



## Shields Tuning Guide

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### I - BOAT PREPARATION

#### THE IMPORTANCE OF THE PROPER TUNING

The Shields is one of the most successful, classic design keelboats in the world. However the same classic, elegant looks that make people notice the boat are also some of the reasons it is one of the more difficult boats to prepare to race. The class limitations allow for very strict one design conformance, which make tuning and sail design extremely important for performance and longevity.

The fact that class rules allow only one sail acquisition per calendar year added to the fact that the three sails that are carried while racing must go through wind ranges of 0-30 knots are very large obstacles that we all must face while racing the Shields. We need our sails to be very flat in heavy air yet full and powerful in the light stuff.

Through some simple adjustments to the headstay and trim we are able to make the Shields perform through all conditions.

#### BOAT PREPARATION

**Hull** - We all know a smooth, fair bottom makes any boat go faster and a Shields is no exception. We recommend that the bottom be faired (see rule 4.4) and properly finished with a racing bottom paint before launching at the beginning of the season. Be certain to check with the Chief Measurer before any major or professional work is done to your hull. During the season it pays to have the bottom cleaned at least once a week and preferably two or more times during the active marine growth period of your region.

#### RIGGING

The simpler your control lines work the easier it is to sail a Shields fast. There are many ways to set up your controls but we have found the following to be among the most important:

**Gooseneck** - The fixed gooseneck is available through many sources including Cape Cod Shipbuilding. This is an easy to install item that all but eliminates the possibility of gooseneck failure. When installing make certain that

the fitting conforms to Rule 5.10.

**Cunningham** - A purchase of 4:1 is suitable for all adjustments to mainsail luff. Make certain that the Cunningham is easily accessible from either rail and will not bind up when used.

**Vang** - The maximum purchase of 8:1 is required to get sufficient tension on the mainsail leech when running in heavy air. A cascading 8:1 purchase is best is the best vang purchase. This purchase system allows for ease of cleating and most important provides the power for reaching. easing must be considered. When installing or updating your current system consider whether the system used provides for the easy ease of the vang.

**Backstay** - An 8:1 purchase led to a cleating system that exits amidships where the skipper sits is a must for changing gears in the Shields. Having the backstay led side to side allows for quick adjustment to mast bend and headstay tension, which is most critical in sailing fast through wide wind ranges.

**Traveler** - The traveler is perhaps the most important control of all. The traveler must be led to the midship position across from the skipper so that the skipper or the main trimmer can quickly and easily make the adjustments. An 4:1 or 5:1 purchase is recommended. It needs to be set up so that it can be played, cleated and uncleated while sitting on the weather rail.

**Twing Lines** - Spinnaker twings are very inexpensive to install and make controlling jibes much simpler. We use Harken 146 bullet blocks snapped onto the twing line with a stainless steel snap hook so that the twing block can be removed in light air.

## RIG TUNING

### I. Step 1.

Before stepping your mast the following procedures need to be followed:

**A.** Make certain your mast has the black band on it at the proper position at the gooseneck as defined by rule 5.8 (2' 5" above the deck).

**B.** Run your backstay down the aft face of the mast and make a mark (use nail polish or similar) 11" up from the bottom of your mast. If your backstay is too short you will need to add length. If too long, it will need to be shortened. Please consult a local rigger for the best way to do this. This mark will be referred to as "Backstay Datum" mark for the rest of this guide.

**C.** Run your forestay down the front face of the mast and make a mark on it at the top of the black band at the gooseneck. This mark we will call the "Forestay Datum"

**D.** A backstay guide needs to be installed on the back deck to measure the amount of backstay that is pulled on at any one moment. We use an old batten mounted on an angle bracket with 1" marks

for a length of about 12".

## AFTER STEPPING THE MAST

**A.** Step 2. Using the "Forestay Datum" adjust the headstay so the mark is 47" from the point where the headstay meets the deck. This is your standard rake position. Typically, at least one Merriman 3 1/8" toggle is needed. The Merriman part number is 5770-312 for bronze and 5770-412 for chrome. Prices should be around \$20 to 23 each.

**B.** Put chocks and/or blocks in the mast partners so that the mast is pushed as far back in the partners as possible and it will not move.

**C.** Attach the upper and lower shrouds and check to be certain that the spreaders are bisecting the shroud angle. This should put the spreaders at an angle about 2" to 3" above perpendicular to the mast.

**D.** Tension the upper shrouds to 800 pounds using a "Loos" tension gauge. Check that the mast is centered in the boat by taking the jib halyard and checking for mast tilt side to side at the clevis pins.

**E.** Tension the lower shrouds to 300 pounds. Sight up the aft face of the mast to be certain that the mast is straight throughout its overall height.

## HEADSTAY ADJUSTMENTS

All active Shields racers have, at one time or another, seen the foredeck crew of a competitors boat on the bow adjusting his/her headstay length. The following table (Headstay length table, Table 1.) indicates headstay length adjustments for three typical wind conditions.

When adjusting your headstay length please be certain to take caution in hazardous conditions. We have found that having the headstay not at the exact proper length is still faster than having a crew fall over-board. Also, carry extra clevis pin "ring dings" on the boat for the ones that may (read: will) fall overboard during some adjustment.

<b>HEADSTAY LENGTH TABLE</b>		
<b>Headstay length</b>	<b>Wind Speed</b>	<b>Notes</b>

47" (Standard)	8-20 MPH	This setting should be used as the all-around setting. It is the best setting for all-purpose conditions.
47 3/4" (Light air)	0-10 MPH	Light air, drifting conditions when maximum power is needed. This setting helps get the mainsail flat while increasing headstay sag to help power up the jib while increasing pointing ability.
46" (Heavy air)	19+ MPH	Shortening your headstay here allows you to pull on enough backstay to get the forestay very straight while allowing the mast to bend and not over flatten and invert your mainsail. The straighter the headstay in heavy air the faster you will go. Pull the backstay on HARD when the breeze is up!

Table 1.

The table indicates target numbers to use as a guide to get going. You may find that your particular boat and sailing style may deviate from these recommendations. Trying different adjustments may help you find the edge you are looking for to win the fleet championship or Nationals. Keep experimenting, but use these numbers to get you in the game.

## II - SAIL TRIM

Learning the set up and trim of your North Shields sails takes only a few minutes of practice time. The following notes will help you determine what to look for to get optimum trim and speed out of your Shields sails.

### MAINSAIL SETTINGS

The three key adjustments for the mainsail are the mainsheet, backstay and traveler. The outhaul, Cunningham and vang help set sail shape and twist.

**Mainsheet** - When trimming the mainsheet we use, as a trimming guide, the aft 12" of the top batten. For most conditions we will get this section parallel to the boom. In light to moderate air and flat water we will trim it so

that it is 2 or 3 degrees closed. If the boat stalls or begins to slow down, ease the sheet to get it going again. In heavy air the top batten will be open 10 to 12 degrees.

**Traveler** - We use the traveler very aggressively on the Shields to balance the helm and actually help steer the boat. Under 10 knots of breeze, after adjusting the mainsheet, pull the traveler so that the boom is within 6" of the centerline of the boat. Over 10 knots ease the traveler up and down to balance the helm. Try not to allow the traveler to go all the way down in any condition as this will make steering the boat and keeping it tracking very difficult. Generally the traveler will not fall below the cockpit coaming.

**Backstay** - The backstay's main use is to tension the headstay. In light air you should be able to adjust the backstay so that the draft is in the middle of the mainsail while the jib does not get too flat. Your mast should have about 1/2" of bend and the headstay should still sag about 6 (Headstay length table, Table 1.). If the headstay is not long enough, pulling on any backstay will over flatten the jib and this is very slow. If the mainsail looks circular and the jib looks round in the front then you have achieved the proper light air.

**Headstay** - As the breeze comes on, and it is over 10 knots, you should set your headstay shorter. This will allow you to pull hard on the backstay and straighten the forestay to keep the jib flat. In breezy conditions (16 knots +) you should have the backstay pulled on so that the headstay has no movement or bounce in it. If the mainsail develops overbend wrinkles (wrinkles from the clew radiating out towards the luff of the sail then your headstay will need to be shortened to achieve this look. Once you have these measurements on your boat and know where to set your headstay and how hard to pull the backstay (use the gauge that you have installed on your back deck with the 1" increments) to document and duplicate the settings for future use.

**Outhaul** - The outhaul is set so that in light to medium winds the clew is 1 1/2" from the back band and in heavy air the clew is 1/2" to 3/4" from the band. The band position is measured from the aft side of the mast to the end of the boom and should measure 13' 3 5/8".

**Cunningham** - The Cunningham we leave slack until over 10 knots of wind. Above this we tension the Cunningham to remove wrinkles and keep the draft forward on the mainsail. It is important to note that while there is no band measurement at the top of the mast, the top of the boom cannot be closer than 2' 5" to the deck, at the black band. If you do not have a fixed gooseneck at 2' 5" make certain that you slide the boom down to that point after hoisting the mainsail and pull the Cunningham on to that point to keep the boom from riding up the track of the mast.

**Vang** - The vang should have an 8:1 purchase to make adjusting it as easy as possible. Set the vang so that downwind the top batten is parallel to boom. In very heavy air downwind pull the vang on very hard to help limit the amount of rolling. If you do broach while going downwind, blow the vang to help relieve load at the top of the mast and get the boat upright again.

## **JIB SETTINGS**

The three adjustments on the jib are sheet, lead and halyard.

**Jib sheets** - We use 1:1 jib sheets because they are faster on the tacks and they don't easily foul. Sheet to the inboard fore and aft track only.

**Jib leads** - In light to medium wind put the lead at the "T" where the side to side tracks intersect the fore and aft track. In heavy air you may decide to move the leads back one hole. At the tack of the jib use a long shackle to get the tack 4" off the deck. To be certain that your lead position is correct view the foot of the jib where it hits the deck. The foot skirt should lie about 6" to 7" in from the hand rail that is on the deck (not the toe rail that is at the edge).

Jib sheet tension - To judge sheet tension use the middle batten of the jib. This should be parallel to the centerline of the boat. For light to medium conditions this will put the leech of the jib about 4" inside the spreader tip. In heavy air the batten will be twisted open about 5 to 10 degrees from the centerline.

**Jib halyard** - The jib halyard should be set loose enough in all conditions so that there are just a hint of wrinkles coming off of the hanks. As the sail ages (1 season or older) the halyard should be pulled so that all the wrinkles are removed.

## SHIELDS

Builder and/or Distributor: Cape Cod Shipbuilding Co. (USA).

Designer: Olin Stephens.

Specifications:

- LOA: 30' 3"/9.22 m
- Beam: 6' 5"/1.96 m
- Draft: 4' 9"/1.45 m
- Displacement: 4600 lbs./2090 kg
- Sail Area: 360 sq. ft./33.4 sq. M

**Builder's Remarks:** This superb design is a lively, well-balanced boat that is fast in light weather and extremely able in a hard breeze. The hull and deck are made of hand-laid fiberglass and color-impregnated gelcoat. The one-piece molded hull is bonded to the deck with fiber-glass, while still in the molds, to assure true and consistent lines. Flotation compartments are located under the fiberglass seat and floor and hull liner.

**Good Sailing!!**

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