

2022 Open 2.4 Meter World Champion Development Dee Smith



The 2.4 mR class have waited long years for our 2022 Open World Championship to be held at Davis Islands YC in Tampa, USA because of Covid. Hurricane Ian failed to have an impact but Nicole did end up presenting us with a few challenges by cancelling two days of racing.

For myself these 3 years of postponement gave me more time to develop my boat. "2 For 1", built in 2017 by Charger, Finland, was a good boat. What is fun about the 2.4 mR rule it is a development rule and I all all this time to tweak the boat and optimize the rating.

My main priority was always to minimize weight. Over my racing career I optimized many big keel boats. This little boat is no different. There are many areas to be looked at. Sail area, RMC, windage, wetted surface, mast configuration, and sail program. Here is my list and method I used to produce the winner:



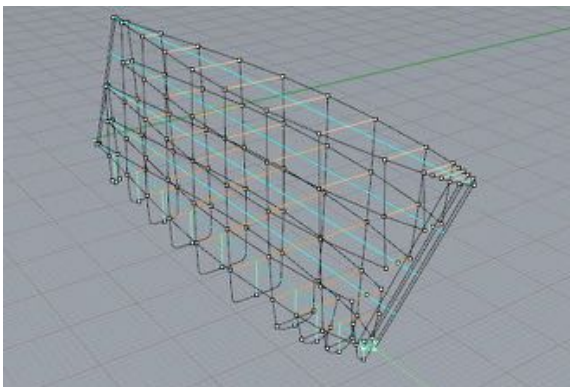
Lets start with RMC

In the 2.4 mR open rule, any weight you can save in the boat equals more lead into the keel. Everything that I could get out of the boat I did. I replaced every stainless steel screw with titanium screws. Anywhere I could use strops instead of stainless steel



fittings I did. The rules allows any material to be used for the steering system. Again, carbon quadrant, foot pedals and hinges. Seat back was made of carbon. Stem fitting is milled titanium. No table inside. I ground off all glass fittings not needed inside. I cut the middle out of the bulkheads and glassed them back in, making them ring frames. I used the lightest hoses for the bilge pumps. I used a light 6 amp hr. lithium battery for my electric bilge pump. I even took out the unnecessary screws out of the mast collar.

After getting the weight out of the boat, my next job was to lower the lead as much as possible. I looked at many options. Even made a digital file for milling new lead to fit perfectly. Expense got in the way of this one, so I kept the basic lead package I had from my 2016 Paralympic boat, "Kanaloa". This was standard One Design lead but I made a new bottom piece and back pieces that fit quite well. This allowed me to lower the standard lead by 5cm. People have done a better job with time and money, but it was the best I could do. Instead of the OD lead package of 181 Kg, I ended up with about 192 KG and lower.





Wetted Surface was reduced by using the original small rudder that Norlin designed. The rage in Europe has been to drop the keel an extra 20 mil. Norlin deigned the boat 20 mil less draft than the rule allowed without penalty. I felt the keel was big any way, so why add drag. The benefit to add the 20 mil is more buoyancy allows more lead but with a trade off of a gain in drag. In keel boat terms, the 2.4 had a lot of drag so I thought best to minimize, not to add.

Other drag was reduced by taking the splash guard off the bow and replacing it with a smaller one at the cockpit. I always felt the splash guard stopped the boat every time



a wave hit it, also more windage and effect on the jib. With the smaller one further aft, the wave has a chance to leave the boat naturally and not slow the boat down as much.

Mast development started in 2015. I thought the the standard Super Spar mast was not stiff enough and the other mast used in the class was heavy, which did not help the RMC. I asked SS to build me some tubes with a custom taper, which they did. My premise was to leave the metal in the tube and take weight out elsewhere. I also wanted the head stay to as tight as possible. Keel boats like headstay tension, higher and faster in a breeze. Starting at the base of the mast, we put a track to allow the mast to go forward downwind. This let us fix the mast at the deck to shorten the panel, less bend more headstay tension. Then my lowers, made of spectra, were set aft of the cap shrouds, and adjustable, which effectively made them check stays, fixing the panel at the spreader, shortening the mast again so the back stay was

bending from the spreaders up. This allowed less mast bend for tension on the back stay/headstay. To keep the weight down, the mast crane was carbon, fixed to mast with a titanium bolt. The fixed in line spreaders were angled down for windage on a carbon spreader bar, helping fix the mast bend in the middle. SK 99 head stay, back



stay and halyards. To get the jib higher, I put the head stay through the upper hole of the halyard block spliced around a titanium bolt. This helped to lengthen the luff length. The mast is minimum weight, close to minimum tip weight and stiff. Giving the boat very good sail control in all conditions. Even though the rule allows an adjustable head stay, this does not allow us to maximize the sail dimensions. So I went to a fixed headstay at 4190. The boat is very balance over all heel angles so there is no reason to change the balance point.

Sail programs has been on going over the last 7 years. Quantum has been in my corner and very easy to work with. Also my old friends at Dimension Sail cloth were very helpful. I wanted the sails to match the best mast and boat configuration, not the other way around. You get the best package this way. The last thing we did was add a bit of luff curve to the proven designs to take advantage of the extra head stay tension. This worked very well.



On the boat configuration, a few things. Shroud position was minimum width, spreaders also and lead position was adjustable like a TP 52 system, yes I stole that one. The mast, extra lead, sheeting position and sails gave me height at same speed or more speed at same height, a good combination.

Then we come to the rating. In the open 2.4 rating system, you have to float in a tank to get the rated length of the boat. The boat measure short and at 255kg so an extra kg of lead over OD and was able to length the E dimension a 17 mils. Which also gave bigger girths. Also there is no maximum mid foot dimension like in the OD rule so I was also to drop the boom and add a very large foot. We went old school and added a flattening reef so we can make the foot extra long for the light air but still sheet it well in a breeze.



Another way I added sail



area was my trick foot jib. The rule does not measure luff length. So we added luff length at the bottom of the jib. Upwind pull the cunningham and sail away, down wind let the cunningham go and the sail gets bigger. I figure about 1/2 sq meter or more than the standard sails.



The result was a boat that in the light it had more sail area and less wetted surface. In the breeze the boat had more righting moment and less drag. The rig and sail controls gave me more options to balance the boat out and sail higher when needed.

The races themselves went very well. It was a pleasure to have good wind the first day, 12-30 knots out of the ENE. This was not normal for Davis Islands, but it made for good racing. The locals go left and stay out of the middle. With this extra wind from the approaching Nicole, I felt anywhere would be just fine anywhere and smoother water was to the right because the land was closer.

The RC pushed 4 races in the first day because they were not sure what Nicole had in mind for us. Nicole hit the East side of Florida as a Cat 1 Hurricane. When it got to us it was a mere tropical storm.

For every race the first day I started near the RC boat, it was a bit favored and it gave me a chance to tack early if the shift went that way. The shifts were big that first day + or - 20 degrees. The first mark was the only time I had other boats around, rounded a close second but the boat behind claimed I tacked in the zone. So in defense I did a 720 that pushed me back to 7th. Speed and sailing well got me back in 3rd at the second windward mark. Then the only line I did not check or replace, the vang strap to the mast step broke. Houston, we have a problem. I did my best to hold my position to take 3rd in the race.













Did my best to fix it between races, but it broke again at the top mark. I ran the off jib sheet from the jib lead through the boom block and held it with my hand for the whole race. When boats got near, I would pump the vang and they would stay behind. I was very happy I was fast enough upwind to manage the vang problem.

The last two races I just tied a line, non adjustable vang. This was good enough. Went in after the first 4 races with 3,1,1,1. Megan was very close with 1,3,3,2. Nicole was approaching and the RC decided to get the boats out of the water for the next two days. Very good idea as it blew over 50 knots at times while she hung around.

Friday, the last day with no races after 2:00 pm, the RC did their best to get in 3 races, a throw out comes in play with the 6th race. Wind was down around 5-8 knots for the first race of the day. Heavy pin end favored and I was lucky enough to win the pin and tack after about 1 minute and lead at the top mark by plenty, even sailed away downwind now using a good vang. There were some big dark clouds showing up in the west of the course, so the RC shorten the race at the leeward gate and sent us in as there was lightning in those clouds. Bruce Millar, who started next to me was second and Megan third. The wind was very steady.

After a very nice lunch in the DIYC they sent us back out still trying to get 2 more races in. But after 2 or 3 general recalls they could only manage one race before the 2:00 deadline. The series was over for me as the last race was to be a throwout. I decided to stay out for my last race I would sail in this boat, it was sold after. I started under the clump at the RC boat just a few boat lengths under Megan. We sailed quite awhile before tacking, the wind did not shift. After about 5-6 minutes I tacked and looked at the fleet to see a very large lead. I sailed very relaxed to finish with my biggest lead. Megan earned her second overall with a second in the last race. Jeff Linton had his best race finishing 3rd. Marco Dahlberg finished 7th in the race but held on to third for the series.



2.4mR												
1		USA 7	2 for 1	Dee Smith	3	1	1	1	1	1	[3]	5.0
2		GBR 163	Pink and Stormy	Megan pascoe	1	3	3	2	3	2	[3]	11.0
3		FIN 196	Decens	Marko Dahlberg	3/ SCP	5	2	3	17	7	[17]	20.0
4		ITA 112	2.4mr	Antonio Squizzato	5	6	4	4	5	5	[6]	23.0
5		USA 160	none	Jeff Linton	7	4	5	6	40/ OCS	3	[40]	25.0
6		CAN 75	Life of Brian	Bruce Millar	6	8	7	11	2	6	[11]	29.0
7		FIN 201		Rikard Bjurström	12	7	8	10	4	4	[12]	33.0
8		CAN 8	Chaos	Allan Leibel	9	12	10	8	19	10	[19]	49.0
9		USA 3	Edge	Tony Pocklington	13	9	6	14	12	17	[17]	54.0
10		FIN 173	Voitto	Niko Salomaa	10	2	20	5	23	18	[23]	55.0