

HIGHLANDER TUNING GUIDE

This document provides information on preparation, Quantum's sail tuning and technique, and other helpful tips to make sure you're ready to meet your challenge in today's competitive Highlander fleets. It represents years of accumulated knowledge as passed down and refined by this generation's best Highlander sailors.

There is no magic elixir for performance. It's the sum of incremental gains. In a game of inches, an extra 1% here and 2% there will add up, providing you with the difference critical to success. In the end, those small percentages will give you the edge needed to success.

As you read this guide, keep in mind that a 1% increase in speed in speed (from 5 to 5.05

knots) over a 7-mile course is equivalent to seven seconds per mile, or 50 seconds over the course.

Ultimately, your challenge is ours and we are your trusted partner to ensure you get the most out of your sailing experience.



PREPARATION

The best part about being prepared is that anyone can do it. The primary goal of preparation to reduce any variables outside of your control. Preparing the boat can be broken down into three sections: bottom, centerboard & rudder and mast.

If you race your Highlander without optimizing each of the four parts of the boat, it'll be as advantageous as racing a car with three wheels. Without proper preparation, sailing your Highlander in less than 10 knots of breeze will make the boat feel unresponsive and slow.

BOTTOM

The key to a fast bottom is ensuring it is smooth and fair. Ideally, you'll want a hard, sandable finish that allows you to remove imperfections by removing voids and hollows.

CENTERBOARD & RUDDER

Like the bottom, the centerboard should have a hard, sandable finish that allows you to remove the hollows and imperfections. Make sure your centerboard and rudder are optimized within the class tolerances for length, thickness and weight.

MAST

Outside of tuning, the single most important thing to consider when preparing the mast is making sure it's straight. An easy way to confirm the mast's straightness is to place the mast on a flat surface, remove the diamond wires and sight down the mast using the mainsail luff track. Tensioning a line, such as the main halyard, from the top to bottom of the mast provides a great reference for

TUNING

LOOS TENSION GAUGE

A Loos Tension Gauge takes the guesswork out of cable or rod tension adjustment. They are especially designed for accurate, repeatable tuning of a sailboat's standing rigging.

DIAMOND TENSION

Before stepping the mast, make sure the mast is straight and set the diamond tension to achieve proper mast bend.

The lower, middle and upper diamonds control deflection over the length of the mast. The tension of the diamond wires should be tuned so the mast bend matches the luff curve of the mainsail. If the lower and middle diamond wires are too loose, the sail may be too flat. Vice versa, if the lower and middle diamond wires are too tight, the main will never flatten in the breeze. The upper diamond is more reflective of the crew weight and sailing style of the team, as less tension on the upper diamond allows for more bend at the top of mast, effectively depowering the mainsail.

J MEASUREMENT

Set the mast in the mast step so that the forward face of the mast at the bottom is a minimum of 67" from the front of the forestay.

RIG TENSION

Set your forestay tension at 28 - 31 on the Model A tension gauge to achieve proper rig tension and control jig luff sag. A good visual indicator or proper rig tension is the leeward shroud should remain firm until all three crew members are on the high side and hiking.

MAST RAKE

Mast rake, forward and aft, affects weather helm. Raking the mast forward moves the centre of effort forward, improving control in stronger breeze. Raking the mast aft moves the centre of effort aft, improving pointing ability in light breeze.

With the proper rig tension, the rake measurement (top of mast to intersection of the transom and back deck) should measure 30' 4".

DIAMOND

TENSION (MODEL A)

Top	4 (0-2 for lighter crew)
Middle	16
Bottom	16



MAINSAIL TRIM

LIGHT AIR (0-7 KNOTS)

In light air, the mainsail should be setup to maximize straight line speed. The halyard/cunningham tension should be set to show slight wrinkles along the luff of the mainsail. The outhaul should be eased to create more depth in the bottom half of the sail, and the bridle height raised to lessen the amount of tension on the leech of the sail. The traveler may be trimmed to weather and the mainsheet eased to keep the upper batten parallel with the boom. The top telltale should be streaming 100% of the time.

When sailing at full speed in light air, trim the mainsheet until the top telltale is stalled 75% of the time, and the boat will point higher but go slower. When speed is needed out of tacks or through waves, ease the mainsheet so the top batten is parallel with the boom.

MEDIUM AIR (8-14 KNOTS)

In medium air, the mainsail should be fully powered up and in pointing mode. Tension the halyard/cunningham enough to remove any wrinkles from the luff of the mainsail. Set the outhaul to leave 1" of distance between the shelf foot seam and the boom. Pull the slack out of the boom vang to keep the boom height

and leech tension consistent when easing the mainsheet. The bridle height should be set so that the upper batten just hooks to weather when the mainsheet is trimmed block to block.

The secret to going fast and pointing high in medium air is sheet tension. In 8-11 knots, the top batten should be hooked 5 degrees for straight line speed and up to 8 degrees for point mode. In 11-14 knots, you'll want to begin to depower by tensioning your control lines to flatten the sail. Ease the mainsheet when overpowered to keep the boat flat and center-board/rudder working effectively.

HEAVY AIR (15+ KNOTS)

In heavy air, all control lines should be maxed and the mainsheet eased aggressively to maintain balance.



JIB TRIM

LIGHT AIR (0-7 KNOTS)

In light air, the halyard/cloth tension should be kept loose, with slight wrinkles along the luff of the jib. The jib lead should remain in its normal position (9' 5" aft of the jib luff wire attachment point).

The Quantum mainsail offers a large spreader window, which allows the crew to view the leech of the jib to use as a guide when trimming.

Position the upper batten of the jib 5 degrees out from parallel with the centerline of the boat, adjusting the sheet for lulls and puffs. In lulls, ease the sheet to build boatspeed, whereas in puffs trim the sheet to maximize pointing ability and depower the sail plan.

The mainsail should never backwind in light to medium air.

MEDIUM AIR (8-14 KNOTS)

In medium air, the halyard/cloth tension should be enough to remove any wrinkles along the luff of the sail. The jib lead should remain in its normal position (9' 5" aft of the jib luff wire attachment point).

Position the upper batten of the jib parallel with the centerline of the boat, adjusting the sheet for lulls and puffs. In lulls, ease the sheet to build boatspeed, whereas in puffs trim the sheet to maximize pointing ability and depower the sail plan.

The mainsail should never backwind in light to medium air.

HEAVY AIR (15+ KNOTS)

In heavy air, the halyard/cloth tension should be pulled on hard.. The jib lead should remain in its normal position (9' 5" aft of the jib luff wire attachment point).

Position the upper batten of the jib parallel with the centerline of the boat, adjusting the sheet for lulls and puffs. In lulls, ease the sheet to build boatspeed, whereas in puffs trim the sheet to maximize pointing ability and depower the sail plan.

The mainsail will backwind up to a few feet behind the luff.

SPINNAKER

The standard techniques for spinnaker trim apply, however since the the Quantum Highlander Spinnaker is designed more towards windward/leeward courses some changes need to be applied when reaching.

When running the sail should be trimmed with a little to no curl in the luff and the tack (controlled by the pole height) should be even with the clew to help project maximum sail area. A good point of reference for pole height is to keep the vertical center of the spinnaker parallel with the mast. The pole should be perpendicular to the apparent wind using a your

tell tales on the shrouds and topping lift as a reference guide.

When reaching, the sail should be trimmed with up to 6" of curl in the luff and the tack should be slightly lower than the clew to move the draft of the sail forward (Think asymmetrical sail). The pole should be perpendicular to the apparent wind using a your tell tales on the shrouds and topping lift as a reference guide.

Remember to head up in the lulls and down in the puffs, especially in heavy air.



QUANTUM CLASS EXPERTS

Like the name says, this is a guide: not gospel. This document has been developed over years of testing and racing to help our customers get up to speed. Small adjustments may be made to these recommendations to capitalize on the various styles and techniques different sailors may utilize.

It's also important to remember that trim is a dynamic animal. It takes constant attention to detail, adjustment and feedback to maximize any sail designs true potential.

If you have any questions, be sure to reach out to us. Quantum's class experts are your support team, providing real-time tuning data, sail trim, sailing technique, mast setup, and tips. We're here to help you enjoy your Highlander!

KARL D. FELGER

Quantum Sails Cleveland
216-346-0878
kfelger@quantumsails.com

BILL WIGGINS

Quantum Sails Charleston
803-354-6973
bwiggins@quantumsails.com

