



For any question you may have on tuning your Sonar for speed, contact our Sonar experts listed below:

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One Design

**Sonar
Tuning Guide**

This comprehensive tuning guide will give you the key information needed to stay in the front of the Sonar Fleet whether you are sailing at the local or national level. Our sails are designed with proven technology in cloth as well as shape to insure durability and speed on the race course. Our sails are also designed to keep things simple in order to give you the confidence that is needed to keep your head out of the boat while sailing in close One Design competition.

TOOLS NEEDED

- 50 Foot Tape Measure
- Shims (At mast partners)
- Electrical Tape
- Silicon
- Screw Driver
- Level
- Mast Blocks (six 1/2" blocks)
- Indelible Marker
- Adjustable Wrench
- Model "A" Loos gauge

Before Stepping the Mast

1. Forestay should be 25' 11" when measured from the bearing point of the Tee fitting aloft to the center of the turnbuckle clevis pin.
2. Clean and lubricate turnbuckles.
3. Spreader angle: set deflection at 2 3/4 -- 3".

***To get proper deflection measure from the back face of the mast to a line extending between the holes in the spreader tips. This distance should be 2 3/4 -- 3".*

After Stepping the Mast

1. Adjust partner to fit snugly side to side (so mast is centered.)
2. Mast step: Measure the distance from the aft face of the mast where it meets the step casting to the gel-coat edge of the center of the cabin opening lip near the floor. This should be set between 28 1/4" and 28 3/4". (Ontario boats only.)
3. Next, measure the distance from the forward edge of the mast partner opening to the center of the headstay anchor point. The class rule limits this distance to 7' -11.5".

Fine Tuning the Rig

1. Center the mast laterally using a tape measure on the jib halyard to a common spot on the port and starboard rails.
2. Remove any mast blocks as well as the lower shrouds from the chainplates.
3. Remove the slack from the backstay until the headstay just becomes taut (no mast bend.) Place a mark on the deck abeam of the aft face of the mast. This is your reference point in the relaxed state.
4. Now pre-bend your mast at the deck with mast blocks on the aft side until you have moved the mast 1" forward of the mark. Make a new mark and erase the old. This is the new "Neutral" position.
5. Next, you want to tension your upper shrouds in equal increments on both

sides to between 230-260 pounds using a "LOOS-Model A" tension gauge (cable size is 5/32" or equivalent.) Check the mast laterally again by repeating step #1.

6. Finally you want to attach the lower shrouds and adjust them so that you can make 8 to 10" circles with them at shoulder height. This requires some guess work but loose lowers are required to keep the tip of the mast in column when you are sailing. Minor adjustments should be made to your lowers when you first go sailing by sighting up the mast track and tightening or loosening the lowers to keep the rig straight. Now you have a great starting point and adjustments will be made from and relative to this position depending on different wind strengths and sea conditions.

Trimming Your Sails

It's important to mark all your shrouds, sheets, tracks, outhaul, backstay, etc. Keep records of your tuning set-ups for different conditions in order to be able to reproduce settings when you know the boat was going fast.

BLOCKING

You want to make six 1/2" wide plastic blocks from the template shown below, this will give you the proper amount of blocks to take up the extra space and allow you to block the mast according to our chart. ****Blocking measured from aft face of mast relative to the neutral position.**

Blocking Positions:

Light Air/Flat Water: 1" in front of neutral
Light Air/Lump: 1/2" in front of neutral

Medium Air/Flat Water: Neutral
Medium Air / Lump: Neutral

Heavy Air/Flat Water: 1/2" behind neutral
Heavy Air/Lump: 1" behind neutral

Mast blocking has two profound effects. First, the more blocks you put behind the mast the less headstay tension you will have and the more the headstay will sag. This results in a deeper and more powerful jib for light and lumpy conditions. Secondly, blocking in front of the mast will create more headstay tension thus a flatter jib for windy conditions. The second effect is relative draft position of the lower part of the main. In lighter air blocking to induce pre-bend (behind the mast), will remove forward draft and decrease the depth of the sail. In heavy conditions, you will want to block in front of the mast in order to power up the bottom part of the main in order to help you through rougher seas. Remember blocking in front also give you more tension on the headstay for a flatter jib.

Mainsail

Trim the mainsheet hard enough to make the top batten parallel to the boom. You can check this by sighting from underneath the boom on a vertical plane. Once the boat has accelerated and you want to point higher, trim harder (2-3") to cock the top batten slightly to weather. If the mainsheet is too tight (evidence by top batten hooking to weather), you will

slow down. In light air and choppy water, the top batten should be parallel or twist off slightly. You may want to mark your mainsheet somewhere in the middle so you have a nice reference point for mark roundings and upwind sailing. Pull the traveler car to windward until the boom is on centerline. To check this, have your crew sight aft along the boom and line up the center of the boom with the eye that attaches the backstay to boat (this should be in the center of the transom). Keep the boom on centerline up to 12 knots and gradually drop the traveler to keep helm and heeling under control as wind speed increases. The lens foot allows the sail to act as a loose-footed sail. Upwind the lens foot should not be fully open. To set your outhaul properly, use the following guide:

****This chart is based on settings relative to the black band**

KNOTS	OUTHAIL TENSION
0-5	Eased 1 1/2"
6-10	Eased 1"
11-14	Eased 1/2"
15+	Maximum

****On reaches and runs the outhaul is eased 1 - 2".**

The cunningham is used to position the draft in the main. Your goal should be to keep the maximum draft position 50% back in the sail or just slightly forward of this. In a new sail, we use no cunningham up to 6 knots, enough

to remove most of the wrinkles in 7 - 14 knots and progressively tighter in higher winds so there are no wrinkles. Pull the cunningham very hard above 18 knots to move the draft forward in the top of the sail. Under most circumstances, you do not need much backstay tension. The exception would be in breezy, extremely puffy conditions, particularly when combined with flat water. In these conditions, you can use the backstay as a power control. Pulling the backstay reduces the power in the mainsail up high by opening the leech, thus reducing heel and weather helm. Remember, backstay has a large effect on luff sag. A tighter backstay equals less luff sag. More luff sag makes the jib entry fuller and moves the point of maximum draft back. This is best in light air and flat water. As the breeze freshens, a straighter jib luff produces a flatter jib entry. Use the boom vang downwind and on the reaches to control the amount of twist in the mainsail. The twist should be the least amount that still permits attached flow at the upper batten telltale and stalling is unavoidable. From 100 degrees or so to a dead run set, the vang so the top batten is parallel to the boom. Your main sail is equipped with a leech cord. The primary function of the leech cord is to prevent the leech from fluttering. In windy conditions, tension the leech cord to prevent the leech from fluttering. In light to moderate conditions, pull it just tight enough to eliminate flutter.

Jib

Your North Sonar jib does not have a wire in it. Therefore, luff sag is controlled by headstay tension (see blocking and backstay section of tuning guide). Luff sag

is measured as an offset from the center of the jib luff to a straight line between the head and tack of the jib. To trim the jib correctly, you must have the lead in the proper fore and aft position. This is accomplished by moving the lead forward or backwards until all three telltales on your jib lift at the same time as you begin to pinch the boat above a close hauled course. If you find that the windward telltale on the top of the sail lifts before the ones lower down, this is an indication that the lead is so far aft and should be moved forward. Conversely, should the windward telltale on the bottom of the sail lift before those higher, then you should move the lead aft. After experimenting in say 8 to 12 knots and you have your central lead position, you may want to move the lead forward a little in very light air and aft a bit when the breeze is above 15 knots. The most critical adjustment you will make with your jib is the sheet tension. The best way to gauge this is to pull the sheet is when you are going upwind until the upper batten is parallel to the center line of the boat at the back end, or perhaps points just to leeward from parallel. In no instance do you want the upper batten pointing to windward towards the mainsail. This will create backwinding and stall the boat which will slow you down.

Spinnaker and Downwind Sailing

Set the vang so the top batten is parallel to the boom. Ease cunningham, outhaul and backstay. Trim the spinnaker so there is 6" to 8" of curl in the luff. Keep pole perpendicular to apparent wind. Keep

outboard end of the pole even with the free clew. On runs you may want to use some leeward tweeker to keep the leeward leech from opening too much.** Remember, over trimming the spinnaker (never allowing the luff to curl) chokes down the slot between spinnaker, leech, and main. The result is a boat driven sideways instead of forward.

Steering Technique

The Sonar has a very big main, therefore, it is very important to balance the boat for different wind strengths. If your boat is not balanced, you will feel it in the helm. In heavy conditions you want to de-power the main in order to reduce windward helm. Since hiking is limited in the Sonar class, it is a good idea to sail with four people, you can use these people to your advantage by moving them around in the boat. Use crew weight to help steer the boat upwind as well as downwind. In light air, keep the crew weight low and forward in the boat as the wind freshens moves the crew weight to the windward rail and forward and close together. In all conditions playing the mainsheet, traveler and backstay will keep you in close tune with the helm. Remember, steering fast is a function of concentration and balance of your boat.

This tuning guide has provided the numbers and know-how to balance your boat. Now it is time to get out and practice and enjoy the upcoming racing season.

Sail Care

Your new main and jib are made from stiff resinated cloth. With just a little extra care, they will perform at top speed longer than softer materials. Both main and jib come in tube bags. They should be rolled starting at the head straight down the leech so that the battens remain parallel. The spinnaker should be flaked so that the leech tapes do not get wrinkled. The spinnaker should not be stored wet for long periods of time -- some bleeding of colors may occur and this is not covered by warranty. All sails should be rinsed periodically to remove salt and should be dry when rolled up. Diligence in these areas will dramatically extend the life of your sails.

Contact North Sails

For tuning information and complete details on how to setup your Sonar sails contact the North Sonar experts listed on the cover of this guide.

Good Sailing!

**NORTH SAILS ONE DESIGN
 QUALITY CONTROL CHECK**

Sonar

MAINSAIL		JIB		SPINNAKER	
Corners		Corners		Corners	
Cunningham		Battens		Numbers (black only)	
A001 near headboard on luff rope		Luff Tabs		Country Code (black only)	
Tack slug		Telltails		Velcro	
Royalty (signed)		Leech telltales		Royalty	
Numbers (black only)		Leech Chord		North Logo	
Country Code (black only)		Trim Chord		Bag	
Battens		Foot Chord			
Leech Telltales		Trim stripe			
Leech Line		Royalty			
Insignia		North Logo			
North Logo		Bag			
Bag					

Checked by: _____

Date: ____ / ____ / ____