

NCSC guidelines for rigging and tuning the Thistle

Note: Additional information on safe sailing of Thistles is found in the Course Material and Safety sections of this manual

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SPRING PREPARATION OF THISTLES

Hardware

All hardware should be removed in the spring, and at a minimum, desanded and sprayed thoroughly with McLube dry lubricant. It is advisable to take apart all cam cleats, clean the insides, and reassemble (best done at home). Take care to keep track of the ball bearings. If you lose track, here is the count:

Medium cleats with three layers (metal) : 11 bearings per level
Medium cleats with two layers (plastic): 11 on top, 12 on bottom
Small cleats with two layers (plastic): 12 bearings per level
Traveler: 42 total bearings

Leave the hardware off until after you have finished applying Cetol.

Running Rigging

Replace all worn halyards, sheets, etc.

- The vang is set up for either a 12:1 purchase or 8:1. The rig can get confusing, so ask an expert for proper rigging.
- There are at least two cam cleats on each 45-degree brace: Cunningham (closest to the mast) and topping lift. Selected Thistles have additional cleats on the 45 for the twing (Green) or the jib tensioner (Gold Rush).
- Traveler lines: be sure they are long enough to reach the rails easily: otherwise the middle crew will have to lean into the boat to adjust them – which is exactly what you don't want in a strong breeze. When rigging the traveler, be sure to cross the lines before threading through the aft blocks.
- Spinnaker halyard. Make sure the cam cleat on the centerboard trunk has a good spring and a stopper ball to prevent the line from running through the ring. In addition, a stopper ball tied about five inches from the end of the halyard will prevent the spinnaker from going to the top of the sheave on the mast – a good thing (it keeps the chute off the forestay away from the bow).
- Jib-halyard tensioner (2:1 ratio). This is fitted to the port side of the centerboard trunk on some boats. In Gold, it is on the 45-degree brace.

Bottom Finish

There are two varieties of bottom paint in use at the club – West Marine CPA and VC Offshore. CPA has better anti-fouling properties, VC is a harder and faster finish.

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For VC Offshore:

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On an unpainted hull, apply three thick coats before wet-sanding to a competitive finish with 400- and 600-grit. For applications in subsequent years, add two coats and sand again.

Tape the waterline. Remove the masking tape when done painting. Don't tape until the temperature is above 60°F. Sand the bottom with 80 or 100 grit to scratch it up so paint will adhere to it. Clean it again, removing all traces of powdered paint. If it's too cold (below 50 degrees), work on something else that day. Bring the paint from home, so it's already warmed up. Cold paint on a cold hull doesn't work.

Apply the first of two coats.

Painting is definitely a two-person job. The tech at Interlux recommended using a 9-inch high density foam roller that is solvent resistant. The foam is really quite thin to avoid sloppy build-ups. Have one person roll out a fairly thick coat of paint in a small section (say, two feet by three feet), and then have the second person "tip" the paint with a brush fore and aft in the direction of water flow, smoothing out the coat and being careful to make the waterline neat. Then do a second section and so on. When you're done, you can clean the roller in solvent and re-use it. But be sure to keep it "wet" – and squeeze out the excess solvent before starting your second coat. You'll need at least a day between coats – check the drying times on the Interlux sheet.

Do not sand between coats. Just get the second one on in the same fashion.

When the bottom is dry, you can start wet-sanding to a hard, smooth finish. Take it down in stages to a 400- or even 600- or 1000-grit and then burnish the bottom with bronze wool.

Flip the boat and get ready for ...

Cetoling Teak

People debate this endlessly. This is one experts advice. First, don't start out with a coarse sandpaper, or you'll scratch the old finish up so bad you'll have to take it down to bare wood to get it right again. Do a light sanding with no less than a 150-grit, then go to a 220 or 320 for your finish. Some people recommend a plastic scratch pad like a Dobie in between coats, but I've always preferred the sandpaper. You will need at least one coat of the matte Cetol, and two coats of the high-gloss marine finish. But if the weather cooperates and you have more time, go for more – maybe two and two, or two and three.

Same rules as with the bottom paint: you can't do it in a cold barn. Also, don't try to force it by putting on an extra-thick coat. Cetol needs to be built up a little at a time.

Tip: the throwaway brushes the club provides are okay for the undercoats, but you'll be picking out hairs and bristles. Splurge on a really good brush for the gloss coats, and don't let anyone near it.

Another hint: don't use the bottom or dregs of a nearly empty can. Too thick, too messy. And don't thin it. Obviously, you have to thoroughly clean and wipe down all the brightwork in between sandings.

Tuning

Consult with the Rigging Captain and the appropriate sail tuning guide.

RIGGING THISTLES

Before departing the beach, verify that all gear is stowed in the dink; sails, life jackets, and personal gear.

Attach dink painter to shroud while boarding; transfer gear, then crew, from dink to Thistle. Remove oars and stow in dink

Once aboard, attach dink painter to stern while rigging

Lower board

Bail rainwater, dry with sponge

Unbag jib, attach jib tack to fitting, attach halyard to jib head cringle, and fasten jib to forestay

Attach jib sheets, pass through blocks and cleats; knot ends with figure eight knots

Remove mainsheet from boom and uncleat. Free bitter ends of other lines (traveler, centerboard pennant, cunningham, topping lift, jib halyard, spinnaker halyard, vang)

Loosen outhaul

Install rudder; install tiller and pin

Unbag main on starboard side. Slide foot of main in boom, slide bottom luff of main in mast slot, attach outhaul shackle

Attach cunningham to lower main luff cringle

Attach main halyard to main head cringle, making sure that it is clear. Stow noodle in dinghy

Loosen main sheet and coil to avoid tangles

Check that boom vang is loose

Stow boom crutch and sail bags in dink

Attach dink to mooring and detach painter from mooring. (Leave mooring line from buoy attached to Thistle)

Raise main sail, allow to luff. Line up main tack cringle with boom and insert pin.

Tighten cunningham and outhaul, adjust vang.

Plan course away from mooring and instruct crew

Raise jib

Remove mooring line from bow eye and cast off

Back jib if necessary

Sail away

THISTLE STOWAGE INFORMATION

From bow to stern:

Main mooring line snapped to boat's lower bow eye.

Secondary mooring line (bow painter) snapped to buoy ring. This line is shackled to boat's upper bow eye

Jib halyard shackled to jib tack fitting, line tightened to take up slack.

Paddles (2) lashed under port bow rail with shock cord.

Boat hook lashed under starboard bow rail with shock cord.

Anchor, chain, and rode made fast to anchor mount forward of mast, either with shock cord or lashing line. Bitter end tied off on mast stanchions with bowline.

Buckets (with bailers and sponges inside) made fast to underside of bow grate with shock cord.

Buoyant cushion tied to underside of bow grate with shock cord. (Can use the same cord that is securing the buckets.)

Cuddy kits closed up and stowed in cuddies.

Main halyard attached to noodle and raised to top of mast. Line from noodle attached to Cunningham. Halyard tensioned along mast with knot at halyard cleat.

Spinnaker halyard attached to mast ring. Line cleated and excess wrapped around boom.

Cunningham hooked to gooseneck. Lines (2) cleated and excess wrapped around each 45.

Topping lift attached to mast ring. Lines (2) cleated and excess wrapped around each 45.

Centerboard up all the way. Pennant cleated and secured with half hitch around block. Excess line wrapped around or hung from boom.

Mainsheet trimmed tight, cleated and secured with half hitch around block. Excess line coiled and hung from boom.

Jib sheets coiled and hung from boom or stowed in cuddy.

Traveler on centerline. Lines cleated and excess wrapped around boom.

Tiller secured under port rail with shock cord.

Spinnaker pole secured under starboard rail with shock cord.

Rudder stowed between stern grate and boom crutch.

Keep all lines and equipment out of the Bilge!

PROCEDURE FOR ROLLING SAILS

Please refer to the following diagram showing the proper way to roll the sails. The mains should be folded at the second batton from the top. The jibs DO NOT get folded, because doing so weakens the wire that runs along the front of the luff.

ROLLING THE JIB

1. Start a tight roll at the head of the sail

ROLLING THE MAINSAIL

1. Fold the sail down forming a crease at the second batten pocket (Figs 3 & 4).

2. Begin rolling the sail at the crease with the top half of the sail on the inside of the roll (Fig 5).

2. Roll the sail to the foot, keeping the sail free of wrinkles, especially at the windows.

3. Place the sail into the jib bag so that the brummel hook goes to the back of the bag and the tack faces outward.

3. Continue rolling tightly, keeping the sail free of wrinkles until the sail is completely rolled and the roll is small enough to insert into the sail bag. (Figure 5)

HINT: Some members have a few tricks for getting that sail into the bag... ask around for a demonstration!

4. Place the sail into the bag so that the clew which attaches to the outhaul faces outward. This makes it easier for the next crew to insert the sail into the boom without unrolling the sail.

(Editor's Note: Do not cut halyards or sheets on any boat if you are not that boat's captain.)

PUTTING A THISTLE TO BED

From time to time boat captains meet and discuss how “our” boats are being put away and cared for. In one such recent meeting it came to our attention that fellow sailors are putting away the boats in different and varied manners when they return to the mooring. We would like to review with you an easier method of how to leave the Thistle for the next day sailor or racer.

Rudder - Stow the rudder with the trailing edge (the thin edge) up and behind the boom crutch but in front of the grate. Do not force the rudder behind the grate’s edge. When removing the rudder from the gudgeons, do not rest the rudder on the traveler track, as most likely you will put nicks or gouges in the rudder. Remove the rudder in one fluid motion and gently place it on the deck. Then when you have regained your balance, place the rudder trailing edge up in front of the grate, **not behind the grate**, and put the boom crutch in place with the rudder between the grate and the boom crutch. This will securely hold the rudder in place and protect the rudder from possible damage.

Cunningham, Topping Lift, Traveler Lines - The lines for the cunningham and topping lift should be *loosely* looped through the most forward opening in the grating one time, brought back to the rear of the grating and secured with a clove hitch. This will enable the next crew to quickly undo the lines with ease. This method is much quicker to release the lines since twenty or more loops around the 45 degree cross bracing do not have to be unwound to free the lines. These lines do not support any equipment any there is no need for them to be set tight, only elevated.

Likewise the lines for the travelers and vang can be *loosely* wrapped around the boom and secured with a clove hitch. The purpose is to keep the lines elevated out of the water that collects in the bilge, to prevent them from becoming slimed, or worse, rotted. There is no need for excessively tight or securely fastened lines, because when the hurricane hits the Delaware shore the boats will have been placed in the barn by then.

Never cut a line! If you feel that a line is too long contact the boat captain with your concern. The rigging is the captain’s responsibility alone.

Never change the rigging of a line! There is generally a reason for the line to run through a block or not. Again contact the boat captain with your concern or leave a note on the board.



Vang - There is no need to tightly secure the vang or secure with a loop around the fitting. By securing the main sheet properly you have provided sufficient leverage to keep the boom in place. Secure the line for the vang by looping the line *loosely* around the boom and secure with a clove hitch.



Centerboard and Main Sheet Lines - The lines for the centerboard and main sheet are the only lines that should be securely fastened with the line looped around the cam cleat to securely fasten the line and prevent the centerboard from dropping or the boom from falling onto the deck.

Make a twist in the line and place the open loop around the clam cleat and tighten the loop (a half hitch). This will secure the lines so they will not slip and hold fast the equipment.

Coil the remainder of the main sheet and secure to the boom. Since the main sheet line is much longer, the line should be first coiled, with a half twist for each coil to prevent curling, with enough

line left at the end to wrap around the coil a few times. Then, make a loop and move it through the top of the coil, wrap it around the edge of the coil, move the bitter end through the top of the coil, loop the remainder around the boom and secure it with a clove hitch.

The centerboard should be pulled up to within an inch of top. It should not hit or rub against the centerboard trunk cap. The remainder of the centerboard line may be looped around the boom and secured with a clove hitch.

Jib Sheets - Coiled and lashed to the boom or stowed in the turtle.

Jib Halyard - The jib halyard **must be shackled to the jib tack fitting**, at the bow of the boat, and pulled tight through the cleat. This is done to provide extra support and reduce tension on the forward stay. Elevate the halyard to the vang and tie it loosely or loop it around the boom several times. Several loops will keep the halyard up and out of the water.

Main Halyard and noodle- Attach the main halyard to the short line on the noodle and raise to the top of the mast. Attach the long line from the noodle to the cunningham. Tighten the halyard and secure by a knot on the halyard through the halyard cleat on the mast.

Spinnaker Lines - Excess spinnaker line can be wrapped around the boom and the end passed through a loop to secure.

Boom Crutch - Not much to say here. See rudder.

Sails - When placing the rolled main sail into the sail bags, the clew, which attaches to the outhaul, should be at the opening of the bag, first out. This makes it easier for the next crew to insert the sail into the boom without unrolling the sail. Likewise, place the jib into the sail bag so that the tack is at the opening of the bag, first out, and the cringle fitting is at the end of the bag.

Tiller - Secure the tiller with a shock cord under the rail. Pull the shock cord away from the middle hook and wrap the cord around the tiller two or three times. Hook the shock cord again to the middle hook. Likewise the spinnaker pole.

Bailing equipment - Secure the buckets with shock cords under the forward grate and store bailers and sponges within the buckets.

Sand - Remove any sand from the bilge prior to setting sail. This will reduce the wear and tear on the fittings and blocks set close to the hull. Tip your shoes in the water so any sand will be washed away before you get in the boat. No, you don't have to soak your feet.

Repairs - If anything is lost or broken during your use of the boat, first attempt to fix it yourself immediately. If the repair is beyond your skill, notify the boat captain as soon as possible.

While this discussion has been somewhat lengthy, the goal is to provide a pleasant experience for you whether you are taking a Thistle out or returning it to the mooring. Best of all, it will maintain the sanity of this year's Thistle captains.



THISTLE TUNING GUIDE

Copied from the North Sails web site:

http://www.northsailsod.com/class/thistle/thistle_tuning.html

This tuning guide is for the two models of North Thistle sails; the Greg Fisher design and the Ched Proctor design.

[Note: NCSC currently has Fisher Mains and Proctor Jibs]

Boat Preparation and Rig Tuning

LOOS TENSION GAUGE

The Loos tension gauge is an instrument to measure the tension of your standing rigging. This gauge is a very helpful tool in tuning your Thistle. While it is extremely valuable in getting us all relatively close to one another tension-wise, it will only actually give us relative tension numbers. We have found wide variances—even with brand new gauges. Please take note of what we describe as the goal in setting the boat up with the proper tension. Remember use your Loos gauge to get you close to the specified tensions. If in doubt, use one Loos gauge to measure the fast boats and the same one to set up your boat. If you need a Loos gauge feel free to contact us as we usually have them in stock.

There is a new spring loaded tension gauge available called the Loos Pro Gauge which some people have found to be slightly more accurate and reliable than the Loos Model A. Following is a breakdown of the numbers we found to be reliable using this new gauge. We have broken down the numbers for 1/8" forestay tension and 1/16" diamond tension.

1/8" Cable Forestay Tension

Tension	Loos Model A	Loos Pro Gauge
240	28	21
260	30	22
280	31	23
300	32	24
320	33	25
340	34	26
360	35	27

1/16" Wire Diamond Tension with North Proctor model sails

Diamond	Model A	Pro
Top	12-13	9-10
Middle	15	11
Bottom	15-16	11-12

1/16" Wire Diamond Tension with North Fisher model sails

Diamond	Model A	Pro
Top	4-8	2-4
Middle	9-15	5-11
Bottom	6-10	3-9

DIAMOND TENSION

Before you step the mast, set the diamond tension to achieve proper mast bend. Diamond tension, not only has an effect on the sideways bend in the mast, but also on fore and aft bend. The suggested numbers that we offer here will, again, get you very close so that your mast and North mainsail will work well together. Due to the nature of the aluminum extrusion and in some cases the way the masts are rigged, some masts are stiffer and some masts are softer than others. This is not a problem, it just requires slight adjustments to your diamonds. Always be sure to check your diamond tension and straightness of the mast while it is supported at both ends with the sail track upwards.

If while sailing in marginal hiking conditions (10 - 12 mph breeze) you notice slight diagonal overbend wrinkles in the upper part of your mainsail, your upper diamonds are most likely too loose which is allowing the upper part of your mast to bend too much. On the other hand, if your mainsail in the upper third appears fairly round and is difficult to flatten out in a breeze, your upper diamonds are most likely too tight.

For Proctor's main when sailing above 475 pounds of total crew weight, set the diamonds close to 18 (number scale on the Loos gauge—the numbers do not correspond to pounds) top to bottom. Set them progressively looser for lighter crew weights to a minimum of 10 on the Loos gauge, e.g. top crew weight of 475 pounds, scale 18; to crew weights less than 430 pounds, scale 10.

For Fisher's main, set your diamonds at approximately 6 - 14 - 9 (not pounds and measuring from bottom to top). The lighter the crew weights, the lighter the tension on the top diamonds. Set the top diamond at 4 or less when sailing below 430 pounds in crew weight.

On wood masts the diamond tension should be slightly less than the standard aluminum mast because of possible compression problems that could develop from excessive tension. Never tension any of the diamonds on a wood mast to more than 16.

On the older, stiffer, gold aluminum masts the diamond tension should be considerably looser to allow the mast to bend as easily as possible. You should drop the tension on all the diamonds approximately 6 numbers from top to bottom.

While the Thistle mast looks fairly complicated with three sets of diamonds, these adjustments listed above will make it fairly easy to properly tune your mast to your mainsail for all crew weights and all wind velocities. If you have any questions about the proper bend in your mast, please don't hesitate to call us.

(Note: Refer to conversion chart under Loos Gauge section for new Pro Gauge.)

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MAST STEP/MAST BUTT

Position your mast butt casting so that the mast will be positioned at the minimum "J" —or 4' 9" measured from the forestay to the front of the mast on an aluminum mast or 4' 8 1/2" measured from the forestay to the front of the wood mast.

Position the mast on the step so that it is even fore and aft. In other words, the mast butt does not stride out over the front or back of the mast step. We have found that it works well to have the step positioned at minimum "J" dimension when the mast is set squarely on the step. The mast should rest on the mast step in such a way that it has nearly 1/2" of positive prebend when the rig is properly tensioned (we'll discuss this later). Measure prebend by pulling the main halyard down all the way to the gooseneck so that the wire is up against the back of the mast. You will notice the prebend as the gap between your main halyard wire and the mast as it bends forward.

There should be a slight gap between the casting on the mast and the casting on the grating at the forward edge. The gap at the front allows the mast to start bending easily because it is rocking on the central axis of the mast. If the mast prebends more than 1" (forward at the middle, aft at the head) shim the front of the step between the step and the grating. This is better than putting thickness (coins, stainless tangs, etc.) between the casting on the mast and the casting on the grating because it still allows the mast to remain flexible. It is important that the mast butt casting be securely fastened to the bottom of the mast. Any slop whatsoever can greatly affect the mast's ability to bend properly. A quick check to verify if the mast is set up properly is to push the mast forward from behind, halfway between the spinnaker pole eye and the lower diamonds. If the mast feels stiff or it's bend restricted, most likely the mast butt is not set up well.

A telltale sign that the mast is bending correctly is that when all the crew weight is positioned on the weather rail (about 8 mph breeze) you will see the beginnings of overbend wrinkles in the mainsail running from the area of the lower diamond towards the clew of the main. In heavy winds (over 15 to 18 mph) or in flat water, these overbend wrinkles should be quite pronounced and should actually run back to the near the aft edge of the windows. If not, there's not enough mast bend achieved and you should double-check your mast butt and diamond tension. If they go past the aft end of the window, then you have too much pre-bend and should add another shim under the front of the mast step.

RAKE

Mast rake is measured by hooking a tape measure on the main halyard and hoisting it all the way to the top of the mast until the shackle just hits the sheave. The measurement point on the boat is located at the back edge of the bottom of the tiller hole (not the traveler). Adjust your shrouds and forestay so that your rake measurement (with the rig properly tensioned and the correct amount of pre-bend) is: 26' 11 1/2" to 27' 1/2" for Proctor's main and 26' 10" to 26' 11" for Fisher's main. The major consideration with both design mainsails is to maximize rake and still be able to get sufficient mainsheet tension for all conditions. The leech is long to get the boom lower. This is more aerodynamically efficient than having the boom higher.

The rake mentioned above positions the rig for proper boat balance. On some boats, however, because the traveler or boom block arrangement is not set as low as ideal it may not be possible to develop enough mainsheet tension in heavy air. To check this, hold your boom up so that the mainsheet is block to block and measure to the 11' 11" point at the back of your boom. On most boats this should be just in front of your outhaul sheave. Again, with the halyard pulled to the top of

the mast, the measurement to the top of your boom should be: 26' 2" minimum for Proctor's main and 26' 0" for Fisher's main. If you can't get this, check to see if you can arrange your traveler or mainsheet blocks to get the number higher.

Note: In order to allow sufficient sheeting with a long leech and rake, the mainsheet needs to be properly arranged at the end of the boom. Do not dead end the sheet on the bottom of the boom block, oftentimes this can reduce available main sheeting by nearly 6". Instead, run the mainsheet from the boom block through the block on the traveler from front to back and dead end it on the boom, behind the block. You can either tie the mainsheet to the same slider that the block is attached to, or preferably a whole separate slider or boom bail. You can even drill a hole in the bottom of the boom and tie a knot inside the boom.

RIG TENSION

For a 1/8", 1x19 wire forestay (which we suggest), tension your rig to the point where your Loos tension gauge reads: 30 to 35 (260 - 360 lbs) for Proctor's main and 28 to 32 (240 - 300 lbs) for Fisher's main. (Important: Measure the forestay, not the sidestays).

For those boats still rigged with the smaller 3/32" forestay the reading should be 5 numbers lower. Too much rig tension will tend to increase prebend. Too little tension will tend to reduce it.

(Note: Refer to conversion chart under Loos Gauge section for new Pro Gauge.)

MAINSAIL

Main halyard :

The halyard should be pulled all the way up to allow for correct leech and luff tension. When hoisted, the top of the sail must pass the bottom of the sheave box. You may check your main halyard lock position with the mast down to be sure the shackle is tight against the sheave when fully hoisted. Stretch in the wire will allow it to come to the proper position when the sail is pulled up.

In lighter winds you may experiment with using the lower ball which reduces the tension and allow wrinkles to develop from head to tack.

An aid in hoisting the sail to the top, is to let the tack out of the tack pin and leave the outhaul looser. After the halyard is locked, pull the sail down with the cunningham to help take in the tack pin. The bolt rope is attached into the luff of your main sail under considerable tension which will help make the cunningham snap up when released. Some Thistlers like to feed the rope back into the groove below the sail entry slot on your mast. To do this you must put the rope in the lower groove before putting the boom on the gooseneck fitting. This will help the cunningham work better but can do harm to the sail if not treated properly. If you feed the rope into the groove below the entry, be sure to release the outhaul before you drop the mainsail. If the outhaul is on tight, you can easily tear the bolt rope away from the sail above the cunningham.

Cunningham :

The cunningham flattens the sail and moves the draft forward as it is tensioned. When underpowered, ease the cunningham and when overpowered pull it tighter. Generally it is better to leave the cunningham too loose than too tight. In light winds, if your main halyard is positioned

properly, there will be wrinkles all the way head to tack. Little or no cunningham will be required. In marginal hiking conditions the cunningham would be tensioned slightly so that the wrinkles will be limited to the lower half of the main. In heavier winds, pull the cunningham harder so that wrinkles are just barely showing in the lower one-third of the luff of your mainsail.

Outhaul :

The outhaul adjusts the depth in the lower part of your mainsail. As the outhaul is eased, the shelf on the bottom of the sail opens and the seam that attaches it to the sail moves away from the boom. To gauge outhaul tension, judge the distance from the seam to the side of the boom at roughly the center of the mainsail foot.

Proctor's main upwind

In 4 to 8 knots of wind and medium chop the seam should be 4" to 5" from the boom. In smooth water 3"; when fully hiked 1". When overpowered and you're dropping the traveler to leeward, pull the outhaul as hard as possible --until the clew slug hits the stop at the end of the boom.

Fisher's main upwind

The outhaul will be pulled tight enough so that there is just a 2" gap between the side of the boom and the shelf foot seam in the middle of the foot. In breezes above 10 - 12 mph when the boat becomes overpowered the outhaul will be pulled tighter until the seam is pulled up snug against the side of the boom (maximum outhaul).

When reaching, to find the most eased position, ease off the outhaul just before vertical wrinkles appear running across the seam perpendicular to the foot into the body of the sail. Tighten your outhaul until the wrinkles are just removed. When overpowered on a reach, with the spinnaker, leave the outhaul set as you had it upwind. For downwind sailing, also leave your outhaul in the upwind tensioned position for maximum projected area.

Mainsheet :

The mainsheet controls the powerful upper leech of your mainsail. It is the single most important adjustment. Therefore you must judge proper mainsheet trim by two factors: angle of the top two battens and feel.

In ideal pointing and boat speed conditions, the top batten will be angled considerably to windward of parallel to the boom (nearly 15 degrees). It is not unusual that the upper batten telltale will be stalled most of the time when the sail is trimmed properly when sailing upwind. In most sailing conditions the mainsheet (and/or the traveler) should be played all the time in order to gain top speed and pointing ability. A good rule is as long as the boat feels good and is going fast, keep pulling the sheet harder. More mainsheet tension usually relates to higher speed and pointing but the sail becomes easier to stall. When the boat starts to feel slow, it's correct to ease the sheet, but for waves, try to anticipate and ease the sheet before you hit them.

In heavy wind be careful not to overtrim. If the mainsheet is trimmed too tight the boat will develop a great deal of weather helm and become more difficult to steer.

In very light winds, where the weight of the boom hangs on the leech and hooks the top batten greatly to windward of parallel to the boom, ease the mainsheet so that the end of the boom is nearly over the corner of the transom. You may experiment with pulling the traveler to weather (but not

farther than the windward edge of the tiller hole) which will help allow the boom to rise slightly easier and the upper leech to open up quicker when the velocity increases.

Traveler :

As mentioned above, in light winds and when you will not be tacking a great deal, some Thistlers have experimented with pulling the traveler to windward, but you should do this only if you have the proper rake, 6" is the absolute maximum, 2" to 3" is normal. Never pull the traveler to weather where the boom is actually positioned to windward of centerline.

In moderate conditions (8-10 knots) you can keep the boat in the groove with the crew hiking with a little help from playing the traveler. In this condition, at times the traveler may be pulled slightly to windward but, again, never enough to position the boom to windward of centerline. The goal is that your helm should always be balanced (nearly neutral). With lighter crew weights it may not be unusual for the traveler to end up a few inches to leeward of centerline in winds even as low as 8 mph to maintain a balanced helm.

In heavy winds (above 15 mph) the Thistle will perform best with the traveler nearly completely to leeward and the mainsheet trimmed quite hard, your mainsheet controls bending the mast. As the sheet is eased the mast will straighten up and the main will, therefore, become fuller.

In extremely heavy winds (above 20 mph) you may experiment with pulling the traveler up slightly and easing the sheet to allow the top of the main to angle outboard slightly. Pulling the boom vang on quite hard can also help in these breezy, puffy conditions upwind. Just be sure to ease it before you round the weather mark!

Boom Vang :

The vang is primarily used downwind to help keep the upper batten parallel to the boom (telltale flowing off the top batten). A common mistake in light to medium conditions is to overvang and tighten the leech too much. In puffy conditions when reaching, the vang is often dumped to help keep the end of the boom from hitting the water and creating a disaster!

Upwind, in puffy, shifty conditions, often times the boom vang is pulled on tight enough so that when the sheet is eased the boom will only move upwards slightly and will allow the mainsheet to act more like a traveler. Be careful of applying too much vang upwind as it could easily bend the boom and depower the mainsail (or break the boom!).

JIB

Proctor's jib is the fuller of the two sails and has a relatively fuller entry to add power and to facilitate steering in difficult conditions. Fisher's jib, is the flatter of the two, but still has a full entry. This allows the sail to point effectively, indicated by the windward telltales lifting. On both jibs, at the lower end of your steering groove (when you are looking to accelerate) the windward and leeward telltales should both stream straight aft. In the middle of your groove, the windward telltales should lift indicating a stall. At the "top end" of your groove (when in a high pointing mode) both telltales will lift and oftentimes the luff of your jib will actually break.

Lead position :

For ***Proctor's jib***, measure from the forestay back over the grating to where the sheet, if extended through your lead, would intersect the thwart. This measurement should be 108 1/2". Remember, if your rake is farther forward than suggested then your lead will have to be set slightly farther aft.

With ***Fisher's jib***, use the trim line that is drawn on the clew jib. This pen line runs from the clew grommet directly out into the body of the sail. When your lead is set properly, your jib sheet should be a direct extension of this line. You should find that on most Great Midwest Boats the lead will be nearly at the forward edge of the thwart. In heavy wind, move your lead aft 1" of the sheet extension to the trim line position.

On both jibs, the lead should be set at 16" - 17" from centerline.

Jib sheet trim :

For ***Proctor's jib***, trim the jib sheet so that the leeward side of the jib at the bottom is just barely touching the rail about 2' aft of the bow. With the foot set this way, the distance between the end of the spreader and the leech of the sail should be 1 1/2 to 2" depending on the length of the spreaders. If while the bottom of the jib is just barely touching the rail the distance of your jib from the spreader is more than 2", move your jib lead slightly forward. If the leech of the jib is closer to the spreader move the lead aft.

For ***Fisher's jib*** in medium winds and flat seas, we suggest trimming so that the leech of your jib is 1" off the spreader at the middle diamond. In very heavy winds and very light winds, ease the sheet so that the leech of the jib is nearly 2" to 3" off the spreader. Do not be surprised to find that the leeward side of the jib at the bottom lies inside the rail approximately 2" to 3" at its middle. Fisher's jib is flatter at the bottom so that the sail will lay inside the rail when trimmed properly, and it will just touch the rail when eased for power to accelerate.

For both jibs, remember to ease the sheet quickly if the boat needs power after tacking, before hitting a series of waves, or after a large header. Ease the jib out to nearly 3" to 4" off the spreader. Note: we have found that in many cases there are wide variances in spreader lengths. Of course, this would make it very difficult to use the spreader as a guide in trimming your jib, We are assuming 9 1/2 spreaders (positioning ***Fisher's jib*** at 10 1/2" and ***Proctor's jib*** at 11" - 11 1/2"). Some Thistlers have put a mark that is the same distance inside the spreader tip that you want to trim outside.

Jib halyard :

On both jibs, tension the halyard so that there are always slight horizontal wrinkles off of each snap tab. This is especially important in light to medium winds, while in heavier breezes the halyard is pulled tight enough so that the wrinkles are nearly removed. The wire in the jib luff is usually slack unless it is blowing very, very hard. In fact, the only reason to have the wire in jib is that class specifications require it.

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GYBING THE THISTLE IN HEAVY AIR

by Greg Fisher (3784) as printed in the Feb/March, 1988 issue of the Bagpipe

Gybing the Thistle in heavy air with the spinnaker up requires careful crew and skipper coordination and precise steering. Timing is critical, and only comes from a great deal of practice. There is just no substitute. Although it is ideal to practice heavy air gybes in heavy air, a great deal can be learned by going out in any wind velocity and going through the steps necessary to survive a heavy air gybe. Let's go through some of these steps.

Let's assume that we're sailing a Thistle in a 15-20 mph breeze.

1. On the reach before the gybe. Forward crew balances the boat, calls the puffs, and watches competition. His job is to be sure the boat is all cleaned up before the gybe so there will be no confusion or jammed lines. Middle crew flies the chute only. The skipper trims the main, and always steers for the mark unless he is sailing high for defense against the faster boat to windward at the forward crew's suggestion. He is very careful to steer the boat well in the waves, and constantly communicate with the middle crew on the spinnaker.

2. Sailing into the gybe. Forward crew hands the old guy/new sheet to the middle crew. He then reaches up and knocks the old guy from the guy hook. The middle crew grabs the old guy/new sheet, takes up the slack, and begins to square the chute as the skipper bears off. He is always very careful to keep the spinnaker filled and not pull the guy back too quickly in relation to how quickly he eases the sheet out as well as the skipper's speed of bearing off the boat towards the gybe. The skipper overturns the main slightly and begins slowly bearing off toward a dead downwind position.

3. The Gybe.

A. The forward crew reaches up on the windward side, legs braced against the grating, and knocks the pole off the guy and the mast. The pole is left hanging free on the topping lift. The middle crew moves in toward the middle of the boat, nearly straddling the trunk, holding the sheet and the guy, always watching the spinnaker trim. The skipper moves from the windward rail to the seat and continues to slowly bear off.

B. The forward crew comes back inside the boat from his position to windward where he released the pole from the guy and the sheet, and balances the boat. The middle crew moves across the boat to the new windward seat or the rail if necessary, and concentrates on the spinnaker, always keeping it full. He is always ready to dump the sheet if necessary to keep the boat upright, but never dumps the guy. If the guy ever gets away from the middle crew, he should quickly let the sheet go. If the chute doesn't immediately begin luffing, he should "quickly" grab the spinnaker halyard and uncleat it and let the spinnaker down. The chute will drop right in the water and probably stop the boat; however, this is a better alternative than allowing both the sheet and the guy to go tight with the spinnaker filled way far away from the boat. This is a sure way to turn over the Thistle in a short time. The skipper bears off very hard, and ducks as the boom crashes overhead, and quickly sits on the windward rail.

C. Forward crew, after being sure the boat is in balance through the gybe, reaches up and grabs the new guy, hooks the pole on the new guy and the mast. He takes the new guy from the middle crew

and hooks it in the guy hook and cleat at the shroud. And hikes! (It is critical that the forward crew is sure the boat is in balance and the skipper has the boat under control before he gets far enough forward to reach the pole to put it on the guy and mast.)

Middle crew releases the new guy after the forward crew has cleated it, and concentrates on the spinnaker sheet. Skipper "rebears" off, completing "the S turn," easing the mainsheet if necessary. ("The S turn" is very important in completing the Thistle gybe, as the boat has a tendency to continue rounding up into the wind after a gybe. The centrifugal force wants to drag the mast down to leeward and turn the boat over even quicker. The skipper must bear off hard to counteract the centrifugal force and continue sailing the boat under the spinnaker.)

In addition to excellent crew work in the boat, certain boat tuning ideas will also help make the gybes go easier. First, it is important that the board is pulled up at least 3/4 of the way going into a heavy air gybe. The length of the board on a Thistle is relatively long in relation to other boats of the Thistle's size, and for that reason the Thistle has a tendency to "trip" over the board if it's not up high enough. It's almost better to have the board up high enough that the boat will actually slide through the gybe instead of tending to turn sharply and pivot on the board's axis.

It's also good to be sure to have the vang in an easy place to get to quickly if the boom hits the water during the gybe. A quick hand releasing the vang can pop the end of the boom right out of the water and allow the boat to recover.

On a heavy air reach I will actually have my forward crew play the vang through the puffs to keep the boat balanced. Of course, ratchet blocks make the middle crew's job of holding the spinnaker much easier and therefore reduces the chance of the guy getting away right in the middle of the gybe due to the middle crew's inability to hold onto the guy. Adequate guy hooks and cleats are a must, as a fly-away guy anytime on a heavy air reach or gybe in a Thistle will always result in a capsize. If you are planning on replacing your spinnaker sheets, you may consider choosing either Kevlar or spectra sheets which will greatly help minimize stretch. Stretch is a big culprit in pole breakage as the guy stretches and the pole bends around the forestay. Kevlar and spectra sheets really aren't that much more expensive than standard Dacron and in the long run may very well prove more durable.

Often it is a natural tendency for the crew to muscle the boom over from the old leeward side to the new leeward side. However, I strongly urge that you let the boom crash over by itself. This way the skipper will know exactly when the boat is about to gybe. On our boat I watch the top of the mainsail, and when the upper batten begins to curl back I know it's time to really push the boat very hard around through the gybe and then start my S turn. If the crew pushes the gybe prematurely it will always throw off the skipper's timing and can be very dangerous.

Also it is important that the skipper be sure that the boat is sailing at top speed before he attempts to gybe. When the boat is slowed down as in punching a wave, falling off a plane, etc. the wind pressure on the sails is the greatest and makes it very hard to turn the boat. The centrifugal force talked about earlier can really become a problem. Get the boat going fast before you gybe!

If the middle crew is not quite strong enough to take both the sheet and the guy through the gybe, sometimes the skipper can help by grabbing the new guy as the boat comes out of the gybe. Obviously, it is much more difficult to trim the guy properly when two people are holding onto it, but at least it is assured that the guy will not get away. However, it is best if possible for the middle crew to take both the sheet and the guy, since he can adjust both clews of the spinnaker continuously for a much smoother gybe.

The most important thing that will always guarantee an excellent gybe in heavy air is practice. Practice does make perfect, and there is absolutely no substitute. Get your crew together and go out, no matter how hard it's blowing, and run through gybe after gybe until you're confident in your technique. See you at the gybe mark!

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