PHASE THREE–Tactical Skiing

TRAINING OBJECTIVE

Task: To teach the soldier tactical proficiency at moving and fighting on skis on all varieties of terrain and in varying snow conditions with combat loads.

Conditions: Given snow covered terrain of the varying conditions expected during the battle or during movement to contact, the soldier is taught to move and fight on skis while carrying combat loads.

Training Standard: Each soldier demonstrates the capability to move swiftly and silently across a snow-covered battlefield to gain and maintain enemy contact while carrying a combat load.

ADMINISTRATIVE INSTRUCTIONS

No classroom work is required. Classes and demonstrations may be held at platoon level. There should be one instructor or assistant per squad. *(NOTE:* The ski instructor here is not necessarily qualified in the same sense as necessary for Phase II. Any capable military skier is qualified to teach Phase III.) Any normal training area with a variety of flat, rolling, wooded, and open terrain is suitable. Course of instruction is eight hours as follows.

First 2 hours: Waxing, diagonal step, two-step diagonal, movement on flat terrain.

Second 2 hours: Supervised practice on broken, hilly terrain, ski-joring, use of climbers, ski pole riding.

Third 2 hours: Battle drill, firing positions, ahkio handling.

Fourth 2 hours: Practical examination to test the soldier in all acquired skills during all previous ski training. This practical exam may be administered as part of a field training exercise.

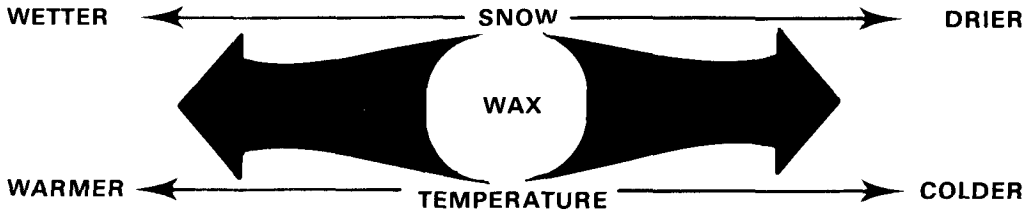
Waxing

Wax is used on the bottom of the skis to make them glide forward while preventing back slip. Variation in temperature and snow conditions requires waxes of varying properties. The US Army uses commercial ski wax. Temperature range and snow condition for each type wax are usually marked on the container. As the weather warms and the snow becomes wetter, apply softer wax. Conversely, the colder the weather becomes, the harder the wax should be.

Wax skis in a heated shelter, if possible, because wax sticks better to a warm surface. During movement, carry wax in an inside pocket to keep it warm. Make sure

the ski bottom is dry and free of old wax, particularly wax different from that to be applied. If necessary, wax can be applied directly over a different wax, if the new wax is softer than the one already on the ski. Wax can be removed using any hard-edged tool, such as a paint scraper or pocket knife. Be careful not to cut into the base of the ski.

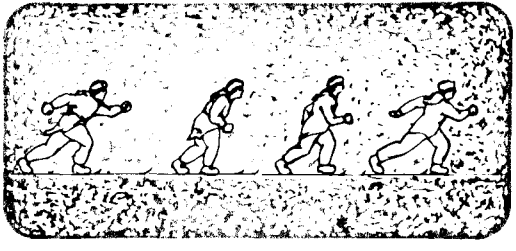
Apply wax over the entire bottom of the ski. Smooth the wax by rubbing it with the heel of the hand or a cork. If a fire or Yukon stove is available, heat the wax to make it easier to smooth out. Do not put the skis on the snow until the wax has cooled to air temperature. Test skis for proper waxing before starting on a long march.



Diagonal Step

The basic movement of the diagonal is a walking step. Forward motion and glide are increased when the skier applies more effort to his step. This added effort is obtained by a lunge coordinated with an increased push from the poles.

The diagonal is the most widely used of all skiing steps. It is applied under all types of snow conditions on level ground.



Technique

- ❑ Lean forward with well-bent knees and ankles. Keep feet flat and shift body weight to right ski.
- ❑ Slide left, pushing unweighed ski straight forward by a springing motion from ankle, knee, and hip, straightening the body and transferring the weight to the left sliding ski.
- ❑ Complete the springing motion (lunge) above by straightening the right knee and pushing off from the right foot, thus completing the weight transfer.
- ❑ Keep body weight on the sliding (left) ski and, as the glide nears completion, bend left knee and ankle in preparation for the next lunge. Meanwhile, the right leg is relaxed and moves the ski

forward in preparation for the next step. As this leg reaches a position approximately alongside the left leg, the next step is made with the right ski by lunging from the left leg.

- When using ski poles, execute the lunge as above, except that as the left foot is slid forward, swing the right ski pole straight to the front and place it towards the tip of the right ski; or, when the right ski is slid forward, bring the left ski pole forward.
- Glide is increased by a push with the ski pole. The ski pole is leaned slightly to the front while the arms are kept close to the body.
- The pushing action of the ski pole is increased progressively by the muscles of the arms and shoulders. The push is finished off by a sharp straightening of the arm for added power. When the push has been completed, the arm is relaxed and brought forward close to the body in preparation for the next poling action.
- During the coordinated movement of pole and lunge, emphasize correct timing and a long glide. The main power glide is obtained from the lunge executed by each leg; the poling action provides only a secondary source of momentum. All motions are rhythmic and fluid. Use poles in a relaxed manner and allow the pressure of pushing to focus on the wrist strap.

Two-Step Diagonal

This step is used to attain a longer and faster glide on the level. It is also used as an aid through dips and over bumps.

Technique
The two-step diagonal is a combination of a fast walking step and a diagonal. Push is obtained by double poling.

- ❑ From a standing position with the knees slightly bent, take a walking step with the left ski to start moving initially.
- ❑ Lunge from the left leg, in a continu - ous motion, to produce a long glide on the right ski.
- ❑ While gliding on the right ski, bring the left ski slowly forward and even with the other ski to complete the first two-step and prepare for the next two-step. This action should be started before the momentum of the glide has been lost.
- ❑ As the first step is made, bring both

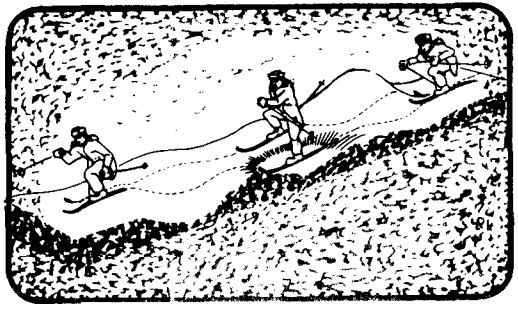
ski poles forward a comfortable distance and set them into the snow alongside the skis in coordination with the lunge of the second step.

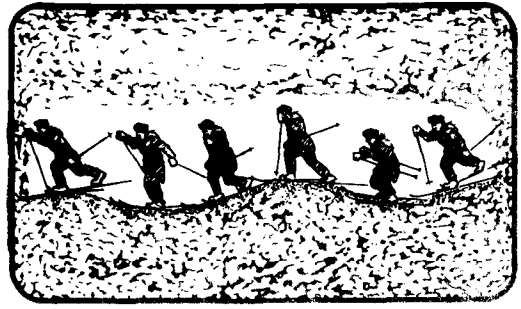
- Pushing action with the poles is applied the same way as described above for one pole. As the poles leave the snow, bring them straight forward in preparation for the next step. It is most important to time this motion properly to coordinate with the next lunge.

Variations and Applications of Ski Steps

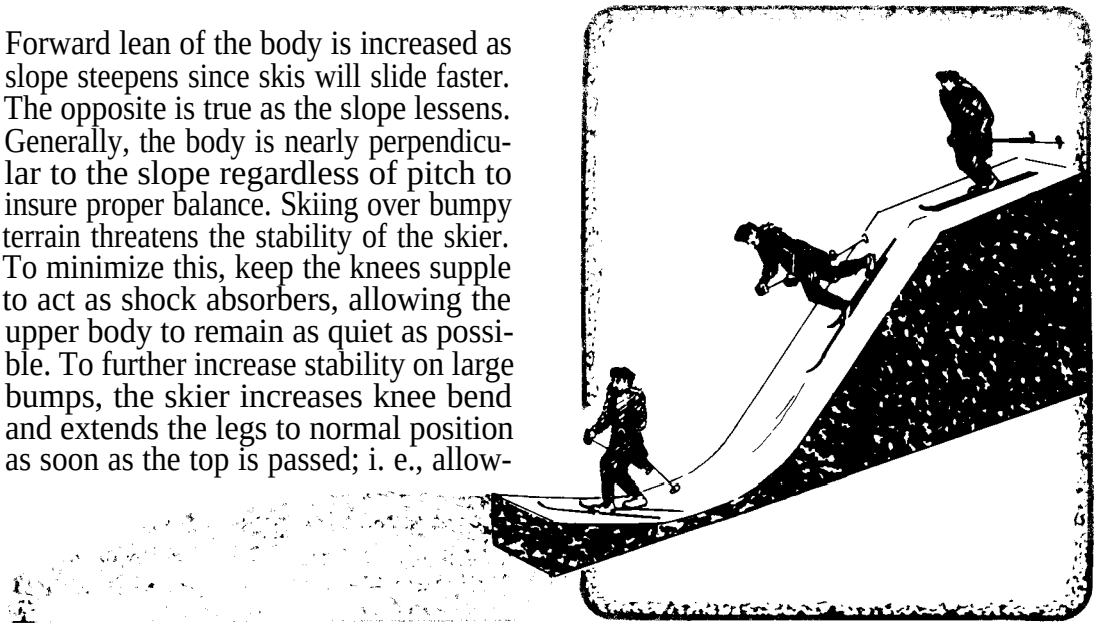
In long, cross-country movement, particularly when skiing with pack and rifle, varying techniques are used according to the terrain to conserve energy. Soldiers attempt to obtain as much glide as possible from the skis during each step. During the glide, the skier's muscles rest momentarily. Constant use of the same step is monotonous and tiring. To avoid this, rhythm and steps are varied often. The same effect occurs in poling. To rest arm and shoulder muscles, several steps are often taken without poling. In the diagonal step for instance, the first two steps can be made without using poles. Additional combinations of steps and poling are made at the skier's discretion, placing more emphasis on leg rather than arm work, or vice versa.

In bumpy terrain, ski steps and poling are used individually or in various combinations to give a strong pushoff, which provides the skier sufficient glide for a continuous motion through a dip and over a bump. When a series of bumps and dips is encountered, the poling action is generally applied on the crest of the first bump to obtain sufficient momentum to reach the top of the next bump in a continuous glide. A step supported by double poling may be applied when skiing through the dip. There are other situations where double poling is applied to gain or increase forward motion of the ski without taking a step.





Forward lean of the body is increased as slope steepens since skis will slide faster. The opposite is true as the slope lessens. Generally, the body is nearly perpendicular to the slope regardless of pitch to insure proper balance. Skiing over bumpy terrain threatens the stability of the skier. To minimize this, keep the knees supple to act as shock absorbers, allowing the upper body to remain as quiet as possible. To further increase stability on large bumps, the skier increases knee bend and extends the legs to normal position as soon as the top is passed; i. e., allow-



ing the skis to drop away. This action will lessen the chance of being thrown into the air. When moving through a hollow, normal ski and body position is maintained, with knees absorbing the sudden change of pressure. In deep snow, leading with one ski improves balance.

When skiing from soft snow onto hard snow, forward lean is increased because the skis will gain speed and have a tendency to run from under the skier. The opposite is true when running from hard snow onto soft snow. In this case, lean slightly to the rear and advance the leading ski farther ahead just before the soft snow is entered. On icy crust, stability is improved by keeping the skis farther apart, or by running in a wedge. To control speed when the slope is rutted, sideslipping may be necessary. On icy snow, the skis may chatter in a turn. To correct this, keep body weight well forward and carefully control edging of the skis as the turn is made. Crusty snow, which will not support the skier's weight (breakable crust), is the most difficult to cope with. Speed is kept slower while making all turns. Sometimes it's necessary to use the step turn or a kick turn to change direction. Ski pole riding can be used to control speed over difficult, steep terrain; particularly when carrying or hauling heavy loads. The straps of both poles are removed. Grasping both handles in one hand, the tips pressed against the snow,

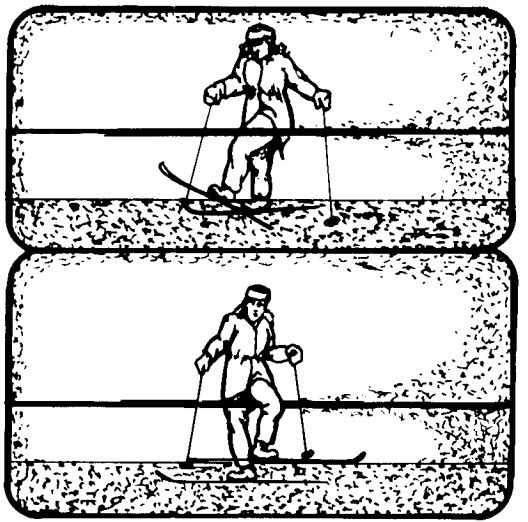
between the legs, by pushing downward at the center of the poles with the other hand. The skier must avoid catching the pole tips or baskets on brush which may be sticking up out of the snow. An alternate method used for traversing is to hold the poles on the uphill side of the body.

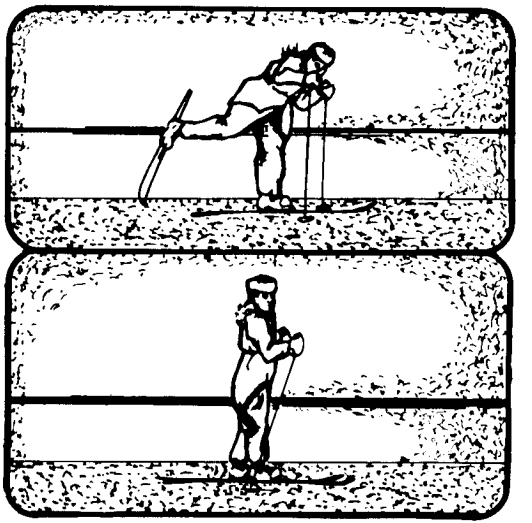
Moving downhill through the woods requires shorter radius turns and quick reaction. The skier must always be alert to sudden obstacles when skiing in the woods. This is the most challenging kind of skiing, requiring skill at all methods of controlling skis. During unit movement in wooded terrain, one man falling can block the progress of all personnel behind him. If an individual fails, he should move off the track as quickly as possible, even if this results in losing his original position in the column.

Crossing obstacles like ditches or fences can be very time-consuming for a unit. Whenever possible, disperse the men to cross on a broad front. Sometimes it is best to remove skis altogether.

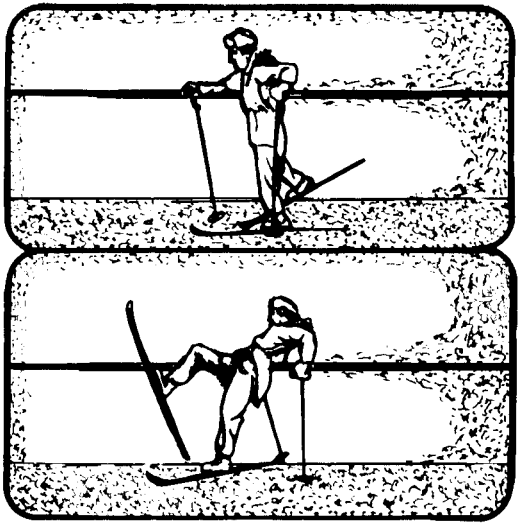
Low fences and windfalls 30 to 60 centimeters high (1 to 2 feet) are crossed by turning sideways to the obstacle so that the skis or snowshoes are parallel and alongside it, then stepping over first with one foot then the other. A kick turn over the obstacle is an alternate method.

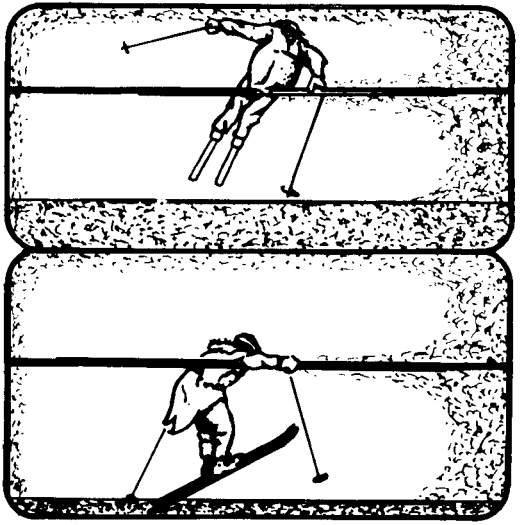
In the case of rail fences or large diameter windfalls, it is often easier to sit on





the obstacle and swing both feet simultaneously to the other side.





Ditches or small streams are crossed by stepping over them sideways, using the ski poles for support.

If the ditches are too deep and wide, it is better to descend to the bottom, either by sideslipping or sidestepping, and then to climb the other side by sidestepping.

When it is necessary for troops to descend or ascend slopes which are too steep for their ability, or traversing is not practical, the sidestep is used. Otherwise, the skis are removed and the slope negotiated on foot, if the snow depth will permit. Mohair ski climbers are used for long uphill climbs when the slope is too steep for wax to hold it properly.

Skiing with Pack and Weapon

Skiing with a pack and weapon changes the center of gravity and affects the techniques of movement. Some techniques follow:

- ❑ Lunges are shorter and pushes with poles less powerful.
- ❑ To aid in maintaining balance when skiing downhill over rough terrain, the leading ski is advanced farther and the knees are kept more flexible than when skiing without a load.
- ❑ Speed of descent is reduced and techniques are applied more cautiously.
- ❑ Slopes are climbed with a more gradual traverse.
- ❑ When skiing through woods or in brushy terrain, care is taken to prevent any protruding parts of the weapon from catching on branches, causing loss of balance.
- ❑ In the event of a fall, it is sometimes more efficient to remove the pack and weapon before attempting to regain footing.

Sled Pulling

Pulling a sled (ahkio) is hard work, requiring both teamwork and technique. Generally, the methods of hauling sleds apply to both skiers and snowshoes. Normally, the number of personnel pulling the sled is three, with one brakeman. However,

the number of pullers may change, depending on:

- ❑ Terrain,
- ❑ Weight of load,
- ❑ Type of movement, and
- ❑ Mission.

Preparation for Sled Pulling

Techniques for sled pulling (ahkio) follow:

- ❑ The tow ropes are laid out and fastened by snap buckles in tandem system. The sled harnesses are adjusted to fit loosely on the pullers.
- ❑ Always consider using ski climbers for best traction. If climbers are not used, waxed skis provide best traction. Don't worry about glide; however, sliding capacity should not be entirely forfeited.
- ❑ Before moving out, check sled for proper loading and lashing to insure the lowest possible center of gravity.

Pulling Sled on Varied Terrain

When pulling a sled over comparatively flat

terrain, skiers normally use the one-step ski technique. When crossing small ditches, stop the sled in the ditch while the pullers go as far as the tow ropes allow. Then all together pull the sled up out of the ditch. To change direction in the woods, continue to move straight forward until the sled comes to the desired turning point. Then move in the new direction with the turn being controlled by the puller nearest the sled–assisted if necessary by the man behind. When the forest is dense and space does not allow the men to move far enough ahead before the turn is made, start the turn by gradually making as gentle a curve as possible, while the two men nearest the sled (in front and behind) guide, lift, and otherwise assist in turning the sled.

Uphill Climbing

To accomplish an uphill maneuver, use the following techniques:

- ❑ On short, gentle slopes the herringbone can be used.
- ❑ On a steep, short slope the pullers can use the sidestep. In this case, the rear man moves to the front and side of the sled, and while sidestepping, assists in pulling the sled by using the rope fastened to the front end.
- ❑ On very gentle slopes, an uphill traverse may be used. Ski climbers are used if the length of the slope justifies the time required to put them on.
- ❑ In difficult terrain, use a relay technique when the necessary equipment is available. A climbing rope, 36.5 meters (120 ft) long, or similar item, is fastened to the sled. The pullers then

climb uphill as far as the rope allows. While they stand in place, the sled is pulled up to their position. This procedure is repeated as many times as is necessary to reach the top. Care is taken to insure that the sled is well anchored each time the pullers move up, thus avoiding a runaway sled. Where steep slopes must be ascended for considerable distances, less energy will be expended if the sleds are left behind and the sled load backpacked to the top.

Downhill Movement

Techniques for downhill movement follow:

- ❑ On very gentle slopes and in poor snow conditions where the sled will not descend on its own accord, use a double-poling technique or a one-step diagonal. It is necessary to control the speed to prevent the sled from overrunning the pullers. The rear man can assist in this by braking the sled, although in most cases very little braking will be needed.

- ❑ A short, steep slope can be descended by sideslipping or sidestepping. If necessary, the rear man is assisted in the braking action by one or more members of the team. During short descents in wooded areas, the braker may position himself behind a tree for added stability in lowering the sled. If necessary, a succession of position moves are made.

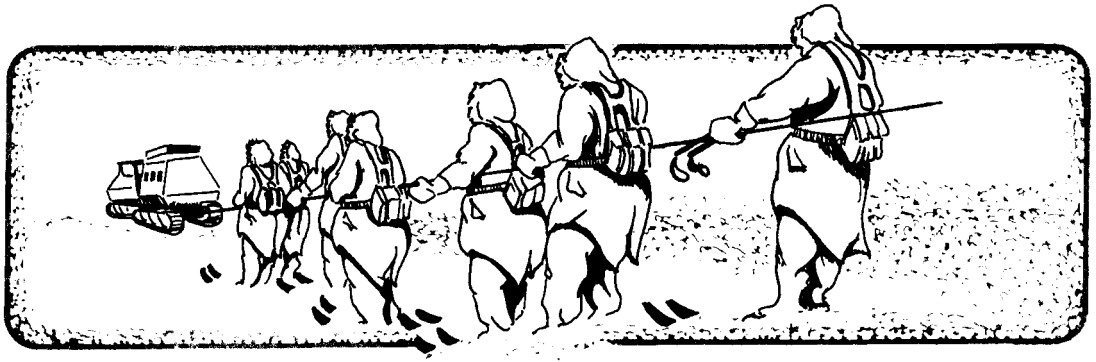
- On long moderate slopes, use the braking wedge to control speed. If more braking is necessary than can be applied by the rear man, he is assisted by the puller closest to the sled, who moves to one side or removes his rope and refastens it to the rear of the sled.

- The whole team is needed to brake the sled when going down a long, steep slope. Fasten all tow ropes to the rear of the sled. All men brake from the rear and/or one skier controls the sled by straddling its front. The braking wedge or sideslipping is used when long, steep downhill slopes are traversed. The puller nearest the sled and the rear man remain above the sled and as far from it as the ropes allow. From this position, they can prevent the sled from sideslipping.

- In very steep terrain, a long rope can be used to lower the sled straight down the slope. This procedure is the reverse of the uphill-relay method described earlier and is good for evacuating wounded.

Skijoring

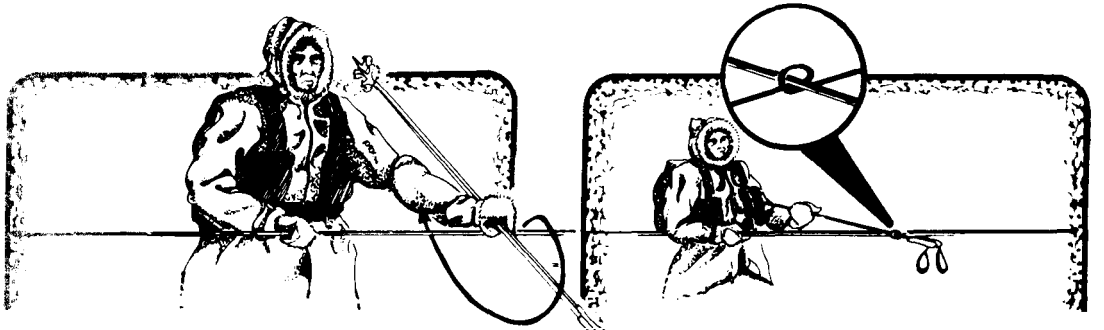
Skijoring is moving men on skis behind vehicles. The best routes for skijoring are snow-covered roads and trails, frozen lakes, rivers, or paths made by tracked vehicles. Speeds up to 24 kmph (15 mph) can be maintained on level ground by trained troops, depending on weather and



trail conditions. The number of men that can be hauled behind each vehicle varies depending on the type and mechanical condition of the vehicle. Towing more than two squads behind one vehicle is impractical, due to the increased length of the column and difficulty in making turns.

Use of Tow Ropes

Two ropes, 36.5 meters (120 ft) long, are used for towing a rifle squad. The skiers, in columns of twos, are spaced at equal intervals behind the vehicle and outside the ropes. A gap of approximately 4 meters (12 ft) is left between individuals.



Several methods of towing are used depending on terrain and distance of movement:

- Each skier grasps a bight of rope and makes a 25 cm (lO-inch) loop by tying a butterfly knot (see TC 90-6-1, *Military Mountaineering).* The loop is held with one hand and poles are held in the other, or a long loop can be formed by tying a butterfly knot in a 1.5 to 2 meter (5 to 7 ft) bight of rope. The skier leans against the loop after placing it around the buttocks. He does not place the body through the loop.
- The ski-pole method is the least tiring way to skijor. Another advantage to this method is that a skier can exercise his hands to prevent frostbite during movement in extreme cold. The rope is looped around the poles to lock them in

position. The poles are held under the outside arm. The skier can rest against the ski pole baskets.

- When being towed through dense wooded areas, or when contact with the enemy is imminent, simply grasp the rope without tying the knot or using the ski poles as a rest. Maneuvering through narrow trails is thus easier and the troops are more prepared for immediate combat.

No matter what method of towing is used, troops are never allowed to fasten themselves to the tow rope. In case of a fall, they must be able to release their hold immediately to avoid serious injury to themselves or to other skiers. The ski poles are usually held in one hand and are available for instant use. During training, and in combat situations when contact with the enemy is not probable, the ski poles may be loaded on the vehicles to avoid accidents.

Skijoring Technique

The track is made as simple as the terrain permits. Steep slopes, obstacles, and sharp turns are avoided. When these cannot be bypassed, speed must be reduced so the skiers can maneuver. One man, usually the assistant driver, is responsible for stopping or slowing the vehicle to prevent casualties due to speed or obstacles. He

constantly observes the skiers and other vehicles, gives the driver orders, and signals the skiers when the vehicle will slow down, speed up, or stop.

When the vehicle begins its forward movement, each man on the rope moves forward under his own power for a few steps, gradually placing tension on the rope to prevent being suddenly jerked into motion and caused to fall. When under way the skier's body is leaned slightly backward, the knees are bent slightly, and the upper body is nearly straight. Skis may be farther apart than in normal skiing. One ski is kept slightly ahead of the other. The position should be one which allows the skier to relax while alert to oncoming obstacles. If a skier falls, he should release the tow rope immediately and roll to the side to avoid being run over by the skier following.

During sharp turns, the vehicle is slowed to walking speed, and skiers walk around the curve being careful not to drop or step on the tow rope. Normal speed is resumed after the last man has made the turn. Vehicle stops and starts are done gradually.

While descending hills, skiers maintain a taut rope using the braking wedge or by moving to the side where deeper snow will slow them down. If the terrain will not allow controlled braking, and collision with the vehicle is immi-

nent, the skiers release the rope and disperse to the sides of the track. On short, downhill slopes, the vehicle increases speed temporarily so that the skiers need not brake. On long, steep slopes, skiers descend independently of the vehicle and reattach themselves at the bottom.

Use of Ski Poles in Firing

- ❑ Firing in snow requires a firm support. On packed snow, the weapons may slide. Branches, skis, snowshoes, or sleds are used to provide a solid base.
- ❑ Skis and ski poles can be used in a variety of ways to form hasty weapons rests while firing on the move.
- ❑ Ski poles can be used as an elbow rest or as a weapons support from the kneeling position in shallow crusted snow. In deep, soft snow, the position of the poles can be reversed for added stability.

- In the prone position, the skis or ski poles can be used as elbow rests or as supports for the weapon.
- Automatic weapons can be fired from the prone position using a snowshoe or ski pole basket as a rest for the bipod. Some machine gunners attach a wide strip of canvas to the bipod legs. When the bipod is opened, the canvas stretches out between the legs over the snow and stops the legs from sinking.

Skis are used as far forward as possible, and are left behind only when the objective can be reached more quickly and easily on foot. It is up to the small unit leader to decide when to do this. As a rule of thumb, skis are left at the last covered and concealed position, short of the objective (see FM 31–70 and FM 31–71). Deep snow may force units to assault the objective on skis.

As friendly forces approach the effective range of enemy weapons, they move by fire and maneuver. Troops proceed by short rushes on foot or on skis, whichever is more feasible. Troops rushing on foot drag their skis by holding them together by the tips (poles through the bindings) in one hand, with the weapon readily available for action in the other. Skis

may also be tied to the belt with a thong slipped through the holes at the ski tips.

When contact with the enemy is not expected, the weapon is carried across the back with the sling over either shoulder, and with the butt at the side or attached to the rucksack. When contact with the enemy is imminent, the weapon is slung around the neck and in front of the body, thus releasing both arms for rapid skiing. When contact with the enemy has been established, the weapon is carried in one hand and the ski poles in the other.

When the depth of the snow is less than 50 cm (20 inches), consider leaving skis in the last covered and concealed position short of the objective.

As soon as the objective has been seized, the skis, ski poles, or snowshoes are recovered and brought forward. A two-man team can quickly make a ski bundle and drag the skis of the entire squad at one time.

Additional techniques

- ❑ In deep, loose snow, under hostile fire, it may be more advantageous to advance in a high-crawl position, holding the skis with hands through the bindings.
- ❑ Sliding forward in a low crawl on skis is another method of advancing, especially over firm snow.

* GPO : 1991 0 - 281-486 (43486)