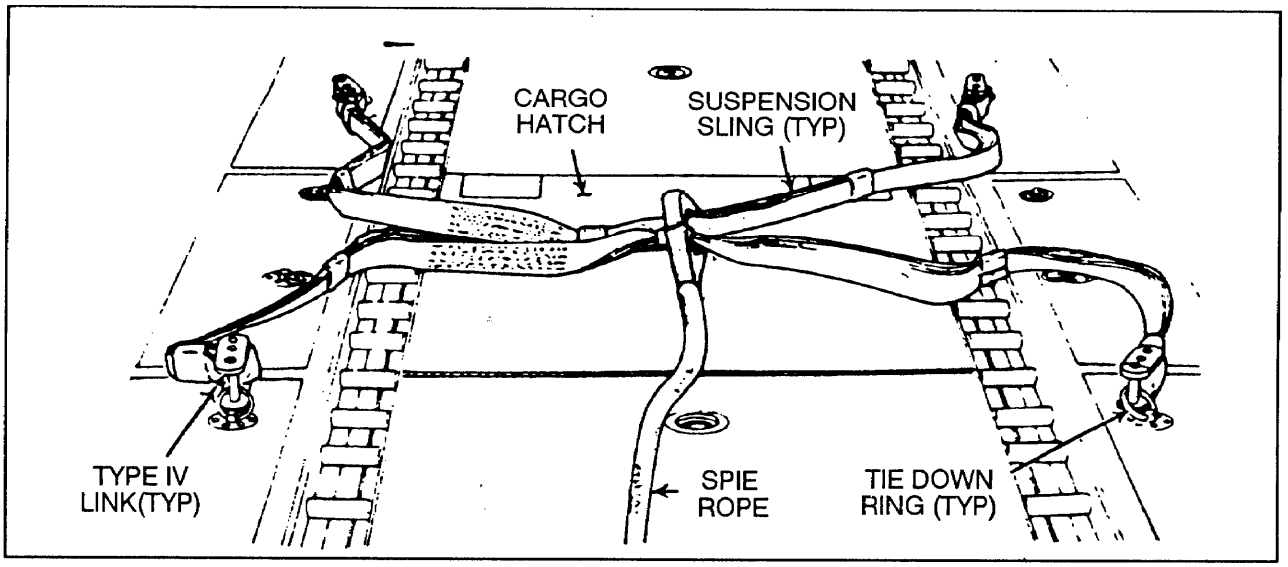


Figure 6-4. CH-46 or CH-47 helicopter SPIES rope attachment.

6-7. FAST-ROPE INFILTRATION/EXFILTRATION SYSTEM

The FRIES comes in 50-, 60-, 90-, and 120-foot lengths and 3 inches in diameter. Before conducting a fast-rope operation, a thorough inspection of the fast rope is necessary.

a. **Inspection of the Rope.** The rope must be laid out to inspect the entire rope. The eyelet on the end should be checked for excessive wear. The rope must be checked along its entire length for fraying. Snags in the rope from normal use will not significantly weaken the rope. However, a rope with fraying of several strands in one particular spot must not be used. If the fast rope becomes wet, it must be S-folded or hung in a dry, warm area to dry before further use. If the fast rope is used in saltwater, it must be washed in fresh water before drying. The rope must also be inspected for contamination of acid, alkaline compounds, salt water, fire extinguishing solutions, or petroleum-based solvents. Although used ropes gradually change color, such changes do not indicate a decrease in strength, unless the change is due to contact with strong chemicals. Changes in color caused by chemicals will probably be spotted; changes occurring because of use will be uniform throughout the length of the rope.

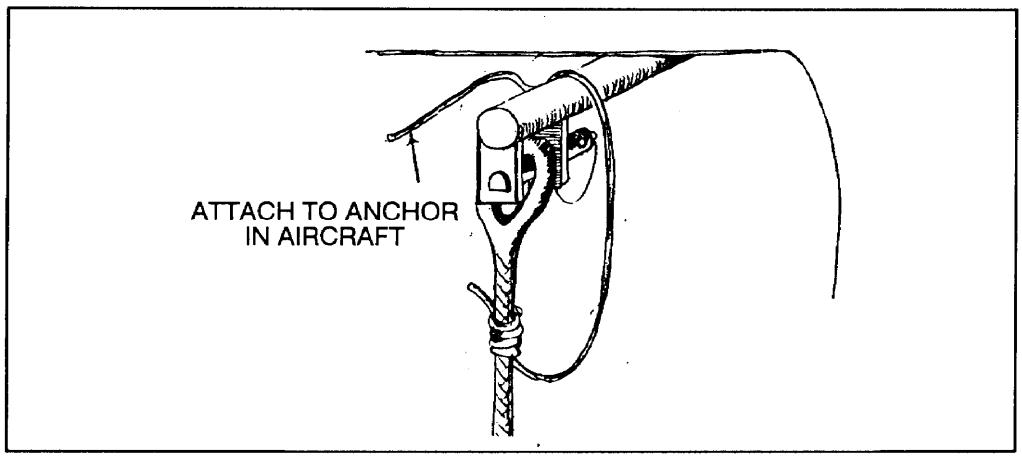


Figure 6-5. Fast rope rigged to UH-60.

b. **Rigging of fast rope in a UH-60.** (See Figure 6-5.)

(1) Both cargo doors are locked in the open position.

NOTE: For arctic or other cold weather operations or during flights of long duration, the cargo doors may be closed and locked until the time specified for opening time.

(2) The center row (nine) troop seats are removed.

(3) Floor restraint provisions are provided to fast-rope personnel while aircraft is in flight. (Seat belts or CGU strap).

(4) The fast-rope master or safety extends the fast-rope bar and inserts the pit pin in the bar.

(5) The fast-rope master inspects the bar for cracks and frays.

(6) The fast-rope master rigs the fast rope to the fast-rope bar:

- Places one retainer device on the fast-rope bar.
- Slides fast rope onto the fast-rope bar.
- Slides second rope retaining device onto the bar.
- Installs the rope keeper pin into the fast-rope bar.

c. **Rigging of Fast Rope in Other Aircraft.** CH-47, CH-46, RH-53, HH-53 use the same type of fast-rope bar only double when using the ramps (see Figure 6-6).

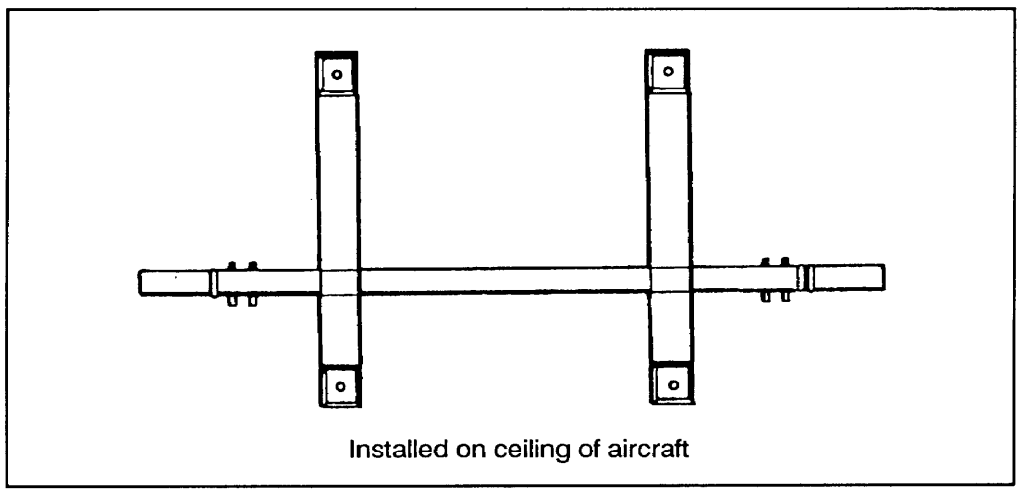


Figure 6-6. Double fast-rope bar.

d. **Consideration for Safety.** While in flight, the normal procedures for in-flight emergencies are used (see paragraph 6-2). Conducting fast-rope operations is dangerous. Doing so with heavy loads requires LRS teams to be proficient in fast-rope operations. While executing the fast-rope operations, the following procedures are used.

(1) Aircraft emergency.

- Stop stick (cease fast-rope operations).
- Ensure ropers are clear.
- Take appropriate action.

(2) Unsafe drift or premature lift-off.

- Lock in.
- Stop stick.
- Get back on target.
- Continue operations.

(3) Hung rope.

- Ensure ropers are clear.
- Descend aircraft.
- Release rope - use ground personnel to untangle rope from obstacle.

(4) No communications.

- Use hand signal to "stop stick" (clenched fist touching the chest).
- Use hand signal for "ropers" (pointing a finger toward the exit).
- Use hand signal for aircraft movement (open palm moved and faced in the direction required).
- Use hand signal to stop aircraft movement (clenched fist).

NOTE: The last minute before "Ropes away" is a critical time. With the doors open and the safety line is the only thing to hold on to, any sudden aircraft movement may throw personnel out of the aircraft.

e. **Fast-Rope Master Duties.**

(1) Brief members of his team and aircrew.

(2) Inspect team members for appropriate equipment configuration and conduct briefback. (Work gloves, all equipment tied down on personnel. Also inspection of aircraft rigging.)

(3) Install the fast rope in the aircraft and conduct safety checks.

(4) Relay 10-minute, 6-minute, l-minute, and 30-second time warnings to team members.

(5) Break chemical lights, if required. (Chemical lights are taped with one at anchor point, one at the bottom end of the rope and another five feet higher.)

(6) Ensure rope is properly configured for deployment (back-fed to prevent tangles).

(7) Ensure team members are in order of exit before l-minute warning.

(8) Confirm target on final approach.

(9) Deploy rope and ensure it is on the ground before ropers descend. (During night operations, two chemical lights taped to the bottom should be used.)

(l0) Deploy personnel using the following warnings to the pilot:

- ROPE OUT—when fast-rope master deploys the rope over the target.
- ROPERS AWAY—when first roper exits on fast rope.
- ROPE CLEAR-informs pilot he is clear for flight.
- HOLD—informs pilot to hold position.
- MOVE, LEFT (RIGHT, FORWARD, BACK).

f. **Execution of Fast Roping.** Individual ropers must—

- Understand all aspects of the insertion and emergency procedures.
- Ensure correct equipment configuration to prevent snagging and injuries.
- Maintain an orderly and rapid exit formation.
- Grasp rope firmly before exit (do not jump for the rope).
- On exit, rotate body 90 degrees to 180 degrees to clear the aircraft.
- Descend down the rope, controlling the speed and breaking two-thirds of the distance down to avoid landing on another individual.
- Upon landing, be prepared to execute a good parachute landing fall, and move rapidly away from the rope(s), avoid the front of the aircraft.
- Consider individual safety:

— Each individual is responsible for identifying hazardous situations and inform the fast-rope master.

— During the fast roping, night vision goggles will not be used by fast ropers, due to limited depth perception and a tunnel-vision effect.

— During descent, ropers must maintain visual contact with lower ropers and watch for obstructions.

— Individual ropers will lock in during emergencies, by wrapping the rope around one leg one or two times and standing on the fast rope with the other foot.

6-8. ARMY AVIATION AND AIR ASSAULT

Army aviation can increase LRSU mobility as well as flexibility. Once inserted behind enemy lines, LRS teams gather human intelligence that can

lead to decisive offensive action. This action can be quickly undertaken to exploit the success of LRS teams intelligence gathering capabilities.

a. **Air Assault.** Successful air assault execution is based on a careful analysis of METT-T and detailed, precise, reverse planning. Five basic plans that comprise the reverse planning sequence are developed for each air assault operation. They are—

- The ground tactical plan.
- The landing plan.
- The air movement plan.
- The loading plan.
- The staging plan.

These plans are normally coordinated and developed by the detachment or company headquarters to make the best use of available time. If time is limited, planning steps may be compressed or conducted concurrently; detailed, written plans and orders may be supplemented by SOPs or lessons learned in earlier training. Previous training and the development of SOPs cannot be overemphasized. Doctrinally, the battalion is the lowest level that has enough personnel to plan, coordinate, and control an air assault operation. When company-size or lower operations are conducted, the bulk of the planning takes place at battalion or higher headquarters.

(1) *Ground tactical plan.* The foundation of a successful air assault operation is the commander's ground tactical plan. All additional plans must support this plan. The plan specifies actions in the objective area to accomplish the mission and address subsequent operations.

(2) *Landing plan.* The landing plan must support the ground tactical plan. This plan sequences elements into the area of operations. They ensure that units arrive at the designated locations arid time and prepared to execute the ground tactical plan.

(3) *Air movement plan.* The air movement plan is based on the ground tactical and landing plans. It specifies the schedule and provides instructions for air movement of soldiers, equipment, and supplies from PZs to LZs.

(4) *Loading plan.* The loading plan is based on the air movement plan. It ensures that soldiers, equipment, and supplies are loaded on the correct aircraft. Unit integrity is maintained when aircraft loads are planned. Cross-loading may be necessary to ensure survivability of command and control assets and the mix of weapons arriving at LZ ready to fight. The platoon or team leader should always ensure that the aircraft is loaded so that dismounting soldiers react promptly and contribute to mission accomplishment.

(5) *Staging plan.* The staging plan is based on the loading plan and prescribes the arrival of ground units (soldiers, equipment, and supplies) at the PZ in the order of movement.

b. **PZ and LZ Criteria.** PZ and LZ size requirements depend on the type and number of helicopters and the minimum acceptable distance between aircraft. Each aircraft should be provided a circular landing point separated from other aircraft and free of obstacles. Minimum recommended landing point sizes (diameter of circle in meters) are—

- Observation helicopters - 25 meters.
- UH-1, AH-1 -35 meters.
- UH-60, AH-64 -50 meters.
- Cargo helicopters -80 meters.

(1) *Surface conditions.* Surface conditions in the PZ and LZ should not conceal the touchdown point or create hazards to landing; that is, sand, blowing dust, snow. The surface of the zone should be free of obstacles that could damage landing aircraft (tree stumps, large rocks). It must be firm enough to support the traffic. Drainage should be adequate for rainfall runoff. If the surface is contaminated (chemical or radiological) to an unacceptable degree, it may preclude use of the area. If part of the area is unsatisfactory for any reason, that part is not used.

(2) *Ground slope - landing. As* a guide, if the ground slope is 0 to 6 percent, land upslope; if the slope is 7 to 15 percent, land sideslope; over 15 percent, no touchdown (aircraft may hover to drop off or pick up personnel and or equipment).

(3) *Obstacles.* For planning purposes, an obstacle clearance ratio of 10 to 1 is used on the approach and departure ends of the PZ and LZ. That is, a landing point requires 100 feet of horizontal clearance if a helicopter must approach or depart directly over a 10-foot tall tree. All obstacles within the PZ and LZ are marked with red lights at night (turned on only when PZ or LZ is in use), or red panels during the day. The markings are not used if they cause the position to be seen by the enemy.

(4) Approach and departure. The terrain surrounding a possible PZ or LZ is analyzed for air traffic patterns. In a tactical situation, constantly approaching the PZ or LZ over the same ground should be avoided. Still, there are only so many ways to get into an area. Approaches should be free of obstacles; landings should be made into the wind, but away from the sun. Ideally approach and departure are made along axis of the LZ over the lowest obstacle, and into the wind.

(5) *Loads.* When a helicopter is loaded to near maximum lift capacity, it requires longer distances to liftoff and land. (It cannot ascend or descend

vertically). The greater the load (near or at maximum), the larger the PZ and LZ must be to accommodate a flight.

c. **Selection and Marking of PZs and LZs.** Small unit leaders should be skilled in selecting and marking of PZs and LZs.

(1) During the day, a ground guide marks the PZ or LZ for the lead aircraft by holding an M16A2 rifle over his head, by displaying a folded VS-17 panel chest-high, or by other identifiable means. At night, the code letter inverted "Y" is used to mark the landing point of the lead aircraft. Chemical light sticks or beanbag lights may be used to maintain light discipline (Figure 6-7).

(2) When more than one aircraft is landing in the same PZ or LZ, there will bean additional light for each aircraft. For observation, utility and attack aircraft, each additional aircraft landing point is marked with a single light emplaced at the exact point that each aircraft is to land. For cargo aircraft (CH-47, CH-53, CH-54), each additional landing point is marked with two lights. The two lights are placed 10 meters apart and aligned in the aircraft direction of flight.

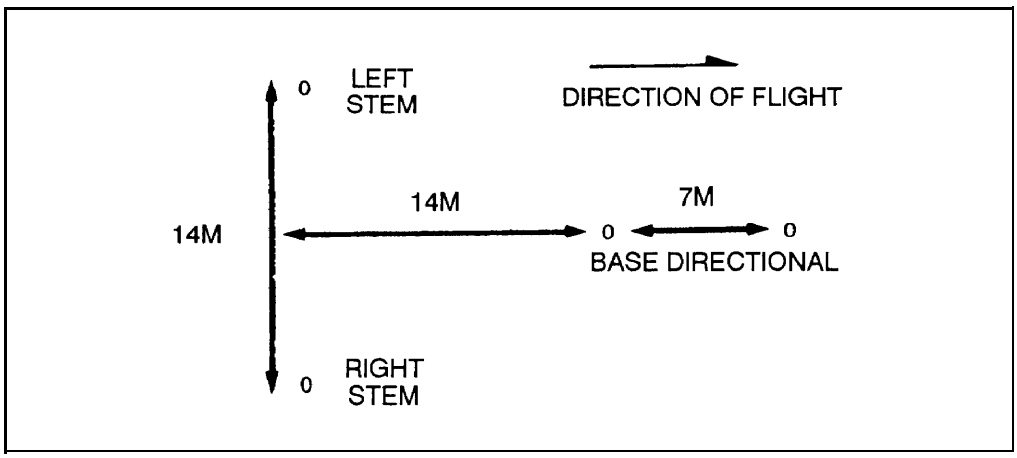


Figure 6-7. Inverted Y.

d. **Obstacles.** These include any obstruction which might interfere with aircraft operation on the ground (trees, stumps, rocks). During daylight, the aircrew is-responsible for-avoiding obstacles on the PZ or LZ. For night and limited visibility operations, all obstacles are marked with red lights. The following criteria is used in marking obstacles:

(1) When the obstacle is on the aircraft approach route, both the near side and far sides of the obstacle are marked.

(2) If the obstacle is on the aircraft departure route, the near side of the obstacle is marked.

(3) If the obstacle protrudes into the PZ or LZ, but is not on the flight route of the aircraft, the near side of the obstacle is marked.

(4) Large obstacles on the approach route are marked by circling the obstacle with red lights.

(5) Approaching aircraft are controlled by the use of arm-and-hand signals to transmit guidance for landing. The signalman is positioned to the right front of the aircraft where he can best be seen by the pilot. Signals at night are given by using lighted batons or by flashlights in each hand. When using flashlights, the signalman must avoid blinding the pilot. Batons and flashlights remain lit at all times when signaling. The speed of the arm movement indicates the desired speed of aircraft compliance with the signal.

e. **PZ Operations.** Before arrival of the aircraft, the PZ must be secured. PZ control party positioned and the soldiers and equipment positioned in the LRS team PZ or ORP. When occupying the team PZ or ORP, the team leader should accomplish the following:

(1) Maintain all-round security of the PZ or ORP.

(2) Maintain communications (ground-to-air purposes).

(3) Brief marking team for exact aircraft landing point and check their equipment.

(4) Establish priority of loading for each soldier.

(5) If time permits a detailed plan, use and incorporate a coordination checklist (see example in Figure 6-8, page 6-33). Apply the information from the checklist to the aerial movement annex to the OPORD (See Appendix J for example OPORD with annexes).

(6) UH-60 loading sequence (Figure 6-9, page 6-35). The team leader and pilot maintain communications by using the aircraft's troop commander's handset or by requesting a separate headset.

(a) Tearn leader initiates movement once aircraft has landed. The far-side and near-side teams move to the aircraft, in file, with the team leader always leading the near-side group.

(b) Team leaders should-

- Ensure all personnel wear and carry rucksacks on the aircraft.
- Notify the crew chief when all team members are on board and ready for liftoff.
- Ensure all personnel buckle up as soon as they are in their assigned seats.

I. GENERAL.

1. Mission:
2. Units Participating:
3. Threat Forces:
4. Weather: Ceiling Visibility Wind speed
   Wind direction Temperature
   Sunrise Sunset
   Moonrise Moonset Illumination
   Prevalent weather condition

II. FLIGHT DATA

1. Troop Load:
2. Equipment Load:
3. Pickup Zone: Time:
4. Lift-Off:
5. Alternate Pickup Zone: Time:
6. Landing Zone: Time:
7. Alternate Landing Zone: Time:
8. Deception Measures:
9. Penetration Points:
10. Flight Route to Objective:
11. Flight Route from Objective:
12. Alternate Routes to Objective:
13. Alternate Routes from Objective:
14. Checkpoints and Description:
15. Aircraft Linkup Point:
16. Air Control Points:
17. Downed Aviator Pickup Points:
18. Abort Criteria:
19. Enemy Air Defense Locations:
20. Suppression of Enemy Air Defense Measures:
    A.
    B.
    C.
    D.
21. Gun-Target Lines:
22. Prominent Features on Routes or Landing Zone:
    A.
    B.
    C.
    D.
23. Aircraft Formation:
24. Aircraft Speed:
25. Aircraft Altitude:
26. Aircraft Crank Time:
27. Pathfinders:

Figure 6-8. Example coordination checklist.

28. Extraction Time:
29. Extraction Pickup Zone:
30. Alternate Extraction Pickup Zone:

III. TACTICAL PLAN

1. Ground Tactical Plan:
2. Fire Support Plan:
3. Air Cavalry:
4. Attack Helicopter:
5. Lift Aircraft:
6. Tactical Air:
7. Ordnance:
8. Hand-Off Point:
9. Aircraft Security Force:

IV. COMMUNICATIONS **FREQUENCY** **CALL SIGN**

1. Commander:
2. Pickup Zone Control:
3. Pathfinders:
4. SOI in Effect: Time Change:
5. Challenge: Password:

V. MARKINGS

1. Panels:
2. Strobes:
3. Bean Bags:
4. Pyrotechnics:
5. Smoke:
6. Light Gun:
7. Flashlights with Filters:

VI. CODE WORDS

1. Clean:
2. Secure:
3. Hot:
4. Cold:
5. Abort:
6. ALZ:
7. APZ:
8. Request Resupply:
9. Fire Preparation:
10. Request Extraction:

VII. SYNCHRONIZE WATCHES Time Zone:

VIII. MISCELLANEOUS Air Movement Table:

Figure 6-8. Example coordination checklist (continued

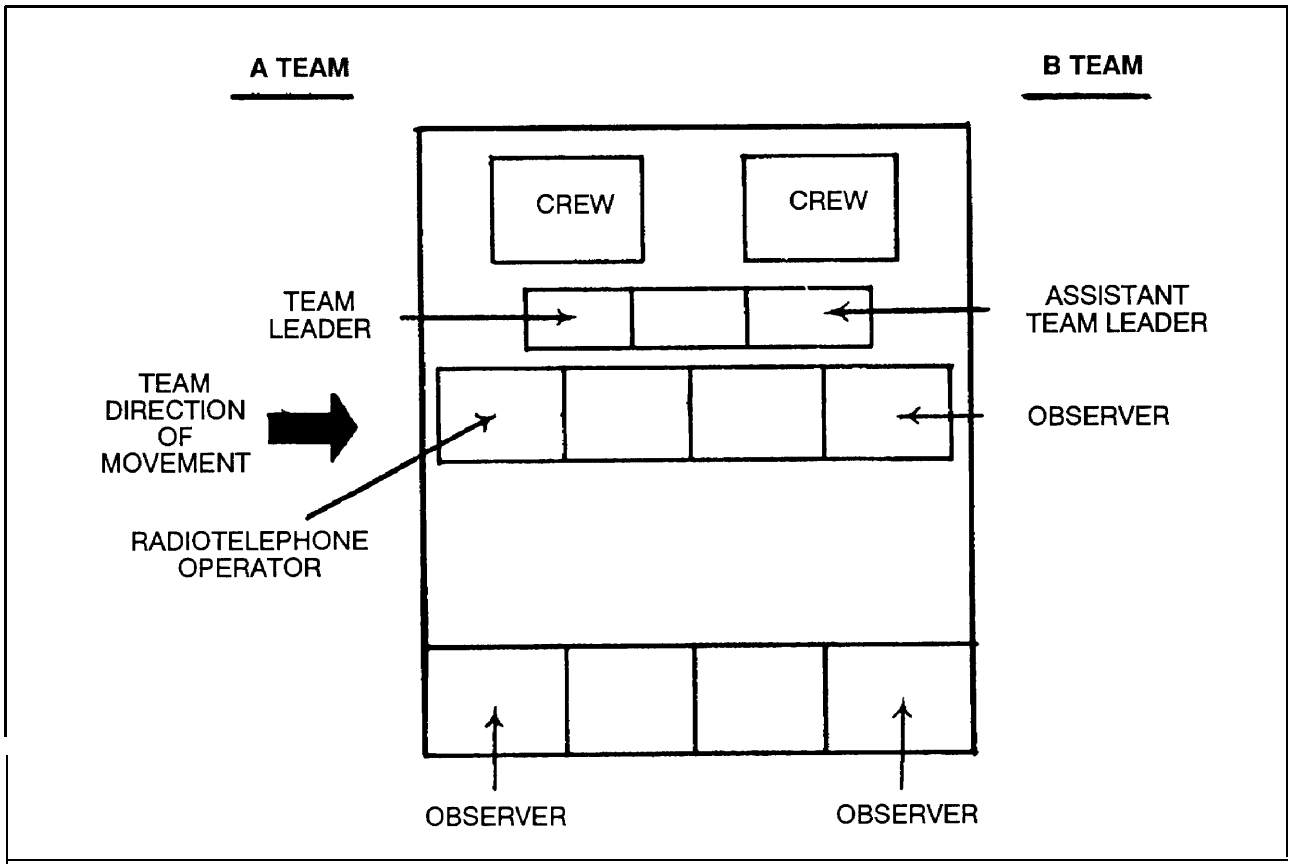


Figure 6-9. UH-60 loading diagram.

f. **Landing Zone Operations.** The following is a priority of actions in landing on an LZ.

(l) The team leader obtains the landing direction from the pilot; then informs all team members before landing. This aids in orientation to the LZ, particularly during night operations.

(2) Unloading of the aircraft does not begin until directed by the crew chief or pilot.

(3) Once the aircraft has landed, personnel unbuckle their seat belts and exit the aircraft as fast as possible with all equipment.

(4) Individuals move 15 to 20 meters out from the side of the aircraft and assume the prone position facing away from the aircraft, weapons at ready position, until the aircraft has departed the LZ.

(5) The LRS team should then move to an assembly area out of sight and sound of the LZ (500 meters) long enough to adjust their senses to the surrounding environment and to verify the location of the LZ using map checks or global positioning systems. After unloading from the aircraft, the

team leader moves the team to a predetermined location, using moving techniques appropriate to the terrain. Once at the concealed assembly point, the team leader makes a quick count of personnel and equipment, and then proceeds with the mission.

(6) Soldiers maneuver off the LZ to the closest side offering cover and concealment.

(7) The team may elect to have the aircraft wait in the vicinity for 5 to 10 minutes to allow for the hasty extraction of the team if compromised.

(8) If soldiers are engaged by nearby enemy positions, they treat it as a near ambush by immediately returning fire. Soldiers who consider themselves in the kill zone may assault the enemy position(s) or attempt to leave the kill zone. Soldiers not in the kill zone provide supporting fire to support the movement of soldiers in the kill zone.

(9) The LRS team leader calls for close air support, if it is available.

(10) Once disengaged from the enemy force, the team leader moves the unit to a covered and concealed position, accounts for personnel and equipment, and assesses the situation as to whether or not the unit can continue its mission.

(11) The team leader may elect to call for an emergency extraction using the SPIES extraction method.

(a) The team leader gives a direction and distance to the emergency extract site from the insertion site.

(b) As the aircraft approaches, the team leader initiates a directional signal; for example, pen gun flare, strobe light with a directional funnel attached.

(c) Ground to air gives the aircraft a clock direction and distance from the aircraft to the team's location and has pilot identify the signal initiated by team.

(d) Once the aircraft confirms the signal, the aircraft forms its approach and receives assistance from the team leader.

g. Command and Control. A member of the LRSU headquarters should fly with the team on insertions and extractions. This headquarters representation and emphasis to the criticality of the air mission and can assist with navigation and other key duties as dictated by the unit SOP.

Section III. AIRBORNE OPERATIONS

Air insertion is the fastest way to infiltrate. LRS teams and equipment may be delivered by parachute, by static-line, or by free-fall techniques. Units must consider the following during planning:

- Suppress air defense along the infiltration corridor.
- Determine if enemy air defense artillery is within artillery or naval gunfire range.
- Coordinate with the transporting unit.
- Consider the chance of inflight emergencies.
- Use adverse weather aerial delivery system during limited visibility or adverse weather.
- Dispose of parachutes once assembled.

6-9. LANDING PLAN

The operation should be planned using the reverse planning sequence. The ground tactical plan is the driving force for other plans. The landing plan includes—

- Place of delivery.
- Time of delivery.
- Assembly area.
- Method of delivery (type of parachutes).
- Sequence of delivery. Team may be transported on an aircraft with personnel dropping on a different DZ. Load in order of the sequence of drops.

6-10. AIR MOVEMENT PLAN

The air movement plan includes the manifest; load plan; flight routes, inflight checkpoints; flight times; load time (50 minutes); station time (35 minutes); takeoff time; and time of target.

6-11 MARSHALLING PLAN

The jump master gives his briefings. The team conducts sustained airborne training. All joint tactical and support planning is conducted. The LRS team, equipment, and supplies are moved to departure airfield. Leader must know how the team will be transported to airfield, where the team links up with transportation, and when the team needs to be at a specified location.

Section IV. STAY-BEHIND OPERATIONS

The stay-behind technique facilitates operation behind enemy lines. The team allows itself to be passed by the enemy so as to perform a specific mission.

6-12. PLANNING

Use of stay-behind operations is often the most advantageous means of infiltration for an LRS team when friendly forces anticipate enemy offensive and friendly defensive operations. Stay-behind can also be used effectively when friendly forces are conducting limited offensive or reconnaissance operations. In both cases, the forward friendly unit escorts the LRS team to the area of operations and provides security for site preparation. Use of a subsurface hide site also allows the LRS team to stock extensive supplies, which allows the team to operate for an extended period.

6-13. SITE PREPARATION

Because the enemy is expected to overrun and occupy the LRS team area of operations, a well-prepared subsurface site is essential. Normally, an LRS team does not have the capability to construct the site without engineer support. (See Appendix F for selection, construction, and considerations for a subsurface site.)

Section V. VEHICLE OPERATIONS

A vehicle is used to move an LRS team from a planning area to a point of departure in a secure area. The team normally dismounts at the forward line of own troops, makes final preparations, and conducts a forward passage of lines. Vehicles are also used to move the team to the area of operations.

6-14. PLANNING

Extensive intelligence on enemy unit locations is necessary for route planning. Fire support must be available to assist the team during movement. Ground surveillance radar can assist the LRS team in avoiding enemy units. Tactical communication intercept systems are tasked to provide early warning to the LRS team along the infiltration route. Radar detection systems can provide early warning to the LRS team for the use of enemy ground surveillance radar.

6-15. LRS TEAM PLANNING

At a minimum, the LRS team leader prepares the following plans and actions for vehicle movement.

- Primary and alternate routes with checkpoints and indirect fire target reference points.
- Plans for the type of vehicle to be used for infiltration.

- Ensures there are at least two layers of sandbags on the floor of the vehicle.
- Assigns team members sector of fire with air guards.
- Plans and rehearses contact drills used with the vehicle.
- Assists the driver in route selection during movement.
- As the vehicle commander, the team leader is responsible for navigation.
- Ensures the vehicle is serviceable and safe.
- Knows the time and location for vehicle linkup.
- Briefs the vehicle driver and crew on the vehicle movement order.

Section VI. FOOT MOVEMENT OPERATIONS

Foot movement into the area of operations is normally used from a point of departure in a secure area. Foot movement can also be used in conjunction with vehicle movement. Foot movement is most often conducted during limited visibility or in conjunction with normal friendly unit activity such as security patrols.

6-16. PLANNING

Extensive intelligence on enemy unit locations is necessary for route planning. Fire support must be available to assist the team during movement. Ground surveillance radar can assist the LRS team in avoiding enemy units. Tactical communication intercept systems are tasked to provide early warning to the LRS team along the infiltration route. Radar detection systems can provide early warning to the LRS team for the use of enemy ground surveillance radar.

6-17. MOVEMENT

Route selection should take advantage of rugged and normally inaccessible terrain to decrease the chance of enemy detection. Movement distances for the LRS team are short and should exceed more than several days because of the terrain and the equipment loads. This also necessitates resupply as a priority once the team arrives in the area of operations.