

ESSENTIAL ELEMENTS AND SKILLS OF RACING

By Ray Pingree

May 14, 2022

Welcome to the Friday Harbor Sailing Club racing clinic

Today I will be discussing some of the **essential elements** to prepare your boat and crew to race. Additionally, I will discuss the **racing skills** that a skipper and crew can utilize to improve their performance.

Predominately we race in light winds and strong currents in the San Juan Islands, I will consider this as the playing field for our discussion today.

It has been said that sailing requires the highest degree of physical and mental agility. Sail boat racing is also the most highly complex and technical sport. The sailor must be able to rapidly analyze a multitude of often conflicting and complicated data. It is also a sport that enables one to compete successfully well into their senior years.

Sailboat racing should be fun, that's why we race... to have fun with our friends while enjoying the best strategy game on the water.

Whenever two or more boats meet, it's a race!

Be realistic with your chances of winning a race. Sail as perfect a race as you can with a minimum of errors and find satisfaction in knowing that you sailed a good race. By taking charge of your performance, you will then be rewarded with your individual success. **Norris has a story to share with us about his match racing, with minimal errors, last weekend.**

Please feel free to ask your questions while we are on a specific subject, this will allow me to address your question quickly.

ESSENTIAL ELEMENTS: Getting ready to race

First rule: Decide to get out and race, and then just do it!

Keep it simple you can improve your performance more by studying the wind than by tweaking your Cunningham.

Boat preparation: Do an operational inspection of all rigging and safety equipment prior to leaving the dock.

Reducing drag: It's hard to lose a race with a faster boat ... a dirty bottom with get you nowhere slowly. Propeller positioning; folding and feathering props in gear, fixed prop in neutral.

Improving power: Sail selection and condition of sails. Make sure you have enough sail power to get around the course.

Understand the basic rules of racing: When two boats meet.

Know in advance what the wind and currents are doing in real time
Predict wind.com and DeepZoom

Rating established: one design, class design, comparable to similar designs, with or without spinnaker. PNW PHRF rating assistance

What races to enter: low key events like Friday Harbor Sailing club races or Friday night racing at shipyard cove.

Thoroughly understand the SI (sailing instructions): Know the course and where the passing lanes are going to be.

Crew selection: Other sailors from our club, especially new members, other clubs and sailing schools, family members, walk the docks. Friday night races at shipyard.

Crew responsibilities: Discuss with your crew before the race what their responsibilities are.

Rules terminology

Starboard tack wind over the starboard rail (green right starboard).

Sea room (water). Room to tack when another vessel is hindering your ability to tack away from an obstruction.

Room at the mark, at three boat lengths of the nearest boat to the mark, you must be inside overlapped to claim room.

An overtaking boat gives way to a boat that is ahead

A windward boat gives way to a leeward boat on the same tack.

Exonerate yourself with turns. 360 hitting a mark, 720 fouling another boat.

Up up up (no barging) at the start

PMS : Premature Starter (over early): no rights and return to the pre start side of the course.

My favorite: Strive for the **safe forward position** where rules don't apply.

Sailing Terminology

Your crew should understand proper terminology for all equipment and their location as well as the commands given while racing. Do a walk through with your crew identifying all controls and what they do. Cunningham, boom vang, outhaul, jib lead car, traveler, backstay etc....

Tacking and jibing commands: Stand by, ready about, helms-a-lee, or 3,2,1, and tacking or jibing.

Made: When the new spinnaker after guy is locked into the outboard end of the spinnaker pole during a jibe and when the spinnaker pole has been reattached to the mast, completing the jibe. With a whisker pole it is when both ends have been secured onto the sheet and mast after a jibe.

Head tack and clew: Three Corners of a sail (top bottom and aft).

Roach: Positive curve in the leach of the mainsail.

Foot: Bottom edge of the sail often having foot roach.

Luff: Leading edge of the sail.

Leach: Aft vertical edge of the headsail or mainsail.

Reefing: (not a city in China) Reducing sail area by lowering the sail partially. If you are thinking you should now reef you are probably too late. Anticipate by looking further down the course.

Wind direction: The direction that the wind is coming from

True wind Direction or Speed: Wind without the influence of a moving object

Apparent wind Speed or Angle Combination of both hull speed and true wind speed or angle

Header A temporary change in wind direction moving towards the bow

Lift A temporary change in wind direction moving aft from the bow

Clocking wind (veering wind) a wind shift in a clockwise direction

Backing wind A wind shifting in a counter-clockwise direction

Pressure An increase in wind speed or a sustained gust of wind

Lull A dead spot of wind or a temporary reduction in wind speed

Windward High side of the boat over which the wind is blowing

Leeward opposite of windward

SOG (speed over the ground) a calculated speed using GPS

Knots (boat speed through the water) When compared to your SOG you can determine any adverse or beneficial current.

COG (course over ground) a calculated course using GPS

Magnetic heading (compass heading) When compared to COG you can calculate any amount of current flow affecting your actual course, push or pull.

VMG (velocity made good) speed directly up into the true wind or directly downwind with the true wind.

Fetching the mark (laying the mark)

Power up Increasing the sail trim to take advantage of a gust of wind

Footing Easing the sheets and bearing off slightly

Pinching Sailing close hauled with the sails starting to luff

Ranging the mark...gaining or losing (making trees)

Trim up bringing the sails in

Ease out (Crack the sheet) Adjusting sails out to a new course or wind direction

Feathering your sails Sheeting in sails to point higher with your sails just beginning to luff.

By-the-lee (sailing off the leach of the mainsail) sailing downwind with the mainsail remaining on the same side of the boat that the wind is hitting

Wing and wing sailing with the mainsail on the opposite side of the headsail

Reaching Close, beam and broad, sailing with the wind 60-160 off the wind

RACING SKILLS

Rule #1: Be aware of your surroundings, and alert to changing conditions.

Common mistakes that slow you down: Not knowing the race instructions, not knowing the real time wind conditions, currents, time, boat preparation (dirty bottom), and not creating good communication with your crew, like knowing who is bringing the sandwiches and beer?

Balancing your helm: It is very important to use your helm as little as possible... think of it as a brake. Normal weather helm when sailing up wind is slightly past centerline, this will cause the rudder to become a lifting surface.

Various forms of balancing the helm: Sail adjustments, hull (healing) mast rake, and crew positioning.

Inducing heel to balance the helm: Crew weight distribution to weather, to leeward, fore and aft. When sailing downwind rock the boat to weather to balance the helm and move the center of your sail area higher. Move the crew forward in light air to reduce wetted surface.

Controlling Weather helm: Use Traveler position, jib sheet lead, backstay tension, and sail twist. Tighten the boom vang and lowering the traveler will reduce weather helm, (feathering the mainsail). Twisting off the top of the sails will reduce heel and weather helm. Backstay tension will flatten the headsail and the mainsail moving the draft forward reducing heel and drag.

Controlling Leeward helm: Tighten the roach or leach of your mainsail by tightening the boom vang, sheeting in the mainsail, or pulling the traveler up, reduce the draft in your jib, by increasing head stay tension. Increase your mast rake further aft.

Know the limitations of steering your boat on a tight reach, or rounding up. At what point of heel does your boat stall its rudder?

Steering with anticipation: Preloading the helm requires less force to stay on course while reducing drag (fast sailing). Anticipate how a roll will affect your course and make corrections before the boat actually changes course due to bow wave influence or waves from hitting your boat.

Tacking and jibing techniques: rolling into a tack and jibe, utilizing waves and heeling to steer your boat.

Sail trim and adjustments: How to reading tell-tails, sheet tension for different winds, Sheet lead position; halyard tension, traveler position, Cunningham, outhaul, boom vang.

Whisker pole: greatly improves downwind performance by increasing projected sail area. Typically made to the length from your luff to your clew of your largest headsail (length perpendicular)

Prop folded or feathered or in Neutral: Reduce drag by setting your transmission in gear or out of gear depending on your prop. Three bladed fixed prop put in neutral. Folded or feathered put in gear.

Books: Performance advances in Small Boat Racing by Stuart Walker. **Sail Power** by Wallace Ross

Sailing Techniques

Rule # 1 practice with your crew. Get out whenever you can and practice your techniques. Friday Night racing at shipyard cove is a great opportunity to hone your skills.

Plan your start and race, then race your plan. Predominately we race in point to point races without a true windward or leeward leg. Because of this we need to formulate a strategy that takes into consideration what the wind and currents are doing in real time. (Deep zoom and Predict wind.com for research prior to racing). I will discuss this in detail later in this discussion.

Sailing in light airs: Rule #1 is to keep your boat moving. Watch your tell tails and try to keep attached flow on your jib even if it means sailing away from your goal. Allow your sails to twist as much as possible, ease your boom vang and move your jib lead aft to open the slot. By rebuilding apparent wind speed your keel and rudder will become more efficient as well as your sails, allowing you to build boat speed as your apparent wind increases.

Sailing to the new wind through a transition zone. Transition zones are tricky and are elusive as the wind oscillates. The best practice is to see in advance the new wind and where the transition zone is the narrowest. If possible use the current to push you in the right direction, utilizing it to build your apparent wind. (Finishing the Shaw classic race in a strong flood and no wind).

Avoiding the dead spots: Know in advance where the dead spots are and make a plan to avoid them. Tacking or jibing frequently to stay in the wind, while watching for wind patterns on the water indicating the wind strength and direction, will keep you out of the dead zones. Also, look for other boats and what wind if any they are sailing in.

If you can't see the wind you are sailing blind.

How to get a good start: (different approaches) **you have won the start if you are where you planned to be 5 minutes after the start.**

Where is the best place to start? In reality the starting line is rarely set at 90 degrees to the wind, making one end of the line generally favored. In an **upwind start** you can luff directly into the wind on the middle of the line prior to the start, and whichever end your bow is pointing to is the favored end of the starting line.

In a reaching start: it is typically best to start at the most leeward end of the line (pin end). This should be the shortest distance to the next mark. You will also be able to set a course that is slightly closer to the wind than the boats upwind. In light airs by sailing slightly closer to the wind you will also improve your apparent wind speed, and boat speed.

Timed approach (Vanderbuilt start) Very risky in light airs and shifting winds. Sail away from the line for 2 minutes 50 seconds and back for 3 minutes. (Allowing 10 seconds for your tack or jibe.)

Reach back and forth: (best in light air and reaching starts) know the time required to sail the length of the line, while reaching close to the line. Shorten your reaches as it gets closer to your start time, always building momentum.

Approach the line slowly and hold luffing near the starting line: (Big fleet starts, (Finn and lasers)

Creating a hole: Create a hole by luffing up the boat to windward of you, and then by footing off into the hole you just created to

leeward before the start, you will develop maximum momentum jumping out ahead of the fleet.

Starting at the boat end with clear air: By starting at the boat end, you are open to tack after the start into clear air. It is OK to start behind the first boat on starboard at the boat end, because you are now in a controlling position and free to tack on to Port.

Pin end start only when the pin end is greatly favored and your timing is perfect. You need to sail well ahead of the starboard tack boats to weather to clear them requiring two boat lengths lead before you can tack. You are also locked out of options if you want to tack on to port tack, it's a long way down to duck endless sterns on starboard tack.

Port tack starts Use only when the pin end is greatly favored and your timing is perfect. A major wind shift (backing wind or lefty) is required to allow you to cross all the starboard tackers.

In light air starts stay close to the line, reaching back and forth to determine where the most wind is and how it is shifting. Progressively shorten your reaches as it gets closer to your start. It is helpful to have a crew member calling out the times so the helmsman can look for a good lane to start in.

Try to limit any sudden course changes, building momentum at this time. This will allow you to jump out ahead of the fleet when the gun goes off!

Now that you have started, you should already know where you are going next avoiding the dead spots and looking for the passing lanes.

Videos: Any sailing videos on YouTube; **North Sails University** by Dick Deaver. **The shape of speed, Trim for speed/dynamic tuning, key to up wind performance.** (I won my first of many BBS on San Francisco Bay as tactician for Dick Deaver of North Sails)

Covering your opponent

Downwind wind shadow covering jibing away at the weather mark, how to jibe onto a covering jibe, sail on the **favored jibe** closest to the shortest course to the leeward mark.

Covering Up-wind Stay between the next mark and your competitor, and tack on their wind whenever possible. Have a good plan where you would like to force the competition to sail, sending them in the wrong direction.

Sail ½ your lead upwind from the leeward mark and then tack if necessary to put yourself directly upwind of your competitor should they tack at the mark, or carry on.

When in the lead over stand the weather mark. This will force the trailing boats to further over stand and the boats that tack on layline will now be forced to sail in dirty air pinching up to lay the mark.

Controlling the competition: by forcing competitors out into adverse current or wind shift. Know where the favored part of race course is? (Catalina 27 and shillelagh at start of Shaw Island classic race, forcing them out into adverse current.)

When two boats meet up wind: Tacking into a safe leeward position or ducking their stern. Protecting your options and sailing on the desired tack.

Approaching the weather mark on starboard: Keeps you from being locked out, and your options open. (Port rounding)

Mark rounding's maintaining speed and course out of the mark: Going in wide and coming out tight when rounding the leeward mark. When rounding the weather mark try to heel your boat to weather, your boat will round the mark with less help from your helm.

Jibing at the windward mark on short courses (protects your clear air) especially on windward and leeward leg courses.

Approaching the leeward mark on starboard provides better opportunity for room at the mark and control of boats coming in on port jibe.

When on a collision course: Making trees? Ducking gives you more options. What is the favored tack?

Book: Positioning by Stuart Walker

WIND

How to see the wind: Masthead wind vane, wind on the water, clouds, other boats, flags, and smoke. You are sailing blind if you cannot see the wind. **Predict wind.com**

Dead zones: Identify with your crew where the dead spots are, prior to your start and during the race. Constantly study the water for wind speed and direction throughout your race.

Lay lines: Tacking through 90 degrees. Know what the currents are doing as well as the shifting wind.

Jibing lay lines: Most direct course to the mark. Note any wind shifts while sailing downwind and plug this into your next beat strategy. Continue to calculate which jibe will be the more direct course to the leeward mark? When sailing downwind and you get a lift (clocking wind) with the wind moving across your stern, it's time to jibe.

Wind bounce: As the wind passes over an undulating land mass it will seek its own undulating frequency mimicking that of the surface of the land mass. Friday Harbor and the gravel pit.

Tacking on wind shifts: Headers verse lifts, more direct course to mark. Playing wind shifts (tacking on headers) will give you a lead on the boats to leeward. Always try to sail on the lifted tack.

Where to tack in a gust of wind. Fanning wind lift on right side while on port tack, lift on the left side starboard tack.

How to sail in geographical wind shifts Wind curves just like ocean waves bending around a point or land mass. (Brown Island)

Apparent wind is the wind you feel blowing straight at you when driving down the road at 45mph with your hand out the window.

True wind is the gentle wind you feel blowing at an angle to your hand when parked on the side of the road.

You can increase the apparent wind speed on board your boat if you keep the apparent wind angle slightly forward of 90 degrees. By keeping the apparent wind forward of the beam your boat speed will then be added to your true wind speed giving you a higher apparent wind speed. (America's Cup boats) [Predict wind .com](http://Predictwind.com)

My favorite book: Expert dinghy and Keel boat racing by Paul Elvstrom. I received this book when I was only 12 years old and have read it many times. It is still very applicable for today's racers.

CURRENTS

How to play currents: know in real time what the currents are doing can greatly improve your performance. Knowing where the passing lanes are, the back eddies and how to range your course to the mark in a strong flood, will give you an advantage. **Deep Zoom.**

Where are the passing lanes? Depends on the **current** flow and velocity. Turn point, Brown Island, Jones Island, Shaw Island

Back eddies: Where water reverses itself much like a bend in the river or around an obstruction

Deep water: In deep channels water is strong with under currents carrying water for longer periods. While it is flooding in deep water it is already beginning to ebb along the shoreline.

Shallow water: Upwelling's and turbulent currents

Points or peninsulas: currents bend around these often bending so far as to produce current in the opposite direction (back eddies)

Predicting lay lines in strong currents: range and bearing

Lee bowing currents: You are pushed upwind and moves apparent wind aft so you can point higher (Friday night race Odin)

Communication is the Key

Everyone on board must be on the same page to execute a game winning strategy. By communicating with your crew before and after the start, you will insure that everyone knows the plan.

In reality sailboat racing is played on a fluid field that is constantly changing by wind and currents that will affect your strategy. Be open to continuous discussion with your crew, and be willing to modify your strategy evolving your race plan throughout the race.

You will learn a lot more by losing than by winning.

Ultimately, by understanding and utilizing the key elements of racing your boat, you will then have the tools necessary to win your race while having great fun doing it. Now go out and enjoy your time on the water.

Other notable readings:

Sailing for dummy's by Peter Isler

Little blue book of sailing secrets by Peter Isler

Best sailing mystery: Riddle of the Sands by Erskine Childers

Notes: