

Setting up the Rad Rig

by Ryan Eric Minth - aka Mr [c-vane](#)



Ryan Minth

I still get asked quite a bit about setting up the Radial rig and requests for this article originally written for the Fall 2001 edition of The Laser Sailor. This version has been updated for all you Olympic aspirants and the lucky fellows that will get to race against them. Again, I have prepared the basics of tuning, this time with two major changes in mind. First, I no longer need to sell the Radial to the sub-170 pound Laser sailor. The fleet is now well established in North America and will only get bigger and faster with its inclusion for the 2008 Games. Second, the Mark 6 version of the Radial sail was released over two years ago and has almost completely replaced the Mark 5 in the fleet. The World Council did a great job managing this sail's development process and produced a great sail that has simultaneously reduced the optimal weight and widened the competitive weight range of the sailors. This goal was accomplished by altering the sail's cloth orientation and with minor broadseaming changes. The result is a subtly shallower sail with a clean exit and a controllable draft that is slightly further forward. Here are the three control lines and how they relate to the Radial.

Cunningham: The sail is fairly deep and the cunningham is very effective at flattening the depth, opening the leech, and generally depowering the rig. Recognize that the distance between the gooseneck and mast head is much greater when the rig is straight (downwind) than when bent (upwind). What once was X amount of luff cloth tension (straight mast) is now less (bent). As a result, if you are headed upwind and your base mainsheet setting changes, you must adjust your cunningham to maintain the same sail setting. Pre-start, ensure that you set your cunningham when sheeted in and sailing upwind. When you ease, the cunningham will look much harder. Do not panic, it will settle in and soften as you trim back for the beat. I use the cunningham to fine-tune the sail and bridge the adjustment gaps of other controls as I shift gears. I will adjust it often if the wind and wave conditions are not consistent, always shifting gears subtly matching the cunningham to the mainsheet's base setting. Essentially, until you are trying to depower, use this control to pull out some of the wrinkles that appear typically around the mast collar. Of the three control lines, while sailing upwind, it is adjusted the most frequently

Outhaul: I will credit Peter Katcha with the "one fist, two fist" (red fish, blue fish) rule of, well, fists. This is the measurement from the maximum depth of the sail at the foot to the boom.

Radial Tuning Guide

Written by Bill Symes

Tuesday, 10 January 2006 23:55 - Last Updated Wednesday, 25 March 2009 00:19

Probably more generous than the actual width of a Radial sailor's fist, start with the sail "two fists" off the boom at max draft of the foot. I am talking 8" to 10" off here. Never any more. Ever. Max tension is then "one fist". Four inches. Never less. Outhaul: it's that simple.

Vang: This is the critical control for downwind sailing and when overpowered as a pre-bend tool. On a reach, adjust the tension with every puff as you reach higher or lower. Basically keep the top batten close to parallel with the boom, erring to the open side. Upwind, the vang flattens and depowers. Think of it as a pre-bend adjustment to the mast as much as anything. Like a big bow (mast) and arrow (boom), the vang control will shove the boom forward into the middle of the soft lower mast section, while pulling from the bottom of the mast at the lower vang tang and the upper mast section via the leech. Mast bend is induced and the sail flattened with the increased luff curve. The Mark 6 Radial sail will now invert, so be careful not to over do it. Reason: that same soft mast falls away as it loads up in puffs or when hitting waves, opening the leech automatically and de-powering. In light air upwind, set the vang to where you want your sail to be when rocking the boat flat after a tack. It does nothing more than that. Also, I think that the Mark 6 has eliminated light air vang sheeting, largely because the leech no longer needs to be artificially opened in light air. Of the three control lines, downwind vang is the most important.

For this edition of the "Radial Rig Guide", I will try to describe settings as if starting in almost no breeze and making adjustments to the boat as the wind increases. The visual queue will be the wrinkles in the sail that run from the mast toward the clew and where your butt is in relation to the gunwale.

Drifter conditions: Start out with the mainsheet trimmed with the aft blocks about ten inches apart, trim cunningham to remove all wrinkles. Now, ease the mainsheet blocks 2" more apart and tension the vang just snug (this will keep the boom/leech honest during roll tacks). Re-trim mainsheet to your ten-ish inch upwind setting and you should see some droop in your vang control line. This is what you want. Outhaul is set at two fists.

3 knots: Trim down to eight inches apart on mainsheet blocks. Leave cunningham and vang settings. You should have more wrinkles in the sail (ease if necessary) and droop in the vang when fully trimmed.

6 knots

starting to get closer to the rail

: Trim the mainsheet blocks two to four inches apart and trim the cunningham to maintain the amount of wrinkles. Repeat the vang-snug drill from #1. If it's lumpy, there probably is enough

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pressure to allow a generous two fists, so consider one or two inches off on outhaul, particularly if you are heavy. 8 knots,

soft hiking and/or bum at rail

: Mainsheet blocks at two inches apart trimming in/out more aggressively, two blocking is OK here, particularly in the flat stuff. Cunningham setting should allow for only subtle wrinkles in the luff. Still no vang tension when trimmed for sailing to weather. Here, I'd go to inside of two fists of outhaul in flat water.

10 knots

fully hiked:

From here upwards (until vang sheeting), the mainsheet is two-blocked, easing in the bigger lumps to balance the helm and help acceleration. Add a touch of cunningham for a smooth luff. Just snug the vang when the mainsheet blocks are two inches apart. Fully hiked means one fist outhaul, although perhaps a generous one.

12 knots

max hike

: I'll begin to use the cunningham to depower at this point, using enough to balance the helm but keep power. One fist for sure here.

14 knots

: Now, I'll finally go for enough vang so that the control line has subtle tension when the mainsheet is two blocked. Continue to set the Cunningham hard enough to depower as needed.

16 knots

: At this point, your cunningham should be very hard and you should begin to depower with increasing amounts of vang. 1

8 knots plus:

From here, continue inducing pre-bend via more vang tension. Hold off when the sail begins to invert. At that point, take on one more inch of outhaul (but never have the outhaul on the boom) and put the cunningham down to absolute maximum. Begin to vang sheet as necessary. I would suggest that a flat, heavily vanged sail that is vang sheeted (off) is faster than one that has been inverted and trimmed harder. At some point as the breeze builds, any Laser rig will become inverted with tension. But at that point, it's fully nuking, you are in a Radial, and if I have said it once, I have said it one hundred times:

"YOU WILL DIG HEAVY AIR!"

oh wait, that's James Liebl's line.

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- 2005 United States National Sailing Team, Olympic Single-handed Dinghy Men – Laser Class
- 2004 USSA Single-handed Championship, Bronze Medalist
- 2004 USSA Single-handed Championship Peter J. Barrett Sportsmanship Award
- 2003 North American Grand Prix Radial Champion
- 2001 Laser Radial Midwinters East Champion
- 2001 Block Island Race Week Champion, J/105 Class – Rolex Boat of the Week, Skipper
- 1995 International J/24 Class Association US Champion, Tactician