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Ready for the circuit

Thomas Jundt updates us on his foiling 18ft Skiff



While foilers are gaining an increased foothold, to date this has been exclusively in singlehanded classes such as the Moth and the RS600 and we are still awaiting news of someone attempting a doublehander. In the meantime, in Switzerland, engineer Thomas Jundt has double-jumped this and for more than a year now has been zooming around Lake Geneva on a foiling 18ft skiff. Since [we wrote about Jundt last year](#) his foiling has come on a lot to the extent that he is preparing to take his flying machine onto the 18ft Skiff circuit next season.

As you might imagine getting an 18ft Skiff successfully airborne is not quite as simple as just chucking some foils on it and going sailing. When we spoke to Jundt last year they were busy working on some of the control mechanisms after a long summer out

on the waters of Lake Geneva. Once again this season the team have spent as much time as possible learning the characteristics of their flying beast and, for the most part, it has been another summer of tweaking, fixing modifying and refining.

Causing particular problems last year was the rudder control system, specifically developing enough lift at the transom to allow the boat to 'fly' level. While they have put a great deal of work into this area, the team have continued to have issues with the ride height for much of this summer. "The first thing we did was to build, a good trim system for the rudder foil," Jundt explains. "Basically, now we can adjust the axis of the rudder for a basic trim and then we can play with the flap." They fitted this double trim mechanism because Jundt says often they were sailing around with the flap all the way down to get more lift aft. However, since this was not always the case, they now opted for a coarse trim on the rudder as a whole, then using the flap as a fine trim. "Since we have fitted this new trim we can have + or - three degrees on the rudder angle, so depending on the speed we can make the trim exact to have a neutral rudder flap. When we fly around at 13 or 14 knots we have it in one position, but when we fly at about 17 knots we have to give it about one and a half degrees more angle to get more lift."

The issue here is that the faster the boat moves, the more lift the foils generate and the higher it climbs out of the water. Obviously with the foils being at a fixed length there is a point at which they break the surface and at that point the boat slips sideways and just falls over. On a smaller boat such as the International Moth this is simply countered by the single sailor shuffling their weight forwards to change the angle of attack of the foils. On something significantly larger and longer, it seems more adjustment is required.

Although this is a relatively simple concept, Jundt says that to build this there are some fairly complicated mechanics at play, particularly with the high loads involved. Due to this the team went through a number of different systems before opting for a stainless steel set-up that they feel is about as good as it is likely to get for now. "For me the whole thing is probably working now at about 90%," Jundt confirms.



With the basic rudder trim system finally looking more sorted, Jundt and his crew were able to move onto some of the less coarse control systems. Essentially this development focussed on to the bow wand set-up which controls the main foil flap and overall ride height (as it does on a Moth). "We tried about 20 or 30 different wand controls, lengths and rigidity. Now I think we have a good set-up with the wand system," says Jundt. "It is set up in a position that when we fly at a good height the wand is almost vertical sitting at about 80 or 85 degrees [from the horizontal]. When you go higher it goes all the way down. A small amount of change in height makes it go forward, corrects and we come down." Again this is done in an effort to avoid the foils breaking the water. Jundt says that if you have the wand at a less vertical angle there is more scope to ride over waves and the boat is likely to stay foiling for longer, however when it goes wrong it tends to result in a solid crash back down in the water. "The flip side of this is when we fly too low the wand reacts slower so it takes longer to gain height," Jundt explains.

The foils for the boat were built at Fastacraft in Australia by Moth builder, sailor and effective father of the modern day foiling Moth, John Illet. This season with the World Championships taking place in the summer at Lake Garda, Illet was able to visit Lake Geneva and sail the boat with Jundt. "What is funny is that we came to the conclusion about how vertical to have the wand when John Illet came to Geneva for two days and went sailing with us," Jundt comments. "When I spoke to him about the wand system and how we managed to fit it he said that actually most of the Mothies came to that same conclusion in Garda."

To get a better idea of what was happening with the foils when they are sailing, the team built a small device that sits in the boat and shows what position the main foil is at. Jundt says they did this because when out on the trapeze it is hard to know exactly what the foil is doing and they thought this might help them. Having set this new device up another problem with the wand soon surfaced: "That small device is how we found out that the wand we were using was too flexible. The wand was bending but we could see that the flap was not moving because there was too much force on it. After we realised this we had to make the wand stiffer and we also increased the leverage to get more strength in the whole system."

Although they have managed to sort many of the early problems and now feel the boat is up to speed in terms of the foil package there is still much work to be done. "All of this took a lot of time and Lake Geneva is not really a great testing environment. You tend to spend all week working on something and then can't test it because there is no wind," Jundt comments. The rig is the next item to be modified although work has already begun on this. "Rig-wise something we have done recently is to stiffen up the mast by adding a stiffer carbon top section. Then we have also been trying to put a square top main on it the boat to add more power and we want to add a more powerful Cunningham system." Jundt says they need to do all this because when the boat is not foiling a great deal of power is required to make it take-off. However once the boat is up in the air much less power is needed and it has to be got rid of efficiently. With a stiffer top section and a square topped mainsail the energy should be there to help the boat onto the foils in lighter wind but then the more powerful Cunningham should still be able to bend the mast and so cause the square top to fall off to leeward and de-power.

The spinnaker is also something they have been working on. Last year they had already significantly flattened the sail to deal with higher apparent wind and the effective tighter angles they would be sailing. However, just flattening the sail has not been enough. "At the moment the sail sags to leeward a bit. In order to carry the flatter spinnaker I am trying to make the bowsprit stiffer so we can get a lot of luff tension on and reduce that," Jundt says.

After the rig has been fully sorted the question of where to go next becomes an issue for the team. "Once we get the rig on the 18 right I would love to build a new hull," Jundt comments. "Ideally that would be much lighter and not a planing hull as we are not in the water over seven knots. The 18 is a great base point but now that we have it flying we have realised that the bowsprit rig and wings are good but the hull needs to be different. At the moment that is just a dream really, as it would cost maybe £20,000 or £30,000." Presumably a purpose-built hull could be built substantially lighter too.

So then after the rig is sorted where next? Well the answer is onto the 18ft Skiff circuit to pit the boat against non-foiling competitive 18s. "Now we know how to sail it and are pleased with wand and rudder control we are ready to sail at 18 regattas. We want to do a couple of events next year to show people how it works," Jundt says. Currently the team are not exactly sure which events they will be attending although it is very unlikely they will leave Europe at this stage. One of the reasons Jundt and his crew decided to put foils on their boat was because none of them had the time to sail on the 18ft Skiff circuit competitively anyway. This has not changed so if they do leave their home-waters it is will only be for one or two events. "We are hoping to go to Lake Garda or Lake Como, but we have to see when the events are and how holiday works out" Jundt explains.

If they do turn up to events, however, they will only be racing for fun and to show off their toy to other 18 sailors. Since the boat hit the water last year, Jundt says, the European 18ft Skiff Class have decided not to allow foiling 18s to compete for results although they are welcome to join the racing. "The purpose was not to race on the circuit or win any 18ft Skiff events anyway so it is fine by us," Jundt says. He adds that they are just happy to let people try the boat for themselves, as he says it is an amazing feeling and once you have tried it, it is hard not to want to do it some more.

It will be interesting to see how the foiling 18 compares on the race track against the non-foilers. There is no doubt that lightweight singlehanders are faster with foils than without, but at the International Catamaran Challenge Trophy Fred Eaton's foil borne cat (also fitted with Fastacraft foils) was way slower than its non-foiling sistership. This obviously may be a 'cat' issue, but it may equally be a 'bigger boat' issue.



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