Dee's tuning and sailing thoughts for the Farr 400

I have had a great time sailing the Farr 400 both in Dubai, the Med and San Francisco. In all sorts of conditions, 0-30 knots.. The boat is light, powerful and an enormous amount of fun to sail. The more I sail her the faster she seems to go. I will list my tuning and thoughts of how to get the most out of the boat at this point. As we start one designing the boats we will learn much more and they will go much faster.

Rig Set Up The Farr 400 comes with a fantastic Southern Spars carbon rig, with EC6 carbon rigging. This makes it very easy to set up. Here are my thoughts:

Rake:

Start with the head stay at the max forward position of about 4.62 degrees of rake. Using an arc with the jib halyard, measure down from the top of the BAS band 1 meter. Then arc the halyard out toward the head stay and make a mark on the head stay. The measurement down to the deck at the center of the head stay should be 1.485 meters.

The mast step should be all the way forward on its adjustment

J measurement should be at 4472 mm, this should have the mast almost all the way back in the partners.

With this head stay arc the following should be used for tuning the shrouds fully bricked:

- **V 1's only 3600 psi**
- **V 1's and D 1's 4500 psi**
- **All on 4900 psi**

This should produce a mast that is straight for sailing in breeze. You should be able to go to max head stay tension of 3.8 ton. Of course the D 1's might need to be adjusted and you should make sure everything is in the middle of the boat. From there check out the mast step and partners to make sure you fit your mainsail. It should be running out of luff curve just as you get to max head stay.

Rake numbers are as follows:

Minimum rake	HS	Rake	Arc	Adjustment
	16.412	4.41	1.470	0.085
	16.417	4.48	1.475	0.090
	16.422	4.55	1.480	0.095
Base setting, 12 knots	16.427	4.62	1.485	0.100
	16.432	4.69	1.490	0.105
Turbo setting, 6 knots	16.437	4.76	1.495	0.110

There are many good things about this boat that makes it very easy to set up and sail. One is the rig and how it works with the sail in different conditions. Since there are runners it is not too hard to get head stay to sag, or have minimum tension. Also, the boat being carbon enables you to have a very straight head stay with not too much tension on the back stay. So I like to drop max 8 mil brick to get to turbo setting for light air. This spoons the rig to leeward and rakes the mast a bit more and is a very simple adjustment with the mast ram. Of course with your sails you can use the smaller adjustments to make go somewhere in between. Here is a good start:

12 knots and up	fully bricked	max runner, 3.8 ton
10 knots	3 mil out	2.5-3.5 ton
8 knots	10 mil out	1.8-2.8 ton
6 knots	25 mil out	min- 1.8 ton

The mast jack can be adjusted while sailing. It is not legal while class racing. You should be very careful not to exceed the Southern max tension while doing this. Make sure you ease the runners enough to allow going up on jack and only doing this in smoother water, not big seas. Some rating systems allow this, like PHRF, or I should say they do not dis-allow this. This can be very useful in changing conditions.

Sailing the boat

There are some good things about how the boat is set up. Let's start upwind. The boat has the ability to sheet in very far. This is great to sail upwind in light and smooth conditions. As the wind comes up, the lead position needs to be dropped out to leeward to open up the slot. Here are my basic numbers:

- **Under 6 knots smooth water, max in**
- **6-12 Lt jib 5.5-6.5 degrees**
- **12-16 med jib 6.5-8 degrees**
- **18-25 hy jib 8+ degrees**

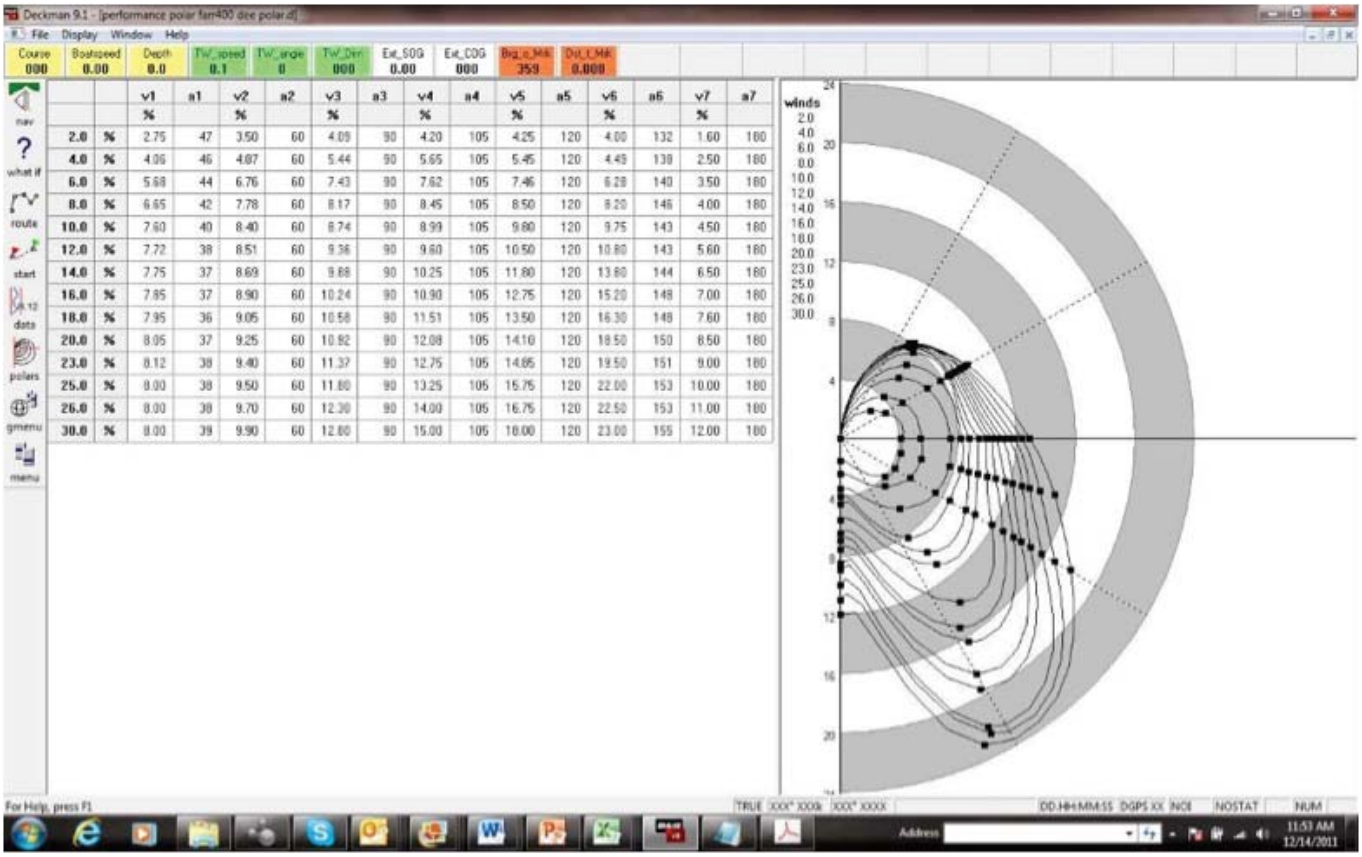
As you can see here the sheet is pretty far in. We have since been much further out, over 20 knots, should be vang sheeting.

This boat likes a lot of twist as the wind comes up. As we sailed the boat over time we have learned that faster is better upwind. The normal Farr targets are slow as the wind comes up over 12 knots. Here is my best guess for now.

Upwind		**Farr VPP**		**Dee's numbers from sailing**		**Downwind**				**Dee's numbers from sailing**	
Wind sp	VS	TWA	Heel	VS	TWA	Wind sp	VS	TWA	Heel	VS	TWA
2	2.50	47	3.2	2.75	47	2	4	132.0	1.8	4	132
4	4.06	45.8	3.8	4.06	46	4	4.49	138.1	1.8	4.49	138
6	5.68	44.0	8.5	5.68	44	6	6.28	140.5	3.2	6.28	140
8	6.65	41.7	15.7	6.65	42	8	7.28	145.7	3.4	8.2	146
10	7.12	40.0	19.9	7.6	40	10	7.78	151.8	3.2	9.75	143
12	7.27	37.8	21.5	7.72	38	12	8.61	152.6	2.9	10.8	143
14	7.39	36.8	23.0	7.75	37	14	9.69	149.9	3.7	13.8	144
16	7.47	36.5	23.7	7.85	37	16	11.05	147.7	6.1	15.2	148
18	7.53	36.4	24.2	7.95	36	18	12.32	148.1	12.4	16.3	148
20	7.58	36.7	24.5	8.05	37	20	13.60	149.0	14.9	18.5	150
23	7.59	37.1	25.0	8.12	38	23	15.90	151.1	18.0	19.5	151
25	7.57	37.3	25.4	8	38	25	17.51	152.6	19.4	22	153
26	7.58	37.8	25.5	8	38	26	18.30	153.4	19.6	22.5	153
30	7.52	39.4	25.9	8	39	30	21.00	155.2	21.9	23	155

As you can see the numbers we have been sailing with are much faster than the Farr VPP numbers. And much fun. It seem the more we worked the boat the faster we went. There will be some times where it would be better to sail lower downwind in the mid ranges, but I think the angles are pretty close. I should add that this is based on a knot meter calibration that was correct at 8 knots. These B&G knot meters read high in the upper ranges.

Here is what the DFW polar looks like:



Sailing the boat

With all the rigging and set up the Farr 400 can be sailed in an aggressive way. It is easy to trim and make adjustments from the weather side. I will go through some of the ways we have learned to sail in different conditions:

- Under 6 knots upwind. Weight forward and in waves it is good to heel as much as possible 12-14 degrees. This makes it easier to get through the waves. In smooth water, you can sheet the jib in vary hard and the boom should be far to windward, leech of the main almost hitting the runner. The idea is to load the boards as much as possible, so there should be good helm of 2-3 degrees. Make sure you get the boat going after the tack first and then bring the boat up. Sail fast so the keel can do its work. Try to keep as much weight below as possible. Little to no runner tension. Sail in Turbo rig set up.

- Downwind 6 knots and under. Same with the weight. The A1 is quite big and can get the boat going very well. Once up to speed work to sail lower but should always have pressure in the chute.

- Upwind in 6-10, This is the hardest condition as the you go from not hiking to full hike. Once the boat is going over 7.25 knots it is best to full hike. Somewhere around 7-8 knots you can have one body behind the helmsman doing the runner. Also at this time you might have to sheet out .5-1 degree. Jib trimmer should trim the jib down in the tacks and trim up and in slowly to help accelerate the boat. It is all about keeping weather helm on and then around 9-10 knot of wind reducing helm, by travel down. Having a good wind caller will keep the trimmer working well together.

- Downwind in 6-10 is when the boat likes to sail lower. It is surprising how fast the boat is in this condition. A1. Still weight forward and testing angles all the time.

- 10-14 upwind, Travel down a bit, somewhere here you look to change to the Med/Hy or #2 jib. Lead goes out to around 6.5 degrees. And near 14 you have max runner and rig loading. This is also when you need to start to vang sheet upwind. Tacking the boat in this condition I like to have one runner person. He takes the current runner with him across the boat and lets it go. Or it is very easy for the helmsmen to take a handoff from the runner guy and release as he turns the boat. This is a bit better as the runner comes up faster. What is really nice is to use the grinder set up for trimming upwind as the wind comes up. If you leave both primary winches engaged, you can trim the jib with the windward winch. So in a tack the trimmer brings the sheet up with him. The grinder, who cast off the sheet after he gets on the rail, puts a handle in the windward winch. Now, one can trim the jib while hiking out. You need good marks on the jib sheet to know where you are. The jib lead lines are also situated to be able to adjust from the windward side.

- 10-14 knots downwind is amazing as this is when you first get on a step. Leave the jib up sheeted to the out board lead. Somewhere around 13-14 knots the boat will feel like it is going just fine and very fast. But what has surprised me is when you heat it up 5 degrees you end up sailing much faster and with the apparent wind going forward you end up sailing lower than before. It is a good idea to keep track of your apparent wind angle. You might find this is an easier way to sail more consistent speeds. Weight starts to move back as you go onto the step, but not too much.

- 14-19 knots upwind, full brick, full runner tension. Two people behind the helmsman after 16 knots. Med/Hy #2 jib. Lead out to 7-8.5 degrees. Hike as much as possible. This is when you might have to ease the jib a bit in the puffs and trim in the lulls. As the waves get bigger it is important to keep the boat going target speeds. Some times faster is better as it is better not to slow down at all. If you get high and slow it is very hard to get going again and you end up low anyway.

- 14-19 knot downwind you sail with A2 and jib. At about 18 knots downwind the weight is back more. 3 people in front of helm. On grinding, one jib trim and one spin trim. Still hiking as much as possible.

- 19+ Now you are on the small jib upwind. Lead is 7-8.5 adjusted to the main and wave conditions. Same techniques.

- Downwind in over 20, all weight back, just the grinder forward. This is when you start to think of using the A3, around 23 knots of wind. Earlier if there are big waves. The jib trimmer can now trim the jib off the leeward runner winch.

Weight aft at over 18 knots Boat Speed!!

Other thoughts:

- Gybe inside all the time. This keeps the sheet out of the water and makes it impossible to get under the boat.

- I like the trimmers to own the primary winches. The pit man should hand them the halyard to put on their winches for hoists and drops. Pit man uses the pit winch and stoppers.

- String drops, you need trust the system. Best if the drop line goes all the way to the winch. I like the patch up one third from the foot of the spinnaker. Then on a 5 to 0 count, at 2 the sheet flies, at one the tack flies and at 0 the halyard flies. There should be some tension on the take down line at 3. You should have the bow man make sure the tack gets inside the boat. The floater should help down below. I like to transfer the spin sheet to the stopper and wrap the jib sheet on the winch before the take down. Then the stopper can be release on the 2 count. The spinnaker should be able to get to the traveler bulkhead down below with the drop line. If it doesn't you need to figure it out why. Most of the time the halyard has too much tension, there should be no drag.

- The boat is set up to sail downwind with the jib up almost all the time. I have left the jib up in as little as 6 knots. The problem is gybing in that wind speed. So I would drop the jib for the gybe until about 10 knots. Most of the time

you sail with 4 sheets on the sail. We use the out board sheet as a hobble.

I like to sail the boat with 9 max people. In light air areas, it is best to keep the boat very light. 7 people can sail the boat quite well in under 10 knots. Also think about the sail weight and reduce if possible. Of course this is for handicap racing.

I hope you have a lot of fun sailing the Farr 400.

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