



## SAILING WITH A SPINNAKER

*“For the racer, sailing upwind has the tactical complexity of a chess match with a grand master. It is a sublime mental challenge and when the wind blows can be the ultimate physical challenge for the crew and boat. For the cruising sailor, the ability to claw upwind off a lee shore can be lifesaving. However, for sheer fun—at times sheer speed and often ultimate comfort—nothing beats sailing with the wind aft of the beam.*

*Offwind sailing is often the most joyful maneuver of the sport. A spinnaker is a billowing, unrestrained device that blows this way and that into a thousand shapes. This is the adult version of kite flying, and it is not surprising that a spinnaker is often called a kite. When you think of it this way, it is fitting that the act and action almost invariably involve bright colors, and this is not just because of the unequaled ability of nylon to be dyed. Colorful off-the-wind spinnaker photographs, seen on magazine covers, posters, even color TVs, speak a universal language of beauty, joy, speed, and freedom.”*

—Tom Whidden, President North Sails

### **Course Objectives**

Welcome to an introduction to spinnakers. The spinnaker is an exciting sail to use and adds instantly to boat speed off the wind, allowing students to reach another level of sailing enjoyment. Onboard training emphasizes the teamwork needed to raise and trim the sail and the procedures needed to keep the sail untangled and flying free.



**Solings under spinnakers**

The club offers spinnaker instruction on both the Solings and J29s. Students should check with their instructor after completing the class for information on how to obtain a spinnaker when reserving a boat.

## SPINNAKER CONTROLS

### Glossary of terms

There are more attachments to a spinnaker than to any other sail on your boat. The following figure shows a typical rig for the spinnaker control lines and an explanation of what they are and do.

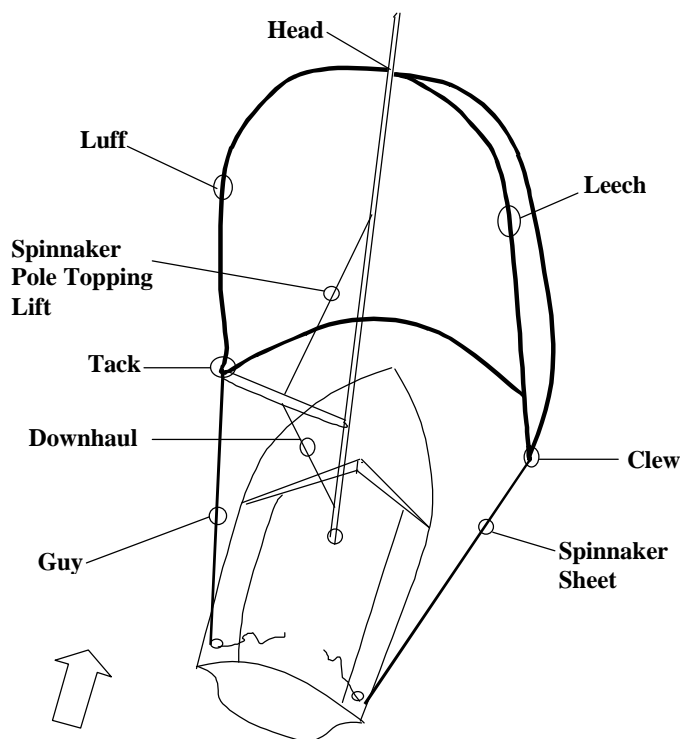


Figure 1 Typical spinnaker controls for a one design or small cruiser

**Spinnaker halyard**—The halyard, of course, raises and lowers the sail. The fastest way to hoist is hand over hand from a standing position forward and next to the mast.

**Spinnaker Pole**—The pole's purpose is to keep the sail as far from the boat as possible. Ideally, spinnaker poles should have a one-handed or trigger method to open any fitting on them that is going to be engaged or disengaged while the spinnaker is working. In other words, you should be able to hold the pole with one hand and simultaneously depress a trigger with the other. The situation to avoid is where you need three hands to fasten the pole: one hand to hold the pole end, one hand to open the trigger mechanism, and a third to place the buy or sheet into the fitting.

**Afterguy, poleguy, or Guy**—Is attached to the tack of the spinnaker, is run through the end of the spinnaker pole and controls the fore and aft angle of the pole in relation to the pole and centerline of the boat.

**Spinnaker sheet**—Trims the clew of the sail like a jib sheet.

**Pole Topping Lift**—Attached to a bridle on the pole or to the pole end, is used to adjust the height of the outboard end of the pole to suit the sailing angle and wind velocity.

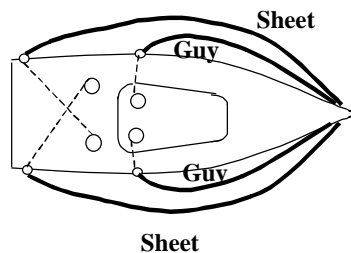
**Pole downhaul or foreguy**—holds the spinnaker pole down. When the lift is raised, the foreguy is eased the same amount, so that the pole is always held in a controlled position.

**Mast track and slide**—Enable you to adjust the height of the inboard end of the pole to changes in height made at the outboard end, thereby keeping the entire pole perpendicular to the mast.

## ***SETTING A SPINNAKER—The bear away set***

### **PREPARATION**

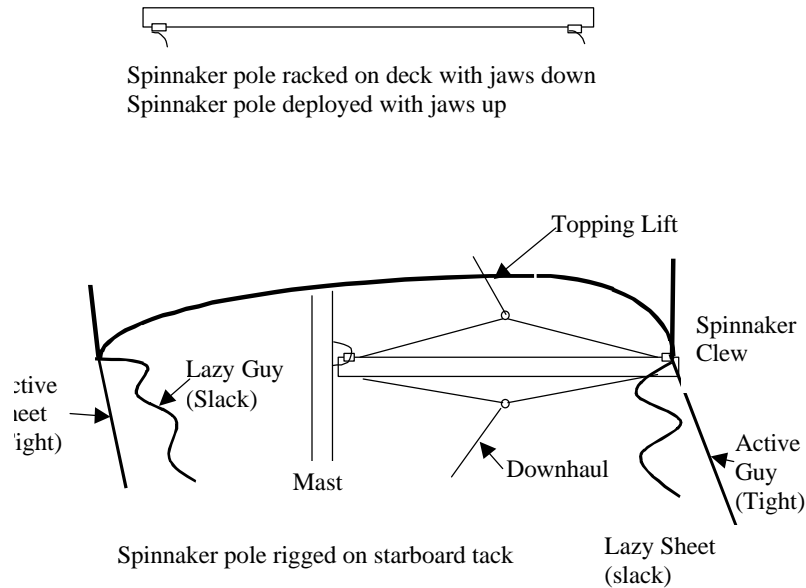
The steps in preparing to set a spinnaker, and the most efficient sequence varies depending upon the boat, the crew and the conditions. The basic steps and their sequence for a bear away set for the J29 is as follows:



**Figure 2: J29 in “ready” position**

1. Use two guys, clipping each to the bow pulpit on either side in the “ready” position. When flying the spinnaker the active guy will be attached to the pole. The slack guy is the “lazy” guy. The guys are tailed on cabin top winches.
2. Use two sheets, clipping each sheet to the guy in the “ready” position. When flying the spinnaker the slack sheet is the “lazy” sheet. The sheets are tailed on deck mounted jibsheet winches
3. Determine which side to set the pole. Position the spinnaker pole so that the outboard end of the pole is over the side of the boat that will be the windward side when the spinnaker goes up.
4. Lead the active guy through the outboard end of the pole and clip it into the jaw.
5. Attach the pole lift and foreguy and hoist the pole at right angles to the mast.
6. Attach the pole to the mast and raise the inboard end of the pole to the at the height which seems appropriate.
7. Attach the turtle (the bag with the spinnaker in it). The turtle should be hooked at the rail about halfway between the mast and headstay. Make sure that the three corners are outside of the bag. On boats under 30 feet, it can be clipped in the bow pulpit.
8. Unclip the lazy guy (which the active sheet is attached to) and attach to the sail.

- Double-check to be sure that it is not tangled with the life lines.
9. Unclip the guy and pull it around the headstay and attaché to the sail.
  10. Attach the spinnaker halyard.



**Figure 2 - J29 Spinnaker pole**

When racing and the boat is heeling over, it's important that the bowman keep his weight to windward while setting up the spinnaker. To do this, the bowman has to break up the jobs listed above, and do them on two different tacks. For instance, when rounding the windward mark to port, have the bowman clip the spinnaker to port rail while on your final port tack to the mark. This way he can hook on the turtle and attach the sheets and guys while on the windward side. When you tack to starboard, he can get the pole ready while keeping his weight to windward. If he has to do any of the rigging at the bow, he should plan out his moves ahead of time so that he spends the least amount of time possible on the bow, i.e. if he has to lead the sheets around the forestay, have the cockpit crew make sure the lines are untangled so that they'll run when he pulls on them. Weight on the bow, no matter how light, disturbs the helm.

The basic steps and their sequence for the Soling:

1. The spinnaker sheets should be run to the "ready" position.
2. Determine which side to set the pole. Position the spinnaker pole so that the outboard end of the pole is over the side of the boat that will be the windward side when the spinnaker goes up.
3. Release both the sheet and the guy from the cleats.
4. Lead the guy through the outboard end of the pole and clip it into the jaw.
5. Attach the pole lift and foreguy and hoist the pole at right angles to the mast.
6. Attach the pole to the mast and raise the inboard end of the pole to the height which seems appropriate.
7. Attache the sheet and guy to the sail.

8. Attach the spinnaker halyard

### **THE HOIST**

The sequence for a bear away set is similar for the J29 and Soling. In either case, do not trim the chute fully until the halyard is hoisted and cleated.

1. Trim the spinnaker guy so that the clew of the spinnaker reaches the jaw of the pole when the pole is laying against the headstay.
2. Trim the spinnaker sheet until the clew is just past the shrouds.
3. Hoist the spinnaker all the way up, then drop the jib
4. Trim the spinnaker to the wind.

### **TRIMMING THE SPINNAKER**

The tools available for maintaining the proper trim of a spinnaker are limited; they consist of pole position and sheet position. Pole position is variable both fore and aft and up and down. Sheet position is varied primarily by pulling it in or letting it out. Normally, the sheet is led to the leeward rail, at or near the stern, but sheet position can also be varied by moving the lead forward. A forward lead is not recommended except when running in strong winds.

The spinnaker is a versatile sail which can be used when the wind is blowing anywhere from 60 to 180 degrees off the bow. Optimal sailing angles are determined by wind strength. In stronger winds, you won't be able to fly the spinnaker as close to the wind because your boat will be overpowered by the spinnaker at the closer angles. If the wind is too light, sailing at the broader angles will be too slow. At the forward end of this range, from 60 to 130 degrees, the wind will be flowing across the spinnaker from the luff to leech. (The principles involved in trimming a genoa are also applicable here.) At some point behind 130 degrees, or thereabouts, the wind blows directly into the sail and ceases to move across it. The sail is then said to be "stalled", and the principles of trim change accordingly.

### **REACHING TRIM**

When the wind is flowing across the spinnaker from luff to leech, reaching considerations apply. If the wind is forward of abeam, the pole should be close to the headstay. "close" means as close as possible to the headstay without allowing the two to touch. If the pole does rub against the stay, there's a risk of damage to the pole, the rig, or both. Fore and aft position is controlled by the afterguy. The sheet should be trimmed just enough to prevent the sail from collapsing. The trim should be constantly tested by easing the sheet slightly until the luff commences to curl, then trimming again when the curl becomes excessive.

If the spinnaker has telltales on the leeches of the spinnaker midway between the head and clews. When reaching, read the telltales like you would on a jib. Keep both the windward and the leeward tales streaming straight back. When both are streaming aft, the leading edge of the chute will curl some --but don't worry. A little bit of curl is fast. Pole height is adjusted by means of the pole lift and foreguy. In any given wind condition, the clew will find its own height. It is commonly recommended that the pole height be

adjusted to match that found by the clew. In that condition, the draft will be approximately in the center of the sail, which is the right place for it. If the pole is slightly lower than the clew, the sail will become asymmetrical, with the draft slightly forward of the center. This asymmetrical trim will be faster in the closer reaches. Putting the pole higher than the clew moves the draft behind the middle. But this always produces slow going: NEVER CARRY THE POLE HIGHER THAN THE CLEW.

At all times, sufficient tension should be maintained on the pole lift, the foreguy and the afterguy to keep the outboard end of the pole firmly in position. When all other adjustments have been made, the inboard end of the pole should be moved up or down on its track to keep the pole perpendicular to the mast. Remember that adjustments to the inboard end are a low priority item. Unless it's grossly out of position, meaning feet, not inches, don't waste time on it until everything else is set correctly.

As the wind moves aft, ease the sheet, while at the same time bringing the pole aft. If the pole is correctly placed fore and aft, the depth of the draft in the sail will be uniform from the top to bottom, and the luff of the sail will extend directly upward from the end of the pole. If the pole is too far forward, the pocket in the lower part of the sail will be too deep, and the luff will angle out to windward from the end of the pole. If the pole is too far aft, the foot of the sail will be too flat, and the luff will angle off to leeward from the pole end.

### **RUNNING TRIM**

When on a run, with the wind blowing directly into the sail, it is desirable to present as much area as possible, subject to certain limitations. The pole should be kept as far aft as possible without making the foot too flat or causing the luff to be other than straight up from the pole end. At all times, sufficient tension should be maintained on the pole lift, the foreguy and the afterguy to keep the outboard end of the pole firmly in position. When all other adjustments have been made, the inboard end of the pole should be moved up or down on its track to keep the pole perpendicular to the mast. Remember that adjustments to the inboard end are a low priority item. Unless it's grossly out of position, meaning feet, not inches, don't waste time on it until everything else is set correctly.

On a run, in a good breeze (you shouldn't be on a run unless the wind is blowing over 14 knots), the clew may seek to rise higher than is desirable. If the foot gets too high, you lose projected area. Therefore, move the spinnaker sheet lead forward to keep the clew down. That way you won't have to raise the pole too high.

At all times, sufficient tension should be maintained on the pole lift, the foreguy and the afterguy to keep the outboard end of the pole firmly in position. When all other adjustments have been made, the inboard end of the pole should be moved up or down on its track to keep the pole perpendicular to the mast. Remember that adjustments to the inboard end are a low priority item. Unless it's grossly out of position, meaning feet, not inches, don't waste time on it until everything else is set correctly. Even in a "stalled" sail, there is some flow of air along the leeward side of the sail and therefore some aerodynamic force, which increases the wind's normal force. This flow occurs at the sides of the sail, moving from both leeches for a short distance toward the center of the sail. A flatter sail projects more area, hampers flow on the leeward side of the sail. A fuller sail

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projects less area, but generates more flow. A similar flow of air also moves over the top of the sail and down the front toward the center. This overhead flow travels further and is more powerful than the flow at the sides. If the foot of the sail is held too low, this overhead flow will be curtailed; if not low enough, too much projected area will be lost. At all times, sufficient tension should be maintained on the pole lift, the foreguy and the afterguy to keep the outboard end of the pole firmly in position. When all other adjustments have been made, the inboard end of the pole should be moved up or down on its track to keep the pole perpendicular to the mast. Remember that adjustments to the inboard end are a low priority item. Unless it's grossly out of position, meaning feet, not inches, don't waste time on it until everything else is set correctly.

Proper downwind trim involves balancing the extra thrust resulting from the aerodynamic forces acting around the edges of a deeper setting versus the greater projected area obtained with a flatter setting. Normally, best results are obtained at the flatter end of the range, but remember that it is quite possible to trim the sail too flat or have the foot too low. Thus, the only way to find the best shape is to experiment while watching you speedometer.

IN HEAVY WEATHER or any other time that the spinnaker takes a dip in the ocean, immediately release the sheet to dump the water out of the sail.

### **THE SPINNAKER JIBE**

Perhaps no sailing maneuver calls for better crew coordination than the spinnaker jibe. There are two basic jibing techniques:

1. End for End: This jibing technique is universally used on one designs and is workable on boats up to 30 feet.
2. Dip Pole: This system is used on boats over 30 feet. It utilizes two sheets and two guys attached to each clew of the spinnaker. With two sheets and two guys, this system converts the spinnaker jibe from the classification of "to be avoided at all costs" to the point where a practiced crew can handle a jibe with the ease of a tack. The beauty of this method is the strain of the spinnaker is taken with one set of sheets and guys so that during the jibe the bowman can easily get the unloaded new guy into the pole.

### **THE END-FOR-END JIBE**

The end-for-end method is only viable on boats below 30 feet because the spinnaker pole becomes free from the mast during the jibe. For the crew to handle the loose pole, the pole must be small and light enough to be lifted and pushed into position.

During an end-for-end jibe, the pole is disconnected from the mast, and disconnected from the sail. Free from the sail, the pole hangs from the topping lift. The end that was hooked to the mast is then connected to the spinnaker sheet and the end that was hooked to the spinnaker guy is hooked to the mast. This system requires a bridle for both the topping lift and the foreguy so that neither require trimming during the jibe. The pole should be attached to the mast with the jaws up.

The steps for an end-to-end jibe are as follows:

1. As the jibe starts, either the downhaul or guy is eased to facilitate removing the pole from the mast
2. The sheet (or lazy guy if available) is brought in close to the shroud where the foredeck crew can grab it.
3. The boat is turned dead downwind.
3. The pole is disconnected from the mast.
4. The old sheet or lazy guy is connected to the end of the pole that was on the mast.
5. The guy is released from the end of the pole.
6. The pole is pushed out and forward on the new windward side.
7. The pole is attached to the mast and the mastman yells made.
8. The cockpit crew trims the spinnaker to the wind.

## **THE DOUSE**

While there are a number of methods for taking the spinnaker down, the essential ingredient, is blanketing the spinnaker behind the mainsail and the jib so that the chute goes limp and can be gathered in easily. In winds over 10 knots, it is essential to stay on a very broad reach when dousing, which maximizes the main and jib's ability to blanket the spinnaker. There is a tendency for the sail to "lift" the crewmen during high winds. All douses should be effected as speedily as possible without causing the spinnaker to drop into the water. This is prevented by the crewman on the halyard dropping only enough sail for the other crew to gather in.

### **METHOD 1: RELEASING THE SHACKLE**

The guy is eased to the headstay and the pole is lowered until it can be reached easily by the foredeck man who opens the snap-shackle that connects the guy to the spinnaker. As the spinnaker is released from the guy, one or more of the crew sitting to leeward of the main, and as far forward as possible, pulls on the sheet and brings the spinnaker behind the mainsail. Some racing crews prefer to take the sail down into the forward hatch to keep the sail from getting tangled with the jib sheet. When the foot is gathered, the halyard is eased slowly and the spinnaker is gathered in as it is lowered.

### **METHOD 2: RUNNING GUY**

This system is basically the same as Method 1, except that the guy remains attached to the sail. First the guy is eased until the pole kisses the headstay, and then it is completely released as the crew gathers the sail. Great care must be taken to make sure that the guy is completely clear, with no knots, so it can run free. The sail is then gathered in the same location as in Method 1.

### **METHOD 3: LAZY GUY TAKEDOWN**

Using either guy release routine as in Methods 1 and 2, the lazy guy takedown uses the idle guy on the leeward side to insure getting the spinnaker into the mainsail's blanket zone. The lazy guy is led forward and under the foot of the genoa. When the sail is released from the pole, the lazy guy is quickly tightened and the spinnaker gathered.

### **METHOD 4: STRETCH AND BLOW**

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This is a heavy air technique designed to depower the spinnaker. In this method the foot of the spinnaker is pulled tight making it impossible for the corners to fall into the water. To keep the clews out of the water and make the foot tight, the pole is eased forward to the headstay and the spinnaker sheet is tightened as much as possible. After the foot is pulled tight, the halyard is cast off and let run. The wind blows the sail parallel to the water allowing the crew to pull the sail in by its leeches. If the sail does touch the water, it won't be able to scoop up a lot of water if the two clews are kept tight. This technique was used during the America's Cup races in Australia where it was especially windy.

### METHOD 5: RETRIEVING-LINE DOUSE

A modification of Method 4, this douse system uses a light line attached to the middle of the spinnaker. The pole is eased forward, the sheet trimmed, and the halyard eased quickly to spill the wind from the spinnaker. The retrieving line is then pulled in quickly beneath the foot of the genoa from about the middle of the foredeck. When the bulk of the sail is on the deck, both the guy and the sheet are eased completely.

### RACING TACTICS

When sailing to a distance mark, it is possible to point too high in order to make the mark without tacking. By sailing off-the-wind an additional 5 degrees, you only have to travel 8% faster to arrive at the same time as a boat not sailing off-the-wind. These figures are derived from a right triangle (the other boat sails the hypotenuse and you sail the legs of triangle). The reason you might possibly beat another boat is if they are sailing too high and their forward speed is significantly less. On the polar curve for the J29, above 40 degrees, the forward speed drops off significantly. If the other boat is sailing higher than 40 degrees and you are sailing slightly below 40 degrees then you have a speed advantage. Notice also, the flattening of the curve at the bottom. This is the reason that in downwind runs, racing boat will “tack” downwind rather than sail directly for the finish line. The advantage of a few tenths of a knot allows a boat on a broad reach to sail as fast as a boat going directly downwind and tacticians will use this speed to their advantage by exploring the run for a more favorable current or wind when they are behind. It would be up to the boat with the lead to decide whether or not they will “cover”.