

## Shockwave Tuning Guide



Rob Wilson shares his tips for tuning the Shockwave. He took the Shockwave to victory in the Round the Island Race 2009, victory in Round Texel 2009, 2<sup>nd</sup> Wolds 2009. In the 2010 Worlds Marcus and Rob won more races than any other team, but unfortunately suffered gear failure costing 2 critical gold fleet races (finally finishing a respectable 7<sup>th</sup>)

### Mast Set up – Spreader rake/ diamond tension

The mast set up is crucial to tuning the Formula 18. The combination of spreader rake and diamond tension has a major influence over the power of the rig. The Shockwave mast has a relatively soft section, so the spreaders are best set slightly further forwards than some other F18s. The numbers are more similar to the old Aluminium mast Tornado settings.

Body Weight KG	Spreader Deflection	3-7 knots Diamond Tension	8-14 knots Diamond tension	15 knots + Diamond tension
140-150	25 mm	38 - 39	39 - 40	41
150 +	17-25 mm	38 - 39	39 - 40	41

*\* Diamond tensions measured on the black Loos gauge, note that they do vary slightly and will read higher with age. Rotate the wheels periodically to change the ware point.*

As a general rule, set the mast up according to the guidelines above. Then adjust the settings according to your body weight and how you like to sail. There will be a slight variation in the stiffness of different masts, so again use the above as a guide and then go from there.

### Mast Rake

This is measured by swinging the trapeze wire forward to the bridle and then back to the transom. Many teams set the rake and leave it. However a few of the teams will increase rake in strong wind by a couple of inches. Increasing rake will increase the feeling on the rudder, moving the mast forward makes the rudder lighter.

We rake our boat to 5.5cm down the transom. This gives us the right amount of feeling and gives a good balance between pointing and hull popping. We leave the forestay, the mast rakes back slightly as we increase tension on the shrouds.

**Rig Tension**

As the wind increases, increase the rig tension as below. If the tension is too high in the light it will interfere with the mast rotation.

Wind Speed	3 - 9 knots	10 -17 knots	18 knots +
Rig Tension	~ 26-28	~ 28	~ 30

**Rotation**

The rotation changes the aerodynamics/ entry angle of the sail and the mast bend characteristics. The range of movement is from 5cm behind the shroud (light wind), to back of CB case (most conditions), Overpowered conditions – sometimes a little more aft. When sheeting the jib it will be in front of the spreader.

**Downhaul**

The downhaul is a critical control, the windier it gets the more you pull! However when the wind is very up and down it is crucial to quickly adjust the downhaul, especially in the lulls. Make sure the mainsail moves freely in the track so that the downhaul will release quickly in the lulls. Cleaning the mast track and ‘Mclubing’ the luff of the sail will help this.

In very light winds (sub 6 knots) it is important to flatten the sail a little to help the air flow, a little downhaul can help this. Pull downhaul so the horizontal creases are removed and then 2-3cm more. Write a scale on the mast, mark every 3cm. Once fast settings are found, make a note so that they can be reproduced.

**Outhaul**

In the maximum power condition, when you are just hull popping, you can ease the outhaul so that there is approximately a 5cm gap between the foot of the sail and the boom to give more power.

In very light and winds a 3-4cm gap is fine.

In breeze a 3-4 cm gap will suffice, as the downhaul is pulled on, the outhaul is effectively tightened so that this gap will reduce to about 2cm.

**Battens**

The North sail is engineered to gradually twist and depower as more downhaul is applied. However to make sure that there is maximum power in the marginal conditions the head of the mainsail has a reasonable amount of shape. 14 knots plus, when downhaul is being applied is the point when you should be thinking about the stiffer battens. It depends somewhat on your body weight and the conditions you want to optimise for.

We always use the stiff batten in the head. Once solidly wiring we use the stiff number 2 batten. If it is absolutely howling we have stiff number 3 and 4 battens too.

Pull the battens to remove the creases and then a little bit more to allow for the knots setting in. It is not necessary to overtighten the battens. This will hook the sail.

If you struggle to pop the battens at the top of the sail in tacks and gybes, it is because of the amount of shape in the head, this has been engineered to give extra hull popping and performance in marginal conditions. Either apply a little downhaul in very light conditions before manoeuvres or practice giving the mainsail a good flick.

## Jib Settings

The jib set up is crucial to the speed and balance of the boat. Even though the sail is small relative to the main it is crucial to get it right.

### Jib car position

The jib car should be moved out as the wind increases from around 37cm from the centreline in light (3<sup>rd</sup> hole in from outside), wiring (3<sup>rd</sup> hole from outside) and 2<sup>nd</sup> hole from outside in windy. If you go out too early on the jib car it will kill pointing.

### Jib sheet angle

In light winds you want to sheet more vertically on the jib, giving a deeper and more powerful jib. As the wind increases start moving down on the sheeting angle. If the boat feels very stalled and difficult to sail, quite often it will be because the jib is set up too full.

### Jib downhaul

Just as with the mainsail, increase the jib downhaul as the wind increases, again this has a surprising effect on the feel of the boat. The North jib is engineered to depower significantly as the jib downhaul is pulled on. In light winds pull just enough downhaul to remove the horizontal creases. As the wind increases increase the downhaul tension, trying to keep the draft of the jib at about 40%.

### Jib Battens

Again, as with the mainsail we are trying to have a powerful jib in the light and marginal and then a flat low drag jib once solidly twin wiring. We therefore use a stiff top and middle batten to help depower the jib in windy conditions.

## Other Points

Light Winds – Weight well forward to avoid pitching, Marcus sits well in front of the beam to avoid pitching, transom drag and use max wateline length.

High Winds – Raise the centre boards approx 30 cms to keep good speed in strong winds.

Boat feels choked up – Check mast rotation, try moving it further aft.

Read the spinnaker notes below for perfect trim.



CAT SCENE

# Lesson Four

## Tuning your asymmetric

Rob Wilson takes time out from the Belgian Formula 18 Nationals to look at asymmetric spinnaker tuning. Fine tuning of your asymmetric ensure that you get the most out of downwind legs on the course. With a well-designed spinnaker tuned well, there is no reason why you can't be one of the fastest boats on the water.

The critical points to getting the best out of your **asymmetric** are the **sheeting position, luff length, luff line** and **leech line**.

### Luff length

This is the distance measured between the block at the top of the mast and the end of the pole. To measure this, run a tape measure up the mast on the spinnaker halyard and push the pole up to take out any slack in the system. Once a fast

setting is found this can be recorded so that it can be reproduced in the future. In the Formula 18 we set the luff length to an all-round position for 9 knots plus, then all we have to do in very light winds is to ease the halyard approximately 4 inches to

soften the luff. In very strong winds the all-round position still works well because the apparent wind moves aft slightly, so the luff does not have to go any tighter. This allows the spinnaker to project forward, keeping the bows out of the water.

### Luff too tight

The symptoms of the luff being too tight are a very tight straight line down the front edge of the spinnaker, as in the photo. The spinnaker will become hard to trim and it will feel as though you have to pull the sheet very hard to keep it flying. Try easing the halyard about three to four inches.

### Luff too eased

If the pole height is too high, or the spinnaker halyard is too eased then the luff will sag off to leeward. In this case the spinnaker will be quite easy to trim but you will lose speed as the spinnaker is pulling more sideways rather than forward. To solve, make sure the halyard is tight. If the halyard is already tight you will have to go to the shore and lower the pole.

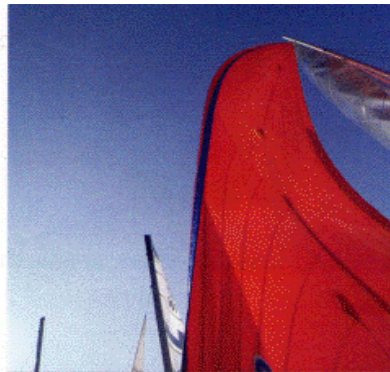
### Luff just right

With the luff tension trimmed correctly, the spinnaker should be easy to trim, projecting nicely and not sagging off to leeward.

Photos: Rob Wilson







### Luff line

Many spinnakers come with a luff line that can be adjusted. A common tuning fault with asymmetric spinnakers is that the luff line can shrink and hence make the luff of the spinnaker very rounded or knuckled. The problem looks similar to having the luff too tight, but will not go away when the halyard is eased. To solve the problem, untie the luff line and ease one or two inches at a time, until the luff does not round up. If the luff is eased too much, the tape at the front will have very little tension and look rippled.

### Leech line

As with the luff line, the leech line can also be fine tuned; if it is too tight the exit of the spinnaker will look hooked in the back two inches. If it is too loose it will have a rippled look and may vibrate slightly downwind. In the photo, the leech line is just on the edge of being too loose. It is better to have the leech line too loose than too tight.



### Sheeting position

Many catamarans have the sheeting position fixed, so you are relying on the sail maker to design the spinnaker well to get the right sheeting angle. If you do have the ability to adjust the fore and aft sheeting angle then the principles are much the same as tuning a jib. The more forward the sheeting position, the more you will sheet down the leech, so the sail will set up deeper and less twisted. If you move the sheeting position back the spinnaker becomes flatter, especially in the base, and more open in the head.

If the boat feels like you are flying a hull early but do not have much forward boat speed, then often it is a sign of sheeting too far forward. On the flip side, if the sheet is too far back you will be slow to fly a hull relative to others but have good speed (assuming you are the same weight!). This will lead to sailing high and not the best VMG. In the photo, the sheeting position is a little too far forward and it is possible to see that the base is quite deep relative to the rest of the sail.



### Trimming

Keep the kite just on the edge of curling; if it is curling constantly it is too eased, but make sure that you do not over-sheet the kite as this will kill speed.

### Rigging your asymmetric

In addition to the above there are a few other little tweaks that will help you to get the most from your asymmetric. Try and set the pole height so that when the luff is at its optimum for medium to windy conditions the spinnaker is relatively tight to the block at the top of the mast and tight at the tack. Do not worry about the halyard or tack line being too close to the blocks because when sailing the ropes will stretch slightly and the spinnaker will be free to rotate.



Tie the tack with a half hitch and thumb knot to ensure the spinnaker does not sag off to leeward. It is very important to get the spinnaker tight to the end of the pole. The head can be tied with a small bowline; a small gap can help to get the spinnaker an inch or so away from the mast.

To make sure that the spinnaker doesn't get caught on the forestay during gybes it is important to find an efficient way of attaching the spinnaker sheet to the clew. I like to use rope with a core, pull a couple of inches out with a fid and then whip on either side. This can then be threaded through itself to fix onto the clew of the spinnaker.



Hopefully these tips will help you to get the most out of your spinnaker, now it's just up to you to steer smoothly, trim well and sail fast! ▶