Chapter 11: Spinnaker Trim

11.1 Introduction

Modern materials, improved design, and refinements in trim technique allow us to adjust spinnaker shape and fine tune trim for top performance across a wide spectrum of conditions.

This chapter will look at spinnaker trim by starting first with a look at downwind performance. We will then describe the rules of initial spinnaker trim before exploring refined trim and shape control for different sailing conditions, including VMG sailing, reaching, close reaching and heavy air sailing. Asymmetric Spinnaker Trim is covered in Chapter 12, next.

11.2 Downwind Performance

Most races today are run using a windward–leeward course. The leeward legs provide an intriguing performance challenge, as it rarely pays to sail directly downwind. We search instead for the optimum speed and angle which will maximize downwind performance, or *Velocity Made Good* (VMG). The same is of course true upwind, but downwind the spectrum of choices is much wider, and the optimum often more difficult to find.

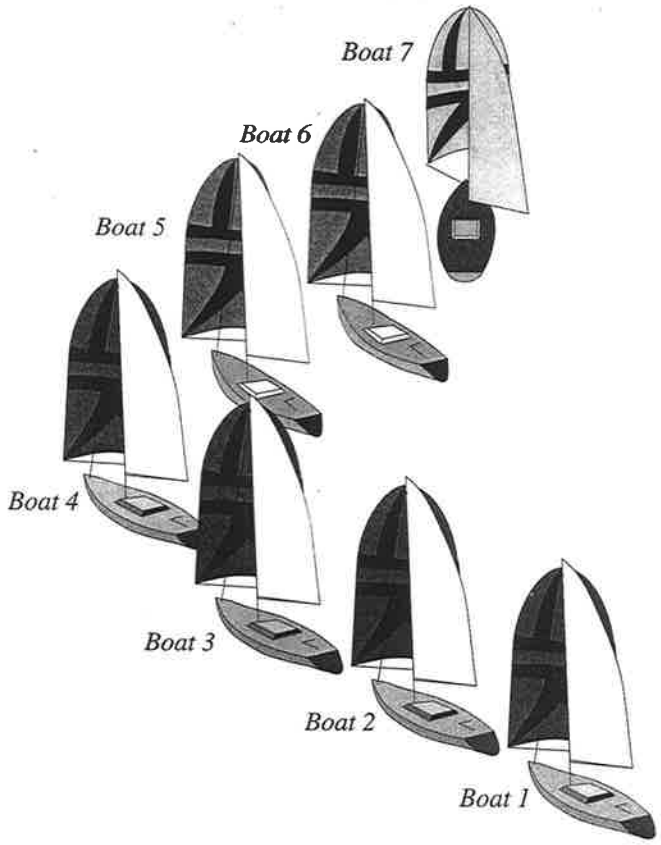
The challenge downwind is further complicated by the fact that the optimum changes dramatically in different conditions. We'll describe here performance parameters which hold for most – but not all – keelboats.

Light, Moderate, and Heavy Air

Downwind performance can be divided into three segments: Light, moderate, and heavy winds. Fig. 1.

In light winds, of 3 to 10 knots of true wind, optimum performance is achieved at true wind angles of 140° - 145°.

Fig. 1 – In light winds of 3 to 10 knots optimum performance is obtained at a consistent true wind angle of 140°-145°. The apparent wind angle shifts aft, from about 95° in the lightest air to 115° in 10 knots. See Boats 1-4.
In moderate winds of 10 to 15 knots, the optimum true wind angle changes dramatically. In 10 knots a true wind angle of 145° is best. The optimum angle swings aft to 165° in 14 knots of wind. Boats 4, 5, and 6.
In heavy winds, over 15 knots true, a direct course to the mark, or a course which allows surfing, is the fastest. Boat 7.



These angles are nearly as wide a out upwind tacking angles. The big variable in these light air conditions is boat speed. Speed changes dramatically with wind speed, while the optimum angle changes very little. Apparent wind angle also changes markedly, from nearly on the beam in lighter going to well aft of the beam in 10 knots of wind.

In moderate winds of 10 to 15 knots the big variable is sailing angle. Once we cross the 10 knot threshold, boat speed is near hull speed. While the boat goes somewhat faster in more wind, what changes most is the ability to carry speed at a much lower angle. The optimum angle changes about 5° for each knot of true wind speed. As the wind builds from 10 to 15 knots, the boat goes a little faster, and a lot lower.

In heavier winds, over 15 knots true wind speed, a direct course is fastest. It no longer pays to sail extra distance. Aim at the mark, and sail as fast as you can.

In very light (under 3 knots) and very heavy air, over 25 knots, there are additional issues to address, which we will, below.

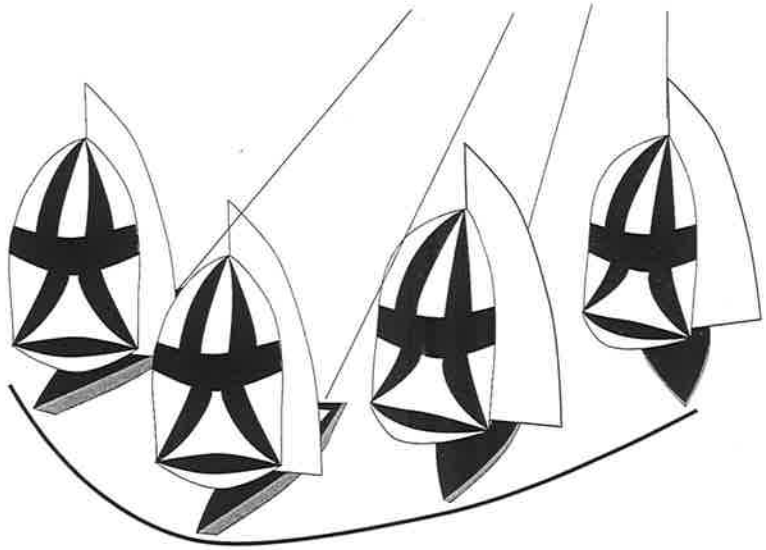
Velocity Made Good – VMG

Finding the optimum speed and angle for a given wind speed will provide the best VMG, or Velocity Made Good. Just as it doesn't pay to foot or pinch upwind, it doesn't work to sail too high or too low downwind. Further discussion of how to find the optimum sailing angle will follow, as we look in detail at performance in light, moderate, and heavy air. Fig. 2.

For Planing Boats, A Pack of Lies

The performance parameters described here are remarkably consistent for moderate displacement keelboats. They are not true for sportboats or other planing hulls. These high performance boats benefit from sailing higher angles, much like the light air angles described here, in virtually all winds,

Fig. 2 – Optimum downwind performance is the combination of speed and angle which takes us furthest downwind – the low point on the performance curve. The shape of the curve, and the optimum angle, change with wind speed, particularly in moderate winds.



until they start planing. Once on a plane the apparent wind angle shifts well forward. Then the trick is to sail down to a low angle while maintaining planing performance and the aggressive apparent wind angle.

Likewise, these performance parameters do not work for non spinnaker boats either! For racing without a spinnaker, set the jib wing and wing on a whisker pole and aim at the mark.

11.3 Initial Trim

The are three standard rules of spinnaker trim:

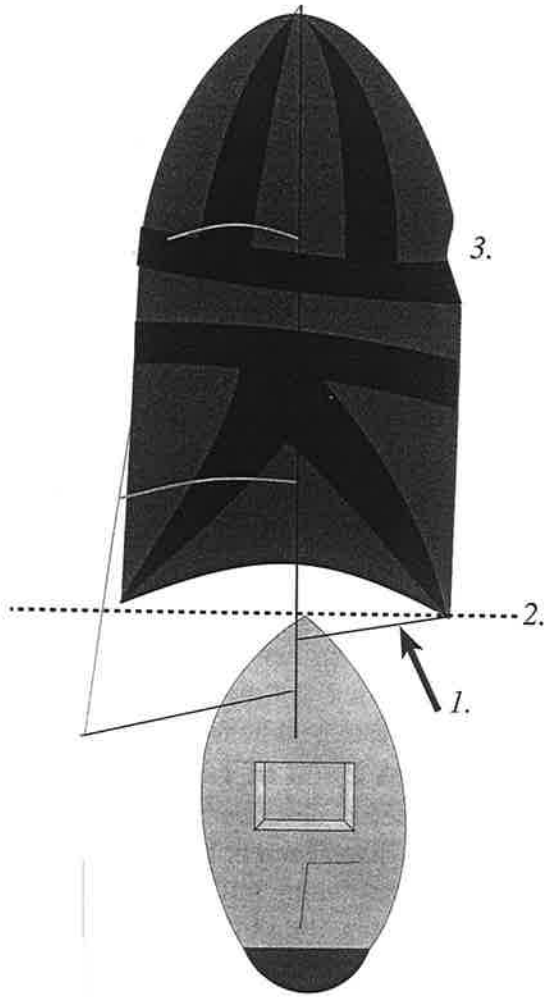
One: Trim the guy to set the spinnaker pole perpendicular to the apparent wind. Refer to telltales or the mast head fly to set the pole angle.

Two: Set the pole height so the clews even. The clews should be at an equal height above the deck, regardless of heel.

Three: Play the spinnaker sheet – ease to a curl and trim – ease and trim.

These initial settings are only the beginning. From here we will refine trim and control shape to match the prevailing conditions, just as we do with other sails. Fig. 3.

Fig. 3 – There are 3 rules to initial trim:
1. Set the pole perpendicular to the wind.
2. Adjust pole height so the clews are even.
3. Play the sheet – ease to a curl and trim; ease and trim.



11.4 VMG Trim

Racing to leeward we are concerned with both speed and angle, similar to racing upwind. Our goal is to maximize Velocity Made Good, or *VMG*.

From our initial settings we will fine tune spinnaker shape to improve our ability to sail fast and low. The key to performance is maintaining flow. Fig. 4.

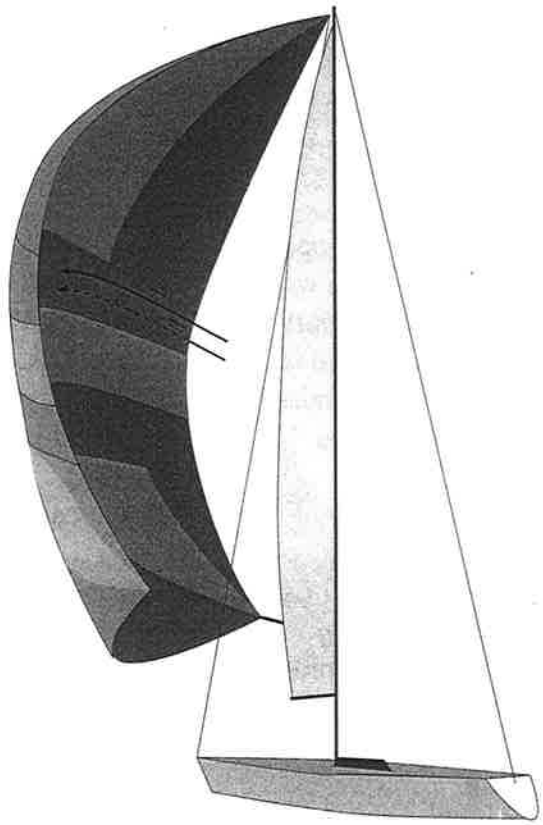
Symmetric Spinnakers are designed symmetrically because the luff and leech reverse when we jibe. This shape – with the draft up the middle, and the leech shaped exactly like the luff – is less than ideal. Sails with discreet luffs and leeches are never designed this way. A better shape puts the draft further forward, and opens the leech for better flow. We will trim the spinnaker to create this preferred shape.

The correct angle and speed varies with wind speed. We'll explore those soon, and look at variations in trim for light, moderate, and heavy air. But first we'll look at spinnaker trim and controls.

Spinnaker controls

We have three controls which affect spinnaker shape: Pole height, guy trim, and lead position. These three are all secondary, of course, to the spinnaker sheet, which must be played constantly. We'll look at each.

Fig. 4 – We achieve this Max-VMG performance by sailing as low as possible while maintaining flow across the sail, from luff to leech.



Sheet Trim

Spinnaker trim requires the trimmer's full undivided attention. The sheet should be played constantly. An over-trimmed spinnaker is slow. Ease to a curl and trim, ease and trim. If the trimmer stops playing the sheet the boat speed will suffer; and if the trimmer fails to give the spinnaker his full undivided attention the spinnaker will collapse in a fit of jealous rage. Fig. 5.

Spinnaker telltales can help with sheet trim. The outside telltale is the important one – if it stalls, the sail is over-trimmed. On a broad reach the telltales may not fly, but keep playing the sheet.

Pole Height

Pole height is controlled by the topping lift. Starting from our initial position with the clews even we can fine tune to draft position. Lowering the pole will pull the draft forward, just as adding luff tension pulls the draft forward in other sails. It creates a more open leech, and a rounder entry. Often the tack will be slightly lower than the clew. Correct pole height is shown in figure 3.

If the pole is too low, the shoulder along the luff will cave in, and the leech will twist open, spilling power. Fig. 6.

If the pole is too high, the luff will fall to leeward, and the leech will close, creating excess heeling force. Fig. 7

Pull the draft just forward of the middle of the sail. On heavy air reaches a low pole will prevent the draft from being blown aft. In light air a high pole position, with the clews even, will provide extra power.

The heel of the pole on the mast should be adjusted to keep the pole level, but don't sweat it if the pole is six inches out of level.

Fig. 5 – Spinnaker Sheet, and pole height.
Play the sheet constantly – ease to a luff and trim, ease and trim. Play the sheet constantly. The pole height here is correct, with good shape across the sail.

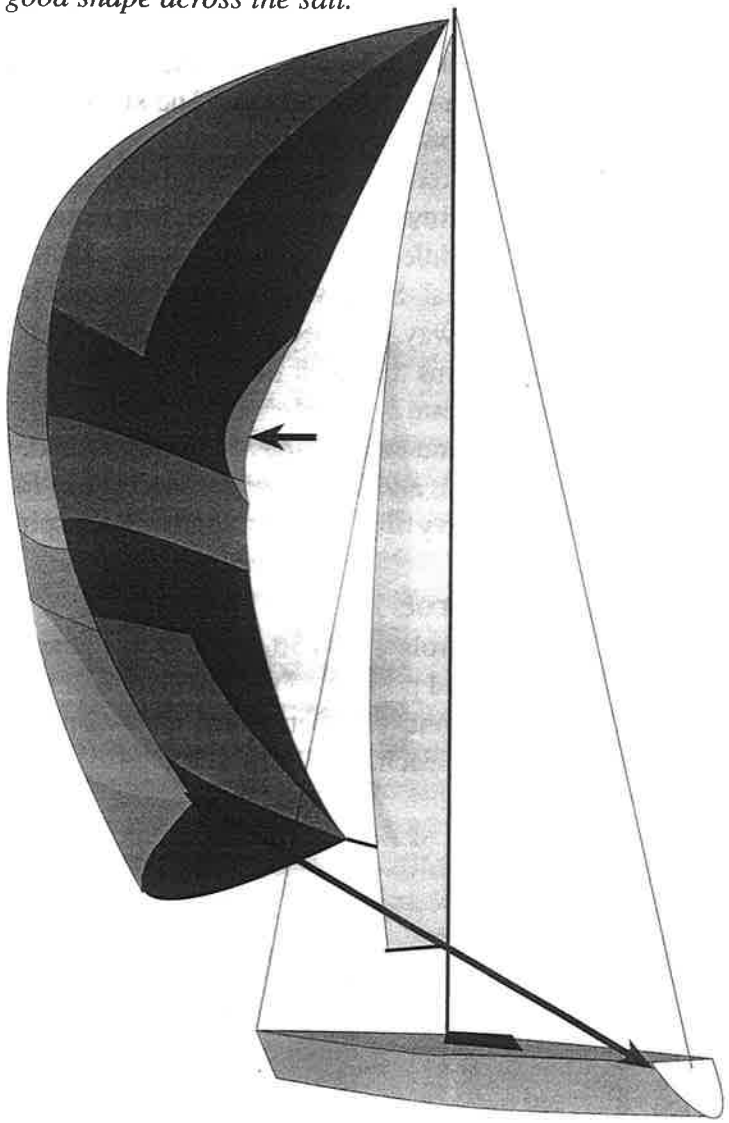


Fig. 6 – Here, the pole is too low. The upper luff is caving in, and the leech is spilling open

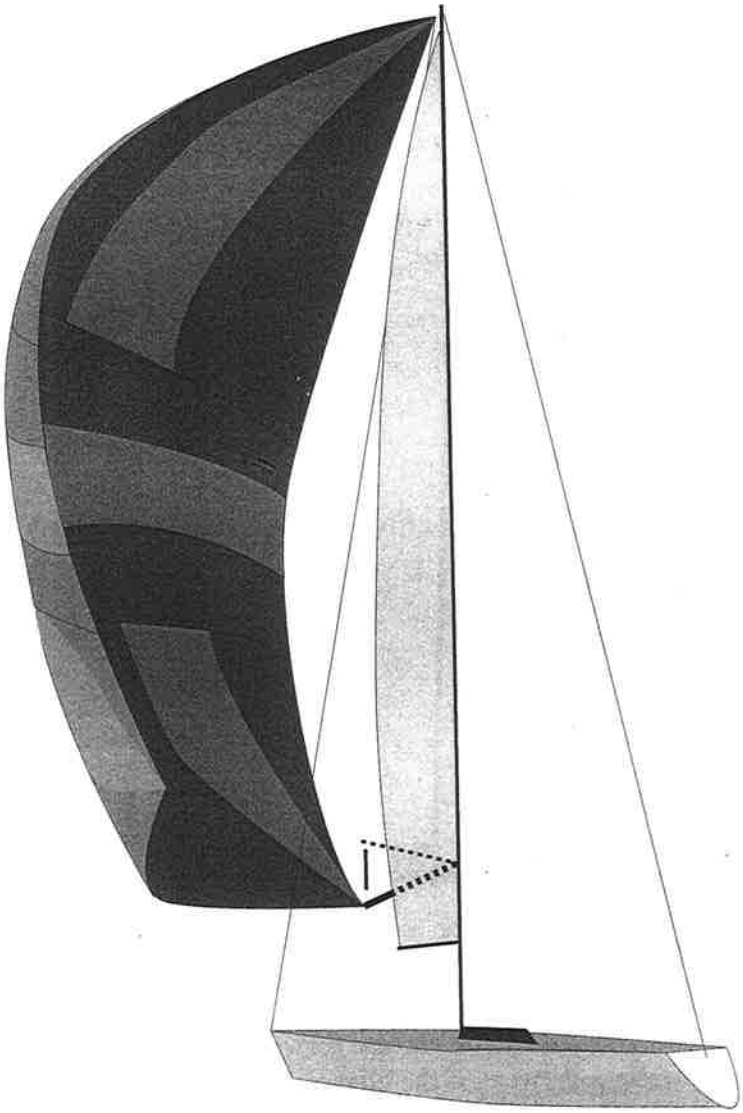
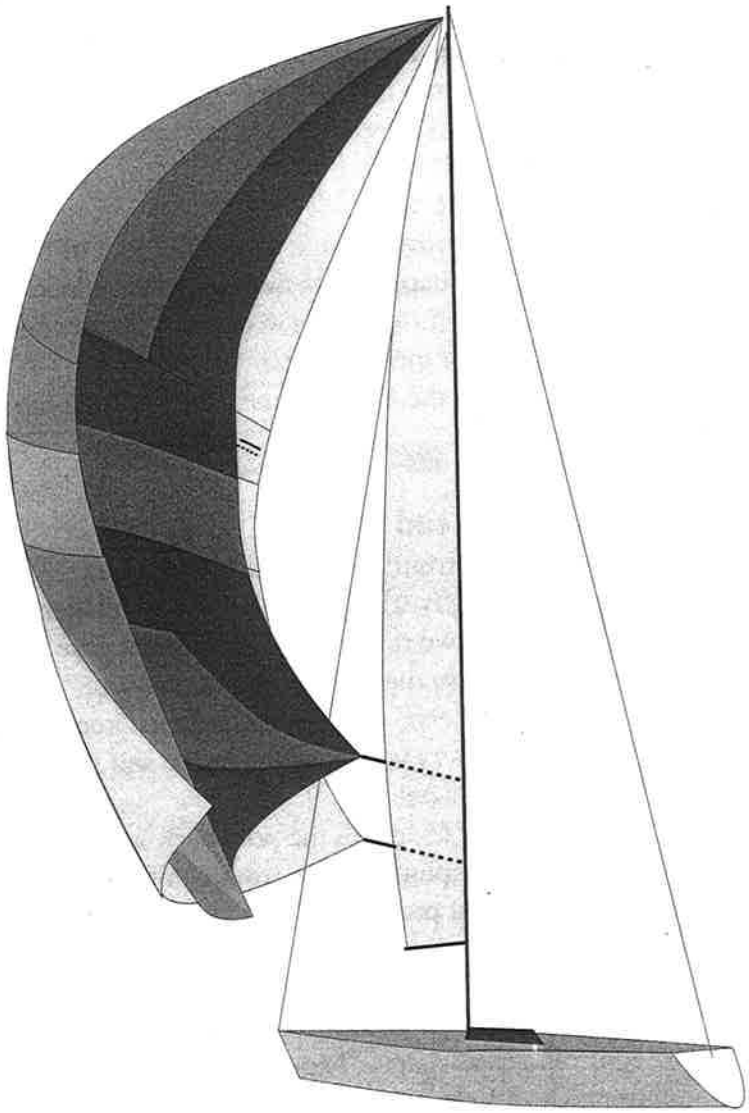


Fig. 7 – Here, the pole is too high. The upper luff is falling away, and the leech is closed. A proper sail shape is silhouetted for comparison.



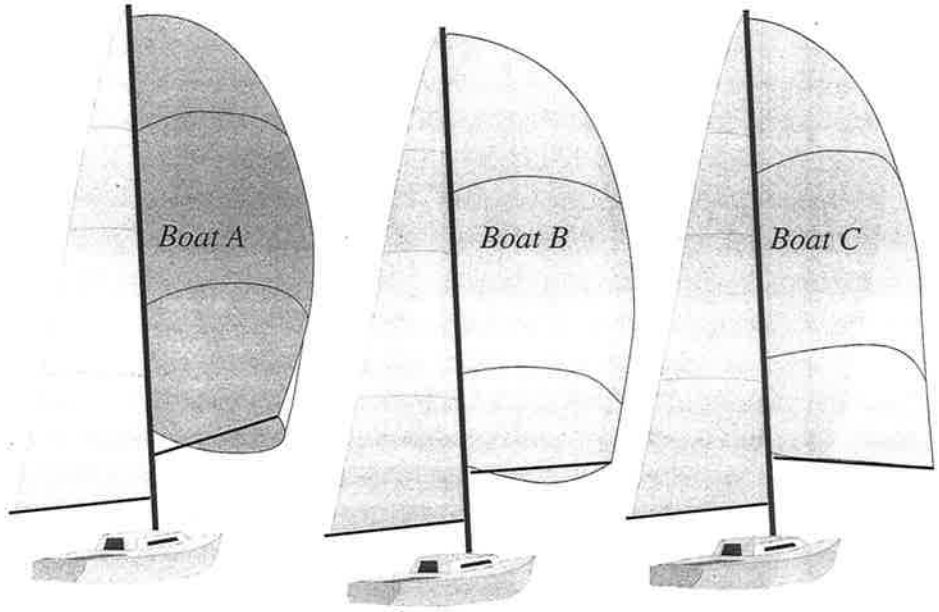
Guy Trim

Guy trim controls pole position. From the initial trim position with the pole perpendicular to the wind you can trim the pole aft a little further.

Look for a vertical spinnaker luff from the shoulder to the tack. If the pole is too far aft the luff will fade to leeward of the pole. Ease the pole forward. If the pole is too far forward the shoulder of the spinnaker will project out to windward of the pole. In this case pull the pole aft.

The other guide to guy trim is shape across the foot of the spinnaker. Try to match the shape across the foot to the shape across the horizontal panels. If the foot is deep trim the guy and pull the pole aft. If the foot of the spinnaker is flat or the spinnaker is strapped against the forestay ease the guy (and the sheet). Fig. 8.

Fig. 8 – There are two guidelines to guy trim: First, we want a vertical spinnaker luff from the shoulder to the tack. Second, the shape across the foot of the chute should match the shape across the middle of the sail. Boat A: The pole is too far forward. The tack hooks in, and the foot is too round. Boat B: The pole position is good, with a nearly vertical luff and good foot shape. Boat C: The pole is too far back. The tack pokes to windward, and the foot is stretched flat.



Sheet, Guy and Sheet Lead

As the course opens up from a beam reach to a broad reach the sheet is eased and guy trimmed to get the spinnaker out from behind the main. If we rely too much on sheet ease without trimming the guy, then the clew goes out *and up*, spilling open the spinnaker leech. Raising the pole to "keep the clews even" only makes matters worse, as the entire sail floats too high, and the head flattens out. Fig. 9.

The correct technique is to square the pole back as the sheet is eased. This gets the spinnaker out from behind the main, and maintains a vertical profile with a wide powerful shape. Fig. 10.

The spinnaker sheet lead also can be used to hold the clew down and prevent the leech from spilling, much the same way the genoa lead controls genoa shape. Though somewhat effective, moving the lead forward also tends to close the spinnaker leech, creating an air brake. If the entire spinnaker is flying too high, pull the pole down and back while trimming the sheet. Fig. 11.

The sheet lead can be choked forward for a more stable shape in chop. Likewise, if the boat starts to roll in heavy air, it helps to choke down the lead for extra control.

Fig. 9 – As the sheet is eased on a broad reach, the clew tends to rise. If you raise the pole to "keep the clews even," the entire sail flies too high (Boat A). Our goal is to maintain a more powerful shape with a vertical profile. We can accomplish this by trimming the guy while easing the sheet (Boat B). If the sail is overtrimmed then flow will stall (Boat C).

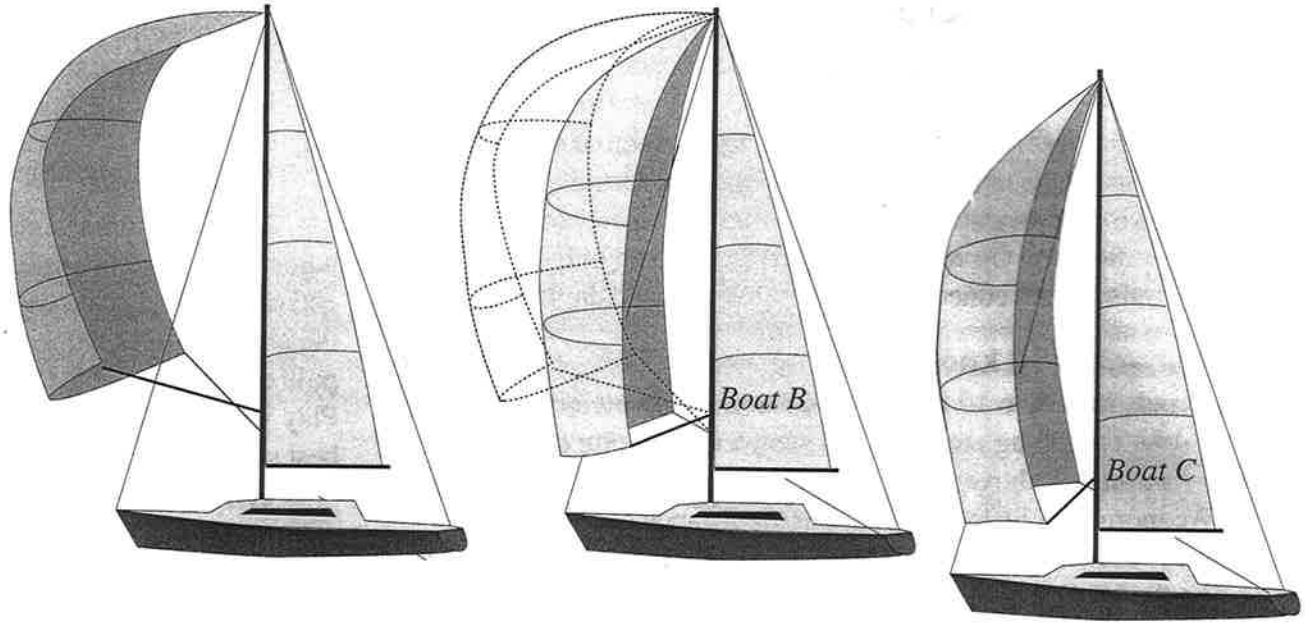


Fig. 10 – Overeasing the sheet to get the spinnaker out from behind the main can spill open the leech. Square back the pole to rotate the luff to windward and initiate a curl, then trim the sheet to keep the spinnaker in a powered-up shape.

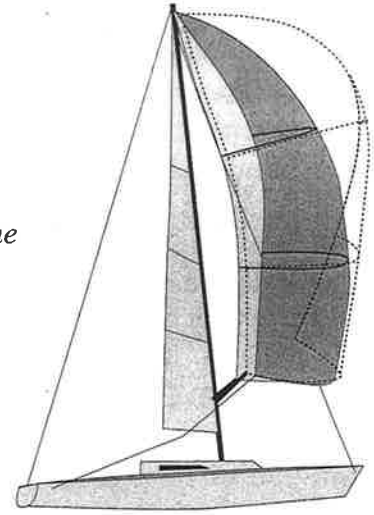
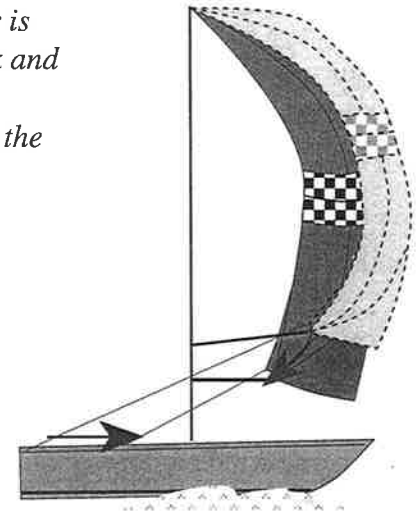


Fig. 11 – If the spinnaker is flying too high, trim back and down on the pole while simultaneously trimming the sheet.



11.5 Light, Moderate, and Heavy Air Trim

The trim guidelines offered above for each control of spinnaker shape can be further refined as we look at trim in different conditions. As we saw earlier, sailing a spinnaker run rarely means pointing at the mark and sailing to it. Usually it involves tacking downwind, reaching up for extra speed and sailing extra distance. On reaches we were concerned only with speed. On runs we are concerned with both speed and angle.

Light Air – 3 to 10 knots

In winds from 3 to 10 knots it pays to tack downwind aggressively. The jibing angles nearly match our tacking angles upwind – about 40° above dead downwind, or 140° true wind angle. We more than make up for the extra distance sailed with extra speed. Light air sheets will help the sail fly (as will removing the lazy guy if you normally use one).

If you do not have true wind instruments to guide you to a 140° true wind angle you can start by sailing the reciprocal of your close hauled course. As you build speed push down about 5°, and you will be close. From there, you be able to feel the optimum angle a couple of ways. First, you should always feel the apparent wind coming over the side of the boat. If the apparent wind goes light and aft, you are pushing too low. Second, the trimmer can guide you to the optimum course by careful attention to the load on the spinnaker sheet and constant attention to...

... Sheet Trim

Play the sheet, with an emphasis on easing the sail every chance you get. The apparent wind angle will be near the beam (90°), to perhaps 110°. In these conditions the driver maintains a steady true wind angle, working up and down only 5° or so, in response to changes in wind and boat speed. The trimmer should help call the boat up or down as sheet load changes. Fig. 12.

Pole Height

From our initial setting, with the clews even, we can adjust pole height to the improve spinnaker shape. In the low end of the wind scale carrying the pole a little high can help lift the entire sail. As the wind speed nears ten knots holding the pole down can pull the spinnaker into a more efficient shape. Play with pole height to find the position which provides the best speed and easiest trim.

Guy Trim

In the lightest air the pole will be near the headstay. As the wind builds the pole can be pulled back beyond the initial *perpendicular to the wind* setting. As described earlier, try to match the foot shape to the shape across the middle of the sail. If the foot is too round, pull the pole back. If the foot is stretched flat, then ease the pole forward.

Chop

Chop can shake the wind out of the spinnaker. Try choking down the lead and pole for a more stable shape. It is easy to mistake a shake for a luff – be careful not to overtrim the spinnaker. And reach up. Get enough speed to crush the chop.

Puffs

In light air our optimum sailing angle does not change in puffs and lulls. The driver should hold a steady course, while the trimmers make adjustments to suit the changing conditions. Do *not* drive off in the puffs or head up in the lulls in light air. Fig. 13.

Crew Weight

Keep weight forward and leeward in the lightest winds to lift the stern out of the water and reduce wetted surface. As the breeze builds move weight up and aft to control heel.

Too Little Wind

You may have noticed that we start light air at 3 knots of wind. When the wind is lighter than that, do anything you can to get the boat moving. Put weight to leeward (or below deck), minimize movement, and look for more wind. Speed is your only friend. Once you are moving then you can try to aim more or less at the mark (or back to the harbor). Good luck.

Fig. 12

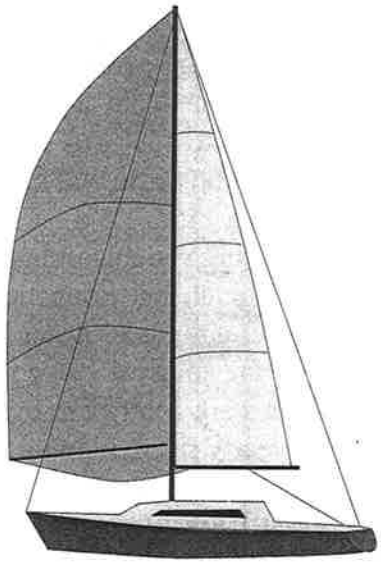


Fig. 12 – In winds of 3 to 10 knots the optimum true wind angle is about 140°. In the lightest air, carry the pole forward and ease the sheet to get the spinnaker away from the main. Move crew weight forward and leeward, and ease the vang to encourage flow on the main as well.
As the breeze builds toward 10 knots you will near hull speed. Sail the boat flat, and square the pole back. Keep speed, and try to carry the speed a little lower. The sheet trimmer calls course. If you sail too low you lose apparent wind speed and spinnaker sheet load. Head up before you lose speed. Pay attention to the feel of the apparent wind over the side of the boat. You'll able to feel how low you can sail while keeping good apparent wind.

Fig. 13

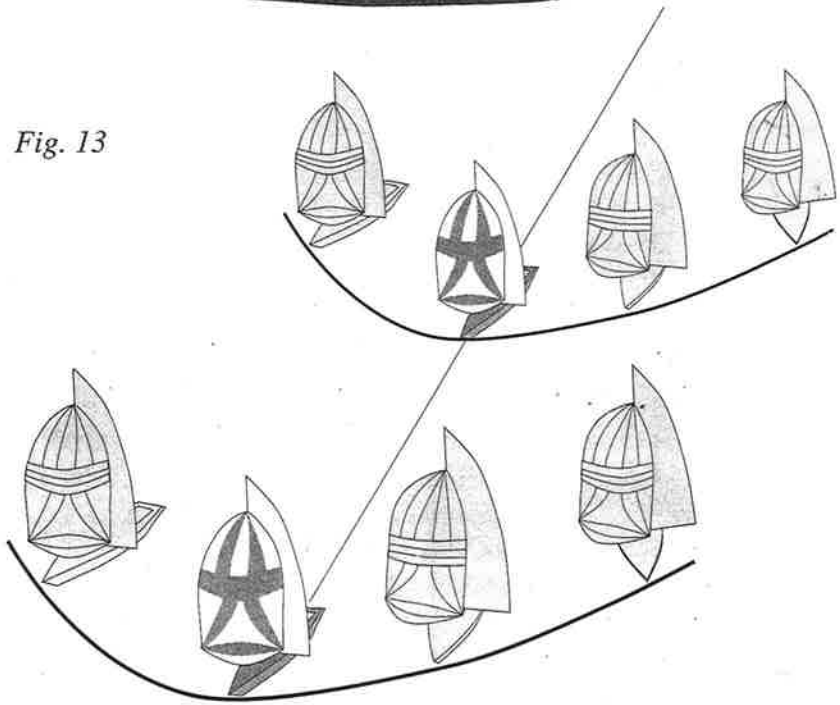


Fig. 13 – In puffs and lulls the optimum true wind angle does not change appreciably. Hold course and retrim to the new wind. Do not bear off in the puffs and head up in the lulls in light air.

Moderate Air – 10 to 15 knots

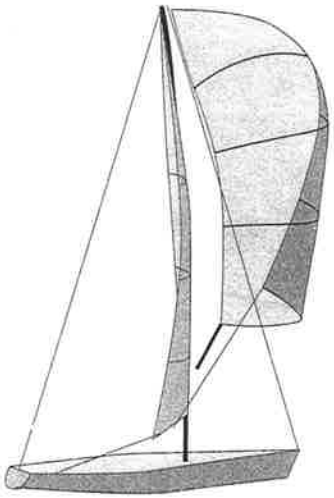
Across the moderate wind range performance changes dramatically. From an optimum true wind angle of 140° in 10 knots of wind we can push down to 165° true wind angle in 15 knots of breeze. The apparent wind angle will also swing dramatically, from about 115° to 155°.

While boat speed was the big variable in light air, in moderate air boat speed does not change dramatically with wind speed. While the boat certainly goes faster in more breeze, what changes most is the ability to carry speed at significantly lower angles. In stark contrast to light air, where the optimum angle remains nearly fixed, in moderate air it is angle, not speed, which is the big variable. With each increase in wind speed we can sail more directly to the mark.

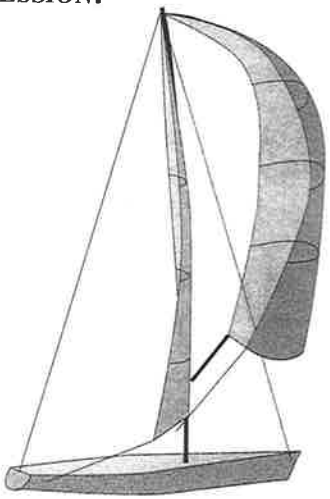
Sheet Trim

The trimmer and driver must work together to sail the boat as low as possible while maintaining speed. The best gauge is *not* matching true wind angle to wind speed. Instead, use sheet load as your guide. Anytime the sheet is pulling hard, drive the boat down, and whenever the load is light, come up. Big changes in course and trim are appropriate in response to changes in wind speed.

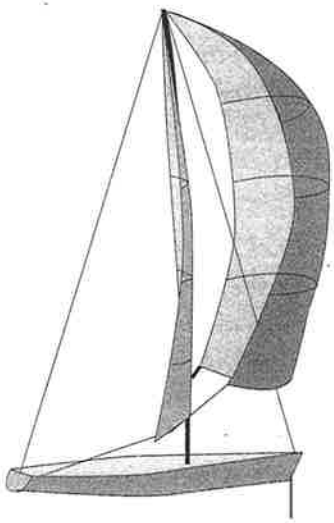
FIG. 14 – SPINNAKER TRIM PROGRESSION:



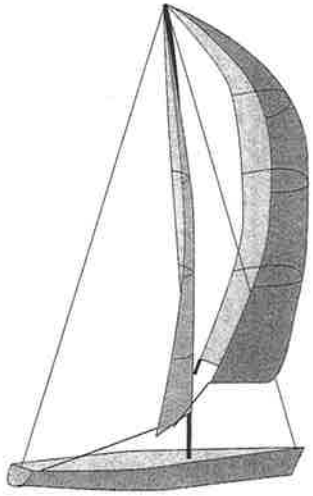
With the pole too high and forward, the sheet is over eased to curl the luff, and the leech is spills open.



The sheet is trimmed, but the pole remains too far forward and high. The clew is also to high, leaving the sail is too flat, especially aloft.



Trimming the pole down and aft adds power. The sheet is trimmed to control the curl. Full speed ahead.



Here the sheet is overtrimmed, and the sail is too close to the rig and starved behind the main. Ease both sheet and guy.

Pole Height

As the pole comes aft it should also go up. When the apparent wind is forward we keep the pole lower to hold the draft forward. As the wind and pole move aft a higher pole position opens up the luff at the head for bigger projected area. Of course, if the pole is too high then the top of the sail spills open, and area is lost below the pole, as we saw a few pages back.

Guy Trim

Play the pole constantly, in unison with the sheet and with the changes in apparent wind angle. Trim to maintain a vertical luff and proper foot shape. The apparent wind angle changes wildly in puffs and lulls in moderate air. Working the guy is critical to maintaining spinnaker shape. It is not enough to just play the sheet. In order to carry speed when bearing off in a puff, the guy must come back as the sheet is eased. Likewise, in lulls the guy must be eased as the sheet is trimmed or the spinnaker will starve behind the main. Fig. 14.

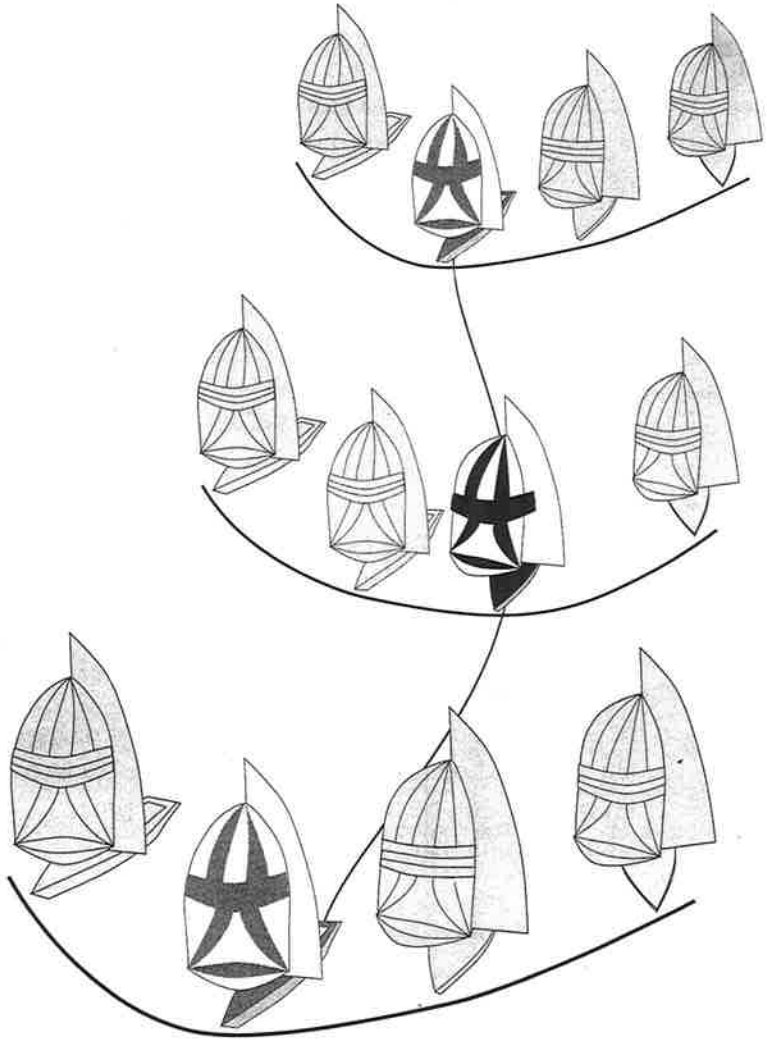
Puffs

Off in the puffs and up in the lulls is the central to moderate air performance. With each puff drive off and carry speed as low as the wind allows while maintaining apparent wind and spinnaker sheet pull. Be prepared to respond aggressively in lulls, *heating it up* in the light spots to maintain speed. Fig. 15.

Crew Weight

Sail the boat flat to maintain a neutral helm. Move weight to weather and aft to help drive the boat down in puffs, and move ahead and to leeward to help head the boat up in lulls. For more on using crew weight to help steer the boat, see *Chapter 13: Section 4 – Not Steering Downwind.*

*Fig. 15 – In 10 knots of wind the optimum true **wind angle** is about 145°. In winds of 15 knots the angle is closer to 165°. This dramatic change in optimum angle requires aggressive trim and steering to respond to puffs and lulls. It is particularly easy to get caught too low, and lose speed in a lull.*



Heavy Air – 15 knots +

When the true wind speed exceeds 15 knots, never mind tacking downwind. Point the boat at the mark and sail as fast as you can.

Sheet Trim

The sheet must be eased way out to get the spinnaker out from behind the main. Ease to a curl and trim, ease and trim. Keep the clew of the spinnaker to leeward of the forestay. If the clew rolls out to windward of the forestay, the foot becomes too round, and we lose projected area.

Pole Height

Set the pole to control luff shape and to hold a 50% draft position. If the pole is too high the luff will be open and flat. Also, if the pole is too high it will allow the entire spinnaker to float up, costing projected area. If the pole is too low the luff will be too round, and cave in. See the earlier figures on pole height.

Guy Trim

Trim the guy back as far as possible while keeping a vertical luff. On a very deep broad reach the pole will be trimmed out perpendicular to the boat, maximizing area. If the boat starts to roll out of control, let the pole forward to put the center of the spinnaker directly over the bow.

When the spinnaker clew floats out to windward of the forestay the sheet should be trimmed to get the clew back to leeward. Often the guy can be trimmed at the same time, spreading the entire spinnaker into a bigger shape.

Crew Weight

Put weight to windward can create windward heel. This will help the spinnaker fall out from behind the mainsail, and it will also help force the boat down to a lower angle while carrying speed. When things get out of control balance crew weight side to side – well separated – and move everybody to the stern.

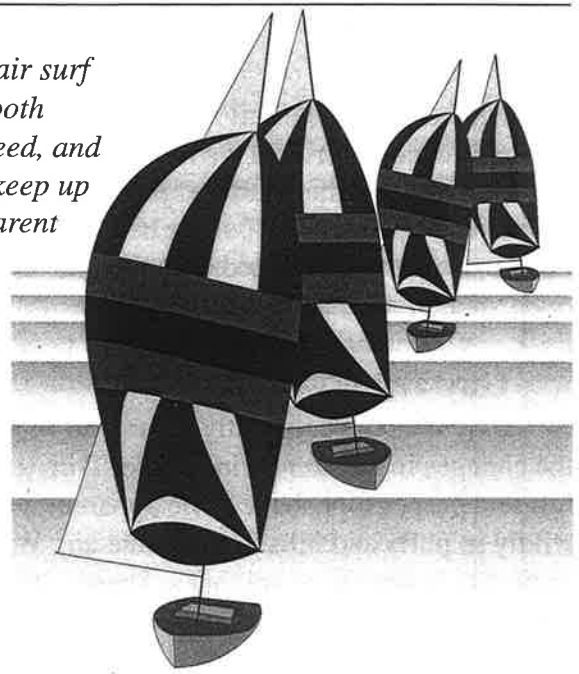


Fig. 16 – In heavy air surf the waves. Use smooth driving to carry speed, and aggressive trim to keep up with changing apparent wind angles.

Surf

Rather than sail straight at the mark, alter course to take advantage of the waves. To catch a wave, trim and head up to build speed. As you start down the wave drive off to stay on the wave, and trim as the apparent wind shifts forward. Be ready to ease as you fall off the wave and the boat slows; and head up to catch the next one. Fig. 16.

Too Much Wind

Running downwind in *very* heavy air can be hair raising, as the boat starts to roll and control becomes marginal. It is in these conditions where it helps to choke down the sheet lead

(perhaps as far forward as max beam) and lower the pole to minimize rolling . Also, tighten the vang. Keep the spinnaker in front of the boat. Trim so the center of the sail is over the bow. Move crew weight aft *and to leeward* to create weather helm. If the spinnaker gets too far to windward it can roll the boat to windward and cause a jibe broach. Not a pretty picture. Steer the boat under the spinnaker and head up slightly to avoid an accidental jibe. Fig. 17.

When You Crash...

A jibe broach starts with innocent rolling. Suddenly you find the world has turned on its side. Hold on. Dump the spinnaker halyard and the boat will stand up. The halyard should be ready to run in heavy air – not in coils, but belayed, or trailing behind the boat. Pull the sail on board, repack it, and try again... Fig. 18.

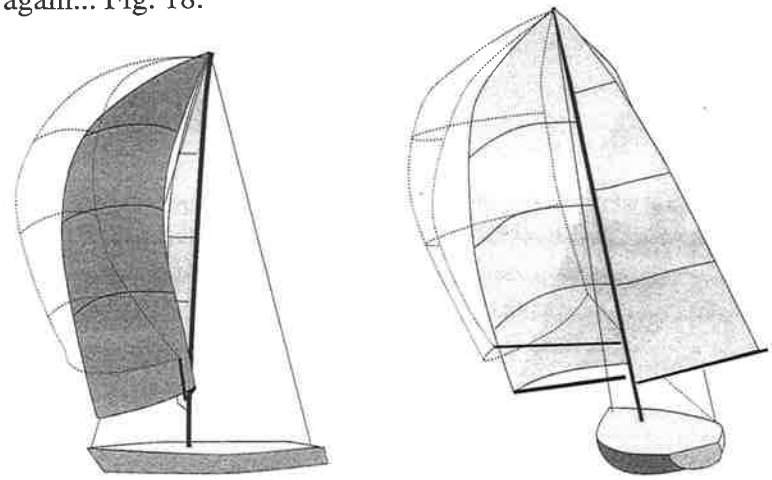
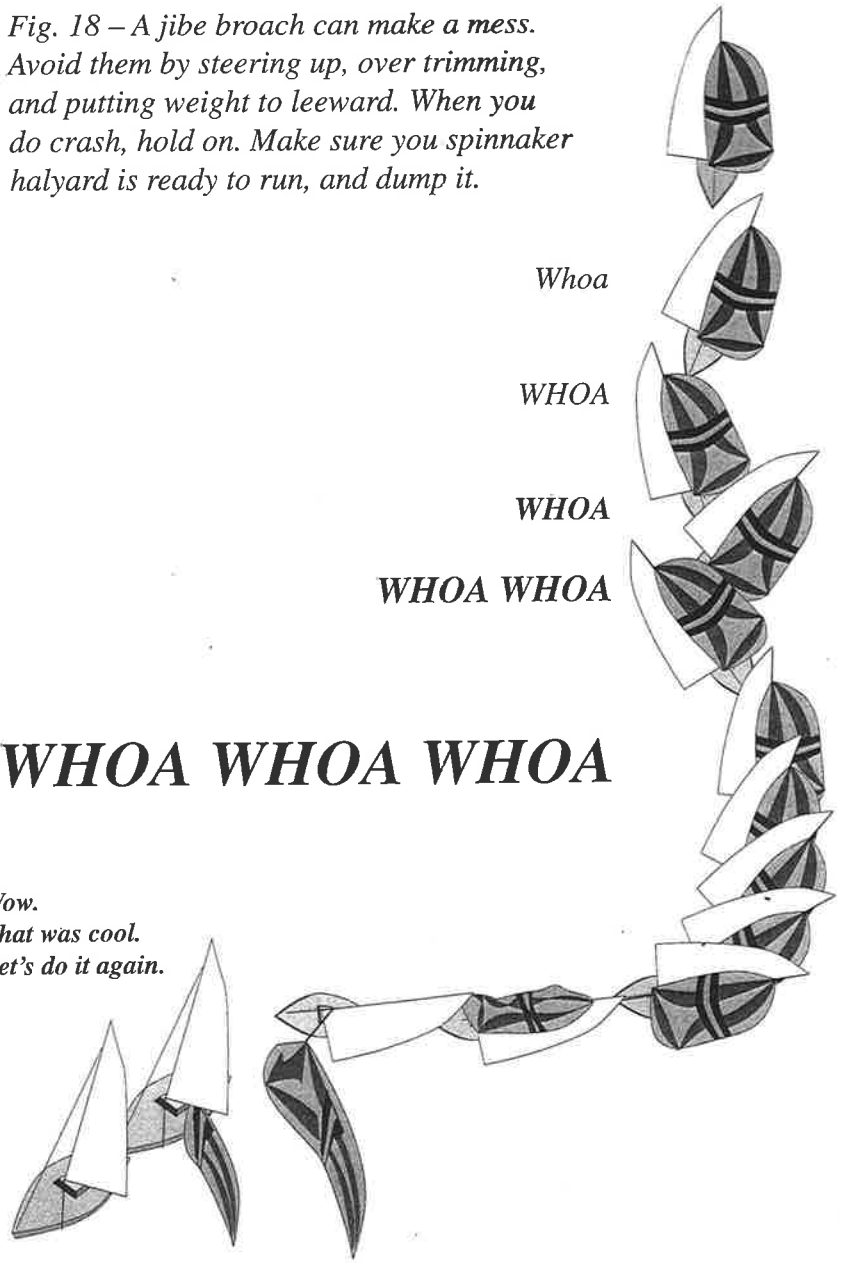


Fig. 17 – Trim for control. Shown are two perspectives on trimming for control in very heavy air. If the spinnaker is flying high and to windward it can cause the boat to roll out of control. To maintain control, choke the spinnaker down and trim it in front of the boat.

Fig. 18 – A jibe broach can make a mess. Avoid them by steering up, over trimming, and putting weight to leeward. When you do crash, hold on. Make sure you spinnaker halyard is ready to run, and dump it.



11.6 Reaching Trim

Close Reaching Trim

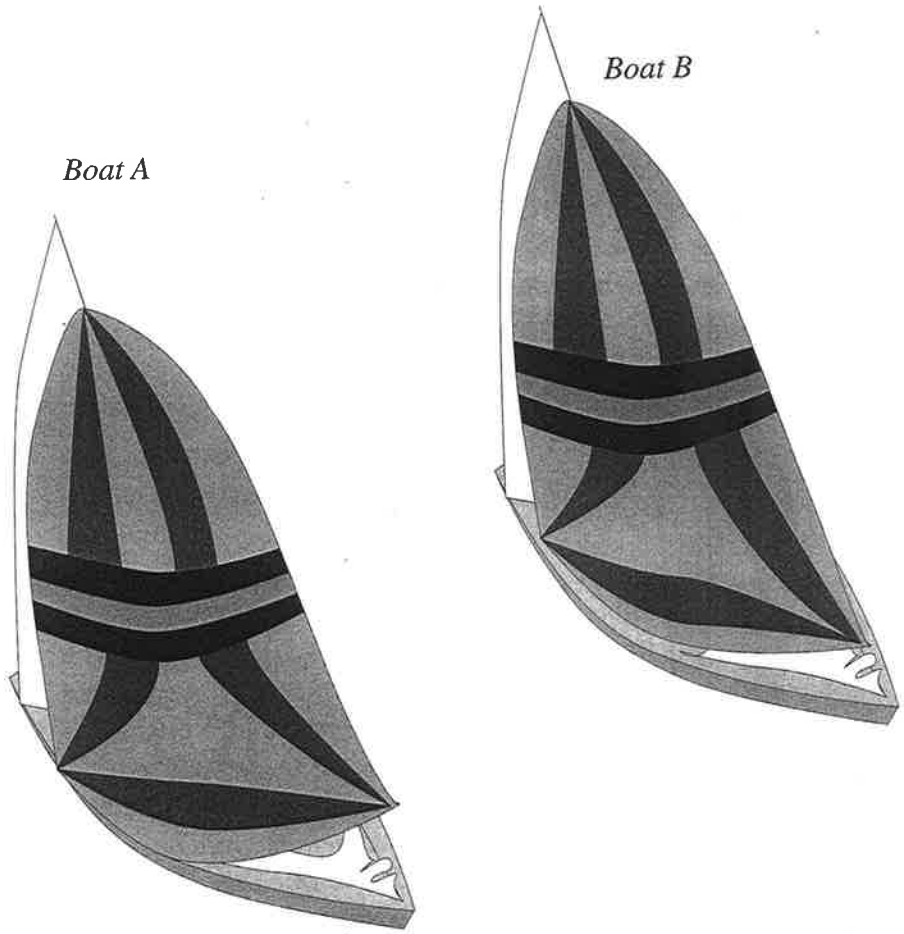
It is on a close reach, with the wind forward of the beam, that the spinnaker behaves most like a genoa. Try a set of telltales half way up your sail, about 15" from each luff. The telltales work on a spinnaker much as they do on a genoa. The outside telltale is a particularly valuable guide to prevent over trimming and stalling.

You can improve close reaching performance by adjusting the spinnaker shape to conditions. For closer pointing in light to moderate air set the pole a little high. This gives the sail a flatter entry, which is a closer winded shape. This high pole position puts the draft aft, creating more heeling forces and drag, so it is slow; but it is better than a collapsed spinnaker and it allows a few extra degrees of pointing.

For heavy air close reaching try a low pole position, and pull the pole a foot off the headstay. This pulls the draft forward, flattens the sail, and opens the leech to spill excess power. This pole position creates less drag and heel, but the round entry does not point as high as a normal shape. Fig. 19.

It is imperative in heavy air conditions that the sheet be eased in puffs or when overpowered; otherwise you round up, out of control. The sheet should be eased as a puff hits, before the boat heels over, so the extra force can be translated into speed rather than heeling. The vang and mainsheet should also be in hand, ready to dump in a big puff to prevent a round up.

Fig. 19 – Boat A: On a close reach in moderate air adjust the pole to control power and pointing ability. Note the genoa on deck, rigged, and ready to go.
Boat B: In heavy air a low pole position pulls the draft forward and opens the leech, helping to depower.



Spinnaker Staysails

Staysails can add valuable tenths to boat speed. They are most effective in ideal conditions – beam to broad reaching in smooth water and moderate to heavy breeze. The further conditions are from ideal the less effective the staysail will be.

Set the tack of the staysail half way between the main and the spinnaker, as far to windward as possible. On a beam reach the staysail should be tacked along the center line. As the pole is trimmed aft on a broad reach, the staysail tack should follow the pole and move to windward. Set the halyard tight and adjust the luff cloth tension separately for a smooth even shape. Position the lead to keep the staysail between the main and spinnaker, and set the lead so the sail sets a little soft up high. Fig. 20.

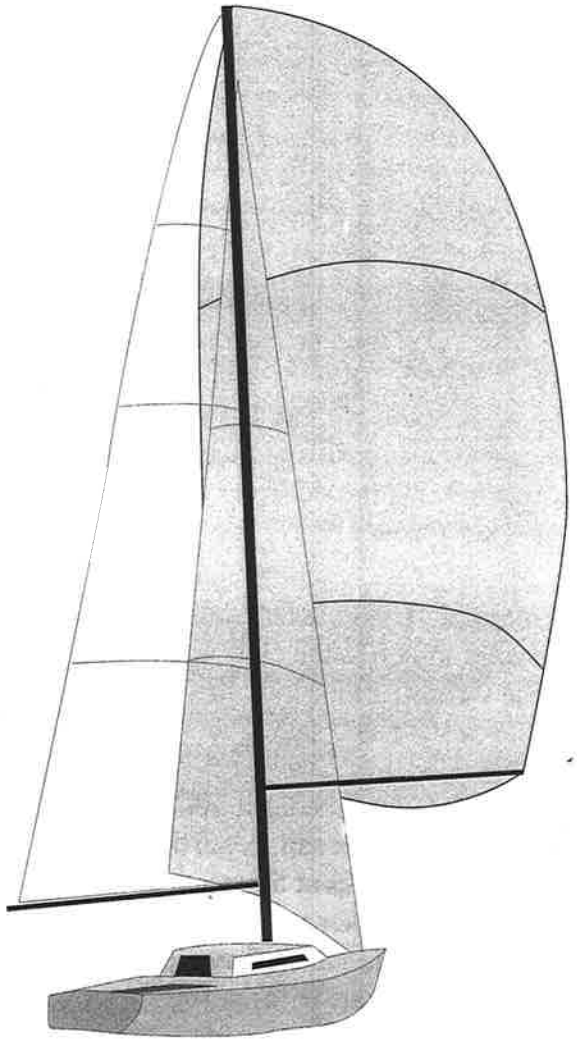
Never overtrim a staysail. It will starve the spinnaker and cause a collapse. Trim the staysail a little soft, and dump the sheet if the spinnaker collapses.

The Magic Rule

Use the staysail only if it improves speed. (WOW!) If it slows you down, take it down. If it doesn't help speed, or it makes the spinnaker difficult to trim, then douse it. Remember that the spinnaker is the first priority.

A mini furling drum can make the staysail more manageable. The hoist is easy with the sail rolled, and you can test the sail by unrolling and rolling, rather than having to hoist and drop to evaluate the impact on speed.

Fig. 20 – Staysails can add speed in ideal conditions. On a beam reach tack the staysail on the centerline, and trim the staysail halfway between the mainsail and spinnaker. On a broad reach move the staysail tack outboard and aft, following the spinnaker pole. A mini furling drum is a nice addition.



11.7 Conclusion

Spinnaker trim starts from an initial setting with the pole perpendicular to the wind and the clews even, but there is much more to it than that. Work with your spinnaker controls to shape your spinnaker to suit conditions. If you get confused in the fine tuning process the go back to the initial settings and try again.

Color Selection

One critical and under-appreciated part of spinnaker trim is the original color selection. A spinnaker which is pleasing to the eye is easier to trim than some garish color sampler. Fig. 21.

From a practical standpoint it is best to have contrasting colors along the edges of the spinnaker. A sharp contrast between the first and second panels makes the curl easier to see, particularly at night. But there is a danger in using too many colors, as each roll of cloth has slightly different stretch characteristics – even two rolls of the same color. For uniform stretch it is best to build the sail from a single roll of cloth.

Range and Care

If properly cared for, your spinnakers will give you years of top performance. To help assure their long life use them only in conditions appropriate to the cloth weight. *Appropriate* depends on the weight of the cloth, the weight of your boat, wind strength, sea state, and sailing angle. Your sailmaker can tell you more.

Your sail will perform better if you pack it clean and dry. The colors may run in a wet sail. Also, do not leave your spinnaker in stops for weeks at a time.

For details on spinnaker handling, refer back to *Chapter 9: Downwind Boat Handling*. For a look at Asymmetric Spinnaker Trim, go to Chapter 12, next.

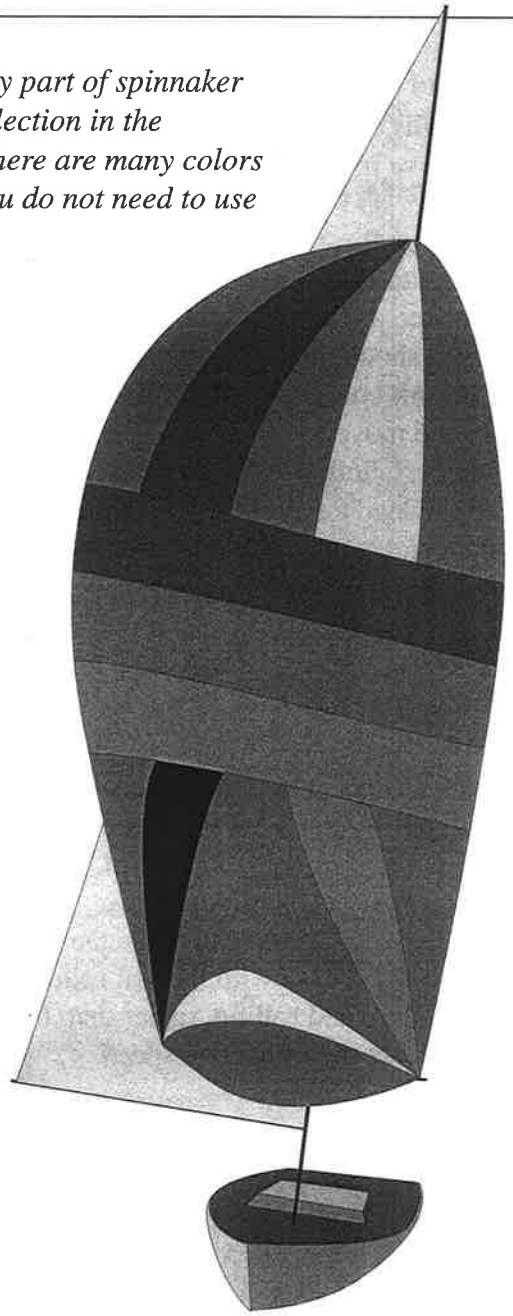


Fig. 21 – One tricky part of spinnaker trim is the color selection in the original design. There are many colors to choose from. You do not need to use them all....