

Notes for informal catamaran training course,

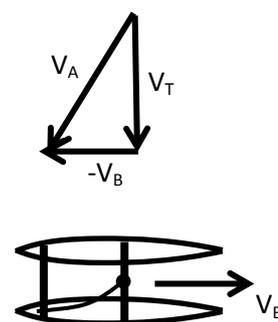
Alec Duncan, 14/3/2015

Part 4: Reaching and running

Now we get to the really fun part of cat sailing, but first you need to know about “apparent wind”.

If you are moving forward in still air, you feel an “apparent wind” blowing on you. This has the same speed as the speed you are moving, but is in the opposite direction. The same thing happens when there is a real (true) wind blowing, but now we have to add the two effects together as shown here.

The arrows in this diagram are called vectors: their lengths are proportional to speed and their directions represent the direction of motion. This diagram is for a beam reach – so the true wind vector, V_T is at right angles to the boat velocity vector, V_B (velocity is just a fancy word for speed when you also specify direction). If we reverse V_B (call it $-V_B$), and add it on to V_T as shown, then we can draw a new vector, V_A , from the start of V_T to the end of $-V_B$. This is the apparent wind vector – it shows the speed and direction of the wind we would feel when sitting on the moving boat. Just like us, the telltales and sails are moving with the boat, so they feel the apparent wind, and that’s what we have to trim them for. They know nothing about the true wind. On a reach like this, the apparent wind is stronger, and coming from further forward than the true wind.



Reaching

Downhaul (not critical) – You can ease this off a little to get a slightly fuller sail if you want, but don’t overdo it – you still want an efficient aerofoil. I don’t usually bother changing it from the setting I use for sailing to windward.

Outhaul (not critical) – theoretically you could also ease this a bit, but it is awkward to do and there are more important things to worry about! I don’t usually bother changing it.

Traveller (most critical) - In any wind strength you want this set so that when you sheet in hard the sail is at the correct angle to the wind (ie. telltales on both sides of the sail streaming). Adjust it on the reaching leg if necessary to achieve this. On a reach the speed of the boat brings the apparent wind forward, so the traveller needs to be further in than it would be if the boat was stopped. Keep this in mind when setting its initial position, but then use the telltales.

Mainsheet (critical) – Hard on to reduce sail twist, bend the mast, and go FAST! Think of the traveller as the device to control the angle of the sail to the wind and the mainsheet as the device control the twist in the sail. Most of the time you don’t want much twist, so you need to sheet in hard. Use the telltales near the top and bottom of the sail as a guide, and try to get the whole sail working efficiently. If you need to dump power (usually because you are about to be blown over sideways or nosedive and do a spectacular cartwheel), then let the mainsheet out rapidly (in an extreme case let it go completely) to let the top of the sail twist off. In strong winds, keep a constant

eye on the bow of the lee hull and sheet in as hard as you dare! If the telltales are indicating that the sail isn't in the right place when sheeted in hard, then adjust the traveller accordingly (you might have to sheet out to do this, then sheet back in).

Jib sheet (critical) – The crew should be continuously adjusting the jib sheet to keep the telltales on both sides of the sail streaming. They probably won't be able to get this happening for the bottom and top of the sail simultaneously, so some sort of compromise is necessary – I usually work mainly off the bottom telltales as there is more sail area down there.

Crew weight (very, very critical) – In light to moderate conditions the skipper and crew should be as far forward as possible to minimise drag from the transom. Move progressively further aft as the wind speed increases beyond the point where you start worrying about nosediving. In strong winds get as far aft as you possibly can. Sit as far outboard as you need to balance the heeling force – again the ideal is to have the windward hull just kissing the water.

Rudders (surprisingly important)- The rudders produce quite a lot of drag and on a reach you only need to have the leeward one down, so pull up the windward rudder. (Lift the rudder bar then pull on the rope.)

Steering – Steer directly for wherever you want to be relative to the next mark when you start to round it, or to your best tactical advantage, and keep adjusting the sails. Ideally in light to moderate winds you'd cleat the main and adjust the traveller but that doesn't work with the older style Windrush travellers. In strong winds you have to be able to dump power fast, so I feel more comfortable cleating the traveller and playing the mainsheet.

Rules and tactics – When reaching you are usually on the same tack as other boats in your fleet, but if you are on port tack you will have to give way to any boats from other fleets that are on starboard, so keep a careful lookout. If you are on starboard tack you still need to keep a careful lookout as you will be travelling fast, and don't want to cut another boat in half that hasn't seen you, even if you have right of way! The rules that apply when two boats are on the same tack are:

- If two boats are overlapped then the windward boat must keep clear of the leeward boat. (An overlap is when the bow of one boat is forward of "a line drawn abeam from the aftermost point of the other boat's hull and equipment in normal position.")
- If the boats aren't overlapped the boat clear astern must keep clear of the boat clear ahead.
- There used to be a complicated rule with respect to luffing rights, mast abeam and all that, but it has now been replaced by a general requirement that a right of way boat that changes course must do so in a way that gives the other boat the opportunity to keep clear. So if another boat is trying to overtake you to windward, then you can head up closer to the wind to try to prevent them, but you must do this in a way that gives them the opportunity to avoid hitting you. Of course in fleet racing if you play these sorts of games you run the risk that the rest of the fleet will sail past you both to leeward!
- One of the more useful rules to know is the Mark Room rule, because you can often use it to your advantage. This states that if two boats are overlapped when the bow of the front one is three of her boat lengths from the mark, then the outside boat has to keep clear of the inside boat while they go around the mark (including any gybing or tacking that this entails).

Note: Mark Room does NOT apply at the start line or between boats on opposite tacks at a windward mark.

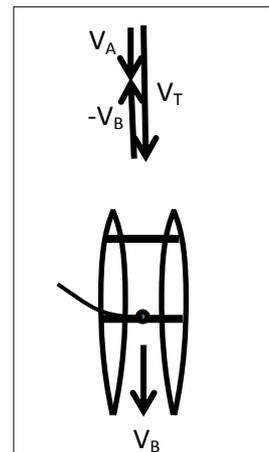
So, if you are close behind another boat on a reach (or a run) it is often best to try to establish an overlap on the inside of the next mark rounding, even if this is the leeward side of the other boat. Make sure you yell "Mark Room" as the bow of the leading boat crosses your best guess of the imaginary three boat length circle, so the other skipper knows you are expecting them to keep clear. (Note: do NOT yell "Water" in this situation – that only applies at an obstruction, and was dealt with in Part 3 of this course.) Conversely, if you are the leading boat and you don't think the other boat has established an overlap, then yell "No Overlap" so the other skipper knows you aren't going to keep clear. The trailing boat then has to keep clear throughout the mark rounding.

Running

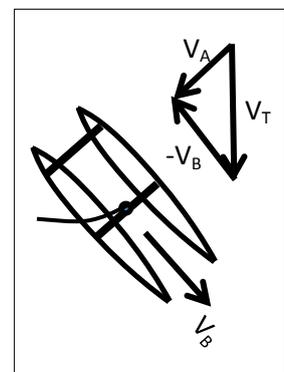
I find running on most boats without spinnakers pretty boring, but not on a catamaran. In fact it is one of the aspects of catamaran sailing I enjoy most. There is a lot to be gained (or lost) on a run so it is worth spending some time working on your technique.

First you have to decide which of two possible methods you are going to use:

1. Sail directly for the next mark. This is the shortest distance and the wind vectors look like the diagram on the right. The motion of the boat results in the apparent wind being substantially reduced compared to the true wind. Also, the airflow on the leeward side of the sail will be completely stalled. Both of these things reduce the force pushing the boat along, so you will go slowly. However, any other option is going to involve sailing further. Have the traveller and mainsheet out as far as they will go (you may need to push the boom out in light winds), and have your weight well forward unless it is blowing hard and a nosedive is a possibility. Pull up one of the rudders – it doesn't matter which one. If you are sailing sloop with the wind directly behind you then goosewing the jib (ie get the crew to hold it out on the windward side of the boat so it isn't blanketed by the main). You can also ease off the downhaul and outhaul to make the sail fuller.



2. Zig-zag downwind, sailing at about 40° to the direction the true wind is going. As you can see from the diagram this is equivalent to sailing with the apparent wind at right-angles to the boat, and in fact that is how I judge the direction to sail when doing this: I steer so that the telltales on my bridle are streaming directly across the boat. Have the traveller all the way out and trim the main using the telltales in the normal way (you'll probably find it needs to be most of the way out as well). On a sloop, trim the jib using the jib telltales. The sails are now working as aerofoils and the apparent wind is stronger than for option 1, so they will be generating a lot more force and you will go quite a bit faster.



The downside is that you also have to sail quite a bit further! Your weight should be well forward (except in very strong winds) and you should have one rudder up (again it doesn't matter much which one). You are obviously going to have to gybe to

reach your destination. Just as when you are tacking going upwind, timing your gybes downwind is critical. Unlike tacking upwind, you lose very little when you gybe so it is often advantageous to do quite a lot of gybes on a downwind leg. Things to consider:

- a. Try to always be on the tack that is taking you closest to the mark. If the wind direction changes to push you further from the mark, then gybe.
- b. Look behind you and to either side for patches of stronger wind, and plan your gybes so you sail into them.
- c. It is often best not to use the full width of the river, but rather to do a series of relatively short legs so you stay where the wind is.
- d. You will be gybing through about 80°, so use this fact to judge where to place your last gybe before the mark.
- e. If you are going to have to gybe around the mark then give yourself plenty of room to do this.

When sailing like this you need to be continually watching the telltales on the forestay or bridle and adjusting the boat's heading to keep the apparent wind at 90°. If you head up a little the boat will accelerate, the apparent wind will come forward, and you can then head further downwind. As the boat slows down, the apparent wind will go aft, so you'll need to head up a bit. Often in a gust you will accelerate enough to bring the apparent wind forward, so again you should bear away. Remember – the mark is downwind of you, so use every opportunity to go as far in that direction as you can without losing speed.

Which method is best? In light winds, you won't get enough extra speed using Option 2 to make up for the extra distance you have to go, so Option 1 will be faster. In strong winds, in a supersloop or sloop, Option 2 lets you use your jib efficiently and will be much faster than Option 1. In a cat in strong winds it is less clear-cut, but if you make use of the wind shifts and gusts efficiently then Option 2 will still be faster. The hard part is deciding which strategy to use in moderate winds! When in doubt I always go for Option 2, because it is way more fun, but if I see I'm losing ground on boats sailing straight down the run I'll switch back to Option 1.

Rules and tactics - Remember that the starboard tack has right of way over port tack rule has precedence over the windward/leeward and clear astern/clear ahead rules which only apply when two boats are on the same tack, so take careful note of the side the other boat's boom is on (the side the jib is on doesn't matter). If her boom is on the port side, she is on starboard tack and vice-versa. If there are several boats sailing downwind using Option 2, then they will be crossing one another frequently, so keep your eyes open! If you are using Option 1, and the run is fairly square, you may want to gybe onto starboard tack so you have right of way over any boats on port.

The Mark Room rule applies at the downwind mark as well, so consider trying to get an inside overlap at the mark. Note that at a downwind mark this rule has precedence over the port-starboard rule at and inside the three boat-length circle (but not if both boats are outside it!). This doesn't make any difference at a port rounding bottom mark as the boat on starboard will also be the inside boat, but at a starboard rounding (eg. Quayle in a south westerly) the port tack boat will have right of way at and inside the circle. This is, however, a risky strategy to use if you are the port tack boat, because if you meet the other boat outside the circle, they have right of way – and exactly where is that circle anyway?!

Gybing

Gybing a cat in all but the strongest winds is much easier than tacking. The only tricky bit is that the mainsheet and tiller position makes it necessary for the skipper to face aft during the gybe, which makes it a bit harder to judge the change of direction. I've found the following procedure works well:

1. Bear away until the boat is heading about 20° off dead down wind, and steady the boat on this course.
2. Move to the centre of the boat, face aft, flip the tiller extension across to the other side and grab it around the far side of the mainsheet. (If you don't do this you'll get a bruised arm when the traveller comes whizzing across.)
3. Grab all parts of the mainsheet in your other hand, then make a deliberate change of course through about 40°.
4. You'll feel the tension come off the mainsheet when the boom is ready to come over – at that point use the mainsheet to pull the boom over so you know exactly when that is going to happen, get yourself over to the other side of the boat and straighten the tiller. (I also use the mainsheet to bring the boom to a more gradual stop than would be the case if it just flicked over on its own.)
5. Get yourself into your normal sailing position and change course onto whatever course you need to be on.

If sailing sloop it isn't critical when the crew brings the jib over or moves across the boat, as long as they are done by step 5, but make sure they keep their head down!

In very strong winds a nosedive is a possibility so in that instance keep the weight back as far as you can.