



Vanguard Sailboats Laser Manual

By Dave Kirkpatrick

Bruce Kirby designed the Laser in 1971. Thirty years later, over 170,000 Lasers have been built and the Laser is now an Olympic boat. Laser racing has always attracted top sailors and continues to do so today. ISAF's 2001 World Sailor of the Year is Laser World Champion Robert Scheidt. The Laser has a reputation as a tough boat to sail, and though this reputation is well deserved, it shouldn't scare anyone off from sailing a Laser.

The following suggestions are equally applicable for Radial sailors as to those sailing standard Lasers. The boat, with either rig on it, is rigged, trimmed and sailed the same way.

Rigging the Boat

In October of 2001, the Laser Class made a change to the rigging rules to allow more powerful sail control systems. The latitude this gives to sailors in designing their own systems makes it difficult to give any meaningful discussion of Laser rigging. If you are using the Vanguard-supplied rigging kits, they come equipped with complete rigging instructions. There are many resources on the internet that show various rigging systems. Most of these can be accessed either from www.teamvanguard.com or on the Laser Class web site, www.laser.org. See the attached sheet for a description of the class rules for the vang, cunningham and outhaul.

There are certain things that should be rigged a specific way. One of these is the traveler. Many times people tie a bowline in one end of the traveler, then pass the tail through the traveler eyes and block, then through the bowline and through the cleat. This method allows the traveler to loosen up when sailing, and shouldn't be used. A better system is to tie a bowline in the traveler line after passing the traveler line through the eyes and block. With this method, you will essentially wind up with a big bowline, with the bowline's loop passing through the traveler eyes and block. It is critical to proper sail trim that the traveler stay very tight, and this method will allow the traveler to be kept tight.

Another item that should be rigged a certain way is the hiking strap. Pass one end of the hiking strap line through both metal eyes on the aft wall of the cockpit, then through the loop on the aft end of the hiking strap. With this tail, tie a bowline around the line between the two eyes on the aft cockpit wall. Tie a stopper knot in the loose tail of the hiking strap line to prevent it from being pulled through the eyes and sending you into the water. With this system, the hiking strap's length is adjustable. Moving the bowline forward, toward the hiking strap, tightens the strap. Moving the bowline aft lengthens the strap. Changing the position of the stopper knot in the line's tail will define the hiking strap's range of motion.

However you choose to rig your clew tie down, it must be tight. The sail should not be able to lift off the boom under any amount of tension. Without a tight clew tie down, your pointing and speed will both suffer.



Lasers are shipped with a long piece of shockcord for daggerboard height adjustment and to keep the board from floating away should it fall out in a capsize. Lead this shockcord forward to the bow eye, then bring it back to the board on the same side of the mast. This way, the shockcord will only be in your way on one jibe going downwind, not both. Since I seem to spend more time on starboard than port going downwind (you start off on starboard at the top mark and it often pays to ride on starboard for a while), I lead the board shockcord to starboard.

The Laser has a kick-up rudder that makes launching and landing a breeze. It is absolutely critical that the rudder blade be all the way down when you are sailing. First, it is illegal to sail with the rudder raised. Second, it is really slow to sail with the rudder raised even one degree. Make the pivot bolt very tight. This will prevent the rudder blade from having any sideways play in the rudder head, and will ensure that once you put the rudder down it stays down.

For racing, the tiller should be jammed firmly into the rudder head. Most top sailors push their tillers so tightly into the rudder head that it is hard to get the tiller out. This prevents the tiller from ever falling out, without requiring you to use the tiller pin, which can catch your mainsheet.

One of the biggest mistakes that novice Laser sailors make is not lining up their sail properly on the mast. The head of the sail must line up with the gooseneck so the sail sets the same on both tacks. If the sail is twisted at the masthead, your boatspeed will suffer dramatically. Another good thing to double check before you put the mast up is the battens. Many a Laser sailor has suffered the embarrassment of taking his sail back down in order to install the battens.

Sailing The Boat

Lasers are, on the surface, pretty easy to sail. Thousands of novice sailors have gone out in Lasers and had a great time. To sail a Laser well, however, is a much different kettle of fish.

The first rule of sailing a Laser upwind is that it must be kept flat. Keeping the boat flat keeps the helm balanced and produces the most power and forward drive. Any heel reduces the effective surface area of the sail and the blades. If your arm is getting tired from steering the boat upwind, you are not sailing the boat flat enough.

Sailing the boat flat is a question of both hiking technique and sail trim. Notice that hiking technique comes first in that sentence. Laser sailing introduced the world to the concept of straight leg hiking, or 'straight-legging.' Traditionally, sailors bent their knees at about a 45-degree angle when hiking. Because of the Laser's low freeboard, this was impractical – if you bend your knees while hiking in a Laser, your butt drags in the water. Any bend in your legs also reduces your hiking leverage, since you become effectively shorter when you bend your legs.



You could write a book about hiking techniques (in fact, people have) so we will just cover the basics here. First, the hips must always be inboard of the shoulders. This will come into play in light to medium air. Your control over the boat and your ability to move within the boat are all dependant on keeping your hips in and your shoulders out. Second, the hiking strap should be relatively tight. How tight depends largely on leg length and personal preference, but if you surveyed the top sailor's boats you would find that their hiking straps, when pushed in the middle of the strap down towards the cockpit floor, stop about 1" off the floor. Third, when hiking, the toes should be pointed to leeward. Fourth, when you are hiking hard, you should be trying to get your shoulders as far away from the boat as possible.

In light air, you will start off with the traveler quite tight, with just enough slack in it so that the traveler block lifts up about 2" off the deck when the sail is sheeted in. The outhaul should be loose enough so that if you make a "thumbs up" signal with your hand, the tip of your thumb hits the boom and the outside of your pinkie hits the sail at the draft (deepest part of the sail). The vang and cunningham should be loose.

In extremely light air, you will be trimming the main very loosely. If you trim too hard, you will close the leech of the sail and you will go very slow. Instead, try pulling on just a bit of vang to bend the mast and trim the main rather loosely. The end of the boom will be several inches outside of the leeward rail. In these conditions you will be trying to get as far forward in the boat as possible. Class rules prohibit going further forward than the mast, but you will want to shove yourself pretty far forward. This is also one of the very few conditions where you will heel the boat upwind, but only just a couple of degrees

As the breeze comes on a bit, you can slack the vang and start to trim the main a bit harder. At the point where you are sitting on the windward rail, you can start to trim pretty firmly. Practice will let you learn when you can really start to pull the main on hard. Try pulling the mainsheet all the way in, and see if the boat powers up and takes off. If it does, keep the mainsheet in, easing only for big lulls and rough patches of water. If pulling the main hard kills your speed, keep the boom about 8" of the deck, trimming and easing in the puffs and lulls. If you are sitting on the rail, put your shins underneath the hiking strap and put your toes on the leeward cockpit grabrail. This will give you good leverage to push and pull yourself in and out of the boat as the wind strength varies. By the time you are keeping the boat flat with your body weight, you should be starting to move back towards the cockpit. At this point, you should also ease your outhaul just a bit for power. When you make a 'hang loose' symbol with your hand, your pinky should touch the boom and your thumb should hit the sail at the draft. This is a neat measurement because, typically, the smaller your hand is the less you weigh and the less power you need. If the water is very flat and the breeze is steady, you can keep the outhaul a bit firmer.

At the point where you are trimming the mainsheet all the way, you need to pull your traveler on hard. Grab the tail of the traveler line (it helps to tie a big bowline loop in the tail to make it easier to pull) sit on your butt in the cockpit facing backwards, put your feet against



the back of the cockpit, and pull for all you are worth. Having a tight traveler keeps the boom low and outboard, which is fast.

Once you need to hike to keep the boat flat, you should be taking the slack out of the vang. Don't tension it; just pull it on enough so that when you ease the mainsheet for a lull, the boom goes out as much as it goes up. At this point you should also pull on just a bit of cunningham – not enough to remove all of the wrinkles coming off the front of the sail, but enough to get rid of some of them. Pulling on the cunningham at this point should not depower you, so if you pull on the cunningham and all of a sudden don't need to hike anymore, you've gone too far. You should be hiking right at the front of the cockpit at this point.

Beyond this comfortable “just hiking nicely” stage we get to the full power and depowering zones. In the full power zone, you just have to ease the mainsheet very occasionally to keep the boat on its feet and flat. You should be hiking all the way out, with just your pointed toes underneath the hiking strap. The vang should be pulled on just harder than the mainsheet – that is, when you ease the mainsheet, the boom goes out and not up. Your outhaul tension will depend on the water condition. Choppy water needs a looser outhaul (about at the ‘hang loose’ measurement), while flatter water can use a tighter outhaul (about at the ‘thumbs up’ measurement). The cunningham can start to get pulled on as needed to depower the boat, but be aware that your pointing will suffer if you pull too much cunningham on. Also, the more outhaul you pull on, the less cunningham you should pull on. By the time you are strenuously hiking all the time, you should be just a bit aft of the very front of the cockpit. In flatter water, you can stay further forward. In big waves, you will need to move aft in the boat. As the waves get big, you will be moving back and forth quite a bit, but more on this later.

When it is really windy and you are overpowered, pull the vang on really tight. So tight that if you took the mainsheet completely off, the boom wouldn't rise a bit. At this point, your cunningham should be firm too. As you get better at steering you will be able to sail faster with a looser cunningham, but if you need to pull the cunningham eye on the sail down to the boom, go ahead and do it. Your outhaul should never be tighter than the ‘thumbs up’ measurement, as the depth in the lower part of the main is what is driving the boat forward at this point, and the power from the eased outhaul is not working to heel you over so much, since all of this power is down low in the sail.

If at this point you are still overpowered, it is time to whale on the cunningham – enough so that the cunningham eye on the sail is at the boom. You can also raise your daggerboard three inches. This will cause you to slip sideways a bit, but it is better than being totally out of control and heeling.



Sailing Downwind - Reaches

After all of that hard working hiking upwind, now it is time to have some big fun going downwind. The reaching leg is where the Laser is going to go fastest. It is a lot of fun.

Sail trim on reaches is pretty straightforward stuff. Ease the outhaul about 4 or 5 inches, let the cunningham go completely and ease the vang some. The easiest way to figure out vang trim is to use a telltale streaming off of your top batten. The vang should be as tight as it can be without having the telltale stall. If the telltale stalls, ease the vang. If you don't accelerate in the puffs, try pulling on a little vang.

Weight wise, you are going to want to be a little further aft than you were going upwind. The bow knuckle should be just out of the water all the time, but most importantly the transom should not be dragging in the water. In non-planing conditions, you are going to need to be towards the front of the cockpit. As it gets windy, you move backwards.

The daggerboard should be pulled up about halfway. If the boat feels like it's sliding out underneath you all the time, put the board down a bit. If you are going slow, try lifting the board.

On a reach, it's really important that you keep your butt out of the water. A lot of people tighten their hiking straps when they are going downwind. Others just hook one leg underneath the other. Either way you choose to do it, keep your butt out of the water. The boat should be kept close to flat on a reach. Someone did some big study a long time ago and found that round-bottomed dinghies catch and maintain a plane fastest at a 10-degree heel. Most people think their boat is flat when it is heeling 15 degrees, so if you feel like you are sailing really flat; you probably have it about right.

It used to be that everyone would hold their mainsheets straight from the boom whenever they were going downwind. Now that's changed and everyone keeps the main sheeted through the ratchet all the time on all points of sail. Choke up a bit on your hiking stick if you need to – you will see a lot of people putting several tape grip wraps around their hiking sticks for better grip on the downwind legs.

Wave catching and riding are techniques that are developed over years of practice. The big moves are steering, weight movement and pumping. This brief primer is not the forum for a detailed description of wave technique, but there are a couple of principles that will serve you well no matter what. First of all, always keep your boat pointed downhill. There will be times when a wave blocks your ability to do this, of course, but the more you can keep the boat on a downslope rather than an upslope, the better. When you catch a wave and start going down toward the trough, turn before you run into the back of the next wave. This way you will stay on the wave and keep the boat going through the water fast. When you get a flat spot, you can break through and catch and ride the wave that next wave in front of you. Second, when you are about to catch a wave, move your weight forward. Once you have caught the wave and



started going downhill fast, move back. If the bow plows into the water, it's really not good. Third, give a big pump just before you are going to catch the wave. You will recognize the surge that happens just before you catch a wave. A very sharp pump at that moment will send you on your way.

Downwind – The Run

Running in a Laser in strong wind and big waves is as fun as any sailing you will ever do. It also takes a phenomenal amount of skill to do it right. Here's how to run in all conditions.

Because there are no shrouds, the Laser's boom can go out past perpendicular to the boat. This has given rise to the practice of sailing 'by the lee.' You are sailing by the lee when your boom is out past perpendicular, and the wind is flowing from the leech of the sail to the luff. You will know for sure that this is happening when your telltales start streaming toward the mast instead of toward the leech.

Sailing by the lee is almost always the fastest way downwind in a Laser. In flat water, crank the daggerboard way up and heel the boat as far to windward as you dare. Let the sail out just past perpendicular (the tip of the boom should be at most about 3" in front of the mast) and hold on. Let the vang off all the way (if it is adjusted correctly it will stop easing with just a little bit of tension still in it), and the cunningham too. It is not as important to ease your outhaul on a run as it is on a reach.

The heavier the breeze is, the further back in the boat you will sit. In super huge breeze, you will be all the way in the back of the cockpit. In light air, you will be scrunched up by the front of the daggerboard.

In big waves and wind, you will be zigzagging all over the place to keep your bow pointed downhill and to shoot through gaps and flat spots in the waves. In lighter air and flatter water, you will steer a much straighter course.

Training

World-class Laser sailors are incredibly fit and strong athletes. They put in a phenomenal amount of training time. They are so fit that they don't even get tired putting in a full day of Laser sailing. This allows them to put in a maximum effort and concentrate on managing tactics and strategy.

Chances are, you are not going to want to go through all of this, and unless you want to sail at the World level, you don't have to. But a bit of training will make your time in a Laser much more enjoyable.

In order to hike hard all day, you will need to have strong legs. Some good exercises for leg strength are cycling (especially up hills), squats (be sure and ask someone to help you with your technique – it is easy to hurt your knees if you do squats the wrong way), leg presses and



leg extensions. The best way to train your legs, however, is to use a hiking bench. The internet is clogged with sites showing how to build a Laser hiking bench. As many excellent Laser sailors have said, "the only real training for hiking is hiking."

In order to sheet the main effectively all day, you will need a strong chest, arms and shoulders. You don't have to build them up like Rocky, but a good strong upper body will help you out a ton.

The underrated strength need for Laser sailing is in your trunk – your abs and lower back. Crunches and sit ups do good things for your stomach muscles, but the jury is still out on those electronic things being advertised on late night TV. To strengthen your back, the best exercise is the 'Superman.' To do these, lie on your stomach with your hands reaching out in front of you and your feet stretched out behind. Lift your hands and feet as high as you can get them without bending your arms or legs, and hold it for five seconds. Repeat this 20 times. In not time at all you will be a hiking animal.

Maintenance

Maintaining a Laser is so easy that most people mess it up. First, never ever put your hull on the ground without a clean, supportive pad underneath it. Preferably you will never put your hull on the ground. Hose everything off with freshwater after every use, and store your boat under a cover. If you are on a tight budget and can't afford a top and bottom cover, get a bottom cover. This way you can keep your boat covered when it is on your car driving to a regatta, and you can use the bottom cover as a makeshift bottom cover. Every so often, clean your bottom with a mild detergent and polish it with a good marine polish. Star-Brite polish with Teflon is good stuff. Keep your blades and other stuff together and protected in a blade bag. Roll your sail from top to bottom; never roll it tightly around the mast, as this will wreck the sail.

With good care, your Laser can look and work like new for many years.