



Sailing Manual

For

Sailors with Visual Impairments

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Sailing Manual For Sailors with Visual Impairments

This manual has been developed for people with visual impairments who are sailing in Martin 16 sailboats. Martin 16s have a jib boom and forward-facing seating, as well as a joystick to control steering. As a result, some of the usual sailing instructions have been modified to suit the boats and the sailors.

Each lesson should be accomplished in about 10 to 15 minutes. More experienced sailors will be able to complete several of the first lessons quickly. It is strongly suggested that all lessons be done in order. Each lesson has been developed to build on the sailing skills and vocabulary discussed in previous lessons.

We hope you enjoy your day on the water, and find these sailing practice skill lessons informative and worthwhile!

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SAILING TERMINOLOGY

PARTS OF A SAILBOAT (See diagram)

- Hull:** The main body of the boat
- Mast:** The vertical spar (pole) that supports the sails
- Boom:** The horizontal spar that holds out the bottom (foot) of the mainsail
- Bow:** Front of the boat
- Stern:** Back of the boat
- Deck:** The top of the boat that covers the hull
- Keel:** The central underwater fin that prevents sideslip and often contains ballast
- Cockpit:** The interior part of the boat where people sit
- Joystick:** The lever in the cockpit used for steering
- Rudder:** The vertical blade in the water at the stern that steers the boat
- Tiller:** Horizontal rod attached to the top of the rudder
- Cleat:** A metal or plastic device used to secure a line
- Block:** A device used to change a line's direction (nautical term for pulley)
- Fairlead:** A circular fitting through which a line passes to prevent chafing
- Traveler:** The track or wire where the mainsheet block connects to the boat

STANDING RIGGING: Wires that support the mast

- Forestay:** The wire that supports the mast from the bow (also called a headstay)
- Shrouds:** Wires that support the mast from the sides of the boat
- Spreaders:** Horizontal spars that spread the shrouds away from the mast

RUNNING RIGGING: Lines that control and adjust sails

Halyard: A line used to raise a sail

Sheet: A line used to adjust a sail against the force of the wind

Boom vang: A line that places downward tension on the boom

Outhaul: A line that pulls the clew (aft corner) of a sail toward the end of the boom

Cunningham: A line controlling tension along a sail's forward edge (luff)

SAILS:

Mainsail: The sail attached to the mast and the boom

Jib: The sail between the forestay and the mast (also called a headsail)

Spinnaker: Large balloon sail used when sailing downwind

PARTS OF THE SAIL:

Head: Top of the sail

Luff: Front edge of the sail

Tack: Front lower corner of the sail

Foot: Bottom edge of the sail

Clew: Bottom back corner of the sail

Leech: Back edge of the sail

Battens: Stiffeners (usually wood or fiberglass) in the leech

Telltails: Pieces of yarn or ribbon that show wind direction (also called trimtales)

SAILING TERMS:

Trim: Pull in a sheet

Ease: Let out a sheet

Luffing: Fluttering or flapping of the sail

Windward: Toward the wind

Leeward: Away from the wind

Forward: Toward the bow

Aft: Toward the stern

Starboard: The right side of the boat when looking forward

Port: The left side of the boat when looking forward

Starboard tack: Sailing so the wind comes from the
starboard side of the boat

Port tack: Sailing so the wind comes from the port side of
the boat

SAILBOAT MANEUVERS:

Tacking: To change direction by turning the boat's bow
through the wind (also called coming about)

Jibe: To change direction by turning the boat's stern
through the wind

Head up: To steer toward the wind direction

Head down: To steer away from the wind direction

BASIC NAVIGATION RULES— When two boats are close to each other and a collision is possible, one boat (called the “give-way” vessel) must alter course or speed as necessary to avoid a collision. The other boat (called the “stand-on” vessel) must continue on her course and maintain her current speed unless it becomes obvious that the give-way boat is not taking appropriate action.

Port–Starboard rule: Port-tack boat must give way to a starboard-tack boat

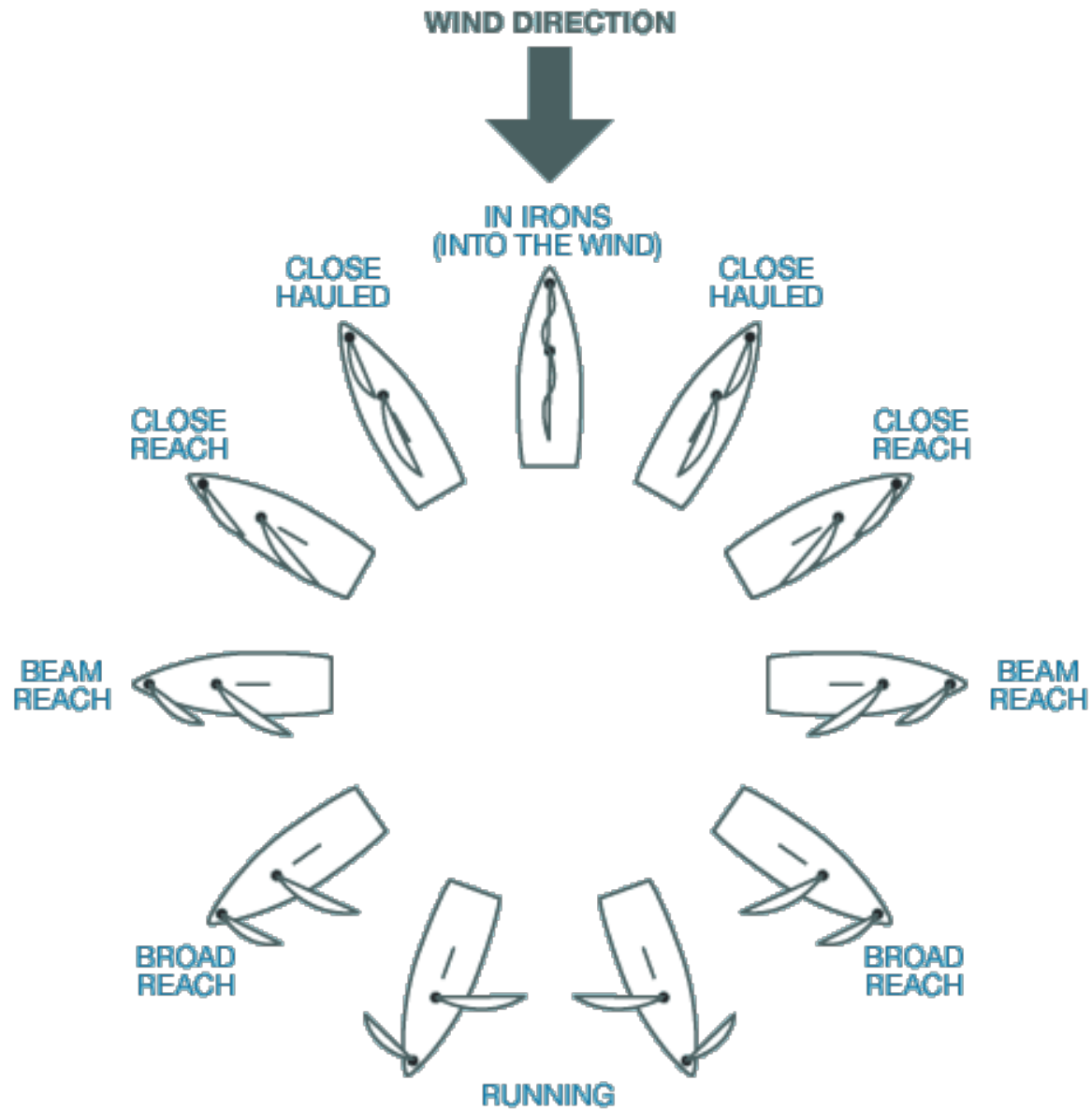
Windward—Leeward rule: Windward boat must give way to a leeward boat on the same tack

Overtaking boat--Overtaking boat must give way to a boat ahead, whether it is a sailboat or powerboat

Recreational powerboats and sailboats—Usually recreational powerboats give way to sailboats. However, sailboats should keep clear of large commercial or naval ships that have limited maneuverability, especially ones that are towing. When in a narrow channel, smaller boats should not impede the passage of larger vessels that are constrained by their size or draft.

Be courteous and avoid possible collisions!

POINTS OF SAIL



Dee Caffari "Points of Sail" deecaffari.com. 2009 www.deecaffari.co.uk/en/did_you_know-edition_07.html

1. IDENTIFYING WIND DIRECTION

It is necessary to understand where the wind is coming from, in order to know which direction to head, and how to trim the sails. These are some ways to determine wind direction:

Feel the wind blowing on your face, ears, and neck.

Notice which way your hair blows.

Reach out and feel the telltales on the shrouds.

Notice the direction that the waves push your boat. The waves will push you in the direction that the wind is moving.

Hear the waves splash on the side of your boat. The waves splash on the side that the wind is coming from.

When the mainsail **fully** luffs, the wind blows from the mast toward the end of the boom. Feel the balance of the boat, and try to determine which side the boom is on, and whether it is in close, or fully out to the side.

Luff your sails and turn your boat until the boom is along the centerline of your boat (over your head). Your boat will be pointing into the wind.

Practice:

Before leaving the dock, determine the wind direction. Then sail out into the bay, and again try to determine the wind direction.

Remember:

Windward means toward the wind. ***Leeward*** means away from the wind.

2. SAIL ON A BEAM REACH

You are on a beam reach when the wind is blowing perpendicular to your boat (directly across the side), and your sails are halfway out. You should feel the wind on the side of your face, and a consistent pressure on the joystick, which will help you sail a straight course. The boat may heel (tip to one side), which is normal.

Practice:

Start sailing so that the wind blows perpendicular to the direction you are traveling (across the side of your boat), and you feel the wind on the side of your face. You may hear or feel the waves hitting against the windward side of the boat.

Adjust the mainsail so it just starts to ***luff*** (flutter back and forth), and then ***trim in*** (pull in) slowly until the luffing stops. This gives you proper mainsail trim. If you cannot hear or feel the sail luffing, your companion will help.

Ease (let out) your jib so it just starts to luff, and then trim in slowly until the luffing stops. The jib often bounces around when it luffs. Try to adjust the jib so it sails smoothly.

You are now on a beam reach.

Try to move the joystick as little as possible. Focus on the feel of the boat as it responds to any small corrections that you make. Concentrate on feeling the boat glide through the water, and try to maintain your speed.

When a wind gust makes the boat ***head up*** (turn toward the wind), push the joystick slightly toward the boom to resist

that movement. Ease the pressure on the joystick when the gust ends.

If the boat slows, and you hear the jib luffing (flapping or bouncing), then you are sailing too close to the wind. Gently push the joystick to **leeward** (toward the boom) to **head down** away from the wind. Return the joystick to center when the boat picks up speed and the jib becomes silent.

If you head too far away from the wind, your boat may slow down and flatten out, but the jib will not flap. Gradually move the joystick to **windward** (away from the boom), to **head up** toward the wind. Center the joystick when the boat picks up speed again. All movements should be minimal and gentle.

If the wind is too strong, you can take some pressure off the joystick and flatten the boat on the water by letting out (easing) the mainsail a small amount.

WIND DIRECTION



**BEAM
REACH**



3. SAIL CLOSE-HAULED

You are sailing close-hauled when you are sailing as close to the wind as possible. Both sails will be trimmed in to their closest positions, and the pressure on the joystick will be stronger than when on a beam reach. You will be heading toward the wind, so you will feel the wind in your face, and the waves will be hitting the windward side of the bow. The boat will be tipping to leeward (away from the wind), and both sails will be on the leeward side.

Practice:

Start sailing on a beam reach.

Trim in (pull in) the jib to a position halfway between the mast and the shroud. Your companion can help you trim your jib to the correct close-hauled position.

Head up toward the wind (push the joystick away from the boom) until you hear or feel the jib just begin to luff. Gently move the joystick toward the boom, and center it when the jib stops luffing. This is your new heading.

Trim in the mainsail until the boom is directly over the leeward stern corner of the boat. Your companion can help you trim the mainsail to the correct position.

You are now sailing close-hauled.

Maintain a gentle pressure to leeward (toward the boom) on the joystick in order for the boat to steer straight. When you feel a gust of wind, increase the push on the joystick slightly, and decrease it as the gust passes. When you are sailing

well, the boat will seem to glide in the water, maintaining the same speed and angle of **heel** (tipping).

If the boat slows and the jib luffs, you are heading too high into the wind. Head down by moving the joystick slightly to leeward (toward the boom), then center it when your speed picks up.

If the wind is too strong, you can take some pressure off the joystick and flatten the boat on the water by letting out (easing) the mainsail a small amount.

WIND DIRECTION



**CLOSE
HAULED**



4. SAIL ON A CLOSE REACH

You are on a close reach when you are sailing halfway between a beam reach and close-hauled. You will feel the wind blowing on your face, and the waves hitting the windward side of the bow. The boat may be heeling, and there will be some pressure on the joystick. Both sails will be on the leeward side.

Practice:

Start sailing on a beam reach.

Head up so you point 20 degrees closer to the wind (push the joystick slightly away from the boom, then center it.)

Trim in (pull in) your jib slowly until the luffing stops. Then trim in the mainsail until it stops luffing. Your companion can help you trim the sails.

You are now sailing on a close reach.

Try to steer a straight course. You may need to maintain a gentle push to leeward (toward the boom) on the joystick in order for the boat to steer straight. Whenever you feel a gust of wind, increase the push on the joystick slightly, and decrease it again after the gust passes.

If the boat slows and you hear or feel the jib luff, you may be heading too high into the wind. Move the joystick slightly to leeward to head down, and then center it when your speed picks up again.

If the boat slows and flattens on the water and you don't feel the wind on your face, you may have turned too far from the wind. Gently push the joystick to windward to head up, and center it when your speed picks up again.

WIND DIRECTION



**CLOSE
REACH**



5. SAIL ON A BROAD REACH

You are on a broad reach when you are headed about 100-140 degrees from the wind, with both sails at least three-quarters of the way out on the leeward side.

Practice:

Start sailing on a beam reach.

Turn your boat away from the wind (head down) while letting out your mainsail, until the wind comes over the windward stern corner of your boat. Have your companion make sure you do not turn too far. You may feel the wind on your back or windward shoulder. It will be harder to feel the intensity of the wind, because you are sailing the same direction that the wind is blowing.

Ease (let out) the mainsail until it just starts luffing, then trim it in until the luffing stops. Have your companion make sure the boom does not rub against the wire shroud. (The boom should always be at least 2 inches away from the shroud.)

Ease (let out) the jib until it just starts luffing, and then gently trim it in until the luffing stops. Your companion can help you with sail trim.

You are now sailing on a broad reach.

Try to steer a straight course, keeping the wind over your windward stern corner and your sails full. The boat will be sailing almost flat in the water. Move the joystick as little as possible.

If the boat slows, and you can hear the jib luffing, then you are heading too high into the wind. Push the joystick gently to leeward (towards the boom) until the luffing stops, then center it.

If you hear or feel the jib switch to the other side of the boat, it means you have headed down too far, and you are no longer on a broad reach. You will need to point the joystick **gently** to windward (away from the boom) until you feel the jib switch back onto the same side as the mainsail. Then center the joystick again.

WIND DIRECTION



**BROAD
REACH**



6. SAIL ON A RUN (WING-ON-WING)

When sailing with the wind directly behind you, your sails will catch the wind best if the jib is on one side, and the mainsail on the other. This is called sailing downwind, or wing-on-wing.

Practice:

Start sailing on a beam reach.

Turn your boat gradually away from the wind (**head down**) while **easing** (letting out) your mainsail, until you are on a broad reach. Have your companion check to make sure the boom is at least 2 inches away from the shroud.

Ease (let out) the jib until it is perpendicular to the boat. Your companion can help with sail trim.

Gently move the joystick toward the boom, to turn the boat a bit more downwind. As soon you feel or hear the jib switch sides, return the joystick to center.

You are now sailing wing-on-wing.

Steer a straight course, keeping the wind over your stern and your sails full. It is difficult to feel the wind on your back in this direction, so you must pay close attention to the feel of the boat. Your mainsail will be on the leeward side, and your jib will be on the windward side. This is a balancing act, which requires careful, controlled steering.

If you feel the boat start to rock from side to side, or you feel the mainsail start to swing toward you, then you are heading

too low (too far from the wind). To prevent the mainsail from switching sides in an accidental jibe, **head up** by moving your joystick gently to windward (away from the mainsail). If you do jibe accidentally, steer straight for a moment to orient yourself. Then gently move the joystick toward the boom to jibe back onto your original course, while pulling in the mainsheet and releasing promptly as you go through the jibe.

If you feel or hear the jib switch to the leeward side, it means you are heading too high towards the wind. **Head down** by gently moving the joystick to leeward (towards the boom) until the jib returns to the windward side and you are once again wing-on-wing. All movements with the joystick should be minimal.

WIND DIRECTION



RUNNING

7. CHANGING YOUR HEADING

When ***heading up*** in a Martin, it is best to pull in the jib first so it doesn't flap around. Then pull in the mainsail once the wind pressure is off it.

When ***heading down***, let the mainsail out first, to take the pressure off the sail, which helps with steering and heeling (tipping). Then you can adjust the jib.

It may be helpful to use whipping twine to mark the close-hauled, beam reach, and broad reach positions on the mainsheet and jib sheet. This will allow you to more easily adjust your sails*.

Practice:

Start sailing on a beam reach.

Practice putting your hand on the jib sheet, and then put your hand on the mainsheet. Repeat this until you are comfortable finding each line quickly.

Ask your companion to check your surroundings for other boats.

Head up to close-hauled, while first pulling in the jib sheet and then the mainsheet. Try to estimate how much each sheet needs to be trimmed in for your new heading, or use the markings as your guide. Try to gauge how high to head toward the wind, making sure your jib doesn't luff. You

should feel the wind on your face, and the waves will be hitting the windward side of the bow of your boat.

After a few minutes, ***have your companion check your surroundings***, then ***head down*** to a broad reach, first easing the main sheet and then the jib sheet. Estimate how much to head down by noticing when the boat flattens out. You may feel the wind on your back or windward shoulder. If your jib switches sides, you have headed too far away from the wind. Have your companion check to make sure the boom does not rub on the wire shroud, or use your twine sheet markings as a guide.

Repeat this procedure several times. Remember to have your companion check your surroundings each time before you change course.

*Note—It is helpful to mark the sheets with one stripe at close hauled, two stripes at a beam reach, and three stripes at the broad reach position. The use of whipping twine is preferable to tape when marking the mainsheet, because tape can become entangled where the mainsheet passes inside the boom.

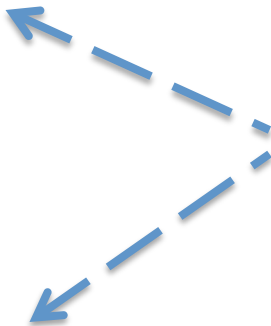
CHANGING DIRECTION

WIND DIRECTION



HEADING UP

**Close
Hauled**



**Beam
Reach**

HEADING DOWN



**Broad
Reach**

8. TACKING (COMING ABOUT)

When you tack, you turn the boat into the wind, through the 90 degree “No-Go Zone” until your sails cross to the other side of the boat.

Practice:

Start sailing on a close-hauled heading, with your sails trimmed in to the correct position.

Say “READY TO TACK?” to let your companion know you plan to change direction.

Have your companion check your surroundings, including behind you, for other boats.

Wait for your companion to reply “Ready”.

Say, “TACKING”, and smoothly move the joystick all the way to windward. You do not have to adjust the sails. The sails will switch to the other side of the boat as your direction changes.

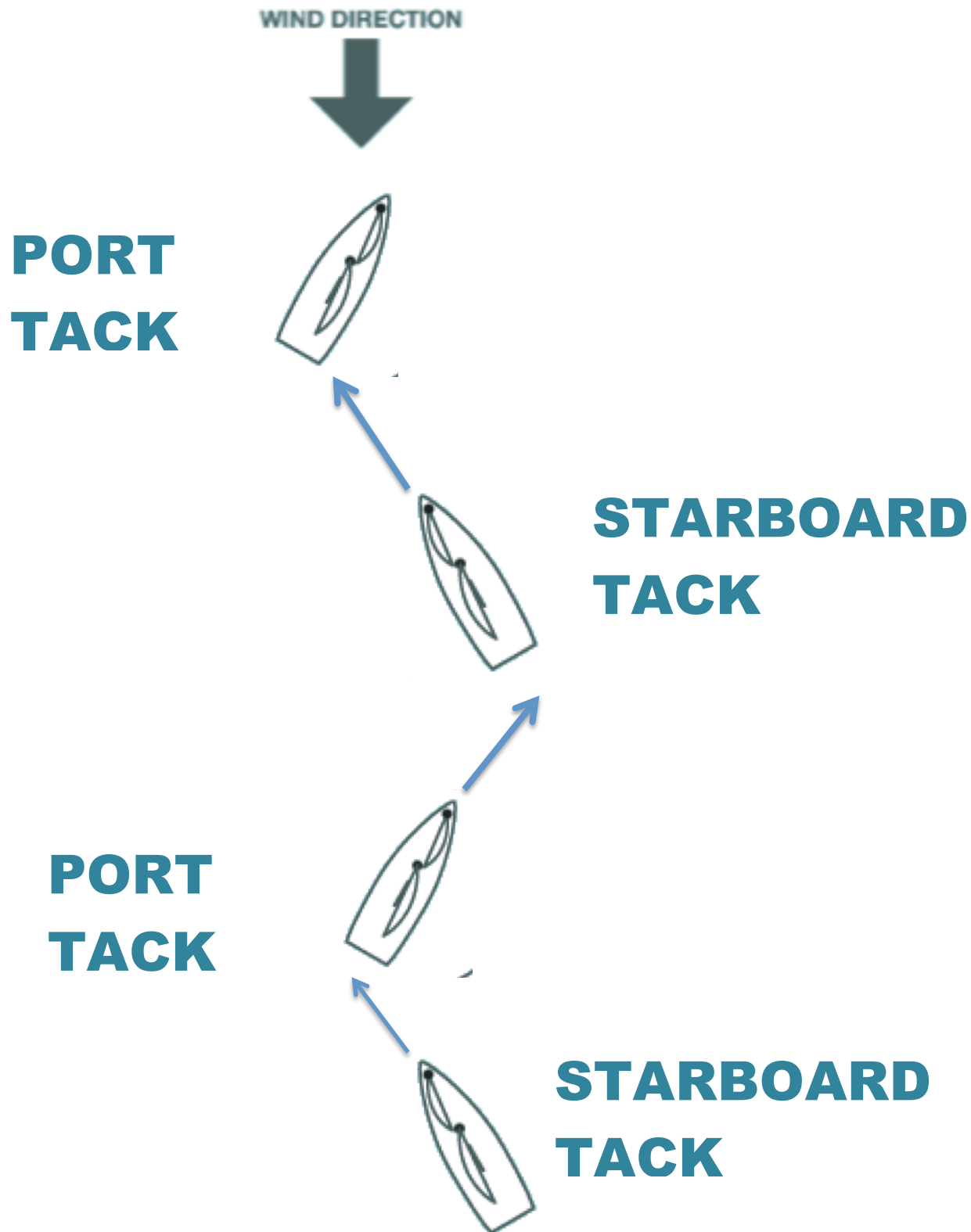
When you feel the boom switch sides, your sails start to fill, and boat start to pick up speed, you will be close to your new heading. Center the joystick. Adjust your heading as needed so that the jib does not luff. The boat may begin to heel, and you will feel pressure on the joystick again as your sails fill.

Your tack is now complete.

“READY ABOUT” and “HARD-TO-LEE” are sometimes used instead of “READY TO TACK” and “TACKING”.

HINT: When doing multiple tacks from a close-hauled heading to the opposite close-hauled tack, there is an easy way figure out how to arrive at the new heading. On your first tack, move the joystick to windward smoothly and count slowly 1,2,3,4,5... and note how long it takes to complete the tack. Each subsequent tack will take the same amount of time to complete if the wind velocity remains constant. Just be sure to move the joystick in the same smooth motion each time.

TACKING



9. JIBING

You jibe when you turn your boat **away** from the wind, and the mainsail crosses quickly to the other side of the boat.

Practice:

Start sailing on a broad reach, with your sails perpendicular to the boat. Have your companion make sure the boom is at least 2 inches away from the shroud.

Say “READY TO JIBE” to let your companion know you what you are planning.

Have your companion check your surroundings for other boats. Wait for your companion to reply “Ready”.

Say, “JIBING”, and start pulling in the mainsheet.

Gently turn the boat away from the wind (move the joystick ***slightly*** toward the boom.)

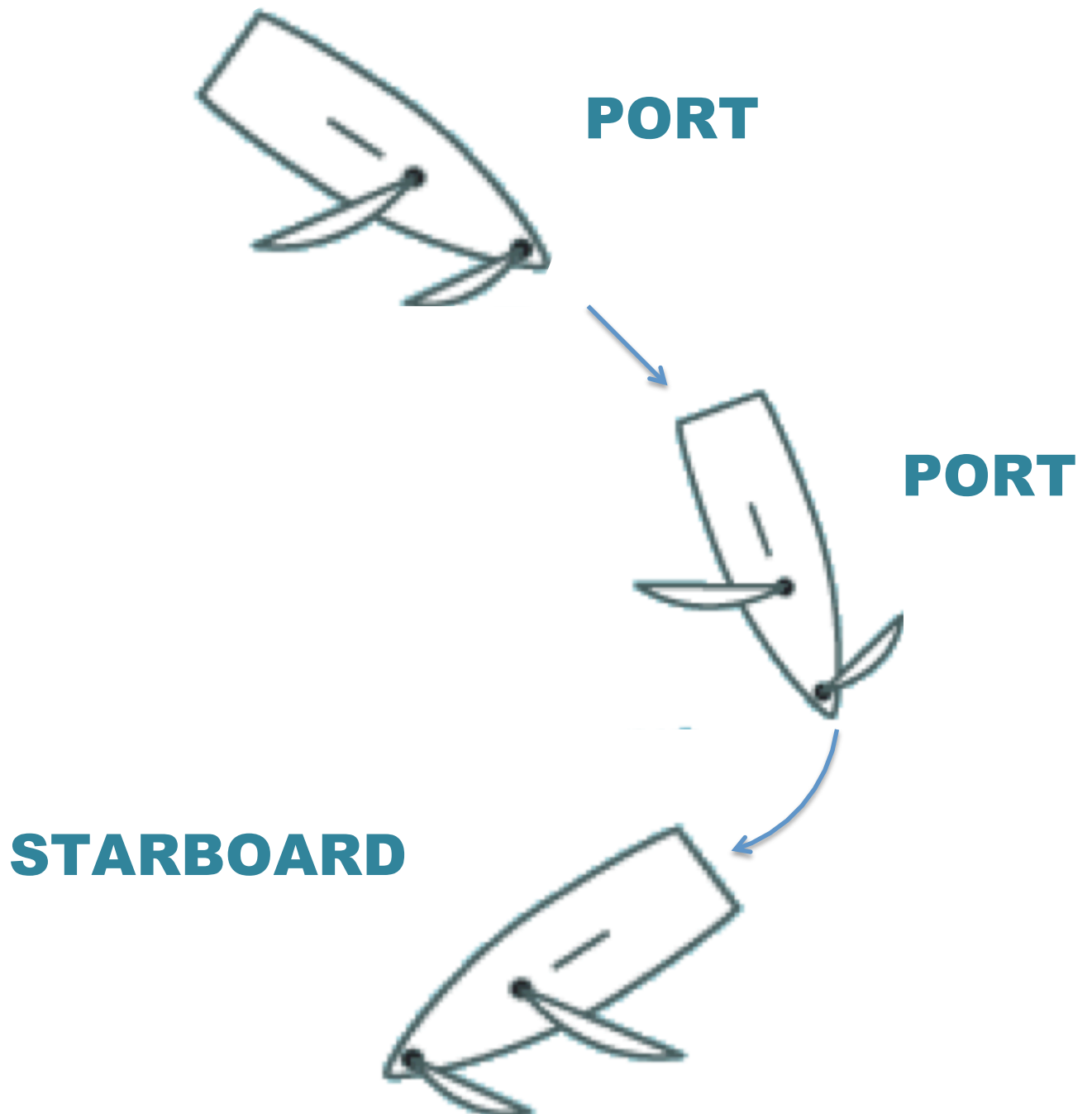
As soon as you feel the boom cross to the other side of the boat, let the mainsheet slide out rapidly but with control until your companion tells you that the boom is near the shroud. Immediately center the joystick. The jib will switch sides without you tending the jib sheet.

HINTS: Pulling in the mainsheet and then letting it out promptly lets you control the mainsail as it crosses the boat. The companion can handle the mainsheet if needed.

“READY TO JIBE” and “JIBE-HO” are sometimes used instead of “READY TO JIBE” and “JIBING”.

JIBING

WIND DIRECTION



10. SAFETY POSITON

The safety position allows you to take a brief, controlled rest from sailing.

Practice:

Start out sailing on a close reach.

Ease the jib sheet and mainsheet until both sails are fully luffing.

Keep your boat on the close reach heading. Your boat will glide to a stop.

To resume sailing, just pull in both sails, and the boat will start moving.

11. SAILING A STRAIGHT COURSE

Sailing a steady, straight course is easier, less tiring, and faster.

Practice:

Start sailing on a heading of your choice.

Concentrate on trying to move the joystick as little as possible, while still maintaining your course. Focus on the feel of the boat as it responds to any small corrections that you make.

As you sail, ask yourself these questions:

Am I continuing to feel the wind hitting the same places on my face, ears, neck and hands?

Are the waves hitting my boat from the same direction?

Do the waves hitting my boat feel and sound the same?

If I was originally in direct sun, am I still in the sun or am I now in the shadow of the boom? (Or vice versa)

Is the heel angle of the boat the same?

Is the speed of the boat the same?

Is the motion of the boat through the water the same?

Is the pressure on the joystick the same?

Do I hear or feel any sails luffing?

Do I feel the boom moving back and forth?

Try to be aware of small changes, so that you can make small corrections in your steering as needed.

12. GETTING OUT OF IRONS

You are “in irons” when your boat is stopped, you are headed directly into the wind with your sails luffing, and you are not able to steer normally. You will feel the wind blowing directly toward your face.

Practice:

Start out “in irons”.

Push and hold the joystick completely to one side. **Be patient.** The boat will drift backward and slowly turn.

When you feel the wind coming across the side of the boat, pull in both sheets, push the joystick toward the boom to head down, and resume sailing.

Hint: If the boat has turned just a bit in the direction you want to go, you can pull the jib in all the way to the mast just briefly to push the bow to leeward and get onto your new heading more quickly.

WIND DIRECTION



**IN IRONS
(INTO THE WIND)**

13. SLOWING OR STOPPING

Usually we want our boat to sail quickly, but sometimes it is useful to slow the boat when trying to avoid an obstacle.

Practice:

How To Slow Down When Sailing Upwind:

Start sailing close-hauled. Let out the sails so that they luff, and your boat will slow down.

Practice:

How To Slow Down When Sailing Downwind:

Start sailing on a broad reach. Head your boat up toward the wind, keeping your sails out so they luff.

Practice:

How To Slow Down When Sailing Downwind If You Cannot Alter Course:

Start sailing on a broad reach. Pull in both sails so they are over the centerline of your boat (pulled in tight). The boat will slow because your sails will be over-trimmed, and not catching the wind properly.

Practice:

How To Stop The Boat:

Start sailing on any heading. Then head to a close reach and luff your sails completely in the safety position.

IMPORTANT: In order to slow the boat when making a downwind or crosswind docking, it is usually necessary to

drop the mainsail, and fully luff the jib. The companion sailor may also need to drag a paddle in the water to slow or stop the boat.

14. MAN OVERBOARD (MOB) DRILL “ADAPTED”

Rescuing a potential “man overboard” is an essential skill for any sailor to know. Most “man overboard” drills involve sailing away from the MOB briefly, then returning to where the person fell overboard. This poses problems for sailors with vision impairments, because they may not be able to see a person in the water clearly enough. The purpose of this drill is to stop the boat as soon as possible, so that a person overboard can swim to the boat. You can practice by sailing close to an anchored mark and pretending that it is your MOB.

Practice:

Start out sailing on any heading.

Sail close to an anchored mark. Pretend the mark is a companion who fell out of the boat.

Say, “Man Overboard”.

Immediately release both sheets, and head up directly into the wind. Then continue turning until you are on a close reach heading in ***safety position with your sails luffing completely***. You will glide to a stop.

Stay in safety position. Drift toward the “MOB” buoy.

In a real “Man overboard” situation, you should call “Man overboard” LOUDLY as soon as the person goes in the water, promptly release both the mainsheet and the jib sheet, and immediately start turning. If the person cannot

reach the boat, or you are unable to get them in your boat, radio for help right away, and try to flag down other boats passing by for assistance.

MAN OVERBOARD DRILL “ADAPTED”

WIND DIRECTION

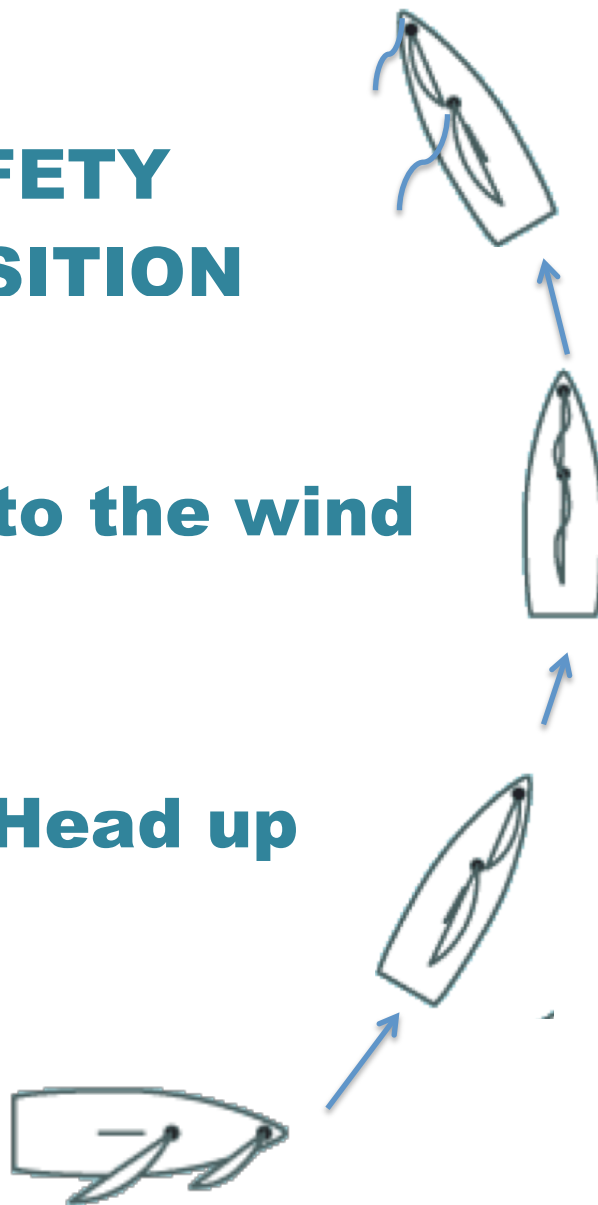


**SAFETY
POSITION**

Into the wind

Head up

***MOB**



15. SAILING USING CLOCK POSITIONS

As sailors gain experience, they can have their companion use “clock positions” to give directions. This lets sailors trim sails and steer more accurately, and also helps them understand the movement of other boat traffic.

Practice:

Imagine that your boat is in the center of an analog clock face, with the 12 o'clock position straight ahead of the bow, and the 6 o'clock position directly behind your stern. The 3 o'clock position is directly to your right (starboard), and the 9 o'clock position is to your left (port).

Start sailing close-hauled on port tack, and ***have your companion check your surroundings for other boats.*** When your companion asks you to, change your heading so your boat points toward the 3 o'clock position.

Sail on this heading for about 15 seconds. After checking your surroundings, have your companion give a command to change to a 10 o'clock heading. (Remember, the 12 o'clock position is always the direction your boat is ***currently*** heading before you begin your maneuver).

Continue practicing steering and changing direction as your companion gives a variety of clock directions, until you become familiar with how much turning and sail trim is required for each change.

You can also practice having your companion tell you the location of other boat traffic using clock positions. For example, your companion can say, “There is a sailboat

approaching us at 4 o'clock, about 50 yards away." This allows you to orient yourself to traffic, and start preparing for any maneuvers that you may need to take to stay clear. Your companion may also give directions by saying, "Our next racing mark is at 2 o'clock."

If the companion gives clock position directions, and the jib sheets and mainsheet have been marked with whipping twine at the close-hauled, beam reach, and broad reach positions, then an experienced sailor with visual impairments will be able to sail with very little additional guidance.

CLOCK POSITIONS

