Chapter 14
EVASION AND SURVIVAL

This chapter will cover basic materials dealing with evading the enemy and survival techniques. It covers field-expedient methods of acquiring food and water; land navigation; construction of shelters; and fire-starting techniques. See also **FM 3-05.70** *(Survival)* and **FM 3-55.93** *(Long-Range Surveillance Unit Operations).*

Section I. EVASION

When you become isolated or separated in a hostile area, either as an individual or as a group, your evasion and survival skills will determine whether or not you return to friendly lines.

14-1. PLANNING CONSIDERATIONS. While certain units formally plan for evasion at the receipt of every mission, every leader should have a plan to facilitate the recovery of his personnel should things turn bad. He can use the following methods and materials for both formal and informal evasion planning:

a. Construct an evasion plan of action (EPA) for each mission, and give a copy to higher headquarters. At a minimum, include the overall plan; routes; a personnel roster; a list of survival equipment and signaling devices you plan to carry; authentication means (letter of the day, number of the day, word, for example), and your evasion intentions, should the situation arise (initial, immediate less than 48 hrs, and extended more than 48 hrs).

b. Prior to initiating movement, review the Air Tasking Order Special Instructions (ATOSPINS), ISOPREP cards, info on operational environment (cultural boundaries, social or political events, and norms and trends), and have everyone "sterilize" their personal effects.

c. You can get other evasion aids through higher headquarters. These include evasion charts (EVCs), which are maps made of waterproof paper. In the margins, they contain survival information such as edible and poisonous plants. Information cards printed in the destination language and in English are useful for emergency communications with locals.

14-2. INITIAL EVASION POINT. This is when you realize that you have become separated from friendly forces. Here is what to do when you reach this point:

- Immediately move to a concealed point
- S.L.L.S. (Do at your earliest opportunity)
- Try to establish communications with friendly forces
- Observe enemy activity
- Evaluate the situation
- Security, camouflage
- Formulate a plan of action
- Employ keyword SURVIVAL
- Inventory supplies (food, water, equipment)

14-3. EVASION MOVEMENT. Do not move from the area just for something to do. Move only if you have to, in which case, consider the following. Traveling alone offers the least possibility of detection, but traveling in groups of 2 or 3 is more desirable:

- Health of evader/ ability to move
- Enemy activity
- Recovery potential

14-4. ROUTES. Plan primary and alternate routes. Consider distance, cover, food, and water. The easiest and shortest route may not be the best.

- Food and water are daily requirements. You can do without food for several days; water, however, is essential.
- Move at night. Use the daylight to observe, plan, and rest in a hide position.
- Linkup only during daylight hours. Place friendly lines under observation.
- Attempt to identify the unit you approach, note their movements and routine.

• After carefully considering your approach route, make voice contact with the unit as soon as possible.

14-5. COMMUNICATIONS. During your evasion, you may be required to relay your location to higher over unsecure means such as cell phone, radio that has either lost or expired, COMSEC or that has been zeroed) you can use one of the following methods. They can be found in ATOSPINS along with authentication means:

Search and Rescue Numeric Encryption Grid. SARNEG is a 10-letter word with no repeating letters; each letter corresponding to a number 0 to 9.

Search and Rescue DOT. SARDOT is a geographic location that is used as a reference to relay your location. It is relayed as an azimuth and distance from you to the SARDOT.

Code Words. Words used to send vital information quickly and in a secure manner so that the meaning cannot be understood by an intercepting element. Words are either pulled from the ATOSPINS, passed down from higher, or generated by the element in planning. Words may have a theme for ease of remembering such as Types of liqueur, animals or sports.

14-6. HIDE SITE. Should be an isolated, covered and concealed site selected during evasion. In the hide site you should take inventory of your situation and accomplish tasks such as camouflage, resting, and planning the next movement. It is seldom used or occupied for more than 24 hrs. When selecting a site consider the following:

• Distance from natural lines of drift (water, roads and trails, ridges, and key terrain)
• Vegetation–thick?
• Concealed from all directions?
• Away from populated or built up areas
• Escape route
• Location where humans do not normally habitat

14-7. HOLE UP AREA. This is an isolated area selected during movement. Use it when your physical condition requires that you stop for food, water, equipment maintenance, and rest. Generally, avoid occupying such a position for more than 72 hrs. When selecting a hole up area, consider–

• Abundance of food and water
• Isolated
• Low population density
• Security at all times
• Movement in or around hole up area is still kept to a minimum
• Decentralize–separate rest, food procurement, food preparation and so on.

14-8. CAMOUFLAGE. While evading, you may need to use field-expedient means to camouflage yourself, your equipment, and your site. Mud, charcoal, berries, vegetation, ash and blood can all be used to camouflage exposed skin and equipment. Natural vegetation can be fixed to clothing and equipment by using vines to secure it or cutting small holes in the rip stop uniform material and feeding vegetation into it. Whenever a site is constructed and camouflaged keep the following memory aid in mind. B L I S S

B LENDS IN
L OW IN SILHOUETTE
I RREGULAR IN SHAPE
S MALL IN SIZE
S ECLUDED

Section II. SURVIVAL

With training, equipment, and the *will to survive*, you can overcome any obstacle you may face. *You will survive*. Understand the emotional states associated with survival. *"Knowing thyself"* is extremely important in a survival situation. It bears directly on how well you cope with serious stresses, anxiety, pain, injury, illness; cold, heat, thirst, hunger, fatigue, sleep deprivation, boredom, loneliness and isolation.

14-9. MEMORY AID. You can overcome and reduce the shock of being isolated behind enemy lines if you keep the key word **S-U-R-V-I-V-A-L** foremost in your mind. Its letters can help guide you in your actions.

S – **S** ize up the situation, the surroundings, your physical condition, and your equipment.

U – **U** ndue haste makes waste; don't be too eager to move. Plan your moves.

R – **R** emember where you are relative to friendly and enemy units and controlled areas; water sources (most important in the desert); and good cover and concealment. This information will help you make intelligent decisions.

V – **V** anquish fear and panic.

I – **I** mprovise/Imagine. You can improve your situation. Learn to adapt what is available for different uses. Use your imagination.

V – **V** alue living. Remember your goal to get out alive. Remain stubborn. Refuse to give in to problems and obstacles. This will give you the mental and physical strength to endure.

A – **A** ct like the natives; watch their daily routines and determine when, where, and how they get their food and water.

L – **L** ive by your wits. Learn basic skills.

14-10. SURVIVAL KITS. Upon finding yourself in a survival situation you will be required to provide for your basic needs; water, food, fire, shelter, medical, signaling and protection. This will be accomplished by using the resources you have on hand and those that may be found or constructed. The more detailed your survival kit the less scavenging or constructing you will have to do. Some examples of individual survival kits follow. All items should be small, portable and most importantly multipurpose.

Level 1 Kit (carried on individual) should consist of at a minimum of a knife, some form of fire starter, such as lighter matches or flint striker, watch, signal mirror and some 550 cord.

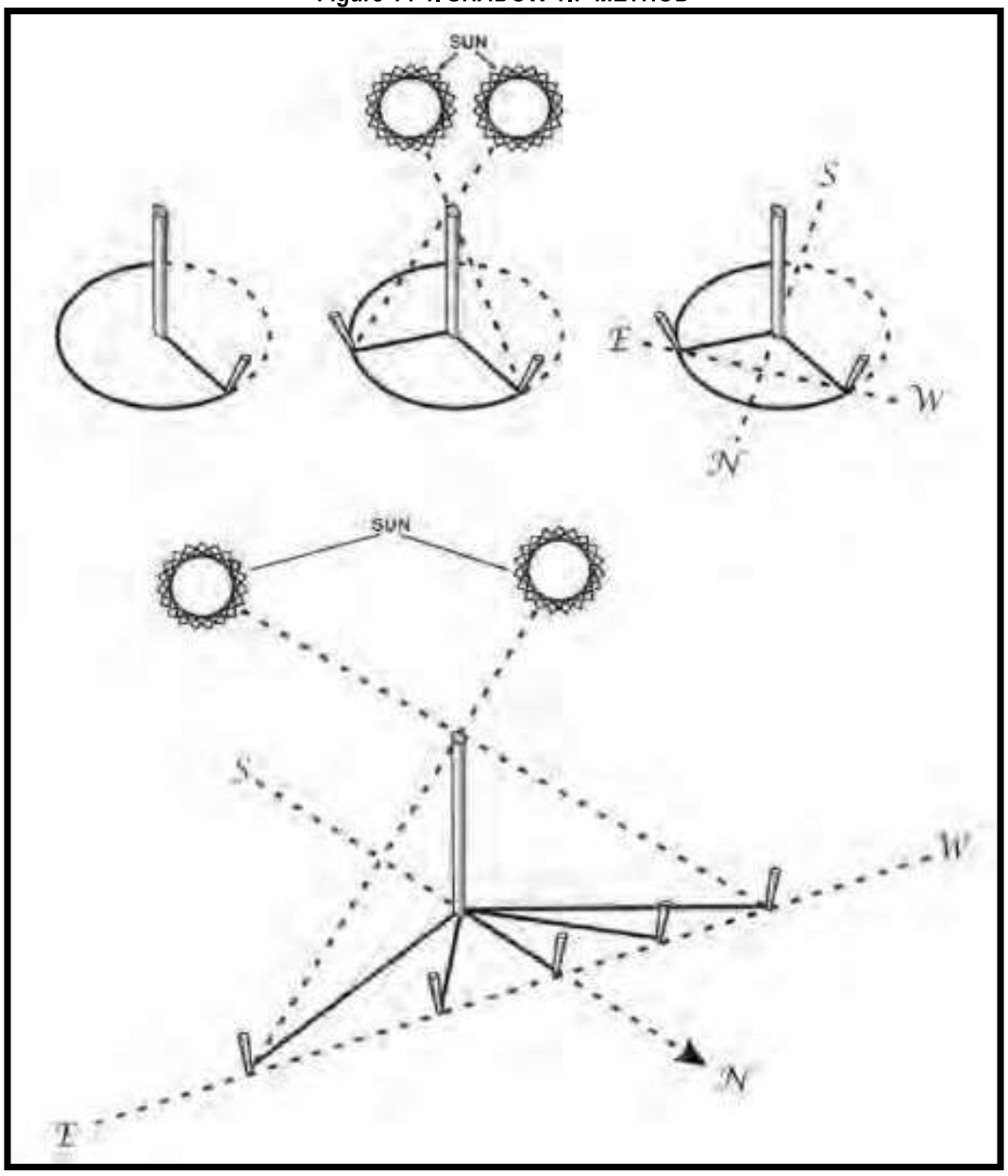
Level 2 Kit (carried in FLC or rack) waterproof container, water purification tabs, 2ft sq. aluminum foil, fishing kit (line, hooks and weights) medical supplies, snare wire, signaling devices, compass and survival knife.

Level 3 Kit (carried in assault pack or ruck) water proof container with more of the materials listed in the level 1 and 2 kits plus shelter making materials (poncho, tarp, bungee cords, or space blanket) and a hatchet or saw.

14-11. NAVIGATION. In a survival situation, you might find yourself without a compass. The ability to determine direction can enable you to navigate back to your unit or to a friendly sanctuary. In sunlight, there are two simple ways to determine direction: the shadow tip and the watch.

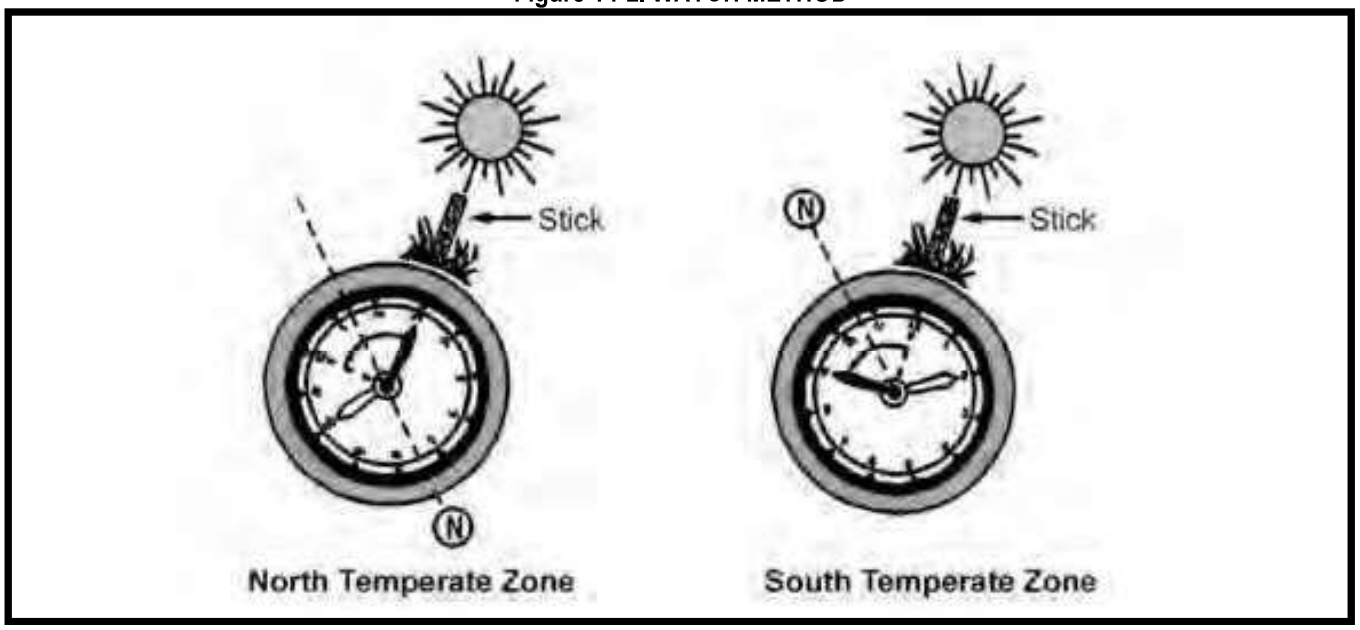
a. **Shadow Tip.** Use the sun to find approximate true North. Use this in light bright enough to cast shadows. Find a fairly straight stick about 3 feet long, and follow the diagram below (**Figure 14-I**).

Figure 14-1. SHADOW TİP METHOD



b. **Watch Method.** You can also determine direction using a watch (**Figure 14-2**). The steps you take will depend on whether you are in the Northern Temperate Zone or in the Southern Temperate Zone. The Northern Temperate Zone is located between 23.4 North and 26.6 North. The Southern Temperate Zone is located between 23.4 South and 66.6 South.

Figure 14-2. WATCH METHOD



c. **Northern Temperate Zone.** Procedures in the Northern Temperate Zone using a conventional watch are as follows:

(1) Place a small stick in the ground so that it casts a definite shadow.

(2) Place your watch on the ground so that the hour hand points toward and along the shadow of the stick.

(3) Find the point on the watch midway between the hour hand and 12 o'clock and draw an imaginary line from that point through and beyond the center of the watch. This imaginary line is a North South line. You can then tell the other directions.

NOTE: If your watch is set on daylight savings time, then use the midway point between the hour hand and 1 o'clock to draw your imaginary line.

d. **Southern Temperate Zone.** Procedures in the southern temperate zone using a conventional watch are as follows:

(1) Place a small stick in the ground so that it casts a definite shadow.

(2) Place your watch on the ground so that 2 o'clock points to and along the shadow.

(3) Find the midway point between the hour and 12 o'clock and draw an imaginary line from the point through and beyond the center of the watch. This is a North South line.

(4) A hasty shortcut using a conventional watch is simply to point the hour hand at the sun in the Northern temperate zone (or point the 12 at the sun in the Southern temperate zone). Follow the last step of the watch method above to find your directions. This shortcut is less accurate than the regular method, but quicker. Your situation will dictate which method to use.

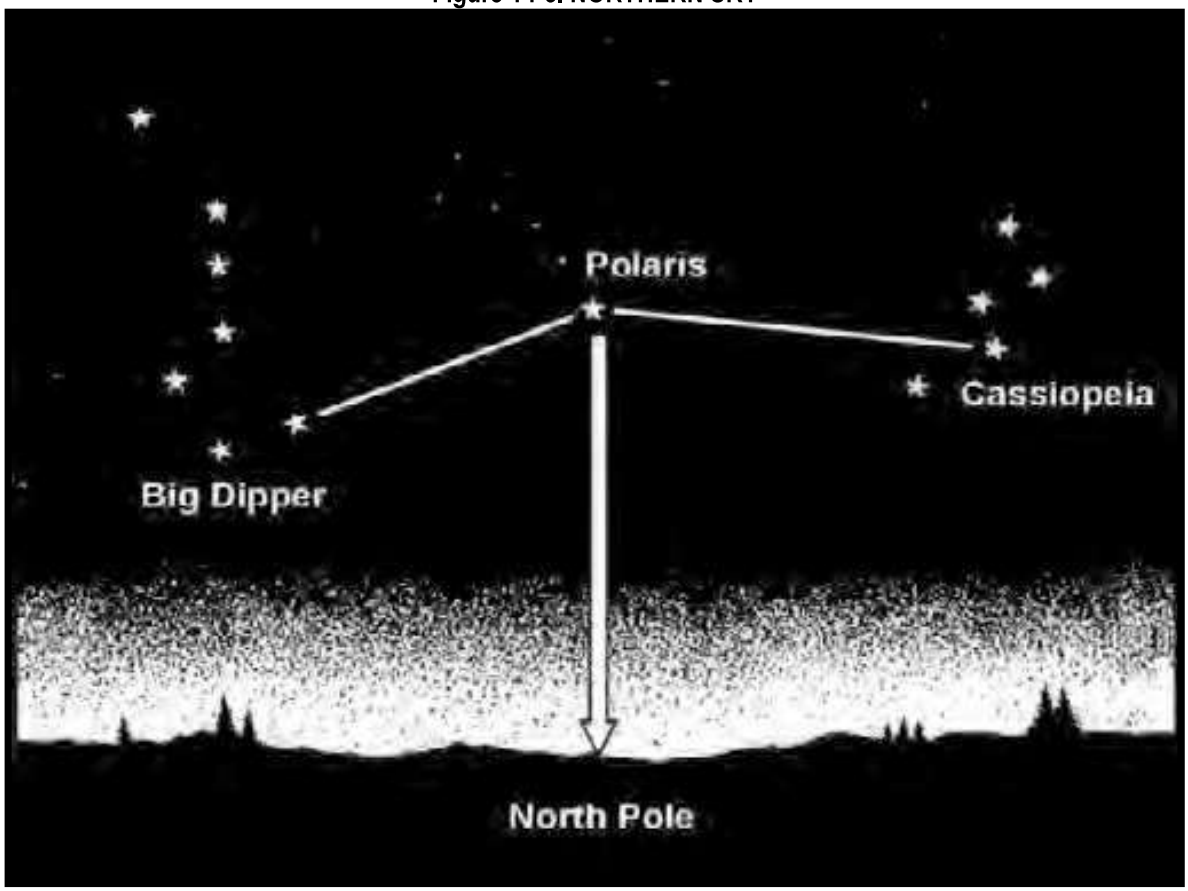
e. **Moon.** Because the moon has no light of its own, we can only see it when it reflects the sun's light. As it orbits the earth on its 28 day circuit, the shape of the reflected light varies according to its position. We say there is a new moon or no moon when it is on the opposite side of the earth from the sun. Then, as it moves away from the earth's shadow, it begins to reflect light from its right side and waxes to become a full moon before waning, or losing shape, to appear as a sliver on the left side. You can use this information to identify direction. If the moon rises before the sun has set, the illuminated side will be the west. If the moon

rises after midnight, the illuminated side will be the east. This obvious discovery provides us with a rough East West reference during the night.

f. **Stars.** Your location in the Northern or Southern Hemisphere determines which constellation you use to determine your North or South direction. Each sky is explained below.

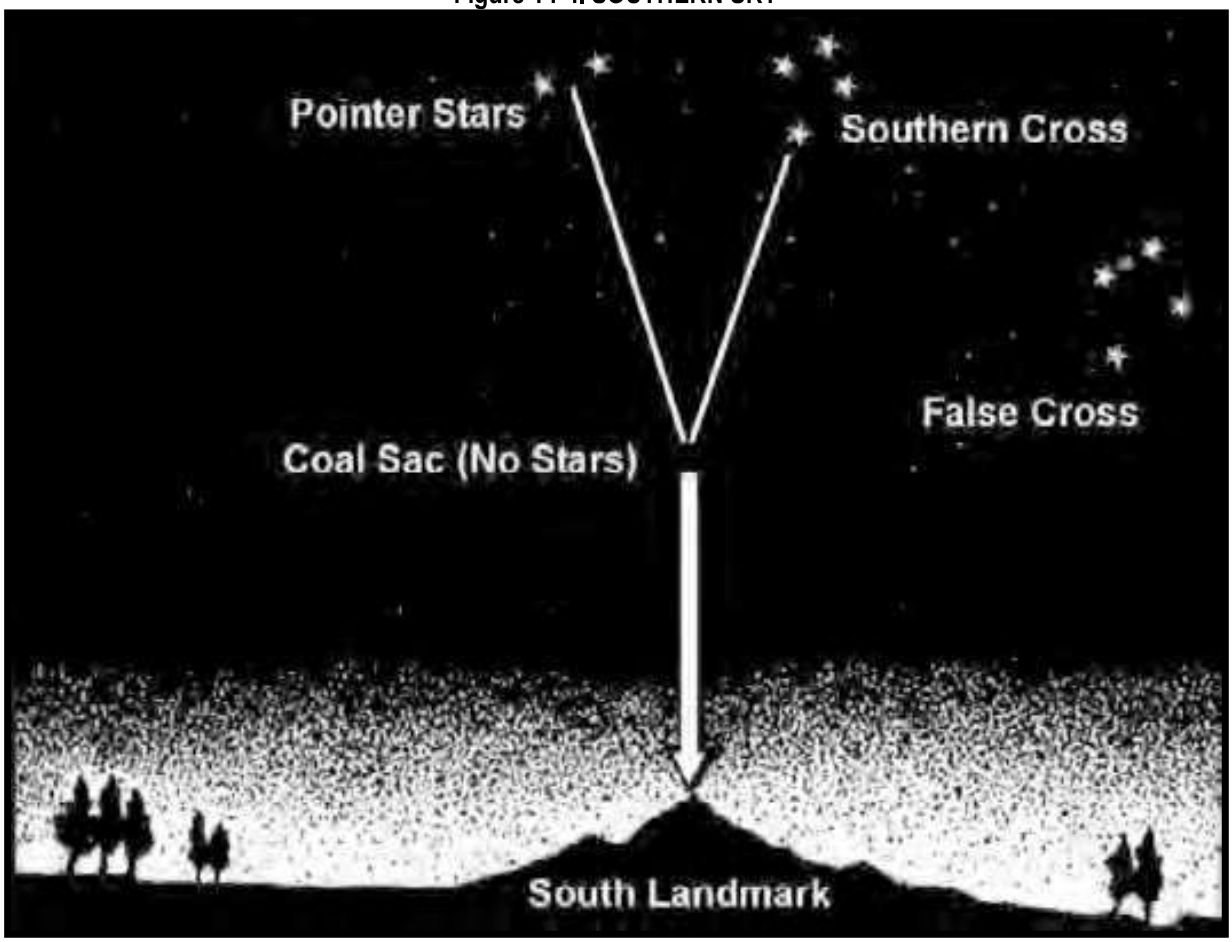
g. **The Northern Sky.** The main constellations to learn are the Ursa Major, also known as the Big Dipper or the Plow, and Cassiopeia, also known as the Lazy W (Figure 14 3). Use them to locate Polaris, also known as the polestar or the North Star. Polaris is considered to remain stationary, as it rotates only 1.08 degrees around the northern celestial pole. The North Star is the last star of the Little Dipper's handle and can be confused with the Big Dipper. However, the Little Dipper is made up of seven rather dim stars and is not easily seen unless you are far away from any town or city lights. Prevent confusion by attempting to use both the Big Dipper and Cassiopeia together. The Big Dipper and Cassiopeia are generally opposite each other and rotate counterclockwise around Polaris, with Polaris in the center. The Big Dipper is a seven star constellation in the shape of a dipper. The two stars forming the outer lip of this dipper are the "pointer stars" because they point to the North Star. Mentally draw a line from the outer bottom star to the outer top star of the Big Dipper's bucket. Extend this line about five times the distance between the pointer stars. You will find the North Star along this line. You may also note that the North Star can always be found at the same approximate vertical angle above the horizon as the northern line of latitude you are located on. For example, if you are at 35 degrees north latitude, Polaris will be easier to find if you scan the sky at 35 degrees off the horizon. This will help to lessen the area of the sky in which to locate the Big Dipper, Cassiopeia, and the North Star .Cassiopeia or the Lazy W has five stars that form a shape like a "W." One side of the "W" appears flattened or "lazy." The North Star can be found by bisecting the angle formed on the lazy side. Extend this line about five times the distance between the bottom of the "W" and the top. The North Star is located between Cassiopeia and the Ursa Major (Big Dipper). After locating the North Star, locate the North Pole or true North by drawing an imaginary line directly to the earth**.**

Figure 14-3. NORTHERN SKY



h. **The Southern Sky.** Because there is no single star bright enough to be easily recognized near the South celestial pole, you can use a constellation known as the Southern Cross. You can use it as a signpost to the South. The Southern Cross or Crux has five stars. Its four brightest stars form a cross. The two stars that make up the Cross's long axis are used as a guideline. To determine south, imagine a distance 4.5 to 5 times the distance between these stars and the horizon. The pointer stars to the left of the Southern Cross serve two purposes. First, they provide an additional cue toward South by imagining a line from the stars toward the ground. Second, the pointer stars help accurately identify the true Southern Cross from the False Cross. The intersection of the Southern Cross (**Figure 14-4**) and the two pointer stars is very dark and devoid of stars. This area is called the coal sac. Look down to the horizon from this imaginary point and select a landmark to steer by. In a static survival situation, you can fix this location in daylight if you drive stakes in the ground at night to point the way.

Figure 14-4. SOUTHERN SKY



i. **Water.** Water is one of your most urgently needed resources in a survival situation. You can't live long without it, especially in hot areas where you lose so much through sweating. Even in cold areas, you need a minimum of 2 quarts of water a day to maintain efficiency. More than three fourths of your body is composed of fluids. Your body loses fluid as a result of heat, cold, stress, and exertion. The fluid your body loses must be replaced for you to function effectively. So, one of your first objectives is to obtain an adequate supply of water.

(1) ***Purification.*** Purify all water before drinking. Either

- Boil it for at least one minute (plus 1 more minute for each additional 1,000 feet above sea level) or for a maximum of 10 minutes anywhere.
- Use water purification tablets.

- Add eight drops of 2 1/ 2 percent iodine solution to a quart (canteen full) of water. Let it stand for 10 minutes before drinking.
- Collect rain water directly in clean containers or on plants. This is generally safe to drink without purifying. Never drink urine or sea water; the salt content is too high. Use old, bluish sea ice, but newer, grayer ice may be salty. Glacier ice is safe to melt and drink.

(2) ***Desert Environment***. In a desert environment, water has a huge effect on Rangers. If a unit fails to plan properly for water, and resupply is unavailable, then they can run out of water. In the desert, look for four signs of water: animal trails, vegetation, birds, and civilization. Adequate water is critical in a hot environment if a unit is to survive and maintain the physical condition necessary to accomplish the mission. Unit leaders must enforce water discipline and plan for water resupply. The leader can use the following planning considerations for water resupply:

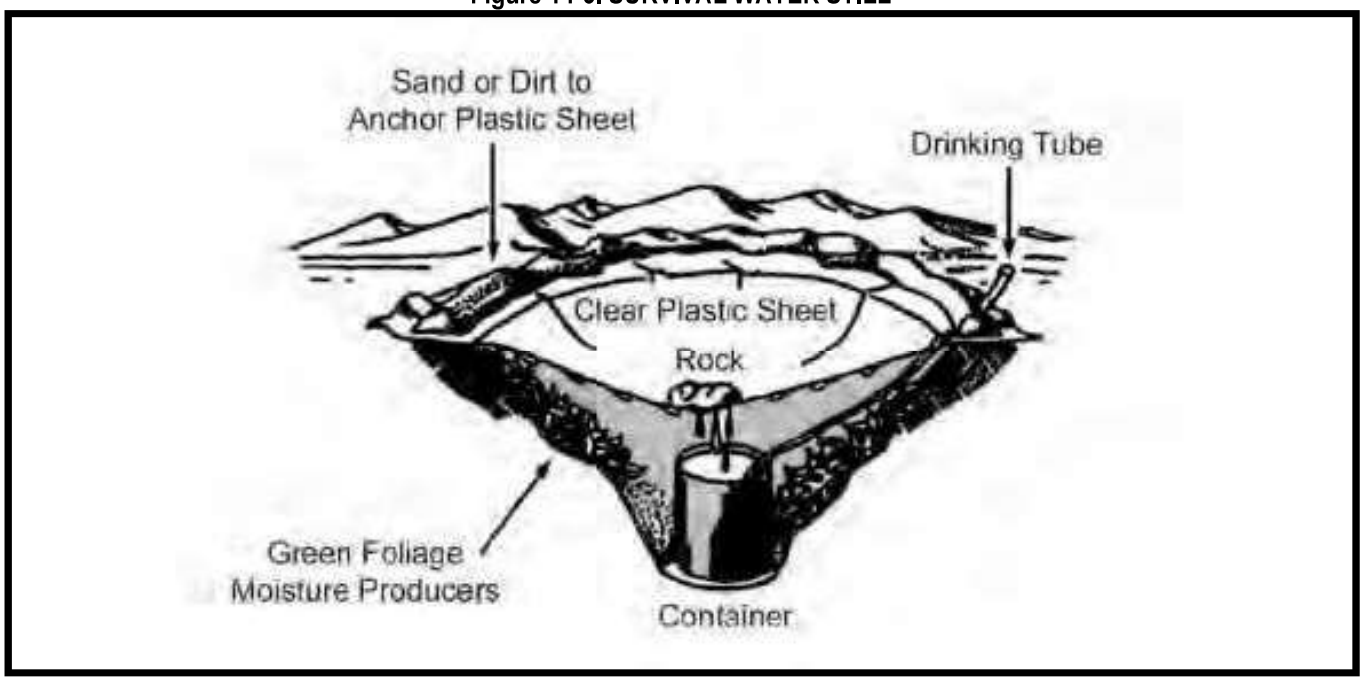
- Units average water consumption.
- Drop sites.
- Aviation support.
- DZ and LZ parties.
- Caches.
- Targets of opportunity (enemy).

(3) ***Survival Water Still***. Dig a below-ground still (Figure 14 5). Select a site where you believe the soil will contain moisture such as a dry stream bed or a spot where rain water has collected. The soil should be easy to dig, and be in sunlight most of the day:

(a) Dig a bowl shaped hole about 3 feet across and 2 feet deep.
(b) Dig a sump in center of the hole. The depth and the perimeter of the sump will depend on the size of the container that you have to set inside of it. The bottom of the sump should allow the container to stand upright.
(c) Anchor the tubing to the bottom of the container by forming a loose overhand knot in the tubing.
(d) Place the container upright in the sump.
(e) Extend the unanchored end of the tubing up, over, and beyond the lip of the hole.
(f) Place plastic sheeting over the hole and cover the edge with soil to hold it in place.
(g) Place a rock in the center of the plastic.
(h) Allow the plastic to lower into the hole until it is about 15 inches below ground level. The plastic now forms an inverted cone with the rock at its apex. Make sure that the apex of the cone is directly over your container. Also, make sure the plastic cone does not touch the sides of the hole, because the earth will absorb the condensed water.
(i) Put more soil on the edges of the plastic to hold it securely in place and to prevent loss of moisture.
(j) Plug the tube when not being used so that moisture will not evaporate.

NOTE: You can drink water without disturbing the still by using the tube as a straw. You may want to use plants in the hole as a moisture source. If so, when you dig the hole you should dig out additional soil from the sides of the hole to form a slope on which to place the plants. Then proceed as above.

Figure 14-5. SURVIVAL WATER STILL



j. **Plant Food.** There are many plants throughout the world. Tasting or swallowing even a small portion of some can cause severe discomfort, extreme internal disorders, or death. Therefore, if you have the slightest doubt as to the edibility of a plant, apply the universal edibility test described below before eating any part of it.

(1) ***Universal Edibility Test.*** Before testing a plant for edibility, make sure there are a sufficient number of plants to make testing worth your time and effort. You need more than 24 hours to apply the edibility test outlined below:

- Test only one part of a potential food plant at a time.
- Break the plant into its basic components, leaves, stems, roots, buds, and flowers.
- Smell the food for strong or acid odors. Keep in mind that smell alone does not indicate a plant is edible.
- Do not eat for 8 hours before starting the test.
- During the 8 hours you are abstaining from eating, test for contact poisoning by placing a piece of the plant you are testing on the inside of your elbow or wrist. Usually 15 minutes is enough time to allow for reaction.
- During the test period, take nothing by mouth except purified water and the plant part being tested.
- Select a small portion and prepare it the way you plan to eat it.
- Before putting the prepared plant part in your mouth, touch a small portion (a pinch) to the outer surface of the lip to test for burning or itching.
- If after 3 minutes there is no reaction on your lip, place the plant part on your tongue, holding there for 15 minutes.
- If there is no reaction, thoroughly chew a pinch and hold it in your mouth for 15 minutes. Do not swallow.
- If no burning, itching, numbing, stinging, or other irritation occurs during the 15 minutes, swallow the food.
- Wait 8 hours. If any ill effects occur during this period, induce vomiting and drink a lot of water.
- If no ill effects occur, eat 1/ 2 cup of the same plant part prepared the same way. Wait another 8 hours. If no ill effects occur, the plant part as prepared is safe for eating.

(2) ***Poisonous Plants.*** Do not eat unknown plants that–

- Have a milky or discolored sap.
- Beans, bulbs, or seeds inside pods
- A bitter or soapy taste.
- Spines, fine hairs, or thorns.
- Foliage that resembles dill, carrot, parsnip, or parsley.
- An almond scent in woody parts and leaves.
- Grain heads with pink, purplish, or black spurs.
- A three leafed growth pattern.

k. **Insects.** Insects are the most abundant and easily caught life form on earth. Many insects provide 65 to 80 percent protein as compared to 20 percent beef. However you should avoid all insects that sting or bite, are hairy or bright colored, are common disease carriers (ticks, flies, and mosquitoes) and caterpillars and insects that have a pungent odor. Insects that have a hard outer shell such as beetles and grasshoppers should have their wings and barbed legs removed and must be cooked because they have parasites. Most soft shelled insects can be eaten raw. Insects can be ground into a paste and eaten or mixed with edible vegetation to improve or mask their taste.

l**. Animal Food.** Animal food contains the most food value per pound. Anything that creeps, crawls, swims, or flies is a possible source of food, however you must first catch, kill, and butcher it before this is possible. There are numerous methods for catching fish and animals in a survival situation. You can catch fish by using a net across a small stream, (**Figure 14-6**) or by making fish traps and baskets. Improvise fish hooks and spears as indicated in **Figure 14-7**, and use them for conventional fishing, spearing and digging.

Figure 14-6. SETTING A GILL NET IN THE STREAM

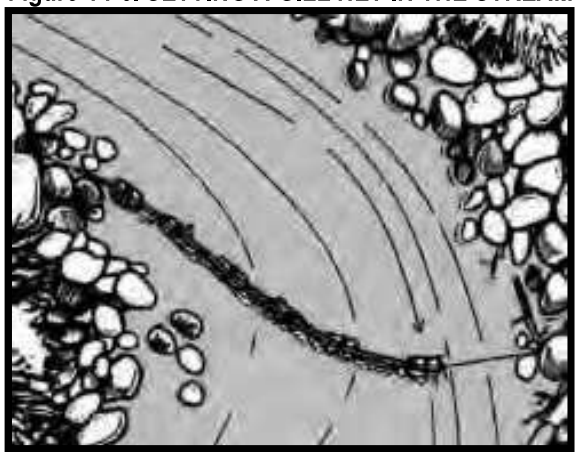
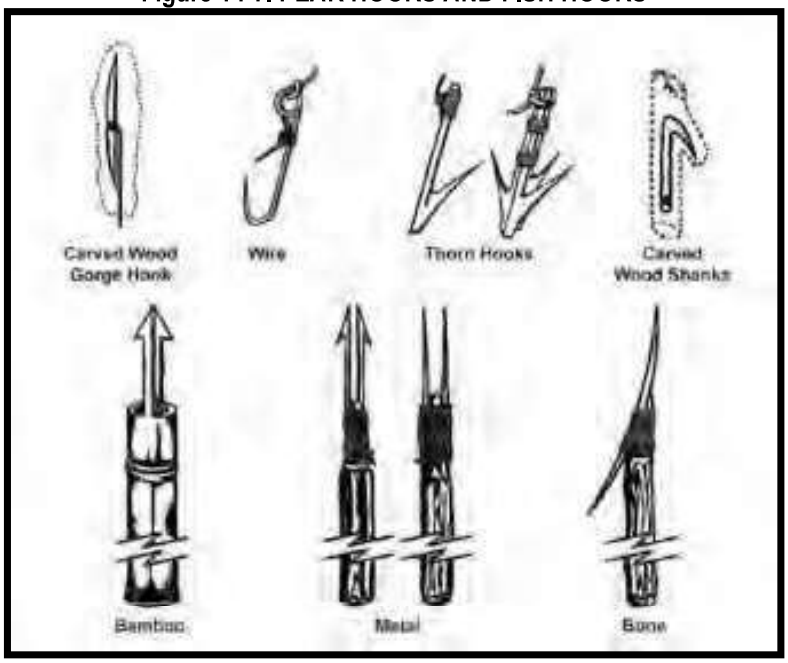


Figure 14-7. PEAR HOOKS AND FISH HOOKS



14-12. TRAPS AND SNARES. For an unarmed survivor or evader, or when the sound of a rifle shot could be a problem, trapping or snaring wild game is a good alternative. Several well placed traps have the potential to catch much more game than a Ranger with a rifle is likely to shoot.

a. To be effective with any type of trap or snare, you must

- Know the species of animal you intend to catch.
- Know how to construct a proper trap.
- Avoid alarming the prey with signs of your presence.

b. There are no catchall traps you can set for all animals. You must determine what species are in a given area and set your traps specifically with those animals in mind. Look for the following:

- Runs and trails.
- Tracks.
- Droppings.
- Chewed or rubbed vegetation.
- Nesting or roosting sites.
- Feeding and watering areas.

c. Position your traps and snares where there is proof that animals pass through. You must determine if it is a "run" or a "trail." A trail will show signs of use by several species and will be rather distinct. A run is usually smaller and less distinct and will only contain signs of one species. You may construct a perfect snare, but it will not catch anything if haphazardly placed in the woods. Animals have bedding areas, waterholes, and feeding areas with trails leading from one to another. You must place snares and traps around these areas to be effective.

d. An evader in a hostile environment must conceal traps and snares. It is equally important, however, to avoid making a disturbance that will alarm the animal and cause it to avoid the trap. Therefore, if you must dig, remove all fresh dirt from the area. Most animals will instinctively avoid a pitfall type trap. Prepare the various parts of a trap or snare away from the site, carry them in, and set them up. Such actions make it easier to avoid disturbing the local vegetation, thereby alerting the prey. Do not use freshly cut, live vegetation to construct a trap or snare. Freshly cut vegetation will "bleed" sap that has an odor the prey will be able to smell. It is an alarm signal to the animal.

e. You must remove or mask the human scent on and around the trap you set. Although birds do not have a developed sense of smell, nearly all mammals depend on smell even more than on sight. Even the slightest human scent on a trap will alarm

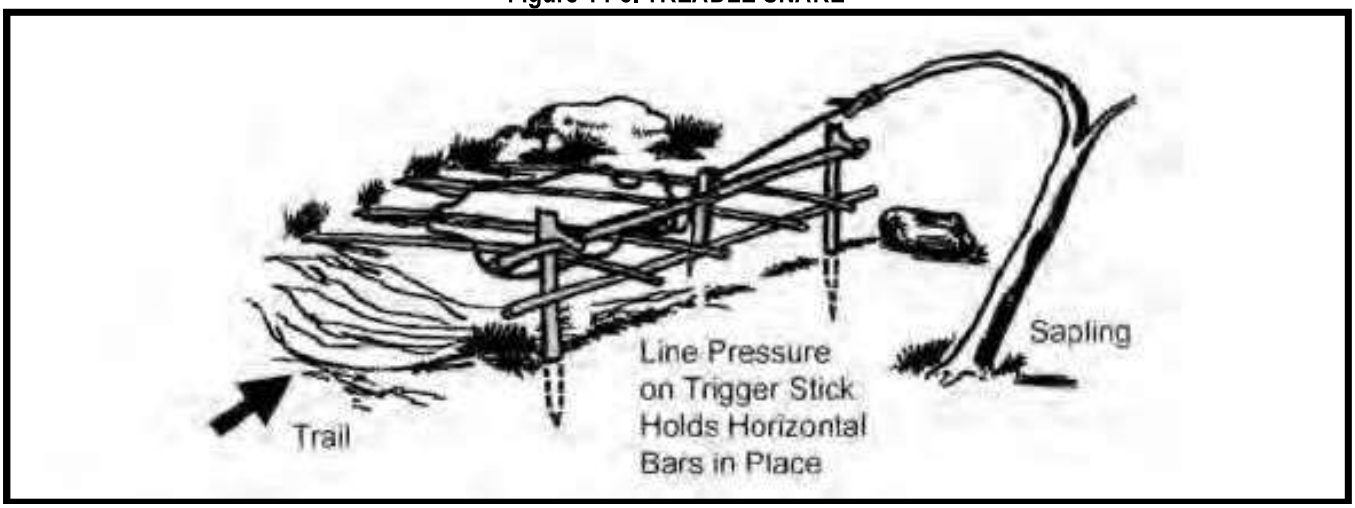
the prey and cause it to avoid the area. Removing the scent from a trap is difficult but masking it is relatively easy. Use the fluid from the gall and urine bladders of previous kills. Do not use human urine. Mud, particularly from an area with plenty of rotting vegetation, is also good. Use it to coat your hands when handling the trap and to coat the trap when setting it. In nearly all parts of the world, animals know the smell of burned vegetation and smoke. It is only when a fire is actually burning that they become alarmed. Therefore, smoking the trap parts is an effective means to mask your scent. If one of the above techniques is not practical, and if time permits, allow a trap to weather for a few days and then set it. Do not handle a trap while it is weathering. When you position the trap, camouflage it as naturally as possible to prevent detection by the enemy and to avoid alarming the prey.

f. Canalize traps or snares you place on a trail or run. To build a channel, construct a funnel shaped barrier extending from the sides of the trail toward the trap, with the narrowest part nearest the trap. Canalization should be inconspicuous to avoid alerting the prey. As the animal gets to the trap, it cannot turn left or right and continues into the trap. Few wild animals will back up, preferring to face the direction of travel. Canalization does not have to be an impassable barrier. You only have to make it inconvenient for the animal to go over or through the barrier. For best effect, the canalization should reduce the trail's width to just slightly wider than the targeted animal's body. Maintain this constriction at least as far back from the trap as the animal's body length, and then begin the widening toward the mouth of the funnel.

(1) Use a treadle snare against small game on a trail (**Figure 14-8**). Dig a shallow hole in the trail. Then drive a forked stick (fork down) into the ground on each side of the hole on the same side of the trail. Select two fairly straight sticks that span the two forks. Position these two sticks so that their ends engage the forks. Place several sticks over the hole in the trail by positioning one end over the lower horizontal stick and the other on the ground on the other side of the hole. Cover the hole with enough sticks so that the prey must step on at least one of them to set off the snare. Tie one end of a piece of cordage to a twitch up or to a weight suspended over a tree limb. Bend the twitch up or raise the suspended weight to determine where you will tie a 5 centimeter or so long trigger. Form a noose with the other end of the cordage.

(2) Route and spread the noose over the top of the sticks over the hole. Place the trigger stick against the horizontal sticks and route the cordage behind the sticks so that the tension of the power source will hold it in place. Adjust the bottom horizontal stick so that it will barely hold against the trigger. As the animal places its foot on a stick across the hole, the bottom horizontal stick moves down, releasing the trigger and allowing the noose to catch the animal by the foot. Because of the disturbance on the trail, an animal will be wary. You must therefore use canalization.

Figure 14-8. TREADLE SNARE



g. Trapping game can be accomplished through the use of snares, traps, or deadfalls. A snare is a noose that will slip and strangle or hold any animal caught in it. You can use inner core strands of parachute suspension lines, wire, bark of small hardwood saplings as well as hide strips from previously caught animals to make snares.

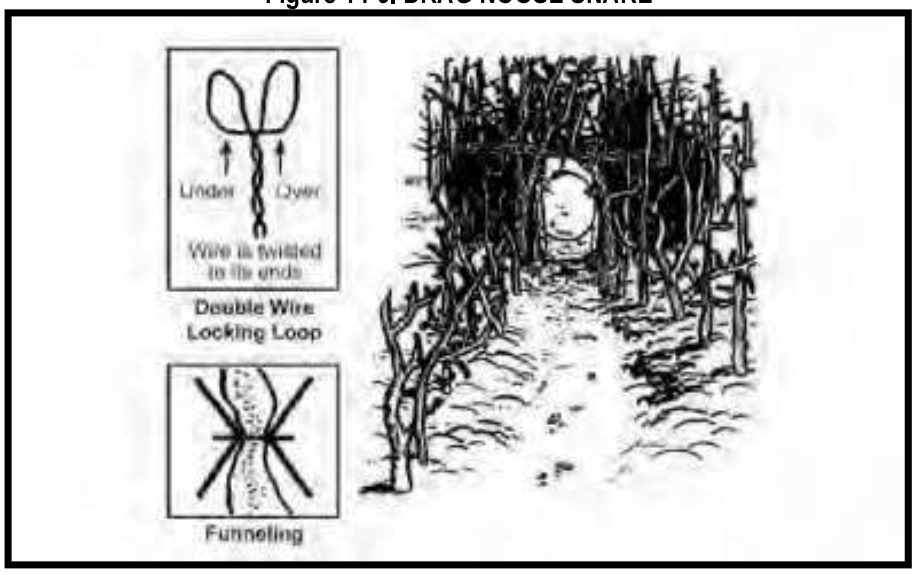
(1) ***Drag Noose Snare.*** The drag noose snare, **Figure 14-9**, is usually the most desirable in that it allows you to move away from the site, plus it is one of the easiest to make and fastest to set. It is especially suitable for catching rabbits. To make the drag noose snare–

(a) Make a loop in the string using a bow line or wireman's knot. When using wire, secure the loop by intertwining the end of the wire with the wire at the top of the loop.

(b) Pull the other end of the string (or wire) through the loop to form a noose that is large enough for the animal's head but too small for its body

(c) Tie the string (or attach the wire) to a sturdy branch. The branch should be large enough to span the trail and rest on the bush or support (two short forked sticks) you have selected. A snared animal will dislodge the drag stick, pulling it until it becomes entangled in the brush. Any attempt to escape tightens the noose, strangling or holding the animal.

Figure 14-9. DRAG NOOSE SNARE



(2) ***Locking Snare Loop.*** Another type snare is the locking type snare loop (**Figure 14-10**) that will lock when pulled tight, ensuring the snared animal cannot escape.

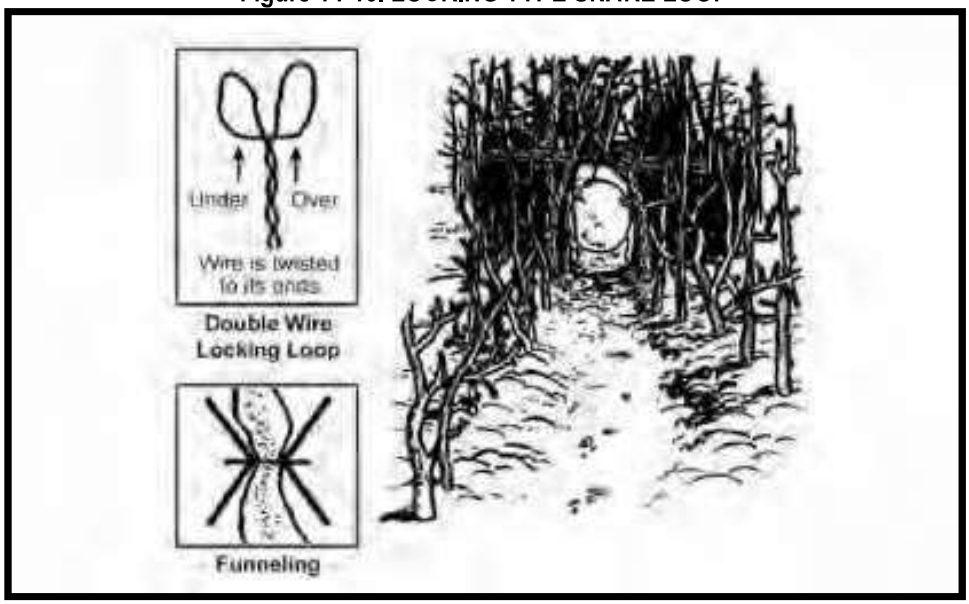
(a) Use lightweight wire to make this snare such as trip wire, or the wire from a vehicle or aircraft electrical system. To construct this snare, cut a piece of wire twice the length of the desired snare wire.

(b) Double the wire and attach the running ends to a securely placed object, such as the branch of a tree. Place a stick about 1/ 2 inch in diameter through the loop end of the wire; holding the wire taut, turn the stick in a winding motion so that the wire is twisted together. You should have four to five twists per inch.

(c) Detach the wire from the branch and then remove the loop from the stick.

(d) Make a Figure 8 in the l/ 2 inch loop by twisting the loop over itself then fold the Figure 8 so the small loops are almost overlapping; run the loose wire ends through these loops. This forms a stiff noose that is strong. Tie the loose end to the stick (for a drag noose square) or branch you are using to complete the snare. This is an excellent snare for catching large animals.

Figure 14-10. LOCKING TYPE SNARE LOOP



(3) ***Deadfall Trap***. Another means of obtaining game is the use of the deadfall trap (**Figure 14-11** and **Figure 14-12).**

Figure 14-11. TRIGGER WITH DEADFALL

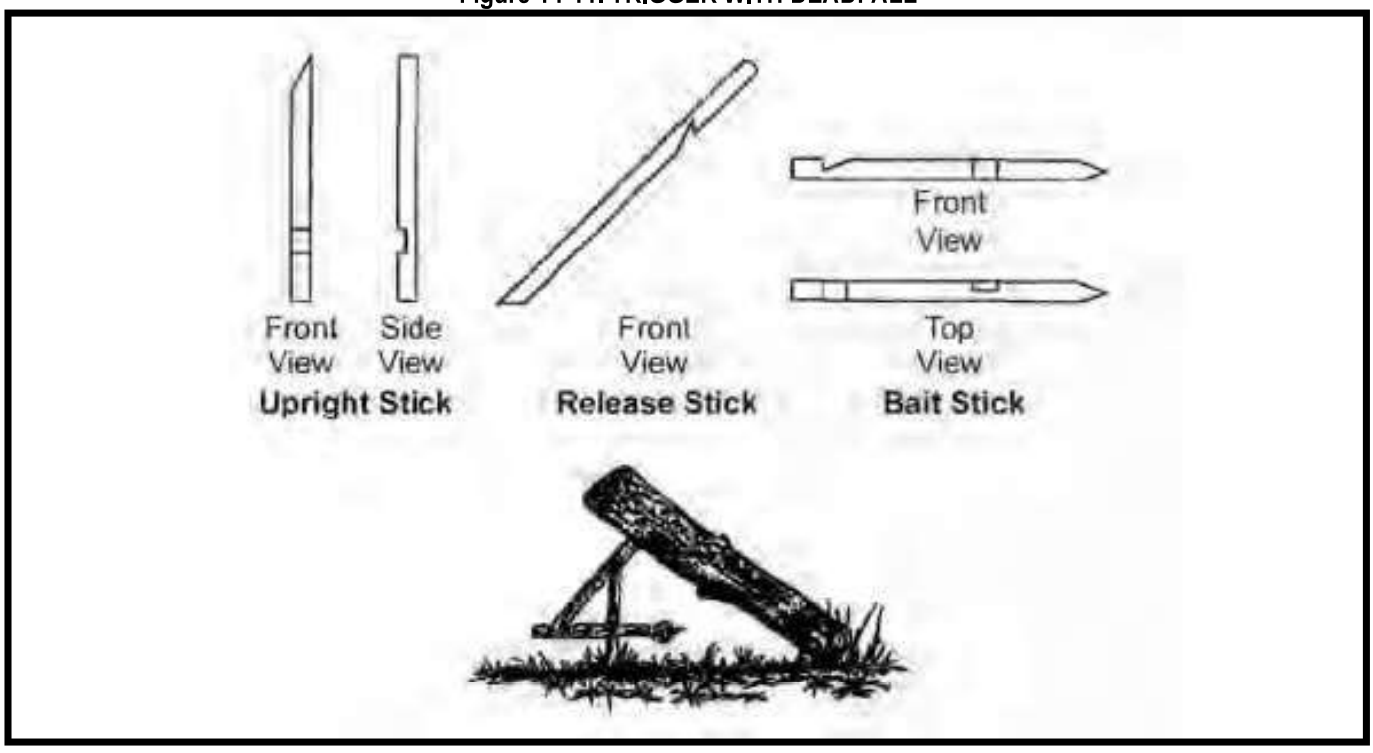
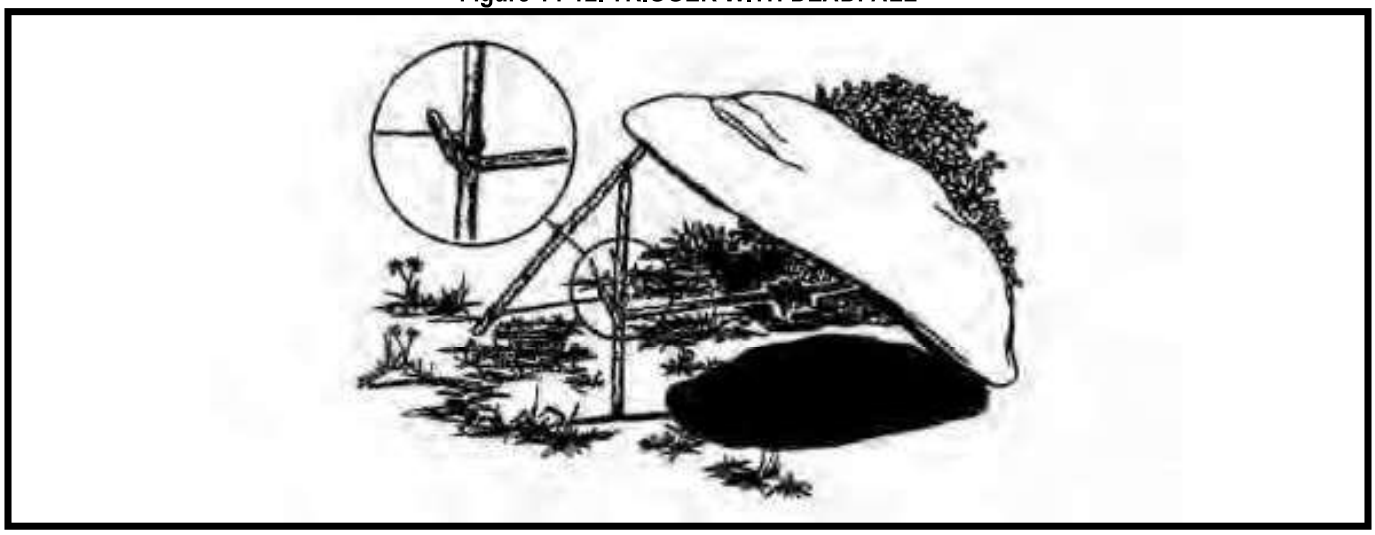


Figure 14-12. TRIGGER WITH DEADFALL



14-13 PROCESSING OF FISH OR GAME. Once you have obtained your fish or game, you must clean/ butcher and cook/ store it. Improper cleaning storing can result in inedible fish and game.

a. **Fish.** You must know how to tell if fish are free of bacterial decomposition that makes the fish dangerous to eat. Although cooking may destroy the toxin from bacterial decomposition, do not eat fish that appear spoiled.

(1) ***Spoilage.*** Eating spoiled or poisoned fish may cause diarrhea, nausea, cramps, vomiting, itching; paralysis, or a metallic taste in the mouth. These symptoms appear suddenly 1 to 6 hours after eating. If you are near the sea, drink sea water as soon as you notice this set of symptoms, or, force yourself to vomit. Signs of spoilage include–

- Peculiar odor.
- Suspicious color. Gills should be red or pink. Scales should be a pronounced–not faded–shade of gray.
- Dent that remains after pressing the thumb against the flesh then removing it.
- Slimy rather than moist or wet body.
- Sharp or peppery taste.

(2) ***Preparation.*** Fish spoil quickly after death, especially on a hot day, so prepare fish for eating as soon as possible after you catch them.

(a) Cut out the gills and large blood vessels that lie next to the backbone. (You can leave the head if you plan to cook the fish on a spit).

(b) Gut fish that are more than 4 inches long cut along the abdomen and scrape out the intestines.

(c) Scale or skin the fish.

(d) You can impale a whole fish on a stick and cook it over an "open fire." However, boiling the fish with the skin on is the best way to get the most food value. The fats and oil are under the skin, and by boiling the fish, you can save the juices for broth. Any of the methods used for cooking plant food can be used for cooking fish.

(e) Fish is done when the meat flakes off.

(f) To dry fish in the sun, hang them from branches or spread them on hot rocks. When the meat has dried, splash it with sea water, if available, to salt the outside. Keep seafood only if it is well dried or salted.

b. **Snakes.** All poisonous and nonpoisonous fresh water and land snakes are edible. To prepare snakes for eating use the following steps (**Figure 14-13**):

(1) Grip the snake firmly behind the head and cut off the head with a knife.

(2) Slit the belly and remove the innards. (You can use the innards for baiting traps and snares).

(3) Skin the snake. (You can use the skin for improvising, belts, straps, or similar items).

DANGER

VENOMOUS SNAKES

TAKE EXTREME CARE IN SECURING SNAKES--THE BITE OF SOME POISONOUS SNAKES CAN BE FATAL. EVEN AFTER A SNAKE'S HEAD IS CUT OFF, ITS REFLEX ACTION CAN CAUSE IT TO BITE, INJECTING POISON.

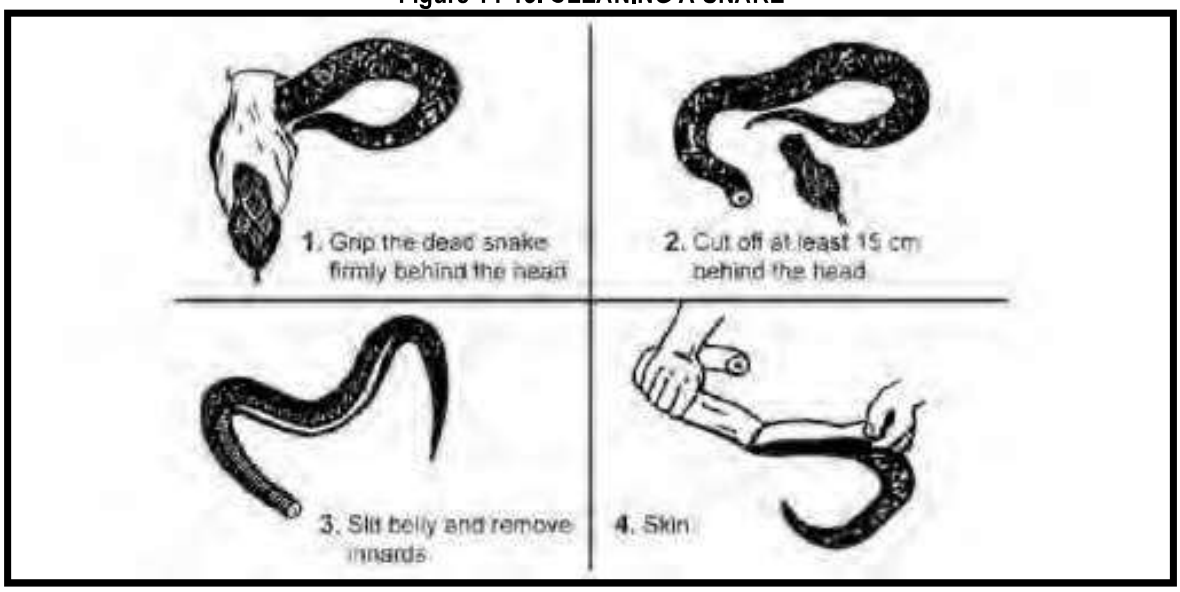
THE BEST TIME TO CAPTURE SNAKES IS IN THE EARLY MORNING OR LATE EVENING WHEN TEMPERATURES ARE LOW AND THEY MOVE SLOWLY.

KILL IT, OR USE A LONG STICK TO PIN DOWN ITS HEAD AND CAPTURE IT.

TO PICK UP A SNAKE, PLACE YOUR INDEX FINGER ON THE TOP REAR OF ITS HEAD WITH YOUR THUMB AND MIDDLE FINGER ON EITHER SIDE OF THE SNAKE'S HEAD BEHIND THE JAWS.

***KEEP YOUR INDEX FINGER ON TOP OF SNAKE'S HEAD* TO PREVENT IT FROM TURNING AND BITING YOU.**

Figure 14-13. CLEANING A SNAKE



c. **Fowl.** Your first step after killing a fowl for eating or preserving is to pluck its feathers. If plucking is impractical, you can skin the fowl. Keep in mind, however, that a fowl cooked with the skin on retains more food value. Waterfowl are easier to pluck while dry, but other fowl are easier to pluck after scalding. After you pluck the fowl

(1) Cut off its neck close to the body.

(2) Cut an incision in the abdominal cavity and clean out the insides. Save the neck, liver, and heart for stew. Thoroughly clean and dry the entrails to use for cordage.

(3) Wash out the abdominal cavity with fresh clean water. You can boil fowl or cook it on a spit over a fire. You should boil scavenger birds such as vultures and buzzards for at least 20 minutes to kill any parasites. Use the feathers from fowl for insulating your shoes clothing, or bedding. You can also use feathers for fish lures.

d. Medium Sized Mammals. The game you trap or snare will generally be alive when you find it and is therefore dangerous. Be careful when you approach a trapped animal. Use a spear or club to kill it so you can keep a safe distance from it. After you kill an animal, immediately bleed it by cutting its throat. If you must drag the carcass any distance, do so before you cut off

the hide so that the carcass is protected from dirt and debris that might contaminate it. Clean the animal near a stream if possible so that you can wash and cool the carcass and edible parts. Fleas and parasites will leave a cooled body so if the situation allows, wait until the animal cools before cleaning and dressing the carcass. To skin and dress the animal (**Figure 14-14** and **Figure 14-15**).

Figure 14-14. SKINNING AND BUTCHERING LARGE GAME

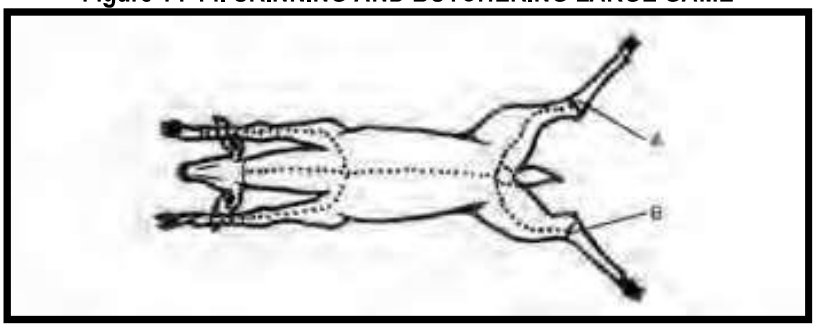
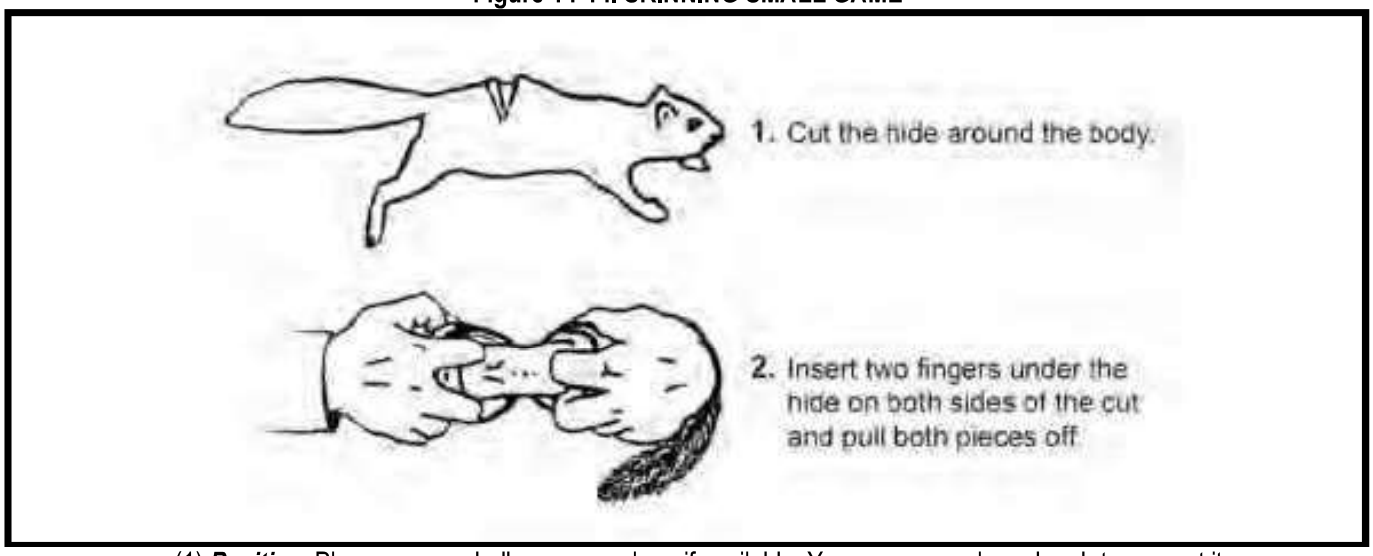


Figure 14-14. SKINNING SMALL GAME



(1) ***Position.*** Place carcass, belly up, on a slope if available. You can use rocks or brush to support it.
(2) ***Genitals and or Udder.*** Remove genitals or udder.
(3) ***Musk Glands.*** Remove these to avoid tainting meat.
(4) ***Hide.*** Split hide from tail to throat. Make the cut shallow so that you do not pierce the stomach.
(5) ***Skin.*** Insert your knife under the skin, taking care not to cut into the body cavity. Peel the hide back several inches on each side to keep hair out of the meat.
(6) ***Chest Cavity.*** Open the chest cavity by splitting the sternum. You can do this by cutting to one side of the sternum where the ribs join.
(7) ***Windpipe and Gullet.*** Reach inside and cut the windpipe and gullet as close to the base of the skull as possible.
(8) Internal Organs. With the forward end of the intestinal tract free, work your way to the rear, lifting out internal organs and intestines. Cut only where necessary to free them.
(9) ***Bladder.*** Carefully cut the bladder away from the carcass so that you do not puncture the bladder (urine can contaminate meat). Pinch the urethra tightly and cut it beyond the point you are pinching. Remove the bladder.
(10) ***Anus.*** From the outside of the carcass, cut a circle around the anus. Pull the anus into the body cavity and out of the carcass.

(11) ***Blood.*** Lift or roll the carcass to drain all blood. Blood, which contains salts and nutrients, is a good base for soups (remember to boil the blood first).

NOTE: Try to save as much blood as you can – it contains food and salt – and then boil the blood.

(12) ***Hide.*** Remove the hide, and make cuts along the inside of the legs to just above the hoof or paw. Peel the skin back, using your knife in a slicing motion to cut the membrane between the skin and meat. Continue this until the entire skin is removed.

(13) ***Entrails.*** Most of the entrails are usable. The heart, liver, and kidneys are edible. Cut open the heart and remove the blood from its chambers. Slice the kidneys and if enough water is available, soak or rinse them. In all animals except those of the deer family, the gall bladder (a small, dark colored, clear textured sac) is attached to the liver.

14) ***Sac.*** Sometimes, the sac looks like a blister on the liver. To remove the sac, hold the top portion of it and cut the liver around and behind the sac. If the gall bladder breaks and gall gets on the meat, wash the gall off the meat immediately so the gall does not taint the meat. Dispose of the gall.

(15) ***Preservation.*** Clean blood splattered on the meat will glaze over and help preserve the meat for a short time. However, if an animal is not bled properly, the blood will settle in the lowest part of its body and spoil the meat quickly. Cut out any meat contaminated this way. If the situation and time allow, you should preserve the extra meat for later use. If the air is cold enough, you can freeze the meat. In warmer climates, preserve by drying or smoking. One night of heavy smoking will make meat edible for about 1 week. Two nights will make it remain edible for 2 to 4 weeks. To prepare meat for drying or smoking, cut it with the grain in quarter inch strips. To air dry the meat, hang it in the wind and hot sun out the reach of animals; cover it so that blow flies cannot land on it.

(16) ***Temperature.*** When temperatures are below 40 degrees, you can leave meat hanging for several days without danger of spoilage. If maggots get on the meat, remove the maggots and cut out the discolored meat. The remaining meat is edible. Maggots, which are the larvae of insects, are also edible.

(17) ***Intestines.*** Thoroughly clean the intestines and use them for storing or smoking food or lashings for general use. Make sure they are completely dry to preclude rotting.

(18) ***Head.*** The head of most animals contains a lot of meat, which is fairly easy to get out. Skin the head and save the skin for leather. Clean the mouth thoroughly and cut out the tongue. After cooking the tongue, remove its outer skin. Cut or scrape the meat from the head. Or, you can roast the head over an open fire before cutting off the meat. Eyes are edible. Cook them but discard the retina (this is a plastic-like disc). The brain is also edible; in fact, some people consider it a delicacy. Each animal's brain matter is considered sufficient to tan the animal's hide.

(19) ***Tendons and Ligaments.*** Use the tendons and ligaments of the body of large animals for lashings.

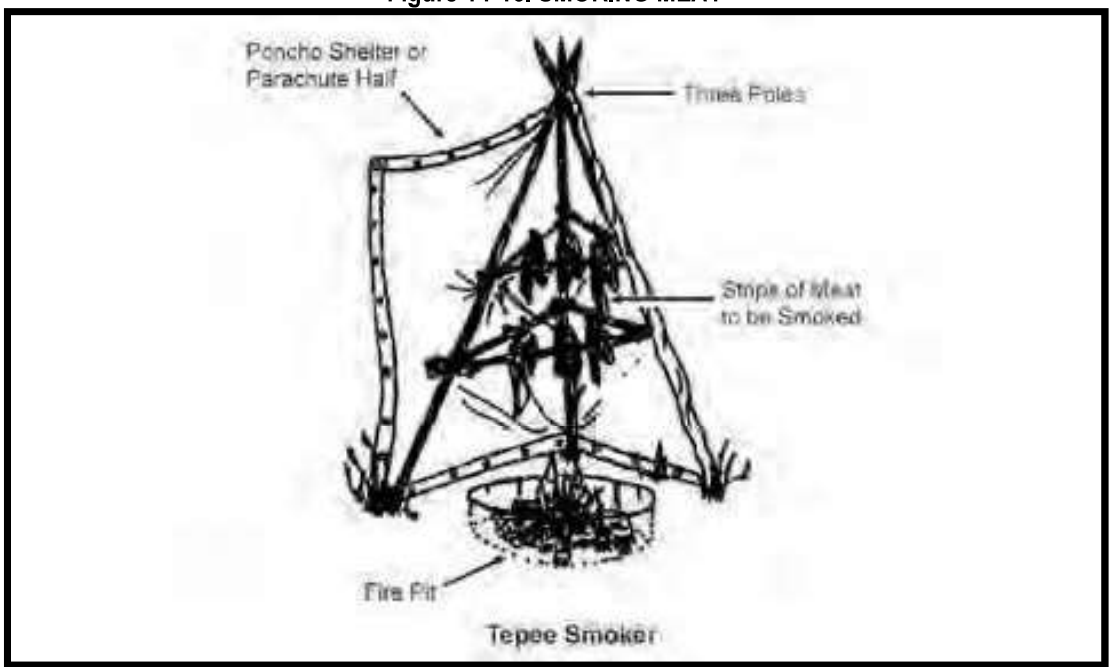
(20) ***Bone Marrow.*** The marrow in bones is a rich food source. Crack the bones and scrape out the marrow, and use bones to make weapons or fish hooks.

(21) ***Smoke.*** To smoke meat, you will need an enclosed area – for instance, a teepee (**Figure 14-16**) or a pit. You will also need wood from deciduous trees, preferably green. Do not use conifer trees such as pines, firs, spruces, or cedars, as the smoke from these trees give the meat a disagreeable taste and the resin is inedible.

(a) *Para Teepee or Other Enclosed Area with a Vent at the Top.* When using this, set the fire in the center and let it burn down to coals, then stoke it with green wood. Place the strips of meat on a grate or hang them from the top of the enclosure so that they are about 2 feet above the smoking coals.

(b) *Pit Method.* To use the pit method of smoking meat, dig a hole about a yard/meter deep and 1/2 yard/meter in diameter. Make a fire at the bottom of the hole. After it starts burning well, add chipped green wood or small branches of green wood to make it smoke. Place a wooden grate about 1/ 2 yard/meter above the fire, and then lay the strips of meat on the grate. Cover the pit with poles, boughs, leaves, or other material. (A half a yard/meter is about 18 inches or 1 1/2 feet.)

Figure 14-16. SMOKING MEAT



14-14. SHELTERS. A shelter can protect you from the sun, insects, wind, rain, snow, hot or cold temperatures, and enemy observation. In some areas your need for shelter may take precedence over your need for food, possibly even your need for water. After determining your shelter site, you should keep in mind the type of shelter (protection) you need. You need to know how to make different types of shelters. Only two are described in this handbook. Additional information is available in FM 3 05.70, Survival (not releasable to foreigners).

a. **Planning Considerations.**

- How much time and effort are needed to build the shelter?
- Will the shelter adequately protect you from the elements (rain, snow, wind, sun, and so on)?
- Do you have tools to build it? If not, can you improvise tools from materials in the area?
- Do you have the type and amount of manmade materials needed to build it? If not, are there sufficient natural materials in the area?

b. **Poncho Lean To.** You need only a short time and minimal equipment to build this lean to (**Figure 14-17**). You need a poncho, 6 to 10 feet of rope, three stakes about 6 inches long, and two trees (or two poles) 7 to 9 feet apart. Before you select the trees you will use (or decide where to place the poles), check the wind direction. Make sure the back of your lean to will be into the wind. To make the lean to–

(1) Tie off the hood of the poncho. To do this, pull the draw cord tight; roll the hood long ways, fold it into thirds, and tie it with the draw cord.

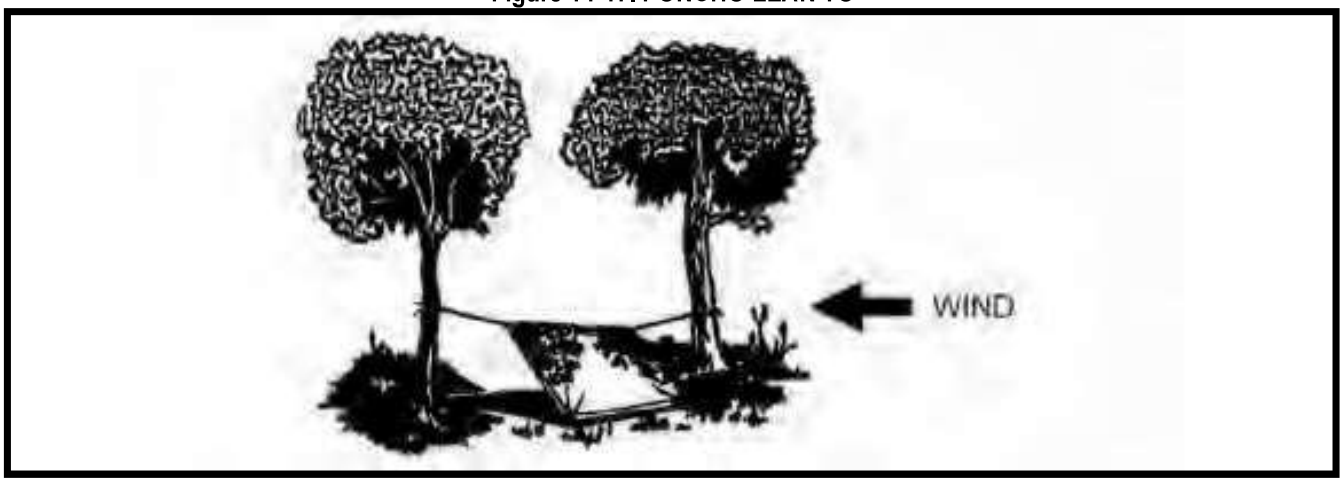
(2) Cut the rope in half. On one long side of the poncho, tie half of the rope to one corner grommet, and the other half to the other corner grommet.

(3) Attach a drip stick (about a 4 inch stick) to each rope 1/ 4 to 3/ 4 inches away from the grommet. These drip sticks will keep rainwater from running down the ropes into the lean to. Using drip lines is another way to prevent dripping inside the shelter. Tie lines or string about 4 inches long to each grommet along the top edge of the shelter. This allows water to run to and down the line without dripping into the shelter.

(4) Tie the ropes about waist high on the trees (uprights). Use a round turn and two half hitches with quick release knot.

(5) Spread the poncho into the wind and anchor to the ground. To do this, put three sharpened sticks through the grommets and into the ground.

Figure 14-17. PONCHO LEAN TO



(6) If you plan to use the lean to for more than one night, or if you expect rain, make a center support to the lean to. You can do this by stretching a rope between two upright poles or trees that are in line with the center of the poncho.

(7) Tie another rope to the poncho hood; pull it upward so that it lifts the center of the poncho, and tie it firmly to the rope stretched between the two uprights.

(8) Another method is to cut a stick to place upright under the center of the lean to. This method, however, will restrict your space and movements in the shelter.

(9) To give additional protection from wind and rain, place boughs, brush, your rucksack, or other equipment at the sides of the lean to.

(10) To reduce heat loss to the ground, place some type of insulating material, such as leaves or pine needles, inside your lean to.

> **NOTE:** When at rest, as much as 80 percent of your body heat can be lost to the ground.

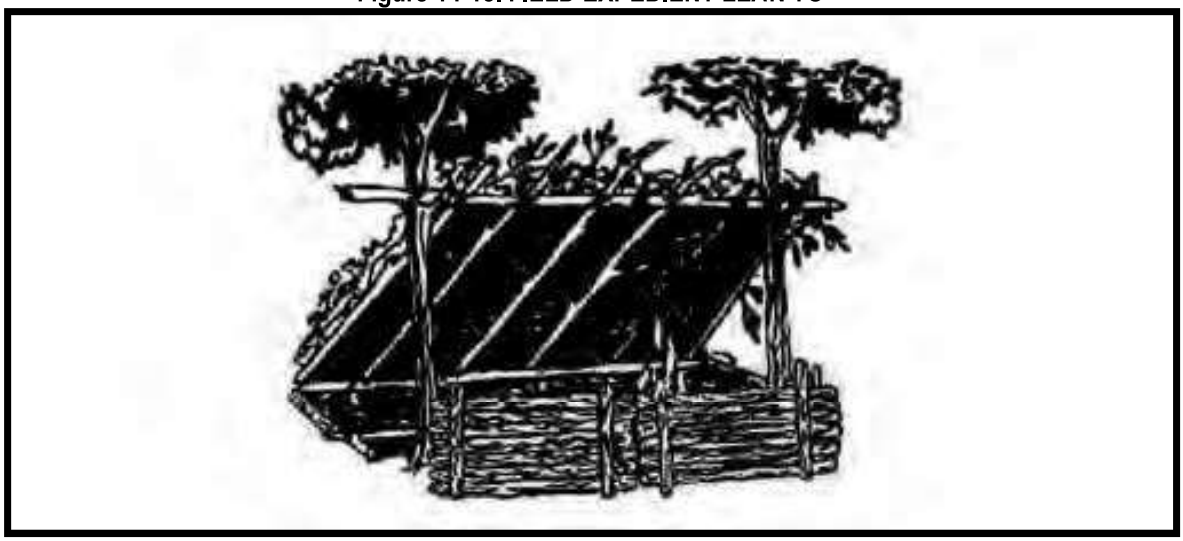
(11) To increase your security from enemy observation, lower the silhouette of the lean to by making two modifications.

(a) Secure the support lines to the trees at knee height rather than waist height.

(b) Use two knee high sticks in the two center grommets (sides of lean to), and angle the poncho to the ground, securing it with sharpened sticks as above.

c. Field Expedient Lean To. If you are in a wooded area and have sufficient natural materials, you can make an expedient lean to (**Figure 14-18**) without the aid of tools or with only a knife. You need more time to make it than the shelter previously mentioned, but it will protect you from most environmental elements. You will need two trees, (or two upright poles), about 6 feet apart; one pole about 7 feet long and 1 inch in diameter. Five to eight poles about 10 feet long and 1 inch in diameter for beams, cord or vines for securing, the horizontal support to the trees and other poles, saplings, or vines to crisscross the beams. To make this lean to:

Figure 14-18. FIELD EXPEDIENT LEAN TO



(1) Tie the 7 foot pole to the two trees at point about waist to chest high. This is your horizontal support. If there is a fork in the tree, you can rest the pole in it instead of tying the pole in place. If a standing tree is not available, construct a bipod using an Y shaped sticks or two tripods.
(2) Place one end of the beams (10 foot poles) one side of the horizontal support. As with all lean to type shelters, make sure the backside of the lean to is placed into the wind.
(3) Criss-cross sapling or vines on the beams.
(4) Cover the framework with brush, leaves, pine needles, or grass, starting at the bottom and working your way up like shingling.
(5) Place straw, leaves, pine needles, or grass inside the shelter for bedding.
(6) In cold weather, you can add to the comfort of your lean to (**Figure 14-18)** by building a fire reflective wall. Drive four stakes about 4 feet long into the ground to support the wall. Stack green logs on top of one another between the support stales. Bind the top of the support stakes so the green logs will stay in place. Fill in the spaces between the logs with twigs or small branches. With just a little more effort, you can have a drying rack. Cut a few 3/ 4 inch diameter poles. The length depends on distance between the lean to support and the top of the fire reflective wall. Lay one end of the poles on the lean to horizontal support and the other ends on top of the reflector wall. Place and tie into place smaller sticks across these poles. You now have a place to dry clothes, meat, or fish.

14-15 FIRES. A fire can full fill several needs. It can keep you warm, it can keep you dry: you can use it to cook food, to purify water, and to signal. It can also cause you problems when you are in enemy territory: it creates smoke, which can be smelled and seen from a long distance: It causes light which can be seen day or night and it leaves signs of your presence. Remember you should always weigh your need for a fire against your need to avoid enemy protection. When operating in remote areas you should always take a supply of matches in a waterproof case and keep them on your person.

a. **Selection**. When selecting a site to build a fire, you should consider the following:
- Where (terrain and climate) you are operating.
- What materials and tools are available.
- How much time you have.
- Why you need a fire.
- Where is the enemy–how near is he?

b. **Preparation.** If you are in a wooded or brush covered area, clear brush away and scrape the surface soil from the spot you selected. The cleared circle should be at least 3 feet (1 meter) in diameter so that there is little chance of the fire spreading. To prepare the site for a fire, ensure that it is dry and that it look for a dry spot that

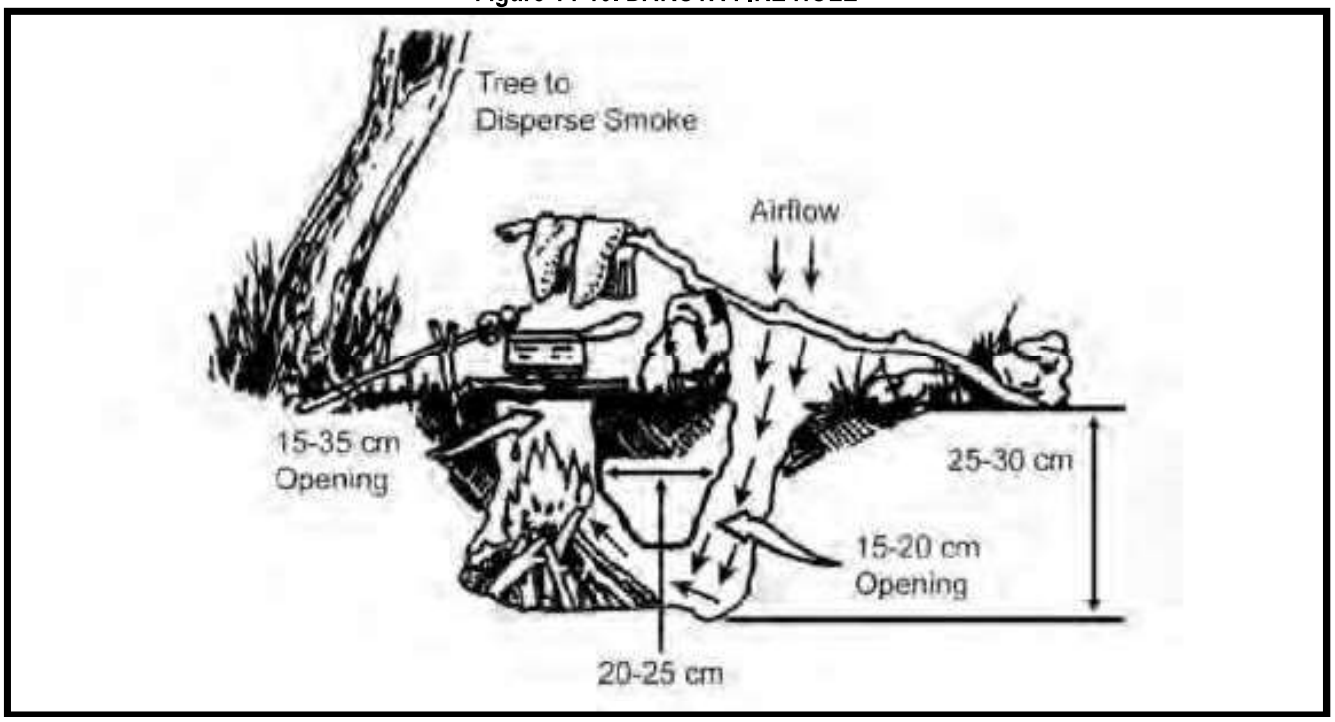
• Offers protection from the wind.
• Is suitably placed in relation to your shelter (if any).
• Concentrates the heat in the direction you desire.
• Has a supply of wood or other fire burning material.

c. **Dakota Fire Hole.** In some situations, an underground fireplace will best meet your needs. It conceals the fire to some extent and serves well for cooking food. To make an underground fireplace or Dakota fire hole (**Figure 14-19**):

(1) Dig a hole in the ground.

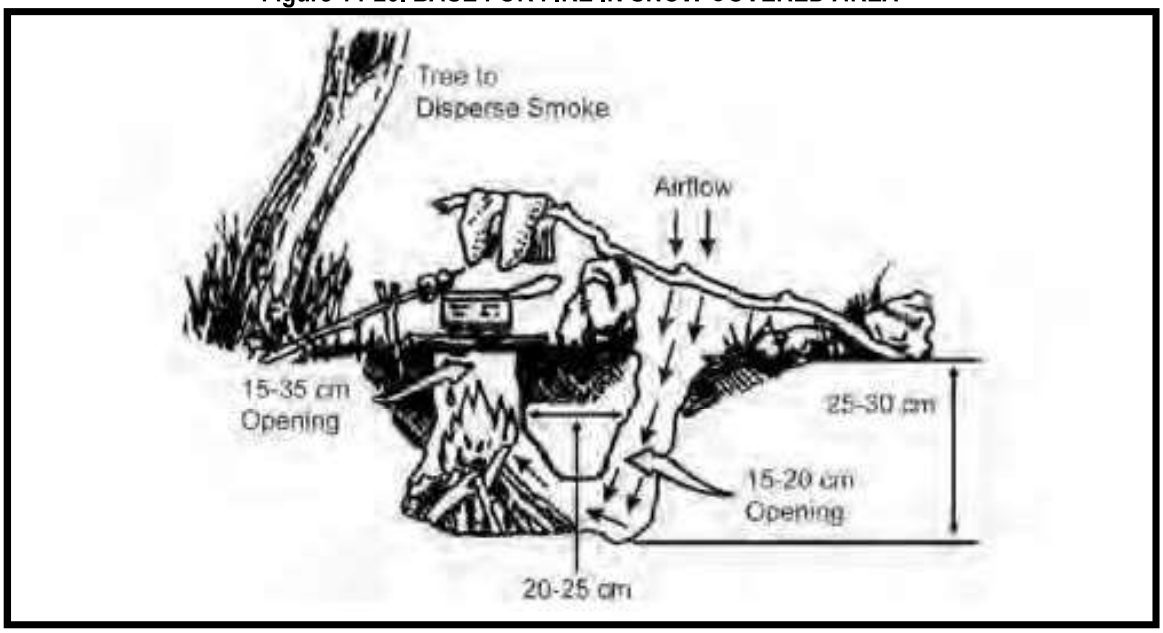
(2) On the upwind side of this hole, poke one large connecting hole for ventilation.

Figure 14-19. DAKOTA FIRE HOLE



d. **Aboveground Fire**. If you are in a snow covered or wet area, you can use green logs to make a dry base for your fire (**Figure 14-20**). Trees with wrist-sized trunks are easily broken in extreme cold. Cut or break several green logs and lay them side by side on top of the snow. Add one or two more layers, laying the top layer logs in a direction opposite those of the layer below it.

Figure 14-20. BASE FOR FIRE IN SNOW COVERED AREA



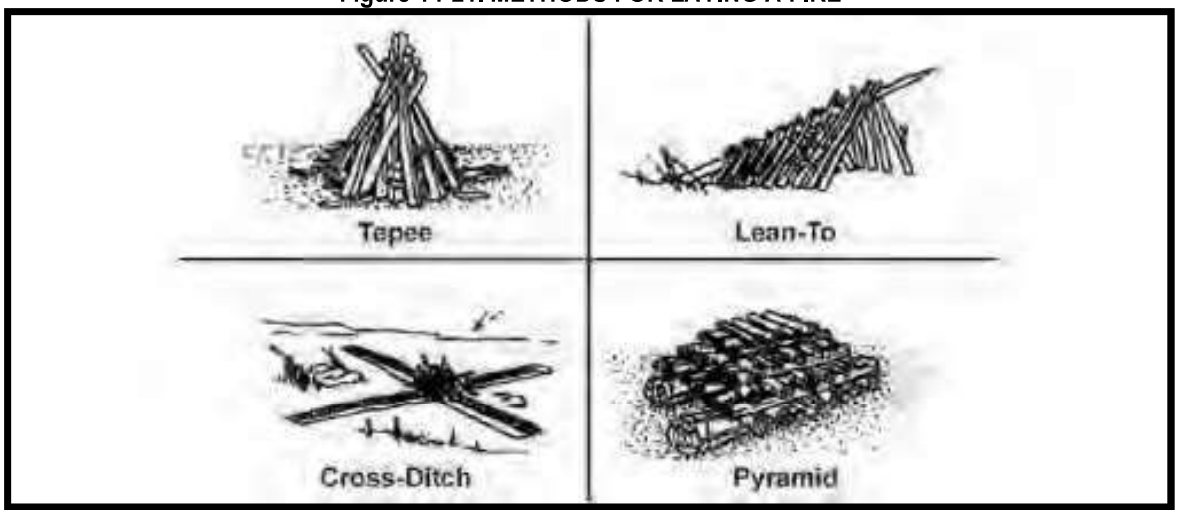
14-16. METHODS. There are several methods for laying a fire for quick fire making. Three easy methods follow (**Figure 14-21**):

a. Tepee. Arrange tinder and a few sticks of kindling in the shape of a cone. Fire the center. As the cone burns away, the outside logs will fall inward, feeding the heart of the fire. This type of fire burns well even with wet wood.

b. Lean To. Push a green stick into the ground at a 30-degree angle. Point the end of the stick in the direction of the wind. Place some tinder (at least a handful) deep inside this lean to stick. Light the tinder. As the kindling catches fire from the tinder, add more kindling.

c. Cross Ditch. Scratch a cross about 1 foot in size in the ground. Dig the cross 3 inches deep. Put a large wad of tinder in the middle of the cross. Build a kindling pyramid above the tinder. The shallow ditch allows air to sweep under the fire to provide a draft.

Figure 14-21. METHODS FOR LAYING A FIRE



Chapter 15
AVIATION

Army aviation and Infantry units can be fully integrated with other members of the combined arms team to form powerful and flexible air assault task forces. These forces can project combat power throughout the depth and width of the modern battlefield, with little regard for terrain barriers. These combat operations are deliberate, precisely planned, and vigorously executed. They strike the enemy when and where he is most vulnerable. See **Figure 2-11**, *Air Movement Annex,* and **Figure 2-12**, *Coordination Checklists*, which include the *Army Aviation Coordination Checklist*.

15-1. REVERSE PLANNING SEQUENCE. Successful air assault execution is based on a careful analysis of METT-TC and detailed, precise reverse planning. Five basic plans that comprise the reverse planning sequence are developed for each air assault operation. The battalion is the lowest level that has sufficient personnel to plan, coordinate, and control air assault operations. When company size or lower operations are conducted, most of the planning occurs at battalion or higher headquarters. The five plans are—

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

b. **Landing Plan.** The landing plan must support the ground tactical plan. This plan outlines a sequence of events that allows elements to move into the area of operations, and ensures that units arrive at designated locations at prescribed times, and that as soon as they arrive, they are prepared to execute the ground tactical plan.

c. **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 troops, equipment, and supplies from PZs to LZs.

d. **Loading Plan**. The loading plan is based on the air movement plan. It ensures that troops, 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 that the mix of weapons arriving at the LZ is ready to fight.

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

15-2. SELECTION AND MARKING OF PICKUP AND LANDING ZONES

a. Considerations. Small unit leaders should consider the following when selecting a PZ/ LZ:

(1) ***Size***. Minimal circular landing point separation from other aircraft and obstacles is needed:
OH 58D – 25 meters.
UH 1, AH 1 – 35 meters.
UH 60, AH 64 – 50 meters.
Cargo helicopters – 80 meters.

(2) ***Surface Conditions***. Avoid potential hazards such as sand, blowing dust, snow, tree stumps, or large rocks.

(3) ***Ground Slope.***
0 to 6 percent—land upslope.
7 to 15 percent—land sideslope.
Over 15 percent—no touchdown (aircraft may hover).

(4) ***Obstacles***. An obstacle clearance ratio of 10 to 1 is used in planning approach and departure of the PZ and LZ. For example, a tree that is 10 feet tall requires 100 feet of horizontal distance for approach or departure. Mark obstacles with a red chemlight at night or red panels in daytime. *Avoid using markings if the enemy would see them.*

(5) ***Approach/ Departure.*** Approach and depart into the wind and along the long axis of the PZ/ LZ.

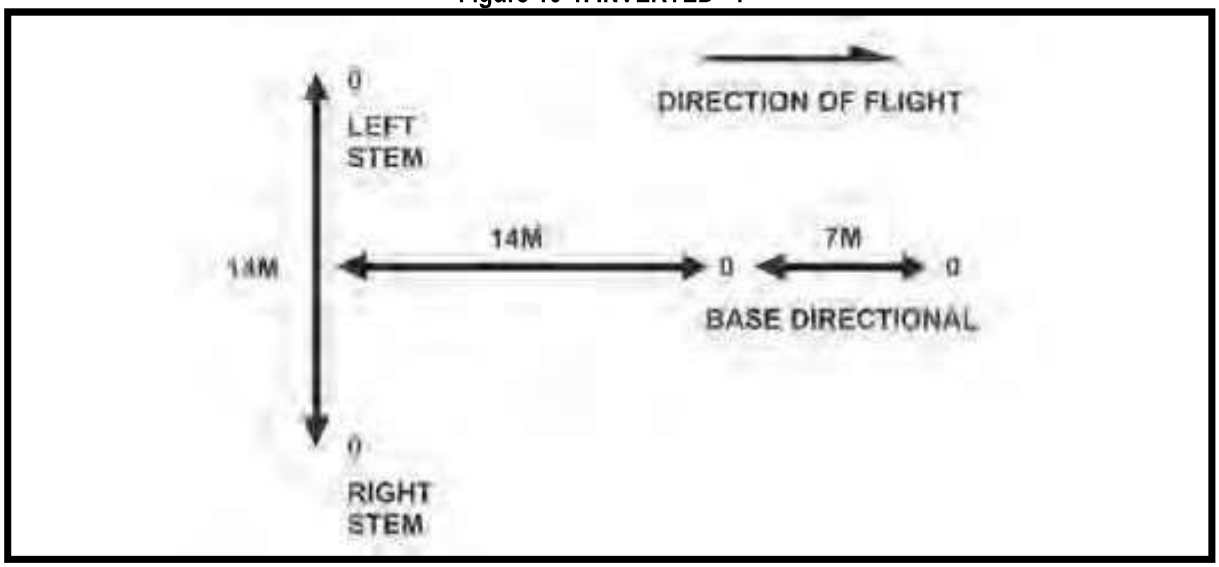
(6) ***Loads.*** The greater the load, the larger the PZ/ LZ must be to accommodate the insertion or extraction.

b. **Marking of PZs and LZs.**

(1) ***Day***. A ground guide will mark the PZ or LZ for the lead aircraft by holding an M16/ M4 rifle over his head, by displaying a folded VS 17 panel chest high, or by other coordinated and identifiable means.

(2) ***Night***. The code letter "Y" (inverted "Y") is used to mark the landing point of the lead aircraft at night (**Figure 15-1**). Chemical lights or “beanbag” lights are used to maintain light discipline. A swinging chemlight may also be used to mark the landing point.

Figure 15-1. INVERTED "Y"



15-3. AIR ASSAULT FORMATIONS. Aircraft supporting an operation may use any of the following PZ/ LZ configurations (**Table 15-1**), which are prescribed by the air assault task force (AATF) commander working with the air mission commander (AMC).

Table 15-1. AIR ASSAULT FORMATIONS

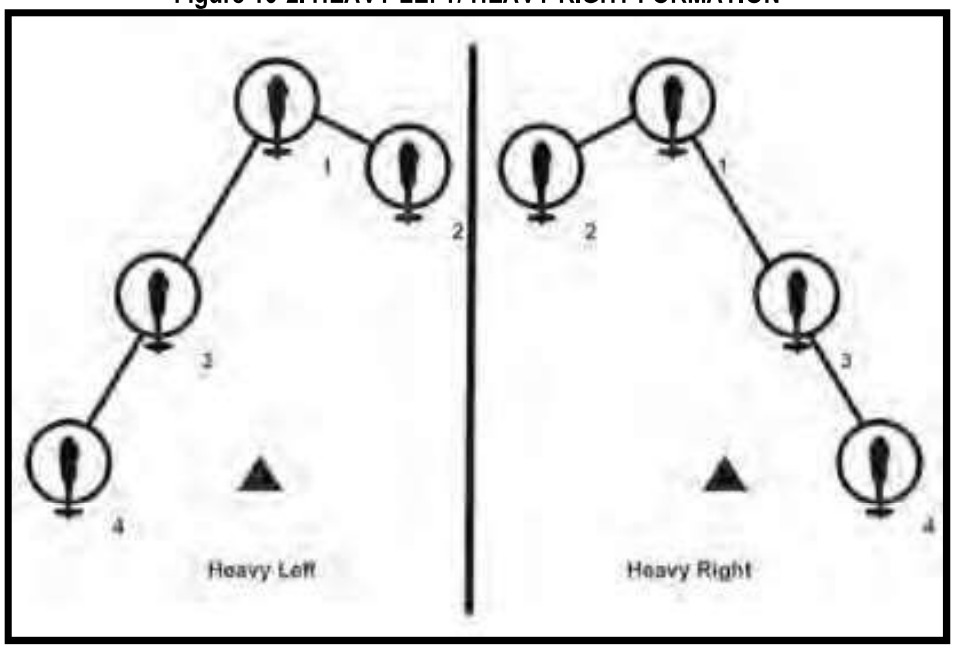
FORMATION	*PROS*	*CONS*
Heavy Left or Right	Provides firepower to front and flank	Requires a relatively long, wide landing area Presents difficulty in pre-positioning loads Restricts suppressive fire by inboard gunners
Diamond	Allows rapid deployment for all round security Requires only a small landing area	Presents some difficulty in pre-positioning loads Restricts suppressive fire of inboard gunners
Vee	Requires a relatively small landing area Allows rapid deployment of forces to the front	Presents some difficulty in pre-positioning loads
Echelon Left or Right	Allows rapid deployment of forces to the flank Allows unrestricted suppressive fire by gunners	Presents some difficulty in pre-positioning loads Requires a relatively long, wide landing area
Trail	Requires a relatively small landing area Allows rapid deployment of forces to the flank Simplifies pre-positioning of loads Allows unrestricted suppressive fire by gunners.	None
Staggered Trail Left or Right	Simplifies pre-positioning of loads Allows rapid deployment for all round security	Requires a relatively long, wide landing area Somewhat restricts gunners’ suppressive fire

a. **Heavy Left or Right Formation (Figure 15-2).**

PROS: Provides firepower to front and flank.

CONS: Requires a relatively long, wide landing area; presents difficulty in pre positioning loads; restricts suppressive fire by inboard gunners.

Figure 15-2. HEAVY LEFT/ HEAVY RIGHT FORMATION

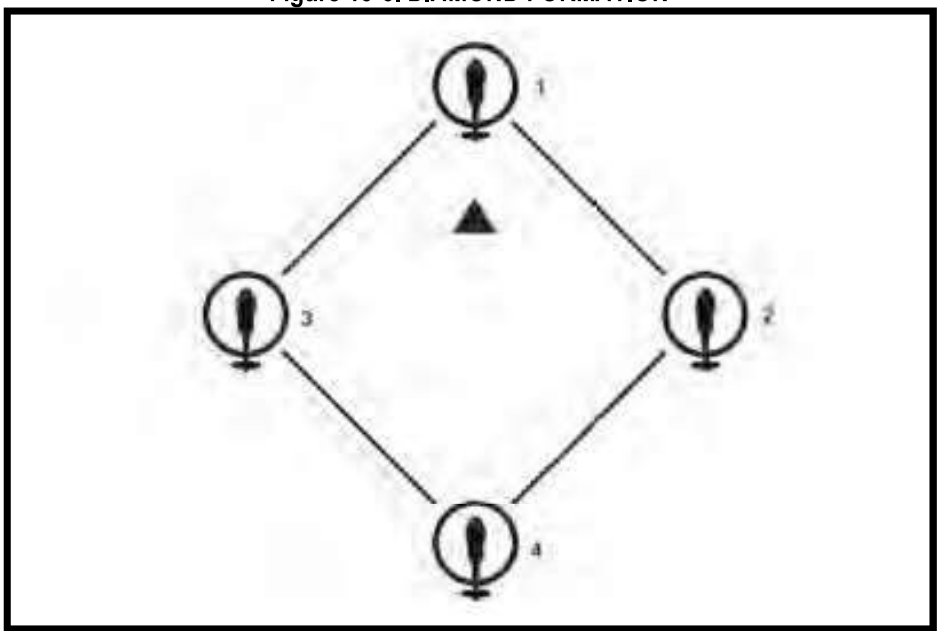


b. **Diamond Formation (Figure 15-3).**

PROS: Allows rapid deployment for all round security; requires a small landing area.

CONS: Presents some difficulty in pre positioning loads; restricts suppressive fire by inboard gunners.

Figure 15-3. DIAMOND FORMATION

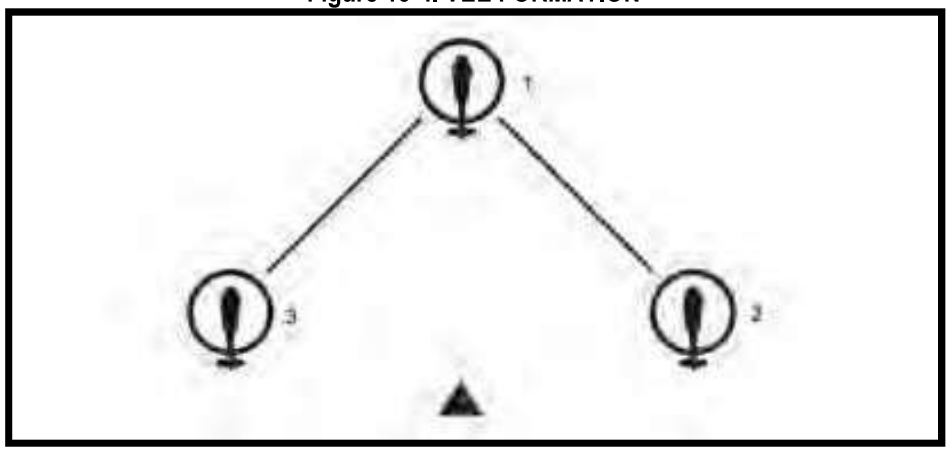


c. **Vee Formation (Figure 15-4).**

PROS: Requires a relatively small landing area; allows rapid deployment of forces to the front; restricts suppressive fire of inboard gunners.

CONS: Presents some difficulty in pre positioning loads.

Figure 15-4. VEE FORMATION

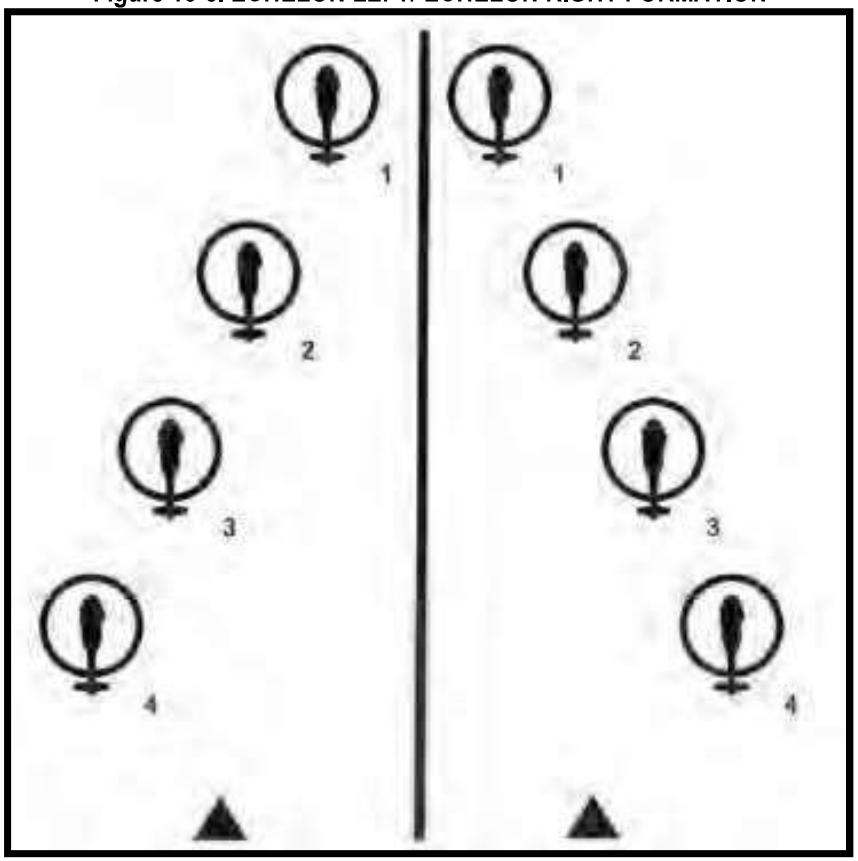


d. **Echelon Left or Right Formation (Figure 15-5).**

PROS: Allows rapid deployment of forces to the flank; allows unrestricted suppressive fire by gunners.

CONS: Requires a relatively long, wide landing area; presents some difficulty in pre positioning loads.

Figure 15-5. ECHELON LEFT/ ECHELON RIGHT FORMATION

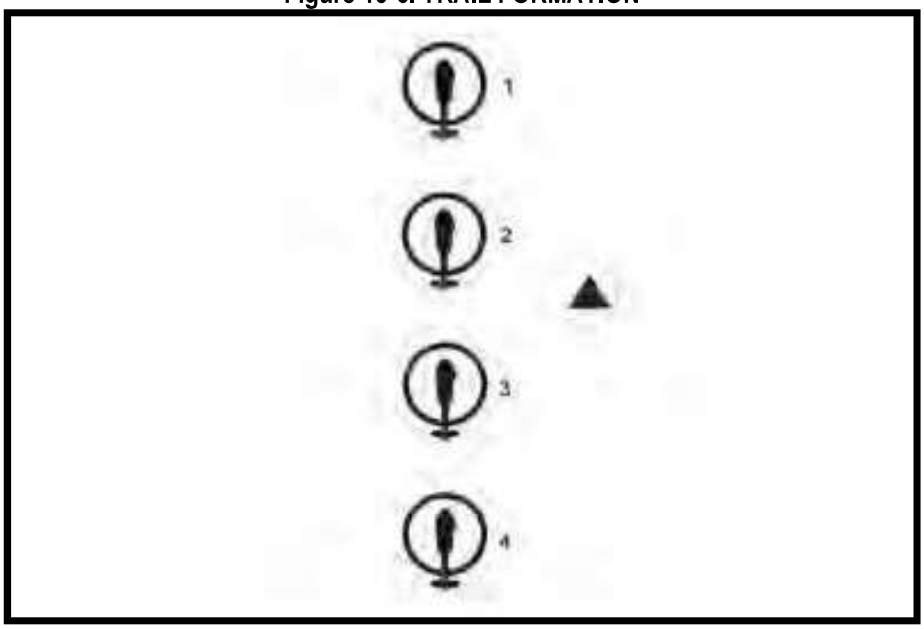


e. **Trail Formation (Figure 15-6).**

PROS: Requires a relatively small landing area; allows rapid deployment of forces to the flank; simplifies pre positioning loads; allows unrestricted suppressive fire by gunners.

CONS: None.

Figure 15-6. TRAIL FORMATION

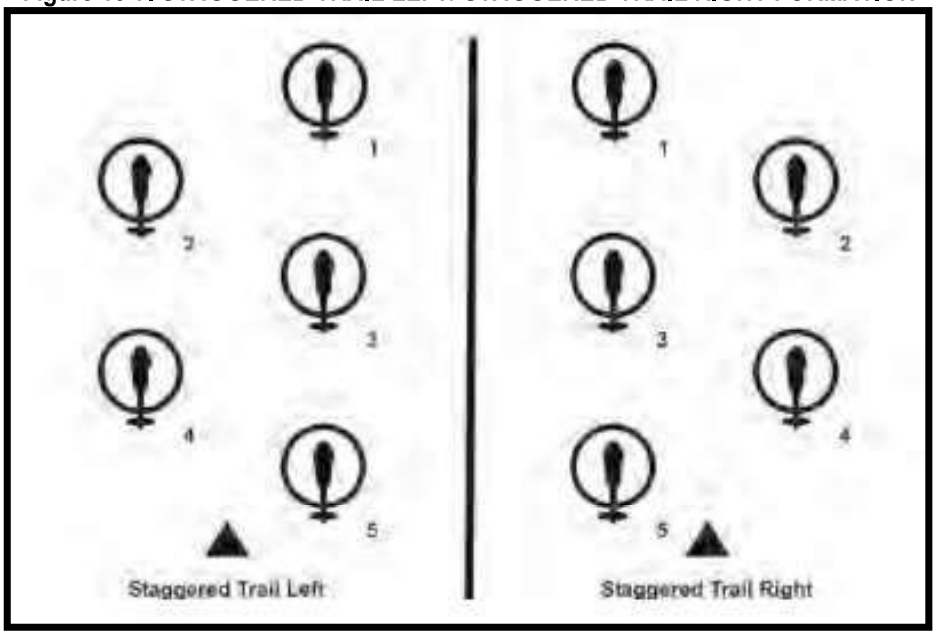


f. **Staggered Trail Left or Right Formation (Figure 15-7).**

PROS: Requires a relatively long, wide landing area; gunners' suppressive fire restricted somewhat.

CONS: Simplifies pre positioning loads; allows rapid deployment for all round security.

Figure 15-7. STAGGERED TRAIL LEFT/ STAGGERED TRAIL RIGHT FORMATION



15-4. PICKUP ZONE OPERATIONS

Prior to arrival of aircraft, the PZ is secured, PZ control party is positioned, and the troops and equipment are positioned in platoon/ squad assembly areas. In occupying a patrol/ squad assembly area, the patrol/ squad leader does the following steps. **Figure 15-8** shows an example of a large, one sided PZ. Figures 15-9 through 15-12 show loading/ unloading procedures and techniques:

- Maintain all round security of the assembly area.
- Maintain communications.
- Organize personnel and equipment into chalks and loads.
- Conduct safety briefing and equipment check of troops.

Figure 15-8. LARGE, ONE-SIDED PICKUP ZONE

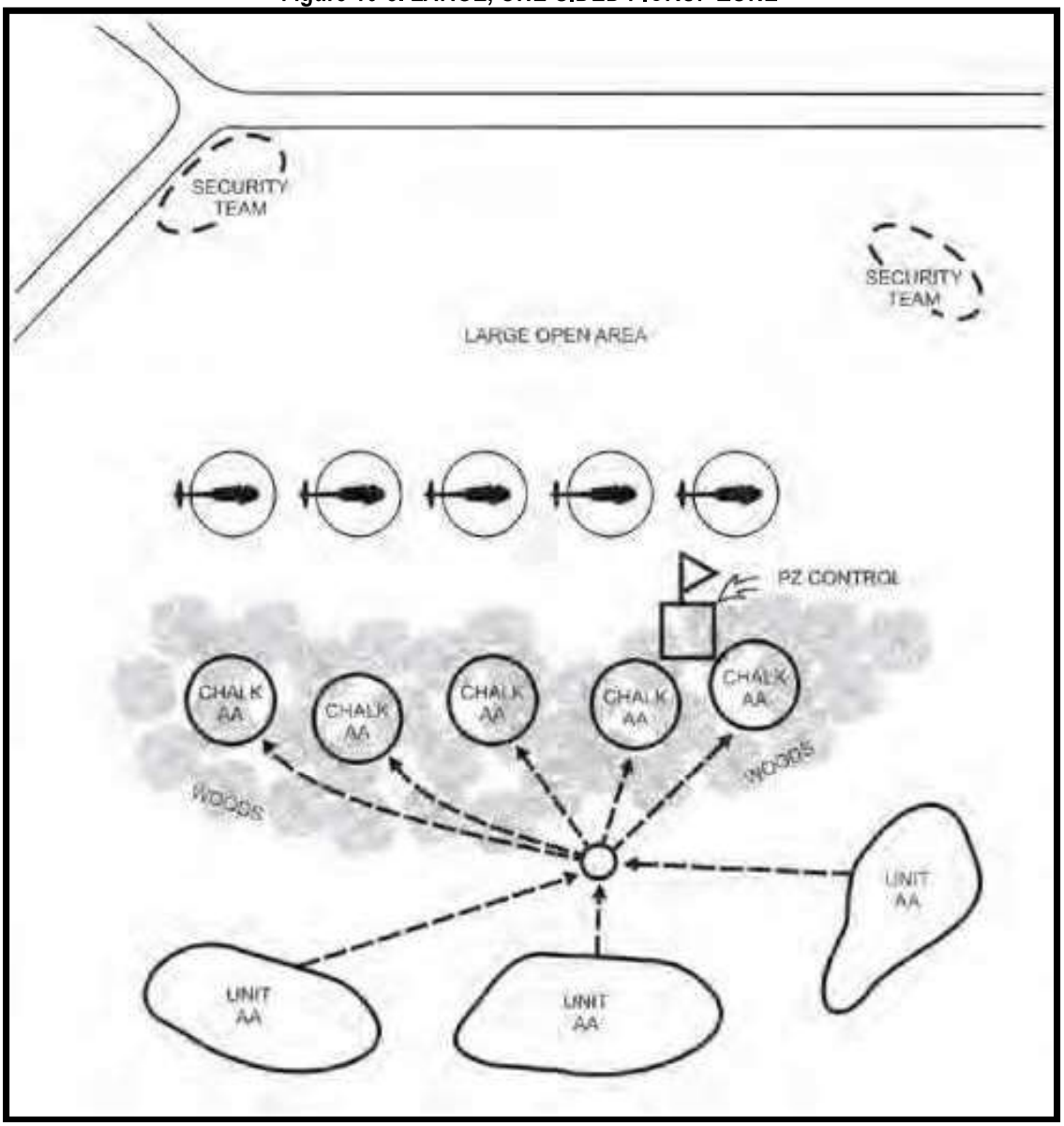


Figure 15-9. UH 60 LOADING SEQUENCE

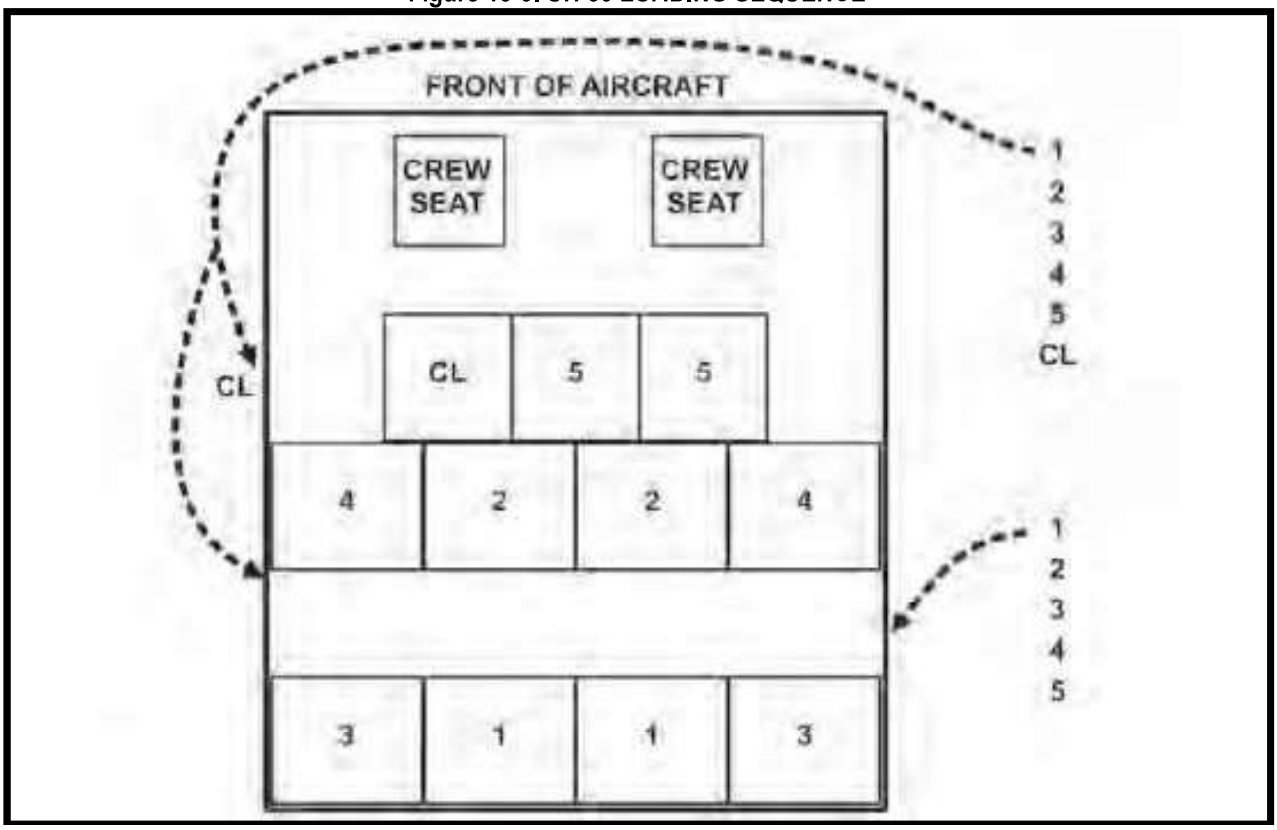


Figure 15-10. UNLOADING SEQUENCE

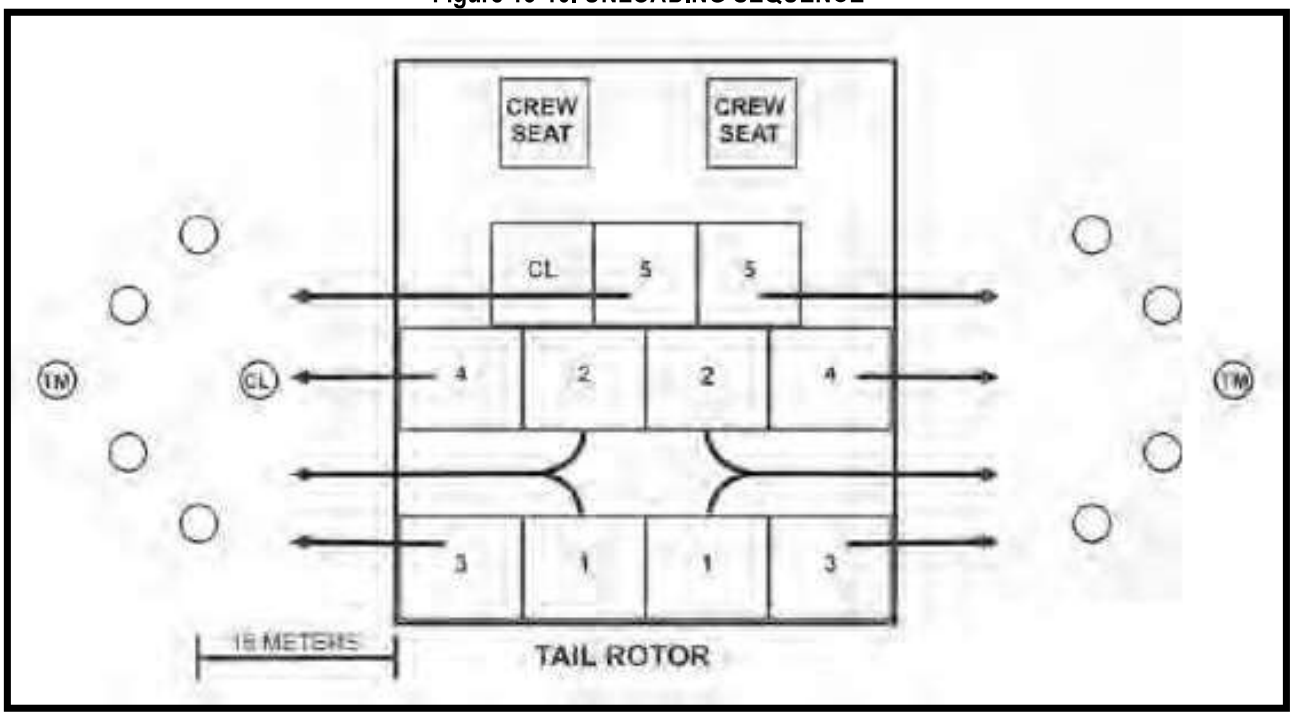


Figure 15-11. TACTICAL LOADING SEQUENCE

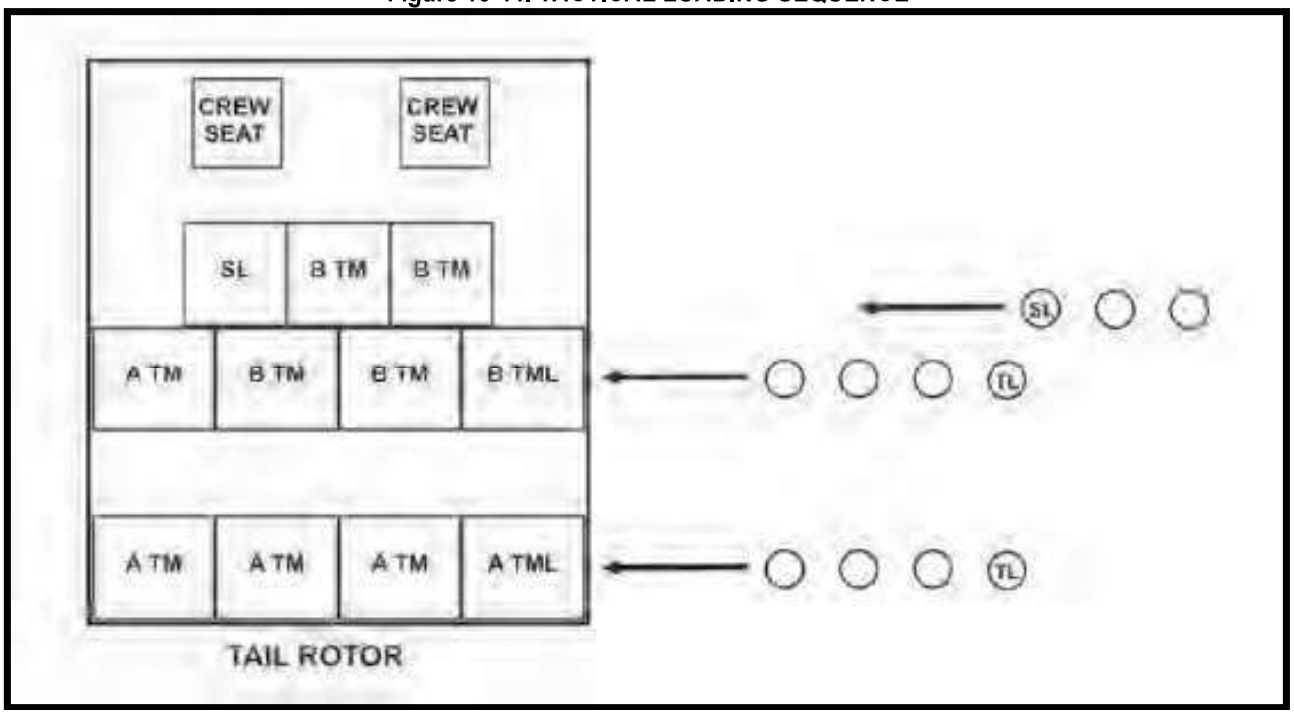
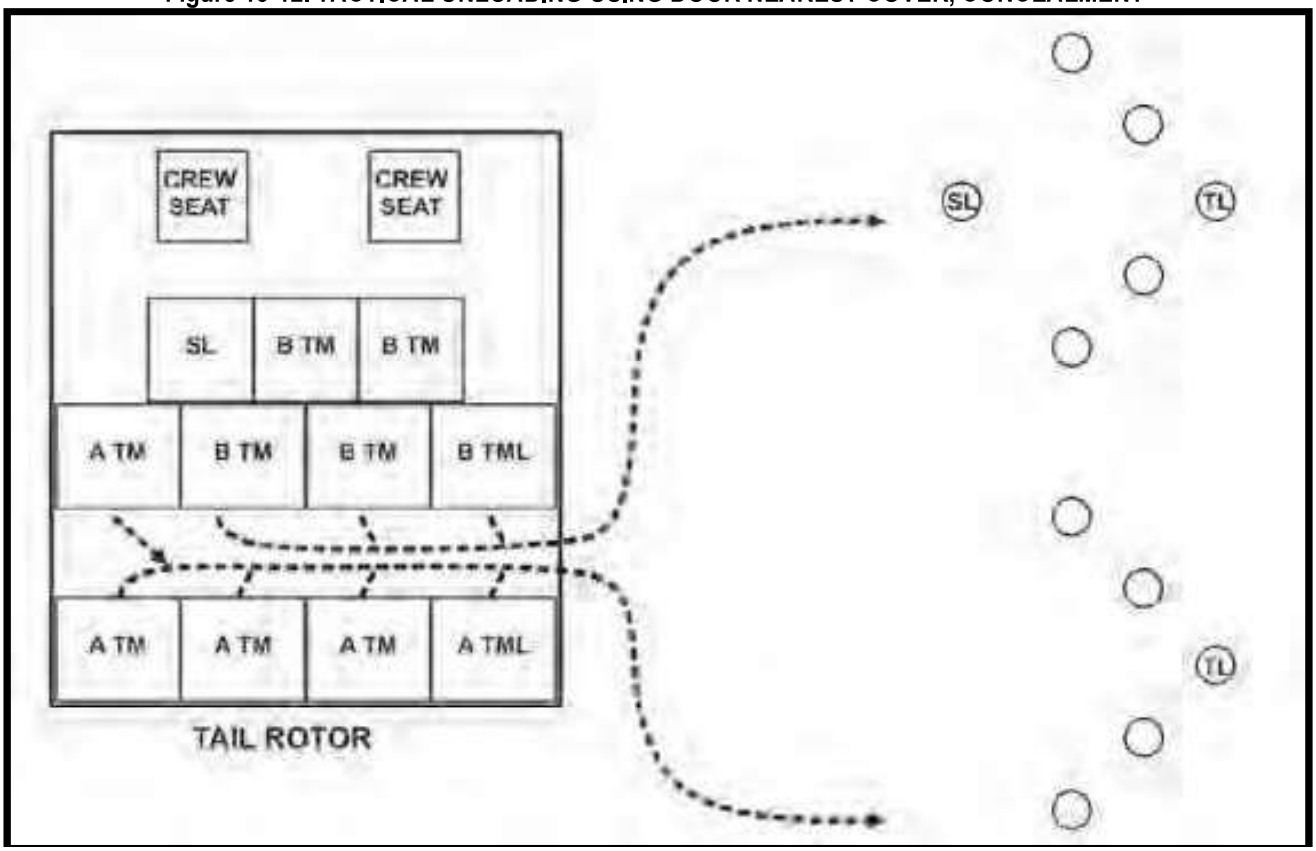


Figure 15-12. TACTICAL UNLOADING USING DOOR NEAREST COVER, CONCEALMENT



15-5. SAFETY. Safety is the primary concern of all leaders when operating in/around aircraft. The inclusion of aircraft into Ranger operations brings high risks. Consider the following:

a. Approach the aircraft from 45 to 90 degrees off the nose.
b. Point upward the muzzles of weapons with blank firing adapters.
c. Point downward the muzzles of weapons loaded with live ammunition.
d. Wear the ballistic helmet.
e. When possible, conduct an air crew safety brief with all personnel.
f. At a minimum, cover loading/ off loading, emergency, and egress procedures.
g. [Leaders] Carry a manifest and turn in a copy to higher.

15-6. REQUIREMENTS. Minimum landing space requirements and minimum distance between helicopters on the ground depend on many factors. If the aviation unit SOP does not spell out these requirements, the aviation unit commander works with the Pathfinder leader. The final decision about minimum landing requirements rests with the aviation unit commander. In selecting helicopter landing sites from maps, aerial photographs, and actual ground or aerial reconnaissance, he considers the following factors:

a. **Number of Helicopters.** To land a large number of helicopters at the same time, the commander might have to provide another landing site(s) nearby. Or, he can land the helicopters at the same site, but in successive lifts.

b. **Landing Formations.** Helicopter pilots should try to match the landing formation to the flight formation. Pilots should have to modify their formations no more than necessary to accommodate the restrictions of a landing site. However, in order to land in a restrictive area, they might have to modify their formation somewhat.

c. **Surface Conditions.** Rangers choose landing sites that have firm surfaces. This prevents helicopters from bogging down, creating excessive dust, or blowing snow. Rotor wash stirs up any loose dirt, sand, or snow. This can obscure the ground, especially at night. Rangers remove these and any other debris from landing points, since airborne debris could damage the rotor blades or turbine engine(s).

d. **Ground Slope.** Rangers choose landing sites with relatively level ground. For the helicopter to land safely, the slope should not exceed 7 degrees. Whenever possible, pilots should land upslope rather than downslope. All helicopters can land where ground slope measures 7 degrees or less (**Figure 15-13**).

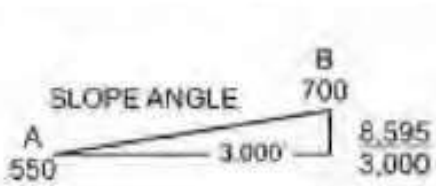
(1) ***Day Operation Signals.*** For daylight operations, you can use different smoke colors for each landing site. You can use the same color more than once, just spread them out. Use smoke only if you have to, because the enemy can see it, too. Try to use it only when the pilot asks for help locating his helicopter site.

(2) ***Night Operation Signals.*** For night operations, use pyrotechnics or other visual signals in lieu of smoke. As in daylight, red signals mean "Do not land," but you can also use them to indicate other emergency conditions. All concerned must plan and know emergency codes. Each flight lands at the assigned site according to CC messages and the visual aids displayed. You can use arm and hand signals to help control the landing, hovering, and parking of helicopters.

Figure 15-13. GROUND SLOPE

GROUND SLOPE EXPRESSED IN DEGREES

The approximate slope angle may be calculated by multiplying the gradient by 57.3. This method is reasonably accurate for slope angles under 20 degrees.



VD = B-A = 150
HD = 3,000

DEGREE OF SLOPE $\frac{150 \times 57.3}{3,000}$

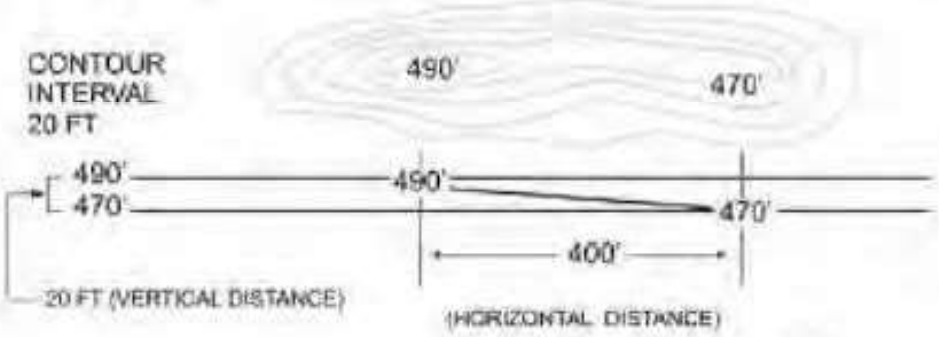
$\frac{8,595}{3,000}$ = APPROXIMATELY 3° OF SLOPE

GROUND SLOPE EXPRESSED AS PERCENTAGE

To determine the percent of ground slope, divide the vertical distance (VD) by the horizontal distance (HD) and multiply by 100.

$$\text{PERCENT of SLOPE} = \frac{VD}{HD} \times 100$$

Verticle distance is the difference in field elevation between the two ends of the landing site. Always round number up to the next whole number.



$\frac{.05}{400/20.00}$ $\frac{.05}{\times 100}$ 05.00 = 5 PERCENT

PATHFINDER SLOPE LANDING RULES

Do not land small utility and observation aircraft on slopes exceeding 7 degrees.
Give large utility and cargo aircraft an advisory if ground-slope is between 7 and 15 degrees.
Always advise pilot when landing wheeled aircraft on a sideslope.

15-7. DESERT. The typical desert is a dry, barren region, generally treeless and sandy. It suffers environmental extremes, with violent and unpredictable weather changes. Its terrain conforms to no particular model. Frequent clear days offer unequaled visibility and flight conditions, but a sudden sandstorm immediately halts all operations. Successful desert operations require special training, acclimatization, and great self discipline.

a. **Communications.** In desert operations, the radio offers the best way to communicate. The low, rolling terrain allows good radio range. Due to the increased distances involved in military desert operations, FM radio communications may prove inadequate, especially in the higher FM frequencies. Rangers, aircraft, and ground crew must all have high frequency radio equipment. Sand or dust in equipment or a poor electrical ground cause most communication problems. Due to the increased distances between land force units engaged in desert operations, helicopters may provide air or ground relay or help deploy ground radio rebroadcast facilities. **Table 15-2** shows an example ground-to-air radio transmission.

Table 15-2. GROUND TO AIR TRANSMISSIONS

Pilot:	***ALPHA ONE LIMA ONE SIX [A1L16], THIS IS ROMEO TWO BRAVO TWO SEVEN [R2B27], OVER.***
Ranger:	ROMEO TWO BRAVO TWO SEVEN, THIS IS ALPHA ONE LIMA ONE SIX, OVER.
Pilot:	***THIS IS BRAVO TWO SEVEN, CCP INBOUND, OVER.***
Ranger:	THIS IS LIMA ONE SIX, STATE TYPE, NUMBER, AND INTENTIONS, OVER.
Pilot:	***THIS IS BRAVO TWO SEVEN, FOUR UNIFORM HOTEL SIXTIES [UH-60s], TROOP DROP-OFF AND SLING LOAD, FOR YOUR SITE, OVER.***
Ranger:	THIS IS LIMA ONE SIX, ROGER, HEADING THREE TWO FIVE [325], THREE THOUSAND [3,000] METERS. LAND THREE TWO FIVE, SIGNAL ON CALL, LAND ECHELON RIGHT, SLING-LOAD AIRCRAFT USE NUMBER FOUR LANDING POINT, CONTINUE APPROACH FOR VISUAL CONTACT, OVER.

b. **Navigation.** Many of the conditions experienced in cold weather operations resemble those in desert operations. Rangers and pilots find distances and altitudes hard to judge in the desert. The lack of definable terrain features makes navigation difficult, especially at night and over long distances. Also, the sameness of the terrain can influence a pilot to pay less attention to his surroundings. Rangers may have to mark and man release points.

c. **Landing Sites.** The climatic conditions in the desert profoundly affect the setup and operation of landing sites. Most importantly, the Ranger must consider density altitude, wind, and sand (dust). Sand on a landing site can produce brownout conditions similar to those in snowy areas, so the same precautions apply. This makes a rocky area a better landing site than a sandy hollow, depression, or valley.

d. **Wind.** Desert winds generally calm down for an hour or two around sundown. Another calm occurs before sunrise. Other than those times, desert winds can drive dense clouds of dust and sand with hurricane force, and rapid temperature changes often follow strong winds. The Pathfinder leader must consider what times of day the wind will allow him to operate the landing site.

(1) The extreme heat often experienced in the desert also affects the aircraft's ACL. When supporting a ground unit, the Ranger leader coordinates with the aviation element to determine the ACL for each type of aircraft. Both the minimum distance between aircraft and the size of the landing point increase in desert operations: 100 meters between aircraft, 100 meter diameter landing points. In daylight hours, ground crew members mark the touchdown points. They paint sandbags a bright color or mark them using some other quick method. Ideally, they use signalmen.

2) When establishing a landing site, the Ranger leader considers taxi procedures. When an aircraft must taxi, the pilot moves it into a vertical position as quickly as possible to reduce the amount of sand (dust) the engine sucks in as well as to avoid a brownout. Pilots should avoid taxiing over the same area repeatedly.

e. **Liftoffs.** Pilots will not try a normal liftoff in a sandstorm. Helicopters with wheels and airplanes should make a running type takeoff. Helicopters with skids should make a maximum performance liftoff.

f. **Landings.** When they can, pilots should use a running type landing to reduce sand intake. If a pilot can make a running landing, he keeps the touchdown roll to a minimum to keep from overloading the landing gear. If the terrain does not permit a running landing, the pilot lands at a greater than normal angle. He should never land from a hover.

g. **Safety.** Ground crew personnel should wear clothing that will protect them against the sand blown around by the rotor wash. Each person on the ground should take special care to keep the sand out of his eyes, ears, nose, and mouth. Goggles, earplugs, and cloth masks provide adequate protection for facial areas. Other ground crew procedures resemble those for cold weather operations.

15-8. MOUNTAINS. Mountains have rugged, divided terrain with steep slopes and few natural or manmade lines of communication. Weather fluctuates seasonally from extreme cold, with ice and snow, to extreme heat. Also, it can switch between the two extremes very quickly. This unpredictability greatly affects operations.

a. **Communications**. Mountainous terrain often limits or restricts communications. To maintain communications within the AO, aircraft may have to limit operations to the vicinity of the unit. Other aircraft can serve as radio relay stations. Ranger units may also have to set up radio relays at the RP, CCP, or both.

(1) Mountain conditions challenge aviators in Ranger operations more than any other conditions. For precise flying in mountainous areas, pilots need large scale terrain maps.

(2) Since intervening terrain degrades GTA communications, providing navigational aid and control over extended ranges might prove difficult.

b. **Wind.** The main weather hazard in the mountains is wind. Even moderate winds (11 to 20 knots) can produce significant turbulence over mountain ridges. Predicting wind conditions is difficult. The windward side of a mountain maintains a steady direction of airflow, though the strength of the wind may vary. The leeward side has turbulent winds with strong vertical currents. This turbulence might prevent assault landings and require pilots to fly at higher altitudes. This naturally increases the risk of detection and destruction.

c**. Density Altitude.** In the mountains, density altitude can vary a lot between PZs and LZs. It can also vary greatly from one time of day to another. It normally peaks in the late afternoon, and drops to its lowest point at dawn.

d. **Navigation.** In the mountains, the helicopter offers the best way to rapidly move forces. In the offense, air assault operations can insert forces into the enemy's rear area and bypass or envelop his defenses. In the defense, helicopters can move reinforcements and reserves rapidly.

e. **Landing Sites.** Mountainous regions offer few, if any airfields for fixed wing aircraft, and few LZs suitable for multiple helicopters.

(1) If the enemy situation allows, Rangers to set up LZs on the windward side of the mountain, since that side offers more stable winds.

(2) When they can only find LZs designed for single aircraft, planners increase in flight spacing. This places an extra load on each crew. When conducting multiship operations into a small LZ, the Ranger controller should allow sufficient time between liftoff and landing for the turbulent air generated during the departure of the previous helicopter to stabilize. Otherwise, the pilot of the incoming craft will experience that turbulence and lose lift.

(3) A pilot must touchdown very carefully on the typical small, rough, sloped mountain LZ. Depending on the angle of the slope and on the aircraft's available torque, the pilot might be able to make a normal slope landing. Pilots of larger craft, such as cargo helicopters, may have trouble positioning the entire fuselage in the available area. Once the cockpit extends over the landing area, the pilot cannot see the ground. He must rely on the crew chief and signalman to direct him.

(4) During a mountain approach to an LZ surrounded by uneven terrain, the pilot has a hard time determining the actual aircraft altitude and rate of closure. Where the terrain slopes up to the LZ, a visual illusion occurs. The pilot may think he is flying too high and closing too slowly. If the terrain slopes down to the LZ, he may feel he is flying too low and closing too fast. Employing a signalman on the ground gives the pilot a visual reference to adjust his controls. He may need more than one signalman.

f. **Site Assessmen**t. Rangers should determine the following information while reconnoitering and selecting a mountain site:

(1) The size, slope, amount of surface debris, and the area covered by shadows and obstacles in and around the site.
(2) The approximate direction, speed, and characteristics of the wind.
(3) The inbound route, if necessary. When the pilot cannot land due to a steep slope, the aircraft may terminate at a hover to off load troops and supplies.
(4) The departure route, which should orient into the wind and over the lowest obstacles.

15-9. OBSERVATION HELICOPTERS. This category includes the OH 58D Kiowa and the OH 6A Cayuse.

a. **OH 58D Kiowa. Table 15-3** shows specifications for the Kiowa; **Figure 15-14** shows the aircraft from three angles.

Table 15-3. SPECIFICATIONS FOR THE OH 58D (KIOWA)

Rotor Diameter	35 feet
Length:	
Rotor Operating	42 feet 2 inches
Blades Removed	33 feet 10 inches
Height to Top of Turret	12 feet 9-1/2 inches
Tread (Skids)	6 feet 2 inches
Main Rotor	
Disk Area	0.962 square feet
Blade Area	38.26 square feet
Clear Area Needed for Rotor	12.5 meters
TDP # 1	25 meters diameter

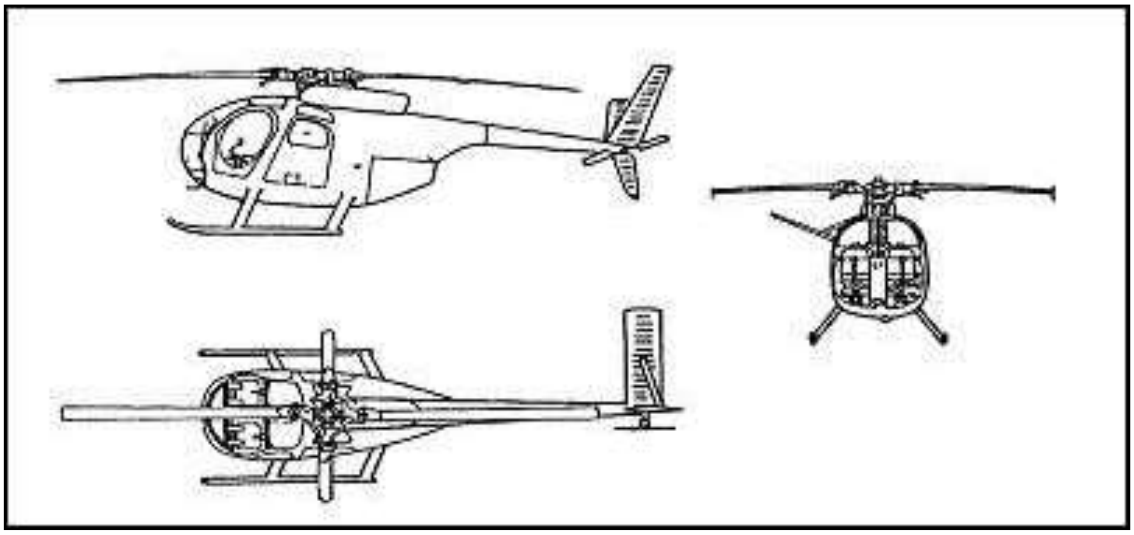
Figure 15-14. OH 58D (KIOWA)

b. **OH 6A Cayuse. Table 15-4** shows specifications for the Cayuse; **Figure 15-15** shows the aircraft from three angles.

Table 15-4. SPECIFICATIONS FOR THE OH 6A CAYUSE

Rotor Diameter	26 feet 4 inches
Length:	
Rotor Operating	39 feet 3-3/4 inches
Rotor Folded	22 feet 9 1/2 inches
Span, Maximum Lateral	26 feet
Height	8 feet 9 inches
Tread (Skids)	6 feet 3 inches
Clear Area Needed for Rotors	9.3 meters
TDP # 1	25 meters diameter

Figure 15-15. OH 6A (CAYUSE)



15-10. ATTACK HELICOPTERS

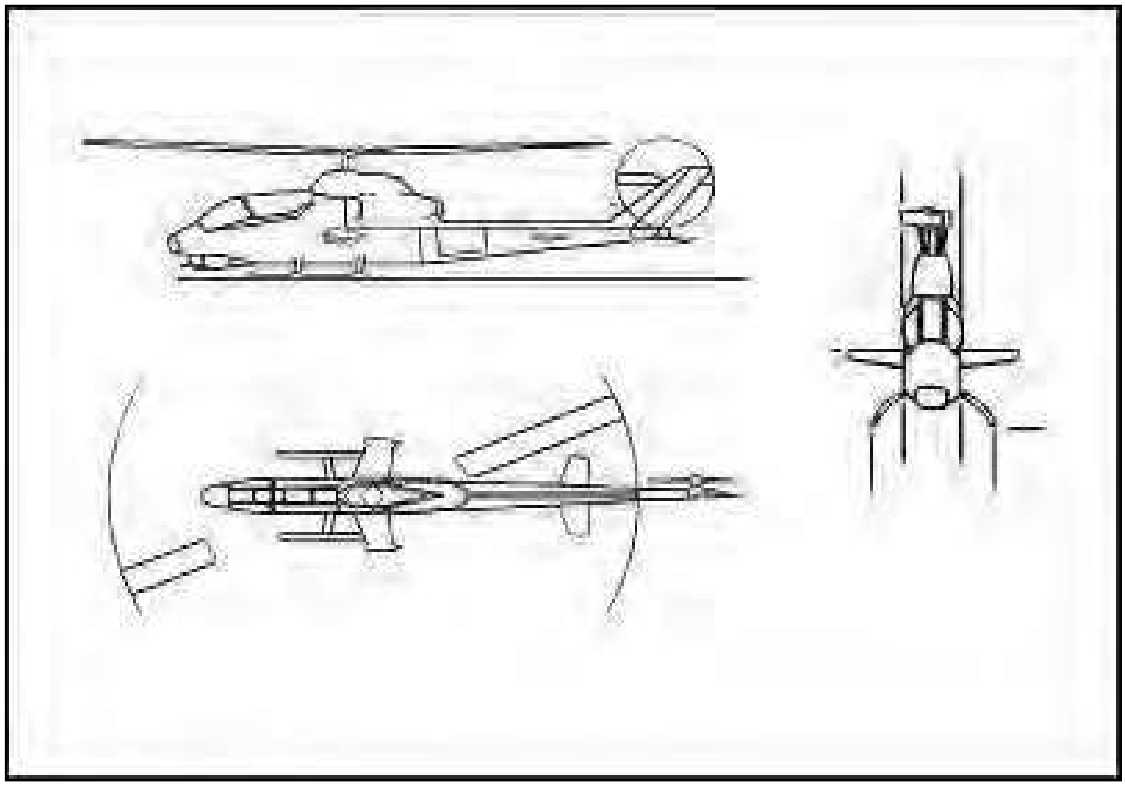
This category of helicopters includes the AH 1S Cobra and the AH 64A Apache.

a. **AH 1S Cobra. Table 15-5** shows specifications for the Cobra; **Figure 15-16** shows the aircraft from three angles.

Table 15-5. SPECIFICATIONS FOR THE AH 1S (COBRA)

Rotor Diameter	44 feet
Length:	
Rotor Operating	53 feet 1 inch
Fuselage	44 feet 9 inches
Span, Maximum Lateral	11 feet 8 inches
Height	11 feet 7 inches
Tread (Skids)	7 feet
Rotor Ground Clearance (Static)	7 feet 10 inches
Clear area needed for Rotors	16.18 meters
TDP # 2	35 meters diameter

Figure 15-16. AH 1S (COBRA)

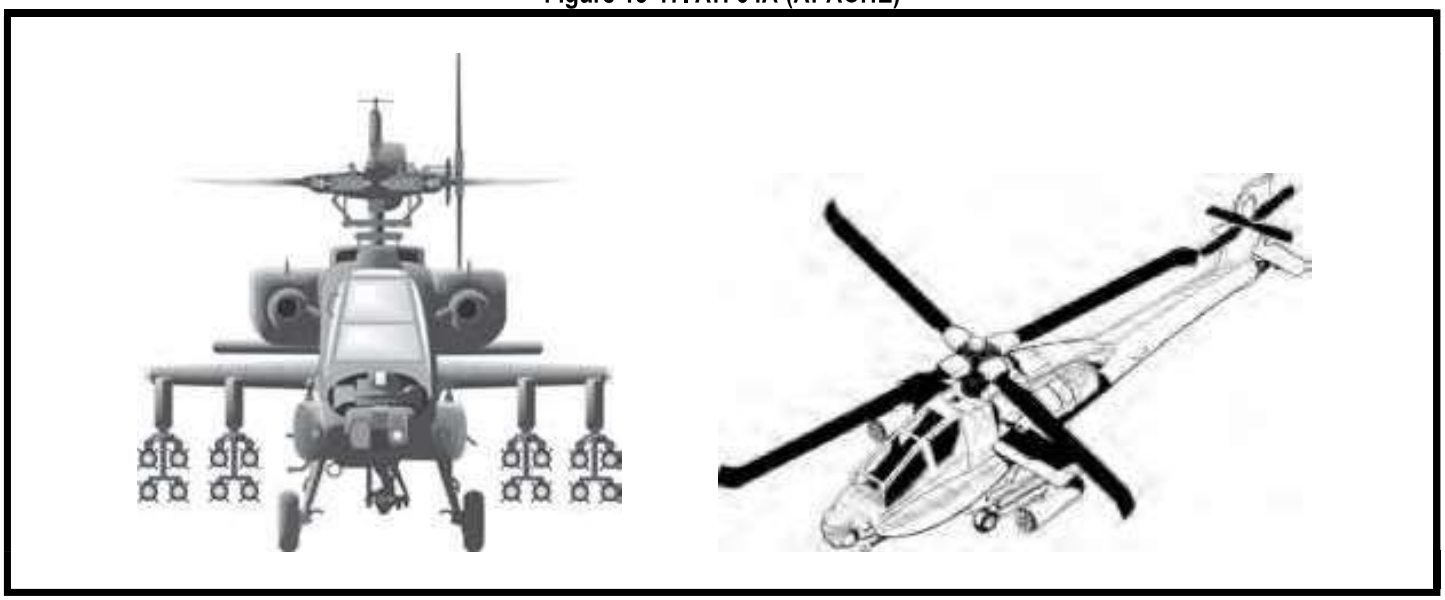


a. **AH 64A (Apache). Table 15-6** shows three views and final specifications for the AH 64A Apache; **Figure 15-17** shows the aircraft from three angles.

Table 15-6. SPECIFICATIONS FOR THE AH 64A (APACHE)

Rotor Diameter	48 feet
Length:	
Rotors Operating	58 feet 3-1/8 inches
Rotors Static	57 feet 4 inches
Fuselage	48 feet
Height	15 feet 3-1/2 inches
Clear area needed for Rotors	17.9 meters
Minimum TDP without commander's approval is #3	50 meters

Figure 15-17. AH 64A (APACHE)



15-11. UTILITY HELICOPTERS

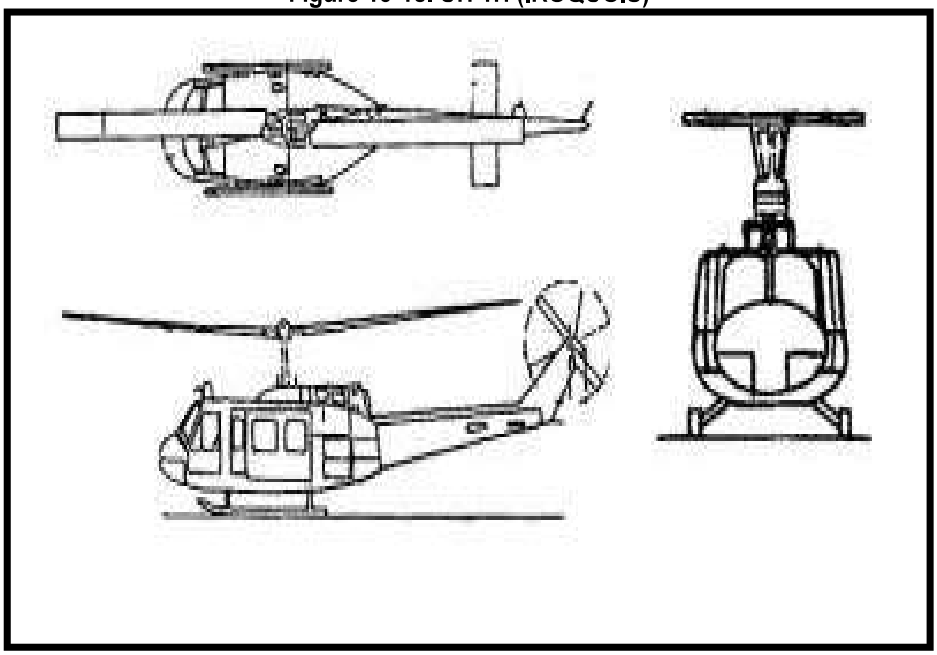
This category of helicopters includes the UH 1H Iroquois and the UH 60A Blackhawk.

a. **UH 1H Iroquois. Table 15-7** shows specifications for the Iroquois; **Figure 15-18** shows the aircraft from three angles.

Table 15-7. SPECIFICATIONS FOR THE UH 1H (IROQUOIS)

Rotor Diameter	48 feet
Length:	
Rotors Operating or Static	57 feet 1 inch
Fuselage	41 feet 10-3/4 inches
Span, Maximum Lateral	9 feet 4 inches
Height	14 feet 6 inches
Tread	8 feet 6-1/2 inches
Ground Clearance (Static)	
Against Stops	6 feet 6 inches
Clear area needed for Rotors	17.4 meters
TDP # 2	35 meters diameter
Allowable Cargo Load	4,000 pounds

Figure 15-18. UH 1H (IROQUOIS)

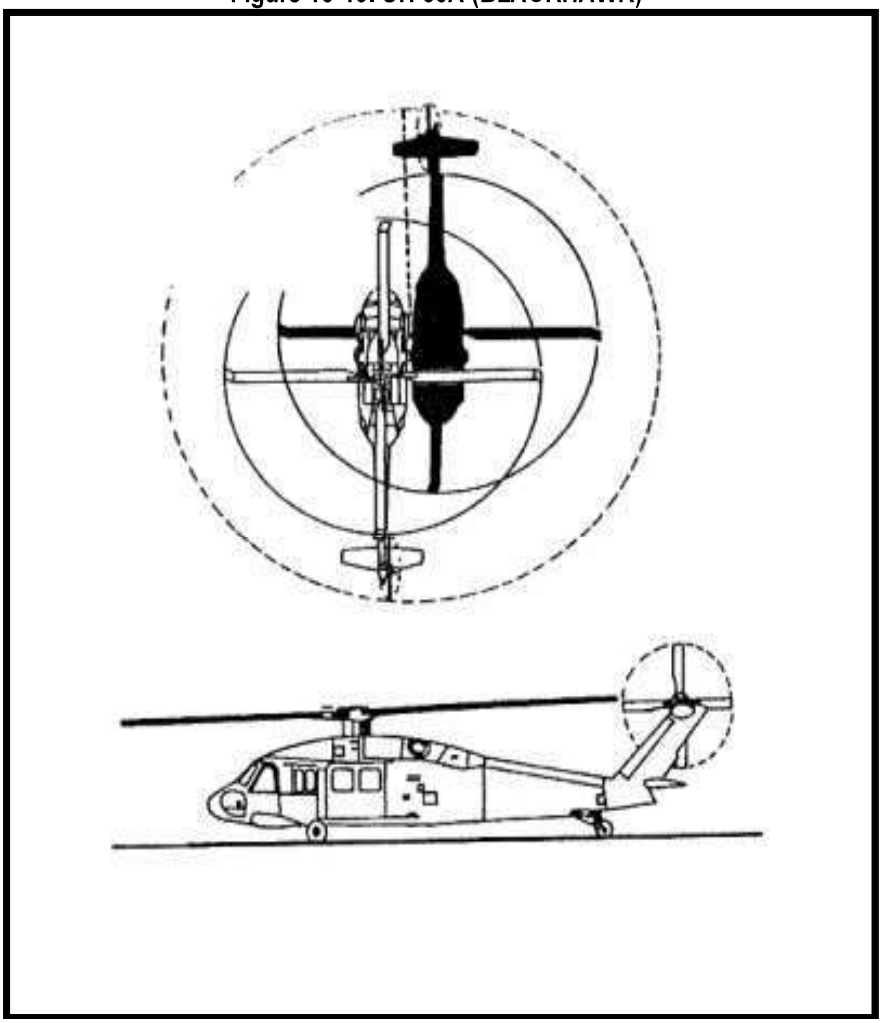


b. **UH 60A Blackhawk. Table 15-8** shows specifications for the UH 60A Blackhawk; **Figure 15-19** shows the aircraft from above and from the left side.

Table 15-8. SPECIFICATIONS FOR THE UH 60A (BLACKHAWK)

Rotor Diameter	53 feet 8 inches
Length:	
Rotors Operating or Folded	64 feet 10 inches
Fuselage	50 feet 7–1/2 inches
Span, Maximum Lateral	9 feet 8–1/2 inches
Height	16 feet 5 inches
Tread	8 feet 10–1/2 inches
Ground Clearance (Static),	
Against Stops	8 feet 9 inches
Clear area needed for Rotors	19.5 meters
TDP # 3	50 meters diameter
Allowable Cargo Load	8,000 pounds

Figure 15-19. UH 60A (BLACKHAWK)



15-12. CARGO HELICOPTERS

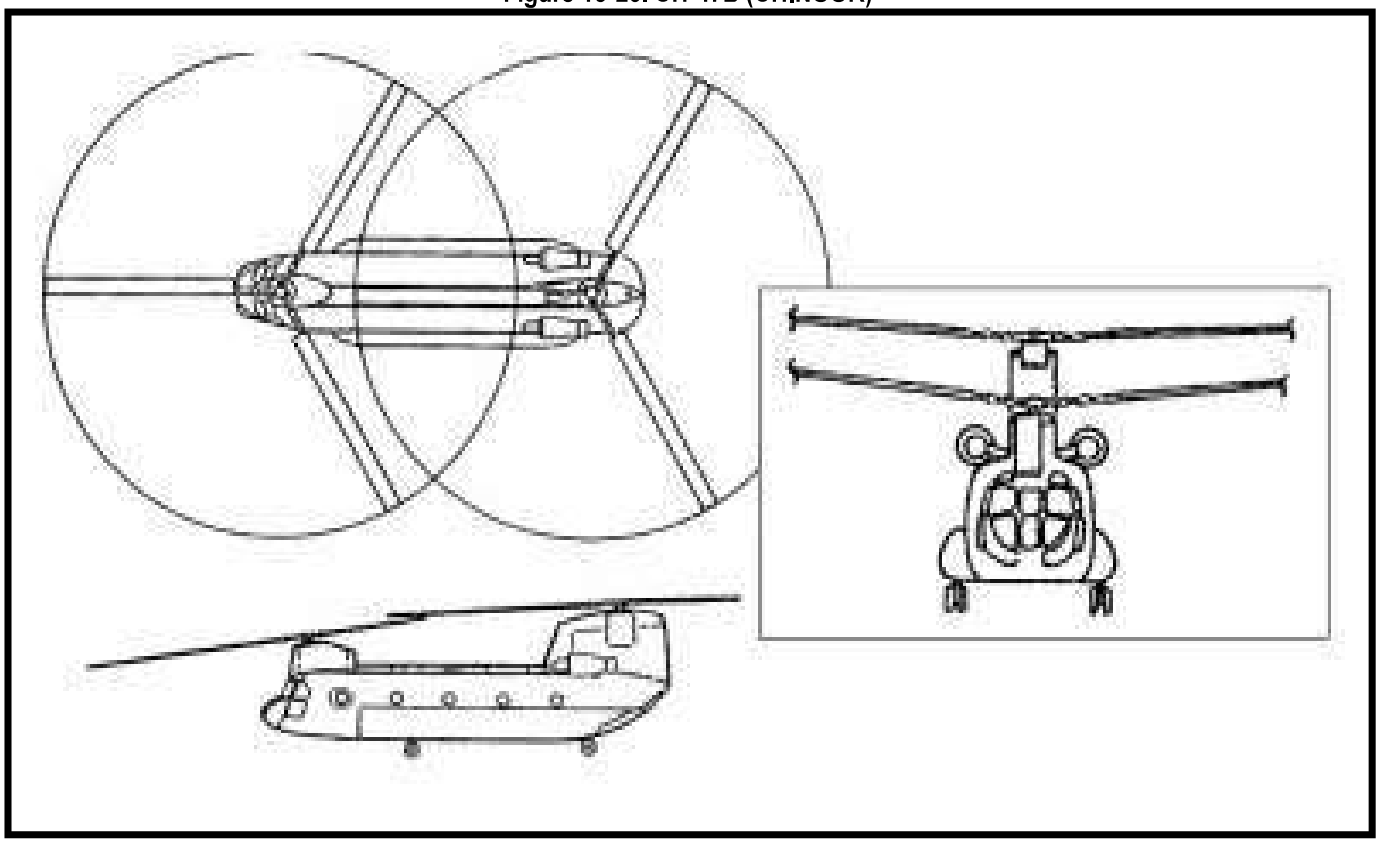
This category of helicopters includes the CH 47B/C and the CH 47 B/D Chinooks. With slingload, cargo helicopter TDP is #5 (100 meter diameter); without slingload, it is #4 (80 meter diameter).

a. **CH 47B/ C Chinook. Table 15-9** shows specifications for the CH 47B/C Chinook; **Figure 15-20** shows the aircraft from three angles.

Table 15-9. SPECIFICATIONS FOR THE CH 47 B/ C (CHINOOK)

Rotor Diameter	60 feet
Length:	
Rotors Operating	98 feet 10 3/4 inches
Rotors Folded	50 feet 9 inches
Height (Overall)	18 feet 11 1/2 inches
Tread	11 feet 11 inches
Rotor Ground Clearance	
Static Forward	7 feet 4 3/4 inches
Idling Forward	10 feet 11 inches
Clear Area Needed for Rotors	30.4 meters
TDP # 4	80 meters diameter
Allowable Cargo Load	21,000 pounds

Figure 15-20. CH-47B (CHINOOK)



Chapter 16
FIRST AID

Patrolling, more than some other types of missions, puts Rangers in harm's way. CASEVAC planning is vital. Also, because trained medical personnel might be unavailable at the initial point of injury, everyone must know how to diagnose and treat injuries, wounds, and common illnesses. The unit should also have a plan for handling KIAs.

16-1. LIFESAVING STEPS. Whatever the injury, (1) stop life-threatening bleeding; (2) open the airway and restore breathing; (3) stop the bleeding and protect the wound; (4) check, treat, and monitor for shock; and (5) MEDEVAC the casualty.

16-2. CARE UNDER FIRE. When still under fire, (1) maintain situational awareness; (2) return fire; (3) protect the casualty; (4) move the casualty to cover; and (5) identify and control severe bleeding with bandage or tourniquet.

16-3. PRIMARY SURVEY. Use the alphabet to remember how to deal with life threatening injures such as blocked airway, not breathing, or uncontrollable bleeding (hemorrhaging) **(Table 16-1).**

Table 16-1. The ABC's.

A	**AIRWAY** Open airway by patient position or with airway adjuncts.
B	**BREATHING** Seal open chest wounds with occlusive dressing.
C	**CIRCULATION**.. Identify uncontrolled bleeding and control with pressure or tourniquet. Start IV if needed.
D	**DISABILITY** Determine Level of consciousness.
E	**EXPOSURE** Fully expose patient. (Environment dependent)

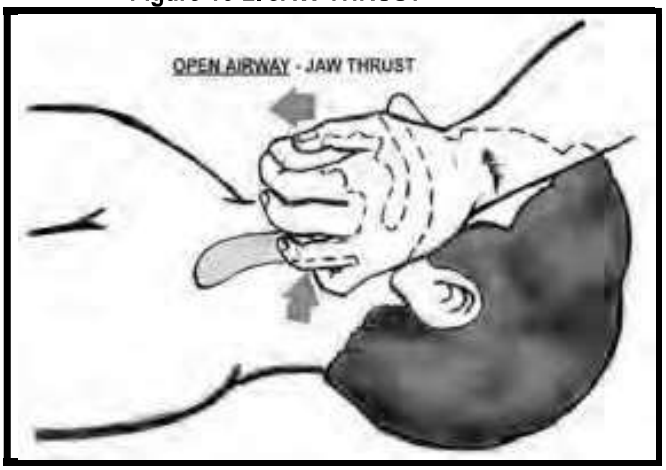
16-4. AIRWAY MANAGEMENT. The airway is usually obstructed (blocked) at the base of the tongue.

a. If this happens, open the airway using the chin lift (for nontraumatic injuries, shown in **Figure 16-1**) or the jaw thrust (for trauma, **Figure 16-2**).

b.

Figure 16-1. CHIN LIFT

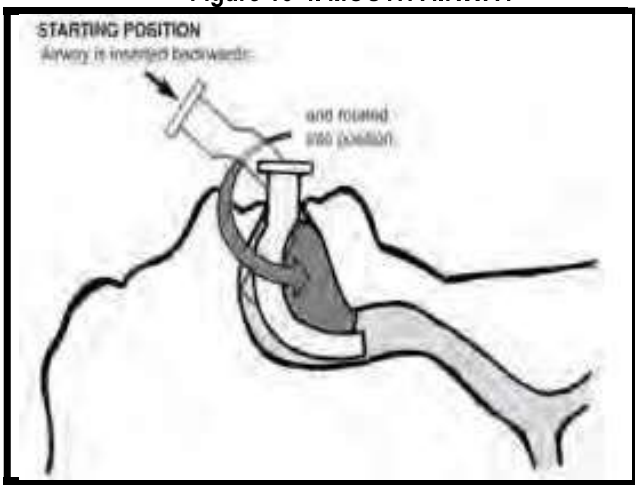
Figure 16-2. JAW THRUST



b. Remove debris (teeth, blood clots, bone) from the oral cavity; use suction if you have it; and place airway adjuncts to allow the victim to breathe through their nose (**Figure 16-3**) or mouth (**Figure 16-4**).

Figure 16-3. NASAL AIRWAY

Figure 16-4. MOUTH AIRWAY



16-5 BREATHING. If the patient is having trouble breathing–

a. Expose the chest and identify open chest injuries

b. Apply a dressing to seal open entry and exit chest wounds

c. Place the patient on the injured side, or position him where he can breathe most comfortably.

16-6. BLEEDING. Quickly identify and control bleeding.

a. Apply a tourniquet to arterial bleeding of the extremities

b. If this does not control the bleeding, apply a second tourniquet above the first and apply a pressure dressing.

c. Control all other bleeding with either a standard or pressure dressing.

d. Check dressings often to ensure bleeding is under control.

16-7. SHOCK. Shock is caused by an inadequate flow of oxygen to body tissues.

a. The most common form of shock is hemorrhagic (due to uncontrolled bleeding).

b. Signs and symptoms of shock include altered mental state, increased pulse and respiration, reduced or no pulse, and profuse sweating.

c. Basic treatment

(1) Control bleeding

(2) Open airway

(3) Restore breathing

(4) Initiate IV or saline lock

(5) Monitor condition.

16-8. EXTREMITY INJURIES. Identify and control bleeding. If you suspect a fracture, splint it as it lies. Do not reposition the injured extremity.

1

16-9. ABDOMINAL INJURIES. Identify and control bleeding, and then–

a. Treat for shock.

b. If internal organs are exposed, cover them with dry, sterile dressing. Do not place them back in the abdominal cavity.

c. Place patient in comfortable position. Flex knees to relax abdomen.

d. Do not give anything by mouth to the patient.

16-10. BURNS

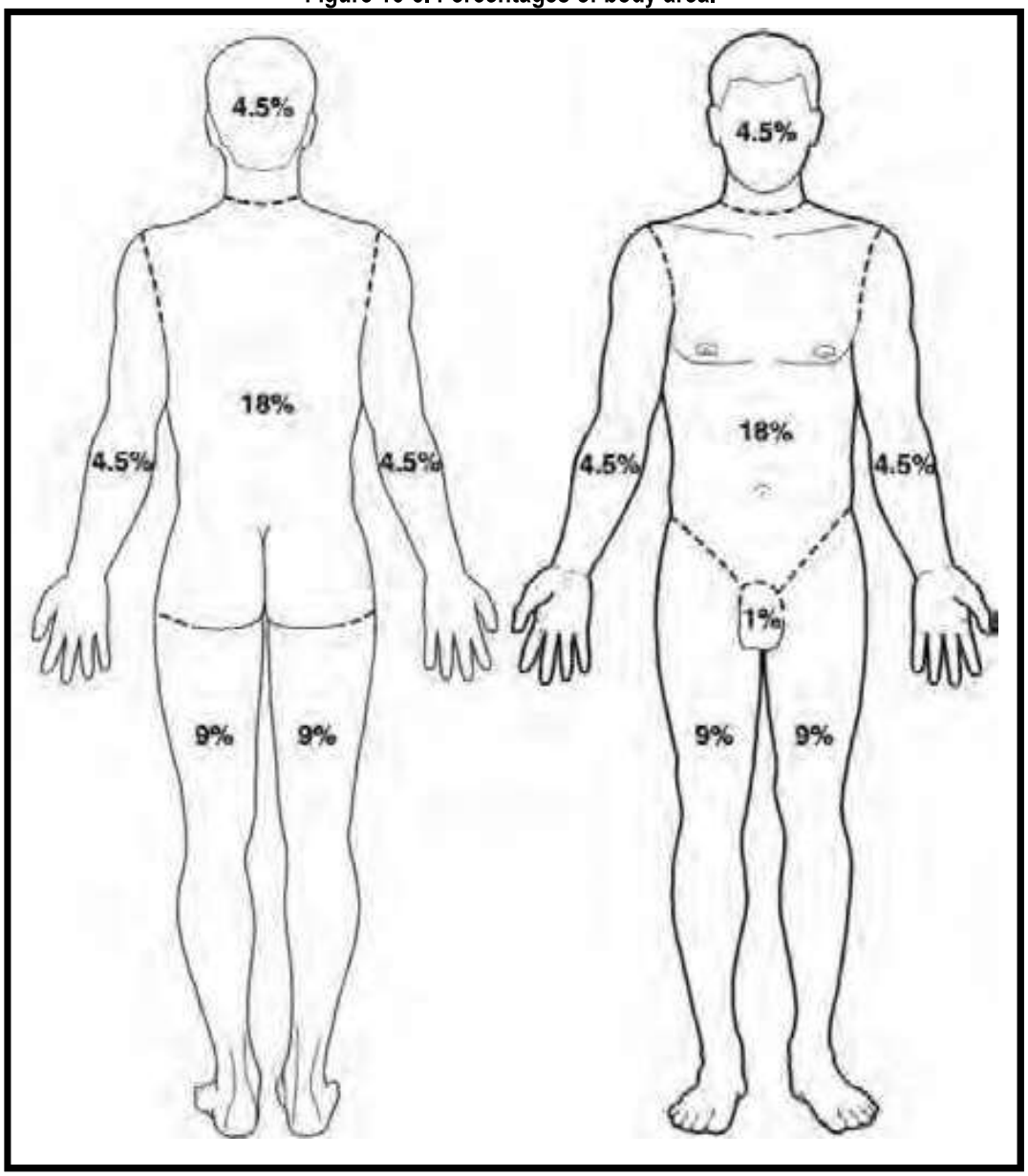
a. Remove patient from burn source.

b. Remove all clothing and jewelry from the areas of the body with burns.

c. Cover burns with dry, sterile dressings. Ensure fingers and toes have dressings between them before covering entire area.

d. Evacuate immediately any casualties with burns of the face, neck, hands, genitalia, or over 20 percent (one fifth) of his body surface (**Figure 16-5**).

Figure 16-5. Percentages of body area.



16-11. HOT WEATHER (HEAT) INJURIES. Table 16-2, Table 16-3, and **Table 16-4** show first aid for heat injuries, cold injuries, and environmental injuries.

Table 16-2. HEAT INJURIES

INJURY	SIGNS/ SYMPTOMS	FIRST AID
Heat Cramps	Casualty experiences muscle cramps in arms, legs and/ or stomach, may also have wet skin and extreme thirst.	1. Move the casualty to a shaded area and loosen clothing. 2. Allow casualty to drink 1 quart of cool water slowly per hour. 3. Monitor casualty and provide water as needed. 4. Seek medical attention if cramps persist.
Heat Exhaustion	Casualty experiences loss of appetite, headache, excessive sweating, weakness or faintness, dizziness, nausea, muscle cramps. The skin is moist, pale, and clammy.	1. Move the casualty to a cool, shaded area and loosen clothing. 2. Pour water on casualty and fan to increase cooling effect of evaporation. 3. Provide at least one quart of water to replace lost fluids. 4. Elevate legs. 5. Seek medical aid if symptoms continue.
Heat Stroke (**Sunstroke**)	Casualty stops sweating (hot, dry skin), may experience headache, dizziness, nausea, vomiting, rapid pulse and respiration, seizures, mental confusion. Casualty may suddenly collapse and lose consciousness.	1. Move casualty to a cool, shaded area, loosen clothing, and remove outer clothing if the situation permits. 2. Immerse in cool water. If cool bath is not available, massage arms and legs with cool water. Fan casualty to increase the cooling effect of evaporation. 3. If conscious, slowly consume one quart of water.
	DANGER **SUNSTROKE** ***THIS IS A MEDICAL EMERGENCY! SEEK MEDICAL AID AND EVACUATE ASAP. PERFORM ANY LIFESAVING MEASURES.***	

Table 16-3. COLD INJURIES

INJURY	SIGNS/ SYMPTOMS	FIRST AID
Chilblain	Red, swollen, hot, tender, itchy skin. Continued exposure may lead to infected (bleeding, ulcerated) skin lesions.	1. Area usually responds to locally applied warming (body heat). 2. Do Not rub or massage area. 3. Seek medical treatment.
Immersion (trench) foot	Affected parts are cold and numb. As body parts warm, they may become hot, with burning and shooting pains. ***Advanced stage:*** Skin is pale with bluish cast; pulse decreases; blistering and swelling occur, swelling, heat hemorrhages, and gangrene may follow.	1. Gradual warming by exposure to warm air. 2. DO NOT massage or moisten skin. 3. Protect affected parts from trauma. 4. Dry feet thoroughly: avoid walking. 5. Seek medical treatment.
Frostbite	***Superficial:*** Redness, blisters in 24 to 36 hours followed by peeling skin ***Deep:*** Preceded by superficial frostbite; skin is painless, pale-yellowish, waxy, "wooden" or solid to touch, blisters form in 12-36 hours	***SUPERFICIAL*** 1. Keep casualty warm; gently warm affected parts. 2. Decrease constricting clothing, increase exercise and insulation. ***DEEP*** 1. Protect the part from additional injury. 2. Seek medical treatment as fast as possible.
Snow Blindness	Red, scratchy, or watery eyes; headache; increased pain in eyes with exposure to light.	1. Cover the eyes with a dark cloth. 2. Seek medical treatment.
Dehydration	Similar to heat exhaustion.	1. Keep warm, loosen clothes. 2. Replace lost fluids, rest, and additional medical treatment.
Hypothermia	Casualty is cold, shivers uncontrollably until shivering stops. A core (rectal) temp below 95° F can affect consciousness. Uncoordinated movements, shock, and coma may occur as body temperature drops.	***MILD HYPOTHERMIA*** 1. Warm body evenly and without delay. (Heat source must be provided.) 2. Keep dry, protect from elements. 3. Warm liquids may be given to conscious casualty only. 4. Be prepared to start CPR. 5. Seek medical treatment immediately. ***SEVERE HYPOTHERMIA*** 1. Quickly stabilize body temperature. 2. Attempt to prevent further heat loss. 3. Handle the casualty gently. 4. Evacuate to nearest medical treatment facility as soon as possible.

Table 16-4. ENVIRONMENTAL INJURIES

TYPE	FIRST AID
Snake bite	1. Get the casualty away from the snake. 2. Remove all rings and bracelets from the affected extremity. 3. Reassure the casualty and keep him quiet. 4. Apply constricting band(s) 1 to 2 finger widths close to the bite. You should be able to slip 1 finger between the band and skin. *ARM OR LEG BITE* - Place one band above and one band below the bite site. *HAND OR FOOT BITE* - Place one band above the wrist or ankle. 5. Immobilize the affected limb below the level of the heart. 6. **Kill the snake, if possible, (without damaging its head or endangering yourself) and send it with the casualty.** 7. Seek medical treatment immediately.
Brown recluse or black widow, spider bite	1. Keep the casualty calm. 2. Wash the area. 3. Apply ice or a freeze pack, if available. 4. Seek medical treatment.
Tarantula bite, scorpion sting, ant bite	1. Wash the area. 2. Apply ice or a freeze pack, if available. 3. Apply baking soda, calamine lotion, or meat tenderizer to the bite site to relieve pain and itching. 4. If site of bite(s) or sting(s) is on the face, neck (possible airway blockage), or genital area, or if reaction is severe, or if the sting is by the dangerous Southwestern scorpion, keep the casualty as quiet as possible, administer an antidote if needed and seek immediate medical aid.
Wasp or bee sting	1. If the stinger is present, remove by scraping with a knife or finger nail. DO NOT squeeze venom sack on stinger, more venom may be injected. 2. Wash the area. 3. Apply ice or freeze pack, if available. 4. If allergic signs or symptoms appear, be prepared to administer an antidote and seek medical assistance.
Human and Other animal Bites	1. Cleanse the wound thoroughly with soap or detergent solution. 2. Flush bite well with water. 3. Cover bite with a sterile dressing. 4. Immobilize injured extremity. 5. Transport casualty to a medical treatment facility. 6. For animal bites, without endangering yourself or damaging the animal's head, kill the animal and send its head with the casualty. 7. For human bites, try to extract some of the attacker's saliva from the wound and send that in a sealed, identified container with the casualty.
Poison Ivy, Oak, Sumac	1. Gently clean affected area two to three times daily. Wash clothing. 2. Apply topical anti-itch lotion or ointment as needed, and cover. 3. Avoid scratching the area. 4. Observe for signs of infection (increasing redness, tenderness, warmth to touch). 5. Seek medical attention if rash persists or signs of infection develop.

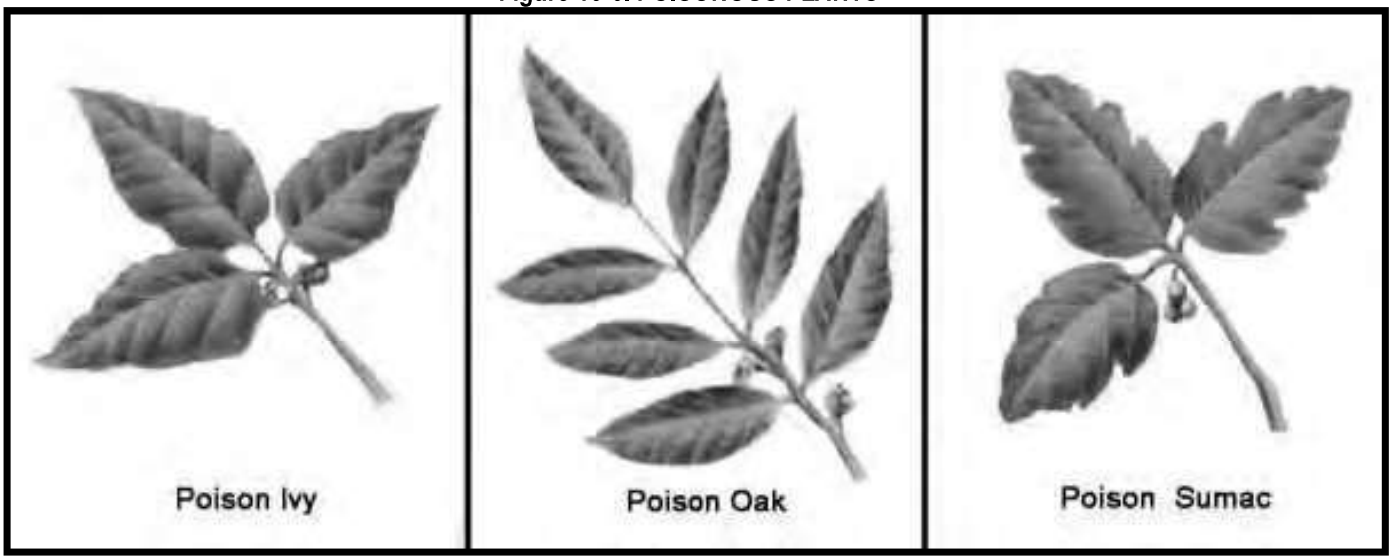
16-12. POISONOUS PLANT IDENTIFICATION. Poison plants include, among others, poison ivy, oak, and sumac, as well as a few more such as stinging nettles, which we will not discuss here (Figure 16 6).

a. Poison Ivy. Poison ivy is grows as a vine or shrub. The compound leaves of poison ivy have three pointed leaflets. The middle one has a much longer mini-stalk than the two side ones. The leaflet edges can be smooth or toothed but are rarely lobed (lobed leaves look something like a hand with fingers). The leaves vary greatly in size, from 1/3 inch to just over 2 inches long. In spring, the leaves appear reddish. They turn green in the summer, and turn red, orange, and yellow in fall. Small greenish flowers grow in bunches right where the leaf joins the main stem. The flowers are later replaced by clusters of poisonous white, waxy, plump, droopy fruit.

b. Poison Oak. Poison oak is a widespread deciduous shrub throughout mountains and valleys of North America, generally below 5,000 feet elevation. It commonly grows as a climbing vine with airy roots that cling to the trunks of oaks and sycamores. Poison oak can also form dense thickets. Leaves typically have three leaflets (sometimes five), with the terminal one on a slender mini-stalk, as opposed to Eastern poison ivy, whose terminal leaf is often on a longer mini-stalk, and whose leaves tend to be less ragged and serrated (less "oak like"). Like many members of the sumac family (Anacardiaceae) new foliage and autumn leaves often turn brilliant shades of pink and red.

c. Poison Sumac. Poison sumac is a woody perennial shrub or small tree. It grows from 5 to 25 feet tall, and favors swampy areas. To identify it, look for the fruit that grows between the leaf and the branch. Look for red stems that stay red all year. Leaves grow adjacent to each other and grow in odd numbers totaling 5- 13 per stem. They have a glossy, waxy look and they turn bright red and orange during the fall.

Figure 16-6. POISONOUS PLANTS



16-13. FOOT CARE. Use moleskin to prevent blisters prior to movement or foot march. Drain large blisters. Clean area, puncture with needle, drain blister. Place moleskin over area. Observe for signs of infection. Keep feet as clean and dry as possible. Use foot powder and change socks. Let feet air dry as mission permits.

16-14. LITTER. The proper procedures for employing a litter follow:

a. **Unroll Stretcher**

(1) Remove the stretcher from the pack and place on the ground.

(2) Unfasten retainer strap, step on foot end of the stretcher, and unroll the stretcher completely, to the opposite end.

(3) Bend the stretcher in half and back roll. Repeat with opposite end. The stretcher will lay flat and is ready to load patient.

b. **Place Patient on the Stretcher**

(1) ***Log Roll Method.***

(a) Place stretcher next to patient. Ensure head end of stretcher is adjacent to head of patient. Place all straps under stretcher.

(b) Log roll patient and slide stretcher as far under patient as possible. Gently roll patient down onto stretcher.

(c) Slide patient to center of stretcher. Be sure to keep patient's spinal column as straight as possible.

(d) Pull straps out from under stretcher and secure patient.

(2) ***Slide Method.***

(a) Position foot end of stretcher at head of patient.

(b) Have one rescuer straddle stretcher and support patient's head, neck, and shoulders.

(c) Grasp foot straps of stretcher and slide stretcher under patient.

(d) Center patient on stretcher and secure patient.

c. **Secure Patient**

(1) Lift sides of stretcher and fasten the four cross straps to the buckles directly opposite the straps.

(2) Feed foot straps thru unused grommets at foot end of stretcher, and then fasten the straps to the buckles.

(3) For horizontal prepare stretcher for horizontal lift/ descent, use two nylon webbing straps rated at 9,000 pounds each. The head strap is 6" shorter than foot strap and is used at head end of stretcher only.

(4) Insert one end of head strap thru lift slot at head end of stretcher.

(5) Bring strap under stretcher and thru slot on opposite side of stretcher.

(6) Equalize length of strap. Repeat procedure with other strap at foot end of stretcher.

(7) Equalize all four straps and secure to large steel locking carabiner.

NOTE: Use this procedure only after loading the patient and properly securing them in the stretcher.

d. **Prepare Stretcher for Vertical Lift/ Descent.**

NOTE: A 30-foot length of 3/ 8" static kernmantle rope with a figure 8 knot tied in the center is used to configure stretcher for vertical left/ descent.

(1) Pass each end of the rope thru grommets at the head end of the stretcher. Pull the knot up against the stretcher.

(2) Continue feeding rope thru unused grommets and carrying handles all the way to the foot end of the stretcher. Ensure both ends of rope are even.

(3) Pass the rope ends thru grommets at the foot end of stretcher from the inside outward. Tie the ends of the rope together with a square knot.

(4) Bring ends of rope up over end of stretcher. Pass thru carrying handles and secure with a square knot. Safety each side with an overhand knot.

e. **Use Carabiner to Complete Lift.** Fasten a large locking carabiner on the Figure 8 located on the head end of the stretcher to accomplish the lift

16-15. HYDRATION AND ACCLIMATIZATION. Table 16-5 shows strategies for minimizing dehydration and increasing acclimatization and good hydration practices.

Table 16-5. HYDRATION MANAGEMENT AND ACCLIMATIZATION

STRATEGY	SUGGESTIONS FOR IMPLEMENTATION
Start early	1. Start at least 1 month prior to school. 2. Be flexible and patient: performance benefits take longer than physiological benefits.
Mimic the training environment climate	1. In warm climates, acclimatize in the heat of day. 2. In temperate climates, work out in a warm room wearing sweats.
Ensure adequate heat stress	1. Induce sweating. 2. Work up to 100 minutes of continuous physical exercise in the heat. Be patient. The first few days, you may not be able to go the full 100 minutes without resting. 3. Once you can comfortably exercise for 100 minutes in the heat, then continue doing so for seven days. Work up to at least fourteen days, and increase your exercise intensity each day (loads, or training runs).
Teach yourself to drink and eat	1. Your thirst mechanism will improve as you acclimatize to the heat, but you will still under drink if you wait until you feel thirst. 2. Acclimatizing to heat increases your water requirements! 3. Dehydration offsets most benefits of physical fitness and heat acclimatization. 4. You will sweat out more electrolytes during the first week of heat acclimatization, so add salt to your food or drink electrolyte solutions. 5. A convenient way to learn how much water your body needs to replace is to weigh yourself before and after the 100 minutes of exercise in the heat. For each pound lost, you should drink about one-half quart of fluid so, for example, if you lose 8 pounds, 8 times 1/2 quart = 4 quarts or one gallon of fluid. 6. Do not skip meals, as this is when your body replaces most of its water and salt losses.

16-16. WORK, REST, AND WATER CONSUMPTION. Table 16-6 shows a work, rest, and water consumption table. The guidance applies to the average size, heat-acclimated Ranger wearing ACU (not hot weather gear, except as noted). The work and rest times and fluid replacement volumes shown will help the Ranger sustain his performance and hydration for at least 4 hours of work in the specified heat category. Fluid needs can vary based on individual differences (give or take one quart per hour).

a. ***"NL"*** means that there is no limit to work time per hour. ***"Rest"*** means minimal physical activity such as sitting or standing, preferably in the shade.

b. Consume no more than 1.5 quarts of fluid per hour, and no more than 12 quarts per day.

c. If you are wearing body armor in a humid climate, then add 5º F to the WBGT. If wearing MOPP 4 clothing, add 10º F to the WBGT.

d. Work categories include easy, moderate, and hard.

1) ***Easy Work.*** This includes, for example, maintaining weapons; walking on hard surfaces at 2.5 mph with a load of no more than 30 pounds; participating in marksmanship training; and participating in drills or ceremonies.

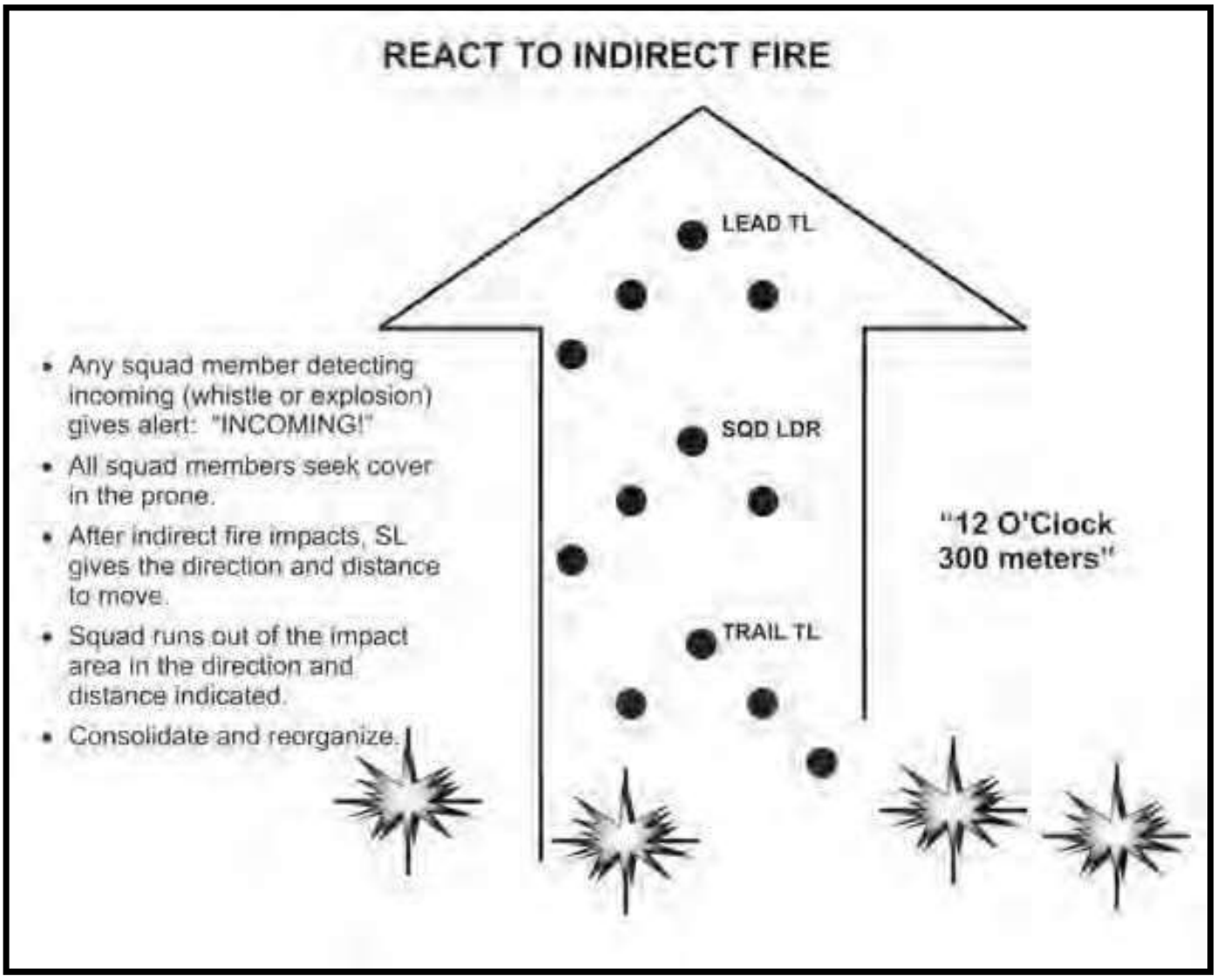
2) ***Moderate Work.*** This includes, for example, walking in loose sand at 2.5 mph (maximum) or with no load; walking on a hard surface at 3.5 mph (maximum) with a load weighing no more than 40 pounds; performing calisthenics; patrolling; or conducting individual movement techniques such as the low or high crawl.

3) ***Hard Work.*** This includes, for example, walking on a hard surface at 3.5 mph with a load weighing 40 or more pounds; walking in loose sand at 2.5 mph while carrying a load; and conducting field assaults.

Table 16-6. WORK, REST, AND WATER CONSUMPTION TABLE

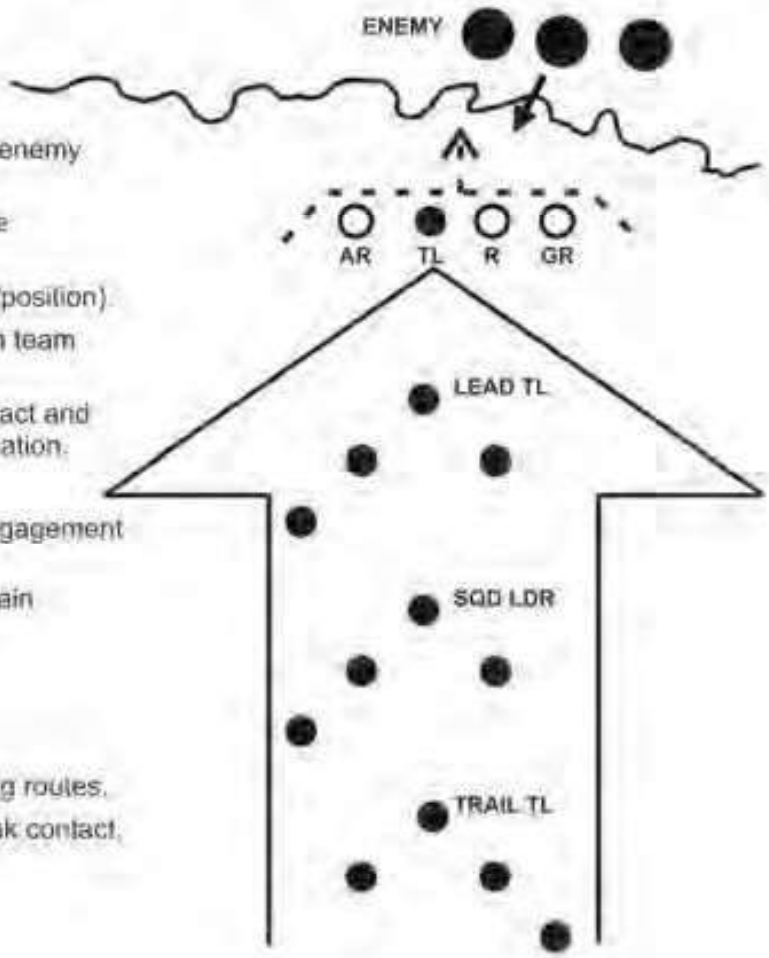
HEAT CATEGORY	WBGT INDEX, IN DEGREES FAHRENHEIT	EASY WORK		MODERATE WORK		HARD WORK	
		WORK/ REST	WATER INTAKE (QT/ H)	WORK/ REST	WATER INTAKE (QT/ H)	WORK/ REST	WATER INTAKE (QT/ H)
1	78 to 81.9	NL	0.50	NL	0.75	40/ 20	0.75
2 (GREEN)	82 to 84.9	NL	0.50	50/ 10	0.75	30/ 30	1.00
3 (YELLOW)	95 to 87.9	NL	0.75	40/ 20	0.75	30/ 30	1.00
4 (RED)	88 to 89.9	NL	0.75	30/ 30	0.75	20/ 40	1.00
5 (BLACK)	90 or more	50/ 10 min	1.00	20/ 40	1.00	10/ 50	1.00

Appendix A
RESOURCES

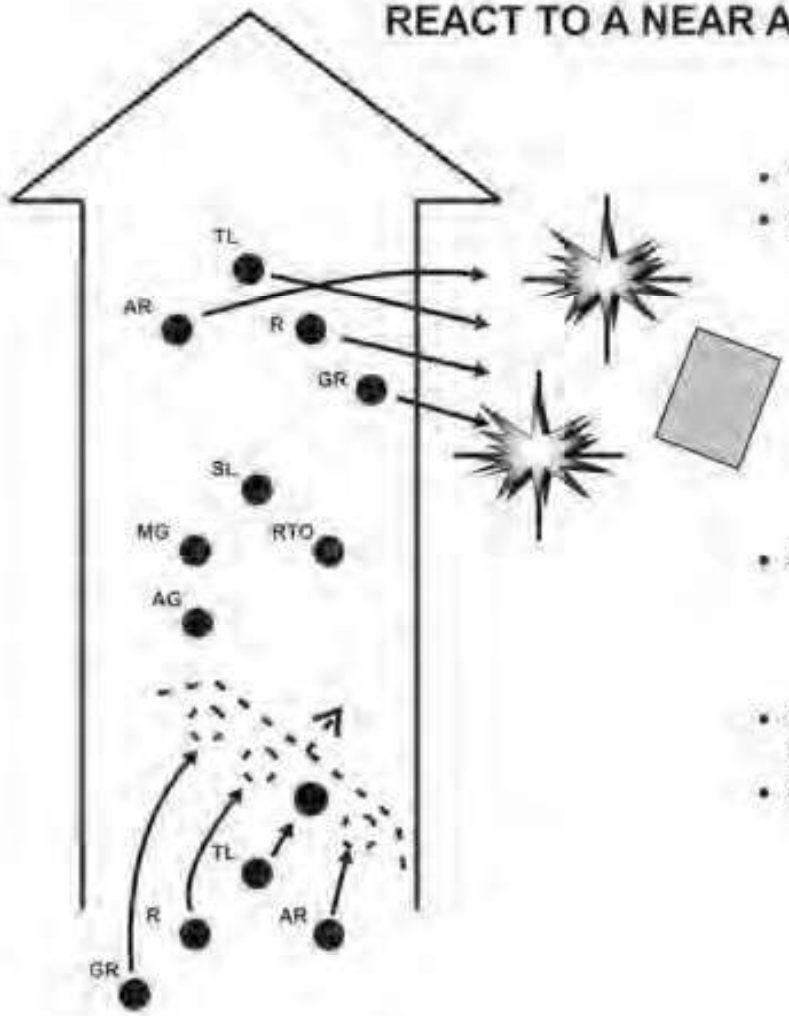


REACT TO CONTACT

- Seek nearest cover.
- Return fire (known or suspected enemy position).
- TM LDRs control fire by using fire commands.
- Report enemy situation (number/position).
- Maintain contact (visual/oral) with team members.
- SQD LDR moves to team in contact and makes an assessment of the situation.
- Factors of his assessment:
  - Can squad move out to engagement area.
  - Can squad gain and maintain suppressive fire.
  - Location of enemy.
  - Size of enemy.
  - Vulnerable flanks.
  - Covered/concealed flanking routes.
- SQD LDR determines COA (break contact, squad attack, etc.)
- Report situation to PL

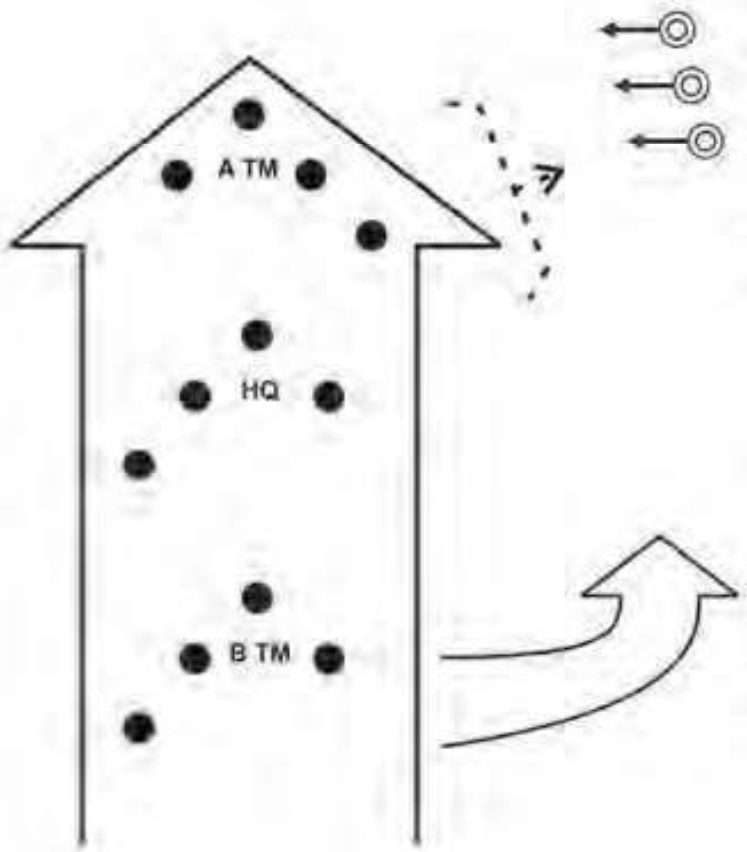


REACT TO A NEAR AMBUSH



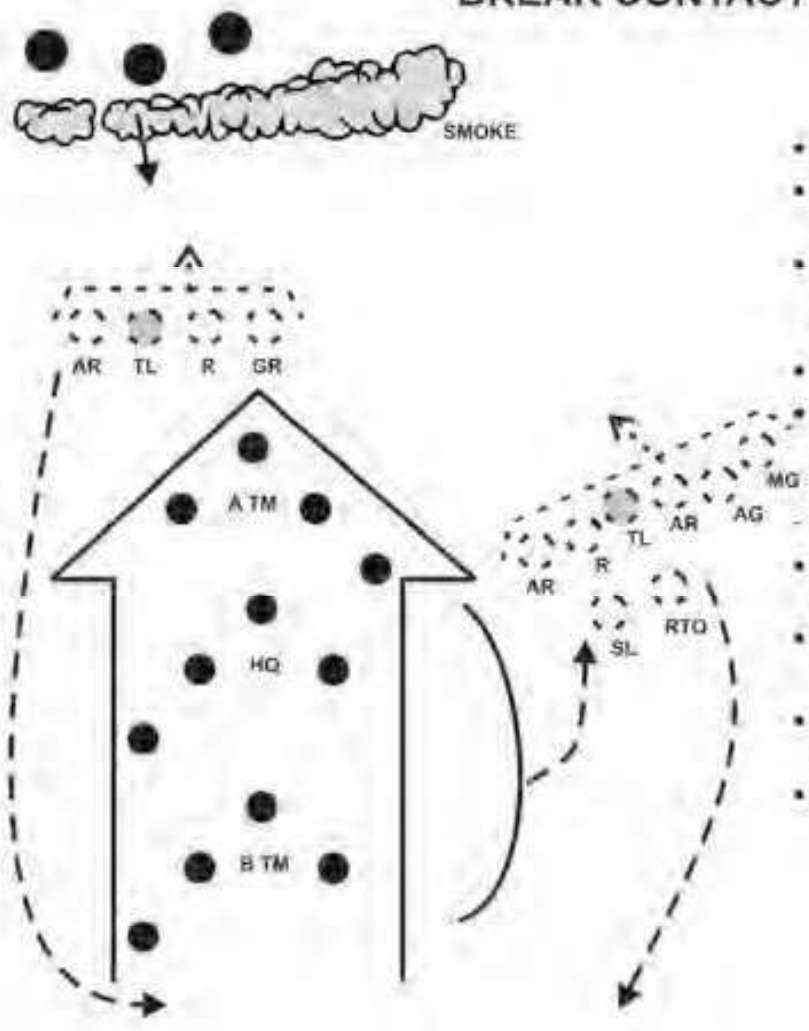
- Within hand grenade range - 35 meters.
- Soldiers in the kill zone: (without orders)
  - Return fire immediately.
  - Seek nearest available cover.
  - Assume prone position.
  - Throw concussion, frag, or smoke grenades.
  - After explosion of grenades, assault through ambush using fire and movement..
- Soldiers not in kill zone:
  - Identify enemy location.
  - Place accurate suppressive fire.
  - Shift fires as assault begins.
- Soldiers in kill zone continue to assault to eliminate ambush or until contact is broken.
- Consolidate and reorganize.

REACT TO A FAR AMBUSH



- More than 35 meters.
- TM in the kill zone. (without orders)
  - Return fire immediately.
  - Seek cover and concealment.
  - Suppress enemy (overwatch).
- SL assess situation.
  - Determine COA (flank)
- TM not in contact:
  - Move along covered and concealed route.
  - Assault enemy on weak flank.
  - Suppress enemy (overwatch).
- Overwatch TM continues to suppress, shifts/cease fire as bounding team enters sector.
- Bounding team continues to assault through enemy.
- SL may request indirect fire.
- Consolidate and reorganize.

BREAK CONTACT

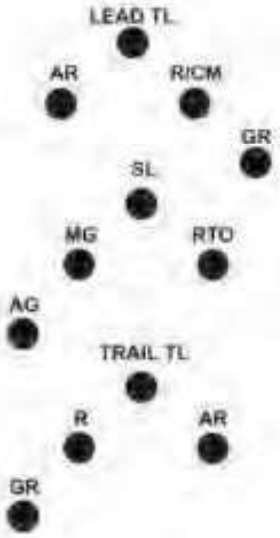


- Squad Leader orders: "Break Contact."
- Squad Leader designates SPT element and maneuver element.
- SL issues distance and direction or a terrain feature for the maneuver element.
- SBF suppresses enemy position.
- Maneuver uses smoke to mask movement.
  - Takes up overwatch position.
  - Begins to suppress enemy
- Squad Leader directs SBF to break contact.
- SBF uses smoke to screen movement.
  - Takes up overwatch position.
- Squad continues to bound away until contact is broken.
- Consolidate / reorganize.

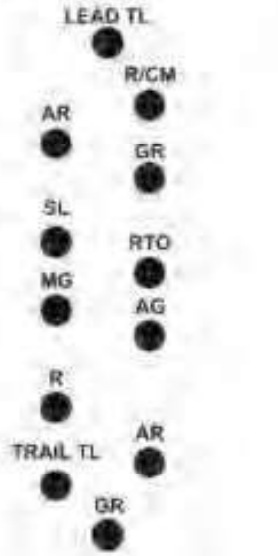
FORMATIONS AND ORDER OF MOVEMENT

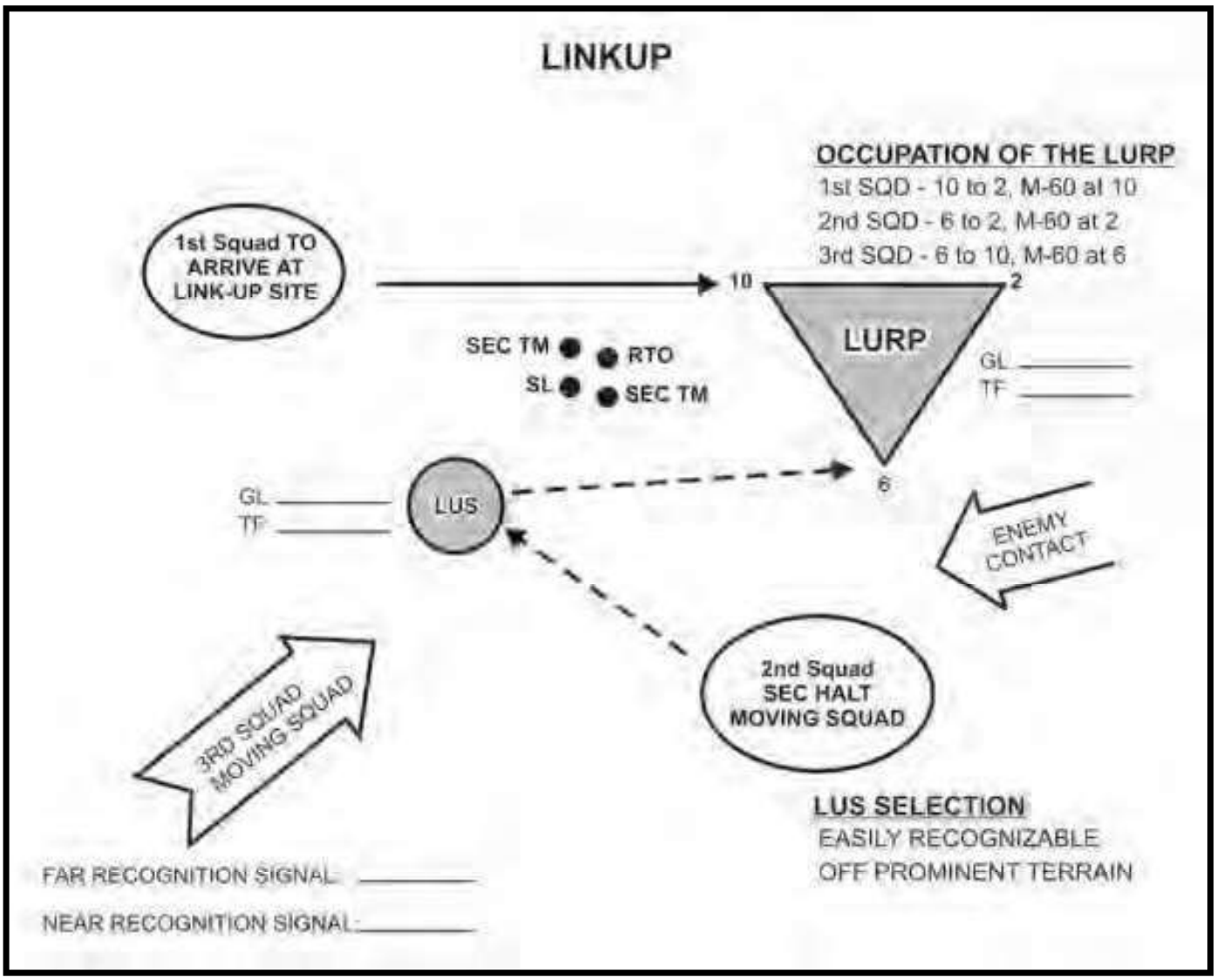
I. Movement Formation: Fire Team Wedge: MG Team attached.
II. Three Movement Techniques used:
    A. Traveling technique used behind FFL when contact is not likely.
    B. Traveling Overwatch forward of the FFL when enemy contact is possible.
    C. Bounding Overwatch used forward of the FFL when enemy contact is expected.
III. Distances are based on but not dictated by visibility, terrain, and vegetation.
IV. Actions at Night: Modified Wedge
V. Actions at the Halt: Short and Long Halt (GV/LV)
VI. Leader Location: Fixed/Unfixed

FIRE TEAM WEDGE

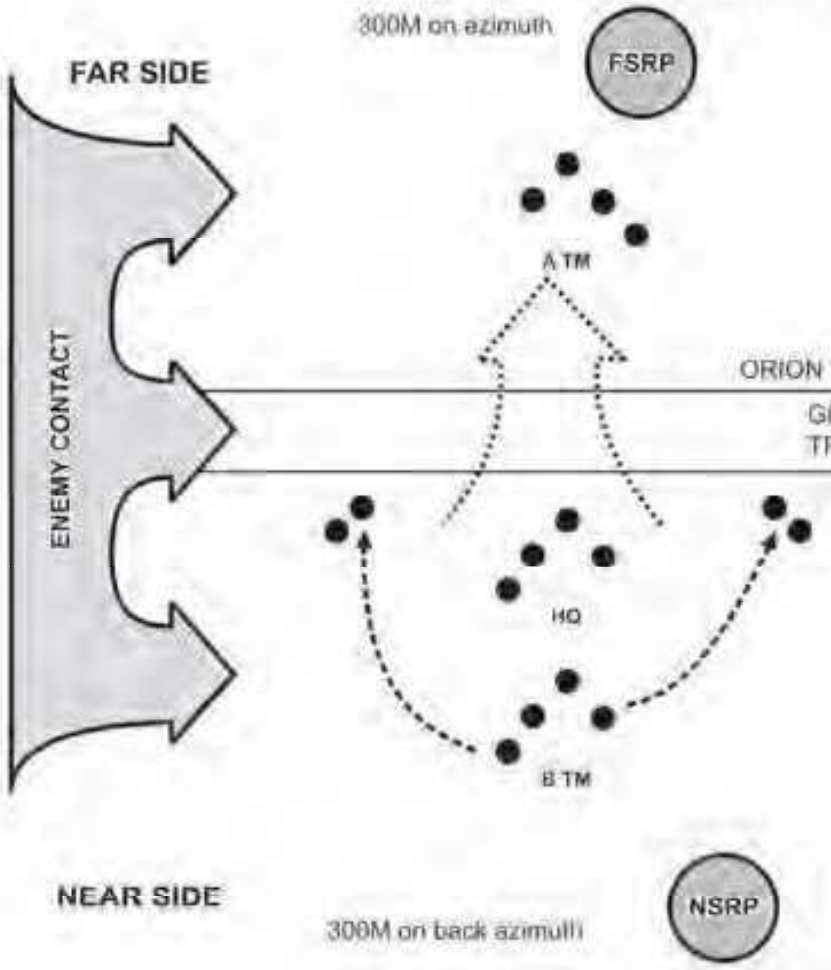


MODIFIED WEDGE




LINKUP
OCCUPATION OF THE LURP
1st SQD - 10 to 2, M-60 at 10
2nd SQD - 6 to 2, M-60 at 2
3rd SQD - 6 to 10, M-60 at 6
1st Squad TO ARRIVE AT LINK-UP SITE
10
2
LURP
SEC TM
RTO
SL
SEC TM
GL
TF
GL
TF
LUS
6
ENEMY CONTACT
3RD SQUAD MOVING SQUAD
2nd Squad SEC HALT MOVING SQUAD
LUS SELECTION
EASILY RECOGNIZABLE
OFF PROMINENT TERRAIN
FAR RECOGNITION SIGNAL:
NEAR RECOGNITION SIGNAL:

LINEAR DANGER AREA



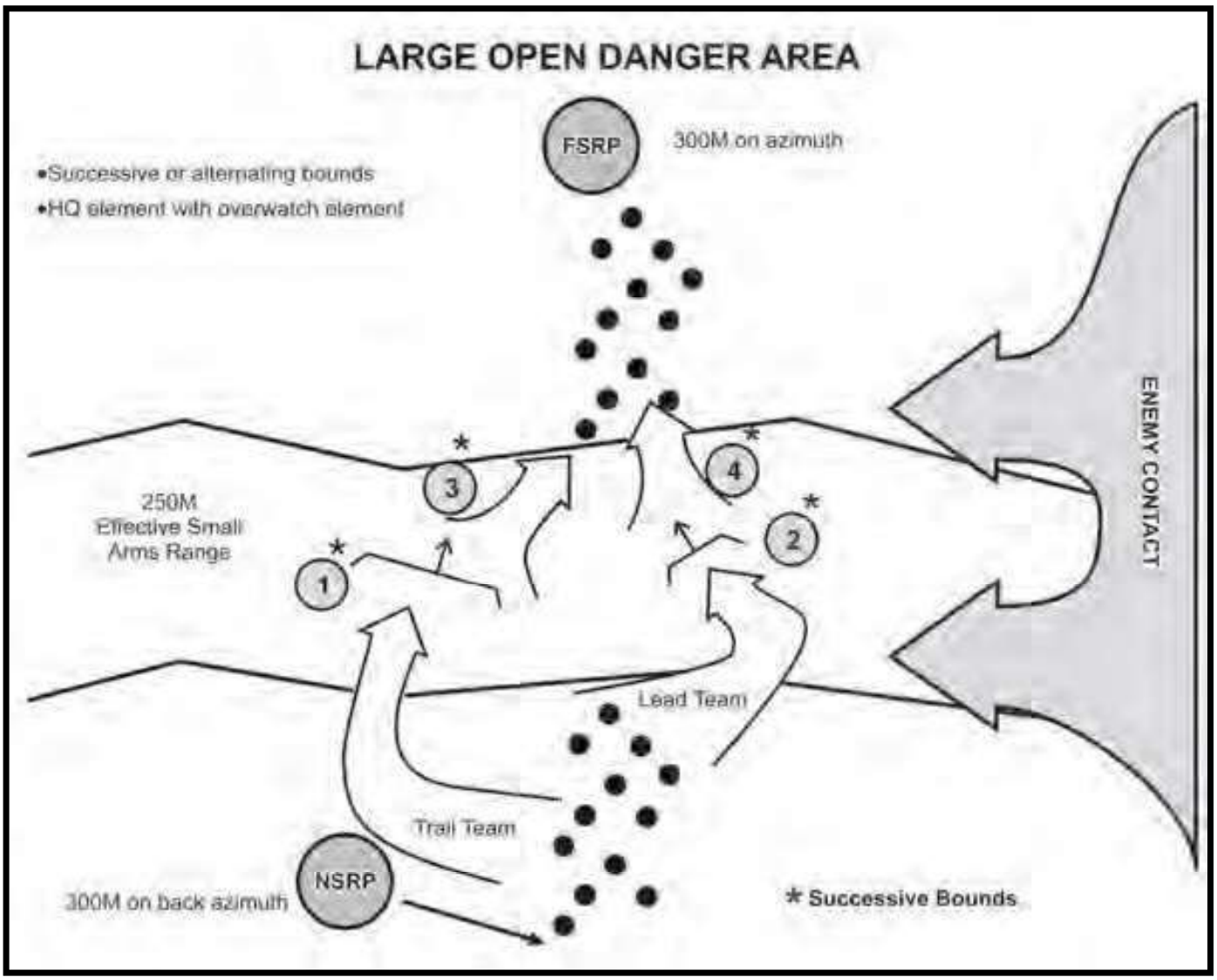
Far side Rally Point info for a known danger area.

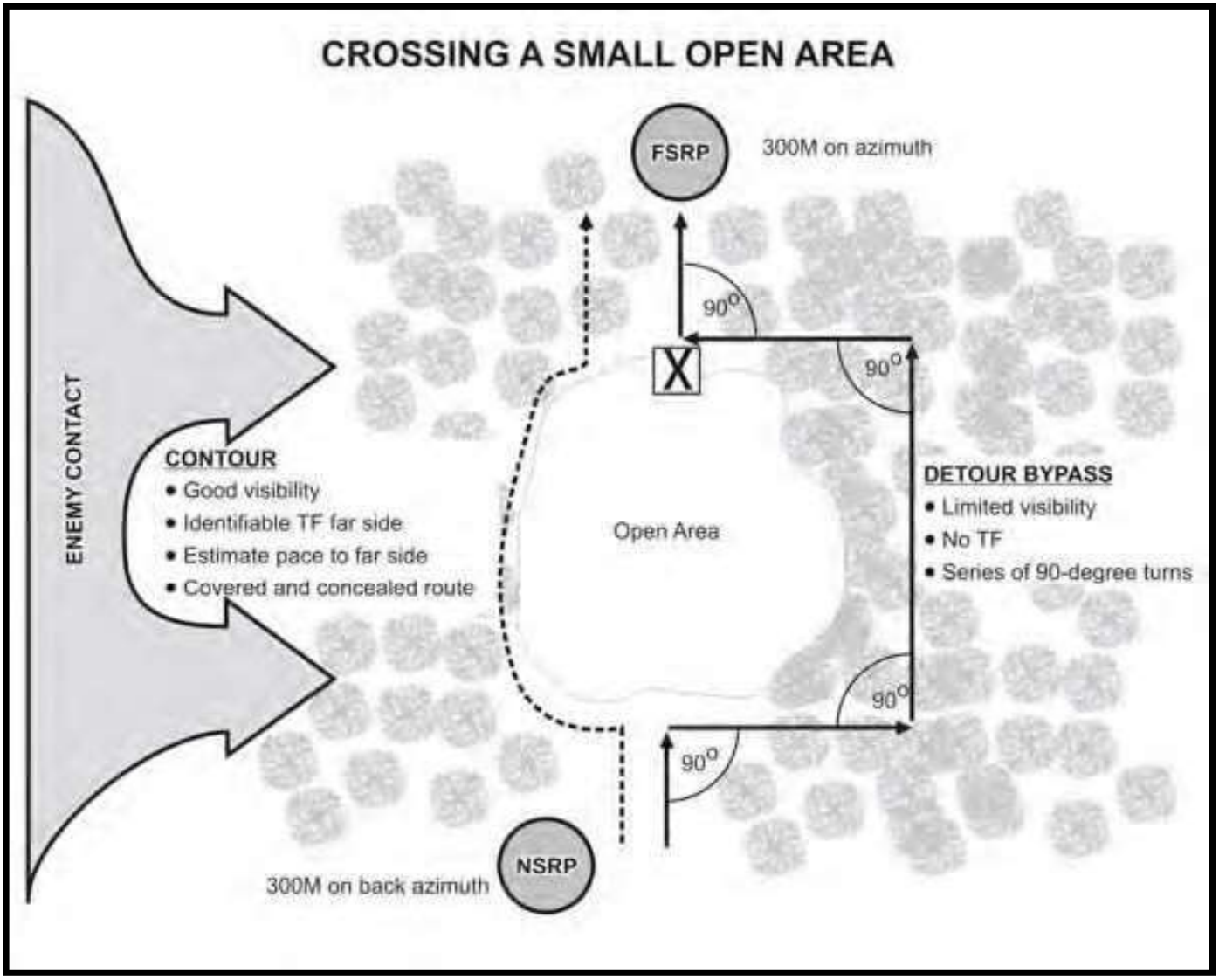
GL _____
TF _____
DIR _____
DIS _____

1. Designate near and far side rally points.
2. Secure near side and emplace flank security.
3. Clear far side.
4. Continue unit crossing.
5. Retrieve near side security and complete unit crossing.
6. Accountability/head count.

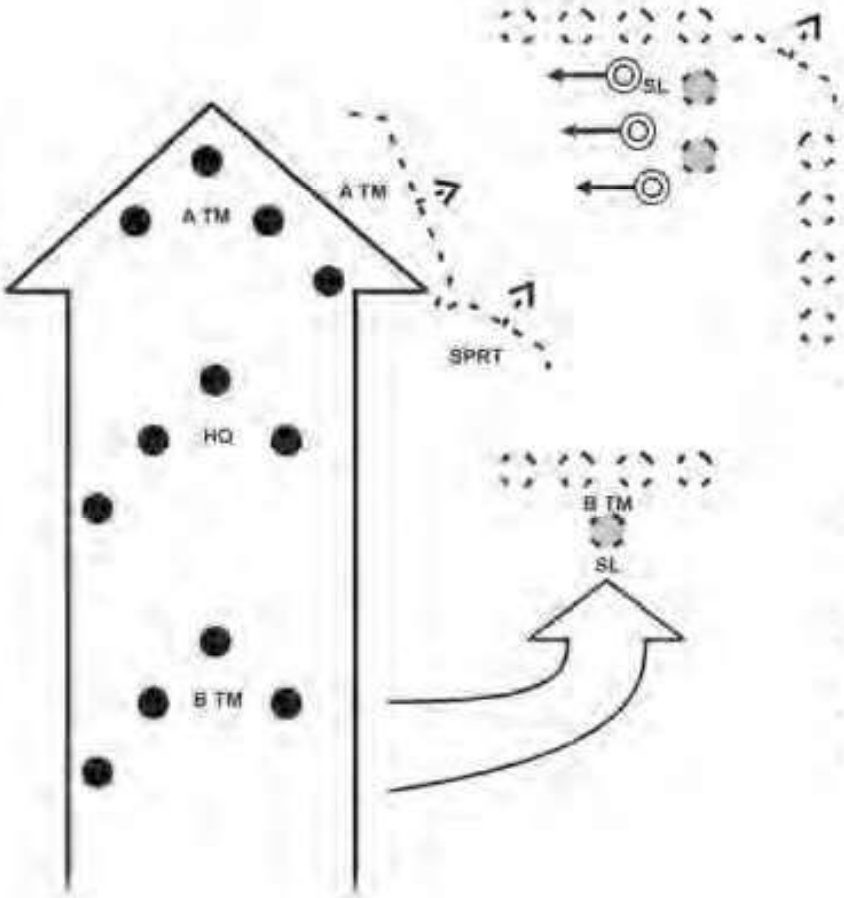
Near side Rally Point info for a known danger area.

GL _____
TF _____
DIR _____
DIS _____


LARGE OPEN DANGER AREA
FSRP
300M on azimuth
•Successive or alternating bounds
•HQ element with overwatch element
ENEMY CONTACT
250M
Effective Small
Arms Range
1
2
3
4
Lead Team
Trail Team
NSRP
300M on back azimuth
* Successive Bounds


CROSSING A SMALL OPEN AREA
FSRP
300M on azimuth
90°
X
90°
ENEMY CONTACT
CONTOUR
• Good visibility
• Identifiable TF far side
• Estimate pace to far side
• Covered and concealed route
Open Area
DETOUR BYPASS
• Limited visibility
• No TF
• Series of 90-degree turns
90°
90°
300M on back azimuth
NSRP

SQUAD ATTACK



- React to contact.
- TM in the kill zone: (without orders)
  - Return fire.
  - Seek cover and concealment.
  - Suppress enemy call out 3 D's become overwatch.
- SL assess situation.
  - Determine COA (flank/attack).
- TM not in contact (with SL)
  - Move along covered and concealed route.
  - Assault enemy on weak flank.
- Overwatch TM continue to suppress shift/cease fire as bounding team enters sector.
- Bounding team – continue to assault through enemy.
- SL – may request indirect fire.
- Consolidate and reorganize.

RAID BOARDS (LEFT)
GENERAL INFO

Raid References:
- RHB Chapter 5
- FM 3-21.8

Purposes:
1. Destroy
2. Liberate
3. Collect Intel

Planning Considerations:
- Mission
- Enemy
- Troops
- Terrain / OAKOC
- Time
- Civilians

STUDENT INPUT WRITTEN HERE

Raid:
A surprise attack on a fixed position or installation ending in a planned withdrawal.

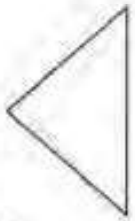
Characteristics:
1. Surprise - Gain
2. Coordinated fires - Maintain
3. Violence of action - Retain
4. Planned withdrawal

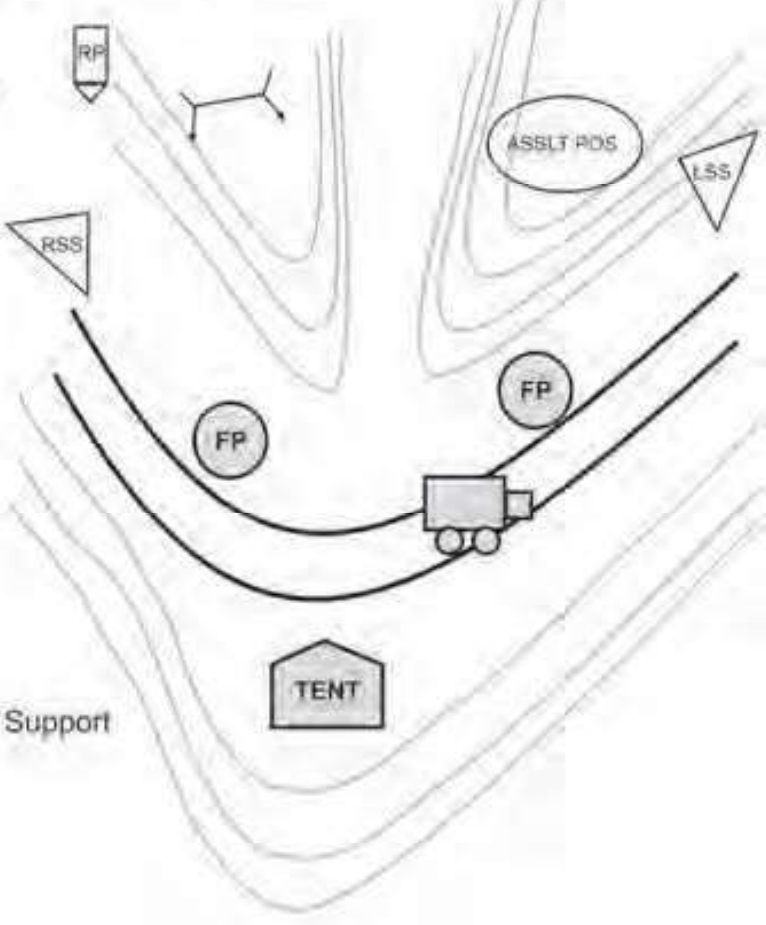
INITIATIVE

RAID BOARDS (MIDDLE)
ACTIONS ON OBJECTIVE

Prep Clearing TM:
PL, RTO, WSL,
3 Ab's, SEC TM

ORP:
Leader's Recon
Prep MWE





Leader's Recon

- Pinpoint OBJ
- Finalize ORP
- Determine Enemy Situation
- Emplace Surveillance
- Emplace Security
- Recon Positions and Routes
- ID Control Measures
- ID and Prioritize Targets
- Left and Right Limits, Aslt and Support
- Divide OBJ
- Signals
- LOA
- Plan to Secure OBJ
- Confirm Plan

RAID BOARDS (MIDDLE)
TASK ORGANIZATION

ELEMENT	WHO	WHY	WHAT
HQ	PL, APL RTO, FO, MEDIC	C2/FACILITATE SIGNALS, PEQ-2, STANO	1 x 119, ICOM, LITTER, PLUGGER
ASLT 1	SQUAD (+)(-)	DESTROY	ICOM, STANO, M18A1, AT4, SPECIAL TEAM KITS
ASLT 2	SQUAD (+)(-)	DESTROY	ICOM, STANO, M18A1, AT4, SPECIAL TEAM KITS
SUPPORT	WPNS SQD (+)(-)	SUPPRESS	3 x M240B COMPLETE, ICOM, PEQ-2, PVS-4, AT, STANO, SIGNALS, MAP
SECURITY	SQUAD (+)(-)	DELAY	ICOMs, M18A1, AT, STANO, MAP SIGNALS

RAID BOARDS (RIGHT)
SOP

CONTINGENCY

1. COMPROMISE
   a. ORP
   b. LEADER'S RECON
   c. OCCUPATION
2. MASS CAL
3. COUNTERATTACK

SOP

1. EPW SEARCH
2. AID LITTER
3. MEDEVAC
4. CCP
5. WITHDRAWAL PLAN

AMBUSH SOP (LEFT)

References:
- RHB Chapter 7
- FM 3-21.8

Ambush:
A surprise attack from a covered and concealed position on a moving or temporarily halted target.

Types:
- Point
- Area

Fundamentals:
1. Surprise - Gain
2. Fire superiority - Maintain
3. Violence of action - Retain

Purposes:
1. Disrupt/Destroy
2. Collect Intelligence
3. Block or Deny Access
4. Canalize

Categories:
Deliberate: Platoon has specific target at a predetermined time and location.

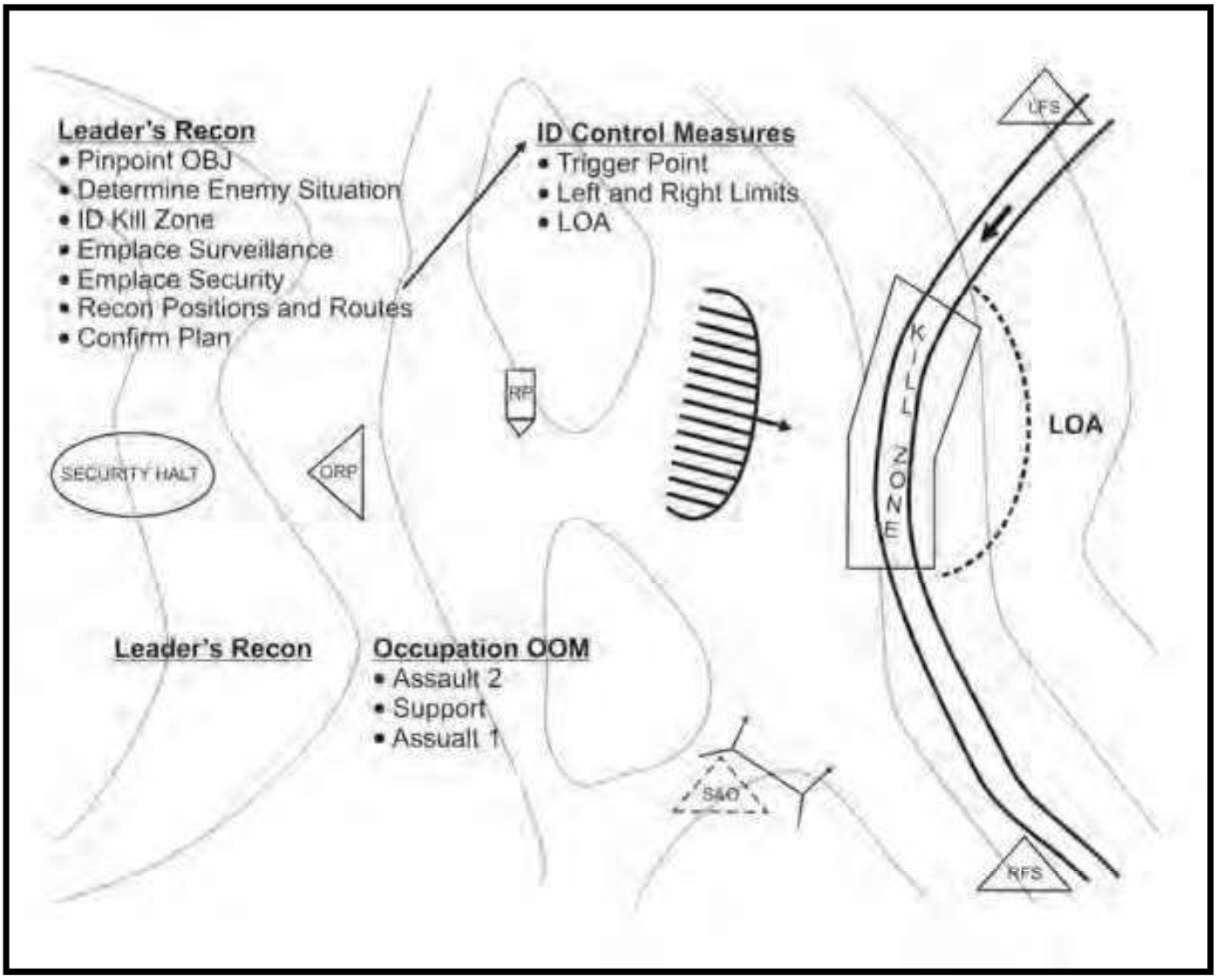
Hasty: Platoon makes visual contact with the enemy and has time to establish an ambush wihout being

Planning Considerations:
- Mission - Task/Purpose
- Enemy - MPCOA, MDCOA
- Terrain - Map Recon/Ldrs Recon
- Time - 1/3 - 2/3 Rule
- Troops - Task Org
- Civilians

AMBUSH BOARDS (MIDDLE)

HQ	PL, PL RTO, PSG, MEDIC, FO	COMMAND AND CONTROL	PRC-119s, ICOM, NVGs, BINO's, LITTER, PEQ-2, SIGNALS, MAP
SECURITY	MINIMUM OF 3-2 MAN TEAMS	EARLY WARNING, SEALS OFF OBJ, LFS, RFS, ORP SECURITY	COMMO, NVGs, CLAYMORES, AT WPNS, BINOs, SIGNALS, MAP
SUPPORT	WSL, 3 GUN TEAMS COMPLETE +/-	SUPPRESSIVE FIRE ON KILL ZONE, SEC ON OBJ DURING RECON/REORG	MGs, COMMO, NVGs, AT WPNS, BINOs, LITTER, PEQ-2, SIGNALS, MAP
ASSAULT	2 SQUADS +/-	MAIN EFFORT, BLOCK, DESTROY, CANALIZE, CAPTURE PIR	NVGs, BINOs, CLAYMORE, AT, FLEX CUFFS, POLELESS LITTER, MARKINGS, SIGNALS

LEADER'S RECONNAISSANCE



RAID BOARDS (RIGHT)
SOP

CONTINGENCY

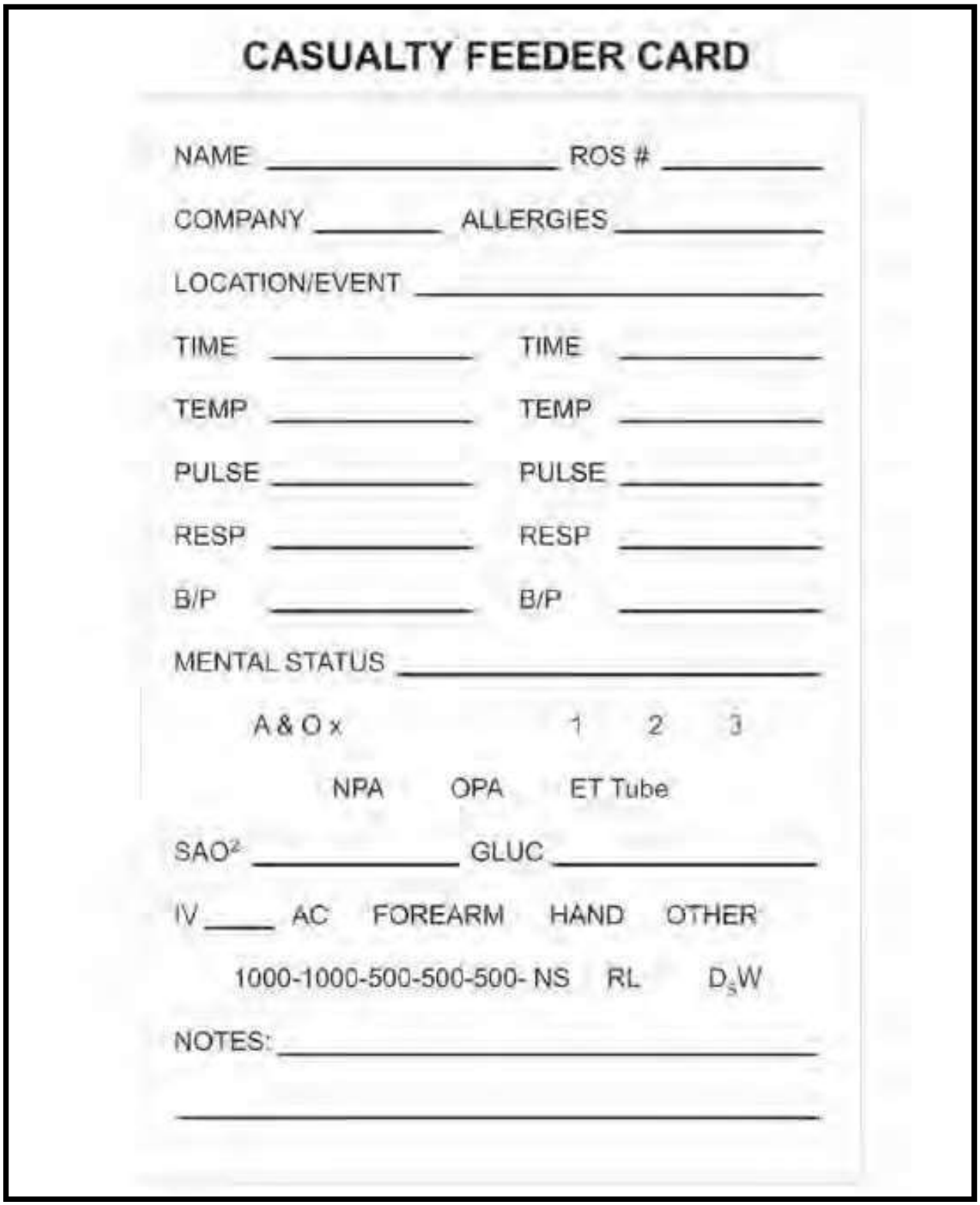
1. COMPROMISE
   a. ORP
   b. LEADERS RECON
   c. OCCUPATION
2. MASS CAL
3. COUNTERATTACK

SOP

1. EPW SEARCH
2. AID LITTER
3. MEDEVAC
4. CCP
5. WITHDRAW PLAN

Appendix B

QUICK REFERENCE CARDS



CASUALTY FEEDER CARD

NAME _____ ROS # _____

COMPANY _____ ALLERGIES _____

LOCATION/EVENT _____

TIME _____ TIME _____

TEMP _____ TEMP _____

PULSE _____ PULSE _____

RESP _____ RESP _____

B/P _____ B/P _____

MENTAL STATUS _____

A & O x 1 2 3

NPA OPA ET Tube

SAO^2 _____ GLUC _____

IV ____ AC FOREARM HAND OTHER

1000-1000-500-500-500- NS RL D_5W

NOTES: _____

_____

GTA 07-01-038
INFANTRY LEADERS' REFERENCE CARD
January 1995

HEADQUARTERS, DEPARTMENT OF THE ARMY
References: FM 3-3, FM 6-30, FM 6-121, FM 7-8, FM 7-10, FM 7-90
(Supersedes GTA 7-1-31)

TROOP-LEADING PROCEDURES
1. Receive mission.
2. Issue warning order.
3. Make a tentative plan.
4. Start movement.
5. Reconnoiter.
6. Complete plan.
7. Issue plan.
8. Supervise.

FIRE REQUEST (FM 6-30)
1. Identification.
2. Warning order.
3. Target location.
4. Target description.
5. Method of engagement.
6. Method of control.

ESTIMATE OF SITUATION (FM 7-10)
1. Conduct a detailed mission analysis.
2. Analyze the situation and develop courses of action.
3. Analyze courses of action (wargame).
4. Compare courses of action.
5. Make a decision.

SPOT REPORT
1. Size.
2. Activity.
3. Location.
4. Unit/uniform.
5. Time.
6. Equipment.

SHELL REPORT (FM 6-121)
1. Observer identification.
2. Location (coded).
3. Azimuth to flash or sound.
4. Time (from and to).
5. Area shelled.
6. Nature of fire.
7. Type rounds received (artillery, mortars, etc.).
8. Damage (coded).

OPERATION ORDER (FM 7-10)
Task Organization
1. Situation
   a. Enemy.
   b. Friendly.
   c. Attachments/detachments.
2. Mission
   - Who, what, where, when, and why.
   - Task and purpose.
3. Execution
   a. Concept of operation.
      (1) Maneuver.
      (2) Fire support.
      (3) Engineer.
   b. Tasks to maneuver units.
   c. Tasks to combat support units.
   d. Coordinating instructions.
4. Service support.
   a. General.
   b. Materiel and services.
   c. Casualty evacuation.
   d. Miscellaneous.
5. Command and signal.
   a. Command.
   b. Signal.

WEAPONS (FM 7-8)

TYPE	MAX EFF RANGE (m)
M16A2	500 (pt) 800 (area) 200 (mov)
M203	150(pt) 350 (area)
M249	600 (pt) 800 (area)
M136 (AT4)	300
M47 (Dragon)	1,000 (sta) 100 (mov)
MK19	1500 (pt) 2,212 (area)
M3 RAAWS	700 (sta) 60 (mov)
M60 MG	1,100 (800 grazing)
.50 Caliber MG	1,800 (1,000 grazing)
TOW	3,000 (ptng purposes)
TOW 2	3,750
105-mm	11,500
105-mm Tank	*2 to 2.5 km
120-mm Tank	*2 to 2.5 km
25-mm BFV	2,200
155-mm M109A3	18,100
M198	24,000
8-in Howitzer	22,999

WEAPONS (MORTAR) HE ONLY (FM 7-90)

	MIN	MAX
60-mm	70m	3,500m
81-mm (M252)	80m	5,800m
81-mm (M29A1)	73m	4,790m
4.2-inch	770m	6,840m
120-mm	200m	7,200m

FPFs (FM 7-90)

GUNS	MORT	WIDTH		DEPTH
2	60-mm	60m	x	30m
4	81 (M252)	150m	x	50m
4	81 (M29A1)	140m	x	40m
6	4.2-in	240m	x	40m
6	120-mm	360m	x	60m
Plt	155-mm	200m	x	50m
Btry	155-mm	400m	x	50m

*Optimum engagement ranges

MEDEVAC REQUEST

1. Requesting unit identification.
2. Location.
3. Number of patients by type (litter or ambulatory).
4. Type of injuries.
5. Special equipment needed.
6. Tactical situation.

AIRCRAFT REQUEST

1. Identification.
2. Precedence/priority.
3. Target description.
4. Target location.
5. Target time/date.
6. Desired ordnance/results.
7. Final control.

DELIBERATE ATTACK CONSIDERATIONS

1. Reconnoiter, pinpoint objective/enemy positions/obstacles.
2. Determine weak points, designate supporting positions.
3. Assign platoon/squad objectives—identify the decisive point.
4. Determine main attack, supporting attack, reserve.
5. Assign breach, support, assault missions.
6. Designate fire control measures.
7. Coordinate indirect/direct fires and CAS to time of attack.
8. Control measures during attack.
9. Secure (ground and air).
10. Consolidate and reorganize.

NBC 1 OBSERVER'S INITIAL OR FOLLOW-UP REPORT

Instructions

1. Line items D and H are mandatory for NBC 1 reports.
2. Line items A, E, G, I, K, L, M, S, Y, and ZA are optional for NBC 1 reports.
3. Line items B, C, F, PAR, and PBR are reported if data is available.

Section I. Chemical or Biological Only

A. Strike serial number, if known (assigned by NBCE).
B. Position of observer.
C. Azimuth of attack from observer (state degrees or mils).
D. Date and time attack started (Zulu, local, or letter zone).
E. Time attack ended, if known.
F. Location of attack (UTM or place) (state actual or estimated).
G. Means of delivery, if known.
H. Type of agent and height of burst, if known.
I. Type and number of munitions or aircraft (state which).
K. Description of terrain (bare, scrubby vegetation, wooded, urban, or unknown).
S. Date and time contamination detected (Zulu, local, or letter zone).
Y. Representative downwind direction—4 digits (state degrees or mils), wind speed—3 digits (data kmph or knots).
ZA. Temperature (centigrade)—2 digits, cloud cover—1 digit, significant weather phenomena—1 digit, air stability—1 digit.
ZB. Remarks.

Section II. Nuclear Only

A. Strike serial number, if known (assigned by NBCE).
B. Position of observer.
C. Azimuth of attack from observer (state degrees or mils and grid or magnetic).
D. Date and time attack started (Zulu, local, or letter zone).
F. Location of attack (UTM or place) (state actual or estimated).
G. Means of delivery, if known.
H. Type of burst (state air, surface, or unknown).
J. Flash-to-bang time (seconds).
K. Crater diameter (meters), if known.
L. Cloud width at H +5 minutes (degrees or mils).
M. Cloud angle(top or bottom) or cloud height(top or bottom) at H +10 minutes (state degrees, mils, meters, or feet).
PAR. Location of radioactive cloud outline (UTM).
PAB. Downwind direction of radioactive cloud (state degrees or mils).
ZB. Remarks.

DEFENSE PLANNING CONSIDERATIONS

1. Establish security (OP/patrols, PWs, M8).
2. Position key weapons.
   a. Coordinate with units on left and right.
   b. Establish FPF or PDF for machine gun.
   c. Ensure mutual support between machine guns.
   d. Cover armor approaches with antiarmor systems.
   e. Establish fire control measures.
3. Prepare positions.
   a. Check sectors of fire.
   b. Check overhead cover and view positions from enemy vantage.
   c. Position in depth and achieve mutual support between positions.
   d. Select/prepare alternate and supplementary positions.
4. Integrate indirect fires, CAS, and obstacles with direct and indirect fire.
5. Check communications and establish emergency signals.
6. Designate ammunition, supply, PW, and casualty points.

IED / UXO

Procedures when IEDs are found

Security - Maintain 360 degrees. Scan close in and far out, up high and down low.

Always - Scan you immediate surroundings for more IEDs.

Move - Move away. Vary safe distances, but plan for 300m minimum safe distance and adapt to your METT-TC.

Attempt - To confirm suspected IEDs using optics while staying back as far as possible.

Cordon - Off the area. Direct people out of danger area. Do not allow anyone to enter except for EOD. Question, search, and detain suspects as defined by your Existing ROE.

Report - Your situation using the 9 line IED / UXO spot report format.

This could be your hand if you try to dispose of UXOs or IEDs. The enemy has developed anti-handling to catch you when you try defusing. Leave it to experts!

Call EOD
- Don't be a Hero!

IED / UXO Report

LINE 1. DATE-TIME-GROUP: When the item was discovered.

LINE 2. REPORT ACTIVITY AND LOCATION: Unit and grid location of the IED/UXO.

LINE 3. CONTACT METHOD: Radio frequency, call sign, POC, and telephone number.

LINE 4. TYPE OF ORDNANCE: Dropped, projected, placed, or thrown. Give the number of items, if more than one.

LINE 5. NBC CONTAMINATIONS: Be as specific as possible.

LINE 6. RESOURCES THREATENED: Equipment, facilities, or other assets that are threatened.

LINE 7. IMPACT ON MISSION: Short description of current tactical situation and how the IED/UXO affects the status of the mission.

LINE 8. PROTECTIVE MEASURES: Any measures taken to protect personnel and equipment.

LINE 9. RECOMMENDED PRIORITY: Immediate, Indirect, Minor, No Threat.

Priority

Immediate: Stops unit's maneuver and mission capability or threatens critical assets vital to the mission.

Indirect: Stops the unit's maneuver and mission capability or threatens critical assets important to the mission.

Minor: Reduces the unit's maneuver and mission capability or threatens non-critical assets of value.

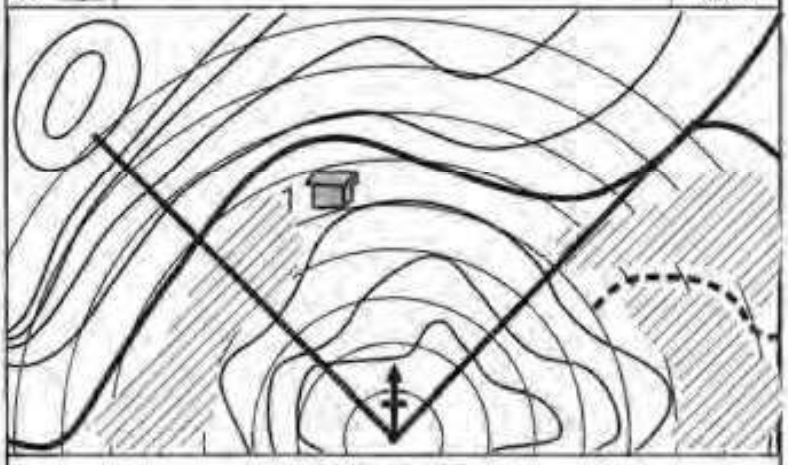
No Threat: Has little or no effect on the unit's capabilities or assets.

STANDARD RANGE CARD

SQD WPNS
PLT 1
CO B

May be used for all types of direct fire weapons

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION: GUN #1
DATE: 2 FEB 06
WEAPON: M240B
EACH CIRCLE EQUALS METERS: 100

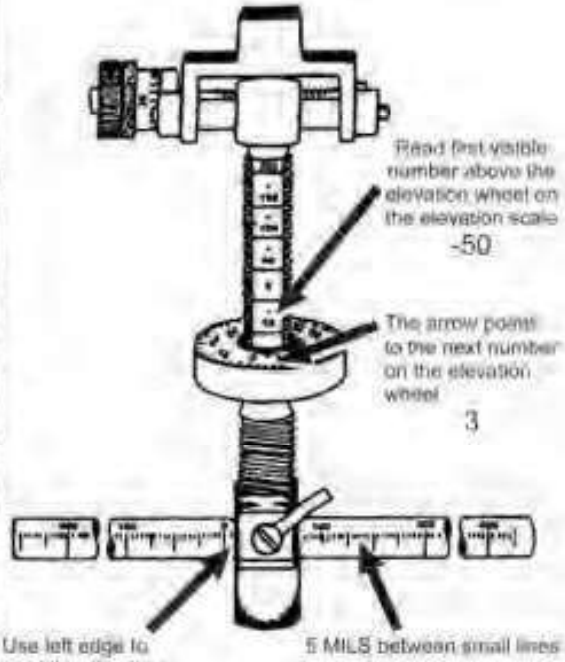
NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	L5	-50/3	550m		Building (PDF)

REMARKS: Swamp Road Water

DA FORM 5517-R, FEB 1986

PDF - Principal Direction of Fire

- First target is always the PDF



* The left or right direction is given for the direction the barrel points.

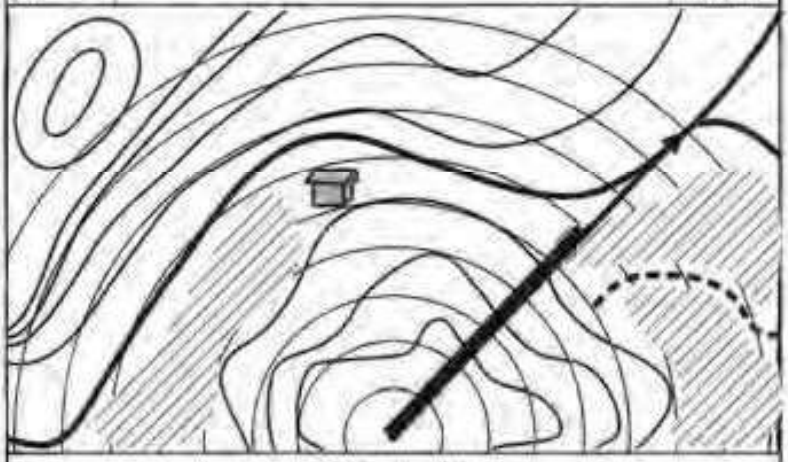
T&E Reading
L5 -50/3

STANDARD RANGE CARD

SQD WPNS
PLT 1
CO B

May be used for all types of direct fire weapons

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION: GUN #1 | DATE: 2 FEB 06

WEAPON: M240B | EACH CIRCLE EQUALS METERS: 100

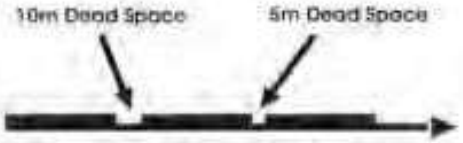
NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	R450	-50/10	600m		FPL

REMARKS: Swamp, Road, Water

DA FORM 5517-R, FEB 1988

FPL - Final Protective Line

- FPL is always target #1
- FPL will always be metal-to-metal
- Represented by thick line
  - Break in thick line for dead space out to 600 meters
  - The gap is equal to the width of the dead space

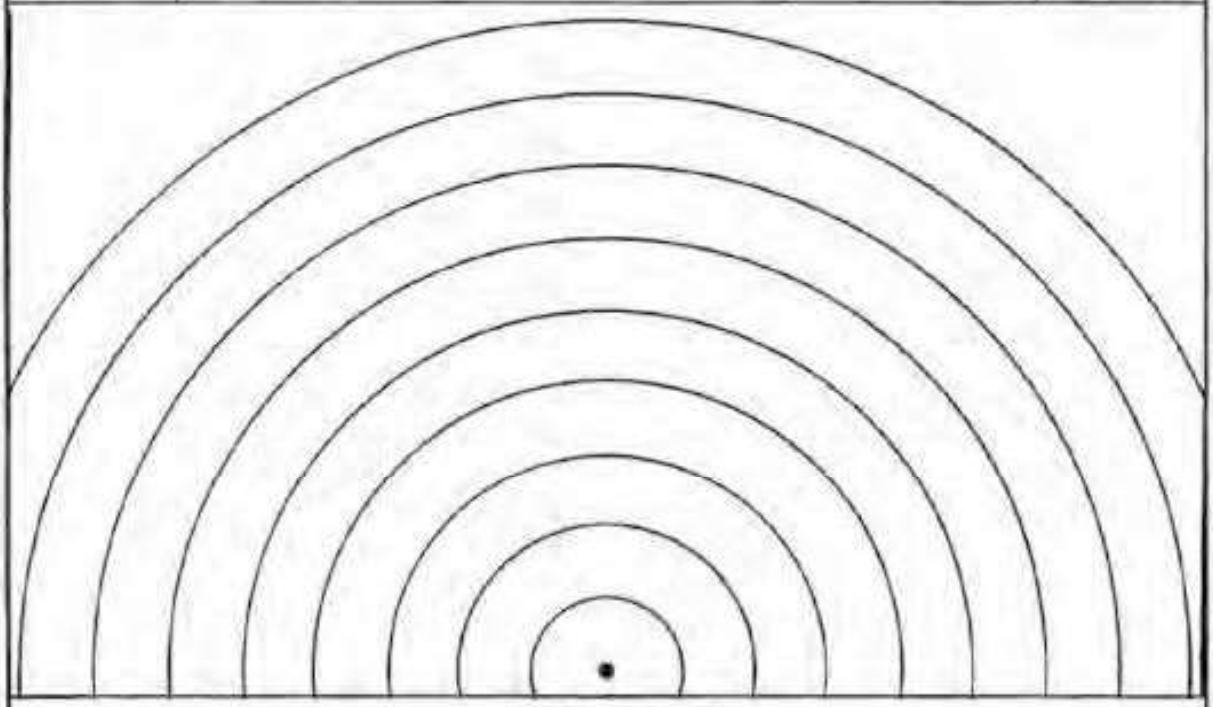


FPL - Final Protective Line

STANDARD RANGE CARD

For use of this form see FM 3-21.71; the proponent agency is TRADOC.

SQD _____ PLT _____ CO _____	May be used for all types of direct fire weapons.	MAGNETIC NORTH



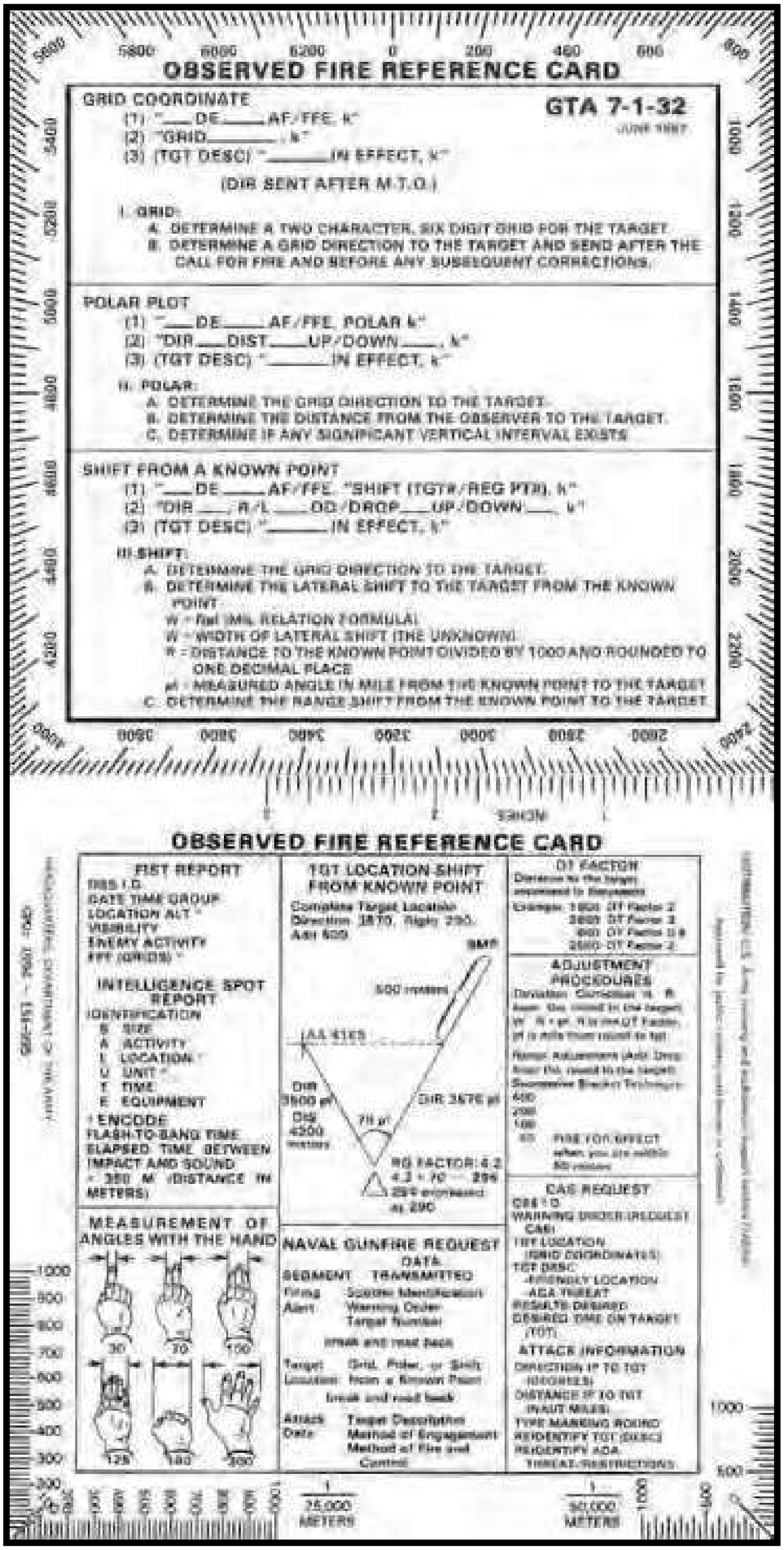
DATA SECTION

POSITION IDENTIFICATION			DATE		
WEAPON			EACH CIRCLE EQUALS _____ METERS		
NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION

REMARKS:

DA FORM 5517-R, FEB 1986

USAPA V1.01



OBSERVED FIRE REFERENCE CARD

GTA 7-1-32
JUNE 1997

GRID COORDINATE

(1) "___DE___AF/FFE, k"
(2) "GRID_______, k"
(3) (TGT DESC) "_______IN EFFECT, k"

(DIR SENT AFTER M.T.O.)

I. GRID:
A. DETERMINE A TWO CHARACTER, SIX DIGIT GRID FOR THE TARGET.
B. DETERMINE A GRID DIRECTION TO THE TARGET AND SEND AFTER THE CALL FOR FIRE AND BEFORE ANY SUBSEQUENT CORRECTIONS.

POLAR PLOT

(1) "___DE___AF/FFE, POLAR k"
(2) "DIR___DIST___UP/DOWN___, k"
(3) (TGT DESC) "_______IN EFFECT, k"

II. POLAR:
A. DETERMINE THE GRID DIRECTION TO THE TARGET.
B. DETERMINE THE DISTANCE FROM THE OBSERVER TO THE TARGET.
C. DETERMINE IF ANY SIGNIFICANT VERTICAL INTERVAL EXISTS.

SHIFT FROM A KNOWN POINT

(1) "___DE___AF/FFE, "SHIFT (TGT#/REG PT#), k"
(2) "DIR___, R/L___, DD/DROP___UP/DOWN___, k"
(3) (TGT DESC) "_______IN EFFECT, k"

III. SHIFT:
A. DETERMINE THE GRID DIRECTION TO THE TARGET.
B. DETERMINE THE LATERAL SHIFT TO THE TARGET FROM THE KNOWN POINT.
W = Rxµl (MIL RELATION FORMULA)
W = WIDTH OF LATERAL SHIFT (THE UNKNOWN)
R = DISTANCE TO THE KNOWN POINT DIVIDED BY 1000 AND ROUNDED TO ONE DECIMAL PLACE
µl = MEASURED ANGLE IN MILS FROM THE KNOWN POINT TO THE TARGET
C. DETERMINE THE RANGE SHIFT FROM THE KNOWN POINT TO THE TARGET.

OBSERVED FIRE REFERENCE CARD

FIST REPORT

OBS I.D.
DATE TIME GROUP
LOCATION ALT *
VISIBILITY
ENEMY ACTIVITY
FFF (GRIDS) *

INTELLIGENCE SPOT REPORT

IDENTIFICATION
S SIZE
A ACTIVITY
L LOCATION *
U UNIT *
T TIME
E EQUIPMENT
* ENCODE

FLASH-TO-BANG TIME
ELAPSED TIME BETWEEN IMPACT AND SOUND × 350 M (DISTANCE IN METERS)

MEASUREMENT OF ANGLES WITH THE HAND

30 — 70 — 100 — 125 — 180 — 300

TGT LOCATION SHIFT FROM KNOWN POINT

Complete Target Location: Direction 3870, Right 290, Add 500.

SMP — 500 meters — AA 6165 — DIR 3600 µl — Dist 4200 meters — 70 µl — DIR 3670 µl — RG FACTOR: 4.2 — 4.2 × 70 = 294 — 294 expressed as 290

NAVAL GUNFIRE REQUEST DATA

SEGMENT	TRANSMITTED
Firing	Spotter Identification
Alert	Warning Order
	Target Number
	break and read back
Target Location	Grid, Polar, or Shift from a Known Point
	break and read back
Attack Data	Target Description
	Method of Engagement
	Method of Fire and Control

OT FACTOR

Distance to the target expressed in thousands

Example: 1800 OT Factor 2
3600 OT Factor 3
800 OT Factor 0.8
2500 OT Factor 2

ADJUSTMENT PROCEDURES

Deviation Correction is R from the round to the target. W = R × µl. R is the OT Factor, µl is mils from round to tgt.

Range Adjustment (Add/Drop) from the round to the target. Successive Bracket Technique:
400
200
100
50 FIRE FOR EFFECT when you are within 50 meters

CAS REQUEST

OBS I.D.
WARNING ORDER (REQUEST CAS)
TGT LOCATION (GRID COORDINATES)
TGT DESC
-FRIENDLY LOCATION
-ADA THREAT
RESULTS DESIRED
DESIRED TIME ON TARGET (TOT)

ATTACK INFORMATION

DIRECTION IP TO TGT (DEGREES)
DISTANCE IP TO TGT (NAUT MILES)
TYPE MARKING ROUND
REIDENTIFY TGT (DESC)
REIDENTIFY ADA THREAT/RESTRICTIONS

1/25,000 METERS — 1/50,000 METERS

9 Line MEDEVAC

LINE ITEM	EXPLANATION
1. Location of Pickup Site.	Encrypt grid coordinates. When using *DRYAD Numeral Cipher, the same SET line* will be used to encrypt grid zone letters and coordinates. To preclude misunderstanding, a statement is made that grid zone letters are included in the message (unless unit SOP specifies its use at all times).
2. Radio Frequency, Call Sign, Suffix.	Encrypt the frequency of the radio at the pickup site, *not* a relay frequency. The call sign (and suffix if used) of person to be contacted at the pickup site may be transmitted in the clear.
3. No. of Patients by Precedence.	Report only applicable info & encrypt brevity codes. A = Urgent, B = Urgent-Surg, C = Priority, D = Routine, E = Convenience. (If 2 or more categories reported in same request, insert the word "*break*" between each category)
4. Spec Equipment.	Encrypt applicable brevity codes. A = None, B = Hoist, C = Extraction equipment, D = Ventilator.
5. No. of Patients by Type.	Report only applicable information and encrypt brevity code. If requesting MEDEVAC for both types, insert the word "*break*" between the litter entry and ambulatory entry: L + # of Pnt - Litter; A + # of Pnt - Ambul (sitting).
6. Security Pickup Site (Wartime).	N = No enemy troops in area, P = Possibly enemy troops in area (approach with caution), E = Enemy troops in area (approach with caution), X = Enemy troops in area (armed escort required).
6. Number and type of Wound, Injury, Illness (Peacetime).	Specific information regarding patient wounds by type (gunshot or shrapnel). Report serious bleeding, along with patient blood type, if known.
7. Method of Marking Pickup Site.	Encrypt the brevity codes. *A* = Panels, *B* = Pyrotechnic signal, *C* = Smoke Signal, *D* = None, *E* = Other.
8. Patient Nationality and Status.	Number of patients in each category need not be transmitted. Encrypt only applicable brevity codes. A = US military, B = US civilian, C = Non-US mil, D = Non-US civilian, E = EPW.
9. NBC Contamination (Wartime).	Include this line only when applicable. Encrypt the applicable brevity codes. N = nuclear, B = biological, C = chemical.
9. Terrain Description (Peacetime).	Include details of terrain features in and around proposed landing site. If possible, describe the relationship of site to a prominent terrain feature (lake, mountain, tower).

Reference: FM 8-10-6, *Medical Evacuation in a Theater of Operations, pages 7-7 through 7-9.*

GLOSSARY

1SG	first sergeant
5-C's	**Confirm**, **Clear**, **Call**, **Cordon**, **Control** (*reactions to contact with an IED*)
5-W's	**Who**, **What**, **Where**, **When**, **Why**?
5-S's	**S earch**, **S ilence**, **S egregate**, **S afeguard**, **S peed** to rear (*rules for handling prisoners*)
AA	avenue(s) of approach
AAR	after-action review
AATF	air assault task force
ABCDE	method of identification and response to life-threatening conditions: **Airway**, **Breathing**, **Circulation**, **Disability**, **Exposure**
ACE	ammunition, casualties, and equipment
ACL	allowable combat load
ACP	aerial checkpoint
ACU	Army combat uniform
ADA	air defense artillery
AG	assistant gunner
ATC	air traffic controller; a mechanical belay device that locks down on itself when tension is applied in opposite directions
ALT	alternate
AMC	air mission commander
ammo	ammunition
ANCD	automated net-control device
AO	area of operations
AOO	actions on the objective
AR	automatic rifleman
ABF	attack by fire
ATL	Alpha team leader
ATM	Alpha Team
bangalore torpedo	A manually emplaced, 1.5-meter long explosive-filled tube used to breach wire and detonate simple, pressure-activated antipersonnel mines. Ten tubes will clear a 1- by 15-meter lane.
belay	Any action taken to stop a climber's fall or to control the rate a load descends
binos	Binoculars
BMNT	begin morning nautical twilight
BN	battalion
body belay	belay that uses the belayer's body to apply friction by routing the rope around the his body
bow line on a coil	knot used to secure a climber to the end of a climbing rope

BP	battle position
British junction knot	knot used to join the ends of detonation cords from multiple charges to one initiation system
BTC	bridge team commander
BTL	Bravo Team leader
BTM	Bravo Team
C2	command and control
CAS	close air support
CASEVAC	casualty evacuation
CCA	close combat attack
CCIR	commander's critical information requirements
CCP	casualty collection point
CDR	commander
CDS	Camp Darby Special (*map*)
CLS	combat lifesaver
CO	company
COA	course of action
COMSEC	communications security
cordelette	short section of static rope or static cord. *Also called* "**sling rope**"
COTS	commercial off the shelf
CP	command post
CPR	cardiopulmonary resuscitation
CQC	close quarters combat
CS	combat support
CSS	*obsolete: now referred to as* sustainment
CTT	common task test
DAR	designated area of recovery
DOL	direction of landing
double Figure 8 knot	knot used to form a fixed loop in the end of the rope; loops are large enough to insert a carabiner
double overhand knot	knot used to secure the end of detonation cord
DP	duty position; decision point (depending on context)
DST	distance
DTG	date-time group
dynamic ropes	one of two classifications of kernmantle rope; used for climbing; *see also* **static rope**
DZ	drop zone
EA	engagement area
EEFI	essential elements of friendly information
EENT	end evening nautical twilight
End-of-the-Rope Clove Hitch	intermediate anchor knot that requires constant tension

End-of–the–Rope Prusik	knot used to attach a movable rope to a fixed rope; *see also* **Middle-of–the–Rope Prusik**
ENY	enemy
EPW	enemy prisoner of war
FA	field artillery
FDC	fire direction center
FFIR	friendly force information requirements
Figure 8 slip knot	knot used to form an adjustable bight in the middle of a rope
FLIR	forward looking infrared
FLOT	forward line of own troops
FO	forward observer
FPF	final protective fires
FRAGO	fragmentary order
FSC	fire support coordinator
FSO	fire support officer
GOTWA	**G** Where leader is Going **O** Others he is taking with him **T** Time he plans to go **W** What to do if the leader does not return in time **A** The unit's and the leader's actions on chance contact while the leader is gone
GPS	global positioning system
GRN	grenadier
HDG	heading
HE	high explosive
H-Hour	hit hour (the time the unit plans to accomplish the mission)
HI	high temperature (weather)
HPT	high-payoff target
HQ	headquarters
IAW	in accordance with
ICM	improved conventional munitions
ID	identification
IP	initial point
IR	information requirements
ERRP	en route to release point
JAAT	joint air attack team
JD	Julian date
KIA	killed in action
LAW	light antiarmor weapon
LBV	load-bearing vest
LD	line of departure

LDA	linear danger area
LO	low temperature (weather)
LOA	limit of advance
LOGSTAT	logistical status
LP	listening post
LZ	landing zone
material factor	the strength, hardness, and mass of the material to be demolished
mb	millibar (a metric unit used to measure air pressure)
MDI	modernized demolition initiator
ME	main effort
mechanical belay	a belay that uses mechanical devices to help the belayer control the rope, as in rappelling
MEDEVAC	medical evacuation
METL	mission-essential task list
METT-TC	mission, enemy, terrain (and weather), troops (and support) available, time available, and civil considerations
Middle– of–the–Rope Clove Hitch	knot that secures the middle of a rope to an anchor
Middle-of-the-Rope Prusik	knot that attaches a movable rope to a fixed rope, anywhere along the length of the fixed rope; *see also* **End-of–the–Rope Prusik**
MG	machine gunner
MOPP	mission-oriented protective posture
MR	moonrise
MRE	meal, ready to eat
MS	moonset
MSD	minimum safe distance
MSL	mean sea level
Munter hitch	commonly used belay that requires little equipment
NATO	North Atlantic Treaty Organization
NAV	navigation
NFA	no-fire area
NLT	no later than
NVD	night-vision device
NVS	night vision system
OAKOC	observation and fields of fire, avenues of approach, key terrain, observation, and cover and concealment
OBJ	objective
occlusive dressing	a dressing that seals a wound from air or bacteria
OD	olive drab
OOM	order of movement
OP	observation post

OPORD	operation order
OPSKED	operational schedule
ORP	objective rally point
OT	observer-target
PB	patrol base
PCC	precombat checks
PCI	precombat inspection
PDF	principal direction of fire
PI	probability of incapacitation
PIR	priority intelligence requirements
PL	platoon leader
PLD	probable line of deployment
PLOT-CR	purpose, location, observer, trigger, communication method, resources (a format for planning fire support)
PLT	platoon
POL	petroleum, oils, and lubricants
PRI	primary
protection	a piece of equipment, natural or artificial, that is used to construct an anchor
PSG	platoon sergeant
PSI	pounds per square inch
PZ	pickup zone
R	rifleman
R&S	reconnaissance and surveillance
RACO	rear area combat operations
RAP	rocket-assisted projectile
rappel seat	a rope harness used in rappelling and climbing
RED	risk-estimate distance
REQ	required
rerouted figure 8 knot	anchor knot that also attaches a climber to a climbing rope
RFA	restrictive fire area
RFL	restrictive fire line
RFLM	rifleman
RHB	Ranger Handbook
ROE	rules of engagement
round turn with two half hitches	a constant tension anchor knot
RP	release point
RTO	radio operator
S-2	intelligence staff officer
S-3	operations staff (and training) officer

SALUTE	**Size**, **Activity**, **Location**, **Unit/Uniform**, **Time**, and **Equipment**
SAW	squad automatic weapon
SBF	support by fire (position)
SDT	self-development test
SE	supporting effort
SEAD	suppression of enemy air defenses
SITREP	Situation Report
SITTEMP	situational template
SL	squad leader
sling rope	short section of static rope or static cord. Also called "cordelette"
SLLS	**Stop**, **Look**, **Listen**, **Smell**
SOC	succession of command
SOI	signal operating instructions
SOP	standing operating procedures
SP	start point
square knot	knot used to join two ropes of equal diameter; used to join the ends of the detonation cord to the explosive
SR	sunrise
SS	sunset
STANO	surveillance, target acquisition, and night observation
static ropes	one of two classifications of kernmantle rope; used where rope stretch is undesired, and when the rope is subjected to heavy static weight. *See also* dynamic rope
SURVIVAL	**S** Size up the situation, your surroundings, your physical condition, and your equipment. **U** Undue haste makes waste; don't be too eager to move. Plan your moves. **R** Remember where you are in relation to important friendly and locations and critical resources **V** Vanquish fear and panic. **I** Improvise. You can improve your situation. Use what you have. Use your Imagination. **V** Value your life. Remember your goal: to get out alive. Remain stubborn. Refuse to give in to problems and obstacles that face you. This will give you the mental and physical strength to endure. **A** Act like the natives; watch their daily routines. When, where, and how do they get food? Where they get water? **L** Live by your wits. Learn basic skills.
suspension traverse	used to move personnel and equipment over rivers, ravines, chasms, and up or down a vertical obstacle
TAC	tactical air controller
tamping factor	depends on the location and tamping of the charge
technical climbing	using safe and proper equipment and techniques to climb on a rock formation in parties of two or more
tensionless anchor	used to anchor rope on high-load installations such as bridging

TL	team leader
TLP	troop-leading procedures
TL	team leader
TOC	tactical operations center
triple roll knot	knot used to join branches of detonation cord
TTP	tactics, techniques, and procedures
uli knot	knot used to securely fasten detonation cord to explosive
VIXL	video image crosslink
WARNO	warning order
WBGT	wet bulb globe temperature
WFFs	warfighting functions (fire support, movement and maneuver, protection, command and control, and sustainment)
WIA	wounded in action
XO	executive officer
WSL	weapons squad leader

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