

Tech Talk *with Don Campbell*

In this issue Don discusses how to control sails in wind.



In the first tech talk on sails, I discussed the desired sail shape by maximizing the flow that was illustrated by the telltales and the controls that you could use to adjust sails. The part that I did not discuss was how to use those controls in wind. The initial settings of the controls for your sails should be set so the range of adjustment is about equal to allow for adjustment for winds lighter and winds heavier than the wind speed specified for you sailmaker to build the sail to. Thus, there is extra line on the sheets to bring the sail in for heavier winds and let the sail out in lighter winds than the settings you have for the designed wind. The same goes for the outhaul, for the halyards, and for any other adjustments that are controlled by lines.

The normal thing to do is to start with the controls set for the designed wind speed. For that wind speed, the angle of the sheets as they come off the clew of the foresail is such that if they were extended into the sail, they would bisect the angle of the clew of the sail. The genoa cars are set to give medium draft. The halyard is tensioned so there are no wrinkles in the luff of the sail. The leech line is such that there is no hook in the sail. The extra things like barber haulers are not necessary. The same goes for the mainsail, the halyard has taken out all luff wrinkles, the outhaul has taken out all creases on the foot and has not done much stretching of the boltrope in the foot of the sail. The leech line is such that there is no hook in the sail. The sheet is tensioned to give a medium leech and the car of the traveler is set so the boom is on the centerline.

The set of these two sails is such that there is no real stretch offered from the controls and it fits the shape as designed. This should give you wonderful sailing at the 12 knots chosen in the instructions to the sailmaker. The backstay adjustment should give a secure mast and good forestay so that there is not much sag.

We then need to consider the changes that we need to make for winds other than the designed wind. So if the wind is lighter, we need energy and power to move the boat on flat water. That means there is very little resistance to our motion from waves, which is a good thing. Deeper drafts give more power so we have to loosen our controls so that the sails develop more draft. The first is to loosen the backstay. This gives more belly to the center of the luff of the foresail (but it still preserves a narrow entry), and hence more depth to the sail as well. If we tried to get this effect from loosening the halyard, we would get scalloping on hank on sails and a very ugly entry on furling units, both of which add turbulence. In light air, you never want turbulence at the front of the boat! In fact you never want turbulence at the front of the boat or anywhere along the sail length until the air has left the mainsail. Move the cars forward and try that, if you have too much draft, then move the cars back and adjust the sheet tension. There is nothing set in stone here, it is what works for your boat and your sails. We can get more draft in

the main with a bit less halyard tension and less outhaul tension (because the mast hides much of the entry of the mainsail and the mainsail is always in a knocked position or a position of lower angle of attack than the foresail). I mentioned last issue that battens may also be adjusted to develop or reduce draft. Battens may be used in foresails, but for the most part their use is to keep the leech smooth. With Alberg 30s the sail cannot be more than a 110 to have battens in it, so this sail is usually all in front of the mast. Once we have some draft in the sails, then we need to adjust the rest of our controls to give us power, so we usually want to deflect the air only as much as will give us laminar flow across the sail. Often the slot is a little wider and there is less twist in both sails, but in any case the leeches should be trimmed to get a uniform slot from bottom to top. This is something that you just need to try as you go, particularly for light air. There is a range of light air velocities that require just the opposite trimming. In very, very, light air, almost any deflection will cause turbulence and so the sails need to be flat. Take out the bend in the battens, and move the cars back tighten the halyard on the main and give yourself some tension on the foot of the main. If anything, play with the position of the boom on the traveller so adjust the slot and still maintain power. (This is one place where a knotmeter that measures in 100ths is a big help.) The ideal is to keep the boat upright, or slightly heeled to leeward (by adjusting crew weight) so that gravity can also give you sail shape and get things balanced to have no helm, and have the telltales coming aft. If the wind is so light that telltales will not fly, then have some ticklers on the stays that are very lightweight wool or cassette tape so that you can see something that shows you the air movement. You will be surprised how quickly you get used to the angle of those ticklers as the limits you use for pointing and announcers of wind shifts.

So what happens when the wind freshens? We need to constantly readjust the controls. As the wind speed increases, draft is reduced, the backstay is tensioned, the outhaul and halyard on the main are tensioned, the slot is narrowed some to give a working venturi, but the sails should still have as uniform a slot as can be achieved bottom to top, there is twist added to the sails up top, (it is difficult to change battens, so often they are not tampered with unless the whole day looks to be light air), the car is offset on the traveller to reduce weather helm and the genoa cars are brought aft. There is usually enough time with a freshening breeze so that these adjustments are gradual and when cruising, one crew can do most of the changing. In races, more crew means more frequent and less drastic adjustments. The idea is to get the main sail flatter, get the genoa flatter and keep going with as much sail as the boat or the crew can handle. Once we are at the maximum the crew can handle, whether it is from an adjustment standpoint, or comfort position, then we need to shorten sail. My normal would be to go head to wind and change headsail from a big one (165 or 170) to a 135. (If I thought the day was going to be one with mostly big winds, I would start with the 135 and not worry about lost production in the light wind for the short time I was in it.) If you have two halyards for foresails and a double track furling system, you can slide the small sail up inside the big sail and carry on by taking the big sail down on a quick pause head to wind. After that, reef the main and after that, I will sail with just the 135 since I don't have a second reef point. The controls still need to be there so that you can manage the sails in those big winds with the crew you have.

I have always found that some sail is better than no sails in rough weather. It gives a far more stable ride if there is some pressure to heel the boat and help with energy to fight the waves. Trimming in

these circumstances is done so that you get the best you can as you make your way off the lake. As long as you have control of the helm and as long as sails are working, things will be fine. Be ready to let off sail tension in squalls and head off for speed and head up in lulls as you bring in the sail. If the waves are such that the period is short and they are steep, sailing is an easier way to go rather than have the prop come out of the lake as you crest waves. That is very hard on all parts of the auxiliary power system.

There are some controls that will not be touched and leech lines are some of those, unless there is a real variance on the stretch of the leech. Adjusting that while under big loads may be difficult. Now, with velcro™ as fasteners, the adjustment is totally variable. Battens are another control that cannot be easily adjusted under sail. Things like rake and mast bend are not easy to adjust in big winds but depending upon the rig set-up may be adjusted but not usually that important on AL30s. Again that depends on your rig. Jean du Sud has running backstays and two sets of spreaders. Yves can adjust tensions in his mast even though the section is a stiff profile and difficult to bend. Rake is something that is usually set as part of the rigging set up. It can change with backstay tension, particularly on downwind points of sail.

The possibilities are there for a fairly sophisticated set up for control of sail shape and positioning with all Alberg designed boats. The class restrictions are not great for most of it provided you stick to the original rig set up with no split backstay, and things like that of obvious infringements. That allows us to upgrade to current technology to keep our boats as modern as we would like and so not necessarily an old boat with no possibilities for ease of usage. Whether the upgrade is to allow women or children to enjoy trimming, or to allow for increasing arthritis in hands and arms to continue to trim, it can be done by using the newer technology of mechanical advantage use to achieve that. It is still a quieter day on the water if you are able to trim a sail comfortably, than to have to resort to trawlers before that necessity arises.

Don Campbell