



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

IMPORTANT WARNINGS!!!

- **The Bladerider X8 and VRX is not a Laser or another plastic boat! It is a high-tech racing boat and should be treated with a very delicate nature. The Bladerider FX and RX however are more robust, and will withstand more harsh treatment.**
- **You may want to wrap padding material like foam or large rubber hose around the side stay adjusters on the forward wing beam. This is to protect the skipper in case of crash landing on the water.**
- **Do not use battened hiking pants, as the point loading on the carbon wing frame can cause it to crack.**
- **Wear a long leg wetsuit and booties to avoid scratches, bruises and cuts from sharp objects such as the side stay adjusters and the foils.**
- **Do wear a lifejacket at all times.**
- **Do not bounce around on the hull or wing frame.**
- **Do not attempt to sail the boat for the first few times in winds greater than 12 knots or less than 7 knots.**
- **Do not attempt to sail the boat for the first few times if the wave height is greater than 0.5m (1').**
- **If you are sailing by yourself, always let someone know that you where and how long you will be sailing.**
- **Sail at slow speeds in displacement mode when unsure of any hazards under the surface.**
- **Avoid any direct pressure on the side of the hull, such as standing or using your arm or elbow for leverage on the side of the hull during a capsize recovery, as this may crush the foam underneath the carbon fibre or worse still, crack the thin layer of carbon fibre on the out skin.**
- **If the boat crashes up and down more than a couple of times when sailing for the first time, disconnect the push rod from the centerboard and sail in safely and slowly to fix the problem using the Trouble Shooting Guide.**



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

3.1 Definitions

3.1.1 Wand

The tapered fiberglass rod hanging off the bow of the boat, that is connected to levers and pushrods along the deck and down to the centerboard to flap on the back edge of the main foil. The wand is held down to the water's surface to 'feel' the how high the boat is above the water and to adjust the main foil flap in order to maintain the altitude of the boat at a constant ride height of around 30-60cms.

3.1.2 May Stick

The forward extension of the wand that 3-4mm elastic is attached to and kept tight in order to pull the wand onto the water's surface.

3.1.3 Ventilate

When a lifting foil breaks the surface to get air on top of the foil surface or the water is separated over a vertical or horizontal foil, the foil is said to "Ventilate".

3.1.4 Cavitation

When the angle of attack is too great on a lifting foil, the foil stalls or cavitates.

3.1.5 Launch

"Launching" is the result of either the boat hitting the back or front slope of a steep wave, and the wand is pushed back to induce sudden lift on the main foil, causing the bow to rise up quickly into the air.

3.1.6 Bunny Hop

After the boat has launched, the usual result is that the main foil will ventilate, but as the rudder foil is still lifting underwater, the bow is pushed down under the water quite hard, as the boat is now pivoting in the air around the centerboard. As a result of this "Bunny Hop", the hull may completely submerge underwater, but if the boat is kept flat, the volume of the hull, will allow it come back to the surface.

3.1.7 Porpoising

When the boat is rides up too high and then comes back down to the water slowly and then takes some time to come back up again, this is called porpoising. See the troubleshooting manual for more information.

3.2 Essential Prior Experience

It is not necessary to have mastered a Moth sailing before sailing a Bladerider. Experience in sailing other high performance dinghies is adequate. However, as we have seen before from big boat sailors, even that is not essential.

Basically, you need to be a good sailor, have a good understanding of apparent wind, good balance, good fitness, reasonable strength. Leg strength and abdominal muscle strength is a benefit for



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

hiking the boat to windward. The mainsheet needs constant trimming, so good shoulder strength is also important. The basic upwind technique is to pull the boat over the top of you and hike comfortably with slightly bent legs. Hiking with straight legs is ideal, as this allows you to get more leverage out over the water. But it is not necessary to be super strong or super fit like other high performance dinghies.

The tiller extension grip is quite important. Unlike the 470, Laser or any trapezing boat, the tiller should be held across the body, so that your thumb is towards your chest. This allows a slower tiller movement at high speed and allows for the skipper to easily rotate the tiller extension around to trim the rudder foil.

3.3 Sailing Environment for Beginners

A relatively steady wind of about 10 knots and no waves is the ideal. Wind which is gusty and shifty makes it more difficult for a beginner.

Avoid significant waves. Waves up to maybe 30 cms may be OK because you can clear that chop when foiling. Bigger waves are difficult for beginners because they will not have developed quick enough control technique to steer around the troughs as they learn to handle the boat.

To sail the boat, you need 1.5m depth of water as a minimum, ideally with no sand bars, reefs and no weed obstructing you. You can get around weed but it is better not to have it. Fish and other marine life also debris in the water can cause problem. If you hit a large jelly fish at high speed it may catapult you off the boat or worse still some foil damage, so that is something to avoid if possible. If you do hit a submerged object in the water, as the boat is so light, it will just flip over itself. But it is critical that you let go of the boat and tiller extension if this should happen to relieve the boat of the momentum from your body weight which may damage it if you hang on. If you are off the boat, the only impact is the boat onto the water and its mass is so small that that it is unlikely that you will cause and damage.

3.4 Moving to the Water

It is extremely difficult to launch a foil Moth in onshore winds if there are breaking waves or surf. If the waves exceed 300mm there is a danger of capsizing and a broken mast or foils snapping. We do not recommend this for anyone regardless of their experience. Therefore launching in offshore winds is by far the easiest, however there are two options:

- 3.4.1 If a ramp is short, steep, difficult we recommend tip the boat over on land, take the trolley off, fit and secure the foils to the hull so it is ready to sail. Then either one person or two can pick up the hull, carry it to and drop it in the water and go. If a third person carries the masthead so it does not drag, that helps.

This is appropriate for Lake Garda where the water becomes deep very quickly and there are queues waiting (as per photo below).



Bladerider – Sailing Help Notes

Last Update - July 22, 2009



- 3.4.2 The other option is appropriate for a more shelving bottom. We secure the foils on the trampolines (under the toe straps); and two people lift the boat out of the trolley and carry the boat upright by the wing frame into shallow water. The sailor then pushes the boat out to chest depth; about 1.3 to 1.5m, tips the boat over, fits the foils from the underside and pins them from the top.

You cannot see the deck when inserting the centerboard from the bottom so we use marks on the centerboard which indicate the depth to which it should be inserted to accept the pin so we can pin it 'blind'. The sailor then connects the wand mechanism to the centerboard and secures the rudder foil in place.

When ready, the skipper can right the boat by pulling down on the windward wing frame or standing on the centerboard (close to the hull).

As the Bladerider has a dagger blade arrangement; you can lift the rudder and centerboard higher for shallow water; when you get to deeper water you can push it down and secure it with the retainer pins.



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

3.5 Moving Offshore

Once you have your foils secured into the hull, there are two ways to right the boat from the on-its-side position.

- 3.5.1 Step 1: In light winds, you will need to stand up on the centerboard close to hull and right it like a normal boat. (*Note: You can stand 'very lightly' on the chine of the hull if necessary, but do not put any pressure on the side of the hull above the chine, otherwise you may crush the foam under the carbon skin or crack the carbon.*) As the boat comes up to 35 degrees, throw one leg over the wing bar.



Step 2: Then get both of your feet into the middle of the boat as soon as possible by sliding down the wing covers. Do this slow and steady to get your balance.





Bladerider – Sailing Help Notes

Last Update - July 22, 2009

3.5.2 Step 3: Pick up the mainsheet and tiller and quickly bear away to get speed and balance.



3.5.3 The other method is to stand on the centerboard again and pull the windward wing bar down into the water with you. Reach into the boat and grasp the mainsheet and the tiller extension with your lower body still in the water and legs pointing away from the boat.

Immediately bear away to sail off on a reach, whilst swinging your body into the middle of the boat to get balance and the wing frame out of the water.

If there is more than 10 knots of wind, the second method is the easier and faster way to get in and go.

3.6 Approaching the Shore

Judging depth is always difficult, so the technique is to drop speed to around 1-2 knots when unsure. Sandy beaches are the best. Concrete or rocks is the worst as they can damage the foils if you hit the bottom.

When approaching the shallow water, remove the ball and socket joint from the bell crank and both retainer pins from the foils. Be sure to go as slow as possible when doing so, otherwise your foils will shoot up into the boat. You can then lift the foils up into the boat, just enough though so that you still have steering and balance.

When in shallow water, put either leeward or windward wing bar in the water and inch in very slowly until you think the water is shallow enough for you to stand up but the foils have not yet touched the bottom. Immediately tip it onto its side to remove the main foil from the bottom of the hull. The foil should float, so if necessary you can leave it in the water (except in an offshore wind). Do not remove the rudder, but instead, lift it to its highest in its box and leave it there until the boat is ashore and in its trolley. However ensure that it has elastic around the blade to hold it in place and does not slip down.



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

3.7 Returning Ashore

The normal technique is to right the boat by pulling down on the wing frame, put the foils into the trampolines and secure them temporarily in the wing cover lacing and underneath the toe straps. Don't forget to lift the wand up as soon as possible and tuck it up above the lower wing frame tube. and two people carry the boat ashore.

If there are two people to carry the boat to the trolley, that is easiest. If not the boat can be left on its side in 100 to 200mm of water, you get your own trolley, fit the trolley to the boat while it is on its side in the water, then right it by pulling down on the wing frame and wheel it ashore by yourself.

3.8 Height Control

Height control is a new responsibility in dinghy sailing. It is shared between sailor and wand. The wand is attached to the bow and senses the height of the bow above the water. The mechanism between the wand and the flap on the main lifting foil gives fine control of the boat's height. When the boat is too low the wand will be pressed up and the mechanism will put the flap down and this will bring the boat up.

When the boat is too high the wand comes forward and raises the flap and the boat comes down. This gives very effective fine control of height. But the wand and its mechanism must not be too sensitive else the boat would leap up and down as it tried to follow the crest and trough of every wave. The art of the recent equipment development has been to create a sensing mechanism which will give smooth accurate control at the desired average altitude without responding to the crest and trough of every wave.

A second foil attached to the bottom of the rudder blade can also be adjusted by twisting the tiller extension. The function of this movement is to provide a manual attitude and pitch control.

The practical result is that this type of wand mechanism works very well indeed PROVIDED the sailor sets the attitude of the foil - i.e. his hull - at the approximate angle of attack required for the present and expected speed. At low speed the wand alone will not lift the boat to fly easily unless and until the sailor lifts the bow to give the required greater angle of attack to the main foil. The sailor controls the altitude initially by moving his body weight fore and aft; and uses the rudder foil for fine adjustment.

Once the boat starts flying it will accelerate quickly. The wand alone cannot stop it climbing too high and launching unless the sailor lowers the bow to about the smaller angle needed at the expected higher speed. Again, the skipper does this primarily by moving body weight forward, and will use the rudder foil adjustment for finer control of altitude.

The end result is that sailing the Bladerider calls for the synchronised coordination of steering, sail trimming, and balance needed to sail a fast skiff, plus proactive control of altitude primarily by movement of body weight and supplemented by rudder foil adjustments to enable the wand to do its job of fine control of the flying height.

Depending on your abilities and the wind conditions, you might want more lift using the flap on the main foil. You can do this on water by simply winding out the ball joint socket head adjuster at the push exit point in the cockpit.



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

Generally if you feel as though the boat is not lifting up easily or your are fighting the boat upwind to keep it airborne, wind the socket head out at least two full turns until you achieve the desired setting.



Whilst on the water, you can unclip and wind the ball joint socket head out two full turns until the desired and neutral lift is achieved. Tie your foil retainer pin to the threaded rod adjuster and use this as a guide to see how far you have wound it out.

3.9 Sailing and Flying

There are two modes to sail the Bladerider:

3.9.1 Displacement Sailing

In the displacement mode the Bladerider is simply another sailboat, and will sail upwind, crosswind and downwind in the normal manner.

3.9.2 Flying

To start foiling it is necessary to reach at 8 to 9 knots of boat speed and the boat will simply just lift out of the water. It is hard to start foiling if you are sailing either upwind or downwind. The most efficient technique is to reach to start foiling, accelerate crosswind to build apparent wind, then turn upwind or downwind with speed.

When beginning the main thing is to get into a reaching position, with body weight positioned in the middle of the wing frame. Newer model boats do not require much or any effort from the rudder foil control to lift the boat out of the water. The main foil plus the wand configuration should be enough to lift the boat out on a reach.

Take off speed is about 9 knots boat speed. That will generate enough apparent wind, even in as little as 6 knots of true wind to get the boat clear of the water and the skipper hiking. The boat must



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

be sailed flat or heeled to windward. If it is heeled to leeward the foils will push the boat over and the boat will tip over by itself regardless of the skipper's efforts to balance it.

Once it is clear of the water the boat will go completely silent; no noise at all, and will accelerate immediately to a minimum of 11 knots depending on the wind. This is new art which differs from normal sailing in two key respects:

The first is that to control these boats you need to think control in four dimensions - pitch, altitude, heading and heel. The pitch of the boat controls the angle of attack on the foils, and hence the drag induced on the foils. However it also has an effect on the lee or weather helm on the boat, as the centre of effort can be easily moved fore and aft around the center of lateral resistance on the foils.

The second is that the dynamics of these boats - their light weight and high speed - require that height control be proactive rather than reactive. You have to be in charge and the boat has to do what you want it to do. It is important to be proactive and not reactive. If you try to sail by reacting to the boat, you will be too late - it has already happened. The human response is not quick enough. Unless it is firmly controlled the boat will just do what it wants to do.

For example, if the boat is clear of the water and the bow is up it will keep lifting. If you do not correct and put the bow down before it is too late it will just launch and turn either way. You have already lost control. The appropriate control is for the skipper to move his weight forward and/or to pitch the bow down to flatten the boat before it lifts too high. You have to anticipate and act first. There is not enough time if you are traveling at 15 to 18 knots for any corrections to be made once the boat is sailing too high.

This was demonstrated during a test sailing day in strong, unsteady wind and small waves, some very good sailors were sailing the Bladerider for the first time. As a group, they initially sat too far aft. The wand was doing all it could but the boat's attitude was too nose-high and it just climbed out and launched and they lost control. When they were encouraged to move forward as the boat started to fly, the bow came down, the wand could then look after the altitude, and they were then in control and able to begin to get the feel of this new craft.

Another important point to note is that because of the stronger apparent wind that the Bladerider has once airborne, the sail needs to be flattened as soon as possible with the use of downhaul and vang. By using moderate to strong tension on the vang and downhaul at all times when foiling, you will find the boat a lot easier to control and the boat will sail faster.

3.10 Landing

If the beginner wants to progress their skills with a series of short flights, then the technique to bring the boat back down to the water is to stall the sail. This reduces drive force, adds drag, slows the boat without upsetting the balance and the boat will settle back to the water under control. Whether you are reaching or sailing upwind or down if you sheet in really hard this will stall the main and push the boat down.

If you move forward or pitch the bow down with the rudder flap this will initially reduce drag and accelerate the boat. If you do it to extreme, it will bring the boat down but much more slowly. Another way if you must stop quickly is to heel aggressively and put the wing frame in the water. This will kill the speed very fast, but it may drag the boat around in a direction you do not want it to.

Therefore, the efficient, fast and controlled way to land is to stall the sail to reduce drive force and increase drag and this will stop it flying.



3.11 Flying Faster

To make the boat sail faster use the tiller extension twist to control the rudder foil to pitch the bow down. This will reduce the angle of attack of the main foil to reduce the drag, and hence speed will increase. Alternatively the helmsman can move his body weight forward; as this will have the same effect. Flattening the sail by more downhaul and/or vang will also reduce drag and increase speed. As the apparent wind increases and goes forward, it will be necessary to sheet in more closely.

The hard-leech fully battened sail acts like a solid wing and always has power. It is important to keep a windward heel 5-10 degrees for maximum speed and lift from the rig and foils. If it is allowed to heel to leeward at all, the foils will push the boat over to leeward, and will result in the leeward wing bar hitting the water, making for a fast capsized.

Because the Bladerider sails so fast with respect to the true wind speed, particularly in lighter winds, the apparent wind is from well ahead of the beam on all points of sailing. As a result there is surprisingly little difference in sail settings between sailing close hauled, reaching and tacking downwind.

3.12 Flying Upwind in Different Conditions

3.12.1 Light Wind and Flat Water

Light airs are difficult in that you need 5 to 6 knots to get it up on foils. Displacement sailing is unstable - not as unstable as the skiff version but less stable than when foiling. You need good balance to move around the boat to keep it upright, and then a lot of skill to get it up in light airs. Generally this will involve a few quick pumps on the mainsheet, body weight toward the back, mast upright and lifting the bow with the rudder foil. But if you have around 7 knots of wind you should be able to foil straight away. In lighter winds you just give it a go and see how it feels. Reach to start flying and accelerate; only then turn upwind and heel to windward.

3.12.2 Moderate Wind and Flat Water

To sail upwind needs slightly more windward heel and hard sheeting of the sail.

3.12.3 Strong Wind and Flat Water.

Depending on the skippers body weight, in +15 knots set a really flat sail, tight leech and exercise firm control. Strong winds are for experienced sailors, not beginners.

3.12.4 Light Wind and Waves

This requires a tremendous amount of skill, but it may help to try and bounce the boat off the top of a wave to help with initial flight and acceleration. Once foiling, keep the rig fairly upright in order to stop the wing bars from hitting the water and slowing the boat down.

3.12.5 Moderate Wind and Waves

The rig should be fairly upright once again but with a slight heel to windward if possible, so the wings and skipper can clear the water when hiking.

3.12.6 Strong Wind and Waves

These conditions do not present a problem as most beginners fear. The boat should



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

almost float in between the troughs of waves and then just skim the top of the wave's crest. By contouring more along the waves the hull stays clear of the water and the boat can move freely and fast. It really is a lot easier than expected.

3.13 Flying Downwind in Different Conditions

3.13.1 Light Wind and Flat Water

The idea here is to look for pressure and sail as low as possible. Speed is good but if you are heading in the wrong direction your VMG may be very low. Sail settings are very important here. You need only moderate tension on the vang, outhaul and downhaul. The fuller the sail, the better!

3.13.2 Moderate Wind and Flat Water

As in lighter winds, but as the apparent wind increases, flatten the sail to reduce drag.

3.13.3 Strong Wind and Flat Water

As above, but it is possible to sail extremely low, so when jibing you need to sail up high after the gybe to get the apparent wind around quickly. A lightweight skipper may not need to let any control lines off downwind as they may be fully powered up already.

3.13.4 Lighter Wind and Waves

This is certainly rare but difficult conditions. The decision must be made by the skipper to sit on the wing bar and sail higher and faster across the waves, otherwise sit in the boat to sail in displacement mode to go low and slow. A VMG GPS will help determine the best angle to sail on.

3.13.5 Moderate Wind and Waves

Depending on the direction of the waves, it is sometimes easier to sit comfortably on the wing covers to sail low but still foiling at around 10-12 knots of boat speed. This may require the skipper to use aggressive fore and aft body movements to stop the bow from pitching too high or digging into the back of a wave. Aggressive rudder angle and trim may also be required to assist the boat in not launching off the back of a steep wave. The alternative to sailing low and slow is to sit on the wing bar and go for speed across the waves. It is important to look for highest water as so the foils do not ventilate. If the boat looks like it might launch up into the air off the back of a wave, the skipper can sheet in, heel to leeward and bear away sharply to reduce lift and power. The boat should slowly come back down to the water across the face of the wave.

3.13.6 Strong Wind and Waves

It is very important for beginners to not to try to fly the boat too much. Good technique is to stall the sail and heel the boat to leeward if out of control or overpowered. If there is any sudden acceleration of the boat it will be hard to control and the boat will just launch off a wave and you will lose control. So try to sail the boat a slower than normal downwind to be safe. Sometimes small areas of flat water offer a chance to speed up a bit, but not for too long. You can try and fly across these flat areas, then stall the sail to bring the boat back down on the water before approaching any big waves. Whenever you feel that the boat is trying to come out of the water too high, immediately bring it



Bladerider – Sailing Help Notes

Last Update - July 22, 2009

down straight away. This way you never launch and it is safer to sail downwind this way than to risk having a good spurt of speed and then crashing and losing 30 to 60 seconds in righting the boat

3.14 Tacking

In order to tack a Bladerider, it is important to keep it airborne as long as possible. Basically the skipper should slowly point to windward and move the weight inwards, until the boat hits head to wind. At that stage the boat and the leeward wing will hit the water killing a majority of the speed. The skipper must quickly jump on the new windward bar to pull the rig over on top of them and keep the leeward wing from going under water.

Bear away past close hauled as quick as possible to get power in the sail and speed up. The boat should accelerate up to 8-10 knots on a tight reach fairly quickly, and when doing so, the boat will lift out of the water. At this point the skipper should heal the boat over to windward and point up to close hauled at the same time.

3.15 Gybing

It is a lot easier to gybe than to tack, but it is suggested that when starting out, try to slow the boat down as much as possible or put the boat back into the water. Use the wing bars to roll the boat over and jump out onto the new windward wing bar. Point up and power up the rig to accelerate and get flying again.

Good luck and have fun! ☺