

NACRA A2 A Class Catamaran Rigging and Tuning Guide

Date: May 18, 2005

Author: Pete Melvin

The settings recommended in this guide are based on settings currently used by others and myself on **A2** A Class catamarans. The guide will be updated from time to time as we determine faster settings for the boat. Your mast and sail combination, especially if significantly different from the mast and sails we have been using, will probably require different settings.

Mast: Hall Spars medium stiff mast as comes stock on the **A2**

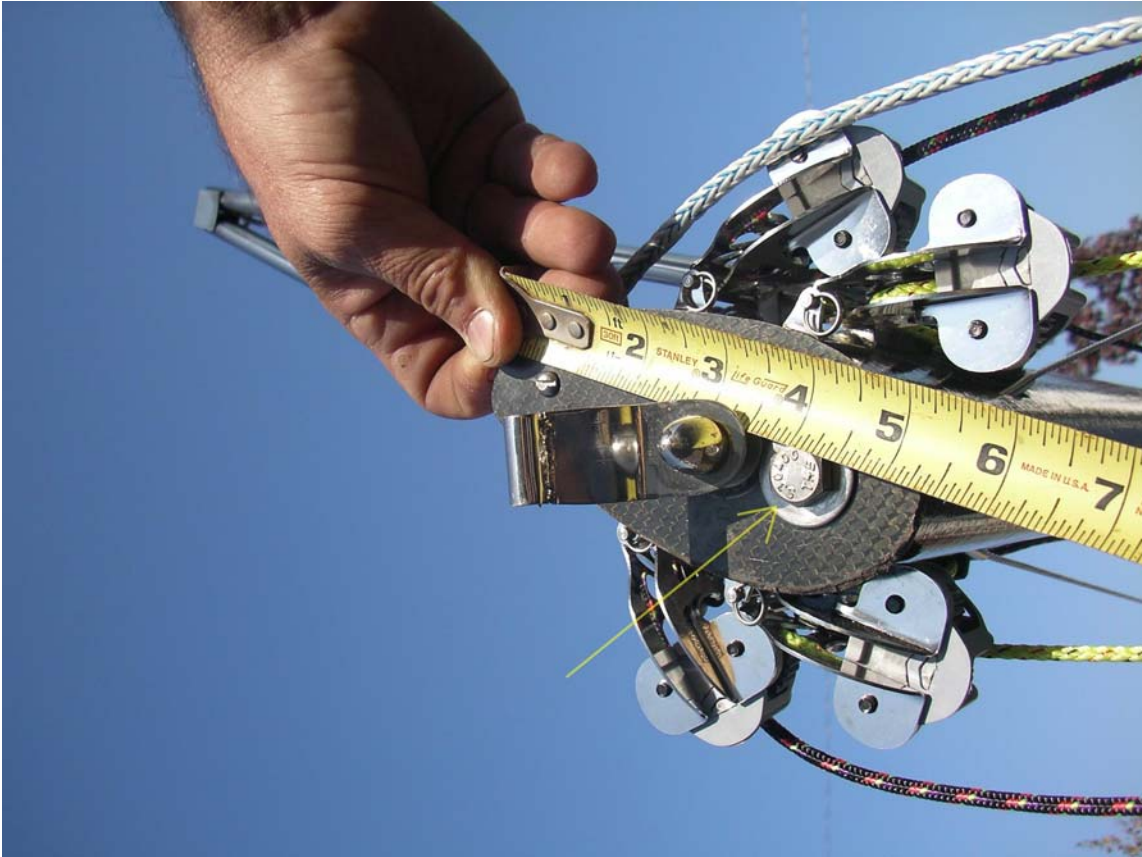
Sail: Ullman Sails 2004 North Americans design

Mast rake – Remove shock cord return for trapeze ring and attach a 3' or longer line to the trapeze ring. Pull down on line and swing trapeze system forward to forestay chainplate. Hold line and mark where the line intersects the hole in the top of the chainplate. Now swing trapeze system aft and note where the mark on the line intersects the deck on hull centerline. The line should intersect the hull within a few inches of the transom. This seems like a good location for all-around sailing. We have tried the rake at about one foot forward of the transom and this seems to work well in lighter conditions but does not appear to be fast in 10 knots or more of wind.

Spreader rake - Place a straight edge across the back of the diamond wires at the spreader tips. Measure the distance from the straight edge to the back edge of the mast. 60mm is the current setting we have been using. If you are lighter than me (about 165 lb) you may want to try 10mm or so more rake, or less spreader rake if you are heavier.



Diamond tension – Using the older style aluminum Loos gauge, we have been using between 32 and 36. Use 32 up to about 8 knots of wind, then about 34 for 8-12, and 36 for 12+. When in doubt about wind strength, use a higher tension. Having the diamonds too loose in windy conditions is much worse than having them too tight in lighter conditions. If you ever see your windward diamond go slack when going upwind, you need more tension. Tension is adjusted via the hex head bolt on the underside of the mast base, just forward of the mast ball.



Forestay and shroud tension – You want to keep the forestays loose enough so that it possible to rotate your mast downwind in light air, and tight enough to keep the rig from banging around in heavy air. The leeward shroud will be loose upwind in all but light air.

The shrouds are normally terminated in a shroud adjuster fitting. The forestays use lashings. Tension in the shrouds and forestays is created by tightening the forestay lashings.

Downhaul – After raising the sail, attach the downhaul and pull enough pre-tension to just take wrinkles out of the luff. The downhaul line exits the mast near the base, goes up through a block on the tack of the sail, down through the cheek block on the aft side of the mast, back up through a block on the tack, and down through the clamcleat on the side of the mast.

You will want your ease out all the slack in the fine tune downhaul lines (the ones that you pull on when you are sailing) and pull the gross-tune line (the line that comes out of the mast and cleats in the clamcleat on the side of the mast) to do all the pre tensioning.

In very light winds (2-5 knots) it sometimes helps to pull some downhaul on to flatten and twist the sail. In 5-8 knots, you are looking for more power and to

keep the hull flying, whether sitting on the side or trapezing. You should have the downhaul max eased in these conditions, until you are flat out on the trapeze and starting to have to ease the mainsheet to depower. As soon as you have to ease in the lulls as well as the puffs, you want to start pulling on the downhaul. You want to keep the mainsheet fairly tight once you are on the trapeze, so keep the downhaul as tight as you can to depower, yet loose enough to keep the hull in the air most of the time.

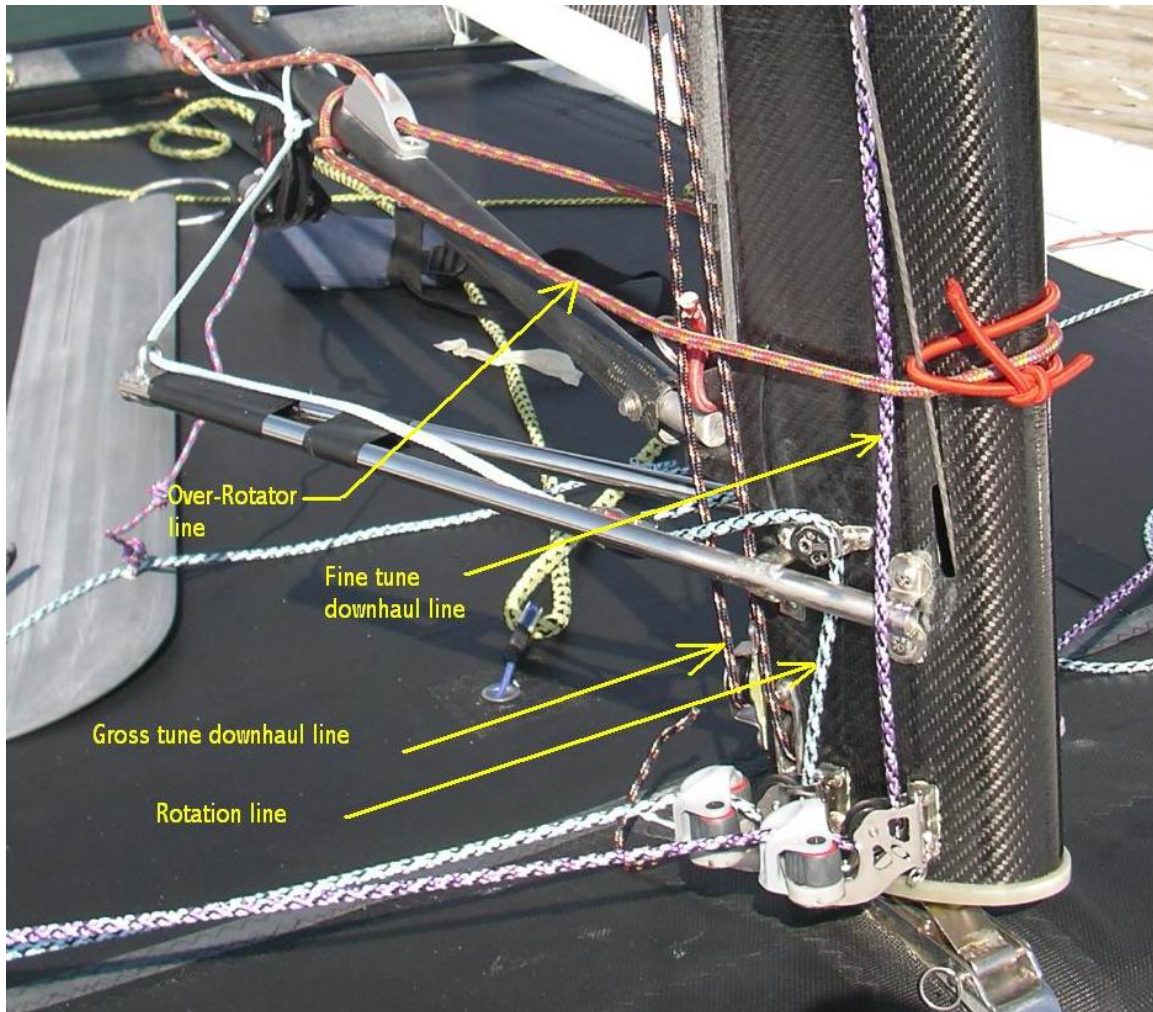
Downwind, we generally ease the fine-tune downhaul lines off all the way to make the sail full and powerful. Make sure you re-cleat your leeward downhaul line before rounding the leeward mark.

The downhaul lines can be lead from the cleats on the mast, out around the front side of the shrouds, and then tied back to themselves in the middle of the boat.

Rotator – In light air upwind, you want the back edge of the mast pointed at the leading edge of the daggerboard. This will give you good power and pointing ability. As you start to increase mainsheet and downhaul tension as the wind increases, you also want to rotate the back edge of the mast aft. This is because you will start to bend the top of the mast aft on the bendy (narrow) axis of the mast, adversely affecting the shape of the sail and dynamic response of the rig. You want the mast to be nearly straight on its narrow axis and with most of the bending occurring on its stiffer longitudinal axis. In windier conditions, you want the mast to bend to leeward at the top in the puffs, requiring the back edge of the mast to be pointed near the leeward end of the aft beam. As you tension the downhaul, you also want to rotate the mast aft.

Downwind in light air, the mast should be rotated so it's aft edge is pointed forward of the main beam by approximately five degrees. This will require the use of the over-rotator system. The over rotator system consists of a line that attaches to the boom aft of the clam cleat, goes forward and around the mast and all control lines, and then back through the clam cleat on the boom. To over-rotate, manually rotate the mast with one hand and cleat the over-rotator line with the other.

Once you start to “wild thing” in approximately ten knots of wind, you no longer have to use the over-rotator in order to obtain optimum rotation. The mast should self rotate to be approximately parallel with the beam.



Outhaul – In light air upwind, the foot of the sail should have three to four inches of foot round. As you start to have to depower with the downhaul and rotator, the foot round should be reduced to about an inch. Never strap the outhaul in tight – it does not seam fast and you will likely pull the boltrope out of the back of the mast when you tighten the downhaul.

Daggerboards – Upwind both daggerboards should be down all the time. Downwind in light air, pull the boards up until just the rounded tips are below the hulls. Once in “wild thing” conditions, you will want about a foot of board in the water. Leave both boards in this position so you do not have to change them when you gibe.

Rudders – You can pull one rudder up when sailing in sub “wild thing” conditions. Set rudders up with zero toe in/out. The helm should be very light upwind. If the helm feels heavy at all, it probably means that the rudders have pivoted up and should be pulled down. Measuring 12” down from the transom, a line projected

through the centers of rotation of the pintles down the rudder should be approximately 1 1/4" aft of the leading edge.

Traveler – Most of use have found that the traveler should be centered upwind in all but the most extreme upwind conditions. Downwind in light to medium air, the traveler can be eased out to the track end stop if there are no waves and the wind is steady. As the waves get larger or you encounter chop, pull the traveler up to about the inner edge of the hull. In extremely sloppy conditions, pull the traveler up about 6" above the inner sheer line. This will help keep pressure in the sail and the boat moving forward. As the wind increases and you begin to do the "wild thing", pull the traveler up about 18" above the inner shear. This will power up the sailplan and allow you to fly the hull. As the wind increases, ease the traveler down as far as you can until you can still fly the windward hull but keep the mainsheet fairly tight. In smoother conditions and steady wind, it is better to keep the traveler further out and the mainsheet tighter. In rougher conditions and/or gusty wind, it is best to keep the traveler up and the mainsheet eased a bit to keep some twist in the sail.

Mainsheet – In light air upwind, the mainsheet should be tightened until you cannot get the upper telltales on the leeward side and leech of the sail flowing. You can pull on a small amount of downhaul which will help improve flow if you are having trouble keeping the sail from stalling in very light conditions. In the 6-10 knot "power up" conditions, you will also want to keep the mainsheet as tight as you can without the sail stalling. In windier conditions, the mainsheet also needs to be tight, but you should be able to play the sheet in and out about six inches (at your hand). If you feel like you are going through a lot of mainsheet to keep the boat flying at an even heel, you probably don't have enough downhaul on.

Regarding the rigging of the mainsheet, it should be attached to the boom a few inches aft of the clew strap. You want to keep the mainsheet attach point and the clew strap separate. The mainsheet should be thrusting forward slightly on the boom so that it keeps the mast rotated upwind and downwind. You may notice that the boom bends a few inches upwind because of the bending moment created by the separate mainsheet and clew attach points. You may need to adjust the position of the mainsheet attach point if you change sails if the different sails have different foot lengths. A sail with a very short foot may require a stiffer boom because the distance between the mainsheet attachment point and clew strap may be too great, causing the boom to bend excessively.



Mast raising and lowering – To raise the mast, attach the mast raising hinge plate on the mast ball to the mast base fitting on the main beam with a clevis pin. Make sure there is a ring ding or other device to keep the clevis pin from accidentally falling out. The mast head should be pointed forward. You will want to place the masthead on a sawhorse or other suitable support.

Next attach the rigging to the mast with the hounds T ball fitting and rubber plug, and uncoil the wires. Tie the forestays to the forestay chainplate shackles, a few inches looser than the normal sailing setting. Tie the trapeze rings (port and starboard) snugly to the main beam between the trampoline edge and hull side. These will act as side stays while you are raising the mast.

Make sure all the wires are straight and the hounds T ball fitting is installed correctly before raising the mast. Next raise the mast carefully until it is past vertical and the forestays are taking some tension. If you are doing this for the first time or if there is any wind, it is highly recommended that you have another experienced person assist you. Once the mast has been stabilized, attach the shrouds to the shroud chainplates and secure with ring dings. It is recommended to tape the shroud pins and ring dings before going sailing to prevent the pins from accidentally falling out.

Next tension the forestay lashings as mentioned previously. Tie the lashings off with no less than three half hitches and tuck the loose tail of the line back through the lashings to prevent the lashing from accidentally coming loose. You can also tape the lashing for more security.

MORRELLI & MELVIN

DESIGN & ENGINEERING, INC

4952 Warner Avenue, Suite 205

Huntington Beach, CA 92649

714-861-1320, 714-840-0538 FAX

info@morrellimelvin.com

www.morrellimelvin.com

The logo for Performance Catamarans, Inc. features the text "PERFORMANCE CATAMARANS, INC" in a bold, white, sans-serif font. The text is set against a dark teal background that has a wavy, water-like texture. The logo is positioned in the upper left corner of a horizontal teal bar that spans the width of the page.

PERFORMANCE
CATAMARANS, INC

Performance Catamarans, Inc., 1800 East Borchard Avenue, Santa Ana, CA 92705 (714) 835-6416 phone, (714) 541-6643 fax, pcat@performancecat.com or check out their website at www.performancecat.com.