

Understanding Trim

The keys to sailing fast downwind are to cycle through some basic trim rules, and never take your eyes off the chute.

By Peter Isler,
Bob Grieser photos



There's nothing slower than an overtrimmed spinnaker. A small curl is the best indication that you're not overtrimmed.

Spinnaker Clinic



I have always loved trimming a spinnaker. Maybe it's the colors. Maybe it's the prospect of sailing fast. When I trim a chute, I feel like an artist, whose practiced eye and skilled actions can create a masterpiece, measured in pure boatspeed.

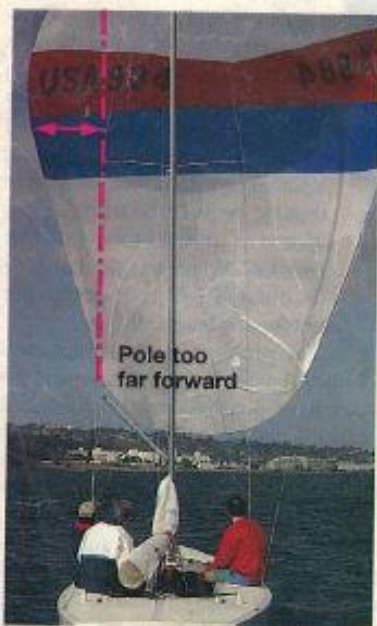
When I set out to write this article I had great hopes of presenting the subject of spinnaker trim as an uncomplicated operation that is wrongly perceived as difficult. After all, isn't it simply a matter of getting the two bottom corners in the right place by following a few general rules? But every time I went racing I was faced with the reality that fast spinnaker trim, albeit simple in theory, requires a tremendous amount of work — more than any other sail. When was the last time you cleated off your spinnaker sheet for any length of time?

The problem is the spinnaker's support system. On the main and jib we have positive control of entire edges of the sail, whereas the "kite" is up there wobbling around attached to the boat only by its three corners. This makes spinnaker trim a dynamic activity, requiring constant attention and adjustment, both by the trimmer and the helmsman. With that reality in mind, let's dive into the trim cycle that will get your boat going fast when the kite is up.

The Trim Cycle

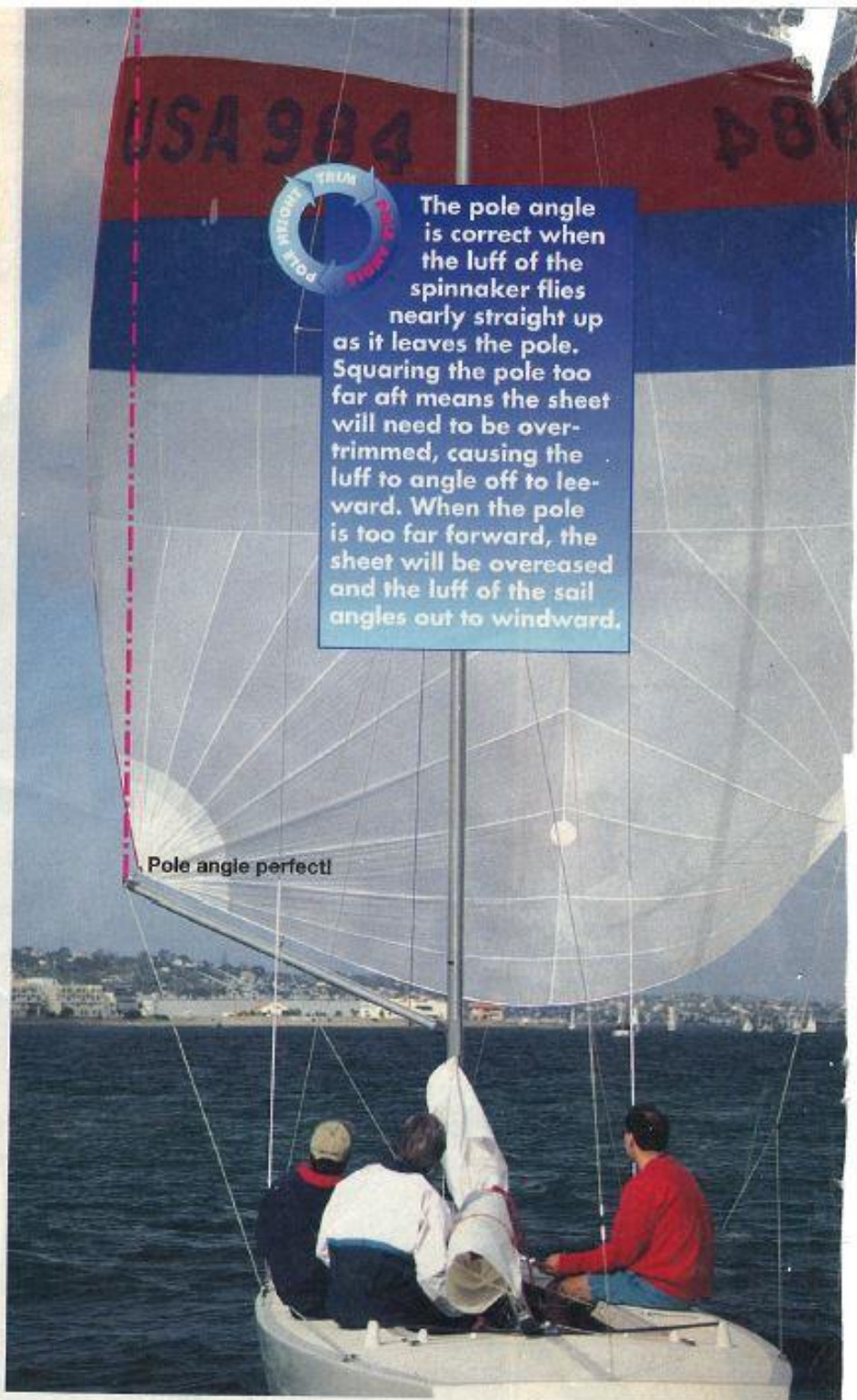
Good spinnaker trim can be broken down into three basic rules. There are exceptions to these rules, but only in extreme or difficult conditions. And because of the spinnaker's dynamic nature, every trimming action has a reaction. Proper trim is like a circular flow chart — you must constantly cycle through all of the steps. Ignore one of these steps, or forget to recheck your work, and you will be slow.

▼ **Set the Pole Angle** The primary control here is the guy. To get the pole angle in the ballpark, first look at your apparent



wind angle. When broad reaching or running (apparent wind angles aft of 120 degrees), adjust the guy until the pole is 90 degrees to the apparent wind.

To fine-tune the setting of the guy, look at the way the spinnaker luff flies as it rises from the end of the pole. If the luff is leaning off to leeward, ease the pole forward. If it's billowing out to windward, square the pole back. The goal is to make the chute look "comfortable." For most boats this means seeing that the luff is flying straight up from the tip of pole, or perhaps just slightly to windward of straight. The trim-



The pole angle is correct when the luff of the spinnaker flies nearly straight up as it leaves the pole. Squaring the pole too far aft means the sheet will need to be over-trimmed, causing the luff to angle off to leeward. When the pole is too far forward, the sheet will be overeased and the luff of the sail angles out to windward.

mer is the best one to judge this, as he or she is positioned directly behind the chute. Train yourself to be sensitive to the "look" of the luff; this can become a powerful tool in extracting speed from the spinnaker.

An exception is on tighter reaches (apparent wind forward of 120 degrees). To help flatten the lower section of the sail, set the guy so that the pole is a little farther aft than 90 degrees to the apparent wind. For

example, when the wind is dead abeam, the pole should be squared at least 10 degrees off the headstay. On a reach this tight, the chute is flying to leeward of the boat, making it difficult to sight the luff and judge whether it is "comfortably" vertical or not.

▼ **Set the Pole Height** The primary control here is the topping lift. Your goal is to position the height of the pole so the



Pole too high



Pole too low

tack and clew are level. For some, this procedure seems like an inexact science, as it is often possible to make the clews fly level with a variety of pole heights. So within this variety, which height is correct?

In light air, one of your goals should be to get the spinnaker to fly farther from the boat, in the better wind away from the windshadow of the mainsail. When your apparent windspeed is less than 5 knots, try raising the pole a few inches, even if the clews are already level. Sometimes this will encourage the entire spinnaker to lift higher, thereby maintaining the "clews lev-



When the pole height is correct, the clews are even and the luff breaks near the center to upper third of the sail. When the pole is set too high, the tack is above the clew and the luff breaks first from the center or below. When the pole is too low, the tack flies lower than the clew and the luff of the sail breaks high.

Pole height perfect!

el" rule and also getting the chute away from the boat.

When running in a strong breeze, drop the pole toward the lower range of acceptable heights. This helps prevent rolling and maintains projected area in the head of the sail. On a tight or especially windy reach, you might try to set the tack lower than the clew, to open up the leech and move the draft forward in the sail. When overpow-

ered, an open leech is fast because it generates less side force (the boat heels less).

Rarely do you ever want the tack of the spinnaker positioned higher than the clew. This drives the draft in the sail aft and is a quick way to put on the brakes.

▼ **Sheet for a Curl** The trim controls are the spinnaker sheet and guy. Remember, there is nothing slower than an over-trimmed spinnaker. When you ease the



One goal in light air is to get the spinnaker to fly farther from the boat, away from the windshadow of the mainsail. Easing the guy and sheet and raising the pole (even if the clews already look level), may encourage this lift.

sheet the luff of the spinnaker will begin to curl before it collapses. The curl is a sure sign that the sail is not being overtrimmed. A curl doesn't assure speed, however.

There are a couple schools of thought regarding how much curl is correct. A chute designed with a well-rounded luff will allow a remarkable amount of curl before collapsing completely. A big curl means a lot of sheet ease, which opens up the leech and moves the center of effort of the chute forward. This is especially good on any reach when rounding up is a worry. However, too much curl disturbs the flow on the windward side of the sail, and reduces effective sail area (especially on a run). It can also create waves rippling through a crispy new spinnaker, especially when the sail is made of polyester cloth (more on this later).

Both Dennis Conner and Paul Elvström are fans of the no-curl trimming technique in most conditions. However, this requires a very skilled crew to avoid overtrimming the chute. As with main and jib trim, it's always better to err on the loose side of sheet trim.

Remember these three basic rules are inextricably related so you must constantly cycle through all three to achieve basic optimum trim. Beware of the backward spiral if

the sheet will have to be overtrimmed to minimize the curl.

Bending the Rules

Like any airfoil, a spinnaker works best when it is acting like a wing, with airflow traveling from luff to leech. However, even when beam reaching, a spinnaker is partially stalled. And at typical running angles, the sail is acting even less like an airfoil and more like the veritable barn door — simply blocking the wind.

Due to their free-flying nature, it's hard to improve airfoil potential by tweaking the flying shape of a spinnaker, compared to a mainsail or a jib. A spinnaker's performance potential is pretty much locked in when it is designed and built. Erring from the aforementioned cycle of basic rules is fast only in specific conditions — for example, when you really need to alter the "stability" of the sail.

Let's take a look at altering stability. Have you ever had a day when it was hard to keep the chute filled, where it seemed harder to fly than usual? This is most apparent in sloppy conditions when the mast is waving around, causing the apparent wind to shift constantly. In these conditions, it's more important to keep the chute full than to have a "fast" shape that is

you leave out one step.

For example, if you overtrim the sheet while reaching, it will cause the clew to fly unnaturally low. So for the clews to be "level," the pole must be lowered — to an incorrect height. Here's another example: If you oversquare the guy, then

always collapsing. Assuming you are set up according to the basic rules, try lowering the pole and easing both the guy and sheet a few inches. The lower pole adds roundness to the luff. Just like a rounder entry in the jib, this makes the spinnaker more stable. The eased guy and sheet create a deeper, more stable shape. If conditions are really difficult, this might be a long-term solution, but more often, it is employed as a temporary technique to "downshift" when things get tricky — such as going through powerboat chop.

The Dynamics of Spinnaker Trim

Trimming a spinnaker requires constant attention. Look away at your own risk! You have to be sensitive to changes in the wind as well as the heading and movement of the boat. The helmsman and trimmer must work together to squeeze the most speed out of the boat. Constant communication is the key. In light air, the trimmer has the best feel for how low the boat can be sailed without the spinnaker dying. He or she has to communicate this to the helmsman. In a breeze, the helmsman has to be just as vocal in order to assure that his course changes are matched simultaneously with trimming changes.

On most boats, the sheet is the most active control, with the guy and topping lift living in the cleat. In theory, once the pole is pulled off the headstay, the guy should be played as much as the sheet. This is often not practical, especially when the guy is heavily loaded. But as the wind comes aft and the loads on the guy decrease, the guy should come out of the cleat and be played in concert with the sheet.

If you follow the three general rules of spinnaker trim outlined above, you will never be far off the mark. The key is to continue cycling through the steps. But this wily sail is by far the most demanding one in your inventory. So break out the sailing gloves and open your eyes. With a lot of hard work and attention to detail you too can become a Rembrandt of spinnaker trim.