Performance Racing Tactics

by © Bill Gladestone

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This is an excerpt from Bill's excellent books on trim and tactics. We will be presenting one chapter at a time for your education on *www.sfsailing.com*. We recommend purchasing these books as they are a great resource.

1.1 Why Do We Race Sailboats?

Sailboat racing requires a broad mix of skills: We need sailing and boat handling skills; an understanding of wind and weather; and knowledge of tactics, strategy, and rules. We also need specialized sail trimming technique; organizational skills to manage crew; and analytical skills to grapple with information. We need to be able to set goals and establish priorities, concentrate amidst chaos, ignore discomfort, and learn from our mistakes.

None of us can master all the skills. Part of the enduring appeal of racing is the breadth of the challenge it presents. Not only can we never master all the skills; we are challenged in new ways every race, for no two races present the same mix of challenges. Sailing's appeal goes beyond these challenges. We enjoy racing for the chance to be out on the water, for the thrill of working with the wind, for the challenge of competition, and for the camaraderie it brings.

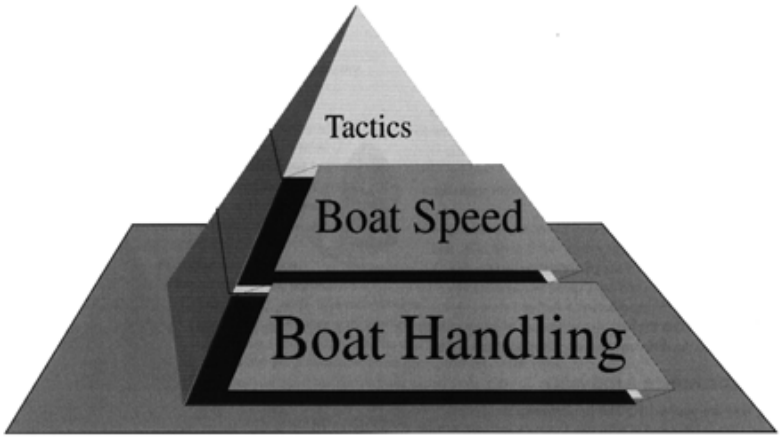
1.2 Tactics

This book covers sailboat racing tactics. Tactics in the broad sense means strategy, tactics, and rules. We define Strategy as the racing plan we create based on wind, wind shifts, and current. Strategy deals with environmental factors. Strategy does not include other boats. By

Tactics we mean the techniques we use to implement our strategy and to deal with other boats. Rules are the U.S. Sailing Rules, and the Sailing Instructions of a particular race. These are the rules of the game, We all have to follow the same rules to be playing the same game.

1.3 The Pyramid

Tactics lie at the top of the racing pyramid. Beneath Tactics lies Boat Speed. Below Boat Speed lies Boat Handling. In order to race successfully you must work your way up the Pyramid. To race successfully your boat handling must be second nature, and you boat speed second to none. Tactics can help you come out on top in your neighborhood. Your neighborhood is determined by your boat handling and boat speed. In this book we assume your boat handling and boat speed are competitive. For more on Boat Handling and Boat Speed refer to the companion volume, Performance Racing Trim.



1.4 Performance Analysis

So, how are your skills? The Performance Analysis presented here is intended to help you look at your own racing skills and focus on areas of strength and weakness.

You should think not only about your own skills but the overall skills on the boat you race. If you are a tactical king you need to team up with a boat speed druid and a boat handling wizard. Of course, if you race single handed you'll need to be all these things!

1.5 Using this Book

Performance Racing Tactics is the most complete book on racing tactics. As such, the book covers a broad spectrum of topics, some of which you will find of more immediate interest than others. While the material in later sections builds on earlier chapters each chapter is written to stand alone, and can be read independently.

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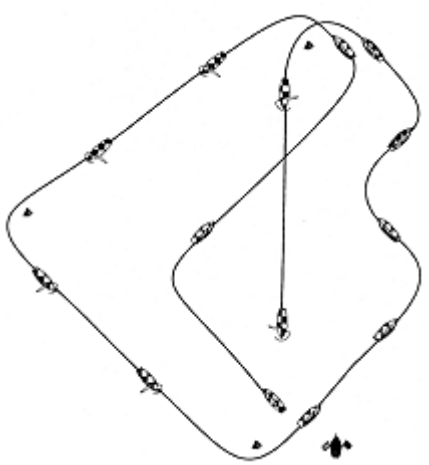
Bill Gladstone also has seminars on Performance Racing Trim & Tactics

The next The San Francisco Bay Seminar has been scheduled for UC Berkeley, by Kimo Worthington and Mark Laura, Sunday, Feb 2. U.C. Berkley Life and Science Building:

Directions:

From I-80 take Ashby Exit east 2 miles then left onto Telegraph. Telegraph deadends at Bancroft which runs along campus. Park on Bancroft and check out campus map at Telegraph/Bancroft. Follow path along Telegraph past Sproul courtyard, through Sather Gate then take the path to the left. Across the second courtyard is the Life and Science Bld. The room number will be posted on the doors.

Performance Racing Tactics Chapter 2



2.1 Introduction

Many races are won or lost before they even start. As boats head for the line some are ready to race and others are not. In this chapter we will look at the things you need to do during the hour or so before the start to get ready to race. Longer term preparation of the boat, crew, and equipment is covered in Performance Racing Sail Trim & Boat Speed. Every yacht race is really several events in one. To succeed we must understand the weather, harness the wind, and battle against our opponents. To win we will need to be ready for challenges of every type.

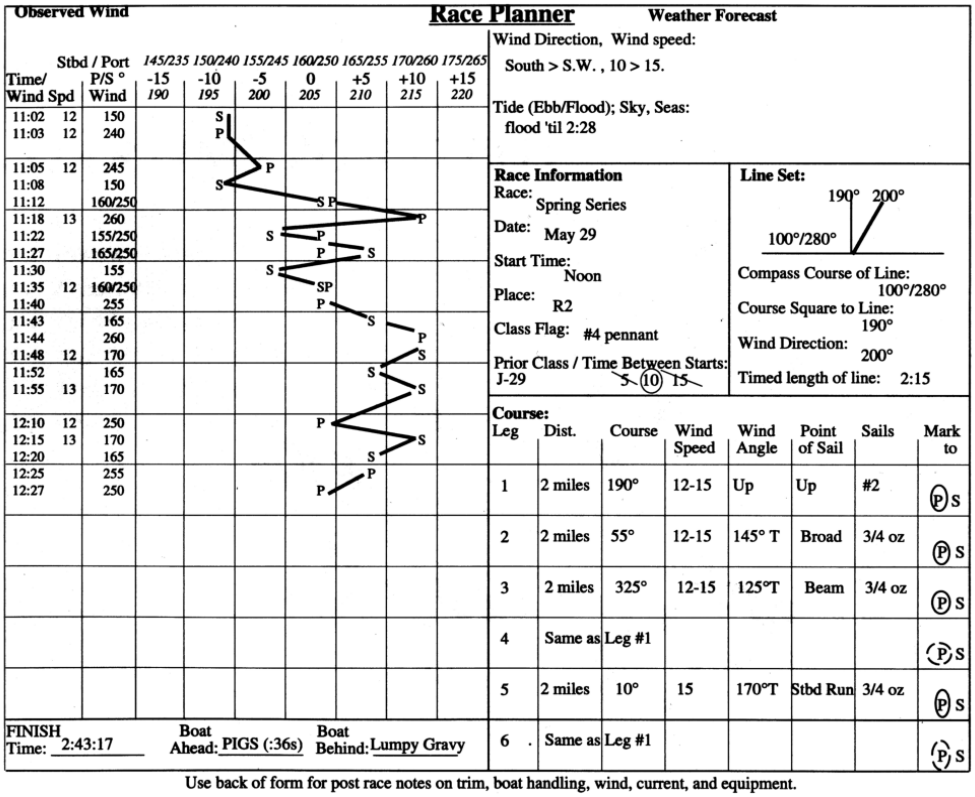
2.2 Get Ready to Race On the way out…

Race Day preparation begins with a routine to insure that everything needed is brought along and anything not needed is left behind. Once on board the time spent getting to the course area should be used to review any changes in technique or organization from previous races. New crew should be briefed on responsibilities by one regular crew member who will work directly with the new crew during the race. The boat should be rigged, and if conditions permit, sailed, to the course area. Preliminary wind checks should be made periodically. Weather conditions and any special strategic situations (season/series standings) should be discussed.

At the starting area…

Plan to arrive at the starting area a full hour before the race. During that hour you will have to plan strategy, make sail selections, and tune up. A routine checklist of pre-race responsibilities can make sure you touch all the bases. You can doubtless add more to this list. Most of the information you need to gather can be compiled in a Race Planner, such as the one show in the next section.

2.3 The Race Planner



Observed Wind

Race Planner

Weather Forecast

Wind Direction, Wind speed:
South > S.W. , 10 > 15.

Tide (Ebb/Flood); Sky, Seas:
flood 'til 2:28

Time/ Wind	Spd	Stbd / Port P/S ° Wind	-15 190	-10 195	-5 200	0 205	+5 210	+10 215	+15 220
			145/235	150/240	155/245	160/250	165/255	170/260	175/265
11:02	12	150		S					
11:03	12	240		P					
11:05	12	245			P				
11:08		150		S					
11:12		160/250				S P			
11:18	13	260						P	
11:22		155/250			S	P			
11:27		165/250				P	S		
11:30		155			S				
11:35	12	160/250				SP			
11:40		255				P			
11:43		165					S	P	
11:44		260						S	
11:48	12	170							
11:52		165					S		
11:55	13	170						S	
12:10	12	250				P			
12:15	13	170						S	
12:20		165					S		
12:25		255					P		
12:27		250				P			

Race Information
Race: Spring Series
Date: May 29
Start Time: Noon
Place: R2
Class Flag: #4 pennant
Prior Class / Time Between Starts: J-29 5 (10) 15

Line Set:
190° 200°
100°/280°
Compass Course of Line: 100°/280°
Course Square to Line: 190°
Wind Direction: 200°
Timed length of line: 2:15

Course:

Leg	Dist.	Course	Wind Speed	Wind Angle	Point of Sail	Sails	Mark to
1	2 miles	190°	12-15	Up	Up	#2	(P) S
2	2 miles	55°	12-15	145° T	Broad	3/4 oz	(P) S
3	2 miles	325°	12-15	125°T	Beam	3/4 oz	(P) S
4	Same as	Leg #1					(P) S
5	2 miles	10°	15	170°T	Stbd Run	3/4 oz	(P) S
6	Same as	Leg #1					(P) S

FINISH Time: 2:43:17
Boat Ahead: PIGS (:36s)
Boat Behind: Lumpy Gravy

Use back of form for post race notes on trim, boat handling, wind, current, and equipment.

A standardized form can help organize race information, and make sure you don't forget any details. A sample blank and a completed form are shown on the next two page. The front of the form is divided into 4 sections.

Section 1

The left side is for observed conditions. Wind and boat data are recorded here. By recording information sequentially trends can be recognized more readily. Comparing observed and predicted conditions can help determine how much faith to put in the forecast for the remainder of the race. The layout for recording wind info is to approximate an average and then plot port and starboard headings related to a particular wind direction. In our example the boat is tacking through 90°, so a starboard heading of 150° and a port heading of 240° would both match a wind direction of 195°. By plotting matched port and starboard headings in the same column we can connect a string of readings into a graphic representation of the wind and wind trends. In the example shown we have oscillations around a wind of 200° initially, gradually swinging to 210°.

Section 2

On top right, this section is used to record the weather forecast and other meteorological information.

Section 3

Section 3, in the middle right, is used to record race information and the set of the starting line.

Section 4

The lower right section is used to record course information. By completing this section before the start you can anticipate the conditions and sails for each leg.

Section 5 (not shown)

The back of the race planner should be used for post race comments. Immediately after the finish review the race leg by leg. Go over trim, tactics, and crew work; record new ideas. List any equipment problems (and think through any excuses you may need to explain away the race back at the bar). Confirm the schedule for the next practice (you do practice, don't you?) and race. Also print a diagram of your local race area on the back of your race planner. The chart can then be used after each race to record any local knowledge tricks you pick up concerning wind or current.

The ultimate value of this pre-race information will become clear as we refer back to it during the starting, strategy, and trim discussions which follow.

Pre-Race Checklist:

1. Collect weather and wind information.
2. Test sail selection and trim upwind.
3. Record close hauled course and speed on each tack.
4. Sail the compass course for each leg of the race in sequence, noting wind speed and angle.
5. Plan sail selection and organize sails below decks.
6. Post start, course, and weather information.
7. Enter marks of course as GPS or Loran Waypoints.
8. Formulate an overall race strategy.
9. Discuss the strategy and basis with entire crew; emphasize expected conditions to look for and things which might require a change in plans.
10. Check the starting line and plan strategy.
11. Set the prop and pump the bilge.
12. Go over crew assignments.
13. Warm up crew; break in new crew.
14. Locate any marks in sight.
15. Observe earlier fleets.
16. Get nervous & get used to it.
17. Get psyched - go team go!

3.1 Introduction

The start of a sailboat race is one of the most exciting and demanding moments in sports. Starts require judgement, timing, and teamwork. They require an understanding of wind and weather; and knowledge of strategy, tactics, and rules. Starts demand dexterity at close quartered maneuvering. Finally, starts require the ability to stay cool and concentrate in an environment packed with distractions. These requirements create a uniquely thrilling, and at times baffling, challenge.

Fig 1a *- Starts are one of the most exciting and challenging parts of any race. To succeed amidst the chaos we will firsts need a starting plan. Then we will need to execute the plan despite all the distractions.*

Fig. 1b *- A good start is one which finds us free to pursue our race strategy a minute or two after the gun.*

With so many areas of concern our success will depend on our ability to prioritize - to determine which factors are critical to a particular start. The goal is to hit the starting line at the gun at the favored end, with speed and clear air, and freedom to maneuver at will. A good start is one which finds us in the front row, free and clear, not just at the gun, but a minute later, after the sprint off the line.

To succeed we must create order from the chaos of the starting line. First we need a starting strategy - a game plan based on the information gathered during our race preparation. Once we have a plan then starting tactics will be used to implement the plan. This chapter will look at Starting Strategy - how to make a plan. The next chapter will show us how to execute the plan.

The importance of a good start should not be understated. While it is not necessary to win the start in order to win the race, a good start is usually required. A good start gives the freedom to pursue strategic objectives without interference. A poor start means compromising strategy and setting off in the wrong direction, or sailing in bad air to pursue strategic goals. Fig . 1b.

In this chapter we will concentrate on upwind starts. Chapter 6 covers Offbeat Starts.

3.2 Elements of Strategy

Starting Strategy means deciding where on the line to start. In deciding where to start we must consider three factors:

1. Our Race Strategy for the First Leg.

2. The Set of the Line.

3. Making it Work.

Our *Race Strategy* will effect our starting strategy, as we shall see. The *Set of the Line* refers to the angle of the line to the wind. In *Making It Work* we will look at balancing Race Strategy, Line Set, and other concerns.

3.3 First Leg Strategy

Our strategy for the first leg of the race is the first factor to consider in deciding where on the line to start.

If strategic considerations suggest sailing up the right hand side of the beat, then a start at the right end of the line is preferred. By starting at the right end we are free to tack and go right immediately after starting. Clear air is relatively unimportant, as we will be tacking away. Freedom to tack and go right is the first priority.

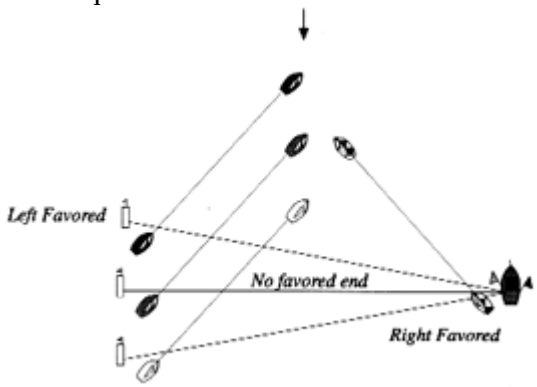
If our race strategy says go left, then a start near the left hand end is called for. The advantage here is not as strong as starting right to go right. More critical than the exact position is clear air, and the freedom to continue to the left unimpeded.

If there is no clear advantage to either side, then a mid-line start is indicated. There are several advantages to a mid-line start. From a starting perspective, it is often the easiest and least crowded place to start. From a race strategy perspective, a mid-line start gives the greatest flexibility, as it offers the freedom to go either way.

Fig 2. - Simply put, start right to go right, start left to go left, and start middle to keep your options open.

3.4 The Set of the Line

By *the set of the line* we mean the angle of the line to the wind. Since we are racing upwind, there is an advantage to starting at the end which is furthest upwind - we call this the *favored end*. A starting line set perpendicular to the wind does not have a favored end. When the line is not square to the wind then one end - the upwind end - is favored.



Two questions come to mind:

Q1. How can you figure out which end is favored?

Q2. How much difference does it make? How much advantage do you get starting at the upwind end?

Fig. 3 - The upwind end of the line is the favored end.

Q1. Which end is favored?

There are several ways to find the favored end of the starting line. Some are better than others:

1. *Compare the Compass Bearing of the line to the Wind Direction*. You can then plot which is the favored end. (See the Race Planner in Chapter 2, for a sample plot). Once you know the bearing of the line, you can update your calculations as the wind changes.

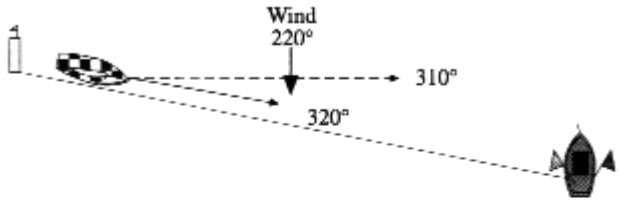


Fig 4a - To find the favored end, sail the compass course of the line and compare it to the wind direction, or...

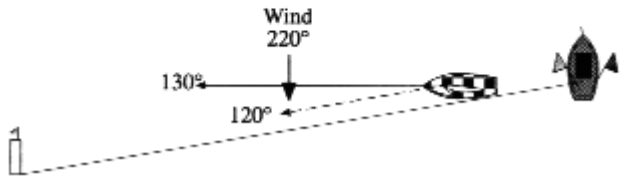


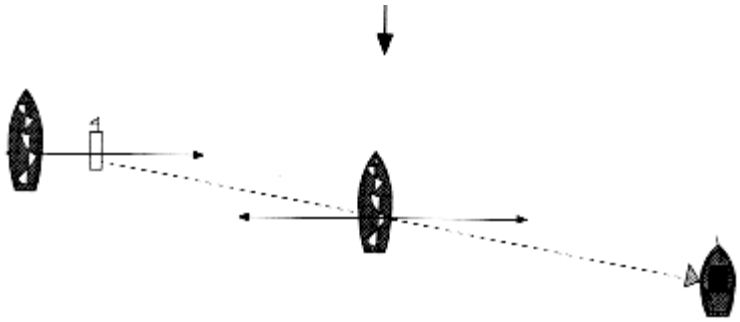
Fig 4b -..sail a course perpendicular to the wind and compare it to the line.

2. *Sail the line on a course perpendicular to the wind.*

Starting at one end of the line sail a course 90° to the wind. This will carry you above or below the other end of the line (or straight down the line if it is square). If your course is above the line you started out at the favored end; if your course is below the line you are sailing toward the favored end. (Using this technique you are sailing the angle of a square line; by sailing to the far end you can see the magnitude of the advantage at the favored end.) Fig . 4b.

3. *Luff into irons on the line (or off one end).*

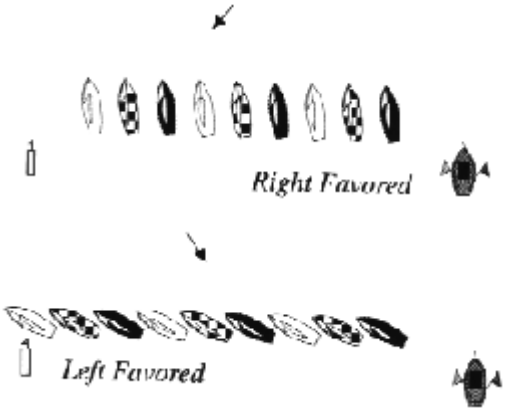
Sight across your boat (using the traveler bar for ex.); your sight will be square to the wind. While this is a popular technique, I recommend against it for two reasons: First, you must re-do it every time the wind shifts; second, it is hell on your sails - the worst thing you can do to



them.
Fig . 5 You can determine the favored end ruin your sails by luffing into irons on the line or off one end.

4. Observe other starts. If the fleet lines up bow to bow off the line, then the windward end is favored. If the fleet lines up bow to stern, then the pin end is favored.

Fig 6. You can determine the favored end by observing other starts. If the fleet comes off the line bow to bow, the right is favored; bow to stern the left is favored.<



5. Sail past one end of the line close-hauled and observe the relative distance as you pass abeam of the other end. This offers only a rough measurement.

No matter which technique (or combination) you use you must re-check the line if the wind shifts. The first technique is preferred because it allows you to quickly recalculate after a wind shift. It also allows you to determine how many degrees off square the line is set, and the magnitude of the advantage, as we shall see.

Q2. How Much Difference Does It Make?

Two boats starting from opposite ends of a square line will be equally far from an upwind mark. If they were on converging tacks they would hit bow to bow. If the line is not square to the wind, then one will start ahead, as shown in the diagram. .

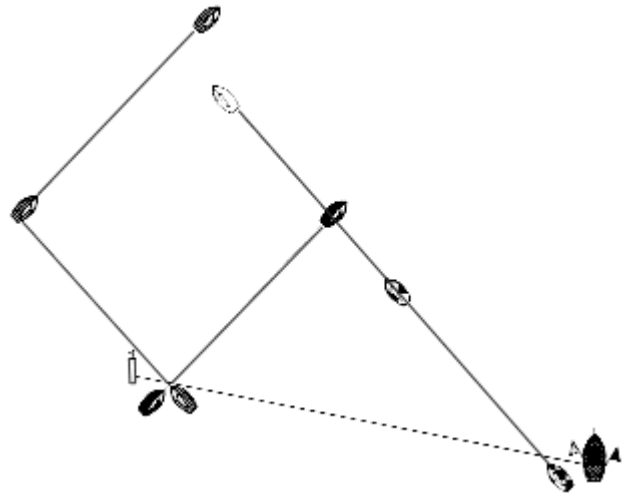


Fig. 7 You need not start on pot tack to take advantage of a left end favored line. You will realize the advantage when you tack.

You donít need to start on port tack to take advantage of a pin favored line. You will realize the advantage when you tack to port. Fig . 7.

How far ahead?

For a line 5 degrees off square (most are), the advantage is 12.5% of the distance between the boats. If the line is 10 degrees off square (not uncommon), the advantage is 25% of the distance between the boats.

On a typical starting line, 20 boat lengths long, and 10° off square, the advantage from end to end is 5 boat lengths! A 5 length lead off the line is no small matter - clearly the set of the line is an important factor in our decision
where to start. Fig . 8.

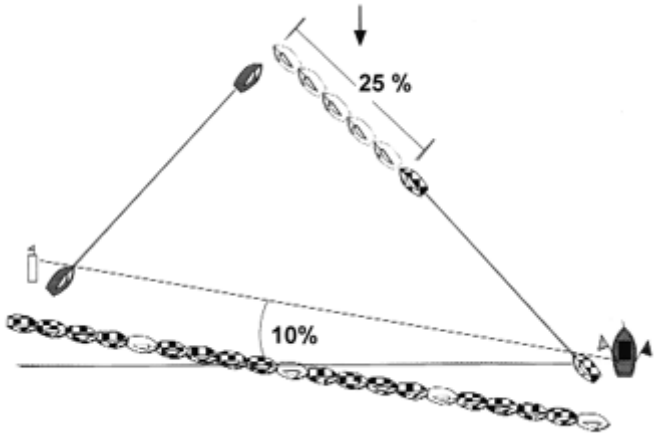


Fig. 8 For a line that is 10 degrees off square the advantage at the favored end is 25% of the line - or 5 boat lengths long.

Mark position and favored end not related

Not so clear is the fact that the position of the windward mark does not determine the favored end of the line. Boats starting at the upwind end will be in the lead, and will be able to cross boats starting from the downwind end and lead them to the mark. Even though the downwind end may be closer as the crow flies, it will be further in upwind sailing distance. Fig . 9.

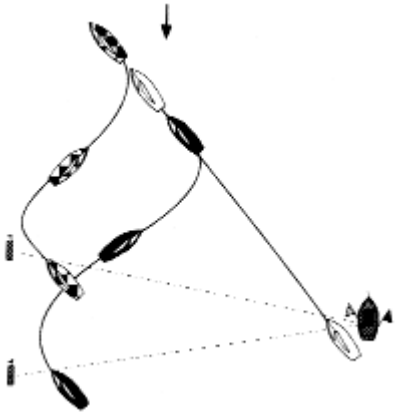


Fig. 9 The position of the windward mark (above) does not determine the favored end of the line. The set of the line relative to the wind, not the mark determines the favored end.

The position of the mark may be a factor in our first leg strategy, and thus may impact our decision on where to start, but it does not determine the favored end of the line. The favored end is relative to wind direction - not mark position.

3.5 Making It Work

Where to start? In addition to our first leg strategy and the set of the line there are a collection of other factors which we will lump under the heading of *Making It Work.* Wind shifts, crowding, and clear air are among the issues we must consider.

A start near the favored end, but clear of congestion, is best. It provides the advantages of the favored end without risking clear air and the freedom to maneuver and accelerate. Remember - you don't need to win the start the win the race; you just need a good one. We'll look at a couple of situations to get a feel for how to decide where to start.

Pick a section

We don't so much pick a spot on the line as we pick a section - left, middle, or right. Fig . 10.

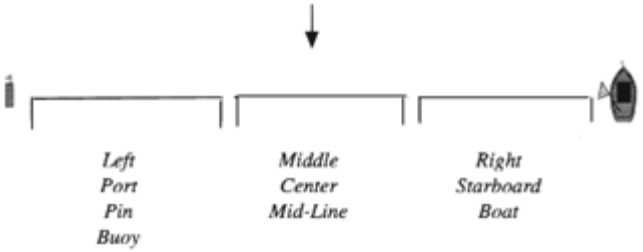


Fig. 10 Pick a section of line for your start. Your exact starting spot will depend on how the

start plays out tactically. Each section has many names.

Mid-Line Starts

Unless there are strong reasons to push toward an end, a mid-line start is the best choice. The advantages include minimal crowding on the approach and strategic flexibility once you clear the line. You can set up for your start with a variety of approaches and you can often get a jump by avoiding mid-line sag (details in the next chapter). Fig . 11.

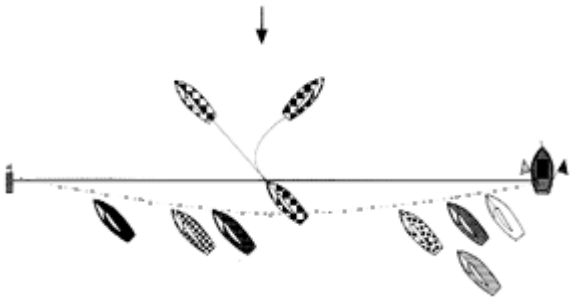


Fig. 11 Mid-line starts are preferred if you do not have compelling reasons to push toward an end.

Starting at the favored end

When our choice is one of the ends, it is best to target near - but not right at - the favored end. A favored end draws a crowd, and you will get much more consistent starts by staying out of crowds. Slide down the line just far enough to clear the crowd and you will have a much easier time getting a good start. In fact, you may end up with the best start, as the boats in the crowd deprive each other of the air and room necessary to accelerate off the line.

Even when one or more boats do get good starts right at the favored end, many more are buried. By hedging toward the middle of the line, you dramatically increase the odds of getting a good start.

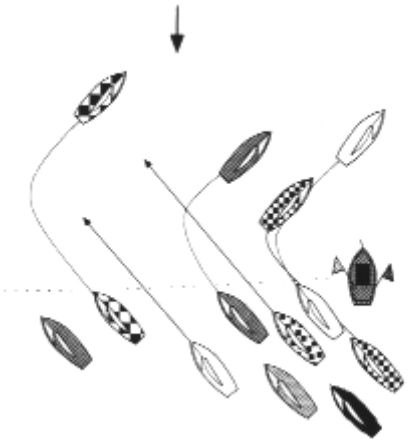
Go Right!

If your goal is to start right and tack out immediately, it may be worth it to go for a start right at the boat. If you get the perfect start congratulationsñand more power to you!

Even if you end up in the second row it's OK, since you'll be tacking out. Sounds good - but in reality the front row boats will be tacking immediately, and you will have to delay your tack to avoid tacking in bad air. The front row a little bit down the line will allow you to sail full speed until you do tack, and may actually allow you to tack sooner! Plus, you avoid the hazards of barging, and of other crowd related problems.

How badly do you need to be the first boat to tack out? What are the odds of pulling it off? Can you afford the risk of being buried? How does that compare with much higher odds of being the third boat to tack by starting down the line? Fig . 12.

Fig 12 To go right, try a start just below the crowd at the boat end. You can get off the line with clear air and be leader going to the favored side.



Go Left!

If everything favors the left side, then get ready to battle! There is little margin for error in these starts, and few spaces in the front row when the pin end is favored. The boat furthest left may be the only one with clear air, but any hesitation may allow the next boat up the line to roll over the top. Again, a start part way up the line may be the easiest way to get the second best start. You'll be able to create space for clear air and room to accelerate. In fact, a jam up at the pin may leave you with the best start! We'll look at the tactics of this position in detail in the next chapter.

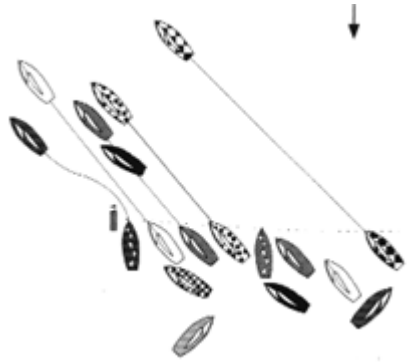


Fig. 13 To go left, a start with clear air is essential - you can't tack out. Once again, setting up just clear of the crowd helps assure a good start.

Hit the Shifts

The best start in shifty conditions is one which allows you to sail to the shift with speed and affords you the room to tack when the shift arrives. Blast off from the middle of the line, tack if the next shift is coming from the right, and sail fast. When racing to a shift speed is more important than pointing, and room to tack is critical if you are going to take advantage of the shift when you get to it. Stay clear of crowds and sail fast.

3.6 Conclusion

Starting strategy is a game of choices requiring a balance between overall strategic goals, line set, and crowding. You must consider the nature of each section of the line: the difficulty in tacking clear after a left end start, the tendency for crowding at the right end, and the ambiguity in calling the line during a mid-line start. When the advantage falls entirely to one end of the line you must consider the risks at the favored end as opposed to attempting a more conservative approach at some distance from the favored end. Once the strategic decision has been made on where to start, a tactical plan must be made to accomplish the strategic goal.

Chapter 4: Starting Tactics

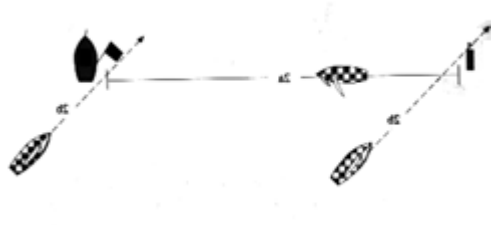
4.1 Introduction

With our strategic plan set, Starting Tactics will be used to execute a start which meets our strategic goals. Our goal is to arrive at the selected spot on the line at the gun at full speed with clear air and no interference from other competitors. No mean feat (Fig. 1).

Tactics will give us the tools to hit the line at the gun in clear air at full speed at the favored end.

In this chapter will look first at the tactical information we need, and how to gather it. Next, we will look at the start itselfÑthose final fractions of a minute which can unravel the best laid plan. This section includes the final approach, the critical sprint off the line, and some common pitfalls.

4.2 Tactical Information

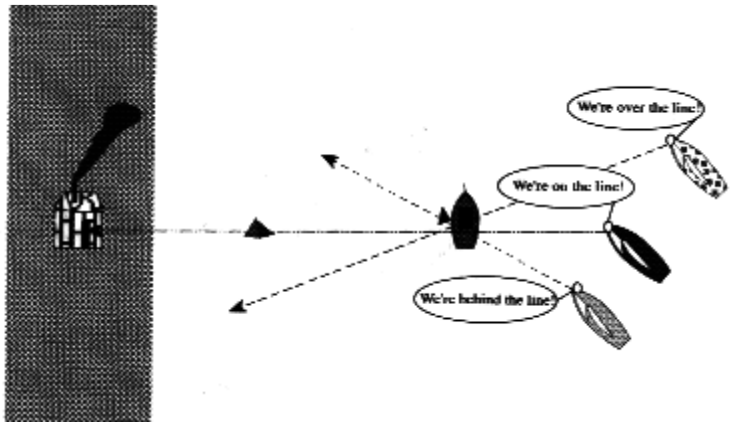


We gather tactical information (Fig. 2) about the line to help us execute our approach. This is different from the strategic information we gathered to decide where on the line to start.

Fig. 2a,b - Tactical Information. 2a - Time the line.

The information we need includes:

The timed sailing length of the starting line (Fig. 2a).



2b - Check the laylines.

This information will help us judge our timing as we set up for our start and as we make our final run at the line. It can also help us figure out if other boats are close enough to pose a threat to our plans.

Laylines to each end of the line (Fig. 2b).

Knowing the layline to each end, particularly if you plan to start near the end, will help you set up. Obviously, you want to be inside the right end layline to avoid barging, and inside the left layline to fetch. But you also can use the layline to position yourself up or down the line. For example, if you want to start five boat lengths down the line, you need to make your turn five lengths after crossing the layline, not five lengths after passing under the end of the line.

Line Sights off each end of the line (Fig. 2c).

Line sights to each end of the line can help us judge how close to the line we are. This is particularly useful for midline starts, or when other boats obstruct our view of one end. Compass bearings are not an effective way to judge the line, as it is not practical to sight the line with a hand bearing compass as you approach. Line sights using a range to an object on shore or to a nearby anchored boat (such as a judges boat or spectator boat off the pin end) are what we want. If you are near the committee boat on your final approach, the eyes of the line caller offer a definitive reference.*

We will use this tactical information will help us execute our start. For our starting plan, we will need to choose from one of the approaches described in the previous chapter.

4.3 The Start

Regardless of the approach we choose, the details of timing, speed, and clear air can be a struggle. Our approach gets us set up. We have taxied into place. Next is our sprint down the runway and the climb out.

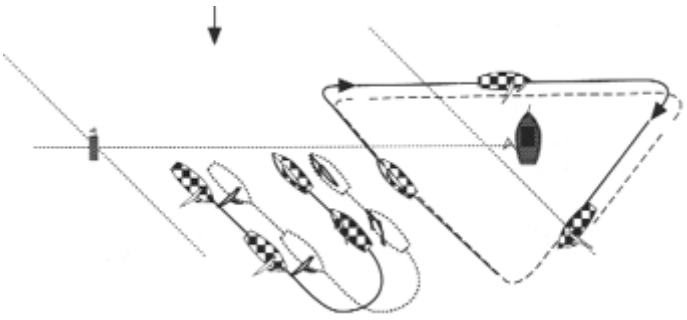


Fig. 3 - The Practice Start: Whichever approach you choose, do a practice run to prepare for the real start.

The Practice Start

A practice start helps assure success. A dress rehearsal of our planned approach (Fig. 3) lets us:

1. Confirm lines of sight and bearings on the line.

2. Check laylines.

3. Confirm wind direction and close hauled headings.

4. Approximate timing for the final approach.

5. Check sail trim for acceleration off the line.

6. Confirm crew organization and communications.

A practice start is an important part of preparing for our final approach. Obviously, it lacks some of the frenzy of the real thing, but it offers a valuable base line.

I often us the five minute signal for our practice start.

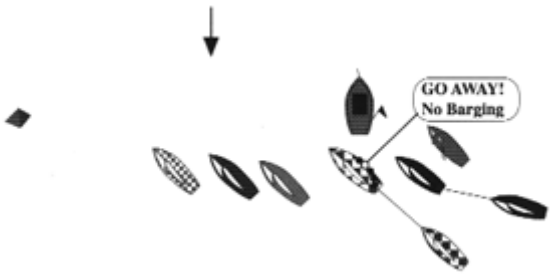
The Final Approach

Our goal is to hit the line at the gun, with full speed, clear air, and no interference from other boats. Here are some things you can do to accomplish this: Sail your boat, create room, control speed, kill time, keep clear air, accelerate, sail faster than full speed, defend your space, start near a marshmallow, call the line, call time, speed and distance, and get off the line.

1. Sail Your Boat

On the final approach you must charge the line. This is no place for the timid. Push hard to hit the line with full speed at the gun. Don't hold back. With the practice run under your belt, you should be able to communicate easily with the crew and concentrate on speed and timing. Do not let the histrionics on boats nearby distract you. Appoint a ÒspokesmanÓ to handle boat-to-boat Òconversation.Ó If the tactician, helmsman, and sail trimmers sail the boat, you will leave the chaos in your wake (Fig. 4).

Fig. 4 - The Final Approach: Sail your boat. Ignore the chaos around you. Appoint a spokesman to handle inter-boat "dialogue".



There are several techniques you can use during the final approach which will help you start with speed.

2. To Create Room

Perhaps the single most important thing you can do on the final approach is create a double space to leeward. You then use part of this space to drive off and accelerate to full speed. Your goal is to save part of the space for after the start, so you won't have any interference from leeward. By carving a double space, you can accelerate more quickly and avoid the danger of sailing down into bad air. You create room by pinching up under boats to windward (Fig. 5).

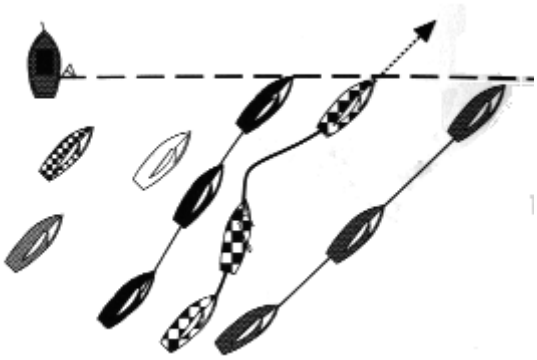


Fig. 5 - To create room, first squeeze up. Then drive off to accelerate.

3. To Control Speed

If you need to slow down during your approach, luff the jib first and keep the main trimmed. This creates weather helm, holding the bow up and preserving space to leeward (Fig. 6).

Fig. 6 - To control speed, luff the jib first.This keeps the bow up and helps create room.

Remember that it takes a long time to trim a genoa; call for trim early so you have full trim when you need it. Time your approach so you hit the line at full speed. Trimming at the gun is too late.

4. To Kill Time

Rather than slow down, a better way to burn off extra time is by oversteering and sailing extra distance (Fig. 7).

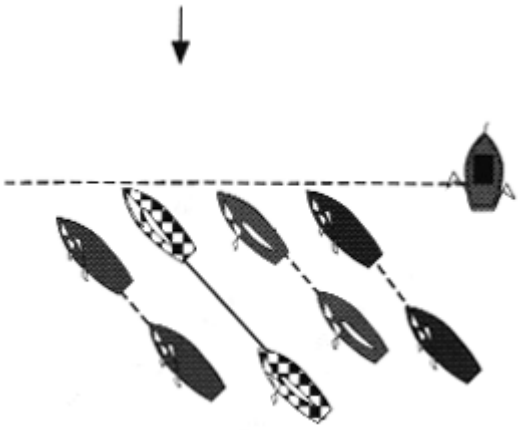
Keep your speed. Steering erratically will keep others away, preserving space and clear air. (My crew tell me I'm great at oversteering!)

5. To Keep Clear Air.

Near the line it is important to keep clear air. You want to keep your bow even with those around you. If you fall into bad air, it is difficult to accelerate.

Fig. 7 - Oversteering is an effective way to kill time.

At the same time, you want to hold back with room to accelerate to the line. Boats which are too close to the line will not have room to accelerate without being over early; boats which are too far back will be in bad air. This is a difficult balance to strike (Fig. 8).



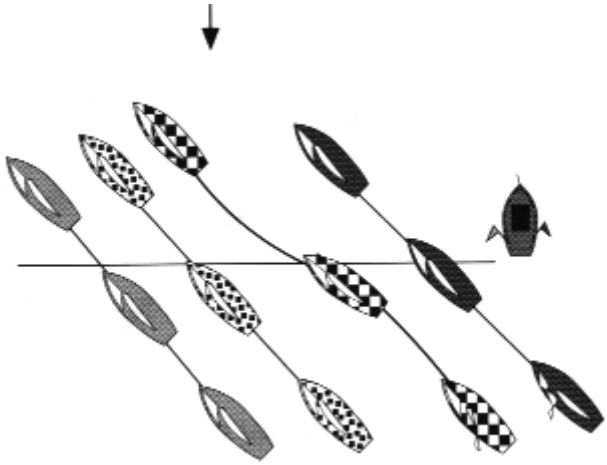
The more room you can preserve in front of you for acceleration the easier it will be to preserve space to leeward, which you can use later if needed. If you use up your forward space, you will be forced to drive down and give up some of your cushion to leeward. You may even be driven down into the exhaust of the boat to leeward.

Fig. 8 - To keep clear air, hold your bow up. But hang back to keep room to accelerate.

6. To Accelerate

To accelerate from half speed, bear off a few degrees from close-hauled. Trim the jib first to drive the bow down, then trim the main. If the main comes in too early it creates weather helm, making it difficult to bear off and accelerate. It also may push the bow up and over early. Trim the jib to accelerate, trim the main to squeeze up to course as speed builds (Fig. 9).

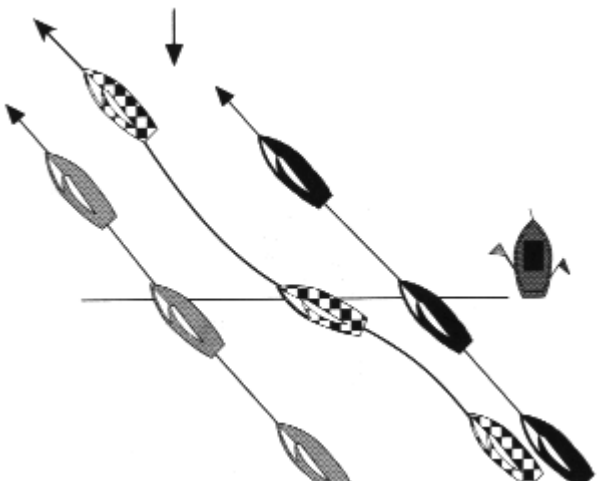
Fig. 9 - To accelerate from a luffing position, drive off by trimming the jib first; then trim the main.



Setting up with a space to leeward helps insure a good start. Without the space to drive off it will be difficult to accelerate. You may end up backwinded by boats close to leeward, or blanketed by boats driving over on top of you. If you have a good double space you can start with full speed and keep clear air off the line
In fact it may be possible to start going faster than full speed.

7. Faster than Full Speed?

Full speed is passé. Our goal is to hit the starting line at faster than full speed. But how?



If you have room to leeward to drive down the line you can accelerate on a close reach to speeds faster than close-hauled. When you trim up to course you will carry the extra speed for a few boat lengths, enough to squirt you out in front of the pack as you come off the line (Fig. 10). We wont settle for full speed anymore ~

;we want to come off the line faster than full speed!!

8. To Defend your Space

Fig. 10 - With enough room you can accelerate to faster than close-hauled speed and then trim up.

Once you are set up with a space to leeward, you may have to defend it from those who would steal it away. This may happen while you are killing time, luffing, before you make your final mad dash to the line. Suppose you see a port tack boat sailing down the line, eyeing your space; or you see a starboard tacker ducking sterns, looking for a space to cut in. How can you defend you position? With sails luffing, turn your bow down and stretch your boat across your space. Unless the space is huge (big enough for two), this should scare off the treasure hunters. The port-tack boat should continue down the line; while the starboard tacker may take the space to windward, rather than leeward. Once the threat has passed, trim the main hard and put the helm over to bring your bow up. You may let your neighbor to windward off the hook with this move, but you should be able to save your space (Fig. 11a,b).

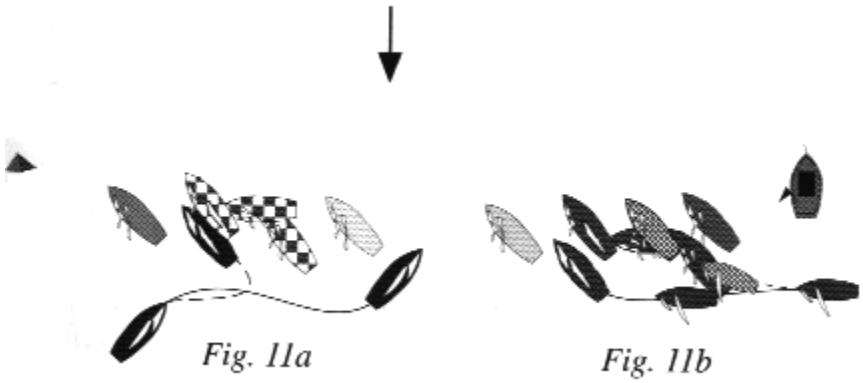


Fig. 11a - To defend your space from a port-tack poacher, rotate your boat across your space with your sails luffing. Fig. 11b - When a starboard tack shark attacks, lure him in above you, or let him pass, and then head up sharply.

If you have already started to build speed on your final dash, then don't worry about others sailing into your space. The port tacker won't be able to tack and accelerate into your spot before you drive over him, and the starboard boat won't be able to drive through you far enough to be a threat. As you trim up, you will gas him.

Another way you can protect your territory is with sweeping turns up and down. This is an effective way to kill time and preserve your space.

9. Start Near a Marshmallow

Another useful technique is to find a "marshmallow" to set up nearby (Fig.12).

If you can surround yourself with slow boats, you will be assured of less interference coming off the line. (Kinda' makes you wonder about all those times you found yourself near the fleet champion at starts last season, don't it?)

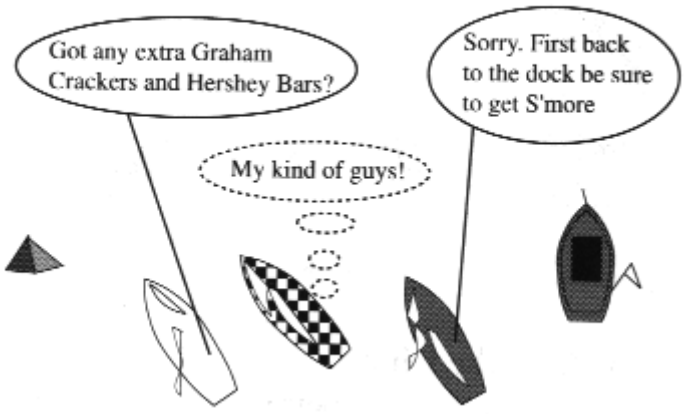


Fig. 12 - Start near a marshmallow.

10. Call the Line

A crew member in the bow pulpit should signal information about other boats and distance to the line. Point at other boats with fingers, and hold fingers up to give boat lengths to the line. Signal where to go with a thumb: up to accelerate, down to slow, windward to head up, and leeward to bear off. The bow crew needs a watch to call the start effectively. As soon as she (or he) knows you will be clear, she/he should get off the bow (Fig. 13).

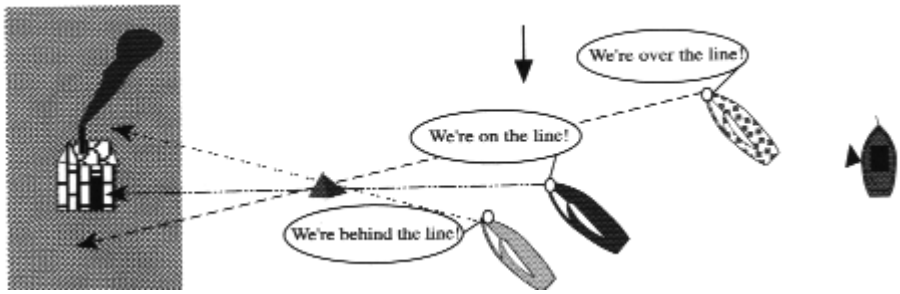
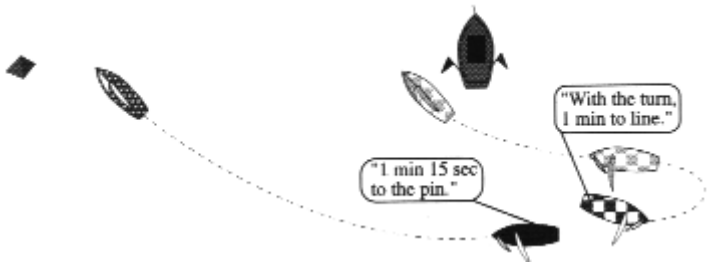


Fig.13 -Call the line accurately to avoid midline sag.

11. Calling Time, Speed, and Distance

Calling starts is tricky, you need to know when to put the hammer down. Too early, and you'll be over, or you'll have to stall at the last moment; too late and you'll be buried by those around you. At every moment during the sequence you should know how far from the line you are (Fig. 14). As you sail away this includes time for a turn.



It isn't easy, but with practice you will find you are able to guess time to the line quite accurately. It is an important skill.

Fig. 14 - You should always know your time to the line. With practice you will be able to make accurate calls.

12. Getting Off the Line

The starting signal marks the midpoint of the start. We've dashed down the runway; now for the climb out. The final seconds before the start, and the two minutes after, are often a pure

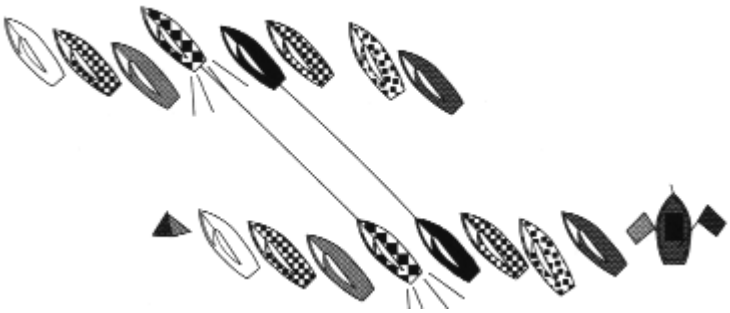
sprint for clear air. Speed is the key ingredient. A little extra speed or pointing here translates into a big advantage. Make sure you are tuned up before the start; concentrate on sailing your boat; ignore others. Try to start faster than full speed if possible, and blast off. Settle the crew and concentrate on steering and trim.

The tactician should watch the compass and the fleet for shifts and room to tack. Being a shade slow or a little low eventually leads to bad air, and problems multiply. Keep clear air and keep moving. Nothing else matters (Fig. 15).

Fig. 15 - At the gun, blast off the line and Sail Fast. Only those with speed will be free to pursue strategy unimpeded. Others will have to compromise strategy to keep clear air.

Pitfalls

*Author's Note: We of course have never personally experienced any of the troubles described here. This section is based on observation and hearsay, and may lack the veracity of the balance of our writing.



Sailboat races are won by the crew making the fewest mistakes. Nowhere is this more true than around the starting line. The most common mistake is being late for the start. Much less common is being over early. Listed below are the most common reasons for being late, and other assorted mistakes* and pitfalls: Caught going the wrong way, son of caught going the wrong way, too far from the line, too late, too early, barging, can't fetch the pin, buried at the start, bad air, tunnel vision, above a pincher, below a footer, and rules.

1. Caught Going the Wrong Way

You're reaching down the line on port tack, looking for a place to turn around. As the pack forms up for a run at the line it can be impossible to find room to turn in the crowd. Look ahead and turn before you get into the crowd. Otherwise, by the time you emerge from the other end and get turned back you will be late, and behind everyone. Turn back early. Point your bow toward the line (Fig. 16).

2. Son of Caught Going the Wrong Way

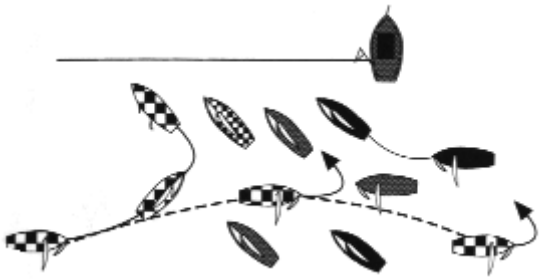
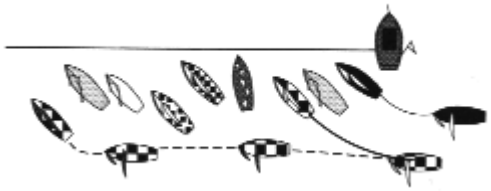


Fig. 16 - Don't get caught in a crowd going the wrong way.

This happens on starboard tack. Ducking sterns of other starboard tack boats stalling ahead. Once you start to duck you may never emerge. It is safer to keep your bow headed for the line. Don't duck unless you are sure you have plenty of time to come out on the other end (Fig. 17).



3. Too Far from the Line

Fig. 17 - Don't duck boats if you aren't sure you have plenty of time to come out the other side.

When the fleet gets between you and the line there is no way to get through, and you get only bad air. In most conditions it pays to stay within a few lengths of the line. In light air or adverse current stay right on the line. It is easy to get pushed away and hard to get back (Fig. 18a).

4. Too Late

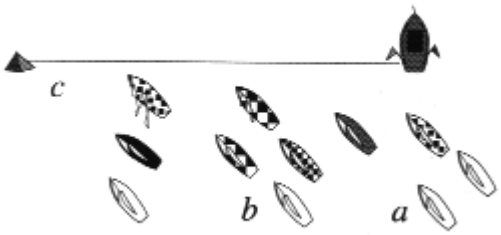


Fig. 18a - Don't get too far from the line. b - Don't be late. c - Don't be too early either!

You approach too late, get bad air, and can never accelerate. Has this ever happened to you? Me neither.

Once, when I was stuck in a streak of late starts I adjusted my timing to try to be five seconds early. It is easier to kill time than to recreate it. Set yourself up to be a few seconds early (Fig. 18b). Don't be late!

5. Arrive Too Early

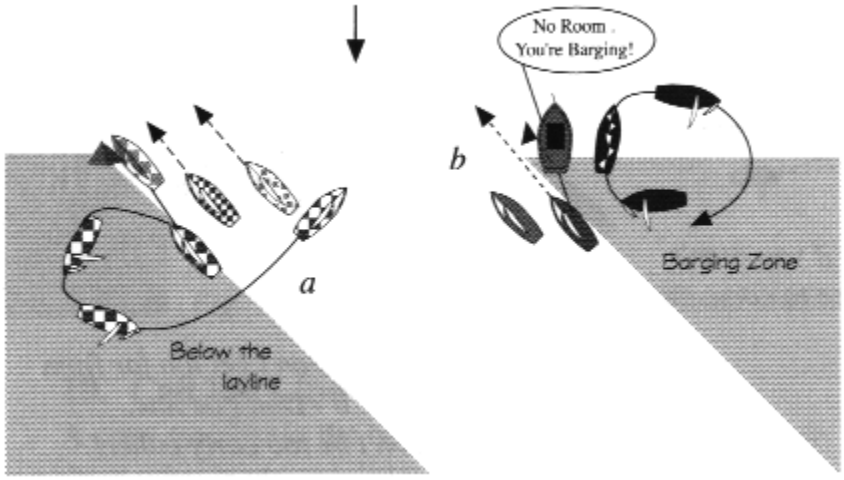
You either end up over early, or you stall and start with no speed and get run over. Timing is trickyÐclose enough to control part of the line, but far enough back to have room to accelerate (Fig. 18c).

6. Barging

Stay below the layline to the windward end. Any time your final approach is from above the layline, you are asking for trouble (Fig. 19b). Barging is reviewed in Chapter 5: Starting Rules.

7. Can't Fetch the Pin

Fig. 19a - If you find yourself below the pin layline, an early bail out can save you. b - Stay between the laylines and don't barge.



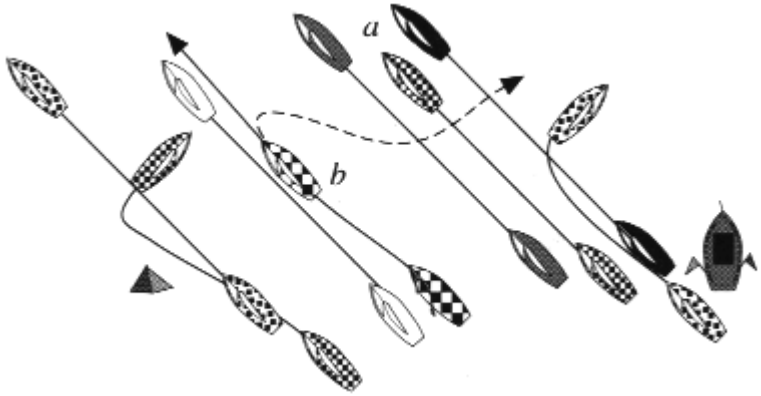
When you find yourself outside the layline to the pin, bail out. At the first sign of trouble jibe around. Tacking to port is suicide. You may be able to come away with a decent start, instead of being wrapped around the pin as the gun fires. For a pin-end approach, you must know the layline and stay above it (Fig. 19a).

8. Buried at the Start

"Everything seemed fine, then we trimmed to go and nothing happened. We shot out the back of that fleet so fast you'd think we came out of a cannon." If you're off the pace by one instant, those around you get the jump.

Sails don't come in instantaneously. From the thought ÒI need speedÓ to the reality takes 5 steps: Thought, Call, Trim, Accelerate, Speed. Call for trim before you need it (Fig. 20a).

Fig. 20a - If you are slow to "pull the trigger" you can get buried at the start. Fig. 20b - Once buried you can hang on or tack out.



9. Starting in Bad Air

Coming off the line in bad air requires a quick evaluation of options. Can we tack? Can we squeeze up or drive off into clear air? It can take minutes before things open up and you have a chance to clear out. If you are unsure what to do consider your overall strategy. If you want to go right then it may be worth ducking a few sterns to get out that way. If you are on the favored tack or if you are headed for the favored side it may be worth eating bad air for a short whileÑthough it will seem an eternity (Fig. 20b).

The tactician should have a contingency plan in mind in the event of a bad start. Think about it before it happens, then see to it that it doesn't.

10. Tunnel Vision

You hit the line right on time and get so excited you over steer and over trim and pinch and . . .

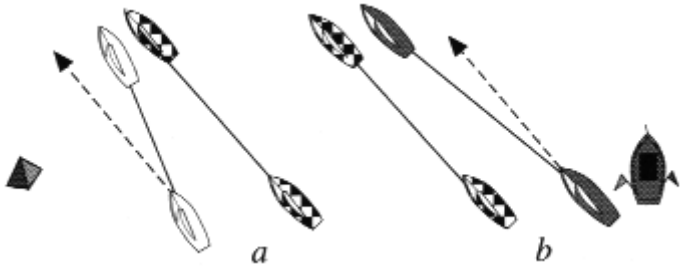
Overtrimming at starts is very common. All that energy and excitementÑplus you are trying to squeeze every last bit of performance out of the boat. Until you are at full speed in clear air and open water, overtrimming squeezes the life out of your performance instead.

11. Start above a Pincher

You come off the line fine, but the guy below you sticks his boat up and pinches. He is slow, but just fast enough to sneak under you and give you bad air. As he ruins your start it is little consolation that he is hurting himself too (Fig. 30a).

12. Start below a Footer

Fig. 21a - A pincher below you can ruin your startÑand his own.Fig. 21b - Try to gas off a footer before the speedster rolls over you.



This can be a problem, or a blessing. If we are inspired to new heights of performance in order to hold off the speedster, this can work to our advantage. If the speedster rolls over the top of us then, we have a problem (Fig. 20b).

13. Rules

In addition to the regular racing rules, there are some special rules which apply only at starts. Know the rules, and be aware that others may not.

Starting rules are such an important topic that they deserve a chapter all their own, which is next.

4.4 Conclusion

Starting Tactics guides us through the most important and exciting part of sailboat racing. It is no wonder more and more races are being run on short courses, with multiple race each day;Everyone wants more chances to start.

Starts take teamwork built around a sound, flexible plan directed toward clear strategic goals. Get the information you need, practice your approach, and don't be late (Fig. 22).

Fig. 22 - Starts require a good plan, great teamwork, and impeccable timing. Fig. 2c - Get line sights off the ends. The line sights can help you call the line even when your view of one end is cut off. Building Starting Skills Stop and Go Drill Park your boat on a close-hauled course with sails luffing, then trim and accelerate to full speed. Experiment to find the best angle and trim sequence (jib before main, but by how much) for different wind and sea conditions. Add Timing Using a short (five minute) starting cycle repeat your stop and go drill with the goal of passing a buoy at full speed at the gun. Luff your sails far enough from the buoy to have room to get up to full speed. How long will it take (in time and distance)? Circle back and do it again every five minutes. Time / Speed / Distance How long will it take us to get to the line from here? You will be practicing this in the timing drill above. Do it everywhere you goÑin and out of the harbor, as you approach a buoy or crab pot or another boat. With a little practice you can refine this all important starting skill. Don't be late If you are habitually late for starts, build in an extra five or ten seconds into the sequence. That is, plan to start five seconds early. It is much easier to waste time than it is to retrieve time that is lost when you are late. (You've noticed that too, I bet.) Rotate Positions During practice, rotate crew positions to get an idea of what each crew member is doing. How hard is it to grind in the jib? How tricky is it to call the line (much less stay on board) when working the point on a wavy day? Watch Other Starts Try a position off the pin end to see how other fleets sag and accelerate. Try watching from behind the line to see how others approach and create room to accelerate. Rather than try to watch the entire fleet, focus your attention on one or two boats for the last minute or two of the sequence.

Chapter 5: Rules at Starts

5.1 Luffing at Starts

5.2 Barging

5.3 Other Starting Rules

Chapter 5: Starting Rules

Starting Rules are a mix of the regular racing rules -such as starboard / port, overtaking, and tacking too close - which always apply; and special rules which apply only during starts (Fig. 1). These special rules include barging (Rule 18a), restarting (Rules 20 & 29.1), and the one minute rule (Rule 30.1). The luffing rules are now the same before starts as they are during the race, though in practice some differences remain, as we shall see.

5.1 Luffing at Starts

As written, the luffing rules are the same before starts as they are during the race. In practice there are differences, as there is no proper course before the start.

Here is how the luffing rules work (Fig. 2):

The leeward boat has right of way (Rule 11) and may luff as she pleases, limited only by the need to give the windward boat room to keep clear (Rule 16).

If the leeward boat established her overlap from astern, then after the starting signal, she shall not sail above her proper course (Rule 17.1).

If the windward boat established the overlap from astern, or if the leeward boat tacked into the overlap, then she may luff and continue to sail above her proper course regardless of the starting signal. (Why she would want to is another question.)

When you find yourself as a windward boat in a luffing situation, the definition of keep clear requires that you respond promptly to a luff. Head up as far and as fast as possible or necessary. Failure to respond to a luff will likely result in disqualification.

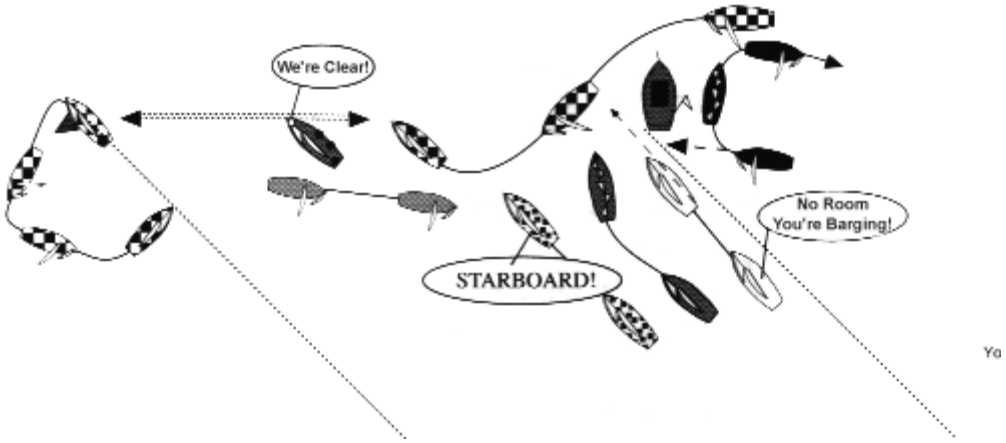


Fig. 1 - *Starting Rules are a mix of the regular racing rules and special rules which apply only during starts. These special rules include barging, restarting, and the one minute rule.*

A leeward boat may luff to clear the pin as long as she allows the windward boat room to keep clear. Even after the starting signal, a leeward boat may luff above close hauled, as starting is her proper course.

Definitions:
The definitions in the US Sailing Rule Book can clarify some common confusion and misunderstanding of the rules.
Proper Course is the course a boat would sail to finish as quickly as possible in the absence of the other boats referred to. A boat has no proper course before her starting signal.
One boat ***keeps clear*** of another if the other can sail her course with no need to take avoiding action and, when overlapped on the same tack, if the leeward boat could change course without immediately making contact with the windward boat.
Room is the space a boat needs in the existing conditions while maneuvering promptly in a seamanlike way.

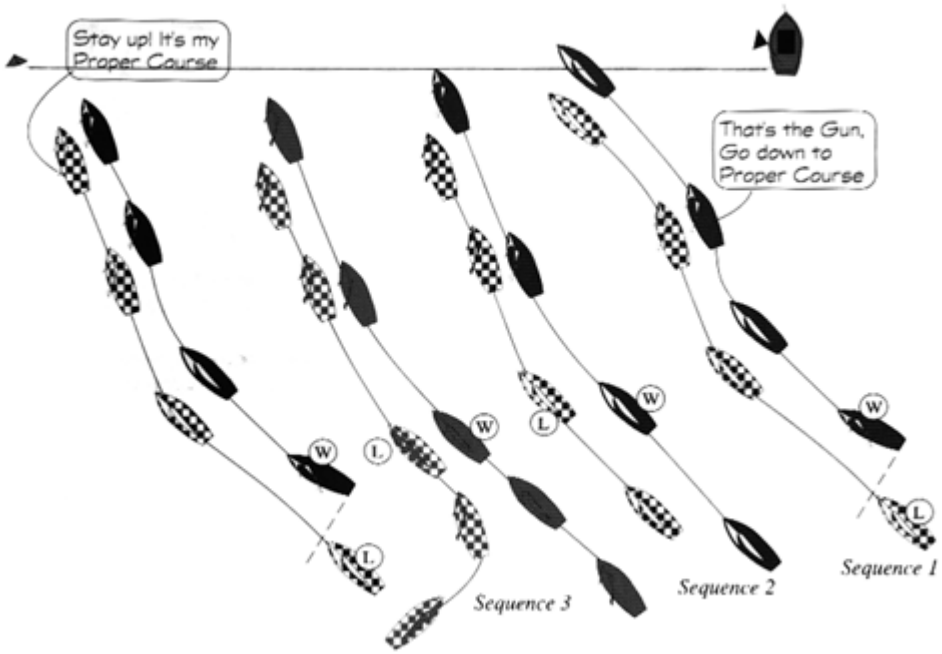


Fig. 2 Luffing at Starts
Sequence 1: *Before the gun L may luff as she please -- provided she gives W room to keep clear. Since L establishes her overlap from astern, she must assume proper course at the gun.*
Sequence 2: *L may luff as high as she likes -- provided she gives W room to keeo clear -- before and after the gun.*
Sequence 3: *After tacking into the overlap, L may luff as high as she likes -- provided she gives W room to keep clear.*
Sequence 4: *As in Sequence 1, after the gun, L is restricted to proper course -- but in this case proper course means pinching up to start.*

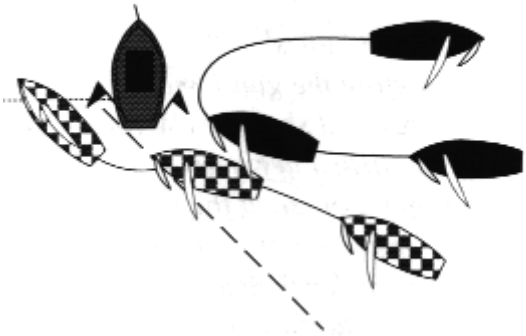
5.2 Barging

A leeward boat need not give an inside boat room at the start. The buoy room rules do not apply at starting marks when boats are on the final approach to start (Rule 18.1a). (An inside boat is entitled to room when the fleet simply sailing around before the start.)

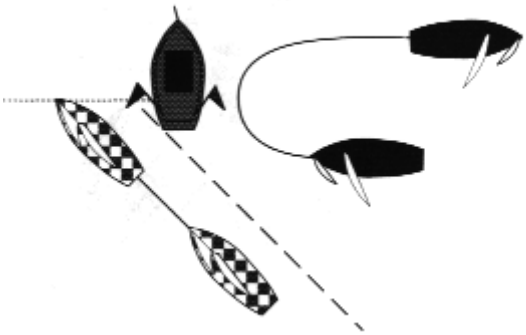
The windward / leeward rule (Rule 11) applies. It is constrained only by the need to leave room for the windward boat to keep clear (Rule 16), If the overlap was established from behind, then the leeward boat is further restricted to not sail above proper course after the starting signal (Rule 17.1).

The anti-barging rule is detailed in the situations presented on this and the facing page.

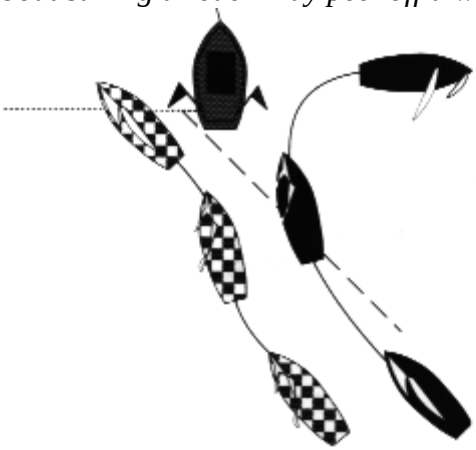
Confused? Here's a tip: Don't barge.



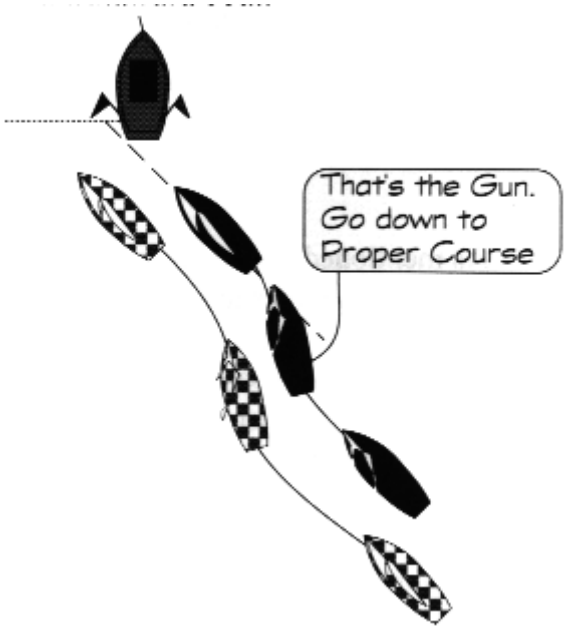
Situation 1 *- A leeward boat sailing close hauled may close out a windward/inside boat at any time.*



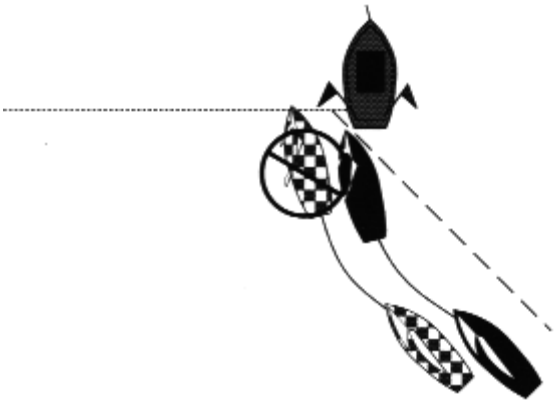
Situation 2 *- A leeward boat sailing a reach may peel off a windward/inside boat at any time.*



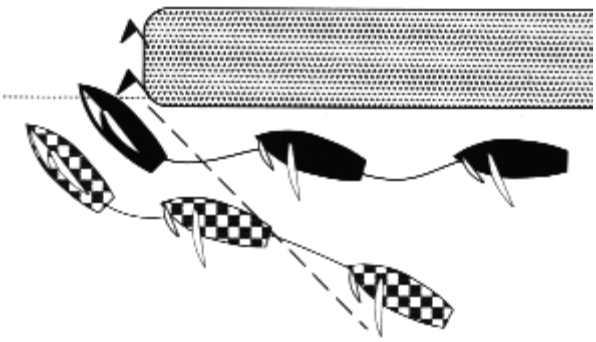
Situation 3 *- A leeward boat may sail <u>above close hauled</u> to close out a windward boat at any time, except....*



Situation 4 *- ... if the overlap was established from behind then after the starting signal a leeward boat may NOT sail above close hauled to close out a windward boat.*



Situation 5 - When a leeward boat changes course she must leave the windward boat room to keep clear.



Situation 6 - When the starting mark is not surround by navigate water, then the buoy room rules apply and the inside boat gets room.

5.3 Other Starting Rules

If you hit a starting mark you may exonerate yourself by doing an immediate 360¡ turn (Rule 31, Fig. 3a).

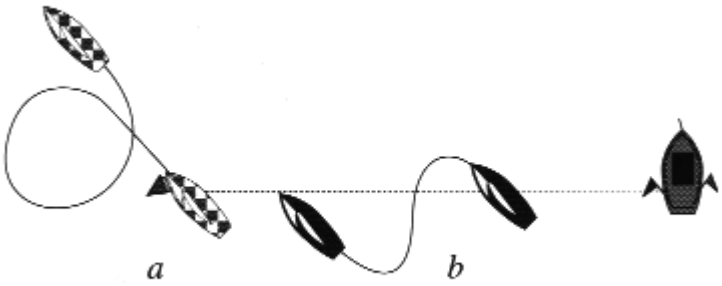


Fig. 3a - If you hit a starting mark, you must to a 360 degree turn.

Fig. 3b - If you are over early, you must restart.

A boat which is over early must restart by returning to the proper side of the line (Rule 29.1). The Race Committee is not required to call you back ~ you must judge for yourself whether or not you have started properly. While returning to restart, you must stay clear of those who have started properly (Rule 20, Fig. 3b).

The one minute rule is in effect when code flag "I" is displayed (a yellow flag with a black "eye"). You may not cross the line from the wrong direction during the last minute prior to the start or after the start. A dip start or dip restart is not allowed. You must clear yourself by sailing around the end of the line (Rule 30.1, Fig. 4a).

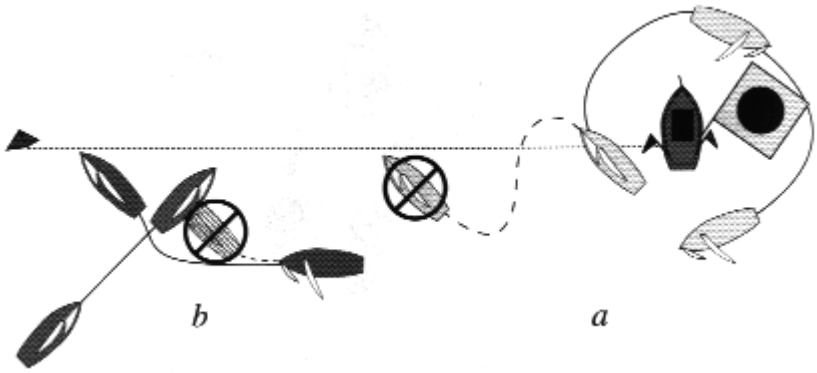


Fig 4a - If the "I" flag is flying, then you may not cross the line from the wrong direction during the last minute prior to the start or after the start. You must clear yourself by sailing around the end of the line.

Fig 4b. - When changing course, a starboard-tack boat must give a port-tack boat room to keep clear.

As mentioned above, the starboard/port, overtaking, and tacking-too-close rules apply during starts just as they do on the course. In starboard/port (Rule 4) situations the starboard boat may do as she pleases, constrained only by the need to leave port a way to keep clear (Rule 16, Fig. 4b).

The starting rules are intended to bring order to a crowded starting line. They are fairly effective, at least for upwind starts. Offwind starts create a whole new set of tactical concerns and rules dilemmas, as we will see in the next chapter.

Chapter 6 - Offbeat Starts

Running Starts

6.2 Reaching Starts

6.3 Starts on One-Legged Beats

6.4 Conclusion

Chapter 6: Offbeat Starts

While reaching and running starts are far less common than upwind starts, the keys to success are familiar: Planning, timing, and judgement are critical as always. Offwind starts lack some of the order of upwind starts; they can be unpredictable, and some of the techniques differ from those we use upwind. Below are a few thoughts on starts in a variety of wind angles, from straight downwind to reaches and one-legged beats.

6.1 Running Starts

As chaotic as upwind starts are, they pale by comparison to running starts. Starting near the ends enables you to reach out to the side for clear air, but you are then committed to that side for the first part of the race. Starting in the middle of the line leaves you in bad air. Pick a side which will give you clear air, and try to anticipate crowds and wind shadows (Fig.1).

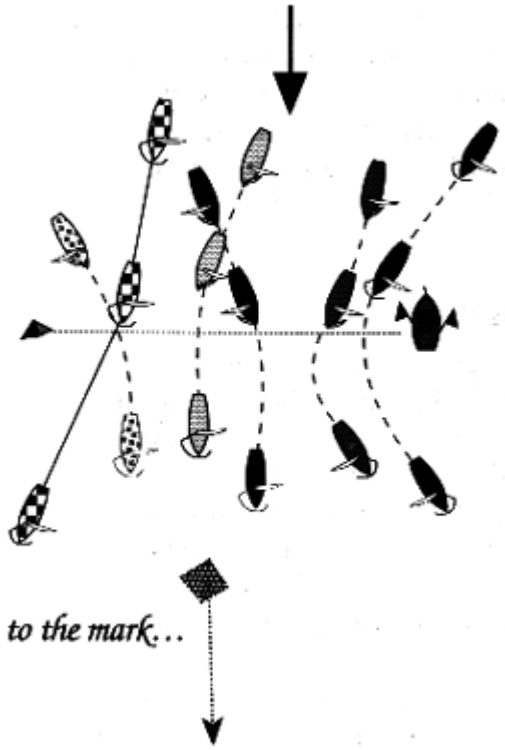


Fig. 1 - For Strats on a run, timing is trickey. Set spinnaker early and sail fast. Control your approach by oversteering, but keep speed. Pick a side to get clear air.

One of the most common mistakes in downwind starts is delaying the spinnaker set. To hit the line at full speed you must have your spinnaker up and drawing on your approach. Hoist your spinnaker in stops (rubber bands or thin yarn). Break it out and trim for full speed as early as you canÑthirty seconds to one minute before the startto get a jump on those who wait for the gun before hoisting. As a small boat in a mixed fleet, this is a great time to draft on the stern wave of a larger boat.

6.2 Reaching Starts

Tactics on reaching starts depend on the exact wind angle of the line and to the mark.

Wind Forward of the Beam

If the wind is forward of the beam, a start near the leeward end of the line gives room to drive off to accelerate in puffs. You are also in position to work up to the fleet, and you have luffing rights. A good start is essential. If you fall into bad air, you risk being rolled by one boat after another.

As a small boat in a mixed fleet, the leeward position may not work out as you get rolled by faster boats. In hull speed conditions, there is an opportunity to hitch a ride on the quarter wave or stern wave of a larger boat by dropping in from close to windward (Fig. 2).

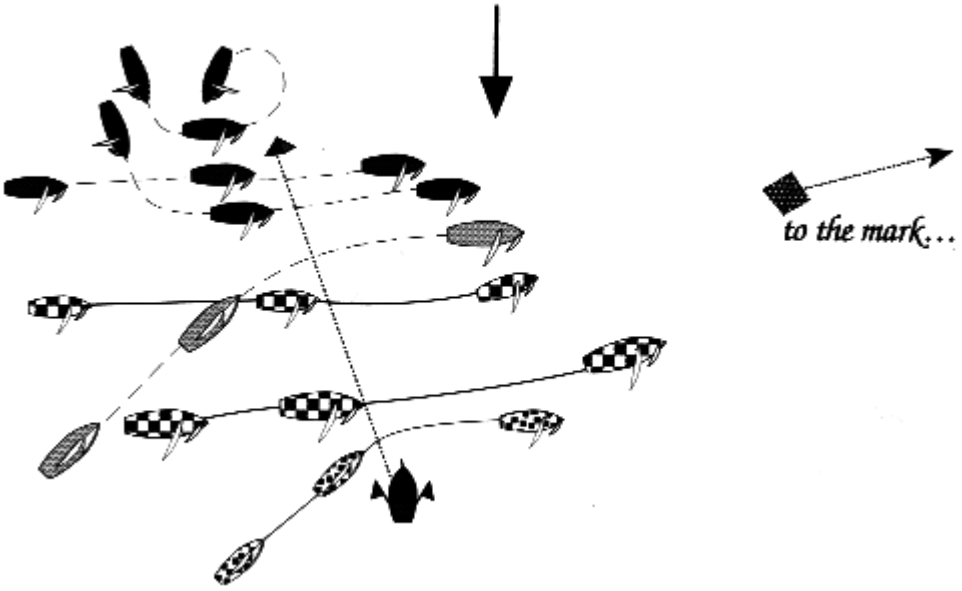


Fig. 2 - On a reach when the wind is forward of the beam, a start at the leeward end of the line gives the best sailing angle. An on time, full speed start is essential. there is a danger of getting rolled by one bioat after another if you fall into bad air. In a mixed fleet, there are particular problems for small boats.

Wind Aft of the Beam

With the wind abaft the beam, clear air is available only at the weather end, and everyone knows it. Reaching up the line will give you luffing rights on those reaching into the line from above, but no wind.

Dont be surprised if the entire fleet does not respond to your hail to clear out as you charge up the line. In a crowd boats are insulated by their neighbors, and often there is no way to respond. Boats with right-of-way and no air are often bowled over by the mass of boats reaching in.

A start which gets your nose out in front of the crowd and into clear air can mean winning the race. Here again there is an opportunity for small boats to draft in the stern wave of larger boats (Fig. 3).

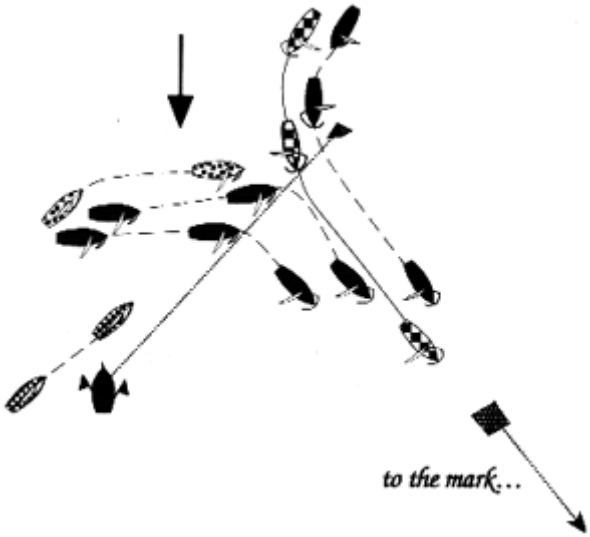


Fig. 3 - When the wind is abaft the beam, then clear air is available only at the windward end. The battle there can be unruly, with right-of-way boats bowled over by the sheer mass of intruders.

6.3 Starts on One-Legged Beats

When a big wind shift turns the first leg of a race into a fetch or near fetch starting tactics change. Typically the line is square to the mark (and original wind) and heavily skewed to the new wind.

Ideally, when there is a big shift before the start of a race, the Race Committee will delay the start and reset the course, but that is not always the case. When a shift turns the first leg into a one-legged beat, the goal of starting strategy is to get off the line with speed sailing on the tack to the mark. The exact position on the line is not important. Lets take a look at the two cases: Port tack fetch and starboard tack fetch.

Port Tack Fetch

When a big left hand shift makes the first leg a port tack fetch (or near fetch), blast off the line on port tack. The fleet tends to bunch up at the port end to the line, barely fetching or not fetching the line on starboard tack. Avoid the jam up, and start in the middle of the line.

Two approaches are recommended. One is a port tack approach, ducking starboard tackers, and finding a gap in the crowd. The other is a starboard approach. Sail up the line on starboard, find an open space, and tack. Allow time to build speed on port. Regardless of approach, the goal is to reach in and blast off!

From a midline position you will be ahead and to leeward of the pack. If the breeze backs further, you may fetch. If the breeze clocks, you will lead the fleet into the header. Meanwhile, the pack at the port end will be jammed up, sailing the wrong way, and unable to tack out (Fig. 4).

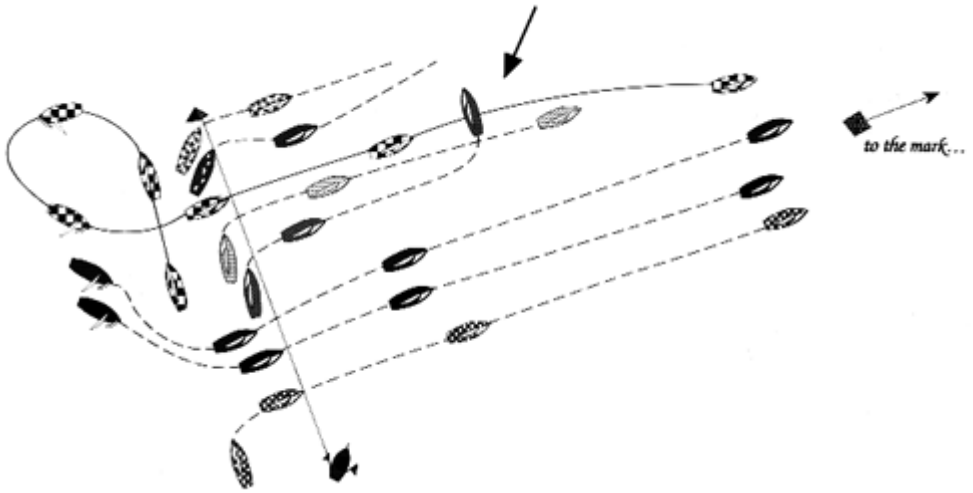


Fig 4 - Port Tack Fetch. Approach on port and duck starboard boats, or approach on starboard and tack into a hole. the critical thing is to blast off on port tack.

Starboard Tack Fetch

When the breeze clocks to create a starboard tack fetch, the same principles apply. Blast off the line on starboard tack. Your position on the line is not importantgetting away clean is. Avoid the crowd at the starboard end; boats in the crowd push each other up as they fight for clear air, and they end up sailing extra distance. Take off from the middle of the line. You will be ahead and to leeward of the crowd; you will be inside (for a port rounding) if the leg becomes a fetch; and you will lead the fleet into the header if the breeze backs. A timed out and back approach is best (Fig. 5).

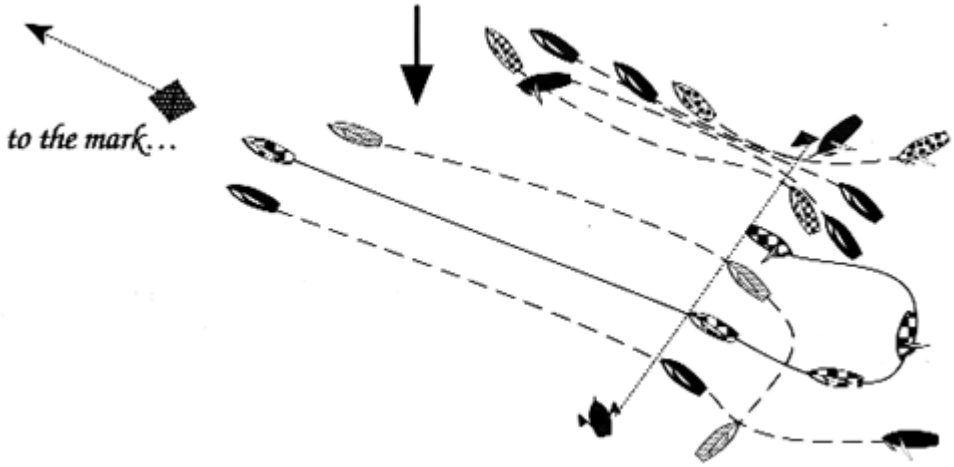


Fig. 5 - Starboard Tack Fetch. Once again, position on the line is not important. A fast, clear air start is the goal. Avoid the crowd at the windward end, and take the preferred position to leewrd.

One-Legged Beats

The tactics for starts on one-legged beats boil down to starting with speed on the tack toward the mark. Position on the line is not important, but clear air is. This strategy applies to any reaching start with the wind forward of the beam and the line perpendicular to the leg.

6.4 Conclusion

Starts are critical, and offbeat starts are no exception. Offbeat starts provide a great opportunity for those who can take advantage of their unique characteristics. It is remarkable how the start can shape the entire race, even a distance race. Try to anticipate the actions of other boats, and get in position to start with clear air and good speed.

Chapter 7 - Upwind Strategy

7.1 Introduction to Strategy

Strategy vs Tactics

Strategy is our racing plan based on wind, wind shifts, and current. Tactics, on the other hand, are techniques we use for positioning and control of other boats or groups of boats. Strategy involves the big picture; tactics focuses in close. Strategy is long term and planned, tactics is more immediate and spontaneous.

Strategy is Wind, Wind shifts, and Currents

There are three factors in planning strategy. We look for better wind. We try to take advantage of wind shifts. And we try to get favorable (or not unfavorable) current. The relative importance of each factor depends on how variable each is (Fig. 1).

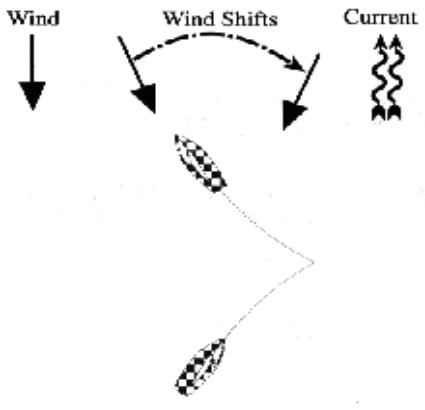


Fig. 1 - Strategy vs Tactics. Strategy is our racing plan based on wind, wind shifts, and current. Tactics, which we cover later, involves implementing our strategy and dealing with other boats.

7.2 Predicting Conditions

Our strategy is based on the expected conditions. The more accurately we can predict the wind and current, the more confidently we can form our strategic plan. As we discussed in Chapter Two, our predictions are derived primarily from our own observations during the hour before the start, and our experience sailing in a particular area. We revise our predictions as we continue to observe conditions during the race.

The figure shows a sample Wind Graph based on our pre-race observations. By carefully tracking the wind we can more accurately predict the wind for the race (Fig. 2).

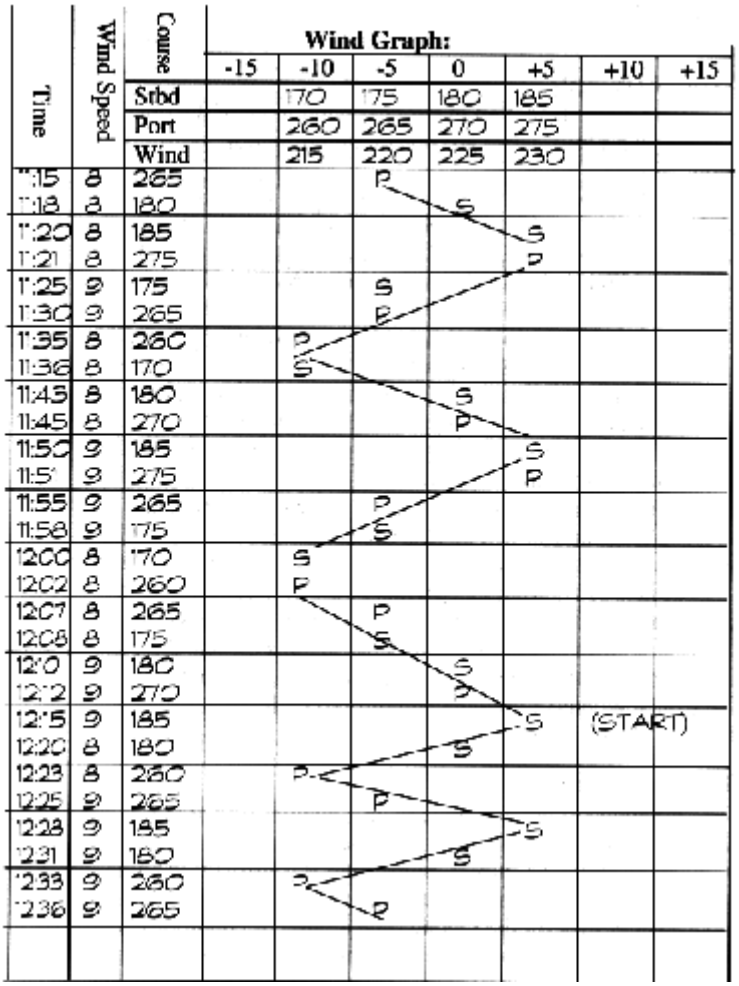


Fig. 2 - Plan strategy based on observed and predicted conditions. The numbers listed here show a history of conditions prior to the start and during the first leg of a race. This information will help us plan and update our strategy. We plot the numbers to get a visual image of the wind pattern. This particular wind chart shows a very regular pattern of oscillations.

Predictable vs Unpredictable

One issue in our strategic planning is our confidence in our forecast. When conditions are highly predictable, we can pursue our strategy with conviction. When we are unsure of what to expect, our strategy will change. First, we would not pursue the strategy as wholeheartedly. Second, we would devote more than the usual amount of attention to watching for changing conditions which might require us to change our strategy.

Our strategy will depend on the predicted conditions and our confidence in that prediction. When we are able to predict conditions accurately and confidently, our strategic planning is relatively easy. In practice our predictions often prove less than accurate, and our planning boils down to playing the odds to reduce risks and increase possible gains.

Strategy and Conditions

As we said, our strategic planning revolves around the expected conditions. When we know what to expect, we will be able to make a firm plan. When our forecast is uncertain, then our plan will be less well defined.

Strategy and conditions are related in another way. The more variable the wind and current, the more important strategy will be to our success. In stable conditions boat speed will be the dominant concern. Our focus depends on what we see as the key to success in today's conditions.

7.3 Wind

Wind Strength

Find more wind. Sail in stronger wind more of the time and you can't lose. There are several things to look for to find more wind.

Look for wind on the water. Stand up in your boat and look upwind. Puffs create dark patches on the water. It is tricky to distinguish shadows, changes in bottom color, and differences due to sunlight; but the wind is there if you can pick it out.

The wind changes near shore. Most of our racing is done close enough to shore that winds vary across the course. Often there is better wind near shore. When the wind is blowing onshore the thermals near shore create more wind. In an offshore wind the thermal mixing near shore sometimes pushes the stronger winds from aloft down to the surface. At other times the wind is lighter near shore. By paying attention and keeping records, you will be able to anticipate the change in wind as you get near shore.

Clouds often bring more wind. In partly cloudy conditions, check under the clouds to see if there is more wind. In a clearing northwest wind with rows of cumulus clouds, there are usually down drafts of stronger wind around the clouds. If you see frontal clouds or building cumulus go to them-they are associated with wind.

The Favored Side

A windward leg will often have a favored side. Boats sailing to one side will have an advantage due to favorable wind, wind shifts, or current. Sometimes it is difficult to anticipate which side is favored. After observing the first leg we will have a better idea for the second time around. If conditions don't change, then we would expect the same side to be favored again. Also, after seeing particular conditions in a local area a number of times, we will be able to anticipate which side will be favored (Fig. 3).

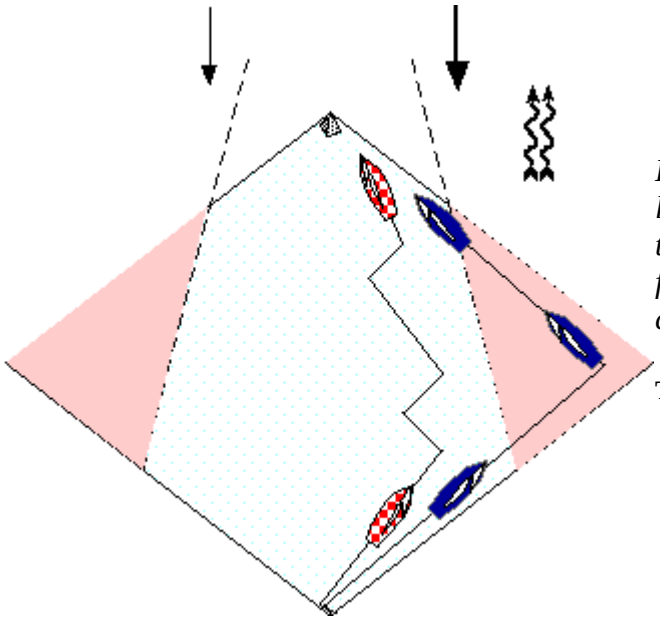


Fig. 3 - We divide the windward leg into left, middle, and right segments. Often there is a favored side. We sail to the favored side of middle, but avoid the corners.

Time Out for Terminology

Before we go on about the favored side a few details of terminology must be cleared up: The favored side of the course carries some strategic advantage. The favored tack takes you to the favored side. This should not be confused with the long tack, which is the predominant tack on a skewed beat, (i.e. a beat where we spend more time on one tack than the other. Often it is strategically correct to sail the long tack first - that is, the long tack is often the favored tack. At other times the favored tack might be the short tack (Fig. 4).

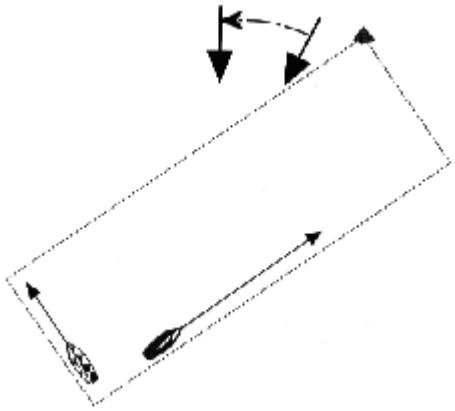


*Fig. 4 - Don't confuse the **long** tack with the **favored** tack*

Why is This Side Favored?

Hopefully we will know not only which side is favored, but why. Knowing the reason will help us determine if conditions have changed and the advantage has changed as well. If current is the factor, for example, then a change in the tide can reverse the advantage. If the advantage is due to the geography of the surrounding shore, then the advantage will endure until the wind changes (or, if you race on the west coast, the shore line is re-configured by an earthquake).

Right, Left, & Middle

In our discussion of strategy we will divide the windward leg into three vertical segments; representing the left, right, and middle of the course. When our strategy favors one side or the other it is generally best to sail to the right or left of the middle, but not beyond. There are several reasons to avoid the extreme sides. For one, our strategy may prove to be wrong and a total commitment would make it difficult to recover. Second, as we shall see, there are strategic and tactical reasons to avoid the corners, since they can leave us out of position and with few options. We would only sail to the extreme sides if:

- We are confident about our strategy *and*
- We must go to the extreme to get the advantage.

Caught on the Wrong Side: Now What?

What should you do if you sail to the favored side, get half way up the beat, and realize it is not the favored side after all? That is a tough question. Often it is surprising how close you end up to the leaders if you bail out half way up the leg and cut your losses. On the other hand, the ultimate frustration is bailing out early and then seeing those who stuck with it come out ahead in the end. Curses.

Of course, never having made such a mistake myself, it is hard to offer insights. I can offer a few ideas based purely on the experience of others:

- Don't overcommit to begin with-play the middle. (Now you tell me!)
- Hedge your bets. When in doubt stay with the pack.
- Be realistic about how things are going; don't kid yourself.

- While you ponder what to do sail toward the middle, not further into the corner.

Chapter 7 - Upwind Strategy

7.4 Wind Shifts

The second strategic factor is wind shifts. Shifting winds allow us to reach the windward mark more quickly than we can in steady winds.

When the Wind Shifts

When the wind shifts, our close-hauled compass courses change. With each shift one tack is lifted up above its earlier course, and the other tack in headed below its previous course. When one tack is lifted the other is headed, and vice versa. Our goal upwind is to sail each tack when it is lifted. By sailing the lifted tack, we sail a more direct route to our upwind destination (Fig. 5).

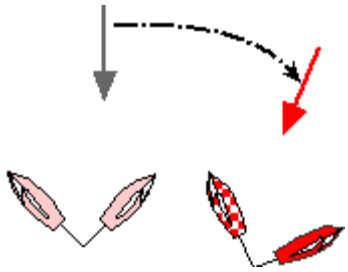


Fig. 5 - As the wind shifts, one tack will be **lifted** up toward the mark while the other tack will be **headed** away from the mark.

Sail to the Shift

The fundamental upwind strategy is to sail toward the new wind or wind shift. As we will see, this strategy keeps us on the lifted tack. The application of this principle changes with different types of shifts; but the fundamental rule-sail to the shift-never changes.

Tracking Conditions

The best way to keep track of wind shifts is track your close-hauled compass course. Before and during the race keep a record of compass headings and establish a range of highs and lows for each tack. By recording the shifts, you can look for patterns (see Figure 2) and anticipate upcoming shifts.

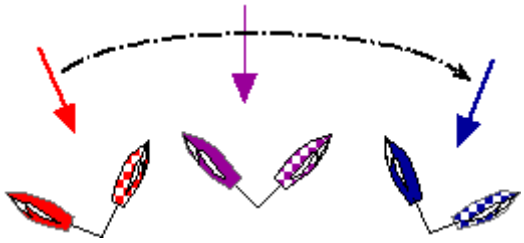
Of course, reading the compass only tells about a shift after it has arrived. In addition to the compass, observe the wind on the water and watch its effect on other boats. Work to recognize and predict shifts before they arrive.

Types of Shifts

Wind shifts are generally categorized in two types: oscillating and persistent. Oscillating winds shift back and forth, like windshield wipers. Persistent shifts swing gradually in one direction, like the hands of a clock. A shift to the right is a clocking shift, or "veer;" a shift to the left is called a "back" (Fig. 6a, b).

Fig. 6a - In oscillating shifts the wind swings back and forth

Fig. 6b - In a persistent shift the wind shifts continuously in one direction.



From experience we know the real world is more complex than simple oscillating or persistent shifts. For starters we are going to look at strategy in these two textbook types of shifts. After that we will look at other variations.

Oscillating Shifts

We will look at wind shift strategy by first looking at the textbook strategies for oscillating and persistent shifts.

The basic strategy in an oscillating breeze is to tack with the shifts. As the wind shifts one tack is lifted so we can point closer to the mark (or average wind) while the other tack is headed further away. When the wind shifts again the advantage will be reversed; whenever one tack is lifted the other is headed. By coming about when headed and sailing on the lifted tack, we can take advantage of the windshifts to improve upwind performance. We use the term staying in phase to describe the process of tacking on the headers and sailing on the lifts.

Sometimes the wind shifts gradually back and forth. This is seen most often when the winds are coming over open water. At other times the shifts hit all at once. We see this when the shifts are coming off shore, or in the northwest winds after a cold front.

On starboard tack a higher compass reading is a lift, a lower number is a header. On port lower is a lift, higher is a header. It is most important to recognize headers since they suggest it is time to tack. Use the phrase Port, Higher, Header as an aid to remember the correlation between compass readings and shifts.

Get in Phase

By collecting wind information before the race and updating information as the race progresses, we should know at any moment whether we are sailing a lifted, headed, or average course. If conditions change, our lifted and headed numbers will have to be adjusted.

Out of Phase

Sailing in oscillations seems pretty straightforward. If the shifts come in a regular cycle and no one gets in your way, it should be easy to stay in phase. Somehow it doesn't always work

that way. If you find yourself out of phase, sail the tack which takes you closest to the mark, or towards the next puff, while you sort things out.

Unbalanced Legs

Tacking as the wind crosses the average works great if the wind spends equal time on each side of average and the mark is straight upwind. This is not always the case. When the leg or shifts are not balanced, then the crossover angle for tacking must be adjusted to match. For example, if the leg is skewed to three times as much starboard as port, then we'll need to sail on starboard for three quarters of the wind range, and port for one quarter.

Similarly, if there are other strategic considerations, our tacking angles may be skewed. For example, if there is better wind or current to one side of the course, we would only sail away from that side at the extreme end of the shift spectrum.

OSCILLATING EXAMPLE

Pre-Race Data

In preparation for our 12:15 start we periodically record and plot our wind information. Using the close-hauled compass course on each tack, we are able to calculate the wind direction. The Wind Graph from our Race Planner shows the following (Fig. 7):

- An oscillating breeze, shifting back and forth.
- Starboard tack headings ranged from 170º to 185º.
- Port tack headings ranged from 260º to 275º.
- We tack through 90º; from 170º on starboard to 260º on port, or from 185º to 275º.
- The wind speed is a steady 8 to 9 knots.

Time	Wind Speed	Course	Wind Graph: -15	-10	-5	0	+5	+10	+15
		Stbd		170	175	180	185		
		Port		260	265	270	275		
		Wind		215	220	225	230		
11:15	8	265			P				
11:18	8	180				S			
11:20	8	185					S		
11:21	8	275					P		
11:25	9	175			S				
11:30	9	265			P				
11:35	8	260		P					
11:36	8	170		S					
11:43	8	180				S			
11:45	8	270				P			
11:50	9	185					S		
11:51	9	275					P		
11:55	9	265			P				
11:58	9	175			S				
12:00	8	170		S					
12:02	8	260		P					
12:07	8	265			P				
12:08	8	175			S				
12:10	9	180				S			
12:12	9	270				P			
12:15	9	185					S	(START)	
12:20	8	180				S			
12:23	8	260		P					
12:25	9	265			P				
12:28	9	185					S		
12:31	9	180				S			
12:33	9	260		P					
12:36	9	265			P				
12:37	9	185					S	NEW	
12:40	9	190					S		

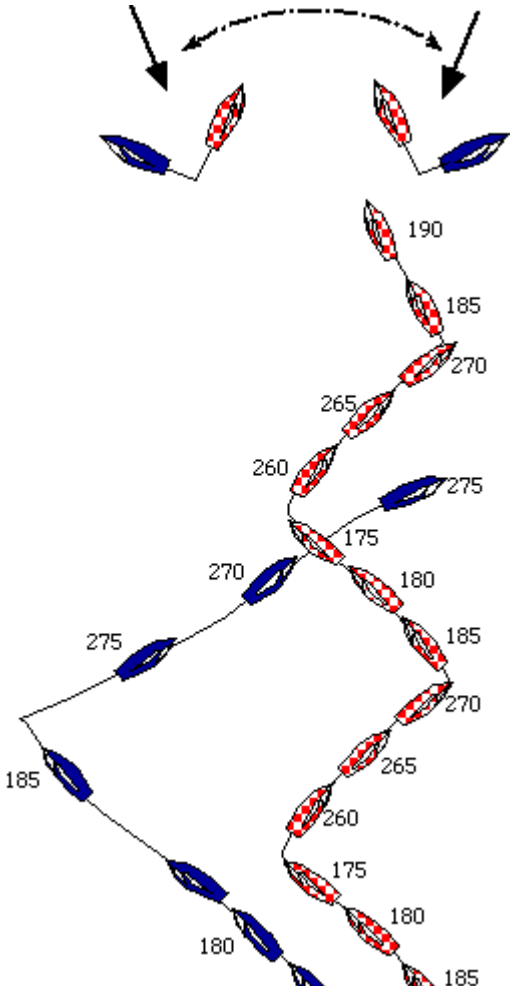


Fig. 7 - The Wind Graph above shows the plot of an oscillating wind over time. Using this information, the tactician is able to plan a strategy to take advantage of the shifts, shown by the checkered boat, above. The black boat ignores the shifts, and falls behind.

Stay in Phase-Tack on the Headers

Coming off the starting line, we are sailing on starboard with a compass course of 180º to 185º. These are high numbers for starboard tack, which means we are lifted. Gradually our course drops to

between 175º and 180º. This is an average course, neither headed or lifted, and we can sail on either tack.

Soon the crew reports that our course has dropped below 175º. Other boats are showing similar angles. We are headed. We tack. As we settle on port tack the compass reads 260º-265º, low numbers which mean we are lifted on port tack. As the numbers rise, we are getting headed. Remember: *Port, Higher, Header*. When our course falls below ouraverage, we tack again and sail lifted on starboard.

As the plot shows , we continue tacking on the headers in the oscillating shifts. Gradually we find ourselves to the left of the middle of the course. We use the time when the wind is at the average direction to sail on port tack, which returns us to the middle. We sail on starboard only when lifted above 180º; we sail on port for any heading between 260º and 270º.

A New High!

Further up the leg, we are sailing lifted on starboard. Compass readings show a course between 180º and 185º. Gradually we are lifted to 190º. At this point lights should flash, bells should ring, and sirens should sound. 190º is beyond our range of oscillations. We are lifted higher than ever before.

We may have to reevaluate the conditions and modify our strategy. What is causing this new reading? Helmsman error? Changing weather? Are we closer to shore? Are there any new clouds? What is going on with the rest of the fleet?

Is this a momentary aberration, after which we will return to earlier conditions? Or is this the beginning of a persistent shift? Perhaps the wind will continue to oscillate, but over a new range.

The key is to first recognize that something new is happening. The next step is to evaluate the change and make plans accordingly. Ideally we would have seen it coming-either from wind on the water, an expected shift near shore, or by observing other boats (in an earlier class-we are leading our fleet, remember).

The Impact of Shifts-Don't Miss 'Em

Meanwhile, one of our competitors has sailed off the line on starboard tack and continued one third of the way up the leg before tacking. From there he sailed across the course on port tack, to the starboard tack layline. Ignoring the shifts has left our rival out of phase and sailing headed half the time. On the other hand, he has only had to tack twice! On a two mile beat with 10º oscillations, a boat which sails in phase will be minutes ahead of a boat which ignores the shifts. That's even after we throw in the cost of a couple of extra tacks!

A little later, we'll pull out our slide rules and find out just how big a deal windshifts are, but for now, just remember: Track the shifts, and hit 'em!

Similarly, if there are other strategic considerations, our tacking angles may be skewed. For example, if there is better wind or current to one side of the course, we would only sail away from that side at the extreme end of the shift spectrum.

Persistent Shifts

The strategy in a persistent shift is to sail toward the new wind. If the wind is shifting to the right, then go right. If the wind is shifting left, go left.

Sail Headed

In a persistent shift, one tack is continuously getting headed while the other is getting lifted. Our strategy is to first sail the tack which is getting headed, then sail the tack which is getting lifted. Why? The tack which is getting headed is getting worse all the time. It is headed now, but will be headed more later. Sail it now before it gets worse. The tack which is getting lifted is improving all the time. If we sail it now we will be missing a better lift later.

Are you Sure it's a Persistent Shift?

How hard is it to split with the fleet and sail into a header? Without our pre-race info, weather forecast, and/or observation of other boats on which to build our strategy, it would be crazy. Even with good information and a well thought out plan, it is hard to stick to your guns as the fleet tacks away. If you know what is coming, then go to it. Position yourself to the favored side of the fleet.

The Rewards

How much do you gain by sailing into a persistent shift? It depends how far the wind shifts and how far you are separated from your competition; but in a word - Plenty.

PERSISTENT EXAMPLE

We know from our Wind Graph that the wind is gradually backing. Our starboard tack readings for the hour before the start show a trend: $30^{o} > 25^{o} > 20^{o} > 15^{o}$. The port tack compass readings are similar: $120^{o} > 115^{o} > 110^{o} > 105^{o}$. Starboard is getting progressively headed, while port is getting lifted. The forecast tells of a low passing to the south. We expect the wind to continue to back (Fig. 8).

Time	Wind Speed	Course	Wind Graph: -15	-10	-5	0	+5	+10	+15
		Stbd		15	20	25	30		
		Port		105	110	115	120		
		Wind		60	65	70	75		
11:15	8	120					P		
11:20	8	30					S		
11:25	9	30					S		
11:30	8	25				S			
11:35	9	115				P			
11:40	9	110			P				
11:45	9	20			S				
11:50	10	110			P				
11:55	10	20			S				
12:00	10	105		P					
12:05	11	15		S					

Time	Wind Speed	Course	-15	-10	-5	0	+5	+10	+15
		Stbd		0	5	10	15		
		Port		90	95	100	105		
		Wind		45	50	55	60		
12:0	11	105					P		
12:5	11	10				S		(START)	
12:20	12	8				S			
12:23	12	5			S				
12:25	11	5			S				
12:28	12	0		S					
12:31	12	90		P					
12:33	12	90		P					
12:36	12	85	P						
12:37	13	80	<P						
12:40	13	75	<<P						

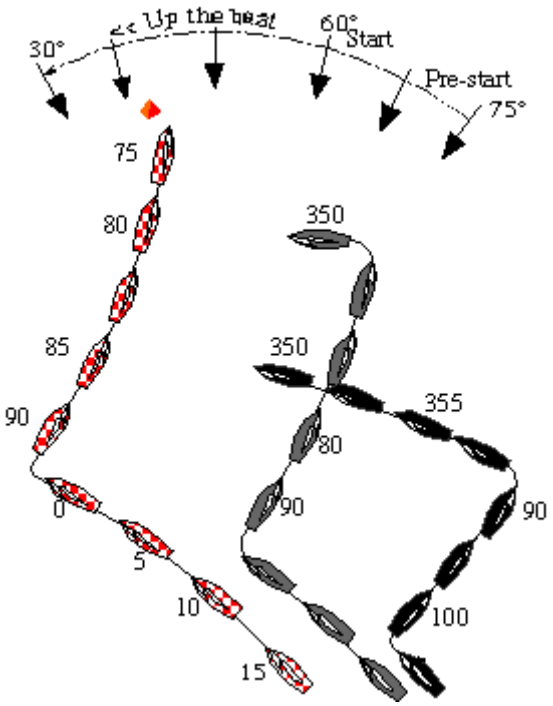


Fig. 8 - Wind Graph and strategy for a Persistent Shift.

Sail to the Shift

Coming off the starting line on starboard tack our compass reads 15º. A minute later it reads 10º, and a few minutes after that it reads 5º. With each little header some of our competition tacks away. Some tacked to port on the first header off the line. Others have gradually bailed out as the header continues.

Eventually, with the compass reading 0º, we tack over. Our course on port tack is 90º. We are short of the layline to the mark. Gradually we are lifted, first to 85º, then 80º, and finally 75º. We are lifted to the mark, far ahead of those who tacked out early.

When should We Tack?

The choice of where to tack is a little tricky. Theoretically we want to tack so we will be lifted exactly to the mark. This curved lifted layline would give us the full advantage of the shift without sailing any extra distance. This is a tough call, to say the least. A more realistic approach is to tack short of the layline. Then, as you approach the mark, tack out again, and take another guess. Don't overstand or you'll be sailing extra distance. As you get closer to the mark, you should be able to make an accurate layline call.

Another (tactical) perspective on where to tack is to maintain position between the fleet and the shift. Don't sail to the corner-just get a controlling position.

So Much for the Competition

Coming off the starting line on starboard, we gradually got headed. Some of the fleet played the header as an oscillating shift, and tacked out. They expected to be headed again (on port tack) before tacking back to starboard. This was a big mistake. We knew from our Wind Graph that we were in a persistent shift. We used persistent shift strategy by sailing into the header, towards the new wind.

The boats which tacked out early kept getting lifted further and further on port tack, which made starboard tack look worse and worse. The port tack boats ended up sailing what is known as the great circle route, getting lifted around the outside of the mark.

Too Far Ahead

If the fleet goes right and you think the wind is going left, then position yourself to the left of the fleet. Don't split completely with the fleet, for two reasons:

First, if you split and you are right, you will end up way ahead, and everyone will think you were just lucky. You don't want to win by too much; just a comfortable margin that will let everyone see who is out front.

Second, if you split with the fleet and happen to be wrong, you are sunk. (Somehow it is not unlucky to be half a mile behind-you are just bad.) Hedge your bets.

Other Types of Shifts

As we said above, pure oscillating and pure persistent wind shifts are quite rare. There are infinite variations.

One variation is a mix of persistent and oscillating shifts. This mixed condition is characterized by oscillating shifts gradually shifting one way or the other-veering or backing-over

time.

Several other types of wind shifts occur. One is a major shift where a new wind completely replaces the existing wind. This can happen suddenly, or after a period of calm. Winds vary in other ways. There are geographic shifts caused by the configuration of land and thermal wind

shifts created by the heating of land. There are also differences in the wind due to differences in current (as we will see below), and there are shifts caused by the movement of weather systems.

Mixed Conditions

Often conditions are not a pure form of persistent or oscillating shifts. Instead we end up with a mixed condition, combining both oscillations and persistent characteristics. The strategy in a mixed breeze is to favor the side toward the persistent shift while playing the oscillations. Part of the trick in coping with these mixed conditions is to realize that the range of oscillations is gradually changing. The high and low numbers on each tack will be increasing or decreasing. What was once a header may now be the median, with a new lower header on the way.

When conditions are too confusing to diagnose, the fall back strategy is to sail to the mark. Which ever tack takes you closer to the mark is preferred until there is reason to do otherwise.

Mixed Conditions Example

Here is an example of strategy in mixed conditions (Fig. 9).

Time	Wind Speed	Course	Wind Graph: -15	-10	-5	0	+5	+1
		Stbd	235	240	245	250	255	26
		Port	325	330	335	340	345	35
		Wind	280	285	290	295	300	30
11:15	8	350		P				
11:18	8	240		S				
11:20	9	245			S			
11:21	9	335			P			
11:25	9	245			S			
11:30	10	340				P		
11:35	10	250				S		
11:36	9	335			P			
11:43	8	245			S			
11:45	8	250				S		
11:50	9	340				P		
11:51	9	345					P	
11:55	10	255					S	
11:58	10	340				P		
12:00	11	350						P
12:02	11	260						S
12:07	11	255					S	
12:08	10	340				P		

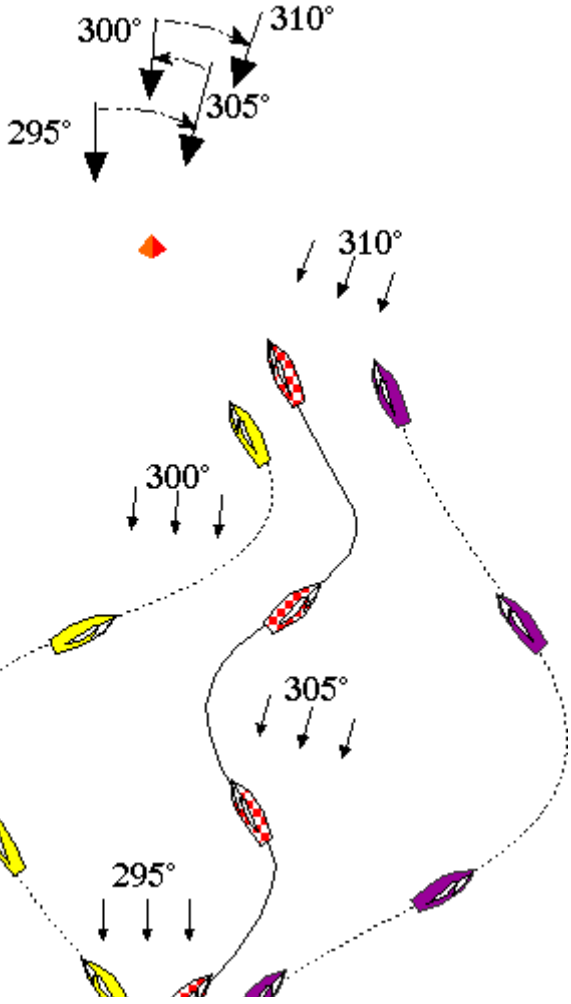


Fig. 9 - Wind Graph and strategy for Mixed Conditions.

Pre-Race Data

Our pre-race data is listed in the Wind Graph. It shows mixed conditions. The trend is veering, but we have oscillations as well. Our strategy will have to consider both; we will also have to keep a keen eye out for changes in conditions. One thing to look for is stronger breeze to one side. Is the trend shifting and building (as in this example) or shifting and fading.

. . . And They're Off

It is interesting to see the different strategies which emerge from these difficult conditions. Some of the fleet will treat the beat as though they were sailing a persistent shift. Others will tack on the headers. Some will try to balance the mix. And still others will be confused and uncertain of how to handle the conditions.

As the fleet moves up the beat in mixed conditions, the apparent leaders will change with each shift. Often it is unclear until the last shift of the leg who will come out ahead.

Keep Fighting

In mixed conditions you are never out of it. Keep working, keep trying to decipher the next shift. There are plenty of opportunities to catch up (and more than enough chances to get confused). If you find yourself baffled, try to re-group. Everyone will have their moments-if you can keep from going to pieces during your bad moments, you'll have another chance for good times.

Geographic Shifts

We do most of our racing near shore, where the interaction of the land and water affects our sailing wind. Further offshore conditions are more stable and predictable; but along the coast, wind conditions are difficult to predict.

There are many ways the shoreline changes the wind. First, the shoreline funnels the wind. The wind shifts to follow the shoreline. Second, offshore winds tend to shift more perpendicular to the shoreline (Fig. 10a). Third, winds shift around obstacles such as hills, buildings, and thermal domes in areas with lots of pavement (Fig. 10b).

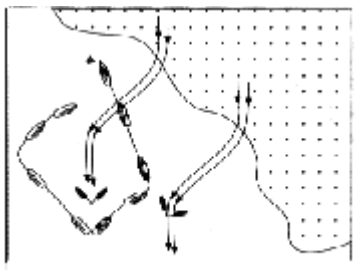


Fig. 10a - Offshore winds tend to shift more perpendicular to the shoreline.

Fig. 10b - A city or hill can create oscillating shifts, with bigger shift near shore.

Fourth, the heating of the land creates thermal winds-sea breezes-which blow towards shore during the day.

Fifth, the thermals create turbulence and mixing which can pull the upper winds down to the surface. These upper winds are generally shifted to the right of the surface winds.

The effect of these geographic changes can be either persistent or oscillating. In offshore winds, there will commonly be a mixed effect-with puffs coming from shore lifting the tack which is parallel to shore, and with those lifts being stronger the closer you get to shore.

The thermal effects on an onshore wind usually create a persistent shift from the prevailing wind direction to the normal sea breeze direction (Fig 11).

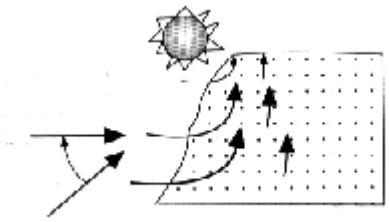


Fig. 11 - As the land heats up, you get a persistent shift as the prevailing wind shifts to the sea breeze direction.

These shore effects are described in more detail in Chapter 13: Weather later in this book.

Weather System Wind Shifts

A Major Change

As weather systems move or weaken, one wind can replace another. A prevailing wind may be pushed aside by a thermal, or a new weather system wind may arrive. Whatever the cause, there are occasions where a new and different wind appears and all the earlier information becomes irrelevant.

If we can anticipate this change based on forecasts or observations (new clouds etc.) and be in position for it, there can be tremendous gains. But beware-There is a danger in chasing the predicted conditions and expecting a shift which does not arrive as scheduled. Summer weather systems often stall or even disappear as the get to the coast.

Squall Winds

Another type of weather system wind is a localized late afternoon squall. These can turn the entire fleet on its head. These squalls create two opportunities-one as the squall hits, and the other as the squall passes.

Be prepared. If you are ready and can continue to race through the squall while others scramble, huge gains are possible. Sail toward the new shift to avoid windward work once it arrives, and be ready to shorten sail. A squall drill should be part of your crew training.

If the squall is localized, then after the squall passes conditions often return to the conditions which existed prior to the squall. If the squall is part of an advancing cold front, then conditions behind the front will be entirely different from earlier. By recognizing the type of squall you may be able to anticipate conditions during and after its passage.

Wind Shear

Wind shear is a condition where there are layers of wind-one at the surface, and the other aloft. Wind shear is uncommon. It occurs most often over smooth cold water early on a spring day, or at night.

There is a boundary layer of cool air on the surface, and a different wind aloft. Sail trimming with the wind 30º, 45º or even 180º different from the deck to masthead can be baffling, to say the least.

Generally the upper wind will become dominant. Fundamental wind strategy says sail toward the new wind-in this case sail toward the upper wind, as it will eventually displace the surface wind. If you are a small boat in a mixed fleet, don't forget to look at the mastheads of larger boats. Sometimes you will be able to find a wind shear (and a clue to the expected wind) which does not show at your masthead (Fig. 12).

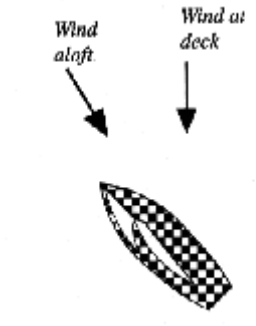


Fig. 12 - Wind shear is the stacking of two winds, one on top of the other. The upper wind usually displaces the lower wind.

Don't confuse wind shear with wind gradient. Wind gradient is the tendency for winds at the mast head to be stronger than those at deck level. It exists almost all the time, and is more dramatic in light air, less pronounced in heavy air.

The Impact of Windshifts

It is often difficult to predict the wind. Is it worth it to try to figure out what the wind is going to do next? How much difference does it make? Here's an example:

The Impact of Oscillations

We'll start first with a boat sailing upwind, with a tacking angle of 90°. Usingtrigonometry (yikes), we find that the distance sailed is 1.42 times the straight-line distance. To sail to a mark one mile upwind, the boat will have to sail a total of .71 miles on port tack, and .71 miles on starboard tack.

If the wind is oscillating as little as 5° either side of the median, then performance improves significantly. To sail to a mark one mile upwind, the boat will have to sail a total of .64 miles

on port tack, and .64 miles on starboard tack. By taking advantage of the shifts, the distance sailed is reduced to 1.28 times the straight-line distance. To sail to a mark one mile upwind, the boat will have to sail a total of .64 miles on port tack, and .64 miles on starboard tack. A savings of .14 miles!

If the wind is oscillating 10° either side of the median, then performance improves dramatically. To sail to a mark one mile upwind, the boat will have to sail a total of .57 miles on port tack, and .57 miles on starboard tack. By taking advantage of the shifts, the distance sailed is reduced to 1.14 times the straight line distance. A savings of .28 miles!

At a boat speed of 6 knots this represents over 2-1/2 minutes in one mile! That's right - 150 seconds per mile! These numbers are for a boat sailing the wind shifts perfectly. If your windshift efficiency is only 40% of optimum, you'll still save one minute per mile! (Fig. 13)

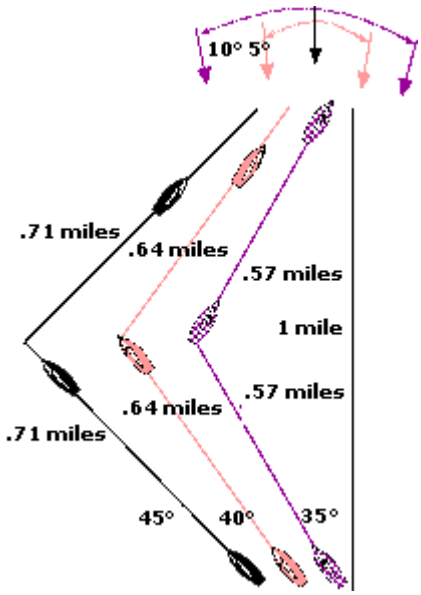


Fig. 13 - The impact of oscillations can be significant.

7.5 Current

Current adds complexity to strategic planning. The obvious, and primary, strategic concern is to seek out better (more favorable or less adverse) current. When the current is not uniform across the course, it can be an overriding strategic factor. Currents run stronger in deep water than in shallow, and faster in narrows than in open water. Below points and around bends, eddies can develop. Adding further complexity is the fact that currents change. Correct strategy can change dramatically over a period of hours. Storms and strong winds can distort surface currents and delay tides, sometimes making tide tables useless (Fig 14).

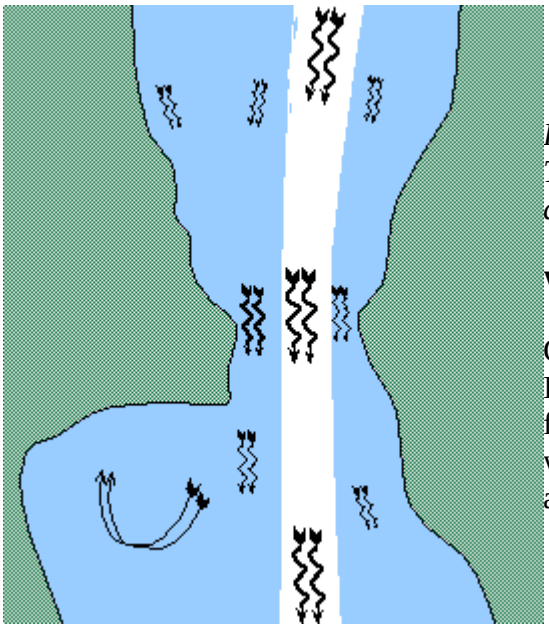


Fig 14 - Currents are created by tides and rivers. They run stronger in channels than in shallows, and can be a major strategic factor.

Wind Driven Current

Currents are not limited to rivers and tidal basins. In the Great Lakes, for example, currents of one full knot are possible. Currents build when strong winds drive the surface water. After the winds abate, the currents reverse as the water, which has

been stacked up at one end of the lake, returns to level (Fig. 15).

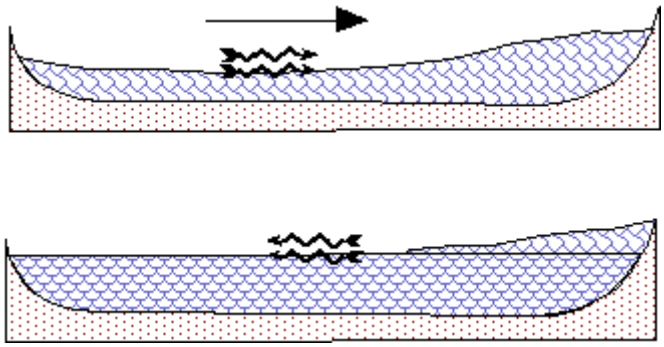


Fig. 15 - Wind can create current. Wind driven current can exaggerate or reverse tidal currents in shallow bays. And it can create currents where there otherwise would be none. After the wind has pushed water to one end of a basin, the current will reverse when the wind subsides.

Uniform Across the Course

When the current is uniform throughout the course, it affects the laylines and sailing angles to the mark. If it is running across the course, then it can also change the balance of time spent on each tack (See Fig. 16).

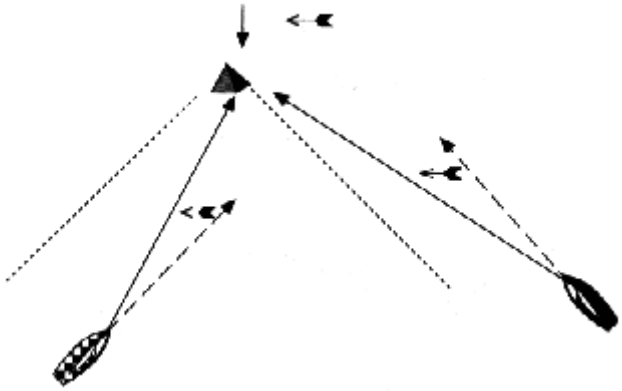


Fig. 16 - When the current is uniform throughout the leg, the biggest impact is on laylines into the mark. Current can also skew the course, changing the balance of time on each tack.

When Current is Not Uniform

When the current is not the same across the course area, then we must seek out the advantage. Differences across the course can shape our strategy. Unless there are dramatic differences in wind conditions a current advantage is key to strategic planning.

Current to one side

Obviously if the current is stronger to one side seek out that side if it is favorable, and avoid that side if it is adverse. A favorable current, running against the wind, can set up a pronounced chop. Look for this. Sail into the choppy water and ride the current upwind. Similarly, smooth water can indicate wind and current running together. Avoid this area upwind (Fig. 17).

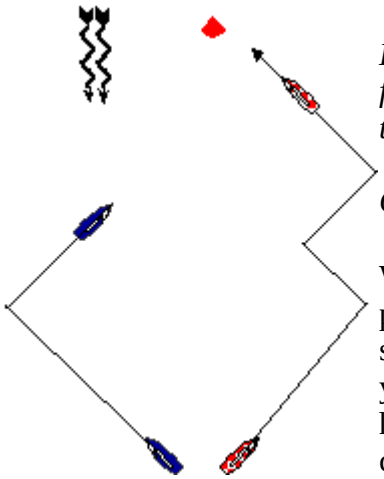


Fig. 17 - When there is stronger current to one side, go to it if favorable, sail away if adverse. The advantage can change with the tides.

Current across the course

When the current runs across the course and is stronger in one part of the leg, you want to take advantage of the change in sailing wind caused by the current. Sailing bow into the current you will be lifted; sailing with the current astern you will be headed. For example, in ten knots of wind and one knot of current the sailing wind is shifted 6º. With one tack lifted and the other headed, the effect is a 20% advantage in VMG (Fig. 18).

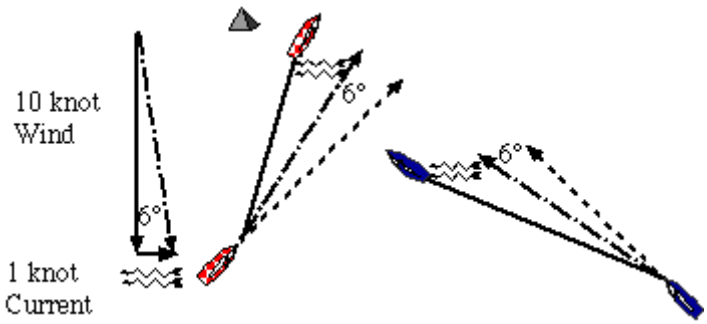


Fig. 18 - When current is not uniform, take advantage of the shift in sailing wind. In this example we have 10 knots of wind, 1 knot of current, and boats tacking through 90°. The current gives one boat a 6° lift, the other a 6° header. The lifted boat's VMG is 20% better than the headed boat's. (VMG is normally .71 of boat speed. The shift is 6° because arc-tan 6°=1/10. A 6° lift creates a VMG of .78, a 6° header creates a VMG of .63. .63/.78=.80. I'm glad you asked.)

Predictable, to a Point

Current, whether tidal or river generated, is predictable. Tide tables and current charts should be studied, and their predictions compared with observation. When the current runs strong it is often more reliable and predictable than the wind; a small current advantage translates into big gains.

In tidal areas the advantage can be fleeting-or reverse-over the course of a race. Obviously we need to pay attention to changes in the tide.

Changes with Wind Conditions

The wind can upset current predictions, particularly in shallow water. A strong wind blowing over a long period can overwhelm tidal effects, pushing surface water and delaying or reversing tides. When the winds abate, the current distortions will remain until the water has had a chance to return to level by flowing in the direction opposite the earlier wind. Winds can also create currents where there otherwise are none, as mentioned above.

Effects on Sailing Wind

Current changes the sailing wind for a boat. The sailing wind is the sum of the true wind over the bottom and the current. The net effect of current on the wind reinforces the effect or the

current. A favorable current creates a favorable change in the sailing wind, and an adverse current makes for an unfavorable change in the sailing wind (Fig. 19). Details are explained in Chapter 13: Weather near the end of this book.

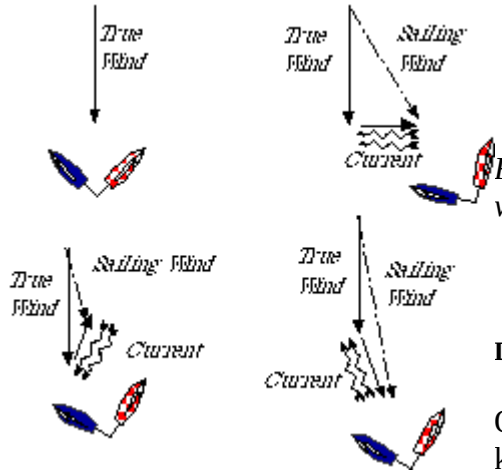


Fig. 19 - The vector of the current is added to the true wind to create our sailing wind.

Develop Local Knowledge

One key to success in current is to develop local knowledge. Keep records of how the current runs in various wind and tide combinations. Our strategic plan is only as good as the information it is based on. Accurate current information is critical to good strategic planning.

7.6 Strategy vs Rivals

While dealing with other boats is really a tactical issue, other boats can enter into our strategic planning. Late in a series we may be concerned with particular boats which are close to us in the standings.

It is good strategy to consider your close rivals, but do not let them distract you from sailing your own boat properly. There is a danger in becoming preoccupied with the opponent. The rivals are but one strategic factor. If you sail your own boat well, the rest should fall into place. If you sail badly, then you stand a greater chance of losing your private war.

The basic strategy when ahead is to stay between the competition and the next mark (Fig. 20). When behind the basic strategy is to split with the rival, but not simply for the sake of splitting. If you are behind and the rival is going the right way, splitting will leave you further behind. You have to be patient and look for your opportunities. For further discussion see *Chapter 8: Upwind Tactics*, next. There are times when you may be close enough behind in the race to be able to preserve a lead in the series. In this case the strategy is simply to follow the rival. You must, of course, consider handicap time differences when evaluating your position.

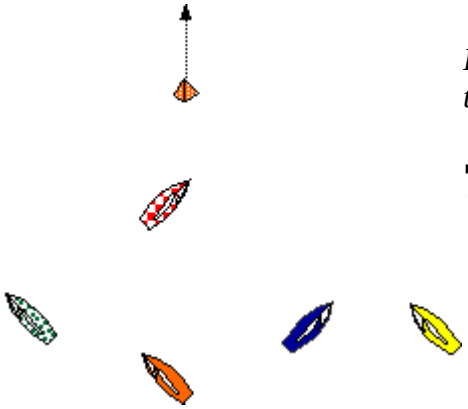


Fig. 20 - Cover your chief rivals. Stay between them and the next mark or the wind.

7.7 The Land of Opportunity

It happens, even to the best of racers. All of the sudden you find yourself at the tail end of the fleet. Who knows how you got there-a third row start, a miserable first beat, a big shift, a boat handling disaster. I will not dwell on the ways to fall behind; at that, it seems, we are all uniquely qualified.

The Most Important Race

So, you're back in the pack. What should you do? Before getting into details, recognize that in any regatta or series your worst race is often the most important. One astronomical score can shatter an otherwise competitive record. The ability to bring that astronomical finish down to earth is the mark of a champion, and success starts with attitude.

Don't Dwell

As a skipper you should take charge. Never mind how we got into this mess-let's focus on getting out of it. (Besides, more than likely it was your fault.)

How Many Can we Pass?

When you find yourself at the wrong end of the fleet, don't get depressed. You are in The Land of Opportunity-there is a whole fleet of boats waiting to be passed. Don't wait for a miracle to save you. Get to work and grind 'em down, one at a time. You're not going to win this race; that is no longer the goal. Actually, winning is redefined for this race. Winning is passing as many boats as you can (Fig. 21).

Fig. 21 - The Land of Opportunity.

Sail Fast & Go the Right Way

Don't panic. Settle down and work on boat speed. You will not pass anyone without good speed. Concentrate on speed, and you should be able to knock off a few tail-enders easily.

Go the right way. In The Land of Opportunity you must concentrate more on your overall strategythan on immediate tactics with those nearby. Upwind, figure out which side of the course is favored and head that way. Back here it is hard to sail the middle; all that gets you is traffic and bad air. You must pick a side. Do it carefully-you can't afford another mistake. If you are not sure which way to go (maybe that's how you landed in the Land of Opportunity), look to the leaders for guidance. The leaders are probably doing what is right. Others will gamble against the odds in hopes of passing the leaders. Our goal is pass the gamblers.

Sail Clean, Fast, Smart

On the reaches, you can save distance by sailing the rhumb line while letting others waste distance sailing high and then low. Avoid luffing duels, plan well ahead for the inside position at roundings and, above all, keep sailing fast.

Running legs offer an opportunity to attack those ahead. For all you need to know about Running Strategy and Tactics, skip ahead a few chapters. There are real opportunities here.

The Promised Land

Hopefully you've fallen behind early, so you have plenty of time to catch up. Play the shifts and work the favored side; and keep sailing fast. Position yourself carefully to pick up a few boats at each mark rounding. Look ahead for changing conditions and be ready to respond.

Every boat you pass is worth a point, and it is easier to move from 15th to 5th than it is from 5th to first. When you find yourself in The Land of Opportunity, keep cool, sail fast, go the right way, and avoid confrontations. You can reach The Promised Land. The End (Fig. 22).

Fig. 22 - When you fall behind (as on the previous page) get to work. With grit, determination, and a little luck, you can reach The Promised Land.

7.8 Local Knowledge

Consistent success in a local area depends on local knowledge. You must learn to recognize local conditions and know the strategy which is called for. When I raced collegiality at Yale, our team captain, Steve Benjamin, required us to complete a regatta report for every regatta we sailed. All the regatta reports were compiled into a notebook. Later, when I went racing on the Charles River in Boston, for example, I could refer to dozens of reports by my teammates covering the boats and sailing conditions I would face.

Local Knowledge: Racing in Annapolis

Each year it seems I race a regatta or two on Chesapeake Bay, out of Annapolis. The northern bay offers a challenging sailing venue. It is close enough to the ocean to be affected by sea breezes, and far enough north to be battered by cold fronts in early fall, when I seem to do most of my racing there. Winds come from all points and in all strengths. The currents run strong and vary widely across the bay. The winds have a big effect on the current, sometimes making a joke of the tide tables.

Disclaimer

Following are my impressions. God save you if you are foolish enough to follow my strategic advice when you go racing on Chesapeake Bay.

South East/South Sea Breeze

Comes in on top of prevailing southerly or when no other weather pattern is firmly in place. South East to South winds are generally shifty but not strong. Current is important, since this wind takes us diagonally across the bay. Beware of getting too far in toward the Eastern

Shore. The breeze tends to run lighter and more southerly there, lifting starboard and making it painful to tack out onto port-and easy to take the great circle route.

Against the current you must get very close to the eastern shore to avoid the current in the main channel, and this often leads to great circle route just described. It seems better to stay right to avoid some current and still keep breeze. Tendency to clock also favors the right.

With an outbound current, sail to the main channel to get current advantage, but stay right once in current. Avoid the left corner.

South/South West Sea Breeze

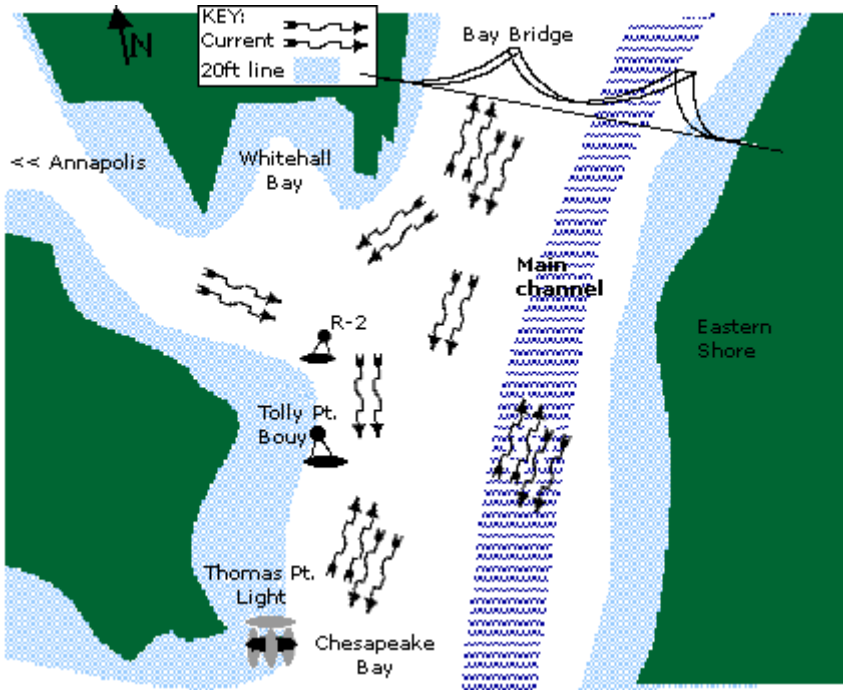
The sea breeze will fill and reinforce a South to South West wind. As the breeze builds, it does not back to the south as might be expected (since ocean lies to S.E.). Winds around 200º-210º roll straight up the bay. Winds tend to clock, and lift inshore between Tolley Point and Thomas Point.

Against the flood, the best tactic is to tack inside the line between Tolley and Thomas (don't forget to honor Tolley Pt. Buoy) to avoid the current. With the wind tending right, all signs lead inshore.

On the ebb, a more moderate strategy is called for; but there is rarely a strong ebb current against a southerly wind. The wind effectively blocks the current, and wind strategy prevails.

Westerlies

The prevailing westerlies can become blustery after a frontal passage. Most cold fronts take the wind N.W. or N., but a post-frontal westerly is not uncommon. The races are generally started near the Eastern Shore, with the windward mark set at the mouth of the Severn River. The wind tends to fan out of the Severn, particularly in the upper half of the beat. Boats sailing out to either side are lifted. They never get a favorable shift for a return tack, and boats come back from the corners headed. The wind also gets lighter off to the sides, with the steadiest and strongest winds coming straight out of the Severn.



Strategy: Play and protect the middle. Don't get driven to the sides.

The reach mark is set in the middle of the bay, south and east of Tolley Point. After rounding the windward mark, particularly on the blustery days, the leg appears too tight for a spinnaker. Go ahead and set. Sail low on the early part of the leg, in the strong winds from the Severn. Later in the leg the breeze will lighten and fair, and it will be advantageous to be able to reach up from below.

WARNING: Things don't always work out this way on the first reach. Sometimes a S. W. puff will come off the shore inside Tolley Point and the boats inside will beam reach across, while those down low struggle to reach up. It depends on the wind direction (S. or N. of W.?) and the position of the mark (the closer under Tolley Point the more likely S.W. puffs are to be a factor).

The second reach across the bay is dominated by current. The same is true of the later part of any leeward leg. The current runs strongest near the mark. Overcorrect for the current to make sure you are sailing with it into the mark. (Work south on a flood, north on an ebb). The wind tends to be much lighter on the Eastern Shore and you don't want to have to fight the current in the main channel.

In the westerlies, the wind tends to be stronger by the river than on the eastern shore. Be ready for more breeze at the top of the leg.

If the frontal passage is weak the sea breeze may push the breeze to the S.W. in the afternoon. A strong front will tend to clock the breeze to the N.W.

North West Wind

After a frontal passage in the fall the strong N.W. winds provide some of the year's best sailing. From a start in mid-bay the windward mark is set at the mouth of Whitehall Bay or off Hacketts Pt. to the east. Coming off the line there tend to be starboard tack lifts, with the boats

up the line gaining an advantage. From there the race is often a sprint to the left in search of puffs from the Severn. The puffs are starboard headers, allowing a tack to port and a lifted track into the mark.

North Wind

In a northerly there is no fixed strategy. With the mark set below the bridge there may be some port lifts off Whitehall, but there may also be better breeze in the open part of the bay. If the wind is clocking then plan a strategy to take advantage of the persistent shift. Current can become a big factor. Stay left to avoid an ebb. Go right to take advantage of a flood, though the wind may diminish its strength.

North East Wind

As the frontal wind fades the breeze will clock to the northeast. The temptation is to go right, and that strategy may pay off early in the leg. But if the mark is set under the Eastern Shore the right will be a problem later on. In the second half of the beat boats coming in on port from the left hand side will be favored by more northerly puffs which roll down from the bridge, while those on the right suffer in fickle easterly puffs off the shore and big northerly headers.

The current can be a big factor, as you will have to cross the main channel on the way to the mark. After a strong northerly there will be little water left for an ebb, but beware the flood which may run longer and much stronger than usual as the bay refills.

Easterly Wind

The easterlies are among the most fickle and difficult of bay breezes. One thing is for sure. Rain is on the way. Stay home, stay dry; put in the storm windows until the rain starts, then watch football on TV If you don't have a good TV go to Marmaduke's Pub on Severn Ave.

POP Quiz and Homework

Newport Rhode Island Strategy Quiz:

See the Chart Below

We are part of a crew racing in Newport, just outside the harbor, adjacent to Goat Island. The course is Olympic-A triangle, followed by windward, leeward, windward. We are about to complete the triangle and turn upwind. Our skipper wants to know what our strategy should be.

Looking upwind here is what we see:

The sea breeze is blowing steadily across the course, about 15 knots true, and very steady everywhere.

On the right hand side of the course where the harbor opens out into Narragansett Bay, there are waves rolling in with the sea breeze. To the left, smooth water, but the same wind; strong and steady.

Which way should we go?

Upwind: Against the waves to the right,

or in the smooth water to the left? _____.

Downwind: With the waves,

or in the smooth water?_____.

Homework:

Make Your Own Local Knowledge Chart

Make a copy of your local sailing area and create a local knowledge chart of your own. List the prevailing wind conditions and strategies for each condition.

What clues help you pick your strategy?

Is a cloudy northerly different from a clear one?

You will be surprised at how often conditions repeat.

If you create your own race planner (or use ours from Chapter 2), print your local knowledge chart on the back. Keep a record of wind and current conditions, and strategies that worked (and didn't work). Also, after each race, write down what you learned about boat handling, and trim, as well as weather and strategy.

When you create your local knowledge chart and written analysis please send a copy to me. Really. I collect them.

Chapter 8: Upwind Tactics

Chapter 8: Upwind Tactics

8.1 Introduction

Tactics to Win

We work for years to develop competitive boat handling and boat speed skills. Why? So we can enter the tactical game in a position to win. With the foundation of our performance pyramid taken care of, we can pick our head up out of the boat and enter the world of tactics

Upwind tactics involve positioning against individuals or groups of boats to take advantage of strategic conditions (i.e. wind, shifts, and current), or to control tactical situations (crossings and mark roundings). Over the course of a leg or race, tactics become increasingly important. Early in a leg or race, it is best to avoid confrontations and concentrate on a strategy that will put you near the top. At the end of a leg, you battle tactically to round ahead of those in nearby. Toward the later stages of a race, your general position is relatively fixed, and your efforts focus on boats just ahead and just behind.

Tactics are relatively unimportant in mixed fleet races, where you are racing the clock. In one-design or level rated racing tactics predominateas your closest rivals are the boats nearby.

This chapter will cover *Upwind Tactics* in seven sections. Following this introduction, Section Two will look at the impact of wind shifts. Section Three describes tactical principles used for positioning and control. Section Four explains how tactics change over the course of a windward leg, while section Five looks at the tactical weapons. Section Six covers rules upwind and their tactical application. After all that, Section Seven tells why and how to eliminate tactics from your racing!

8.2 The Impact of Wind Shifts

Our strategy forms the framework for our tactics. We use tactics to fulfill our strategic goals. One key element of strategy is wind shifts, which we discussed in the previous chapter. As we work to take advantage of shifts, we need to know their tactical impact: How should we position ourselves against our rivals in order to take advantage of the shifts, and what impact do the shifts have?

LEP: Climb the Ladder

Sailing upwind is like climbing a ladder. The rungs of the ladder hang perpendicular to the wind, and boats on the same rung are equally far upwind. Each rung is called a *line of equal position*an *LEP*

Strategy in Brief: Be Near the Shift

When the wind shifts the ladder rotates. A boat closer to the new wind gainshe is on a higher rung, and boats further from the shift end up on a lower rung. The closer to the shift you are, the further you are up the ladder and the less distance you have to sail to get to the mark.

How Much do you Gain (or Lose) in a Shift?

The distances are staggering. When the wind shifts 10¡ the boat closer to the shift gains 25% of the lateral distance separating the boats.* For boats on the same LEP, and separated by 100 yards the gain is 25 yards. For boats separated by a greater distance the gains/losses are greater**.

For example, if two boats are separated by 848 feet the gain/loss would be 212 feet. 848 feet of separation may seem like a lot but consider

How Quickly it Happens

Imagine two boats sailing close hauled at a boat speed of 6 knots and tacking through 90¡. They cross tacks, with the port boat ducking. Each boat sails for one minuteyou know, sixty seconds. After one minute of sailing time, they will be 848 feet apart. A 10¡ shift will put one boat 212 feet ahead. At six knots, that distance represents 21 seconds of sailing time. Separating for 60 seconds creates a 20+ second gain/loss. Your risk/reward is one-third the time you spend splitting tacks with another boat.

When One Boat is Ahead

When one boat is ahead of another, results are similar. Consider gains and losses as a percent of distance behind, from LEP to LEP. We will consider three cases: the boat behind will have leverage equal to the distance behind either toward the shift (boat 1), away from the shift (boat 2) or be straight downwind with no leverage (boat 3). When the wind shifts 10¡ the boat closer to the shift gains 19%, the boat away from the shift loses 16%, and surprisingly, the boat straight downwind gains slightlyabout 2%.

When the boats are further separated the gains and losses increase. We use the term *leverage* to describe this lateral separation. The further apart boats are the more leverage they have, and the more they stand to gain or lose in a shift. A boat which is behind will pull even with the

leader in a 10¡ shift if his leverage is 5.7 times the distance behind (boat 4). In a bigger shift less leverage is needed to catch up, or t*o fall twice as far behind!* .

WOW!

Through all numbers and examples, one point stands out: *wind shifts are a big deal*. As I said before, the potential gains/losses are staggering.

The Message

Wind shifts are a big deal. We got that message.

Two corollaries follow:

First, if you can predict the next shift, sail to it.

Second, if you don't know what to expect, then minimize leverage to minimize the impact of shifts. (Have you ever been unable to anticipate the next shift? Me neither, and the check is in the mail.)

We'll look at these two corollaries from two perspectives: catching up when you are behind, and protecting a lead when you are ahead.

Catching Up

It is particularly interesting to note that a boat directly behind gains a little on every shift and never loses. When you're unsure of the next shift, minimize leverage by staying near this *no risk* position. Try to nibble away at the leader with speed while eliminating the risk due to shifts. Then, when you can predict an upcoming shift, go to it.

By minimizing leverage, you deny the leader the chance to stretch the lead, and you stay within striking distance.

Splitting with the leader just for the sake of splitting is a mistake. You are at least as likely to lose as gain. (Maybe more likely to lose; odds are that the leader is going the right way.) Stay close and wait for an opportunity. Split only when the odds are in your favor.

Staying Ahead

You hear this said about champions: *He gets ahead, and he is gone*. How do they do it?

About other racers you may hear: *Don't worry about him, eventually he'll go to pieces*. Why?

Tactical dogma when in the lead is *stay between the competition and the next mark. Cover 'em and you can't lose.*

When you're in the lead, it is not enough to simply stay between the competition and the mark. As we have seen, boats behind gain a little with each shift from that position.

Keep the Initiative

Real leaders continue to lead. To keep the lead, you must keep the initiative. Sail fast, hit the shifts, and do the things you did to get the lead. Pay attention to those behind you, yes; but think in terms of stretching the lead and adding a cushion rather than simply going into a defensive shell and sitting on the lead you've got. You certainly don't want to split with the fleet, but you have to do more than look back. The true champions pay attention to the fleet behind them; but they keep working, keep hitting the shifts, keep looking ahead. (I've yet to test this myself, but I'm ready to give it a try).

All too often sailors change their tactics once in the lead, and lose the initiative. Maybe you've experienced this. You kick and scratch and fight your way to the lead. Once you get there, you start to shake, you feel queasy, and your eyes glaze over. Curtains, and a quick trip back to the cheap seats.

When you're sailing with a comfortable lead, proper positioning can help protect it. If the next shift or the mark is to the left, then position yourself to protect your left. Use a loose cover (see Fig. 31 below), and don't let trailing boats get enough leverage to threaten your lead.

8.3 Tactical Principles

There are a number of general tactical principles to keep in mind as you sail upwind. The overall objectiveyour upwind strategyshould remain the priority. Use tactics to help you achieve that goal.

Keep Clear Air & Freedom

Keep control of your own destiny. Avoid situations where other boats can control you. You need to look ahead and position yourself clear of crowds.

Cross When You Can

This is also called consolidating your lead. If you wait, conditions may change, and you may lose your opportunity

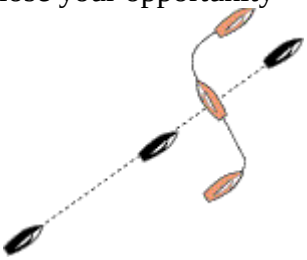


Fig 8 Cross when you can. If you don't, the wind may shift and you may lose the oppurtunity.

Don't Let Others Cross You

When the wind shifts, don't let those who gain consolidate. Go to the next shift and recoup. By staying off to the side, ahead and to leeward, a favorable shift will help you . The catch is that you have to be going the right way. If the shifts are large and difficult to anticipate, you run the risk of being buried if the shift works against you. When things get weird, it may be best to position yourself with the leaders until you can sort things out; then use the *Catching Up* ideas from the previous section.

Stay Toward the Middle

A championship tactic, which sometimes doesn't work for the rest of us who spend most of our time in the middle of the fleet. When you are in the lead, or near it, adhere to this rule, as it minimizes leverage for those behind and gives you the ability to go either way to protect your position .

Back where most of the fleet does most of their sailing, the traffic and disturbed air of the middle can be devastating. Yes, sail the middle when you can; but balance this with concerns for clear air and the search for favorable shifts.

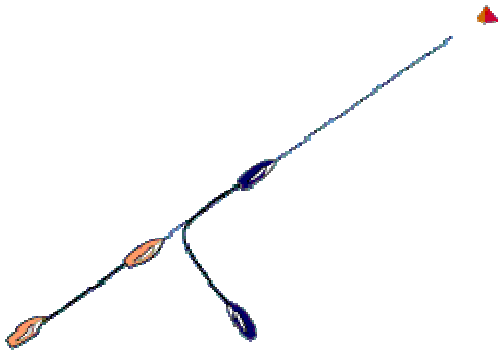
When one side of the course is heavily favored, then the middle moves with the fleet. The middle is the middle of the fleet, really. When the entire fleet goes left, the middle goes left with the fleet.

Avoid the Laylines

Once you hit the layline, you are out of options. You are subject to attack, and you are hurt by any shift.

Avoiding the laylines is a good principle, with few exceptions. The most notable exception is in the middle of a *huge* fleet.

Fig. 11 Once you reach the layline, you run out of options. You are vulnerable to attack, and the shifts no longer help you.



First, you will be forced out of the middle by traffic. Then, as you approach the mark, the turbulence and disturbed air between the laylines must be avoided; often by sailing a few boat lengths beyond the layline to get clear air. Until you have approached the windward mark 52nd in a fleet of 63, you don't know how bad bad air can be.

Stay With the Fleet

When you are ahead, stay with those behind you. No surprise here. Sail the same breeze as those around you; just sail it better. When you are on the favored side, there is no need to split. Just stay on the favored side of the fleet .

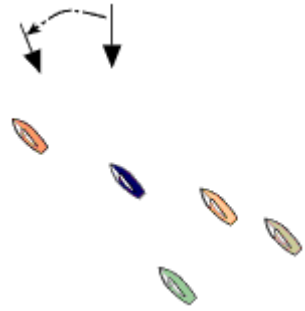


Fig 12. Don't split with the fleet just because you are behind. Go the right way, or you will lose.

The real application for this principle is sailing to a favored side when you are behind. It is true that you can't win by following, but tacking away will only make

matters worse. Until the leaders make a mistake, you won't catch 'em. Hang on even if it hurts, and stay close. Tacking away from the favored side or a persistent shift is not the answer. You'll get a chance to fight back if you stay close, and you'll get hammered if you tack away.

Lead the Crowd

As you approach a crowd of boats, tack ahead and to leeward, rather than sail through the crowd to their hip. There are a number of reasons why this works. First, it is best to stay with the fleet, as mentioned above. Second, if the crowd is sailing toward the next shift, then you will be the first to get it. Third, once you sail into a crowd you may have trouble finding clear air or a tacking lane.

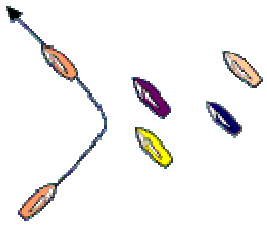


Fig.13 Lead the crowd by tacking ahead and to leaward.

Fourth, if you decide you want to get across to the outside, you can tack again and exercise that option later. Once you cross the crowd, you can't reconsider and return to the ahead and to leeward position.

This principle is particularly powerful if you can lead the crowd toward the middle of the course. On the other hand, you may want to abandon this principle if crossing the crowd will get you to the inside of the group, closer to the middle. From a position on the inside hip, you are ready to lead the fleet to the middle as they tack that way .

Cover When Ahead

Stay between the fleet and the next shift. If you are ahead and can anticipate the next shift, sail to it. If you are ahead, you have to hit the shifts to stay ahead. Your lead won't last long if you follow the fleet into the shifts .

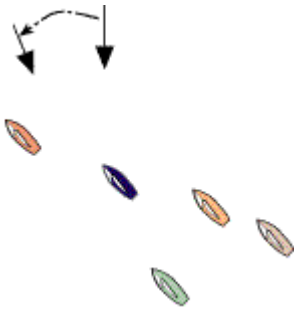


Fig. 14 When in front, cover by staying between the fleet and the next shift.

. If you can't find the next shift, find the mark and protect your position that way. Lead the fleet toward the mark or shift.

Sometimes you can't cover. There are times when it simply does not pay to cover. When conditions become dramatically shifty, the impulse is to cover tightly. But in these conditions it can prove impossible to cover an opponent. Concentrate on sailing your own race. Try to keep your cool when things get weird.

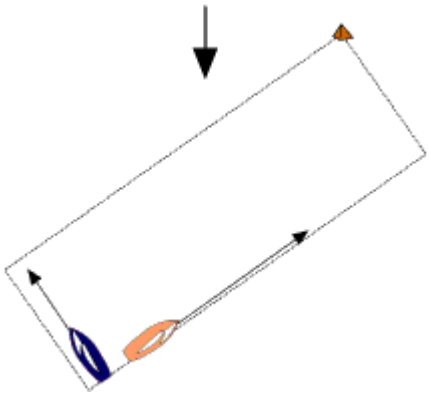
One-Legged Beats

When the course is skewed by a major wind shift so you can nearly fetch the windward mark, you are sailing a one-legged beat. Tactically, the best position is ahead and to leeward. If the leg is a port fetch, try to avoid a clearing tack to starboard when you round the leeward mark. On a starboard fetch, try to tack immediately at the mark.

From the ahead and to leeward position, you have greater control and better opportunities in wind shifts. If you are lifted you may fetch; and if you are headed, you will be able to tack and cross those on your hip.

If you sail the short leg first, then you will quickly find yourself in the corner with few options.

Fig 15. One a one-legged beat sail the long leg first.



More Tactical Ideas

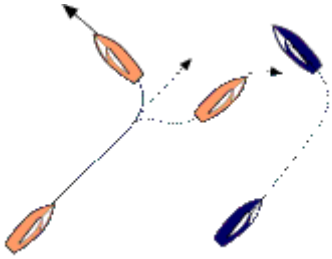
Anticipate

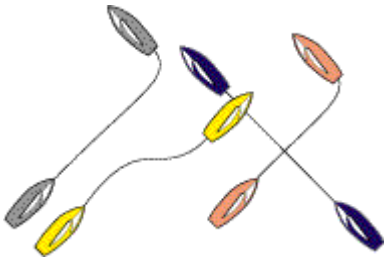
When you're on port tack, sailing on the hip of another port-tack boat, plan how you will react if he tacks. Will you tack or duck? Your response depends on a number of tactical and strategic factors. Don't wait for the other boat to tack to decide your response.

Get Blockers To Protect You

You're on port, and you're getting ready to tack. You look over your shoulder and see a crowd on your hip.

Fig 16 When on the hip of a port tacker, anticaipate his task, Will you tack, cross, or duck?





You need a blocker (a boat ahead and to leeward) to shield you from the crowd .

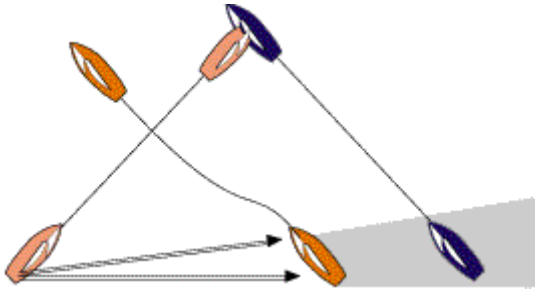
Fig 17. When tacking toward a crowd, get a blcker. Cross him, and tack. Others will have to deal with him first, leaving you free.

A blocker will take all the heat (lee bows etc.) as you sail into the crowd. A boat you can just cross makes an excellent blocker. After you cross, sail two lengths and tack. Now your blocker will lead you through. Anyone who can cross the blocker can cross you. Boats which might normally create a problem for you run into the blocker first. You sail on without interference.

Hidden boat trick!

Watch for this: Two starboard-tack boats are approaching a port-tack boat. The leeward starboard boat waves the port tacker by, ÒGo ahead.Ó Imagine the port tack boat's surprise when he sees another starboard tacker previously hidden from view!

Fig 18. When a starbord boat waves you by. watch out for a second starboard boat previously hidden from view!



8.4 Up the Beat in 3 Stages

Tactics upwind is a matter of positioning for wind shifts and positioning for control. We can divide the beat into three segments. The initial segment is the period after the start or leeward mark rounding when we are sailing in a crowd and fighting for clear air. The middle segment starts when we break out of the crowd and are free to pursue strategy. The final segment is the battle for position approaching the windward mark. Boat-to-boat battles predominate at the beginning and end of the leg, while wind shifts are the focus in the middle segment.

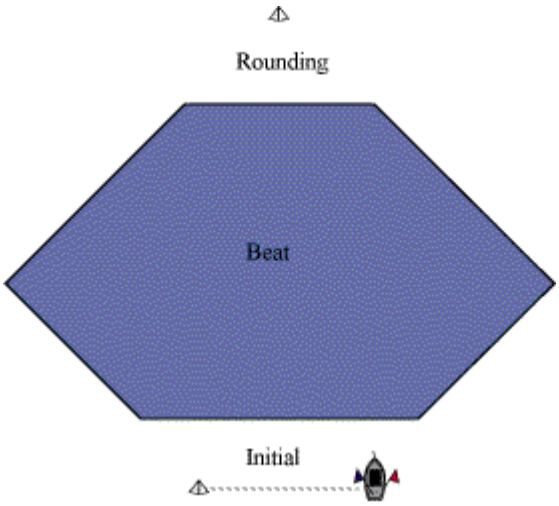


Fig 19. The windward leg can be divided into three tactical segments: the initial segment, the beat, and the rounding.

The Initial Segment: Positioning for Freedom

The priorities during the first part of any beat are to keep clear air and to have the freedom to pursue your strategy. The first few minutes after a start, as discussed earlier, are critical; any advantage gained there will be magnified.

At the beginning of subsequent beats, the goal is to catch the first shift and get to work on strategy. If the goal is to work to the right, it may be necessary to tack shortly after rounding and then tack back when a clear lane to the right is available. If you are outside at the rounding, you may be able to reach through for clear air and save two tacks.

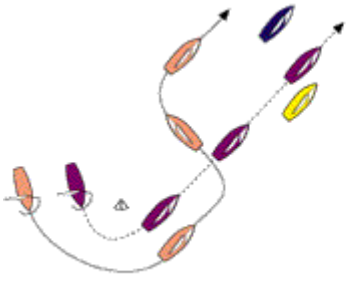


Fig. 20 A short tack to the left may be needed to find a lane going right. You may be able to

Fig. 21 To go left, tack into an open lane, clear of traffic.

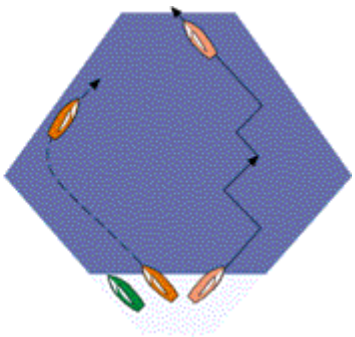


Fig. 22 During the beat segment, pursue your stratrgy.

foot along the crowd.

If the strategy is to go left, then you must work to be free to tack after the rounding. Beware the wind shadow and turbulence of boats which have yet to round and are still on the previous leg. While you will have right of way close hauled on starboard, there may still be reason to delay a tack until you can clear that hazard.

The Beat: Strategy Reigns

The middle segment starts once you are clear of the crowds at the start or leeward mark and continues until you start working for position at the windward mark. Tactics on this segment focus on the freedom to pursue your strategy.

The tactical principles discussed above come into play during this segment. The overall objectiveyour upwind strategyshould remain the priority. Use tactics to help you achieve that goal.

The Rounding: Positioning for Control

As you approach the weather mark, work for control of those nearby. Keep clear air, and try to keep from being pinned by others. Inside the laylines, a weather quarter position gives control as a boat on the lee bow is pinned and not free to tack.

This position must be carried all the way to the layline or it will be reversed if both boats tack. On the layline, a lee bow position is preferred, but there is a danger in this position should you fail to fetch the mark.

With marks to port, the left side is inside at the rounding, and a boat on the right controls the last starboard crossing. If you are sailing marks to starboard, then the right owns both the inside position and the last starboard crossing. This puts a premium on controlling the right when marks are to starboard.

The Last Oscillation Is A Persistent Shift

In an oscillating breeze, treat the last shift before the mark as a persistent shift.

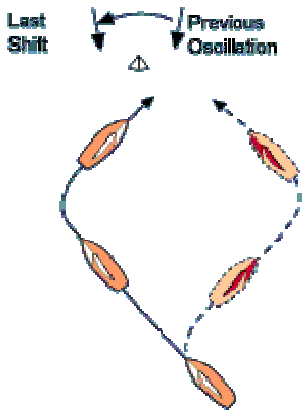


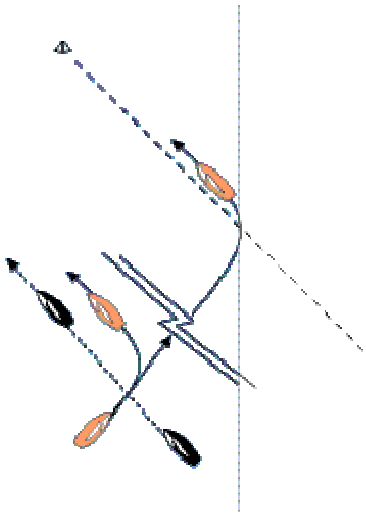
Fig. 23 Sail into the last oscillation going into the mark as though it were a persistant shift.

Sail the header to the layline, then tack for the lift. Any leg which has just one shift should be sailed strategically as you would a persistent shift. Imagine the last part of the leg is just a very short leg with one shift.

Inside the Laylines

A port-starboard crossing near the layline is a common situation which offers many options and counter options.

Fig. 24 If a port tacker can cross, he can then tack and pin a starboard boat or sail on to the layline.



If the port-tack boat can cross, he has several choices. He can cross and continue on port tack toward the starboard layline; he can tack to lee bow or cover the starboard tacker, giving the starboard tacker incentive to tack away; or he can tack to pin the starboard tacker and carry out to the port layline.

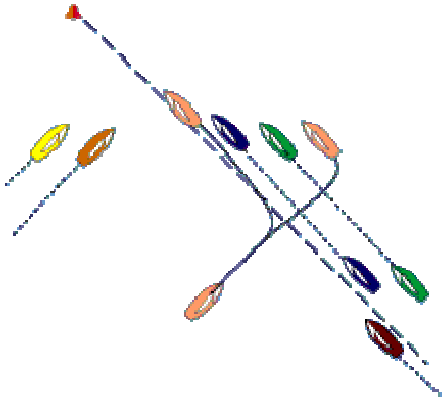


Fig. 26 A port tacker can lee bow a starboard boat on the layline, or cross and use the starboard boat as a blocker.

If the port tacker cannot cross, then he can tack or duck. If he chooses to tack, he may be pinned out until the starboard boat tacks. A well-executed duck creates an opportunity for a reversal at the next crossing. To prevent a reversal, the starboard tack boat can respond with a slam dunk. If the starboard tacker is not prepared or fails to execute properly, then he will not be able to prevent a reversal

If the port-tack boat sails to the starboard tack layline, then the starboard tacker (now coming in on port) may be able to lee bow and lead to the mark. If the port tacker tacks short of the layline, then we have a reversal of our earlier situation. Go back 4 paragraphs. Do not round the mark. Do not collect $200.

On the Laylines

If the starboard tacker is on the layline, a port tacker can tack ahead or on the lee bow to round ahead of the starboard tacker. If there is doubt about whether or not the starboard tacker will fetch, it is best to cross and tack to weather, using the starboard tacker as a blocker against those coming into the layline later.

If there is a crowd on the layline, tack away and come back later rather than sail extra distance or in bad air at the layline. Once you go to the layline and duck the crowd, you concede (for that leg). By tacking out you give yourself one more chanceat the risk of losing others if the layline fills.

Bail Out Early

You're on the layline. Almost. Just a little shy of the layline maybe, but you can pinch up and make it. Maybe. Stop kidding yourself and bail out now.

If you bail out early, there may still be room on the layline to get back in line. If you wait until later to flop to port, it may be too late. You will end up ducking the entire fleet before you find a space on the layline.

If you are approaching the mark in clear air and no turbulence, you might be able to pinch up and make it; but if there are other boats on your air then bail out early.

8.5 Tactical Weapons

Our upwind strategy gives us the big picture, and our tactical principles guide us as we confront groups of boats. Tactical weapons are the tools we use to put the principles into practice and achieve our strategic goals. Broadly speaking, there are two general categories: Those that allow us to control and influence others, and those which allow us to prevent others from doing the same to us.

As we look at tactical weapons, we will discuss what each does and how it is used.

Controlling other Boats

Tight Cover

A tight cover is a an aggressive move which slows an adversary by putting the him in your wind shadow. A tight cover necessitates a response. Use a tight cover when you want to force another boat away.

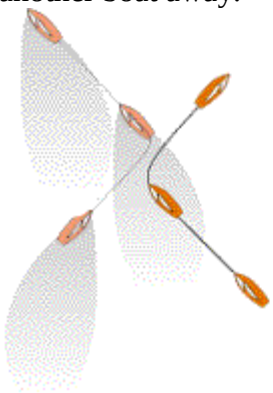


Fig. 29 A tight cover puts your rival in your wind shadow and forces a response.

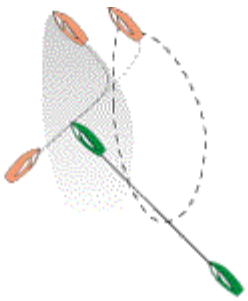


Fig 30. Tack so you end up upwind; don't tack when you are upwind.

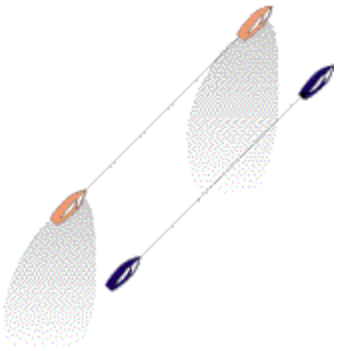


Fig. 31 A loose cover does not impede the progress of your opponent. It keeps you sailing in the same conditions as your rival.

Tack so you are directly upwind after accelerating or the rival may escape your shadow.

Loose Cover

A loose cover is a course parallel to the opponent(s) which does not put the other boat(s) in our wind shadow. A loose cover is more defensive than a tight cover. A loose cover does not impede the progress of the other boat(s). It puts you in a position where you can protect your lead.

Your intent with a loose cover is to deny your opponent the opportunity to sail different conditions than you are sailing. A tight cover, on the other hand, often forces your opponent to tack away. The danger with a tight cover is that your opponent then separates from you, and may find more favorable conditions.

When you are unsure of what to expect next with the wind, a loose cover lets you sail near your opponent.

Go Ahead and Cover

If you are ready to tack but delay for a moment, you can dump bad air on an opponent close behind. This frustrates the opponent, as he must now tack away or sail in bad air. Given the chance, you can be sure he will return the favor.

The assumption is that you would be tacking anyhow, for strategic reasons, and take the opportunity to force the rival to sail the wrong way.

The Stupid Cover

You are crossing a close rival and tack on his air. You hadn't planned to tack, but couldn't pass up the opportunity to *face* on your rival. Trouble is, you were going the right way, towards a shift perhaps. Now you have traded places. You are going the wrong way, and you have forced your rival to go where you wanted to go. Stupid.

Don't lose sight of your strategy as you play tactical games.

Herding

Herding is any technique which encourages other boats to go the same way you are going. Hmm. Why would you want to do that? And how would you do it?

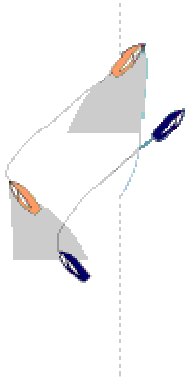


Fig. 33 You can heard a boat with a tight cover on one tack and a loose cover on the other tack.

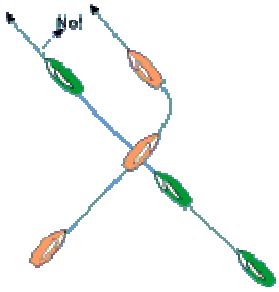
You herd other boats along when you are fearful of what may happen if they get away. If you are uncertain of what the wind shifts will do, you want to stay near others to minimize your risk.

There are two basic ways to herd another boat. The first uses a series of tight covers on one tack and loose covers on the other tack. This encourages the opponent to sail the loosely covered tack. The second is with a pin, which is described below.

Pin

A pin is a tack into position on another boat's hip which prevents the opponent from tacking away.

Fig. 34 A pin prevents the outside boat from tacking until the inside boat tacks.



It is used approaching a layline, where you can prevent your opponent from tacking to the mark until you do. It is also useful when herding one boat back toward a pack you want to cover.

Slam Dunk

The Slam Dunk is a technique for pinning a port-tack boat after he ducks a starboard-tack boat. Immediately after the port tacker ducks, the starboard boat tacks.

The Slam Duck does not always work. The Slam Dunk is a good way to pin a rival out to the starboard tack layline if it is not too far away, but over time the leeward boat can often gas off the windward boat.

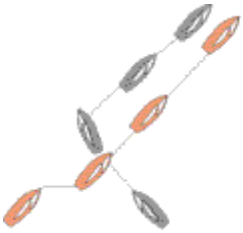


Fig. 35 A Slam Dunk is used by a starboard-tack boat to pin a port tacker. It doesn't always work.

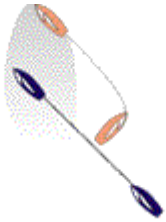


Fig. 36 Tack into a position on top of another boat to put them in your wind shadow.

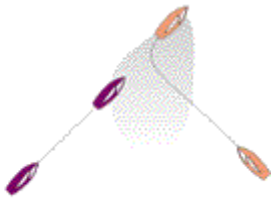


Fig. 37 A tack directly in front of another boat will push the rival back.

Using Your Wind Shadow

You can slow another boat by positioning your wind shadow on him. Once in your wind shadow, the opponent can either sail slowly or tack away.

From Directly Upwind

The simplest way to attack another boat is to position yourself directly upwind. This is the epitome of a tight cover. When tacking into this position, remember that you want to be directly upwind after you finish your tack and regain speed. It is common for attacking boats to tack too late and let the target boat break through.

From Ahead

Another effective position for attack is directly in line with the opponent. The turbulence off your sails will foul the air for a several boat lengths off your stern. To assure that your

opponent cannot escape your wind shadow without tacking, aim for a position between directly upwind and ahead.

From the Lee Bow

As the name suggests, a lee bow position is on the leeward bow of an opponent. Boats create a surprising amount of turbulence *to windward*. Tacking ahead and to leeward can have a devastating effect.

When you tack on a lee bow, be sure you have proper position. You must be nearly a full boat length ahead in order to lee bow properly; otherwise the opponent will squeeze up and put you in a pin; or worse, he may even roll you and force you to tack again.

Defending Yourself

The defence from attack is anticipation and quick response. In order to survive an attack, you must break through to clear air before the attacker has reached full speed. Once the attacker is up to speed, it is nearly impossible to break clear.

Squeeze Up to Windward

If an opponent tacks on your lee bow, you may be able to escape by pinching up into clear air. React as soon as you are attacked. Once you fall into the attacker's exhaust, performance will suffer and you will not be able escape.

If the attacker's position is strong, tack out as soon as possible, before the attack impacts your ability to tack and escape smoothly.

Drive Through to Leeward

If a boat tacks on your air, you can either tack away immediately or try to drive through to leeward to clear air. If you anticipate the attack, you can prepare to respond. If you want to stay on your present tack, then reach off slightly as soon as the attacker crosses your bow. With a little extra speed and a slightly late tack by the opponent, you may be able to break through in front of his wind shadow.

If you plan to tack away, then do so immediately. Start your clearing tack while you still have full speed to minimize the hurt.

Don't Tack into a Pin

When tacking to leeward of a boat or boats, do so with enough room to be free to tack back should the need arise. Don't hand a rival boat the power to decide when you will next be free to tack.

Sucker Cover

If you are preparing to tack and see a rival coming, you may want to delay your tack for two reasons. One is to avoid tacking into a pin. The other is to tempt the rival to tack on you (and

presumably sail off in the wrong direction) while you tack as planned (presumably going the right way). See earlier Figure 32 for stupid cover, but now you are the other guy!

Wave 'em By

A port tacker who may or may not cross you can become a real nuisance if he throws in a last second lee bow tack. If you want to continue on starboard, wave 'em by, even if you have to duck a little bit. Anything to encourage him to keep going the wrong way and stay out of your way.

Fig. 41 If you are going the right way, wave a port tacker by, even if you have a to duck a little.

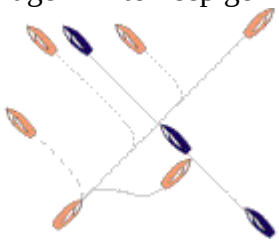


Fig. 42 When in doubt duck.

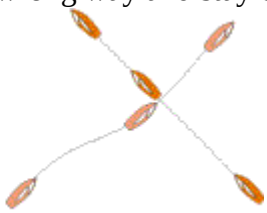


Fig. 43 Make a smooth turn and carry speed as you trim up.

Ducking and Reversal

You're on port tack, and you are approaching a starboard-tack boat. You have five options: Cross, lee bow, cross and tack, tack, or duck. Your selection depends on whether or not you can cross, and which way you want to go. If you can cross, go ahead. Or lee bow, as detailed in Figure 39. If you can cross, and you are unsure which way to go, then cross and tack to put your opponent in a loose cover. If you can't cross, then tack or duckÐwhat would you do in the absence of the other boat? If you decide to tack, try not to tack into a pin. Otherwise, duck.

Take a Bearing

You can tell if you will cross by taking a bearing from your stern to the starboard boat's bow. If the bearing is increasing, you will cross.

If there is doubt about crossing, then duck. Don't forfeit the race with a protest. And don't wait for the last instant to decide. A good smooth duck costs little. A poor duck or a crash tack can be a disaster.

Here's How it Works: As you approach it looks close. ÒLet's duck.Ó Wave to the starboard tack boat so they know you see them. No need to yell. From a few lengths, ease your main and jib slightly and bear off. Aim for the spot where the starboard boat will be as you pass. A boat length away, your bow will be pointed at his. He'll sail a boat length, and you'll pass smartly under his stern. Well, maybe don't aim exactly at his bow, but you get my drift.

As you pass under his stern you want to be going faster than your close-hauled speed (after reaching off), but you want to be trimmed up to close hauled again. You must ease to build speed when you bear off, but don't wait until you have passed to t>

close-hauled and trimmed all the way as you pass under his stern. You get a lift from the air off his sails. Pinch up in it and work to weather. If you're lucky, you'll even be able to surf out on his stern wave.

You sail fast, and eventually you tack. Your opponent tacks too. You come together; only this time you're on starboard. You give him a wave. Theoretically he will cross you by the margin of your duck. Too close to call. Not only that, but you were going faster than full speed as you passed under his stern. You made up some of the distance. He can't cross. He'll duck no, tack . he can't decide.

Here's how it doesn't work #1: He may cross. No, he can't. He decides to duck, no, tack. He throws the helm down. The crew are caught by surprise. The jib backs before it is finally released. It luffs on the new tack. No one was ready. There was no warning. Finally the jib is trimmed. As the sails fill the old foe is safely behind, in your wind shadow, unnerved, confused, and sailing badly.

Or #2: He may cross. No, he can't. He decides to duck, no, tack. Yes, duck. He pulls the helm up under his chin, but the boat hardly responds. The jib sheet is thrown off. ÒI thought you said tack.Ó After a nervous moment the rudder grabs and the boat pivots down to a broad reach, sailing nearly parallel to you. Passing under your stern on a reciprocal course, they head the wrong way, finally coming to course about 2 boat lengths to leeward. The jib comes in slowly.

Or #3: He may cross. No, he can't. He decides to duck, no, tack. Yes, duck. He pulls the helm up under his chin, but the boat hardly responds. The main has not been eased and the boat won't bear off. He hits you amidships, just behind the shrouds, and takes a big chunk out of your port rail. The only thing bigger than the hole in their bow are their eyes.

In order to achieve a reversal, you must duck properly. Look ahead, and be ready to react.

8.6 Rules Upwind

The main rules upwind are *On Opposite Tacks* (Rule 10), *Same Tack, Overlapped* (Rule 11), and *While Tacking* (Rule 13). The *Mark and Obstruction* rules (Section C) also come into play upwind. We generally refer to these as *Starboard/Port, Windward/Leeward, Tacking too Close,* and *Bouy Room*.

It is a miracle to survive a protest. If you scare someone and raise their blood pressure when tacking or crossing, they may protest you and throw you out. The same applies if you get someone angry. Never mind the fine print, that is how the rules work.

There are two common ways to get in trouble, greed and surprise, both of which can cloud good judgment. Don't be greedy, and look ahead to avoid surprises.

Starboard/Port (Rule 10)

The next time you are on port tack in a close crossing consider this: Racing sailors would rather have their house burn down than crash their boat. After all, the family can always sleep

on the boat; but if they crash their boat, they can't race the house. The guy on starboard is not going to risk crashing *his* boat to prove that *you* could cross. If it is close, he will bear off, and protest. Don't risk it. Duck instead .

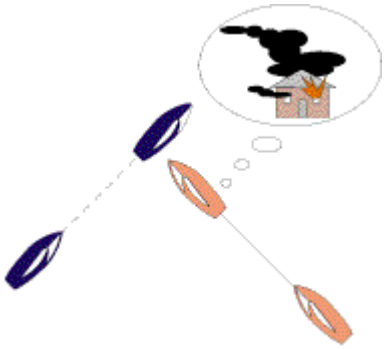


Fig. 46 When on port, don't expect a starboard tacker to risk crashing his boat!

As Rule 10 is currently written, the starboard-tack boat is no longer frozen by the approach of a port tacker. A starboard-tack boat may alter course as long as port has room to keep clear (Rule 16). For example, it would now be legal for starboard to pinch up to prevent port from crossing as long as port still had the option to tack. The freedom of the starboard boat to hunt the port tacker strengthens the starboard boat's ability to protect the right side of the course. In a close crossing the only sure way for the port-tack boat to go right is to duck.

Windward/Leeward (Rule 11)

Windward boats must stay clear. With everyone sailing close hauled, the windward/leeward rules are not as volatile upwind as they are downwind; but windward boats must still be careful. Even if your boat is not as close winded (doesn't point as high) as a leeward boat, you must stay clear.

Tacking Too Close (Rule 13)

The tacking boat must complete her tack (finish turning and be on course) before the right-of-way boat initiates an evasive maneuver, or she has tacked too close. If it comes to a protest, then not only must you tack legally, you must also be able to prove it. Be careful.

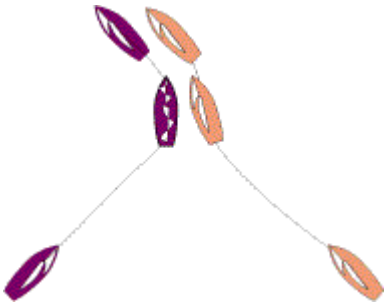


Fig. 48 You have tacked too close if the trailing boat must start evasive maeuvers before you finish your turn.

Obstructions (Rules 18 and 19)

When two (or more) port tack boats approach a starboard-tack boat, the port tackers must stay clear. The starboard-tack boat ranks as an obstruction. The port-tack boats may duck or tack in order to stay clear. The leeward port tacker may choose to duck and give others room to duck as well, or he may choose to tack.

If the leeward boat chooses to tack, he must hail the boat(s) to windward (Rule 19). The windward boat must tack, or hail ÒYou tack,Ó and stay clear. The leeward boat must tack as soon as he gets a response (either action or words).

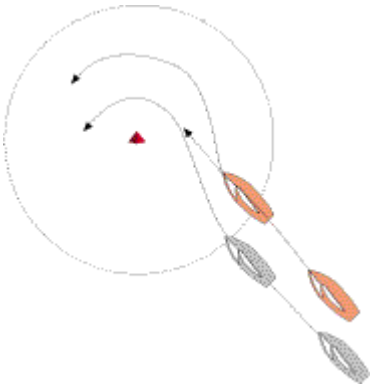
Windward Mark Roundings

The mark rounding rules at the windward mark differ from those on a free leg of the course. There are three basic situations:

1) Both boats on starboard tack, leaving the mark to port, (or both on port, mark to starboard).

This is a windward/leeward or clear ahead/clear astern situation. The boat to leeward or ahead has right of way, and may luff to round the mark (this is proper course). The other boat must keep clear.

Fig. 50 The inside, leeward boat has right of way.



A boat clear ahead which must tack to round the mark must obey Rule 13: While Tacking.

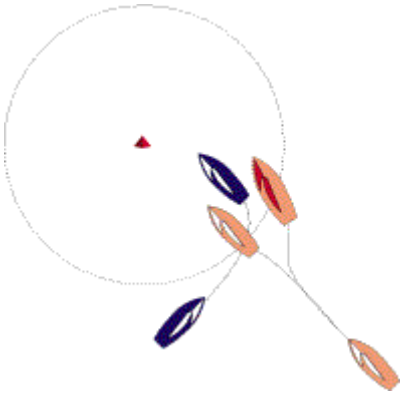
2) One boat on starboard, one on port. Starboard/Port and Tacking-too-close rules apply. There is no buoy room for boats on opposite tacks at the windward mark (Rule 18.1 b). At a port rounding, the port tacker must stay clear.

Fig 51 The starboard boat has the right of way. There is no buoy room.

If a port-tack boat tacks to starboard inside the two boat length circle, then Rule 18.3 applies. If the starboard boat must head up to avoid the tacking boat, the tacking boat has violated the rule. Furthermore, if the starboard boat overlaps the tacking boat to the inside, the tacking boat must keep clear.

The burdens on the boat tacking inside the two boat length circle are so onerous that a tack outside the circle is advised.

Fig. 52 A boat tacking inside the two boat length circle has no rights.



3) Two boats on port tack. When two port tackers approach a mark to be left to port, (or two starboard tackers for a starboard rounding), the buoy room rules apply. The outside boat must give the inside boat room to round and tack if the two are overlapped when the outside boat reaches the two boat length circle (Fig. 53).

Marks To Starboard

The mark rounding rules are the same when marks are to starboard, but they do not work as cleanly. At a starboard rounding, the starboard tacker has right of way while on course, but is not entitled to tack in a port tacker's path. The port tacker must stall, duck, or tack away while the starboard tack boat crosses ahead. The situation gets unruly during a crowded starboard rounding.

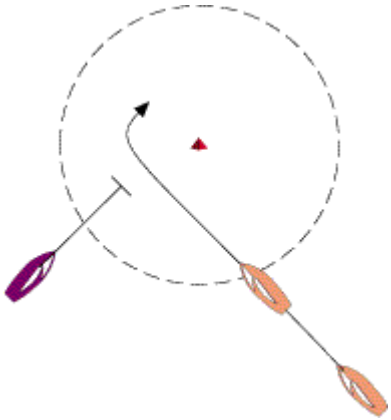


Fig. 54 With marks to starbard, the port boat must stall while starboard crosses, Starboard must not tack too close.

Hitting The Mark (Rule 31)

A boat which hits a mark must immediately get clear of other boats and do a 360¡ before proceeding. While doing a penalty turn, a boat has no rights and must stay clear of all other boats. If the boat was wrongfully pushed into the mark, she may proceed, but she must protest the offending boat.

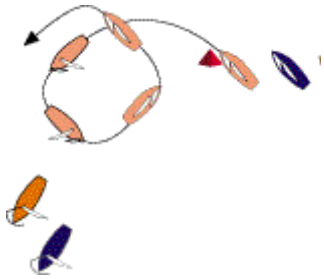


Fig. 55 A boat which hits the mark must do a 360.

Rules, Ethics, and Self Interest

The rules upwind are straightforward, much more so than at starts or offwind marks. Protests are usually the result of greed or surprise which cloud your judgment. Don't get greedybe ready to duck if you can't cross cleanly, and look ahead to avoid surprise.

When you have the right of way, you need not protest every offense. You can protest a close port/starboard; but you can also hail the offender, ÒYou owe me one.Ó In the long run, your own interests will be better served if you don't protest unless your performance suffers. If you protest even when the port boat might have made it, you will probably win the protest. He will be thrown out, and he will doubtless look for a chance to return the favor.

At the same time, you have an obligation to protest a gross offense. If you would cut a port tack boat in two, you owe it to the rest of the fleet to protest the port boat. Otherwise you are condoning cheating. Ideally the port boat will withdraw or take a penalty without forcing you to file.

8.7 No More Tactics!

Tactics provide the thrill of direct confrontation with our rivals. The interaction of attack and response challenges our skills to react as situations evolve. We must consider not only the boats at hand, but also the rest of the fleet and our overall race strategy as we make split second decisions. *This is hard!*

Not only that, but if the wind is shifty we can lose hundreds of yards in a matter is minutes. *This is scary.*

Maybe we'd be better off eliminating tactics from our racing, or at least minimizing their impact, but how?

No More Tactics

The trick is to rely on things you can control: boat handling and boat speed. Then you can minimize the impact of things you can't control: the wind and other boats. Do this by staying near the fleet, while positioning yourself to take advantage of known shifts. The more you can rely on things you can control, the less you will have to rely on things you can't.

You can order this great book called Performance Racing Trim in it's entirety.

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