Two Boat Tunning and Sail Testing
by Mark Reynolds


Head to head in San Francisco Bay

A well-organized two boat-testing program is the best way to make advances in boat speed. As a sailmaker I am often doing quite a bit of sail testing with two boats. You can also go out with two boats to test sails, tuning such as sail adjustments, body positions or spars.

Trying to determine speed differences on the racecourse can sometimes be difficult. There are many variables. Testing and tuning in a more controlled environment separate from racing tactics, other boats and lay lines can be much more fruitful. Two-boat testing is the way real progress gets made with sail design. Much more can be done in a shorter time period. Testing sails on the course is still important. When sail testing, because you can concentrate more on just steering, sometimes a flatter sail can prove to be a bit faster but on the race course you may have trouble accelerating off the line out of tacks or just keeping in the "groove."

It is best to have the same manufacture of boats if possible and crew weight. When testing something you always want to reduce as many variables as possible. If possible also use a rubber boat with an observer. Camera gear can be used to record and later observe sail shape and mast bend and boat trim. We use a Nikonos waterproof camera on the boat and a camera on the observer boat. By using mainly Polaroid instant slide film you can look at the photos enlarged on a wall after returning each day. The advancing technology of Digital Photography is making it much easier to process and print photos more quickly. The photos are very important. They allow you to actually measure the shapes to learn the differences. Quantum has the ability to bring a digital photo into a sail measurement program that will plot and measure the sail's

shape, twist, and entry and exit. No mater how good your "eye" is when you look at a measured photo there is any guesswork. If you then re cut the sail you can see exactly how the shape changed. It also provides you with a record that you can look back at. We often look back at slides and prints taken earlier. With a fresh program or new sail designs it's good to keep a photo logbook documenting your progress.

The location is also important when testing. Pick a location with steady wind. Long Beach is one of the best places for testing I've seen because the wind is very steady and the conditions very consistent every day. In the morning we have light air and fairly smooth water and in the afternoon moderate air with some chop and small waves. If possible get away from the shore to get winds as steady as possible. In the Snipe we often test on Mission Bay, which is a small body of water so we sail right along the lee shore to get as little affect from the land as possible.

The boats need be separated by about two boat lengths. I learned from Bill Buchan that it's best to have the leeward boat a little in front of the windward boat. In the Star the boats should be lined up so that the windward boat's helmsman can sight straight across the stern of the leeward boat. This rule of thumb may work in most boats. As soon a one boat moves more than one boat length ahead or the gap between boats is greater than three boat lengths then you should line up again. This is the biggest mistake most people make. It is very important to get lined up again because it gets more difficult for the guy behind and you both will just start wasting time. If you are testing sails it's best to start out with the same sail on both boats and only after each boat gets tuned up and going the same speed the sail on one boat is changed. One boat stays constant all day and changes are made on the "test" boat. At the end of the day the original sails may want to go back on the test boat to confirm the test boat is still going the same speed as at the beginning of the day. It's often tempting to make many changes at once because larger differences may show up but you may not know what was the reason for the speed change and you don't make steady progress. Throughout the testing it's important to keep notes on the results, observations and conditions and record settings. Much of this info should be also kept with the photos.

If you are testing sails I think the same boat should always stay to windward and the other to leeward. This will take out a variable. If you are testing tuning you may want to switch every once and a while to confirm your results because of wind shifts or pressure one side may always be better. It's a good idea to start out with the standard tune and sails and then one boat starts making predetermined changes. The difference between fast and average sails is usually so small that it takes a while to figure it out. Also often a sail, especially a main, may test slow initially but after a bit of adjusting with the rig it may go much better. If one boat needs or wishes to try an adjustment then he should tell the other boat, using radios for communication could be a big help.

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