

## Simon Payne Moth Tuning Worlds 2010

I thought I'd write down some notes on how I handle my rig. It's kind of hard to shout to people on the water as we fly past each other so I hope this helps. Andrew has added a piece on the bottom for MSL13 users too.

With 19 of the top 20 Moths at the recent World Championships being Mach 2's, the latest Moth to be designed by Andrew McDougall and built by McConaghy, one might assume that all the top Moth sailors now go the same speed.

However nothing could have been further from the truth. In fact there were big differences in speed, and these differences can be attributed to one thing only:

I won the event and I thought I'd take time to explain my rig, because although other people were fast, I think I was the fastest for most of the time and right now, with all of our other equipment being so similar, optimising your rig is critical as it is your only differentiator.

Someone once said that "boat speed makes you a tactical genius" and no one believes that more than me. A fast Moth can make up for an average start, mediocre race craft or in my case indifferent fitness after a knee operation.

So we all agree boats speed is import, and given the above it's kind of surprising that people still make rig purchase decisions based on emotion rather than fact. I have observed this and I sympathise. I have found one of the hardest things to do is to make balanced impartial calls when you choose kit, but this you must. Friendships, colours, new things and advertising sway us all but spending lots of money to go slower is to me a sign that Darwins Theory of Evolution is clearly not right.

You have to look at what's fast, and to do that you have to look at historical results for the conditions you anticipate at your target event.

In Moths a lot of people use KA sails, and I do so for a several reasons. Let me share these with you so you can understand my thinking.

Firstly when we talk about the rig we are referring to the sail and the mast. In the Moth world few suppliers have a collaborative relationship here but I do know that the Mach 2 series of masts are the same ones you can buy from KA and it's these masts that fit the KA sails. To me that makes sense as they both come from the same designer.

But in Moths a minor change in wind conditions can change boat speed dramatically. That's because it doesn't take much before 25 knots of wind (gradient plus apparent) is coming over the deck, where previously, in a few of knots of less wind, we were low riding. This means that to win a championship you need a sail that changes gears easily. Very easily. You cannot be out for a day's racing knowing that you have a weak spot if the conditions change. There are plenty of sails I know to be fast in one mode but they then slow up as the

conditions change.

Of course you can't have everything, and clearly something's must change to maintain a fast pace as the breeze builds or fades. I do not change sails, but I do change masts as I believe that this minimises the degree of risk because the difference of change is less than the difference that occurs when you change sails.

At the worlds I used the KA MSL10 sail. In less than 12 knots I used the KA/Mach2 stiff mast, and over 12 knots the KA/Mach2 soft mast. One day I got confused and used the soft mast in light winds and still went OK. You see what I'm getting at here? Winning Moth Championships is about staying fast and managing risk. The sail fits both masts really well.

So if you agree that the rig needs to work through a number of conditions let's talk about those gear changes when using a KA MSL10 or KA MSL13 Sail

1st Gear. We have "traditional" conditions where the wind is light, the windage is low and the sail must produce maximum power to get you on the foils. The outhaul is off with about an 8 inch gap between the sail and the boom. The cunningham is on just enough to take the creases out and the kicker is on to keep the leech straight. At the first scent of foiling I let the kicker off in order to generate the twist needed to get on the foils early, In first gear your primary control is the kicker.

2nd Gear. The boat is now foiling in marginal conditions. Boat speed has risen from a low riding 4 knots to a foiling 12knots. In this gear you need to manage the power and drag ratio of the rig. Pull the kicker on and Cunningham on until you can sail with the boom on the centreline (mainsheet block to block) without spilling wind. Your drag will be at its minimum and the power will be the maximum you will need. However no wind is so constant that you can just set it and forget it and if you do find yourself falling off the foils after sailing into a light patch then ease the outhaul straight away .If the wind is dying you wont have time to do anything else and the KA MSL10 powers up well like this. In second gear your primary control is the outhaul

3rd Gear. In a medium breeze upwind the fastest Moths to the windward mark are the highest ones. Pointing comes from the windward "push" developed by your hydrofoils as you heel the boat to windward but it also comes from that lower leach of your sail. You should be looking at that bit of leach between the bottom batten and the third one up and try to get that perfectly straight. You do this by alternately pulling the kicker on, then the cunningham on. The head will be bladed and loose like a birds wing or the head of a fast windsurfer sail because the centre of effort has moved and the power is coming from lower down the sail. In 3rd gear your primary control is the Cunningham for managing variations in the wind speed..

"Cruise control" .This applies to downwind work which most people think is just the same as

upwind. It isn't, you may still have the boom on the centreline but you don't generally heel to windward and you get to make gains by bearing away. I find a small easing of the kicker on the final approach to the windward mark is all that's needed to get the head to "self work" and that gives me time to forget about the rig and plan my approach to the leeward mark. I've often seen people needing to constantly fiddle with controls, a sign that the mast and rig don't work well together. I use consistently high kicker loads down wind and in a breeze when I move to a softer mast this is where I see the real speed gains. It improves my downwind speed as much as my upwind. Primary control here is the cunningham which is used to control mast bend and move the fullness forward if you need to sail low. Useful if you have to sink low to get through a finish or round a mark.

These are the wind ranges and points of sailing your rig need to take you through. My rig does, and that's why I think I'm so consistent. If you can achieve the same with whatever equipment you have then you are on the right road too.

Finally I have a habit of not changing sails if I can help it. I like to get to know a sail intimately and that's because I believe the last 10% of performance is basically hidden and is only revealed after you've both spent some time together. If the above makes sense then just like me you're going to have to find it to. You won't do that by having a random multi make sail programme.

Here are some additional observations from Andrew McDougall, who always uses the MSL 13.

"The physical difference between MSL13 and MSL10B is ridiculously small, but the difference on the water is huge.

The MSL10B is an easy sail, smooth and efficient, utilising the 8 m<sup>2</sup> of sail area in a way that is not extreme considering the speeds we are foiling at. The MSL13 on the other hand, requires more tuning between modes. For me this is a small price to pay for the extra power of the 13 has. I am a little heavier than the average moth sailor, and certainly not smooth moving around the boat, so the extra power is worth the extra work, allowing me to make boat handling errors and be able to get quickly back on the foils.



Like Simon, I only use one sail: the MSL13 and normally I try to only use one mast, the KA/Mach2 soft mast, so that I can rig and forget. (*And forget to de rig! - Si*)

This rig can be a handful at times, requiring lots of vang and Cunningham to blade it out for efficient upwind work, or to get rid of power at the top of the sail when sailing downwind in extreme conditions.

Upwind it works quite similarly to the MSL10B, but it is downwind where the technique can be completely different. The trick of sailing downwind fast is getting the balance of low drag and right power correct. Too little vang will knuckle up the front of the sail causing high drag, too much vang will not allow the sail to twist enough to get the top working. The MSL10B does not like having little vang, so both upwind and downwind modes are similar. I.e. sail fast and get the apparent forward. The MSL13 on the other hand, with its fuller head, can work well with low vang tensions allowing a low 'soak' mode that is not as available to the MSL10B. I sail in this mode most of the time, particularly if the wind is strong or if the wind is very light. In strong winds because going high won't make you any faster, in light winds because the angles are so bad that any depth you can get gives very big gains.

The important thing to understand with the Moth is that the range of speeds and power requirements are more varied than almost any other boat, and not necessarily just because the conditions change. This means that any rig that is too far outside the middle ground is not going to work. This is why we have two sails that are very similar, right in the middle of the extremes.

I get reminded every time I sail these boats that adjustments generally need to be very small. It is tempting to make large adjustments when you feel you are not on the pace, but it's highly possible that you are only slightly off with your tuning but causing many knots of boat speed difference. A large adjustment will often end up on the other side of the setting you need. You need to be disciplined when other boats around you are going faster: knowing that you must make small and considered adjustments to get yourself back up to speed."

And by the way, I was the fastest, not Simon