



SHORE SAILS
ETCHELLS TUNING GUIDE
1997

*The definitive guide
to sailing your Etchells fast*

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I. INTRODUCTION

“Fast sails for normal people”

The **SHORE SAILS** tuning system is simple, sophisticated and effective. We have tested and simplified our techniques over many seasons of racing. Some of our techniques may be new to you, but you will find them easy to use.

SHORE SAILS for the Etchells are designed to help you minimise headstay sag, which is clearly a fast technique. When more power is needed in the jib, the lead is moved forward. This approach makes double snaps unnecessary.

The **SHORE SAILS** Etchells Tuning Guide will help you to tune your boat thoroughly and with confidence. We want you to understand how the tuning adjustments interact. This guide and on-the-water practice will help you to analyze your tune quickly and decisively.

Over the past few years, competitors in the Etchells class have become much more sophisticated in tuning their rigs. Mast foot movers, shroud position adjustments and systems for easily moving the mast partner blocks offer many options.

The rules allow us to carry only one main on the boat. This makes using and understanding the adjustment tools more important. We need tuning that is easy to understand and manage.

With **SHORE SAILS**, you are not restricted to one type of mast. Our designs and tuning adapt to stiff, medium and soft masts.

The four most important things are: sail it high, sail it flat, use enough backstay, have fun!

We want your feedback!



Let us know if you have good tuning ideas or if you have suggestions for improving our techniques.

Guide to the Guide

We take you through the process of setting up, tuning and trimming, starting by outlining the basic characteristics of the boat and rig, then going step-by-step to consistent boat speed in all conditions.

The best time to concentrate on tuning is before the race.

The key settings appear in the text with the discussion. They are summarized at the end of the tuning guide, together with a flow chart, for quick reference.

We think of tuning in stages according to when the adjustments can be made. These are:

- Mast preparation (Chapter 3)
- Stepping your mast and initial set-up at the dock (Chapter 4)
- Pre-race tuning on the water (Chapter 5)
- Tuning changes that can be made while racing (Chapter 6)
- Trimming (Chapter 7)

Pre-Race Tuning

▪ **Option 1**
0-14 knots

▪ **Option 2**
8-22 knots

▪ **Option 3**
18-30 knots



II. HOW THE ETHELLS RIG WORKS

The Etchells has a tall and flexible mast with few direct controls. The boat does not have running backstays, checkstays or swept back spreaders. We do not reef or change headsail size. The Etchells sailor has to persuade his rig to work for him.

Key to the Etchells: correct headstay sag/mast bend

Wind pressure in the jib naturally causes the headstay to sag into a curve, aft and to leeward. The effect on the jib is to make it fuller and to close the leach. To keep the headstay straight, we pull back on the mast with the mainsheet and backstay. This has a side effect, mast bend. There are several ways to control and shape mast bend and, thus, headstay sag.

We control mast bend and headstay sag by tensioning the mainsheet and backstay and by moving the mast partner blocks and upper shrouds.

Etchells sails are designed for mast bend and headstay sag

Some mast bend and headstay sag are inevitable, so all Etchells sails are designed to set correctly when the headstay sags (but not too much!) and the mast bends.

Thus, we have to *induce* mast bend and (a little) headstay sag in light air.

In heavy air we want to *limit* mast bend and headstay sag.

Mast bend and headstay sag: basic concept

Imagine disconnecting your headstay and putting partner blocks behind the mast. If you pull on the backstay and adjust the mainsheet, you can bend the mast until the main looks nice. Now, without changing these settings, imagine re-connecting the



headstay, hoisting the jib and adjusting the headstay turnbuckle until the sag is correct for your jib. This is a basic light air set-up.

In real life, we use a known headstay length and adjust partner blocks and shroud position to achieve this result.

Now imagine you don't have partner blocks behind the mast. The headstay is all that prevents the mast from falling backwards. The harder you pull the mainsheet and the backstay, the more tension you put in the headstay. This will give you too much mast bend, so you need to stiffen the mast with partner blocks in front and by moving the upper stays aft. This is a basic heavy air set-up.

Why upper shroud position and spreader angle affect mast bend

As the mast bends, the middle of the mast moves forward. The spreader, which is fixed to the mast, moves forward, too. However, the tension of the upper shroud resists the forward movement of the spreader, restricting mast bend.

By moving the upper shroud aft on the chainplate or fixing the spreader tips at a more forward angle, we can restrict bend (stiffen the mast) and vice versa. The spreaders influence bend in the middle part of the mast and the partner blocks affect the lower part, so we have tools to control both total stiffness and where the mast bends.

The effect of moving the mast butt

Mast butt forward reduces weather-helm and vice versa.

Because the partners are a fixed length, mast butt aft increases the amount of pre-bend possible by blocking behind the mast. When the butt is forward the mast can be stiffened more by blocking in front.



We only move the mast butt a little: forward one hole ($\frac{1}{2}$ "") for medium and heavy air.

Overall tuning objective

We always aim to keep the headstay sag in the same range of three to five inches, to give the main appropriate depth and twist for the conditions and to make the mast-bend even and well matched to the luff-curve of the main. We do all of this by setting the blocking, stay position and butt position in synch, then using the mainsheet and backstay.

III. HOW TO PREPARE YOUR MAST FOR TUNING

In this section, we explain how to measure the stiffness of your mast and then how to set your spreaders to the correct angle for your particular mast. We suggest tips for making standing and running rigging work smoothly.

Get to know your mast stiffness

Etchells masts vary in stiffness. They are all the same section, extruded from alloy of the same specification and cut to the same taper. However, variations in the alloy stock, the manufacturing process and the age of the spar lead to differences among manufacturers and between masts from the same manufacturer.

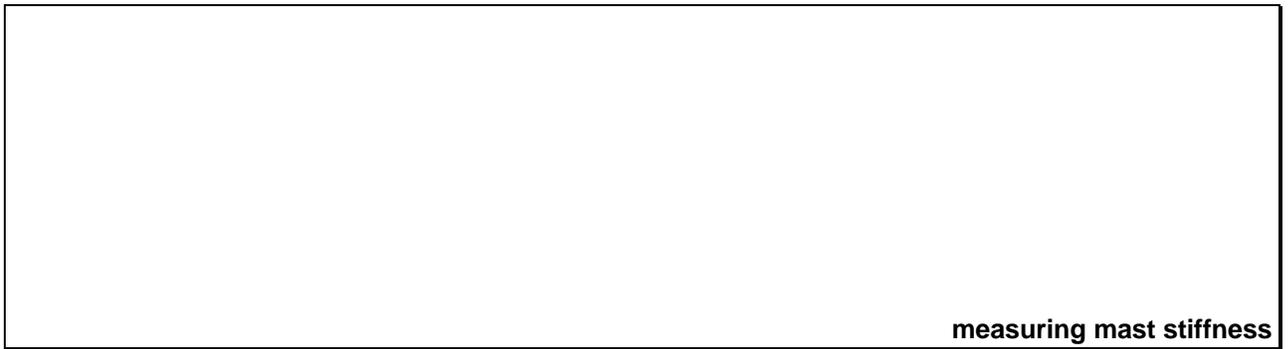
Mast Stiffness		
	spreaders	headstay
stiff	less than $1\frac{1}{4}$ "	less than 1"
medium	$1\frac{1}{4}$ " to $1\frac{3}{4}$ "	1" to $1\frac{1}{2}$ "
soft	$1\frac{3}{4}$ " plus	$1\frac{1}{2}$ " plus

It is helpful to measure the stiffness of your mast, as this gives a baseline for setting up your rig, and allows us to cut your **SHORE SAILS Main** to match your particular mast.

We classify spars according to



the table.



How to measure your mast stiffness

The standard system for measuring mast stiffness is easy to do.

- Lay the fully rigged mast horizontally on trestles, luff track up, so it is supported at the upper black band and at the position of the partners where the mast goes through the deck. Take care that the fore and aft axis is truly vertical.
- Tie all rigging along the mast so it doesn't touch the ground. Shackle the halyards to the spinnaker pole ring.
- Stretch a thread or light string **tight** from the upper black band to the lower black band, so it touches the aft edge of the mast at each band.
- Measure from the aft edge of the luff track up to the string both at the spreaders and at the headstay intersection.

Careful, thorough measurement and preparation is the key to good tuning and consistent speed.

The good news is that it only has to be done once!

Mast straightness

Many Etchells masts are not straight; sideways, fore and aft, or both. The most common bend is a curve to one side in the tapered section above the hounds. As this area is not controlled by the shrouds, a mast with this fault is hard to tune well.

The gentle art of mast torture.

We have had some success in straightening masts with sideways curve by supporting them on a padded sawhorse in the region of the bend, wedging the tip under something heavy, like a trailer, and pushing down hard on the butt. If you try this, have a spreader installed so you can restrain the mast from turning as you torture it. It helps to have two people for this job and to proceed cautiously, as overdoing it can fatigue the metal and leave the spar with no liveliness.



Do this at your own risk!

Fore and aft bend is rarely correctable. Some masts have a permanent aft set above the hounds and in others the track kicks forward in this area. These faults affect the stiffness measurements and may require a change from our recommended shroud positions. If you have a mast like this, you should let us know before we make your main, so we can adjust the luff curve.

Spreader angle

The most important factors in setting spreader angle fore and aft are:

- raking the spreaders back ***equally*** on each side
- choosing the correct angle for your mast stiffness

Recommended Spreader Angles (distance forward from aft face of mast)	
stiff mast	1 ¼"
medium mast	1 ¼"
soft mast	2" (spreaders are straight across)

We measure how far forward the aft edge of the spreader tip is from the aft face of the mast. When you lay a long straight edge across the aft side of the mast, how far forward is the spreader tip on each side?

*To measure the spreader angle, be sure to push the spreader tips ***aft*** firmly.*

Remember to pull aft on the spreader tips, as you want to measure the furthest aft the spreaders will go. The easy way to do this, when the mast is lying down, is to support the weight of the mast with blocks of wood under the spreader tips. If the mast is in the boat, be sure to have your stays adjusted and the backstay tensioned firmly.

Setting spreader angle

Kenyon spreaders. There are two techniques for setting the angle: glue them in with thickened epoxy, or wrap the end of the spreader



with glass fibre tape. We like the second method, as it is easier to fine tune the angle. The plastic inserts that come with the mast are useless.

First, check your spreaders are the same length. Then, wet-out some 2" fiberglass tape with polyester or epoxy resin and wrap it around the end of the spreader until it is too thick to fit into the spreader base.

Let the resin cure. Then grind it until the spreader fits into the spreader base at the appropriate angle. Re-drill the holes for the retaining bolts and re-make the cut-outs for the lower shroud tangs.

Spreader tip heights: most spreader brackets angle upwards slightly. This is correct. The spreader should bisect the angle between the stay above and below the spreader tip.



To set the spreader angle, it helps to level the mast on blocks, luff track up, and place supports under the spreader tips. Masts with extruded grooves in each side can be leveled by using the grooves as a reference. Masts without grooves can be leveled by using a level against the side of the heel plate, but make sure the bolts are tight.

Initially, aim to set the spreaders a little forward of your target position, as it is easier to grind away material than to add it!

Procter spreaders. These have an aluminum sleeve around the inboard end which can be filed carefully to adjust the angle.



Australian spreaders. These are a pretty tight fit. You may not be able to rake them back, in which case you can compensate by moving the shrouds forward on the chain plate. We discuss this under Initial Shroud Position on page 13.



Do not tape your spreader tips until after you have fine-tuned the spreader angle!

Final tuning of spreader angle

To fine tune and equalize spreader angle, we measure and adjust it when we have the mast fully set-up in the boat. The boat should be in the water with the shrouds tightened correctly, and the backstay tensioned. The next section discusses stepping the mast and initial shroud set-up.

Final spreader tuning is best done with two people. The measurements are taken from a ladder with its top securely lashed to the mast and to the deck near the front of the cuddy.

Please always use appropriate safety precautions when working aloft!

The spreader tips have to be at equal height above the deck. Measure to each spreader tip from the center of the front face of the mast at the deck. Push the tips up or down the stay until they are equal.

Now compare the fore-and-aft position of the port and starboard spreader tips by measuring carefully from each tip to the point where the backstay intersects the deck. Make sure the backstay is tensioned to bend the mast at least 3 inches.

If the tip positions measure equally within 3/8" (6 mm) and are also the correct distance forward of the aft face of the mast, have a beer!

If one or both of the tip positions are too far forward, you can slack off the upper, take the spreader out of the socket, slide it down the shroud to the deck, grind down the fiberglass and then re-assemble the whole thing. Re-tighten the upper shroud. It really saves time to note or mark the turnbuckle setting before you slack it off. Now re-measure. Repeat the process until both spreaders are correctly angled. In practice, this procedure goes quite quickly.

*\ time saver idea...
then you take your mast
own, loosen the turnbuckles
on one side of the boat only.*



If the tips are too far back, the quick fix is to shape a ½" length of hose clamp around the back edge of the spreader and slide it into the spreader socket so it pushes the spreader forward. Be sure to tape around the outside to keep it in place. The real fix is to re-fiberglass the spreader, which is why it is smart to grind down to the correct angle gradually!

Old-style Kenyon spreader bases are useless! They have an oval base plate, and are attached to the mast by four pop rivets. The best thing to do is replace them. The alternative is to connect them together by a stainless strap around the front of the mast, welded to each base plate. The objective is firm control of the aft swing of the spreader.

Shrouds and turnbuckles

The right equipment is really helpful.

- Use Dyform wire for the lowers. Dyform is a special low-stretch version of 1 x 19 wire. As the wind increases, the uppers, made of regular 1 x 19 wire, will stretch more than these Dyform lowers. This is good because it automatically re-tunes the mast for you! The result is improved performance in gusty winds and fewer adjustments to lower-shroud tension while racing.
- Use calibrated turnbuckles and write the settings on the deck, or use some other system to allow you to repeat settings, such as tape on the threads.
- The turnbuckles should be easy to adjust with a minimum of tools. Our favorite for the lowers are the flat strip style made by Staymaster, type 532 or 632. They can be adjusted by hand on the lee side, will fit in the next hole to the uppers and are relatively cheap. There are several other good options.

Another time saver idea...

leave the heel plug attached to the mast step when you take the mast down.



Marking the spreaders

Before you step the mast, mark the spreaders with a white band at the knuckle, as a jib trim reference. Not all spreaders are equal! Check that your mark is 19½" from the mast on both the port and starboard side. You should write *port* and *starboard* on the spreaders to prevent mix-ups later.



Spinnaker halyard size and sheaves

Make sure you have the thinnest legal spinnaker halyard. The rules call for 7.9 mm. Some brands of ¼" Spectra line, such as Samson Ultra Lite, are just big enough. Also, be sure to use Harken #160's for all three of the spinnaker halyard sheaves.

Check backstay length

We have sailed many Etchells on which the backstay was too long. The result is that the swedge hits the deck in heavy air. This prevents the use of adequate mast bend and guarantees you will be slow. We use a backstay length of 36' 6" pin-to-pin. This will never hit the deck.

While you have the mast out of the boat, it is simple to have a rigger shorten the wire and swedge on a new eye. We usually replace both ends.

You will have to change the wire lengths inside the boat so you can let the backstay off enough downwind. The objective for downwind is that the front face of the mast will go forward all the way to the front of the mast partner with a little slack left in the backstay.



IV. PUTTING THE MAST IN THE BOAT

For the purpose of initial set-up, we use light-air positions for the uppers, mast butt and mast partner blocks. In subsequent sections, we discuss how to change these settings for other conditions. We use one headstay length for all conditions.

Mast butt position

Step the mast. The mast butt position is measured in the standard manner for Etchells:

- Hold the end of the tape at the intersection of the aft deck and the stern, on the center line.
- Pull the tape tightly over the mainsheet track, through the center console and to the base of the mast.
- Measure to the aft side of the mast extrusion at the very bottom.

Light/Medium Air Mast Butt Positions (medium/heavy: ½" forward)	
aft keel boats i.e. Bashford, most Tillotson-Pearson, 1992 or later Ontarios etc.	17' 6½"
pre-1992 Ontario	17' 7"
We do not have data on some boats, such as Tietge, Driscoll, Pamcraft. If you are in	?

Tensioning the shrouds

The critical parts of setting up the shrouds are

- centering the mast
- tuning the mast straight



The boat should be in the water (it changes shape noticeably on the trailer) and head-to-wind. The backstay should be loose and the mast partner blocks removed.

The mast must be centered and straight.

We start by centering the mast athwartships in the mast partners. This is done initially with the lowers, and should be done very carefully. An off-center mast will set up differently from tack-to-tack.

Tighten the lowers, leaving the uppers really loose. You can check the centering of the mast roughly by using the pole topping lift and measuring to each chainplate. However, our preference is to look for equal space on each side of the mast in the mast partners. Some mast collars make this hard to see, but there is usually a little play, which allows you to see which side is under pressure, by pushing on the mast and seeing which side it prefers. The lowers should be fairly tight at this stage, around 300 lbs if you are using a gauge.

Now, tighten the uppers to around 700 lbs, sighting up the luff track repeatedly as you go to ensure the mast is straight.

If your mast has a permanent warp to one side, try to end up with the masthead directly above the luff track at the spreader level and ignore the wiggles in-between.

The best way to sight the mast accurately is to plaster your face against the mast so your eye is as close to the luff track as it will go.

This foreshortens the track, emphasizing the wiggles.



Shroud position for initial set up and light air

- If your spreaders are set at the recommended positions, put your *lowers in the third hole* from the front of the chainplate.
- For your initial set-up, put your *uppers in the second hole* from the front.
- If your spreaders are not in the recommended position, move both shrouds *one hole forward for each 3/4"* the spreader tips are forward of the suggested settings and vice versa.
- If you have Handilock or Spinlock turnbuckles with folding adjuster handles, you will need to move the lowers aft one hole. This will allow you to use the handles.

Now go back to the partners and check that the mast is still centered athwartship. If not, loosen a turn or two off both upper and lower on one side and take up an equal amount on the other. This will usually correct the situation.

When you have this right, the mast will be straight and pass through the center of the partners. It pays to keep working on this until you have it right. Record your settings!



Headstay length

This is measured in the standard Etchells manner. Before attaching the headstay, lay it along the front of the mast and mark onto it the height of the **top** of the black band at the gooseneck.

Headstay Length	
all boats	45½"

Now attach the headstay, tension the backstay and measure from your mark, along the headstay wire to the deck. If the headstay is already attached, use the jib halyard to transfer the black band position to the headstay. Be careful of stretch.

*Use the **top** of the black band to mark the headstay.*

Initial mast partner block setting

To get a starting point, we suggest you remove all the partner blocks, and tighten the backstay until the headstay just comes straight. Now check and mark the position of the mast in the mast port. Push the mast forward and put partner blocks behind until it is 1¼" forward of the mark. This is a typical light air position, which you will refine by using the techniques in the following sections. Make a note of the number of blocks you use.



V. PRE-RACE TUNING ON THE WATER

This section focuses on choices made before the race. These changes either cannot be made while racing or are very disruptive. To assess your choices, use the techniques described in subsequent sections.

There are three basic tuning **options**, for light, medium and heavy winds.

Tuning Options	
option 1 0–14 knots	uppers in hole 2, standard butt position, SUPER STEALTH JIB
option 2 8–22 knots	uppers hole 5 or 6 SUPER STEALTH JIB or WAVEBUSTER (14+: butt forward ½")
option 3	uppers hole 9 or 10 WAVEBUSTER

Before each race, choose the position of the uppers on the chainplate, mast butt position and the jib.

Jib changes during the race are painful. The uppers and mast butt may not be moved while racing.

Decision path for the three basic tuning options

Consider your crew weight, the wave action and whether you expect the wind and waves to build up or taper off. Decide which **option** to use. If you plan to use **option 2**, decide which jib to use and where to set the mast butt.

Sail upwind in race mode:

- Check your jib leads and sheet tension.
- Assess your mainsail shape.
- Experiment with backstay, mainsheet and partner block settings.
- Is your helm balanced?
- Check and adjust lowers.

Tune for the conditions you expect.



- Is the headstay steady or pumping?
- Do you feel fast, or should you consider another **option**?

Mast stiffness, choosing a jib and shroud position option

The differences between masts are quite noticeable. We recommend that if you have a soft mast, you should decrease the wind speeds for each option by two knots. If your mast is stiff, you may move the changeover points up two knots.

The wind ranges of the two jibs have a substantial overlap. The Stealth works well in 0–20 knots and the Wavebuster works well in 10–30 knots. This gives you opportunities to finesse your tuning.

Imagine it is blowing **12 knots**. What should your stay position and jib selection be?

Beware of being under-powered when the waves are big but the wind isn't!

- Choose **option 1** if there are lumpy waves and/or the breeze is steady or decreasing.
- Choose **option 2** with the **SUPER STEALTH JIB** if there are lumpy waves and the breeze is building or gusty.

Now imagine it is blowing **18 knots**. You can use a similar analysis:

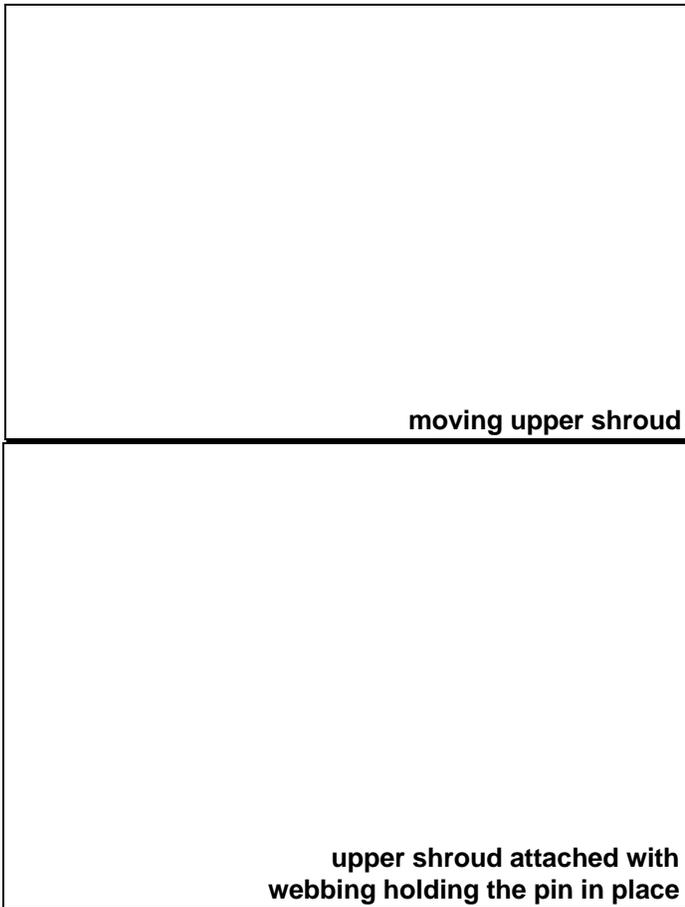
- Choose **option 2** with the **SUPER STEALTH JIB** if it is choppy with no major gusts, and/or the wind is going to decrease.
- Choose **option 2** with the **WAVEBUSTER JIB** if the waves are flat or big but longer and/or there are stronger puffs, or your crew weight is light.

How to move the uppers

Moving the shrouds or mast butt fore and aft while racing is illegal and unsafe!

*You can use the same upper turnbuckle setting for all three upper shroud positions used in the three tuning **options**.*





moving upper shroud

upper shroud attached with webbing holding the pin in place

We have a simple system to move the upper shroud position on the chainplate. Instead of normal clevis and cotter pins, we use Avibank pins, which have a spring-loaded ball in one end and a big ring-ding in the other end. The ring-ding acts as a handle. They are easy to push through or pull out of the turnbuckle and chainplate.

We use a loop of 3/4" nylon webbing, bolted to the deck ahead of the chainplate. It is just long enough to pull over the aft end of the chainplate as a safety strap.

This has three functions: it passes through the big ring-ding on the Avibank pin so you cannot throw the pin overboard; it is extra insurance against the pin coming out; and it stops the

guy catching under the pin.

The secret is that the webbing stretches when wet, so the loop needs to be long enough to just fit over the chainplate when wet. We use a screwdriver to lever it on and off.

When there is enough breeze to hike, the lee shrouds are slack and shifting the shroud is easy. No tension adjustment is necessary: moving the upper back makes it a little looser, which has the same effect as

The webbing on the chainplate should be wet to get it on and off.



tightening the lower, which is good for higher winds. You should always recheck your lower settings (sideways bend) after moving the uppers. ***Be sure you do not tack while the stay is detached!***

In light air, we attach the jib halyard to the chainplate on the lee side, tension it to steady the mast, loosen the upper turnbuckle and move the shroud.

Before tightening the turnbuckle, we tack, move the halyard over and move the other upper. Be sure you have enough thread left on the turnbuckle you loosened before you tack! When both stays have been moved, re-tighten the upper to the same setting as before.

Look at your main for correct upper shroud position

Remember that the objective is to get the mast bend to be even, so when you move the uppers back, you will have to move more blocks in front of the mast, to stiffen both areas equally. Then you get the correct bend by adjusting the backstay.

To read your mast bend, you have to understand the symptoms if one area of the mast is either too straight or is over-bending. Partner block settings are discussed in the next section, but similar principles apply.

If the mast is bending too much, over-bend wrinkles will come out of the clew of the main and aim for the part of the mast that is too soft. The sail will look flat and tortured along the line of the wrinkles. Pulling the Cunningham helps but won't quite cure the problem.

If the mast is not bending enough, the main will be too full, either in one area or overall.

When you have done your best to trim the sails and balance your helm for the conditions but you are still seeing mainsail faults, you probably need to adjust your tune by shifting your uppers, moving a partner block or both.

Q. "I can make my main full or flat, or even overbend the mast just by adjusting the backstay and the mainsheet, so what do you mean?"

A. A good starting point is to flatten the main until it is barely showing backwind from the jib.



Two common scenarios

The breeze increased. You moved blocks in front of the mast but are still getting overbend wrinkles. The wrinkles aim at, or above, the spreaders. When you de-power with the backstay, the whole sail looks too flat, twisted and gutless. When the main looks right you see too much headstay.

Solution. move the uppers back to stiffen the mid-part of the mast. Now, when you pull the backstay the main will twist and flatten at the top first and you will regain control over the headstay.

The breeze decreased. Your uppers are back. You put partner blocks behind the mast to soften the mast and the headstay, but the top part of the main looks full, cupped and closed. Pulling more backstay makes the bottom of the main ugly without helping the top and flattens the jib a lot.

Solution. Move the uppers forward so that the top of the main flattens out and looks as if it belongs to the rest of the sail.

Once you start to get some experience with these adjustments, you will be amazed at how effective they are!

If you are familiar with checkstays, you can think of moving the uppers back as tightening the checkstay.



VI. TUNING CHANGES THAT CAN BE MADE WHILE RACING

This section covers the position of the mast partner blocks, headstay sag and sideways bend using the lower stays. These adjustments should be part of your pre-race tuning, but can be changed during the race. Sail trim settings are described in Section VII, Upwind Trim, page 21.

Partner block settings

We strongly recommend installing an effective mast-moving system so that shifting the partner blocks is straightforward.

The symptoms for needing to move the partner blocks are similar to those for the upper shroud positioning which we discuss in Section V, Pre-Race Tuning on the Water, page 15.

- Too many blocks behind the mast create overbend wrinkles in the lower part of the main and too much headstay sag. The jib will be too full and the main too flat.
- Too many blocks in front of the mast make the main too full and the jib too flat because the headstay is too straight. The helm will feel heavy and choked.
- ***In the light and middle wind ranges, always aim for marginal overbend in the lower part of the mast, by putting blocks behind the mast.*** This is key. If the breeze drops a little and you are slow, move a block behind immediately!



When you find you need extreme trimming to achieve good helm balance, you should try a different set-up which leaves you room to power up and to depower.

- In light air and flat water, an extra ½" block in front of the mast than your normal setting can work.
- In heavy air, above 20 knots, we have most or all the blocks in front.

As always, settings vary according to crew weight, jib selection, mast stiffness, upper shroud position, waves, etc.

We always fill all the space in front and behind the mast with partner blocks so that the mast does not pump as the boat hits the waves.

Setting the lower shrouds

The Etchells is quite sensitive to correct side bend because the mast is tall, with a long unsupported section above the hounds.

Lower shroud tension is determined by sighting up the luff track while sailing upwind. We like to sight up the mast before the race to check our settings and to give us a baseline for changes during the race. When we make adjustments during the race, we keep track of the number of turns we make on each turnbuckle.

It is critical to learn to look carefully at side bend and to sight the mast correctly. The motion of the boat and the considerable fore and aft bend can be misleading. Practice this until you are confident. As with the dockside tuning, your eye must be as close as possible to the luff track. We kneel on the cuddy top, forward of the mast but facing aft, then twist sideways to squint up the track. We recommend removing your hat first!

We look at the relative position of the masthead and the luff track at the spreaders.

- Loosening the lowers allows the middle of the mast to sag to leeward, kicking the top of the mast to weather. This generates weather helm, punch and pointing in light



and light-to-moderate air (0–10 knots). Sideways sag at the spreaders is usually less than 1”.

- As the breeze builds and you need to depower, the lowers should be tightened, bringing the mast straight sideways by about 16 knots.
- In higher wind, the lowers can be tighter than the uppers.

The actual settings you use will depend on your crew weight, the stiffness of your mast, your jib selection and the size of the waves. As with all tuning choices, let your helm balance be the primary guide.

How much headstay sag is right?

Your headstay will always sag between 3”–5”. It is a common mistake to over-sag the headstay in light air. It is better to move the jib lead forward than to have a floppy headstay. If the headstay is moving or pumping a lot as you go over waves, it is sagging too much.



VII. UPWIND TRIM

Theory

To approach upwind trim, it helps to understand the way the boat responds to different wind strengths.

There are three broad regimes:

- under-powered
- adequate power
- way too much power

While the boundaries of these states vary according to wave size and crew weight, on any given day the transitions are quite clear. They are a result of the physics of sailboats. Each requires a different approach to trimming.

Sailing upwind, at any wind speed, only a small fraction of the force generated by the sail plan is pushing the boat forward. The majority of the force creates heeling, leeway and drag.

Under - powered

In the under-powered mode, the wind is so light that the friction drag on the hull limits boat speed to a couple of knots. Waves are major obstacles. The apparent wind speed effects on available power are minor.

Our strategy in this mode is to try to develop forward speed. If the breeze increases just a little, the very efficient Etchells rapidly overcomes skin friction and accelerates towards hull speed. This generates more apparent wind and the boat's speed will nearly double, with better angle.

The Etchells has a rare combination of stability and low drag.



Adequate power

The huge payoff for finding a little more wind when you are under-powered is the transition to the adequate power mode. The wave-making drag of the hull in displacement sailing increases rapidly as the boat approaches hull speed. With limited power available upwind, the boat hits the wall at 60%–70% of hull speed, which is the 4½–5½ knots at which we sail upwind.

This is the mode of the familiar trade-off where it is hard to sail faster, so we try to point high without having our speed slip. Between about 5–18 knots of air, the payoff for finding more breeze is mostly higher angle rather than a big increase of forward speed.

Way too much power

Above 18 knots, you have way too much power. Although you can keep de-powering the rig to maintain reasonable heel forces and forward drive, the drag on the rig, sails and hull increase dramatically as the wind and waves increase. So the strategy becomes one of minimizing drag by flattening and twisting sails, balancing the helm, sailing flat and avoiding waves.

Using sail controls upwind

The **SHORE SAILS** philosophy of “*fast sails for normal people*” means that our sails are designed with clean, natural shapes that respond well to trimming. They are not fussy or tweaky.

Allocate sail controls according to the skills and preferences of your crew.

Make sure your controls work!

We feel it is helpful to rank the trimming controls. This ranking is a combination of frequency of use and power of effect.

- backstay & mainsheet the primary and basic power controls for the whole boat



- jib sheet crucial for helm balance, speed, pointing and waves
- jib luff tension helpful with helm balance and jib shape
- jib lead position controls depth of jib
- main outhaul controls depth of main and helm
- cunningham used for balancing the helm in mid- and upper-wind ranges but rarely used below 10 knots
- traveler used to keep the boom on or above center, except above 15 knots and to help steer in waves.
- vang always loose upwind

The controls in detail:

- **Backstay & main sheet**

The **SHORE SAILS** mainsail has enough luff curve to allow generous use of the backstay, which keeps the headstay fairly straight. The jibs are designed to set this way. Our starting point is to set the mainsail just flat enough to have little or no backwind from the jib. Obviously we need to have the jib sheeted to roughly the right spot (see the discussion on Jib Sheet on page 24).

The most common error we see in Etchells trimming is insufficient backstay tension. The consequences are either a full main with a closed leach or a twisted but under-trimmed main with a floppy, sagging headstay. A tighter backstay allows

We design our SHORE SAILS Etchells mains and jibs to respond to a firm hand on the backstay.

Our designs allow a wide range of trim.



more main trim with twist control and restores the headstay sag to the correct profile.

The big roach of the **SHORE SAILS** main leach allows it to be set with some twist in most conditions and considerable twist in wind and waves. ***When in doubt, try more backstay!*** Even in very light conditions, we still bend the mast with the backstay.

The main sheet is usually trimmed quite firmly, as the main has an open leach. An inch or two of trim can change the way the boat feels and sails. If someone is trying to roll over you, and you need to go forward fast, a 2" ease on the sheet without changing anything else is effective. Note that when the main is trimmed correctly, the upper leach telltales will be stalled most of the time.

In very light air, we pull the traveler well to windward and keep the main sheet loose. It helps to take the spinnaker pole off the boom.

We pay close attention to main sheet trim, but once we find a good spot, we do not mess with it unless something changes. The moment-to-moment trim changes and gust management are done with the backstay. In light and moderate air, it can help to ease the sheet two to four inches after a tack.

We mark the backstay and mainsheet with one mark on each which is clearly visible through the full range of settings. This serves as a vital reality check to be sure that we are not straying too far from our normal settings. It is also great when coming out of the start or the bottom mark. If we are using an unusual set-up, the marks remind us and help us revert to normal trim easily.

▪ **Jib sheet**



Jib trim has a powerful effect on helm balance.

Jib trim has a powerful effect on helm balance. In moderate winds, tightening the sheet will reduce weather helm. However, pulling it too tight will choke the boat and give you a case of high-and-slow. If the jib is too loose, the main will need to be de-powered too much in order to balance the helm with the result that you will not point well.

We find it is easy to be wrapped up in balancing the helm with the main and forget the other end of the equation, jib trim.

While the generic rule of sheeting to the spreader knuckle is a useful reference and starting point, we often trim inside or outside the knuckle.

The best spot to see jib trim is from the lee side of the cockpit against the coaming. By checking from here before the race, we get a feel for the view through the trim window and the **height of the clew above the deck**. This is a constant quick reference, particularly after a tack.

- In light air, particularly if there is slop, our **under-powered mode**, we keep the jib eased a couple of inches or more outside the knuckle until the boat gets up to speed, into the beginning of **adequate power mode**.
- In a moderate and medium-heavy breeze, you can usually trim at or inside the knuckle. Trim tighter in flat water when the boat is up to speed. Trim looser when there are significant waves or the boat is below full speed.
- In very heavy air, our **way too much power mode**, it sometimes works to ease the jib as much as 3 inches to help balance the boat. This avoids lee helm and makes steering around waves easier.



▪ Jib luff tension

In winds up to about 12–14 knots, we set jib luff tension just loose enough to see wrinkles from the snaps about one-third up the luff. For higher winds, we smooth out the jib luff. Over-tensioning the luff a little can help with helm and de-powering in the upper wind range of each jib. Older jibs need more luff tension than newer sails.

SHORE SAILS Etchells jibs are built to be the correct shape for their range. You do not need to coax the draft into position. You do not have to sail with the luff in big scallops in light air.

In changing conditions, the jib luff tension needs frequent attention. Each time the backstay is tightened, the jib luff needs to be tightened. When the backstay is eased, ease the jib luff.

We like to adjust the halyard, rather than the tack, as tightening the halyard increases the distance between head and clew. This reduces the need for a simultaneous jib sheet adjustment. However, both methods work well, as long as the control line is led to the side of the boat where it can be used effortlessly.

▪ Jib lead position

The **SHORE SAILS** jibs are fast over a wide wind range because they respond well to lead adjustment. The sail can be made fuller by moving the lead forward and flatter by moving it back. This allows the headstay to be kept fairly straight in most conditions. Each time the lead is moved, the sheet needs to be adjusted to restore correct trim.

Look at the jib from the lee side of the cockpit and assess the fullness of the sail in the foot and middle height areas. You can get a feel for lead position by going through the following exercise. Start with the lead way back and move it forward, retrimming the sail as you go. Watch the angle of the sheet.



You will reach a point where the sheet is close to vertical. Now keep moving the lead forward. The sheet angle will stay close to vertical and the jib will become more and more full. Repeat this a couple of times until you have a good feel for the point where the sheet first comes vertical. Mark this position. It is your base position for the lower end of the wind range of each jib: 4 to 8 knots for the **SUPER STEALTH** and 10-14 knots for the **WAVEBUSTER**. For lighter winds in each case you can move the lead forward more. Above the base range, the lead comes back as power, balance and wave conditions dictate.

If the foot is stretched tight when the leach comes in to the knuckle, the lead is too far back.

▪ Main outhaul

The **SHORE SAILS ALL-CONDITION MAIN** has a clean, open leach from head-to-clew and has consistent depth throughout. As a result, the sail is quite responsive to outhaul settings. The outhaul can be set loose to power-up the sail and tightened progressively to depower the boat and lighten the helm as the wind increases.

Tightening the outhaul reduces weather helm.

We do not adjust the main outhaul moment-to-moment. However, we do not hesitate to change it if there is a substantial change in wind speed. Be sure your outhaul works well and can ease far enough. We use a 2 X 3 (i.e. 6:1) cascading wire and spectra system inside the boom. Instead of an outhaul car, we use a very tight spectra loop around the boom.

▪ Cunningham



We keep the boom on centerline until we have used all the other depowering tools.

Cunningham tension tends to reduce both pointing and weather helm. We use it very little until we are de-powering fairly seriously, above 14 knots, when it becomes a very useful control. Old mains need Cunningham earlier, sometimes as low as 8 knots.

▪ Traveler

We use the traveler to keep the boom on centerline as long as possible. In light air, once the boat is up to speed we often carry the boom a couple of inches above center.

We find that 15"–18" of traveler each side of center handles all these jobs.

Using the traveler to reduce weather helm in medium-heavy conditions should be done sparingly. First, use backstay, outhaul, Cunningham and your jib controls. However, once you have used these options, dropping the traveler a few inches is very effective.

in big waves, playing the traveler in synch with the helm will help you to steer through the waves without excessive heeling and helm.

In very heavy air, with the top part of the main twisted, the traveler comes up towards center to keep the boat balanced. Otherwise the jib can take over and drive the bow down, causing lee-helm and excessive heel.

Emerging from tacks in breeze we center the boom to fill the mainsail and to stop the boat turning. Then, we drop the traveler 6"–8" until the boat accelerates, gradually squeezing the boom back up to center. In light air, use the mainsheet instead.

▪ Vang



Both the Etchells vang and boom are too weak for effective vang sheeting upwind. We check that the vang is loose at the start of each upwind leg, then reset it just before the weather mark.

Upwind hull trim

We try to sail the boat upwind with a very small heel angle in all conditions. The Etchells has a big and heavy keel combined with a well-balanced hull shape. These features disguise the bad things that happen when you sail heeled.

To convince yourself to sail the boat upright, try sailing with the lee rail just out of the water. Turn around and look over the weather side. You will find that the root of the keel is virtually breaking the surface!

Sail the boat upright as much as possible.

We find the habit of sailing upright changes the way we trim the boat. When there is enough wind to hike, the benefit to helm balance is immediately apparent. In lighter winds, it takes some concentration, but with practice we find the boat feels better sailed upright.

We pay a lot of attention to keeping our crew weight together. In waves or slop, it really helps to keep the bowman back at the spinnaker ratchet on the side deck, with the middle crew and skipper shoulder-to-shoulder behind him. Bowmen tend to drift to the front of the cockpit and this should be resisted.

In light air, we line-up across the boat in front of the center console, over the keel. Moving weight forward can help with helm in light air, but is risky if there are waves.

The Etchells is very responsive to being steered by weight movement and sail trim. To prove this to yourself, try sailing around a short triangle course without touching the tiller. This weight movement is effective in heeling the boat to leeward to initiate a roll

For a 720°, everyone sits on one side of the boat and stays there.

Try it!



tack, in rounding windward and leeward marks and in doing penalty turns!

In light air, careful weight movement can be used to steer with reduced helm movement.

Upwind steering

The two most common errors in steering the Etchells upwind are

- steering too much
- steering too low

The boat does best when guided, rather than pushed around.

In big waves, it is possible to luff up on the wave faces and bear off through the crests.

In chop, it is better to look ahead and try to sneak around groups of big waves. If the chop is severe and the wind gusty, the boat does need to be pushed around quite aggressively. Two hands on the hiking stick can help.

When we see that we will hit waves, we tighten the backstay so we can bear away without excessive heel or helm. More twist is fast when the boat is pitching.

The only time to steer the boat low, absent tactical considerations, is in light air, particularly in waves.

The weather jib tell-tale should always be breaking, except when steering low in waves or to accelerate.

In flat water, the jib tell-tale can point straight up a lot of the time.

In very strong winds, sail with the front of the jib backwinding at least some of the time. This is a low-drag mode.

Don't wiggle the tiller too much!



VIII. DOWNWIND AND REACHING TRIM

Spinnaker trim

There seem to be many styles of downwind trim, all reasonably effective. Attentive sheet trim is always the key. The very best spinnaker trimmers understand and anticipate the puffs, lulls and movements of the boat. They manage to have the spinnaker trimmed correctly ahead of the action rather than reacting to what happens.

We pay a lot of attention to pole height and guy position. Lowering the pole tensions the luff of the spinnaker, which is like tensioning the luff of any sail: it makes the front of the sail full and the back more open. This pulls the shoulder of the sail forward and to windward, which is good in moderation for both tight reaching and square running. At intermediate angles, we carry the pole as high as the sail will tolerate without any hint of instability.

The spinnaker luff should rise vertically from the pole end.

If the pole is too high the head of the sail will tend to collapse in the middle, creating an **elephant ass** appearance, and the shoulder will not stand.

Bill Shore says, "Watch your telltale!" Constant attention to the telltale on the weather shroud will help your steering downwind.

The other most visible symptom of the pole too high and/or too far back is that the luff does not rise vertically from the pole, but leans to leeward. Conversely, if the pole is too far forward, the luff will lean outboard from the pole end.

We take the jib down as soon as the chute is up for all running legs and for reach legs unless it is heavy air.

Raking the mast forward

We find it makes a big difference running in light and medium air to ease the backstay and remove the forward partner blocks so the



mast rakes forward. The front face of the mast should be against the front of the mast port.

If there is any wave action, a fracalator, or magic string, helps stabilize the mast and rig. We have the jib halyard rigged so we can tension the mast forward with it when we use the fracalator.

For heavy air running, we do not let the mast all the way forward, both to avoid inverting it and because we like to sail a little higher to get the boat to plane.

Trim for running deep angles in medium-heavy breeze

Once there is enough wind to run square and surf waves, it helps to ease the vang and the outhaul, pull the pole way back and down a little and pump the guy and sheet on the waves. Good steering and kinetics can be a big help in these conditions.

However, anytime you have to head up to a broad reach for tactical reasons or because the wind has dropped, you must immediately tighten the vang, ease the guy forward and raise the pole.

Hull trim downwind

We try to keep our weight forward as this maximizes the immersed waterline. It can work to heel to windward a little. This evens out the helm and raises the boom.

Gybing

We rarely roll gybe the boat, as it seems to work better to turn the boat more gently and not disturb the spinnaker. We like the mainsheet rigged double in the center of the boat, as this makes it easy to throw the boom across quickly and cleanly.

In heavy air, if there are waves, timing the gybe when the boat is running down a wave takes the drama away. In heavy air with short

Gentle gybes seem to work best.



or no waves, gybe the boom first and then gybe the pole. This keeps the spinnaker and the boat stable.

Reaching

Light air reaching is mostly common sense. The main thing is not to have the pole too high. The vang should be moderately tight and the mast upright, not forward. Use the **SHORE SAILS LIGHT RADIAL REACHER** as your secret weapon on light runs with the pole forward as well as on real reach legs.

Heavy air reaches are fun, requiring good technique. You need a firm, even brutal, hand or hands on the tiller, a vang that releases a long way (to keep the boom out of the water) and a strong, coordinated crew to hike and work together trimming and easing the spinnaker sheet, main sheet and vang, if needed, as each puff hits.

We always put the chute up immediately at the weather mark and take it down later if we can't make the wing mark.

We move back in the boat and try to be already heading down and easing as each puff hits. It is usually possible to work up in the lulls and when the boat is planing.

Heavy air reaches are fun!

The pole should be a touch low to open the leach of the chute. If it is too low, the sail will tend to collapse too suddenly.

The jib must *never* be over-trimmed downwind or reaching.

On windy reaches, it is fast to pull hard on the tiller. No balanced helm here!



IX. SAIL CARE

Mains and jibs for Etchells are built from resin-coated cloth. They will last longer if you roll them carefully, do not let them flap or flog unnecessarily and do not stomp on them. When rolling sails, we fold the sail at the top batten first. Do not remove a crease by pulling, rather shake the sail gently or push the crease out gently. Keep your sails dry and out of the sun.

When storing spinnakers, we recommend flaking and then loose rolling, rather than leaving them stuffed in their bags.

Check your sails often for damage. Look at batten pockets, bolt rope ends and corners. Check spinnakers for small holes or tears.

X. CONCLUSION

At **SHORE SAILS**, we believe tuning should be simple, repeatable steps just like boathandling. We have a tuning move ready for each new situation. Then we can concentrate on racing tactics.

The basis for our program is careful preparation ashore, which gives you a firm foundation for all your on-the-water tuning.

The best time to adjust and play around with your tuning is before the start. This gets you and your crew into the game and gives you confidence.

Remember, sail it high and flat, use plenty of backstay and have fun!

We'll see you on the starting line!

Gain familiarity with your tuning moves by experimenting and practicing.



XI. KEY SETTINGS SUMMARY

	Mast Stiffness Categories		Spreader Angles
	spreaders	headstay	see diagram
stiff	less than 1¼"	less than 1"	1¼"
medium	1¼" to 1¾"	1" to 1½"	1¼"
soft	1¾" plus	1½" plus	2" (spreaders are straight across)

Mast Butt Positions light/moderate winds (go forward ½" for medium/heavy)	
aft keel boats i.e. Bashford, most Tillotson-Pearson, 1992 or later Ontarios etc.	17' 6½"
pre-1992 Ontario	17' 7"
We do not have data on some boats, such as Tietge, Driscoll, Pamcraft. If you are in doubt ask us how to check your keel position.	?
Headstay Length, all boats	45 ½"

Initial Shroud Position
<ul style="list-style-type: none"> ▪ Spreaders to the recommended positions, <i>lowers in the third hole</i> from the front of the chainplate. ▪ <i>Uppers in the second hole</i> from the front.

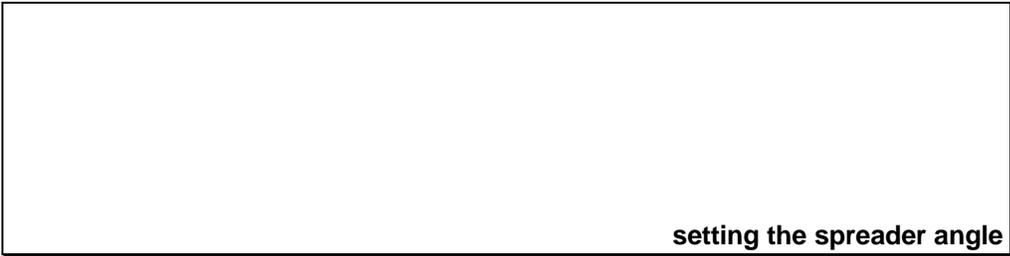


- If your *spreaders are not in the recommended position*, move both shrouds one hole forward for each $\frac{3}{4}$ " the spreader tips are forward of the suggested settings, and vice versa.
- If you have Handilock or Spinlock turnbuckles with folding adjuster handles, you will need to move the lowers aft one hole. This will allow you to use the handles.

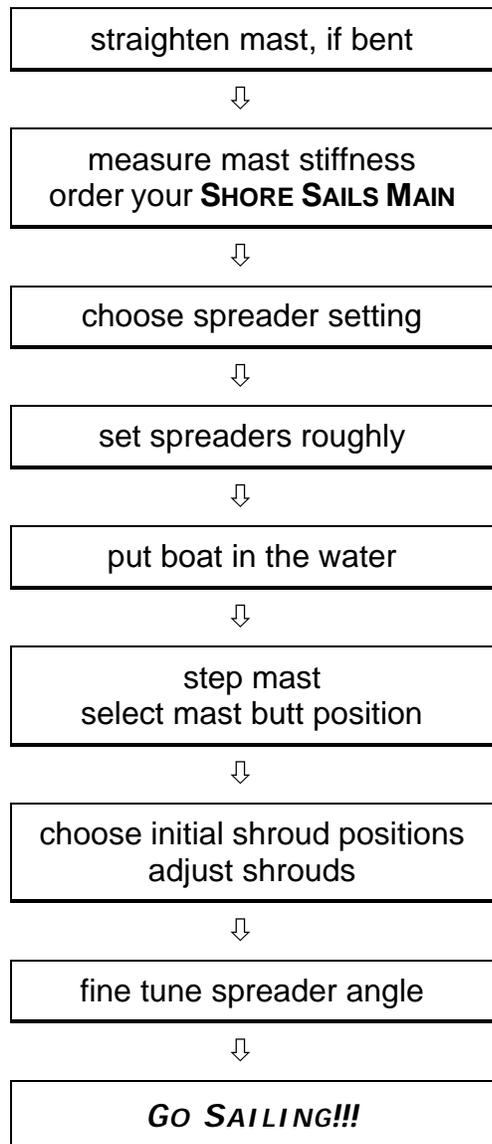
XI. KEY SETTINGS SUMMARY

Tuning Options	
option 1 0–14 knots	uppers in hole 2, standard butt position, SUPER STEALTH JIB
option 2 8–22 knots	uppers hole 5 or 6 SUPER STEALTH JIB or WAVEBUSTER (14+: butt forward $\frac{1}{2}$ ")
option 3 16–30 knots	uppers hole 9 or 10 WAVEBUSTER JIB . Butt forward same as option 2.

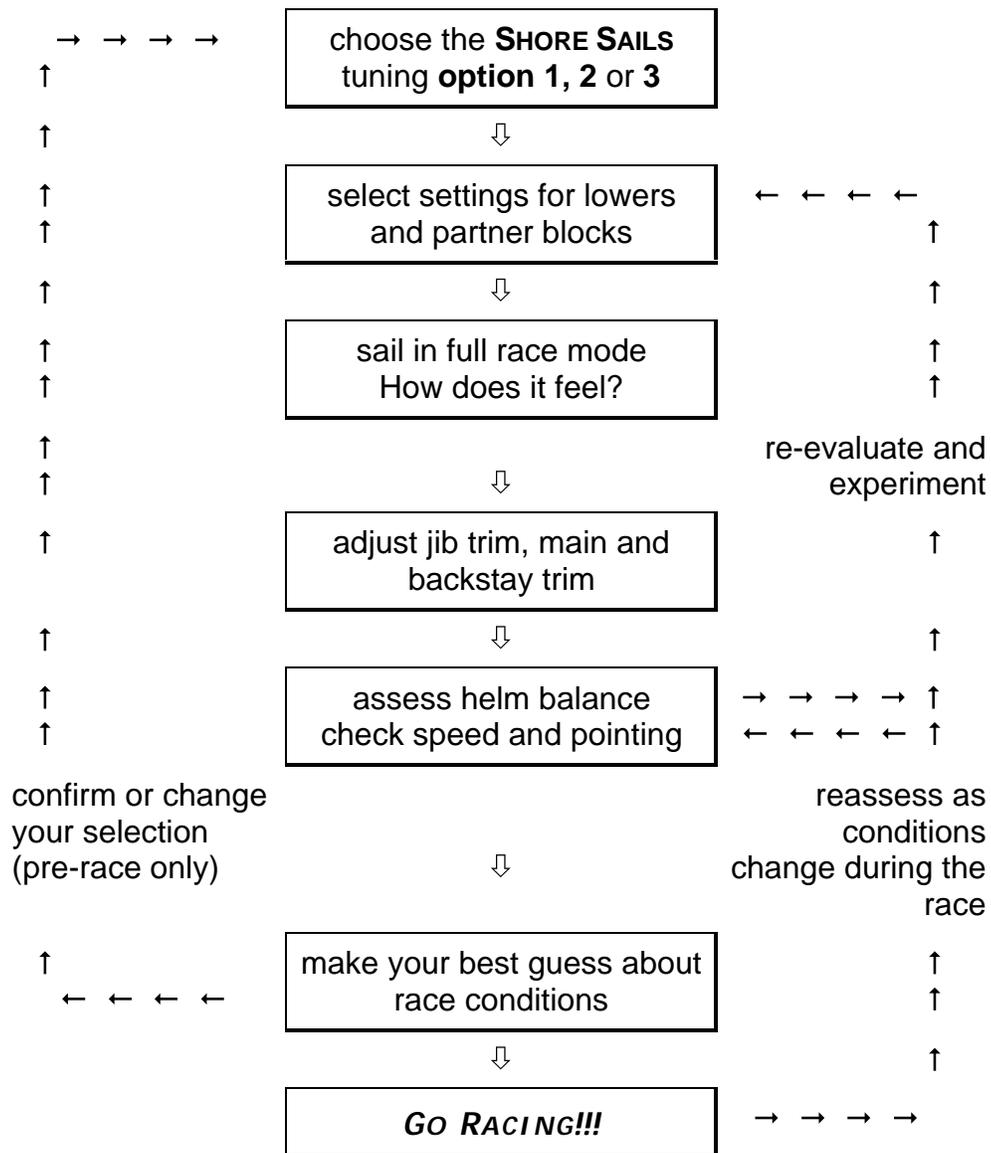




XII. TUNING FLOW CHART



XII. TUNING FLOW CHART





SHORE SAILS

“Fast sails for normal people”

Ben Altman

773/935-9007

FAX 773/935-8202

CompuServe 104310,210

Bill Shore

401/849-7700

Fax 401/849-7952

CompuServe 73307,2455



SHORE SAILS 7 Merton Road Newport RI 02840

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