Sailing with a Smile

1- Welcome Aboard

Welcome aboard A Class Sailing Akaroa's flagship, SV Manutara. Our objective on this cruise is to provide you with a pleasurable experience and at the same time teach you some of the rudiments of sailing. SV Manutara is a classic, long keeled, ocean sailing yacht. It's characteristics make for an especially stable and seaworthy vessel. On Manutara we heel less than most lighter, modern boats in the same breeze. Additionally, Manutara is technically slower than modern light displacement yachts. Nevertheless, the basics you'll learn on board can be applied to any sailing vessel, from dinghies, to racing yachts.

How does a sail work? When considering learning how to sail, there's only one thing to remember: The sails on a yacht work the same way as the wings on an aircraft. They are even the same shape. The yacht's sails are upright, and the aircraft's wings are horizontal, but they are still both aerodynamic surfaces. Aircraft are not pushed into the air… they are sucked into it, by the vacuum that forms on the top side of the wing. The same way that a yacht is not pushed along by the wind (except when running). The yacht is sucked along by the vacuum formed on the front edge of the sails.

The sail shape is a gentle curve, just like the aircraft wing. When air passes over the curve (or wing) the air on the outside of the sail has to travel further than the air on the inside. This makes the air molecules spread out. The result is a slight compression of air on the inside of the sail, and a slight vacuum on the outside. The sail is a membrane that prevents the air on the inside moving to the outside to equalize the pressure between them, and therefore that pressure/vacuum tugs at the material of the sail. The sail is attached to the yacht by a forestay, halyard and sheets, and through these connections, pulls the yacht towards the direction of the vacuum.

The sailors job is simply this: Maximise and control the vacuum by changing the sails or course to provide full sails. That's it! Nothing more to do!

The sailor uses all the sail trimming devices on a yacht to achieve that objective. Now you understand how a yacht moves, we'll take you through the basic ways the sailor can modify the sails to the best advantage.

Getting on with the skipper. Each skipper has his favourite ways of doing things, and this varies from boat to boat, and from skipper to skipper. The golden rule for any crew member to remember is that each skipper does things the right way for their boat (even if it's wrong). You'll enjoy the cruise or race much more if you relate to what the skipper asks and do it "his" way.

It helps to watch how he/she does things and copy them without being asked: the way they trim the sails, the way they coil halyards and sheets, the way they use the main sheet, and the way they prefer the tacking or gybing maneuver to be done.

Using the basics in this handbook will definitely get you started as a good crew member, but fine tuning your techniques to match those of the skipper will set you apart as an excellent crew member.

So, armed with his booklet, and your experience aboard Manutara you should feel confident in your ability to sail any keeler or trailer sailer, whether for fun or racing.

2- Safety: Hold On, Weather side movement, sitting down

The first word to be said when boarding any boat is about safety. Your care and safety on board can affect the safety of others, especially those less experienced than yourself. Here's a few safety tips for you to consider. We have omitted the obvious like wearing lifejackets and other commonsense items and concentrated on the finer factors that can make the difference between enjoyable success or injury and misery:

- Arrive with all your gear in one bag
- Always wear non-skid, non marking footwear, even on a hot day.
- Do not leave sheets or halyards lying around on deck for other crew to trip on, or to fall overboard on the next tack
- Always place winch handles in the winch or winch handle pockets – never let them fall to the cockpit floor or on the deck

3- The courses

We sail around the buoys set down by the Akaroa Cruising Club. Our course choice is made based upon wind direction, and sometimes speed, to provide our guests with experience in a windward leg (tacking), a broad reach (sail setting and trimming) and a down wind leg (gybing etc).

4- Raising sails: Mainsail, Headsail

There are two sails we will be using: the Mainsail (The rear sail, connected to the top of the mast and having its foot on the boom) and the Headsail or Genoa (the front sail connected between the bow and the top of the mast, with its foot free). The mainsail is the sail that trims the attitude of the boat as the wind increases, and the foresail (genoa, or jib) is the 'Power' sail that does most of the driving work when we sail away. On Manutara the mainsail is hauled up the track on the rear face of the mast, requiring crew to raise the sail at the foot of the mast and the genoa is mounted with a self-furling arrangement, and can be set from the cockpit.

To prepare for raising sails we leave the jetty and motor out into the bay. Then we point the bow of the boat into the wind. This allows us to raise the mainsail with no pressure on the sail. We loosen the mainsheet on the traveller cam cleat and the crew go forward, loosening the Boom Vang ("kicking strap" on a dinghy). Loosening these allows the boom freedom to move upwards, easing the hoisting of the mainsail.

We untie the sail ties that hold the packed mainsail on the boom. By pulling on the main halyard (The rope that hoists sails), we hoist the sail up the mast. We use a winch at the base of the mast to tighten the luff, or leading edge of the mainsail, so there's no slack between the mast slides.

The two main ropes on a yacht are Halyards and Sheets. Halyards hoist sails, and sheets trim them once they are up. Remember which is which by remembering that **H**alyards **H**oist Sails.

Once this is done, we loosen off the topping lift (Wire rope holding the boom up when the sail is down). This frees the boom to move around as we set and trim the main sail.

5- **Setting Sails**

At this point we tighten up the mainsheet (The rope that controls the boom, and therefore, the mainsail, is called the Main Sheet). We turn the helm down wind and allow the breeze to fill the mainsail. We can sail on a mainsail alone, but it's never as fast as sailing with both headsail/genoa and mainsail working together.

With the mainsail up and trimmed, it's time to unfurl the genoa. With even just a little breeze, the genoa will unfurl itself, once the furling guyrope is feed. First we free up the furling mechanism by carefully allowing the Furlex guy to uncoil. Then, all we do is free up the genoa sheet on the windward side (the side of the boat the wind crosses first) and haul in the genoa sheet on the leeward side. The wind will catch the sail as it unfurls, and pull it out for us.

All we have to do is make sure there are three turns of the genoa sheet on the leeward winch, and haul the genoa in tight enough, so that the wind fills the sail with a gentle belly. Immediately this happens, the sail will start working and we can feel the boat begin to heel a little and start speeding up as the genoa starts to do its job, creating that vacuum we talked about earlier. This increase in boat movement and speed is called "Powering Up".

6- Leg 1 – Upwind (Close Hauled)

Tacking. The first leg of the regatta is normally an upwind leg. This means the place we want to go is almost directly in front of the boat, but also almost directly where the wind is coming from. No sailing vessel can sail directly into the wind. Most yachts can sail 30° away from the wind direction, either to the left or right of the wind direction. So to sail to the next mark, which is in front of us, and up wind, we have to alternate between 30° left and right of the wind direction. By zig-zagging to windward this way and that we will eventually arrive at the mark. This zig-zagging technique is called "Tacking" to windward.

Another name for this point of sailing is "hard on the wind" or on some boats, a 'tight reach'. The 60° angle (30° either side of the wind direction) is called the 'Impossible Course'. It's easy to see where the impossible course is. Look up to the top of the mast and there you'll see the Wind Indicator. The arrow on the pointer points the direction of the wind. The tail indicates how close the course of the boat is to the impossible course. By keeping the tail of the arrow, just OUTSIDE of the V formed by the tail arms, we can successfully sail close to the wind.

Simply put, tacking involves repeating left and right turns of the boat as many times as is necessary to make progress towards the objective, upwind, and overcome this 'impossible course'.

Tacking itself involves nothing more than turning the boat from one side of the 30° impossible course, through the eye of the wind and on to the other side of the 30° impossible course. At the same time as the boat is being turned through the eye of the wind by the helmsman, the cockpit crew prepare to let go the genoa sheet from the tack just completed. Once the foresail starts to fill with wind from the new course, the leeward winch crew haul the sheet (and the genoa sail to which the sheet is attached) around the front of the boat to set it on the new tack. The mainsail generally looks after itself, unless the wind changes and it needs re-trimming.

Here's the sequence of events, one by one:
The Skipper calls "ready to tack" (cockpit crew get ready, one on each winch.)
Then the Skipper calls "tacking" and puts the wheel over to turn the boat to the new course. The Cockpit crewmember on the sheeted in winch quickly unwinds all the genoa sheet off the winch in an upwards corkscrew fashion, allowing the breeze to pull the sail around the front of the mast, while at the same time, the other winch man pulls the genoa sheet in as fast as he can, while there's no strain on the sail. Then when the sail takes the wind and pulling the sheet becomes too hard for the winchman, he hands the sheet to the now idle other winch man to tail, and the primary winch man, grinds the winch handle. First in the 3:1 ratio, and then when it becomes too hard, he reverses his direction and the two speed winch changes gear to the 10:1 ratio automatically, as the winch man hardens up the genoa.

In a gentle breeze the mainsail has politely stood by, tacked itself on to the new course and filled as the boat bears off the wind onto the new course, without any attention.

The boat continues on this 'board' (or course for the duration of this tack) until the next tack is needed.

In the meantime, the winchman who was grinding, now puts three loose turns on the unused winch, in preparation for the tack he knows will happen sooner or later.

Whilst on the board, a good winch man will know how to read the genoa (by watching the woolies) and will be adjusting the sail using the loaded winch. The skipper should be mindful of the winch man's job and hold a straight course, allowing the boat speed to build and the assisting the winch man with setting the headsail properly.

Good Winching Practice: Rule Number One: There are only two places to put a winch handle on a yacht; 1- In the Winch or 2; away! NEVER leave winch handles loose in the cockpit. NEVER drop winch handles on the cockpit floor. This will certainly result in you not being invited on board again.

Which way does the winch turn? It's a good idea to know which way the winches turn. All chrome winches on Manutara turn in a clockwise direction, when you look down on them. All bronze winches on Manutara turn in an anticlockwise direction. If you look at the base of the winch there's a red arrow which shows winch direction.

Avoiding riding turns. When pulling the genoa sheet in quickly, it's easy for the sheet to ride up over itself on the winch drum. When this happens, it's called a 'Riding Turn' because the sheet seems to ride up over itself. If further turns are added before the riding turn is fixed, the sheet on the winch can jam up, making further sail

trim impossible. When this happens, the only solution is to loosen the tight sheet, take off sufficient turns of the sheet until the riding turn is freed. This is easier said than done. Each skipper has their own way of freeing up the riding turn and their choice is usually based upon whether they are racing, or just cruising. Either way, the pressure has to be removed from the sheet before the riding turn can be freed. The best way to do this is to tie another secondary sheet to the clew of the genoa, take it to the secondary winch (or if there is no secondary winch, through the spinnaker blocks to the other primary winch, and by tightening up on the secondary sheet, relieve the pressure on the bound sheet. Then the riding turns can be loosened off evenly, without interrupting the progress of the boat on its course too much.

Tailing the winch. When using a standard non self-tailing winch there usually needs to be two people: one to grind the winch, and another, behind him, to tail the sheet. Tailing the sheet means keeping the sheet taut, thereby maintaining the friction on the drum of the winch. If the 'tailer' lets go, the sheet will slip on the drum. When you are shorthanded, doing it all by yourself, or the tailer has little strength, there's a trick to assisting the tailer by making the ordinary winch behave a bit like a self tailing winch. This trick is as follows:
When you've pulled on the sheet with two or three, or in stronger winds, 4 turns on the winch, and it's now too hard to tail and grind with the other hand, put 8 or more tight turns on the winch, effectively loading up the winch drum with the sheet. Now try to grind with both hands, leaving the sheet to tail itself, or with very little effort required to tail. Great eh?

Sail trim: Reading the woolies.
On both the main sail and the genoa, there are small tufts of wool stuck to the sail with self adhesive patches. They're normally stuck to either side of the sail in the same places. These woolies on the foresail assist the winch man to harden up (trim the sail in/tight) or to ease (trim the sail out/looser). The woolies show the winchman the way the air is passing over the sail. If the air is passing smoothly over each side of the sail and the woolies are both flowing evenly, the sail is trimmed correctly and is working well. The sail stops doing its work when one of the sides of the sail has turbulent air on it, preventing the correct balance of pressure and/or vacuum.

Although they look complicated, they're not. Simply, if the woolies are waving around violently on one side of the sail, that's the side the sail must be trimmed to. Ease or Harden the sail to achieve balanced woolies. If the woolies on the port side (usually red ones) are wobbling violently, move the sail to port until they settle down. It the starboard woolies are dancing around, move the sail to starboard until they too are flowing evenly.

An important factor in sail trim is to keep the boat on a steady course. If the helmsman is inattentive and allows the yacht to move upwind (weather helm) or to drift off the wind (leeward helm) the setting of the sail will have to change. If you are on the helm, keep your attention to the woolies, or the wind indicator. If you are on the winch, gently remind the helmsman that the course is changing. Luffing is a real indicator of the set of the foresail.

Luffing
Luffing happens when the sail is so poorly set, or the wind so variable, or the course is not being held, that the fore sail is about to lose drive completely. The symptom is the leading edge (or Luff) of the fore sail flapping and fluttering. The only cure for luffing is to harden up the sail in question, or if this is not possible, to bear off the wind (turn the boat away from the wind) until the correct course is re-established. Luffing normally occurs when the skipper is distracted and wanders downwind off his course, or when the skipper points the boat too close to the 'Impossible Course'.

The other time where luffing occurs is on the headsail and/or mainsail when the wind becomes too strong for the amount of sail set. The only solution is to bear off the wind and sail downwind, or to reef either the main or the genoa by furling some of it, or both. We do not cover reefing in this simple basics booklet. There are many excellent publications to buy for further reading on reefing.

Heeling.
Heeling is not something to be scared of. Its the natural action of a boat when the wind starts to make the sails work. A boat sails best when heeled 10 to 15 degrees off the vertical. Luckily, this is also almost automatic when there's enough breeze for it to occur. When the boat heels too much, due to too much wind or poor sail setting, the heeling will start to have a negative effect on the hydrodynamics of the hull and will reduce boat speed. It may be exhilarating to have the leeward toerail under water, but unfortunately, it's also an inefficient way to sail. To correct heeling, we simply let the main sheet out a bit, thereby spilling wind from the sail, and reducing the vacuum effect on purpose. Excessive heeling can also occur when there's simply too much sail set for the wind conditions, and that's when it's time to reef the sails.

7- Leg 2 – Downwind (Running)

The second leg of or sailing trip will generally be downwind. This means, the boat will be gybed at the last turn, and will sail away from the wind. The mainsail and boom will be let out to one side of the boat.

It is when sailing down wind, or 'running' that we must be very careful to avoid an involuntary or 'crash' gybe. This happens when either the roll of the yacht gives the boom enough momentum to crash from one side of the boat to the other, or we sail over the wind, which will blow the boom over to the other side of the boat.

Both of these events can be particularly dangerous, especially for people standing in the cockpit and/or around the boat. Crew have been knocked overboard, banged on the head and even killed by uncontrolled gybing.

It's not too difficult to avoid however, provided we sail downwind, but alter course, so the wind comes over the stern quarter of the boat rather than right over the stern. We simple bear off from the true downwind course, and sail a little off course, to one side or the other. In fact, by sailing a little off the true downwind course, the yacht will generally sail faster too, thereby making up the time lost by not sailing a straight downwind leg to the next mark. You can see this in action when watching the downwind legs of the Americas Cup boats. They never sail truly downwind, but gybe their way downwind with the wind over their stern quarters somewhat.

8- Leg 3 – A Beam Reach (Reaching).

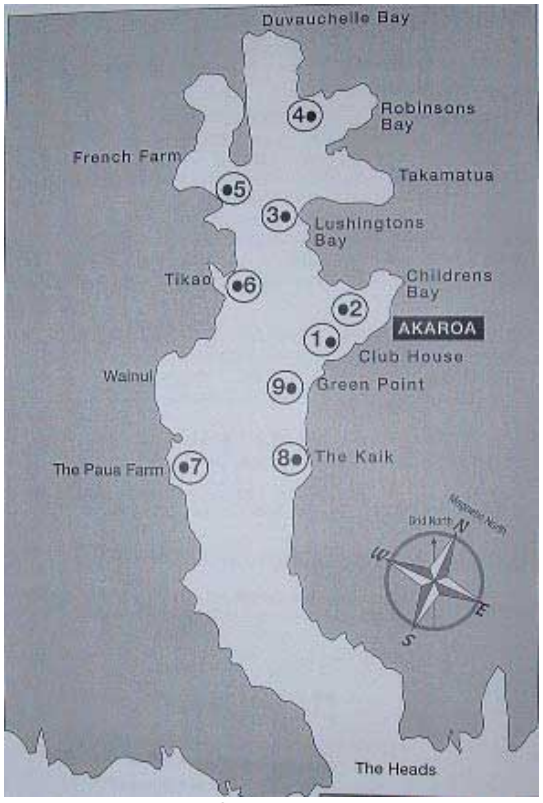
Reaching occurs when we sail the boat at close to right angles to the direction of the wind. We can sometimes get our fastest speeds when reaching. Sail trim is important to achieve this speed. It's important to set the boom correctly with the mainsheet, so the boom is at the right attitude to the oncoming wind. The way to calculate the set of the boom is simple. Take the imaginary angle of the wind to the centerline of the yacht, say 90°, and set the boom on the leeward side of the boat at half this angle; 45°. No matter what the wind angle is (between from 45° forward of the yacht's centerline – a reach, to 90° aft of the yachts centerline, -a run). If you employ this method to initially set the boom, and then trim it carefully, you can't go far wrong.

If you see how the headsail behaves, and trim it accordingly (IE same method as the mainsail) you'll be surprised at how fast the boat will travel. Use the woolies to see if there's a good airflow over the wing shape of the sail, either main or head.

If the yacht heels too far, you can turn up into the wind and intentionally luff the sails to slow it down, or you can reef both sails.

Manutara will happily sail with full sails set in up to 17 or so knots of wind. Over that, I like to reduce the headsail to 70% by roller furling it. If the wind speed increases to 25 knots, I also like to put two reefs in the mainsail. For wind to 35 knots, I prefer to douse the headsail completely and hoist a smaller staysail on the inner forestay. For 35 to 50 knots, I prefer three reefs in the mainsail, and a storm jib on the inner forestay. Over 50 knots, I try to stay home.

9- **Akaroa Harbour Marks**



These are some of the marks we sail to when sailing around the harbour.

10- Lowering the sails

When the cruise is over, it's time to lower the sails. The way you put away the sails will impress the skipper more than most other things (with the possible exception of winch handle etiquette).

We furl away the head sail by putting the furlex guy on the secondary winch. One crewmember tails the guy, one crewmember releases the genoa sheet gently, keeping just enough tension on the sheet to furl the sail tightly, but not so much tension so that the grinder has too hard a time of it to wind in the sail. By luffing the headsail and maintaining mainsail settings, we can sail on, and furl the genoa simultaneously.

Once the headsail is neatly away, and the furlex guy, and genoa sheets tidy, we start the engine to assist us to point the yacht into the wind. When there's no pressure on the mainsail, we can drop it. We go forward to the mast. We tighten up on the boom topping lift to hold the boom up when the sail's tension is no longer there.

We put 5 sail ties on the cabin top in preparation for the drop. Then, take the halyard from its stowage point on the mast and lay it on the deck, without knots in it. One crewmember opens up the clutch and starts lowering the sail, while the other crew flake the sail on top of the boom, like a huge concertina.

Starting at the rear end of the boom, we fold the sail onto the boom keeping that concertina shape. We tie the sail down as we go forward on the boom. Meanwhile, one crew member takes the halyard off the headboard at the top of the sail and secures it to the deckbolt just forward of the starboard side of the front of the cabin. Remember to close the main halyard mast clutch handle.

When the sail is tied down, the helmsman turns the boat back to the jetty, and the cruise is over. During the trip back, the sail cover is put back on the boom to protect the sail from UV light degradation.

Then we congratulate ourselves on the good things we did, and review the mistakes so hopefully, they won't happen again.

So, you see sailing isn't so difficult. Just remember the basics, and always think safety first, and you can't go wrong.

Enjoy your sailing and thank you for choosing 'A-Class' Sailing Akaroa.

'A-Class' Sailing Akaroa, P O Box 175, Akaroa 7542
Departs end of the Main Wharf at Akaroa, 10.30am to 1pm, and 1.30pm to 4pm, returning just in time for the Shuttle and Bus to Christchurch.
Bookings, ph 0800-724-528

An inspirational thought:
To sail a yacht efficiently, you don't have to be a superman or a genius. You just need to know what to do.