

Oppie Tuning

Tuning the oppie is very subjective, it is tailored to the individual sailor, their weight, strength, style of sailing against the factors of sea state, wind speed, equipment and I even take into account the child's mood. I know this sounds like a daunting black art but I can give you some very precise tips to mix with your own experience and experimentation is a very thrilling part of coaching this technical dinghy.



The tuning tips in this guide are meant for children to perform and for parents to provide the guidance allowing the sailor to develop their own tuning skills.

Tip 1: Tune with critical passion. You have a phenomenal engine that needs to be adjusted for speed, millimetre differences make huge changes to sail shape and rig performance. Learn to take time and patience tuning your rig, be very critical it will put you in a league of your own and you will out perform most of your competitors.

The sail is a beautifully cut piece of cloth that must be kept in its shape for maximum performance and you will notice if you lay the sail on the floor the front edge (the luff) is far from straight. The biggest problem we have tuning the oppie rig is how to put a curved sail on a straight mast, a mast that will bend depending on the wind and a sailor's weight and strength. All of the sail adjustment points can be altered on the water but it is much easier to do it on the beach anticipating the conditions we are going to experience once we've launched.



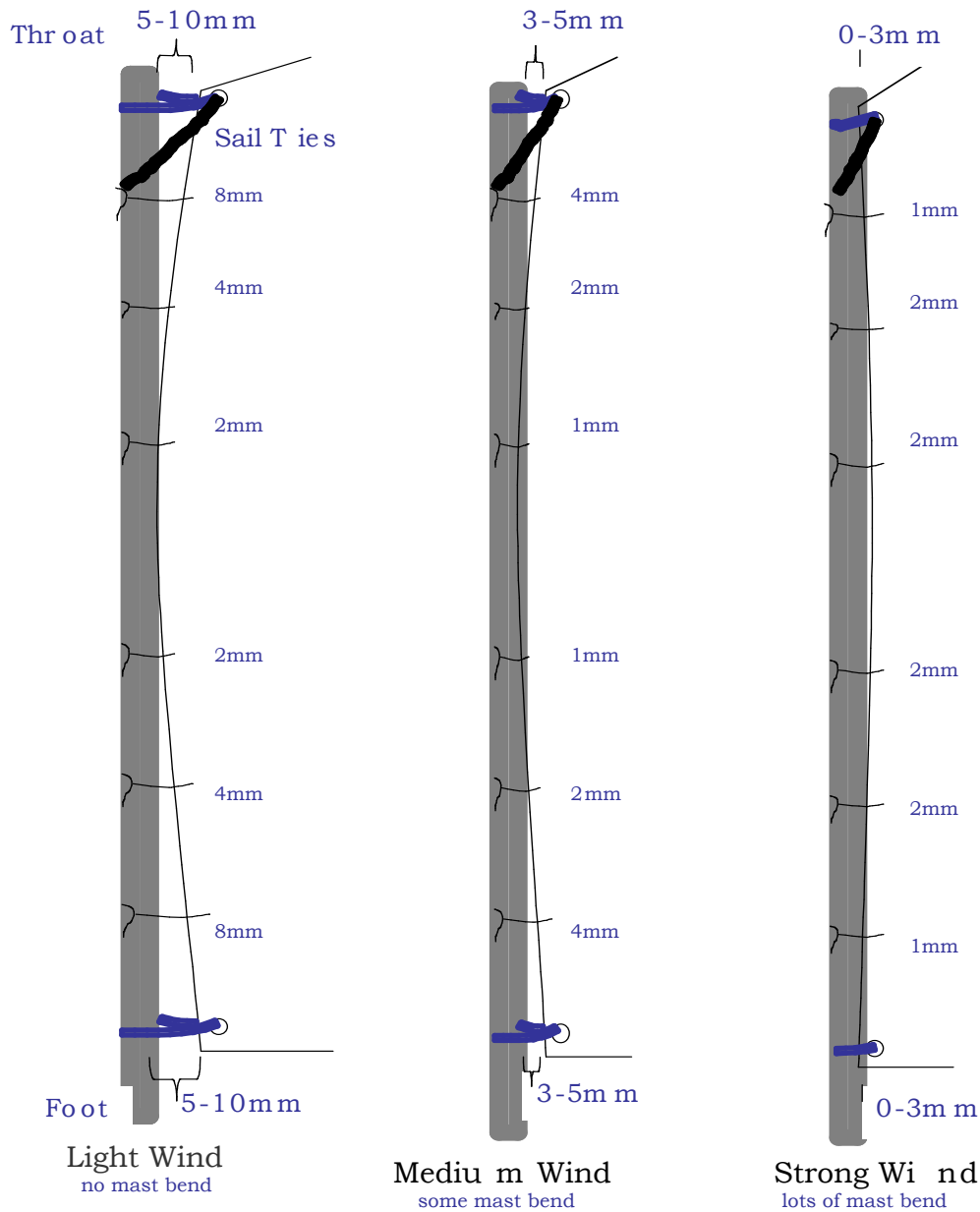
Class Rule: The maximum distance between the sail and spars at attachment points is 10mm – the width of your little finger

Tip 2: Most of our tuning effort should be focused on the luff of the sail and how it lies against the mast. On the boom the ties once set can be left and just checked occasionally to make sure they are not coming undone. Also the Throat Check once correctly adjusted for sail height at the rigging stage can be left and only periodically inspected for chaff and wear.

(See rigging section to explain the names of the sail and strings!)

Curved Sail - Straight Mast

(maximum distance between the sail and spars at attachment points is 10mm)



Here are some tuning figures I use for the Olympic radial sails, I haven't specified the exact wind strengths in precise terms because the sail set up will depend on a number of factors not only wind speed and type of sail, but sailor's weight, ability, sea state and even air temperature (A hot day in Dubai against a cool day in the UK has a density difference equivalent of climbing up a 5000' mountain and the difference in the amount of pressure in the rig is remarkable)

The bottom line is one of how much power is coming out of the rig and how much of it can we control, the more excess we have the further right in the diagrams we go. A light child in flat water will be on strong wind settings before his bigger competitor.

Luff Tuning

Light Airs:

The sail is not pulled in hard so the mast will not bend, for the sail to keep its beautiful design curves we must adjust all the attachment points to allow the sail to find its natural shape. The throat and foot are eased to the maximum 10mm, the sail ties adjusted individually to follow the cut of the luff. The boom is lifted to ease the tension in the front of the sail by twisting and shortening the goose neck strop making the luff fuller.

The outhaul is eased to allow the foot of the sail to scallop to give belly to the sail and also allow it to flop over the boom easily when tacking.

Increasing Wind Strength:

If we don't adjust the sail for the conditions as the strength in the breeze increases so we need to adjust the rig accordingly. The mainsheet will be pulled harder, the unstayed mast will bend, the sail will mis-shape and the power will be unbalanced. When we tune, the throat and foot need to be brought closer to the mast and the ties adjusted so that the bending of the mast on the water does not distort the sail. The front of the sail can be flattened to control its power by taking twists out of the goose neck strop allowing the boom to drop and luff tensioned.

The outhaul needs to be progressively tightened as the breeze builds, flattening and depowering the rig.

Tip 3: A sail tuned for fullness has a greater curve to the sail providing power in light wind, waves, and for heavier sailors. But it has a big downside, a more rounded sail prevents you from pointing as high as a flatter sail. Light sailors often sail higher and faster because they don't need such a powerful (curved) sail and can flatten the rig allowing them to point higher before the sail stalls.

Its all about critical angles of attack and the point at which lamina airflow breaks down because it needs more energy to flow around the surface with a greater curvature.

What we need to know is that there is an optimum balance depending on conditions for power (full sail) vs height (flat sail).

The Sprit

The sprit is the greatest tuning tool. It is always rigged on the starboard side so that on the start line you aren't disadvantaged by having the spar disturb the airflow over the critical lifting section of the sail.

Tip 4 : WHEN ON THE WATER THE SPRIT MUST BE CONTINUALLY ADJUSTED FOR THE CONDITIONS

Ace sailors alter the sprit tension around the course as they race. With practice it's very easy to adjust and if done at the appropriate time then the sailor will not lose any ground making the change and only gain hull speed after.

So how much sprit tension should you have? Well the sail is the biggest and best signpost for telling you how much sprit you need and it also advertises to the world if you are an ace sailor or not. The simple answer is if the sail looks right the tension in the sprit is right.

Here are a few pointers:

- Never should there be vertical creases in the sail when sailing it means the sprit is too tight. This often happens in light wind, if the sprit is not eased for the reach and run vertical creases appear, these kill the airflow and destroy the sails performance, you will go slower than anyone else who has adjusted their rig.
- Horizontal creases aren't nearly so bad and means the tension across the sail is loose so the sprit needs to be tightened. Often we would sail with slight horizontal 'speed creases' as this means the sail is at its most efficient.



horizontal
creases
(sprit loose)



perfect



vertical
creases
(sprit tight)

Kicking Strap

Often poorly adjusted, the kicking strap is critical to the curve at the back of the sail (the leech). Too much kicker and the leech is hooked acting as a brake and stalling the airflow, too little and the boom lifts, the leech twists, depowers the sail and off the wind forces the boat to roll to windward easily resulting in a capsize. So how much kicking strap? The kicking strap should always be adjusted to take up any slack in it once the sail has been sheeted into its normal position for beating. As the breeze builds so the mainsheet is pulled harder to keep the sail in the beating position and so more kicking strap tension is required.



Tip 5: check your kicking strap when sailing upwind if the rope is slack then the kicking strap is too loose you are going to have stability problems downwind.

To adjust the kicking strap easily on the water there are 2 ways of doing this depending on your strength and the amount of wind blowing.

1. Light airs – slightly lift your centreboard, over sheet the main sail, put mainsheet and tiller in one hand and reach forward with the other to adjust the kicker.

With all the variations of kicking strap setup I have now come back to a short length of rope that is pulled up to cleat rather than over the boom and pushing down, the children find the first easier and quicker.

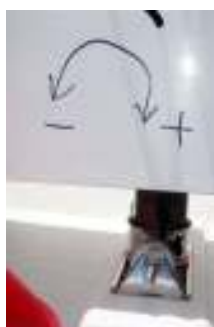
2. Strong airs / smaller sailor – lift the centreboard, bear away slightly, let the sail right out. Quickly go to the front of the boat ease the sprit off. With your backhand reach as far down the boom as possible and put all your weight on to it. With your front hand cleat the kicker firm.. *(easier if you are pulling the kicker up to cleat)* Then tension the sprit, jump back, centreboard down, sail in, hike out hard and off you go again back up to top speed as quickly as possible.

Mainsheet

Often another adjustment over looked is the mainsheet stopper knot which needs to be altered for the conditions. When sailing downwind the boom needs to let out so that it is just in front of the mast as the boat is rolled to windward when the sailor kites the sail wants to fall forward and not back into the boat which would choke it. However as the breeze fills here is more pressure in the sail so it won't fall back into the boat and if the mainsheet is not shortened the loading in the rig forces it to twist and the boat becomes more and more unstable until you capsize to windward.

Mast Rake

Of all the tuning areas this is the most subjective, coaches sailors, squads, national teams all have their own ideas. Simply put mast rake is the measured distance between the top of the mast and back of the transom with the boom pulled in to a position for beating. Raking the rig either by choice using the adjustable mast foot or as a direct result of the unstayed mast bending under load, changes the balance of the boat.



Tip 6: to use the mast rake properly make sure the mast foot cup is easy to adjust by rotating the foot plate screw wheel but do ensure that a locking nut is in place to tighten and prevent the wheel from spinning inadvertently. Where the mast passes through the thwart it must be a snug fit. Mark the thwart which way to turn the wheel.

A forward rig will take the centre of pressure further ahead of centre of lateral resistance provided by the centreboard. The result is a turning moment and the dinghy will want to bear away, felt by the sailor as a slight lee helm. Visualise a windsurfer putting his rig forward to bear away.

Conversely an aft rig will do the opposite and bring the centre of pressure over the top of the centre of lateral resistance, the centreboard, and the dinghy will have a tendency to luff up in much the same way the windsurfer puts the rig to the back of the board to point up into the wind.

Mast rake considerations

	response	benefits	use	dangers
Aft <280cm	tendency to luff up	<ul style="list-style-type: none"> - keeps the boat pointing high - helps depower 	<ul style="list-style-type: none"> - lighter winds - flat water - light helm 	<ul style="list-style-type: none"> - drag from weather helm - rig depowered - pinching all the time
Fwd >280cm	tendency to bear away	<ul style="list-style-type: none"> - bow down - corrects mast bend in stronger winds 	<ul style="list-style-type: none"> - stronger winds - in wave - heavier helm 	<ul style="list-style-type: none"> - loss of height - over powered rig - bow pushed down



The whole problem of boat balance is compounded by the fact that the mast is unstayed and not only bend backwards and forward but also laterally as well. A rig filled with wind will be forced over the side of the boat so the result is to increase the separation of the opposing forces, the boat will want to screw into wind. This is often made worse by the sailor letting the dinghy heel and the tendency to luff into wind made greater.

Sailors can counter this weather helm by rolling the boat towards them instead just as the windsurfers hang under their sails which have been swung to windward to keep their craft neutrally balance.



'flat is fast'

There is no one answer or solution to the mast rake required. Here I give my rake solutions for one particular sailor, who is the fastest British junior, using an Olympic Radial cut sail on stiff Optimax MkIII spars.

Mast Rake:	275 – 285cm		
	wind		
wave	light	medium	strong
flat	277cm	280cm	281cm
chop	279cm	281cm	283cm
wavey	280cm	282cm	285cm

Mast rake is so dependent on the child I do get the children to tune their boats individually. The very best starting point is a rig at 279cm and use that as a datum. If the wind is particularly strong come forward 1 or 2cm. As the sailor develops so to can your mast rake strategy even taking into consideration how strong the child is feeling that day.

Tip 7: Aft rake is always preferred to allow the boat to point and get height but it must be applied cautiously so that speed is not compromised, the boat must be kept flat or slightly to windward and performance against other similar sailors closely monitored.

Extreme Conditions 25kts+



The oppie is a versatile little boat and can be sailed through out a great range of wind strengths by all levels of sailor. The boat is extremely exciting in survival conditions and very easy to handle giving a thrilling ride when most other sailors have been forced off the water. There are one or two tuning techniques that enable the rig to be depowered, the boat balanced and the conditions enjoyed.

- Mast rake forward 285cm.
- Centreboard raised the width of a fist.
- Throat eased 10mm
- Sprit eased to give obvious horizontal creases

and hike hard 'go for it'