

# *Downwind Speed*



## **Under Jib and Main**

**Non-spinnaker racing isn't non-competitive!**

**Ed Baird explains how to get an edge downwind with a whisker pole.**

Non-spinnaker divisions in distance races and jib-and-main evening races represent a growing segment of sailing. Sailors enjoy the simplicity of jib-and-main racing because it doesn't require a big crew or a lot of expensive gear. There are more and more races that now include non-spinnaker divisions so that a broader range of sailors (and a bigger fleet) can compete. Obviously, this breeds a whole new set of performance questions for getting downwind. A boat sailed correctly can make huge gains in a short time - the kind of situation we all daydream about - so it's real-ly worth working on!

As most boats turn downwind, past the tight-reaching angles and into the broad-reach and running apparent-wind angles, a

tremendous loss of power is felt. What's happening, aside from an associated drop in apparent windspeed, is that the wind flow across the main and jib does not stay attached as far aft, leaving the sails stalled. The boat's meant to be using a spinnaker.

But with jibs and genoas only, you're stuck. You can try to keep the telltales flowing by moving the leads forward as you sail a broader angle, but eventually the sail gets too round and much of it stalls. Circulation around the main is better because you can use the vang to maintain shape, but the main alone won't give you the speed you need. Also, as you ease the main it steals the wind from the genoa, and the genoa leech gets too close to the main and slows the airflow there. This is not a fast situation!

### **The Mighty Whisker Pole**

Enter the whisker pole. Cruisers and pas-sage makers have long known the value of sailing wing-and-wing and have learned to appreciate the stability of using a pole to keep the jib to windward. Likewise, Snipes and other dinghy classes hold the jib clew out to windward on a pole in lieu of adding spin-nakers to their class-prescribed sail arsenal.

You'll often find your jib wanting to cross over to windward on its own when you're running. Letting it cross over, in fact, forcing it there, is a lot faster if done properly. When you put your jib or genoa on a pole out to windward, you reverse airflow across it and expose it to air that is undisturbed by the main. By pulling the pole aft you can get the sail into

a flatter configuration with normal airflow over both sides along most of the sail. This gives the sail power again and your boatspeed will jump up.

On larger boats, a spinnaker pole will work in this situation, but an adjustable whisker pole is better as its length can be adapted for different wind angles and different-sized sails. Most fleets allow whisker poles to be extended to at least the length of the boat's J dimension (from the front of the mast to the bow), but you should check the rules for your local fleet. Some fleets allow poles as long as 1.5 times J - a big advantage on a tighter reach, especially if you have an overlapping headsail.

The idea here is to set the sail with proper power (the right amount of depth), and trim it aft until the leech curls back towards the boat. At this point, just as with proper spin-naker trim, you're getting the most lift and the best speed out of the sail.

This isn't startling to most readers, but you might run into problems deciding when to pull the headsail over to windward, and knowing exactly how to set it up when it gets there. To make these decisions simpler, let's first look at how the boat feels when it needs the boost of sailing wing-and-wing.

The first clue that the sail needs wind is when the headsail sheets go limp, meaning the airflow has been greatly reduced and the sail isn't generating any power. To get more power, you can head up, refilling the sail with wind and building speed, or wing the headsail out to windward on the pole if staying low is necessary to get to the mark. There's usually an overlap of angles where the jib can work on either side, and you don't have to wait un-til the genoa sheet is hanging in the water to

know that it's all right to pole out the jib.

When the jib is out on the whisker pole it's generally more efficient than when it's trimmed to leeward, so your tendency should be to get it out there right away. But to be safe and also to keep your tactical options open (it's tough to luff another boat when you have your jib on a pole to windward!), you need to be sure there's a real opportunity for improvement before going for the pole.

### Sailing by the Numbers

Take a look at the accompanying chart. You can develop some general strategic assumptions from this information: When it's windy, and the boat is traveling at close to hull speed, struggling to set the genoa to windward probably won't help you until you're way off the wind, say 150 degrees apparent. When it's really choppy and rough, you should probably postpone setting the pole a little longer too, as it would be hard to keep the sail from collapsing as your boat rolls around in the waves. In lighter winds, getting the genoa across when the wind is 90 degrees apparent (if you have a long enough pole), and aft of that, will help keep your boatspeed up.

The key to making the decision to wing the jib is to know what your speed *should* be. Every boat has an optimum speed for every point of sail. Velocity prediction programs generate polar diagrams for your boat that will show you how fast you should be going at given angles to the wind and windspeeds. These charts are quite common, and are available through the designer or manufacturer of your boat, or through US SAILING. Ask for "cruising canvas" polars for your

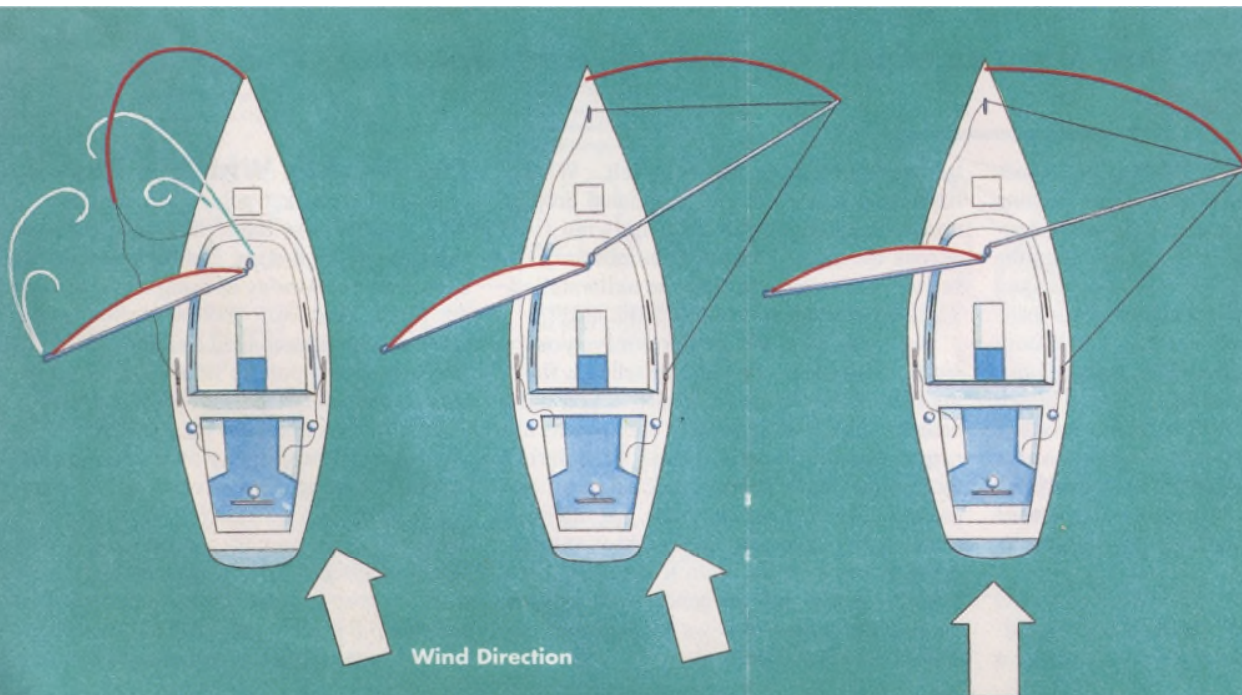
boat, which take into account your non-spin-naker configuration.

If you really want to max out your off-wind speed, a practice session with polar information in hand and a few quick tests at different apparent-wind angles with and without the headsail to windward should give you some hard data to work with in future races. Cruising canvas polars don't automatically assume that you'll be using a whisker pole at the broader angles, so through a little experimentation you can develop your own quick-reference chart and keep it on deck to help take the guesswork out of when to set the pole, and how fast you should be going. If you can show in practice that you can get closer to your target speeds with the pole out at a particular wind angle, your team can be ready to set the pole when you reach that angle in the next race.

### Setting the Pole

You should also practice how to use the whisker pole. I believe the best whisker poles are the infinitely adjustable ones, as opposed to those with pins and stops that set the length. Being able to change the length of the pole with an internal purchase system makes it easier to adjust the sail for any wind angle.

During practice, the pole needs to be marked for two lengths that fall within the rules for your fleet: Longer for close reaching, shorter for broad reaches and runs. When you decide to pull the sail across to windward, put the lazy (windward) headsail sheet into the outboard jaw, then extend the pole, and attach it to the mast. Have the helmsman steer low for a short time to relieve some of the pressure on the sail, then ease the



Putting your genoa out to windward with the whisker pole on broad reaches and runs allows it to develop more power in undisturbed air. The tighter the angle, the longer the pole should be, especially when using an overlapping genoa. When sailing dead downwind, the pole can be pulled aft and shortened.

Jim Sollers Illustration

leeward sheet, and trim in the windward one.

A word of warning: With the sail out to windward, terrific pressure can be developed on

the pole in strong winds or if sailing close wind angles. Some whisker poles aren't built to withstand the pressure that a reaching course in strong winds can place on them, and could break or jump off the mast causing damage or injury. If it's that windy, it would be just as fast to have the headsail trimmed to leeward anyway, so be smart and avoid situations that will put your pole under these loads.

On broader angles, as you trim the pole back it will tend to lift up as the sail fills. Then it will want to bounce up and down in puffs and as the boat goes over waves. A quick fix for this, which is especially nice on boats with limited hardware, is to loop the leeward sheet around the front side of the bow cleat. When you've brought the pole back to the position you like, tighten up the leeward sheet and use it as a downhaul. Of course, if you're on a long leg and have the proper equipment, a real foreguy should be rigged. But this technique is great for short courses.

Keeping the pole at the right height is a must for good boatspeed. It should be low enough to keep the top leech from twisting off around the headstay, but high enough to give the leech some "give," allowing it to curl before collapsing. Different windspeeds, wave conditions, and sailing angles will require varying pole heights. If you're using a spinnaker pole as a whisker pole, you'll probably find the topping lift and foreguy useful for controlling pole heights, especially on larger boats (over 35 or 40 feet). Big boats with larger, heavier whisker poles will benefit from a topping lift as well.

When the pole is out, there should be constant dialogue between the driver and trimmers about changes in course, wind direction, and velocity. When the boat is turned, the sail must be adjusted. When there is a windshift, the trimmer must respond. Just like a spinnaker, the jib out to windward must be constantly tended. The trimmer should watch the leech of the jib, and keep an occasional curl which shows the sail is working best.

As far as sail selection goes, most boats will simply wing out the sail they're using for the upwind leg. If it's windy and you're racing upwind with a small headsail, like a

## When To Wing It

Wind Speed (knots)	< 10	90 - 120'	120' - 180'
Light 0-5	Maybe	Yes	Yes
Medium 5-12	No	Maybe	Yes
Heavy/Medium 12-18	No	No	Yes
Heavy 18+	No	No	Maybe

**Every boat is different, so you should develop your own chart, like the one above, so you can quickly decide when to wing your genoa out to windward. Keep in mind that at the top of the wind scale we suggest you avoid using the pole unless your team is very competent - the risk of clanging or injury can be quite high, especially in big waves. Jibbing the whisker pole before the main (below) will help you come out of the jibe with speed.**



JH Peterson photo

No. 3 jibe, you could conceivably change to a larger genoa that will give you more sail area off the wind for a long leg. However, if the downwind leg is short and you have a small crew, it's probably more efficient to stick with your upwind headsail and avoid the complicated sailhandling. Again, work on these decisions in your practice sessions and your choices will be clearer during the race.

## Jibbing and Stowing the Pole

Depending on the length and type of pole you're using, it's usually not possible to do end-for-end jibes. On most boats, the pole will have to come off the mast and the forward end is passed through the foretriangle. To do this, the bowman, trimmer, and driver need to work together.

First, ease the foreguy or release the lazy sheet from the bow cleat. Next, as the boat is turned into the jibe, the pole should come off the mast, and be pulled back along the leeward side of the boat, probably between the shrouds and the mast. If one person has to do all the work on the bow, he'll have to place the pole on the deck and switch the sheet in the outboard end. Another crewmember

holding the pole can help; but you can also have a loop in the clew of the sail that the pole always stays hooked to, which will make things go a lot faster.

When the sail is clipped to the pole on the new side, the pole should be pushed out and attached to the mast. Trim the sheet in a bit and then jibe the main. (It's illegal to sail with the whisker pole on the same side as the main, unless you're in the process of jibbing.) With this technique, the jib is full right away after the jibe, stabilizing the boat. If you jibe the main first, the jib won't come across as easily and the pole will be a bear to get over to the new side. Once the jibe is completed, reset the foreguy or leeward sheet and you're off!

When it comes time to drop the pole and head upwind, the whole team needs to work together to help the bowman. First, ease the foreguy (or take the leeward sheet off the bow cleat), and turn the boat down slightly as you did on the initial set. This allows the bowman to get the pole off the mast without a lot of pressure on it. Bring the pole back along the leeward side and detach it from the clew of the jib. Make sure the pole is under the jib sheets so you can tack, then shorten and stow the pole

The trimmer should not let the sail cross to the leeward side until the pole is off the clew so the bowman doesn't get tangled, and the helmsman should avoid the temptation to head up until the pole is released and on the deck. Like any racing maneuver, following these steps gets the job done well. Rushing things can really screw it up! When planning for a leeward mark rounding, remember it's usually better to stow the pole too early and be ready for the next leg than to risk a bad rounding by pushing things to the last second.

The whisker pole can make a huge difference in getting downwind under main and genoa. For new sailors, teaming to fly the jib on the windward side is a great stepping stone to using spinnakers. For seasoned sailors racing shorthanded in non-spinnaker races, it's another challenge and a tool you can use to work the boat to its best potential.

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