



# 420 Racing Guide

The key to read this tuning guide is not memorizing it, but to understand it in order to be aware through the boat feeling how the settings will effect speed.

## Preparation

Your preparation goals should be to ensure:

- Boat safe and strong enough not to fail in any condition.
- Present a clean profile both to wind and water.
- Allow smooth, easy and hazard-free control of all adjustments.
- Always have the best spar, foils, fitting and possible hull.

## Hull, centerboard, and rudder

Everything shall be very clean. If the centerboard or the rudder need a polish à put it on.

Make sure that the centerboard is in a fix contact to the boat. Be sure that it is allowed to raise the board in rough conditions.

## Rig

The rig requires only a minimum amount of work:

- Tape the ends of the spreaders to protect the spinnaker.
- Put a cable clip on the end of the spreaders that the spinnaker sheet are not able to knot
- Be sure that all adjustment systems are not able to slit the sails à on sharp places put tape on but be aware of windage if you put too much of it on.
- Make sure that the trapeze wire and the terminals are correct.

## Deck layout

- There are a few small items that will improve your boat handling:
- Adjust marks on the wave breaker to see your individual jib setting.
- Glue extra grip-tape on the deck, where the crewman has to stay
- Use tapered spinnaker sheets.
- Have a look for the mast and the mast partners there should be no space.

## Tuning the Rig

Wind Strength	0-6	7-11	12-15	16-19	20+
<b>Mast Foot Position*</b>	42cm	42cm	43cm	43.5cm	44cm
<b>Shroud Tension*</b>	28	30	30	29	29
<b>Spreaders length</b>	46-48/46-48	46-48	46-48	46-48	46-48
<b>Pre-Bend</b>	3.5cm	3cm	3cm	3cm	3cm
<b>Mast Rake</b>	609cm/120cm	607cm/118cm	605cm/116cm	602cm/112cm	597cm/107cm
<b>Jib Wire Tension*</b>	21	21	20	18	16

- \*The **mast foot position** is taken from the centerboard-pin to the middle of the mast profile. Generally if the boat turns quickly into the wind, then the mast position is too far aft and needs to be moved slightly further forward and the other way around.
- \***Spreaders length**: Make sure that you know the general effect of long or short spreaders. The longer the spreaders are, the mast becomes stiffer sideways.
- \***Jib wire tension**: This will affect the amount of sag you are sailing with.
- \*Loose & Co Model-A <http://www.loosco.com/>

*This Tuning guide is specialized for Proctor Kappa model but also a benchmark for Superspar M7.*

**Chocks:** The chocks control the pre-bend of the mast. In light wind conditions you will not need any chocks. If the wind is getting stronger you need them to close the leech to get more power. Then you can put in more chocks in than the neutral position. In very windy conditions you can sail with lesser chocks helping the depowering.

## Sail Trim

Once your boat is set up properly, there are three sail adjustments that will affect your boat's speed more than any other while sailing to weather. These are mainsheet tension, jib sheet tension and kicker tension. If you feel that you lack speed, there is a 90% chance one of these adjustments is incorrect. By following this trim guide you can spend more time concentrating on tactics while still going fast. Be sure that you know the general theory

- Flat water, strong wind -> flat sail
- Choppy water, light wind -> powerful sail
- Choppy waves -> more twist, more speed
- Flat water -> less twist

## Mainsail Trim

### Top Battens

Max tension in light medium conditions to power up the top of the main. Use medium tension in heavy air. A stiffer batten will be quicker in more than 18 knots.

## Mainsheet

The throttle of the boat!. Your aim is to keep the aft part of the top batten between 5 degrees inn and 10 degrees off the boom paralleling. Light air trim the main so the top batten is between parallel to boom or twisted open 5 to 10 degrees when light and chop. Sheet hard in medium so the batten is parallel or 5 degrees to windward for max power. Once the boats becomes overpower use the mainsheet to control twist and adjust continually for s peed and stability.

## Bridle

Bridle length should be adjusted as long as possible allowing 4-6cm of over-trimming before mainsheet system gets block to block. Use the new clam cleat system to adjust the bridle always to the right position. You can also sail with a shorter bridle but never forget the possibility of topcoat.

## Cunningham

The Cunningham controls the fore and aft position of the mainsail draft. In light air, the Cunningham is totally eased so there are horizontal luff wrinkles in the sail. More wind means more Cunningham to get a flatter and more open mainsail.

## Outhaul

It should be pulled in light and strong wind condition for a flatter profile. In medium conditions it could be great to do a depth into the mean to produce more power that the crew has the possibility to trapeze. Naturally on the run it should be opened.

## Jib Trim

The Ullman jib comes with a leech telltale sewn on the leech. This telltale makes trimming the jib really easy. In most conditions trim the sheet hard enough so the telltale is just on the verge of stalling. The skipper can see the telltale if he look under the mainsail. The times it can be stalled and should not be are in really light air, choppy conditions, out of a tack, off the starting line and whenever you feel slow. The height of the jib is also very important. The fastest will be if the jib touches the deck slightly. The crew has also to adjust the barber haul. This makes the jib more powerful and faster in conditions with high waves but when you are overpowered put it off.

Wind Strength	0-6	7-11	12-15	16-19	20+
<b>Centerboard</b>	Angled Forward	Normal/Vertical	Lift Slightly	Raise	Raise A Lot
<b>Chocks</b>	0/-1	0	1/2/3	2	1
<b>Kicker</b>	Slack	Tack out slack	Ease On	Pull Hard	Pull Hard or Open
<b>Cunningham</b>	No Use	No Use	Lighter Teams Use	Pull	Pull Hard
<b>Barbahuiler</b>	None	None	Pull	Pull Harder	Ease

## Sailing the Boat

### Upwind

The 420 is most efficient when sailed as flat as possible. Excessive heel causes leeway which is slow. The skipper must work the helm and the sail controls to keep the boat at a constant angle of heel while the crew trapeze as hard as possible. In regards to steering, the boat should not be pinched unless in heavy air and flat water. In light air, the crew weight should be as low and close together as possible and forward to the shrouds. Promote some leeward heel in super light air.

### Downwind

Like upwind, the 420 should be sailed flat. Crew moves side to side to keep the boat flat. The weight should be low and forward while in displacement mode and gradually move aft as the wind increases to promote planing. In extreme conditions, one crew may move behind the skipper. In light air, sail a hot angle to keep the boat moving at all times. As the breeze increases, begin to bear off to sail the puffs as low as possible till the boat slows, then head up to regain speed. This should be a constant S course. In planing conditions, sail a hot angle again to promote planing. Once planing bear off till the boat is about to fall off of the plane and then head up again to maintain the plane. The extra distance sailed to plane is easily compensated for by the tremendous gain in speed. In light to medium air, the crew should roll jibe just as roll tacking upwind.

### Sail Care

After each use, wash the sails with fresh water and dry thoroughly. Roll the mainsail from the head down while keeping the battens parallel. If the main will not be used for a while, release the batten tension. If the boat will not be sailed in a while, also roll the jib from the head down and store in its tube bag. Flake the spinnaker and store in its bag.