

HOW TO SAIL THE SIDEWINDER

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## CHARACTERISTICS

Sidewinder is a superb example of the versatility that may be accommodated by a well-designed boat. She's literally a three-in-one boat - basic cat boat (one sail) for beginning or easy sailing - sloop (two sails) for intermediates - and racing sloop with the spinnaker. Sidewinder is capable of performing in these modes by virtue of a fully movable, placeable centerboard and a hull design that allows the sails the optimum ability to transfer their forces into boatspeed.

Sidewinder is used as an excellent trainer due to her three-in-one versatility. As the novice gains skill and knowledge, the jib may choose to be added - or if the jib is already rigged, unfurl it - and then master the techniques of a sloop-rigged boat. Once the sloop rig has been practiced, the step-up into a full racing dingy may be made by the addition of a spinnaker. Sidewinder is now an exciting, skill demanding racer, satisfying the needs of the most accomplished helmsman.

Sidewinder's ability to be easily righted - combined with the self-draining cockpit - allows for a high degree of safety when children are in command.

Since Sidewinder is designed as a high-performance sailboat, she notices and appreciates the providing of proper weight placement, sail trim and handling. The difference in boat speed between a properly sailed Sidewinder and a poorly sailed one is very obvious. The following comments will provide one with the knowledge necessary to sail Sidewinder at her maximum potential.

## HOW TO SAIL THE SIDEWINDER

### BATTENS

As the battens are being inserted into their pockets, one should make certain that the batten end is placed against the elastic material in the batten pocket. Failure to do this will result in insufficient tension in the leech and hence a poorly setting and inefficient sail.

### THE SIDEWINDER JIB

To make the Sidewinder truly a high-performance boat, the jib may be added. Unlike many other jibs, the Sidewinder jib may be fully furled, or furled just enough while underway to make her easy to handle. This has great benefits to the novice. In lighter winds, the jib may be fully exposed to derive maximum power from the wind. If the wind increases to a precarious degree, the jib may be slightly furled, thereby reducing the amount of force developed by the sail. If the wind continues to increase, the jib may be completely furled with little effort. Once this has been done, the centerboard should be moved to its after cat-rigged position to once more allow the boat to be in balance.

### THE MOVING CENTERBOARD

As there is a point on any shaped mass where one could consider all the force to be located - the center of gravity - so is there a point on a sail(s) where all the forces of the wind may be considered to be concentrated - the center of effort (CE). In order for a boat to handle properly, forces applied to the boat should be nearly balanced. So, to balance the force produced at the center of effort, one considers a point on the hull called the center of lateral resistance (CLR), the point at which all

## The Moving Centerboard continued

sideways pressure may be considered to be located. When the center of effort is directly over the center of lateral resistance, the boat is in perfect balance (no weather helm or lee helm). However, if the boat is perfectly balanced, the rudder is not, providing any sideways force (lift). To allow the rudder to help provide lift, thus decreasing the leeway angle, the center of effort should be slightly behind the center of lateral resistance to provide for a slight (3-5 degrees) rudder displacement to weather. This now allows the rudder to contribute to lift (movement to weather) which will help oppose the forces in the sail that are trying to drive the boat to leeward.)

On the cat-rigged Sidewinder, if the centerboard is in the after position, the boat is in proper balance. (i.e. a slight touch of weather helm) If the centerboard were in its furthest forward position, the CLR would be ahead of the CE, (or the CE could be considered aft of the CLR) and the boat would have excessive weather helm, making maneuvering difficult.

If the jib is added on the Sidewinder, the center of effort moves forward in the sail plan because the jib is now exerting a force even further forward in the boat than that which just the main provided. In order to once again balance the forces, the centerboard is moved to the forward slot, causing the CLR to move forward thereby again balancing the forces.

Hence the need for the movable centerboard in the Sidewinder; an extra to provide a constant degree of high-performance when sailed either cat or sloop rigged.

## TUNING

On a cat-rigged Sidewinder, the mast rake is fixed so no tuning by mast rake may be accomplished. This keeps the boat simple and always competitive.

On the sloop-rigged Sidewinder, the only "tuning" that may be accomplished is shroud tension. The shrouds should be just tight with the sail off. A little slop under these conditions is also acceptable.

## WEIGHT DISTRIBUTION

### a) On the wind

A rule of thumb on the placement of skipper and crew (if the racing sloop-rigged) should be crew against shroud and skipper next to crew. What this accomplishes is the boat assuming a level attitude; the stern just out of the water keeping the force of drag to a minimum. Keeping your weight near the center of buoyancy helps to reduce the tendency for the boat to move up and down (pitch). If your weight is separated, the tendency for the boat to pitch is amplified by your weight now being added to the ends of the boat. When the boat pitches, the bow and stern of the boat is alternately raised and lowered, at times forcing the bow down in the water and at times, dragging the stern through the water. This is how pitching reduces boat speed. If your weight is kept close together, pitching may be kept to a minimum and boat speed to a maximum.

If the wind conditions are heavy and large waves begin to develop, it may be necessary for skipper and crew to move slightly aft to prevent excess amounts of water from being taken on over the bow. The boat should be kept flat at all times, to reduce weather helm, except during drifting conditions when some heel will reduce wetted surface, thereby aiding boat speed.

## b) Reaching

Reaching in light or medium winds, requires the same weight placement as on the wind. As planning conditions develop, it is necessary to move aft (always keeping your skipper and crew weight together) to facilitate planning by allowing the boat to settle on her after-hull sections. Weight movement aft must be continued as the wind increases, to the point in high winds of the skipper next to the transom and crew next to him. The movement of weight aft counterbalances the effect of the driving force depressing the bow into the water. When this force has been properly counterbalanced, the boat once more assumes a level attitude.

## c) Running

When running, the skipper and crew should be positioned across from each other and on opposite sides of the boat, forward enough to keep the transom out of the water. Sitting across from one another helps minimize the rolling produced from the wind vortices off the sail. If sailing sloop-rigged, the jib may be held out on the side opposite the main. This will also counterbalance some of the adverse rolling. As the wind increases to heavy proportions, it is necessary to move aft to prevent the bow from burying.

## THE SAIL

The best indicator of the proper attitude of the sail in relation to the wind is a ribbon punched through the sail with a darning needle, about three feet aft of the mast to a convenient height to view---half the ribbon on each side of the sail. The power in a sail, as developed by the wind, consists of positive pressure on the windward side and a low or less than atmospheric pressure on the lee side---both caused by flow of wind on the sail. The ribbon as blown by the flow of wind is an indication of the nature of the flow on the sail. Ideally, both the windward and lee-side should be streaming straight aft. If the ribbon on the leeside is blowing upward or even forward, the sail is at a stall and wind flow is turbulent---the sail must either be paid off with the mainsheet or the boat pointed higher. The weather side ribbon is not as positive in its indication as the leeside. However, if the weather side is blowing mostly up or even forward the sail needs to be pulled in or the boat sailed at more of an angle to the wind (lay off the wind more). Since the wind is constantly changing direction, there is a constant requirement to alter the direction of the boat to gain smooth flow of the wind as indicated by the ribbon through the sail.

## SAILING TO WEATHER

Sidewinder is sailed to weather the same as any other light, high-performance boat---hunting to weather in the lifts, laying off to drive through seas, and as high on the wind as possible while still maintaining boat speed.

For light wind conditions, the boom should be trimmed approximately to the corner of the transom. The jib in light going should not be in tight, as with the main, and the boat should be allowed to drive a few degrees off of going hard to weather. If drifting conditions are prevalent, 10-15 degrees of heel will help the sails maintain a somewhat "full" shape.

In medium to heavy conditions, the boom should be trimmed to the area between the transom corner and centerline. The jib should be continually trimmed tighter (or more flat) as the wind increases. In survival conditions, the jib should be in as

## Sailing to Weather continued

tightly as possible with the main let out enough to keep the boat under control. In heavy conditions, downhaul pressure on the main should be increased to keep the draft forward in the sail and in turn, the boat in balance. Heeling due to the heavy air causes unequal forces on the boat's underwater surfaces, contributing to the boat rounding up to weather (weather helm). Heeling also displaces the CE to leeward of the CLR which will also produce weather helm. The combination of these two forces tend to produce more weather helm than desirable.

To remedy this, merely raise the centerboard until the excessive weather helm has disappeared. Hiking to keep the boat level will equalize forces on the boat's underwater surfaces and once more the boat will have symmetrical underwater areas. The combination of hiking and moving the centerboard back will once again place forces acting upon the boat in balance.

## REACHING

On reaches, the sail(s) should be trimmed according to the wind direction as discussed in the section on the sail. One will notice however, that as planning conditions develop and then hold, the sail(s) must be hauled in closer and closer. This is due to a shift in the apparent wind. (i.e. If one slowly drives a car down a road perpendicular to the wind, the wind may be observed to be blowing directly through one window and out the other on the opposite side of the car. As one speeds the car up to a much faster rate, the wind is now observed to be blowing straight at the car, with no wind being felt coming through the car. The resolution of the two forces of wind; the wind perpendicular to the car and the wind from straight ahead due to the car's motion, produces a wind direction of a few degrees from coming straight ahead). The same thing happens to a lesser extent when the Sidewinder begins to plane. The increase in boat speed causes the apparent wind to shift further ahead. In order to keep the sail(s) properly trimmed, it is then necessary to haul them in until once more in trim (the ribbons flowing back smoothly). Conversely, if the wind lightens or one drops off the plane and the boat speed decreases, expect the apparent wind to move aft; thus requiring the easing of the sails to keep them properly trimmed. When racing on the reaching leg, it is desirable in puffs to fall below the layline to the bouy. This gives one the option, when the wind lightens and moves aft, to head-up and thereby maintain boatspeed.

## RUNNING

When running downwind, vortices of air and wave action flowing off the sail produce a rolling, side-to-side motion. This may be alleviated by crew placement, as earlier discussed, or by holding the jib out on the side opposite the main. By doing this, the rolling force produced by the jib somewhat cancels the force produced by the main. Going "wing and wing" as it is called, reduces rolling and hence provides better boat speed since the boat is now sailing on her designed waterlines.

## MANEUVERS

In all light, high-performance boats, weight placement is critical in the achievement of maximum performance. This is not an exception with the Sidewinder. When tacking, the tiller should be eased over to bring her about, not rammed over which will stall the rudder and slow the boat down. When the boat is head-to-wind, one's weight should be centered in the middle of the boat. As the boat continues it's tack, weight should be moved to the new weather side. Failure to move one's weight smoothly to the new weather side may result in an unexpected capsize. If one doesn't make a

Maneuvers continued

smooth transition from one side of the boat to the other during a tack, and instead, just decides to jump over at the last moment, a capsize to weather may result. Tacks should be UNRUSHED, SMOOTH AND COORDINATED.

Jibes follow the same concept. In all winds up to heavy, the boom may be guided across the boat by merely grabbing the mainsheet tackle in one hand, allowing the boom to smoothly cross over the boat. In heavy winds, it may be necessary to pull in the mainsheet until the wind wants to fling the sail to the other side. As soon as the wind pressure is felt on the mainsheet, let the sheet run out through your hand. This procedure allows for the boom to come to a controlled stop and cases the total force on the sail through the controlled drag of the mainsheet. If one chose not to pull in the mainsheet and then let it out; but instead just let the sail slam over, a capsize could result with the instant stopping of the sail on the opposite side--transferring all the force instantly to the boat; instead of the force being dissipated over a greater distance as when you let the mainsheet run out and transfer your weight to counteract that force.

Another safe method to use in these conditions is to sail by the lee, then keep sailing more and more by the lee until the wind catches the back of the mainsail and forces it to the other side of the boat. Now the main will just lie, streaming in the wind; the force being dissipated by the wind blowing across each side of the sail, making it luff.

#### CAPSIZE

A capsize in any boat can be dangerous, but with a little practice, capsizing a Sidewinder can be fun; one won't even get wet. The Sidewinder has a completely self-bailing cockpit, so as the boat is righted, virtually all water drains out. Once capsized, care should be taken that no one hangs on the boat or rigging. Weight on the deck side of the boat, or rigging could cause the boat to turn turtle (a completely upside down capsize with the spar and sails pointing straight down at the bottom of the lake.) To right the boat from this type of capsize, hold on to the top of the centerboard with your hands and place your toes on the rub rail. Pull back with your hands and bounce on the rub rail. As the sail appears and comes to the surface, hop up on the centerboard and right the boat as from a normal capsize (one in which the sails are lying on the surface of the water and the boat is on it's side).

To successfully accomplish a righting after a normal capsize, one needs only to release the sheets and get out on the centerboard. If your weight is insufficient to bring the boat back to an upright position, move further towards the end of the centerboard and lightly bounce on it's end. As the boat begins to come upright, hop into the center of the boat and remain there until the boat is again stable. This maneuver requires quick execution and timing. However, if the boat is righted in this manner, the only water you'll get on yourself is that which drips off the sail. If this maneuver is not acceptable and you and your crew are in the water after the boat has been righted, climb into the boat from opposite side, directly across from each other. This prevents the occurrence of another capsize if you both were to climb in the boat from the same side. Climbing in from over the stern is also an acceptable alternative, particularly if single handing.

#### OPERATION OF THE TILLER EXTENSION

The tiller extension is put on the Sidewinder to allow the skipper adequate

## Operation of the tiller extension continued

mobility and weight transfer over a range of area that otherwise would have been impossible. To smoothly operate the boat with the tiller extension, several ideas may make it's handling considerably easier. When on a tack, the skipper always sitting on the weather side, should hold the extension on the side of his body that faces aft. On a starboard tack, the extension is held on your left side; on a port tack, it's held on your right side, grip the extension the same as you would grip another person's hand; just like you're shaking hands with the extension. The combination of these two ideas, allows one to have a maximum amount of comfort and maneuverability. When jibing or tacking, keep the tiller extension aft of yourself. This keeps it out of the way for your transfer to the other side. During the tack or jive, it may be easiest as you're going across the center of the boat to point the extension aft and then retrieve it from the other side, completing an arc from one side to the aft, then to the other side. Just go out, remember a few of these ideas and practice maneuvering until the tiller extension feels as or more comfortable than the tiller itself.

## BAILING

The bailer flap causes an accelerated water flow around it to produce an area of low water pressure directly behind the bailer. When this happens, the water in the cockpit is now free to drain out of the bailer and into the area of low pressure (high pressure trying to equalize low pressure).

(If the boat is not moving and the bailer is opened, no reduction of water pressure occurs, because there is no acceleration of water flow under bailer. Therefore, since the water pressure under the boat is greater than the water pressure in the cockpit (the water under the boat is supporting the boat and is pushing up with a force proportional to the weight of the boat), water flows into the cockpit in an effort to equalize pressures. If the boat is completely under water, water pressure under the boat is equal to that in the cockpit. Water then ceases to flow into the cockpit.)

Once the boat has enough speed, low pressure develops behind the bailer and now the water in the cockpit exerts a greater force than water under the bailer. Water now flows out the bailer in an attempt to again equalize water pressures. Hence, if the boat hasn't enough speed, the bailers should remain closed until the boat develops enough speed. In drifting conditions, it is not possible while sailing, to obtain enough speed necessary to operate the bailer. If water is taken on board in slow speed conditions, it is necessary to remove it by a sponge or bailing bucket.

If you suspect water in the inner hull, remove the neoprene plug from the head in front of the bailer. Open the bailer (if moving at a speed to facilitate bailing) and let the water run into the cockpit. Once again, if you don't have adequate boat speed for bailing, the water will have to be removed by bucket or sponge.

## SAFETY

When rigging the boat and raising the mast, look around and up high to make certain there are no power lines overhead or anywhere nearby that you might accidentally hit while launching the boat. Some power lines have not been adequately maintained and insulation may be non-existent. If a mast bumps into such a wire, or the shroud wears through the insulation on a wire, electrocution may result to anyone touching the boat, trailer, or car attached to the trailer.

Safety continued

If sailing in a climate where cold winters are prevalent; early spring and late fall sailing deserve special consideration. During these periods of the year, the water temperature is cold. Falling overboard in very cold water can result in death after three to five minutes of exposure. If you are planning to sail in these conditions, wear warm clothing (preferably a wetsuit and lifejacket).

In heavy air, lifejackets should be worn at all times because these winds place the greatest strain on boat and person, at times resulting in capsizes, man-overboards, or breakdowns. If one is involved in any of these occurrences, the extra support a lifejacket provides while in the water will make the situation at hand much more manageable. If sailing in times of storm activity, and there seems to be a forthcoming electrical storm (as heard of the thunder from the lightning), head immediately to shore. A sailboat spar on an open body of water is by far the highest object. Lightning is attracted to such high objects. An electrical discharge to the top of your spar could easily revert yourself and your boat to the basic elements of which they were once composed.

### GASKETS

On the bottom of the hull, encompassing the perimeter of the centerboard slot, are the neoprene gaskets. These gaskets close together on and around the centerboard when it is up or down, making a tight seal to keep water from flowing inside the centerboard trunk and cockpit. (When water sloshes up into the centerboard trunk, water strikes the back edge of the trunk then falls forward, forming a movement of water within the trunk. This movement of water causes turbulence along the centerline of the boat, breaking down the flow of water; hence, slowing down the boat.) After a period of use, the gaskets lose their "liveliness" and cease to seal the centerboard trunk slot completely. As a result of this occurring, water sloshes into the centerboard trunk and then into the cockpit, both slowing down the boat and accumulating if the bailers are not open.

Inspect the gaskets periodically for deterioration and replace if warped or if water comes through them and into the cockpit while sailing.

### FLOTATION AND WATERTIGHTNESS

The foamed reserve bouyancy in the Sidewinder is sufficient to float the boat and its maximum recommended capacity when the inner hull is completely filled with water, providing the people are in the water, hanging onto the boat. This amount of reserve bouyancy exceeds all federal standards by 50%.

An all glass boat will collect some moisture, therefore the reason for drain plugs in the hull. The Sidewinder is sealed at the deck level, however, age of the boat, prolonged hot weather, or bumps and bangs against the hull, can result in the seal being less than 100% watertight. Another possible source of water could be the rudder fittings on the transom, or a loose fitting drain plug. (The drain plug can be expanded by turning the screw base on the plug.)

The inspection port holes on the forward cockpit bulkhead are not absolutely watertight. If the boat is to be on her side in the water for a long period of time, care should be taken to keep the inspection holes just out of the water. Do not go sailing without these covers firmly attached; for a capsize without the covers on could fill the inner hull with water, making the boat unsailable until the water is drained. Periodic checks should be made to maintain the watertight integrity of the hull and the tightness of the bolts on the rudder fittings, to insure maximum bouyancy, even in a prolonged capsize.