Basic Knots and Rope Management



Terminal Learning Objective

Action: Tie Basic Knots and Perform Rope Management

Condition: In a classroom environment, to facilitate mobility operations in various types of terrain, weather, and environmental conditions, given seasonal clothing and equipment.

Standard: Students will identify components of a climbing rope, describe knot terminology, demonstrate their ability to inspect ropes, and tie basic knots IAW TC 3-97.61.

References

- TC 3-97.61 Military Mountaineering
- Mountain Operations Visual Reference Guide (KP21-MIL-GEN47)

Agenda

- Care and Maintenance
- Inspection
- Terminology
- Knots

Care and Maintenance

The rope is a climber's lifeline. It must be maintained and used properly. These general guidelines should be used when handling ropes:

- Do not step on or drag ropes on the ground unnecessarily. Small particles of dirt will be ground between the inner strands and will slowly cut them.
- Do not allow the rope to contact sharp edges. If the rope must be used over a sharp edge, pad the edge for protection.
- Keep the rope as dry as possible. Should the rope become wet, hang it in large loops off the ground to dry.
- Never dry a rope with high heat or in direct sunlight.
- Never leave a rope knotted or tightly stretched for longer than necessary.
- Do not mark ropes with paints or allow them to com in contact with oils or petroleum products.
- Washed periodically to remove dirt/grit and rinsed toughly.
- Store ropes loosely coiled and hung on wooden pegs or placed in a rope bag and stored on a shelf in a relatively cool area with low humidity.
- Each rope should have a rope log, DA Form 5452-R, which is also a safety record (see TC 3-97.61 Chapter 4, Figure 4-1)

Inspection

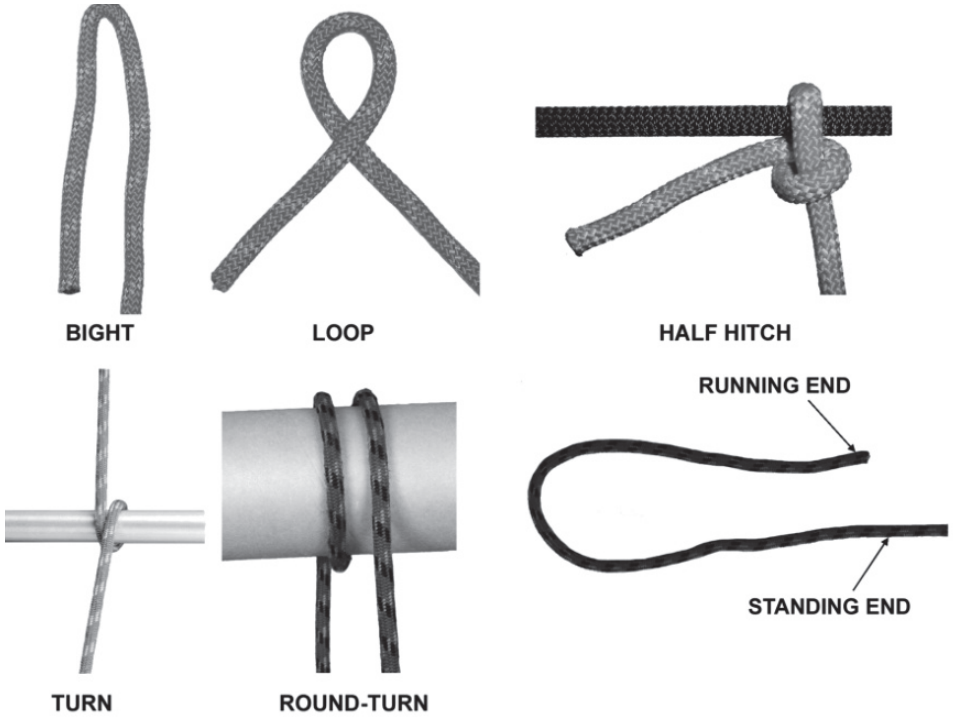
- Check rope before and after use for lumps, flat spots, and localized reduction in the diameter of the rope. This indicates damage to the kern (core)

- Verify suspected damage to kern by placing rope under tension, the weight of one person standing on a prusik is sufficient. If a noticeable difference in diameter is noted, annotate in the rope's DA Form 5452-R and retire the rope immediately.

- Inspect mantle (sheath) for signs of abrasion or cuts. If kern is exposed isolate section within a fixed loop of a knot or shorten the rope by cutting out the damaged section.

Terminology

- **Bite**
  - A simple bend of the rope in which the rope does not cross itself.
- **Loop**
  - A bend of a rope that does cross itself.
- **Half Hitch**
  - A loop that runs around an object to lock or secure itself.
- **Turn**
  - Wraps around an object to provide 360-degree contact.
- **Round Turn**
  - Wraps around an object one and one-half times.
- **Running End**
  - The loose or working end of a rope.
- **Standing Part**
  - The static, stationary, or nonworking end of the rope.
- **Lay**
  - The direction of twist used in construction of the rope.
- **Pigtail**
  - The portion of the running end of the rope between the safety knot and the end of the rope.
- **Dress**
  - The proper arrangement of all the knot parts, removing unnecessary kinks, twists, and slack so that all rope parts of the knot make contact.

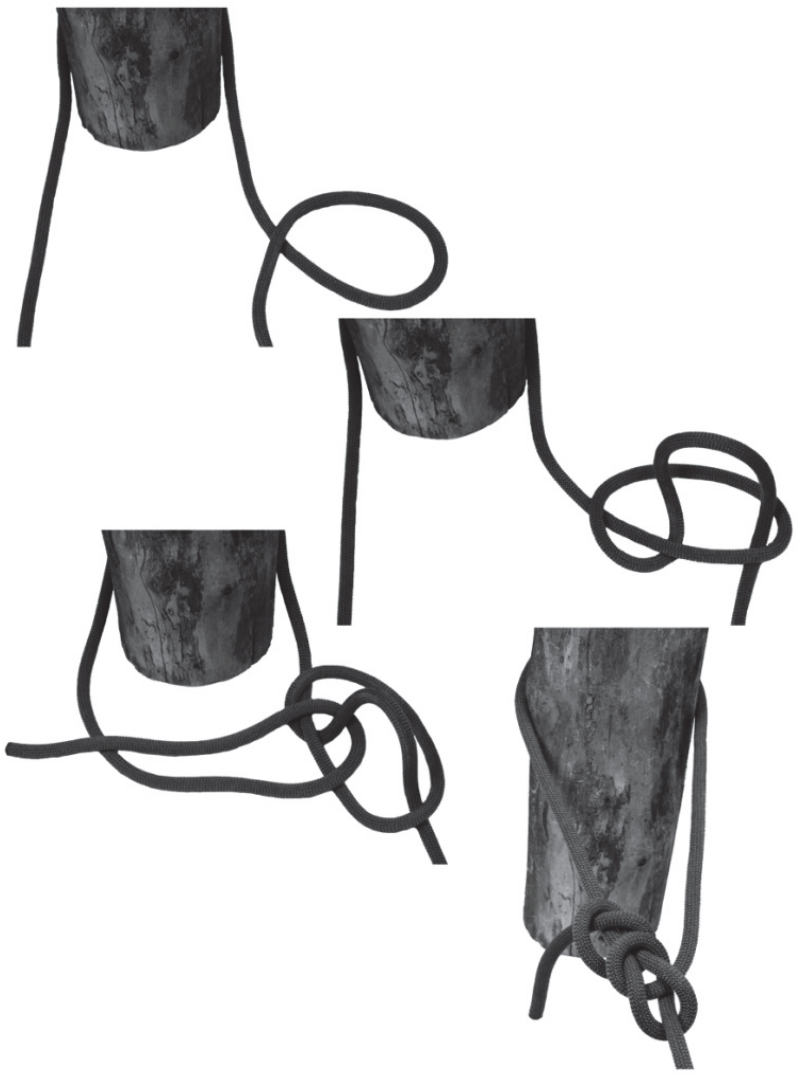


Knots

- Bowline
- Clove Hitch
- Girth Hitch
- Munter Hitch
- Auto Block

Knots: Bowline

The bowline is used to tie the end of a rope around an anchor. It may also be used to tie a single fixed
loop in the end of a rope. It is an anchor knot.



- Bring the working end of the rope around the anchor, from right to left (as the climber faces the anchor).
- From an overhand loop in the standing part of the rope (on the climber's right) toward the anchor.
- Reach through the loop and pull up a bite.
- Place the working end of the rope (on the climbers left) through the bite and bring it back onto itself. Dress and set the knot.
- Form an overhand knot with the tail from the bite.

Knots: Clove Hitch

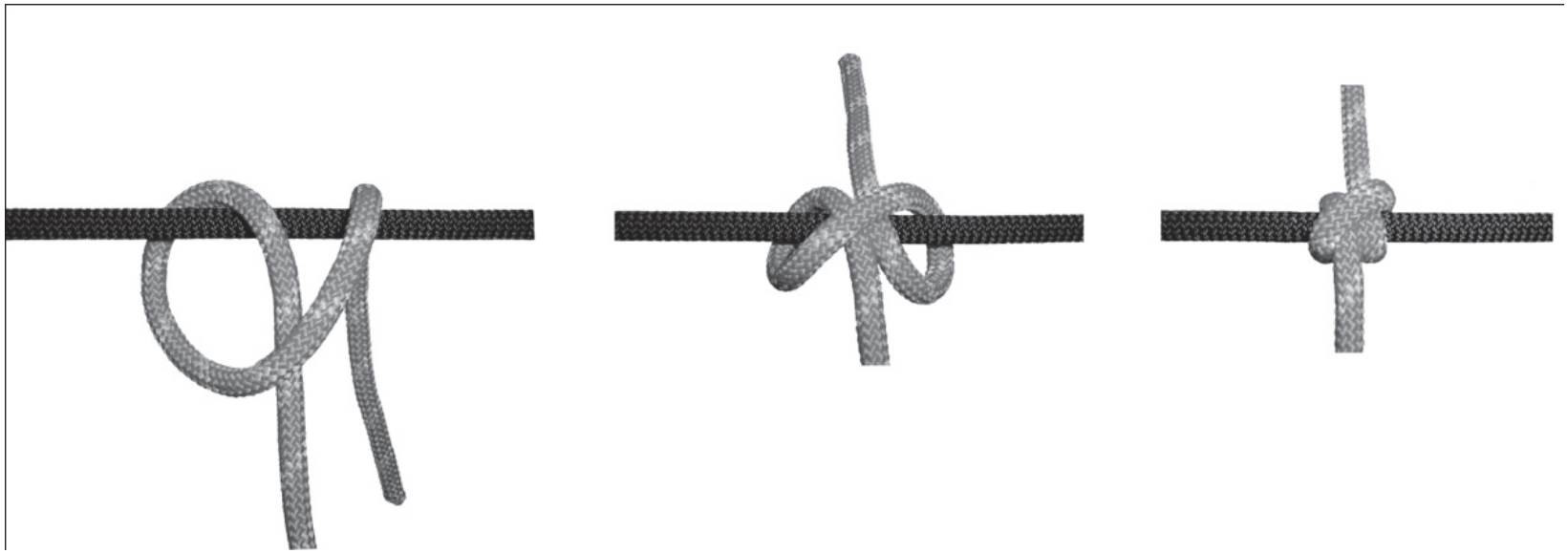
The clove hitch is an anchor knot that can be used in the middle of the rope as well as at the end. The knot must have constant tension on it once tied to prevent slipping. It can be used as either an anchor or middle-of-the-rope knot, depending on how it is tied.

Middle of the Rope

- Hold rope in both hands, palms down with hands together. Slide the left hand to the left 8 to 10 inches .
- Form a loop away from and back toward the right.
- Slide the right hand 8 to 10 inches to the right. Form a loop inward and back to the left hand.
- Place the left loop on top of the right loop. Place both loops over the anchor and pull both ends of the rope in opposite directions. The knot is tied.

End of the Rope.

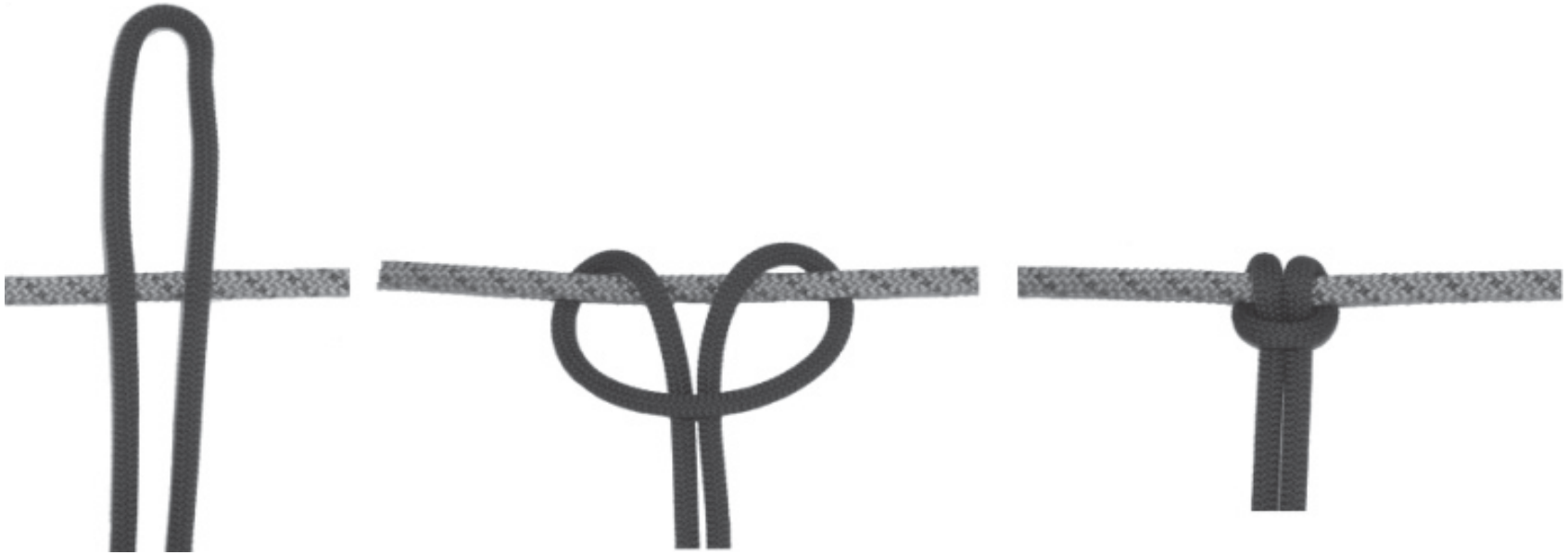
- Place 30 inches of rope over the top of the anchor. Hold the standing end in the left hand. With the right hand, reach under the horizontal anchor, grasp the working end, and bring it inward.
- Place the working end of the rope over the standing end (to form a loop). Hold the loop in the left hand. Place the working end over the anchor 8 to 10 inches to the left of the loop.
- With the right hand, reach down to the left-hand side of the loop under the anchor. Grasp the working end of the rope. Bring the working end up and outward.
- Dress and set the knot.



Knots: Girth Hitch

The girth hitch is used to attach a runner to an anchor or piece of equipment. It is a special-purpose knot.

- Form a bight.
- Bring the runner back through the bight.
- Cinch the knot tightly.



Knots: Munter Hitch

The munter hitch, when used in conjunction with a pear-shaped locking carabiner, is used to form a mechanical belay.

- Hold the rope in both hands, palms down about 12 inches apart.
- With the right hand, form a loop away from the body toward the left hand. Hold the loop with the left hand.
- With the right hand, place the rope that comes from the bottom of the loop over the top of the loop.
- Place the bight that has just been formed around the rope into the pear-shaped carabiner. Lock the locking mechanism.

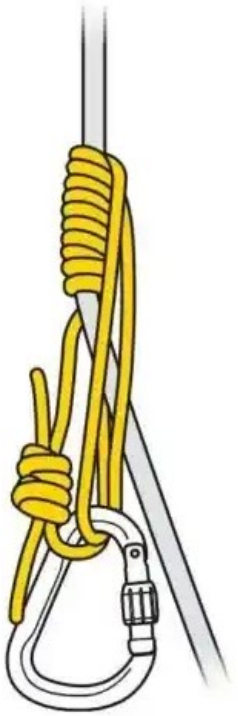


Knots: Autoblock

The Autoblock knot provides a moveable, easily adjustable, high-tension knot capable of holding loads while being pulled tight. It is a special-purpose knot.

- Using cordelette tied in a continuous loop or pre-sewn runner offset top bite from the knot/pre-sewn tab by 12 inches. With the ends offset, lay the bight over a horizontal rope.
- Wrap the tails of the utility rope around the horizontal rope back toward the direction of pull. Wrap at least four complete turns.
- Secure both bites of the rope in a locking carabiner.
- Dress the knot down tightly so that all wraps are touching.





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Questions?

