

SailDisc Reference

Beyond the Run

This collection of diagrams, notes and articles explains all you need to know about sailing "**by-the-lee**". Singlehanders use this point of sail to best effect so most of the content is aimed at the **Laser**, although is easily adapted for other classes.

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Contact Details:

BY-THE-LEE: INTRODUCTION

Sailing by the lee is a point of sail like beating, reaching and running. Singlehanders without stays can continue bearing away past a dead run while easing out the mainsheet without gybing. This is called sailing by the lee: when the wind is on the same side as the boom.

The advantages of sailing by the lee are related both to boat speed and race course tactics. Boats will sail faster by the lee than they do on a dead run because the wind is flowing over the sail instead of just pushing against it. The air also flows over the sail with less turbulence than it does on a broad reach because the leech becomes a very efficient leading edge, free from mast disturbance. However, on a dead downwind leg, sailing by the lee will mean that the boat has to sail further to reach the mark because it is not sailing the rhumb line. The increased speed associated with sailing by the lee easily outweighs the distance increase to give a better velocity made good (VMG) over the whole leg. The polar speed estimate for the Laser shows that in light winds, angles of up to 215° to the wind prove fastest overall. As well the boat moving faster, sailing by the lee means that you can go anywhere on the course without gybing, making it easier to catch gusts and waves.

Sailing by the lee also has three main tactical advantages in racing situations. First, you can sail in any direction on starboard tack so maintain your rights all the way downwind. Secondly, you can sail in any direction to keep opponents covered and more importantly, break cover without having to gybe. Thirdly, by sailing very low by the lee, you can approach the leeward mark with very favourable overlaps on the rest of the fleet so putting you in a better position for the start of the upwind leg.

It is advisable to invest in a good gooseneck mounted wind indicator that help you judge which way you are sailing in relation to the wind. Telltales on the sail are also useful for sail trim but ensure they are not positioned too close to the mast.

Downwind sailing in singlehanders can be very unstable so make sure you loosen the downhaul at the top mark. Adding kicker tension will stabilise the boat but at the expense of boat speed and maneuverability. Likewise, the centreboard can add stability when you are *moving forwards fast* but increased drag will slow you down. It is therefore sensible to evaluate the risk and adjust the kicker and centreboard as you think appropriate for the conditions. To flatten the boat, push the tiller downhill. Moving your weight to counter rolling will only initiate a roll in the opposite direction and any judges looking for rule 42 infringements will get suspicious. The rudder will have a vertical life component when heeled so can drive the back of the boat up or down to flatten the boat.

Sail trim is similar to reach trimming except it is reverse. Watch the leech instead of the luff. Sheet the main in until the leech flicks and ease out to prevent a gybe. To increase boat speed, heel the boat away from the boom to get the centre of effort above the centreline and reduce the wetted surface area (so reduce drag). This technique is called kiting and works to great effect in singlehanders with just one sail.

When you get the leeward mark, make sure you have gybed early if you need to because when the boom is a long way out, you have even more mainsheet to pull in before the upwind leg.

Sailing by the lee is a light to moderate wind technique that will greatly increase your downwind speed. Get out and sail!

BY-THE-LEE: KEY POINTS SUMMARY

- By-the-lee is fast in light and moderate winds.
- Trim the sail in reverse: pull in until the leech flicks and then ease out.
- Kite, kite, kite!
- Push the tiller downhill to stay dry.
- The centreboard and kicker will stabilise the boat. Cunningham will get you wet.
- Loosen sail controls for speed.
- Look behind for gusts and waves: S-curve.

The 5 Essentials when By the Lee:

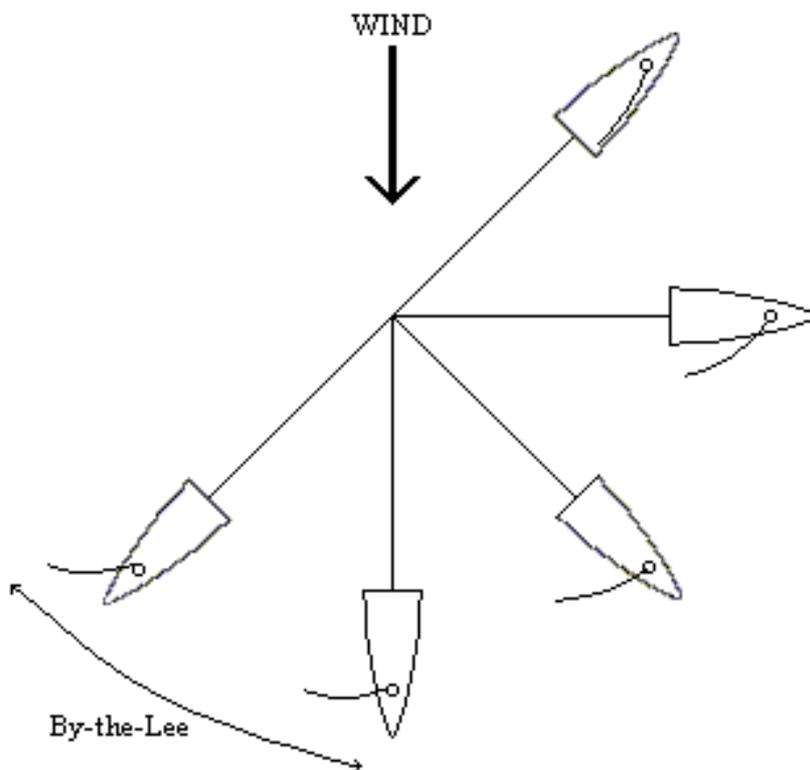
| | |
|---------------------|---|
| Course: | S-curve - look for gusts and waves. |
| Sail Trim: | No downhaul, less kicker for more speed and less stability. |
| Balance: | 'Kite' the boat to windward. |
| Boat Trim: | Keep forward for a long waterline length in light winds. |
| Centreboard: | Keep up for more speed but lower for stability. |

BY-THE-LEE: A POINT OF SAIL

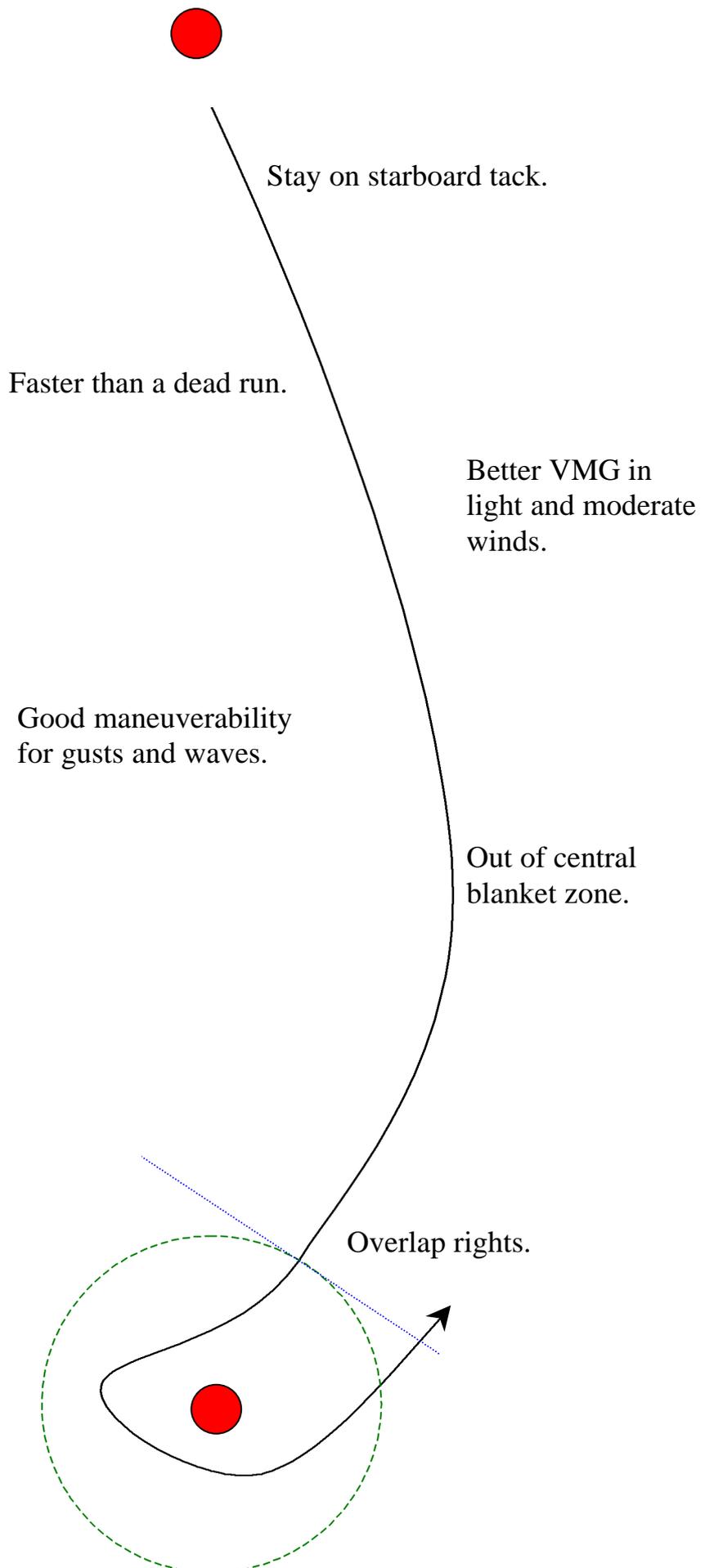
Beat, beam reach, broad reach, run, by-the-lee: the five points of sail for singlehanders.

Bear away from a dead run while sheeting out will get the boat sailing by-the-lee.

Like beating and reaching, and unlike running, when sailing by-the-lee, the sail works as an aerofoil.

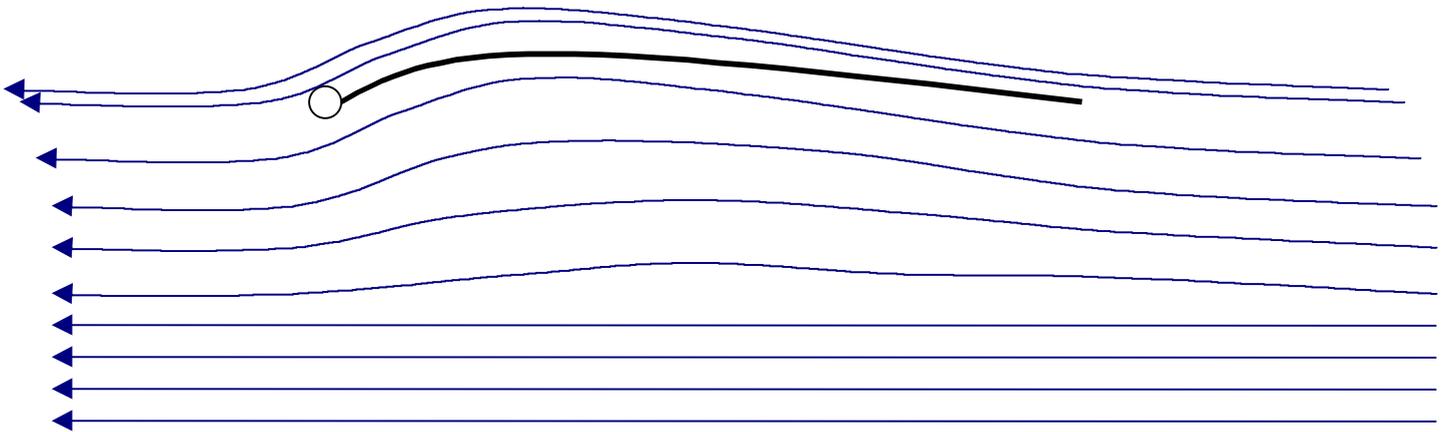


BY-THE-LEE: ADVANTAGES



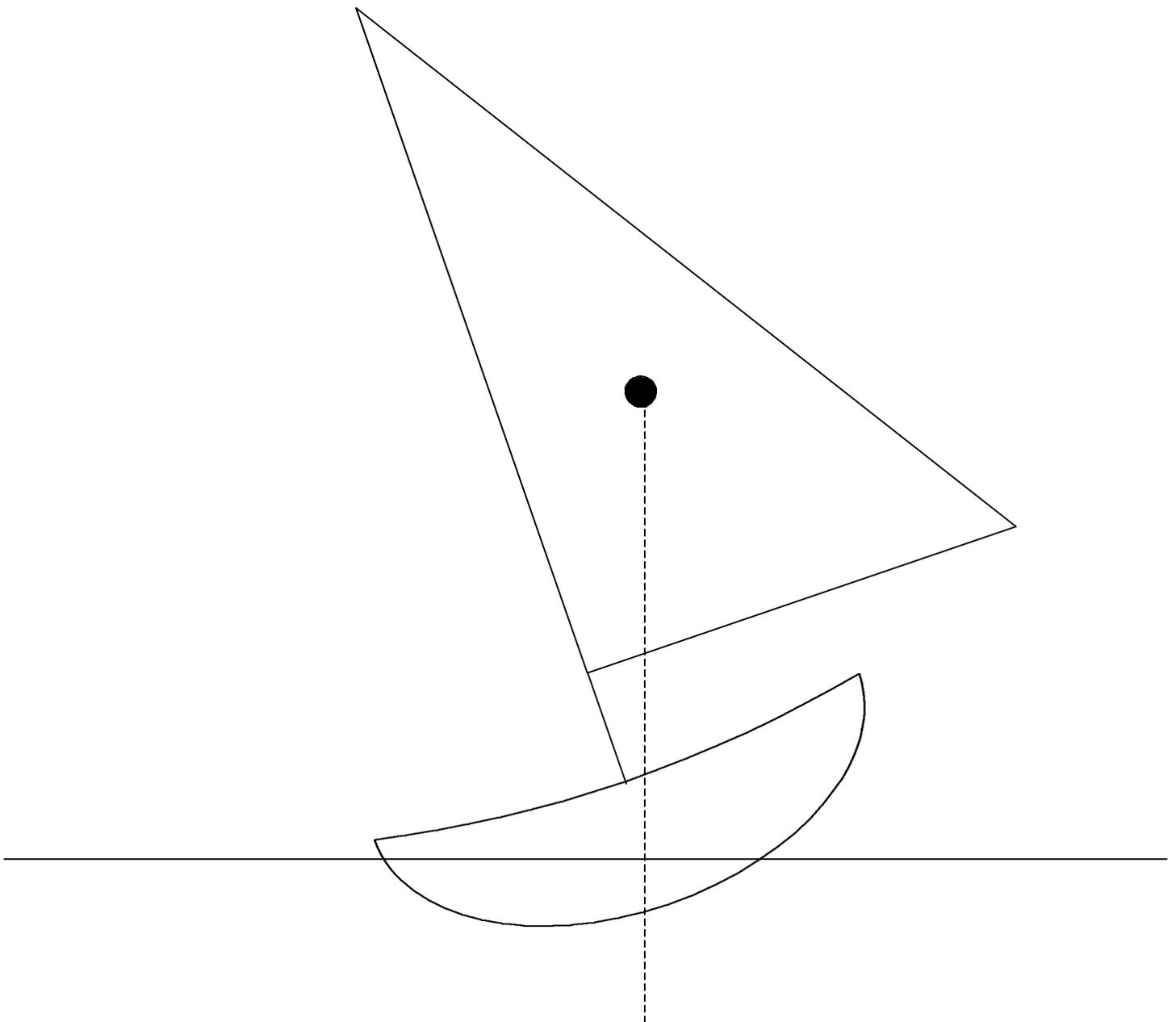
BY-THE-LEE: AERODYNAMICS

- The sail works as an aerofoil, but the wind flows from leech to luff.
- The leech becomes an ultra efficient leading edge - free from mast turbulence.
- The luff becomes an ultra stiff leech.
- Telltales fly towards the mast when the sail is trimmed correctly.
- Wind indicators are useful for precision wind awareness.



BY-THE-LEE: KITING

- Reduces wetted surface area so reduces surface interface friction. (Wetted surface friction is the main decelerating force at sub-planing speeds.)
- Moves the rig's centre of effort to boat's centreline so provides a balanced helm. (Less rudder lift friction speeds up boat.)
- Lasers are fastest at 20° windward heel. (Gunwale just above waterline.)



BY-THE-LEE: PICOS

It is possible to introduce the concepts associated with sailing by-the-lee in Picos.

Standard Pico mainsheets are not long enough to let the boom past 90° so mainsheet adjustment is required:

1. Undo the knot at the aft end of the mainsheet.
2. Take mainsheet out of becket of aft boom block.
3. Re-tie knot so mainsheet is stopped at traveller block.

This system decreases the upwind mechanical advantage from about 5:2 to 3:2 so when beating, cleats may have to be used.

Side toestraps are useful to help the sailor "lock-in" to the boat.

Jibs should not be used.

Leech lines can be adjusted according to conditions and ability.

Remember to loosen the downhaul - it is easy to forget as it out of sight.