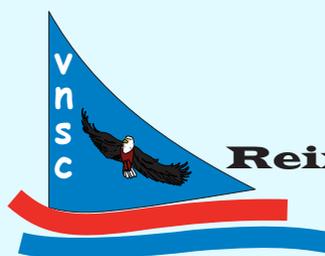


Laser Sailing



**Reint J Bakema
4th Edition**

What this booklet is all about

The Laser dinghy is one of the most popular sailing boats in the world. It is easy to rig and transport, it is fast and it can be sailed by anyone between 12 - 80 years, and between 35 - 110 kgs. You find active Laser fleets in almost any sailing club in the world, and the International Laser Class Association organises numerous racing events every year.

The Laser is also a perfect boat to learn how to sail. Since you are on your own, you have to do everything yourself, from setting your sail, timing the start, reading the weather and applying rules and tactics to outsmart your opponents.

For the last 2 decades the VNSC has organised two adult beginners' training courses, and several intermediate training days each year. This booklet is a brief compilation of the training ideas, materials and methods that we have developed for these courses.

This booklet is structured from sailing basics

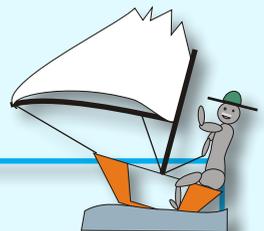
to more complex issues. The first bit is about how to get a boat rigged and moving, then we look at how make it move faster, then how to be more clever than others, and last how to plan and sail your races. Interspersed in the text are the main rules, brought in when they become relevant in the context of other issues.

If you are a beginner and got this booklet as a handout at the start of the training course, some of the stuff may seem to be a bit threatening. But you'll be surprised how quickly you will have reached the last page and recognize the ideas and situations described. If you have sailed for some time there might still be one or two things you forgot, or you never fully understood.

For all of you, happy reading and see you on the water.

Reint J Bakema

Kampala, Uganda
September 2010



Glossary

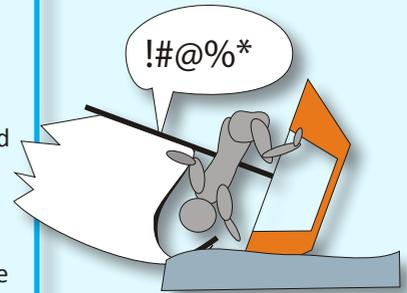
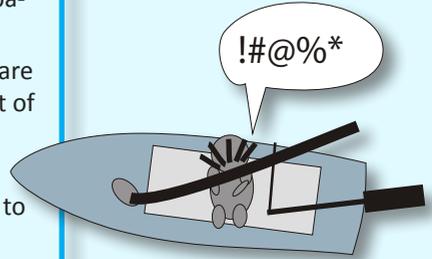
- Upwind: a point in the direction where the wind comes from
- Downwind: a point in the direction where the wind blows towards
- Tack: changing direction by going through the wind, whereby the sail moves to the other side of the boat
- Gybe: movement of the sail to the other side of the boat while running
- Beating: sailing towards a point upwind, thereby making one or more tacks
- Running: sailing towards a point downwind, with the wind blowing towards the stern of the boat
- Reaching: sailing in a direction with the wind coming in from the side of the boat
- Close haul: sailing as close a possible towards the wind
- Port: the left side of the boat
- Starboard: the right side of the boat
- Windward: the side of the boat directed towards the wind
- Leeward: the side of the boat dirtected away from the wind
- Lay-line: the line along which to sail close haul to reach a point upwind

Sailing and safety



Sailing is a safe sport: we have had no serious sailing accidents at Kaazi for as far as the current members can remember and we would like to keep it like that. So please adhere to the following basic rules:

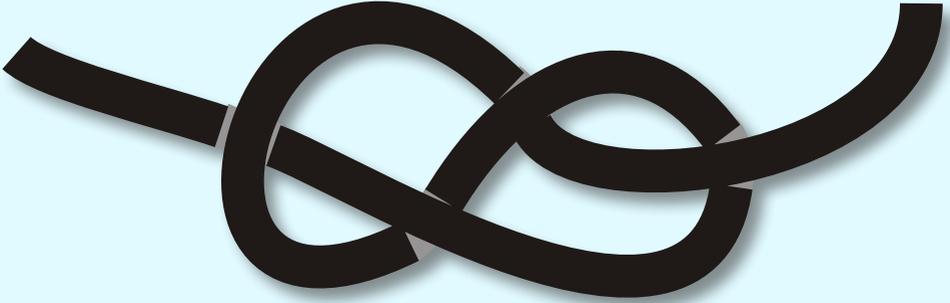
- Never go out sailing alone beyond your capabilities
- Make sure that somebody knows that you are out on the lake, especially when you go out of sight of the club
- Always wear a tight fitting life jacket even when you are touring. You are not allowed to race without it.
- Wear sufficient protection against the sun (hat and sunblock) and against the cold (shirt)
- Drink before you go out, or carry water with you
- Let your sail out flapping and just rest for a while if you are exhausted or have no idea how to get back to the shore,
- In case of gear failure or failure to bring the boat up after a capsize, sit on the centreboard and try to attract attention by waving your arms over your head
- Never, ever leave your boat. The hull floats and you don't, and a rescue team will find the hull, but not a lonely head in the water.
- Be patient when waiting for help, the rescue boat may have other priorities
- If you are on the shore, keep a look on what is going on on the water. Alert the rescue boat when you don't trust what you see.



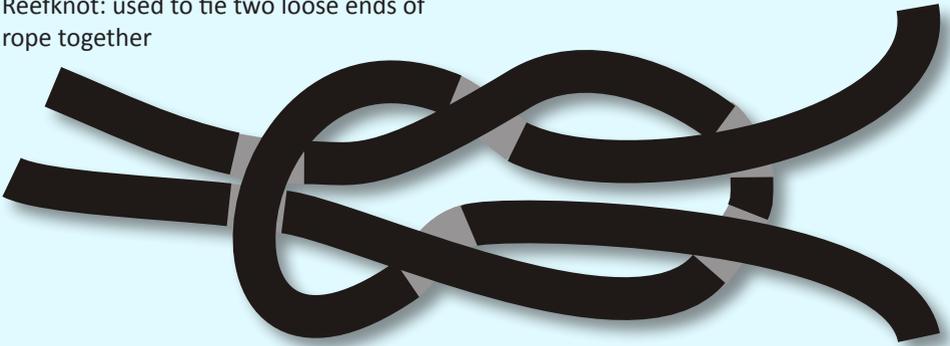
During Sundays and racing events, a rescue boat will in principle be out on the water, and alert. However, you remain responsible for your own safety.



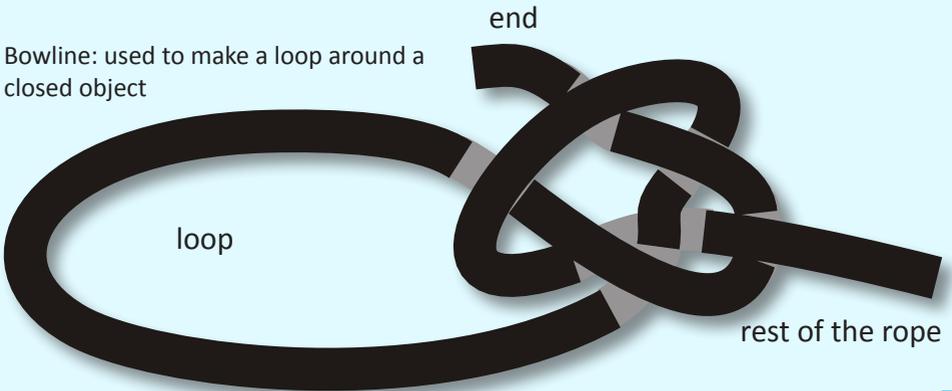
Figure of eight: put at the end of a rope to prevent it from slipping out of a cleat or pulley block



Reefknot: used to tie two loose ends of rope together



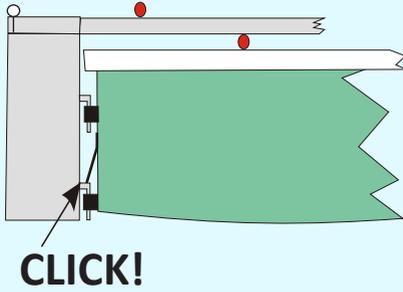
Bowline: used to make a loop around a closed object



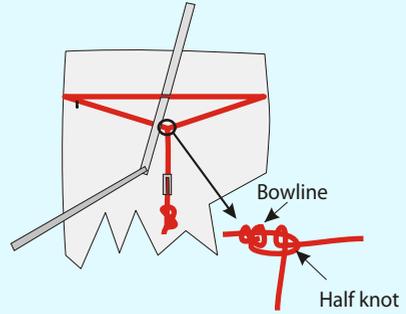
Rigging a Laser



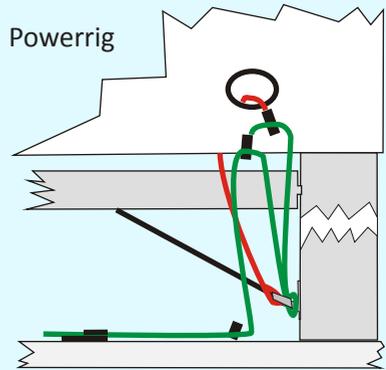
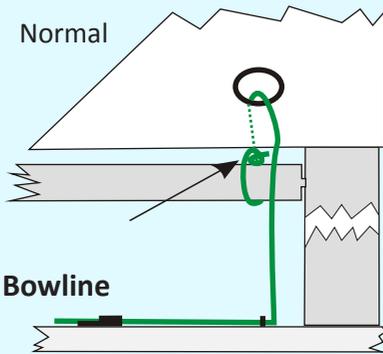
Rudder



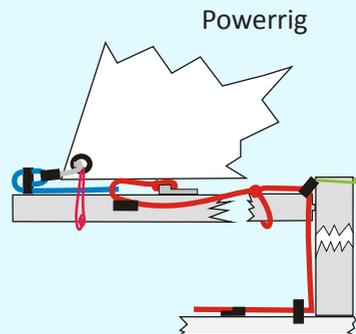
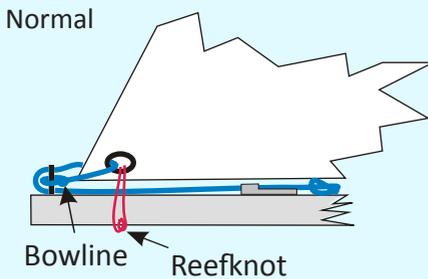
Traveller



Cunningham



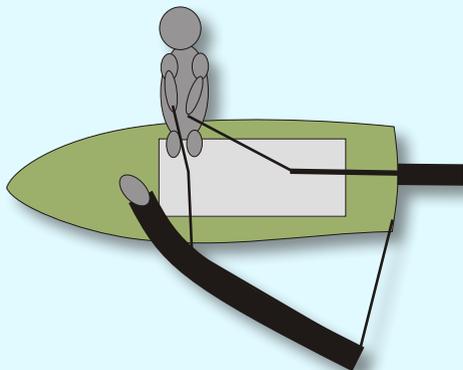
Outhaul and tiedown





Controlling the speed of your boat

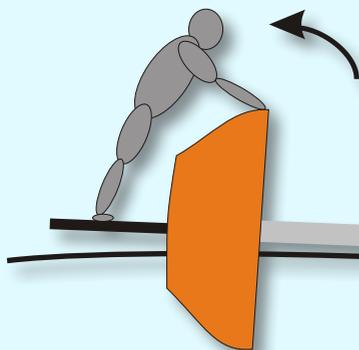
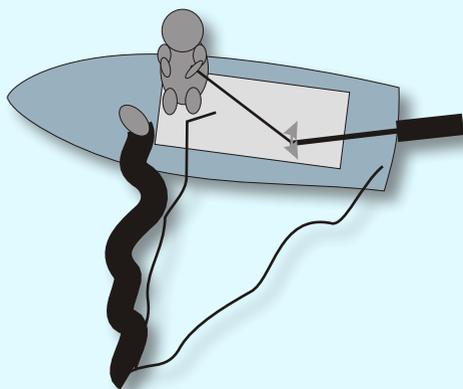
Maximum speed: a boat usually moves at her maximum speed on a particular course if the sail is just full (or just not flapping), the boat is flat in the water (hike out!), and the rudder is kept straight.



You reduce the speed or stop the boat on a beat or reach by letting your sail out, *while not changing your course*.

You reduce the speed or stop the boat on a run by turning the boat into the wind forcefully (push the tiller away from you fast).

You keep the boat in position without moving by letting the sail out completely while keeping her to a 45-90 degrees angle from the wind.



You lift a capsized boat: by climbing on the centreboard, grabbing the deck and leaning backwards.

When she is upright, climb in the boat at the rear end of the cockpit, grab the tiller extension and pull the tiller towards you, while sheeting in the main sheet.

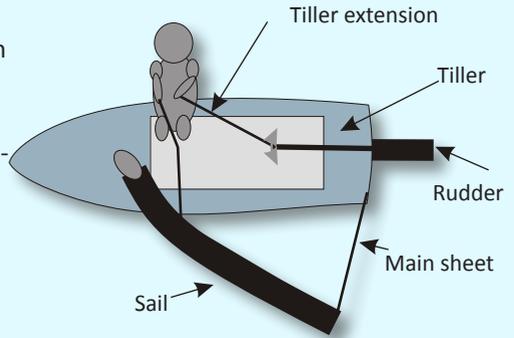
Steering a Laser



Sailing a straight course:

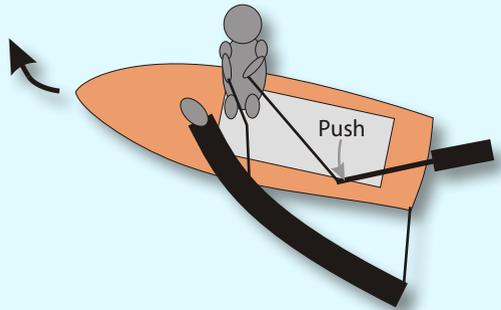
Tiller and rudder are in the centre of the boat. Tiller extension in back hand, and in an angle to the tiller. Main sheet in front hand, sit at the front of the cockpit.

Look ahead and push and pull tiller extension slightly to steer straight towards a landmark on the shore.



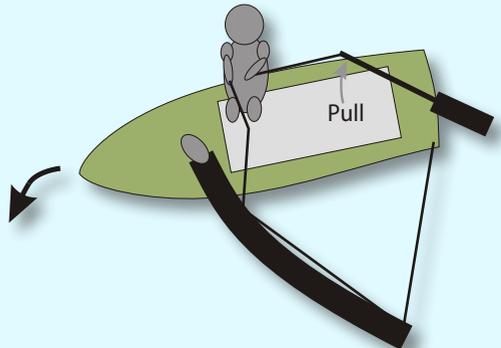
Hardening up (steering towards the wind):

Push the tiller away from you, pull the main sheet in, until you reach your new course. Straighten your tiller and rudder.



Bearing away (steering away from the wind):

Pull the tiller towards you, let the main sheet out, until you reach your new course. Straighten your tiller and rudder.

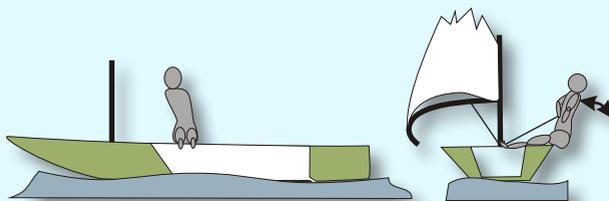




Where and how to sit in a Laser

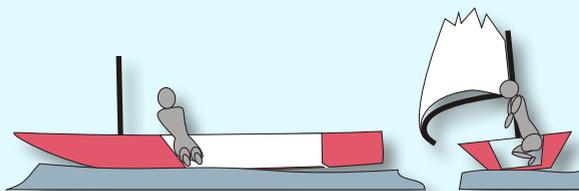
Standard position (moderate winds reach and all beats):

Sit to the front of the cockpit, upper body over the edge of the windward deck, feet under the toestraps, lean out and forward keep to boat flat and the transom out of the water.



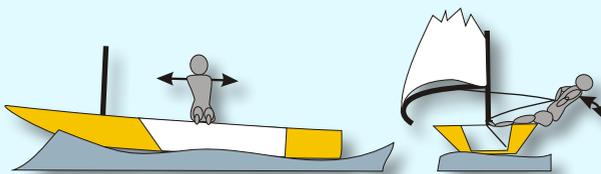
Very light winds all points of sailing:

Sit inside the cockpit as much forward as possible to lift the transom out of the water, lean to leeward to keep the sail full and to leeward, move as little as possible.



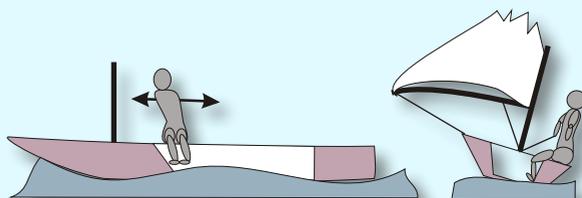
Stronger winds reach while planing:

Sit 1/3 from the front of the cockpit, bum and upper body over the edge of the windward deck, feet under the toestraps, lean out to keep the boat flat, move upper body backwards and forwards to lift the bow over the waves.



Running (by the lee) with moderate to strong winds:

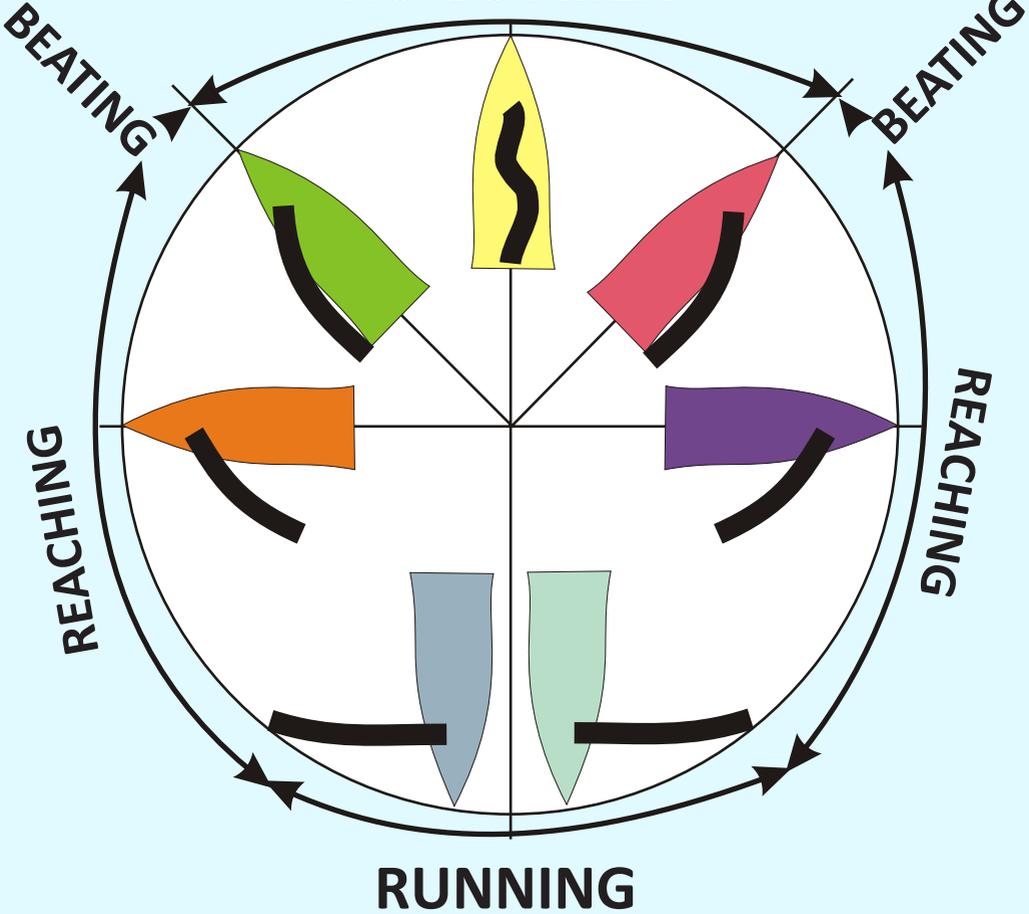
Sit forward on the deck, lean out a bit heeling the boat to windward, move backwards to lift the boat over wave and forwards to run down a wave.



Points of Sailing



NO GO AREA



Beating:

- Sail tight (block-to-block)
- Centreboard down

Reaching:

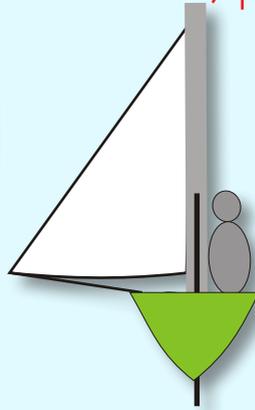
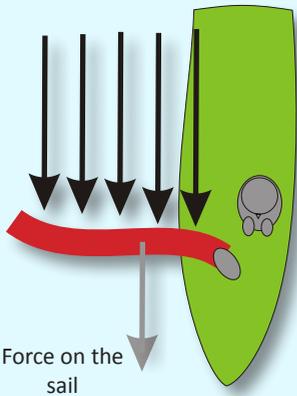
- Sail a bit loose, to slightly over halfway out
- Centreboard a bit up

Running:

- Sail all the way out
- Centreboard half-way up

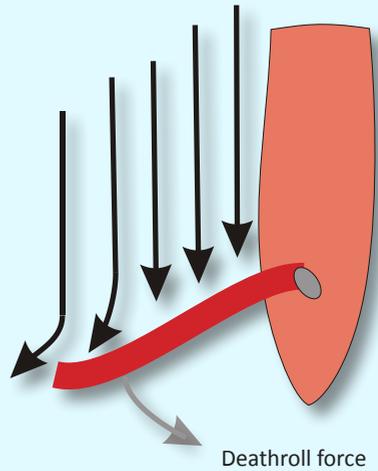
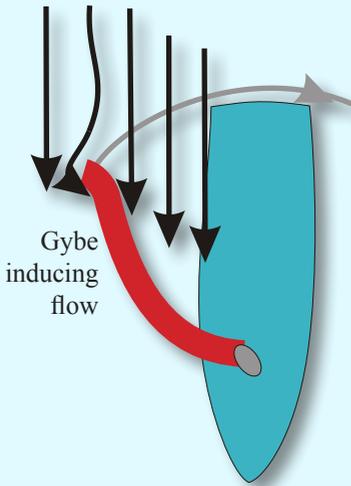


Running



Running:

Sail fully out. The boat is pushed forward, no flow along the sail. Only a forward force, no drift or tilt, therefore usually no need for centreboard and hiking out.



Running, sail too tight: not all wind is caught and the boat does not reach its maximum speed. Chances for an involuntary gybe increased.
Signs: unstable leech. Remedy: let sail out

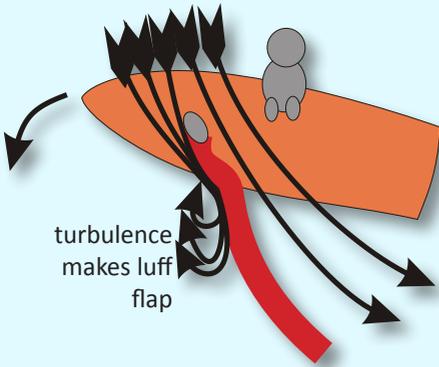
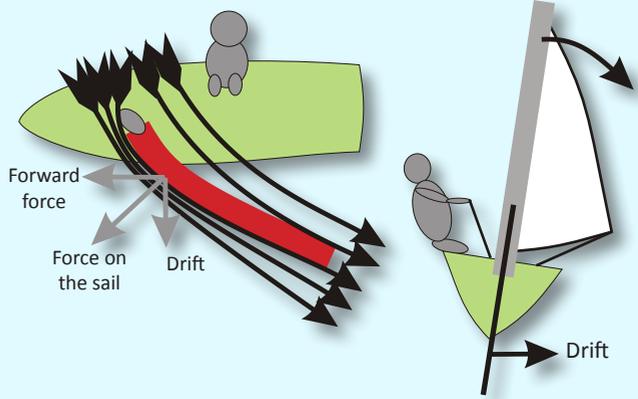
Running, sail too loose: wind is shed at the leech and the boat does not reach its maximum speed. Signs: Boat tends to roll to windward and dip its bow, sometimes resulting in a deathroll. Remedy: pull sail in, and bear away.

Reaching



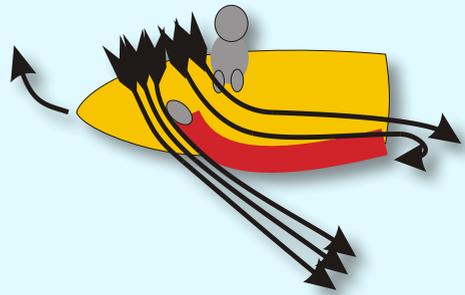
Reaching:

Sail halfway out, flow along the sail creates forward force and drift. Large forward force in comparison to drift and tilt. Centreboard halfway down to counteract the drift, some hiking to counteract the tilt.



Reaching, sail too loose:

Flow bounces off the luff of the sail.
Signs: Flapping luff, boat does not move well, tends to turn away from the wind, no tilt.
Remedy: pull sail in until flapping stops, and rudder feels almost neutral.

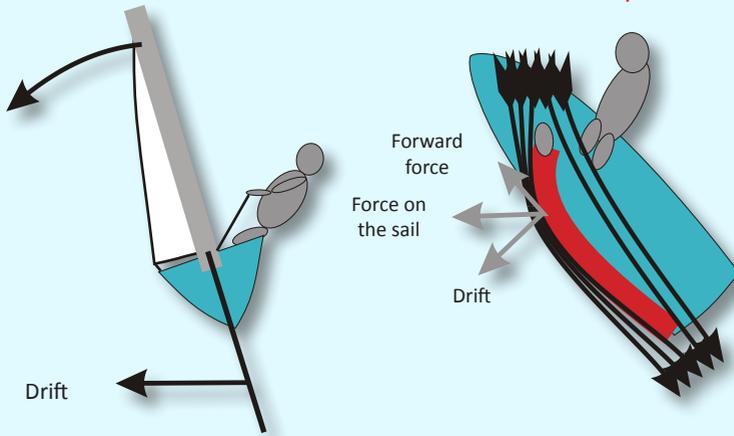


Reaching, sail too tight: Flow does not follow the luff of the sail, windward flow bounces off the leech.

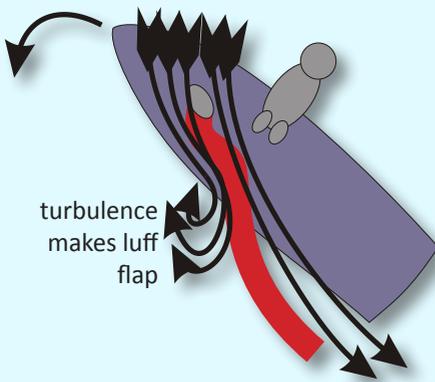
Signs: no speed, too much tilt, boat tends to move into the wind.
Remedy: let sail out until the luff starts flapping, then pull it in until it just stops flapping.



Beating

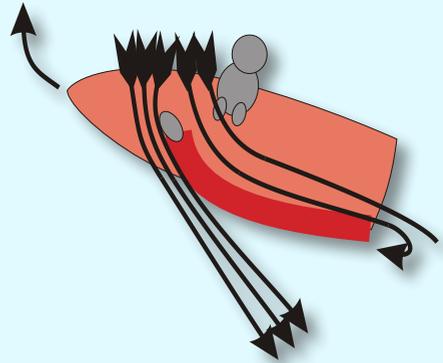


Beating:
Sail tight (block to block). Small forward force in comparison to drift and tilt. Centreboard down and hiking out to counteract drift and tilt.



Beating, sail too loose:

Flow bounces off the luff of the sail.
Signs: Flapping luff, boat does not move well, tends to turn away from the wind, less tilt.
Remedy: pull sail in until flapping stops, and rudder feels almost neutral.



Beating, not close enough to the wind:

You are sailing a greater distance than necessary to reach your upwind target.
Signs: no speed, lots of tilt and drift, boat tends to turn into the wind.
Remedy: push the tiller away from you (turn the boat towards the wind) until the sail starts flapping, pull the tiller a little towards you (bear away) until the sail is full. Keep doing this constantly while beating

Changing course



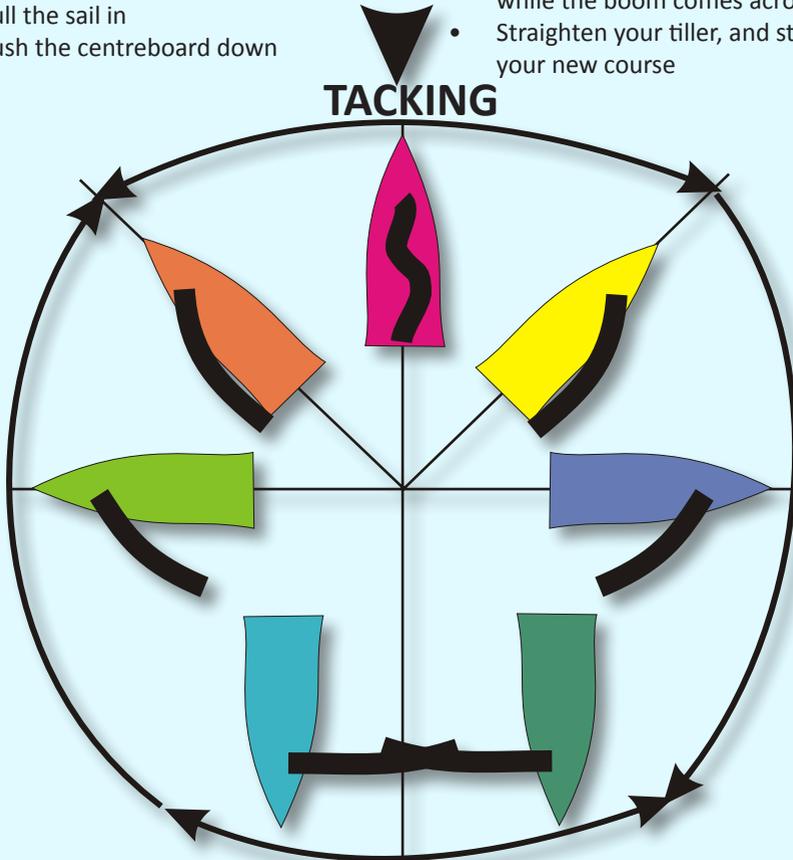
Hardening up:

- Push the tiller away from you
- Pull the sail in
- Push the centreboard down

Tacking:

- Pull the sail in
- Push the tiller away from you
- Duck and move to the other side while the boom comes across
- Straighten your tiller, and steer your new course

HARDENING UP (TOWARDS THE WIND)



BEARING AWAY (FROM THE WIND)

Gybing:

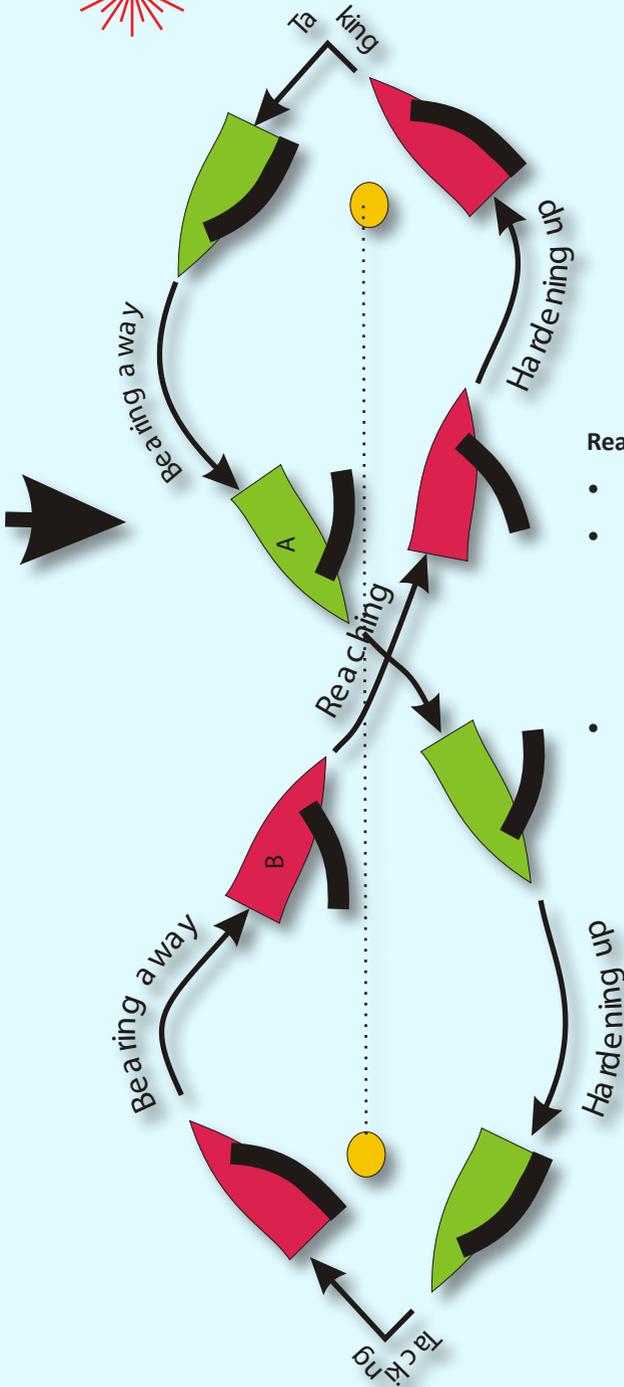
- Pull the sail a little bit in
- Pull the tiller towards you
- Duck fast, and move to the other side while the boom comes across
- Straighten your tiller and steer your new course

Bearing away:

- Pull the tiller towards you
- Let the sail out
- Pull the centreboard up



Reaching and tacking



Reaching:

- Centreboard half up
- Sail about halfway out
 - when speed reduces, let your sail out a bit or harden up
 - when speed increases, pull your sail in a bit or bear away
- Surf down the waves for maximum speed

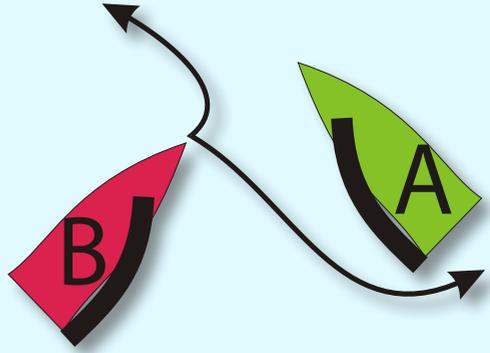


RULES WHEN BOATS

Boats on different tacks:

A boat sailing on starboard tack has right of way over a boat on port tack. A boat sails on starboard tack when the boom is on the port side (left) of the boat.

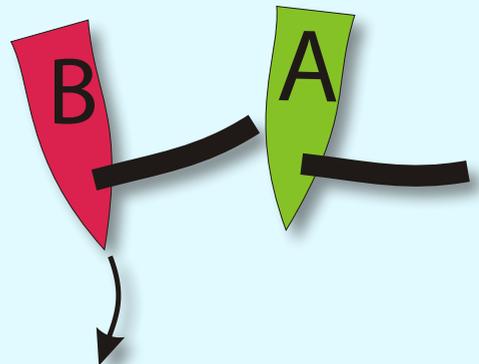
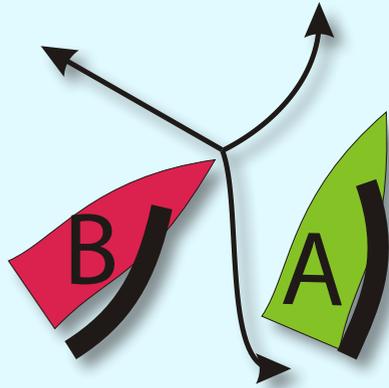
In the diagram B is on port tack and has to give way to A. She can either tack or pass behind the transom of A.



Boats on the same tack:

A boat sailing windward of another boat has to keep clear of the leeward boat. A boat sails windward of another boat if its boom points towards the other boat.

In the diagrams, B is the windward boat and has to keep clear of A by steering closer to the wind, tacking, or passing behind the transom of A.



Breaking a rule:

If you fault another sailor you have to do a 720 (tack, gybe, tack, gybe), if you hit a mark you do a 360 (tack and gybe).

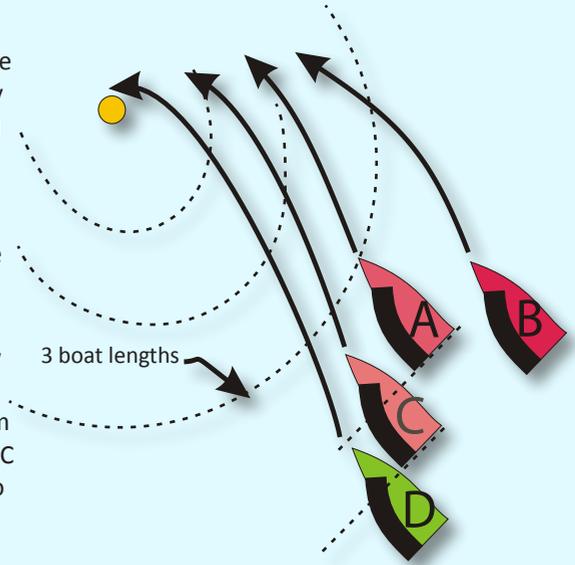
MEET ON THE WATER



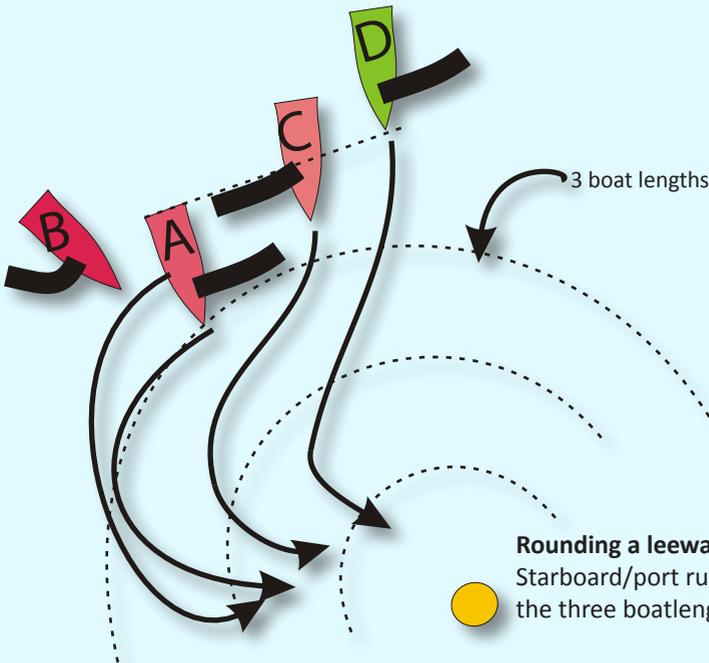
Overlap rule for all mark roundings:

When a boat hits the three boat lengths zone around a mark, an inside boat with an overlap has right of way at the mark. This rule cascades down to any other boat with an overlap on a boat with right of way. A boat has established an overlap on another boat when her bow has passed a line perpendicular to the transom of the other boat.

In the diagrams to the left and below A hits the mark-zone while C has an overlap. Therefore A has to give room to C. Because D has an overlap on C, C has to give room to D, hence A has to give room to C and D. B has no rights and has to give room to all other boats.



Rounding a windward mark:
Starboard/port rule applies.

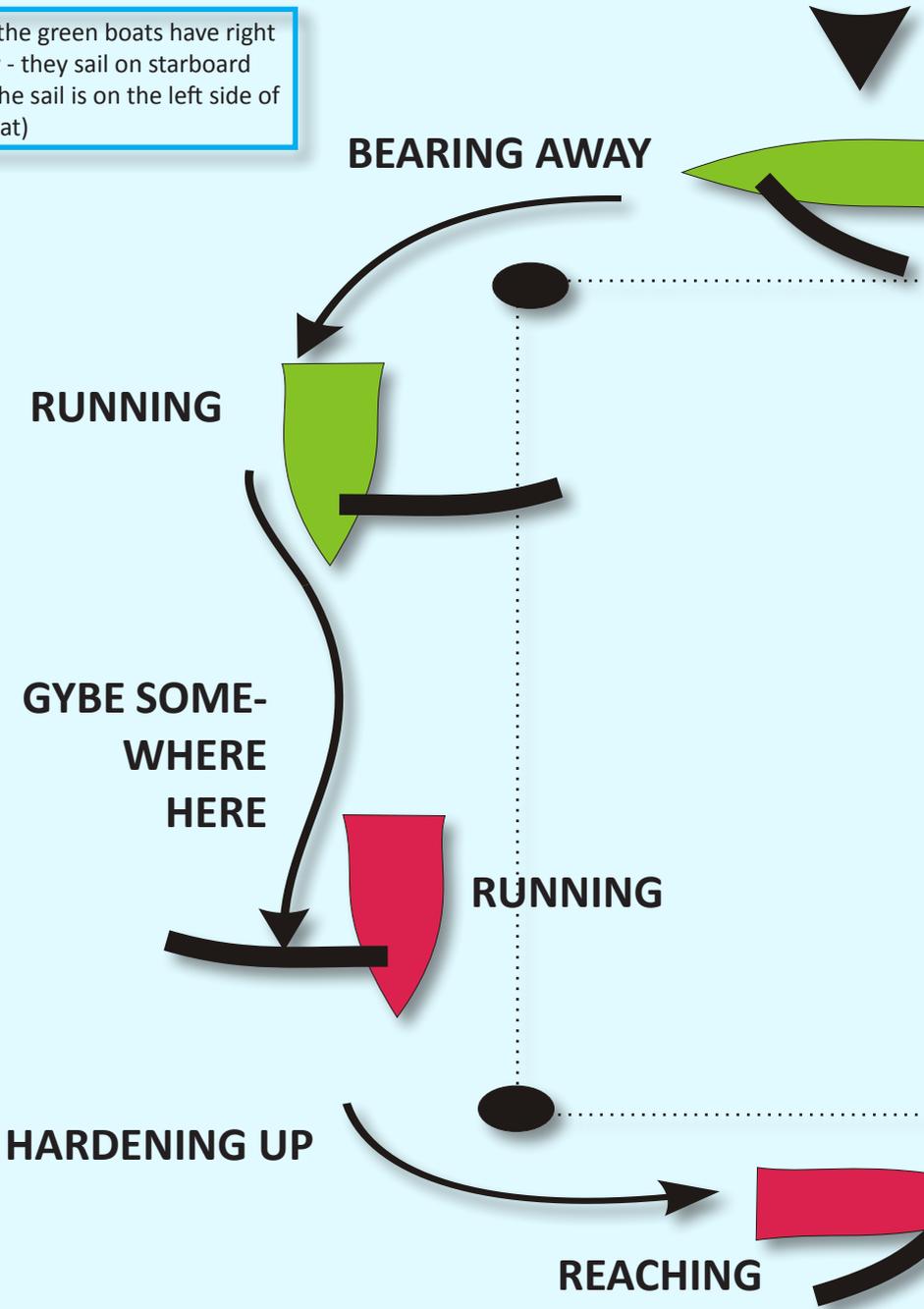


Rounding a leeward mark:
Starboard/port rule does not apply within the three boatlengths zone.

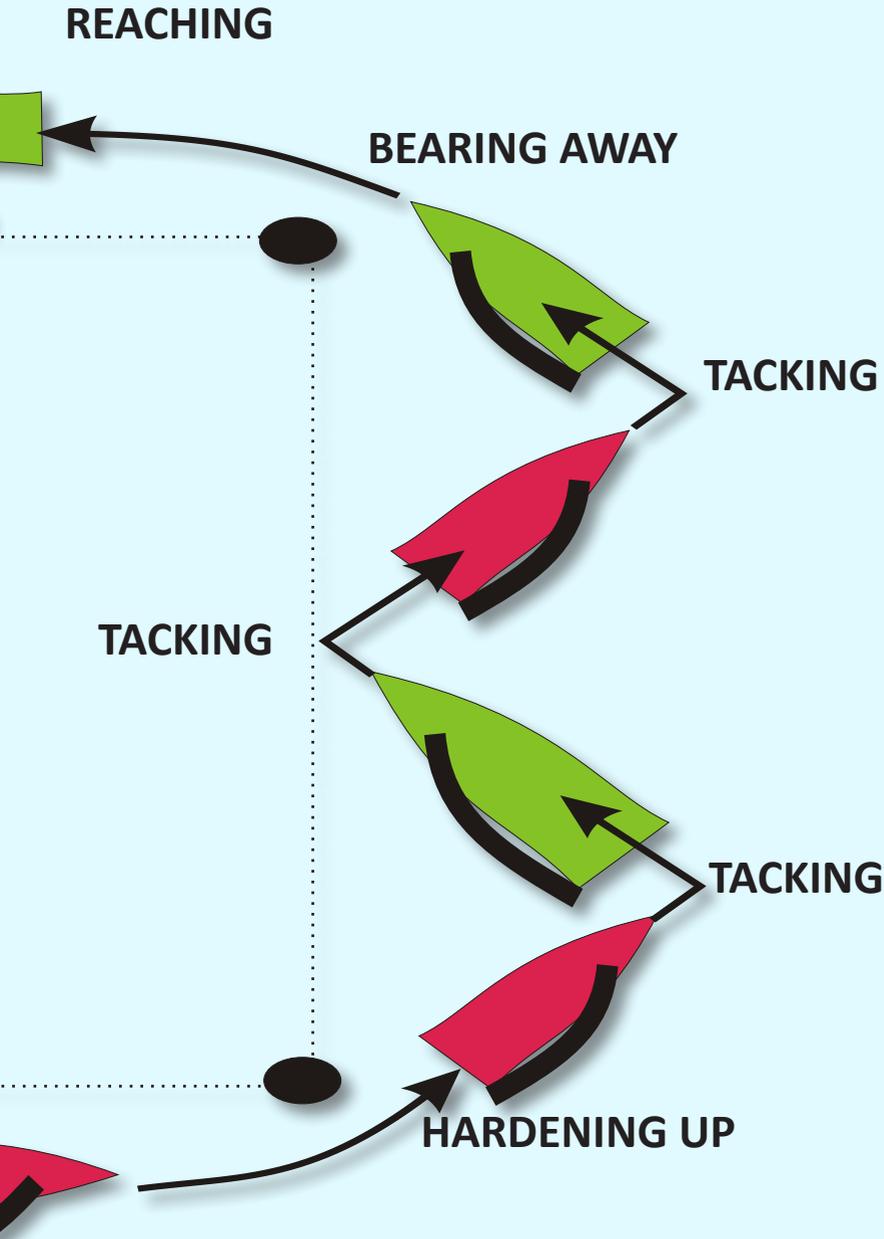


Putting it all together:

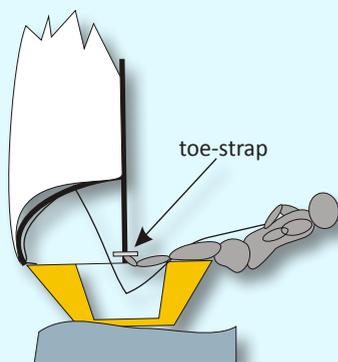
Note: the green boats have right of way - they sail on starboard tack (the sail is on the left side of the boat)



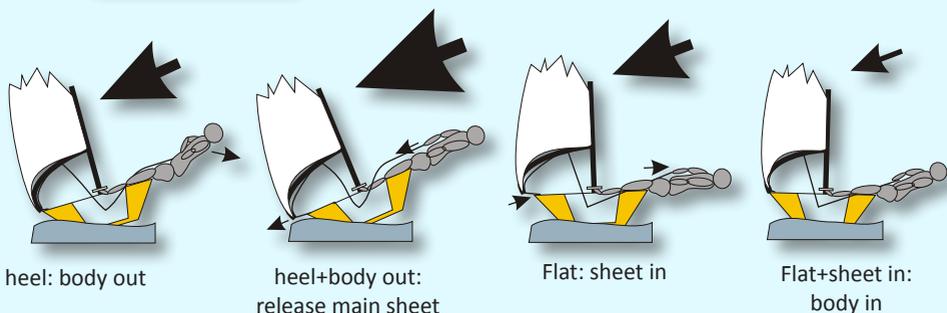
sailing a square (or to any- where)



Going faster: keep your boat flat



Lasers move faster when they are flat in the water. Depending on wind and waves, you keep the boat flat by leaning your body in and out, while sitting on the deck. In stronger winds put your feet under the toe-strap, stretch your legs, push your bum over the deck and your shoulders out as far as necessary. If the boat heels over in a gust, shed some wind by releasing a bit of mainsheet. Pull the sheet back in when the boat is flat in the water again.



heel: body out

heel+body out:
release main sheet

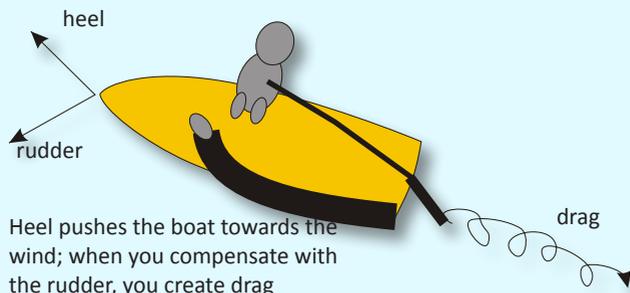
Flat: sheet in

Flat+sheet in:
body in

Going faster: limit rudder movements



A well trimmed and balanced boat will sail roughly in a straight line when the rudder is kept in the centre. If the boat heels over to leeward, and/or the sail is too tight, it tends to turn towards the wind, while if the sail is too open or the boat heels to windward it tends to bear away. You can use this to limit your rudder movements: keep your boat flat and your sail just full to sail straight; pull your sail in to turn your boat towards the wind, and let your sail out to turn away from the wind.

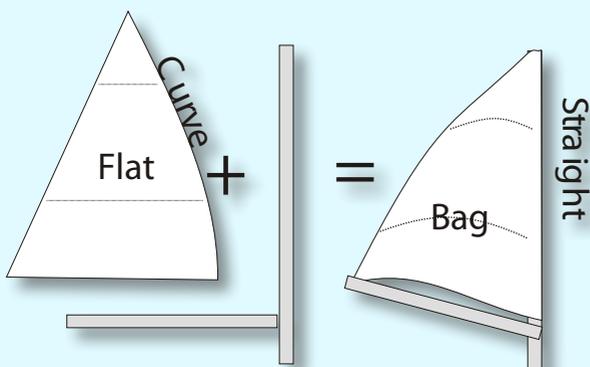


When rounding a mark to turn downwind, you will have to let your sail out besides pulling the tiller towards you, otherwise the Laser will simply refuse to bear away.



Going faster: working your control ropes

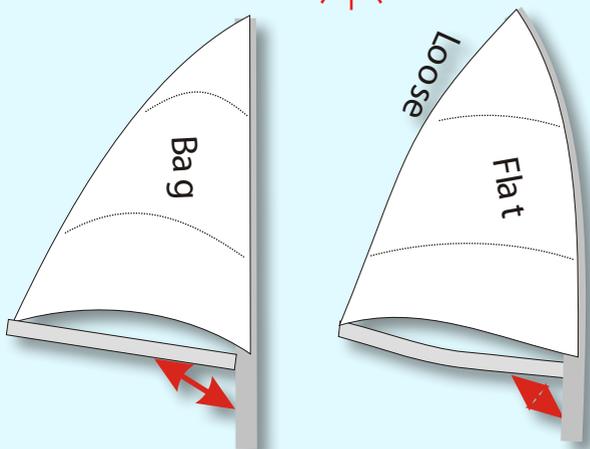
A laser sail is an almost flat piece of cloth which curves at the front (luff). If you stick a straight pole (mast) through the luff, the excess cloth will produce a bag in the sail. This bag drives the boat.



The basic rule is: **more bag gives you more power and therefore more speed.** In stronger winds, a baggy sail may result in being overpowered: the boat heels over, and is generally difficult to control. You can change the bag, hence the power, in the sail by adjusting the three major

control lines, the kicker, the outhaul and the cunningham. For all three ropes the rule is: **the tighter the rope, the flatter the sail, the less power.**

Kicker



When you tighten the kicker, the mast is pulled backwards into a curve, thereby reducing the bag, hence the power, in your sail. A flatter sail will also make your boat point higher (so long as your leech is tight), an important feature when beating. Therefore the basic rules for kicker management are:

On a beat: sail block to block and kicker tight.

In lighter winds, kicker a bit more off, so that the leech is kept close by the tension in the mainsheet.

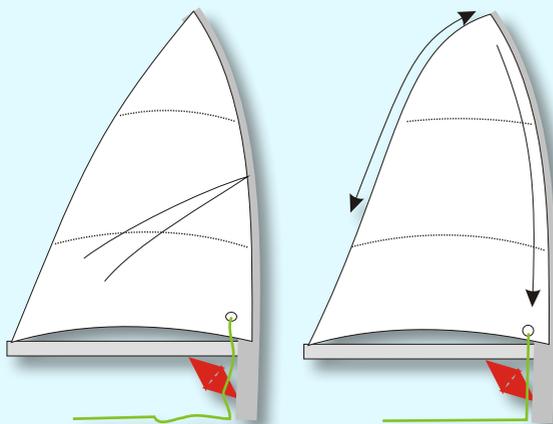
On a run: kicker a little loose. Too much off opens the leech and gives a big twist to the sail, which makes the boat unstable and prone to a deathroll.

On a reach: kicker a little more off. This keeps the boom out of the water, and gives a good drive to your sail.

Cunningham



When you tighten the cunningham, the luff is shortened and the bag of your sail moves forward. This flattens the top of the sail and opens the top leech. The top of the sail will spill wind, which will reduce the heeling over of the boat. The impact on the drive of the sail is limited as it affects a relatively small surface area. In normal conditions, you pull the cunningham just enough to straighten out the creases that appear in your sail from the mast joint when the kicker is tight. When overpowered on the beat, a tight cunningham is the best way of keeping your boat flat. On the reach and run, a loose cunningham gives you extra drive and keeps the leech closed and the boat more stable.

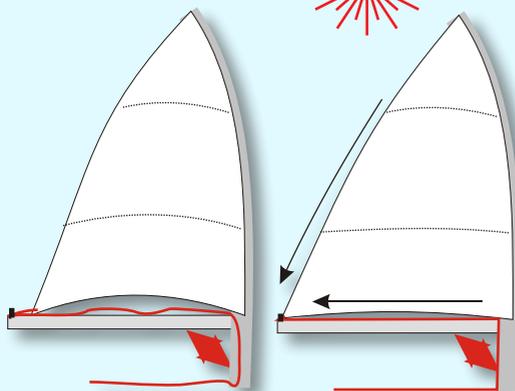


Outhaul



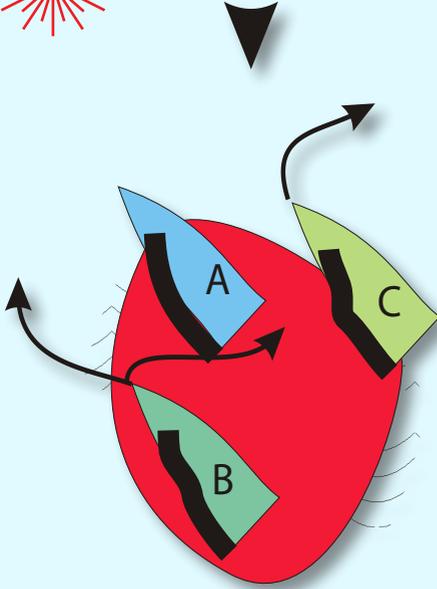
When you tighten the outhaul the bottom part of the sail will lose much of its bag. A tight outhaul will mainly reduce the drive of your sail. Because the main area affected is close to the deck, a tight outhaul will have a smaller impact on the heeling of the boat. Therefore the outhaul is usually the last to tighten when overpowered. As a rule of thumb, the outhaul's most open setting is so that the distance between the

bag and the boom is roughly the size of your stretched hand between your thumb and little finger. On the reach and run you leave your outhaul in this loose position, unless you are completely overpowered. On the beat the outhaul is more tight, and is further tightened when overpowered.

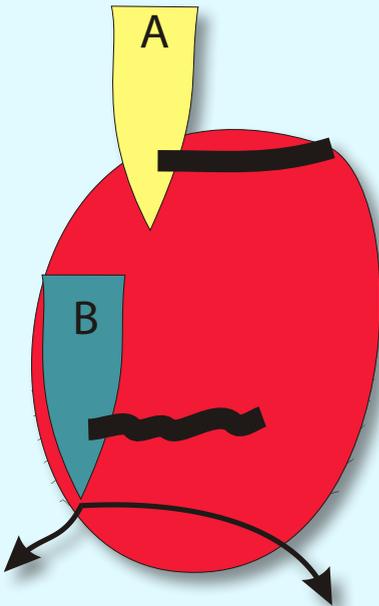




Going faster: free wind

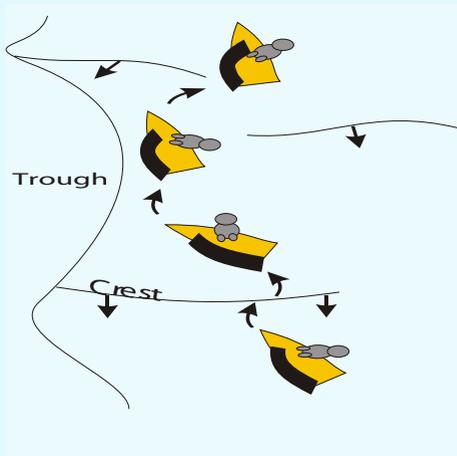


A sail creates an area of disturbed wind around it as shown in the diagram. Boat B and C are slowed down and lose height because of bad wind from boat A, and lose out against other boats in the fleet with free wind. Both boats will have to take action to get out of the disturbed wind of A by either tacking away, or, for boat B, bearing away from A.

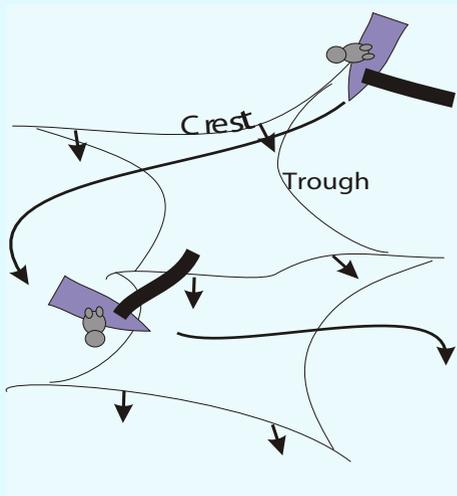


On the run, disturbed wind is created by the boats behind for the boats in front. Boat A will try to cover boat B as much as possible and eventually will come aside or overtake. Boat B can try to move away from A. It can bear away (long arrow), so long A has no overlap, or it can harden up a bit (short arrow). Doing nothing will result in A catching up, or passing to leeward.

Going faster: riding waves



On the beat, you want to spend as little time possible climbing waves and as much time possible riding down the crest of waves. At all cost, you try to avoid slamming your hull into the water. Steer up when climbing while moving your body backwards, bear away and stick to the wave when surfing down. Steer for gaps between waves wherever possible.



On the run and the reaches you ride 'downhill' as long as you can, even if that means making sharp turns and sailing further than a straight line to the mark.

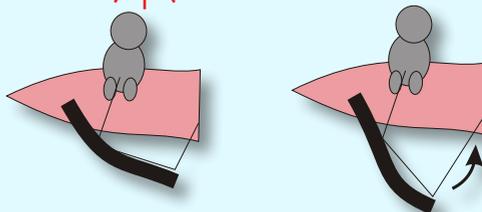
In practice, therefore, you hardly ever sail straight downwind, but switch between sailing 'by the lee' and broad reaching, thereby sticking to a wave as long as you can, and jump to another one when you are about to reach the trough.

Avoid being caught up by a wave at all costs.

Rules: pumping

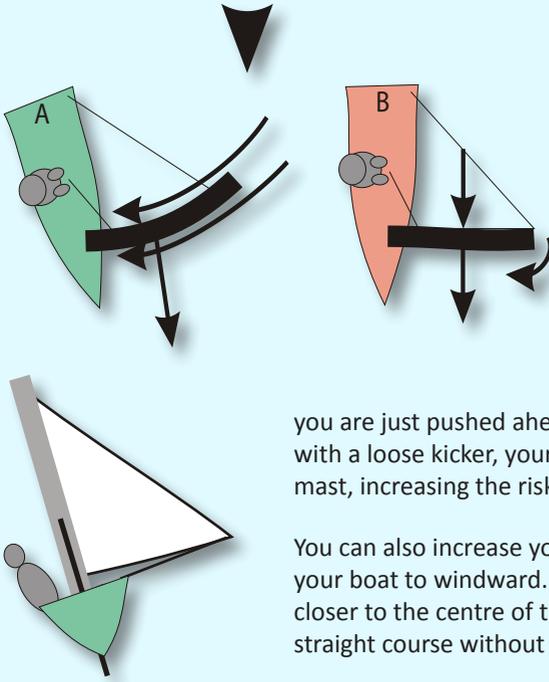


Rule 42 prohibits repeated fanning of the sail by pulling in and releasing the sail or by body movements, unless for initiating surfing (rapidly accelerating) down the leeward side of a wave. In such a case you are allowed the pull the main sheet only once for each wave or gust of wind.





Going faster: sailing 'by the lee'



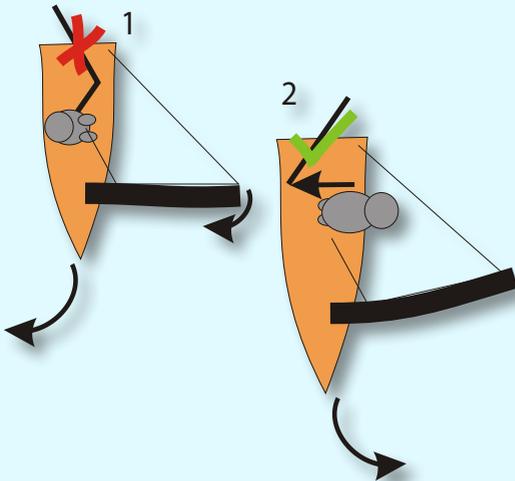
Because a Laser has no stays, you can let your sail out at or even beyond 90° to the mast. On a run you can use this to create an air flow along the sail from the leech (outside) to the luff (mast) by sailing a little bit 'inside' the wind (A). This will give you a more stable ride, because the forward force is close to the centre of the boat, and it will give you higher speed, than when

you are just pushed ahead. In the latter case, and especially with a loose kicker, your top leech may twist in front of the mast, increasing the risk of a 'deathroll' (B).

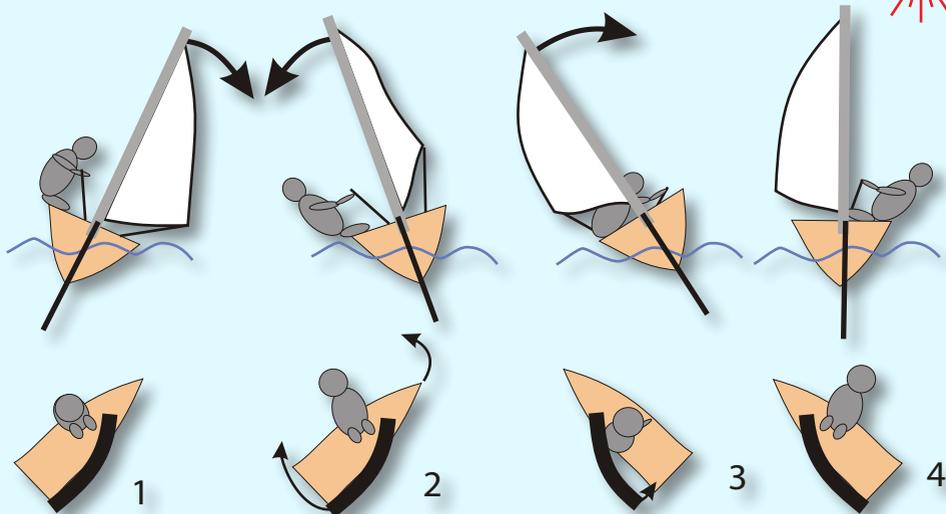
You can also increase your downwind speed by leaning your boat to windward. This helps to put the forward force closer to the centre of the boat, and keeps the boat on a straight course without having to use your rudder.

A **deathroll** is a very fast and violent capsize to windward over the bow, caused by too much twist in the top of the leech. The stern of the boat is lifted out of the water, while the boat turns towards the wind. Intuitively you tend to rectify a pending deathroll by pushing the tiller away (hardening-up), but this will make things worse: the rudder works as a plane, lifting the stern even faster out of the water (1).

You can recover from a pending deathroll, by 1) pulling your sail in fast, 2) jumping to the leeward side of the boat and 3) bearing away (pushing the tiller hard to the windward side of the boat) (2), all at the same time!



Going faster: roll-tacking

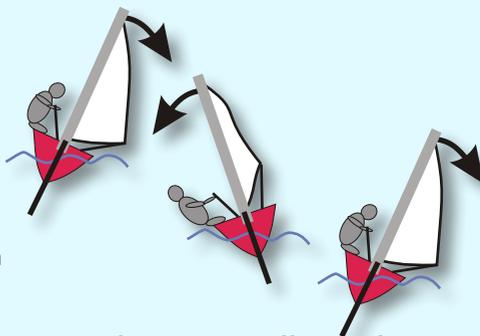


During a roll-tack you try to snap the sail in a single movement from one side of the boat to the other thereby minimizing a flapping sail and loss of power, and to create some additional airflow along the sail, which helps to get the boat started on the new tack. It involves 4 steps: 1) first roll the boat to leeward, until the water reaches the deck; 2) roll the boat back to windward while turning it through the wind; wait until the boom comes across and the now new leeward deck almost touches the water, slip a bit a mainsheet; 3) duck under the boom, grab the windward deck and haul yourself smoothly to the windward side of the boat, while pulling in the sail; 4) bring the boat in horizontal position and sail on.

Rules: rocking a boat



In low winds you can create airflow along the sail by rocking your boat. Rule 42 prohibits the repeated rolling of the boat induced by body movement, adjustment of the sail or steering. However, you are allowed to roll your boat to facilitate steering (roll to windward and the boat will bear away and vice versa). You may also roll your boat through a tack or gybe as described above, provided that just after the tack or gybe the boat speed is not greater than it would have been in absence of the tack or gybe.



Rocking: not allowed



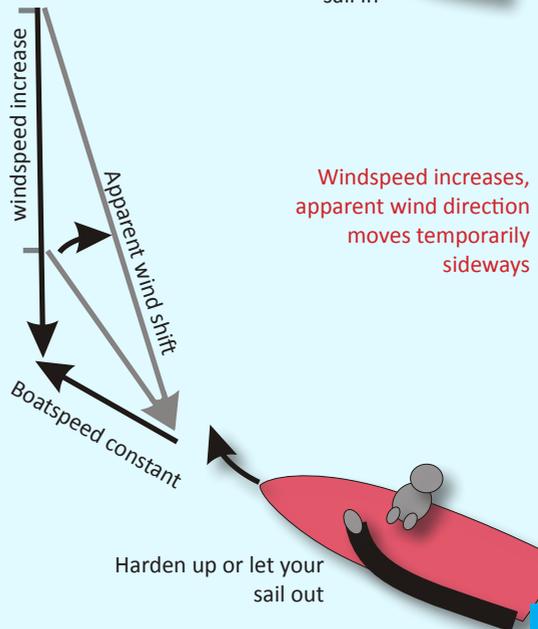
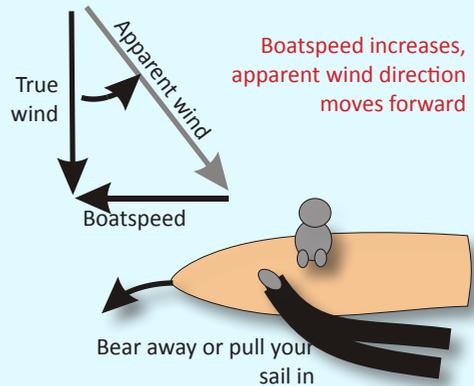
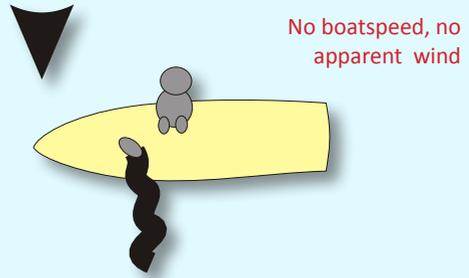
True and apparent wind directions

The wind direction experienced by a not-moving boat is different from that by a moving boat.

A moving boat creates her own wind in the opposite direction in which she moves, just like a moving car or bicycle. This shifts the angle of the wind on the boat a bit forward, and the effect becomes bigger when boat speed increases. Consequently, you have to adjust your sail setting or your course when your boat speed changes. For instance when you run down a wave and your speed increases you have to pull your sail in, or bear away a bit. When boat speed reduces, you let out your sail or harden up.

A change in windspeed also affects the apparent wind direction. When a gust hits a moving boat, it will take some time before boat speed increases. In that short period the apparent wind moves from the front of the boat to the side. Consequently, you can harden up, or let your sail out a bit, until the boat speed is adjusted to the wind speed.

Beginner sailors and light sailors tend to harden up in a gust rather than let the sail out. This 'pinching' of the boat is in most circumstances not the fastest technique. The rule is: go for speed before you go for height.

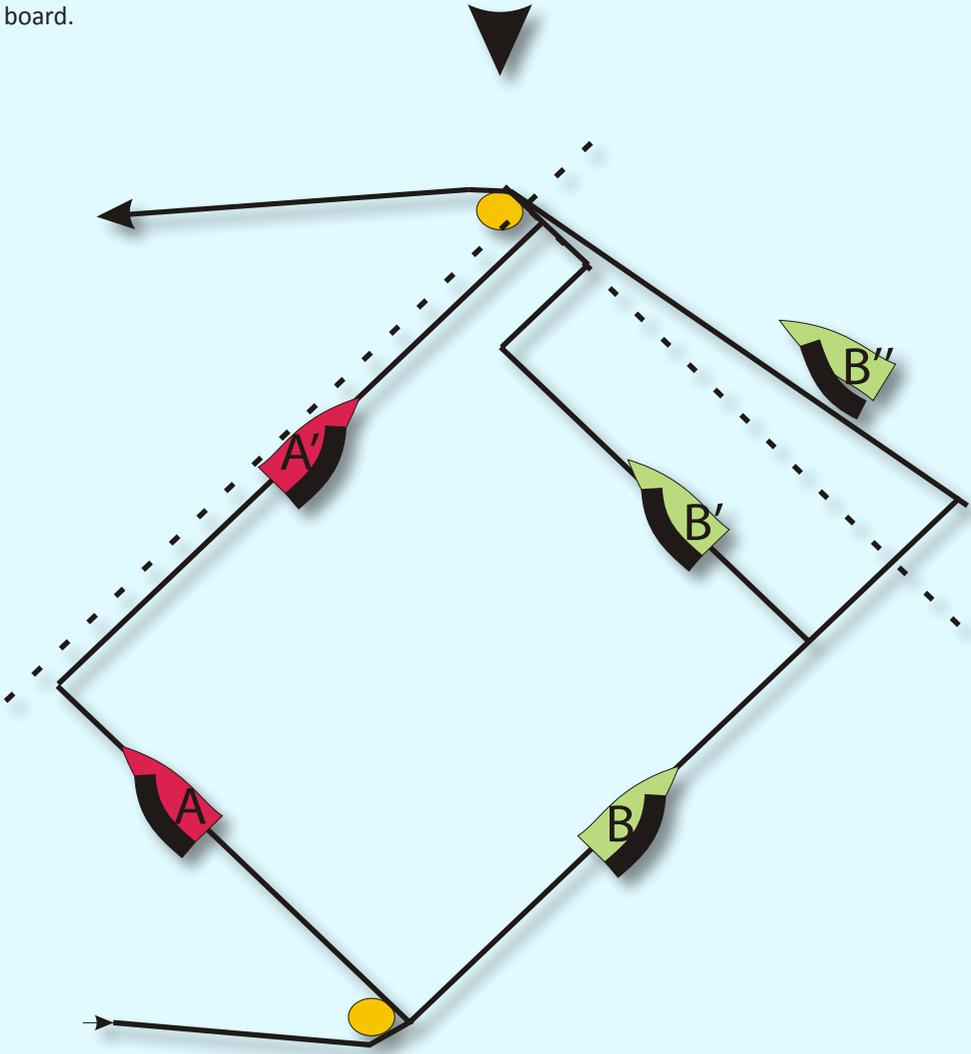


Arriving earlier: the shortest course upwind



If the wind does not shift, route A-A' and B-B' have exactly the same distance. Route B-B'' is longer because B has over sailed the layline to the windward mark. From far away it is difficult to judge where the layline is. It may also change because of a wind-shift. An extra tack, as B-B'' does, is a safe way of approaching the mark without sailing too far.

A-A' approaches the mark on port tack, which puts her in a disadvantaged position at the mark, because she has no right of way on boats approaching the mark on star-board.

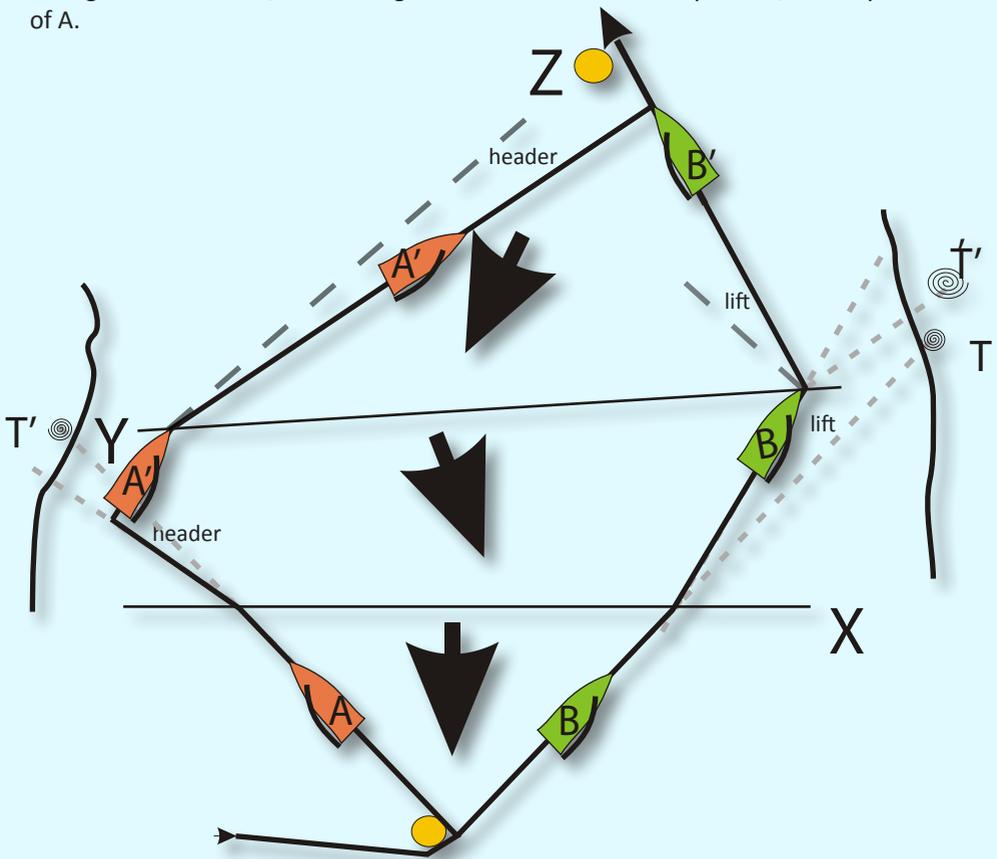




Arriving earlier: the shortest course upwind in shifting wind conditions

The wind never blows constantly from one direction. The normal S winds at Kaazi in fact oscillate 5-10 degrees on either side of the average direction. Noticing and acting upon the 'shifts' is a critical skill of a competitive sailor.

Moving with the windshifts gives you the shortest route between two marks as shown in the diagram. Boat A and B start at the same time from the leeward mark and move at the same speed. At time X, the wind shifts to the left. B notices that the tree on the hill she was pointing at shifts to leeward: she is 'lifted' (moves closer to the mark) and continues her course. A encounters the same shift but for him it is a 'header' (moves away from the mark): the tree on the hill shift to windward. He fails to tack and sails further than needed. At time Y the wind shifts back to the right of the course. A' and B' are both headed (see a tree moving to windward). B tacks while A again continues sailing into the header, and sails again further than needed. By time Z, B is way ahead of A.



Arriving earlier: the shortest course upwind in a permanent windshift



If the wind shifts persistently to one side of the course during a leg, the shortest route to sail the beat is on the 'inside' of the windshift.

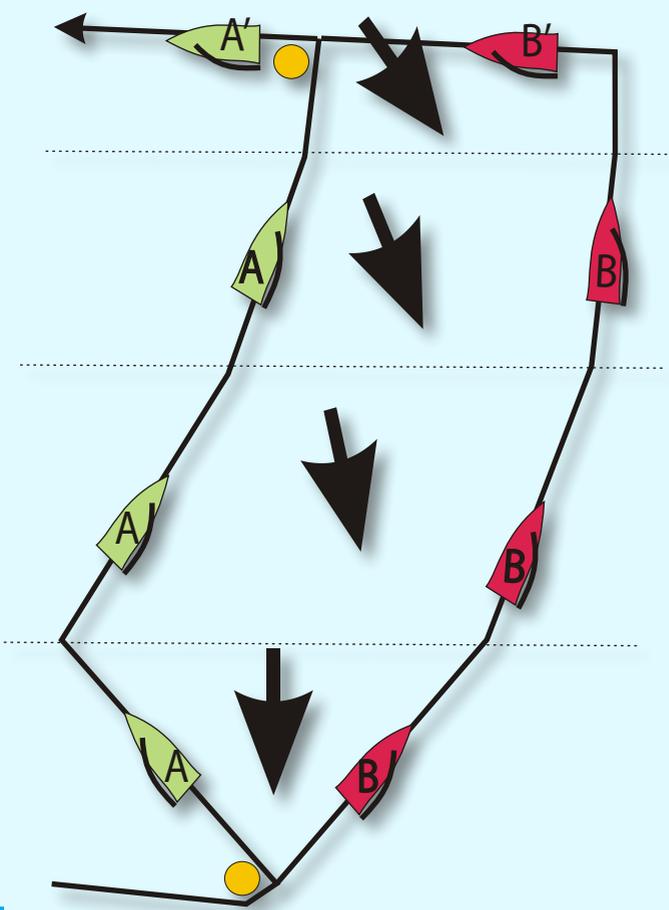
A and B both round the bottom mark at the same time and move with the same speed. A expects a windshift to the left and sails on starboard towards the shift, while B continues to sail on port to the right side of the course. When the shift hits the course, A is headed and tacks to port. B is lifted and happily continues sailing.

As the wind continues shifting to the left, both boats are being lifted and sail in an arc towards the mark. Because A is on the inside, her arc is shorter and she will arrive at the windward mark before B.

If you find yourself in position B early in the shift, the best is to bite the bullet and tack

to the other side of the course, thereby trying to minimise your loss.

You can distinguish a persistent windshift from normal oscillations by looking at what causes the shift: a thunderstorm over Mukono will pull the wind persistently to the East. On a clear day an early SE wind tends to move in the afternoon slowly but persistently to S (the right side of the course).





Arriving earlier: clever mark roundings

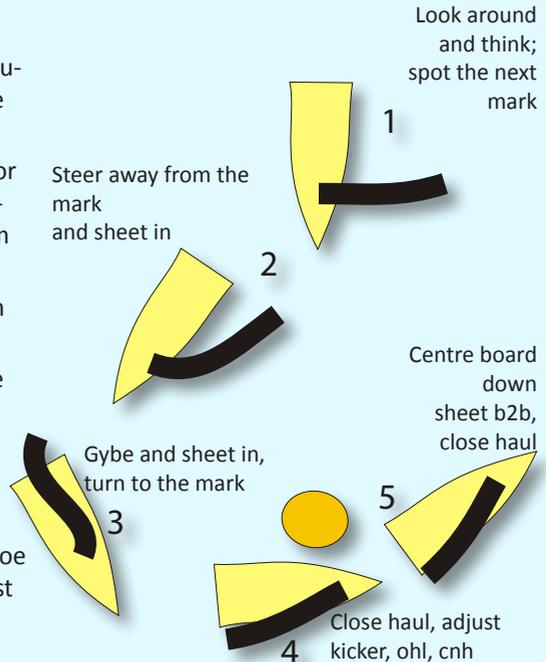
You gain a lot by perfecting your **windward mark roundings** as follows:

1. 5-10 boatlengths from the mark: look where the next mark is, and where your competitors are - do you have right of way, can somebody still squeeze in?
2. 3-5 boatlengths: release the kicker, bear away towards the mark
3. 1-3 boatlengths: release outhaul and cunningham, start releasing the mainsheet (watch out that the tip of the boom does not touch the mark), look for a wave to catch
4. clear the mark, pull the centreboard up, jump on a wave and pump the sail once



The **leeward mark rounding** is even more critical, since more steps are usually involved and more ground can be lost to your competitors:

1. 5-10 boatlengths: look around for the next mark and your competitors: make sure nobody can claim water
2. 3-5 boatlengths: steer away from the mark and start sheeting in
3. turn the boat and gybe, continue sheeting in
4. at the mark: centre board down, sheet in b2b, and harden up to close haul
5. steer close haul, feet under the toe strap, hike out, kicker tight, adjust cunningham and outhaul



Laser racing



A good and exciting way of practising and improving your sailing skills is by sailing races. You can start joining club races, and move to regional and even international racing once you are comfortable in the Laser. Club regattas consist usually of three or more races of about 45 - 60 minutes, international regattas may include races of 1.5 hours over several days.

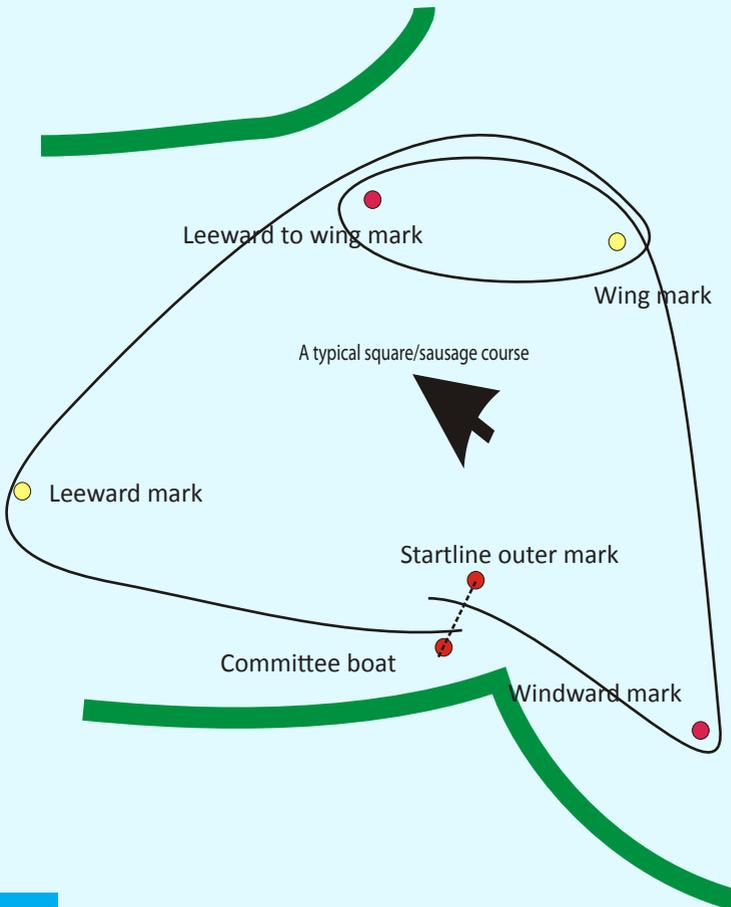
A standard course for a race includes all points of sailing. The Olympic triangle or trapezium is most often used: it consists of a full course, a loop (the sausage) and another full course. All marks are usually rounded to port.

Points are awarded for each race: first 1 point, second 2 points etc. Winner of the event is the sailor with the lowest score out of all races.

If the fleet has mixed standard, radial and 4.7 sails, the smaller sails are handicapped: their elapsed time is adjusted by 2% and 9% respectively as compared to the standard

sail. In strong winds and for light or less experienced sailors, the smaller sails often lead to better results.

Many clubs have a personal handicap system. This is calculated as your average sailing performance as compared to other sailors. The handicap system ensures that anybody can win a race or an event. Actually, experience has shown that beginners tend to win many of the handicap events because they learn so fast. So give it a try.



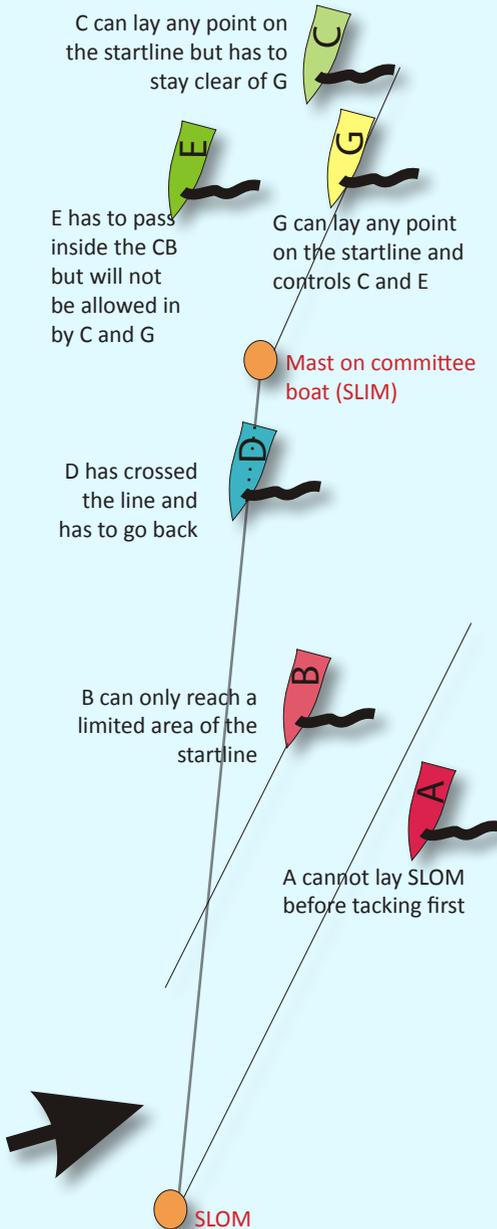


Starting basics

A good start makes up for at least 30% of your race result. Mastering starts is therefore a critical sailing skill.

Starting preparations:

- 30-10 minutes before the start: check the course, launch your boat from the beach, test the wind, set your sails while moving to the start area, run the course in your head
- 5 minutes warning: be around the starting area, set your watch, do a short beat, run back to the start line, adjust your sails, clean your foils
- 4 minutes preparatory: check your watch again, sail the start line, time the speed, decide your start tactics and how to do the first beat, keep an eye on other boats



1 minute before the start:

- float at your preferred position, watch the other boats, move slowly towards your preferred place at the start line, fend off other boats, increase speed and go.

Worst positions:

- $A > E > D$: all have to turn before they can start

Not so good positions:

- B has limited room for manoeuvre

Good position:

- C can duck behind G, or wait if G floats off the lay line

Excellent position:

- G can lay any place on the line and controls C and E

Where to start and finish

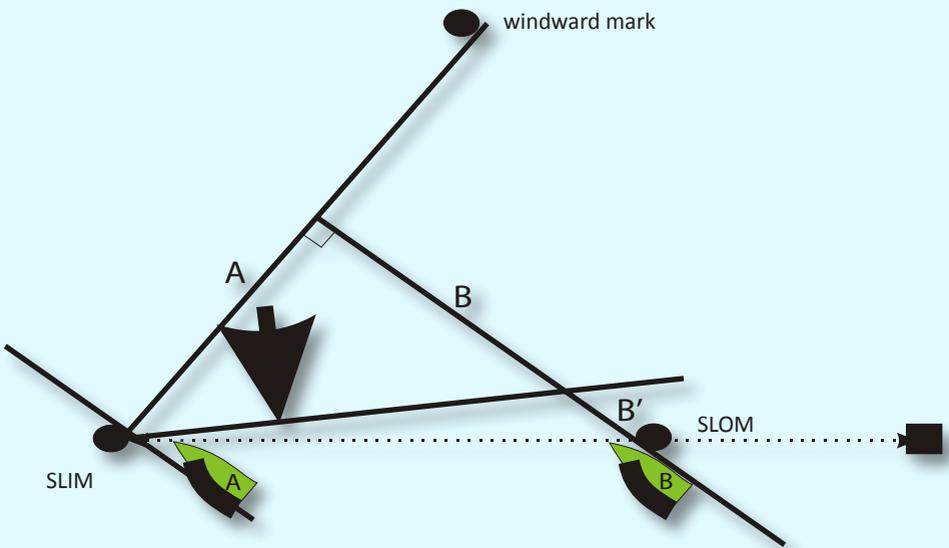


If the wind hits the startline not at 90 degrees, the best place to start is at the end of the startline where the wind comes from.

Boat A and B start at exactly the same time. Boat B has to sail B' further than boat A, and with the same speed will be later at the windward mark than A.

Another important consideration for where to start is to have free wind. If one end of the startline is favoured, it may be so crowded that staying out of the fray and find a place with free wind, is the better option.

When finishing on a beat the shortest route is to finish at the leeward side of the finish line, or the opposite side of where you should have started from, provided that the wind has not shifted to the leeward side of the line during the race.

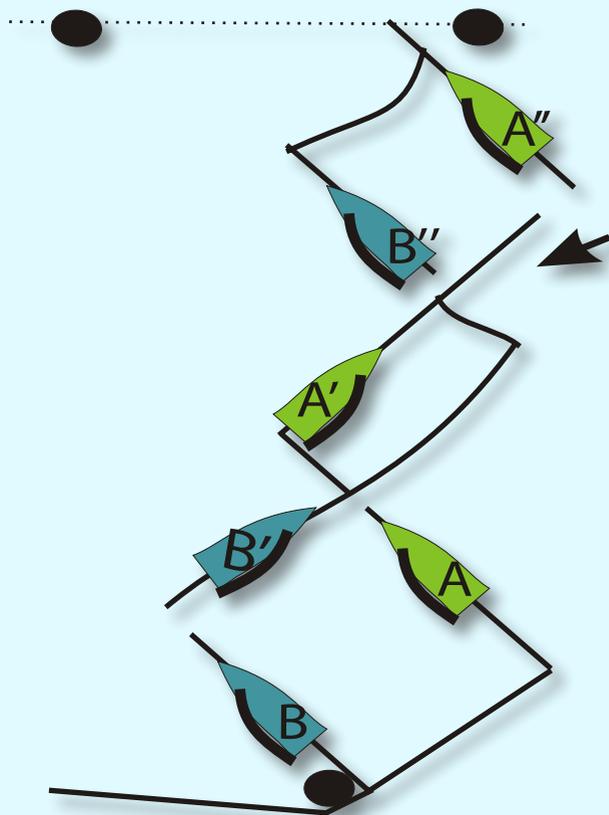


You can find out what the windward side of the startline is by reaching along the line before the start in both directions. If from SLOM to SLIM your optimum sail setting is further out than from SLIM to SLOM, SLOM is the windward side of the startline and vice versa.





Tactics: defending on the beat



You defend your lead on a beat by keeping your boat between your competitor and the next mark or the finish line. On your starboard tack (A and A'') your cover can be a bit loose, since you will have right of way over B when she tacks towards you. On your port tack, and if B is seriously threatening, you keep a close cover (A'). That will slow B down, and will give her no chance to tack and call starboard on you. If B threatens to pass you to leeward, you can sail a bit off wind towards her (footing), to stop her from tacking to starboard.

Rules: tacking in one's water



While a boat tacks she shall keep clear of other boats until she is on a close hauled course (rule 13). This means that a leeward boat cannot tack if, before she has finished her tack, she would touch a windward boat. Under this rule, you can stop a leeward boat, or a boat ahead, from tacking, by sailing close to her stern or windward side.



Tactics: attacking on the beat



Just trailing a leading boat on the final beat to the finish will not give you the win. You have to attack and you do that by trying to break out of the leading boat's cover.

One option is to sail in the opposite direction, hoping that the other boat will not cover you (as explained on the previous page), and because you expect a wind-shift or a few gusts will take you ahead.

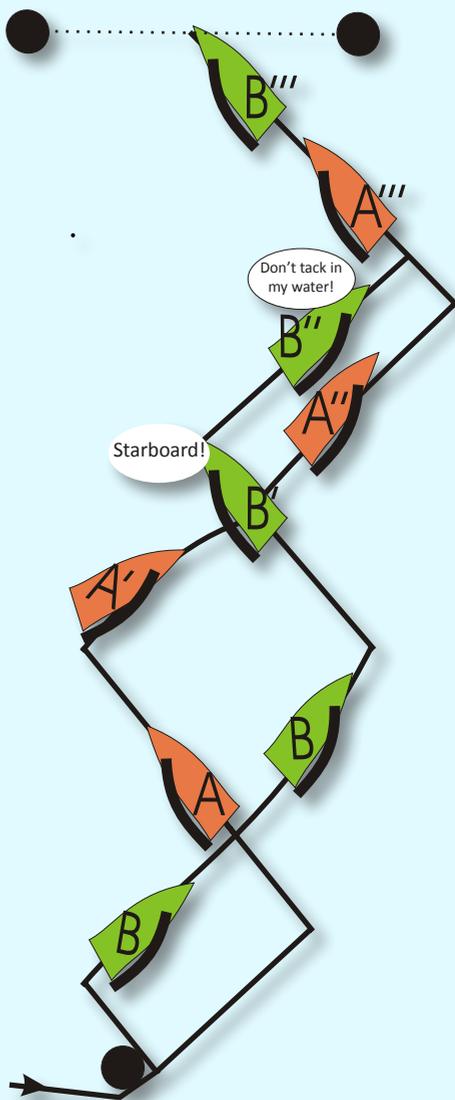
You can also attack by trying to get a starboard position on the opponent through a close tacking duel.

In the diagram, B ducks behind A's stern and hardens up quickly. A does not immediately tack to cover B, and B works for a short time very hard to gain a few meters on A.

The next time the two boats meet B' can call starboard on A'. While A' ducks the stern of B' (trying to emulate B's feat), B' immediately tacks to slow A'' down (B'') and prevents her from tacking to starboard.

Now B'' fully controls A''. By covering A'' close on port, B'' prevents A'' from tacking to starboard (see previous page). A'' will also have no chance getting ahead downwind of B'', because of B''s wind-shadow.

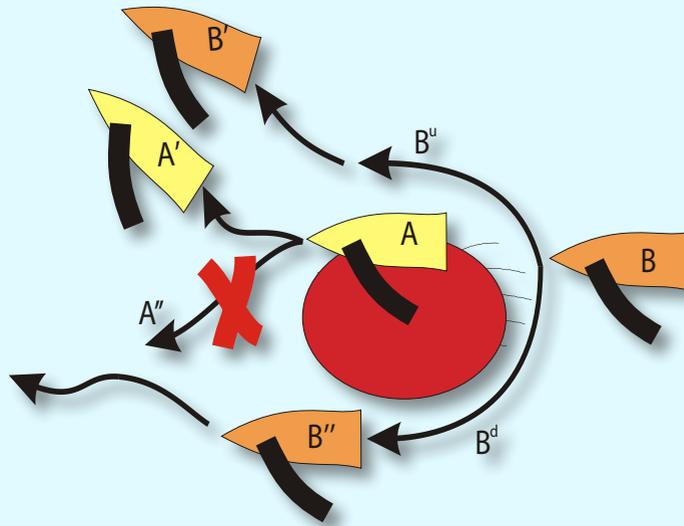
A'' slowly falls behind and below B''', and when B''' tacks for the line, A''' has lost the race.





Tactics: attacking and defending on a reach

On a reach you can try to overtake a boat ahead by steering upwind or downwind from her. If you go upwind (B^u), you will keep free wind. However, the boat ahead can 'luff' her.



you, meaning it can steer upwind to close haul thereby pushing the overtaking boat upwind as well (A' and B').

If you take the downwind course (B^d), you will have to break through the wind-shadow of the boat ahead, for instance by riding a wave that A missed (B''). The downwind route is harder, but it may give you 'water at the mark'. So long B'' is astern of A, A is free to

sail where she wants. Once B'' has established an overlap, A cannot bear down on her.

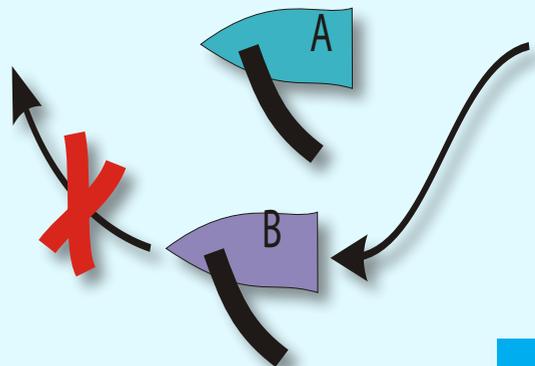
Rules: luffing rights



A boat has luffing rights when overtaken **to windward** by a boat clear astern (rule 11: windward/leeward). However, when a boat with luffing rights luffs the windward boat, she shall give the other boat room and opportunity to keep clear (rule 15 and 16).

In the diagram above, A' can luff B', but must do it slow enough for B' to move upwind.

In the diagram to the right, B has no luffing rights on A above her proper course because she established an overlap from behind within two boat lengths from A (rule 17).

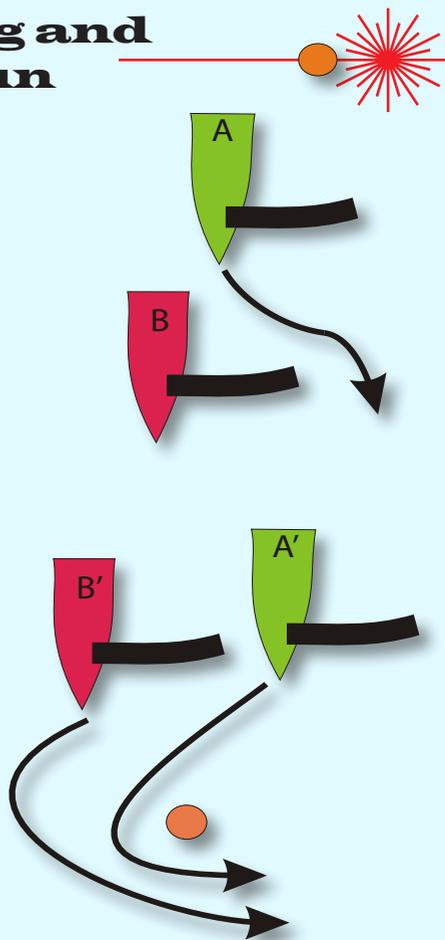
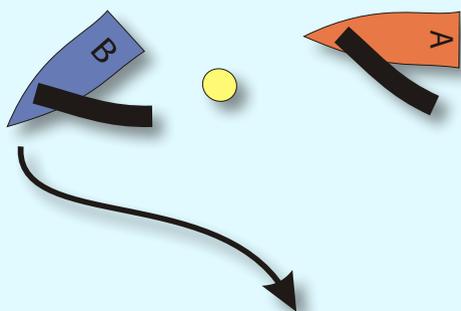


Tactics: attacking and defending on a run

On a run, a boat astern (A) casts a heavy windshadow ahead of her sail, which she can use to overtake a boat ahead (B) to leeward.

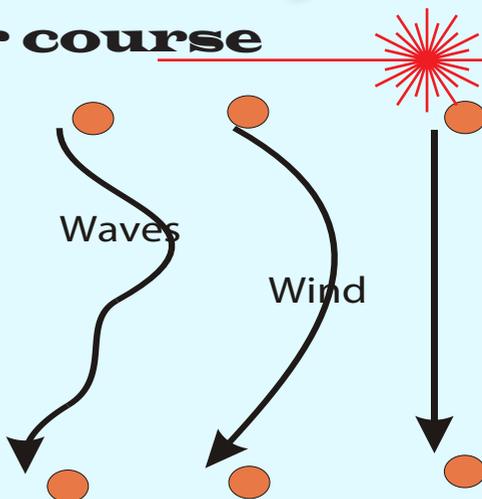
If the next mark is rounded to port, and A has an overlap she will be ahead on the next leg (see right diagram).

B can protect her position by, when rounding the windward mark, immediately steer to the left side of the course (to leeward), thereby closing the leeward space for any attacking boat from behind (see diagram below).



Rules: proper course

Rule 17 prohibits a boat to sail above her proper course when she gets an overlap to leeward on a boat clear ahead. Proper course is defined as the course a boat would steer if no other boats were around. Proper course is, therefore not necessarily a straight line to the next mark, since you may wish to ride waves, or steer towards a plac where you expect more wind. All three courses, therefore in the diagram to the right could be proper courses.





Protests and penalties

Once in while it may happen that you unintentionally foul another boat.

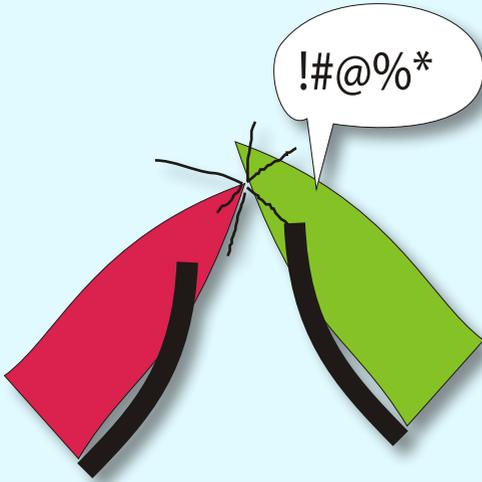
If there is no damage, you can exonerate yourself by doing 'a 720', that is a tack, a gybe, a tack and a gybe, or a gybe, tack, gybe and a tack.

If you don't do a 720, because you think you were in the right, you may be protested or protest the other boat.

When two boats touch each other, one of the two is always wrong. When none of the two does a 720 a third competitor can protest both boats.

When you touch a mark, the penalty is 'a 360', tack, gybe; or gybe, tack.

Doing your penalties is an essential element of fair sailing and sport(wo)manship behaviour.

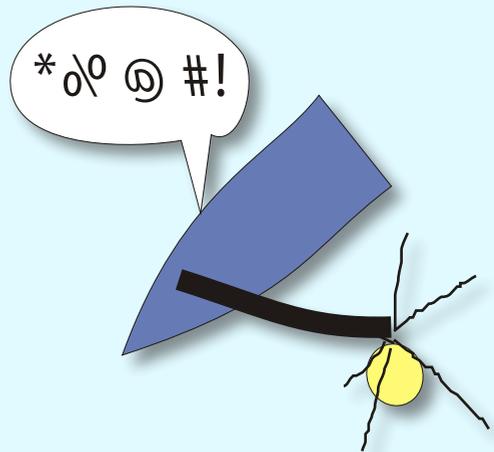


If you want to protest another boat, you hail her and tell her that she will be protested.

Immediately after the race, you fill in a protest form. An ad-hoc committee is formed to hear the case and pass a verdict.

The boat that loses the protest is usually disqualified from that race.

Protests are a normal part of competitive sailing, and it is perfectly in order to protest somebody if you genuinely believe you were in the right.





***HAPPY
SAILING***