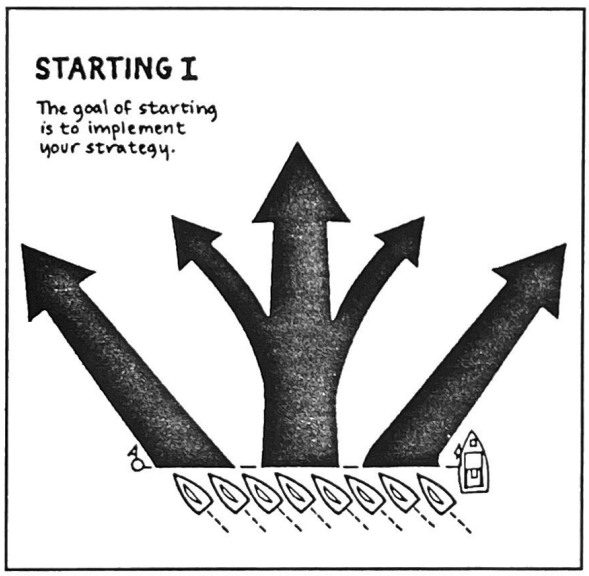
observation over a period of time

The start of a sailboat race is certainly an exciting, and critical, moment. With the entire fleet forced to sail through a very small area, the potential for gain or loss is huge. While you don't have to win the start to win the race, it certainly helps to be in the front row. And doing this consistently requires a good deal of tactical skill, boathandling expertise, sense of timing and strategic planning.



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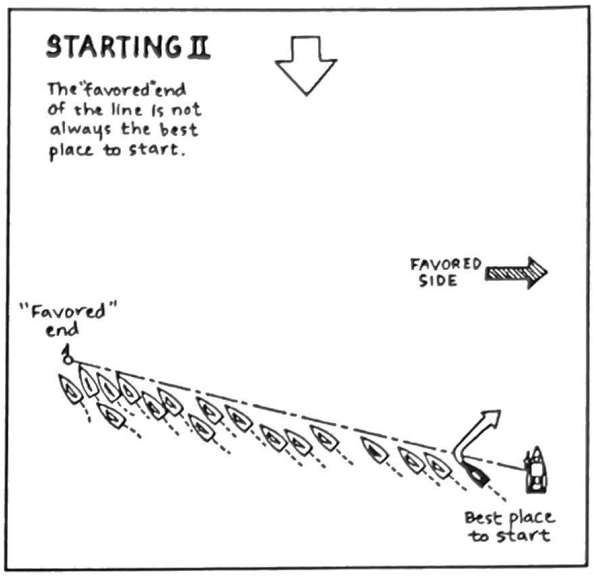
How strategy affects starting

The goal of starting is to put yourself in a position so you can implement your strategy and get to the windward mark as quickly as possible. Getting a good start is not an end in itself. It will do you no good to "win" the start if this means you have to sail toward the wrong side of the course.

The "big" picture In general, your position on the starting line should reflect where you want to go on the first beat (Figure 1). If you want to play the left side, start near the pin end. If you want to go right, start at the committee boat. If you want to go up the middle (or keep your options open), start in the middle of the line.



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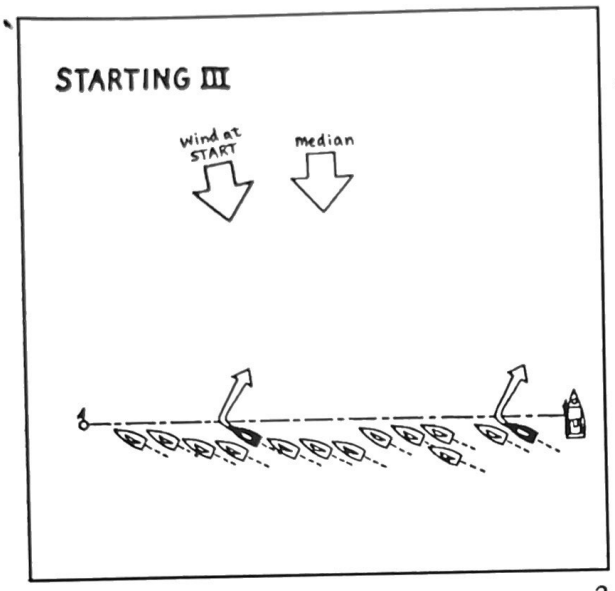
When your strategic plan favors one side quite strongly, then this will be the overriding factor in your starting plan. At the 1984 Olympics in Long Beach, for example, it was usually quite favored to go all the way to the right side of the course. For this reason, the race committee placed the pin end of the line farther to windward (if the line was square to the wind, everyone would have started at the committee boat). Even with the pin end favored, the best strategy was often starting at the right end and tacking immediately (Figure 2).

The "small" picture To implement your strategy, it's important not only where you start on the line, but where you start in relation to the boats around you. Consider the situation where you



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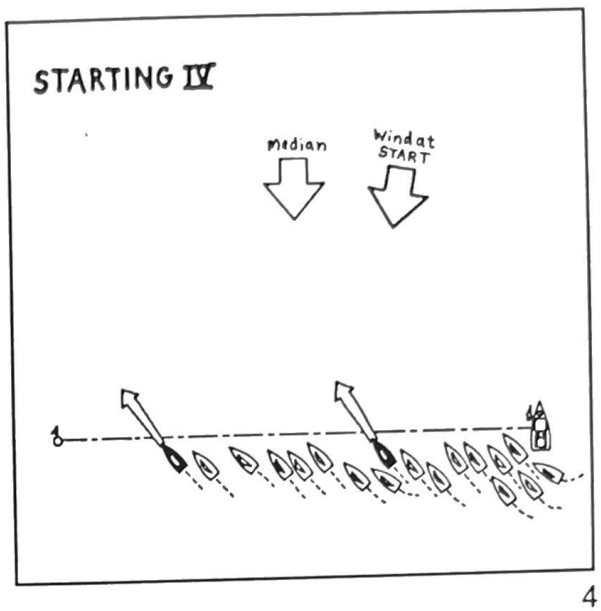

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are starting in an oscillating breeze. Here your primary strategic consideration is to get in phase as soon as possible.

If you are in a header when the gun goes off (Figure 3), you will want to tack as soon as possible. This means you must be far enough ahead of the boats on your weather hip so you can cross them cleanly. The worst thing would be starting in a position where you were pinned on starboard and had to continue sailing through the header.

If you are in a lift when the gun sounds (Figure 4), you will want to keep sailing on starboard. This means you better have a nice hole to leeward so you won't get pinched off. When you're on a lift, you want to avoid bad air, and you certainly don't want to tack.

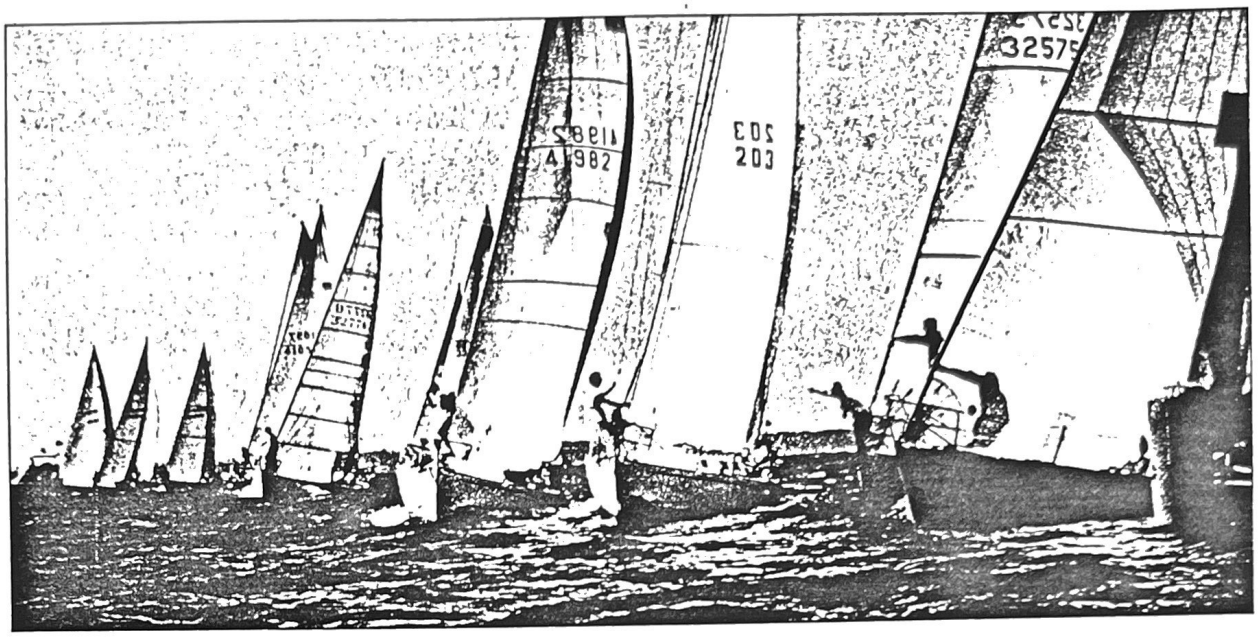
Finding the "favored" end

When we talk about the "favored" end of the starting line, we usually mean the end that is closer to the wind. In other words, it's the end that is on the most upwind ladder rung. As we've just seen, the favored end is not always the best place to start. It is usually crowded, and it may not be close to the favored side of the windward leg. So you should rely primarily on your strategic plan to help determine your starting position.

However, if everything else is equal, the best place to start is near the end of the line that's more upwind (on the higher ladder rung).. Here are five ways to identify the favored end and by how much it is favored.

Method 1 The most commonly used method is shooting head to wind in the middle of the line (Figure 5). When your sails are luffing on centerline, the favored end is the one that's closer to the direction your bow is pointing.

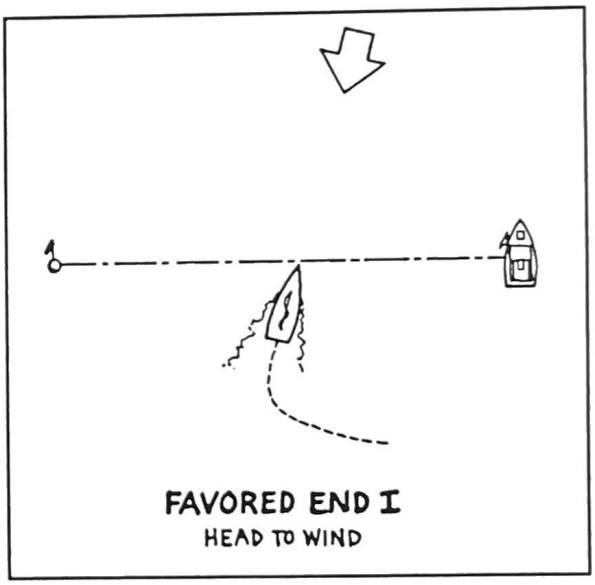
The advantage of this technique is that it's quick and can be used to check the wind direction continually during the starting sequence. The disadvan-



Watch the angles of boats at other starts for clues about the favored end. The line above looks fairly square. Most starting lines have crowded ends and a sag in the middle. Note the bow people using hand signals to tell their skippers how far they are from the line.

tages are that it's not always too accurate, especially if a) the line is long; b) there are boats creating a lot of bad air; or c) you have a hard time judging perspective. *TIP* To avoid fouling other boats, always go head to wind from starboard tack. As long as you do not go past head to wind, you remain on starboard and keep the right of way.

Method 2 The most accurate way to find the favored end is by using your compass. Go head to wind and get a compass bearing. Then go outside one end of the line (the pin end is usually better) and line up the two ends of the line (Figure 6). With your bow pointing right down the line, read your compass. Now use simple geometry to figure out which end is favored and by how much.



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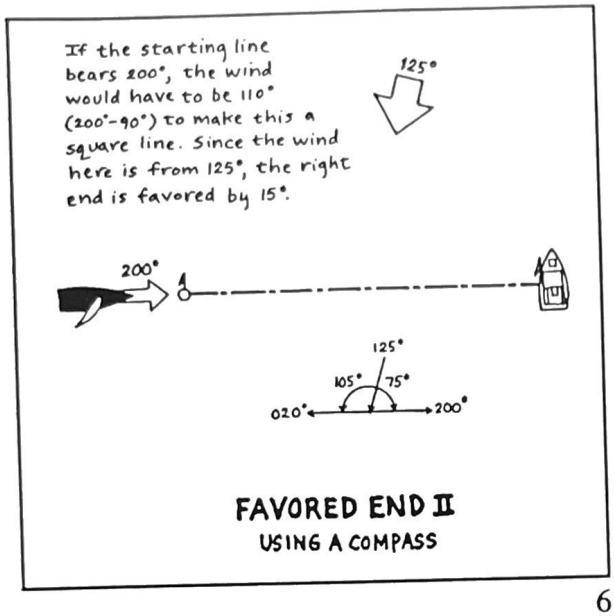
For example, pretend that the wind direction is 125. You find that the line bears 200 (or 020 if you are looking from the committee boat toward the pin). For



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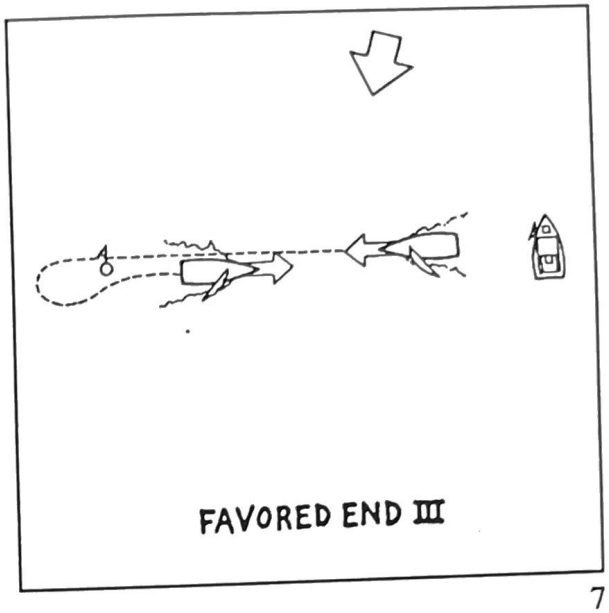

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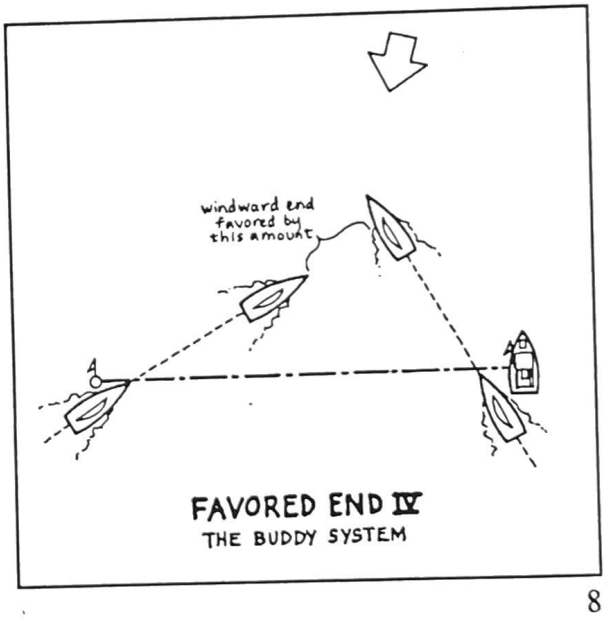
the line to be "square," the wind direction would have to be 110 (90 degrees to the line). Since the wind is actually 125, this means the starboard end is favored by 15 degrees. To figure out what this means in terms of boatlengths, estimate the length of the line and use the windshift geometry from the Basics chapter.

TIP If you have trouble getting an accurate wind reading by going head to wind, sail closehauled on each tack and note your compass headings. The wind direction will be roughly half way between these numbers.

Method 3 Some racing sailors prefer another simple technique. Sail from the committee boat toward the pin, and trim your sails so they are right on the verge of luffing. When you get to the pin, tack or jibe around it, keeping your sheets trimmed exactly as before (Figure 7).

Now look at the front of your sails. If they are luffing, you know the wind is coming more from ahead, so the committee boat end is favored. If you can ease your sheets further without the sails luffing, then the pin end is favored. (By the way, this method gives you a perfect chance to time the length of the line.)



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Method 4 Here is an accurate technique to use if you are racing one-de-

signs, and you have a friend and a bit of time before the start. Have one boat start on port tack at the leeward end while the other starts on starboard at the windward end (Figure 8). Both sail fast upwind until they meet. If the starboard tacker crosses ahead by two boatlengths, then the windward end is favored by two boatlengths.

This method works especially well for long starting lines when neither end is obviously favored (especially if you don't have a compass). Beware, however, of windshifts between the time of your test and the start.

Starting Ideas I

- Appoint someone on your boat as your "official" timekeeper and ask him or her to call the time loudly at regular intervals. Set your time by the race committee's visual signals, not by sound signals.
- Your sailtrimmers should always trim the sails for full speed ahead, unless they hear "Luff sails" from the skipper or tactician.
- If your boat is big enough to have a tactician *and* a helmsperson, let the helmsperson make moment-to-moment decisions while the tactician concentrates on the big picture.
- Remember the racing rules go into effect at the five-minute preparatory signal (unless otherwise stated in the sailing instructions). Make sure all members of your crew keep a lookout for other boats.
- Always stay close to the starting line (never more than half the line's length away), especially in light air.

Method 5 Another easy guide is to watch the boats that are sailing close-hauled off the line (and the fleets that start before you). The key is their angle on each tack. Figure out which boats sail more perpendicular to the line, and start at the end that's on their windward side.

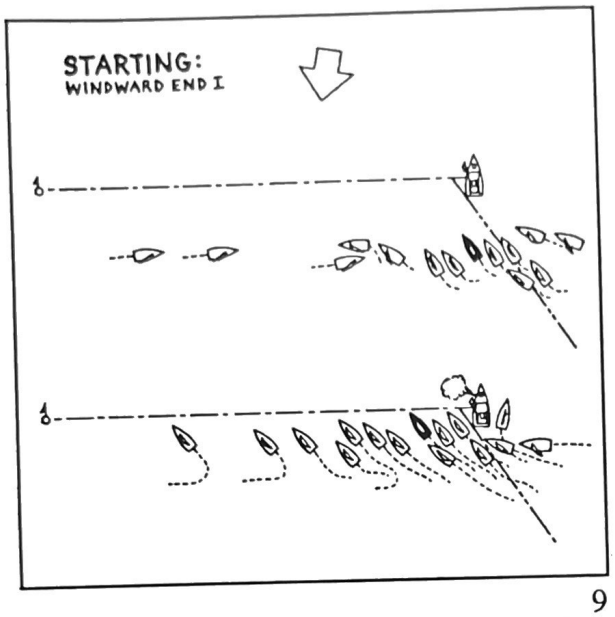
Remember that a shifting wind will change the favored end of the line, so you must be careful of tests that are carried out too long before the start. Here is where a little preparation can save the day. If you have been monitoring the shifts, you will be able to compare your wind bearing at the time you determined the favored end to the wind direction just before the start.

Pretend, for example, that you found the windward end to be 15 degrees favored when the wind direction was 125. A minute before the start, you check the wind again and find that it has shifted left to 105. Now the leeward end of the line is actually favored by five degrees. To improve accuracy on a shifty day, take many wind checks, and try to postpone your decision about the favored end until the last possible moment.

When the wind is shifting persistently, it's important to plan your start so you can head immediately toward the favored side. In an oscillating breeze, your position on the line is less critical. You may actually want to start farther away from the upwind end so you will be closer to the next shift.

Three places to start

Think of a line in terms of its thirds, not its ends. When we talk about starting at



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the windward end of the line, for example, we are usually considering the windward third of the line. In most cases, you don't have to be right at the favored end in order to reap the advantages of starting there; starting down the line a little will lower your risks.

Windward end

This end is also called the starboard end (and is usually the committee boat end too). This is definitely the place to be when your strategy calls for going right. There are other reasons for starting here:

Advantages

1) It's easy to judge where the line is.
2) If you have a bad start, it's easy to bail out and get clear air on the other tack.
3) You'll have no problem seeing the signals and hearing the gun. In fact, you can often hear the race committee's countdown.
4) If you're over early, you can easily hear your recall number. And if the one-minute rule is in effect, it's easy to round the committee boat.

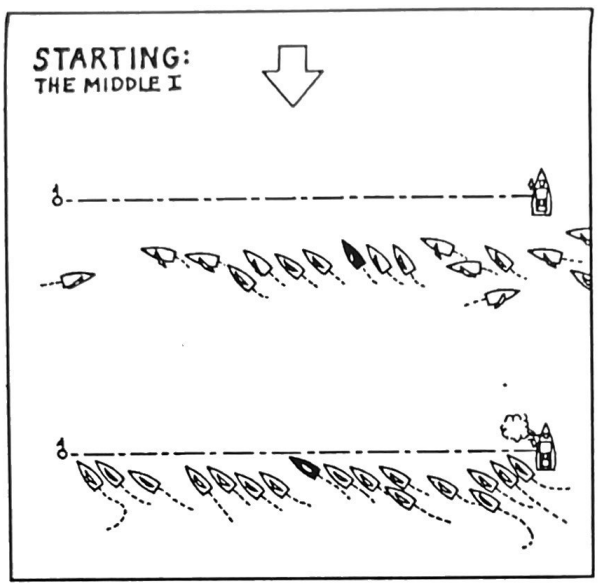
Disadvantages

1) The boat end is usually crowded, even when it's not particularly favored.
2) You risk the chance of being caught barging, especially if there is any current pushing you to windward.

It is usually difficult to get *the* start right at the committee boat. Everyone fights for this, and your chances of pulling it off perfectly are slim. That's why it is better to start down the line a little.

Begin your approach slightly to leeward of the layline to the windward end (Figure 9). You have to be on starboard tack relatively early, because port tack approachers often find an impenetrable traffic jam. Try to luff in position and maintain a hole between you and the boat to leeward. Then accelerate so you hit the line at the gun going full speed.

Late at the windward end – If you really want to go right, the best approach



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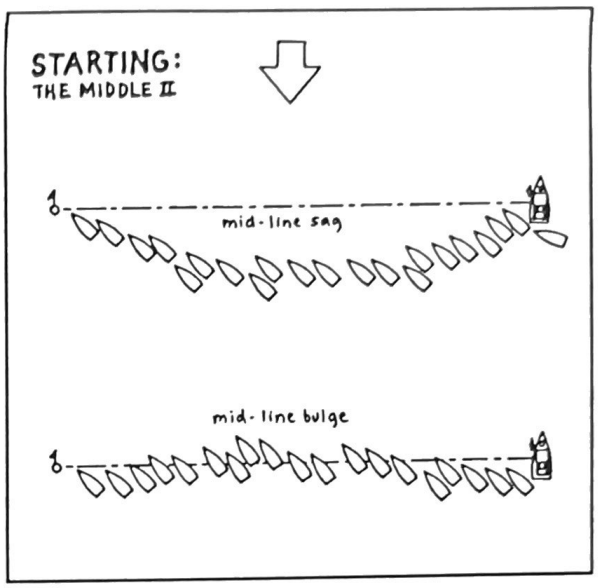

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may be a slightly delayed start at the committee boat. To do this, hang out in a barging position and look for a hole at the stern of the boat (Figure 10). You may have to start behind one or two boats, but at least you will have the chance to tack right away.

Middle of the line

Starting in the middle often seems less glamorous than starting at either end, but this position offers a much better chance to get off the line fast and clean.

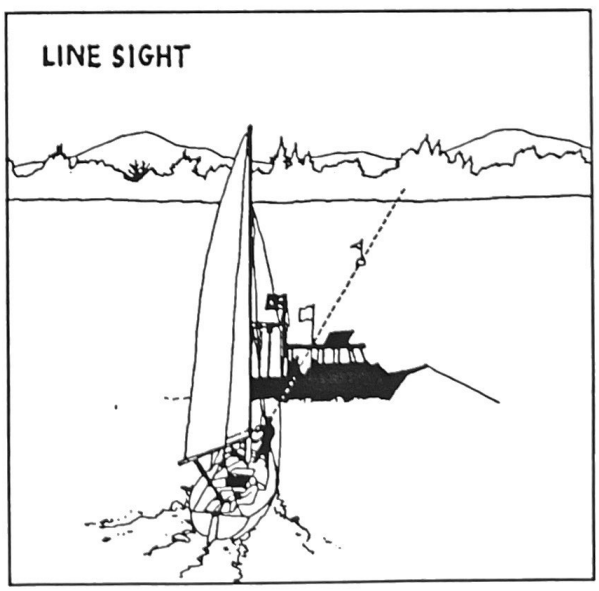
Advantages

1) This is usually the least crowded part of the line.
2) It's the best place when the wind is oscillating or when you're not sure which side of the course is favored.
3) You can take advantage of the mid-line sag.

Disadvantages

1) It's hard to judge where the line is.
2) Since one of the ends is favored almost all the time, you will lose some distance to the boats at that end.
3) In a big fleet, the wind may be lighter and the chop bigger in the middle.
4) You're in deep trouble if you're over early during the one-minute rule.

When starting in the middle, you can often get a big jump on the boats



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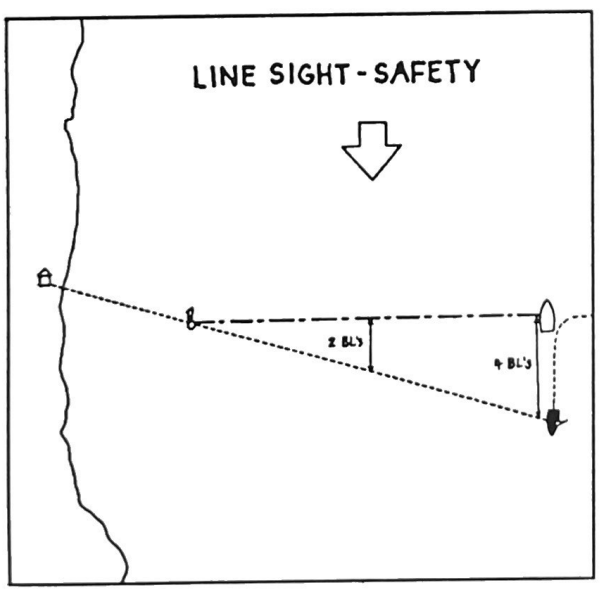
around you. If it looks like there will be a mid-line sag, hold back and luff with the others (Figure 11). Then, when you have just enough time to make it to the line at the gun, trim in and go full speed ahead. You want to be close to the boat on your windward side with a hole to leeward.

The main disadvantage of starting in the middle is that it's hard to judge the line (Figure 12). This increases the likelihood of a mid-line sag (where everyone is late) or a mid-line bulge (where many boats are caught over early).

If you choose this approach, it's critical to have a line "sight" or "range." After the race committee sets the starting line, go outside the committee boat end and sight through the flag on the boat and the leeward end (Figure 13). Or, if there are no good landmarks beyond the leeward end, you can always sight the line the other way. Your goal is to line these ends up with an object on shore. Then, as you approach the line to start, use this



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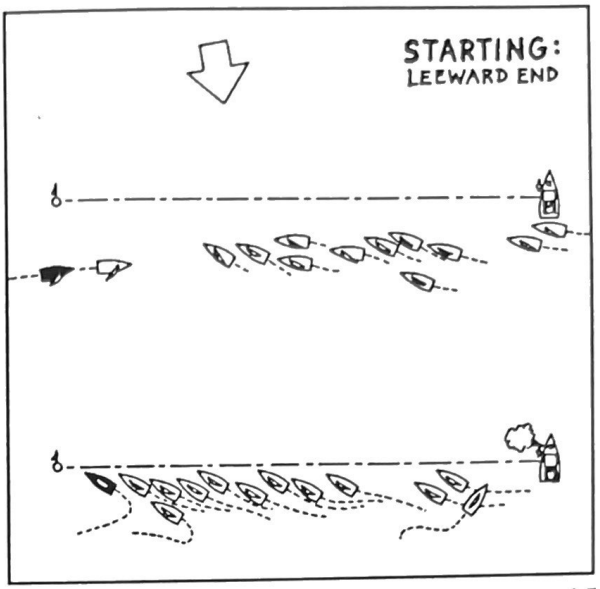

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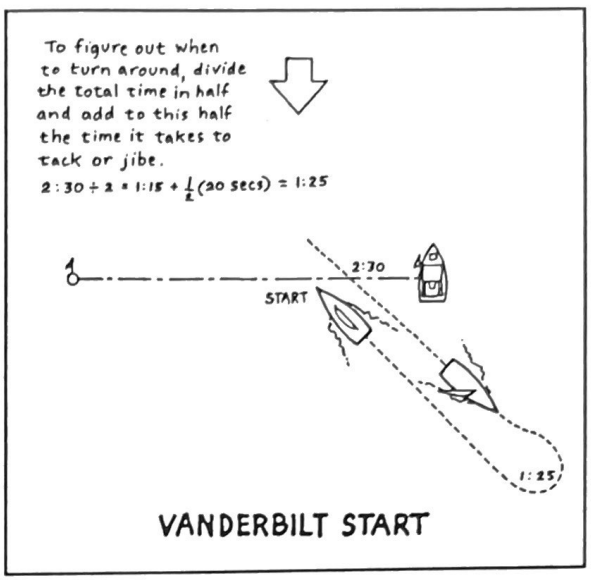
range to position yourself confidently just below the line.

It can be helpful to have a "safety range" to windward of the line (Figure 14). To get this, start at the committee boat and sail dead downwind. When the leeward end lines up with a landmark, note how far you are from the committee boat (distance X). As you approach the start, you'll know this range is always safe. It will also give you an estimate of your distance to the line. In the middle of the line, for example, you will be half of X from the line.

Leeward end

This end is also called the "port" or "pin" end. A start here can be difficult to pull off, but it offers big rewards when your strategy says go left. You can either drive off to leeward and leave the fleet in the dust when you get the next shift, or pinch like crazy and start a chain reaction that stops everyone in their tracks.



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Advantages

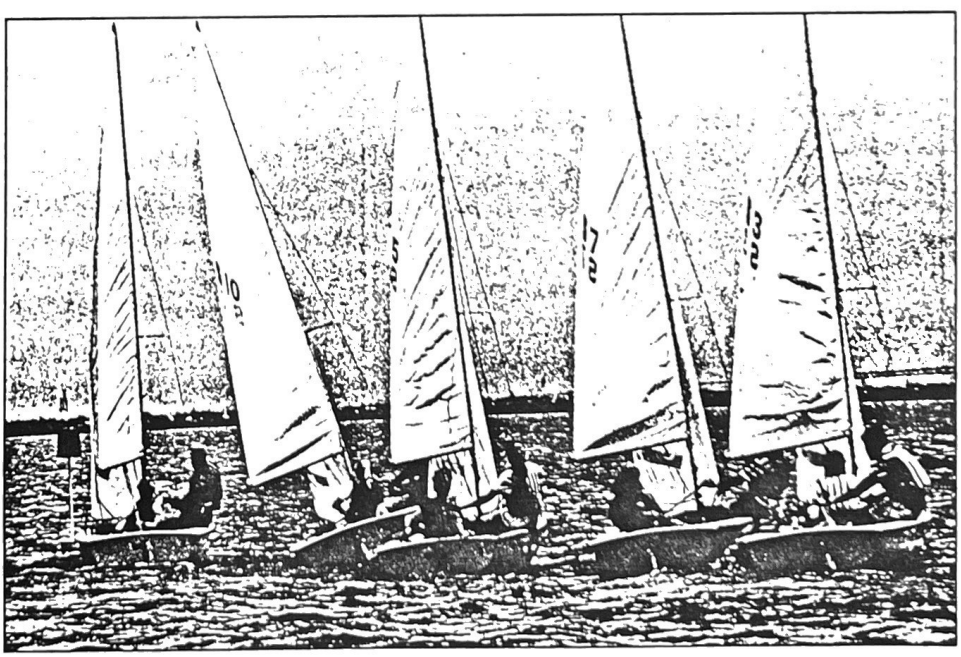
1) It's easy to judge where the line is
2) If you're right at the pin, you won't have any boats to worry about on your lee bow.
3) It's easy to round the leeward end if you are over early when the one-minute rule is in effect.

Disadvantages

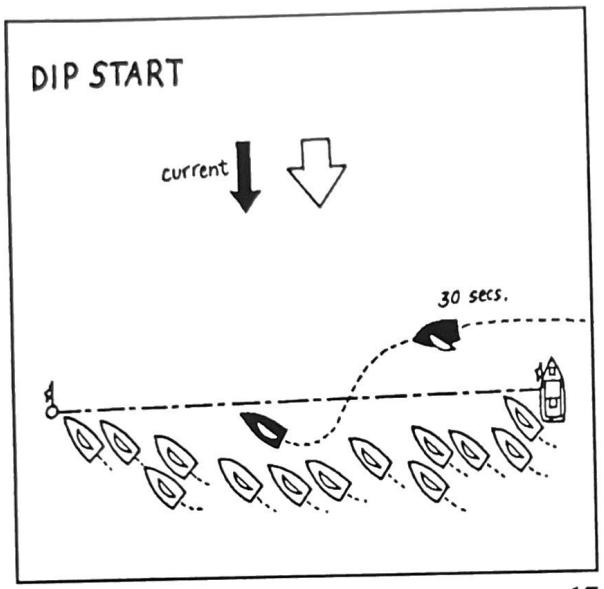
1) This end is usually crowded, especially if it's favored.
2) If you get a bad start, it will be very difficult to find clear air.
3) You may get pinned on starboard for longer than you want

A port-tack approach is usually the only way to get a good leeward-end start, especially in a big fleet. Try to be the last boat on port approaching the pack, and tack on the lee bow of the first starboard tacker (Figure 15). It's best if you tack close enough so the other boat cannot sail over or under you. This way, if you are early, you can luff and hold the other boat back until you accelerate to the pin.

Don't forget the possibility of a port-tack start. This won't work very often, but if the leeward end is favored by quite a bit (especially if the current is making it hard to cross the line), you may be able to cross the fleet on port.



The leeward end is a risky place to start because it's usually crowded. Often only one or two boats will emerge from the pack with clear air. If your timing and skills aren't pretty good, your chances of clear air and speed will be much better up the line a little.



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Starting tactics

Once you've devised a strategy for where you want to start, you have to use the tactics necessary to get you there at the gun. Here are some tools you may want to employ:

The Vanderbilt start This is a simple out-and-return pattern used primarily by larger displacement boats that take a long time to accelerate (Figure 16). In recent years, the master of the Vanderbilt start has been Dennis Conner. In both the 1983 and 1987 America's Cup series, Conner used his excellent sense of timing to negate the better maneuverability of his competition. Here is how the Vanderbilt start works:

1) Pick the place you want to start.

2) When you are ready to make your final approach, go past this spot on a port tack beam reach.

3) Note the time remaining.

4) Divide this time in half and add an allowance for time to tack or jibe.

5) Proceed on a broad beam reach until the designated time; then tack or jibe around and go for the start.

Dip start This approach works well when the fleet is late for the start, such as in light air, big waves or a foul current. Hang out to windward of the starting line until you have less than a minute to go. Then reach down (dip) below the line and head up to start (Figure 17). This gives you excellent speed and a minimal risk of being late. Of course, this won't work well when the fleet is crowding the line, or if the one-minute rule is in effect.

Luffing in place One of the most valuable skills for starting is the ability to luff in place and keep control of your boat. This helps in almost every start,

Acceleration Times *

	Time (secs) to accelerate from 0 to full speed	Time (secs) to travel 1 boat length at full speed
WIND: 5 knots		
Laser	15	3
Lightning	30	3.5
J/24	45	3.7
50-footer	70	5
Your boat	—	—
WIND: 10 knots		
Laser	7	2
Lightning	15	2.4
J/24	25	2.7
50-footer	40	4.1
Your boat	—	—
WIND: 15 knots		
Laser	4	1.7
Lightning	10	2
J/24	15	2.2
50-footer	30	3.8
Your boat	—	—

*These numbers are approximate references only

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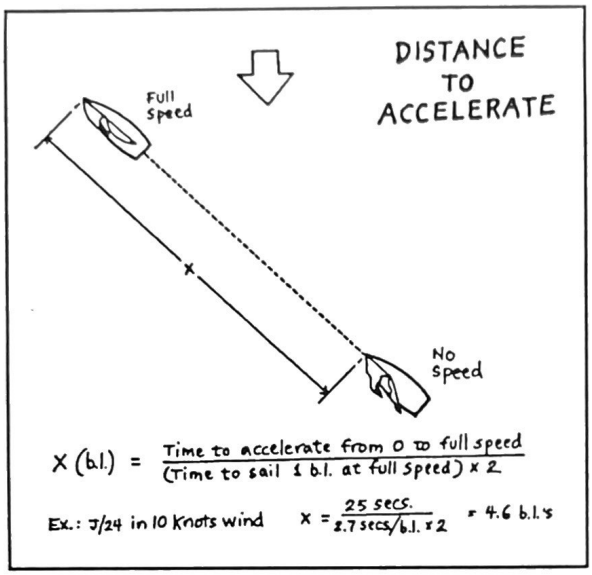

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especially on a crowded line or when you are early. To luff in place, the key is maintaining a slight angle to the wind. Do not go head to wind; this is the quickest way to lose steerage.

Once your boat is stopped, use your sails to maneuver. To open a hole to leeward and squeeze up to a boat on your windward side, trim your main only. To accelerate at the start, trim the jib first to pull the bow off toward a closehauled course. Then trim your main.

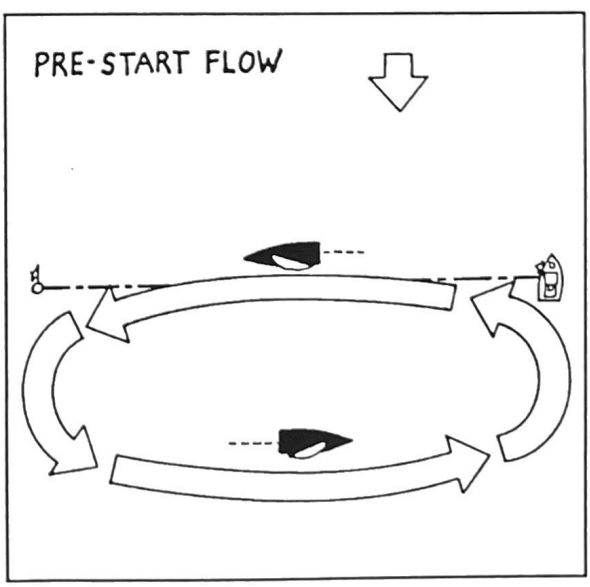
Of course, if you plan to kill your speed just before the start, you better know how long it will take you to get up to full speed again. This will be a function of boat type, wind speed, waves and the presence of other boats (Figure 18). If you know your closehauled boatspeed and the time required to accelerate from 0 to full speed, you can figure out how much distance you need for full acceleration (Figure 19).

Get into the flow You can often figure out where most of the boats will start by watching the behavior of the fleet in the final two or three minutes before the start. Use this information to avoid congestion at the start.

Typically the fleet sails in a counterclockwise oval (Figure 20), with the starboard tackers sailing right along the line and the port tackers staying to leeward of them (to keep clear). Unless you have a good reason, don't go against the grain because you risk a foul or collision.

When you are part of the flow, it's important to keep your options open (Figure 21). Maintain the opportunity to head up, head off, tack or jibe as long as possible. Don't get in a position where other boats are pinning you. That's the quickest way to lose control of your starting tactics.

The port-tack approach The port-tack approach has become quite popular during recent years. The main advantage of this technique is the ability to pick and choose your place on the line, as



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well as your position relative to nearby boats. It's also the best way to start on someone's lee bow, which is important at the leeward end.

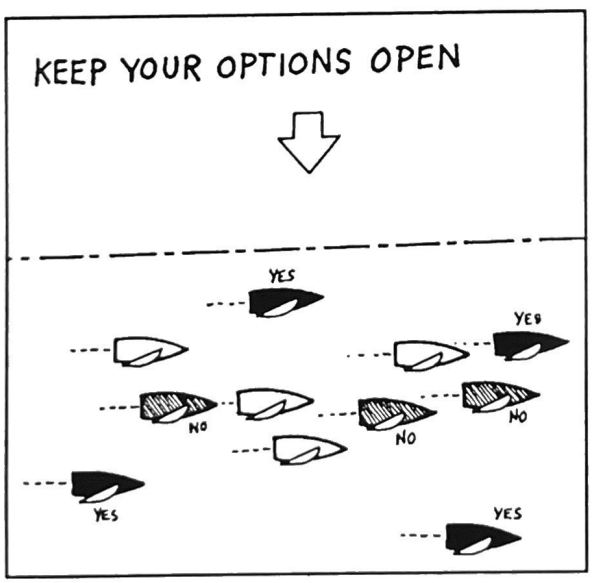
The main disadvantage of the port-tack approach is that you can get "locked out." This is likely to happen in bigger fleets, or when the windward end is favored. In these situations, it's better to set up on starboard early to reserve a spot in the front row.

When approaching on port tack, your object is to set up on the windward side of a hole between two boats. To do this, make your tack onto starboard so you end up right underneath the boat on the windward side of the hole you've chosen (Figure 22). You want to have your bow just slightly ahead of the windward boat. This allows you to luff this boat and hold him in place; it also prevents him from bearing off behind your stern into your hole.

TIP When you're on port looking for a place to tack, pick a spot that is just to

Starting Ideas II

- When changing tacks to turn back to the line for your approach, remember that a tack takes longer, but a jibe will move you to leeward and is risky in heavy air.
- Unless you have a very good reason, always cross the line on starboard tack.
- On bigger boats, it may help to send a crewmember to the bow as you approach the start. It will be easier to estimate distance to the line from there.
- For practice, pretend that the five-minute gun is your start. Go through your whole approach to work on timing, crew communication, etc.
- If possible, go on a close reach for a few seconds before the start, then luff up to closehauled as the gun goes off. This will let you cross the line with better speed than usual.



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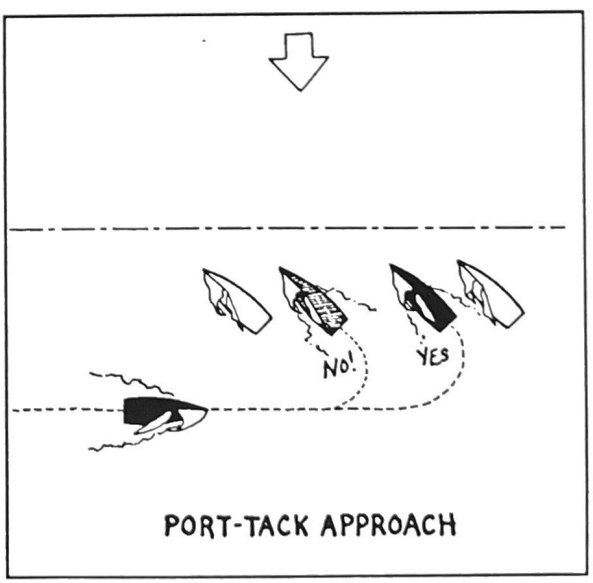

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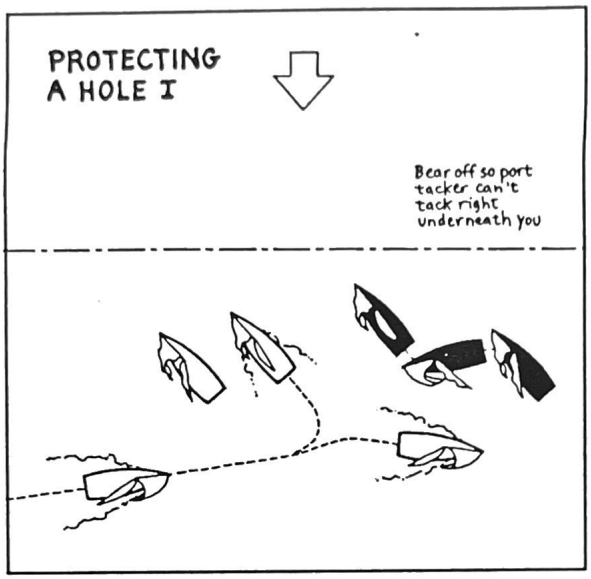

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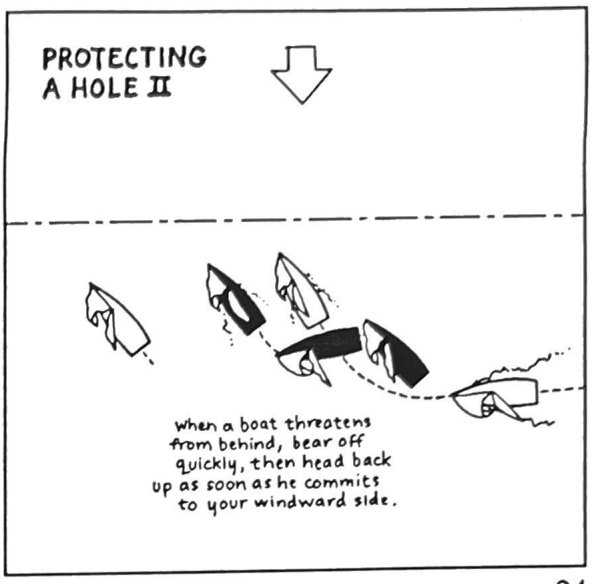


24

windward of a relatively slow boat. You certainly don't want to start with the fleet champion on your lee bow.

Defending against a port tacker OK, you've carved out a nice hole to leeward and now you're luffing on the line with only a few seconds before the gun sounds. You're getting psyched for a great start when, all of a sudden, a boat approaches on port, tacks into your hole, stuffs you head to wind and leaves you wallowing in the dust. It's your worst nightmare.

Creating a hole to leeward is only half the battle. Protecting it from the vultures is the other half. You must always keep a lookout to leeward for port tackers approaching your hole. If they look seriously interested, bear off and aim right at them (Figure 23). At the same time, luff your sails to kill forward progress so you don't use up your hole. This maneuver forces them either to tack early or bear off below you. As soon as they commit to one of these options, head back up into the wind so you don't sail down into your hole any more than you have to.

TIP In a competitive fleet, don't try to horde too much space. Make a hole to leeward that's big enough to give you room to accelerate, but small enough so you don't tempt another boat to go in there.

Defending against a starboard tacker Sometimes, when you're luffing on starboard tack with a nice hole to leeward, the biggest threat is a boat that comes reaching in from behind. The defense against these boats is usually tougher than against port tackers, mainly because they're coming from behind and are often obscured by other boats.

Obviously, your first priority is to keep a lookout behind. When you see a vulture approaching, quickly turn your boat and head off in front of the other boat before he becomes overlapped to leeward (Figure 24). Your object is to get

him to head up on your windward side; as soon as he does this, luff up hard so you save your hole to leeward.

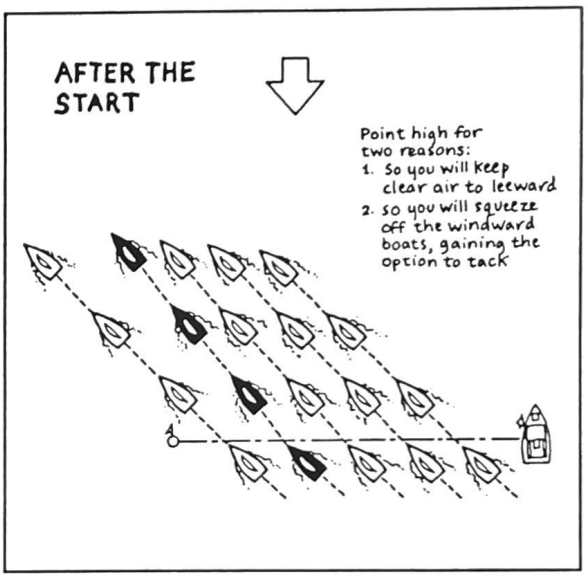
TIP Position your boat so that when the mainsail is luffing, the boom sticks out as far as possible to leeward. This is a great way to fill up some of your leeward hole and discourage another boat from trying to squeeze in there.

In a mixed fleet When sailing in a handicap fleet with different size boats, it's more important than ever to plan your starting position relative to the competition. In general, don't start just to windward or leeward of bigger boats (Figure 25) or you will soon have bad air.

After the gun

The first few minutes after the starting gun are perhaps the most critical moments of any race. This is the time when everyone fights for clear air and tries to implement their strategic plan. It's important to go flat out during this time. For example, straight-leg hike as hard as you can on a one-design. Every foot gained off the line will help immensely in the long run.

Watermelon seed After several minutes, a few boats will squeeze ahead of the pack like watermelon seeds. Your object is to be one of those boats. Shift



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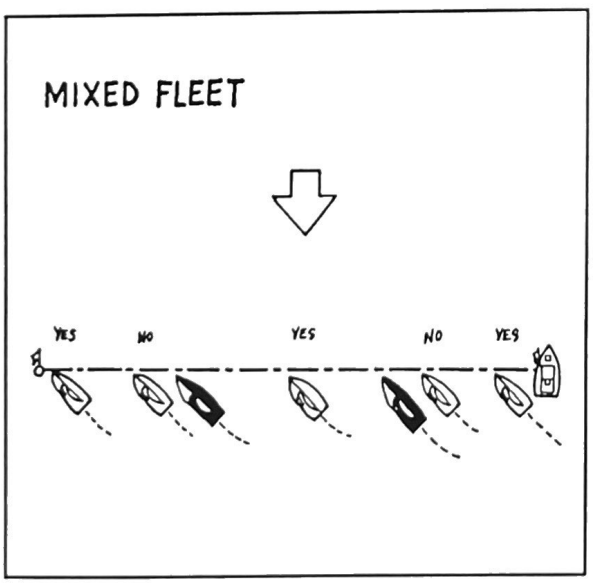

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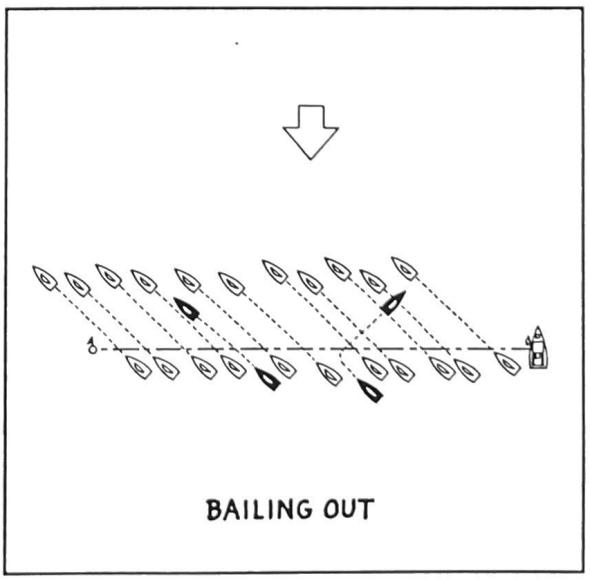

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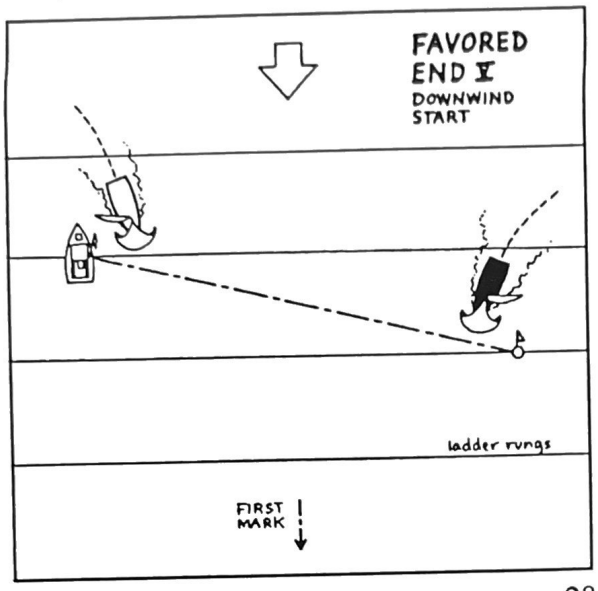

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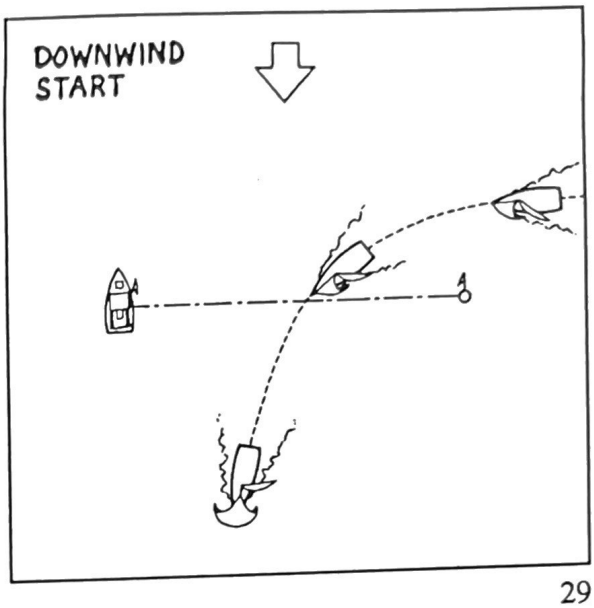


29

your sail trim into point mode for two reasons: 1) To make sure you do not fall into the bad air of the boat to leeward; and 2) To squeeze up in front of the boats to windward, which is important if you want to tack (Figure 26).

Bail out If you aren't lucky enough to be a watermelon seed, you will sooner or later end up in bad air. Unless your strategy says you *have* to go left, tack away immediately and duck as many sterns as needed to get clear air (Figure 27). Cut your losses by getting into clear air before the "seeds" have developed an untouchable lead.

Downwind starts

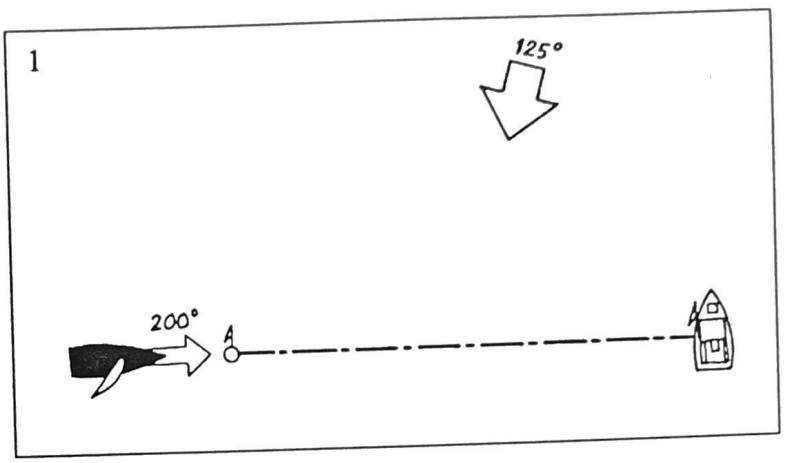
The general principles of starting downwind are a lot like starting upwind, except you have the added intrigue of spinnakers, and it's a lot harder to luff on the line. This type of start is usually used for bigger boats and fixed marks.

Finding the favored end is not too hard. Simply follow the same steps you used for upwind starts, except you want to identify the end that is most *downwind*, or on the *lower* ladder rung (Figure 28). This is the "favored" end.

Like upwind, the approach to a downwind start should almost always be made on starboard tack (Figure 29). A reaching approach along the line has three advantages. First, you will be leeward boat and will have right of way over all others. Second, you will be closer to the line, so it will be easier to judge how long it will take you to get there. And third, you will have full reaching speed as you bear off at the gun.

Problems

1. The race committee has just set the starting line, and you're trying to figure out which end is more upwind (see Diagram below). When you went head to wind, you learned that the direction of the breeze was 125. Now you are outside the pin end of the line, sighting toward the committee boat, and you find the line bears 200.



Which end is more upwind?
By how many degrees is this end favored?

2. Now you decide to time the line, and you find it takes two minutes to sail from the pin to the committee boat. You estimate your average speed during this time at 6 knots.

a) How long is the line?

b) If you start at the favored end, how far will you cross ahead of a boat that starts at the leeward end?

3. There are 35 seconds to go before the start, and you're luffing on starboard tack, just to leeward of the line, with a nice hole carved out to leeward. How do you protect this hole against:

a) a port tacker threatening to tack into your hole?

b) a starboard tacker threatening to fill your hole from behind?

4. You are parked on the line on a close reach with all sails luffing in the type of boat you race most often. Assuming that no other boats interfere with you, how much time will it take you to trim in and get to full speed on a closehauled course:

a) in 5 knots of wind?

b) in 10 knots of wind and sloppy seas?

c) in 15 knots of wind?

5. You are representing your country at the 1992 Olympic Games in Barcelona, Spain. The team meteorologist has advised you that the wind will veer steadily during the morning race. The race committee has set a starting line with the left-hand end favored by 15 degrees. Where will you start on the line? Why?

6. You've spent an hour timing the shifts before the start, and you've learned that the wind is oscillating regularly. On starboard tack, your high heading is 290 and your low heading is 270. You've also found there is roughly ten minutes between extreme left and right-hand shifts.

After your warning gun sounds, you head up to closehauled on starboard tack and find that your heading is 272. Based on this information, what will your strategy and tactics be for the start?