

# Etchells Tuning Guide



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## RIG SET-UP

**MAST STRAIGHTNESS (STIFFNESS):** Etchells masts need to be stiff and straight to help support the headstay in fresher conditions as backstay is applied. Older, softer masts can work in light to medium windspeeds, but are too flimsy for heavy air performance.

**MAST STEPPING:** Before stepping your mast, insert a piece of mylar or delrin 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" (5321.3 to 5340.4 mm.) On boats fitted with adjustable mast steps the range of adjustment should be from 17' 4.5" to 17' 7" (5295.9 to 5359.4 mm.)

### UPPER & LOWER SHROUD POSITION

Once the mast is stepped, attach the upper shroud turnbuckle to 2nd hole from the front on the chain-plate, and the lower shroud in the 4th hole from the front (don't tighten yet).

### 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 47.5" to 48" (1206.5 to 1219.2 mm) 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 47.5" to 48" (1206 to 1220 mm) that works for your boat. From that base setting you can tighten the headstay 1/2" (12.7 mm) for heavy air and loosen 1/2" (12.7 mm) for light air we generally make 1/4" adjustments (6mm.)



## UPPER & LOWER SHROUD TENSION

Now you're ready to tension the shrouds to the base setting. 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 20 on the Loos PT-2 gauge for starters. Then tension the lowers evenly hand tight so the mast is straight side to side. The goal is to start with them at 12 at base setting. 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.

## BACKSTAY REFERENCE MARKS

We also like to mark backstay at deck as follows....Once the headstay is adjusted to your base setting, mast step positioned at 17' - 6" (5334 mm) (base setting) and upper and lower shrouds adjusted to a base setting you can then install backstay reference marks.

When at the dock or hardstand pull the course backstay so that headstay just comes firm (you'll feel the resistance just as it comes firm). Mark the backstay at deck level where it exists the stern tank. That will be your 11 knot max power backstay reference position. Then with a sharpie marker put another mark up 140 mm above that (length of a sharpie marker 5.5"), this is your max backstay mark. We never pull backstay past that mark for max depower because the mast will overbend and the main will invert. For light air put a third mark 60 mm below base mark (2.5") and we never ease backstay more than that upwind in lightest air. We find those marks good references for repeating fast settings.



**Etchells APG Mainsail Tuning Matrix**

Chainplate UPPERS & LOWERS (from front)	WIND SPEED	FORESTAY LENGTH (Mark top of the LB to deck)	MAST STEP (from Transom)	Loos Gauge PT-2		MAST BLOCKING (Aft)	BACKSTAY TENSION	OUTHAUL TENSION (From Band)	TRAVELER POSITION	JIB LEAD POSITION	JIB INHAUL POSITION
				UPPER TENSION	LOWER TENSION						
U #2 L #4	0 - 3	48.75"	17' 5.5"	16	0	.75"	-2.5	-1"	12"	8' 6.5"	none
	4 - 6	48.75"	17' 5.5"	17	6	.75"	-2.0	-1"	12"	8' 6.5"	2.5"
	7 - 10	48.5"	17' 5.75"	18	10	.5"	-0.8	-.75"	9"	8' 6.5"	2.5"
	11 - 14	48.25"	17' 6"	20	14	.25"	base	-.5"	3"	8' 6.5"	2"
	15 - 18	48"	17' 6.25"	20	16	-	2.5	-.25"	center	8' 6.5"	1.5"
U #6 L #4	19 - 21	47.75"	17' 6.25"	21	20	-	max	max	-2	8' 7"	none
	22 - 24	47.5"	17' 6.25"	22	22	-	max	max	-3	8' 7"	none
	25+	47.5"	17' 6.25"	22	24	-	max	max	-4	8' 7"	none





## Etchells AP & AP-2 Mainsail Tuning Matrix

Chainplate UPPERS & LOWERS (from front)	WIND SPEED	FORESTAY LENGTH (Mark top of the LB to deck)	MAST STEP (from Transom)	Loos Gauge PT-2				MAST BLOCKING (Aft)	BACKSTAY TENSION	OUTHHAUL TENSION (From Band)	TRAVELER POSITION	JIB LEAD POSITION
				UPPER TENSION		LOWER TENSION						
U #2 L #4	3 - 6	48"	17' 6"	-1	17	5	-1	0.75"	-2.5"	-1.5"	10	8' 6.5"
	7 - 9	48"		-1	19	9	-1	0.50"	-1.5"	-1"	8	
	10-11	48"		base	20	13	base	0.25"	-0.75"	-0.75"	4	
	12-13	47.75"	17' 6.25"	+1 turn	21	15.5	+1 turn	-	base 1.5"	-0.5"	3	
	14-16	47.5"		+1	23	18	+1		2.5"	-0.25"	2	
	17-19	47.5"		+1	24	20	+1		5.5"	max	center	
20 - 23	47.25"	17' 6.5"	+1	25	23	+1						
24+			+1	27	26	+1						

## TUNING WHILE SAILING

Unless you are sure what the conditions will be on the race course or it is extremely windy, I generally recommend starting at base setting (20-12.) 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 12 to 14 knots, adjust the uppers up one turn and lowers two turns. For wind speeds below 10 knots, the uppers should be loosened 1 turn and the lowers two turns for every setting. The initial step above or below base setting after is just one turn on each upper and lower.

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 leeward upper.

First make sure the leeward upper is not too slack or too firm while sailing closehauled. The best way to determine the correct rig setting is while sailing with the main and jib sheeted in on a close hauled course. The leeward upper shroud should just be firm in each wind speed. If the upper feels too tight, then ease the rig one setting; then check the firmness of the leeward shroud again. Conversely, if the uppers are floppy, tension the rig one setting and repeat that ratio on both sides until leeward shroud has slackness removed. If the rig tension is too loose as the wind speed freshens to 15+ knots, then the headstay will be too saggy, the main will wash out from overbend, and the boat will be overpowered.



## **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" (25.4 mm) 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). Adjustable levers for the mast partner are now legal in the Etchells to replace the mast chock system.

## **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 (scallop) 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" (2603.5 mm) 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 LEAD FOR ETCHELLS WITH DUAL TRACKS OR INHAUL SYSTEM***

We set the outboard car (bearing surface of block in its loaded position) at 2592 mm (8' - 6") and don't move it much from there. Maybe 10 to 15 mm (one hole) either side of that but we like that position in most conditions for the out board car.

We set the inboard car as a base setting positioned in the same distance back from headstay (2592 mm) (8' - 6").

We set jib halyard fine so I have 0 -15 mm of tack adjustment. I trim to same marks on spreader 150 mm to 230 mm from tip (Mark at 6" and mark at 9" from spreader tip).

We sail with luff with a little scallop except when overpowered and then just smooth out the luff tension with jib tack and halyard once jib tack is bottomed out.

## ***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.

## ***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.



## ***MAINSAIL TRIM TIPS FOR DEPOWERING IN WAVES***

If main gets too flat, it could be that mast should be chocked all the way back in partner and/or consider moving mast step forward 6 mm. In 12-14 knots and chop I like mast all the way back in the partner and possibly move step forward so main is not too flat in the waves. In the chop and waves everything needs to be muscled in a bit more (such as tuned for high higher win speed). This keeps enough power in the main to twist more in the chop.

We like traveler car just above centerline without too much mainsheet in waves. We recommend sneaking up on the right mainsheet tension in waves and not be too tight and bound up on either jib or main sheet. Leech telltales should fly all the time. Maybe top main batten telltale brakes a little in max power, but in depowered conditions leech telltales should be flying.

### ***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" (305 mm) 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.

