

# Chapter 13

## Rope Use and Care

### 13.1 Types of Ropes

There are two basic types of climbing ropes used by the USAP: climbing (dynamic) ropes and static (non-stretch) ropes.

- Climbing ropes are carefully designed and constructed to balance such factors as rope stretch, impact force transmitted to the climber, and abrasion resistance with the goal of producing a rope that minimizes the chance of injury to a falling climber or glacier traveler.
- Static ropes are designed primarily to minimize stretching under working loads. These ropes are useful for rescue and fixed safety line applications, or where rappelling or prussiking are expected, because they eliminate bouncing. Static lines should not be used as safety lines when working in crevassed areas because these ropes transmit large impact loads on a falling victim and the anchor.

Ropes will be identified for you at issue and are easy to tell apart once you know the difference. Use only the correct rope for your intended application or injury may result. In general, all safety ropes will be climbing (dynamic) ropes.

## 13.2 Rope Care

It's important to treat your ropes as safety devices, as peoples' lives may depend on them.

Ropes are designed to be as durable as possible, but they are nevertheless susceptible to damage from a variety of sources. The biggest causes of damage to ropes are abuse, chemical contamination, and degradation due to ultraviolet light exposure.

Never step on a rope. When dirt or grit is worked into the sheath, it will invisibly abrade the core. Never tow anything behind a vehicle with your climbing (safety) ropes or subject them to repeated high impact loads, such as long practice falls.

When using your ropes around vehicles and people wearing crampons, be careful not to damage the ropes. These ropes have a self-healing sheath which hides damage to the core. As the core accounts for 80% of the strength of the rope, this could be very dangerous.

Chemicals can severely weaken a rope without leaving obvious signs. Battery acid and solvents are a particular problem. Even the vapors from these chemicals can weaken a rope. Damage from ultraviolet light is easier to detect, but no less serious. Ropes should be stored in a stuff sack or pack when not in use.

Both climbing and static ropes should last for several field seasons if they are well cared for and protected from damage. If one of your ropes becomes damaged or

suspect, remove it from service and mark it with a tag explaining the problem.

If replacement ropes are not readily available and the damage is localized, you can isolate the damaged section of the rope with a Figure-8 or butterfly knot, with the bad section in the resulting loop. However, this is a stopgap measure and will greatly complicate a crevasse rescue should one become necessary.

When in doubt about a rope's condition, be conservative - the life you save may be your own.

### **13.3 Knots**

Diagrams of some basic knots used for safe crevasse travel are on the following three pages (figures 13-1, 13-2, 13-3). See Chapter 18: "Glacier Travel and Crevasse Rescue" for more details on when to specifically use each of these knots.

Note: Both the Muentzer Hitch and the Clove Hitch are usually tied in the middle (of the rope) without accessing either end of the rope. This is not intuitively obvious in the following illustrations.

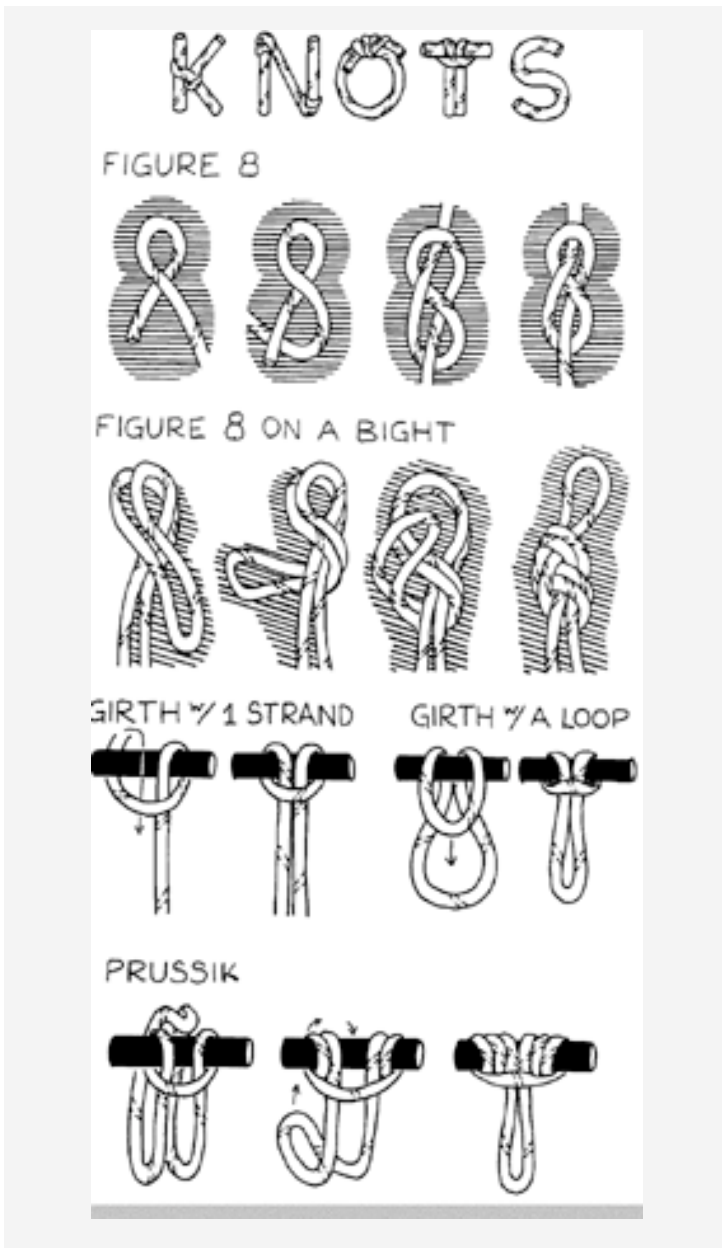
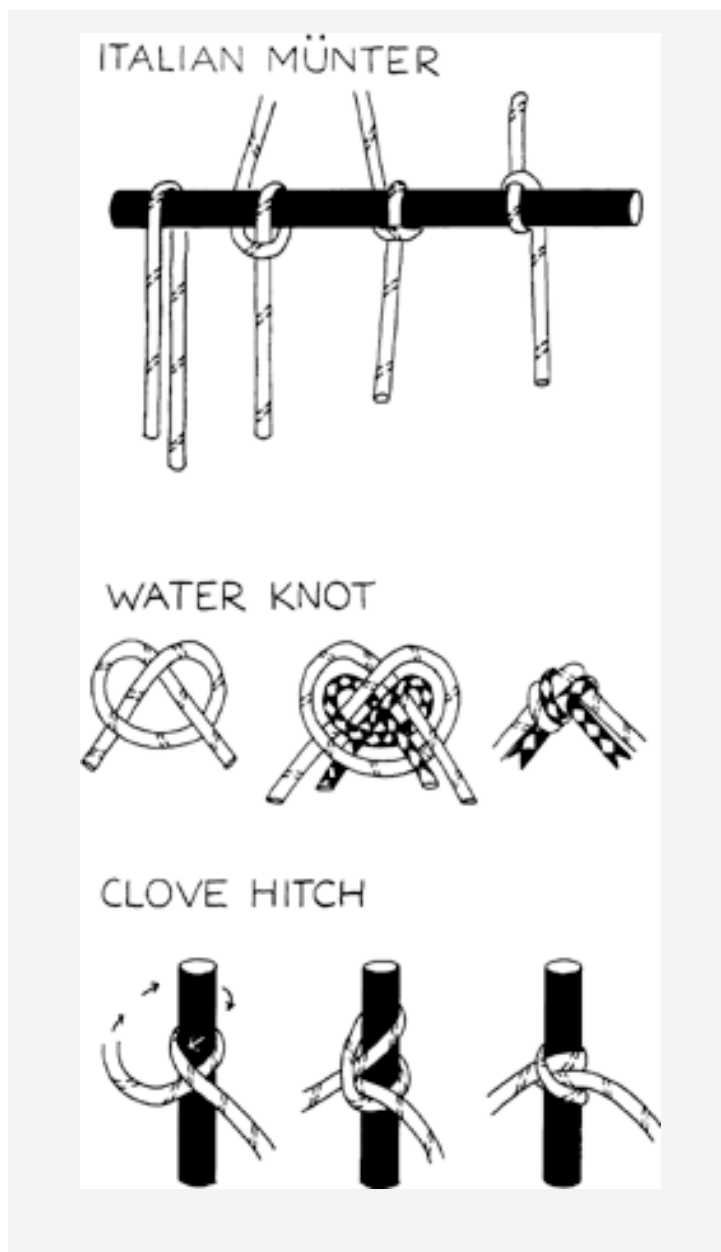
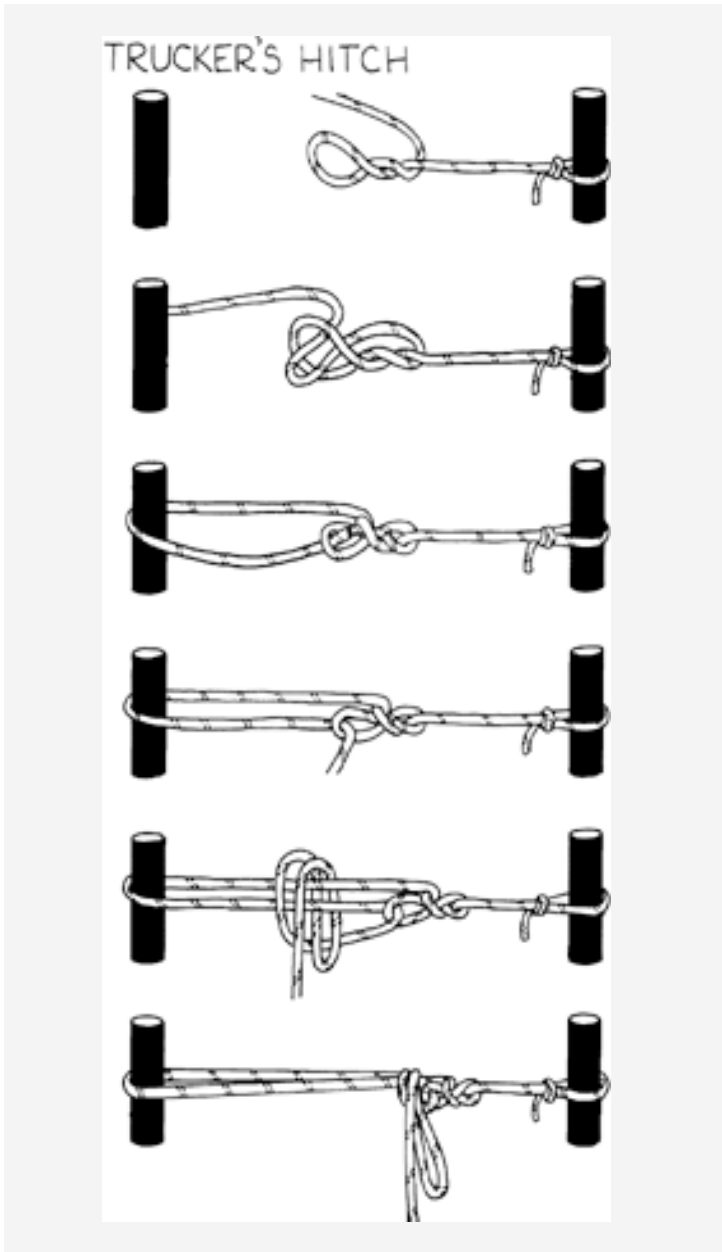


Figure 13-1: Figure 8, Girth and Prussik knots.



*Figure 13-2: Italian Munter, Water and Clove Hitch knots.*



*Figure 13-3: Trucker's Hitch.*