

Please note this is Neil Baker's interpretation of the Simon Payne mach 2 seminar with a few added thoughts learnt from UK moth training events and Mothfest.....and not gospel.

### Tacking on the foils

Keep the boat dead flat pre-tack. Some people look to the rear wing-bars to judge this. Move faster and earlier than you want to (or even can imagine) and steer right through to a beam reach to keep the speed up.

Sheet in as you head up.

Top sailors put a knot in the mainsheet to keep the main half in if dropped so as to help keep power and stay on the foils through a tack. This does need to be adjusted for wind strength and consider that lighter sailors usually need to ease the mainsheet further for leeward mark roundings in breeze.

Easing the mainsheet post tack is required and a thinner mainsheet may help if you find it doesn't go out quick enough.

There doesn't seem to be an accepted technique for where to place the feet through a tack. E.g. don't feel you need to get your feet out of the toe-straps as they naturally come under the body as you start to move. However, strong quads help with the explosive power needed to get across the boat in time.

Hands should be swapped after the boat has tacked and is in control, not in a hurry post tack whilst still building speed.

Top sailors don't ease vang or Cunningham pre-tack.

### Gybes

Speed, Stability and steady steering make the gybe happen. My personal recommendation to people learning to gybe is to tuck your forward foot under your bum and get your back foot out from the toe straps to be ready to move. But you need to go as soon as you're ready Simon recommends you don't heel into the turn but aim to keep the boat flat all the way through

Faster is faster! It's a good simple rule to aim to reduce speed loss to a minimum

Always look forwards and move earlier than you think you need to

Its seen as faster to gybe the boat faster and get as far out on the new wing bar as possible, steering the boat up to the breeze to keep you there will keep the power on and get you back to max speed quicker.

Make sure you do the Harry Potter and the Meerkat: This isn't a 70s dance move, it's the action of getting the tiller round the back and under the boom then slap it to the wing bar to keep your steering controlled (like tapping a wand, hence the Harry Potter). Then as you move under the boom and get across you plant your outboard knee and pop up like a Meerkat Don't drop the tiller to change hands, you can try but you'll learn why it doesn't work quickly

### Marginal Wind Take off

Start trying to foil when the boat hits 7 knots.

Get as much lift on the rudder as possible so wind it all the way forward (pin at the front)\*

Kicker should be loose enough pre-foiling to get some twist with the outhaul off so that there is circa 4-6 inches between the mid-sail point and the boom.

Cunningham should be loose enough to allow mast to straighten but not allow wrinkles in the sail.

Crack to gain speed

Induce a minimal amount of leeward heel so that you can bring it upright as the boat starts to foil and you pump twice (no more!). Simon suggests that the lighter sailors could/should hike at this point.

Once foiling head back up to the breeze and bring on the kicker

\* Some people wind rudder stocks out up to 6 full turns (no more on a mach 2) to get rudder lift. Simon Payne recommends not doing this as the gantry can drag in non-foiling conditions. Instead he puts some card from the packaging of a Harken block in the rear part of the join between the rudder horizontal and vertical to give more AOA on the rudder. For upwind trim whilst foiling aim to have fore-aft trim horizontal then add two turns for downwind to get bow down and reduce AOA on main foil. This will use more flap to gain lift but is more efficient than having increased AOA and less flap. It also makes the wand work harder resulting in better control.

### Gearing

Gearing was seen as the be-all/end-all post Belmont when the leaders were sailing with minimal gearing in flat water. However at the 2011/12 Aussie Nats and Garda 2012 when sailing in the northerly everyone found that gearing in the big waves/breeze was key. The recommended start point for gearing on the Mach2.1 is 5 turns down on the bow fitting (3 turns on the Mach2.0 which has less adjustment).

Note the sailing bits RHA reduces gearing further due to higher connection at bell crank Vs Mach2 or JPZ/Swiss RHA

All other things being equal: The faster you go the less gearing you need and the bigger the waves the more gearing you need

Fastpoint is a new term in mothing which represents the point where the bow actuator is moving in the range that has the most impact on the push rod, i.e. when the actuator is vertical, regardless of where the wand is, it will have the most effect on the push rod and therefore the most control.

The Mach 2 has an adjustable wand rake on the bow fitting (the outboard section). For light winds only this can be in the aft position which will put the actuator in the fastpoint whilst low riding and aid early take off. Remember this will also affect ride height so compensate for it by winding out the ride height. Put it back forward for anything other than marginal sailing.

### Rig Setup

Simons tuning guidance from Dubai is at the bottom

All measurements done with Sail on mast, cams engaged but boom not attached and no Cunningham

Up wind pointing is broadly 50 degrees TWA

Aim to keep boom centreline for pointing. Mainsheet strop has the most impact on this. Can be set up on the beach as follows: Load the kicker and Cunningham for upwind setting. Then pull mainsheet on with aim to be block to block. If blocks not touching, strop is too short, and if the leeward strop is slack, strop is too long

Outhaul can always help pointing

Simon recommends putting tell tales all over the main starting one hand length back from the luff sleeve. One on each panel, except maybe top and bottom. Each set should be 3 deep. Leech tell tales serve no purpose as they won't work in the traditional way as you'd never want them to fly on a moth sail.

Simon measure his rig to the mast tip from the back of the wing bars (in the centre!).

Another, simpler method to measure the Mach 2 rig is as follows:

Put your mast up with sail on and measure from the top of the fore-deck, at the base of the mast stump, 3.6m up the mast. This is likely to be around the forestay attachment. Then, at the point perpendicular out from there on the forestay measure down 3.6m. Mark this point for future reference. Measure from this point down to the top of the hull, at the bow. Aim for this to be between 40-42cm. This should give you a good start point to tune your Mach 2.

#### **Battens:**

Stiffer Battens act like a stiffer mast

Too much tension gives leech flutter which is slow i.e. sag at leech between battens when kicker and Cunningham loaded

Creases/darts at the front 10% of the batten are ok and should be there

To set battens put the boat on its side with controls on and back battens right off. Then tighten them until the creases go leaving a few light creases at the front as above

In breeze you could reduce tension in top battens to reduce power in the top of the sail

#### **Downwind**

Downwind rig setting is best with twist but not a “knuckle” (not too much draft forwards) at the front of the sail which will cause you to sail low and slow rather than true VMG by building apparent. Avoid the “knuckle” by keeping on enough Cunningham.

Top tell tale can be useful to see if flow has re-attached

Hike downwind

To achieve best VMG trim to enable to you hike then steer to keep enough pressure to keep you there, similar to steering a skiff to what Bethwaite calls the “stability limit”.

Best fore/aft trim is with the bow down. This reduces drag on main foil as mentioned above and reduces rudder vertical in the water. Aim to keep only just enough rudder vertical in the water. Equivalent to 1 chord length of the horizontal is needed to keep flow attached and avoid stall

#### **Foil Finish**

For a non-painted foil with the factory finish you may want to improve the surface. Start with 600 grit and move through the range to 2000 grit

Make sure that you do not change/damage/affect the shape of the foils. Especially on the underside of the flap on the main foil. The shape here is vital to the lift given by the foil.

Some people like to durapox foils then sand them down to get the finish they want

It's almost certainly worth checking with Mach 2 before you do anything to change the finish of your foils.