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Opti Rigging and Tuning

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McLaughlin Optimist
2012 USPS
Long Beach, CA

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SETTING UP THE HULL:

Most of the time, you will probably leave the hull rigged, but it's always a good idea to give it a quick look over before you leave the dock just to make sure it's safe and ready to go. Below are a few points that should be looked at often and can make a big difference in the performance and safety of the boat.

Hiking Straps: The adjustment lines for most hiking straps are behind the aft airbag so it's a good idea to inspect them and adjust them BEFORE going on the water. Once on the water, it is tough to adjust them. A simple square knot with an additional safety hitch on either side is a good way to tie them off.

Bailers: The Opti is NOT self bailing. The boat is actually designed to swamp making it easy for a young sailor to ride after a capsized. Because of this, you really need to make sure the boat has 2 bailers in it. Also, the best place to tie the bailers in is the aft airbag straps of the forward airbags or around the midship frame where it meets the deck.



Airbags: The airbags in the Opti are probably the most overlooked piece of equipment on the entire boat. Often I see green fleters out on the course really struggling with a swamped boat because their airbags are so deflated that they can't keep the rail above the water. For the sake of Johnny, please make sure the airbags are blown up and don't leak. If the boat has the oversize square bags in them, also make sure they are oriented so the "ears" of the bags are pointing out. If not, they will plug the drainage holes that are built into the midship frame. When the boats come off the water, also think about the temperature. If it's a hot day, then you need to let some air out of them. Otherwise, you will risk them exploding.



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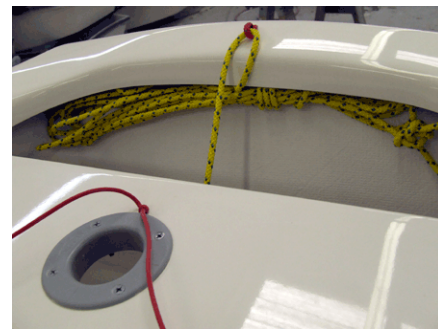
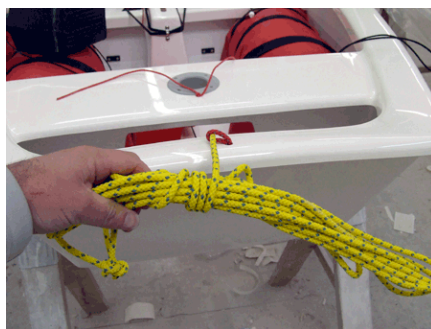
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Mainsheet: The most common set-up for the mainsheet is a 3:1 purchase with the system dead ending at the boom block. Please note that in the picture a bowline knot is used, not a stopper knot. A stopper knot will cause the block to orientate itself incorrectly under load making it harder to trim. In addition to a 3:1 purchase, I have seen a 4:1 purchase set up with a floating block or a cheek block for the light sailors. The racers use a 3:1 system that has a quick release to it.



Bowline: Since the boat is for young kids, it is important to make sure the bowline is rigged and stored properly. The bowline dead ends at the mast step with a slip knot or tight bowline. If you use a bowline, make sure it's tight so it will not loop itself around the threaded adjustment rod. The boats are towed in a daisy chain configuration, so you also want to make sure there is a bowline on the bitter end of the line and it's coiled up and stuffed under the rail.



Mast Rake: The mast rake for the Optimist is measured from the top of the mast to the end of the gunwale. It is a really good idea to measure the mast rake before tying the sail onto the spar. Most Optimists have a racing deck collar. This means that the deck collar is slightly oblong. When measuring the mast rake, you want to give the tape measure a slight pull or have someone push slightly on the mast so that it is aft in the deck collar. You do not want the mast bent, you just want it set as it if would be sailing upwind. The typical range for the mast rake is 110-113 inches. If the sailor is on the lighter side of 100lbs, then 110-111 in. is a good range to start with. If the sailor is on the heavier side of 100lbs then 111-112 in. is a good window. I highly suggest after measuring the mast rack that you make a few marks on the mast step itself to help with quick adjustments on the water. This can really help since checking the mast rake on the water is almost impossible



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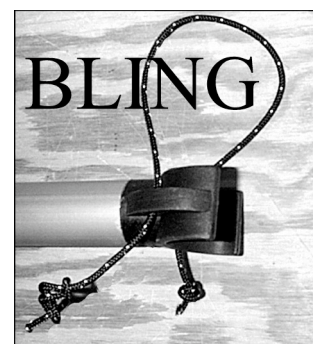
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SETTING UP THE RIG:

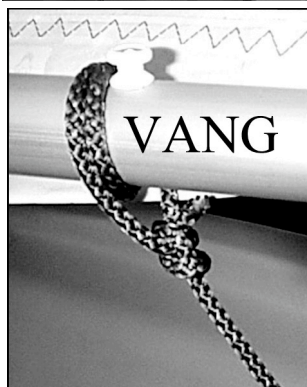
There are a couple of common spar sets for the Optimist. The Club Rig is silver anodized with eye straps at the mast head and a fixed sprit halyard block. The rig is designed so that the sail stays rigged on the mast all the time and loose parts are minimized. This is the basic set up for beginning Opti sailors, clubs, community programs, and sailors who are not concerned competing past the beginning GreenFleet level.

The Quick Silver® and Blackgold® spar sets are regatta spar sets. They have holes at the top of the mast, accept a wind pennant, and utilize a hook-in type block for the sprit halyard system. Both spar sets are designed so the sail can easily slide on and off the mast with ease. The Quick Silver® spar set is designed for the lighter weight sailors or regional sailors and is silver anodized. The Blackgold® spar set is anodized black and is for the heavier and most competitive sailors.

Boom: Starting with the boom jaw, tie the “bling” or gooseneck preventer. Tie a figure eight knot close to one end and pass it through the holes in the gooseneck jaw as shown and tie another figure eight knot in the end. The bling is very important but often omitted. It works in conjunction with the vang and sprit adjuster by restricting the downward pull from the vang. It is the primary control line for adjusting the fullness or flatness of the luff. By twisting the bling line, the distance between the boom and bling peg is shortened. This gives the sail more depth in the forward part. Consequently, the less twists on the bling, the flatter the sail will be.



Next, add the **boom vang**. On the racing rigs, there might be a smaller line or wire that connects the vang adjustment line to the boom. On the club rig it is just a simple line and it can be secured to the boom with two half hitches or a doubled turn bowline. This will prevent it from riding over the vang peg toward the mast.



The **outhaul** is a simple 2:1 purchase that dead ends on the boom end fitting and uses the grommet of the sail as the pivot point. Tie a figure eight knot in one end of the outhaul, pass it through the sail grommet and then back through the end fitting to the cleat. (see picture at the bottom of page 5)

Last on the boom is the **bridle** for the mainsheet attachment. This line must be Spectra or even better, Vectran, as it sees high loads and must not stretch. Start by tying a bowline tightly around the boom at the forward bridle fitting. Next, Thread the stainless ring onto the bridle and wrap the line twice more through the ring. This is where the mainsheet will eventually attach.





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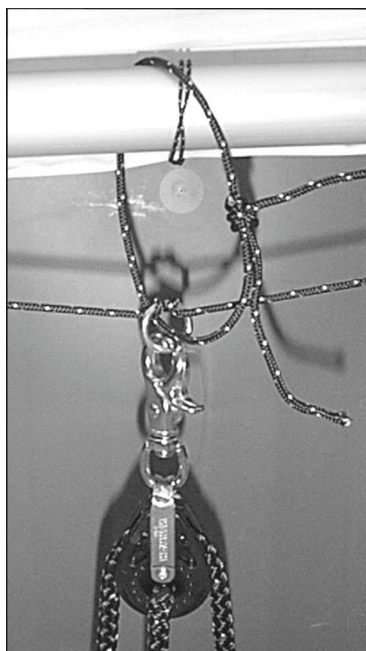
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Next, secure the bridle to the aft bridle fitting with a trucker's hitch. Pull the trucker's hitch as tight as you possibly can. To finish it off, wrap the hitch with half hitches that draw the bridle even tighter. After the bridle is done, you will want to pull the bridle like an archery bow string and make sure it does not exceed the maximum of 10 cm from the boom (class rule). If it does, start over with the trucker's hitch and stretch it even tighter.

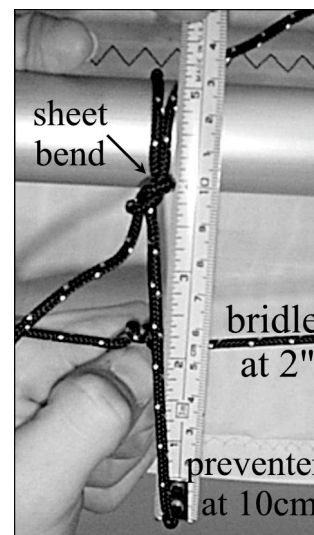
Performance Note: With the bridle fully tensioned the bridle ring will be very hard to move. To purposely adjust the position, use a screwdriver, pliers handle, or piece of line inserted into the ring to pull the ring to the new position. Why adjust it? Move it forward for larger sailors who may have difficulty getting past the sheet (they are usually strong enough to handle the decreased leverage). Move it aft for a smaller, weaker sailor (especially in a breeze) to allow better leverage yielding less tension on the mainsheet. The median position would be directly above the ratchet block.



Once satisfied that the bridle is tensioned correctly, add the bridle preventer. The **bridle preventer** should restrict the bridle to pulling no more than 10 cm from the boom in the event it loosens. Tie the preventer with a sheet bend (a square knot would flip and loosen under tension).

Safety Note: A loose boom bridle can hang below the boom in a "v" shape. It can trap a sailor's head resulting in possible capsize and catastrophe. DO NOT ALLOW SAILORS ON THE WATER WITH BOOM BRIDLES THAT HANG FARTHER THAN 10 cm FROM THE BOOM. Also, use a bridle preventer to help restrict the stretch to less than 10 cm.

Performance Note: The bridle is designed to be attached to the boom in two locations to spread the load. The boom is not designed to have tension on the bridle preventer. The preventer is to prevent head entrapment.



Tie the sail on: Lay the mast on the floor or grassy area. Next, slide the boom bling around the bottom of the mast and snap the boom jaw to the mast about 6" below the bling peg. Make sure the boom is right side up at this point as well and the vang cleat is directly under the boom. Now spread the sail out to fit inside the mast and boom with eyelets toward the spars.

Begin tying on the sail by securing the throat eyelet to the masthead (see pic below). Use the longer, thicker **sail ties** (corner ties) and loop twice through the eyelet, each time passing around the mast and through the upper eye strap. The sail should be very tight against the mast at this point. Secure with a square knot making sure that it's pulled as tight as fingers will allow. Tighten the knot further by grabbing the sail and pulling. This tightens the knot from the inside. It also allows you to check that the sail is still close to the mast, even under pressure. Retie as needed. Savvy Opti sailors will now tie an extra "half of a square knot" to help hold the original square knot from slipping.



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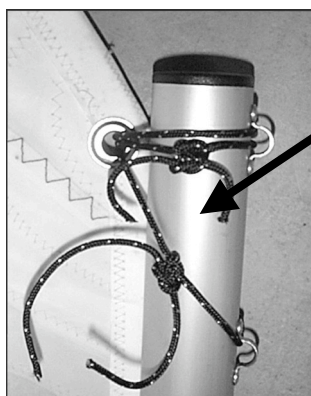
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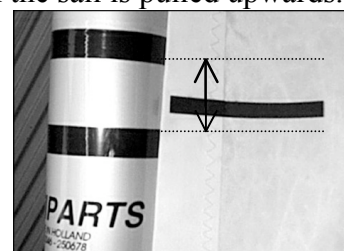
Note: Double length sail ties are recommended as they can be tied tighter than a single wrap.

Note: After a day of sailing you may notice that the sail is not tied nearly as close to the mast as it was. Short Vectran, Spectra, even Dacron sail ties don't stretch that much. The reason is slippage of the knots. To correct for this, all sail ties must be very tight to begin with and the knots are pulled very hard from the inside as well as the outside.

The next sail tie to install is the **halyard preventer**. It is also one of the thick ties as it sees higher loads, like the corner ties do. The purpose of the preventer is to keep the sail from riding too high on the mast when the sprit adjuster (halyard) is tensioned. It loops only once through the same throat eyelet, but at an angle to the lower eye strap. Instead of pulling this tie tight, adjust the loop so the top corner tie remains perpendicular to the mast when the sail is pulled upwards.



Performance note: Accordingly, the halyard preventer works in contravention to the sprit adjuster by positioning the sail band within the class legal bands on the mast. Tighten it to lower the sail. Loosen it to raise the sail. Keep in mind that after setting it, heavy vang and halyard adjustment can sometimes pull the sail past the mast bands and must be accounted for.

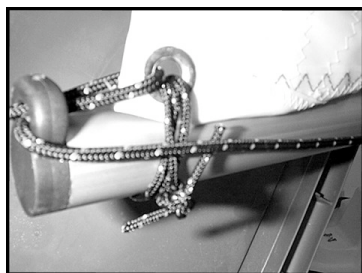


Now you can work your way down the mast, tying each eyelet with a double loop of the thinner sail ties



All sail tie knots should be pulled very tight to avoid the sail pressure pulling the knot and loosening the distance between spar and sail. The four corner ties should hold the sail so it's touching the spar, but not so tight that the sail is bent or disturbed. In light winds, it's OK to have some space showing. Intermediate sail ties along the mast should be set in the same way. Intermediate sail ties on the boom need to be set loose so the sail can "tack" over the boom fittings. A good rule of thumb is a pencil width. Class rules specify that no sail tie or corner tie be farther than 10mm (about 3/8") from the spar.

The last tie on the mast is the tack corner tie. Make sure it's tied below the bling peg and remember to tie this with extra effort as it sees a very high load.



Finish up by tying the boom corner tie at the tack, followed by the loose intermediate boom ties (be sure to tie under the bridle or outhaul). Don't make the mistake of leaving off the clew corner tie and assume the outhaul will hold it down. This tie is just as important as all the others (see left pic).



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Note: make sure the tale of the outhaul is not too long. 45" is plenty long enough for the overall length to achieve the maximum 2:1 purchase. Tie a bowline in the end to make it easy to grab and to keep it from hanging down and getting in the way. Handles are not allowed and not necessary.



Rig the Sprit Adjuster: The sprit adjuster or halyard is a 2:1 purchase. This is a class rule. For the club rig, use the longer line to attach the Sprit to the purchase system. The loop from a bowline knot works as a cradle for the sprit tip. The shorter line is used to create the purchase. Tie one end to the bridge of the cleat and the other end is fed through the floating block and then through the cleat.

Performance Tip: Make sure you put the sprit on the starboard side of the mast, not the port. This actually has some merit as the sprit won't disturb the sail shape on starboard tack.



Stepping the mast: Most eight year olds are able to step the mast alone after a little practice. The trick is to keep the hands spaced wide apart on the mast. If the rig must be transported any distance or if the wind is too strong, fold the boom up to the mast and carry it folded up.



Immediately after stepping, the mast should be tied into the boat. The mast tie-in prevents the mast from coming out of the mast step cup and damaging the mast thwart in event of a capsize. The tie-in lines should be long enough to wrap around the mast, crossing over top of the vang cleat and securing in front with a square knot and a half. Test that the mast cannot be lifted out of the cup BEFORE the boat leaves the dock.

Safety Note: The use of a mechanical clip for securing the mast are becoming more prevalent, especially with racers, but they should be used as a secondary means in conjunction with tie-in lines. Tie-in lines afford a visual check while under sail.

The mainsheet should be attached to the boom bridle with a shackle that is easy to use, lightweight, inexpensive, takes only one hand to use and is SAFE! Why one handed? So the sailor can steer while connecting or disconnecting.

Safety Note: Clips that can open by themselves are extremely dangerous. They are known as carabiners and at one time were widely associated with the Opti. The danger is they can grab clothing, lifejackets, even tow lines... the result is often capsize which has led to documented cases of near drownings.

