Thanks to North Sails, who gave us these fast rigging tips.

Congratulations on your purchase of North Club 420 sails. We have worked hard to design and produce the fastest, easiest to trim and most durable sails available.

The following measurements are those we have found to be the fastest settings for your new North sails. After experimentation you may find that a slightly different setting may mean even better boat speed for you and your style of sailing. If you have any questions about your sails or this suggested tuning, please don't hesitate to call us.

We want to thank Tyler Moore, multi-year collegiate All-American and past collegiate sailor of the year (and expert Club 420 sailor!) for his time, effort and input into the creation of this tuning guide.

As you know, the Club 420 is an extremely popular boat used in both college and club/junior racing. It has been sailed in numerous Youth Championships. It is the recognized junior class boat in many areas. In college sailing, once the standing rigging is set, there is no adjustment to the shrouds, spreaders, mast butt position, etc. In club/junior sailing there may be an opportunity for adjustment. Our tuning guide addresses both types of sailing and the compromises necessary for collegiate racing.

Mast Step

The mast step should be se at 9'-4 1/2" when measured from the transom along the floor of the boat to the back of the mast. Usually this places the butt of the mast in the first pin hole from the front.

Mast Rake

To measure the rake hoist a tape measure to the top of the mast on you main halyard. Lead the tape measure over the top of the transom down the aft face of the transom to where the transom meets the bottom of the boat, For club/junior sailing the rake should be adjusted to fall between 2l'-6 1/2' for light winds and 20'-9 1/2" for heavy air, near survival conditions. Note that the shrouds and, therefore, the rig tension should be adjusted as well, as the rake is altered for varying wind conditions.

In general in heavier winds and as you become overpowered, rake the mast farther aft which will twist open the leech of the jib and depower the sail. This has the same effect as moving the jib lead aft. Raking the mast aft also moves the center of effort aft, which makes the boat naturally head up into the puffs instead of being blown over sideways. Heavy crews (over 270 lb.) will want to rake aft in higher wind velocities because they can use the extra power. Lighter crews (under 240 lb.) will tend to be overpowered sooner and should rake aft in lower wind velocities. Here is a good rule of thumb. If your boom is consistently out beyond the corner of the boat to maintain the boat balance when sailing upwind, you should rake the mast farther aft. Note: As mentioned earlier, racing the Club 420 collegiately you are limited in the amount of adjustments that can be made. You are restricted to the shroud settings that the host college has selected. Each fleet may be set up differently (hopefully each boat in the fleet is identical) making the "magic numbers' different. In light winds you want the rig raked farther forward. In heavy winds it is necessary to rake it aft. Since you are not able to adjust the shrouds as the rig is raked aft, the result is a looser rig, but one that is still better balanced with depowered sails. By itself this set up is fine, but be careful of overtensioning the boomvang in a breeze. Too much vang tension without the tighter rig and mast blocks (see section on following pages) will lead to excessive headstay sag and overbending of the mast. This creates a jib that is too full, a main that is too flat and a badly balanced boat. Instead sail with a looser vang in heavy winds. With the vang

more eased the mainsheet will control the amount of twist (the angle of the top batten to the boom). You can depower quickly by easing the sheet and twisting the main more open. This makes it easier to quickly balance the boat and pop it up on a plane when sailing upwind in a breeze.

Rig Tension

The tension of the rig is effected through shroud position and channel adjusters and tension of the jib halyard, It is measured off the 1/8" sidestays with either the new Loos model PTI tension gauge or the older model A tension gauge. (These gauges are very helpful in tuning your Club 420.) While they are valuable in setting the tension close to that of other boats, they will only give relative tension numbers. We have found wide variances, even with new gauges. Take note of what we describe as the goal in setting the rig up with the proper tension. Remember, use the Loos gauge to got dose to the, specified tensions. If in doubt, use your gauge to measure the fastest boats and set your boat up accordingly!

While sailing your Club 420 in club/junior racing, your rig tension should be varied from 240 lb. in fight winds, to a maximum tension of 360 lb. in near survival conditions. When the rig is tensioned properly for upwind sailing the leeward shroud just starts to go slack (definitely not "dangling").

For the collegiate sailors, since you are not able to adjust your shrouds, go ahead and read on.

The best method to change your rig tension while on the water between races is to ease the jib halyard until the forestay is just taking all the load. This will allow the mast to fall back enough that it should be fairly easy to adjust the position on the leeward shroud. When completed, tack and do the other side, On some older boats it may be necessary to add an extender to the forestay to allow the rig to drop back enough to change the pin position. To pull the rig back forward, use the 3 to I purchase on the jib halyard, bowstringing the halyard above the purchase then taking up the slack created with the 3 to I purchase. For lightweight crews or those low in strength, it may be difficult to change the rake and rig tension on the water. Some may find it helpful to tension the jib halyard through placing your feet on the bow while the crew tightens the halyard inside the boat.

Mast Blocks

Mast blocks are usually not supplied with the boat. Mast blocks are either wood or plastic spacers that are cut to fit into the mast partners in front of the mast, Placing mast blocks in the slot in heavy winds will help prevent the mast from overbending too much down low. In fight winds mast blocks are not at all necessary. As the breeze builds, especially when more boomvang tension is applied, the mast will bow forward. if unrestricted it can bend too much below the spreaders. Overbending creates two major problems. First the jib luff will mg more which reduces your boat's pointing ability and it will overpower the boat by making the jib too full. Secondly, overbending the mast down low will overflatten the main in this area and greatly reduce its drive and power. Ideally in windy condition where the boomvang is tensioned, mast blocks are placed in front of the mast in the partners to the point where they fill up the space less about 1/8" to 1/4". If there is the possibility of a capsize, be sure to use some type of retaining line or duct tape to hold your blocks in place.

When sailing collegiately, unless the entire fleet is fitted with mast blocks and their adjustment is specifically allowed, this tuning technique is not applicable.

Centerboard Position

When sailing upwind the centerboard is usually in its maximum down position. In the near survival conditions when the boat is greatly overpowered, it is helpful to pull the board up as much as 2 or 3 inches to balance the helm and make the boat easier to steer. Downwind and on a reach with or without the spinnaker, the board should be positioned high enough so that the helm (whether the tiller "tugs" or "pushes") is neutral. If the board is down too far and there is too much windward helm the boat will tend to "trip" over the board and will not plane as fast.

Main Top Batten Tension

While the proper tension on the upper batten is not critical, it is important that the batten is neither too loose or too tight, Ideally the batten would be tensioned just until the vertical, perpendicular wrinkles to the pocket are just barely removed. Overtensioning the batten past this point will make the sail too full and the leech will be too closed. Undertensioning the batten in heavy winds will allow the batten to slide aft in the pocket and the leading edge will poke through the front of the pocket.

Main Halyard/Cunningham

Tension on the luff of the main will affect the draft position and to a lesser extent the depth of your mainsail. A loose luff with wrinkles all the way from tack to head is necessary in fighter winds to allow the draft to move aft and flatten the entry of the main. In heavy winds tension the luff until the wrinkles are almost completely gone. This will help maintain the proper draft position, You can adjust the luff tension on your Club 420 main with either your main halyard or cunningham. If you expect to be sailing in a constant, relatively unchanging condition (is that ever possible?!), then it may be best to use the main halyard to tension the luff of the main. On the other hand, if the conditions are puffy yet still leave enough time to adjust the luff tension, you may want to initially set your main halyard so there are slight wrinkles all the way up and down, Then use your cunningham tension (through the grommet just above the tack), to fine am the luff tension for the proper wrinkes and draft position.

Outhaul

Your North Club 420 mainsail does not require a great range of adjustment to be set properly.

For lighter winds tension the outhaul until vertical wrinkles just disappear and the sail is smooth. As the breeze picks up and the boat becomes more overpowered progressively tension the outhaul. The foot tape on the bottom of the sail should be standing straight up from the boom in very windy, near survival conditions. Downwind if there is an opportunity to adjust the outhaul, case it until the bottom of the sail is just smooth.

Be conscious of overtensioning the outhaul in any conditions, as this will overflatten the bottom of the sail and depower the boat which harms the boats pointing capability.

Mainsheet Tension

Ideally the mainsheet should be tensioned so that the last 18" of the top batten is set nearly parallel to the boom (sighted from underneath the boom looking up the sad vertically). Trimming the mainsheet harder will hook the top batten in relation to the boom which will provide the boat with short bursts of pointing ability at the expense of power and acceleration. Easing the sheets so that the top batten twists open (falls away) from parallel to the boom will compromise top end speed and pointing ability, but greatly increase the boat's power to punch through waves and ability to accelerate out of a tack. The

mainsheet will never just be cleated and left alone. It is one of the more critical adjustments on the boat. Play it constantly to allow the boat to point and power up and to sail with a balanced helm.

Boomvang

Downwind the boomvang is tensioned just enough so that the last 18" of the top batten is nearly parallel to the boom. Be careful of overvanging in fight winds and undervanging in heavy winds.

Upwind in fight winds, the vang needs to be loose enough so that the leech Will twist open (upper batten angled outboard) to help the boat drive through waves and accelerate out of a tack. The Yang should not be totally loose as this will compromise the boat's speed and acceleration out of tacks. The vang should be set loose enough so that when the mainsheet is eased out the upper batten a good 15 to 20 degrees open from parallel to the boom, but no looser.

As the breeze picks up, increase boomvang tension to help bend the mast and flatten the sail. At maximum boomvang tension there will be slight overbend wrinkles running from the mast toward the clew of the main. These should be just below the spreader and just barely evident in the heaviest of winds, In very heavy conditions, near survival, it may be advantageous to ease tension on the vang allowing the top of the main to twist way open reducing heeling moment.

Jib Sheet Tension

On the Club 420 the jib leads are fairly far outboard which makes it necessary to use windward sheeting in fight to medium winds to bring the lead closer to the centerline. The leeward sheet is d in tight until there are slight creases from the tack to the clew. Trim the, windward sheet hard enough so that the creases just barely disappear (approximately 1 1/27" to 2"). In light to medium winds when trying to accelerate ease the leeward sheet and not the windward sheet. In breezy conditions do not use the windward sheet.

Spinnaker Trim

Your North Club 420 spinnaker should be flown with 4" to B" of curl in the windward luff at all times. An overtrimmed spinnaker will close the slot between the spinnaker and the main. It will not only make the boat sail much slower, but the spinnaker will also become more difficult to fly. Set your pole topping lift height so that it is roughly parallel to the horizon. In light winds it is necessary to lower the pole, in a breeze raising the pole will keep the 2 clews even. Set the pole position nearly perpendicular to the wind when selling on a broad reach or a run. A telltale on the topping lift 1 ft. up from the pole will greatly aid in setting the proper angle of wind to pole position. Finally, ease your halyard off the top of the mast approximately 6" to help open up the slot between the spinnaker and the upper sections of the main,

Weight Placement

Upwind in very light winds the helmsman should sit just in front of the traveler with the crew placed just forward of the centerboard thwart. In medium winds the helmsman will move aft slightly just straddling the traveler. The crew will be anywhere from just behind the thwart to just forward of the helmsman. In a breeze the helmsman will move aft of the traveler. When on the trapeze, the crew will have his/her aft foot just forward of the helmsman's body. When hiking the crew will be just forward of the helm and hopefully leaning aft and angled behind the helmsman. Remember to keep the weight

centered so the boat proper balance through chop.

We would like to acknowledge Tyler Moore's help in putting the tuning guide together. We encourage you, if you have any questions, to give North Sails One Design a call. Good luck and good sailing.

-Your North Club 420 Representatives

North C420 Upwind Sail Trim Chart

Wind m.p.h.	Rake	Rig Tension	Mast Blocks	Centerboard	Cunningham	Outhaul	Mainsheet Tension	Vang	Jibsheet windward	Jibsheet leeward
0-6	21' 6 1/2"	240	none	max down	wrinkles in full luff	no vertical wrinkles	upper batton open 10"	loose	1 1/2"	eased
7-12	21' 3 1/2"	280	none	max down	wrinkles in lower 3/4 luff	no vertical wrinkles	upper batton parallel	loose	2"	tighter (foot taught)
12-18	20' 1/2"	320	+1/4" gap	max down	wrinkles in lower 1/2 luff	more tension	upper batton parallel	medium	1 1/2"	tighter (foot taught)
19+	20' 9 1/2"	360	+1/8" gap	up 2-3"	no wrinkles in luff	maximum tension	upper batton open 10"	max- (slight overbend wrinkles)	none	tight (foot smooth)