mission request will include items one through six of the standard DZ report as they pertain to the alternate DZ.

(3) **Special situations.** In special situations, additional items may be included in DZ reports; e.g., additional reference points, navigational check points in the vicinity of the DZ, special recognition, and authentication means. If additional items are included they must be identified by appropriate paragraph headings.

c. **Azimuths.** Azimuths are reported as magnetic in degrees and in three digits. With the exception of the aircraft track, all azimuths are measured from the center of the DZ. For clarity, the abbreviation DEG will be used when reporting direction.

d. **Initial Points (IP's).** The IP, located at a distance of 8 to 24 kilometers from the DZ, is the final navigational checkpoint. The pilot selects the IP; the DZ party can assist him by recommending a track that will facilitate the selection of an identifiable IP. Upon reaching the IP, the pilot turns to a predetermined magnetic heading that takes him over the DZ within a certain number of minutes (fig. 6). The following features constitute suitable IP's:

(1) **Coastlines.** A coastline with breaking surf or white beaches is easily distinguished at night. Mouths of rivers over 50 meters wide, sharp promontories, and inlets are excellent guides for both day and night.

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Figure 5. Reporting of obstacles and reference points.
(2) Rivers and Canals. Wooded banks reduce reflections, but rivers more than 30 meters wide are visible from the air. Canals are easily recognizable because of their straight banks and uniform width; however, they may be valueless in areas where they are uniformly patterned.

(3) Lakes. Lakes, at least 1 square kilometer in size, give good light reflection but must be clearly identifiable because of shape or some other distinctive characteristics.

(4) Forest and woodlawns. Forested areas of at least one-half kilometer square with clearly defined boundaries or unmistakable shapes are easily identified.

(5) Major roads and highways. Straight stretches of main roads with one or more intersections can be used as an IP. For night recognition, dark surfaced roads are not desirable; although, when the roads are wet reflection from moonlight is visible.

(6) Railways. When there is snow on the ground, rail lines which are frequently used will appear as black lines cutting through the white landscape. Under other than snow conditions, where rail lines make junction with other prominent landmarks, such as highways,
bridges and tunnels, they can be used as IP's.

e. Subsequent Use of DZ. SFOR maintains reported DZ's on file. If a previously reported DZ is to be used again, the mission request need contain only—

1. Code name of DZ.
2. Date/time mission.
3. Supplies/services desired.
4. Alternate DZ.
5. Track of alternate DZ.

58. Alternate Drop Zones

To increase the probability of success in receiving supplies and personnel, an alternate DZ will be designated for every mission requested. Separate drop times are established and both DZ's will be manned by at least a skeleton reception committee. If the primary DZ is not suitable for reception due to unfavorable conditions, the aircraft proceeds to the alternate DZ. Drop times for alternate DZ's are determined by the air support unit and are included in the mission confirmation message (app. III).

59. Mission Confirmation for Air Drop

Following the processing of the DZ report and resupply request at SFOB, a confirmation message is transmitted to the operational detachment usually by blind transmission broadcast (BTB). The confirmation message includes—

a. Code Name of the Drop Zone. Code name identifies the mission.

b. Track. The magnetic azimuth upon which the aircraft will approach. The actual track flown may differ from the original request to conform to the location of the IP selected by the aircrew.

c. Date Time of Drop. This also may differ from the original request because of priorities, weather, or aircraft availability.

d. Number of Cargo Containers or Personnel. This assists the reception committee in the recovery of all containers and personnel.

e. Drop Altitude. This assists the reception committee in properly placing DZ release point markings to compensate for wind drift.

f. Alternate DZ. See appendix III for sample drop confirmation messages.

g. Drop at Alternate. Date Time of drop at alternate DZ.

60. Area Drop Zone

a. General. An area DZ consists of a prearranged flight over a series of acceptable drop sites which establishes a line of flight between two points, (A and B, fig. 7). The distance between these points should not exceed 25 kilometers, and will have no major changes in ground elevation in excess of 90 kilometers. Drop sites may be selected not more than 1 kilometer to the left or right of the established line of flight.
The aircraft arrives at point A at the scheduled time and proceeds towards point B looking for the DZ markings. Once the markings are located, the drop is conducted in the normal manner. The area DZ system is particularly well adapted for use in conjunction with preplanned automatic resupply operations where DZ's are frequently selected on the basis of map reconnaissance. The area DZ system is also adaptable to long-range patrols and operations conducted by counterinsurgency elements in pursuit of an insurgent force.

b. **Drop Zone Data.** Area DZ's are reported using the normal DZ report format, with these exceptions:

1. Locations of both point A and B, including reference points.
2. The open quadrant is reported as “none.”
3. Obstacles over 90 meters above the level of the terrain along the line of flight, and within 8 kilometers on either side and not shown on the issued map (fig. 8). These obstacles are reported in reference to either point A or B.
4. See appendix III for sample area DZ report.

Section III. MARKING DROP ZONES

61. **Drop Zone Identification**

The purpose of DZ markings is to identify the...
a visual track for the aircraft. The procedures for marking DZ’s are included in the SOI.

a. Nighttime marking of DZ’s is accomplished by using lighting devices such as flashlights, flares, and small wood, oil, or gas fires.

b. For daylight operations a satisfactory marking method is the Panel Marking Set AP-50 or VS-16. If panels are not available, sheets, strips of colored cloth, or other substitutes can be used provided there is a sharp contrast with the background. Smoke grenades or simple smudge fires used in conjunction with other markings greatly assist the aircrew in sighting the DZ markings on the approach.

62. Homing Devices

The use of electronic homing devices permits reception operations during conditions of low visibility. Such devices may also be used in conjunction with visual marking systems.

63. Computation of Ground Release Point

a. General. The release point is determined to insure delivery of personnel or cargo within the usable limits of the DZ. Computation of the ground release point involves the factors in b through d below.

b. Personnel and Low Velocity Cargo Drops.

   (1) Dispersion. Dispersion is the length of the pattern formed by the exit of the parachutists or cargo containers (fig. 
3. The desired point of impact for the first parachutist/container depends upon the manner in which the calculated dispersion pattern is fitted into available DZ space.

(2) Wind drift. This is the horizontal distance traveled from the point of parachute deployment to the point of landing as a result of wind conditions. The release point is located a calculated distance upwind from the desired impact point. To determine the amount of drift, use the following rule of thumb formulas:

(a) For personnel using the T-10 parachute: Drift (meters) = altitude (hundreds of feet) × wind velocity (knots) × 4 (constant factor).

(b) For all other low velocity parachute drops: Same as 1 above; however, instead of 4 use the constant factor 3.

(c) For a mixed load of personnel and cargo, use the personnel factor (4).

(3) Forward throw. This is the horizontal distance traveled by the parachutist or cargo container between the point of exit and the opening of the parachute. This factor, combined with reaction time of the personnel in the aircraft, is compensated for by moving the release point an additional 100 meters in the direction of the aircraft approach.

(4) High Velocity and Free-Drop Loads. High velocity and free-drop loads are not materially affected by wind conditions; therefore, wind drift is disregarded. Dispersion is computed the same as for low velocity drops. On the other
hand, without the restraint of a parachute, forward throw is compensated for by moving the ground release point marking in the direction from which the aircraft will approach; a distance equal to the altitude of the aircraft above the ground.

Methods of Release Point Marking

There are two methods for marking the DZ release point. The principal difference between the two is the method of providing identification. The marking systems described in $a$ through $c$ below are designed primarily for operational drops executed at an altitude of 400 to 800 feet. Training jumps executed at an altitude in excess of 800 feet require modification of the marking systems.

$a$. The primary marking method employs lights or panels in a distinctive configuration which changes daily according to unit SOL. In addition to marking the ground release point this configuration serves to identify the drop zone to the aircrew.

(1) The number of markers used seldom exceeds six.

(2) The distance between markers is 25 meters for drops executed at operational altitudes of 800 feet or less. When the drop altitude exceeds 800 feet, the spacing is increased by 50 meters.

(3) The release point markers normally will form a distinctive shape (square, rectangle, triangle) or letter ($T$, $L$, $X$).

(4) In executing drops, the aircraft is aligned as accurately as possible over the right hand row of markers. Deviations will not exceed 50 meters to the right of the row of markers. The drop is made
directly over the last light in the right hand row (fig. 10).

b. The alternate marking method employs a standard three-marker pattern (fig. 10) positioned in the form of an inverted L. Identification of the drop zone is accomplished by means of a code light displayed in addition to the 3 lights of the standard inverted L, placed 5 meters from the stern marker S.

c. All jumps from an absolute altitude in excess of 800 feet require the use of a flank marker placed 200 meters to the left of the release point markings. The configuration of some cargo and troop carrying aircraft prevent the pilot from seeing the markings after approaching within approximately 1.6 kilometers of the DZ while flying at 1,000 feet absolute altitude. From this point on, the pilot must depend on flying the proper track in order to pass over the release point. The flank marker indicates the release point and the exact moment the drop should be executed. Operational drops executed at altitude less than 800 feet do not require the flank marker.

65. Placement of Markings

a. Markings must be clearly visible to the pilot of the approaching aircraft. The formula for determining mask clearance is 15 units of horizontal distance, a ratio of 15 to 1, for each unit of obstruction. As an example, markings must have a clearance of at least 450 meters from an obstruction 30 meters in height (fig. 11).
Additionally, precautions must be taken to ensure that the markings can be seen only from the direction of the aircraft approach. Flashlights are sufficiently directional not to require shielding if aimed toward the flight path. Fires from improvised flares are screened on three sides and placed in pits with sides sloping toward the direction of the aircraft's approach (fig. 12).

c. When panels are used for daylight DZ marking they are positioned at an angle of approximately 45° from the horizontal to present the maximum surface toward the approaching aircraft (fig. 13).

a. Unmarked Drop Zones

b. Personnel and equipment may be dropped on unmarked drop zones when necessary. This technique is generally limited by visibility to specific moon phases or daylight. A drop zone selected for this purpose should be located in an isolated or remote area and free from enemy interference.

b. Drops on unmarked DZ's may be preplanned for specific periods of time. The receiving unit is required to keep the DZ under constant surveillance during the time the drop is scheduled. As soon as the cargo is delivered, observers alert the receiving unit, measures are taken to dispose of the items received, and the DZ is sterilized (obliterating all signs of the drop). To aid in recognition, the DZ's should be of odd configuration and size and have specific, recognizable land marks.
marks. Electronic signaling devices, compatible with the aircraft equipment, should be used with a previously planned recognition signal where possible.

c. On the basis of available intelligence and

Information from the operational area concerning weather conditions and prevailing winds, the pilot will compute the air release point.

Section IV. HALO OPERATIONS

47. General

When atmospheric conditions over the target area prevent the infiltrating groups from sighting the DZ as they exit the aircraft, special techniques are employed. If electronic equipment compatible with aircraft radio and radar facilities is available and used, the time of exit may be determined by a ground release point system. If a trained reception committee with special communications equipment is not available, a computed air release point system may be used. In all cases, air crews are responsible for the release point.

48. DZ Markings

The visual ground marking release system is used when the aircraft can fly to the desired DZ with good forward ground visibility.

a. In HALO operations DZ markings indicate the impact point, not the release point. Markings will indicate wind direction and speed; flares, gas pots for night operations, and panel marking devices for daylight operations are set in the form of an arrow pointed into the wind (fig. 14).

b. Five marking devices placed at 25 meter intervals outline the arrowhead.
c. The stem of the arrow will act as the wind speed indicator, with markers placed at 25 meter intervals. The arrowhead indicates to jumpers 0 to 5 knots of wind; the first marker below the arrowhead, 5 to 10 knots; the second marker, 10 to 15 knots; and the third marker, 15 to 20 knots of wind. HALO parachutists, knowing their opening altitude, estimated wind speed, and direction as indicated by the markings on the ground, will mentally compute their wind drift after opening. Using the “tracking” technique for horizontal movement, they will move to their selected opening point. Additionally, visible markings on their designated leader enables them to assemble in the air while maneuvering for their opening.

a. The procedures for indicating an abort or on-jump status are the same as those outlined in this chapter. If DZ markings can be observed before the jump and wind indicators reflect winds in excess of 20 knots, there is no jump. Airborne operations orders will indicate rescheduling of the mission or cancellation.

69. Obscured DZ’s
Situations often require the use of sites that are difficult to locate and identify. Atmospheric conditions may obscure the pilot’s view of the ground. Then audio, radio, or radar devices must be used in conjunction with standard signals.

a. If electronic equipment is available for use, the electronic ground mark-release system may be used. This system requires personnel on the ground to place an electronic device in such a position that it can be interrogated by incoming aircraft. The device can be either passive or active and will be selected by the Air Force to ensure compatibility with equipment installed in
aircraft. When employing this system, good forward visibility from the aircraft is not required. The aircraft must be flown at a predetermined track, altitude, and air speed from the IP to the electronic device. When the aircraft is directly over the device the parachutists are released.

b. When no ground personnel are available to provide terminal air markings, the computed air release point system (CARP) is used. The aircrew must know the desired impact point and be able to visually identify landmarks short of the impact point and in the line of flight from the IP. The CARP system is the parachute release system used during normal, joint airborne operations.

70. Premission Planning

Joint premission planning will include the establishment of oxygen procedures, exit door opening procedures, magnetic course from IP, airspeed and altitude at release point, the release point, and recognition and abort procedures.

71. Resupply

Resupply procedures may be carried out by HALO techniques using various methods to free fall equipment into designated areas.

a. Nonelectric blasting caps may be used to fire parachute retaining devices and time fuse can be cut in accordance with altitude and desired free fall time of equipment.

b. Power actuated reefing line cutters, an item of issue available to airborne units, may be used when longer delays are necessary.

c. Use of high altitude bombing techniques are satisfactory for delivery of time-delay cargo parachutes.

Section V. DZ LANDING OPERATIONS

72. Reception Committees

It is desirable that the Special Forces detachment be met upon infiltration by an indigenous reception committee. Infiltration without the assistance of the reception committee may be necessary when there is no prior contact with the resistance element in the area and time does not permit the establishment of such contact. Once the detachment is within the operational area, reception committees are formed to conduct all future airborne or air landed operations within operational areas. Reception committees normally are composed of indigenous personnel trained and supervised by members of the Special Forces operational detachment. The functions of a reception committee are to—

a. Provide security for the reception operation.

b. Emplace DZ markings and air ground identification equipment.

c. Maintain surveillance of the site before and after the reception operation.

d. Recover incoming personnel and cargo.
e. Sterilize the site.

f. Provide for movement from DZ and disposal of equipment.

73. Composition and Duties

a. Organization of Reception Committee. The reception committee normally is organized into five parties—
   (1) Command party.
   (2) Marking party.
   (3) Security party.
   (4) Recovery party.
   (5) Transport party.

b. Command Party.
   (1) Controls and coordinates the actions of all reception committee components.
   (2) Includes the Reception Committee Leader (RCL) and communications personnel, consisting of messengers, a radio operator, and the Special Forces advisor.
   (3) Provides medical support during personnel drops.

c. Marking Party.
   (1) Sets up and operates the marking system.
   (2) Lights and extinguishes lights as directed.
   (3) Assists in recovery of personnel and equipment.

(4) Helps sterilize DZ, by covering all traces of light pattern.

   (1) Insures that unfriendly elements do not interfere with the operation.
   (2) Consists normally of inner and outer security elements.
      (a) The inner security element is positioned in the immediate vicinity of the site and is prepared to fight delaying or holding actions.
      (b) The outer security element consists of outposts established along approaches to the area. They may prepare ambushes and road blocks to prevent enemy movement toward the site.
   (3) The security party will be supplemented by auxiliary personnel depending upon the operational environment in guerrilla operational areas and by local, self-defense units or civil defense groups in a counterinsurgency environment. These groups generally are used to maintain surveillance over enemy activities; keep the security party informed of enemy movements; and, when necessary, conduct limited objective attacks or ambushes to prevent enemy movement toward the site.

(4) Provides march security for moves between the reception site and the destina-
tion of the cargo or infiltrated personnel.

e. Recovery Party.

(1) Recovers cargo and air delivery equipment from the DZ.

(2) For air delivery operations, the recovery party should consist of at least 2 men for each parachutist or cargo container. The recovery party, usually dispersed along the length of the anticipated impact area, spots each parachute as it descends and moves to the landing point.

(3) Once a bundle is found, one man must stay with it while the second takes the parachute to the recovery collection point and guides a detail back to carry off the packages. Another technique is to divide the recovery party into 2-man teams which have been assigned a parachute number coinciding with the sequence of exit from the aircraft. If personnel are available, the recovery party leader stations a separate recovery detail at the far end of the DZ to track and locate bundles in event the exit is delayed or disrupted. Recovery party personnel must have a simple signaling means, such as a metal cricket or tone sticks, to preclude shouting and unnecessary movement. When the first bundle or parachutist exits from the aircraft, the recovery party leader should station a man directly under the point of exit. This man remains in place until all bundles or parachutists are recovered. He serves as a reference for the point of exit and can subsequently indicate the aircraft's exact line of flight in the event a bundle is lost and a sweep of the DZ must be made.

(4) To insure sterilization, the recovery party must—

(a) Clearly instruct all reception committee personnel on the dangers of leaving cigarette butts or candy and gum wrappers, mislaying equipment, and leaving "sign" of occupancy (crushed undergrowth, heel scuffs, trails, human waste).

(b) When unpacking bundles, keep all rigging straps tied or buckled together; make only one cut on any single strap.

(c) Have one individual at the recovery collection point to be responsible for accounting for air items and packages as the recovery teams bring them off the DZ.

(d) Provide a two or three man surveillance team, preferably from the supporting auxiliary, to maintain a close watch on the DZ area for enemy activity during the 48 hours following the drop.
(5) To insure sterilization, the individual parachutist must—
(a) Recover all parachute items; straps, buckles, pieces of equipment, or objects that have been introduced into the area in connection with the drop.
(b) Not lay anything on the ground during the removal of individual parachutes (e.g., gloves, helmet, weapon) or during the recovery of bundles.
(c) Bury unwanted air items separately at the base of thick bushes.
(d) Erase drag marks, footprints, and impact marks with a scrubbing motion of a leafy tree branch.
   Note. Disguise freshly cut tree branch stubs with mud.
(e) Avoid trampling or crushing vegetation; skirt around plowed areas and grass fields when moving off the DZ.
(f) Select and prepare cache sites concealed from ground and air daylight observation.
(g) Prevent accidental compromise of the operation by avoiding paths and roads and by moving cross-country to the assembly point.

f. Transport Party.
(1) Moves items received to distribution points or caches.
(2) Consists of part, or all, of the members comprising the command, markings, and recovery parties.

74. Drop Zone Authentication

a. Air to Ground. The aircraft is required to arrive over the DZ within a specified time usually extending from 2 minutes before scheduled drop time to 2 minutes after. The DZ markings are displayed according to the schedule. Arrival during this specific time period, approach on the designated track, and flying at designated altitude as indication to the reception committee that the aircraft is friendly.

b. Ground to Air.
(1) The reception committee is identified by one of the following methods.
   (a) Primary method. Display a specific DZ marking configuration for the date or each day of the week. The display of proper markings for a particular 24-hour period identifies the reception committee.
   (b) Alternate method. Display a standard marking configuration indicating the release point and identifying the reception committee by means of a coded light or panel signal. The following rules govern the use of a coded light signal:
      1. Never use code letters consisting solely of all dots or dashes, e.g., I,E,-M,O,S,T.
2. Use the following time intervals to assist the aircrew in recognition of the signal: dots—2 seconds; dashes—4 seconds; interval between dots and dashes—2 seconds; interval between coded letters—5 seconds.

(2) The schedule of DZ markings, or identification and authentication signals, is contained in the detachment SOI. This schedule is changed as frequently as necessary for security.

Section VI. AIR LANDING OPERATIONS

75. General

Air landing operations provide the Special Forces detachment with a speedy and efficient means of evacuating both personnel and cargo from the operational area; however, such operations are difficult and require highly trained aircrews and reception committees. Normally, in guerrilla operational areas, air landing operations are conducted at night. In a counterinsurgency environment or in the conduct of counterguerrilla operations, air landing operations may be conducted either at night or in daylight commensurate with the mission.

76. Security

Special emphasis is placed on security. Because of the probability of the enemy's detecting the operation, LZ's established in guerrilla operational areas are located away from the guerrilla bases and are seldom reused. LZ's used in counterinsurgency operations may be adjacent to base camps rather than at great distances. This permits the counterinsurgency force to provide maximum security to POL dumps and areas used for loading and unloading equipment and for personnel moving in or out of the operational area.

77. Landing Zone (Land)

a. General. The general considerations applicable to DZ selection apply to the selection of LZ's; however, site size, approach features, and security are far more important.

b. Selection Criteria.

(1) Terrain.

(a) LZ's should be located in flat or rolling terrain.

(b) Level plateaus of sufficient size can be used. Because of decreased air density, landings at higher elevations require increased minimum LZ dimensions. If the LZ is located in terrain above 1,220 meters or in an area with a very high temperature, the minimum length will be increased as follows:

1. Add 10 percent to minimums for each 305 meters of altitude above 220 meters.

2. Add 10 percent to minimums for the
Figure 15. Landing zone (land) medium aircraft (night operations).

Figure 16. Landing zone (land) light aircraft (night operations).
altitude if temperatures are over 90°F. Add 20 percent if temperatures are over 100°F (38°C).

(c) Although undesirable, sites with only a single approach can be used. When using such sites it is mandatory that—

1. All takeoffs and landings be made upwind.
2. Sufficient clearance at either end of the LZ permits a level 180° turn to either side within a radius of 5 kilometers for medium aircraft, or 1.5 kilometers for light aircraft.

(2) Weather. Prevailing weather in the landing area should be favorable. In particular, there must be a prior determination of wind direction and velocity and conditions restricting visibility such as ground fog, haze, or low-hanging cloud formations.

(3) Size. The required size of LZ's varies according to the type of aircraft used. Safe operations require the following minimum dimensions (fig. 15 and 16):

(a) Medium aircraft, 920 meters in length, 30 meters in width (45 meters at night).
(b) Light aircraft, 305 meters in length, 15 meters in width (45 meters at night).

(c) In addition to the basic runway dimensions, and to provide a safety factor, these extra clearances are required—

1. A cleared surface, capable of supporting the aircraft extending from each end of the runway and equal to 10 percent of the runway length.
2. A 15 meter strip extending along both sides of the runway and cleared to within 1 meter of the ground.

(4) Surface.

(a) The surface of the LZ must be level and free of obstructions such as ditches, deep ruts, logs, fences, hedges, low shrubbery, rocks larger than a man's fist, or grass over .5 meters high.
(b) The subsoil must be firm to a depth .6 meters.
(c) A surface containing gravel and small stones or thin layers of loose sand over a firm layer of subsoil is acceptable. Plowed fields or fields containing crops over .5 meters high will not be used.
(d) Surfaces that are not desirable in summer may be ideal in winter. Ice with a thickness of 20 centimeters will support a light aircraft. Ice with a thickness of 61 centimeters will support a medium aircraft. Unless the air-
craft is equipped for snow landing, snow in excess of 11 centimeters must be packed or removed from the landing strip.

(c) The surface gradient of the LZ should not exceed 2 percent.

(5) Approach and takeoff clearance. The approach and takeoff clearances are based on the glide/climb characteristics of the aircraft. For medium aircraft the glide/climb ratio is 1 to 40; that is, one meter of gain or loss of altitude for every 40 meters of horizontal distance traveled. The ratio for light aircraft is 1 to 20. As a further precaution, any obstructions in approach and departure lanes must conform to the following specifications (fig. 17):

(a) No obstruction higher than 2 meters and closer than 36 meters for light aircraft or closer than 72 meters for medium aircraft.

(b) A 15 meter obstruction may not be closer than 610 meters for medium aircraft, or 305 meters for light aircraft.

(c) A 155 meter obstruction may not be closer than 7 kilometers for medium aircraft or 4 kilometers for light aircraft.

(d) Hills of 305 meters or more above LZ altitude may not be closer than 13 kilometers from the landing zone for medium aircraft.

(e) The heights of obstacles are computed from the level of the landing strip.

(f) Distances are computed from the nearest end of the landing surface.

Figure 17. Takeoff and approach clearances (fixed-wing aircraft).
78. Markings

a. For night operations, lights are used for marking LZ's; during daylight panels are used. When flashlights are used, they should be hand-held for directional control and guidance, and during the aircraft's final approach they should be held at knee height to avoid giving an erroneous impression of the location of the surface of the landing strip.

b. The pattern outlining the limits of the runway consists of five or seven marker stations (fig. 18). Stations A and B mark the downwind end of the LZ and are positioned to provide for the safety factors previously mentioned. These stations represent the initial point at which the aircraft should touch the ground. Station C indicates the very last point at which the aircraft can touchdown and complete a safe landing.

c. A signal light manned by the reception committee leader (RCL) is incorporated into light station B, figure 18. For night operations, the signal light should be green; the remaining lights should be white. During daylight operations, a distinctive panel or colored smoke located approximately 15 meters to the left of station B (RCL), is used for recognition.

79. Conduct of Operations

a. The LZ markings normally are displayed 2 minutes before the arrival time indicated in the mission confirmation message. The markings remain displayed for a period of 4 minutes or until the aircraft completes its landing roll after touchdown (fig. 18).

b. Identification is accomplished by—
   (1) The aircraft arriving at the proper time on a prearranged track.
   (2) The RCL flashing or displaying the proper code signal.

Figure 18. Landing procedure (land LZ).
c. Landing direction is indicated by—

(1) The RCL signal control light (station B) and marker A which are always on the approach or downwind end of the runway.

(2) The row of markers which are always on the left side of the landing aircraft.

d. The pilot usually attempts to land straight-in on the initial approach. When this is not possible, a modified landing pattern is flown using a minimum of altitude for security reasons. Two minutes before landing the RCL causes all lights of the LZ pattern to be turned on and aimed like a pistol in the direction of the aircraft’s approach track. The RCL (station B) also flashes the code of the day continuously with the green control light in the direction of the aircraft’s approach. Upon arrival in the area (within 15’ to either side of the approach track and below 500 feet), the LZ marking personnel follow the aircraft with all lights. When the RCL determines that the aircraft is on its final approach he will cease flashing the code of the day and aim a steady light in the direction of the landing aircraft, being careful not to blind the pilot with the light. The solid light provides a more positive pattern and perspective for the pilot during landing. If a “go around” is required, all lights follow the aircraft to assist the pilot in maintaining orientation with respect to the landing strip; all lights continue to follow the aircraft during touchdown and until it passes each respective light station.

e. Landings normally are not made under the following conditions:

(1) Lack of, or improper, identification received from the LZ.

(2) When the RCL gives the abort signal, which is extinguishing of all lights on the LZ.

(3) Any existing condition that, in the opinion of the pilot, makes it unsafe to land.

f. After the aircraft passes the RCL position at touchdown and completes its landing roll and a right turn, stations A and B shine a solid light in the direction of the taxing aircraft, continually exercising caution not to blind the pilot. These lights guide the pilot who will taxi the aircraft back to takeoff position. After off-loading or on-landing is complete and the aircraft is ready for takeoff, the RCL moves to a vantage point forward and to the left of the pilot, causes the LZ lights to be illuminated, and directs his light toward the nose of the aircraft as the signal for takeoff.

g. To eliminate confusion and insure expeditious handling, personnel or cargo to be evacuated or exfiltrated wait for unloading of incoming personnel or cargo.

h. When all evacuating personnel are loaded and members of the reception committee are clear of the aircraft, the pilot is given a go signal by the RCL. LZ markings are removed as soon as the aircraft is airborne.
i. Under ideal conditions, to increase the probability of success of an air landing operation, an alternate LZ may be designated for some missions. Separate landing times are established and both LZ's are manned. Personnel or cargo to be exfiltrated normally are stationed at the primary LZ; operational planning should allow for the orderly, secure transfer of personnel or cargo to the alternate LZ should the primary become unsuitable sufficiently in advance of the landing time. No attempt should be made to transfer personnel or cargo to the alternate LZ during the interval between landing times. Incoming personnel or cargo can be received at either the primary or alternate LZ.

Section VII. LANDING ZONE (WATER)

80. Selection Criteria

a. Size. For medium amphibious or seaplane aircraft, the required length is 1,220 meters with a minimum width of 460 meters; for light aircraft 615 meters long and 155 meters wide. An additional safe area equal to 10 percent of the airstrip length is required on each end (fig. 19).

b. Surface. Minimum water depth is 2 meters. The entire landing zone must be free of obstructions such as boulders, rock ledges, shoals, waterlogged boats, or sunken pilings within 2 meters of the surface.

c. Wind.

(1) Wind velocity for medium aircraft must
not exceed 20 knots, light aircraft, must not exceed 15 knots in either sheltered or semi-sheltered water.

(2) No landing can be made when crosswind components are greater than 8 knots from an angle of 45° to 90° to aircraft's landing heading. Medium and light aircraft can land in crosswind components of 20 and 15 knots respectively at 0° to 40° angles from landing heading.

(3) Windwaves for medium aircraft will not exceed 1.9 meters in height, and windwaves for light aircraft will not exceed .5 meters in height.

d. Tide. Tides should have no bearing on the suitability of the landing area; however, whether high tide or low tide, the area should conform to minimum requirement.

e. Water/Air Temperatures. Because of the danger of icing, water and air temperatures must not fall below the following minimums:

<table>
<thead>
<tr>
<th>Water temperature</th>
<th>Air temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt Water</td>
<td>+18°F (-8°C)</td>
</tr>
<tr>
<td>Fresh water</td>
<td>+35°F (+2°C)</td>
</tr>
<tr>
<td>Brackish water</td>
<td>+35°F (+2°C)</td>
</tr>
</tbody>
</table>

f. Approach and Takeoff Clearance. Water landing zones require approach/takeoff clearances identical to those of land LZ's (fig. 16) and are based on the same glide/Climb ratios.

g. Marking and Identification.

(1) Depending upon visibility, lights or panels are used to mark water LZ's.

(2) The normal method of marking water LZ's is to align three marker stations along the left edge of the landing strip.
Station A is positioned at the downwind end of the strip and indicates the desired touchdown point. Station B marks the last point at which the aircraft can touchdown and complete a safe landing. Station B is also the location of the RCL and the pickup point. The RCL light is an additional light and should not be in the same boat as the B station marker light. Station C marks the upwind extreme of the landing area. At night, stations A, B, and C are marked by white lights. The RCL signal light is green.

An alternate method is to use a single marker station, marked at night with a steady light in addition to the signal or recognition light. This station is located to allow a clear approach and takeoff in any direction. The pilot is responsible for selecting the landing track and may touchdown on any track 305 meters from the marker station. Following pickup, the aircraft taxis back to the 610 meter circle in preparation for takeoff (fig. 21).

h. Conduct of Operations.

(1) The LZ is carefully cleared of all floating debris and the marker stations are properly aligned and anchored to prevent drifting.

(2) The procedure for displaying water LZ markings and identification is the same as for operations on LZ's.

(3) Personnel or cargo to be evacuated or exfiltrated are positioned in the RCL boat. Following the landing run, the aircraft turns to the left and taxis back to the vicinity of the RCL boat to make the pickup. The RCL indicates his position by shining the signal light toward the aircraft and continues to shine his light until the pickup is completed. This light should not be aimed directly at the
cockpit to avoid blinding the aircrew (fig. 22).

(4) The RCL boat remains stationary during pickup operations. The aircraft taxis to within 15 to 30 meters of the RCL boat, paying out a dragline from the left rear door. The dragline is approximately 45 meters in length and has three lifejackets attached; one close to the aircraft, a second at the midpoint, and the third on the extreme end of the line. The lifejackets have small marker lights attached during night operations. The aircraft taxis to the left around the RCL boat, bringing the dragline close enough to be secured. The RCL fastens the line to the boat (fig. 23). Due to the danger of swamping the craft, the RCL does not attempt to pull on the line. Members of the aircrew pull the boat to the door of the aircraft. Should the boat pass the aircraft door and continue toward the front of the aircraft, all personnel in the boat must abandon immediately to avoid being hit by the propeller (fig. 23).

(5) After pickup, the aircrew is given any information that will aid in the takeoff. Following this, the RCL boat moves to a safe distance from the aircraft and signals the pilot “all clear.” If necessary, previously installed JATO bottles are used for positive power takeoff.

Figure 22. Landing procedures (water LZ).
Section VIII.
LANDING ZONES FOR ROTARY-WING AIRCRAFT

81. General

a. Within their range limitations, helicopters provide an excellent means of infiltration, exfiltration, and evacuation from GWOA’s and counterinsurgency operational areas. Their advantages include the ability to—

(1) Ascend and descend almost vertically.
(2) Land on relatively small plots of ground.
(3) Hover nearly motionless and take on or discharge personnel and cargo without landing.
(4) Fly safely and efficiently at low altitudes.

b. Some unfavorable characteristics of helicopters are—

(1) Engine and rotor noises compromise secrecy.
(2) Icing, or high gusty winds make flying difficult or sometimes impossible.
(3) Changes in atmospheric conditions reduces the aircraft’s lift capability.
(4) Dust clouds caused by the rotor compromises security of location.

c. For the maximum effective use of helicopters, LZ’s should be located to allow landings and takeoffs into the wind.

d. During night operations, helicopters usually must land to transfer personnel or cargo.
A decrease in normal air density limits the helicopter payload and requires lengthened running distances for landing and takeoff. Air density is largely determined by altitude and temperature. Low altitudes and moderate to low temperatures result in increased air density. Conversely, high altitudes and high temperatures cause decreased air density.

8. Selection Criteria

a. Size. Under ideal conditions, and provided the necessary clearance for the rotors exists, a helicopter can land on a plot of ground slightly larger than the spread of its landing gear. For night operations, however, a safety factor is allowed with the following criteria as a guide:

(1) An area of 50 meters in diameter cleared to the ground.

(2) An area beyond this, surrounding the cleared area, 20 meters wide and cleared to within 1 meter of the ground.

(3) The completed LZ is thus a minimum of 90 meters in diameter (fig. 24).

b. Surface.

(1) The surface should be relatively level and free of obstructions such as rocks, logs, tall grass, ditches, and fences.

(2) The maximum ground slope permitted is 15 percent.

(3) The ground must be firm enough to support the aircraft.

(4) Heavy dust or loose snow interferes with pilot visions just before touchdown. This effect can be reduced by clearing, wetting down, or using improvised mats.

(5) Landing pads may be prepared on swamp or marsh areas by building platforms of locally available materials (fig. 25). Such LZ's are normally used for daylight operations only. The size of the clearing for this type of LZ is the same.

Figure 24. Landing zone for rotary-wing aircraft.
as b above, with the following additional requirements for the platform:

- **EARTH PACKING**
  - STAKES
  - LOGS

- **SURFACE PLATFORM**

- **ROUGH GROUND PLATFORM**

- **SWAMP OR SHALLOW WATER PLATFORM**

*Figure 25. Examples of platform landing zones for rotary-wing aircraft.*

(a) Large enough to accommodate the spread of the landing gear (plus 10 feet).
(b) Capable of supporting the weight of the aircraft.
(c) Of firm construction that will not move when the helicopter touches down and rolls slightly forward.
(d) Level.
(e) If logs or bamboo are used, be constructed so that the top layer of poles is at right angles to the touchdown direction.

(6) Helicopters, other than the HU–1 series, can land in water without the use of special flotation equipment provided—
   (a) The water depth does not exceed 46 cm.
   (b) A firm bottom such as gravel or sand exists.

(7) Landing pads can be prepared on mountains or hillsides by cutting and filling (fig. 26). Caution must be exercised to insure there is adequate clearance for the rotors.

**c. Approach/Takeoff.**

(1) There should be at least one path of approach to the LZ measuring 75 meters in width.
(2) A rotary-wing aircraft is considered to have a climb ratio of 1 to 5 (fig. 27).
(3) Takeoff and departure from the LZ may be along the same path used for the ap-
83. Marking and Identification

a. LZ's for rotary-wing aircraft are marked to—

(1) Provide identification of the reception committee.
(2) Indicate direction of wind or required direction of approach.
(3) Delineate the touchdown area.

b. Equipment and techniques of marking are similar to those used with fixed-wing LZ's—lights or flares at night and panels in daylight.

c. An acceptable method of marking is the Y system. This uses four marker stations (fig. 28).

(1) The direction of approach is into the open end of the Y.

Figure 26. Preparing landing pads in mountainous terrain (rotary-wing aircraft).

Figure 27. Approach/takeoff clearances (rotary-wing aircraft).
(2) When compatible with approach paths, wind direction is along the stem of the Y toward the open end.

(3) The touchdown area is delineated by the triangle formed by the three lights marking the open end of the Y.

(4) Station No. 2 is also the signal station. Light or panel signals may be used for identification. Smoke may be used to assist the pilot in locating the landing zone, but it is placed so it will not obscure the touchdown area.

84. Reporting Landing Zones

a. Reporting of LZ's and the coordination between the operational detachment and the air support unit through the SFOB closely parallels the procedures used in aerial delivery operations. The minimum LZ data required is—

(1) Code name. Extracted from detachment SOI.

(2) Location. Complete military grid coordinates of the center of the LZ.

(3) Long axis. Magnetic azimuth of long axis of runway. It also indicates probable direction of landing approach based on prevailing winds.

(4) Description. Surface, length, and width of runway.

(5) Open Quadrant. Measured from center LZ and reported as series of magnetic azimuths. Open quadrants indicate acceptable aircraft approach.

(6) Track. Series of magnetic azimuths clockwise from north.

(7) Obstacles. In addition to the limitations pertaining to takeoff and approach clearances, obstacles exceeding 90 meters above the level of the LZ within a 8 kilometer radius, and not shown on issued maps, are reported by description, azi-
muth, and distance from the center of
the LZ.

(8) Reference point. A landmark shown on
the issued map; reported by name, azi-
muth, and distance from center of LZ.
Used with (2) above in plotting the LZ
location.

(9) Date/time mission requested.

(10) Items to be infiltrated or evacuated. See
appendix III for a sample LZ report

b. Reporting LZ’s for Rotary-Wing Aircraft.
The minimum landing zone data reported gen­
erally is the same as for fixed-wing LZ’s, except
in first paragraph indicate that the site is for use
by rotary-wing aircraft.

85. Mission Confirmation (Air Landing)

a. Following the processing of the LZ data at
the SFOB, and coordination with the air support
unit, a confirmation message is transmitted to the
operational detachment. This procedure is sim­
ilar to that used for aerial delivery operations.

b. The confirmation message contains, as a
minimum, the code name of the LZ, the date/time
that the aircraft will arrive, and the track to be
flown.

c. See appendix III for sample air landing con­
firmation message.

86. Skyhook Operations

a. General. Exfiltration is the means employed
to return or bring personnel out of operational
areas to friendly territory. Exfiltration and evac­
uation techniques normally employed in support
of unconventional warfare and counterinsurgency
operations have already been discussed in the air
landing portion of this chapter. Skyhook is an­
other technique within the capabilities of the
Special Forces groups, Army aviation support
units, and Air Force support units. Skyhook tech­
niques may be used to exfiltrate or evacuate per­
soneel and equipment from areas inaccessible to
aircraft landings.

b. Missions. Skyhook missions must be approved
by the SFOB and the supporting air unit selected
for the mission. Aircraft equipped to fly exfiltra­
tion or evacuation missions using skyhook tech­
niques will be placed on standby status. Opera­
tional missions may include evacuation or infil­
tration of—

(1) Seriously ill or injured U.S. personnel.
(2) Guides or assets who can brief opera­
tional elements and reinfiltrate with op­
erational detachments.
(3) Priority and valuable cargo and equip­
ment from remote areas, that might
normally require days or weeks of haz­
ardous travel to bring out.
(4) Downed aircrews.
(5) Bodies subject to possible desecration
such as heroes and martyrs.
(6) Personnel engaged in underwater opera­
tions against selected targets following
mission accomplishment.
(7) Prisoners who possess useful information.

c. Capabilities. Because of the unique vertical lift capability of skyhook, combined with the use of large, long-range aircraft, geographical restrictions are few. Pickups can be performed under varying conditions and may include—

1. Pickups performed in 40 knot winds.
2. Night pickups with stroboscopic lights attached to the lift line.
3. Open sea pickups.
4. The use of small clearings in dense forests that will not permit helicopter landings.
5. Multiple pickups, using longer and heavier duty lift lines. Loads are strung along the line separately rather than being tied together in one unit.
6. A virtual all-weather capability. Weather affects operation only to extent that visibility may be restricted. Operations normally are delayed only when weather grounds aircraft.

d. Equipment.

1. Skyhook equipment consists of 2 air-droppable containers of heavy duck material and nylon webbing. In the containers are two fiberglas containers filled with 650 cubic feet of helium; a polyethylene, dirigible-shaped balloon with an automatic valve that seals when inflation is complete; 500 feet of tubular nylon lift line; a protective helmet; an all-weather, nylon coverall suit with zippered front, one chest strap, integral self-adjusting harness to fit any size person, and sheepskin hood protecting the head and neck. The equipment may be packaged in a waterproof container and equipped with a rubber life raft for airdropping into water or swampy areas. Difficulties in reading printed instructions are obviated by an animated cartoon instruction board.

2. Aircraft (fig. 29) presently used by light aviation units Air Force support units, with slight modifications, may be used for skyhook operations. The aircraft is equipped with a "yoke" or wide fork horizontally mounted on its nose. The yoke is used only to guide the lift line to its center where it locks to the nose. The yoke with a 25-foot opening, is constructed of light weight tubing and readily supports a 200 pound weight. Deflection lines divert the lift line around the wing tips in the event the pilot fails to intercept the yoke. An electrical, hydraulic, or pneumatic winch is mounted inside the aircraft. Large radomes and side access hatches cause no interference.

37. Employment

a. Normal air drop techniques will be used to
Figure 29. Top view of yoke mounted on aircraft.

Figure 30. Skyhook pickup.
deliver the special equipment required. The equipment is dropped on the initial pass over the DZ. The person to be exfiltrated or evacuated, following directions on the illustration board, will don the coverall suit with the harness, attached to the lift line which is attached to the balloon. The balloon is plugged into the helium bottles. The extractor then pulls a safety pin and squeezes a valve on the helium bottle, permitting the flow of gas to inflate the balloon. He releases the balloon, and sits down facing the approaching aircraft (fig. 30).

b. On the return pass over the DZ, the aircraft, flying upwind of the lift line, approaches the balloon at an altitude of approximately 400 feet. Three cerise colored flags, spaced 25 feet apart, are attached to the lift line; the first flag is 50 feet below the balloon and serves as the contact point for the aircraft. In night operations the lift line, equipped with stroboscopic lights at the same intervals are activated by a remote control unit in the hands of the extractor. These lights permit the pilot to line up the aircraft on the approach run. The aircraft is also equipped with a remote control unit on the instrument panel, permitting the pilot to activate the lights until contact is made with the lift line.

c. Special Forces detachments requesting exfiltration or evacuation by the skyhook technique will be required to establish the DZ and receive the required equipment. They will assist the extractor to don his suit and dispose of the remaining equipment immediately after the pickup. In emergencies, the person to be exfiltrated may be required to perform the ground phase of the operation alone. In this event, areas selected for the pick-up should be remote and inaccessible to ground interference. Remaining equipment may be hidden by the person to be exfiltrated, or picked up at a later date by the operational detachment.

88. Low Level Parachute Extraction Resupply System (LOLEX)

a. General. This system of resupply is the delivery of supplies by cargo aircraft without the aircraft's landing in the operational areas. This system is within the capabilities of light aviation. Using the LOLEX technique, aircraft require the same landing patterns, turn-around radio, and approach and takeoff clearances as normal landing operations.

b. Extraction. Extraction of loads up to 6,000 pounds, depending on the aircraft, is accomplished while the aircraft flies above ground at delivery point, altitude 3 to 6 feet. The extraction parachute deploys and pulls the load from the rear of the aircraft. The deceleration provided by the parachute's opening and ground friction quickly stops the forward momentum of the load.

c. Lashing. The load normally is lashed to wooden platforms with the forward portion rounded like the front ends of skis or sleds. This prevents the load's digging into the ground and flipping over.

d. Advantages. The advantages of LOLEX are
pinpoint accuracy, ability of the air support unit and reception committee to clear the landing zone quickly, and the absence of a requirement for ground equipment.

e. Responsibility. The reception committee must provide transport personnel sufficient to remove dropped loads as quickly as possible.

f. Further Information. Complete details on LOLEX operations are found in TM 57-210-1.
ment and key personnel; or to cause casualties among the enemy and his supporters. Raids also serve to distract attention from other operations, keep the enemy off balance, and force deployment of additional units to protect rear areas.


(1) **Size.** The size of the raid force depends upon the mission, nature and location of the target, and the enemy situation. The raid force may vary from a squad attacking a checkpoint or a portion of unprotected railroad track to a battalion attacking a large supply depot. Regardless of size, the raid force consists of two basic elements—assault and security.

(2) **Assault element.** The assault element is organized and trained to accomplish the objectives of the raid. It consists of a main action group to execute the raid mission and may include personnel detailed to execute special tasks which aid the main action group.

(a) The main action group executes the major task insuring the success of the raid. For instance, if the raid objective is to destroy a critical installation such as a railroad bridge or tunnel, the main action group emplaces and detonates the demolition charges. If the target, such as enemy personnel, is to be neutralized by fire, the main action group conducts its attack with a high proportion of automatic weapons. In some instances the main action group moves physically on or into the target; in other instances they are able to accomplish their task from a distance. The other elements of the raid force are designed to allow the main action group access to the target for the time required to accomplish the raid mission.

(b) If required, special task details assist the main action group to reach the target. They execute such complementary tasks as eliminating guards, breaching and removing obstacles to the objective, diversionary or holding actions, and fire support. The special task details may precede, follow, or act concurrently with the main action group.

(3) **Security element.** The security element supports the raid by preventing the enemy's reinforcing or escaping the target area. The security element also covers the withdrawal of the assault element and acts as a rear guard for the raid force. The size of the security element depends upon the enemy's capability to intervene and disrupt the operation.

c. Preparation.

(1) **Planning considerations.**
(a) The first step is the selection of the target, based upon criticality, vulnerability, accessibility, and recuperability. Other important considerations are the nature of the terrain and the combat efficiency of the raiding force.

(b) Secondly, the Special Forces and indigenous force commanders must consider any possible adverse effects on their units and the civilian populace as a result of the raid. The objective is to diminish the enemy’s military potential, but an improperly timed operation may provoke enemy counteraction for which indigenous units and the populace are unprepared. Also, an unsuccessful attack often has disastrous effects on troop morale while successful operations, on the other hand, raise morale and increase the prestige of the units and their leaders in the eyes of the civilians and makes them more willing to provide much needed support. Further, every precaution is taken to insure that civilians are not needlessly subjected to harsh reprisals because of raid actions. The impact of successful raids can be exploited in detachment psychological operations; however, it is important that before such action is taken, any possible unfavorable repercussions from the population and the enemy military forces be considered. If a raid is unsuccessful, psychological operations will be required to lessen any adverse effects on the friendly indigenous force.

(c) Although detailed, the plan for a raid must be simple and not depend upon too many contingencies for success. Activities in the objective area are planned so that the installation to be attacked is not alerted. This means that activities will conform to normal patterns. Time and space factors are carefully considered—time is allowed for assembly and movement, particularly during darkness. All factors are considered to determine whether movement and attack should be made during daylight or darkness. Darkness naturally favor surprise and normally is the best time when the operation is simple and the physical arrangement of the installation well known. Early dawn or dusk is favored when inadequate knowledge of the installation or other factors necessitate tight control of the operation. A withdrawal late in the day or at night makes close pursuit by the enemy more difficult.

(2) Intelligence. The raid force commander must have maximum intelligence of the target, enemy forces capable of inter-
vening the civilian population’s attitude and support, and the terrain to be traversed en route to and from the objective area; therefore, an intensive intelligence effort precedes the raid. Indigenous intelligence and reconnaissance elements conduct premission reconnaissance of the route to the target and of the target itself. In guerrilla operations local auxiliary sources are exploited, and the auxiliaries may act as guides. Surveillance of the target begins early and is continuous up to the time of the attack. The raid force commander exercises extreme caution to insure the secrecy of the impending operation by careful assignment of missions to indigenous reconnaissance elements so that the local population will not become alerted and alarmed.

(3) Rehearsals of participants. Realistic rehearsals by all participants are conducted for the operation; terrain similar to that found in the target area is used when available; sand tables, sketches, photographs, and target mockup are used to assist in briefings; contingency actions are practiced, and final rehearsals are conducted under conditions of visibility expected in the objective area.

(4) Final inspection. The raid force commander conducts a final inspection of personnel and equipment before moving to the objective area. If possible, weapons are test fired, faulty equipment is replaced, and the condition of the men is checked. During this inspection a counterintelligence check is made of personal belongings to insure that no incriminating documents are carried during the operation. This inspection assures the raid force commander that his unit is equipped and ready for the operation.

d. Movement (fig. 31). Movement to the objective area is planned and conducted to allow the raid force to approach the target undetected. Movement may be over single or multiple routes. The preselected route or routes terminate in or near one or more mission support sites. Every effort is made to avoid contact with the enemy during movement. Upon reaching the designated rendezvous and mission support sites, security groups are deployed and final coordination takes place before moving to the attack position.

e. Action in the Objective Area (fig. 32). Special-task details move to their positions and eliminate sentries, breach or remove obstacles, and execute other assigned tasks. The main action group quickly follows the special-task details into the target area. Once the objective of the raid has been accomplished the main action of the group withdraws, covered by preselected fire support elements or part of the security force. If the attack is unsuccessful, the action is terminated to
prevent undue loss and the special task details withdraw according to plan. The assault element assembles at one or more rallying points while the security elements remain in position to cover the withdrawal according to plan. The assault element withdraw on signal or at a prearranged time.

f. Withdrawal (fig. 33).

(1) Withdrawal is designed to achieve maximum deception of the enemy and facilitate further action by the raid force. The various elements of the raid force withdraw, on order, over predetermined routes through a series of rallying points. Should the enemy organize a close pursuit of the assault element, the security element assists by fire and movement, distracting the enemy, and slowing him down. Elements of the raid force which are closely pursued by the enemy do not attempt to reach the initial rallying point; but, on their own initiative, they lead the enemy away from the remainder of the force and attempt to lose him by evasive action in difficult terrain. If the situation permits, an attempt is made either to reestablish contact with the raid force at other rallying points, to continue to the base area as a separate group, or to reach an area for evaluation. The raid force, or elements of it, may separate and proceed as small groups or individuals to evade close pursuit.

Figure 31. Raid-movement to the objective.
(2) Frequently, in GWOA's the raid force disperses in smaller units, withdraws in different directions, and reassembles at a later time at a predesignated place to conduct further operations. Elements of the raid force can conduct other operations, such as an ambush of the pursuing enemy force, during the withdrawal.

g. Large Raids.

(1) General. When a target is large, important to the enemy, and well guarded, a larger raid force is required to insure an attack. Large raids may involve the use of a battalion-size unit; and, though the operation is conducted similarly to that for smaller raids, additional problems must be considered (fig. 34).

(2) Movement to objective area. Surprise is just as desirable as in a smaller raid, but it is usually harder to achieve. In GWOA's, the number of troops to be deployed requires additional mission support sites at a greater distance from the target to preserve secrecy, which necessitates a longer move to the attack position. A large-raid force usually moves by small components over multiple routes to the objective area. In counterinsurgency operations larger raids are conducted by regular troops, at times using air assault techniques,
supported by Special Forces-directed units.

(3) Control. Another problem inherent in a large raid is that of control. Units without extensive radio communications equipment will find coordination of widespread elements difficult to achieve. Pyrotechnics, audible signals, runners, or predesignated times may be used to coordinate action.

(4) Training. A high degree of training and discipline is required to execute a large raid. Extensive rehearsals assist in preparing the force for the mission. In particular, commanders and staffs must learn to use large numbers of troops as a cohesive fighting force.

(5) Fire support. Additional fire support usually is a requirement. In GWOA's this may mean secretly caching ammunition in mission support sites over a period of time before the raid. Guerrillas may each carry a mortar, recoilless rifle round, rocket or box of machine-gun ammunition and leave them at a mission support site or firing position for fire support units. In counterinsurgency operations sufficient firepower is moved into areas within range of the selected target area and is on call to support the action.

(6) Timing. Timing is usually more difficult for a large raid. More time is required
to move units, and the main action element needs more time to perform its mission. This requires stronger security elements to isolate the objective for longer periods. The timing of the raid takes on increased importance because of the large numbers of personnel involved. Movement to the objective is usually accomplished during periods of low visibility; however, because of fire support coordination requirements and larger numbers of personnel, the action may take place during daylight hours.

(7) Withdrawal. In a GWOA, withdrawal from a large raid usually is by smaller groups over multiple routes in order to deceive the enemy and dissipate his pursuit. Dispersed withdrawal has the added advantage of denying a lucrative target to enemy air and fire support elements; however, the raid force commander must consider the possibility of an alert and aggressive enemy defeating the dispersed elements of the force. All factors must be carefully weighed before deciding on how to conduct the withdrawal.

Section II. AMBUSHES

90. Techniques

a. General. An ambush is a surprise attack from a concealed position, used against moving or temporarily halted targets such as trains, boats,
truck convoys, individual vehicles, and dismounted troops. In an ambush the enemy sets the time and the attacker sets the place. Ambushes are conducted to destroy or capture personnel and supplies, harass and demoralize the enemy, delay or block movement of personnel and supplies, and channel enemy movement by making certain routes useless for traffic. They usually result in concentrating the majority of movements to principal roads and railroads where targets are more vulnerable to attack by other forces.

(1) Organization. Like the raid force, the ambush force is organized into assault and security elements. The assault element conducts the main attack against the ambush target which includes halting the column, killing or capturing personnel, recovering supplies and equipment, and destroying unwanted vehicles or supplies which cannot be moved. The security force isolates the ambush site using roadblocks, other ambushes, and outposts. Security elements cover the withdrawal of the assault element.

(2) Preparation. Planning and preparing an ambush is similar to planning and preparing a raid except that selecting the ambush site is an additional consideration.

(a) The mission may be a single ambush against one column or a series of ambushes against one or more routes of communication.

(b) The probable size, strength, and composition of the enemy force that is to be ambushed, formations likely to be used, and enemy reinforcement capabilities are considered.

(c) Favorable terrain for an ambush, providing unobserved routes for approach and withdrawal, must be selected.

(d) Time of the ambush should coincide with periods of low visibility, offering a wider choice of positions and better opportunities to surprise and confuse the enemy; however, movement and control are more difficult during the night ambush. Night ambushes are more suitable when the mission can be accomplished during, or immediately following, the initial burst of fire. They require a maximum number of automatic weapons to be used at close range. Night ambushes can hinder the enemy’s use of routes of communications at night, while friendly aircraft can attack the same routes during the day. Daylight ambushes facilitate control and permit offensive action for a longer period of time and provide the opportunity for more effective fire from such weapons as rocket launchers and recoilless rifles.

(3) Intelligence. Since the guerrillas are sel-
dom able to ascertain the exact composition, strength, and time of convoy movements in advance, their intelligence effort should be directed towards determining the convoy pattern of the enemy. Using this information, guerrilla commanders are able to decide on the convoys to be attacked by ambush. Intelligence considerations for a raid are equally applicable to an ambush.

(4) Site Selection. In selecting the ambush site, the basic consideration is favorable terrain, although limitations such as deficiencies in firepower and lack of re-supply during actions may govern the choice of the ambush site. The site should have firing positions offering concealment and favorable fields of fire. Whenever possible, firing should be through a screen or foliage. The terrain at the site should serve to funnel the enemy into a killing zone. The entire killing zone is covered by fire so that dead space that would allow the enemy to organize resistance is avoided. The ambush force should take advantage of natural obstacles such as defiles, swamps, and cliffs to restrict enemy maneuvers against the force. (When natural obstacles do not exist, mines, demolitions, camouflaged barbed wire, and other concealed obstacles are employed to canalize the enemy.) Security elements are placed on roads and trails leading to the ambush site to warn the assault element of the enemy approach. These security elements also assist in covering the withdrawal of the assault element from the ambush site. The proximity of security to assault elements is dictated by terrain. In many instances, it may be necessary to organize secondary ambushes and roadblocks to intercept and delay enemy reinforcements.

b. Conducting the Ambush.

(1) Movement. The ambush force moves over a preselected route or routes to the ambush site. One or more mission support sites or rendezvous points usually are necessary along the route to the ambush site. Last minute intelligence is provided by reconnaissance elements, and final coordination for the ambush is made at the mission support site.

(2) Action at the ambush site (fig. 35).

(a) Troops are moved to an assembly area near the ambush site, and security elements take up their positions first and then the assault elements move into place. As the approaching enemy column is detected, or at a predesignated time, the ambush commander decides whether or not to execute the ambush. This decision depends upon the size of the enemy column, guard
and security measures, and estimated 
worth of the target in light of the 
mission. If the decision is made to 
execute the ambush, advance guards 
are allowed to pass through the main 
position. When the head of the main 
column reaches a predetermined 
point, it is halted by fire, demolitions, 
or obstacles. At this signal the entire 
assault element opens fire. Designated 
details engage the advance and rear 
guards to prevent reinforcement of the 
main column. The volume of fire is 
rapid and directed at enemy personnel 
exitng from vehicles and concentrated 
on vehicles mounting automatic weap­
ons. Antitank grenades, rocket launch­
ers, and recoilless rifles are used 
against armored vehicles. Machine­
guns lay bands of fixed fire across 
escape routes. Mortar shells, hand and 
rifle grenades are fired into the killing 
zone. If the commander decides to 
assault, it is launched under covering 
fire on a prearranged signal. After 
enemy resistance has been nullified, 
special parties move into the column 
to recover supplies, equipment, and 
ammunition. When the commander 
desires to terminate the action, be­
bcause the mission either has been 
accomplished or superior enemy rein­
forcements are arriving, he withdra­

(b) If the purpose of the ambush is to 
harass and demoralize the enemy, a 
different tactic may be adopted. The 
advance guard is selected as the target 
of the ambush and the fire of the 
assault element is directed against 
them. Repeated attacks against enemy 
advance guards—

1. Cause the use of disproportionately 
strong forces in advance guard 
duties. This may leave other por­
tions of the column vulnerable or 
require the diversion of additional 
troops to convoy duty.

2. Create an adverse psychological effect 
upon enemy troops, and the con­
tinued casualties suffered by the 
advance guard make such duty un­
popular.

(3) Withdrawal. Withdrawal from the am­
bush site is similar to withdrawal from 
a raid in that the security elements cover 
the assault elements.

c. Special Ambush Situations.

(1) Columns protected by armor. Attacks 
against columns protected by armored 
vehicles depend upon the type and loca­
tion of armored vehicles in a column and 

(2) Columns protected by armor. Attacks 
against columns protected by armored 
vehicles depend upon the type and loca­
tion of armored vehicles in a column and 

(2) Columns protected by armor. Attacks 
against columns protected by armored 
vehicles depend upon the type and loca­
tion of armored vehicles in a column and 

the weapons of the ambush force. If possible, armored vehicles are destroyed or disabled by fire of antitank weapons, land mines, molotov cocktails, or by throwing hand grenades into open hatches. An effort is made is immobilize armored vehicles at a point where they are unable to give protection to the rest of the convoy and where they will block the route of other supporting vehicles.

(2) Ambush of trains. Moving trains may be subjected to harassing fire, but the most effective ambush is derailment. The locomotive should be derailed on a down grade, at a sharp curve, or on a high bridge. This causes most of the cars to overturn and results in extensive casualties among the passengers. It is desirable to derail trains so that the wreckage remains on the tracks to delay traffic for long periods of time. Fire is directed on the exits of overturned coaches; and designated groups, armed with automatic weapons, rush forward to assault coaches or cars still standing. Other groups take supplies from freight cars and then set fire to the train. Rails are removed from the track at some distance from the ambush site in each direction to delay the arrival of reinforcements by train. In planning the ambush of a train, remember that the enemy may include armored railroad cars in
the train for its protection and that important trains may be preceded by advance guard locomotives or inspection cars to check the track.

(3) 

**Ambush of waterway traffic.** Waterway traffic, such as barges, or ships, may be ambushed similar to a vehicular column. The ambush party may be able to mine the waterway and thus stop traffic. If mining is not feasible, fire delivered by recoilless weapons can damage or sink the craft. Fire should be directed at engine room spaces, the waterline, and the bridge. Recovery of supplies may be possible if the craft is beached or grounded in shallow water.

**Section III. OTHER INTERDICTION TECHNIQUES**

**91. Mining, Sniping, and Expedient Interdiction Techniques**

a. Mining affords the Special Forces and indigenous forces commanders a means of interdicting enemy routes of communication and key areas with little expenditure of manpower (fig. 36). Mines can be used with other operations or used alone. When used alone they are emplaced along routes of communication or known enemy approaches when traffic is light. This allows personnel emplacing the mines to complete the task in secrecy without undue interference. The use of mines is
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cover the withdrawal of a raiding or ambush force. This slows enemy pursuit and their use in the roadbeds of highways and railroads interferes with movement. Mines can be emplaced around enemy installations and will cause casualties to sentinels and patrols; tend to limit movement; and cause low morale among enemy troops.

b. Sniping is an interdiction technique. It is economical in the use of personnel and has a demoralizing effect. A few trained snipers can cause casualties among enemy personnel, deny or hinder his use of certain routes, and require him to employ a disproportionate number of troops to rid the area of snipers (fig. 37). Snipers may cover an area that has been mined, act as part of a raiding or ambush force, or operate by themselves. Snipers operate best in teams of two, alternating the duties of observer and sniper. Snipers may be used effectively in border denial operations from positions in field fortifications and lookout towers.

c. Expedient interdiction techniques against enemy personnel can be used to the fullest extent for security or denial operations against the enemy. Some of these devices are barbed wire, sharpened stakes, impaling poles, man traps, and all types of boobytraps. See FM 31-73 and FM 5-31.
CHAPTER 8
WATER OPERATIONS

Section 1. GENERAL

92. Planning and Preparation

a. Amphibious operations may frequently be employed in guerrilla warfare or counterinsurgency operational areas having exposed coastlines, coastal rivers, or harbors. Infiltration, exfiltration, evacuation, or resupply may be accomplished using amphibious techniques. While water landing sites lack the flexibility of air delivery sites, infiltration operations by both sub-surface and surface craft is considered the most secure and efficient means of providing required support for operational detachments.

b. The landing craft used depends upon the type of ship employed, the tactical and physical condition at the landing site, the number of personnel, and the amount of cargo to be landed. Of basic concern to the detachment commander is the type of landing craft he will be assigned for operations. Normally, the inflatable reconnaissance boat (designated IB(L) with a capacity for 12 men or IB(S) with a capacity for 7 men) will be used for this purpose. While in the briefing center and before leaving the departure site, the detachment commander insures that his detachment is proficient in amphibious operations.

c. Upon assignment of a transport vessel, the detachment commander should become familiar with the ship's characteristics, facilities, and interior to include exact troop locations and storage areas for the detachment's equipment and boats. Equipment is then prepared and packaged in containers of specific dimensions and weights, according to the requirements of the assigned craft. All equipment is waterproofed and marked for identification. When a submarine is the transporting craft, inflatable boats are deflated and stowed in the free-flooding portions of the superstructure.

93. Tactical Considerations

a. Amphibious operations conducted in support of Special Forces units may be divided into the following phases:

(1) Movement by transport craft to the debarkation point.

(2) Debarkation from transport craft and movement to the landing site in small landing craft.

(3) Disposal of landing craft. In some situations, the detachment may be required to secrete or cache their landing craft for possible use in exfiltration or evacuation from the operational area. Landing craft may sometimes, when specific
mission dictates, be returned to the transport vessel by naval personnel supporting the operation.

(4) Movement of personnel/cargo from the beach site into the objective area and sterilization of the site.

(5) Transferring personnel/cargo from the transporting ship to indigenous craft at a rendezvous point at sea. The indigenous craft, with personnel/cargo concealed or provided with cover, proceed to the landing site in a normal manner.

b. To prepare the detachment for these phases, the detachment commander conducts extensive joint training exercises. Numerous drills in the basics techniques of debarking, boat handling, use of escape trunk, recovery of personnel, and use of communications equipment are accomplished. Complete rehearsals are conducted daily. In addition, if the move is to be made by submarine, physical conditioning exercises should be a part of the daily routine. If a completely submerged transit is made, this will preclude any possible physical exercise because of the restrictive limitations of the submarine.

Section II. LANDING OPERATIONS

94. Debarkation Techniques

Debarkation and ship-to-shore movement are precise operations which can easily jeopardize the safety of all elements and compromise the mission. Detection of the submarine before debarkation could result in delay, modification, or cancellation of the operation. The choice of a debarkation method will depend largely upon intelligence gathered during the planning phase and on the type of mission, as well as by the degree of training of the Special Forces detachment to be infiltrated.

a. Surface Launch. The surface launch may be conducted by either the wet or dry method. The dry launch consists of the submarine personnel inflating boats, sliding them over the side into the water, positioning them at specified stations, and debarking troop personnel. The wet launch is similar to the dry launch except that after the boats are inflated they are positioned on the deck, Special Forces personnel debark, and the submarine submerges beneath the boats.

b. Broached Launch. This procedure requires the submarine to surface with decks awash. The Special Forces personnel debark through the upper conning tower hatch into the water. As soon as the last swimmer leaves the conning tower, the hatch is secured and the ship submerges at dead-slow speed, preventing propeller wash from injuring the swimmers. The swimmers may then make a compass swim to the beach or inflate the boats in the water, secure equipment, and row the boats to shore. This technique restricts the amount of equipment that can be carried.

c. Bottom Lockout. This procedure can be used when debarking from a submarine and when the