



## **How to get THE BEST FUN from your FireBug**

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The following paragraphs are not meant to be a beginners guide to sailing, but a "What to do, when and why" explanation on sailing your Firebug. I would suggest that you read right through to the end then come back and read each section two or three times. In doing this my explanations will become clearer. It will also help you to memorize much of what has been written. Please feel free to contact me with any queries that you might have - [rayobrien@clear.net.nz](mailto:rayobrien@clear.net.nz)

In my early sailing days (1940s), a senior member would come up and suggest that you do this or that because of the conditions prevailing at the time. This would always be followed up with how you should do it, why you should do it and the expected results from these actions.

Endeavoring to get the best performance from your ship can be as technical as you want to make it, but don't weigh yourself down with too much scientific knowledge - it can become an obsession that will spoil your sailing fun. There is much more to sailing that is not covered here, such as Helming, Tactics, Wind Patterns and Wave Actions etc.

## **The Basics**

Perhaps if we understood the basic principles of boat design and the power that drives it through the water (wind and sails) things might fall into place and give more credence to those questions and answers.

Lets look at the sail, does it push the boat along or does it suck the boat along. There is a little experiment we can easily try here: Take a piece of A4 paper and cut it into 4 pieces. Take one of these pieces and on one of the short ends make a 10 mm crease line. We now roll this piece of paper up starting at the other end and then let it unroll, we should now have a piece of paper looking a bit like the wing of a bird, we may need to flatten it out to get the shape. We next hold the crease strip edge between the fingers and thumbs, hold it horizontally close to our mouth and blow, if we have got everything right the curved edge should start to lift up. The aerodynamic shape that you have created by rolling the paper brings this about. The lift is created by the fact that as the air passes over the wing shape it has to travel faster and in doing this it becomes thinner and lighter. While the under side which still has the full pressure is literally (sucked) or (lifted) up into this vacuum type space. Convert this paper to a sail and with your centreboard down to give you lateral (sideways) resistance, your boat will move forwards. You need to try this to see what I mean.

## **The Sail**

Taking another look at the sail - if you draw a straight line from the top to both ends and across the bottom to each corner, you will find that a certain amount of sail will curve out side these lines. This is called the Roach. Not only does it increase the sail area, but also builds shape into the sail. Especially at the front edge (Luff) and at the top of the sail (Peak) where a batten is required to build in shape as well as holding out the extra amount of sail curve preventing it from collapsing The pressure applied on this batten will also allow you to alter the shape in this part of the sail. That area along the bottom is called the foot of the

## **Sail adjustments to suit the various conditions.**

In very light weather we require a very flat sail so that the wind can clear away and not get trapped thus blocking that continuous flow of wind over the surface of the sail, but don't make it drum tight as this will stall your ship.

In light to medium conditions we need to power up our sail by giving it a fuller shape.

In heavy weather we need to go back to having a very flat sail, this has the effect

of de-powering the sail. It may be that you will have to reef it and if you are still having trouble holding your boat upright then it might be more prudent to retire and go home!

**Very Light Weather Sailing:** Slacken off the top batten but making sure that it will not jump out of the plastic pocket that it fits into. Next take up some of the slack up the Luff by either pulling harder on the main halyard or by applying more pressure to the Down Haul. Next take out some of the curve in the foot of the sail, don't make it drum tight, about 35mm curving of sail out from the centre of the boom. To keep track of this adjustment it is a good idea to have graduated strips of numbers on the outer end of your boom so that you can take notes of the settings for various wind condition.

**Light Weather Sailing:** Apply tension to the Main Halyard or to the Down Haul or to both. Pull the sail out along the boom making sure that you have not made it drum tight. Also before putting up your sail try and slacken off your top batten. If you make your sail too flat your boat will be sluggish and slow (stalling)

**Heavy Weather Sailing:**

The same thing applies as Light Weather sailing but if conditions are too rough take a reef in your sail remembering that the sail has to be loose footed and not fastened to the boom so make sure that the ties (if you have them) only gather up the foot of the sail.

**Medium Weather Sailing:**

That range between 8-15 knots. Power up your sail by easing up on your down haul and or halyard. Slacken off the out haul on the end of the boom giving about 150mm curving of sail at the centre of the boom. Before hauling up the main sail apply more tension to the top batten to give more shape to the top of your sail. All these adjustments apply to on the wind sailing. As you gain more experience you will find you are able to judge those in between adjustments for a greater wind speed range.

**For down wind sailing:**

You add more shape to the sail by making it fuller. This has to be done while sailing but any speed advantage is only slight so don't bother too much. Slacken off on the down haul and then the out haul on the boom.

**In rough conditions:**

This can be a difficult task to accomplish. Although there is one thing that you will have to take into consideration, that is the ability of the skipper to handle the

prevailing conditions and also the weight of the skipper. The skipper's weight must also be kept well aft to prevent the bow nose diving. One important thing to remember is when making sail adjustments always aim to have a nice even flow over the whole sail. A good idea is to stand in different positions before taking to the water. Walk around your ship and apply tension to the main sheet, you will then be able to see that nice even flow that you are looking for.

### **Taking a look at boat design:**

As you have probably now realized from the Americas Cup this is a very complex task but if we keep to the little Firebug some light may show at the end of the tunnel. The first line drawn by a designer is the water line and from here he will draw a profile of what is required by the builder. Now a 4 meter boat will or should be faster than a 3 meter boat as boat speed is usually governed by boat length.

But in the case of the little Firebug, if you look at the plans and also look at the boat sitting in the water you will see that some 200mm is sitting out of the water, so instead of having a 2.4m boat you really have only about 2.2m of the boat sitting in the water. We will come back to this later. The design has a rather large rocker (curve) in the keel. This makes for very quick tacking and also gives a very good loading capacity. The boat also has a wide beam with both the waterline beam and deck beam very symmetrical in shape. This is proven by the fact that the front bulkhead and aft bulkhead are the same shape. So to get the full water line length, you need to allow the boat to heel slightly, this not only gives us the full 2.4 meters but also retains the extra curve in the hull shape, thus giving that extra length. When sailing the boat upright you have a very large area of flat surface on the bottom which creates a lot of drag. But when the boat is heeled, the buoyancy is altered allowing the boat to sit deeper in the water thus giving that extra water line length and less drag. An added advantage to this is the fact that you have removed some of the blunt bow from the face of the waves, which can have a stopping effect. It also reduces much of the water entering the cockpit, which as we know can get very hectic at times of rough water, even with splash boards fitted.

### **The Centreboard and its use.**

Some yachties put it down and forget about it, but think of all that extra drag when it's not required. I have found that on the wind in very light conditions I only put my centreboard down far enough to prevent my boat side-slipping. It's not difficult to judge, as you will feel the boat check and grip the water as the board is lowered.

In a fresh breeze on the wind to get the best from your board you need to have it fully down. but in very strong winds lift it up enough to allow your boat to side-slip. If the wind is gusty you may only need to lift it as the gusts hit you, this will

help to stop your boat heeling over and rounding up. Reaching across the wind: once again the board plays a critical part in giving your boat those little extras that help your speed - adjust until it feels right.

### **Lee Bowing the Current**

A great way too get more speed and at the same time gain weather ground, is to lee bow the current. This situation can be achieved using the action of the waves. Lets take an Orange Pip and squeeze it between thumb and finger and we find that the pip shoots out. We can create this situation on the wind or when reaching by having the wind hit our sail (thumb) and the pressure of the current hitting the centreboard, (our finger) Of course this happens most times while sailing, but if we can increase the face area of the center board to the current, we are going to get that extra lift and speed. You will find that if you allow our boat to heel slightly, it will point higher thus allowing the current to flow against that greater area of board. You can feel when you have got it right, because your boat should be sailing higher and faster. It is possible to sail out from under the fleet and be in front. When you try this, you may find you can only do it in short bursts, because the wind always swings from different angles and is never steady from one direction.

### **Caught in Irons**

I guess we all find our selves being 'caught in irons'. You know this has happened when you try to tack and you stop head to wind, your sails start flapping and then you start to go backwards. What do you do? Now if you keep pushing your tiller away from you your ship will make what is known as a stern board and slowly turn back onto the same tack. But if you want to complete the original maneuver and 90% of the time we do, you will need to pull the tiller towards you to complete the tack. A good way to remember this is to point the rudder blade the way you want the stem to go so that you point the boats bow onto the new tack. But be wary when doing this maneuver because your boat will be stopped dead, or even moving backwards in the water, this will put you in the position of stopping a greater force of wind on your sail and lead to a capsize.

### **Sailing Down Wind:**

We need to have another look at the sail to understand why we do what we do. If we spread our mainsail out on the ground and run three straight lines from the top to half way along the foot, and an other from halfway up the mast hoist (Luff) out to the end of the boom (Clew). Then the third from halfway up the back edge (Leach) down to the front corner where boom and mast meet (tack) we will find the centre of effort of the sail. This is the area where all the lines intersect. The C of E comes into play in conjunction with the centre of lateral resistance (C of L) this is where the center case and centerboard are positioned. If

both the C of E and the C of L are placed in the right position you should have a perfectly balanced boat.

Now getting back to down wind sailing: When sailing down wind you need to lean your boat over to Windward. In doing this you get full boat length and less drag. BUT most of all, we bring the centre of effort of the sail over the centre line of our boat, thus reduces rudder drag, Now if you have got it right, pressure on the tiller will become neutral, which at the time does feel quite strange and unsafe, but work on it. Try it out in light conditions, and as you get the hang of it, you will find that you can do it in a stronger breeze. If your boat gets the death rolls as is some times the case, you have not applied enough boom vang tension . This should be done just before you round the top mark. Trying to apply it while running down wind in a fresh breeze is almost impossible. If it still gets the rolls and it some time does, then put your helm down a bit and bring your boat slightly on to a reach, at the same time pulling your mainsail in a bit, then when things settle down go back onto that dead run. Some times you may only have to pull your mainsheet in slightly to correct that rolling motion There is some thought that leaning the boat to weather on a run lifts your sail higher to the wind. In a minor way this is probably right but it's shifting that C of E that counts. Another point to consider is the fact that when leaning your boat over you are again creating that extra length in the Hull. If the wind is light it will pay dividends if you also shift your weight forward in the cockpit so as to keep your stern clear of the water, as it is better to push water than drag it.

### **The Boom Vang (Kicker):**

When to apply it and when not to apply it. The main aim of Boom Vang is to stop our sail from twisting off along the Leach edge when running down wind. If we didn't have one fitted when running down wind, our boom would lift up allowing the leach edge of our sail to go forward of the mast about two thirds of the way up, this would create a situation where the sail would roll from side to side around the front of the mast and in turn start your boat rolling from side to side as previously stated . (To correct this we need to pull our sail in a bit and go onto a slight reach. When the boat has stopped rolling we can then go back to our original course.) By applying tension, our Boom won't be able to lift up and allow our sail to twist off. Of course when a jibe is required at the bottom mark you need to take some of the tension off the kicker (Boom Vang) and this will slacken off the Leach and make it easier to pull the sail across. It will also allow the boom to lift and not drag in the water immediately after the Jibe. This dragging can easily cause a capsize and of course when the Boom hits the water you can't let the sail out any further, thus making a capsize more likely. So try and keep your boat flat when coming out of a Jibe. Applying the Boom Vang on hard on the wind will help flatten out a sail by bending the Mast in the middle, but as the Firebug is a loose a footed sail. It will

not have the same effect as a sail fixed to the boom. Remember also the possibility of hooking your leach when applying tension.

### **Surfing the waves:**

Do this to make use of the waves when on a reach. As the wave approaches our stem quarter, be ready to steer up and go slightly across its face at the same time pulling your main sail in slightly. Then as you pick up speed let the sail out and give it one pump at the same time steering your boat down the face of the wave. If you pick up enough speed and there is enough wind you might be able to go over the wave in front and down that face as well. When doing this maneuver you will find that all the pressure will come off our mainsheet because you are getting nearer to the speed of the wind. Repeat as opportunities arise.

### **Always check your position when tacking:**

You should always check your position with the rest of the fleet before making that tack. It may mean that you have to tack again to clear a right-of-way boat if you didn't have that quick look around. Remember also that every time you tack you are losing about one and a half boat lengths.

### **Roll Tacking:**

Master this and you are on your way to winning those races. When tacking don't change sides until the boom has crossed right over. This will give your ship a lean to leeward. On reaching this point you then move quickly across to the other side and as you bring your ship upright, the extra leverage will create more wind on the sail giving you a bit more speed coming out of the Tack. Scary? a bit!

The best idea is to try it in light conditions until you have got the hang of it.

### **That Hooked Leach:**

We don't want Hooked Leaches because it creates weather helm. In fact if it is blowing hard you won't be able to hold your ship on course, she will want to round up, head to wind and stop. As soon as you start fighting this by pulling the tiller towards you, you effectively are applying the break. What is a Hooked Leach? If we take an imaginary straight line from the top of the mast to the outer end of the boom. (Do this by standing at the stern) Then pull in the main sheet hard, then on looking up we see the leach of our sail crossing over this imaginary line, then yes we have a hooked leach. This is mainly brought about by the boom vang being applied to hard, now that's OK for off the wind sailing, but not for beating to weather. Our leach must be open, that is not crossing over that imaginary line from the masthead to the end of the boom. The same effect will occur if you sheet your main in to hard when going to weather, so keep it free.

**Mast Rake and Position:**

Some sail with the mast in the front hole. Some sail with the mast in the centre hole. Some apply 200 mm of Rake aft while others only have 50 mm. The plans say 100 mm rake My thoughts are that what ever you set your mast rake at, once done, leave it at that for some time and see how you go. You could play around with the mast position and rake finishing up chasing your tail. Wait until you have got other things right before experimenting with this side of sailing. When rigging your ship, don't play around with it too much, try and be consistent and set it up to suit your style of sailing and weight. I would suggest aiming to setting up for three conditions - Very Light, say five knots, Fresh, 12-15 knots and strong winds say 15 plus knots. As you gain experience you will be able to decide on those in between settings.

**Care of your Firebug:**

After sailing wash your ship down with fresh water and dry off. Next remove the inspection ports to allow fresh air to circulate, that is important. Give your ropes a wash at the same time, along with your centerboard and rudder. If your sail has got wet then give it a wash down with the hose only (no soap) and spread out to dry on the lawn. If you hang it up to dry you may stretch the leach which will then flutter for the rest of the sails life. Next wash down your trolley, especially around the wheels and axle. It will also lengthen the life of the axle and bearings if you keep them greased. Do this maintenance and your ship will give you many years of fun.

**The FireBug Philosophy:**

The Firebug was designed by the late John Spencer as a FUN BOAT. Many would say that John Spencer was one of the best yacht designers New Zealand has produced. I think that the little Firebug proves this. It was never meant to be a high tech ship. This means that you don't have to keep adding and adjusting any expensive technical gear in the hope that you will go faster. What this does is leave you to concentrate more on developing your helming skills, which will stand you in good stead when moving up to a more high tech class.

The Little Firebug has brought fun back into sailing - something that has been lacking in the small dinghy classes for many years. So try the basic rules I have covered above but remember that time on the water is the best way to get to be a good sailor and keep on having fun!

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