

A PHRF Prospective on competitive racing

This document has been consolidated from "The PHRF Prospective" newsletters posted on the Southern California PHRF web site. http://www.phrfsocal.org/Perspective_Index.htm The documents purpose is to help skippers and crew identify areas to improve performance, and to help PHRF handicappers set and maintain competitive standards to use for comparison when setting or changing a class of boats rating.

(Part 1) Get a Better Rating through Boat Preparation

Top placing boats, almost always, are better prepared to race and are usually bettered optimized for performance. Performance and practice makes doing well easier by getting your boat's speed potential equal to or better than the handicap rating for that class of boat. The premise of the PHRF rating criteria is that a well crewed, well equipped and well raced boat has an equal chance to be competitive to place in the money. Preparation of your boat plays a major part in its success and your enjoyment.

As you prepare for a season of racing, it's a good idea to keep in mind upgrading your boat as you maintain her. Many of the following suggestions were set forth by former PHRF Board member, Bruce Cooper.

1. RIG: Mast tune determines how your sails perform. Check that your rig is straight at the dock and again while sailing. Ask your sailmaker or rigger to check if your mast is tuned, i.e., if your rig has enough pre-bend and rake, if it is centered, and if it has proper tension. A tuned rig will help your upwind speed and pointing considerably!

- Put your rig on a diet and focus on removing weight aloft. This greatly helps your boat's righting and pitching moment; it means less heeling and more speed! Use Vectran or Technora halyards. You can eliminate bloodstains on your sails and foredeck because there will be no meat hooks! New Vectran line with a polypropylene cover is light, strong and doesn't absorb moisture. If you have older "double channel" sheaves intended for use with wire, you can lighten your load without replacing the sheaves. Splice on a foot & a half of wire and swedge the shackle on! Here are a few more ideas:
- Newer ropes are strong enough to lift your boat! Don't try this without a safety net. Now, high load capable, nearly zero stretch rope permit downsizing many of your lines.
- Have your sailmaker supply two feet of luff tape with cringles for halyard & downhaul to clean headfoil grooves for faster hoists. Spray with McLube or Boshield.
- For fast and consistent trimming of the genoa, put 1" tape on the spreaders at 3", 6" and 12" to give your trimmers an easy-to-use reference.
- Mark your halyards for maximum hoist to add consistency to trimming your sails. Halyard tension is a big part of sail shape and speed. Make sure your sails, shrouds and backstay have ribbon or yarn telltales and your masthead Windex is aligned.
- Your spinnaker pole and spinnaker pole track should be in good working condition. If not, you'll be losing valuable time at every jibe and mark rounding.
- Keep your spinnaker pole rigged low on the mast (with the topping-lift pulled aft) so it's pre-set for the mark rounding. Saves time rounding the weather mark!
- Remove the roller furling drum for racing and have a racing Genoa cut full length.

2 SAILS:

- The newer cloths are light, stronger and more durable than. Consider Carbon and blends. Prices are more reasonable and carbon has advantages over Kevlar and other UV sensitive materials that make it worth seriously considering. Ask your sail maker for his opinion on what is best for your use. Make sure the sails you use most are more recent than the rest of your sails.
- And remember, new sails equal speed. Period. For small repairs, use Tedlar, an adhesive backed Mylar that sticks well on dry Mylar surfaces. It comes in various width tapes and sheets. Order some from your sailmaker.

3. BOTTOM:

Put the bottom at the top of your list this year. A fast bottom will have less drag, which equals greater speed, acceleration and pointing! The bottom paint rule for serious racers: pay for it to be done right the first time so you are not paying someone else to fix it. Prepare the bottom correctly so the paint sticks the first time. Stick to the basics: You want a faired and smooth bottom with a proper epoxy barrier coat and a very smooth paint job. Shortcuts equals slow.

- Ask winning skippers what yard they use for their bottom and who does the work. You can't argue with success. Unless you have a race-prepared bottom that just needs paint, start by taking off the old bottom paint and barrier coat down to the original gelcoat. New boats from the factory generally do not have race-prepared bottoms.
- The barrier coat is sprayed in several coats and long-board sanded to insure any hull or foil imperfections are faired and corrected. Sanding "orange peel" texture away is especially important. If left on, your race bottom paint will go on an uneven surface and lead to a rough, slow bottom. A barrier coat is the key to a successful bottom. It seals the hull from moisture that can lead to blisters or worse.
- The fastest bottom paints have a harder finish similar to Micron or Baltoplate. Proline 1088 is an acceptable fast alternative. Check with the fastest racers to find what they use. Wet-sanding the bottom before it goes in the water polishes the bottom and knocks off any small particles. Have your rudder and keel painted light colors or white to help see kelp or garbage bags. If your boat does not have flush thru-hulls, switch to them for a much smoother bottom. Consider installing kelp windows. The kelp window allows the crew (inside the boat) to see kelp, etc. While the boat is in its cradle and you can see the prop, mark the prop shaft inside the boat when the prop is properly folded or feathered. This makes alignment an easy task when heading for the start line!

4. More ideas:

- If you are racing with a fixed prop, GET RID OF IT and be sure to immediately notify PHRF to update your certificate! A feathering or folding prop is worth major savings in drag and gives your boat instant speed.
- Use paint-friendly floss line for removal of kelp, garbage bags, tuna, etc. A polypropylene line knotted every foot or so is cheap and effective.
- Get the bottom cleaned before each race. It has to be clean to be fast. Hire a bottom diver who knows how to service a race bottom and uses light duty cleaning methods. Good divers know how to preserve a race bottom. Listen to them.
- With your sails, rig and bottom in the best shape possible, you're almost ready to go racing. But first, you should get the crew out to practice. Practicing WILL make you faster. Practice your roundings. This is a good time to break in a new foredeck person. Practice starts and speed test with a sistership or a similar boat with a similar rating. Also, review and learn the racing rules. Then practice some more.
- With your boat a little lighter aloft and faster on the bottom along with a practiced and cohesive crew, you will find that the rating you have been dragging around is not as tough to sail to as it was.

Please remember to report any reportable changes you make to your boat as specified in the PHRF rules. Ask any PHRF club rep/handicapper if in any doubt about what is a reportable change.

(Part 2) Get a Better Rating Through Boat Preparation

Now let's look at the deck and interior. You can get your boat's performance potential equal to the rating through optimization and preparation. Your boat's rating will then be easier to sail to with a lighter boat and a deck layout that makes boat handling easier and faster. The premise of the PHRF rating criteria is that a well crewed, well equipped and well raced boat has an equal chance to be competitive to place in the money. This is the second part on boat preparation originally written by Bruce Cooper and then updated. The easiest area to optimize is your deck gear layout and interior.

A. ON DECK: The goal is to improve speed and performance by lessening weight in the ends of the boat. Weight increases the pitching moment and causes your boat to "hobby horse" diminishing speed and acceleration.

- To start your boat on a significant diet, begin at the bow of your boat and, working aft to the stern, make a check list of items that can be changed, (re)moved or modified to improve your performance.
- Two items at the top of your list should be removing any roller furling gear. This may take more time to convert back to cruising mode, but the weight will make a difference. Many boats have an anchor locker. Don't use it! Remove all ground tackle from the bow and stow it below deck in the center of the boat directly over the keel or as near to it as possible. Check for any cruising gear on deck. If it does not help racing performance remove it. This includes dodger gear, boom cover and cockpit cushions! If your boat has an outboard motor, take it and the bracket off the stern and put it below. Serious racers wouldn't even think of racing with the outboard hanging out the back! Every boat is guilty of storing "stuff" in the cockpit lockers or below. Put all items of substantial weight in the dock box, or if they mean too much to you, put them in a box below decks next to the anchor gear. Don't be a pack rat; get the ends ultra-light.
- Next, evaluate your deck gear and determine if you are getting top performance from your winches and sail control systems. The more wind you sail in, the better your deck gear needs to be. The crew needs the gear working for them, not against them! On 30' or longer boats upgrade the primary winches to three-speed for faster grinding and less wear and tear on the crew. Most production boats come with undersized winches so upgrade to a more appropriate size. Another must do performance upgrade is to install adjustable genoa leads and a windward sheeting traveler. When sails need adjusting for optimum trim and speed, the genoa leads and main traveler need to work easily and smoothly. Also installing a spring-loaded boomvang with ample purchase of at least 16:1 to 24:1 will give you an advantage in light air to keep the boom from "hooking" the mainsail leech and eliminate the need for a boom topping lift: Less weight and windage!
- Lead all halyards and control lines to the cockpit. This will allow sail changes to run more smoothly and makes for easier adjustments with halyard winches and rope/halyard clutches led aft in an organized manner. Usually this type of deck layout reduces the number of winches needed, which means less weight! Proper labeling of halyards and control lines will be more user-friendly. Double-led adjustment lines (vang, cunningham, etc.) can allow adjustment by crew without getting off the rail!

B. INSTRUMENTS:

- One other way to optimize the "deck layout" is mast-mounted instruments or repeaters for the instruments mounted at the mast for "heads-up" sailing for the skipper and crew. If possible, for larger boats your instrument package should have an option for integrating jumbo repeaters for the mast which will make trim adjustments evident to the whole crew—not just the person sitting next to the instrument.
- Repeater along with a digital compass will add instant feedback to you and the crew to keep the boat going as fast as possible all the time and in the right direction! For smaller boats, mount your compass and knotmeter on the mast. And make sure your instruments are calibrated properly otherwise B.S. in is B.S. out.

C. BELOW DECKS and INTERIOR:

- Now, optimize the interior. The first rule to remember is you CANNOT remove weight or items that are FACTORY SPECIFIED or INSTALLED. This means you must leave doors, the stove, cushions, the table and the like in the boat because that is the way it came from the factory. The boat was rated with that equipment. Everything else needs to go. If you DO remove any "permanent" or factory items, your PHRF certificate instantly becomes invalid (that means you cannot race until a new certificate—acknowledging the modifications—is issued). You must report any modifications to PHRF. We strongly suggest you talk it over with your PHRF Representative before you get out the Sawzall. Put the interior on a race diet! Read the sailing instructions for each race and add only the necessary safety equipment on board. As on deck, remove all the weight from the ends. A little weight in the bow will not counteract weight in the stern; it just causes more "hobby horsing." The ideal spot for weight below is centered and down low, usually over the keel. This encourages better acceleration and more speed.
- Keep the sail inventory on the floorboards and in an organized manner. If the crew knows where each sail is kept, the next sail change can save you time and speed. Know the tankage of your fuel and water. If you are buoy racing, empty the water tank and drink personal-size bottled water. Leave a few gallons of fuel in the tank. For offshore or overnight races, plan the fuel and water consumption accordingly.
- Surprisingly, the removing and shifting of gear on deck and below can add up to (if you are a pack rat) perhaps a hundred pounds of weight savings or more. This will translate into instant speed in all wind conditions and on all legs of each race.

D. More Tips:

Here are a few more tips to make your sailing easier and add up to extra non-rated speed:

- Convert your spinnaker pole foreguy to be "double ended." Lead it down each side of the boat to be cleated and controlled while sailing on either gibe.
- Place a code flag decal in the cockpit (most underrated piece of equipment on any boat). Don't waste time at the start looking for the code flag book and wondering what bearing, course or mark is being posted. Rig adjustable "tweakers" for your spinnaker sheets amidships on the rail.
- These will help overall spinnaker control and shaping. It is a good way to keep the guy from bending a lifeline stanchion while on a reach and may eliminate the need for a reaching strut (more gear off the boat and on the dock)
- Use ratchet blocks for your spinnaker sheets on the rails near the stern and try not to use the winches as often. This will give the trimmer better feel and free up a winch for the next mark rounding.
- Install rollers on forward stanchions & top lifelines for fast and easy skirting of the genoa foot when tacking.
- Put a spinnaker bag in the front hatch for launching and dousing. This will free up the cockpit from having the spinnaker interfere with trimming the genoa during the rounding. And it keeps it out of the crew's faces at every leeward mark rounding. Hoist and douse into the forward hatch. It saves time from having to "pack" the spinnaker again. This is a MUST when buoy racing! But you must practice this at first!

Most of these optimizing tips can help you get better performance and **non-rated** speed from your boat. And don't forget to practice. **Practice is a non-rated item by PHRF.** Your boat's rating is based on being prepared according to the above tips. Combined with a little practice, you can be one of the faster boats in your fleet!

E. Upgrade crew for better speed and performance

Be prepared to improve or replace crew that is "slowing you down" or wiping out the brew supply before your first leeward mark rounding. You are racing, not playing cards or hosting a debate. Chatty Cathy's on the rail are a distraction to the crew's focus, the helmsman driving, and tactical considerations of the race. Moreover, they are usually slow to react to boat handling demands. Ask them (nicely) to save the Bear or Bull market discussion for the Club afterwards. If that doesn't work, leave 'em on the dock. And a crew member who will not follow directions (like getting off the bow) is a liability for boat speed and needs to be replaced.

PHRF Racing

Improve, Then Use Your Assets!

With so many different types, designs, styles and generations of boats, it's impressive that the PHRF system can encompass all of them. There are the new generation of large and small sport boats (i.e., Melges 24 to J-120s), cruisers that were not necessarily intended for racing, cruiser-racers, racer-cruisers, old IOR and recent IMS designs and one designs from Solings to Farr 40s, 12 Meters, AC Boats, Maxis, Sleds and Open 60s round the world racers. And each has a rating!

The boat's rating!

- When a new boat appears, it can be quite an undertaking to rate it accurately. Research by PHRF handicappers can range from looking at similar, like kind boats that have very close ratings, comparing IMS measurements, consulting with the designer and looking at the ratings other areas across the US assign to sister ships. Modified sister ships may not be a picnic either. Take your pick of tall rigs, short rigs or fractional rigs. Try deep draft, elliptical, winged, shoal, standard draft or modified keels.
- It all has to start somewhere. In order to get a more accurate rating the first time, the Request For Rating Form asks the applicant for various significant dimensions, the model, builder, keel, rig, etc. Try to provide the most accurate data. Other wise, "garbage in-garbage out." Don't rely on the broker (usually inaccurate). Verify the data from the designer or builder. You can always ask your area PHRF representative for help or have your sail maker measure your rig.

The challenge of your rating!

- Your boat's rating (initially) may seem harsh or difficult to sail to. But there is a good reason for the rating given. Many Board members have 15 to 20 years experience racing and are familiar with the performance of all kinds of boats, large and small.
- So before you start complaining about the assigned rating, LEARN the boat, SAIL the boat, be one with the boat (oops, sorry, counterculture flashback!), PRACTICE with your crew and make sure the boat is prepared for racing. You should have new or recent racing sails (lose the roller furling headsail unless you are in the Cruising Class), the bottom should be race prepared (Hint: Do not roll on paint over a bumpy bottom!) and the deck hardware should be functional to allow enough adjustment to power the rig up or down in varying sea and wind conditions. Then go race it a bunch of times. In different conditions.
- You must be willing to practice and learn techniques and tricks in order to start climbing up the race results.

Most boats are oriented to a specific wind range in the way they are designed and set up. Some are "light air boats." Some are better in heavy air. Most are oriented to 12 knots and are adjustable enough to cover most extremes. Figure out what you have and, if you have-let's say a heavy air boat, try to get as fast as you can in light conditions to maximize your results in conditions NOT favorable your boat. Hang in there during the light stuff...it will, most likely, blow later. You may have to invest in a very narrow range light-air genoa that you might have to change once the wind gets to 6 or 7 knots or so. Speak to your sail maker for techniques and suggestions.

Remember, some of the people you are competing against may be exceptional sailors and others have great gobs of experience. Most would be receptive if you wish to speak to them about your boat or the way you are sailing it. You should also speak to your area or club's PHRF representative if you feel inclined or are having difficulties.

A simple review... Do the Math! If each of the 9 areas listed above have the potential to increase your boat performance by +3 seconds a mile, then a total of +27 seconds per mile can be gained. At 6 knots through the water, a boat is moving at 10' per second. This equates to 270 feet (or nine 30' boat lengths) per 1 mile leg. In some races this amount of a win margin would be considered a "Horizon Job".

Making it better....

Try to improve!

- PHRF ratings seem to work best when the difference of rating is about 30 Seconds per Mile. The larger the difference of ratings, the more that difference becomes apparent. As an example, a Santana 20 (rating 222) will NEVER correct on a Santa Cruz 50 (rating 0) in any normal race longer than a mile assuming both boats are sailed similarly.
- Call your racing pals to get them to participate in certain regattas with you for a greater turnout. Try to persuade your Cruising class friends to give PHRF racing a try (it won't affect their Cruising Class rating!) The bigger the turnout, the better chance you have for more classes with narrower ratings bands. That is, assuming you and your fellow racers make your desire for narrow class splits known to the Race Committee before the event. It also helps to be on the Race Committee to influence the other R/C members. However, if there is an event that is lightly attended, who cares! Try to do your best and practice maneuvers that need more practice.

Practice to improve your starts and performance.

- You might try to organize a practice session where you establish specific goals to achieve. I just participated in a "STARTING CLINIC" held by South Bay Yacht Racing Club in Marina Del Rey. Wow! In the morning, some of the more experienced racers spoke on techniques to find the favored end, starting tactics and discussed the starting rules, etc. Afterwards, on the water, we practiced several times going up to the line and signaling when we thought our bow was on the line. Then the committee boat told us (by radio and bullhorn) if we were over or short of the line by how many feet! Our calls got better each time. Next, we had several practice starts with several boats in each "class."
- Experienced coaches were available for boats that wanted them. You might try to organize a similar Starting Clinic like this from your club or clubs in your area. Drop an inflatable mark in the water, anchor and set a line and you're ready. Get some of the hotshots and sail makers in your fleet to help out as coaches and to give a talk. Trust me, it's a great way to improve by practicing multiple starts.

Using your assets and your competition's weakness at the start.

- The more you race, the more you will learn your boat's best conditions and your competition's worst. Use this knowledge:
- If you can't point well in certain conditions, do NOT start to weather of a boat that can point unless you want to tack right away! If there is a breeze, starting to leeward of a longer, bigger boat will result in you quickly getting rolled-not a good idea.
- If you accelerate better than another boat, get under his lee bow before the start, luff him, then crack off to start...you will leave him in your wake if you do it right.
- If you are fast in light air, start away from traffic in CLEAR AIR and just go! Use your speed to get ahead and then to the favored side. Anticipate. You can predict, from where he is, what a competitor may try to do. He may duck to leeward and try to force you over the line or tack from port under your lee bow. Luff, slow or bear off to foil his plans (within the Rules).
Sail better, smarter and faster and soon that rating will be an asset, not a liability.