



Department of the Treasury
Federal Law Enforcement Training Center
Glynco, Georgia

Marlinspike Seamanship

Office of Special Training
Driver and Marine Division

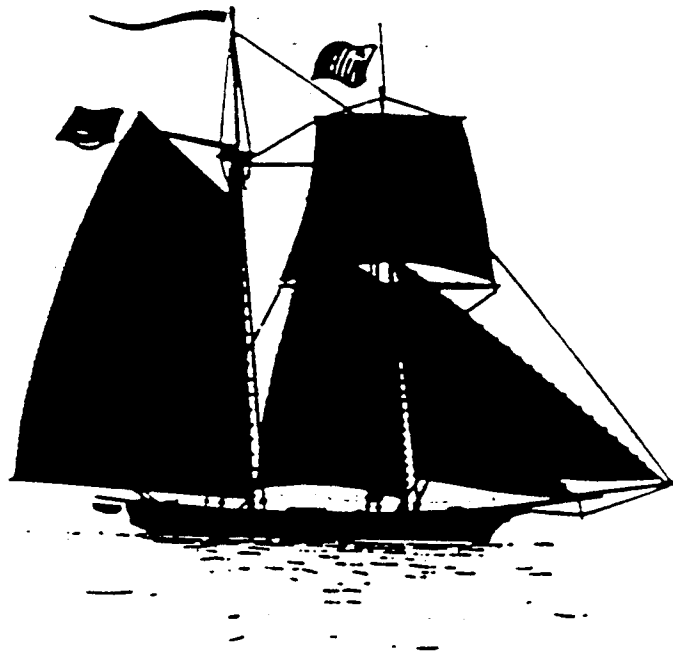
Student Handout

INTRODUCTION

Marlinespike seamanship is the art of handling line and wire rope. This includes tying knots and splicing. We will discuss different types of line and their characteristics. In addition, we will discuss knots, bends, hitches, and common uses of lines on boats.

The term "marlinespike seamanship" comes from a tool used by sailors and riggers called a marlinespike (sometimes spelled marline spike or marlingspike). This tool is a pointed metal spike used in splicing line or wire rope. It can also be used to untie knots that are jammed after being under heavy strain. The marlin fish is so named because its snout resembles a marlinespike.

The knowledge and skills of marlinespike seamanship are valuable to have for any boat crewman or skipper. In certain situations, the ability to quickly and effectively handle lines or tie knots could save a life or prevent damage to the boat.

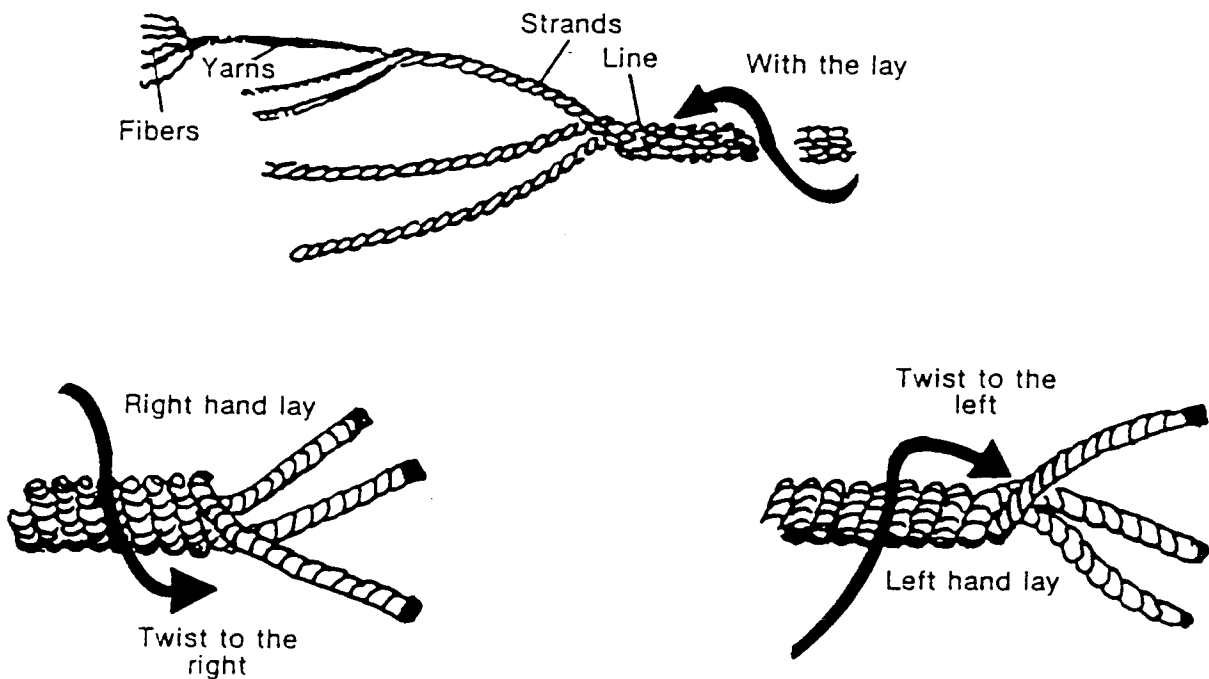


Dacron line is the most resistant to ultraviolet rays. Generally, it will last longer when exposed to the elements. It is, however, relatively expensive. Other types of line work just as well in the marine environment and cost less.

Nylon line is relatively strong. It is resistant to damage from rot and mildew. It is not as slippery as polypropylene and is much more flexible. For this reason it is easy to splice and holds a knot relatively well.

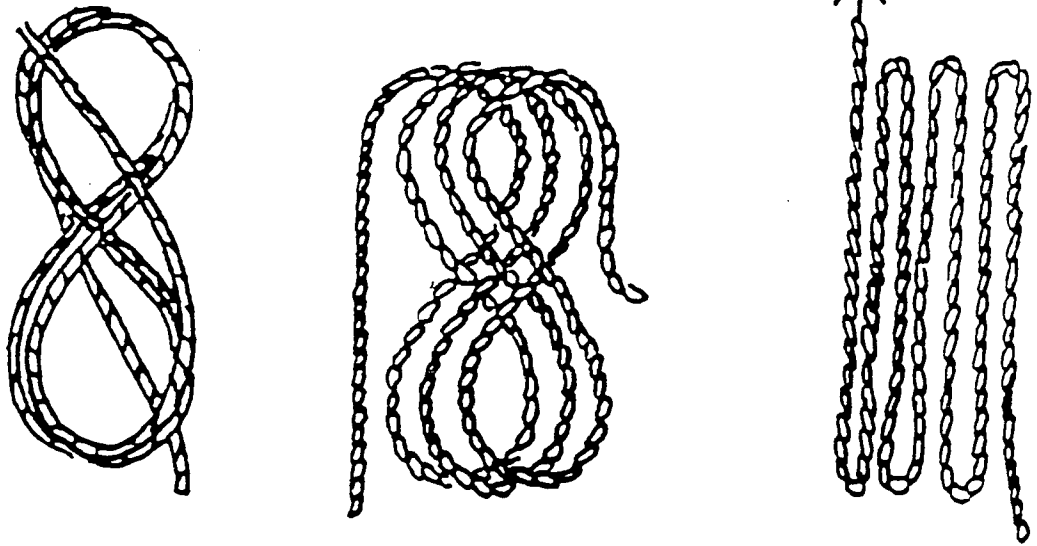
The small fibers used to make line are generally twisted (laid or corded rope) or braided (single or double braided rope) together to make lines of various sizes. Nylon double braided line is relatively strong. It is well suited to use on boats, especially in load bearing situations. It is more expensive than laid or corded line. In addition, it also requires special tools and knowledge to splice double braided line. It is possible to buy double braided line already spliced for specific uses (mooring lines and anchor lines, for example).

If cost is a consideration, stranded nylon line is the second choice for use on boats. It is, probably, the most common type of line found on boats today. It has resiliency and relatively high tensile strength. It is less expensive than both dacron line or nylon double braided line. With minimal care, stranded nylon line should give you years of wear.



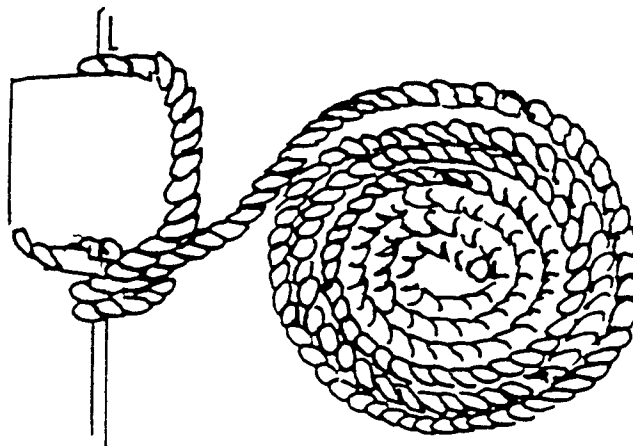
Faking Down

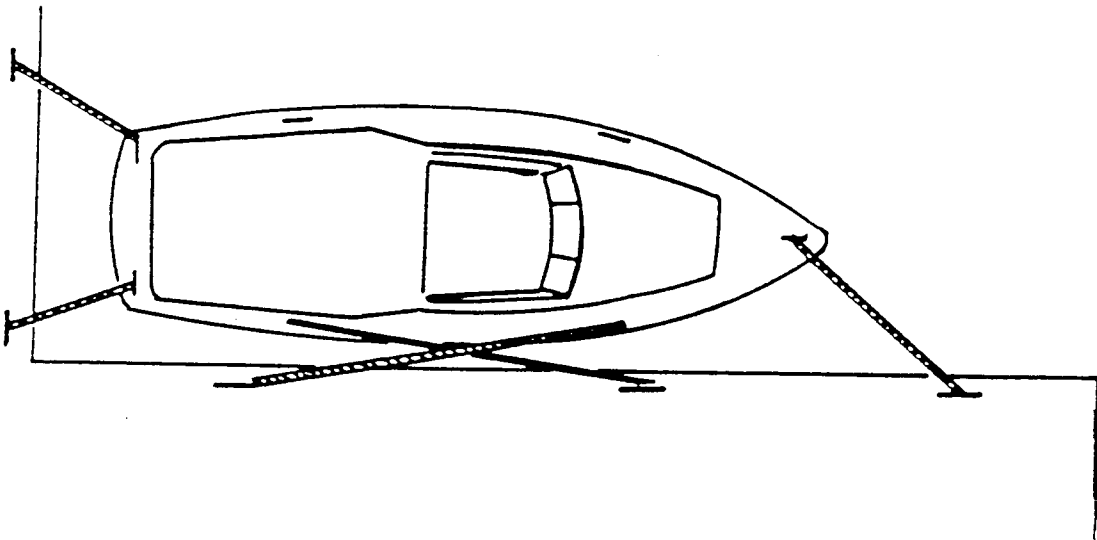
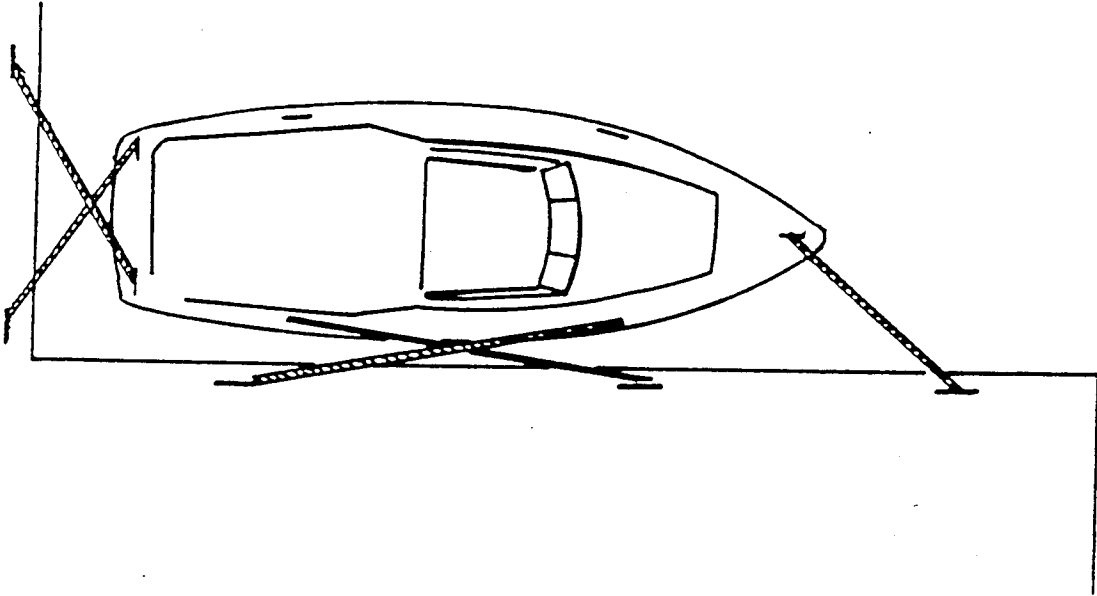
This means laying the line down in long flat bights, each slightly forward of the last instead of in round coils. This is useful for storing either very long or very heavy lines on very large vessels. A figure eight pattern is often used to prevent the line from tangling when it is being run out. This method is recommended for use on small boats when preparing a tow line for immediate use.



Flemishing Down

This method coils the line in a tight spiral mat on the deck. Start your spiral from the bitter end and spiral it out in a clockwise direction. This method is used primarily for decorative purposes. The flush mat of a flemished line does reduce the possibility of trip hazards on the deck or on the dock.





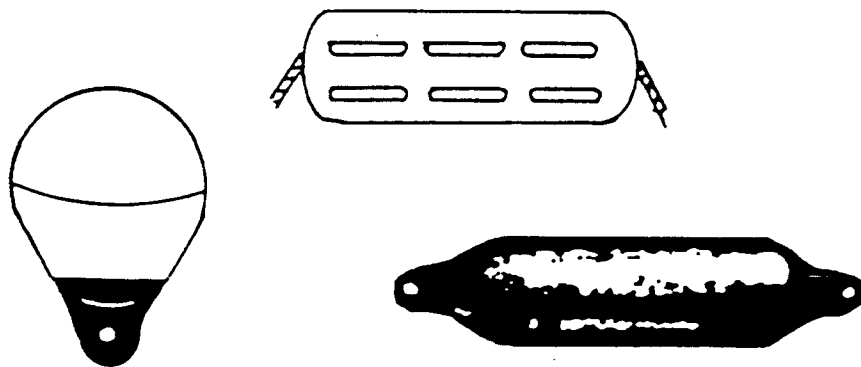
FENDERS

Fenders keep the boat from being damaged from contact with docks, pilings or other boats. There are many different types and sizes of fenders available on the market. One type works as well as the next as long as you have sufficient quantities of the right size for your boat.

Even the slightest movement of a boat as it rises and falls with the tide will mar the hull or rub rails. The boat also surges for and aft with the current. Wind can also the boat to make contact with the pier. Most damage, however, usually occurs from inconsiderate boaters causing a wake as they pass your moorings. Most, if not all, of this damage can be avoided with properly placed fenders.

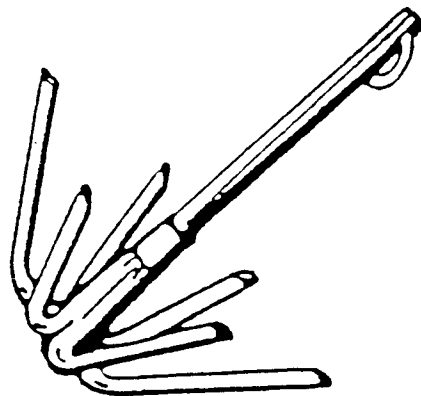
Fenders are made of rubber or a rubber-like plastic. They are filled with air under low pressure to provide shock absorption. They may be tubular or spherical. They have some means of attaching a line to suspend the fender over the side. This may be a grommet hole, padeye, or an axial tube running through its center. Four to six fenders are the average number which should be carried on small boats. More would not hurt, if you have room to store them when underway.

When using fenders, remember to place them at the point where contact is likely to be made. If your mooring next to a low, floating dock, rig the fenders low, near the waterline. If your coming alongside another boat, you probably will want to rig your fenders high along your rub rail. Spread your fenders apart along the side of your boat to provide maximum protection along the hull.

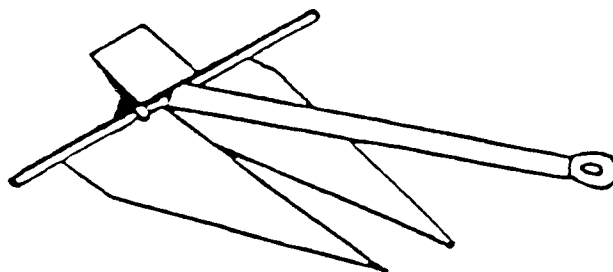


MOORING FENDERS

- c. **Grapnel** - This anchor is sometimes used by commercial fishermen, especially in rocky or coral bottoms. It usually consists of three to five curved prongs symmetrically arranged around the crown end of the shank. When used to anchor in rocky or coral bottoms a trip line must be attached to the crown. A more common use for grapnels, especially in law enforcement, is to grapple for items thrown overboard.



- d. **Danforth Anchor** - This anchor was developed during World War II for use by landing craft during beach assaults. Its light weight and efficient holding power soon made it the most popular anchor among recreational boaters. It stows easily because of its flat profile. Its light weight makes it easy to deploy and recover. The flat crown pieces force the long, wide flukes into soft bottom for maximum holding power. The danforth anchor can also be used in rocky or coral bottom if a trip line is attached to the crown.



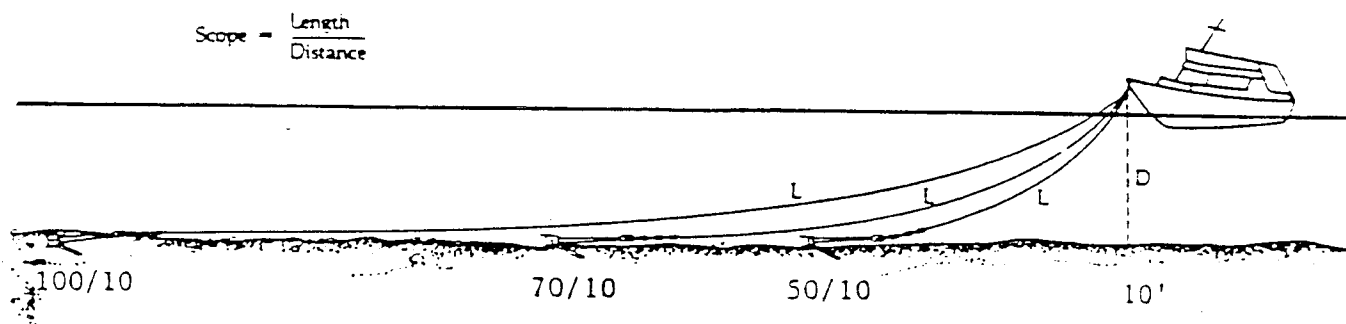
ANCHORING TECHNIQUES

The first step in anchoring is to select an anchorage site. In an emergency situation you may not have the time to select a proper anchorage. In an emergency, the object is to get the anchor down to prevent your boat from drifting into a more hazardous position. For routine anchoring, selecting the right anchorage is critically important.

Shallow, sheltered water is preferred for anchoring. In shallow water, a given amount of scope on the anchor rode will provide better holding power. A shorter scope will reduce the diameter of the circle through which your boat swings when riding at anchor. Other factors you should consider in selecting an anchorage include; the bottom contour, quality of bottom, the tide range, and the presence of hazards. Always consult a chart and verify the water depth with your fathometer prior to anchoring.

Proper scope must be determined prior to setting anchor. To do this add the depth of water at the proposed anchorage site to the distance from the waterline to the cleat securing the anchor line. Add to this sum the anticipated rise of tide, if any. This total represents distance to the bottom. This total is now multiplied by a factor to obtain a suitable ratio of distance to bottom and length of anchor line. Generally, this ratio should be between 5:1 and 10:1, depending on wind and sea conditions.

- a. **Five to one** - This is sometimes called a "lunch hook." This might be considered the minimum safe scope in calm, protected waters. With such a short scope, an anchor watch must be maintained at all times.
- b. **Seven to one** - This would be an adequate scope for use in calm to moderate conditions for an overnight anchorage.
- c. **Ten to one** - For use in heavy weather.



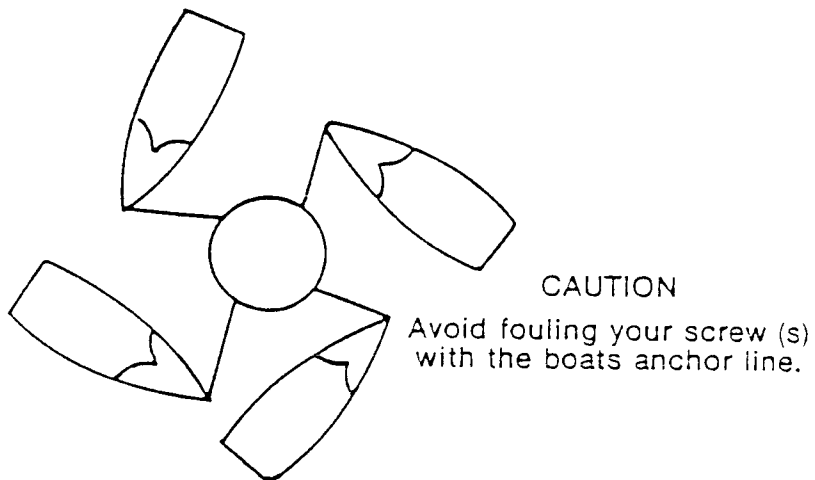
Weighing Anchor

Before weighing anchor, work out a system of hand signals with your crew. The signals will allow the crew member on the bow to relay information about the direction the anchor rode is tending. This is extremely important on larger boats where communication may be more difficult. You should use full arm signals for best visibility.

- a. Arm straight out, fingers extended - The anchor rode is tending in the direction the arm and hand is pointing.
- b. Arm held aloft with fist clenched - Take all way off, stop.
- c. Arm held aloft with fist clenched and thumb extended The anchor is at short stay.

As you prepare to weigh anchor, start your engines. Have a crew member stand at the bow. Slowly apply power to move up the anchor rode. The crew member can unhitch the anchor line from the bow cleat. Have the crew member take up the slack as he can. It is much safer for the boat operator to maneuver the boat up the anchor rode than for a crew member to pull the boat toward the anchor. The crew member must continually give the boat operator hand signals as to where the anchor rode is tending.

When the anchor rode is at short stay (the anchor line tends straight up and down), take all way off. The crew member can make the anchor line fast to the bow cleat. The natural rolling of the boat should be enough to break the anchor free of the bottom. If the anchor fails to break free, come ahead slowly on your engines. This should cause the anchor to trip and break free. If the anchor refuses to break free, run slowly in a circle around the anchor. This action should break the suction on the anchor. In addition, if the anchor was snagged on the bottom, the changing angles of pull as you circle the anchor might pull it free.



- m. **Reeve** - To pass a line through a hole or opening as through a fairlead.
- n. **Rigging** - Lines or wire fitted to masts or spars for control and support.
- o. **Rode** - An anchor line.
- p. **Rope** - The term rope is seldom heard on board boats. It generally refers to new stock in unbroken coils. Once rope is cut and put to use on a boat it becomes line. The term "learn the ropes" is derived from apprentice seaman learning the forty to sixty or so "ropes" found on old sailing ships. (For example, bellrope, manrope, etc.)
- q. **Round turn** - Two rounds of a line around an object.
- r. **Snub** - To quickly check by making fast to a cleat a line that is running out.
- s. **Standing part** - The long, unused, or belayed (secured) end of a line.
- t. **Take a turn** - To pass a line once around an object.
- u. **Turn** - One round of a line around an object.
- v. **Veer** - To pay out or let out a line or chain.
- w. **Working end** - The manipulated end of a line.

FIGURE-EIGHT KNOT

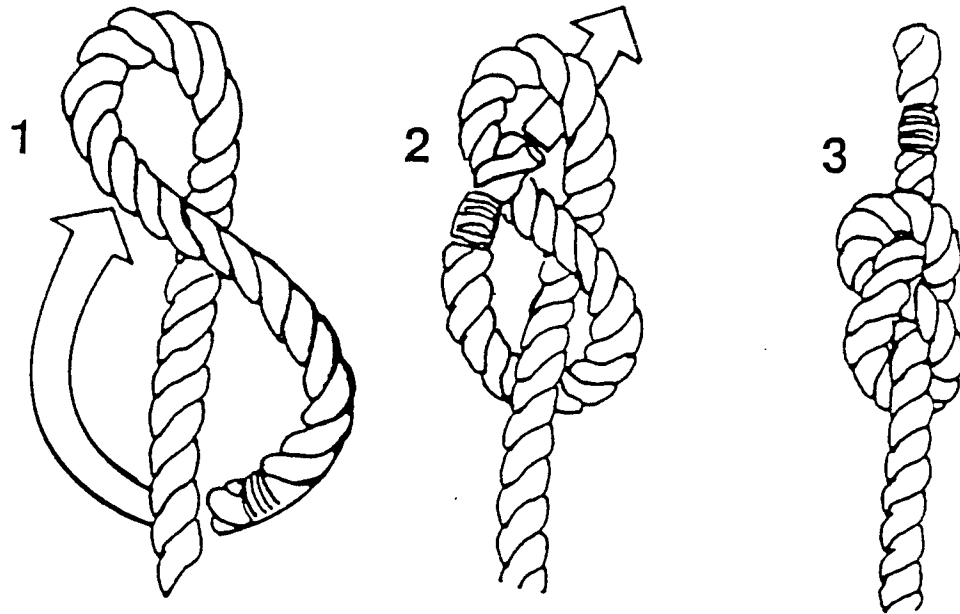


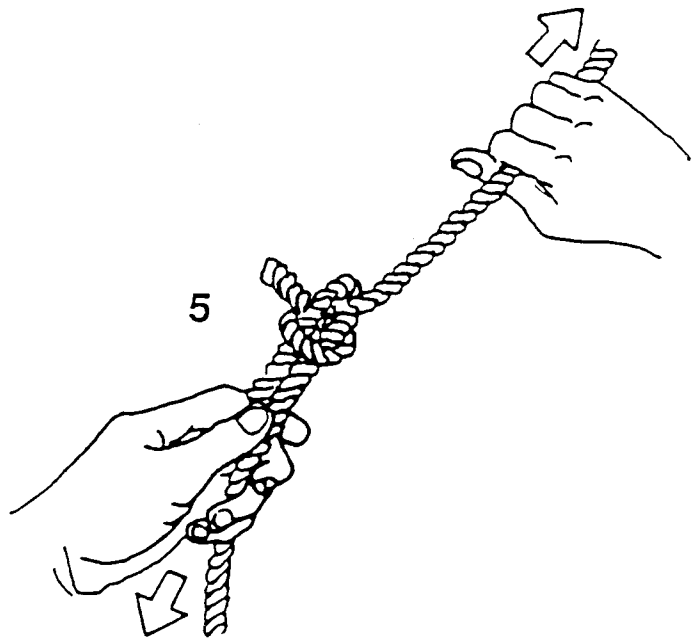
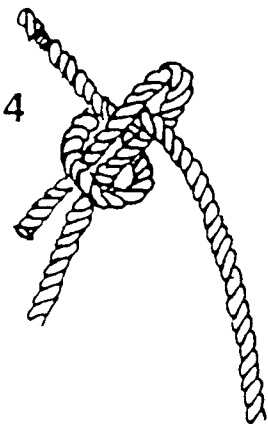
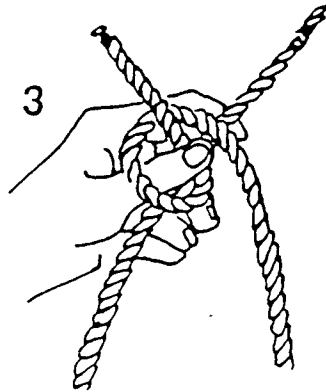
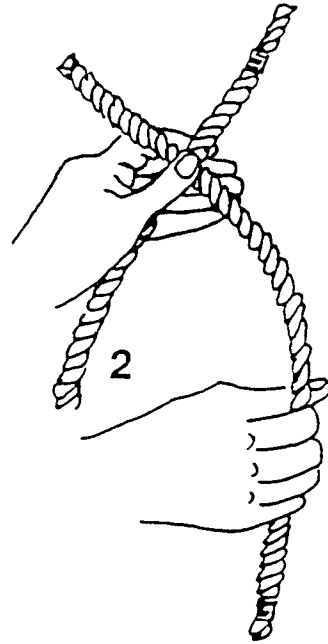
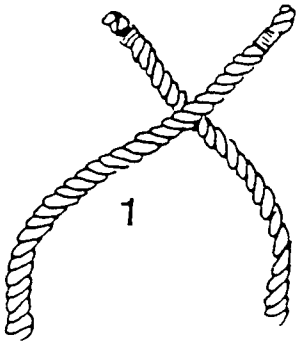
FIGURE-EIGHT KNOT

The figure-eight knot is a stopper knot. It is used whenever you need a temporary stopper in the end of a line. A temporary stopper has two primary functions. The first is to prevent the end of an unwhipped line from unlaying. The second is to prevent the end of a line from running through a block. The figure-eight is not as likely to jam as a simple overhand knot stopper.

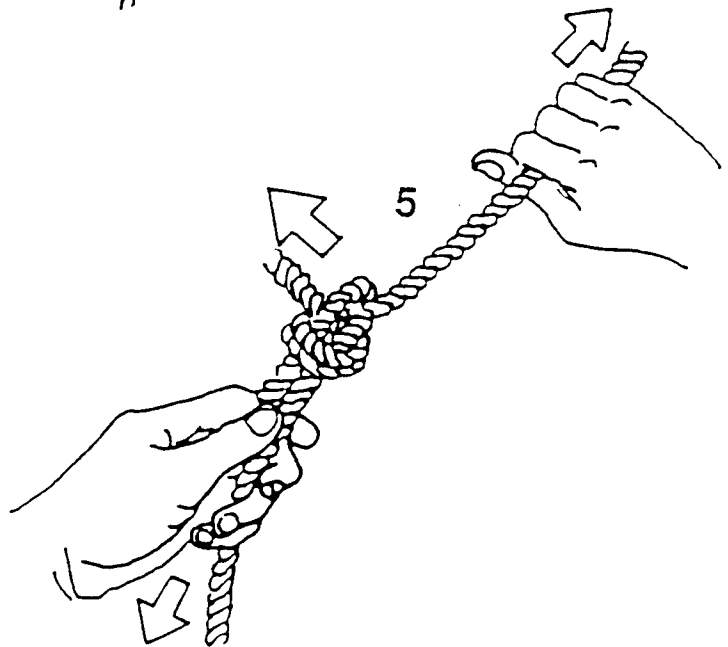
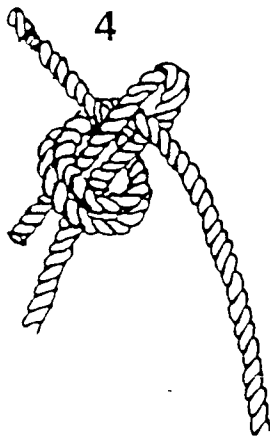
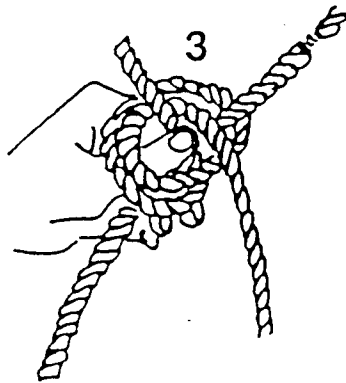
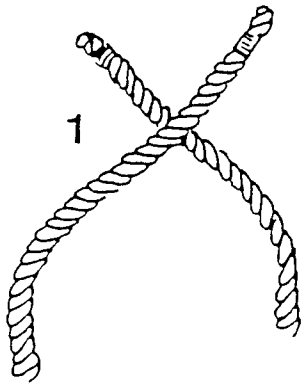
To tie the figure-eight knot:

1. Form an overhand loop in the line. To do this, simply bring the bitter end around and over the standing part. (Figure 1 above.)
2. Pass the bitter end under the standing part and then through the overhand loop. (Figure 2 above.)
3. Draw the knot up tight. (Figure 3 above.)

SHEET BEND



DOUBLE SHEET BEND



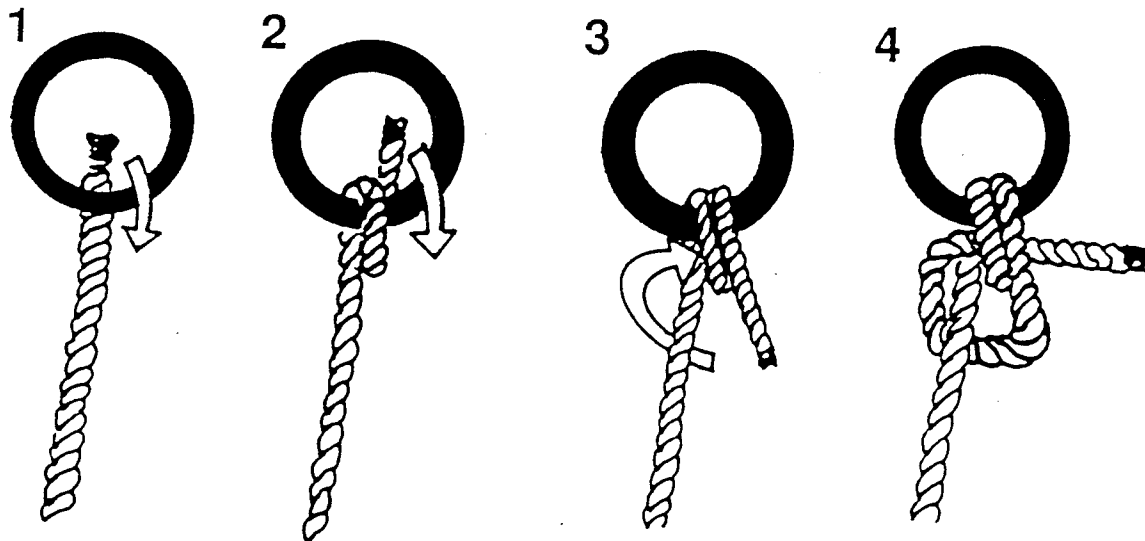
BOWLINE

This knot is the -"**King of Knots.**" This knot is not prone to slipping or jamming when properly tied. In fact the bowline is very unlikely to capsize before the line's breaking point is reached. It is so good, sailor's seldom use any other type of knot to form an eye in the end of a line. In spite of its incredible holding power the bowline can easily be untied. A bowline can be used to hitch a line to an object. Two bowlines can be linked together to form a hawser bend.

To tie the bowline:

1. Hold the bitter end of the line in your right hand. Hold the standing part with your left hand. Leave enough slack between your hands to form the size loop you want.
2. Place the bitter end over the standing part grasping the two parts of the line between your first two fingers and thumb of your right hand. (Figure 1 next page.)
3. Roll the wrist of your right hand away from you.
 - a. Forming an overhand loop in the standing part. (Figure 2 next page.)
 - b. The bitter end is brought up through the center of the loop at the same time the loop is formed. (Figure 3 next page.)
4. Run the bitter end behind and around the standing part and back down through the loop. (Figure 4 next page.)
5. Draw the knot tight as shown. (Figure 5 next page.)

ANCHOR HITCH



ANCHOR HITCH

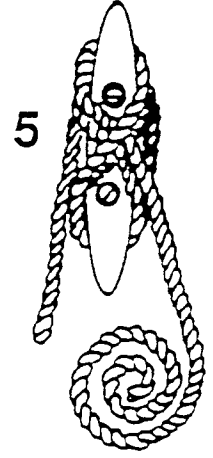
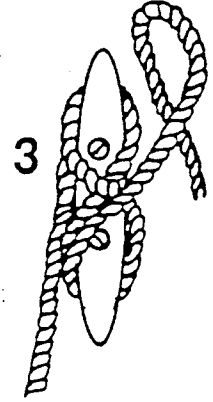
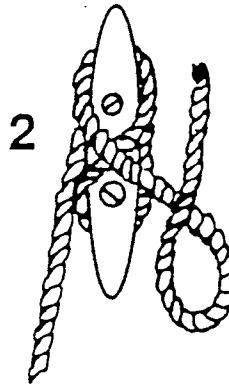
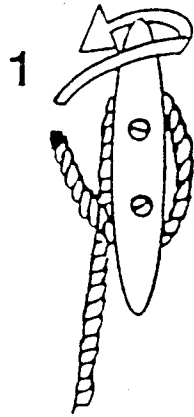
This knot is also called a fisherman's bend or anchor bend. It is used to secure a line to a ring or post. It is a very useful knot for temporarily attaching a line to an anchor.

To tie the anchor hitch:

1. Pass the bitter end of your line through the ring. (Figure 1 above.)
2. Form a loop around the ring. (Figure 2 above.)
3. Pass the bitter end through the ring to form a second loop. (Figure 3 above.)
4. Pass the bitter end around the standing part and through the center of the two previously formed loops. (Figure 4 above.)
5. Pull tight.

NOTE: This knot is usually finished with a half hitch around the standing part to secure the bitter end. (A bowline may be substituted.)

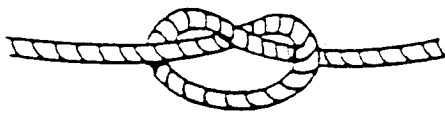
CLEAT BELAY



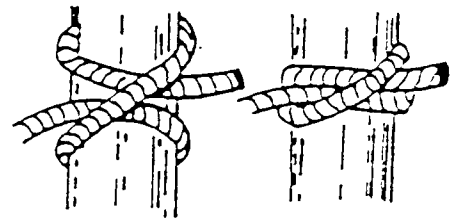
To belay a line to a standard cleat:

1. Take a turn around both lugs of the cleat. (Figure 1 above.)
2. Make a figure-eight around both ears of the cleat. (Figure 2 above.)
3. Make the line fast with a single hitch (half hitch). To do this form an underhanded loop in the bitter end. (Figure 3 above.)
4. Place the underhanded loop over the ear of the cleat and pull tight. (Figure 4 above.)
5. If the cleat is on a dock, flemish the bitter end. This last touch will reduce the potential of having a passerby tripping on the line.

KNOTS



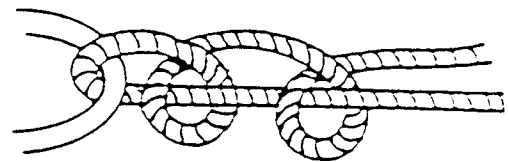
OVERHAND - prevents fraying



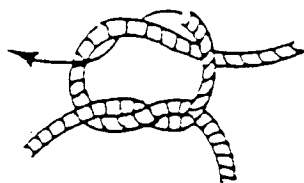
CLOVE HITCH - to secure temporarily to a timber



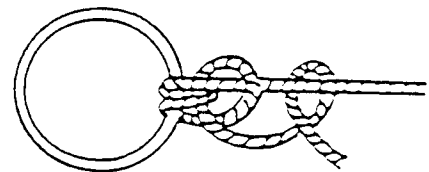
FIGURE 8 - used as "stopper"



TWO HALF HITCHES - securing to a timber



SQUARE - tying together lines of same diameter



ANCHOR BEND - securing to a ring