How to Sail Fancy Free

Specifically for Anne, Ally, and Zoe so they can be more confident on board. Also, some general sailing, docking, anchoring stuff of general use. And some emergency stuff that is probably more scary than it needs to be. That last is at least as important as it is scary as I might be the person overboard…

Note. This document is started with me in an almost Zen like state of ignorance which I am slowly losing. Treat this more as ramblings, perhaps collected wisdom, than anything definitive.

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Steering and Manoeuvring

Underway

Steering underway is relatively simple. One thing to bear in mind is that the response to the rudder is not immediate. Until you have internalised the response of the boat you are likely to steer a zig zag course as you over steer and over correct. Use small movements of the wheel. Underway it would be odd to use more than a quarter, maybe half, turn of the wheel. It does take the boat a second or two to respond. The faster she is going, the faster she responds and the less wheel that is needed.

While on the subject of steering, a quick note on navigation. The first thing you have to be aware of on helm is where you are headed. This will generally be a route shown in Navionics on my tablet (or Anne's… same info, same account). The next thing to be aware of is any navigational hazards, shallows, shoals, rocks. Those are shown both on Navionics and on the helm display, but some hazards only appear as you zoom in. Beware!

Then there is traffic. There are well defined rules of the road defined in "Colregs" (Collision regulations). The Colregs are remarkably concise and clear. You can read them at https://laws-lois.justice.gc.ca/eng/regulations/c.r.c.,_c._1416/FullText.html. Colregs define who is supposed to do what when boats are on conflicting courses. Generally, one boat is supposed to give way, and the other is expected "to maintain a steady course and speed unless changing course is necessary to avoid a collision". This means be predictable.

The rules say that certain types of vessel have priority over others. The rules are pretty obvious, but do not expect everyone to know what they are doing. In descending order of priority, you have

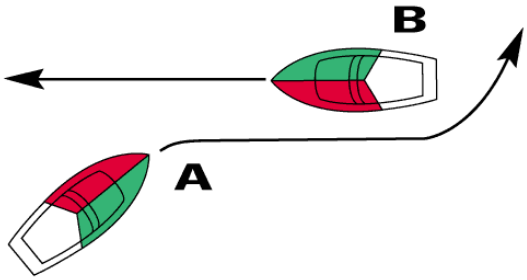
1. Boats anchored, aground, unable to manoeuvre
2. Boats with limited ability to manoeuvre. These are boats engaged in fishing, dredging, playing with underwater cables, clearing mines(!), and some tugs. Lets be reasonable. I include here thumping big ships and all tugs with tows.

    > Boats engaged in fishing does not mean a boat with a rod out. It means serious long lines or nets.

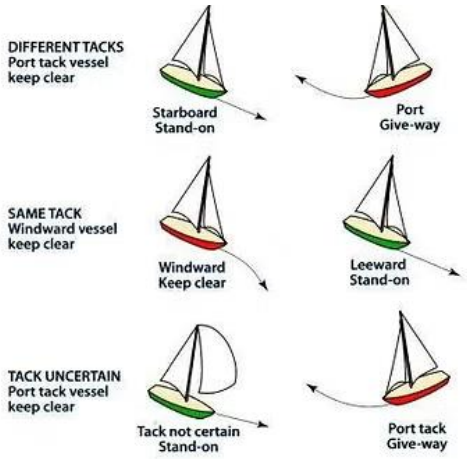
3. Boats under sail only (but don't push your luck, and if you have the motor on you are demoted to category 4)
4. Everyone else

Then there are a few other fairly obvious(ish) rules:

- Overtaking vessels give way.
- Pass port side to port side ("Keep right"). This one is really important. If two vessels of the same priority are sort of head on, they should both alter course to starboard.
- When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.



- A sailing boat on the port tack has priority (this is more or less a corollary of the previous rule)
- If two sailing boats are on the same tack, the one to windward is the give way vessel
- If two sailing boats are approaching and there is doubt which tack the other boat is on (goose winged, spinnaker…) The boat on the port tack should give way
- And manoeuvres should be obvious to the other vessel. Don't turn a couple of degrees at a time, make it 10° or 20° so the other boat knows what you are doing.



And the last rule is **if all else fails it falls to you to take action to avoid a collision.** Oh, and use the radio: tell tugs with log tows that you have seen and are avoiding them. Suggest to powerboats heading towards you that perhaps they should alter course to starboard.

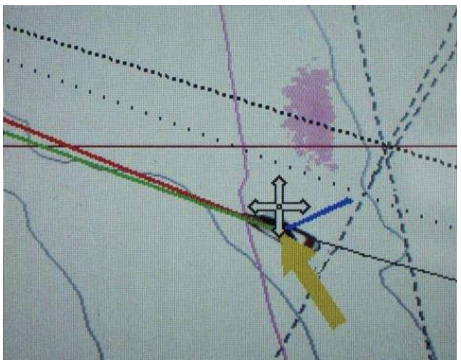
Seaplanes are supposed to avoid all vessels, but stay out of marked seaplane areas, or at least don't go into one if there is a seaplane approaching, either landing or preparing to take off.

Not all traffic has AIS, so not all of it shows up on the display. All commercial boats are supposed to have AIS, but I have seen a tug with a log tow and no AIS. You have to keep a constant watch for traffic, including boats coming up from behind. There will be tugs with tows. Sometimes they are obvious, sometimes not so much. The tow lines between tugs and their barges are long, much longer than you'd expect. The distance between a tug and the barge being towed can be half a mile. If you see a tug and barge you will think they are two separate vessels. Log tows are very hard to spot. You can not see them, you can't see

where they start, and you can't see where they end. Certainly not with the naked eye: use the binoculars. Log tows can also be very long.

All commercial vessels, and that includes tugs, should show up on the display. If you click on a boat symbol it will tell you what sort of boat they are, e.g. tug, but it does not discriminate well between tugs with tows and those without. You can see barges being towed, but might think they are a separate vessel. For log tows, the easiest way to identify them is by the tug's speed. If they are doing 2kn or there abouts they have a log tow. Stay well clear. Also shown on the vessel details, for vessels on a convergent course, is the distance of the anticipated closest point of approach. This is labelled CPA. It also shows the time to the CPA, called TCA. These might be important, but not if they or we are changing direction.

Note that clicking on a boat's symbol on the chartplotter is difficult. Use the touch screen to get the cursor close, then use the big button on the side to manoeuvre the cursor over the icon. This is more than a button: it is a joystick that you use to move the cursor by wobbling it side to side or up and down, and a select button that you use by pushing the button in. But be aware that the joystick can "stick" and the display start scrolling continuously in one direction. If this happens just touch the joystick again.



The chartplotter shows lines off our boat symbol showing direction and strength of the wind (yellow), current (blue), heading (the direction the boat is pointing) (purple), and course (the direction we are going) (green). It also shows the course for other AIS vessels. That last line is 12 minutes long, showing how far they get in 12 minutes. The length of our heading and course lines is settable. Sometimes long is useful so you can see if you are making your destination, sometimes 12 minutes long is useful as it is the same length as projected track displayed for other boats. Set this length under menu – presentation – vector length.

The blue and yellow lines get thicker as the current or wind get stronger. Be aware that the current indicator is derives from our GPS course and speed, and our compass heading and water speed. The water speed instrument is one of the least trustworthy, so take the current shown with a pinch of salt.

There are also a speed indicator, a wind direction indicator (vital for sailing), and a depth gauge as separate instruments. The depth gauge works down to about 125 metres. Beyond that it gets quirky. It is pretty determined to get a reading, so it will tell you the depth of fish, seaweed, current or temperature changes, whales, submarines, giant squid, and often

features of its own imagination. You will be using the wind direction indicator a lot when you are sailing.

There is a real temptation to steer by the chartplotter, barely looking up to check traffic. This is not good practice. Instead, identify in real life, the features on the chart and refer to the chartplotter as the scenery changes or to check for AIS data. This puts you in a much better position if you have to revert to paper charts if there is a system failure.

Better yet, practice with paper charts, noting bearings to identifiable objects, openings of passages between islands, noting the correction between true and magnetic north, taking bearings, generally practicing all the skills you will need if the electronics fail you. Not only is all that an important skill, but it gives you a much better connection to the landscape.

Be aware that compass variance in our cruising area is 16°E. That means a true bearing is 16° less than the reading you get from a compass.

Reduced Visibility

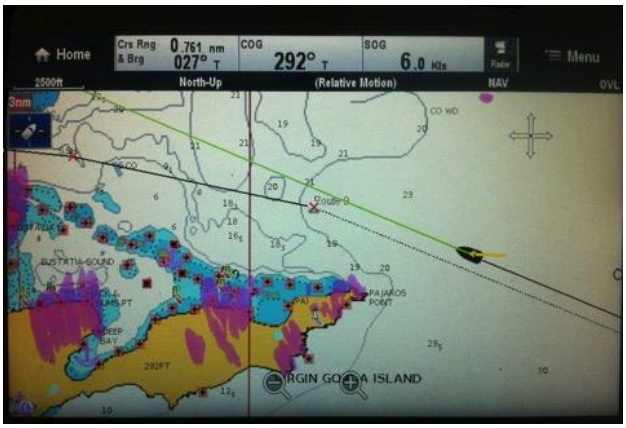
You should never set out if the visibility is seriously compromised by fog or rain or smoke or is expected to become so. However, visibility can be reduced by any of those things even if you set out in bright sunshine. There are three things that are important:

1. Don’t hit land or run aground or hit any other navigational hazards
2. Avoid other vessels
3. Be “visible” so other vessels can avoid you.

Unlike in days of yore, you have GPS and a chartplotter. That makes objective 1 fairly easy, other than crab pots. For them, the best advice is not to go too fast in water less than 40m, and to have a lookout posted on the bow: a cold and clammy job. Use the headsets used for anchoring to help communications. I would not like to negotiate, in fog, a very narrow passage (think the entrances to Von Donop, Gorge Harbour, Smuggler Cove, Pender Harbour, Waiatt Bay, or even our home port of Nanaimo). You are better off mucking about outside the anchorages than blundering through. But if you are in danger of being benighted you have limited choice.

You have several tools that help objectives 2 and 3: AIS, radar, sound signals and lights. OK, the lights are pretty useless, but it is entirely possible that the fog is only 20 feet deep, in which case the mast head light will be visible to ships. Oh, and use the motor and drop the sails. Under power you can be heard, and your course is more predictable for other boats.

Fancy Free both receives AIS signals from other boats, and sends AIS data. That means that avoiding and being avoided by big boats and ships is relatively simple. But smaller boats are unlikely to transmit AIS, and little fishing boats are quite likely not even receiving AIS.



For them you have to use the radar. Practice with the radar in good visibility so you can see how things out there appear on the radar screen. Little fishing boats underway are fairly easy to spot: a dot that moves across the screen. Fishing boats not moving simply appear a stationary dots. They are reasonably clear on the radar screen if the sea is calm, but if it is bumpy with metre high waves little fishing boats will disappear in the wave clutter on the screen. Luckily, fog is usually associated with calm air, so the water is likely to be flat, and if it is that wavy the fishing boats are more likely to be in port or heading back.

The radar has to be turned on at the nav station then warm up for about a minute before you can use it. Then, on the chartplotter, press menu, radar and AIS, then switch the radar to transmit. Underway you probably want it to set the range to over a mile.

But the radar by itself is not foolproof for avoiding little fishing boats. You need to use the foghorn so they know we are out there, and to encourage them to use some sort of signal so we know they are there. The foghorn is on the nav station, and should be brought up if there is fog

The signals for different types of boat are as follows:

- A boat under power making way should sound the foghorn for 5 seconds every 2 minutes.
- A boat under power but not moving should make 2 5 second blasts separated by a second.
- A boat at anchor should ring a bell for 5 seconds every 2 minutes, but most of the boats you can't see with AIS or radar won't have a bell. But they are supposed to make some sort of noise, even if it is just a shout.
- A boat sailing, fishing, etc, etc is supposed to sound a 5 second blast followed by 2 one second blasts.
- A boat at anchor that thinks you are going to run into them is supposed to make a short blast followed by a long then another short (a morse R)

Don't expect anyone out there to know any of that. Just sound the foghorn diligently and listen for sounds out there. With the motor running that is difficult. Another job for the lookout. That suggests that the headset should only be over one ear.

Autopilot

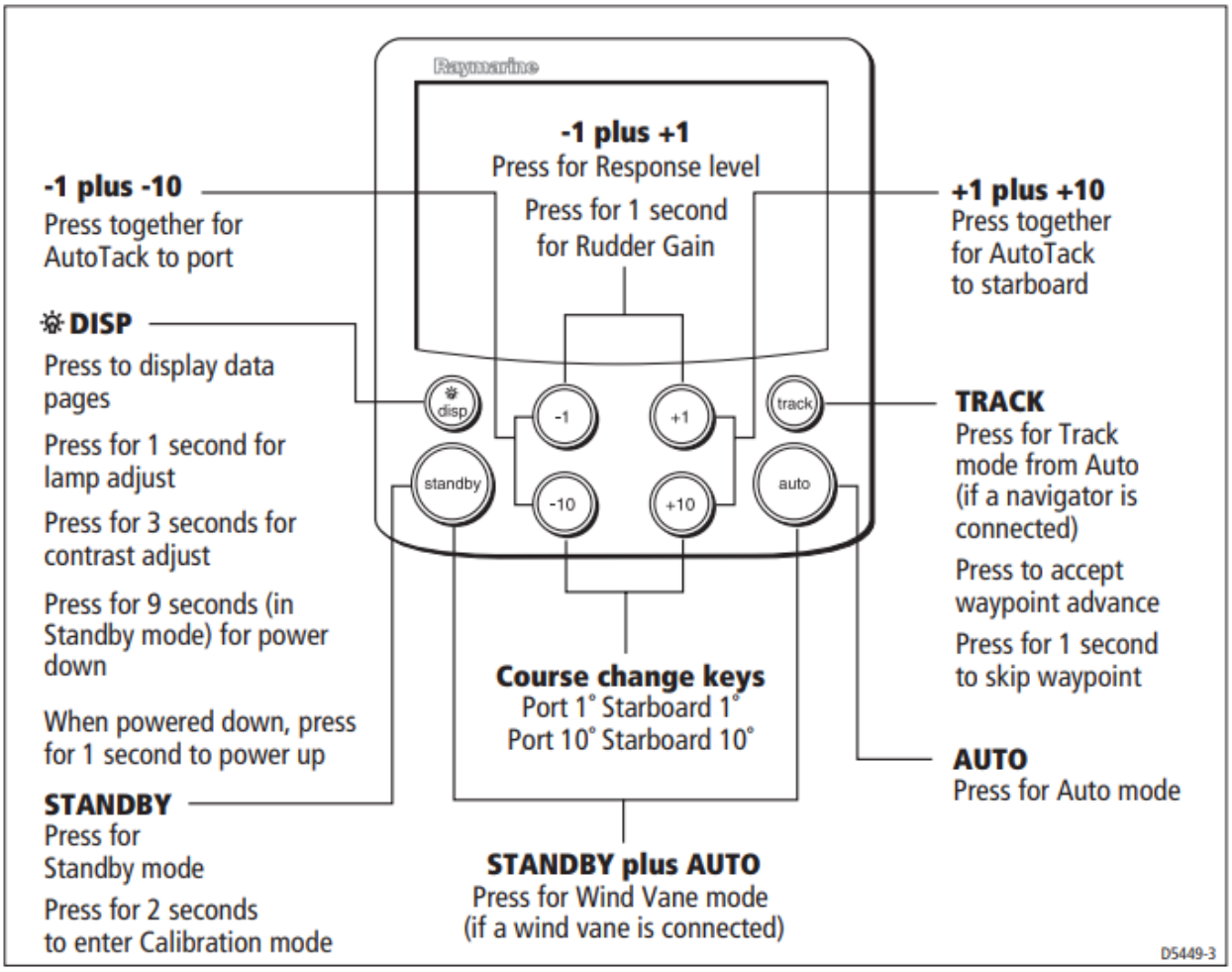
Using the autopilot really helps prevent zig-zagging, but using it encourages a dangerous lack of attention and means you are not learning how the boat feels. Also beware of the transitions to and from autopilot. There is a temptation to start turning and, when the boat is pointing in the right direction, to press the auto button to get into autopilot mode. This does not work well. Instead, establish a stable course in the direction you want, then press the button.

Being able quickly and instinctively to change from autopilot to manual steering is vital if you are going to use the autopilot. If you spot a hazard such as a log close to the boat, you need to be able to alter course quickly. The natural thing to do is to pull on the wheel. In autopilot mode that doesn't work. You need instinctively to press the standby button then turn the wheel

Reading the autopilot manual, I discovered that you program in the response rate of the boat, and that seems to have been done right.

There are several commands you are likely to use, and at least one that is very clever, but is perhaps more suited to open ocean than coastal cruising.

The autopilot does quite well under sail but less well if the sails are unbalanced from ill-advised reefing. It also doesn't like large heeling angles, or strong winds from astern (unless you are running with just the genoa).



To activate the autopilot press the auto button (red, on the right). The display will show the selected course in degrees true.

To switch back to manual steering press the standby button (red, on the left)

To alter course port or starboard press the +1, +10 left or right. You can press these buttons quite quickly so you could do a 90° turn to starboard by pressing the +10 button on the right 9 times in quick succession.

To tack press the +1 and +10 buttons on port or starboard together.

To steer a course relative to the wind press the auto and standby buttons together. This locks the course relative to apparent wind, and the display will show the locked wind angle, e.g. 45P for 45° off the port bow, 125S for 35° abaft the starboard beam.

Keeping Log

There are various types of log that you might keep. The simplest and most fun is simply to write up a summary of the day each evening, noting what happened, where you went, what went right, what went wrong, decisions made and reasons why.

A more formal log is a separate exercise. In principle the log should record position, speed, conditions (wind, sea, temperature and pressure, and engine or sail setting) every hour and every time there is a course change. And every time a decision is made. This should be preceded by a passage plan for the day. The passage plan should, in theory, be sufficient for navigation should all electronics and charts be lost. In theory. If you keep such a log, or even something approximating it, then the evening log becomes a summary of the day and how it differed from the plan. The plan is analogous to the blueprint plan for the day, the evening log is analogous for the “as built” blueprint.

When writing a passage plan, try to anticipate what information would be helpful both with and without the electronics. For with electronics, the instructions can be quite simple, noting headlands and landmarks and channel choices and distances.

For the case where the electronics have failed, you want far more detailed info. It is important to know which way to go as you leave your moorage, and when any channel choices need to be made. This is where bearings to headlands and navigation marks might be important, as will the opening and closing of channels (a channel “opens” when, as you sail by you can just start to see up the channel, and closes when you just stop being able to see up the channel). Both give you a line on the chart across which you know the boat passed. You should also note navigational hazards such as shallows, rocks, etc: you won’t have the paper charts at the helm, just your passage plan. Remember that when you write your passage plan you won’t know the winds but you will know the tides. Note the tides and currents in the plan, and take account in your instructions the possibility that you may be tacking.

Manoeuvring Speed

Generally sailing and motoring underway is the easy bit. Manoeuvring at slow speed in harbour surrounded by expensive boats is much more challenging. Be reassured: no one is really comfortable doing this, but with practice comes competence and confidence. The following is not definitive. It is really a set of observations that may help you avoid expensive mistakes. (They will happen)

Turning the rudder if there is no flow over it achieves nothing.

The response time of the boat at slow speeds is sluggish, but once she starts turning the turning radius is remarkably tight.

The auto pilot display (rightmost instrument) shows the position of the rudder. If you lose track that is useful. There is also an indicator on the wheel itself giving you the centred position. This is particularly nice as it gives you tactile feedback, so you can tell the position of the rudder without having to look at the controls.

Wind and current affect you much more at slow speed.

The boat's axis of turning is forward of the dodger, aft of the mast: the bow and stern swing. Beware in particular of the stern swinging away from the direction of turn.

You can turn the boat more or less on the spot, especially to starboard. There are three zero speed manoeuvring techniques. The first is called **prop wash**. This one is pretty obvious. The rudder is aft of the propeller, so if you give a burst of forward you get a directed jet of water in the direction the rudder is turned. This is quite a powerful effect, but does not work in reverse.

To keep the boat on the spot, use a burst of reverse to cancel the forward speed given by the burst of forward. BUT in reverse you get a phenomenon called **prop walk**. This is caused by the differential effect of the prop deep in the water and nearer the surface. In reverse the prop pulls the stern of the boat to port. This phenomenon also happens in forward, but is a much smaller effect. This makes it MUCH easier to turn the boat to starboard in a marina rather than to port. It is also really helpful if you are docking along side with the dock to port: come in at about 20° and turn as you get close, then as you reverse to kill your momentum the back of the boat pulls into the dock. Very helpful.

The third zero or low speed turning mechanism is the bow thruster. This could be considered cheating, but that is the way to win. The bow thruster is great, but only so strong. Activate the thruster by pressing both "on" buttons together. A little (not very obvious) green light comes on. Then you can push the bow to port or starboard using the joystick. Do not use the bow thruster for more than 3 seconds at a time: the motor and

wiring are not rated for continuous use. And beware: the bow thruster times out. If you haven't used it for 30 seconds it turns itself off. Before you really need it, give it a tiny burst to check that it is still on.

Going Backwards

When going backwards the wheel still turns the rudder in the same direction, but for some reason this can confuse people. Some people stand the other side of the binnacle so they are facing aft and the wheel is in front of them.

The bow of the boat will, more or less, follow the stern as you turn, BUT

- If you turn hard then centre the rudder the bow will overshoot
- If there is any wind the bow will be blown to the side. This is not a minor effect despite the keel: the boat pivots around the keel. The boat has scars because of this. This is pernicious when docking as sometimes the bow catches the wind when the helm is still in the wind shadow of other boats or the dock.
- Beware of changes in the current. These are not unlikely in the sort of places you are likely to be manoeuvring. If a current pushes the keel one way and a different current pushes the rudder the other, you will turn. No real choice.

A low speeds, the sort of speeds you are likely to be doing in reverse when manoeuvring, the rudder actually achieves practically nothing. You do not have "steerage way" until you are moving through the water at about 1.5Kn or more. So how do you steer in reverse? There are three answers:

1. Go faster. I don't like this answer for the obvious reasons, but it is needed if you have to deal with wind or current.
2. Use occasional bursts of forward to push the stern to one side or the other
3. Use the bow thruster to move the bow around. This is my favourite approach, but note that as the bow swings to one way the stern swings to the other. This really matters in tight spaces.

Docking

OK, this section is a bit light because I don't know enough about it. First some general advice: note the wind and current. The wind is fairly obvious and you have instruments that tell you about it. Current can be pernicious. In some marinas it is obvious there is no current. In others it is not necessarily obvious, and the current can be nontrivial, and the current can be in any direction: on dock, off dock, any direction. You can often determine the current by looking at the "bow waves" of buoys and pilings.

If there is any doubt, stop and see which way the boat wants to drift.

Fendering

However you dock, you are going to be doing something that comes unnaturally to the boat: you are bringing her in contact with solid objects. Boats do not like that, hence fenders. There are two basic purposes for fenders: protecting the boat during the docking operation, and protecting the boat while docked. This requires fenders in different places.

In the picture you can see that there are fenders at the extreme ends of the boat, on rail verticals as far astern and as far forward as possible. Those are to protect the bits of boat most likely to come to grief if you mess up docking, which will happen: docking is learnt by brail. Then there is a fender on the first independent stanchion forward of the entry gate: this protects that vast expanse of otherwise unprotected hull, and is likely to get used as you first catch the dock and the boat swings about the midship point.

Then there are the two fenders hanging each side of the entry way. These fenders are the ones expected to do all the work overnight.

How high should the fenders be? For most docks the answer is so low that they almost but not quite touch the water, but if you are docking along side another boat, then the fenders need to be higher. If the boat you are tying to is similar size or bigger, you want the fenders tight up to protect the gunnel. In the unlikely event you are docking along side a smaller vessel, or if a smaller boat is coming along side you, you will want the fenders a little lower.

And finally, after you have docked, you should pull that furthest forward fender up because if it gets windy in the night it is otherwise likely to swing against the hull disturbing anyone in the fore cabin.

You also need to deploy the mooring lines. The black ones go on the bow and stern, the two blue ones midships. Fenders and lines are stored in the port lazarette. The dock line lengths are … adequate. Just adequate. It's on the list.

Side on Docking

This is where you dock along side a dock. This is mostly easier than docking in a berth between fingers or worse between a finger and another boat. One little problem is that the height of the deck above the dock can make getting on and off the boat awkward. That is especially a problem on that initial step ashore with the first line. There is a fancy boarding step that should be attached to the stanchions each side of the boarding gate.

The easiest docking is with a gentle onshore wind or current. If there is an offshore current it can be difficult. Undocking is the opposite. An offshore wind makes life easy, and onshore wind makes it difficult.

Docking, any docking, is described in the books as being in phases. Plan, setup, manoeuvre, dock. Would that it were that well defined. Certainly you start by planning what you are going to do, and what to do if it starts to go wrong.

Take your time. Check winds and currents, work out which side you are going to dock on, which direction you are going to approach from, where the fenders and lines are going to be and what traffic there may be. Figure out how you are going to get secured to the dock. Make sure the crew has a clear idea what the plan will be: it will be one of them stepping ashore to tie up (unless there are nice friendly dock hands to help). Turn on the masthead camera. My preference, all things being equal, is to dock port side in, a forward approach. That's because I find forward easier than backwards, and to take advantage of prop walk. Always have a back-out plan. At least try to.

The setup step is less obvious, but at the very least, deploy the fenders and lines and open the gate in the safety line. The positioning of the fenders for the approach and docking manoeuvre is not necessarily the same as you want them when docked. Yes, the midship fenders, but you will want a fender a long way forward and possibly one way aft. And a roving fender can save you a lot of money if you muck up. Get the boat in a good starting position. Turn on the bow thruster and the masthead camera. Work out your plan, including how you can bail out and try again.

If there is no wind and no current, come in at about 20 degrees, nice and slow. Turn remarkably late, but remember the rudder takes time to have any effect, especially at dead slow. Prop wash, on the other hand is fast and effective. And you have a bow thruster. Using the masthead camera you can turn as the dock disappears under the gunnel at the bow. Use a bit of reverse just before the last turn to kill your forward momentum, and possibly s burst of forward with the rudder full to starboard to push the stern in, and a blast of bow thruster to push the bow out. Mix and match as needed. You should be able to stop with the gate right next to the dock. If you muck it, it is better to be too far away than to bump the dock hard, or other boats at all.

There is a way to move the boat sideways: turn the rudder all the way away from the dock. Use a burst of forward, a burst of bow thruster, and a burst of reverse. The burst of forward is directed by the rudder, and its main effect is to push the stern towards the dock. The bow thruster pushes the bow towards the dock, and the reverse stops any forward motion. This same mechanism can be used to shimmy the boat sideways away from the dock unless there is anything other than a slight onshore breeze.

If you decide to abort and go around again, make sure the crew knows this. If you come to a halt bow out, use the bow thruster. If you are stern out, use the prop walk or prop wash. Prop walk is good, prop wash is much stronger. If you leave the turn too late for the rudder to act quickly enough, use the bow thruster or abort and try again.

A crew member should be in a position to step ashore with a midship line and get the boat attached. No fussing making sure the lines are diagonal, no faffing with pretty knots. Quick and dirty. You can control fore and aft movement using the engine, so there is no need for spring lines yet. Then get the bow and stern attached. Then sort out the centre lines to turn them into spring lines. When everything appears secure you can step ashore to check and tidy up. Make sure there is crew aboard at this point, just in case. Then you can turn off the engine. I recommend staying with the boat for a bit to check all is happiness.

If there is an onshore wind or current, you can have the boat come to a halt parallel to the dock a little ways off. Use the engine, rudder and bow thruster to maintain fore and aft positioning and to keep the boat parallel as the wind or current gently pushes you onto the dock. Once you are on dock, this is the same as if there was no wind. Fenders are that much more important if there is a significant wind: you may want to double up the midship fenders.

If there is an offshore current or wind, things are less easy, and the standard advice about doing everything dead slow just doesn't work. The authorities won't say "you have to go more quickly". Instead, they tell you to dock "with authority". Which means faster and looking as if you know what you are doing, or better, knowing what you are doing.

In normal parts of the world (everywhere except the Pacific North West), you will be tying up on cleats or maybe bollards. Up here there are these bull rails, great big, rough 4×4s along and just above the edge of the dock. That makes getting a line halfway secure is that much harder to do quickly, but the theory is the same. Get a wrap of line and hold it. Then make some sort of knot. Friction is your friend at this point. BUT, if the crew can not get a line secure, make it clear to them that they should abandon the tie before the line and rail (or cleat) eats a finger. Have their back up plan be to throw the line back onto the boat and stay ashore to catch a line next time round. Actually, that might even be plan A.

With the wind or current directly offshore, your approach to the dock can be a bit steeper: the wind or current will be trying to push the bow out. If the wind or current is offshore and from astern, consider coming in starboard side in instead. Otherwise you will find you lack the speed through the water to be able to manoeuvre. There is a wind or current offshore technique of last resort that I have seen advertised: come in at right angles to the dock, stern in. Get a line attached, then use forward thrust, rudder, and someone pulling a bow line to turn the boat to get her properly on dock. Sounds convincing, but requires serious fendering.

If there is a current parallel to the dock from ahead this will tend to push the boat towards the dock. More accurately it will try to push the bow towards the dock. This is because the current is pushing over the keel which then acts like a sort of forward rudder. This action of the current is pernicious. If you are unaware of the current or ignore it and you are aiming for a gap between two boats the current will push you towards, potentially into, the nearer boat.

The best approach in this situation is to line the boat up with the target bit of dock, parallel to it, and balance current with the motor so the boat is not moving forwards or backwards. Then angle the bow in slightly. The current will try to push the bow towards the dock. Correct this tendency with the rudder and thrusters and hold a shallow angle. The boat will move gently sideways onto the dock. Once on the dock, this current will try to pull the bow back out from the dock before you get tied up if the bow is pointing even a little bit out. And it will be if you turn the boat so the gate is right against the dock. With luck, you can hold it in with the bow thruster. Otherwise it will require quick work by the crew to get the boat secured.

A wind or worse a current from behind has the opposite effect, tending to push the bow out. But this situation can be difficult as the current will be trying to push you into the further boat if you are trying to moor between two boats. And if the current is strong, it might be faster than you want to manoeuvre, or at least as fast as, and that makes steering hard. Consider coming in from the other direction into the current rather than with it behind you.

If you have both wind and current pushing you around, it is really important to stop and drift to see what the combined effect on the boat is.

And there are docking techniques where you come in backwards instead. I don't like doing that as the bow is that much harder to control, although the thrusters help.

Side on Undocking

Undocking is generally easier than docking, but not always. If there is an offshore wind life is wonderful: untie the lines and drift off taking the crew with you. If there is no wind, or just a little onshore wind, you can shimmy the boat out from the dock. This is done by giving a short blast of bow thruster to take the bow away from the dock, then turning the rudder all the way towards the dock and using a short burst of forward, which uses the prop-wash to push the stern out. If you need then to kill the little forward movement you now have, use a little bit of reverse, but remember always pause in neutral between forward and reverse.

If there is a strong onshore wind or current, you probably want to do a bit of a "spring manoeuvre", This is where you leave a slightly diagonal line from a bow cleat leading towards midship, and drive the boat forward, so she pivots around a well positioned fender. In that case have the wheel turned in towards the dock to aid with the pivoting. You may have to use an alarming amount of engine. Then back to neutral, release the spring line (from onboard) and reverse out swinging the rudder the other way to help the bow clear the dock. Use the bow thruster as needed. This manoeuvre can also be done pivoting around the stern, but it is less satisfactory in all sorts of ways.

There are a couple of ways to set up a line so it can be released from onboard. The first is to run the line from the boat, under the bull rail, then back to the boat where it is made fast to the cleat. To release the line, untie it from the cleat and throw it ashore. Because the line goes under the bull rail, throwing the line ashore "unties" it from the rail making it easy to pull aboard.

The second approach is to use a "triple Douglass Hitch", which you can see demonstrated at https://www.youtube.com/watch?v=Dcm9BbICYks. This, unfortunately, uses a lot of line, and the dock lines on Fancy Free are short for the purpose. Tie a heaving line to the end of the dock line using a double sheet bend, https://www.animatedknots.com/sheet-bend-knot), and have that heaving line on board ready to pull the knot clear. If the knot fails to release, or worse starts to release early, let helm know immediately so they can stop and let the wind take the boat back to dock to start again. This knot is quite secure and comes undone when you pull on the free end of the line, and as only loops of line go under the bull rail, once it is undone the line is completely free.

Docking in a Slip Between Fingers

If there is no wind or current this is simply a matter of manoeuvring slowly into place and tying off. This can be very difficult if the dock space is tight. Fancy Free's home slip is at the very end of a very narrow channel, significantly narrower than the boat is long, and she lives stern in. Even in a dead calm this is challenging.

Set up lines and fenders. The lines want to be on the port side. When setting up the fenders, you will want fenders on both sides and a fender horizontal over the stern. Tie a fender with two whips to the bottom of the stern rail, well to outboard so the stern gate (swim ladder) can be opened. This will take a bit of time to adjust. You will want someone with a roving fender to protect the port side from the corner of the finger. As you are trying to protect the boat from a corner, you will want the fender sideways, so tie whips on both ends of the fender.

Start well out from the channel so you can line the boat up in reverse. Go slowly, 1kn is OK, dropping to close to zero as you turn into the slip. Remember that you do not have much, if any, steerage way. And the prop walk will take the stern to port, but most of the time you will be in neutral.

Steer the boat up the channel using the bow thruster. It is important to catch any tendency to drift to port or starboard quickly as there is little room. The final turn into the slip is complicated by a similar size boat in the slip opposite so there really is limited room.

Position the boat towards the port side of the dock, the side the slip is on. Just a bit to port. Start the turn using the bow thruster. If the corner of the finger starts threatening to scratch the boat, use full port rudder and a burst of forward to blow the stern away from the corner. If the starboard corner of the stern gets too close to the other side, use full starboard rudder and a burst of forward to turn the boat using the prop wash. The main steering is done using the bow thruster.

If, however, there is any significant wind or current then again you have to dock "with authority". Let me know when you have worked this out because I haven't. I have seen it done. It will be a long time before I'm confident enough to be anything close to happy doing this. In 2024, two sailing instructors caused $20,000 of damage between them trying this sort of manoeuvre (not with Fancy Frrer). Here are some ideas From what I saw.

First, ask for there to be dock hands to help by catching lines. If the wind is down the passage, you will want a line on the starboard bow that you can throw to someone on the dock just past the finger to help pull the bow round. The stern can be caught using the line on the port stern cleat thrown to someone to the dock at the head of the finger. And the

boat can be held in towards the finger as she turns into the slip by throwing a midship line to someone on the finger.

If the wind is up the passage, the important lines become the stern line to pull the stern in and to port, the midship lines to hold the boat as she turns, and to control the bow until the bow line can be thrown to the dock hand on the finger.

An up passage wind is the worst as it can catch the bow and turn the boat as you come up the passage, and the bow thruster is not strong enough to counter this unless you catch it quickly. This requires you to do the manoeuvre at a higher speed than I'm comfortable with.

Sailing

A yacht can sail in any direction except within about 45° away from straight upwind. The speed a yacht can sail depends on many factors: wind speed, wind direction (relative to the boat), wave height, length, and direction, and how well the sails are set.

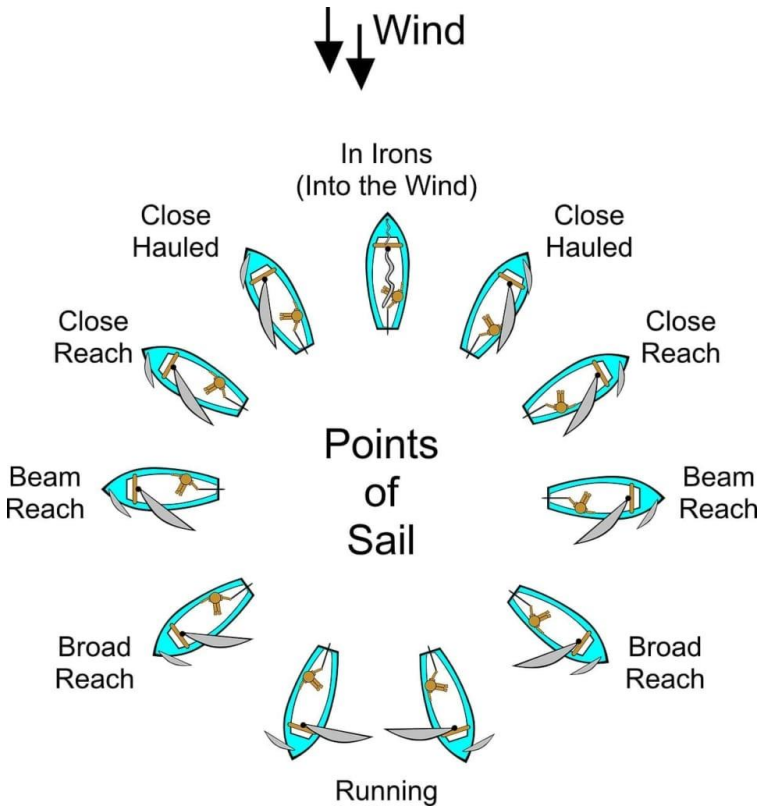
Sailing Angles and Sail Set

Sailing as close to the wind as possible is called **close hauled.**

Sailing further off the wind, but not close to 90° off the wind, is called a **close reach**.

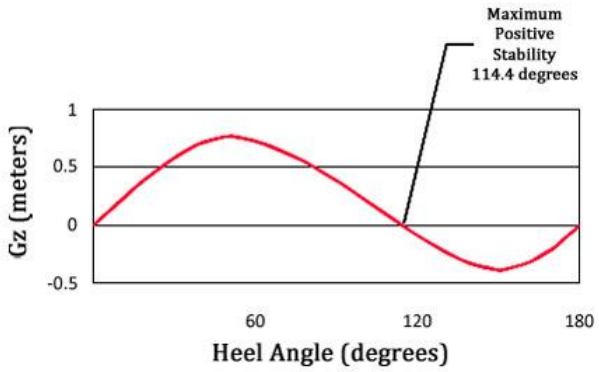
Sailing about 90° off the wind, that is across the wind, is called a **beam reach**

Sailing about 135° off the wind, that is down wind but not straight down wind, is called a **broad reach**.
Sailing straight downwind is called **running**.



And more terminology: if you are sailing at all across the wind, that is you are not running down wind, then you are said to be on the **starboard tack** if the wind is coming at you from the starboard side, and on the **port tack** if the wind is coming at you from the port side. And if two boats are on a collision course, the one on a port tack is supposed to give way to the one on the starboard tack. That is, they are expected to turn to go behind the other boat. This is actually quite obvious as all boats and ships are expected to pass port side to port side. Do not rely on a yacht on a collision course knowing this. In any such situation, regardless of who is the give-way vessel, use the radio to clarify who is manoeuvring how.

Boats roll in waves, and sailing boats, particularly monohulls, lean over to the side (heel) with the force of the wind hitting the sail. This can be a bit unnerving for anyone not used to it. But sail boats are designed to heel, and have a lot of stability. To the right is the stability curve for Fancy Free. There is a positive righting moment all the way to almost 115°. That means that unless the boat fills with water, she will tend to come back up even if she is 25° past horizontal.



That is quite reassuring. However, there are a couple of other angles of interest. Starting at about 25° the righting moment stops going up linearly, and at about 52° the righting moment starts decreasing. What this means it that if the boat is rolling, she will feel a little "soggy" if the angle she rolls to is past 25°, and it will feel like she hesitates before rolling back from over 52°.

You might think that once the righting moment starts decreasing that the boat will go over, because if whatever pushed her to 55° continues to push and, as the righting moment is decreasing, it is game over. The primary forces that heel a yacht are the wind and the waves. The heeling moment from the wind goes down as the boat heels as the sails catch less and less wind. A yacht will not typically heel past about 30° under steady wind action alone, as the heeling moment goes down and the righting moment goes up. A sudden hurricane force squall can knock a boat down almost 90°, but not capsize it where it doesn't come back up. Waves are a somewhat different story. Waves can push a boat over, but it takes breaking waves, which you will not see except in very high winds and shallow water or hurricane force winds in deep water. Try to avoid such conditions.

When sailing, one of the most useful instruments is the wind speed and direction instrument. It shows the wind speed and direction relative to the boat. This display is a little confusing as first as there is a temptation to turn the wrong way, thinking somehow, that you are turning the pointer. No, you are turning the boat.

Sometimes you want the true wind speed and angle, sometimes the apparent wind speed and angle. You can switch between them using the True/App button.

On the speed display there is a little mark at the bottom left or right to tell you whether what you are looking at is true or apparent.

OK, how to sail these various points of sail.

When the boat is sailing close hauled, close reach, or beam reach, the sails work by redirecting the wind, so it is turned from its original course to blowing off the sail to aft. The sails are acting like the wings of an aeroplane.

When the boat is running straight down wind, the boat is just being blown along, and the sails are acting like a parachute.

When the boat is on a broad reach the sails are in the transition from wing to parachute and it is all complicated.

Close Hauled

When you are close hauled, clawing your way to windward, you want both sails as flat as possible and sheeted in as tight as possible. For the genoa this means having the jib sheet very tight. The creaking as you sheet in that hard worries me. Tighten by hand so you have more idea the forces being applied. If we were racing, we might consider moving the jib car aft, but we aren't going to be, so you don't need to worry about that. For the main it also means sheeting in hard. But the sails are not rigid, but cloth, and twist in the wind. That means that the top of the sail (where the stronger wind actually is) is at a bigger angle to the centre line than the boom is. To counter that, we can move the traveller all the way to windward. That changes where the sheet is attached to the boat to a point further to windward, pulling the boom in past the centre line so the upper parts of the sail are in the right position.

If the boat was set up for racing (which she isn't) and had more conventional rig, not boom furling, she wouldn't have a rigid vang, and we could reduce the twist by tightening the vang. But we don't, can't, do that.

OK, we're not racing, but we can make sure the sails are working as best they can. That's called "trimming the sails" and can make a huge difference in how fast she can go: a very small change in jib sheet tension can make the difference between 6Kn and 8Kn. Trimming is particularly important when tacking as it affects how close to the wind you can sail without pinching.

Both the main sail and the genoa have short ribbons attached to them. These are called tell-tales and tell you quite a lot about the flow of air over the sails.

The tell-tales on the main are on the leech (trailing edge). The tell tales on the genoa are near the luff (leading edge). When close hauled, these are used to tell us if the boat is pointing too far upwind. If these tell-tales are flying fairly straight out, then the flow of air over and behind the sail is nice and smooth. If the tell-tales are fluttering madly then the air flow is turbulent. Pay attention to the middle set of tell tales.

If the air flow is turbulent on the inside of the genoa, the boat is sailing too close to the wind (assuming the sail is as tight in as it should be). Bear away (steer a little more to leeward, away from the wind) until the tell-tales behave.

If the tell tale on the outside is dancing, the sail is too tight in, or you are further off the wind than necessary. In this case either turn closer to the wind or let the genoa out a little.

The upper and lower tell-tails tell you if the sail is too flat or too full, information that can tell you whether to move the jib car forward or back on its track. We're not racing, so never mind those tell-tails.

Fancy Free will sail as close as 45° to the wind, but is much happier and faster 60° away. Sailing so close to the wind that the boat slows down is called pinching. Apparent wind is a better guide to how close to the wind you can sail. Aim for about 35° to 40°, but the wind direction indicator is off by about 7°, so on a starboard tack (sails out to port) you want 27° to 32°, and on a port tack you want 42° to 47°.

If you want to be fancy, you can set the auto pilot to sail relative to apparent wind. Press Auto and Standby at the same time, then adjust the angle by pressing the +1, -1 buttons. If the wind vane was correctly centred, then using the auto pilot to tack would be great: it would take you to the same angle off the wind on the other tack; but it isn't, so going from starboard tack to port tack, increase the wind angle by 15°, then tack by pressing +1 and +10 together, and going from port to starboard, decrease the wind angle by 15° and quickly tack: hanging around will cause the boat to stall.

Close Reach

This point of sailing is only a little more relaxed. The genoa maybe wants to be sheeted in a little less tight, but I don't think so. The main can be adjusted by moving the traveller more towards centre, but probably doesn't need the sheet letting out. To be nice to the traveller, let out the main sheet a little to reduce the vertical force on the traveller, then adjust the traveller, then take up the slack in the main sheet.

The sails can be trimmed using the tell-tales. Starting with the main: if the tell-tales are fluttering, move the traveller more to leeward or slacken the main sheet. The genoa is trimmed using its tell-tales as for close hauled

Beam Reach

Let the genoa out a little. Centre the traveller and let out just a little mainsheet.

The tell tales are used in this sailing angle, and for broad-ish reaches, in much the same way as for close reach

Broad Reach

When the boat is only sailing a little downwind, say 105°, the sails should be set much as for a beam reach but a little more relaxed.

When the boat is sailing within 60° of down wind, we are transitioning to that parachute mode, and the sails need to be set much further out, and the genoa wants to be fuller. If we were racing, we'd move the jib car further forward. But we're not playing that game.

At this angle to the wind, the tell-tales become less useful.

Running Downwind

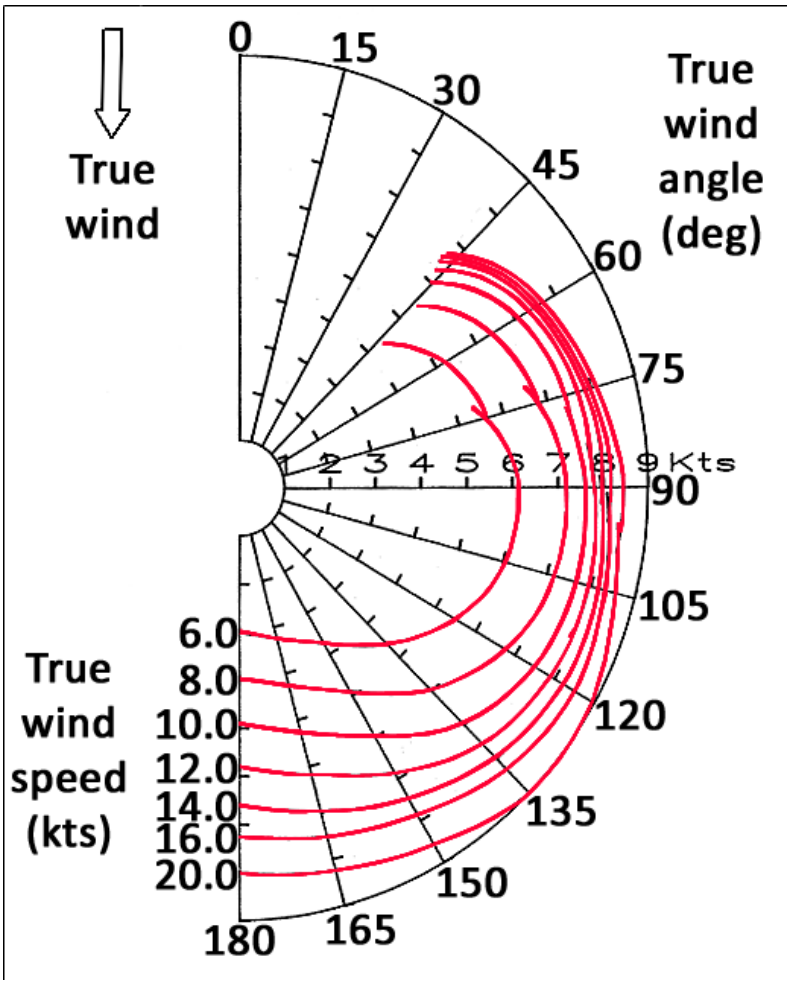
She does not like this point of sail. The best thing we can do is to sail goose winged. To achieve this, put the boat on a broad reach then turn the boat across the wind as if you were going to gybe onto the other tack, but leave the main right out and let the genoa gybe across. Then get back to down wind before the main gybes across in an uncontrolled manner (which is bad. Very bad). This is an awkward manoeuvre, and even when you have achieved the sails being on opposite sides the genoa is going to keep trying to collapse, "backing and filling", and you find you have to sail with the wind coming a little bit on the side the boom is out on. The answer to that is to use a whisker pole. I now have one. I have never used one and am not going to until I have been shown how to use it or the conditions are perfect. But in principle, the whisker pole goes from near the bottom of the mast to the clew (the free corner) of the genoa and holds the sail out. How you use the whisker pole (in theory) is described later in the section "Getting the Sails Goose-winged for Downwind Sailing".

If the wind is strong, 20kn or more, it makes more sense to use just the genoa. You won't go any faster with the main pulling as well, and it saves a lot of grief if the wind then strengthens as it is difficult (potentially hair-raising) to reef the main when going downwind.

Sailing Polar

This is what is called a “polar”. It shows the theoretic maximum speed for various wind speeds and directions. This is for a Catalina 42 mkII, which is what Fancy Free is, but this is for the deep keel version. Fancy Free has a wing keel so her speeds will be a little different.

I’m not clever enough to get these speeds very often: the sail trim has to be exactly right. And Fancy Free is heavier as she is set up for cruising and has quite big tanks. But I know that in light winds she really does not perform well going down wind, and her speed drops off quite quickly if you try to get her closer than 45° off the wind.



Getting close to these speeds requires the sails to be set just right. Just a few inches adjustment of the genoa sheet can take the air flow over the genoa from turbulent to lamina and can add a knot or more to your speed.

Changing Direction

There are four types of direction change:

- changing to sailing closer to the wind. This is called **heading up**
- changing to sail more downwind. This is called **bearing away** or **falling off** the wind
- crossing the wind by turning the boat so she is pointing directly into the wind then keeping turning. This is called **tacking** or **going about**. The word tacking is also used to mean repeatedly going about to zig-zag upwind
- crossing the wind by turning so the boat is heading straight down wind then keeping turning. This is called **gybing.**

Heading up and Bearing away (falling off)

These are usually simple manoeuvres and simply require the set of the sails to be adjusted. Big changes involve bigger changes to the sail set and can, in strong winds, be dramatic.

Tacking, Going about

This is sort of straight forward. The main sail requires little urgent attention, just adjust the traveller after completing the turn. The fun comes with the genoa. With a jib (a smaller headsail) as you turn through the wind, you watch the jib and as it starts to back wind, that is when it starts to fill from the other side, then you quickly release what was the working jib sheet and then immediately pull in (hard) the other jib sheet. Little finesse is needed.

With the bigger genoa it is a little trickier. The genoa has to push its way past the mast with all its clutter (including the radar dome on the front of the mast). If you treated the genoa as if it was a jib, it is likely to get stuck on these things (potentially damaging itself) or at least push past in an undignified manner that wears out the sail.

So what does one do? This manoeuvre requires fairly precise timing. Just as the genoa begins to think it is uncomfortable, when the leech (trailing edge) of the genoa starts to think about quivering, release the working sheet. This will let the genoa sort of fold in on itself so it can sneak past the mast. Almost immediately after releasing the old working jib sheet, take up the slack in the other jib sheet, the one that is becoming the working sheet. Watch to see that the genoa is crossing over cleanly before sheeting the sail in hard.

There is a chance that the genoa will get hung up. If that happens, turn the boat back onto the old tack, let her speed up, then try again. Worst case someone has to go on deck to talks some sense into the sail.

Alternatively furl the genoa. In fact, one school of thought says to furl the genoa before the tack and unfurl it afterwards (as you would do on a cutter if you had the genoa on the further forward forestay). Cutters have two forestays so they can have three sails deployed.

Or furl the genoa down to the size of a jib before tacking and unfurl it afterwards. A problem with that approach is that there is no winch for the furling line, and furling the sail under load requires a strong pull if there is a significant wind. The whole manoeuvre becomes complicated: slacken the working sheet while furling in the genoa, tack, then unfurl the genoa while pulling in on the new working sheet. A palaver. And this approach moves the centre of effort forward, making the boat less eager to tack, requiring more rudder, and risking getting stuck in irons.

So how is this done in practice? The process is done in stages:

1. Helm decides that a tack is needed, checks for traffic and other obstacles, and identifies a landmark to head for when the tack is done. Without that last step it is quite difficult to know you have turned 90° or 100°. Actually, I often cheat on that: I tell the autopilot to turn us 100°, but still pick out a landmark so I know where I'm going. Helm then tells the crew to get ready: "**Prepare to go about**"
2. In a perfect universe the crew then centres the traveller. That step is optional and gets forgotten. The crew then go to the jib winches. On the lazy sheet (lee) side, they make sure that most of the slack in the line is taken up, and they put a couple of turns on the winch in preparation. On the working sheet (windward) side, they take any safety turn off the winch, open the jamming cleat, and stand by to release the sheet: hold the sheet in one hand maybe 6" above the winch, holding it thumb up. Crew then replies to helm "**ready**".
3. Helm then starts the turn saying "**going about**" or "**turning**" or the old fashioned "**helm a'lee**" which makes no sense if you don't have a tiller to pull to lee, but have a wheel which you turn to windward.
4. As the genoa starts to go slack the crew whips the working sheet out of the tailer and swings the loop of line round to unwrap the line from the winch. This sounds like a recipe to have your fingers eaten by the line and the winch, but I have not seen any anthropopic tendency from the winches when doing this. Helm will also be watching the sails, and when they think it is time to release the sheet they will say "**Let go".** When the genoa has (mostly) pushed past the mast, the sheet is pulled in as quickly as possible on the new side. Helm is still watching the sails and may say "**Pull in**". You are pulling the sheet with it wrapped a couple of times round the winch, but the drum happily rotates as you pull.
5. When you are getting diminishing returns from pulling on the sheet, put a couple more turns on the winch and put the line in the tailer. Carefully. The winch and line do show more tendency to eat hands when you are doing this. You should be wrapping the line holding the line so that your little finger, rather than thumb, is towards the winch. If the wind is at all strong, close the jamming cleat so you can wind the sheet on the winch safely. When pulling a line that is on the drum of a winch, you should hold the line with both hands, again with little fingers towards the winch, and use your weight, not your arms to pull.
6. Crew pulls the traveller all the way to windward, and trims the jib using the winch to tighten up the new working jib.
7. Helm corrects the course for optimum "velocity made good", a fine balance of course into the wind and speed through the water. The instruments can be made to show "VMG" instead of "Speed" and "SOG" (Speed over Ground) but that requires you cleverly setting a destination waypoint on the chartplotter, very sophisticated

stuff. You want to be as close to the wind as you can get without losing too much speed (pinching). This is a judgment call that gets easier, even obvious, with practice.

At that point the excitement is over until the next tack, and the crew can go back to reading their books. A good video to watch on tacking can be found by searching for "Sailing Virgins tacking" in YouTube: https://www.youtube.com/watch?v=dxFqc81CKvQ. But be aware that they are sailing with a jib not a genoa.

Gybing

Gybing has a bad reputation. Some sailors are scared to gybe, and instead do a manoeuvre called a "chicken gybe", where instead of gybing through 90° or whatever, turn the other way and make a 270° turn involving a tack. This is actually uncalled for. An uncontrolled gybe, where the boom crosses from fully out on one side to fully out on the other side is dangerous, and can kill people, can break the gooseneck (where the boom hinges on the mast), or even break the mast. Don't do that. Ever. But a controlled gybe is not difficult or dangerous.

The gybe requires preparation. The first step is to sheet in the mainsail so the boom is more or less centred. From there the boom can not swing wildly: it has been tamed. Then you start the turn, deal with the foresail, then let the main sheet out with the boom on the other side. There is quite a lot hidden in "deal with the foresail".

The problem with the foresail, jib or genoa, is that if you do the same thing as when tacking, just releasing the working sheet, the sail will billow out forwards, and get all caught up on its own forestay. So instead, you let out the working sheet "while at the same time" pulling in on the other sheet. That works with a jib. With a genoa this would more or less guarantee that the sail will get hung up on the radar dome or something.

What one actually needs to do is:

1. Helm decides that a gybe is needed, checks for traffic and other obstacles, and identifies a landmark to head for when the gybe is done, as when tacking. Helm then tells the crew to get ready: "**Prepare to gybe**"
2. The crew then sheets in the main, so the boom is more or less centred, then puts a couple of turns of the lazy jib sheet on its winch and pulls in the slack in the lazy jib sheet, but does not make it tight, just not looped around on the foredeck. The crew then stands by the winch on the working side in anticipation of letting out some line. Don't take the line out of the tailer yet
3. Helm then says "**gybing**", and starts the turn.

4. As the boat turns to dead down wind, gradually let out the working sheet. Helm is also watching the sails and may say "**Pay out**".
5. At some point in the proceedings the boom will snap across to the other side, but the main can be ignored during the turn.
6. When the leech of the genoa is forward-ish of the mast, and before much of the sail gets forward of the forestay, start gradually pulling in the lazy sheet. Helm may say "**Pull in**". Actually, you can take up the slack in the old lazy sheet as the working sheet is paid out, allowing the clew of the sail to go forward, this prevents a loop in the lazy sheet (which is all too keen to get hung up on one of the hatches). Do not pull the new working sheet at all tight until the leech of the genoa is forward of the mast.
7. When the genoa is pretty solidly on the new side, the old working sheet can be completely released and the new working sheet adjusted.
8. The main sheet can then be paid out and the genoa trimmed.

That sounds all very involved. In practice it is a nice controlled manoeuvre.

Getting the Sails Goose-winged for Downwind Sailing

This is a somewhat tricky manoeuvre that involves gybing the genoa across while leaving the main on the side it started on. It requires fine control, and I won't do it except in fairly light winds that are nice and steady. The starting position is a broad reach. The steps are:

1. Helm prepares to turn as if for a gybe, but not turning quite as far. We will be turning past dead downwind as we have to persuade the genoa across. Helm is likely to say something like "OK, let's try to get this thing goose winged".
2. The crew then do the same preparation on the jib sheets as for a gybe, but leave the main fully out. They then say "**ready**"
3. Helm then starts the turn, and things proceed as for a gybe, but as soon as the genoa is safely across, helm stops turning and settles on a course as close to down wind as is possible, keeping the genoa from collapsing.

There are refinements to this. We could, and should, in stronger winds use a "preventer". This is a line that runs from the boom forward to a cleat forward on the lee gunnel. This prevents the main from gybing across. Or helps prevent that from happening. The preventer has to be disconnected before a gybe and put back on afterwards. For the goose wind exercise the preventer should be checked as part of the preparation.

And then there is the whisker pole. The problem with sailing dead down wind is that there is nothing holding the clew of the genoa out, and when the genoa fills, the sail will billow

forward with the clew coming closer into the boat. It may then fill again and the sail fills and expands out again. And repeat. A really frustrating slow motion flogging.

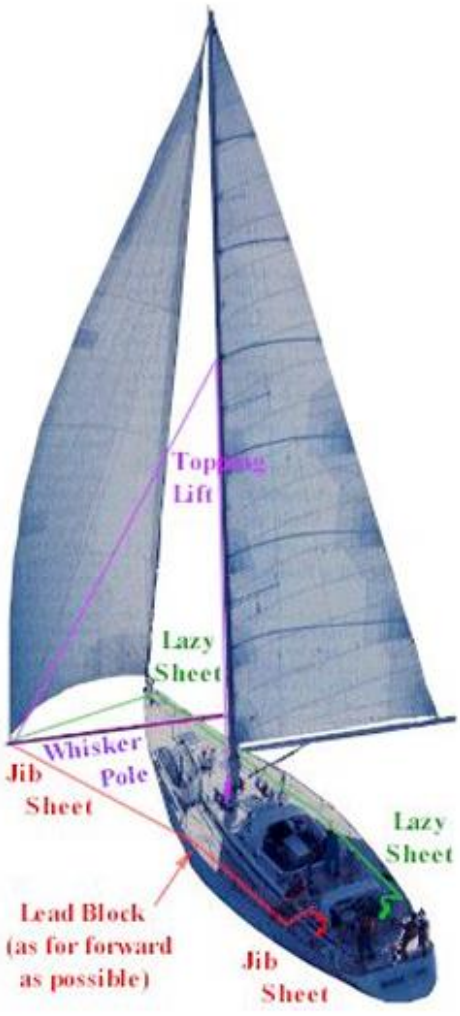
The whisker pole is the thing that holds the clew of the genoa out, so it does not do this.

I have never used a whisker pole in any wind, so the following is almost the blind leading the blind. But that has never stopped me before, so let's get on with it.

The whisker pole is a pole that gets attached to the mast and sticks out sideways. It has an openable ring at the end through which a genoa sheet is threaded. This allows you to pull the clew of the genoa out to the side, which is otherwise impossible. The pole has to be guyed so the end does not flop around.

While you set up the whisker pole you want to be clipped on.

To get the whisker pole deployed, before even up clipping it from its chocks, attach the line that runs from the far end of the pole to the top of the mast. We use the spinnaker halyard for this purpose. The spinnaker halyard, when not in use, is clipped to the port grab rail. From there it goes to the top of the mast, round a sheave, down the mast, round a turning block and back to the cockpit where you find it to port of the companion way, held in place by a clutch. Let out about 2 metres of line at the cockpit end (open the clutch, pull some line forward through the clutch and close it again). Then unclip the other end from the port grab rail and attach it to the dyneema loop and the outboard (forward when stowed) end of the whisker pole. This then means that the pole can be rescued if it falls overboard while you are faffing with it.



Next attach the fore and aft guys to the pole (bowline though the same dyneema loop on the pole as the spinnaker halyard) and attach the other ends to the fore cleat and midship cleat respectively. They need to be quite slack at this point. Pay attention to how these lines run: when the pole is deployed the guys will be outside the safety lines, so run them like mooring lines. And make sure the fore guy is tied

to that dynema loop in front of the aft guy. Take the pole out of its chocks and put it on the foredeck. Be very careful if the boat is at all active. Then, clip the genoa's lazy sheet into the clip at what will be the outboard end of the pole (the end everything is attached to), getting it the right way round.

Now the pole is ready to be deployed. Clip the pole to its ring on the mast. Get the pole more or less in the right position while pulling in on the topping lift (spinnaker halyard) so it (just) takes the weight of the pole so it doesn't rest on the lifelines. Finally, adjust the topping lift (the spinnaker halyard) and the fore and aft guys so the pole is securely in the right position, which is out horizontal from the mast straight out to the side.

When you are ready to move from a broad reach to a downwind run, furl the genoa, alter course to down wind, then pull the genoa out using the sheet that runs through the eye at the end of the whisker pole. Until this has been done a number of times the exact position of the end of the pole will require adjustment. Eventually you will have the two guys and the topping lift marked so you know how to adjust them.

There are other ways to deploy a whisker pole with fewer lines, but with this arrangement the genoa can be reefed or furled from the cockpit with the whisker pole left in position, but it has to be taken down, and the sheet led aft, not through the eye at the end of the pole, before the boat can be put on a reach requiring that sheet.

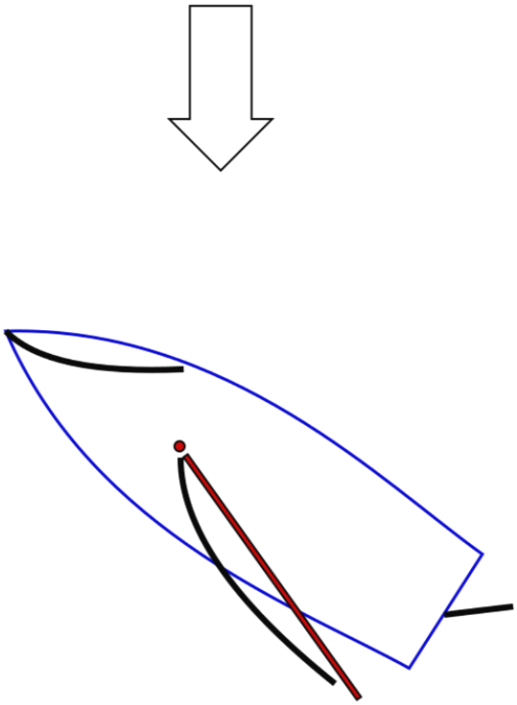
Having a whisker pole should make sailing downwind easier, but it means that if we have to change course someone has to go out on the foredeck to take the thing off the genoa and secure it out of the way. This slows down any manoeuvre.

To take the whisker pole back down, you basically reverse the process. Furl the genoa, then slacken the two guys and the topping lift. Unclip the pole from the mast and carefully manoeuvre the thing onto the deck, slackening the topping lift further, with the outboard end of the pole going forward. Stow the pole back in its chocks and make it secure and detach the guys. Detach the spinnaker halyard from the pole and clip it back onto the grab rail on the port side and pull the halyard snug in the cockpit. Finally tidy up and coil or flake the two guys lines.

There is a good discussion on whisker poles at https://www.ftp.tognews.com/Projects/Whisker_Pole_Instructions/Whisker%20pole%20instructions.pdf

Heaving to

This is a way of having the boat more or less stopped. It is useful if you are out in conditions that are really grim: you have reefed as much as you can, but the sea is building and you want it all to just stop. Well, you can't stop the wind and waves, but being hove to is a lot more comfortable, and is a stable configuration allowing everyone to go below and wait out a storm.



The theory is that you have the foresail, the main sail, and the rudder all working against each other.

Start from being on a port tack, then go about onto a starboard tack but let the jib go aback and then turn the rudder hard to starboard and lock or lash the wheel. The jib is trying to turn the boat to port and push the boat backwards. The mainsail is trying to drive the boat forwards. The rudder is trying to turn the boat to starboard. The net effect is that the boat should sit about 30° off the wind and drift slowly sideways.

All boats behave differently when you try to heave to. Without practicing this manoeuvre in reasonably safe conditions you will not know what to do if you need to heave to. I need to practice this.

You can heave to on the other side, starting on a starboard tack, but under colregs a boat hove to is "under way", and by being on a starboard tack while hove to means you are the stand-on vessel (for whatever that is worth). [If I was making the rules, I'd assert that a boat that is hove to would be a "vessel not under command", as the whole point is that things are gnarly and the crew is hunkered down below]

This manoeuvre should be practiced in more clement conditions so you know what you are doing if it gets gnarly.

Accidental Changes in Direction

Other than just generally wandering off course there are at least two types of change in direction that are at best exhilarating, at worst dangerous and destructive. These are the accidental gybe and the broach.

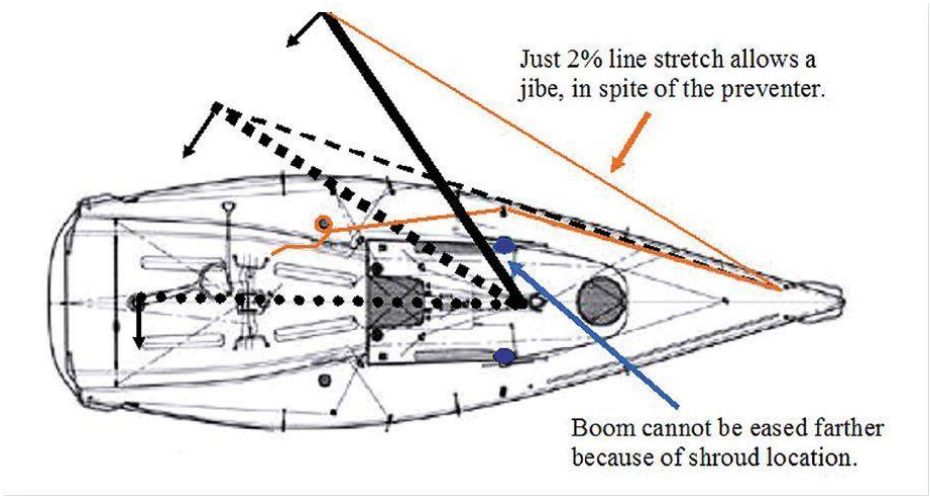
Accidental Gybe

Gybes can happen if you are sailing downwind and either you carelessly change course towards the side the main is out on, or the wind shifts or there is a gust of wind from just the wrong direction.

In any case the scenario is this: the main is well out to one side and the wind catches it from behind. The sail and boom go swinging across to the other side until they are suddenly stopped by the main sheet. Besides being noisy and scary, this is very bad for all the rigging. You can break the boom, mast, gooseneck, traveller, peoples' heads. Fancy Free's boom is particularly heavy because of the boom furling, so the risk of damage is that much higher. Just not good.

There are things that can be done to mitigate the risk of this happening. The most important, easiest and cheapest thing that reduces risk is for helm to pay attention. When sailing on a broad reach or downwind watch the main. If the main starts to stall or to flutter, steer the boat away from the sail, i.e. "head up". You will be busy watching traffic, and keeping the genoa happy, but the main needs watching too. I have had Anne at helm watching the wind angle very carefully, and me holding the main sheet out of the tailer ready to pull it in as quickly as possible if the sail starts to flutter.

Another thing that can be done that is cheap, but not that easy, is to rig a preventer. This is a line from somewhere on the boom going forward to hold the boom out.



The difficulties with preventers are that they are working at a mechanical disadvantage, mounting points are awkward, and you have to go on deck to set them up and take them down. I need to set up blocks on the stanchions to lead the preventer lines aft, rather like the blocks that lead the furling line aft.

https://www.youtube.com/watch?v=HffyKM0QeU8 shows a benign accidental gybe.

Broaching

Broaching is another thing that can happen when sailing down wind. Or even on a reach.

One picture is this: you are sailing in heavy seas, possibly with a bit too much sail up. You are sailing down wind with the wave behind you, surfing down a wave. You slide down the wave and go bow first into the wave ahead of you. This slows you down so the wave behind starts to catch you up. The boat is pitching forward, the crest of the wave passes under the stern and … the rudder is partway out of the water. The boat turns uncontrollably. If you are lucky you turn towards the side with the sail out, otherwise you have an accidental gybe. The boat, in turning, heels like crazy and you end up stuck in the trough then keep turning to point upwind.

Another picture is this: again, you are sailing in heavy seas, but this time reaching. A big, cresting wave hits the boat and again the boat heels right over, possibly knocking the boat right over on her side. The rudder is out of the water and the boat turns up into the wind.

The common factors here are heavy seas, massive heeling, and an uncontrolled turn.

If the boat is heeling more than you are comfortable with, depower the sails some by slackening the sheets. They will flap a bit. You should have reefed earlier, but late is better than never.

The good news is that the boat will come back upright even if the masthead touches the water. But there are risks. The obvious risk is that someone falls overboard. This can be avoided by (a) holding on, (b) being clipped on. The next risk is that the boat floods with water pouring down the companion way. This is actually unlikely. The biggest risk, no, not risk, certainty, is that down below with be a complete mess and anyone below will be thrown around and possibly injured. And everyone will be cross with the captain and the helmsman.

https://www.youtube.com/watch?v=DkouAjobzac discusses broaching and is mostly relevant. Ignore that it is talking about a spinnaker. Broaches are more dramatic with spinnakers. Just pretend you hear genoa whenever they say spinnaker. They are also talking about the “kicker”, the UK term for vang. We can’t adjust our vang, so ignore that.

Sails

Raising the Sails

Preparation

Check that all hatches and port lights are fully closed and dogged. If the fore hatches are even slightly open (for instance on the second latch on the dogs) then the jib sheets will (not may) catch and jam. Badly. And that is a real pain to fix, and bad for the lines and hatches.

If you are expecting strong winds or active seas, you should close some of the seacocks. In particular the seacocks for the showers and the aft head sink. The locations of through holes and seacocks is described in the section Through Holes.

Make sure you have plenty of sea room and you aren't in too much traffic. If the wind is offshore, that bit about sea room is doubly important as you will be pointing the boat into the wind, and with an offshore wind that means towards the land.

Take off the slapper-stopper. You should have done this earlier.

Point the boat into the wind and set the autopilot. You normally won't need much engine, but if there are big waves or strong winds you need more welly. Really, more welly than you'd think. Otherwise the autopilot will not be able to hold course, will give up and squeal, the genoa will back, and you have a mess to sort out

Pull out the fall of the furling line and chuck it down the companion way and make sure it is not tangled. There is quite a lot of it.

Put the main halyard on the main winch.

Think about which way you are going to sail off, and winch on the appropriate jib sheet. Make sure the other jib sheet is free to run, not stuck in its jammer, and is tangle free.

Raise the main first.

Release the main sheet, or make sure it has lots of slack. Completely releasing it makes for even more of a mess if things go pear shaped. Release the clutch for the furling line. Let it run out through your hand as you raise the sail. In light winds this may not matter much, but in strong winds you want to have control. In fact, in strong winds you may want the furling line to go round the starboard jib winch. You are also checking that no kink stops the furling line going out properly.

Make sure you have a good view of the sail where it goes into its track. If anything looks like it is going wrong, even slightly, stop and investigate. This is especially important near the start and end of the sail raising exercise.

Use the winch to pull on the halyard to raise the sail. Do not raise the sail too far. When you can see the reinforcing for the tack either hand crank or use very short bursts of power winching. If you are hoisting the sail reefed, make sure that there is still a full wrap of sail around the mandrel in the boom past any batten. There is a single red mark on the halyard for a reasonable 1st reef point with one batten still on the mandrel, and 2 red marks for a reasonable 2nd reef point with two battens still on the mandrel. These also give you some warning that you are approaching fully raised.

Close the clutch for the furling line, check the clutch for the halyard (it should be closed). Flake the remaining tail of the furling line and put it back in its bag, the inboard one. Take the halyard off the winch and put the main sheet on. Flake the whole mess of the fall of the halyard and put it in its bag, the outboard one. Make sure that these lines do not cross the main sheet. OK, the clearing up of the lines is likely to happen after you have raised the genoa and are underway, but clearing away the lines is important for safety: a neat boat is a safe boat.

Genoa

In light winds you can set your course and sail off under main alone and kill the engine while you get the genoa prepared. In stronger winds not so much. In stronger winds alter the course the auto pilot is holding to about 30° off the wind on the tack you will be starting on. This will stop the genoa from flogging as you unfurl it.

Make sure you have the jib sheets prepared: the working sheet with a couple of turns on the winch, the lazy line free.

Take the hank of the reefing line off the rail and drop it so it is free to run. Check that the jamming cleats for the furling line and the lazy jib sheet are open.

Keep control of the furling line so it does not run out uncontrolled. In strong winds this may require a bit of strength. In this case, or if you are planning on releasing only a reefed genoa, you probably should run the furling line round the lazy sheet's winch or at least round one of the cleats aft of the furling line's jamming cleat. This helps keep the furling line out of the jammer and adds a bit of friction so you can more easily control the line.

Pull out the working jib sheet by hand with just a couple of wraps round the winch. In strong winds you might want three turns: the line will be a bit harder to pull, but easier to control, and in strong winds the wind will be "helping" to pull out the sail. Pulling the sheet should

be quite easy. If there is a strong pullback you should suspect a jammed furler and need to investigate. There is a particular twist to setting up the genoa on this boat. As you pull out the working sheet, also pull (not so hard) on the lazy sheet until the clew of the genoa is at the mast. If you fail to do this, you will find the sheet catches on a hatch cover even though it is properly closed. Not badly, but sufficient to be a pain the first time you tack or gybe. You do not want any real tension on the lazy sheet, just enough to keep it from dragging on the deck and catching.

If you are raising only a partial genoa, when you have pulled out sufficient sail, pull the furling line into its jamming cleat and make the furling line fast to the little cleat there. Make sure there is slack between the jamming cleat and the regular cleat, otherwise the furling line may get pulled out of the jamming cleat. If you are fully deploying the whole genoa, note when the full sail is out: there will only be a little furling line left in the cockpit. Pull the furling line into the jamming cleat anyway.

Put a couple more wraps of the jib sheet round the winch and into the tailer. In strong winds you need to be careful the line doesn't bite your fingers.

Cancel the autopilot and turn towards your intended course. At this point, if the engine is still running, stop it. Then. If the intended course is other than a close haul you will need to let out more sheet on both the main and the genoa. If you are close hauled, move the traveller to the windward side. Generally trim the sails and clear up the lines.

Reefing

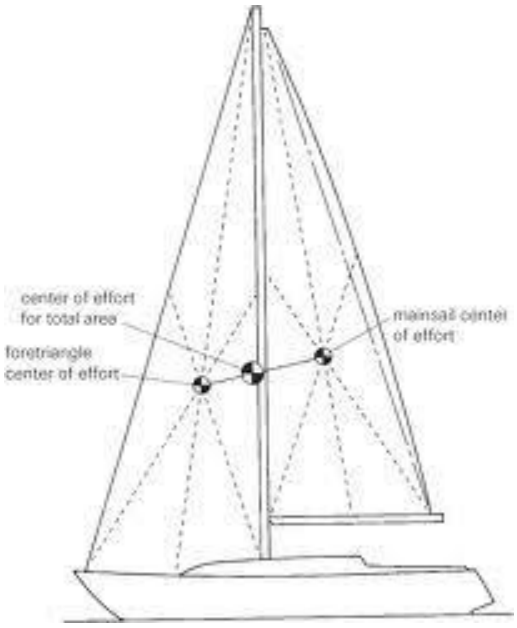
The general advice is that you want to turn into the wind to reef. That is a somewhat misleading oversimplification. In light winds it is sort of right, but why would you be reefing in light winds? This is not the complete truth and is particularly not true when it comes to the genoa. What is true is that you want to "depower" the sails so (a) you can reef them and (b) won't damage them trying. Reefing is a stressful game at the best of times, and more so if you left it too late. And sooner or later you will.

I have found no useful resource on the web. Everyone follows the party line with weasel words about how this doesn't really work going downwind. Thanks everybody.

Always start the engine, and do not be afraid to use the auto pilot. This gives you more control if things go a bit pear shaped.

Sail Balance

An aspect of reefing that is easy to forget about in the excitement of shortening sail is balance. If you are on any sort of reach, the main sail, as well as propelling the boat, allows the wind to apply a force aft of the centre if the boat. If you were to try to reach under main alone you would need a lot of rudder to prevent the boat from turning into the wind, rounding up. Similarly, trying to reach under a reefed genoa alone would require a lot of rudder to prevent the boat from turning down wind, bearing away.



If you consider the lateral forces on the boat, there are two big ones under the water: keel and the rudder. And two big ones aloft: the main and the genoa.
Below water, the centre of effect of the keel, the point at which forces average to, is the mid point of the keel. The force contributed by the rudder is that with the rudder centered, the rudder acting like the keel, plus a force that depends on how it is set. You want that to be small, as turning the rudder adds drag.
Aloft you can consider the center of effort of each sail as being its mid point. On a boat that is balanced as you reef the genoa two things happen: the force becomes smaller and the center of effort moves7\\\\\\\\=ward. As you reef the main, the center of effort also moves down and forward and the size of the force decreases. Which way the net centre of effort moves is quite complicated and idiosyncratic to each boat and set of sails.

Well balanced sails will require only a little rudder. You want the boat to have a slight tendency to round up. This is for safety. If for whatever reason you let go of the wheel it is a lot safer for the boat to turn into the wind and stop than to turn downwind and possibly gybe.

The simplistic advice is to put the same number of reefs in both sails. But with a big genoa rather than a jib this is not necessarily right. A fully deployed genoa extends quite a long way aft, and the furthest aft part of the sail is actually aft of the centre of the boat. The first little bit of reefing of the genoa moves the balance forward, giving the boat a tendency to turn down wind. So the easy advice is the first reefing to do when reaching is to start by reducing the genoa almost to a jib and putting one reef in the main. After that furl in more genoa and more main to keep the balance.

When sailing more or less downwind you want the balance well forward so the boat is being pulled from as far forward as possible. This may not matter much of the time, but if you have the wind behind you, you probably have the waves from behind too. If those are of any size they will have the tendency to turn the boat. Having the sails pulling far forward means the sails are

counteracting that tendency. Besides, it is a lot easier to reef the genoa going downwind than the main.

Genoa

If you are planning to reef the main, which more or less requires that you turn into the wind, your first step should be to furl the genoa. This stops the genoa from flogging or, worse, backing.

To furl the genoa, slacken off the working sheet. If you are close-hauled you slacken quite a lot. If you are on a broad reach less slackening is needed. Then pull in on the furling line while gently paying out the sheet. Pulling in the furling line is OK to begin with, becomes difficult, then towards the end is very easy. You should never use the winch to pull the furling line, at least never, ever, put the line in the tailer. You can get a bit of assistance while not stressing the sails or furler by putting a couple of wraps on the drum of the winch and pressing the button. Then a little tension on the tail of the furling line lets the winch help. Slackening that tension and the line just slips on the winch. Use this only if you really can't pull the furling line any other way, and even then be very, very careful: unless the sail is pulling hard the furling line should not be hard to pull, and you should not be furling a fully powered up sail.

Both sails have roller furling, so in principle you can reef either sail as much or as little as you want. However, you want to maintain balance between the two sails, and for the main you want to reef to a point not too close to a batten: you do not want a batten close to the boom, nor on the roller close to coming out of the boom. The genoa has marked vertical lines for one and two reefs. The main has no such convenient marks, but it does have marks on the halyard: one red ring for first reef, two red rings for second reef. These marks should be just inboard of the clutch for the "known" reefing position. This is particularly useful if you are initially raising sails with a reef or two in them (and this is the best time to reef). Without the marks you would not easily know how many battens there were still on the mandrel, so you wouldn't know when to stop raising the sail. Use the marks.

On Beam Reach, Close Reach or Close Hauled

Start by furling the genoa. Let out the main to shelter the genoa from the wind. This will also slow the boat down, diminish the heeling, and is generally a good thing if you are over sailed.

Then you can move on to the main. Turn the boat until she is pointing directly into the wind. Run the fall of the halyard around the base of the winch.

Take the main sheet off the winch and open its clutch, or better pull some slack through the clutch and close it. The sheet should be pretty slack, but it will want watching.

Put the furling line on the winch. Take up the tension on the halyard in your hand (as in pull) and open the halyard clutch.

Watch the sail closely as you let out the halyard while winching in the furling line. It is important to maintain tension on the halyard as you furl, otherwise you end up with a mess. If the sail goes slack at the boom, stop and pull up the halyard to tension it. This is not a happy place to be as you will need to put the halyard on the jib winch to pull it up.

You can reef to almost any amount of sail, but make sure there is a full wrap of the sail past any batten on the mandrel in the boom. There are marks on the halyard for nice first and second reefs. That takes the guesswork out of ensuring the battens are where they should be, and allows you to maintain sail balance if you put one or two reefs in the genoa

Close the clutch for the halyard. Check the clutch for the furler is closed. Check that the luff of the sail is tight: there should not be ugly folds of the sail just above the boom. Take the furling line off the winch. Put the main sheet back on the winch and close its clutch. Clean up the lines and resume course.

Broad Reach and Running

Turning from a downwind heading to upwind increases the apparent wind speed by a good 15 knots, and if there is a strong wind blowing you don't need that. And you are turning from with the waves to into the waves. That is at best uncomfortable, and if you are over sailed, the last thing you need is more wind, big seas, and less comfort. So instead of following conventional wisdom, you may want to depower the sails another way. The following is good in theory, but in practice is pretty horrid and really stresses the furling gear for the main. Use this method only if turning into the wind looks like a really, really, bad idea.

If you are running straight down wind, alter course to a deep broad reach. By choice, onto a starboard tack. It really helps to be on the starboard tack as it fills the sail in such a way as to make it a little easier to furl. This may involve gybing over the genoa, the main, or both. If you are over sailed and really don't want to gybe, then stay on the port tack and deal with the genoa first. If you are goose winged then you'll just have to reef the genoa with it pulling: but if you are running like that it is easy to get the genoa to partially collapse in on itself which depowers it. Fully furl the genoa or take it down to jib sized. That makes gybing less stressful. You should be able to gybe the main over even if you are over-sailed by pulling in hard on the sheet beforehand. If you have furled the genoa and have gybed the main, then continue from there without letting out the main sheet.

Next the main. The following sounds good in theory, but should be considered desperate measures. I've tried it and didn't like it. You really can't depower the main enough that the furler is even slightly happy. If you have really left it too late and the situation is such that turning into the wind feels downright dangerous, try this. Pull in the main sheet so the sail is just off to windward with the boom almost centred. This depowers it and makes it less of a catastrophe if the sail gybes. But it is more likely to gybe being that close in. Pay attention to what the wind and sail are doing! You are going to be using the main winch for the furling line and the halyard which you just run around the base of the winch. The mainsheet should hold just fine in its clutch: having the sheet let go under these conditions would not be good.

Then go through the reefing process just as you would when pointing upwind, except the forces on the sail are horribly bigger. Be very careful with the halyard and don't let go. Be very aware that you are stressing the furling system.

When reefed, close and check all the clutches (only the halyard clutch should have been open) and take the halyard off the main winch and put the main sheet back on the winch.

Once things are settled down, kill the engine and tidy up the lines.

Furling the Sails

Normally you'll be furling the sails with the boat pointing upwind with the engine running. In strong winds you want to get the genoa put away while the boat is pointing just off the wind to minimise flogging. Otherwise, this case is like reefing all the way to no sail. The only other things to be aware of is that you want to let the jib sheets wrap at least once around the forestay, and for the main make sure you do not reel it in past the mark, and you want to put the slapper-stopper on. Eventually. It can wait until you are safely anchored or moored.

However, you might be furling the sails while running downwind. This is the extreme case of downwind reefing, and is exactly the same process, and just as much "desperate measures".

Motoring

Motoring is noisy, carbon intensive, and smelly. Sail is much better. But if the wind is not blowing or the conditions are horrible, or if you need to do some fine manoeuvring such as negotiating a narrow tidal passage, or anchoring, or mucking around in a marina, you need to use the motor. Also, using the engine recharges the batteries and heats the hot water.

Whenever the engine is running you want the engine compartment fan on. It is controlled by the little toggle switch on the helm. As the fan only runs when the engine is on, you can ignore the fan as long as you leave this switch alone.

Before you start the engine give it a little throttle while leaving it in neutral. This is done by centring the throttle lever (at the black mark), then, while pressing the button at the bottom of the handle push the lever forward. You may have to jiggle the lever a little to get the button in properly, and the lever should move more freely without the fairly obvious resistance you feel as the gears engage.

Then turn the key clockwise. You should hear an ear-piercing squeal. If you don't then something is wrong. You then push the black button on the helm. The engine should start and the revs rise to about 1000. Adjust the throttle lever so the revs are 1000 and note the position for future reference.

You want the higher revs than just idle to prevent a phenomenon known as "wet stacking": when the engine is cold and idling, you get incomplete combustion which is smelly and causes condensation of diesel fuel on the cylinder walls, which can then seep into the lubricating oil, which is bad. If the air is cold, you may see a little white smoke from the exhaust and smell diesel. The engine does not have a preheat which would prevent this. It is harmless and expected. And a bit smelly. Sorry.

If you hear that squeal when the engine is running, it means there is a problem: oil pressure or over temperature, probably the latter. Unless you are in the middle of a critical manoeuvre, turn off the engine and check things. Or turn off the engine as soon as it is safe.

Do not engage gear unless the engine revs have dropped to idle (800). Especially do not shift directly between forward and reverse. Either can strip the gears. When changing from forward to reverse or *vice versa*, always pause at the neutral position and count to two before continuing.

The key turns on, or off, the electrics for the engine. Diesel engines require no electricity to run and are stopped by stopping fuel getting to the injectors. If you turn off the key with the engine running you (1) risk damaging the alternator by disconnecting it suddenly, and (2) turn off the power to the solenoid you need to stop the engine. Do not touch the key when

the engine is running. You stop the engine by pressing the red button on the helm. Hold the button until the engine stops and you get that ear-piercing squeal again. Then turn off the key (anticlockwise). The engine is a bit like a horse: you need to run it gently for a bit to let it cool down before turning it off, about 5 minutes. If the engine has been running slowly for a while, you are supposed to race the engine just before the cool down period and every 2 hours of slow operation. The procedure to race the engine is to accelerate up to 2500rpm and back to idle about 5 times with the gears in neutral (the button at the bottom of the lever). This is to burn off any soot deposits in the cylinder from idle or slow use. Make sure the engine is in neutral before stopping.

Pre-start checks

There are four regular checks, ones you should do before starting, and certainly if you hear that squeal when the engine is running normally.

Dip stick. You want to check the oil level. You access the dip stick from the forward engine hatch in the starboard aft cabin. Pull out the dip stick, clean it with a tissue, put it completely back, then pull it out again. The oil, which will be black, should be between the high and low marks. If the engine has been running, you will get an artificially low reading if you read too soon as the oil will be up in the galleries. If you wait a bit, you will get a slightly high reading because the oil is hot and has expanded. If you need to add oil, note it in the log. The engine is well looked after: checking the oil every time is a bit overkill.

V belt. You access the v belt by hinging the companionway ladder forward. You want to check the tension in the belt. You should be able to push it in a centimetre with not too much effort, but no more than two cm even pushing reasonably hard. Too tight or too slack needs fixing.

Drips. If there are drips or puddles of fluid (or loose nuts) under the engine there is a problem brewing. Try to identify the fluid and source and note in the log. Then clean it up.

Cooling water. The cooling happens with “Primary Coolant” and “Raw water”. The primary coolant is fresh water treated with things that make it less likely to boil or freeze and which help lubricate. This in turn is cooled by raw sea water. This is done because sea water is really not good for anything mechanical. The check you regularly do is to look in the raw water filter to see if it has seaweed in it. If you can see seaweed, close the raw water sea cock (it is labelled), open the lid of the filter, clean it out, reassemble it, open the sea cock and mop up the seawater that overflowed into the bilge. The raw water filter and the seacock are under the starboard arm of the berth in the port aft cabin.

If the engine alarm went off and this filter is clear, suspect the impeller. To check or replace that, you need to phone base for instructions.

The engine burns diesel. That is stored in a tank that holds 175 litres (46 USgal). To be safe, you should assume that the bottom of the tank contains muck and water, so to avoid issues, try never to take the tank below half full.

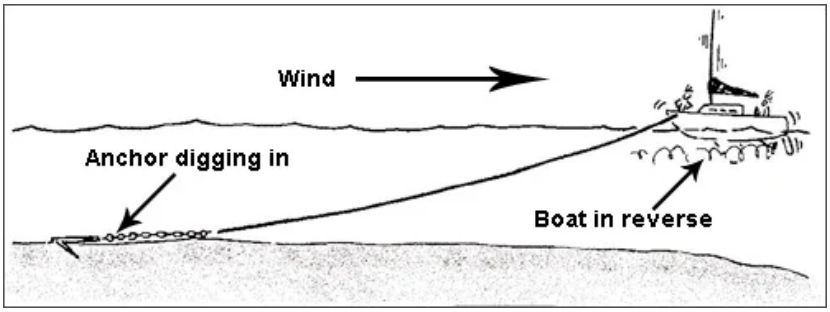
The filler cap for the tank is near the stern on the starboard side, and you open it using the same tool as used on the water tanks. The tank gives almost no warning that it is approaching full. You can hear a slight change in the sound of the fuel going in, but you have to know what to listen for and listen carefully. Always hold a fuel mop up cloth outboard of the filler pipe when fueling to minimise the spillage.

A quick aside on phones. Cell coverage is variable in our cruising area. If you don't have phone connection when below, try in the cockpit or on deck. My phone is used as a WiFi hotspot. If it can work while plugged in that is best. Failing which, it can be hung up under the dodger, and if that doesn't work, it can be hoist up the mast using a spare halyard, but remember to attach another line to the halyard shackle as a downhaul or my phone will be stuck up the mast.

Anchoring

When choosing an anchorage read the chart carefully. There is a lot of information about the various anchorages in Navionics. Note the reviews: they are likely to contain more up to date information. In Navionics use the crowd sourced “SonarChart” maps as well as the nautical charts. There places where the charts are very wrong about depth. For instance, behind Musket Island the nautical charts have the depth less than two metres. The actual depth is more like ten metres are reported in the SonarChart maps. Check in Wagoner’s as well. But after all that, be aware that all that information my still be wrong, or wrong for you. The worst case is where an anchorage has been filled up with private mooring balls. There are no easy answers. The only way to learn what the good anchorages are is by trying them.

How the heck does anchoring work? The anchor is not that big a hook, and Fancy Free must get pushed by the wind and waves. Why doesn’t the anchor just slide along the bottom. And if it holds so well, how come you can get it back up again? Well, there are several answers to that. The trite one is “it works”. It is sort of reassuring to see other boats out there anchored, not going anywhere. And you know a fair proportion of them must be skippered by people who are ignorant, careless, or stupid, or some combination of those. And yet it works. And it can’t be that difficult.



The anchor works by being a clever design that causes the pointy bit, the “fluke” or “spade” to bite into the sea floor. The chain, with adequate scope (chain length divided by depth), has sufficient weight and length that the force exerted on the anchor by the boat is almost horizontal, the direction that the anchor is designed to resist, but when retrieving the anchor the direction of pull is vertical so the anchor releases. Usually.

The chain hangs in a catenary. That curve drops down steeply then levels out. The key to anchoring is that the chain be long enough that at the anchor the force is close enough to horizontal to make no difference. There is lots of contradictory advice out there on scope. You will find people saying you want seven to one scope. That might be true in really shallow, non-tidal water like the Caribbean, but is plain silly in our deeper, tidal water.

No anchorage is perfect. Compromises have to be made. You may have to be more exposed than you like, in deeper water than you like, have less scope, be closer to other

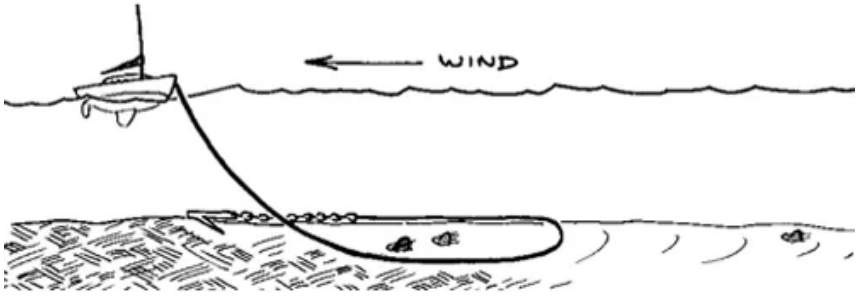
boats than is perfect. Accept that. Conventional wisdom has it that no skipper sleeps soundly on anchor.

There is more to it than that. If the sea floor is mud, silt, or sand then the ground acts sort of like a liquid when disturbed, but more solid when settled. So when anchoring, the action of setting the anchor, by pulling away from it, digs in the anchor so that the ground has settled back and becomes more solid by the time any nasty wind picks up to stress the anchor.

Not all sea floors are mud, silt, or sand. Sometimes the sea floor is covered in thick seaweed. In that case sometimes the anchor fails to get through the weed and just drags over the top. It may take several frustrating attempts to get the anchor to set, and between each one the anchor has to be brought all the way up so it can be cleared of weed: it can bring up a prodigious amount of weed. Or the sea floor can be rock. Rock is hard and the anchor can not dig in. But it is likely to be uneven, and the anchor will usually catch. This catching can be quite sudden and dramatic as the boat suddenly stops and the bow dips while setting the anchor. Recovering the anchor from such a set can be difficult.

Charts show the type of seabed with the following codes. The table is more or less in preference order, at least down to Pebbles. Boulders and coral are a nightmare as the anchor will foul, and the chain will wrap. Often you are told not to anchor on seagrass as it is an important and fragile habitat.

Symbol	Seabed type	Symbol	Seabed type	Symbol	Seabed type
S	Sand	G	Gravel	Sh	Shells
M	Mud	P	Pebbles	Wd	Weed
Cy	Clay	R	Rock, Rocky		Kelp, weed
Si	Silt	Bo	Boulders		
St	Stones	Co	Coral	Sg	Seagrass



Of course, sometimes the wind (or current) changes direction overnight. In that case, the chain will pull round and the anchor will probably release and probably reset. That resetting is a bit iffy, and there should be an anchor watch for a bit after such an event. That will happen pretty spontaneously as the anchor alarm will go off because the boat has moved so much. This can be an unnerving experience.

If the anchor does drag you have a problem. If it is daylight you have the option (maybe) of re-anchoring. If it is in the middle of the night the situation is more serious. You may have to start the engine and gently power forwards to take the strain off the chain. That is not a nice option, but the alternatives may be worse. Be aware that if you are having problems then the boats around you probably are too. Watch for them. Deploy fenders.

There are other considerations on where to anchor: exposure to wind and waves, depth, distance to rock and shoals and other boats, and the gradient of the seafloor.

Wind and Waves

I suppose if the weather is settled you could ignore the risk of wind and waves. In that case, it is hardly worth dropping the anchor at all. No. Do not ignore the possibility of wind and waves. Having said that, compromises have to be made. No anchorage is perfect. If the weather is calm, is forecast to remain calm, and you believe it, then you can be less fussy about shelter. If the weather is set with the wind in one direction, is forecast to remain that way, and you believe it, then concentrate on being sheltered from that direction. Some anchorages only really work with the wind in one direction. In our cruising area the winds are generally from the SE or NW. And can switch fairly quickly. Local topography will affect the direction of the wind in the anchorage, often in weird ways that are less than obvious. Wind is particularly important if you are stern tying. You really do not want wind on the beam, and in crowded stern tie anchorages just getting stern tied in wind is a nightmare.

Waves go with the wind. Usually. Some sheltered bays may be wavy because of passing ships or ferries. Waves have to be added to the depth calculation if they could happen at high tide. They also affect how much scope you want: the waves will help lift the chain, generally adding to the forces on the chain and anchor.

If the wind is expected to change and is significant, then you might want to anticipate the anchor tripping and resetting. That will affect how much room you want. Normally a wind shift with light winds just causes the boat to swing round without the bulk of the chain moving at all. But if possible you want to leave more room than that at least to the shore and other solid objects. Other boats, especially other boats of the same sort, should all swing together. Or not, but if the anchorage is crowded you have to pretend that is the case. Maybe put out fenders just in case if badness is anticipated.

In some anchorages there may be a consistent wind across the waves. That makes for a very uncomfortable, rolly, night. There is a solution to this: set up a bridle from a midship cleat to the chain and back to a bow cleat. Adjust the lengths of the sides of the bridle until the boat sits at a good angle to the waves.

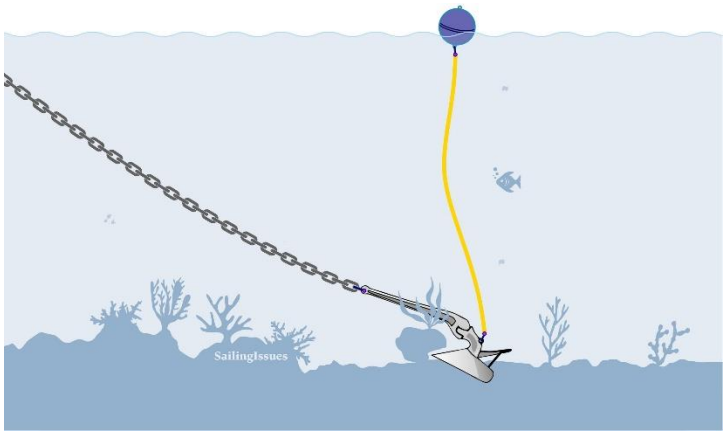
Depth

Depth affects how much chain you have to put out, as if that even needed saying. The relationship between depth and chain length is called scope. The deeper the water is, the smaller that ratio can be. The mathematics of catenaries is a bit ugly. All things being equal, you want to anchor in fairly shallow water where there is always going to be at least a metre under the keel, so 3 metres at lowest expected tide. Or better 3 metres chart datum.

You can anchor in up to 20 metres. That's 15 metres chart datum. Or you can push that to 18 metres if you feel lucky.

Preparing Trip Line

If you are setting out to an anchorage where the bottom has snags, for instance Squirrel Cove, you want to set up a trip line. This is a line that goes from the crown of the anchor, the pointy end, up to a buoy on the surface. You could set up the trip line underway, but attaching a line to that bit of the anchor under way is fraught.



The trip line is a 15 metre nylon line kept in the anchor locker. You should attach the other end of the line to the 6" buoy also kept in the anchor locker. And you want the length of line between the anchor and the buoy to be such that the buoy is never pulled underwater, but with as little freedom of movement as possible. Guess, as best you can, the maximum that you might anchor in including any expected tide and add about 1.5m to allow for the

anchor pulling some line into the mud, and for little waves, and error. You do not want a free end of line flapping around catching people's propellers, so attach the line to the buoy using a long bowline. If there is still line left over, attach it to the loop using a rolling hitch. The line is marked in metres.

Make sure that the line is free to run overboard in such a way that the buoy can get overboard too.

Gradient

If the sea floor where you are anchoring is steep, then the anchor will hold well if the boat is pulling up hill, not so well if pulling down hill. And if the anchor trips being pulled down hill the probability of it resetting is close to zero. Also, steep sea bottoms tend to be rock, for obvious reasons. If the sea floor is that steep, you probably need to stern tie.

Before Getting into Anchorage

Look at the charts and tide tables. Know what the state of tide will be when you anchor and how much it is going to rise and fall while you are there. Look at the depth on the chart. If it shows it, note the type of bottom. The best bottom for anchoring is mud, then sand, then gravel. Rock is difficult. Check in the various guides to see if they say anything about the bottom and potential hazards: wrecks, logging debris, and so on.

Turn on the engine and furl the sails. Turn on the radar as it takes a couple of minutes to warm up and get going. And set the radar to a short range: you are only going to use it to measure the distances to other boats and the shore.

Scouting

When you get into an anchorage you need to consider depth of the water and scope of chain. From that you can calculate your swing radius. You need to be able to judge distances to the shore and other boats: for this the best bet is to cheat and use the radar.

Communications between helm and the person dropping the anchor is vital. To help with this we have 2-way headsets. To turn the head sets on (or off) press the centre button and the + button for one second. You should see a long blue light followed by a short blue, several red flashes then a final blue flash. The number of red flashes indicates their battery state. 4 is good, 2 is not good. Check connectivity and volume (controlled by the + and – buttons). There is also a masthead camera that will show helm what is going on on the foredeck. Once you are finished with the radar, switch the helm display over to the camera.

Setup

Get the anchor ready. Make sure the windlass breaker is on. It is by the forward cabin door on the wall near the bottom on the port side. Open the anchor locker and secure the hatch. Unhook the snubber from the chain and take the snubber off the cleat and reattach it so the snubber is a good length, and put the snubber out of the way. Note how long the snubber line is: you are going to drop the chain, stop, attach the snubber, then let out more chain. So the total length you let out includes the length of the snubber (minus the metre from the cleat to the bow roller).

Once you have identified your spot, you need to note the depth for the initial drop and calculate how much chain total you will need. For chain length use at least the lesser of 15+2*d and 4*d, where d is the maximum expected depth + 1.5m, the height of the bow roller over the water. More is better, but letting out lots of chain is a bit antisocial in a crowded anchorage. The chain is helpfully marked every 25 feet, which is just over 7.5 metres and double marked every 100’ (30m) with bits of yellow twine. There is no mark for 25 feet, and there are two marks at 100 feet and 200 feet. The chain is also helpfully marked with yellow paint every 30 feet, 9 metres. Convert the calculated lengths into the number of marks you need to see go past. The chain goes out very fast, so you will have to watch like a hawk to see the marks.

This length of chain is also used to calculate your swing radius. Swing radius is length of chain + length of boat (13m). OK, it is a bit less than that, but if a strong wind blows up from the opposite direction, the boat will swing all the way round and the anchor will twist out and (one hopes) reset. That adds a bit to the radius. Verify that the distance to other boats is about 2x the swing radius and the distance to the shore or shallow water is greater than the swing radius. It may not be possible to be 2x swing radius to other boats. In theory the boats will all swing together, but that is only true of similar boats. If you have to anchor closer than you like to other boats, try to anchor with similar monohull sail boats.

Anchoring

Manoeuvre the anchor over the bow roller so that it is still on the roller but will easily go over and down when you let out chain. This is easier to say than do. What I do is let out 3 inches of chain by just touching the down button very quickly: the windlass is fast. 3 to 6 inches. Less than 3 and the anchor will not go far enough. More than 6 and the anchor is too far out. Then standing in the very front of the anchor locker, push the anchor forwards over the roller. You have to push the shank of the anchor: pushing the swivel doesn’t do it. It only needs to move that three inches to balance so it will drop. All under control and only small forces required.

You want to approach your anchoring spot dead slow from down wind (or down current if that is the dominant force) — if necessary, stop the boat and see which way she drifts. You want the boat to be directly head into the wind. If the boat is at an angle to the wind, or if the wind is variable, the boat will swing as you try to stop and back away. You may want to use the bow thruster to keep the boat under control.

You will want to drop just enough chain on the spot to put the anchor on the bottom (current depth + a couple of metres) and note your position with the anchor alarm. We use an anchor alarm app on my phone rather than the one at the helm. This saves having to have the instruments on all night, but means my phone should not go ashore with me. You then let out the rest of the chain as the boat backs away slowly away from the wind.

If you have the trip line attached, then you have to pay out that line and help the buoy overboard.

Once the chain is laid out, you want to attach the snubber. Hook the snubber onto the chain preferably just past the bow roller (I never achieve that, but the hook will remain attached as it goes over the bow roller if you keep tension on the snubber). Then, keeping tension on the snubber, let out more chain. I like to let out the chain about half a metre at a time, keeping the weight of the chain on the snubber, then paying out the snubber until the chain is almost taut, then repeating until the snubber is taking the load on the cleat. The snubber should be over the bow roller next to the chain and to port of the chain. Then let out another metre of chain. You may need to do that in half metre chunks and help it over the roller.

Then you need to set the anchor. That means pulling on the chain so the anchor digs in. Put the engine in reverse and slowly raise the engine revs from idle up to 1500 or possibly 2000. While doing this, check that the boat is not moving by checking against other boats (that might be blowing around) and the shore (which won't be blowing around). Do not use the instruments for this check: they will mislead you. You also want to feel the anchor chain either by putting a hand on it or a bare foot, to feel if the chain is juddering: that indicates the anchor holding and releasing. If the anchor drags, you need to pull it in and try again.

In a crowded anchorage you probably want to set the anchor with only some of the chain out.

Once the anchor is set, close the hatch, turn off the windlass breaker, and when you are confident everything is good, turn off that noisy motor.

Raising the Anchor

Make sure the boat is ready for departure. Use the checklist

Start the engine and turn on the windlass.

If the trip line is deployed, pull its buoy onboard as soon as it is in reach and secure it out of the way. Use the boat hook to catch the line just under the buoy. As the chain comes in, watch that the line is not tangled up in it. Anticipate some untangling using the boat hook. When the anchor is snug, pull in the rest of the line coil it neatly and put it and the buoy in the anchor locker.

If there is no wind you can use the windlass to lift a length of chain until you see it rise to an angle, but not taut, then pause and let the weight of the chain pull the boat forward. Repeat this until the anchor is off the bottom (the anchor is tripped). As the hook end of the snubber comes aboard put the whole snubber off to one side, not in the anchor locker. You do not want it under a pile of chain.

If there is any amount of wind or current, you should not use the windlass to pull the boat forward. You need to motor forward very gently being guided by the anchor hand who should be pulling in the chain as you go forward. This is easier said than done. One thing to avoid is overrunning the chain, which can damage the gelcoat. Otherwise carry on as you would with no wind.

Let helm know when the boat is adrift. Pull in the rest of the chain and anchor making sure that the anchor is the right way up and you are not pulling vast quantities of mud aboard. If the anchor insists on being the wrong way up, give it a prod with the boat hook. If the anchor (or chain) is filthy muddy, try dropping it and raising it again to do some rinsing. It can make a difference. Make the anchor snug, but the chain should not be tight. Then use the snubber to hold the anchor tight by hooking the snubber onto the chain, and making it taut and fast to the cleat in the anchor locker. Close the hatch, turn off the windlass and you are done.

What to do if the Anchor is Stuck

If the anchor is caught and won't come up, or if a great log or something comes up with it, you have a problem. All is not lost. The first thing to do is to back away laying out all that chain you just brought in. That is to give you room to turn the boat around to pull from the other direction. Back away in the direction you were pointed and gently pull on the chain using the engine to pull the chain. Then try to retrieve it as normal. Might, might not work. Keep trying, pulling in various directions, and pulling back more emphatically.

If you anticipated this problem and have the trip line out, you may be in luck. Let out sufficient chain so it is slack, and take a few wraps of the trip line round the winch drum of the windlass and take up the tension on that line. Then keep tension on the tail of the line and use the windlass to pull on that line. In theory that should pull the anchor free. If it does, then let a little tension off its tail so the line does not go overboard, but will slip on the drum and pull in the chain as normal.

If none of that works you have a problem. One suggestion is to take the boat in fairly close to the anchor, so the chain is close to vertical and go out in the dinghy with the stern line weighted a few metres further in than the depth of the water. Loop this line around the anchor chain at the point where the line is weighted and pay it out. When the line touches bottom, let out some more chain and back the boat away, then let the chain relax so some chain is lying on the bottom. Pull the line to and fro as if trying to saw through the chain while pulling gently on the line. The idea is to try to get the line under the shank of the anchor as close to the flukes as possible. Then pull hard on the line to try to pull the anchor up from the fluke end. It might work.

If nothing works, you will have to abandon the anchor.

Anchors and chains are expensive, so we will want them back. Find a line that is a few metres longer than the depth at your location at highest tide. Tie that line to a fender. Tie the other end of the line to the chain, forward of the bow roller, and let out all the chain to the bitter end. Untie the chain from the boat and let it go (with an awful sinking feeling) There is a spare anchor and chain. Arrange for a dive boat to come and try to rescue the anchor, or at least the chain. Let them know the location of the anchor, both lat and long and description.

The spare anchor is in the anchor locker. The spare chain is in a big bucket in the port lazarette. Do not drop either overboard: they don’t float. Let’s hope you never need them.

Stern Tie

The stern tie starts as an anchoring manoeuvre, except that you want to let out less chain before the set, so you have room to set the anchor. And there will be (potentially) far less space to the neighbouring boats. So as part of the setup, deploy the fenders. If there is any wind, this whole thing will be a nightmare.

The way I was taught was to unreel the stern tie line over the stern of the boat, feed the end through the chain or ring-bolt on the shore, bring the end back to the boat and make both ends fast to cleats on each side of the stern. This makes no sense, as if it is windy and the wind shifts, the line will chafe horribly in the (often very rough) chain or ring-bolt with the result as shown.

Instead, in the summer when it is crowded and the weather is settled, take the line out and back to one cleat, or two if it is crowded and you are convinced it won't chafe. In the shoulder season when it is windier, use two lines one from each side of the stern to two different anchor points on land. If you only have one line, take it out and back, pulling lots of line through so you can take it out and back again to the second anchor point. The line must be cleated so each loop to shore is effectively an independent line with a bit of slack between the two (looping between the two stern cleats in such a way that you won't trip over them.

In the off season, in small anchorages, it would be better to use three or four lines, the third and fourth going from the bow of the boat.

Start by reading all about anchoring. The following only highlights the differences.

Before getting into Anchorage

Note where the stern tie rings are expected to be. Dig out the binoculars so you can spot them. The stern tie rings are typically lengths of (rusty) chain, or ring bolts set into the rock. In either case they may be marked by paint marks in what may once have been a bright colour, or marked by yellow reflectors.

Scouting

For stern ties the scope may have to be less than you like. For instance, at Smuggler Cove, there is a rock in the middle of the main bay and there may be lots of boats in there. If they

all had 4-1 scope everybody's anchors would be on top of each other. Try for 3 to 1, but in any case, scope+13m should be between 10 and 30 metres less than distance to the shore. You can use Navionics to get a reasonable estimate of distance to shore, but it isn't perfectly accurate. According to it I have happily sailed on land. The radar isn't perfect, but reflects reality, and also shows other boats.

Note where the free stern ties are, and how close the other boats are. Consider the wind direction and how the boat will blow around as you anchor and while you get the stern line tied and tight. If you are expecting wind overnight, try for a stern tie where the boat will be pointing directly into the wind, failing which directly away from the wind. In a crowded anchorage you may have limited choice.

Setup

Roust out the reel of line from the port lazarette. You are not intending using this line, but if you want it, you don't want to be fumbling head down in the lazarette. You will actually be using the stern tie strap from the reel on the port rail. If you are going to be stern tying close to other boats, put out fenders both sides. Tie them high, not at the water line as you would for docking.

Once you have identified your spot, you need to note the depth for the initial drop and calculate how much chain total you will need. In this case the length of chain is determined by the distance to the shore (which in turn is calculated by two or three to one scope).

Anchoring

You want to approach your anchoring spot dead slow from about where you want the boat to end up tied. If there is wind take that into account: you want the boat to be directly head into the wind. If the boat is at an angle to the wind, or if the wind is variable, or there is a current, the boat will swing as you try to stop and back away. You may want to use the bow thruster to keep the boat under control. Given that you may be constrained by where the stern tie ring is, and by other boats, you may not be able to be head to wind. Then life gets difficult.

You will want to drop just enough chain on the spot to put the anchor on the bottom (current depth + a couple of metres). You then let out chain to about twice the depth as the boat backs away slowly towards the shore

Then you need to set the anchor. This is nerve wracking because you are pulling directly towards the shore which is likely to be uncomfortably close.

Once the anchor is set, lay out a bit more chain and set off in the dinghy with one end of the stern line. Land, and clamber up (if necessary) to the ring. Keep hold of the dinghy's painter

so it doesn't sail off by itself. Pass the stern line through a ring and pull sufficient line into the dinghy to be able to get back to the boat. If you are tying to a length of chain, try to pass the stern tie line through a link that is not badly corroded – you want to avoid chafe. Also, when passing the line through the link, make sure that the rest of the chain, the dangling bit, is behind the line. If the line is through the middle of the link with the dangly bit at the end of the link, then the line will get caught in the constriction between the two links.

I tie a quick bowline in the end of the line and loop it over my wrist to keep hold of it as I row back. Make fast the free end of the stern line to a cleat in such a way that the line will not pull against the stern rail.

It really helps if the person left at helm is able to keep the engine in reverse and hold the stern of the boat pointing at the intended anchor point. This is easy if the wind is in the right direction. Otherwise, the occasional burst of forward with full rudder to push the stern around will be needed. Warn the person in the dinghy before doing that. Use the headsets so communication between helm and dinghy is easy.

Pull in and reel up the other end of the line until the boat is more or less held. The reel is not designed to be used to pull the line: try to keep tension off the line on the reel. Make that line fast to a cleat. If there is room and it might be windy, use the spare line to go out again to a second anchor point and be made fast to the other side of the stern.

Next you want to adjust the length of the anchor chain and the stern line and attach the snubber. The stern line should be fairly tight, and the anchor chain should also be fairly tight. You need the boat to be held in position so it doesn't hit the shore or other boats if the wind picks up. This is a finicky exercise that should get quicker with practice. When everything feels stable, close the anchor hatch, turn off the windlass breaker, and when you are confident everything is good, turn off that noisy motor.

In minute anchorages it can be worth while tying the bow to the opposite shore. Using four lines would be even better, but there is limited stern tie line on board.

Untying and Raising the Anchor

Make sure the boat is ready for departure. Verify the stern line is not twisted round the ring on shore (inspect it carefully using the binoculars). Send a dinghy to fix it if necessary. Start the engine and turn on the windlass.

Untie both, or all four, ends of the stern line(s) from the cleats, and as quickly as possible, pull in the stern line(s) and reel it up. If there is no wind you can pull it in and reel as you go. If there is wind you may need the motor to control the boat, and you want that line out of the water quickly.

You then raise anchor as you would if you were simply anchored, but starting uncomfortably close to the shore and quite possibly other boats..

Using Mooring Buoys

In some places a bunch of buoys have been anchored for the specific purpose of having boats tie to them instead of anchoring. These mooring fields have a number of advantages: they protect the sea floor if it is delicate, they are more secure than anchoring, and they allow boats to be packed in more densely than anchoring would allow.

Picking up a mooring buoy in calm conditions is reasonably easy. It is a long reach down to the ring on the top of a mooring buoy from the bow of the boat. Conventional wisdom suggests you can pull the ring up using the boat hook: I have never seen that work. A better approach is to come alongside the buoy at a boarding gate where the deck is lower, and capture the buoy using a spare length of line, then walk the buoy forward to the bow and make the line fast before attempting to get the mooring lines from both bow cleats through the ring and secure.

Using a spare length of line is convenient as it is likely to be thinner and more flexible than the bow lines, and is longer, which allows you to hold on to the captured buoy even if it tries to drift away from the boat.

Getting the bow lines onto the buoy can be difficult, even when the buoy has been secured like this. It is possible that you can pull the buoy and its ring up some using the spare line allowing the first bow line to be threaded through the ring. Then getting the second line involves getting the line round the bow and anchor before threading it through the ring as well.

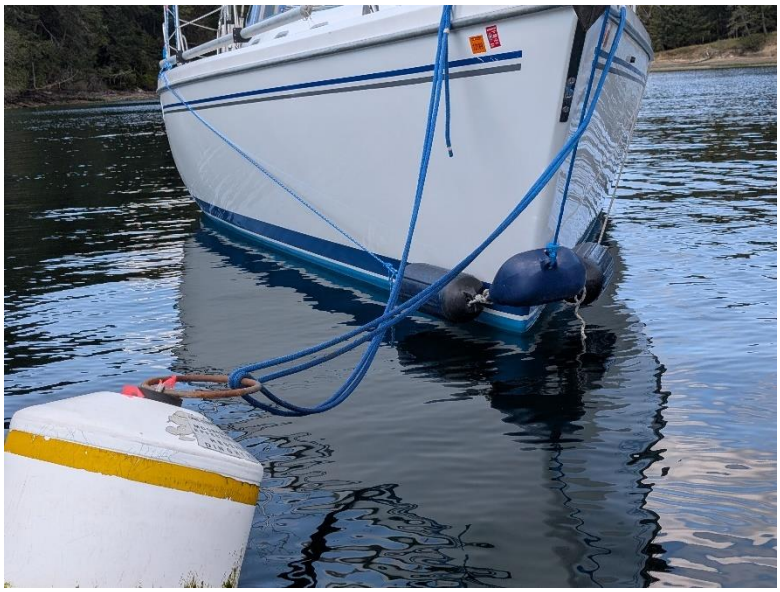
You want two bow lines for redundancy. And you want each line to go from a cleat straight back to the same cleat. Threading them from one cleat to the other invites chafe.

If it is difficult to get the bow lines threaded this way, you can use the dinghy to go forward and thread the lines. Be careful around the bow of the boat. The anchor is hard and sharp. Banging your head against it would be a bad idea.

If it is windy you want to approach the buoy from down wind. Use the bow thruster to keep the bow into the wind as you come alongside the buoy. Getting the line through the ring of the buoy is more difficult as if it is windy it is almost certainly also wavy. Not only is it more difficult, but it has to be done quite quickly, and the line either made fast to the nearest cleat, or better, quickly walked forward and attached to a bow cleat.

Getting the bow lines through the ring will also be challenging. In one way it could be easier: The waves will be picking up the buoy and bringing it within reach, but it is then a moving target. And using the dinghy will also be challenging. Not only is rowing the dinghy going to be more of a challenge in the wind and waves, but that anchor overhead at the bow is potentially lethal. Be very careful.

Once the buoy is on both bow lines, you want to make sure that the two lines are the same length, otherwise only one line is taking the strain. This too is a little tricky.



Some mooring buoys have oversized rings. While this might make them easier to catch, they can be a hazard and can damage the gel coat at the bow. You can make a chain of fenders: fender – fender step – fender, and tie then round the bow of the boat, attaching them to the midship cleats on each side and to the cleat normally used by the snubber to hold the assembly up a little. The boat will look like a working tug with fenders like that, but it does protect the gel coat. Even with regular mooring buoys, deploying fenders like this can prevent the buoy hitting the side of the boat if the wind is variable. Those bumps can sound very loud in the middle of the night.

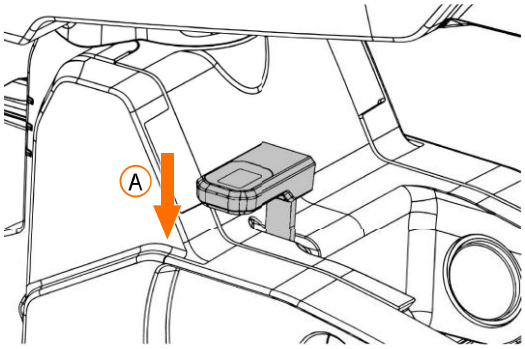
Dinghy and Outboard

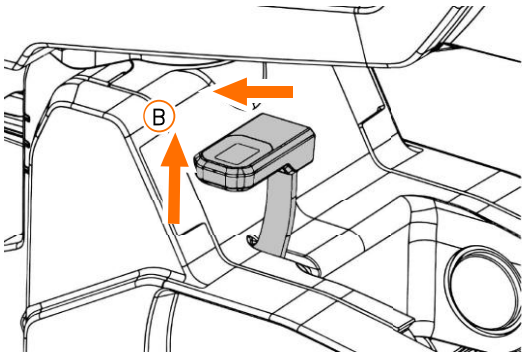
The dinghy can be rowed or you can use the outboard. The oars should be stored in the Velcro tabs on each side, and only mounted on the oarlocks when they are used. But realistically, you can stow the oars by bringing them right in on top of the gunnel and turning them flat. The blade is then snug under a handle. Be careful of the thwart: it slides on the bead it is mounted on, so check it is properly mounted before you sit on it.

The outboard is electric. With the battery mounted on it, it weighs just over 20kg. To make it easier to manhandle, separate the battery from the motor when bringing it onboard Fancy Free, and assemble the motor and battery once the motor is mounted on the transom of the dinghy. This is best done with the motor turned 180° so you are putting the battery onto the motor without having to reach over the back of the dinghy. Both the motor and the battery will sink if dropped overboard, so it makes sense to have them on a leash attached to the stern rail as you manoeuvre them.

Mounting the battery on the engine requires first that the protective cap be taken off the connector on the motor, then positioning the battery over the engine, angled strongly down towards the connector. It should slide easily in its grooves then connect with a solid click.

This motor, in common with all outboards, can tilt up. This is important when beaching the boat and when operating in shallow water where you might hit the bottom and having the motor swing up rather than banging to a halt is a good thing. On the other hand, if the motor can swing up whenever it wants, then using reverse is not really possible as the propeller will simply pull itself out of the water.





There is an orange lever near the hinge, under the tiller arm. When this is down, position (A) in the diagram, the motor is locked in its full upright position. This is how you want the motor when in deep water or manoeuvring it on or off the stern rail of the boat. When the lever is up, position (B), the motor can tilt up if you hit something or pull it up (using the handle at the back of the battery — not the orange battery release handle!) As the engine swings up, you will hear a series of clicks. These are points at which the engine will rest in a partially of fully tilted position. You want the engine fully up

when beaching. The engine can be used (gently) is a partially tilted position in shallow water. You can release the tilt and let the engine drop down into its locked down position by pulling that lever forward and letting it drop into its down position.

The motor lives on the stern rail. The battery lives in the cabin attached to its charger, plugged in, so it gets charged whenever the inverter is on, or shore power is attached. The motor has a good range, but not if you drive the dinghy like a looney. The priority should always be to charge the house batteries first, but they can only take so much current depending on how discharged they are. The alternator on the engine can provide 60A (it is rated at 80A, but the charging electronics limit it). The outboard charger draws 20A. So when you start the engine, check how much current the house batteries are taking. If it is less than 40A (the batteries are over 75% charged) turn on the inverter and charge the outboard battery.

The outboard requires a sort of magnetic safety key. This is on a lanyard. Make sure it is well attached to you. We only have one spare, and they cost. The motor needs to be turned on. Press and hold the on/off button until something happens, about 5 seconds. Same goes for turning it off. You make the motor go, once it is turned on, by rotating the handle on its tiller. You can go very slowly, very quietly and efficiently, or up to about 4.5Kn, which uses much more battery, and is a little bit noisier

If you take the dinghy ashore to a beach there are several considerations:

- Beware of oysters. Their shells will lacerate the inflatable tubes
- Be aware of the tide. Both falling and rising tides have their issues. The first can leave you with the boat high and dry, tens of metres from the sea, and the thing is very heavy to carry over oyster shells or even drag over sand. With a rising tide you need to do the humping of the boat for a long way just after you land, or you could lose the boat
- If you are using the outboard, tilt the motor out of the water as you approach the shore. Do not bang the propeller on a rock or even sand, not even if it is not rotating.
- Tie the dinghy well. Test tree stumps to make sure they aren’t rotten. If tying to a rock, wrap the painter a couple of times round the rock, and preferably pick one that is covered in barnacles for the added friction (and mind you don’t skin your knuckles in the process), and consider dropping a rock on the painter as well. Make sure the point at which you tie is good and high if the tide is coming in.

Mayday Radio Procedures and Disasters

The rules say that only someone with a Radio Operating Card can so much as turn on the radio. This is clearly ignored if there is a serious problem. If, for instance, I fall overboard or am incapacitated, then besides taking whatever action you can to rectify the situation, you should issue a Mayday. This happens in two stages. First you issue a DSC Mayday. This sends a digital signal to the coast guard and all nearby boats. This is very useful as far as it goes. It tells the receiving parties the boat identifier, the MMSI, the boat name, and most important, the position of the boat. But it doesn't describe the nature of the maritime emergency. So it must be followed by an old fashioned voice mayday call on channel 16.

To make a DSC mayday call, flip up the red cover over the help button, and press it for 5 seconds. The radio will display that you need to keep holding it until the 5 seconds have elapsed. It will then say "mayday sent". Then you proceed with the channel 16 mayday call.

If the radio is not on channel 16, press the 16/9 button to put the radio on channel 16. The display will show you what channel you are on. Then pick up the microphone, press the transmit button (which is on the edge of the mic… you just need to hold the mic firmly to press the button). You then say

> **Mayday, Mayday, Mayday**
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free,**
> **MMSI 3 1 6 0 5 6 2 0 5**
> **Mayday Fancy Free**
> **MMSI 3 1 6 0 5 6 2 0 5**
> **Our skipper has fallen overboard. We now only have two children and no adults on board. We need immediate assistance.** Or whatever the problem is
> **Our position is** (give lat and long: the radio should be displaying this info) (also give an informal description of where you are, e.g. Malaspina Strait, 2 miles south of the north end of Texada Island**)**
> **Over**
>
> Then let go of the transmit button

OK, that is what you should say if you are following the protocol, but to be honest that really isn't that important. What is important is that you say it is a mayday, identify yourself, and say what the problem is. Don't be afraid to play up the children bit. That might be getting less and less true, but it will get everyone's attention. Giving the informal description of

where you are will help other boats in the area come to help: The Coast Guard may ask you to use channel 22A.

> **Mayday, Mayday, Mayday**
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free,**
> **Our skipper has fallen overboard. We now only have two children and no adults on board.** Or whatever the problem is
> **We are** (give an informal description of where you are, e.g. Malaspina Strait, 2 miles south of the north end of Texada Island**)**

The Coast Guard should respond with questions. They will want to know things like what the MOB is wearing (e.g. Yellow foulies and a life jacket), or what injuries there are, how old you are and if you can attempt a rescue yourselves. They will probably also issue a request for help from “Boats in the area”.

And try to keep calm. The problem will be resolved.

You can make the channel 16 mayday call using the microphone in the cockpit. That might be important if you have other things you are trying to do, such as starting the engine and lowering the sails so you can try to rescue a MOB.

Man Overboard

There are all sorts of fancy sailing patterns that are supposed to help you come back to a person in the water. Ignore them. The important steps are:

- Press the MOB button on the helm display
- Keep track of where the MOB is, by eye if possible, and by using the mark on the chart plotter
- If the engine is not on, start it
- If you are sailing
    - Turn mostly into the wind. Maybe 20° off
    - Get the sails under control. This may mean putting the sails away. This could be important if the winds are strong. But the sails help stop the boat rolling as much as it otherwise would. But you want the sails down as you circle round to get the victim. This is a compromise.
- Make a mayday call: this is likely to be a problem you can not solve by yourselves
- Drive the boat so you can circle the MOB.
- Verify that the line for the life sling is well attached: its line is horrid and slippery, so tie a bowline through the cleat and put a stopper knot on the free end of the line.

- Throw the life sling into the water. Do not worry too much about getting it that close to the MOB.
- Drive the boat slowly in a circle, capturing the MOB in the loop of the life sling. They should be able to grab the line then get themselves into the sling (round the back, under the arms). Don't pull them in yet.
- Drive the boat so you can come to a halt pointing about 20° into the wind with the MOB on the lee side of the boat (insofar as a boat pointing more or less into the wind has a lee side). Manoeuvre slowly, and keep the bow and stern of the boat clear of the MOB. The bow and stern bounce up and down too much and are dangerous. The stern is also dangerous because of the prop. Cutting up the MOB with the prop doesn't help
- Pay attention to traffic and the shore or rocks and shoals. Having a collision or going aground won't help

Now you need to get the MOB back onboard. The person in the water is heavy, wet, cold, probably ataxic, maybe half drowned, and unlikely to be able to get themselves back on board unaided. How are you going to get 100+kg of dead weight up and over the safety lines? And do it without risking yourself? This is a very hard problem, and should be real incentive not to go over the side in the first place. If there is a more capable boat nearby let them do the rescue.

Let out three or four of metres of the spare halyard, the big fat one that is in a clutch on the starboard side by the main winch, then untie it from the port grab rail, and pass/drop the end to the MOB. The MOB has to tie this line either to their harness or to the straps at the top of the life sling. If they are too ataxic, there is a problem.

Then use the main winch to pull the MOB onboard. Unless they have been in the water for a long time, or are injured, they should be able to help by pulling themselves up on the gunnel then the shrouds. If possible have someone help guide them on board.

Get the MOB secured (clipped to a jack line or into the cockpit). The spare halyard should be made fast to something, anything. You don't need it thrashing around, and you especially do not want to lose the end up the mast: you may need it again.

The victim maybe in pretty bad shape. It is not unusual to get a live person out of the water and for them then to die once "safe". One of the primary reasons for this is that their entire system is half shut down from the cold, and in the water they are supported. If they stand, or sit up straight when rescued, all their blood drops into the lower legs and the heart stops. Let the victim lie in the scuppers for a bit or at least crawl along to the cockpit.

If they have inhaled or swallowed any amount of sea water they will vomit. Better out than in.

They will need help getting warm and dry. Hot tea will help, but if it is too hot they can damage themselves as they may have trouble holding a mug. A hot water bottle can warm them up quickly, but apply it to the neck and/or abdomen, not the underarms or crotch. Another thing that kills people after they are rescued is a sudden drop in core temperature as cold blood from the arms and legs starts circulating. Help them out of their wet things, get dry and into warm dry clothes. Clear the MOB alarm on the helm.

Then you need to tidy up. Secure the halyard back where it belongs on the port grab rail. And tighten it up so it is out of the way

Keep the coast guard (and boats around you) informed of your progress or lack there of. The protocol for that is something like this:

> **Mayday, all stations, all stations, all stations**
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free**
> then what has happened, e.g., we can not get along side the Man overboard or we can not get the victim back on board, or the victim needs medical help
> **over**

Or in the happy case where everything worked

> **Mayday, all stations, all stations, all stations**
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free**
> **We have recovered the man overboard and all is well**
> **Fancy Free Seelonce Feenee**

Let's hope you never have to use this section for real.

What's with that Seelonce Feenee? It is actually Silence Fini, but it is French, so it is pronounced Seelonce Feenee. If means silence finished. When a Mayday is declared, no one is supposed to use channel 16 except about the Mayday. When it is over, the Silence Fini means OK, you can chatter away now.

Now you can get back underway, possibly even under sail.

Some final words on man overboard. OK, person overboard. Don't. If you are out on the foredeck when it is rough, be clipped on. Even a "harmless" overboard situation such as falling overboard by tripping when at anchor can be dangerous. There is a phenomenon called "immersion shock". As you enter cold water you will involuntarily gasp for air, and the chances are that the air will actually be water. Now you are half drowned, not wearing a

life jacket and unable to help yourself. Protect yourself: don't muck around on deck, and if you feel yourself going over, take a huge breath of air: if your lungs are full, you can not gasp and breathe in water.

Injury

If there is a serious injury on board, one that needs immediate attention, not one that can wait until you reach port, then you need to make a mayday as for MOB. The coast guard will ask questions and tell you what to do. Do not pretend to have skills you don't have. Lean on them for advice and help. But do what you can to help the victim:

- Control bleeding by applying pressure to the wound
- Untangle them from any constricting lines. Cut the lines if necessary
- If their back or neck is at a funny angle, don't move them unless not moving them puts them at further risk.
- Try to keep them warm and treat them for shock: warm sweet tea

You can continue underway, but you may want to put the sails away and use the engine

If you have an injury that can wait until you are in port, but your ability to sail has been compromised, you still want to issue a mayday. Or pan-pan, mayday's less urgent cousin (from the French panne – breakdown).

If you can sail on to port you will need to dock. Radio the port and tell them you have an injured party on board and need help docking and medical help when you get there.

The call to the port should be on the channel the port uses for normal approaches, typically 66A, but may be something different. Look this up in Navionics or the Wagoner Guide. You may do better using a cell phone. Again their number should be in Navionics or the Wagoner Guide. Or use channel 16 and ask the coast guard to inform the port that a boat is coming in with an injured party.

This call should go something like this:

> Lund Marina, Lund Marina, Lund Marina (or what ever port you are heading into)
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free**
> **We have an injured skipper on board, otherwise just children**
> **We are approaching**(wherever)**, and do not have the skills to dock unassisted.**
> **Help is needed to dock, and medical help will be needed once we are in port**
> **Over**

If there is no answer and cell phone does not work, make a similar pan-pan call, tell the coast guard, and when closer, other boats in the marina something like:

> **Pan-pan, pan-pan, pan-pan**
> **All stations, All stations, All stations**
> **This is sailing vessel Fancy Free, Fancy Free, Fancy Free**
> **We have an injured skipper on board, otherwise just children**
> **We are approaching** (wherever)**, and do not have the skills to dock unassisted.**
> **Help is needed to dock, and medical help will be needed once we are in port**
> **Over**

Even that may not work: boats in the marina probably do not have their radios turned on. If you get no response, you may have to get in closer and use the foghorn, a 5 second blast, then yell for help. That should work.

If you take on board someone to help you into port you should make it clear to them that this is not salvage.

Once you are in port, let the harbour authority take over, or any helpful third parties.

Let's hope you never have to use this section for real either.

Steering failure

If the steering fails, you have a bit of a problem, but there is a backup system. In the starboard lazaret, in a bright yellow bag is the emergency tiller. There is a big heavy tube and a little bent tube with a hand grip. The big tube fits on the top of the rudder stock.

First remove the cover plate just aft of the binnacle. This plate has two holes. Put a screwdriver in each hole and use them to rotate the plate anticlockwise. Try not to lose the plate or the screwdrivers.

Then put the slotted end of the big tube on the top of the rudder stock so the slot slips over the thing nicely.

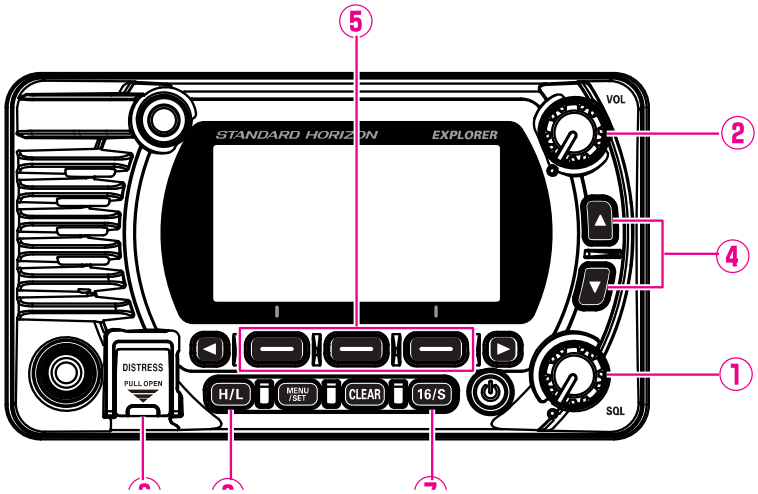
Then take the little bolt out of the small tube. It is at the bent end and you will want it to hold the handle on the big tube. Put the end of the small tube into the hole at the top of the big tube and put the little bolt back in place so the handle does not fall out.

You can swivel the handle so it goes over the binnacle so you can steer to both port and starboard: that is important.

This enables you to limp along, probably. This may be time for a pan-pan or mayday call.

General VHF Use

The VHF radio has lots of buttons and knobs. The only ones you are really interested in are the 16/9 button, The Distress button, the up and down buttons, the WX button, the H/L button, the 16/9 button, and the volume and squelch knobs.



1. **Squelch —** What the heck is “squelch”. Radio is noisy. There is background noise and distant signals that are too weak to hear but add to the noise. You can tell the radio the threshold below which any thing it receives is noise. What you want to do is turn the squelch down until you hear constant or almost constant noise, then turn it up a click or two so the noise disappears.
2. **Volume —**Volume is obvious
3. **H/L —** You can select high power transmission or low power. Channel 16 defaults to high. You want to use low if you are talking to stations nearby such as another boat in a marina, or the marina itself. Use high power when hailing another boat. Low power is for 1 mile or less range. There is an indicator top left on the screen as to what the current setting is.
4. **Up and Down Buttons —** These are used to change channel
5. **WX Button —** This is a “soft” button. It is labeled on the screen rather than on the button. If it does not show, use the left and right arrow buttons until it does appear. It is used to select the weather channels. There are several weather channels. Select the strongest one in English using the up and down buttons.
6. **Distress Button —** This button is behind a cover. You have to press and hold for 3 seconds to send a DSC Mayday call
7. **16/9 Button —** Press this button to select channel 16, then subsequent presses to toggle between 16 and 9

The VHF radio is used for more than just emergencies. You can use it for ship to ship, ship to marina, Vehicle Traffic Services, and non-urgent calls to the Coast Guard.

You should have the radio set to VTS for your area to hear chatter about any big ships in the area. Even if you select 11, for instance, the radio is also still listening on 16. Do not call on a VTS channel. To make a call to another boat you hail them on 16, then swap to the channel they tell you to. Similarly, if another boat calls you, they will hail you on 16, then you reply telling them to go to a ship to ship channel. In Canada, 06 would be the default. In the USA, 09. Channel 68 is also an option, as is 09 in USA and BC

> **Fancy Free, Fancy Free, Fancy Free**
> **This is Sailing Vessel FooBar, FooBar, FooBar**
> **over**
>
> **FooBar, FooBar, FooBar**
> **This is Sailing Vessel Fancy Free, Fancy Free, Fancy Free**
> **Go to zero six**
> **Over**

Of course, that interaction requires that the responding party knows that they should chat on a frequency other than 16, and that they should be using 06, 68, or possibly 09. If they do not respond telling you to go to a general ship to ship channel, then you should:

> **FooBar, FooBar, FooBar**
> **This is Sailing Vessel Fancy Free, Fancy Free, Fancy Free**
> **over**
>
> **Fancy Free, Fancy Free, Fancy Free**
> **This is Sailing Vessel FooBar, FooBar, FooBar**
> ***General chit chat***
> **Over**
>
> **FooBar, FooBar, FooBar**
> **This is Sailing Vessel Fancy Free, Fancy Free, Fancy Free**
> **Go to zero six**
> **Over**

If after whatever they had to say you only need to make a brief reply and end the call, you can do that on 16. And If you have a brief message only requiring an acknowledgement or a brief reply, you can do that on 16.

Fancy Free, Fancy Free, Fancy Free
This is Motor Vessel Big Tug, Big Tug, Big Tug
Are you turning into Departure Bay
Over

Big Tug, Big Tug
This is Sailing Vessel Fancy Free, Fancy Free
Affirmative. We are heading into Departure bay and will be out of your way
Over

Fancy Free, Fancy Free, Fancy Free
This is Motor Vessel Big Tug
We will pass you starboard to starboard
Over

Big Tug
This is Sailing Vessel Fancy Free
Roger
Out

That is about as long a conversation that is reasonable on 16. Note that the names of the vessels are not repeated 3 times. The rule is up to three, but the same number for their name any your own. And best practice is to hail with the names repeated three times as the receiving boat might be surprised, not expecting a call, and having difficulty recognising their name.

Sometimes you want to call a boat, and you don't know their name. In that case describe them:

Vessel northbound from Montague Harbour, Vessel northbound from Montague Harbour,
This is Sailing Vessel Fancy Free, Fancy Free
Please alter your course to port
Over

If you are calling a marina, use 66A or whatever weird channel they use. Do not hail them on 16. Note that 66A and other Alpha channels are also known as 1066 (or whatever).

It is also possible to initiate a call using DSC, but don't bother. No one on this continent has a clue about that.

This is a table of the various VHF channels you might be interested in. Generally avoid other channels.

Use	**Channel**
Mayday and Hailing	16
Ship to ship	06
Ship to ship (USA and BC)	09
Ship to ship	68
Most Marinas	66A, 1066
Lund marina	73
VTS South Strait of Georgia	11
VTS Strait of Georgia north of WG and on north to Port Hardy	71
Juan de Fuca Strait and San Juans	5A, 1005
VTS Puget Sound	14
VTS Vancouver approaches and harbour. Also James Street Bridge in Victoria	12
VTS Fraser River and West Coast of Vancouver Island, up to Prince Rupert, and down to 48° N.	74
Coast Guard (non urgent)	22A, 1022

Other boat systems

There are four systems to consider: electrics, plumbing, cooking, and heating.

Electrics

We have to consider electrics first as everything else relies on them. Note that: if the batteries are depleted, nothing works.

There are two sets of batteries: the house batteries (“large” capacity) used for everything except starting the engine, and the starter battery. These are separate so even if you run the house batteries down you can still start the engine. The batteries are currently lead acid batteries, which means they should not be run down below 50%. Below that you risk damaging the batteries: lead acid batteries become sensitive to vibration below that charge level and can very easily be permanently damaged. There is a gauge by the nav station showing the state of charge of the house batteries.

Various things use electricity. The biggest current draws are the bow thruster, windlass, and the winches. But you don’t use them for long, and you should not use the bow thruster or windlass unless the engine is on: they draw over 100 Amps which is a bit hard on the batteries. The alternator on the engine is not big, but can provide 60A which helps.

The other significant loads are the fridge which uses about 4A on average, the inverter (which produces 120V AC when needed) 2A even with no load attached, and the heating.

The general rule is that if you are not using something it should be turned off. That is especially true of the gas solenoid, but also true of the inverter, lights, water pump, heating, instruments,.. All these things can be turned off from the panel by the nav station (or in the case of heating nearby). Other than the windlass whose breaker is just by the door for the fore cabin

There is also the possibility of shore power. Shore power provides AC power to the sockets and recharges the batteries. The cable for that is in the starboard lazarette, and the connector is on the transom on the starboard side. Make sure the breaker for shore power is turned off before connecting the boat to power on the dock. Make sure the breaker on the socket on shore is also turned off. Connect the cable to the boat first, then to the plug on the dock. Try to prevent the cable dipping in the water. Most important, do not let either end of the cable fall in the water. Turn on the dock breaker, then the breaker on the boat. Check that the battery level indicator says that it is charging.

Finally, in the unlikely event that the starter battery fails you can connect the house batteries and starter batteries together using the big rotary switch under the berth in the

port stern cabin. Do not do that unless absolutely necessary, and turn it back once the engine has started.

When shore power is attached, you should not turn on the inverter, but you can use more power-hungry devices such as the toaster.

Lights

While on the subject of electrics, let's consider the electric lights. You want to use these when it is dark, and it makes sense to know where the lights are, and more important, where their switches are.

Stern Cabins

These each have three lights, one on the wall outboard of the door, and two on the inside of the hull over the berth. The one on the wall has a rocker switch on its inboard edge. The two on the hull, one over the port light the other aft of that are sort of reading lights. They have a button under the light on the base. Press and release for dim red light, press and hold then release for a white light. The lights also have USB sockets. So the boat is well equipped with USB sockets.

Heads

In both heads there is a foot long light over the mirror on the inside of the hull. There is a rocker switch on the forward end of this light.

Fore cabin

This has four lights, two on the forward bulkhead, two beside the aft end of the bunk. The two on the forward bulkhead are sort of reading lights. They have a button under the light on the base. Press and release for a dim red light, press and hold then release for white light. The lights also have USB sockets. The two other lights are on the lower bit of ceiling under the portlights. These have rocker switches on the inboard edge.

Galley

The galley has three lights on the ceiling just above the portlights. The forward one is slightly inboard just forward of the small hatch. The middle one is just aft of the opening portlight, the aft one is just forward of the head. Each of these has a rocker switch just inboard of the light.

Salon

There are two ceiling lights over the table. The rocker switches are forward of the aft light, aft of the forward light. There is a poncy brass light thing on the wall at the forward end of the salon just port of the door to the fore cabin. It has a push button switch on its wooden mount just below the light.

There is also a light on the ceiling over the port portlight. Its rocker switch is on its inboard edge.

There are two lights over the nav station: a round one under the shelf over the desk at the aft end. Its rocker switch is inboard and a little forward. The other light is on a gooseneck also on the aft side. It has a rocker switch right at the end.

Plumbing

There are four aspects to the plumbing to consider, cold water, hot water, grey water, and black water.

Cold Water

There are two cold water tanks. They are connected, so you don't have to worry about using one then the other. Even when you fill with water you need only to fill the forward tank. Water will flow and fill the aft tank. The tool for opening the filler cap for the water tanks is in the nav station. The fillers are on the port on the fore deck and starboard aft deck. They are labeled. Do not put water in the holding tanks or fuel tanks by mistake. The filler caps have little retaining chains, so will not fall overboard. If you fill using the forward filler cap, you will find that both the forward and aft tanks are filled. The water gauge by the nav station tells you how full the aft water tank is. The fore tank gets emptied first, so the gauge will read 100% until the water is half gone.

The pressure at the taps is maintained by a pump in the lazarette just behind the starboard aft cabin. It is noisy, so be considerate if you use water when people are asleep. The pump pressurises a little pressure tank, so the pump does not come on immediately you turn on a tap, nor does it go off immediately.

Hot Water

There is a small pressurised hot water tank. It is heated either by the engine waste heat or by electricity (if the breaker is turned on and you are on shore power), or by the cabin heating system.

Grey Water

This is the name given to water that has been used in the showers or sinks. It flows directly into the sea, even in marinas. That is not allowed in some places (Turkey, Finland), and may be restricted in some marinas, but generally have at. The drainpipes are fairly narrow, and the flow rate is fairly slow. Help prevent hair and soap scum build up by not letting hair go down the drains, and by using liquid soap.

The drains for the shower sumps and the sinks in the heads can get airlocks. To minimise the risk of airlocks, close the sea cocks for these before sailing or motoring through any rough water. The seacocks for the forward head shower sump and sink are under the sink in the head. The seacock for the aft head sink is under the floor in the salon in front of the door to the head. You access it under the panel and the rectangular plastic bucket thing at the bottom of the companion way. The seacock for the aft shower sump is next to the seacock for the aft holding tank in the starboard stern cabin.

Black Water

This is the name given to the output from the toilets. Using the toilets is not quite the same as using a toilet on shore. In the first place, the output does not just go away down the drain: it goes into the fore or aft holding tanks, which have limited capacity. There is an indicator in each head showing how full the tanks are. If they are full, the toilets will not work. So do not use silly amounts of water in the toilets.

The toilets on Fancy Free are electric and use fresh water. The first feels like unnecessary complexity. The latter feels profligate, but there is a reason for this. Salt water is incredibly “hard” in that it contains lots of calcium. When mixed with urine this calcium precipitates out in the form of calcium carbonate, lime scale. Given the small cross section of the plumbing on yachts you can see that using fresh water can make sense. Also, sea water is teaming with life, and when you add nutrients these things grow, and smell.

There are two rocker switches that control flow into and out of the toilet bowl. The one on the right adds water if you press the upper end, and pumps it out if you press the lower end. The left button, when pressed down adds water and pumps it out at the same time.

To pee, just pee, then empty the bowl by pressing the right button down. Then add a little more water to rinse the bowl by pressing that button up, then down to empty the bowl.

To poop, first make sure there is water in the bowl. Either pee first, or add water by pressing the right button down. Then do your business, then use the flush button. You will need to add water and flush again to clean the bowl. Note that only things you ate and the peculiarly thin and precarious toilet paper can be flushed. Also do not swallow cherry stones: the pumps really do not like them. Anything else you might want to dispose of (girls, you know what I’m talking about), can be disposed of first in the doggy poop bags in the drawer by the sink, then dropped into the bin.

The toilets should be left empty when the boat is underway.

Emptying the holding tanks can be achieved in two different ways. You can use a pump-out station, or if you are in Canadian waters and more than 1nm from shore, or in American

waters, not in Puget Sound and more than 3nm from shore, you can pump the tanks out into the sea. Some countries you have to be 12nm offshore.

To empty the holding tanks into the sea, open the sea cock (locker by the head in the starboard aft cabin, under the floor (called the sole on board a boat) in the fore cabin, then use the switch in the aft head or near the seacock for the forward head to pump out the tanks. Do not let the pump run dry for more than 20 seconds: the aft one you have to listen to carefully if the engine is running. Then close the sea cock. If the boat is moving slowly and there is little wind, the people in the cockpit or on deck will most certainly know what is going on.

A word of warning: the switch in the aft head is all too easy to knock and turn on, and it is difficult to see if it is on or off. It may be a really good idea to turn of the macerator pumps at the breaker panel by the nav station. Unfortunately this also turns off the 12v socket in the fore cabin, one of only two on board.

The sea cocks are stiff. There is a short length of pipe by each of these sea cocks that can be slid over the handle to extend it to give you a bit more leverage, but it remains an awkward job.

The alternative is to use a pump-out station. This is a somewhat grim job, but nowhere near as bad as it sounds. You probably want to wear rubber gloves. There are a number on board in one of the draws in the galley. The caps for the holding tanks are one forward, one aft, on the opposite side to the water filler caps. The same tool opens and closes these caps as is used for the water filler caps. These caps do NOT have those little retaining chains, so can fall overboard. Be careful. We really do not want to have to leave a holding tank open.

There are two ways the pump hose can attach to the opening: the nice way and the not so nice way. The nice way is that they clip on to the adapter that is kept in a ziplock bag in the port winch handle pocket. The adapter screws into the opening just like the cap does. The less nice way is that you have to hold the hose firmly and absolutely vertically onto the opening. In either case, you can see the contents of the tank going down the pipe: there is a clear window section. When this is consistently empty, stop, put the pump thing away and close the hole.

Cooking

Stove

Cooking uses propane gas. Propane is significantly denser than air (molecular weight ofC_3H_8, 3x12+8=42 compared with N_2 80%, O_2 20%, 14x2x0.8 + 16x2x0.2=29. So 42÷29, 1.45 times as heavy), so if there is a leak the gas will accumulate in the bilge until there is a

spark, then there would be a big explosion quite literally blowing the boat to bits. So we need to be careful about the gas.

> Why is propane used on boats if it is so dangerous? It is cheap, and easy to store as it becomes a liquid at modest pressures. What are the alternatives that are lighter? Ethane (C_2H_6) does not liquify under pressure. Ethylene (C_2H_4) becomes a liquid at about 60 atmospheres, 6 times the pressure needed for propane. And it is expensive. Acetylene (C_2H_2) is quite explosive and does not compress to become a liquid unless very cold. Hydrogen does not liquify unless silly cold. Why do we care if a gas liquifies under pressure? Because then you can store much more of it without silly thick (expensive, heavy) storage tanks.
>
> Ammonia (NH_3) liquifies easily and burns sort of, but is poisonous, and corrosive, and the combustion products are poisonous too.

There are three gas valves between the gas tank and the burner: the obvious one on the stove, and electric solenoid, and a mechanical valve on the tank itself. Correctly, no valve should be open unless the stove is in use. Typically, the one on the tank is only closed when the boat is underway, if then. The electric solenoid is opened by turning on the breaker labeled gas. Remember to turn this off when you are finished with the stove.

The knobs on the stove have a safety: they only allow gas through if the detector for a flame is hot or the knob is pushed in. To light a ring push in the knob, turn it, holding the knob in and press the ignition button (it clicks) several times if necessary to light the gas, then hold the knob for about 5 seconds if the ring was cold.

If the ignition does not work, use one of the lighters to ignite the flame. These lighters have a safety button on the top which you are supposed to hold down with your thumb so the trigger on the bottom does anything. Pulling the trigger turns on the gas in the lighter and causes a spark. If it does not immediately light, let go the trigger and try again. Anne has trouble with these. With small hands it might be hard to hold the safety down while pulling the trigger. If so, hold the button down with your non-dominant hand while pulling the trigger and holding the lighter with the other hand. Once it is lit, carry on as before.

The stove knobs are a little difficult to adjust. If they do not easily turn in the direction you want, first turn them a fraction the other way. Weird, but it works.

The stove has gimbals so it can swing as the boat heels. It can be locked in the normal vertical position for use when moored. There is a little bolt on the oven that engages with a little hole in the cabinet adjacent.

To light the oven, I've found it best to use the barbeque lighters. The flames are at the bottom at the back (as you would expect on a gas oven). The calibration of the oven temperature is somewhat off. There is an oven thermometer, and the following calibration

table will be filled in. It is currently barely informed guesswork. But always check using the thermometer.

Desired temp °C	Desired Temp °F	Set Temp
175°C	350°F	190
190°C	375°F	210
200°C	390°F	220
220°C	425°F	240

Microwave

The microwave is reasonably obvious. But, despite the label, it should not be used except on shore power. Or at least not on full power. With the engine on it can be used, but not over 50% power. Any more than that and you overload the alternator, the alternator gets too hot and cuts out, and you end up drawing far too much current from the batteries. At 50% you will be pulling about 50A from the alternator, and another 30A from the batteries.

When using the stove, make sure a hatch or two are open near the galley. Burning propane generates quite a lot of water vapour, and condensation is an issue especially in winter.

Fridge

The fridge is not very big, and is the largest continuous electrical load on the boat, averaging about 4A, more if you keep opening the front door, less if you keep the thing shut or just use the top hatch (cold air is heavier than warm air and opening the door allows the cold air in the fridge to pour out). Also, the door seal on the front door has iffy seals and that is a pain to fix, so the less that door is used the better.

Leave the temperature control more or less alone. Any adjustment should be between 3 and 4. If you are really clever and are prepared for things to freeze, you could turn the fridge up while on shore power or when the engine is running, and back down when unplugging the boat or turning off the engine. Will you remember to do that? I wouldn't.

Barbecue

There is also a barbecue on the stern rail. This also uses gas. It is a very conventional gas barbecue, if a little smaller than many. It is also quite powerful and rather close to the bimini. If you cook a lot of fatty meat at a normal high temperature, you run the risk of the fat burning. While this is a normal and expected part of barbecuing, the resulting flames can get dangerously close to the bimini. If you are on anchor with a little wind this may be OK as the flames and smoke will be blowing away from the boat over the stern, but if the

wind is at all fitful or variable you may have a problem. You can close the lid and turn off the gas until the problem has subsided.

Do not use the barbecue when docked. At dock, the wind, if any, can be altogether in the wrong direction, risking the bimini. The barbecue is also a bit smokey, and you do not want that smoke blowing into the cabin. And of course, at dock you are close to other boats who also are likely not to appreciate the flames and smoke. Marina rules probably preclude barbecues anyway.

Heating and Ventilation

Ventilation is really important, especially in the cooler shoulder seasons. Without adequate ventilation there will be so much condensation on the hatches and the ceiling that it will feel like it is raining. Lots of things release water vapour: burning gas, cooking, cups of tea sitting around, wet clothes, wet dog, and human bodies both as sweat and from breathing. Water vapour is lighter than air, especially if it is warm, so it rises. That tells us that opening hatches is really important in the galley area and even more so in cabins. If hatches in the cabins are not open at least a crack when you are sleeping, you will wake up to a cold wet bed.

There will be condensation anyway, just far less. But what there is is in unfortunate places like between the mattress and the hull. If possible, move the mattress away from the side during the day, and turn the mattress every week.

The boat has central heating. It burns diesel and uses electricity to blow hot air into the cabins. It is quite effective, but takes ten minutes or more to get going. The heating system uses 120V electricity, so you have to be attached to shore power, or the inverter has to be on. If you do not have 120V turned on, then turning on the heating not only won't work, but will cause a safety in the heater to trip. That safety is a pig to reset, so make absolutely sure the inverter or shore power is on. There is a fan heater that it is better to use if you are on shore power. Do not leave the heating on overnight as that will use up the battery and would be noisy especially for the person in the port aft cabin. The heating is turned on with a switch by the nav station, and there is a thermostat by the door to the fore cabin and in each cabin. When the heating is running, quite hot exhaust goes out the exhaust pipe fairly high up on the port side of the transom, hot enough to damage ropes. Make sure the dinghy painter won't get damaged by keeping it on a short painter when leashed to the mother ship.

Living aboard

Life aboard is much like life ashore, but there are certain differences. These differences are similar to camping, but not as extreme.

Water is in finite supply. You don't have to be completely obsessed with saving water: we are not on an ocean crossing, but neither be profligate. Hot water is sometimes available in reasonable volume, sometimes not. If we are on shore power, or if the engine is running or the heating, is running then water is being heated. Other times what hot water there is, is cooling...

Electricity is a very finite resource unless we are on shore power. Try not to use any unless it is needed. Turn off lights that are not being used. Don't leave electronics on, or even plugged in, unless they are being used or charged. The heating, even though its main source of power is burning diesel fuel, uses about 10A of electricity out of the batteries, so it should not be used except to warm the boat up in the morning and early evening.

The microwave and other big consumers of electricity should not be used unless we are on shore power, or to some extent if the engine is running. The engine can safely produce about 50A. The primary use of electricity from the engine is to charge the batteries, but can be used occasionally for big loads. 50A at 12V is 600W, so less than a low power toaster or even the microwave at half power. The batteries can be asked to produce another 40A, say 450W, but can't do that for long. So do not use big electricity users except on shore power or very carefully and rarely when the engine is running. At a push the toaster can be used if the batteries are mostly charged, as can the microwave on half power or less, but no more than half power other wise the alternator on the engine will overheat and drop out, leaving the batteries to carry the whole load.

Food is not limited as such, but reprovisioning stops are far between, and in between them the food you have is the food on board. Much of the food will be predicated to various recipes already decided upon, so random snacking on vegetables, or such, need to be done with a view to that.

Preservation of food is also of concern. The fridge is small, the freezer smaller. Fruit and vegetables are best kept in the fruit hammock as there they are well ventilated and any problems can be seen and dealt with quickly. Some fruit produce ethylene, which promotes ripening and aging of other fruit and vegetables. Apples, bananas, melons, pears, and peaches are ethylene producers. Tomatoes are moderate ethylene producers. Broccoli, cabbage, cauliflower, etc., are ethylene sensitive. Ethylene producers should be stored away from other fruit and vegetables, especially those that are particularly sensitive.

Storage is limited on board. Most food that isn't in the fridge or fruit hammock will be in the plastic boxes on top of the hanging lockers in the various cabins.

The lack of space also extends to rubbish. There is a small rubbish bin under the sink. Rubbish should be as clean as possible so it doesn't smell too much when it is stored. This is particularly true in the summer. Rinse out bottles, jars, tins, and plastic meat trays. "Meat nappies" are a difficult problem. The best solution I can come up for them is to put them in dog poo bags. Rubbish should also be compressed for storage. Storage for recycling is difficult. The key is to keep the recycling scrupulously clean. Compress tins. Glass you really cannot safely compress on board. Plastic can be compressed. Remember that once in a marina the various types of recycling might have to be separated.

Organics need to be kept until they can be jettisoned mid channel much like emptying the holding tanks. There are various schools of thought on this. MarPol rules say that you should be 3kn offshore, and no item should be bigger than 1". Use some sense. In tidal channels, mid channel when the current is emptying into the Strait of Georgia and beyond it is probably OK. Maybe. Use the same sort of judgement as you use for emptying the holding tanks.

Condensation is a problem onboard unless it is warm out and hatches can be wide open. That means that anything that produces water vapour below needs to be thought about. That means using lids on anything being boiled in the galley, and anything that might be wet and evaporating is a potential issue. Wet outerwear should generally be taken off and shaken off in the cockpit. Even cups of tea are a potential problem.

Dog towels, towels in general, wet clothes, etc, should be hung up on the life lines at least for their initial dry. There are pegs. Or under the Bimini if hanging them on the life lines is ill advised, either because we will be underway or because it is raining. Actually, if we are going to be underway, then wet anything hanging anywhere will be a bit of an issue. Underway the things should be put out of the way somewhere they won't cause problems and won't get in the way.

Sand is an issue. We do not want any more sand then is possible in the salon, and none, if that is possible in the cabins. This means that boots should be rinsed in the sea before coming aboard, sandy shoes should be left in the cockpit to dry, and the dog's feet, the main culprit, need to be thoroughly wiped and dried with a dog towel before he goes downstairs. And if the dog is at all suspect (damp, gritty), cabin doors should be closed to protect the cabins and especially beds.

The boat is big as boats go, but it is much smaller than a house, and you can't just "go outside" unless she is docked or to a lesser extent anchored. That means that people will

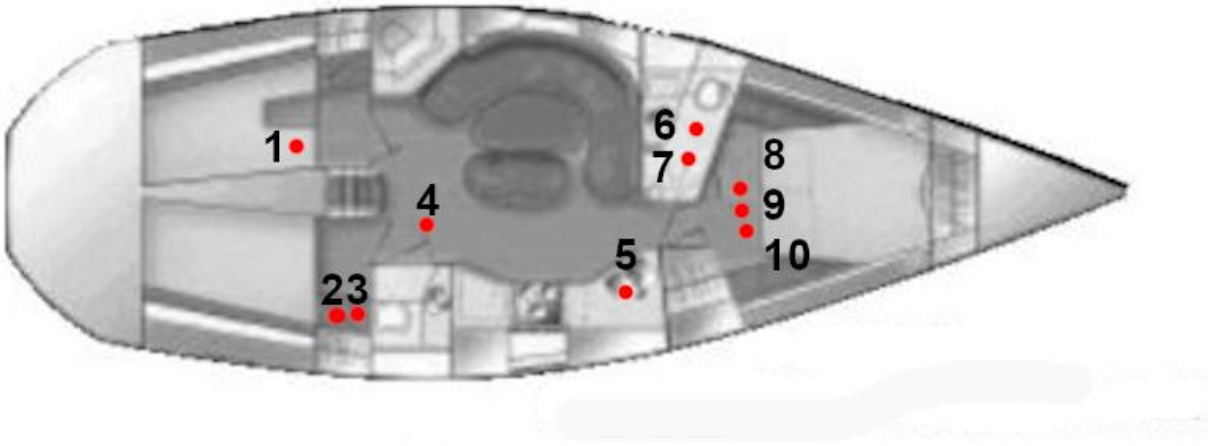
be on top of each other, and private time will be hard to come by. If someone has shut themselves in their cabin to be away from others, leave them alone. People need alone time from time to time.

Boat Mechanicals

It is important to know something about how the boat works, what systems there are on board, where they are, and what attention they need. I know far less about Fancy Free than I would like.

Through Holes

The hull has holes in it. Ten of them are below the water line. This sounds like it is a bad idea. They are necessary, but they are also a bit of a liability. All the plumbing through holes have seacocks so you can close them. You need to know where they are in case a pipe breaks and the water is coming in. And some of them you need to close during routine operation or maintenance.



1. Raw water inlet. Must be open when the engine is running. Close when cleaning the filter
2. The aft head sink under the little padded bench
3. The aft macerator outlet.
4. The seacock for the aft head shower is under the salon floor with access through the floor panel at the bottom the companionway, and under the sort of square plastic bucket that fits there.
5. Galley Sink under sink. Under the rubbish bin.
6. Forward shower. Under the sink.
7. Forward sink, Under the sink.
8. Forward macerator outlet.
9. Depth sounder
10. Speed sender

The first eight of these through holes have seacocks, the last two are for instruments. In all cases, there is the (small) risk that the fitting will break. If that happens, water will fountain

into the boat at an alarming rate, and things will need fixing very quickly or you will find yourself in just the dinghy.

By each through hole there is a carrot shaped piece of wood. These are the through hole bungs. In the event of a through hole failure, you have to wade through the water down in a sinking boat, find the through hole that is fountaining, find the bung that is supposed to be attached to the seacock, and push it into the hole, then find a big hammer (under the couch in the salon in a tool bag), and wang the bung firmly into place. That is a scary thing to have to do, and a complete nightmare if you don't know where things are.

Other mechanical things on board

- Behind the companion way, and between the two aft cabins are the engine and transmission. Access is by unlatching the companionway stairs and pulling it open. It hinges at the bottom on hinges designed to come apart. The stairs can be moved to one side. There are also hatches in both cabins for further access, two in the starboard cabin, one in the port cabin. In the port cabin, under the narrow bit of berth next to the engine is further access to the engine and the raw water filter and through hole.
- Behind the engine are the transmission, the prop shaft, and the shaft seal.
- Behind the engine and above the prop shaft are the battery charger taking power from the alternator (a small black box), and the inverter charger, a bigger whiteish box (on the port side)
- Further back are the hot water tanks. Yes tanks. One is for domestic hot water, the stuff that comes out of the taps, the other is part of the central heating system. The hot water tank is heated up to a very high temperature, something like 85°C. There is a thermostatic mixing valve behind it to provide water at a reasonable temperature at the taps.
- Under the berth in the port cabin are the batteries. Aft are two big house batteries. These are the ones providing power for all the boat systems except the engine. Further forward, and on the port side is the relatively small starter battery. There are also some important breakers in here.
- On the forward edge of the berth in the port cabin, between its legs, are some isolation switches for the batteries. These should not need touching, but if for some reason the starter battery is flat, you can short the two batteries together. This is an emergency setting, and the switch should never be left in that position.
- Above the berths in each aft cabin is a hole with a canvas cover. Up there are the motors for the electric jib winches.

- In a low bit of ceiling up by the starboard aft cabin is the motor for the electric winch for the main sheet and halyard.
- By the nav station on the aft side is the water gauge. This tells you how full the aft fresh water tank is. It will remain full until the forward tank is empty, then start dropping. This means that you do not know how much water you have used until you have used half of it.
- Also by the nav station, aft, is the switch for the heating. It must not be turned on unless the inverter is on, otherwise a safety will trip and you have a problem.
- Similarly located is the control panel and display for the inverter charger. There is a button labeled “inverter”. You press and hold this button to turn on the inverter (a light lights up). You press the button again to turn the inverter off. There are other buttons. Please do not press them.
- On the forward side of the nav station is the electrical gauge showing the state of charge and the flow into or out of the batteries
- Behind the desk at the nav station are the breakers for the various circuits. If they pop, there must be a reason, and you need to investigate. Be aware that even on shore power there is a 15A limit on the 120V sockets of the port and starboard sides of the boat. That means that if you plug the fan heater into a socket on the starboard side and turn on the microwave, that breaker will trip.
- Scattered all over the boat in unlikely places there are inline fuses on odd wires. There ought to be a supply of spare fuses. There isn’t.
- Under the berth on the starboard side are the fresh water tank, the fuel tank, and the holding tank. I think.
- Under the berth in the forward cabin are the forward holding tank and the forward water tank. And forward of that the motor for the bow thruster (and its battery). At the aft end there must be the forward macerator pump.
- In the starboard lazarette are the compressor and heat exchanger for the fridge (an odd looking thing) outboard and forward.
- On the aft side of the starboard lazarette are the breaker for shore power and a thing called the zinc saver: this is a protection for stray DC currents coming aboard on the shore power ground connector. Such currents can eat the boats sacrificial zincs very quickly.
- Also in the starboard lazarette on the forward side is the aft macerator pump.
- In the port lazarette is the central heating thing.

This section is a bit of a place holder as I learn the boat.

Before leaving Port

Before even starting out

Passage plan

Before starting out at all, you should have as clear an idea as possible where you plan on being each night of the passage, what state the tides will be at each critical point, and any special considerations such as hazards to avoid, whether there are tidal constraints requiring an early start, and so on. This should be written down, hard copy for use on board, and given to a responsible party ashore. This is called your passage plan. Use the charts, cruising guides, all the info you can find as well as prior experience in making the plan.

You plan will, no doubt, take into account of tides. Beware of being too prescriptive in your plan: you may get held up because of weather. Have you plan give tide windows over a range of probable days.

You should also make sure that that responsible party knows what to do if things go wrong, and how to determine whether something has gone wrong. They will be able to see where the boat is using an AIS tracker website such as myshiptracker.com, and ought to be informed if there is a deviation from plan, if that is possible. They can also see what the weather is doing, in theory, but they won't know what it is really like. Their information may be incomplete, and they should be aware that absence of information has to be pretty extreme before it implies a real problem that needs reporting. That will depend on them being kept informed of any changes to the plan, and on whether that is possible.

Provisioning

It is trite to say you should have sufficient food on board for the trip, and to know where the reprovisioning opportunities are. But the reprovisioning places may be less complete than anticipated. This is another area where your plans have to be flexible.

Each day

The evening before any passage, write up a passage plan for the day. This should take account of the anticipated weather. Before starting out, the first things to decide is whether to go, and whether there needs to be any change in plan. Things that influence this are the weather, the condition of the boat, and the condition of the crew.

Weather

You will not know what weather you will actually encounter. However much you follow the weather forecasts, the actual conditions can be very different. But you have to make do

with the information you have. Get the marine weather forecasts from Environment Canada (in Canada) or NOAA (in the USA). These are broadcast continuously on VHF weather channels, but they can be hard to hear. They are also available online, if you have phone coverage. Note the weather in more than just the immediate area you will be in: weather patterns can move faster than forecast and knowing what is forecast in adjacent areas can help guide you.

Also look at the wind, wave, and gust forecasts in a tool such as Predictwind or Windy. These offer very detailed forecasts using a number of different forecast models. Sometimes the models all agree, in which case you can be fairly confident of the forecast. Sometimes the models disagree quite drastically, in which case you have no confidence at all. Act as if you more or less believe the worst of the forecasts. The HRRR model seems to be the most accurate in the Pacific Northwest, but is intended for USA only, so cuts out at the north end of Cortes Island. The Environment Canada forecast also seems to be quite accurate.

It is worth noting that the wave height given in these forecasts is the “significant wave height”, which is the average height of the highest third of the waves. It is possible to encounter a wave twice that height, but really unlikely. Given the distribution of wave heights, you can expect waves 50% higher that the advertised height every 100 waves, and 80% bigger every 1000 waves. The wave period is given by Predictwind along with the height. If the period is 3.6 seconds and the height is given as 1m, then you can expect a wave 1.8m high once an hour.

Look at what is actually happening. Note the wind and rain, but remember you are (presumably) in a sheltered harbour, and the wind and waves will be stronger, potentially much stronger, on passage. Actually, you must be weather aware all the time you are sailing. The weather powers the boat, and unexpected changes can be at least uncomfortable. Note the clouds. It is hard to interpret what the clouds mean, but with experience they will come to mean something.

Be aware of local conditions. If you are sailing past a gap between islands, anticipate that the wind may suddenly change direction and strength. It is at times like this that the sails may suddenly gybe. The charts and cruising guides may help you anticipate such things, but more important is being aware of the potential changes by being aware of what is going on around you, and anticipating potential problems before they arise.

As an example, if you are sailing downwind and there is a channel between the islands to port, ensure that the main sail is out to starboard. There is a good chance that the wind suddenly change to blowing from that gap, and if the main is out to port it could gybe. If the wind shifts blowing up the channel, the change will be more gradual. If you are sailing

goose-winged, the foresail is very likely to be disturbed. Be prepared for it to blow across to starboard too. If you are using the whisker pole, consider reefing in the genoa so it can blow across more easily, or even furling it. And be ready for it.

Boat Readiness

Things break. There are all sorts of reasons why the boat may be a factor in deciding whether or not to set sail. It is easier to deal with problems on anchor, or in port, than when out in the wind and weather.

Crew Readiness

Is the crew ready? Do they want to go? It is really important that the crew be happy. Remember this is supposed to be fun. If the crew (and that includes the skipper) really wants to stay another day, and if the plan can handle the change, stay. Or if the plan had you staying a couple of days somewhere expected to be entertaining and it isn't, and they want to move on, then go, the weather and tides permitting.

Crew happiness is dependent on them being well fed, comfortable and entertained. Pay attention to these matters too or things can go at least as badly wrong as if you had misjudged the weather. It is important for the crew to speak up if there is an issue so it can be addressed.

Crew happiness will be affected by whether or not they are warm and dry below deck. Do not be too parsimonious with the heating, if needed, and do not forget to keep the boat adequately ventilated overnight and when cooking. And in the mornings dry any condensation there may be on the ceiling, hatches, and the inside of the hull. Pull mattresses away from the sides if possible. Similarly, there needs to be an adequate supply of hot water, which will be in short supply if you have not had shore power, have not run the engine, and have not run the heating. It grieves me to run the engine when the sailing is good, but sometimes the supply of hot water or the state of the batteries requires it.

Glossary

A-... — Ahead, astern, abaft, a'port, a'starboad, alee, awindward, aloft, aboard, ashore. At or in the direction of. Below, meaning not on deck but down inside the boat breaks the pattern. Ahoy is just a general purpose hail, not at or in the direction of a hoy. "Ahoy Fancy Free! Your anchor is slipping", for instance.

Aback — Of a sail, filled on the "wrong" side. If you start a tack and fail to release the working sheet, the foresail will flap across against the mast and then be "aback".

Aft guy — the line stopping the whisker pole flopping forward.

Apparent wind — the perceived speed and direction of the wind as felt on the boat. The direction is measured in degrees port or starboard. The apparent wind is closer on the bow than the true wind.

Aye Aye — heard and understood. Traditional response to an order on board ship. It is better to repeat the command back, than say aye. "Hard a'port!", "Hard a'port, aye". (or better reply "Hard a'port, aye sir", but I'm not pushing my luck)

Back — of a sail, to fill from the "wrong" side. Bad if the genoa backs when you are trying to tack or gybe, wanted behaviour if you are trying to heave to

Back and fill — a pathological behaviour of a sail, typically a fore sail, where it folds in on itself then suddenly billows out. In strong winds this can be loud and potentially destructive.

Batten — a stiffener in a sail, typically horizontal as they are on Fancy Free.

Beam Reach — sailing about right angles to the wind. Across the wind.

Bear away — to turn down wind, see also fall off.

Belay that — to belay means to make fast a line to a belay pin. We have no such things on board, but "Belay that" is now used to cancel an order just given.

Bend — to tie to, e.g. "bend the heaving line onto the mooring line", means to tie the (thinner, longer, easier to throw) heaving line onto the thicker, shorter mooring line. The knot to use in this case would be a double sheet bend. I'm sure Kelly would say to use the double sheet bend Yosemite backup.

Bimini — a sun/rain shade over the cockpit. Typically canvas, but not always.

Binnacle — the column on which the wheel, compass, and instruments are mounted. Almost the same as helm.

Block — a pulley.

Block and tackle — pair of blocks with a line going up and down to give a significant mechanical advantage.

Bow thruster — an electrically driven propeller mounted in a tunnel through the hull at the bow. This can push the bow to one side or the other

Capsize — To heel to the point where the boat floods and sinks or turns turtle and does not right herself.

Centre of effort — The average of the forces on something. For the sails this varies depending on which sail is reefed how much. If only the main is up, the centre of effort is further aft. If the centre of effort of the sails (simply known as centre of effort) is forward of the centre of effort of the keel, which is called Centre of Lateral Resistance) then the boat will tend to turn downwind (lee helm), if the centre of effort is aft of the centre of effort of the keel then the boat will tend to turn into the wind (weather helm).

Clew — The aft bottom corner of a sail, where the sheet is attached on a jib.

Close hauled — sailing as close to the wind as reasonable

Clutch — a device for holding or releasing a line. It serves the same function as a jamming cleat but is much more solid. To open the clutch, to release a line, pull the handle up then push it forward: you should feel it release. To close the clutch, to hold a line, pull the handle forward then push it right down. A clutch holds the line in tension, but allows you to pull the line further in.

Companionway — the hatch and ladder leading down from the cockpit.

Dodger — The “windscreen” and shelter above the companion way.

Dog — To dog a hatch means to secure it, typically using a lever. The portlights (side windows) on Fancy Free are difficult to dog, and important in case she heels over more than intended.

Fall — various meanings, but of a line, the end that left to itself would fall in a mess on the cockpit floor.

Fall off, falling off — an old-fashioned expression meaning to bear away, to turn down wind

Flog — various meanings, but of a sail or flag, to flap violently and potentially destructively in the wind.

Fore guy — the line stopping the whisker pole flopping aft.

Furl — to put away, more specifically to roll up a sail.

Furler — a spool where the furling line coils up as a sail is raised or deployed.

Furling line — the line you pull on to furl a sail.

Genoa — a headsail that overlaps the main sail. Their size is expressed as what percent they are of the space between the forestay and the mast. Fancy Free has a 135% genoa.

Going about — The act of turning through the wind. To tack.

Goose-winged — head sail out on the opposite side to the main, one sail out each way. Pretty, efficient, but difficult to achieve reliably without a whisker pole.

Gybe — Turn so that at some point during the turn you are pointing straight down wind. Also means to turn so a sail changes from one side to the other.

Halyard — the line you pull to raise a sail.

Head — the top corner of a sail.

Head — a bathroom on a boat.

Head up, heading up — to turn into the wind.

Heave to, past tense **hove to** — to bring the boat to a halt. In a sailing vessel this involves a clever arrangement of the sails and rudder to balance the boat..

Heel — To lean over to one side.

In irons — pointing straight into the wind.

Jammer, Jamming cleat — these are the poor cousin to a clutch. The difference is that where a clutch can be released under load, a jammer can't. There are several types, and there are three types on board: a simple (pathetic) friction jammer, a sprung cam jammer, and a cam jammer.
The main sheet had a simple friction jammer. The main sheet is too big to be held by it. The cleat is still there, but we now use a clutch for the main sheet.

The jib sheets have cam jammers. You have to open the lever to release the line, but it will stay open. You can not open them under load.

The genoa furling line has a sprung cam jammer. You pull the line up to let it run out, down (and in) to get it to hold.

Jib — a headsail that does not reach further aft than the mast. Colloquially used to mean any headsail whether it is a jib or genoa.

Jibe — weird North American variant of Gybe.

Kicker, kicking strap — weird UK variant word for vang.

Lazarette — a big locker at the stern.

Lazy — of a jib sheet: the one that is slack, the one on the windward side.

Leech — the trailing edge of a sail running from the clew to the head.

Lee helm — a tendency of the boat to turn down wind. Called this because you have to steer a bit to windward to compensate, and with a tiller that means pulling it to lee.

Lee shore — the shore on the lee side of the boat, the one the wind is trying to blow you onto. Lee shores are considered threatening.

Leeward — the side of the boat away from the wind. See windward. Sometimes pronounced looward in UK. Very silly.

Life Sling — a rescue device to be thrown to a MOB. Much better than a ring.

Luff — the leading edge of a sail running from the tack to the head

Luff — what a sail does when it loses wind.

Luff up — to turn the boat into the wind.

Make fast — to tie a line to something. UK usage. Really confuses on this continent. You might hear me use it.

Mandrel — various meanings but in this context, the tube or axel around which the sail is furled in the boom

Painter — line on the bow of a dinghy used for mooring and to be towed.

Pinch — to sail too close to the wind so as to be inefficient and lose speed. A bad thing when tacking, not a bad thing when trying to reef the sails.

Pitch — A boat pitches as the bow goes up and down. This is what happens if the waves are from ahead or, to a lesser extent, from astern.

Preventer — A line running from near the end of the boom forward and kept taut to prevent the boom from gybing over..

Prop walk — the tendency of the propeller to pull to one side. Particularly pronounced when going astern.

Prop wash — the jet of water pushed astern by the propeller. This flows over the rudder giving you forward steering even with no way on the boat.

Pulpit — the railing at the bow of the boat. By extension there exists that ghastly word pushpit meaning the railing at the stern of the boat.

Reeve — Fancy nautical word meaning to thread a line through a block.

Roll — A boat rolls as it heels first one way then the other. This is what happens if the waves are on the beam.

Roust out — to get something out of a locker in preparation for use. Also to get lazy crew members out of bed in the morning.

Running — various meanings, but in this context to sail directly down wind.

Scuppers — The outer edge of the deck. More accurately, originally, the drain holes in the bulwark.

Sheet — a control line used to control the clew of a sail.

Sheave — the wheel in a block, or in a fixed position acting as a pulley.

Slapper-stopper — this is used to prevent the halyard from pinging against the mast all night. Ours is a simple bungy cord that you hook on the halyard and somewhere on the boom, an attachment point for one of the sheet blocks, I think.

Snatch block — a block which opens on the side so it can be attached to the middle of a line.

Snubber — a length of line with some elasticity, attached to the anchor chain and a strong point of the boat to prevent the boat from being jerked to a stop by its anchor or mooring.

Spring line — a mooring line running diagonally fore or aft. These prevent the boat from moving along the dock.

Tack —pertaining to a sail, the front bottom corner.

Tack — the act of turning the boat “through the wind” so that at some point of the turn the bow is pointing straight into the wind. See going about.

Tack — of a position of sail. Which side the wind is blowing from.

Tacking — either the act of making a tack (turning the boat through the wind) or to make progress to windward by a zig-zag series of courses close hauled on port and starboard tacks.

Taffrail — an archaic word meaning stern rail.

Tailer — the top bit of a winch that holds the line. The main part of the winch is called the drum.

Thwart — a transverse plank or seat. Athwartships means oriented across the boat. Also to deliberately foil someone's plans.

Topping lift — a line holding a horizontal spar up. Most Yachts have a topping lift on their boom to support it when the main is furled. Fancy Free has a rigid vang, so does not need a topping lift. But the same term is used for the line holding the whisker pole up.

Track — the groove the sail slides up.

Transom — the squarish stern end of a boat. Not all boats have transoms. Canoes conspicuously do not. Yachts that have no transom are called "canoe sterned"

Traveller — an odd arrangement to adjust the effective point of attachment of the main sheet to the boat.

True wind — the actual speed and direction of the wind. The instruments calculate this from the measured apparent wind and the boat speed and direction.

Unreeve — see reeve.

Vang — the line or strut that prevents the boom from rising up especially when the main sheet is let out. Without it the boom would buck or kick.

Weather helm — a tendency of the boat to turn into the wind. Called this because you have to steer a bit to lee to compensate, and with a tiller that means pulling it windward. A little weather helm is preferable as you'd rather the boat turned into the wind and stopped if the rudder broke, or the helmsman lets go of the wheel.

Welly — Not a sailing term. More car or motor racing. **More welly** means more speed.

Windward — the side of the boat the wind is coming from.

Washboards — on Fancy Free the folding door that goes across the companionway. On some boats the same function is served by removable planks that fit in a groove each side.

Whip — The short line attached to a fender to tie it onto a stanchion or wherever.

Whisker pole — a pole that attaches to the mast and the clew of the foresail to hold it out. Used, if you are clever, when running downwind.

Working — of a jib sheet: the one that is taut, the one on the leeward side.

Yaw — This is when the boat rotates around the mast. A boat will pitch, roll, and yaw when the waves are on the quarter (on the beam from astern) or broad on the bow (on the beam from ahead). This combined movement can be uncomfortable: keep your eyes on the horizon.

Inventory

Item	Location
Anchor, Primary, Delta 45, 160' chain 100' Rode	Anchor Locker, Bow
Anchor, Secondary, Danforth 40	Starboard Side of Anchor Locker
Anchor, Secondary, Danforth 40 rode	Port, Aft Lazarette
Anchor, snubbe	Anchor Locker, Bow
Batteries, spare flashlight (2)	Nav Table
BBQ Cover Black	BBQ, store in x locker when BBQ in use
BBQ, Magma Catalina Grill	Stern Rail, Port
Bilge Pump, Manual, Handle	Aft, Port Propane Locker
Binoculars, West marine blue	Salon, Port, Forward Shelf
Boat Hook	Port, Aft Lazarette
Chart No.1, Symbols, Abbreviations, and Terms	Salon, Port Shelf
Chart, Maptech Chartbook, San Juan Islands	Salon, Port Shelf
Chart, Roll #18421 San Juan Islands	Salon, Port Shelf, In Tube
Chart, Roll, # 3441, 3442 & 3443 Gulf Islands	Salon, Port Shelf, In Tube
Cockpit Cushions (2)	Stateroom, Aft Starboard when not in use
Compass, Handheld	Nav Table
Coolant, Engine	Salon, Forward Settee Storage
Crab Cooking Pot	V-berth, Starboard Closet
Crab Pot with Line & Float	Starboard, Aft Lazarette
Cruising Guide, Gulf Islands, Dreamspeaker	Salon, Port Shelf
Cruising Guide, San Juan Islands, Boater's Guidebook	Salon, Port Shelf
Cruising Guide, Wagonners	Salon, Port Shelf
Current Atlas & Tables	Salon, Port Shelf
Cushions, cockpit	Stateroom, aft, starboard
Cushions, Shorter Posts, dinette table berth conversion	Cushion- V-berth, Starboard shelf
Deck Fill Cap Wrench (Tool)	Nav Table
Dinghy, 12' Azzurro Mare inflatable boat; AM365	Dockside, At the Head, Cleated to Dock
Dinghy, Foot Pump	Cockpit Locker, Port
Dinghy, Outboard, Honda 2 hp 4 cycle	Stern Rail, Port
Dinghy, Patch Kit	Dinghy Bow Locker

Dividers	Nav Table
Dock Lines (7), 5/8", (6) Blue Braided, (1)Black	Starboard, Aft Lazarette
Documentation/Registration, Vessel	Binder, Charter Guest Reference Manual
Fender Step, White West Marine	Cockpit Locker, Port
Fenders (5), Black Taylormade, Size xx, End Tabs	Cockpit Locker, Starboard
Fire Extinguisher 1	V-berth, Starboard Closet
Fire Extinguisher 2	Galley, Under Stove
Fire Extinguisher 3	Port, Aft Stateroom inside closet
First Aid Kit	Aft Head, Vanity Cabinet
Flag, Canadian Courtesy	Nav Table
Flares	Under Nav Table In top Drawer With Horn
Item	Location
Flashlight 1	Nav Station, Mounted Next to VHF Radio
Flashlight 2	Nav Station
Horn, Air	Under Nav Table In top Drawer With Flares
Hose, 50 foot White Garden	Port, Aft Lazarette
Keys, Deck Fill Caps (2 sets)	Nav Table
Keys, Engine (2 sets)	Chart Table & San Juan Sailing office
Legs, dinette table, berth conversion	Salon, Forward Settee Storage
Lifesling	Aft, Starboard Rail
Manual, Charter Guest Reference	Salon, Port Shelf
Manuals, User, Electonics	Salon, Port Forward Cabinet
Manuals, User, Mechanical	Salon, Port Forward Cabinet
Navigation Rules	Nav Table
Oil, Engine	Companionway, Engine Compartment
Parallel Rules	Nav Table
PFDs	Aft, Starboard Lazarette
Radar Reflector	Starboard Shroud
Seacock Plugs, Tapered Wood	Seacocks, tied with lanyard
Seacock Plug, Tapered Foam Sta-plug	Nav Station in mesh bag with flares and horn
Shore Power Cord, 50 foot	Aft, Port Lazarette
Spares, Engine, Fuel Filter, Alternator Belt	Salon, Forward Settee Storage
Step Stool, folding dock	Aft, Starboard Lazarette
Stern Tie Line, 600'	Starboard, Aft Lazarette
Tide & Current Tables, Ports and Passes	Salon, Port Shelf

Tiller, Emergency	Aft, Starboard Lazarette
Tools, West Marine Shipyard socket/tool set	Salon, Forward Settee Storage
Tools, supplemental tool kit	Salon, Forward Settee Storage
TV Screen	Above Nav Table
VHF Radio	Above Nav Table
Winch Handles (2)	Cockpit Cubby under side deck & Nav Table

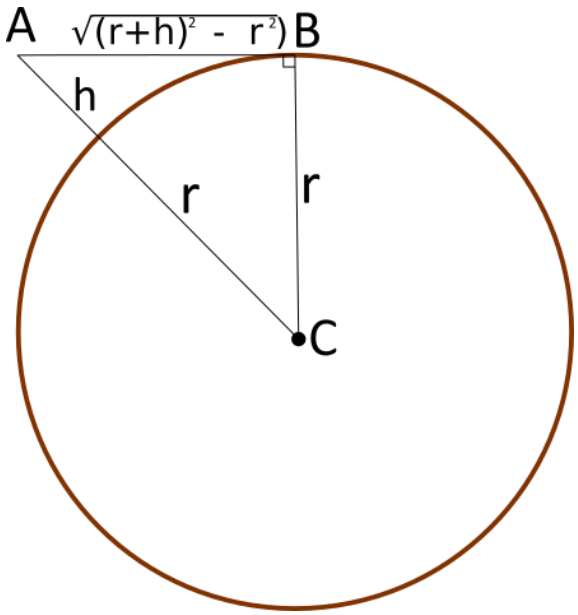
Distance to Horizon

The table on the next page gives the distance to the Horizon from various heights, and the distance at which an object of various heights is visible from various useful heights. The cockpit is about 0.5m above the sea. Eyes are about 10cm from the top of the head.

I am 182cm tall, so standing in the cockpit, I want to say 182cm+50cm-10cm, 2.2m, so I want to use the 2.2m column and the row for how high the object is. So for a barge with cargo deck 1m high and containers 3 high, and with containers being 8' (2.4m) high I want to use the row for 1m+7.2m, 8.2m. There isn't one, so use the one for 8m, and get 8.3nm. That is to say that barge is completely below the horizon for me standing in the cockpit if it is over about 8nm away. If I stand on the foredeck which is about 1m above the water, I want a column for 2.7m. There isn't one, so I want to add the distance to the horizon for 2.7m (3.1nm) and the distance to the horizon for 8m (5.5nm) to get a distance of 8.6nm.

If I was bloody bold and was hoist to the spreaders on the mast which is about 12m above the sea, I'd be able to see the top of the barge at 6.7m + 5.5nm, 12.2nm. Hmm, maybe going up the mast is a good idea… Er, no.

The calculation, should you care, is actually quite simple. Consider the diagram to the right. The circle represents the earth. The viewer is at A, h metres above the surface. The radius is r, so the distance to the horizon is derived by Pythagoras. And the radius of the earth is 6378137 metres, so for height 2m, you want



$$\sqrt{(6378137+2)^2 - 6378137^2} = 5051$$

So the distance to the horizon is 5051m ≈ 5km.

One nautical mile is 1.852km, so the distance is 5km ÷ 1.852 ≈ 2.7nm. Which is what you see in the 2m row in the table.

height (m)	horizon (km)	horizon (nm)	1.6m	1.8	2m	2.2m	2.4m
0.5	2.5	1.4	3.8	4.0	4.1	4.2	4.4
0.6	2.8	1.5	3.9	4.1	4.2	4.4	4.5
0.7	3.0	1.6	4.1	4.2	4.3	4.5	4.6
0.8	3.2	1.7	4.2	4.3	4.5	4.6	4.7
0.9	3.4	1.8	4.3	4.4	4.6	4.7	4.8
1.0	3.6	1.9	4.4	4.5	4.7	4.8	4.9
1.1	3.7	2.0	4.5	4.6	4.7	4.9	5.0
1.2	3.9	2.1	4.6	4.7	4.8	5.0	5.1
1.3	4.1	2.2	4.6	4.8	4.9	5.1	5.2
1.4	4.2	2.3	4.7	4.9	5.0	5.1	5.3
1.5	4.4	2.4	4.8	4.9	5.1	5.2	5.3
1.6	4.5	2.4	4.9	5.0	5.2	5.3	5.4
1.7	4.7	2.5	5.0	5.1	5.2	5.4	5.5
1.8	4.8	2.6	5.0	5.2	5.3	5.4	5.6
1.9	4.9	2.7	5.1	5.2	5.4	5.5	5.6
2.0	5.1	2.7	5.2	5.3	5.5	5.6	5.7
2.2	5.3	2.9	5.3	5.4	5.6	5.7	5.8
2.4	5.5	3.0	5.4	5.6	5.7	5.8	6.0
2.6	5.8	3.1	5.5	5.7	5.8	6.0	6.1
2.8	6.0	3.2	5.7	5.8	6.0	6.1	6.2
3.0	6.2	3.3	5.8	5.9	6.1	6.2	6.3
4.0	7.1	3.9	6.3	6.4	6.6	6.7	6.8
5.0	8.0	4.3	6.8	6.9	7.0	7.2	7.3
6.0	8.7	4.7	7.2	7.3	7.5	7.6	7.7
7.0	9.4	5.1	7.5	7.7	7.8	8.0	8.1
8.0	10.1	5.5	7.9	8.0	8.2	8.3	8.4
9.0	10.7	5.8	8.2	8.4	8.5	8.6	8.8
10.0	11.3	6.1	8.5	8.7	8.8	9.0	9.1
12.0	12.4	6.7	9.1	9.3	9.4	9.5	9.7
14.0	13.4	7.2	9.7	9.8	9.9	10.1	10.2
16.0	14.3	7.7	10.2	10.3	10.4	10.6	10.7
18.0	15.2	8.2	10.6	10.8	10.9	11.0	11.2
20.0	16.0	8.6	11.1	11.2	11.4	11.5	11.6
25.0	17.9	9.6	12.1	12.2	12.4	12.5	12.6
30.0	19.6	10.6	13.0	13.2	13.3	13.4	13.6
35.0	21.1	11.4	13.8	14.0	14.1	14.3	14.4
40.0	22.6	12.2	14.6	14.8	14.9	15.1	15.2
45.0	24.0	12.9	15.4	15.5	15.7	15.8	15.9
50.0	25.3	13.6	16.1	16.2	16.4	16.5	16.6

Checklists

Pre Departure

Discuss plan

Weather Check – online, radio, observe wind, tide, and current

Engine check – WOBBLE, water, oil, belt, bilge, levels, exhaust

Hatches fully closed – including portlights. And properly dogged

Lines secured – fender knots, anchor tie, dinghy painter

Dinghy motor securely aboard and oars secured

Outboard battery plugged in to charge

Everybody aboard including the dog

Shore power disconnected

Secure below – lockers latched; doors latched; plates and mugs empty and put away; tall things in sink especially tea thermos (which should be full); heads dry

Secure on deck, in cockpit, in dinghy. Washboards secure

Gas off

Instruments on and covers off

Slapper stopper off

Condensation/rain off dodger windows

Transom gate closed. Side gates closed (except entry gate if docked)

Suitable clothes on or to hand – gloves, hats, foulies. Sunscreen?

Life jackets on, including dog

Anchor light off

Engine on – fast idle

Post Departure

Fenders and lines stowed

Check hatches

Anchor secured (and hatch closed)

Gas off

Windlass breaker off

Pre Arrival

Discuss plan

Lines and fenders or

Anchor free and windlass breaker on

Stern line rousted out?

Side gate open

Sails furled

Post Arrival

Secure and tidy lines

Lights

Anchor / dock check

Slapper stopper on

Windlass breaker off

Gas on

Instruments off and covered

Shore power attached

fill water tanks if needed

pump out if needed and available

Daily checks

Water levels

Holding tank levels

Battery charge state

Dry any condensation

Check fuel and gas levels

Weekly checks

Check shackles are tight or seized

Inspect vang and gooseneck

Check pelican clips

Check and turn mattresses

Check bilge pump

Vessel data

Model:	Catalina 42 MkII
Year:	2004
Hull number:	857
HIN:	CTY087F304
Registration:	YT9345014
LOA:	12.75m (41’ 10”)
LWL:	4.1m (13’10”)
Draft:	1.5m (5’). Don’t take her into water less then 2.5m deep
Anchor:	45lb Delta Quick set
Anchor Chain:	84m (275’) of 5/16 HT
Spare anchor:	28lb Danforth
Water:	496 litres (131 US gal)
Holding tanks:	98 litres (26 US gal) each
Displacement:	9,300kg (20,500 lbs) dry
Bridge clearance:	18m (59’)
House batteries:	220Ah (do not take below 50%)
Engine:	Yanmar 4JH3E, serial number: 126388
Reduction Gear:	Kanzaki KM3A1, S/N: 03445, Gear Ratio 2.64
Shaft:	1 1/4” Stainless Steel, PSS shaft seal, FRP stern tube, rubber cutlass bearing in bronze “I” strut
Propeller:	17” Max Prop
Bow Thruster:	Sidepower 12VDC
Fuel tank:	174 litres (46 US gal)
Fuel Filter:	Racor 500FG
Propane:	2 10lb tanks
Engine oil:	Extra DELO 15-40, 4.5 litres (4.8 US quarts)
Engine coolant:	water + Yanmar Diesel YG30R ELC Ultralife Antifreeze/Coolant, 8 litres

Impeller:	Yanmar Impeller Kit 129670-42610
Batteries:	(4) 4D AGM service bank, (1) Group 31 AGM start battery, (2) Group 24 AGM thruster bank, 12V
Inverter/Charger:	Magnum MS2812
Aft Winches:	Lewmar 52ST Electric
Forward Winches:	Lewmar 40ST electric, Lewmar 40ST
Chart Plotter:	Raymarine Hydridtouch E95
Instruments:	Raymarine i60 Wind, Speed, depth gauges
Auto pilot:	Raymarine ST6001
VHF Radio:	Standard Horizon GX1800
Outboard:	Torqeedo Travel XP