"Intermediate - Just call me Skipper"

Leaving the Dock

Steering: Sailboats are steered by a rudder. For a rudder to work there needs to be water flow across it. In forward gear the initial water flow is created by the propeller's thrust, so a sailboat will respond very quickly when going forward. However, when in reverse gear, the water thrust is away from the rudder, thus the only water flow over the rudder will be once the sailboat begins to move, so sailboats respond a lot slower when backing up.

Prop walk (Transverse Force): This is the lateral thrust created by a spinning propeller. Looking at the stern of the boat, a right-hand prop will spin clockwise in forward gear. In reverse gear the prop will spin counter-clockwise. The spinning blade will initially "walk" the sailboat to port, because there is not enough water flow over the rudder to counter the effect. Once the boat picks up speed the rudder will take over and the sailboat will straighten up.

When backing out of a slip with a right-hand prop, the easiest way is to make your turn to port. Here the prop walk works for you.

However, if you have no choice but to make your turn to starboard, when backing out of the slip, before putting the sailboat in gear, spin the wheel hard over to starboard, this will help counter the prop walk. Be prepared for the sailboat to slide out of the slip still moving a little to port before the rudder takes over.

Making tight turns: Pivot turn is a technique for turning boat 180 degrees in a narrow channel. This involves shifting from forward to neutral to reverse to neutral several times. The turn has to be done in the direction of the propeller's prop walk when the boat is in reverse gear. Thus, in a sailboat with a right-hand prop, the maneuver is done in a clockwise direction (forward to starboard and reverse to port).

Turn and keep the wheel to starboard.

1. Short burst of forward thrust - Turns bow to starboard.
2. Place in neutral for a short pause.
3. Reverse thrust to generate prop-walk - Turns stern to port.
4. Once backward motion is felt, place in neutral for a short pause.
5. Repeat Steps 1 though 4 until the turn is complete.

Returning to Dock

One of the most difficult aspects of sailing a larger sailboat is docking. Sailboats are heavy and have significant inertia. Reverse gear often does little to slow the boat and will usually swing the stern to one side or another due to prop-walk.

One should become familiar with the rotation point of the boat (usually where the keel is), the turning radius and the glide zone. The glide zone is the distance it takes the boat to stop when the forward thrust is turned off while advancing at the minimum speed to maintain steerage. Approach the dock with a speed no greater than to maintain steerage, usually around one knot, and with fenders and dock lines already in place.

DO NOT DOCK ANY FASTER THAN THE SPEED AT WHICH YOU ARE PREPARED TO HIT SOMETHING!

Low wind conditions*:* It is easier to dock to on the port side if your sailboat has a right-hand prop. Approach the dock straight on, ease into neutral and allow the sailboat to slow down to 1 knot. You can bump in and out of gear to maintain this speed. Once in the slip,

apply reverse gear, this will allow the prop walk to swing the stern of the boat toward the dock and stop forward movement.

NOTE: When docking in windy conditions, often your first approach is not with the intention of even docking, it is just to test the reaction of the boat to the wind and determine the amount of drift you will need to allow for. Back out and try again now that you have seen how much the boat will drift downwind.

Crosswind blowing away from the dock: The sailboat should approach the dock at a 45 degree angle. Once near the dock a quick turn away from the dock is made and the boat is brought alongside, apply reverse to stop the boat. A crew member may have to quickly step off and secure the dock lines or the sailboat may be blown away from the dock.

Crosswind blowing towards the dock: Approach upwind of the dock slowly and let the wind gently blow the boat into the slip while in neutral. In a heavy wind you may need to use reverse thrust to keep the boat from approaching too fast.

Stern wind: Approach the dock straight on, leave the engine in **reverse** in order to keep the speed down to one knot. Once in the slip, increase power (while in reverse) to stop the boat and drop into neutral once the lines are secure.

Bow wind: Approach the dock straight on bumping in and out of forward gear in order to maintain 1 knot. Once in the slip, give a burst of reverse to stop the boat.

High Wind Sailing

The most comfortable sailing is in winds from 5 to 12 knots. Below 5 knots the wind is too light and maneuvering and powering the boat with the sails may become difficult. Above 12 knots (aboard the particular boat you are learning on), the boat may heel excessively and some sail area may have to be taken down or at least the sails depowered and made less efficient to the wind. Sailors normally prevent keel boats from heeling more than 20 degrees, with an optimum heel of 15 degrees. The ability of a sailboat to handle strong winds is also dependent upon design and size. Some large sailboats are designed to sail efficiently and comfortably with winds of 20 to 25 knots.

Excessive heeling of a sailboat has the following negative effects:

- Increase the leeway or lateral drift of the boat with the wind because the keel is no longer vertical.
- Makes the boat harder to steer.
- Slows the boat.
- If a heavy iron keel is present, a heeling error in compass readings may occur.

Learn to anticipate the wind by looking at the water. Puffs (areas of strong wind) and lulls (areas of weak wind) can easily be seen by ripples on the water.

If caught in a storm with high winds it may be safer to stay out at sea than to head into a narrow harbor. If your maximum speed is 7 knots and the currents and waves have a greater speed, then you may be at their mercy as you enter a narrow inlet.

National Weather Service Warnings

- Small Craft Advisory - to 33 knots
- Gale Warning - 34 to 47 Knots

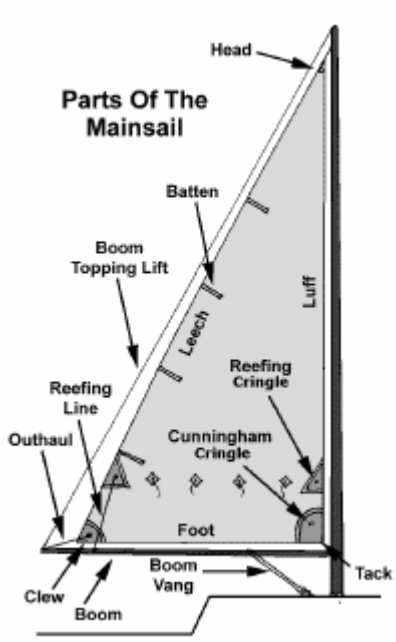
- Storm Warning - 48+ knots
- Hurricane Warning - 64+ knots

Sea and Sailing Conditions

- 0 to 10 knots: Smooth water with small waves. The boat will be easy to handle under full sail.
- 11 to 16 knots: Moderate seas with some white caps. If the boat feels overpowered, consider reefing.
- 17 to 21 knots: Lengthening waves with many white caps and some spray. The boat will be more difficult to manage and you should be reefed in by now, on at least one reef on the main sail and to 100% on the Genoa.
- 22 to 27 knots: Large waves, many white caps and spray. The boat will need at a second reef in the mainsail and 80% on the Genoa. These conditions require considerable sailing experience. Listen to radio weather for small craft advisories.
- 28 to 47 knots. Gale conditions. High waves with white caps and foam. This is a good time to drop all sails fire up the iron genny!

Depowering the sails

The easiest way of handling a sudden gust of wind is to let the mainsail or the jib out. This will immediately spill the wind and remove the force of the wind on the sails. Be careful that the mainsail does not hit the spreader or the side stay. Over a long period of time this may damage the sail.



Another method is to turn into the wind. Regardless of your tack, this will cause wind to spill from your sails and remove the force on your mainsail. However, it will also cause the boat to change course. This method is desirable if one is sailing on a close hauled approach and trying to sail upwind. The closer you point to the wind, the less is the wind pressure on the sail.

If the increase in wind speed is sustained, you can flatten the mainsail, taking out the horizontal curvature which is needed for maximum sailing efficiency. There are three main techniques to do this.

Method One: Set the Cunningham Cringle (grommet), which is found a few inches above the tack (lower front corner) of the mainsail, over a hook found on the forward part of the boom. This shortens the luff (front edge) of the sail, flattens the sail and moves the draft forward.

Method Two: Tighten the outhaul. This method tends to flatten the lower one-third of the sail allowing it to spill wind.

Method Three: Tighten the backstay to create a large vertical curvature in the mast which flattens the upper two thirds of the mainsail. However, if undue tension is placed on the mast by bending it, it may increase the chances of mast failure in a heavy wind situation and demast the boat… not the best thing to happen! Also, on some sailboats due to the nature of their design, the backstay is impossible or extremely difficult to tighten.

Moving the traveler downwind will also help to depower the boat.

Reefing the sails

Golden Rule: If you are thinking about reefing, you should have reefed already!

The best way to judge when to reef is by the degree of heel and weather helm produced by the boat since the ability a vessel to sail in high winds will vary with its size and design. It is always easier to reef in the sails before you leave port and then take out the reef if not needed, than it is to place a reef in high winds.

An increase in wind speed is easy to feel when beating or sailing close-hauled. However, when running with the wind or on a broad reach, the wind may not seem as strong and may increase rapidly in strength before it is noticed. Always have a safety harness handy.

When making a course change from a board or beam reach to a close haul in high wind conditions, it is advisable to reef before making the course change.

When to reef depends upon the size and stability of your boat. You should consider reefing if your boat is heeling excessively or if you are expecting high winds.

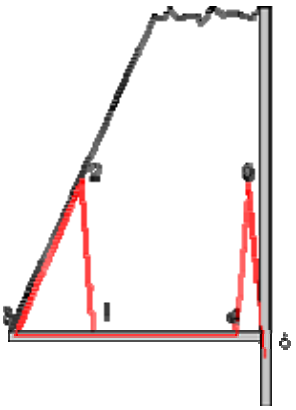
Most large sailboats will have one to three reefing points on the mainsail. These points are reinforced cringles (grommets) on the luff and leech of the sail. The cringles on the sails leech have a line through them which passes through the boom, and down the mast. Some boats might even have the line running all the way to the cockpit. This is called Jiffy Reefing. Jiffy reefing also has the line passing through the cringles on the sail's luff before running to the cockpit. Sailboats rigged with Jiffy Reefing allow the entire sail to be reefed by lowering the main and tightening the reefing line.

Boats without Jiffy Reefing only have the single line to the boom from the leech grommet, and require a crew member to go forward to the boom in order to reef. Make sure the crew member is wearing a harness in adverse conditions.

Steps in Reefing (not Jiffy):

1) Heave to.
2) Loosen the boom vang.
3) Loosen the halyard and carefully lower the mainsail just enough to allow the reefing cringle at the sail's luff to be secured to the boom.
4) Hook the reefing cringle through the reefing hook on the boom. Depending on the sailboat and on which reefing point you are using, you *might* need to allow several of the slides attached to the main to slide out of the track. You would do this by releasing and lowering the sail track stop.
5) Some sailboats might have a reefing hook on the grommet itself with a reefing line attached allowing you to secure it to the boom without having to drop slides out of the mast track.
6) If there is no reefing line or hook, run a piece of line through the reefing grommet and wrap the line around the anterior portion of the boom at the gooseneck, pulling the sail down and forward. Secure with a square knot.
7) Tighten the reefing line which will secure the reefing cringle at the sail's leach, forming a new clew.
8) Tighten the boom vang.

Now secure the reefing lines below the foot of the sail and above the boom. This does not have to be done immediately, choose a time when it is convenient and safe to do so. This will prevent the sail from accumulating water in the rain and flapping in the wind. The lines are tied with a reef or square knot.



These reefing lines should be tied around the bottom of the sail and ABOVE the boom. Tying them around the boom may cause the sail to rip in high winds.

Jiffy Reefing: To reef the mainsail, release the halyard and pull the luff of the sail down with the reef line. When the sail gets down to where you want it, cleat off the halyard and then pull in the reefing line to shorten the leech reefing point. When the leech reef is set, you cleat the reefing line and then tighten the halyard. You still have to go up to tie the reef points, but you can do that when it is convenient. The diagram to the left shows the passage of the reefing line.

In Boom or In Mast Furling system: If your sailboat is fortunate to have an in boom or in mast furling system, then reefing the main is as easy as reefing the headsail, simply roll it in to the desired position.

Headsail Reefing: The jib or headsail can also be reefed. Most boats have a roller furling system which allows the jib to be partially rolled in and thus adjusts the amount of sail. The amount of jib needed depends upon the strength of the wind and the balance of the boat. If only the mainsail is out with no jib, the boat may be very difficult to control and may head forcefully toward the wind - this is called weather helm. A little weather helm is desirable, but not a lot.

If you have no roller furling, you will need to take down the jib and replace it with a storm jib (25%).

In very high wind conditions, you can take down the main completely and sail only with a jib or Genoa. You can set a storm jib, or roll in the Genoa to a comfortable level. However, this will depend upon the balance of your sailboat. As you will effectively be transferring all the wind pressure to the front of the boat, it might become unbalanced. The other disadvantage of sailing on the Genoa only, is that it reduces your ability to point close to the wind. However, in strong winds and gusts having only the Genoa out makes it safer and easier to adjust sail trim.

In a sudden gust of wind you want the boat to turn into the wind to depower.

Rolling the jib is best done in a deep broad reach or running reach. In this point-of-sail, the mainsail masks the jib's wind. This will prevent excess luffing of the sail.

The Roller Furling Line: This is a small line which attaches to the bottom of the forestay of the boat to which the jib is attached. In high winds this line may be difficult to control. As you loosen this line, a high-wind may pull the line through your hands and unintentionally unroll the jib. It is sometimes helpful to place several loops of the line around a winch so the line can be stabilized. Then loosen the jib's sheet and with your hands pull in the jib's furling line.

The same problem exists when unfurling the jib in a high-wind situation. First loosen the furling line by a few feet and then secure it. Then un-furl the jib using the jib's working

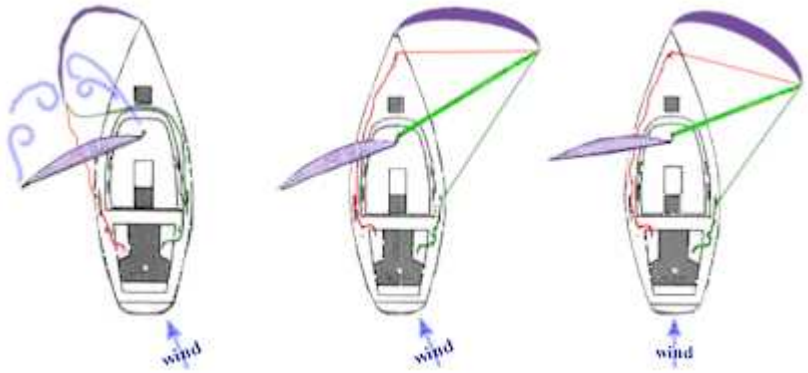
sheet. If you unroll the jib first with the sheet and the wind catches the sail, it may fully unroll the jib and pull the furling line through your hands. Thus, secure the furling line first.

NEVER TIGHTEN THE JIB's FURLING LINE USING A WINCH HANDLE. If the line gets caught on the forestay, this could bring down your rigging and in a high-wind situation and demast the boat.

There should be enough roller furling line to fully furl the jib, wrapping the sheet around it several times, regardless of the tightness of the furl. The jib will typically furl tightly in high wind conditions.

Using a Whisker Pole and running "Wing on Wing"

Whisker Poles are used to "wing-out" the jib when sailing downwind. They extend between the mast and jib sheet at the clew to hold the jib out on the opposite side of the main in clean air, producing a greater degree of control and efficiency than you could possibly achieve without a whisker pole. Sailors who have attempted downwind sailing without a whisker pole can appreciate the value of being able to stabilize the jib, enabling the sail to work more efficiently.



Advantages of Using a Whisker Pole: A whisker pole allows you to control the shape and position of the jib on a downwind run, exposing it to air that is undisturbed by the main sail, thus producing a very noticeable increase in efficiency and boat speed. Sailing wing-on-wing is much easier than handling a spinnaker and takes less people to handle equipment.

Types of Whisker Poles: There are three basic styles of poles to fit almost any boat.

- Fixed length (aluminum or carbon fiber)
- Twist-lock aluminum telescoping
- Line-controlled telescoping (aluminum or carbon fiber)

The fixed length whisker poles are typically used on either small boats (up to 12') or large boats (over 50') and in both cases are sized to a specific headsail. Fixed length poles offer the advantage of increased strength over weight for both small boats that often have class restrictions, weight considerations and a single jib as well as for the long distance cruising boats sailing under downwind conditions.

For the coastal or weekend sailor, the telescoping pole offers the advantage of versatility in use with popular roller furling genoas since the pole can be telescoped to the required length as the wind goes light or in the typical varying conditions. Having the ability to vary the length allows one pole to be used with the roller furling sails or with the different size headsails found in the cruisers sail inventory. These poles are heavier than a fixed length pole but their versatility makes up for their weight.

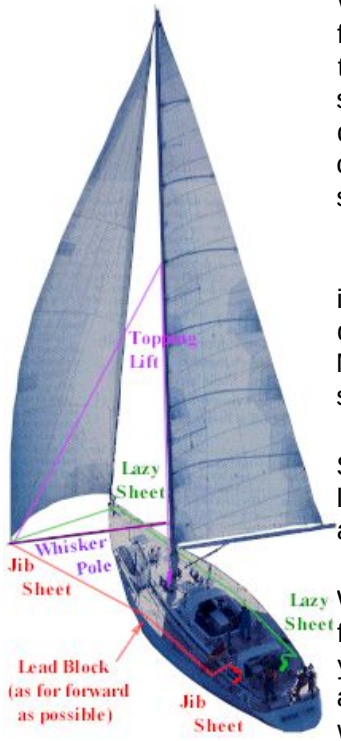
There are two styles of telescoping poles available: twist-lock telescoping and the line-controlled telescoping.

Twist-lock poles are made for boats from 12 to 25 feet and are relatively lightweight. They use an internal off-set cam lock to control their length. All you do is twist the inner tube to unlock, pull the inner tube out to the desired length and then twist again to lock. They are infinitely adjustable from their minimum to their maximum lengths so they can be marked and set exactly to the sails requirement.

Line-controlled telescoping poles are infinitely adjustable and made for boats from 25 to 55 feet. They are a bit heavier because they must take the higher compression loads resulting from larger sails. Line-controlled whisker poles are adjusted to length via a fixed length control line that runs internally and externally for the length of the pole.

By un-cleating this line, you simply pull the line and the pole telescopes. To set the length you then cleat off the line when you've reached the desired length.

Choosing a Whisker Pole: Whisker poles are not to be confused with spinnaker poles that are of fixed length and sized to the boat's "J" dimension. The basic length of a whisker pole should be 100% of the foot length of the sail it is to be used on. For boats carrying a variety of head sail sizes or incorporate roller reefing for the jib, an adjustable whisker pole is ideal.



Whisker poles are designed to operate under higher compressive forces than spinnaker poles. Since tube diameter and wall thickness are a major function of strength, whisker poles must be sized accordingly. The size requirement of the whisker pole depends on boat length, type of sail used and general wind conditions. Additional variables include displacement and bow sprits that extend the basic fore-triangle.

Attachment to the Mast: Mast attachment is critical to insure that the whisker pole can move in the necessary direction without binding under the compression loads. Mast fittings are available in two basic styles: fixed eye or sliding car.

Sliding Car mast fittings allow the mast attachment to be raised or lowered, while fixed eye attachments, the whisker pole remains at a single height on the mast.

When setting the spinnaker pole, attached the one end to the jib first, with the open end of the claw UPWARDS (this is so that when you pull the release it drops easily off the sail). Push out the pole and attach the other end to the mast. Now you can pole out the whisker pole.

Once the whisker pole is set on one side, you can now easy the main sheet and allow the mainsail to run out on the opposite side, hence the term “Wing on Wing”. Make sure your helmsman stays DEAD DOWNWIND, a wondering or mistake could bring the boom crashing across the sailboat causing injury to anyone in its way.

Once the boom has been eased to its desired position, it is imperative that a “**preventer**” is set. This is a device to lock down the boom in its position so that it does not swing across and deck in the case of an accidental change in course.

The easiest way to set a preventer is to unlatch the boom vang from the foot of the mast and hook it onto the toerail forward of the boom, or if your sailboat does not have a toerail then the foot of a stanchion or any other sturdy attachment.

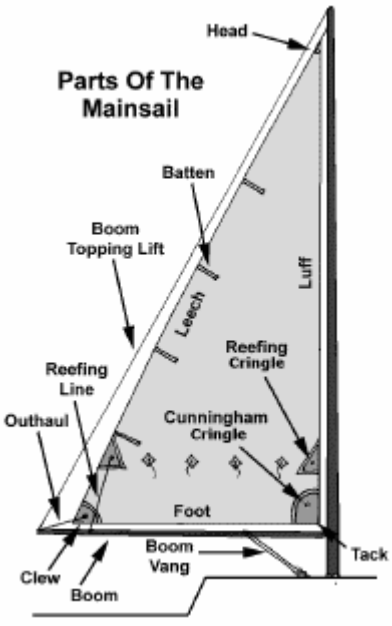
In the case of a boat which has no boom vang, then use a simple piece of line tied from the boom to the shrouds, anything that will prevent the boom from swinging.

Whisker poles are set when the apparent wind angles are such that the mainsail begins to blanket the headsail. This happens at different times on various boats but will always occur whenever you are sailing close to downwind. Wing-on-wing sailing is not an easy point of sail without the use of a whisker pole. The jib tends to drift from side to side; unable to maintain its fullness. However, sailing wing-on-wing is much easier than handling a spinnaker and takes less people to handle equipment.

The most important part of sailing wing-on-wing is to maintain the correct course with wind coming from aft. Even a relatively small deviation from course could backwind either sail and create a problem or even dangerous situation in stronger winds, because both sails are “locked down”. If the jib gets back winded there is a strong chance the whisker pole might break and two pieces of aluminum flying around the sailboat is not a good situation.

Advanced Sail Trim

Main Sail: For maximum efficiency a sail should have a curve, or draft. The larger the draft or curvature of the sail usually creates a more powerful sail. In moderate wind conditions, the draft should be approximately 45% of the way back from the luff (front edge of the sail), much like a wing of an airplane.



However, in stronger winds it may be desirable to flatten the mainsail. Flattening the curvature of the sail will make it less aerodynamic and reduce the "pull" on the leeward side of the sail. This can be done by tightening the backstay (flattens the upper 2/3 of the sail), and by tightening the outhaul of the mainsail (flattens the lower 1/3 of the sail). However, many cruising sailboats have split backstays which are impossible or very difficult to tighten.

Tightening the backstay will bend the top of the mast backward and the mid-portion of the mast forward. This will flatten the upper two thirds of the mainsail and depower the sail. However, this also moves the draft or maximum curvature of the sail aft (toward the stern). Setting the Cunningham will

tighten the sail's luff (front edge of the sail) and move the draft forward and back to its correct position approximately 45% of the way back from the luff (front edge of the sail). To set the Cunningham, loosen the main sail halyard and pull the Cunningham cringle over the reefing hook.

Tightening the outhaul will flatten the foot of the mainsail and depower the sail. Loosening the outhaul will increase the draft of the mainsail and power-up the sail. One must be careful not to cup the sail with too little tension on the foot of the sail by having the outhaul too loose.

Tightening the boom vang will reduce the twist of the mainsail. Loosening the boom vang will tend to twist the sail, causing the superior portion of the sail to be let out in relation to the lower portion. Adjusting the boom vang will compensate for a change in sail shape as the mainsail is let out or eased. It can also be used to compensate for an increase in wind speed and change in apparent wind direction which is present aloft (towards the top of the mast). Twisting of a sail is a fine adjustment which is guided by the behavior of the telltales on the mainsail's leech (back edge of the sail). If the boom is over the water, one may want to first trim the lower part of the mainsail by using the mainsail's sheet, then loosen the boom vang until the aft (top) portion of the mainsail or telltales start to luff then tighten the boom vang until the luffing stops and the telltales are streaming backward.

Once the proper shape of the mainsail has been achieved, any changes in the tension of the boom vang or the mainsail's sheet will change the shape of the sail. The mainsail's sheet not only determines the position of the boom in relationship to the deck but also places a downward pull on the leech (aft or back edge) of the mainsail. If one lets the mainsail out by loosing its sheet, decrease tension on the main's leech may occur, resulting in an undesirable twist of the sail. If one wishes to let out the mainsail with little change in sail shape, the "traveler" should be used. (By also adjusting the mainsail's sheet, the sail can be let out without any change in shape). The traveler is a track with an adjustable car to which the mainsail's sheet is attached. By sliding the traveler's car to port or starboard the position of the boom is changed without changing the length of the mainsail's sheet.

Many beginning sailors will only use the mainsail's sheet to trim the sail. However, for maintaining proper sail shape the mainsail's sheet, traveler and boom vang should all be used. All three lines will change the sail's twist and trim (position from the sailboat's midline) to some degree. When the boom is near midline, being over the sailboat, the traveler can be used to ease or trim the sail and the main's sheet's used to control sail twist. (In this position, the sheet's main pull is downward). As the boom is let out over water, the mainsail's sheet can be used to trim or ease the sail and the boom vang to control sail twist. In this position, the sheet's main pull is horizontal.

The Traveler: The traveler controls the angle of attack for the main. Adjusting the traveler is quicker than adjusting the mainsheet in puffy conditions and it allows for a constant mainsail tension as opposed to using the mainsheet which changes the mainsail tension every time it is adjusted.

> ***Heavy Winds:*** The goal is to keep the boom on centerline till the boat becomes overpowered. As the breeze increases, gradually drop the traveler 2" at a time. Drop means, move it DOWNWIND.
>
> The traveler is usually positioned in the center of the boat unless the boat is extremely overpowered and difficult to hold down. In this condition, easing the traveler down as

much as a foot can help maintain the balance of the boat. Rarely does it help to ease the traveler farther than a foot off of centerline.

Don't ease the traveler to leeward so much that the genoa backwinds the main (wind bouncing off the genoa pushes the main sail back). This may be necessary for a short time to ease helm, but it generally means that you need to depower.

Light Winds: In light winds you want the main sail to have more curve, this is done by easing it. However, easing the mainsheet also allows the boom slack to move downwind and off the centerline. When sailing close hauled you want the boom to be on the centerline, so this is achieved by moving the traveler to windward.

Move the traveler up (WINDWARD). When adjusting the traveler, you almost never want to pull the traveler so much to the wind that the boom angles to windward of centerline. It's tempting to try this when you're looking for more helm in light air, but it usually stalls the main.

Increasing Winds: As wind increases, the tighter you want the main, so trim the main and move the traveler back downwind. If the wind increases too much making the sailboat over powered, dropping the traveler away from the wind will help to depower the main. If instead, the main sheet was used to ease the main, the mainsail then develops more curve and therefore more power, which is not desired, so the traveler helps in this situation, to keep the main flat, but eased off the wind.

The Jib: There are three ways of modifying jib shape.

The first is with the jib sheet. In moderate winds, a rule of thumb is to have the maximum sail draft (deepest part of the curve in the sail) about 45% back from the sail's luff (front edge). One can also ease the jib (or let the jib out) and trim it (pull it in), stopping just as it ceases luffing. It is important not to have the jib too tight or cupped. If this happens, significant power may be lost from not only the jib but also the mainsail.

The second is to move the jib sheet's block (fair lead) aft (towards the stern or back of the boat) or forward. Moving the block aft will place more tension on the foot (bottom edge) of the sail as the jib's sheet is tightened. This will flatten the foot or bottom of the sail and twist the top of the sail, thus, depowering the jib. Moving the bock forward will place more tension on the top of the leech (back edge) as the jib's sheet is tightened. This will result in an increased draft of the jib and untwisting of the sail. This will power up the jib. If the jib luffs at the top of the leech first, the fair lead is to far aft. If the jib luffs at the bottom of the leech first, the fair lead is to far forward.

The third way is to straighten the forestay (or head stay) which the luff (front edge) of the jib is attached to. This will straighten the front of the jib and improve efficiency. This is done by tightening the backstay. One should note that when the backstay is tightened, the mainsail's sheet and boom vang may also have to be adjusted or the mainsail's shape will change.

Notes:

Anchoring

The rode is the line and chain which goes to an anchor. The chain is attached to the anchor and it helps the anchor to lie flat on the bottom. This has three benefits:

1. The chain lies flat on the bottom and increases the horizontal pull on the anchor. This will increase the anchor's holding power.
2. The chain will not chafe as it is pulled across the ocean bottom.
3. The chain acts as a shock absorber as the boat intermittently pulls on the rode, lifting the chain off the sea floor.

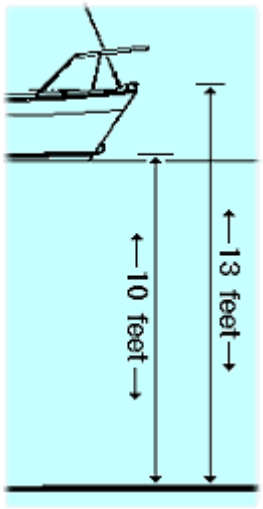
The Anchor Rode: Your rode (that's anchor line!) should be long enough for your expected anchoring conditions. For a 30+ foot boat expecting to anchor in depths up to 25 feet, have at least 10 feet of chain (20 is better) and about 175 feet of no less than ½ inch rode (1 inch is better).

The chain is attached to the anchor and the line using shackles. The screw pin in the shackle has an eye hole through it. The purpose of this is to secure the pin to the shackle with stainless steel wire or ring, so the pin cannot unscrew. THIS IS VITAL and often overlooked by boaters. The strongest anchor and rode in the world is useless if the shackle comes apart.

Run the SS wire through the hole and then around the shackle foot twisting the ends with pliers. Or use a SS ring looped through the eye hole and the shackle.

You won't know how much rode to let out unless it is marked. You can mark sections of the rode by sewing colored thread to it, or using flexible paint or a permanent marker pen. Mark the rode every 20 or 25 feet.

Anchoring: Approach your anchorage and motor in a circle around your intended drop point watching the depth sounder. This is to make sure there are no shoals in the area that you might get hung up on if the wind swings the sailboat around.



Always anchor into the wind (unless the current appears to be stronger than the wind). Once pointed to the wind, shift to neutral and allow the sailboat to coast to a stop. Lower the anchor until you feel it hit bottom. As the wind pushes the sailboat backwards, slowly ease out the rode keeping pace with the speed the wind is pushing the sailboat. If there is no wind, have a crew member slowly back the boat away from the anchor as you pay out the rode.

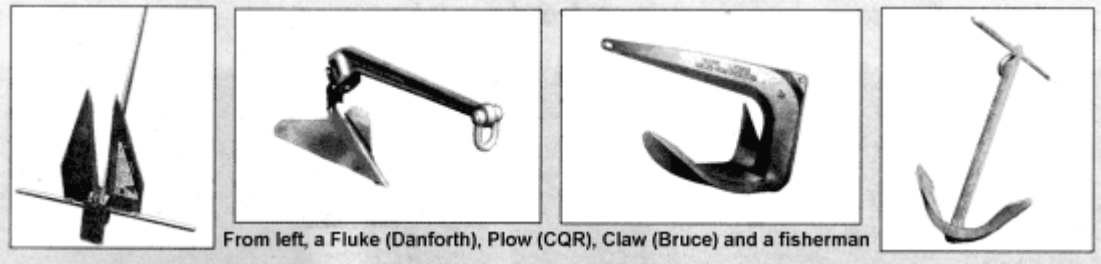
Do not drop all the rode faster than the boat is moving as it might fall on top of the anchor and foul it which will prevent the anchor from holding. If you let out too much rode too soon it can wrap the keel.

Let out enough rode to allow a 7 to 1 scope. That is 7 feet of rode for every 1 foot of distance between the sea floor and the boat – be sure to include the distance from the water surface to your bow roller in your calculation. Thus if you are in 10 feet of water, and the distance from the water surface to your bow roller is 3 feet you need to multiply 13 feet by 7 meaning you need 90 feet of rode. Also check the tide charts, anchoring in 7 feet of water at low tide means that you might be in 11 feet of water at high tide meaning an additional 30 feet of rode!

As you let out the rode the sailboat will tend to swing sideways to the wind, you can prevent this by keeping a little tension on the rode by wrapping it once around a cleat and paying it out slowly.

Once you have reached your 7:1 ratio cleat off the anchor and place the sailboat in reverse at 1000 rpm, slowly increasing to 2000 rpm. Watch your GPS and make sure that your speed is 0.0 knots. It might drift up to 0.4 kts or 0.7 kts as the boat swings a little, make sure it always returns to 0.0 kts. YOU'RE HOOKED! But set the anchor alarm anyway for good measure.

Types of Anchors


From left, a Fluke (Danforth), Plow (CQR), Claw (Bruce) and a fisherman

Danforth anchors: The lightweight anchor, such as the Danforth or Fortress, is a burying anchor with wide sharp flukes and a stock. It holds very well under high loads in mud and sand but may be difficult to set in clay, grass, weeds, rock or shell bottoms. You may want to consider a lightweight as a secondary working anchor or a lunch hook. It requires more scope than other anchors and can be stored flat on deck, or from a rail.

Plow anchors: The Plow (or CQR) anchor is a burying anchor that has a hinged shank to keep it from breaking out if the boat swings to one side. It holds well under large loads and in most bottoms, although it can be difficult to set in grass or weeds. It can be stored on a bow roller.

Bruce anchors: The Bruce is a claw-like burying anchor that sets quickly and resists breaking out without resetting if the wind or tide changes. Bruce anchors are good for crowded anchorages since it holds well at short scope and in most bottoms, including sand and rock. It sometimes grabs loose rock and fails to set and can drag under very high loads. In very silty soft bottoms it can also drag under very high wind conditions as it does not bury itself as deep as a plow. It can be stored on the bow roller.

Fisherman or Kedge: The oldest style anchor dating back hundreds of years is now considered obsolete and is not recommended.

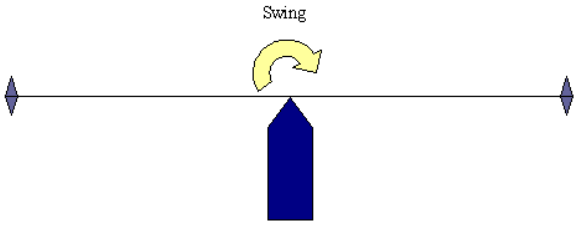
Others: There are other types of anchors such as Grapnel, Mushroom and Hall, however, these are designed for smaller fishing type vessels and are not recommended for sailboats.

Anchoring Techniques

Ketch Anchoring: If you are really concerned about your holding, especially in high wind conditions, ketch anchoring increases your holding power 10 fold.

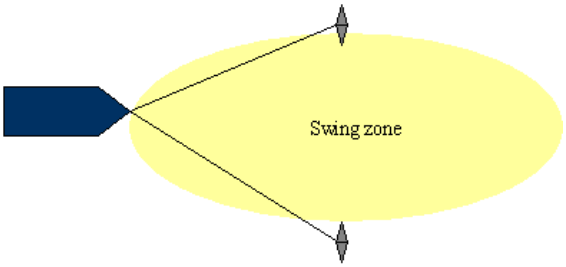
Disconnect your lunch hook (Danforth) from its rode, leaving the chain on. Attach the bitter end (loose end) of the chain to the front part of your main anchor. Drop the Danforth, feed out the chain and then drop you main anchor. This does not double the hold power; it increases it by 10 times!

Bahamian Style Anchoring: Used when you are in tight quarters and do not want to swing much. Set two anchors at 180 degrees.



Drop the first anchor, fall back letting out double the length of rode you need. Drop the second anchor. Pull in on the first anchor taking in half the rode while paying out rode on the second anchor. You should now be pointing to the wind facing the first anchor, while the second rode should be hanging with enough slack on the bottom of the seabed so that your keel will not get caught on it as the boat swings. Use your largest anchor to the seaward side if anchoring near land, so your strongest anchor will be primary if the wind is blowing toward land.

45 Degree Two Anchor System: Similar to Bahamian style, this is also used to reduce swing, especially if you are expecting high winds. Drop one anchor, fall back and then power up motoring at a 45 degree angle until you are level with the first anchor. Drop the second anchor and fall back until you have the same length of rode out on each anchor. Be sure NOT to foul the first anchor line around your prop while motoring to the second anchor position.



Notes:

VHF Marine Radio Procedures

The standard procedure for a non-emergency call such as calling another vessel, marina, or restaurant to ask where to tie up for dinner, is as follows.

1. Call the vessel, marina or restaurant on channel 16 in the following manner.
2. Name of station being called, spoken three times, for example: “Sailfish, Sailfish, Sailfish” where the vessel you are calling is called Sailfish.
3. The words "This is the sailing vessel {name of your boat, such as Windsong}", spoken once, followed by “Do you copy? Over.”
4. Then you wait for the station being called to answer. Their answer should be in the same manner as your call.
5. Once answered you should suggest a specific working channel to carry on your conversation. “Sailfish, go to channel 72, channel seven-two, over”.
6. Wait for reply or confirmation from the station being called, and then switch to the working channel. “This is Windsong on 72.”
7. Once finished you discussion go back to channel 16 after saying: “Windsong, going back to One Six (16).”
8. If you are asked to wait on the channel for the other party to come back to you, say “Windsong, standing by on 72”.

Emergency calls on Channel 16.

Distress: "MAYDAY, MAYDAY, MAYDAY." This is the International Distress Signal and is an imperative call for assistance. It is used only when a life or vessel is in immediate danger.

Urgency: "PAN-PAN, PAN-PAN, PAN-PAN" (PAHN PAHN). This in the International Urgency Signal and is used when a vessel or person is in some jeopardy of a degree less than would be indicated by Mayday.

Safety: "SECURITY, SECURITY, SECURITY" (SA-CURE-I-TAY). This is the International Safety Signal and is a message about some aspect of navigational safety or a weather warning.

"MAYDAY" is to be used ONLY in an emergency in which the boat and/or persons on board are in **imminent danger** of sinking or major injury or death. You may only have seconds to send a distress call. Transmit in this order:

1. Tune radio to Channel 16.
2. Distress signal "MAYDAY", spoken **three times**.
3. The words "THIS IS" followed by your vessel type and name. (This is sailing vessel Windsong or fishing trawler Charlie Tuna).
4. Repeat "MAYDAY" and name of vessel, spoken once.
5. Give position of vessel by latitude or longitude or by bearing (true or magnetic, state which) and distance to a well-known landmark such as a navigational aid or small island, or in any terms which will assist a responding station in locating your vessel. Include any information on vessel movement such as course, speed and destination.
6. Nature of distress (sinking, fire, medical, etc.).
7. Kind of assistance desired.
8. Number of persons onboard.

9. Any other information which might facilitate rescue, such as length or tonnage of vessel, number of persons needing medical attention, color hull, cabin, masks, etc.
10. The word "OVER"

Stay by the radio if possible. Even after the message has been received, the Coast Guard can find you more quickly if you can transmit a signal on which a rescue boat or aircraft can home in.

Phonetic Alphabet

Alpha	**E**cho	**I**ndia	**M**ike	**Q**uebec	**U**niform	**Y**ankee
Bravo	**F**oxtrot	**J**uliette	**N**ovember	**R**omeo	**V**ictor	**Z**ulu
Charlie	**G**olf	**K**ilo	**O**scar	**S**ierra	**W**hiskey	
Delta	**H**otel	**L**ima	**P**apa	**T**ango	**X**-Ray	

Marine VHF Radio channel guide

Channel	Xmit Freq. (MHz)	Rec Freq. (MHz)	Communication Purpose
06	156.300	156.300	Intership safety communications (Mandatory).
09	156.450	156.450	Commercial and non-commercial intership and coast-to-coast (commercial docks, marinas and some clubs); also used by recreational boaters as alternate calling channel. This is also used at some locks and bridges.
12	156.600	156.600	Port Operation, traffic advisory, still being used as channel to work USCG shore stations.
13	156.650	156.650	Navigational, ship's bridge to ship's bridge (1 watt only) Mandatory for ocean vessels, dredges in channels, and large tugs while towing. This is also the primary channel used at locks and bridges.
14	156.700	156.700	Port Operations channel for communications with bridge and lock tenders. Some CG shore stations have this as a working channel.
16	156.800	156.800	**DISTRESS SAFETY AND CALLING** (Mandatory).
22A	157.100	157.100	Primary liaison with USCG vessels and USCG shore stations and for CG information broadcasts.
24	157.250	161.850	Public telephone (Marine Operator); also Channels 25, 27, 84, 85, 86, 87, 88.
26	157.300	161.900	Public telephone, first priority.
28	157.400	162.000	Public telephone, first priority.
65A	156.275	156.275	Port Operations intership and ship-to-coast); also Channels 20A*, 66A, 73, 74, 77*
67	156.375	156.375	Commercial intership all areas, plus non-commercial intership (Puget Sound and Strait of Juan de Fuca). In the Lower Mississippi River, use limited to navigation bridge-to-bridge navigation purposes (1 watt).

68	156.425	156.425	Non-commercial intership and ship-to-ship coast (marinas, yacht clubs, etc.).
69	156.475	156.475	Non-commercial intership and ship-to-coast.
70	156.525	156.525	Distress and Safety Calling and general purpose calling using Digital Selective Calling (DSC) ONLY.
71	156.575	156.575	Non-commercial intership and ship-to-coast.
72	156.625	156.625	Non-commercial intership (2nd priority).
78A	156.925	156.925	Non-commercial intership and ship-to-coast.
79A	156.975	156.975	Commercial intership and ship-to-coast. Non-commercial intership and ship-to-coast.
80A	157.025	157.025	Commercial intership and ship-to-coast. Non-commercial intership on Great Lakes only.
WX-1		162.550	Weather Broadcasts.
WX-2		162.400	Weather Broadcasts.
WX-3		162.475	Weather Broadcasts.
WX-4		162.550	Weather Broadcasts.
WX-5		162.400	Weather Broadcasts. (Tampa Bay Area)
WX-6		162.475	Weather Broadcasts.

Heavy Weather Sailing

Heavy weather can be weather conditions and high winds which cause a boat and crew to depart from their planned track and take evasive action to prevent capsizing and loss of the craft.

Needless to say, the best tactic to deal with heavy weather is to **avoid it**. Before leaving port always consult the weather forecast. A tight time commitment to be some where must come second to not going out in dangerous weather.

The objective of all heavy weather tactics is to avoid knocking down or capsizing the boat. Breaking waves are the dangerous waves and can easily capsize a boat if the height of the wave is equal to or greater than 60% of the length of the boat when hit end on or much smaller if the breaking wave hits the boat on its side.

Boat stability is the ability of the boat to resist capsizing when hit on its side. It should be obvious that one of the major goals of heavy weather tactics is to keep the bow or stern of the boat end-on into the waves. In doing so, boat stability has only a little impact on surviving the storm.

The main factors are length of the boat, longer is better, and the ability of the crew to keep the bow or stern positioned into the wind. A slight increase in wave height can easily overcome boat stability characteristics. Large breaking waves should be avoided at all cost and a skilled crew to maneuver the boat under reduced sails or bare poles is the most important factor to surviving a storm. Thus, active tactics which allow the crew to maneuver the boat away from large breaking waves are preferable to passive tactics which invite knockdowns or the possibility of being capsized.

Active Tactics

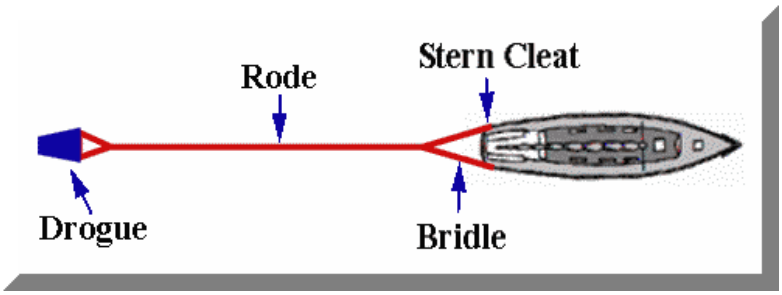
If you are able, actively sailing in heavy weather is preferable to passively riding out the storm. Sailing also has the advantage of helping you to avoid large breaking waves and positioning your boat in an area where it can better ride out the storm. If you are in a coastal area, you may want to approach a windward shore (a shore that the wind is blowing from). In this area, the waves will be smaller because of the reduced fetch (distance of water that the wind is blowing over). Avoid areas where the wind is blowing against the current, since larger, breaking waves with a more frequent period will be found in this location. Finally, you may find a safe harbor to enter but be careful. A wide-mouthed harbor on the windward shore is ideal. However, a harbor on the leeward shore with a narrow entrance may be too dangerous to enter.

Reduce sails or running with bare poles: Reduce the ship's sails by reefing the main or going to a storm trysail (a small heavy weather sail) and by hoisting a storm jib. If the boat still has too much sail, consider running with bare poles. "Bare poles" refers to sailing the craft without sails hoisted. In this situation, the force of the wind on the hull and rigging generates enough force to propel the craft.

Running with the wind and surfing: The first tactic is to run with the wind. This reduces the force of the apparent wind and may allow you to navigate the boat away from the path of the storm or into safer waters. If large waves are present, the boat may begin to surf down the waves. When this happens, the restrictions of hull speed are thrown out the window and even a heavy displacement cruiser may achieve a significant increase in speed. Control of the boat as you travel down the waves is of utmost importance. Often the boat needs to be navigated down the waves at an angle to prevent slamming into the back side of the wave in front of you. If this happens, crew can be injured; the boat may lose its rigging or be

pitchpolled. However, by going down the waves at an angle, you also place your boat at a greater risk of broaching and capsizing.

Running warps and use of a drogue: Controlling the boat can be difficult, since waves will often be traveling faster than the boat and will be breaking over the boat's stern. This will tend to push the boat sideways creating a danger of broaching (uncontrolled broadside positioning of the boat in relationship to the waves) and capsizing. To help keep the boat on course, you may want to increase the drag of the water on the stern of the boat. A small amount of drag will help keep the stern pointing into the oncoming waves but not enough to appreciably slow the forward motion of the boat.



A small amount of drag can be created by running warps, or loops of lines secured on the port primary winch, into the water off the stern, then looping back and secured to the starboard winch. If the boat is still at risk of broaching, then increase the drag by using a drogue. This is a small-cone shaped device which is attached to a rode. The rode is then attached to a bridle (a line running from one port winch or cleat, into the water behind the stern and attached to the starboard winch or cleat.) A bridle will reduce the load on a cleat or winch by distributing the force between both the port and starboard sides of the boat.

The drogue should be set so it is in the wave's trough when the boat is on a wave's crest. The bridle can also be adjusted to help steer the boat.

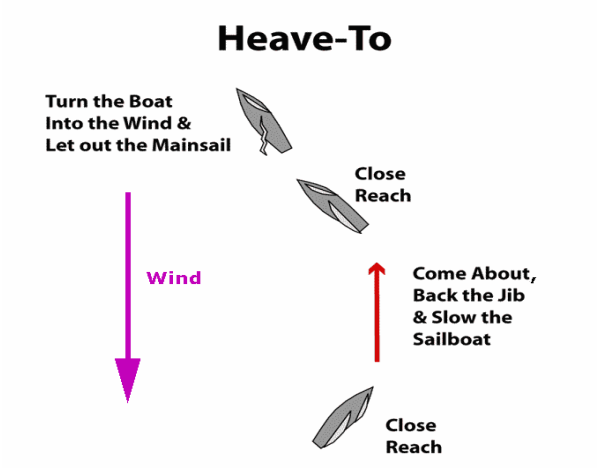
When too many waves are coming over the stern and you are unable to control the forward motion of the boat, it is time to adopt a passive technique.

Passive Tactics

"Being Hove to in a long gale is the most boring way of being terrified I know." Donald Hamilton

Passive techniques involve positioning the bow of your boat into the wind to help avoid broaching and capsizing. Unlike active techniques, the boat has no hope of lessening the force of the storm, or avoiding an approaching large breaking wave which can pitchpoll (end-over-end capsizing of the boat) the boat.

Heaving To: In this technique, the forward motion of the boat is slowed, the bow of the boat is turned through the wind but the jib is not released on the windward side (the jib is backed). The mainsail is then eased out and the boat is now turned into the wind. The mainsail is trimmed to help balance the jib, to keep the boat as close to the wind as possible. Two opposing forces now exist. The jib pushes the boat away from the wind but the rudder pushes the boat into the wind. Thus, the boat comes to a near standstill, drifting slowly to leeward.



Use of a sea anchor off the bow: Sea anchors are essentially large drogues. Initially, many were made from military parachutes and are often referred to as parachute anchors. The large size of the anchor creates a large amount of drag which will significantly slow the motion of the craft and align the bow directly into the waves. Unlike a drogue, a sea anchor is always placed off the bow and not the stern since the bow cuts into the waves and sheds water much better than the stern of the boat. (The diameter of the parachute anchor should be at least 35% of the boat's LOA)

Hoisting of a small sail at the stern of the boat: On a two masted boat, a small sail can be hoisted on the aft mast. This sail can act as a weather vane and help keep the bow pointed into the wind. On a sloop, a small sail, riding sail, can be set on the backstay. This technique can be used in conjunction with a sea anchor.

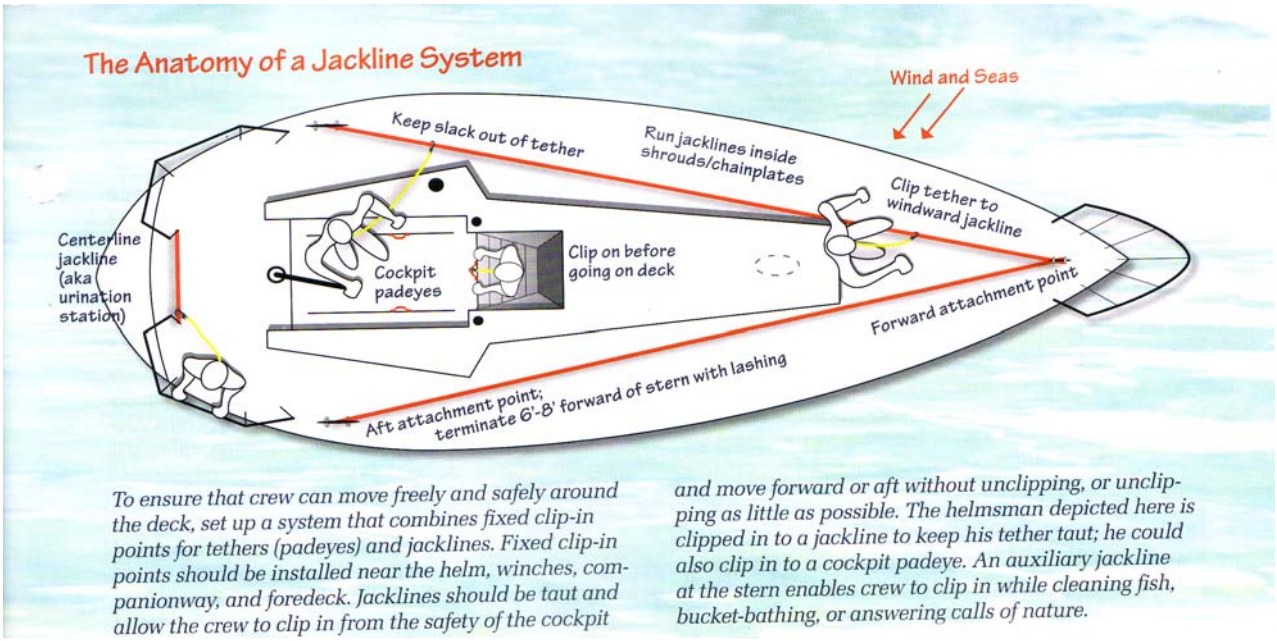
Lying a-hull: As a last resort one might elect to go down below and ride out the storm, letting the boat find its own path in the water. This almost always exposes the beam of the boat to oncoming waves and increases the chance of capsizing. A non-breaking wave no matter how large will not capsize a boat. However, when hit beam on, the breaking wave has only to be higher than the width of the beam of the boat to capsize the craft. Lying a-hull is not recommended in breaking waves.

Notes:

Setting up Jack Lines:

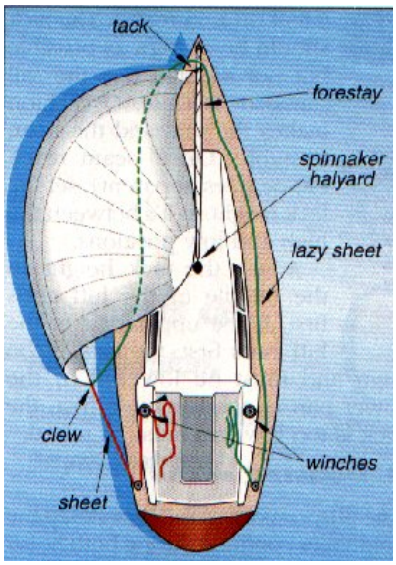
Jack lines are sturdy lines running the length of the boat that allow you to clip onto at night, or in heavy weather conditions. You can clip your harness onto these lines and go forward without fear of falling overboard.

Jack lines can be made from wire, webbing or yacht braid, they should have minimum stretch and be tensioned firmly. Set a jack line on each side of the boat running from the cockpit INSIDE the shrouds to the bow.



To ensure that crew can move freely and safely around the deck, set up a system that combines fixed clip-in points for tethers (padeyes) and jacklines. Fixed clip-in points should be installed near the helm, winches, companionway, and foredeck. Jacklines should be taut and allow the crew to clip in from the safety of the cockpit and move forward or aft without unclipping, or unclipping as little as possible. The helmsman depicted here is clipped in to a jackline to keep his tether taut; he could also clip in to a cockpit padeye. An auxiliary jackline at the stern enables crew to clip in while cleaning fish, bucket-bathing, or answering calls of nature.

Sailing with a Spinnaker



One of the most popular sails in the cruising sailor's inventory these days is the asymmetric, or cruising spinnaker. It is known by a variety of sailmaker trade names, such as Gennaker, Flasher, MPS, and Spanker. Unlike the conventional spinnaker which is symmetrical on either side of its centerline, the cruising spinnaker has a definite luff and leech, with the luff being the bit longer of the two. The sail is about 25% smaller in total area than a standard spinnaker, but it is about twice as big as a conventional 150% genoa.

The cruising spinnaker is designed specifically to enhance a boat's downwind performance. It will also make downwind sailing safe and easy — even when sailing shorthanded. Fulfilling this criterion leads to another major difference between the cruising spinnaker and the conventional spinnaker.

The cruising spinnaker does not require a spinnaker pole because the tack remains attached to the forestay no matter which tack the boat is on. Gybing a standard spinnaker with a pole means moving the outboard pole end from one clew to the other, and this is the moment when most spinnaker-handling problems occur. This is also what discourages many cruising skippers from using the sail. They don't like to handle a conventional spinnaker with a pole unless they have a crew of experienced sailors on board.

The good thing about the cruising spinnaker is that you jibe this sail very much the same way you would if you were flying a genoa, thus avoiding the risk of an uncontrolled sail during the jibing maneuver.

This sail is for use primarily in light winds, 10 knots or less.

Using the Spinnaker Halyard: You should have a separate halyard for the spinnaker. Attach the halyard to the head ring on the sail. Then attach the tack of the spinnaker to a ring on the bow of the sailboat. The line from the spinnaker's tack should run OUTSIDE of the pulpit and back to the ring.

Attach the spinnaker sheets to the clew grommet on the spinnaker and make sure the lines are led aft outside the lifelines to a turning block on each side of the cockpit AFT of the winch (or as far toward the back of the boat you can get it). Then run it forward to a winch. The sheet that is not being used — the lazy sheet — should also be attached to the clew of the spinnaker, **led forward in front of the headstay**, and then back on the other side of the boat — outside the shrouds and lifelines — to another turning block positioned just forward of the stern pulpit. Then take that sheet and lead it to a winch.

Now you are ready to hoist the spinnaker. Start by heading off to a square run. Leave the mainsail fully out during the hoisting procedure as it will blanket the spinnaker and keep it from filling until you are ready for it to be set.

Once it is fully hoisted, slowly head up to your desired course and pull in the sheet until the sail sets. Make sure you have at least two turns of the sheet around the winch. Now you are off and sailing with your cruising spinnaker.

Jibing the Spinnaker: Ease out the spinnaker sheet until the sail collapses in front of the boat. Don't lose the end of the sheet. Then bear away to a dead run and pull the mainsail to the centerline. To complete the jibe, ease out the mainsail on the new jibe, and head up onto your new course. Pull in the new spinnaker sheet (the lazy sheet on the previous tack) until the sail is set correctly for the new course. This completes your jibe.

Lowering the Spinnaker: Bear away onto a dead run, but this time keep the mainsail out. Do not ease the spinnaker sheet. The sail will collapse once the mainsail blankets it. Have one person ease the halyard while another pulls the sail down by pulling on the leech. Ideally, whoever is pulling the sail down should be positioned on the leeward side of the boat just in front of the boom. This position will ensure that the spinnaker remains blanketed by the mainsail until it is completely lowered to the deck.

Dousing Socks: The purpose of the sock is to keep the spinnaker confined during both hoisting and lowering. It is a good idea to use a dousing sock if your boat is over 30 feet long. When you hoist the spinnaker, it will be inside the sock and will not fill until you are ready for it to do so. Once you are ready to set the spinnaker, raise the sock to the top of the spinnaker by pulling the sock-control line.

When it is time to drop the spinnaker, bear away onto a square run the spinnaker collapses behind the mainsail. Pull the sock-control line so the sock comes down over the collapsed spinnaker. Ease the spinnaker or genoa halyard so the sock and spinnaker are on the deck.