

 **ETCHELLS TUNING GUIDE****RIG SET-UP**

**MAST STEPPING:** Before stepping your mast, insert a piece of mylar between the I-beam and underside of the plate with grease to allow the mast step to be adjusted easily under load. Also, check that your mast is not kinked or that the tip is not hooking off to one side or the other. If it is, straighten it or have it straightened by a professional.

To locate the position of the mast step, hold the end of your tape measure near the centerline intersection of the stern deck and the transom. Then run the tape forward over the traveler through the console to the bottom, aft edge of the mast. This distance should average from 17' 5.5" to 17' 6.25". On boats fitted with adjustable mast steps the range of adjustment should be from 17' 4.5" to 17' 7".

**UPPER & LOWER SHROUD POSITION:** Once the mast is stepped, for most conditions (under 16 knots) attach the **upper shroud turnbuckle to 2<sup>nd</sup> hole from the front** on the chainplate, and the **lower shroud in the 4<sup>th</sup> hole** from the front (don't tighten yet). For heavy air attach your upper shroud turnbuckle in the 3<sup>rd</sup> hole from the front of the chainplate. If your spreaders are fixed straight or swept back you may need to jump the uppers behind the lowers to the 5<sup>th</sup> hole from the front. This will help keep the mast from over bending at the spreaders in heavy air.

**HEADSTAY & MAST RAKE:** Before attaching the headstay hold it taught along the front face of the mast and mark the headstay at the point that corresponds to the upper edge of the black band at the gooseneck. Once you have attached your headstay, adjust your turnbuckle so that the reference mark is **46.5" to 47"** above the deck measured along the forestay. This determines the proper mast rake.

Ideally, you have an open barrel headstay turnbuckle (must be below deck, class rule), and an above deck fork-eye connection. This way you can adjust your headstay above deck without having to climb into the bow tank. Your headstay turnbuckle should have only one cotter pin to prevent the barrel from spinning off while sailing. We recommend determining a base headstay setting 46 3/4" to 47 1/2" that works for your boat. From that base setting you can tighten the headstay 1/4" for heavy air and loosen 1/4" for light air.

**UPPER & LOWER SHROUD TENSION:** Now you're ready to tension the shrouds. Before you do, pull the backstay so that the headstay is just taught and remove all the aft chocking at the partners, and insert full forward chocking, which will eliminate any pre-bending of the mast. Begin by tensioning the upper shrouds evenly so that when you sight the mast slot it

is essentially straight side-to-side. **Tighten the uppers to 17 on the Loos PT-2 Gauge for starters.** Then tension the lowers evenly hand tight so the mast is straight side to side. Since the lower tension varies so much depending on the wind speed, the goal is to start with them even before sailing and adjust them for the conditions on the race course. Make sure to tie off or lock off your turnbuckles each time before and while sailing or the turnbuckles could spin off on their own.

### TUNING WHILE SAILING

Unless you are sure what the conditions will be on the race course or it is extremely windy, I generally recommend fine tuning the shrouds, mast step and mast chocking while tuning up before the start of the race. Remember the Etchells class rules allow you to adjust your shrouds, backstay and mast chocks while racing but prohibits adjustment of the mast step and headstay while racing.

For wind speeds 10 to 15 knots, leave the uppers at 17 on the new Loos PT-2 Gauge. For heavy air, tighten the uppers to 20 on the gauge. For wind speeds below 10 knots, the uppers should be loosened to 15 on the gauge.

Begin by sailing close hauled with the mainsail and jib sheeted in properly. Next, pull the backstay enough to firm up the headstay. Then you must decide to change a few key adjustments based on the wind speed, the mainsail and jib cross-sectional shape and the sideways mast straightness.

First make sure the leeward upper is not too slack or too firm while sailing closehauled. Once you have adjusted the upper tension equally, it is probably a good idea to check the mast straightness by sighting the rig, while it's loaded on a close hauled course. If the mast is sagging to leeward at the spreaders more than 1", then the lowers should be tightened evenly (some sag can be good in lower wind speeds). If the mast is lifting at the spreaders and there is less than 18 knots of wind, then the lowers should be slackened evenly until the mast is at least straight.

**MAST CHOCKING: Mast chocking at the deck is the next adjustment and probably the most critical.** If after you have tensioned the backstay to set the desired amount of headstay sag / firmness and the mainsail camber depth looks wrong, then you'll need to adjust the mast chocking at the partners. (This is when a good for'n aft mast under deck tackle system is essential.) **Quite simply if the mainsail looks too full, add chocking behind the mast** (typically necessary in lighter wind speeds - inducing pre-bend). If you find you are needing more than 1" of chock behind the mast, then your mast step is probably too far forward. Once again after each mast chock adjustment, check the jib trim and headstay tension and adjust the backstay accordingly to achieve the proper headstay tension as the wind speed varies so that the jib is set perfectly.

**If you have too much chocking behind the mast the mainsail will develop overbend wrinkles from the mast toward the clew.** In which case you'll need to add more chock in front of the mast and/or move the mast step forward if you are already fully chocked aft. As a general rule of thumb, I like to see the wrinkles in the lower luff of the mainsail stop at about 50% camber position (middle of the lower aft window in the main).

### SAIL SETTINGS AND CONTROLS

**JIB SETTINGS: Jib shape** is the most critical on the Etchells. The cross-sectional shape is largely affected **by headstay tension (the amount of sag).**

To get the most low wind range out of your headsail, you can induce **fullness, power and pointing** by easing the backstay to sag the headstay a bit more and at the same time slacking (scalloping) the luff tension by easing the adjustable tack. This will help move the extra fullness back to the proper draft position. **If you have too much sag, the jib will actually become too flat and knuckle forward, which defeats the purpose (wrong foil shape).**

To get the most **high wind range** out of your headsail, **flatten and depower your jib by tightening the backstay, which reduces sag, and at the same time tightening the luff tension at the tack.** This will help pull the draft forward again, and prevent the entry from becoming too flat forward, to lock in a proper foil shape.

**JIB LEAD: The jib lead** should start at approximately **8' 6.5"** measuring from the headstay at the deck level to the center of the sheeve in the loaded position. Fuller jibs, such as the DCL and DCM, like the foot almost taught while flatter jibs, such as the AP 7.5, perform best with some depth in the foot. This takes some experimenting to get right, but remember that every time you adjust the halyard or change the halyard length you will change the clew height, which will affect jib sheeting angle. Your jib leads should be mounted on the deck as close to the cuddy as possible and have room for adjustment forward and aft of the recommended settings.

**JIB SHEET TENSION: The jib sheet** should be trimmed to keep all the telltales flying, which includes **the leech telltale** that should never be stalled. To maximize pointing upwind we try to trim the jib as tight as possible without ever stalling the leech telltale.

**Dual tabs on the jib luff** is a feature designed to both add fullness and allow for a tighter headstay in sloppy conditions. On the long tabs the headstay can be carried tighter and will not bounce as much in the chop. This technique works best in the lower wind range of the headsail you are flying when you are in need of more forward speed and power. Bare in mind that you will lose some pointing ability because of the combination of tighter headstay and fuller shape that is achieved with the long tabs.

**MAINSAIL SETTINGS:** For most conditions, the mainsail should be trimmed so that the top batten is parallel to the boom. When in either very light air or medium to heavy air and chop, the top batten should be twisted open a few degrees to keep the top batten leech telltale flying at least half the time.

**TRAVELER:** We like to set the traveler to fine tune the weather helm. In all wind speeds, I like to carry zero to three lbs. of weather helm. In light air, the traveler car can be as much as 12" above centerline, and the boom can actually be a few inches above center line also in order to load the helm. As the wind speed increases from 6 to 12 knots the traveler car progressively gets closer to centerline.

As the breeze increases over 20 knots, the top batten will become more than 5 degrees open. All this time the backstay will have become progressively tighter. Before lowering the traveler below centerline make sure the outhaul is fully tensioned to the band. I don't like to carry the traveler more than a few inches below centerline or I find I cannot sail close enough to the wind.

**CUNNINGHAM:** The cunningham should not be used until 15 knots or more. As the wind continues to build and you tension the backstay more to flatten and de-power the main the cunningham can help reposition the draft back forward in the mainsail.

**Remember, we're only a phone call or email away.**

## Jud's Etchells Tuning Matrix February 2008

### AP Mainsail

		Mark top of the LB to deck	from transom	Loose gauge PT-2		Aft		From band		
Uppers hole #2, Lower #4	Wind Speed	Forestay Length	Mast step	Upper tension	Lower tension	Mast blocking	Backstay Tension	Outhaul tension	Traveler positon	Jib Lead position
	0 to 3	47.5"	17'5.75"	15	0	.75"	-2.5	-1.5	10	8'6.5"
	4 to 6	47.5"	17'6"	16	3	.5"	-1.5	-1	8	8'6.5"
	7 to 10	47.25"	17'6"	17	10	.25"	-0.8	-0.75	4	8'6.5"
	11 to 14	47.25"	17'6.25"	18	14	-	base 1.5	-0.5	3	8'6.5"
	14 to 18	47	17'6.5"	19	19	-	2.5	-0.25	2	8'6.5"
	19 to 21	47	17'6.5"	20	22	-	5.5	max	c	8'7"
	22 to 24	47	17'6.5"	20	24	-	5.5	max	c	8'7"
Uppers #5 or #6 Lower #4	25+	47	17'6.5"	20	24	-	5.5	max	c	8'7"

## Jud's Etchells Tuning Matrix February 2008

### DC+ Mainsail

		Mark top of the LB to deck	from transom	Loose gauge PT-2		Aft		From band		
Uppers hole #2, Lower #4	Wind Speed	Forestay Length	Mast step	Upper tension	Lower tension	Mast blocking	Backstay Tension	Outhaul tension	Traveler positon	Jib Lead position
	0 to 3	47.5"	17'5.75"	15	0	.75"	-2.5	-1.5	10	8'6.5"
	4 to 6	47.5"	17'6"	15	0	.75"	-1.5	-1	8	8'6.5"
	7 to 10	47.25"	17'6"	16	5	.5"	-0.75	-0.5	4	8'6.5"
	11 to 14	47.25"	17'6.25"	17	10	.25"	base 1.5	-0.25	3	8'6.5"
	14 to 18	47	17'6.25"	19	15	0	2.5	max	2	8'7"
	19 to 21	47	17'6.25"	20	20	0	5.5	max	c	8'7"
	22 to 24	47	17'6.25"	20	24	0	5.5	max	c	8'7"
Uppers #5 or #6 Lower #4	25+	47	17'6.25"	20	24	0	5.5	max	c	8'7"