

Hurricane SX (Tuning Guide)



(for the 'Fat Head' main and new class rules 2009)

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Welcome to the New Rules Fat Head HSX!



My hope in writing this tuning guide is that the fleet sails faster and continues to spread the wealth as we learn how to get every extra knot out of the boat! When you pick up a useful tip, post it on the forum. <http://hurricane59.myfreeforum.org/>

Whilst there are a lot of numbers and settings in this guide, please treat them as a 'bench mark' only, they are a good way to 'get you into the right ball park' but the fastest way to sail is developing your own feel for the boat....PRACTISE like Elvstrom said, time on the water is the only way.

The Hurricane remains an incredibly smooth, strong, beautifully balanced and stable performer with bursts of acceleration and far higher top speeds than ever before.

The mast is very much up to the job and so long as you ease the downhaul before the kite goes up and you watch how the mast section is coping as you drive the boat hard. You can play the main sheet without fear of breaking the mast downwind.

When its windy with big waves downwind, make sure your foot strap is on the back corner, put your crew in it and put the hammer down, this is where the fun begins! But don't forget, only move back as the boat needs it to ride up and through the waves, go back too early and the boat will drag its stern!

You will certainly find that you will need to relearn many of your sailing techniques in order to get the most out of this new boat. Forget the settings used for the previous 'pin head' sail this boat needs an entirely new rule book.

I hope you enjoy this guide.

The Hurricane remains, quite easily the best value fast catamaran on the market, nothing comes close!

Mast Setup

(NB: this is for a 'soft' or slightly newer mast sections, generally from sail number 400 upwards, for the stiffer masts you may want to add additional rake for increased thrust.)

Diamond spreader rake

Before the mast goes up, you should set the spreader rake. The amount of fore and aft rake (or angle) in the spreaders defines how easily the centre section of the mast bends as the mast is loaded with diamond, then downhaul and finally mainsheet tensions.

Make sure that you measure the spreader arms independently, to ensure that they are both at the same angle fore and aft, they should also bisect the angle where the spreader end meets the diamond wire.

Alan and I are both 12 stone and run 40mm of rake as measured in the photo. As a basic rule, if you are heavier than us you will want to decrease the spreader rake, if you are lighter than us you will want to increase it.



Diamond wire tension

Probably the most critical piece to get right when you are sailing, without this the boat won't accelerate cleanly and you'll be fighting the main, regardless of how much downhaul you use.

For our crew weight, we found that in Force 7-8 we wind the diamond tension on to 42 on the loos gauge, there will be about 1cm of unused thread at the top of the bottle screw. NB: this translates to 42mm of prebend in the mast measured at the spreader attachment point. (pull the main halyard tight, touching the end of it to the mast foot)

We re-adjust this each time the wind strength drops by 2 beaufort levels approximately, the fine tune is done by feel.

So, Force 7-8 +8 turns, Force 5-6 +6 turns, Force 3-4 +4 turns, Force 1-2 +2 turns. The diamond tension minimum is around 25 on the loos gauge, this is what I refer to as zero turns.

Think of diamond tension as a course tune, then on the water you should use downhaul as medium tune so that when you get it right you will be playing about 1-2ft of mainsheet, fine tune. (With the occasional gusts which are beyond the mean gust requiring more ease than this)

We use a small adjustable spanner tied to the tramp and a small snap shackle through the bottle screw to stop it releasing when its not supposed too!



One rusty spanner, fits the bottle screw perfectly and the snapshackle stops it unwinding accidentally, you can easily adjust this between races.

NB: this is maximum diamond tension, any more is for the brave.

Mast Rake

We found that we had to bring the rake back from our old settings. The Hurricane while relatively long at 5.9m is a relatively fine entry bow and upwind the bow ride height is key.

We found that the 'pink' water line on 'The Presidents' is the bench mark. Upwind, it should be slightly below the surface in light to moderate wind with flat water and should gradually lift as the wind and waves build, allowing the hull to accelerate. The max point being the 'turn of the bow' should sit just above the water in extreme conditions, but no more.

We found that this means the upwind crew position is further back than our previous habits, with Alan typically standing with his back foot on or near to the shroud (which is actually mid-centreboard, perfect!), as the breeze really builds his feet were either side of the shroud plate.

We found that 28cm of mast rake meant that the boat will accelerate nicely without any tendency to drop the bow in too far hence slowing the boat down. Obviously if you have differing weights to us, you will need to adjust our numbers slightly to suit your needs. Rake further if lighter, or go more upright if heavier.

To measure the rake, take a trapeze line and add a short piece of rope to it. Take a mark at the stern.



Then without moving your grip, take it to the front and measure the distance from the aft edge of the bridle take off plate to where your grip just touches the inner front edge of the deck.

For us its 28cm.

Rig Tension

An easy one. We set the rig in most conditions to 30 on the loos gauge. With the clevis pins on the shrouds its not easy to alter the tension in a fine tune way.



Spinnaker Gear Setup

Spinnaker Pole setup

(Before setting up the spinnaker pole, stand the mast up and apply rig tension) The spinnaker chute has to be one of the easiest to hoist from I have ever seen. The tactic compass sits perfectly behind the forestay and out of the way of the jib. (Bracket available from Andy Webb awsailboats.co.uk) Note how the spinnaker pole is tied close to the bottom of the forestay. (a small strong shackle is supplied as standard)



The main thing here is to ensure that you have a nicely pre-bent pole. The pole is absolutely up to the job, but if the bow bridles are too loose, you will have a folding pole very quickly! As we discovered at Grafham in 2008!

The test is to stand so your view is just like the photo. Then ask your crew to lift the boat (from the spinnaker pole end) so that the bows just lift away from the launching trolley. If the pole is straight at this point, it will break when you sail in strong winds.



Our measurements (assuming that your rake is set like ours) are: 174cm from pole end to bridle tang.



Don't forget we all have one design kites so the hoist height is the same. This simple approach will not work entirely on other spinnaker set ups, ie the sport kite.

However the principles remain the same, the main one being that the distance between the pole end and mast head turning blocks should be approx 8cm shorter than the luff length of the spinnaker. (measuring between the bearing surfaces of the blocks and bearing surfaces of the spinnaker eyes respectively.)

The hoisting rule here is, when its windy or you are on a close reach, halyard goes all the way up. In light conditions ease it 6inches, this helps to bring the spinnaker round in front of the boat a little better and makes its easier to trim.

Tip: mark the halyard at the spinlock jammer so that your crew has an easy confirmation that the spinnaker is all the way up!

Spinnaker Sheet turning blocks

I'll cover the set up in three steps. Ratchet block positioning, sheet block positioning and re-siting the sheet block cleat which controls the sheet block position.

Spinnaker sheet Ratchet block positioning



The ratchet block has a small self tapping screw into the beam to its port side. This prevents the block sliding over to the trampoline and getting caught up. It also leaves the rotation cleat fixed to the deck, clear to operate cleanly.

Sheet block positioning



We adjust the block position towards the stern as the wind and waves increase. This block is shackled to the slider which is used to take the jib sheet block in 2 sail mode.

The maximum point aft is 62cm. (This is measured from the aft end of the slider, where the blue rope is attached)

The maximum point forwards is 32cm this is good for very light wind drifting.

Note the elastic between the blocks which ensures the sheet doesn't twist and jam.

Re-siting the sheet block cleat



Since we no longer use the 2sail jib, the cleat no longer needs to be where the helm sits! No more torn wetsuits or painful back from sitting on it.

This also allows for easy adjustment by the helm, as the conditions change.

Order up some long pop rivets from Andy Webb and move it to the position shown. This is adjacent to the shroud plate.

NB: the tape measure (out of picture) is touching the aft end of the front beam.

Spinnaker halyard take away



During our testing on the Hurricane and on the Tornado we found that the halyard would twist causing the take away block to twist. This also means a jammed halyard and a spinnaker that will not come down!

After trying several ideas, we came up with this solution. No more jams, ever!

Just two cheek blocks fixed to the trampoline with nuts bolts and washers! Very simple.

Gybing pointers

In moderate to stronger breeze this 4 step process works well. The helm should always steer smoothly and confidently, placing the boat on a clean arc into and out of the gybe. When the conditions become challenging, the helm should straighten the rudders as the main boom gybes, thus ensuring that you don't exit the gybe 'too hot' and capsize. However the more your co-ordination improves, the more aggressive you will be at looking for that 'hook up' point where the boat powers up and takes off out of the gybe.

Crew 4 step process

1. In off the trapeze and ease the sheet as the helm bears away. But not more than a meter or so, as the spinnaker gybes, 1 metre of spinnaker should lay onto the windward side of the jib, then stop easing any more. Thus helping the bow bear away and initiate the gybe.
2. As the main gybes and the spinnaker begins to gybe, ease another meter of sheet as you pick up the new sheet. Then snap the sheet back sharply and force the spinnaker to re-fill as early as you can.
3. Ease it again immediately, keeping the spinnaker full, since the helmsman is probably now, bearing away on the new gybe, and will be looking for power and acceleration. This is the hook up and the crew should be looking for the trapeze fast. (if the breeze is fresh).
4. The helm will now be looking to find a stable and fast course at which point you will sheet back on.

So for the crew a four step process. Ease, Snap, Ease, Trim for speed.

Windy 'bear away' pointers

In 22knots or more and waves you have to be aware of the pressure on the bow as you bear away at the top mark. This is frequently a challenging part of the course.

This is a sure fire way of surviving this dial down and once you master it, you can modify it and push harder!

1. As you approach the windward mark, the helm eases 6inches of main traveler and comes in from the trapeze taking the main sheet with him. And takes up a position in the back corner of the boat on the tramp. (allowing a path for the crew once the dial down is complete)
2. Crew moves into the back footstrap with his front foot on the rear beam, he can also for extra security, place his back hand into the footstrap. This is a rock solid position.
3. The helm keeps the boat moving as fast as he can with the mainsheet uncleated in his hand. Then he initiates the bear away and allows the sheet to run as necessary. (Pick your wave and look for gusts!)
4. The boat dials down through the 'high pressure on the bow point', once the bow begins to rise again, get the crew in and the kite up!

Simples!

Foot straps

New Centre foot strap

Check out the previous picture. There are certain conditions where the helm needs to sit in and you then find that you have little to brace yourself with. You are allowed a maximum of four foot straps in addition to the full length toe straps

This centre footstrap solves the problem!

Rear foot strap positioning



It takes a lot of wind and wave to need the rear footstrap in the Hurricane, above 22knots with waves (which is much later than the Tornado!).

But when these are the conditions, this is where the footstrap needs to be.

There are three foot positions once you need it. (as the wind and wave build).

1. Back foot in strap, front foot on the back of the rear beam.
2. Back foot in strap, front foot halfway between the beam and strap on the deck
3. Back foot on the rudder, front boot in the strap!

NB: The back foot should be on the stern for 2 & 3.

Steer using the connection bar when your crew is in the rear foot strap, not the extension in these conditions as your crew will not like being poked by you! Also, don't ever cleat the main sheet in these conditions, play it!

Jib Setup

The first thing to point out is that I have drilled 3 extra holes in the track. These are the same spacings as the supplied Ronstan section.

Generally I avoid pushing the traveler car in too far. Since having the jib/main slot closed down is very damaging.



In light winds we have 3 holes showing on the inboard edge of the traveler car and work our way to having the pin out completely when the wind hits Force 4 with waves or Force 5 with flat water.

Don't forget to pull the jib halyard on so that you don't have any luff creasing as soon as the wind moves past force 2.

The clew board has 3 holes and the sheet shackle is attached to it almost always in the centre hole. When its Force5 and with waves, it goes to the bottom hole to open the leech a little more.

The top trimming tip here is to fit a leech line tell tale just above the 2nd batten and it should never be allowed to curl.

I have used 4mm Jib sheet, since I found that the 6mm doesn't ease in light airs and the loads are not very high, so 4mm handles nicely. It is lead back via the shroud with an endless takeaway under the tramp.

This means that when its windy downwind the crew doesn't have to go towards the bow to trim the sheet. (Would you like to do it when its windy and there are big waves ready to grab the bow?)

So Alan will over ease the jib sheet at the top mark and then get on with trimming the spinnaker. The jib sheet is then right next to where I sit and so I trim it in once the boat is at its target downwind speed, easy!



There is an extra hole in the tramp for the take away. The lead block its tied on with string allowing for good articulation and its in the perfect place for the helm downwind and either helm or crew upwind.

So easy jib adjustment without the need to move from the best sailing position up or down wind, excellent!

Trapeze Height



The other tip hear is, the crews front foot should point along the hull, not to the sky. In waves this gives the wave a lot less surface area to grip and pull you off the side!

Also, the helmsmans front foot should be just on the crews back foot. So if the boat slows down, the helm will naturally move more pressure onto his front foot, hence holding the crews back foot on the boat! Very secure!



One of my biggest lessons of the summer was trapeze height.

We were training for the Tornado Worlds and found that if we trapezed as low as the 7 time World Champion Darren Bundock we could sail past crews 35kg heavier than us at the German Nationals!

It does take a little getting used too. Certainly the crew must have the mainsheet (as all the best do) and upwind the helm has to be careful not to steer too close to the wind. This allows the crew to pull the main in a little harder if a large wave appears trying to knock you off!



This is Alans crew trapeze height. If anything it could be 2cm lower.

In the picture above Alan (crew) is JUST low enough, I, on the other hand am WAY TOO high! Your ankles, hips and shoulders should be in line with the deck!

You will find that you have just a little more time to react when big gusts come in and that the boat will steer more easily.

You will be MUCH quicker and more stable in breeze!

Main Sail

Telltale Setup

The bit you have all been waiting for! The sail has 4 distinct sections as detailed below.



Battens

- Standard Fibre foam from Andy Webb awsailboats.co.uk
- You can use your old mains battens
- No need for new ones as this sail has fewer battens than the previous sail

Tell tale positioning

Copy these positions to get a clear picture of how your sail is functioning.

1. Outhaul telltale
 - a. The two at the bottom of the sail.
 - b. Adjust the outhaul until they fly correctly
2. Prebend telltale
 - a. The two by the numbers. The diamond rake and tension need to be correctly adjusted to make them fly (use bottlescrew tension whilst afloat). They may also stall if the jib slot is too closed up.
3. Sheet tension telltale
 - a. The telltale below the insignia (not shown)
 - b. Adjust your sheet tension to keep them flowing, critical upwind in underpowered conditions, absolutely critical in all conditions downwind.
4. Rotation telltale
 - a. The telltale above the Hurricane symbol closest to the mast.
 - b. Adjust the rotation to get these flying correctly

Main Sheeting Pointers

- Upwind fully powered up all the leech tell tales should fly correctly. And the top two should be backing 25 – 50% of the time.
- Upwind depowered, the top two don't count as much since the minute the downhaul comes on this part of the sail flattens.
- Downwind the two usual mistakes are that the main is cleated (the 'swimmers mistake!') The other is over sheeting, which is easily seen since the leech tell tales will stop flying immediately!

New 16:1 Cascading Downhaul System



This is without doubt a huge change to the Hurricane. It is EASY to pull on, meaning that you can pull it on exactly when you need it. With one hand!

The old system requires a very strong crew, or a cleat on your harness. Resulting in injured hands and without doubt you will miss the gust or be under powered in the lulls because its too difficult to pull back on!

Ours is lead back to the shroud and then to an endless takeaway so that you never run out of string. As you will see below, I hold the downhaul upwind and the crew has the main. This is very effective since when we are under powered I can ease the downhaul immediately and pull it on when I see a particularly big gust coming.

Upwind trimming tip, once you are both trapezing LOW, bring on the downhaul until you are able to keep the hull just out of the water and the last 6 inches of centerboard in the water, anything else is SLOW!

Overpowered Upwind?

The main principle is, as you depower with the downhaul the rotation should come back (aft) a little more each time. This is very much a principle used in A class and F18's by the top sailors. When you have reached all the stoppers its time to drop your traveler down the track.



Rotation Control

Rotation on the new mainsail is very important particularly upwind. There are two principles to remember.

Pointing Mode Upwind

Tight leech means pointing, open leech means good acceleration, but less pointing.

With the rotation arm pointing at the shroud you are making the leech of the main (in the roach or top of the main) stand up more. Hence this is 'maximum pointing' mode. So this is useful just after the start of a race as it will allow you to hold your lane or when you are trying to hold a clear lane as you come out of the leeward mark.

However the best combination of speed and pointing will usually be a little further back than this.

Footing (Fast forward) Mode Upwind

If you are trying to go 'fast forward', or foot over the top of a leeward boat (when you are fully powered up, on the trapeze and down hauled).

For example you may be on the layline coming into the windward mark. If you were to just bear away or foot 3 or 4 degrees you'll find the hull up in the air and your speed way down. The other option is to ease the main, but then you will slow down and not be able to overtake that leeward boat.

The answer is pull on some downhaul, which will open the leech a little more and to open the leech further try pulling on some more rotation (placing the sail in 'acceleration mode').

This summer in Germany on the Tornado, Alan and I were sailing in 22knots and 1meter waves vs some German guys 35kg heavier than us. We were able to match their speed and point higher, but we couldn't 'roll' them. So we pulled on all of the downhaul and kept pulling on a little more rotation. Eventually we found the sweet spot and we could foot down over them whilst keeping the hull down and also gain a boat length with every gust. So we were able to convert our height into distance in front of them.

Rotation Calibration

Whilst tuning with the new main, on every occasion Andy Webb asked me where I thought the rotation arm was pointing, I was wrong. We also found that when we wanted to 'fast forward' we needed to set the rotation to the right point immediately, this is where the calibration really helped



This is the standard Hurricane rotation system. There are two changes:

1. This is the shorter raised gooseneck boom. See Andy Webb for details on making this change if you still have a long boom set on a gooseneck at the bottom of the mast.
2. A calibration system has been added.
 - a. The block on the rotation arm is a bullet block with a becket.
 - b. One end is shackled to the arm
 - c. The other has a small 2mm purple line tied to it and is fed through a hole in the boom. You can see it disappear into the boom in this picture. This means that it will not foul the rotation control.
 - d. This is then fed back out of the boom further along and tied to a 4mm piece of elastic. The knot serves as a 'pointer' on the scale. For our boat the two black lines indicate when the rotation arm is pointing at the shroud or rear beam and is easy to read from on the trapeze! Our 'fast forward' mark is '6' on the scale.
 - e. The other end of the elastic is passed back into the boom through a small 4mm hole and then dead ended with a stopper knot.



If you have any questions contact me on the class association forum, by email or phone.

Best wishes

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