



SNIPE

TUNING GUIDE

Quantum San Diego

QUANTUM SNIPE PERFORMANCE GUIDE

The key to successful Snipe racing is not the memorization of information, but the understanding of it. Why must I set my rig with prebend? How come I can't depower my rig with boomvang without also using aft puller? Why should my chines be sharpened? You can only go so far by copying others without understanding why the technique is fast.

The days of just hopping into your boat and competing at the top level of the class are gone. These boats are continuously optimized to a high level, and a by-product of this enhanced performance is a boat that is far more pleasurable and worthwhile.



At Quantum Sails we test and tinker on a year-round basis in an attempt to improve the speed, durability and ease of use of our sails, and we do our best to share anything we learn with other members of the Snipe class. You will find some of our latest thoughts on our web page at www.quantumsails.com/snipe. Our goal is to give you the best combination of performance sails and information possible so you can most enjoy the sport of Snipe sailing. If you have any further questions after reading the tuning guide, don't hesitate to contact us.

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I. QUICK SET UP GUIDE

What follows is the placement or a range of placements for each item. For more detailed explanations, please refer to the Rig Tune section

Spreaders- Length: 16.5" - 16 7/8" (42 - 43 cm)
Angle: 29" - 30 1/2" (73.5-77.3 cm)

Initial Shrouds- 21' 1" - 21'2" (642-645 cm) *

Jib Halyard (Final Rake)- 21' 5" - 21' 7"(652-658 cm) *

Prebend/Rig Tension- 1 1/2" - 2 1/2" (28-50mm) prebend with a Loos Gauge reading for rig tension of 180-220 lb. 18-19 are the base tuning number with the PT-1 Loos gauge.

Shroud Deck Location- from forestay/jibstay pin to shroud pin
- 5' 5.75" - 5' 6.25"

Mast Butt-	Persson	Center of transom to pin 10' 8 7/8" 327.4 cm
	Jibetech	Center of indent to pin 10' 8 1/8" 325.5 cm

Jib Tack- 11" (27.9 cm) aft of stem

Whisker Pole- Maximum class rule length of 104" (264.1 cm)

While these are the ranges, we recommend starting at these settings:

Proctor mast:	Sidewinder & Cobra II:
Rake: 21' 6 1/2"*	Rake: 21'6 1/2"*
Spreaders length: 16 7/8"	Spreader length: 16 3/4"
Tip to Tip: 29 3/4"	Tip to Tip: 29.5"
Tension: 18 - 19	Tension: 18 - 19

* Note- The measurements listed are for the McLaughlin, Persson, Eclipse or Jibe Tec boats. If you have a Phoenix, Lillia, or a Mueller, add an inch to the given measurements. For a Skipper Snipe, subtract 2 cm (3/4").

1 Inch = 2.54cm 1 Foot = 30.48cm 1 Knot = .514 m/s = 1.151mph

II. BOAT PREPARATION

Boat preparation is critical for success in the Snipe Class. Sails, rigging, centerboard and rudder shape, hull fairness and mast tuning all share equal importance. Too often these elements are put off until next year, but the reality is that you will not reach your competitive goals until you tackle all these important factors.

A. HULL PREPARATION

1. Bailer

The through hull bailer must be checked for smooth operation and fairness. If friction causes the bailer to be difficult to operate, coat the moving parts with Vaseline. Next turn the boat upside down and check if the bailer is flush with the hull. Fill any highs or lows to make the bailer as fair with the hull as possible.

2. Chines

Check the condition of the chines. The side/hull chine can be sharpened in the aft third of the boat, along with sharpening the stern/hull and stern/side chines. Like the trailing edge of the rudder and daggerboard, the hull should have a clean exit point for the water. Position a strip of masking tape 1/4" (6 mm) from either side of the chine for the length that will be sharpened. This will control your work area. Using gelcoat or some other thin filler, place a bead of the material along the chine to build it up to a point. Remove the masking tape and let the filler dry. Before sanding, re-tape as before. This will control the area that is sanded. Use large sanding blocks and sand along the two planes that form the chine. When the filler is knocked down to where you are now sanding the tape, remove the tape and carefully sand the filler down to fair into the hull. Be wary of sanding the hull too much as you sharpen the chine.

3. Fairness

The Snipe hull is strong but still may deform around its structural bulkheads or the bunks of the trailer. Identify any problem areas of your trailer and reform the bunks so the hull load is better distributed. Turn your boat over and fill any areas where your hull has deformed inward. Follow the filling with a full hull sanding

using large sanding blocks. Start with 320 and work to 1000 (or 1200 for the overachiever) grit sandpaper. Polish with rubbing compound, and finish with a Teflon-based polish afterwards to seal the fiberglass pores and return the hull's shiny appearance. Occasionally resanding with 600 or 1000 grit and re-polishing may be necessary.

B. BLADE PREPARATION

1. Daggerboard

The perimeter of the board can be faired up to 1" (25 mm). The leading edge shape should look like that of a bullet, having a slight point with a gradual radius back to the limit line. The trailing edge should be blunt by 1/16"-1/8" (2-3 mm). The shape from there is flat to the 5/8" (16 mm) mark and then curving gradually after that to the limit line. The bottom of the board is free game, as no shape seems to have an advantage. To reduce helm, the centerboard should sit all the way aft in the trunk when sailing upwind.

2. Rudder

The Class rules state a maximum thickness of 1 1/2" (38 mm). A rudder this thick is superior when loaded or when steering aggressively. This would typically be in medium to heavy winds and/or waves. The rudder must be mounted as close to the stern as possible to lighten the helm load. It must also be as low as possible to maximize rudder area. Be sure to check the class rules for specific restriction. Also check the rudder head and tiller connection. This must be solid and tight to eliminate any delay when steering.

C. RIGGING

1. Ratchet Blocks

- a. Mainsheet- This system should have an Auto ratchet behind the daggerboard and another Auto Ratchet on the boom. Mainsheet load is greatly reduced with both ratchet blocks turned on, allowing the mainsheet to be hand-held on even the windiest days to make quick and critical mainsheet adjustments.
- b. Jib Leads- Harken Auto Ratchet blocks make the minor but critical adjustments possible, and allow the pole to go out faster when launched. Check how close together your leads are. By

measuring across from the bearing surface of one jib lead to the other, the lead should fall within the range of 27"-32" (685-813 mm). The newer boats have the tracks closer together (2' 5.5" /75 cm apart), this helps pointing in marginal hiking conditions. Mclube-ing the tracks is also helpful for the crew.

2. Layout

Rigging layout must reflect job responsibilities of skipper and crew. Adjustment placement must also reflect when adjustments are used. The adjustments near the rail must be only those used when hiking, as too many in this area make quick adjustments difficult. Use of minimum diameter line with a polypropylene cover will minimize friction and weight when wet. Also, cutting the lines to the minimum length possible will reduce weight and clutter.

3. Reference Marks

To support our sail adjustment guidelines, all the adjustment lines should have reference marks and number scales to allow them to be set consistently. When you find that you are going fast with the outhaul on #3, you want to be sure to put it on #3 every time you have the same conditions.

III. RIG TUNE

There are a number of areas that must be measured and set correctly when tuning the rig. Once these are set correctly they need only minor adjustments for you to stay fast in all conditions. The primary variables for tuning the rig are the shrouds, jib halyard and spreaders. There are other secondary areas for you to be aware and these are covered later in this tuning guide. To begin, first identify your mast type.

A. MAST TYPES

The masts that work best are the so-called "bendy masts". The most popular are the Proctor Miracle and Sidewinder Gold. The bendy masts are easy to tune and use throughout the wind range, though they are a little tricky in heavy air. When tuning your rig, it is important to realize that each mast is a little dif-

ferent, even those from the same company. The measurements listed in this guide should be used as references and not as rules.

B. PREPARATION FOR RIG TUNING

Recommended settings:

SD-6K and C-2 mainsails

Proctor: 21'6 1/2", 16 3/4" x 29.75"

Sidewinder 21'6 1/2", 16. 3/4" x 29.5"

For the Sidewinder Junior Mast, we recommend using 15 7/8" x 30.5" with 1" of prebend because the mast is so flexible. Upwind, when the jib hits the spreader, pull the aft puller as much as half inch behind neutral to just keep the spreader off of the jib.

1. Measuring your boat

The suggested tuning numbers in this tuning guide are for the Persson hull. If you have another type of Snipe you must measure several parts of the boat to see how you should adjust the tuning of your boat from the Persson numbers.

2. Adjust Spreaders

Spreader length and angle (tip to tip distance) are the two areas where you can tune your mast for your crew weight and mast stiffness. Before stepping the mast these two items must be set up within the prescribed range. We encourage the use of adjustable length and angle spreaders at this stage, as they will allow you to adjust your spreaders with accuracy and ease.

- a. Spreader Length- The length of the spreader controls sideways bend. Spreaders that are too long will push the middle of the mast to leeward. This clogs the jib slot and hurts pointing. Spreaders that are too short allow the middle of the mast to pop to windward, robbing the main of critical power. As you want to hold onto as much sail power as possible, try to keep the spreader length and angle at their largest dimension. If you are troubled with a mast that is too stiff, try a longer spreader length than the prescribed range and a spreader angle that is near the minimum of the range. The spreader can help push the middle of

the mast forward in this setup, but be sure that the middle of the mast is not also getting pushed to leeward. If it is, decrease the angle, and/or shorten the spreader length.

With the spreader in the mast and pulled aft to the stops, the length is measured from the side of the mast to the shroud/spreader intersection. We recommend measuring on the top of the spreader, and looking for the shortest distance from the mast to the shroud. The prescribed range is 15 7/8"-16 3/4 (40-42.5 cm).

The goal for sailing upwind in 10 knots of wind is to have the slight sag from the gooseneck to the hounds. Check this by sighting up the forward centerline of the mast. Adjust the spreader length until you have reached this goal.

If this is the first time that you are setting your spreaders, first check the distance between the shrouds at deck level, this distance varies from boat to boat. For every 3/4"/1.9 cm further apart your shrouds are from 4' 7 1/2"/141 cm you will have to lengthen your spreaders 1/8"/.31 cm, (and vice versa if your shrouds are closer together) from the recommended settings above. Also keep in mind that the further forward you rake your mast, the shorter your spreaders will need to be.

- b. **Spreader Angle**- The angle of the spreader affects how much the mast will bend in moderate to heavy air. A large angle measurement will stiffen the mast (similar to using more running backstay, good for heavy teams or soft masts) while a small number will allow the mast to bend more (similar to using less running backstay, good for light teams or stiff masts). The prescribed range is 29"-30.5"/73 - 77.5 cm. This distance is measured at the spreader tips, from one shroud to the other with the spreaders locked aft. If your spreaders need to be longer or shorter than standard, set your tip to tip measurement when your spreaders are at the standard length and then change the length of your spreaders. The angle is more important than the numbers.

It is imperative that the spreader angle be symmetrical to the centerline of the boat. With the mast up, unhook the mast puller and pull the jib halyard on hard so the spreaders swing back

to their locked position (check by lightly pulling the shroud aft), stand about 20 feet to the side of the boat and line up the base of the two shrouds with your eye. Follow the shrouds up to the spreader. If the shrouds are parallel, and appear as one shroud, your spreaders are set correctly. If you see one shroud going forward and one aft, then move one spreader forward and one aft by adjusting the screws until the shrouds look as one when viewed from the side of the boat.

2. Forestay

The Class rules state that the forestay must be all wire (no smaller than 3/32"/2.4 mm) and shall be of such length as to prevent the mast from touching the back of the mast partners. When the forestay is cut at the maximum allowable length, it is too slack, bouncing on the jib and getting in the way of the whisker pole. The forestay length should be such that it barely allows you to attach the shrouds when rigging. Some sail with it even shorter than this to help stabilize the mast off the wind, though this makes it difficult to adjust your shroud tension.

To help keep the forestay from fouling the pole while jibing, tie one end of a short piece of shock cord 1' (30 cm) up the forestay with the other end attached to the tack fitting or to the bow. The shock cord will pull the forestay tight so it does not get in the way of the pole when jibing.

3. Mast Butt Location

The mast butt's ideal position has been a debate ever since the max forward position rule was removed. Some have moved the butt forward and found that the boat goes fast, but does not point well, while others have gone aft to get better point, but less speed forward. We recommend setting the mast pin at the position of the old 60" rule:

Persson	Center of transom to pin 10' 8 7/8"
Jibetech	Center of transom indent to pin 10' 8 1/8"

4. Mast Butt Angle

Check your mast butt to see if it is cut off squarely and perpendicular to the mast. Side bend problems will result if this is not done. The cause of insufficient fore and aft mast bend can be

due to your mast butt being unable to rock on the pin when loaded. The bottom, forward corner of the mast butt must have sufficient clearance above the mast step to allow the butt to rock and the mast to bend, when sitting on the center pin. Without sufficient clearance the butt will get stuck in the step and the mast bend will be restricted.

5. Shroud Deck Location

If your shrouds are 4'7.5"/141 cm apart, the distance from your shrouds to the forestay should be 5' 5.75"/167cm (front hole on Persson). As your shrouds get further apart you will also need to move them further aft to help limit headstay sag upwind. If they are 4'9"/145 cm apart, they should be about 5'7"/170 aft. If your shrouds are too far forward you will get too much headstay sag as the breeze increases. Too far aft and you will not get enough sag.

In moderate to heavy air (over 15-18 kts), moving this position back 1" (or outboard on the older Jibe Tec) will tighten the rig to help depower the sail plan. This aft placement will also encourage lateral bend to help depower the sail plan upwind as well as minimizing the possibility of offwind mast inversion.

If you are unable to move your shrouds fore and aft, you should consider modifying your boat so that this is possible.

6. Jib Tack

The jib tack must be fastened at the furthest forward position allowed by the Class rules to reduce the main and jib slot overlap. This distance is 11" (27.9 cm) back from the stem. Attach the jib wire, with the shackle provided, on the bow fitting to the point closest to this measurement. Class rules do not allow the jib and forestay to share the same pin. Run your forestay under/through the jib shackle to the second pin aft on the bow fitting.

C. TUNING THE RIG

The measurement ranges given allow you to tune the characteristics of your mast for your crew weight and wind conditions. Any time you need power, either because you are a heavier team and/or the winds are light, the mast must be more upright

and/or the shrouds looser. When you need to depower, the mast must be further back and/or the shrouds tighter. For the sake of deciding whether you're sailing at a heavy or light crew weight, let's define a median crew weight as 300 pounds.

Your eventual rig tune will reflect the characteristics of your mast and crew weight. This tune will need both a light air set up and heavy air set up. Experimentation is necessary to develop these rig tune steps through the wind range (see Wind Range Step #4). For starters, let's set up your boat with a good light to moderate wind tune.

Place the mast in the boat and attach the shrouds and mast ram. Fasten a tape measure (at least 25'/7 m) to the main halyard shackle, raise the main halyard all the way and secure it in the halyard lock. All measurements assume that your halyard is the correct length after it has been locked, meaning that the top of your mainsail is even with the bottom of the top band. With my halyard locked, and I pull the tape measure down the back of the mast to the top of the black band, the distance is 16' 9"

Step 1

Shrouds- Use the fore puller to pull the mast forward against the shrouds. The shrouds should be barely tight and the mast near straight. Take the tape measure to the stern and measure from the top of the mast to the intersection of the aft deck (center) and the stern of the boat. Adjust your shroud tension until you are within the measurement range of 21'1"-21'2" 643-645cm. Consider your crew weight at this stage. We encourage the use of Sta/Master shroud adjusters for accuracy as they allow for very small increments of change. Because of the variance possible in the amount of fore puller tension, this is not a very accurate method of determining your exact shroud setting. It does, however, get you close. Fine tuning will be done when checking your Prebend/Rig Tension (section #3). Make note of the shroud size and wire design (3/32" or 1/8"; 1 x 19 wire, rod rigging, etc.) on the mast. The stronger wire will require a looser shroud tension setting to achieve the correct rig tension. If the rig has new shrouds, be sure to check the shroud measurement after having sailed a couple of times. New shrouds will elongate following their initial use and must be tightened accordingly.

Step 2

Mast Rake- The wire in the jib luff assumes all of the mast load while sailing. By adjusting the jib halyard with the pullers off, changes are made to the mast rake and prebend/rig tension. With the jib up, take the tape measure to the stern to measure the rake. Adjust the jib halyard until you are within the measurement range of 21' 6" -21' 7" (653-658 cm). This will be your upwind halyard setting.

Deck Crown- Hold a straight edge from one transom corner to the other and mark this line in the middle of the stern. From this line to the top of the deck, the Persson measures 1.75"/4.5 cm. If your boat measures less you will have to add the difference to your rake number, and if it measures more, you will have to subtract the difference to get your rake number.

Step 3

Prebend/Rig Tension- Because of the jib luff wire loading against the shrouds, the middle of the mast will bend forward (assuming your mast pullers are off). This is called prebend. After the mast rake is set, (check that the mast is floating freely in the partners) hold the tape measure (or main halyard) so that it is just touching the back side of the spreader bracket. When the halyard is just touching the back of the spreader bracket, the bottom of the halyard (at the top of the black band) should be within 1/4" of the front of the mast.

If there is too much prebend (halyard is forward of mast), ease the shrouds and re-measure the rake. For too little prebend, tighten the shrouds and re-measure the rake. It is this stage of rig tuning that is most critical. Though you may have a bendy-style mast, they still vary in their actual stiffness. Utilizing a Loos Tension Gauge will allow you to check the pressure on your shrouds. The base shroud tension is 18-19 units on the Loos PT-1 gauge.

If the shrouds are at the tight end of the range to arrive at the prebend measurement, the mast is stiff and must be tuned differently. Set the mast within the prescribed rake range but with not as much shroud tension (less than 19 units) as would be necessary to achieve sufficient prebend. This will make the mast too

straight at the dock, but it will keep the jib luff from being too tight in light air. Due to less prebend, more fore puller must be used in the light air range.

Step 4

Wind Range Steps

Simplicity in rig tune is essential, but it has become apparent that a single rig tune will not suffice for all wind conditions. Depending on your mast, you will find the need for either two or three mast tune steps to get from light air to heavy air. After you have developed a starting light/moderate air setting, you can develop your medium air (15-18 knots) tuning by: tightening your shrouds a half hole for Holt-Allen adjusters or 1.5 turns on the Sta-masters and keeping your jib halyard at the same mark. Recheck steps 2 and 3 to note the changes. This will increase your shroud tension and prebend, and increase your mast rake, all good things to have happen as the wind increases. When the wind goes over 15-18 knots you may want to move your shrouds aft one hole (.75"/2cm). All of the time you will use the same halyard mark.

A helpful rule to determine when to change your shroud tension is to watch the angle of your leeward Sta-master, and the sag between the forestay and jibstay at the bottom jib telltale. If the Sta-master is leaning over more than 20 degrees (the angle your middle and index finger make when making the peace sign), or if you can fit more than three finger widths between your jibstay and forestay at the bottom telltale (forestay shockcord pulled to same pin as jibstay), you should tighten your shrouds.

D. RIGGING

1. Jib Halyard Length

After setting the jib halyard at the correct rake measurement, ease it off all the way and check that there is at least 10" of adjustment. If there is less, you must either replace the jib halyard or use a wire pennant to lengthen the jib halyard.

2. Mast Partner

The mast must be shimmed tight in the mast partners. With the

boat on the trailer and the rig loaded at its upwind prebend setting, remove the shims and measure the thickness that is needed for both sides of the mast. Since the mast partner is rarely in the middle of the boat, the shims will likely vary in thickness. It is critical that the mast be held centered at the partner, but not too tight to prevent the mast from bending. With a softer mast, when the jib up and shims installed, pull the mast 1/2" aft at the deck to make the mast straight for/aft and sideways. Then sight up the back side of the mast to make sure the shims are set right and the mast is straight side to side.

IV. SAIL ADJUSTMENT GUIDELINE

This tuning guide is arranged so you can look at a specific section when you want information on either main or jib trim. Each section contains the correct sail control settings for that particular point of sail.

A. UPWIND SAILING-MAINSAIL

1. Tack Line

The Quantum main comes with a tack line to keep the tack of the sail forward. Pass the tack line through the tack grommet and around the mast twice, tying it to place the front edge of the sail snug to .5" (1.5 cm) away from the mast, and so that when the outhaul is pulled tight, the clew of the main is max aft and the foot of the main is tight.

2. Main Cunningham

This adjustment works to control the sail's shape throughout the wind range. Due to cloth stretch from wind loading, this adjustment must be gradually tightened as the wind increases. Under ten knots very little cunningham is used. Above that, apply enough tension to keep the draft about 42% aft in the middle seam of the main. You can find this spot by pulling on the cunningham until the deep spot in the middle seam is under the second to last sail number on starboard tack. If you pull harder and move the deep spot forward you will point lower, less cunningham and you will point higher but go slower in chop. The

Quantum Sails Snipe Tuning Grid

Base Assumptions:

Persson Mast step - Center of transom to to center of pin 10' 8 7/8"

Jibetech Mast step - Center of transom indent to to center of pin 10' 8 1/8"

Shroud tension measured with Loos PT-1

Measure spreaders on top, with tips all the way aft. Center of shroud to closest point on mast or bracket

Jib Halyard stays at same mark through wind range

With main halyard locked at the top, the measurement to the top of the black band (at gooseneck) is 16' 9"

SD-6K

Wind Speed - Knots

	Initial Rake	Final Rake	Shroud Tension	Spreader Length	Tip to tip	Shroud Position	Aft Puller
0 to 6	21'2"	21'7"	less 1 turn	16 3/4 - 16 7/8	29	1	1" fwd
7 to 9 flat water		21'6.5	Base 18-19		29	1	Neutral
7 to 9 waves		21'6.5	Base 18-19		29.5	1	Neutral
10 to 15		21'6	add 1 turn		29.5	1	Neutral
16 to 22		21' 5.5"	add 2 turns		29.5	1	Neutral
22 +		21' 5"	add 2 turns		29.5	1	Neutral

C-2

Wind Speed - Knots

	Initial Rake	Final Rake	Shroud Tension	Spreader Length	Tip to tip	Shroud Position	Aft Puller
0 to 6	21'2"	21'7"	less 1 turn: 16-17	16 3/4 - 16 7/8	29	1	1" fwd
7 to 9 flat water		21'6.5	Base 18-19		29	1	Float
7 to 9 waves		21'6.5	Base 18-19		29.5	1	Float
10 to 15		21'6	add 1 turn: 20-21		29.5	1	.25" forward
16 to 22		21' 5.5"	add 2 turns: 22-23		29.5	1	.5- .75" fwd
22 +		21' 5"	add 3 turns: 24-25		29.5	1	.5- .75" fwd

Floating Jiblead

Wind Speed - Knots

	Forestay to Twing-line	Twing-line eased from Car	Distance between twing, pulled apart	Jibsheet In/Out compared to cockpit edge
5-10 knots	90"	0-1" Ease	29"	Even
12-18 knots	89"	2" Ease	31"	1-2" out
18+ knots	88"	3" Ease	33"	3'-4" out



Outhaul	Traveler	Cunningham
ease outhaul 3/4"	0	slight wrinkles
ease outhaul 1/2"	0	
ease outhaul 1/2"	0	
outhaul to band	2-4"	some wrinkles from cunningham grommet
outhaul to band	4-8"	draft under 2nd number from front
ease outhaul 1/4"	10+ "	

Outhaul	Traveler	Cunningham
ease outhaul 1/2"	0	
outhaul to band	0	
ease outhaul 1/4"	0	
outhaul to band	2-4"	crease from clew to cunningham grommet
outhaul to band	8	draft under 2nd number from front
outhaul to band	10	

important point is to not have it set too tight, which is much worse than having it set too loose. Heavy cunningham tension increases mast deflection, further flattening the sail and opening the upper leech.

3. Outhaul

The Quantum main is constructed with a shelf foot to give the bottom third of our main the broadest range of shapes possible. Upwind the outhaul is normally pulled out to the band making the foot of the sail tight. If you feel that you need more power in light conditions, you can experiment with easing your outhaul up to .75" or 2 cm. The SD-6K requires the outhaul to be eased when the crew is just sitting on the deck or inside the boat. With the fuller C-2, the outhaul can be left on in light air.

4. Mainsheet

The mainsheet is the most important adjustment on the Snipe and must be constantly adjusted to keep pace with the changing conditions. It affects both mast bend and jib luff sag which changes the sail shape in both the main and the jib. The rule for upwind sailing in light to Medium air is to trim the mainsheet so the top batten is either parallel with the boom or just twisted open 5 degrees. To improve pointing when the boat is up to speed, sheet the main in tighter to hook the top batten. Be aware that this will eventually slow the boat down. Mainsheet trim is a constant cycle of sheeting in to point and then easing out to accelerate. In lighter air the weight of the boom will prevent the top batten from opening. When this occurs ease the main out so the top batten is parallel to the centerline of the boat. In heavy air your main will twist open to the point where the middle batten is parallel to the boom, even though you are using significant cunningham and vang tension.

5. Fore/Aft Mast Puller

The puller controls mast bend which not only affects the shape of the mainsail, but the jib as well. Using the forepuller increases mast bend which flattens the main but also sags the jib luff which makes the jib fuller. With the aft puller on, mast bend is restricted and the jib luff is straightened, thus increasing main fullness while

decreasing jib fullness. When used correctly, the mast puller will improve your sail's ability to cover the wind range. Since crew weight and mast bend characteristics are always different, it is difficult to list strict rules to follow. What is stated below are general rules and logic to understand when using the puller upwind.

- a. **Deck Marks**- With the boat on the trailer, the rig tuned at your rake measurement (jib up), and the mast floating freely in the partners, place a mark at the side of the mast and also one on the deck which lines up with the mast mark. This is your prebend or neutral mark. Place a mark 3/4" (19 mm) in front of the prebend mark and a mark 1/2" (13 mm) behind the prebend mark. These three marks will aid you in using the puller both upwind and downwind.

- b. **Using The Puller**- Pull the fore puller to the front deck mark when the wind is too light for the top batten to twist open to an angle parallel with the boom, usually when your crew is to leeward. This will flatten the sail, open the main leech and sag off the jib luff. Once there is just enough wind pressure for the top batten to stay open (crew sitting on the centerboard or just to weather of the centerboard), release the forepuller and allow the mast to float unrestricted. This will position it at or just in front of the neutral prebend mark. As the wind builds and you are both sitting on the deck (about 8 knots) you may want to set the mast just in front of the neutral prebend mark. There should be enough sag already in the jib at this time to accommodate the straighter mast. With the flatter SD-6K, you can try bringing the aft puller 1/8" (3mm) behind neutral in 7-8 knots upwind to gain height and power. As the wind builds further you will be using the boomvang (see boomvang section) in conjunction with the aft puller. Depending on your crew weight, it will be necessary to gradually ease off the aft puller forward of neutral, as much as 1/8" (3-4mm) with a Proctor mast and 1/2 - 3/4" (1-2cm) with a Sidewinder mast, as the wind strengthens to allow the mast to bend and the main to flatten.

6. Boomvang

The boomvang is used upwind in medium to heavy wind. When the wind has built to where it is necessary to ease the main in a

puff or to help steer around a wave, set the aft puller at or just in front of neutral. Sheet the main in correctly and then take all the slack out of the boomvang (and aft puller). As the wind strengthens, increasing vang tension (and decreasing aft puller) will help flatten the main while controlling jib luff sag. You will need to pull on a lot of vang in the breeze, but be careful not to hook the top batten to the boom as this is slow. It is critical, though, that the vang gets eased when the wind lightens or the main leech will hook excessively. Through trial and error you must come up with vang (and aft puller) settings for the different wind strengths that work best for your mast and crew weight.

WARNING: In breeze, ease the vang before going around the top mark to avoid breaking your mast as you turn downwind.

7. Traveler

The split mainsheet is the best system and allows the tails of the traveler to be pulled through the back boom block when trimming the sail upwind. This assures that the boom will be on centerline when correctly trimmed. When rigging your mainsheet/traveler, be sure that the splice goes through the back block in even the lightest of winds. If you decide to use a double mainsheet with a soft mast (Proctor Miracle or Sidewinder Junior), be careful not to oversheet in medium to heavy breeze.

There are two schools of thought on the traveler. One thought, that works well with the Proctor, is to not have a traveler and only vang sheet when the breeze comes up. To do this, the shrouds must be moved aft on the deck when the wind builds to help eliminate the added headstay sag created by using the vang. Using this method, we will only ease the traveler 1" max if the waves are large and the wind is light. This allows us to open the lower main leech and also sheet hard at the same time.

The other school of thought, that is great for a Sidewinder, is to use the traveler to help keep the headstay tight. Here is how this is done: Easing the traveler is the best way to get the boom to leeward of centerline when depowering the boat since you do not alter your jib luff tension in the process. As the traveler is not as easy to adjust as the mainsheet, its role is minimized but still important. The traveler is kept centered until all other

mainsail adjustments are well into their heavy air positions. Begin by easing the traveler 2" (5 cm) to help keep the boat flat. In puffy, overpowering winds a balance between the traveler and the mainsheet must be found. Example: In 15 knots, the boat is balanced with the traveler out 4" (10 cm). The wind puffs to 17 knots and the main is pumped to release the pressure. The wind drops to 15 knots and the main is back in. The wind drops to 13 knots and the traveler comes in to center.

Extra Traveler Tips- The traveler must be brought in quickly as the wind lightens. With the traveler out too far, the boat becomes punchless with pointing suffering as a result. However, in medium to heavy wind, overeasing the traveler is effective if you overstood a mark or need to foot over someone. Going to the traveler earlier in rougher water will help stabilize the rig through the waves. This is because the load on the leeward tail increases with the traveler off, thus preventing the mast from pumping forward as the bow hits a wave. The maximum the traveler is ever eased is approximately 10" (25cm). In light conditions, some sailors have rigged a system to pull the traveler to weather to help pointing.

B. UPWIND SAILING-JIB

1. Jib Leads

The first step in establishing the fore and aft setting of the lead is to use the trim line on the jib clew. The leads should be set so the jib sheet lines up as an extension of the trim line in 5-8 knots and flat water. This will get the lead close to the correct position, but now you must go to leeward and look up at the jib leech to see how it is curving into the main. When looking at the jib leech, the second flutter patch up from the clew (middle seam) should be parallel to the centerline of the boat. Moving the lead forward will bring the flutter patch in while moving the lead aft will twist the patch out. In light air the lead is furthest aft to help open the leech of the jib. As the breeze builds, move the jib lead up to 2" (5cm) forward and ease the jibsheet further out. Once the wind gets over 18 knots, begin moving the lead aft to keep the leech from hooking.

Over 15 knots, moving the jib lead outboard 1" (2.5cm) will help

open depower the jib and reduce helm. This moves the tracks from 29.5" (75cm) apart to 31.5"(80cm) apart. The tuning grid, on page 13, had more information for setting floating leads.

2. Jibsheet

This control is one of the most important for boatspeed and should be adjusted as often or more often than the mainsheet. Your best reference for repeatable jib settings is where the foot falls on the splash rail. Depending on wind strength and athwartship jib lead position, the foot will come down to the splash rail anywhere between 13"-18" (33-46cm) off centerline. This is the vertical plane of the jib, not the very edge of the foot. The jib is trimmed to 18"/46cm+ in drifting conditions, 15"/38cm in light-medium air and flat water (don't let the leech telltale stall!), and is progressively eased out to 20"/50cm as the breeze and waves increase.

3. Jib Cunningham

This adjustment works to control the sail's shape throughout the wind range. The rule is to trim the luff to have slight wrinkles coming out of the bottom half of the luff, or just smooth, when sailing upwind. Like the main cunningham, it is better to set it too loose than too tight. It is never fast to remove all of the wrinkles with our mylar jib.

4. Jib Halyard

Your rake setting is perfect for most conditions, but you may find your boat sluggish when at one end of your wind range of any given mast tune step. If your rig tune setup is good for up to 14 knots and now the wind increases to 15 knots during the race, you may need to ease your halyard to help keep the boat depowered. This will open your jib slot, drop the rig to leeward and aft, which are all good things when overpowered. The opposite is true when your boat feels like it needs more power. Pulling on the halyard will get the mast more upright and will tighten the jib leech, which again are all power-inducing qualities. When the wind is light enough to require forward puller, the increased forward puller will increase jib luff sag as well. Added jib luff sag means a fuller jib luff, which could be good in bumpy seas or shifty winds. By tightening the jib halyard to pull the mast

forward, the amount of jib luff sag will return to the previous amount. You may find your rig is already positioned well forward, but that you still need more power in the light and lumpy conditions. With the forward puller on because of the light winds, ease off the jib halyard 1" (2.5 cm) to make the jib luff the fullest shape possible.

C. DEPOWERING UPWIND

Listed below are the steps for how the sail trim adjustments are used when depowering. Be sure you are in the proper rig tune step for the conditions.

1. Set the outhaul, main and jib cunningham as the tuning guide suggests.
2. Set aft puller at neutral. Ease as wind increases.
3. Sheet main in for correct trim. This will set the mast bend.
4. Ease the jib out and move lead forward to foot more.
5. Remove slack in boomvang and tension slightly. Increase significantly as wind builds.
6. Move shrouds down 1/2 hole and later down another 1/2 half hole.
7. Ease traveler when steps 1-3 do not suffice.
8. Move jib lead back two holes (last resort).

D. OFFWIND SAILING - MAINSAIL

1. Main Cunningham

Due to a straighter mast and decreased wind pressure when sailing offwind, cunningham tension is completely off for all offwind sailing.

2. Outhaul

When reaching in planing conditions, don't ease the outhaul. In light air ease the outhaul until the shelf is nearly open. When running, the outhaul is optional.

3. Mainsheet

When reaching, ease the mainsheet out as far as it can go without luffing. In planing conditions, slightly overtrimming the mainsheet will help the boat get on a plane quicker and sustain the plane longer. When running, the mainsheet is eased out until

the boom barely touches the shroud. If running in high winds, tie a knot in your mainsheet so that the boom cannot touch the shrouds. This will help keep your mast from inverting.

4. Fore/Aft Puller

It is fast for the main to be very powerful when reaching. If non-pole reaching, pull the mast to the aft deck mark to straighten the mast. This in turn will make the main fuller. The only time you do not want to do this is when the wind is too light to keep the leech from hooking. With little wind pressure, the weight of the boom pulls the leech in. Using the aft puller would only aggravate this situation. In this instance, pull the mast forward to the front mark to open up the upper leech and soften the jib luff.

In light air, when pole reaching and running with the jib halyard eased, the fore puller must be used to keep the mast from falling back. Tension the fore puller so the mast is fairly straight and resting lightly against the shrouds. This should place the mast between the aft and middle deck mark. When running in Medium air, ease the mast 1/2 - 1 inch aft of neutral helps get the boom out further. When reaching/running in heavy winds, the mast should be pushed 1/4" to 1/2" forward of neutral to prevent it from inverting.

5. Boomvang

When reaching adjust the vang so the top batten is parallel to the boom. In planning conditions, make the next seam down parallel to the boom. When running the top batten should be twisted off to make it perpendicular to the centerline of the boat. This allows for a deeper running angle. When the wind is light or the water is confused, the leech may bounce around too much if twisting off so the boomvang must be tightened so the top batten is parallel with the boom and the leech is stable.

E. OFFWIND SAILING - JIB

The first question you must ask before starting an offwind leg is whether you can set the whisker pole. There is a gray area where the pole is as effective as trimming the jib to leeward. You should use the pole with the wind abeam (90 degrees) and certainly use it once the wind is behind the beam.

1. Non-Pole Reaching

- a. Jibsheet- The jib is trimmed to keep the telltales on both sides of the sail flowing. When the jib is eased and bending around the shrouds, the clew must be taken around the shrouds and the sail be trimmed outboard. This can be done by either a barberhauler system (see section below) or by having the crew handhold the jib sheet.

Since the jib does not have a vang or a boom, it needs to be held down and moved outboard by one of these two methods. When you must use the barberhauler you do not have the flexibility of trimming options that the crew can give you. The drawback to hand holding is that it is very hard to hold the jib steady in puffs and choppy water. Using two sets of telltales (one high, one low) helps tell the crew how hard to pull down on the sheet. They should both be flying together (example- if the top of the sail luffs, the clew needs to be pulled down more). The distance the clew is held outboard is less obvious. If it is held too far outboard the foot will get too flat, and when trimmed from the rail the foot is too full. Your goal is to find an area in between these two extremes that will give the sail moderate foot fullness.

- b. Barberhauler- The barberhauler is designed to help trim the jib correctly when reaching by moving the lead position forward and outboard. When it is too windy for the crew to hand trim the jib to leeward or their weight is needed to windward to sail the boat flat, the barberhauler must be utilized. When the wind gets over 18 knots, the barberhauler isn't necessary off wind, but can be used upwind to sheet the jib clew up to 4" outboard.
- c. Jib Halyard- When non-pole reaching, the jib luff should sag to leeward to increase jib fullness. If the aft puller is being used, the jib luff may get too tight. To return fullness to the jib, ease the jib halyard about 1" (2.5 cm) to soften the jib luff.
- d. Jib Cunningham- Since the loads on the sail are now much less than when going upwind, the jib cunningham must be eased off completely. Only in heavy air might the tack rise too high (get big luff wrinkles) and need some tension.

2. Pole Reaching and Running

- a. Jibsheet- When reaching, pull the pole back as far as you can

without the leech (which now acts like the luff) collapsing. If you are running the jib leech won't collapse, so the rule then is for the jib to be pulled back until the jib foot is barely kicking up. Only in light air is the jib trimmed a little looser to give the foot a fuller shape. The error when trimming the jib sheet with the pole up is usually to not pull the pole back far enough.

- b. **Lazy Jibsheet**- When running in waves it can be fast to lightly tension the lazy (leeward) jibsheet. This keeps the pole from lifting and keeps the jib leech taught which prevents a loss of power.
- c. **Jib Halyard**- The farther the wind is behind the boat, the more the halyard must be eased. This allows the jib to project away from the boat and enables the pole to be pulled back farther when running. The halyard will be at the upwind setting when using the pole on a very tight reach or planning, and then gradually eased off until you are on a downwind course. Anytime the luff bounces around due to light air or confused water, the halyard must be tightened to stop it. The tendency when pole reaching is to ease the halyard off too much. This makes the jib too full and prevents the pole from getting pulled back far enough. If, when pole reaching, you need to ease the jib sheet due to the leech collapsing, tighten the halyard first. A good rule when pole reaching in under 10 knots, is to keep the pole parallel to the horizon by adjusting the jib halyard. When running with the pole, the general tendency is to not ease the halyard off enough. The halyard should be eased off 10"-14" (26-36 cm). The goal when reaching or running with the pole is to maximize the jib's projection to the wind.
- d. **Jib Cunningham**- When running deep, the jib cunningham is eased 4"-8"/10-20cm for all downwind sailing.

VI. BOAT HANDLING

This section is designed to offer some tips that should help improve your sailing. More tips can be seen on the Tuning DVD

A. ROUNDING MARKS

1. Weather Mark

Listed in order are the sail trim adjustments to be made when

rounding the weather mark to go offwind:

- a. Ease boomvang (especially if tensioned hard)
- b. Ease mainsheet and jibsheet at mark
- c. Put pole up (if appropriate)
- d. Jib halyard off and fore puller on (If non-pole reach, set aft puller and ease halyard)
- e. Daggerboard up
- f. Check boomvang tension
- g. Main and jib cunningham off
- h. Outhaul off

2. Leeward Mark

The exact reverse of the weather mark adjustments.

B. RAISING THE CENTERBOARD

On a tight reach the centerboard is needed less as a preventative to slide-slipping and can be raised to minimize drag. Unless close reaching, always get the board as high as possible offwind. Remember the class rules state that at least one foot (30.5 cm) of the board must extend below the keel at all times! If you have the hook system, be sure the top hook raises it this high. If you have a flopper or other system make a mark on the top of the centerboard trunk that the leading edge of the board will meet when it is pulled up to its maximum legal height.

C. CREW WEIGHT PLACEMENT

In light air the skipper is sitting on the inboard edge of the side deck, just over the jib leads. The crew should be all the way forward, very low and in a tight tuck to leeward on the floor. It is recommended to keep the crew off the leeward deck if possible. This keeps the crew weight forward with minimum windage. If more leeward heel is needed, it is better for the skipper to sit on the floor rather than have the crew on the leeward rail. As the wind builds, the skipper will move outboard and aft to just behind the side deck adjustments. At the same time, the crew will be moving to windward, ultimately sitting just in front of the skipper.

Skipper placement for light air reaching is the same as light air beating, with the crew forward on the leeward rail. As the wind builds both will slide to weather and back, ultimately getting aft to the bailer in strong wind. With the pole up, the skipper sits over or just behind the jib lead with the crew forward on the side deck. Both will slide back as the wind increases, staying forward to get the bow down the wave and moving back to keep the bow from burying helps the hull get through chop or sloppy seas. You should sail with a slight heel while reaching. The boat can be flattened once planning. Once you come off of a plane, heel the boat to leeward and dig the leeward chine immediately. For downwind sailing in very light air, you will want to sail with leeward heel. As the wind builds the boat should heeled to windward.

D. HEEL ANGLE

Upwind the boat is almost always sailed with a slight heel. One chine is always out of the water, this makes the boat easier to steer and more forgiving in big shifts. In light air the heel assists in keeping the sails full. Downwind, either the weather or leeward chine should be out of the water in 0-12 knots.

E. POLE LAUNCHER

To launch the pole, the crew quickly pulls on the launcher line until the pole is fully extended. The skipper trims the jibsheet as the pole is launched, being careful not to fight the crew during launch while also preventing the pole from blowing forward. When gibing, retract the pole as the boom begins to come across. You must make certain that the pole is sufficiently retracted when the boom crosses centerline for the outboard end of the pole to avoid the forestay. When retracting at the leeward mark, you must give the jibsheet a quick pump as the launcher line is released. This pump will prevent the outboard end of the pole from blowing forward, keeping the pole and boom parallel long enough for the pole to begin retraction. Tips on rigging the launcher are on our website.

F. ROLL GIBING

While there are many ways of gibing a Snipe, we have found a way that we feel is very easy for the crew and quite fast too. To

begin with, the crew sits on the leeward side and is facing across the boat. When the skipper is ready to gibe the crew stands up with their knees locked against the centerboard, and heels locked against the outboard edge of the cockpit. As the skipper begins to roll to weather the crew also rolls to weather by bending over the centerboard (be careful not to hit your head on the deck). The skipper pumps the main into the gibe, and the crew uncleats the pole line as the boom comes across. The skipper uncleats the old jibsheet. Once the boom is across the crew stands up and launches the pole by pulling the pole line up and over their head. The skipper pulls in the new jib sheet (the crew may need to assist) and both people switch sides and sit down.

If you have any questions please feel free to contact us anytime. For even more detailed information, check our web pages at www.quantumsails.com/snipe. Good luck and good sailing.



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