



## 2<sup>nd</sup> Mornington Sea Scouts Seaman Ship



Apart from the rowing, seaman ship component is also a very important section of the traditional rowing. This section will cover the Seaman Ship components of knots, basic navigational aids and

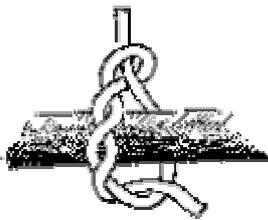
### **Knots;**



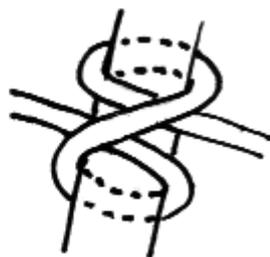
Bowline



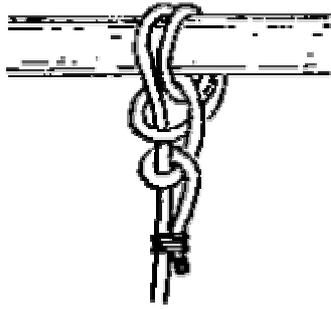
Figure of Eight



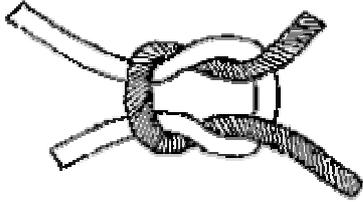
Timber hitch



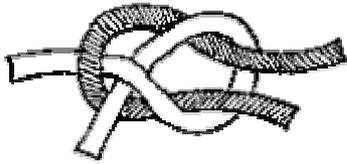
Clove Hitch



Anchor bend



Reef knot



Sheet bend.

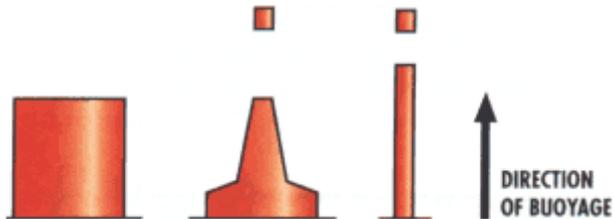
## International Association of Lighthouse Authorities System A Markers.

The international Association of Lighthouse Authorities (IALA) System A marker is an international buoyage system of markers used by Europe and the Commonwealth.

### Lateral Markers:

Indicate the preferred channel or route to buoyage

Port hand markers; Red in colour and indicates the port side of the channel or route.



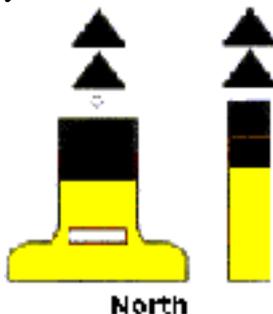
Starboard hand markers; Green in colour and indicates the starboard side of the channel or route to buoyage.



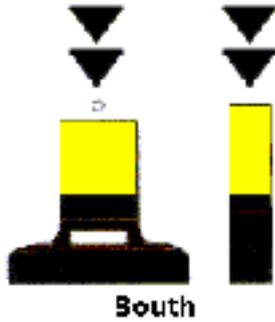
### Cardinal Markers:

Indicates the best navigable water, the safest side to pass a feature or danger. Cardinal marks yellow and black horizontal bands with double black cones as its top mark. The double black cones and yellow and black colour patterns indicate which direction to pass on.

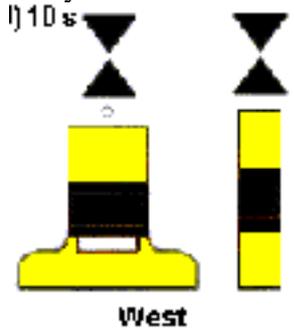
North cardinal marks; double black cones pointing upwards, the buoy is black top half and yellow bottom. Pass on the northern side.



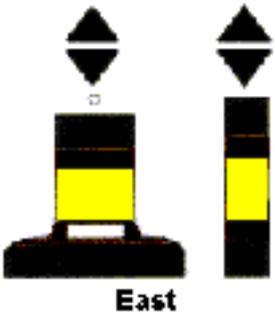
South cardinal mark; double black cones pointing downwards, the buoy is yellow top and black bottom. Pass on the southern side.



West cardinal mark; double black cones point to point, the buoy is yellow top, black middle and yellow bottom. Pass on the western side.

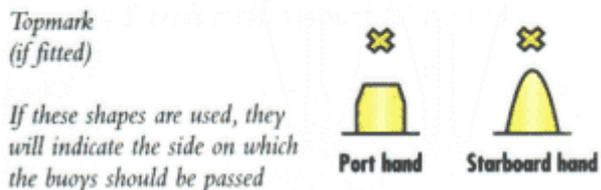


East cardinal marks; double black cones pointing away, the buoy is black top, yellow middle and black bottom. Pass on the eastern side.



### Special Markers:

Yellow marker buoys with a single yellow X on top. Indicates a special area, which charts or sailing directions need to be consulted for specifics. May indicate spoil ground, deep draft, pipeline and in the Port Phillip and Pilot buoy in Western Port are recreation buoys.



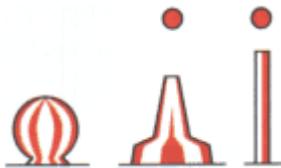
**Isolated danger markers:**

Indicates an isolated danger, which has navigable water around it. A Black and red horizontal strip, black is the top mark. Fitted with double black spheres on top.



**Safe water markers:**

Indicates navigable water all around the buoy. A red and white vertical strip spherical, pillar or spar buoy, with a single red sphere fitted top mark to pillars or spar buoys.



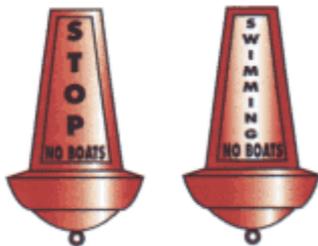
**Zone signage:**

Yellow buoys or piles with a yellow X top mark indicate no boating zones in Victorian port and coastal areas.



**Red:**

Used to indicate prohibited water and swimming areas.



**Yellow:**

Speed restriction zones usually maximum speed written on.



**Green:**

Indicates access lane.



**Red and yellow:**

Special purpose used to indicate regatta areas, hazards or channels.



## Navigational Lights:

Navigational lights are used from sunset to sunrise or during periods of restricted visibility.

Sailing boats and row boats under 7 metres and is not using an engine are to display port, starboard and stern lights or shine a torch vertically and onto the sail in case of a sailing boat.

Lighting technique used on small sail and rowboats.



## **Rules of the Road:**

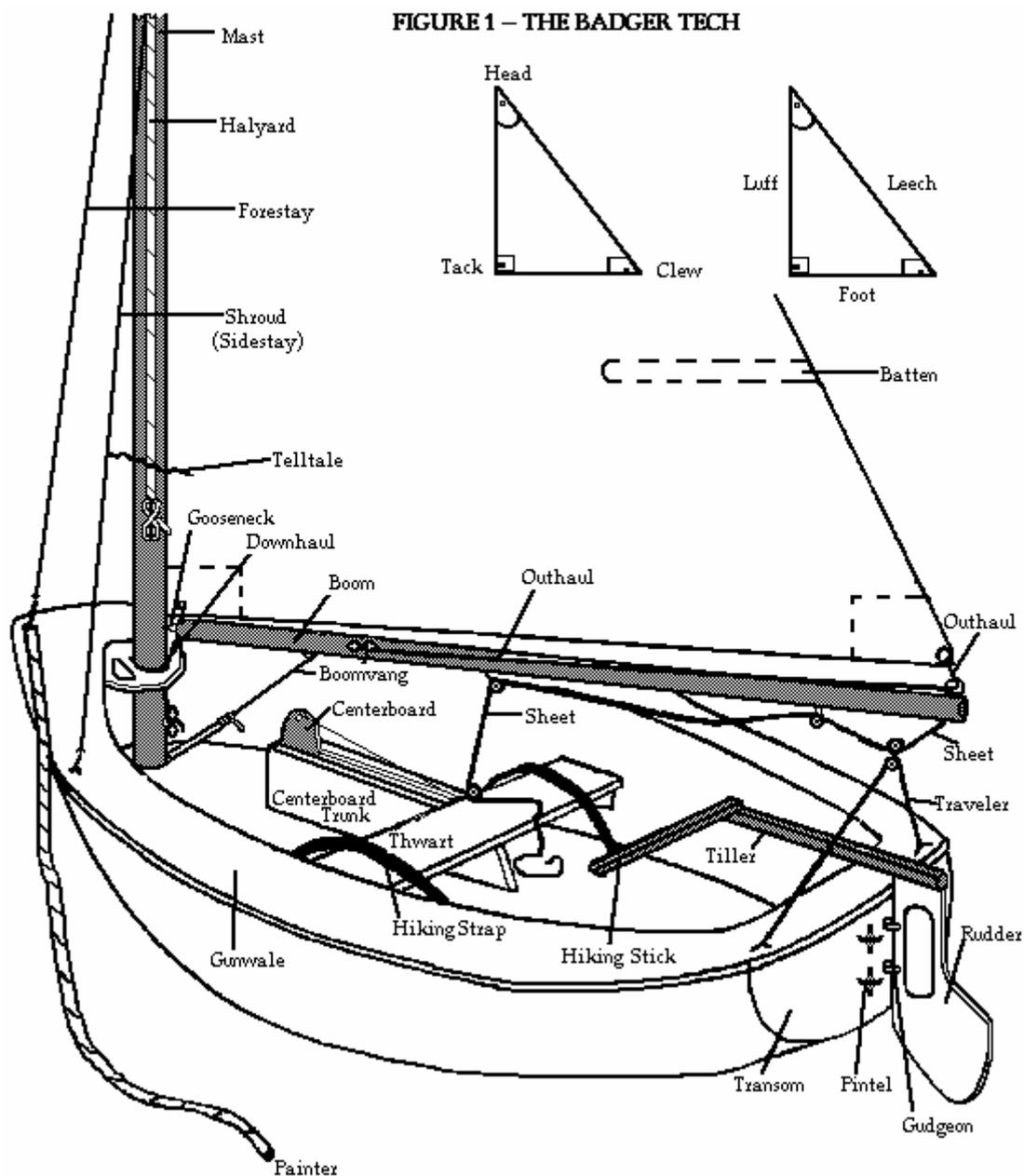
Like riding your bike or walking along the road when out on the water they're a number of basic rules of the road to maintain safety.

Unlike the rules of the land road where we keep to the left (port) on the water it is keep to the starboard side, especially when in narrow water ways or shipping channels.

Powered vessels must give way to sailing and rowing boats. Remember common sense must prevail, for larger ships and boats it is advisable for small boats to keep well clear of these vessels.

Give way to starboard; when a vessel approaches on your starboard side has right of way. If approaching a vessel on your starboard side give clear early indication of your intentions; i.e. slowing down, or a directional change to sail aft of the vessel on your starboard.

Whilst sailing the vessel which is on starboard tack (sailing with the wind coming over its starboard side) has right away, with the exception when rounding a buoy. A crew cannot use the starboard call to prevent another vessel from rounding a buoy clearly.



**Figure 1**  
**SAILING TECHNOLOGY**

You can see from figure #1 that even as simple a craft as the Tech Dinghy has a formidable number of parts. You should become familiar with these names. Three parts you will need to be most familiar with when you begin sailing are the *sheet*, the *hiking stick* (also known as the tiller extension), and the *telltale*. Look again at the drawing.

The *hiking stick* is the handle or lever with which you steer the boat; it is a smooth handle about 30 inches long, which swivels about the end of the tiller. The *tiller* is attached to and controls the rudder. The *rudder* utilises the resistance of the water to provide the turning force for the boat. When sailing, you can hold the *hiking stick* *anywhere* along its length in order to make a comfortable connection between you and the tiller.

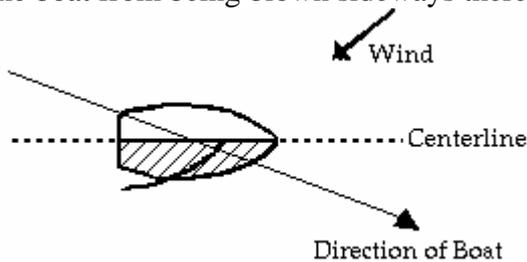
The *sheet* is not the sail. It is the *line* (rope) with which you control the sail. *Trimming* (pulling) in on the sheet will bring the sail closer to the centre of the boat. *Easing* (letting the sheet out) will allow the sail to swing in the direction that the wind blows it.

The *telltale* is a short length of string or yarn tied to the wire side-stay or *shroud*. The purpose of the telltale is to indicate the direction the wind is blowing so it is a good idea to refer to it often when sailing. As you sit in the boat, with the hiking stick in one hand and the sheet in the other, you will be sitting on the *thwart* (seat); or on a heavy day you will be sitting on the *gunwale* (pronounced "gunnel"), *hiking* (leaning) *out* to keep the boat level. The force of the wind against the sail tends to make the boat tip or *heel*. To counteract this heeling you must hook your feet under the *hiking\_strap* and extend your body out over the water.

Even in circumstances where you may be able to hold the tiller directly, you will find that it is easier to control the tiller by sliding your hand down and holding the hiking stick close to its joint with the tiller. It is advisable for you to become accustomed to using the hiking stick *at all times*, even when you are not hiking out. This will give you faster and more efficient control, plus eliminate the possibility of tangling the dangling hiking stick in the sheet.

### WHAT MAKES IT GO?

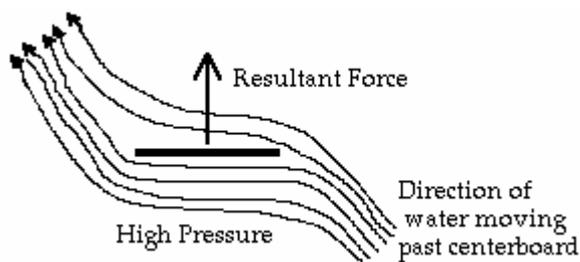
The sailboat gets its power from the force of the wind flowing around the curved shape of the sail. A properly trimmed (adjusted) sail assumes a shape similar to that of an airplane wing (airfoil). A sailboat is driven by the same force which supports an airplane in flight. The flow of air around the sail creates high pressure on the windward (side the wind hits first.) side of the sail and low pressure on the leeward (pronounced "loowerd;" meaning away from the wind) side. This pressure difference tends to push the sail from high to low pressure. However, only part of this force acts to push the boat forward while the rest tends to push the boat sideways. To prevent the boat from being blown sideways there is projecting down into the water a centreboard, a



pivoting fin-shaped blade. The centreboard also acts as an airfoil. As the boat moves forward, it also side slips, causing the board to pass through the water at an angle.

**Figure 2**

If we look at the water passing the centreboard instead of the centreboard passing through the water we can see how it works to prevent sideslip



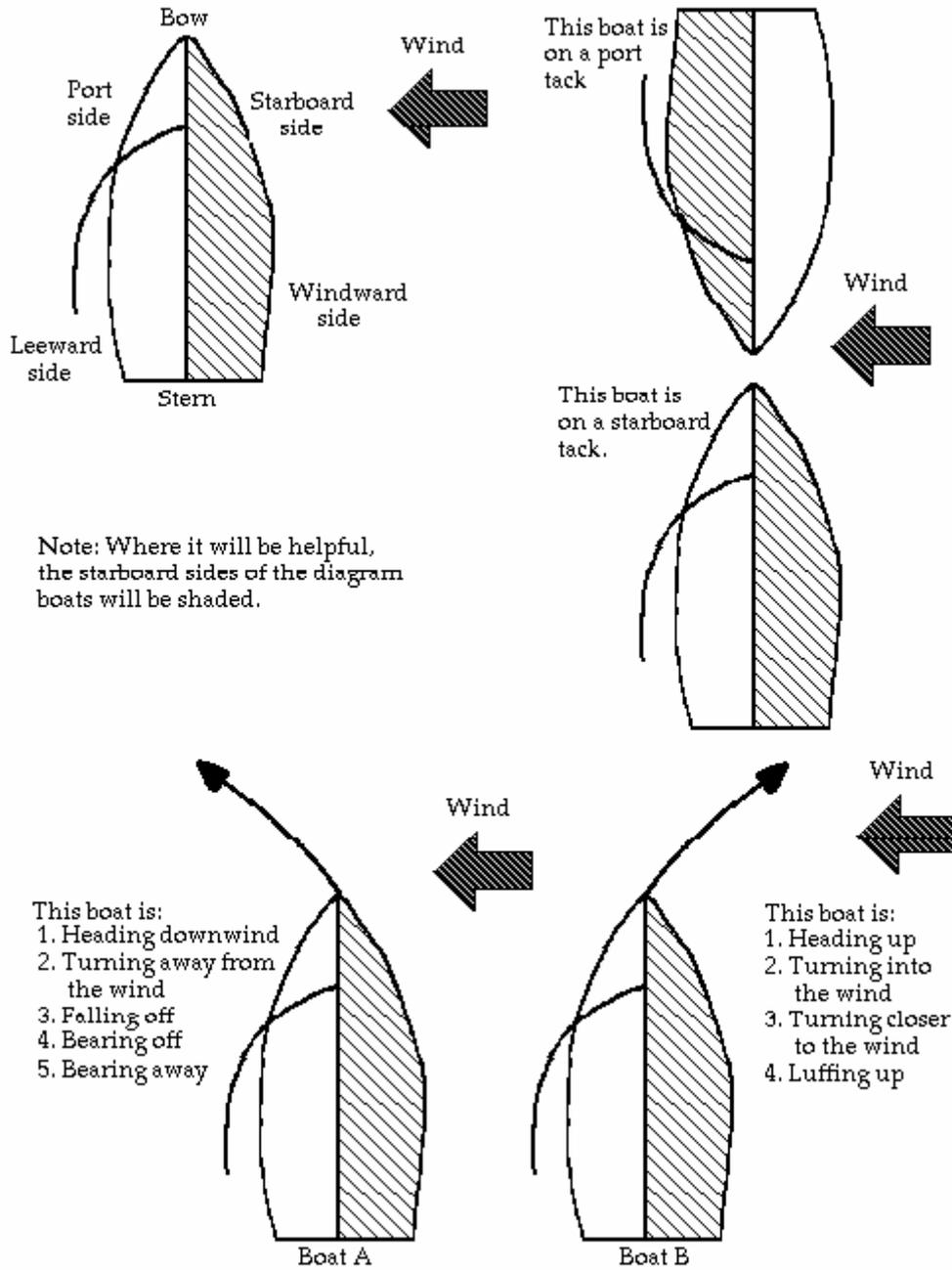
through the water.

**Figure 2a**

Besides learning the terms for the parts of the boat, you should also learn the general sailing terms represented in Fig. 3. The right side of the boat is called the *starboard side* (shaded side in the diagrams); the left side is the *port side*. If the boat is sailing so that the wind first crosses the starboard side, the boat is sailing on a *starboard tack*. Similarly, if the wind first crosses the port side, the boat is sailing on a *port tack*. Except for when the boat is *sailing by the lee* (which we will discuss later), the sail is always opposite the wind, so that a boat on starboard tack has its sail on the port side of the boat.

A few other terms you will hear mentioned are *pinching*, *footing*, *feathering*, and *broaching*. *Pinching* is trying to sail higher into the wind than close hauled; sailing lower is called *footing*. In heavy air when close hauled, excessive heeling should be avoided by heading up gently in the

puffs; as the puff passes, the boat can smoothly be borne off to its proper course. When done as a smooth, continuous operation, this is known as feathering. Broaching is allowing the boat to head up immediately after the jibe and may result in capsize.



**Figure 3**

**Figure 3**

# Controlling a Sailboat

Figure 4

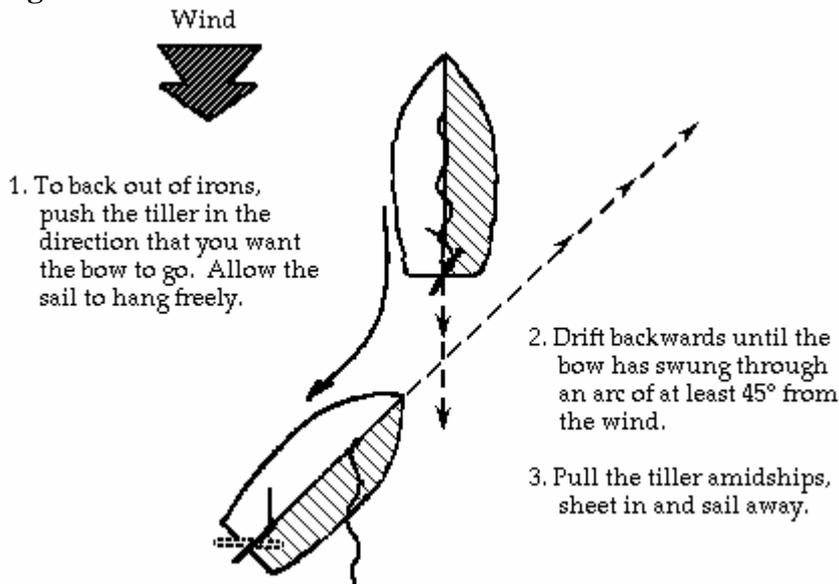


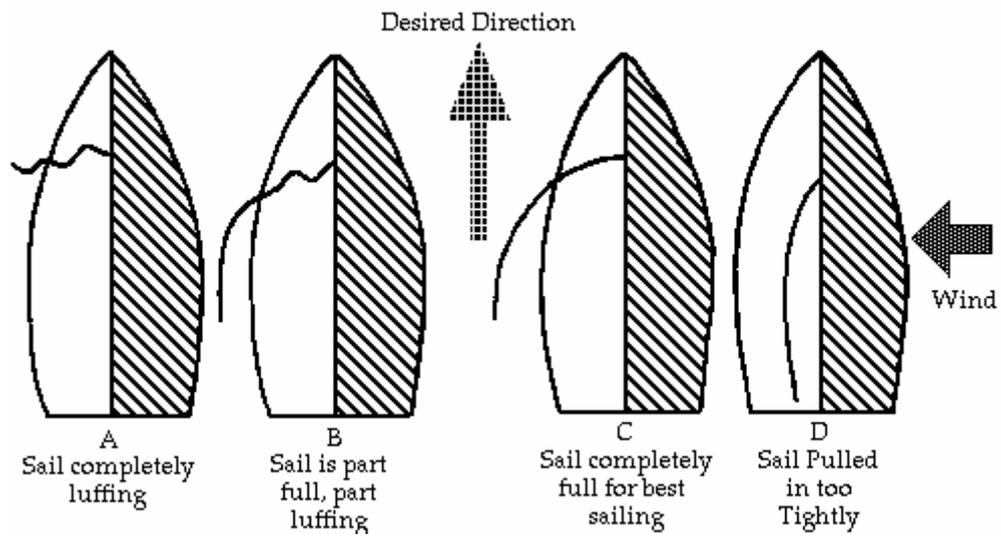
Figure 5

## SAILING A STRAIGHT COURSE

You are now ready to sail a straight course. Assuming your boat is pointing in the direction in which you want to go, you must adjust the sail correctly. If you let the sheet run out, the wind will swing the sail around parallel to the wind (boat A Fig. 6). At this point the wind is hitting both sides of the sail with equal force, causing it to flap, or *luff*. The wind is not pushing the boat forward. As you pull the sheet in, the aft part of the sail begins to catch the wind and form the curved airfoil which will give the boat forward motion. Continuing to pull the sheet in will cause more of the sail to fill (boat B, Fig. 6) until the whole sail is filled and there is no luffing (boat C, Fig. 6). At this point you will be able to achieve maximum speed. If you pull the sheet in even further (boat D, Fig. 6) the wind will not flow as fast around the curved sail, and the forward thrust from the wind will be decreased.

Once your boat is moving it is very important to keep it moving in a straight line. To accomplish this, make sure that the *tiller* is always pointing directly towards your mast. It is also helpful to pick a stationary object on shore and continue sailing towards it. This will allow you to watch your sail and still have a reference point on land to help keep you sailing in a straight line.

While you are sailing in a straight direction, it will be necessary to check the sail often to see that you are getting the maximum force of the wind. If the sail is full, you have no way knowing whether it is too tight as in boat D in Fig. 6. Therefore, you must run a sail check by letting the sheet out (easing) until the sail begins to luff. Then trimming the sail by pulling the sheet in *until the luffing just stops*. When the luffing stops, your sail is set properly *for the direction you are heading*. When you are sailing in some directions, the sail will not luff no matter how far out it goes. In this case it should be left *as far out as possible* (it will be roughly perpendicular to the boat) to get the maximum force of the wind. This method of trimming the sail (letting out the sheet until the sail luffs, then pulling it in until the luffing stops; or, if it doesn't start to luff, leaving it out as far as possible) is used for boats sailing in any direction, with one exception which we will get to later. An important fact to remember is that *whenever* you alter your course, you must also alter your sail trim.



**Figure 6**

**Figure 14**

# CAPSIZING

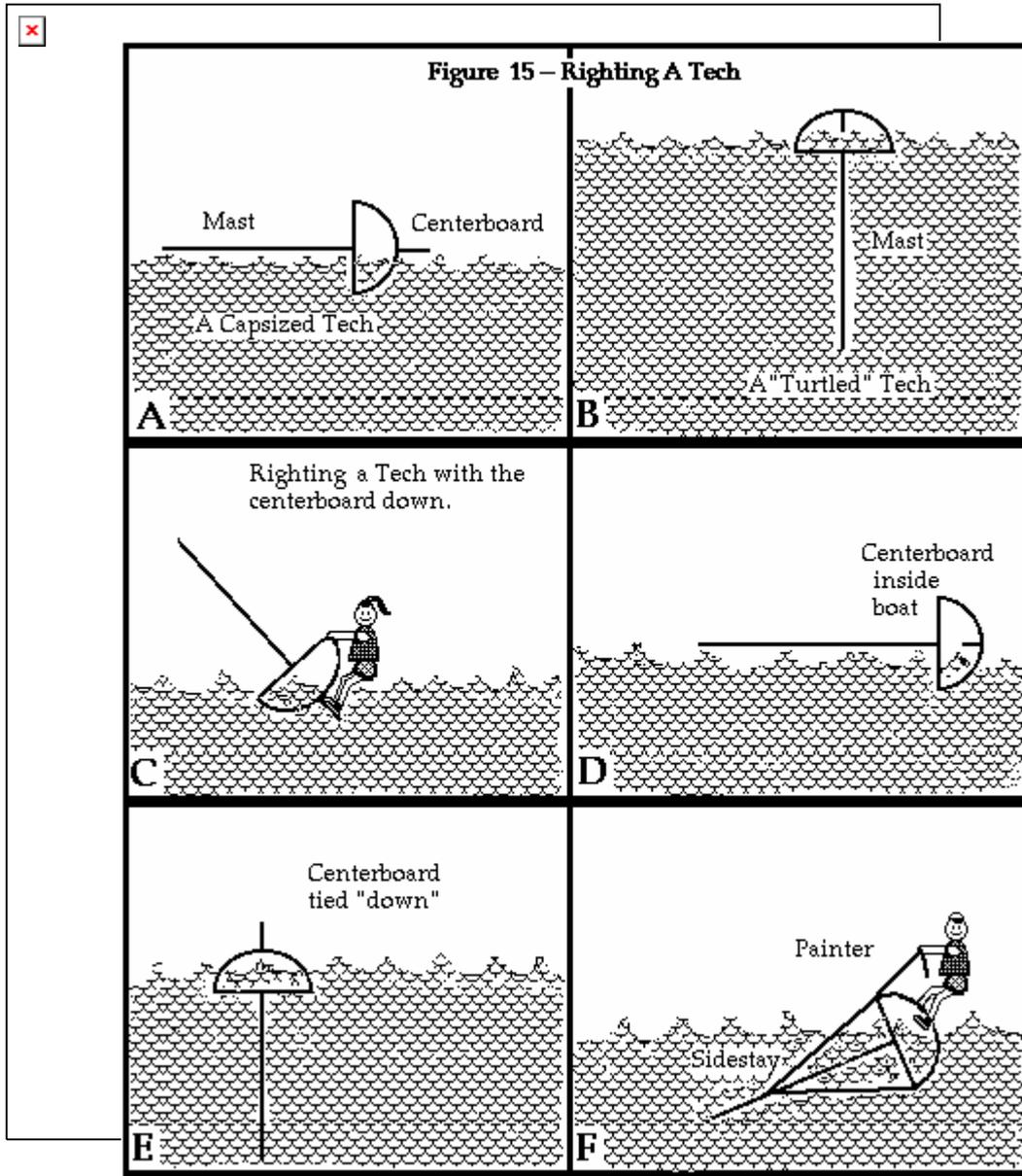


Figure 15

## HEAVY WEATHER

## BOOM VANG

Figure 16

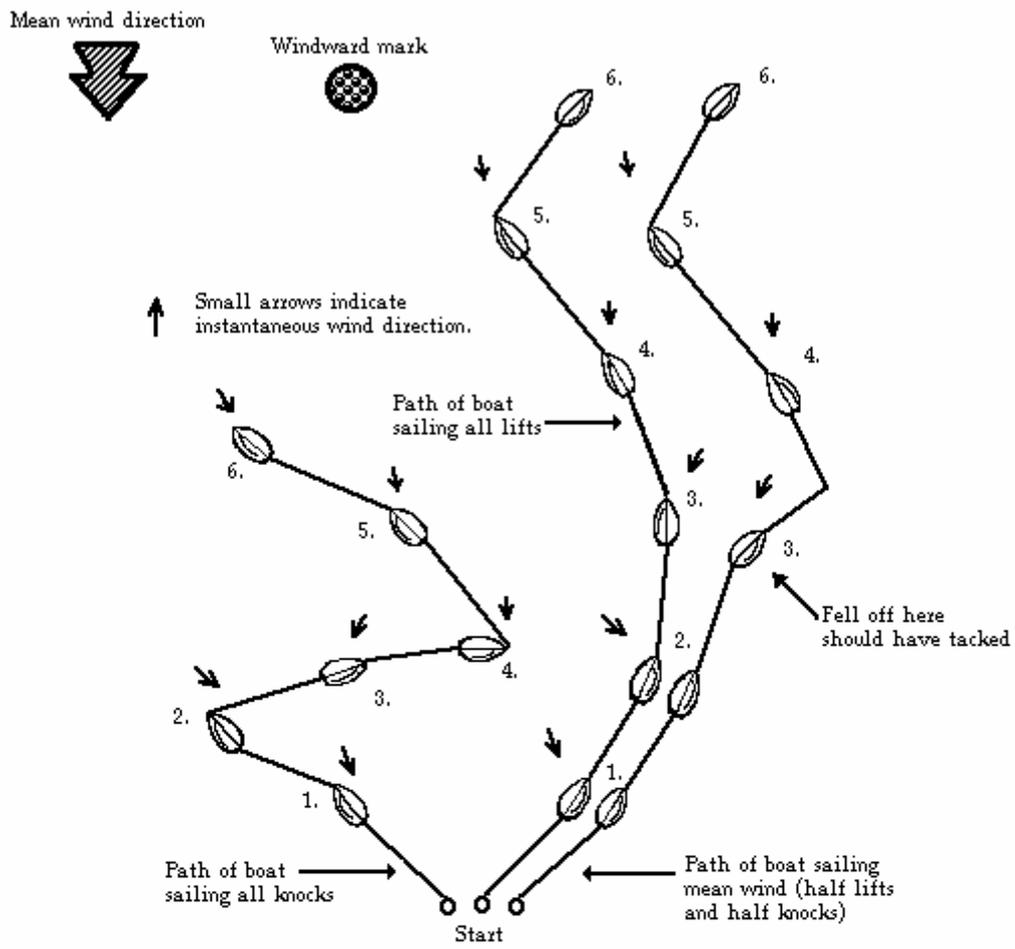


Figure 18

Figure 18

Figure 19

## GLOSSARY OF TERMS AND SAILING VOCABULARY

**ABEAM**--Any location either side of the boat, located on a line *at right angles* to one running from the bow to the stern.

**AHEAD**--In *front* of.

**AMIDSHIPS**--The portion of a vessel midway between bow and stern; also midway between port and starboard sides.

**ANCHORAGE**--A sheltered place or area where boat can anchor.

**APPARENT WIND**--Wind felt on a moving vessel

**ASTERN**--Behind or backwards.

**BACKING WIND SHIFT**--A counter-clockwise wind shift.

**BACKWIND**--To hold the mainsail or jib off to the side to cause the wind to blow onto the backside of the sail.

**BAIL**--To remove water from a boat by hand.

**BATTENS**--Long, thin, narrow strips of wood that are placed in pockets sewn perpendicular to the leech of a sail and are used to hold the leech out.

**BEAM**--The greatest breadth of a boat.

**BEARING OFF/AWAY**--Altering course away from the wind on any course from head to wind until the boat begins to jibe.

**BEAT**--To sail towards the direction from which the wind blows by making a series of tacks while sailing close-hauled.

**BEFORE THE WIND**--Sailing with the wind from astern, in the same direction toward which the wind is blowing

**BIGHT**--Any part of a rope with the exception of the end; usually refers to a loop in a rope

**BLOCK**--A pulley through which a line passes.

**BLOWING STINK**--A term made famous by Hooper instructors. High winds! It is advised that at the first sign of the Big Stink one should Rig and Go!

**BOOM**--Pole or spar attached to the mast to which the foot (lower edge) of the sail is fastened.

**BOLT ROPE**--Rope sewn into the luff and foot of sail for attaching to the mast and boom.

**BOOM VANG**--A wire or rope running from the boom to or near the bottom of the mast which holds the boom down.

**BOW**--Forward part of the hull.

**BOW PLATE**--A plate that fits on the bow of the boat to which the lower end of the forestay is attached.

**BROACHING**--A sudden swooping around broadside to the wind and waves while running.

**BROAD REACH**--Sailing with the wind coming from any direction from abeam to on the quarter.

**BY THE LEE**--Sailing before the wind with the wind coming from the same side that the boom is on.

**CAST OFF**--To let go.

**CENTER OF EFFORT**--Centre point of sail area where all the force of the wind can be said to be centred.

**CENTER OF LATERAL RESISTANCE**--Centre point of all underwater area of the hull where the hull's lateral resistance can be said to be centred.

**CENTERBOARD**--A fiberglass or metal blade projecting through the bottom of the hull in centre which prevents the boat from sliding sideways. It pivots up and back into the centreboard trunk.

**CENTERBOARD LINE**--A rope or wire attached to the top of the centreboard with which it is raised or lowered.

**CENTERBOARD TRUNK**--Watertight housing for the centreboard.

**CHAIN PLATE**--A plate that fits on the side of the boat to which the lower end of a shroud is attached.

**CLEAT**--A formed fitting in wood or metal to which lines are made fast.

**CLEW**--The lower after corner of a sail.

**CLOSE HAULED**--Sailing close to the wind (sails all the way in).

**CLOSE REACH**--Sailing with sheets eased and the wind forward of the beam (sails out 1/4).

**COCKPIT**--The box-like well in a boat from which the skipper and crew operate.

**COMING ABOUT**--Changing tacks by heading up, bow into the wind and past head to wind on the other tack (tacking).

**CUNNINGHAM**--Line passed through a grommet in the luff of the sail used to flatten the sail by tightening the luff.

**DAGGER BOARD**--A centreboard that slides up and down in a vertical slot.

**DECK**--The horizontal top on the hull.

**DINGHY**--A small handy rowing boat, sometimes rigged with a sail.

**DISPLACEMENT**--The weight of the water displaced by the vessel.

**DOWN HAUL**--Line attached to the bottom of the boom used to flatten the sail by pulling the boom down, and thus tightening the luff of the sail.

**DOWNWIND**--In the direction the wind is going. A boat sailing downwind is running with the wind.

**DRAFT**--The depth of water to a vessel's keel.

**EASE SHEET**--To let the sheet out.

**EYE OF THE WIND**--An unsailable sector between close hauled headings.

**FATHOM**--Measurement of six feet.

**FENDER**--An object used over the side to protect a vessel from chafing when alongside another vessel or wharf.

**FOOT**--The bottom edge of a sail from Tack to Clew.

**FORE AND AFT**--In the direction of the keel.

**FORESTAY**--A wire running from the upper part of the mast to the bow of the boat.

**FREEBOARD**--The direction from the waterline to main deck or gunwale.

**GENOA**--A very large jib that overlaps the mainsail considerably.

**GOOSENECK**--Hinged fitting on the mast which connects the boom to the mast.

**GROMMET**--A ring sewn into the sail through which a line can be passed.

**GUDGEON**--The rings which, with pintels, make up the hinge assembly for the rudder.

**GUNWALE**--The upper edge of a boat's side.

**HALYARD**--A line used to raise the sail.

**HAUL**--To pull.

**HEAD**--Uppermost corner of a sail, or the toilet.

**HEADING UP**--Turning closer to the wind, up wind.

**HEADWAY**--Moving ahead.

**HEAVE IN**--To haul in.

**HEEL**--To tip to one side, due to wind pressure on the sail or crew on the side.

**HELM**--The tiller.

**HELMSMAN**--The one who steers the boat.

**HIKING STICK**--See **TILLER EXTENSION**

**HIKING STRAPS**--Straps to hook toes under in cockpit.

**HULL**--The actual body or shell of the boat.

**IN IRONS**--When a tack is not completed and the boat stalls out with the bow pointed directly into the wind.

**INSHORE**--Toward the shore.

**JIB**--A triangular sail at the bow of the boat.

**JIB SHEET**--The lines that lead from the clew of the jib to the cockpit and are used to control the jib.

**JIBE**--To go from one tack to the other when running with the wind coming over the stern.

**KEEL**--A fixed centreboard, usually found on larger sailboats.

**KNOCK**--A wind shift that forces a boat to sail below its mean wind course.

**LEECH**--After edge of a sail.

**LEEWARD**--The direction away from the wind (opposite of **WINDWARD**).

**LINE**--A rope.

**LIFT**--A wind shift that allows a boat to sail above its mean wind course.

**LUG**--The forward edge of a sail.

**LUFFING**--When the forward part of the sail is fluttering.

**LUFF UP**--To steer the boat more into the wind, thereby causing the sails to flap or luff.

**MAINSAIL**--The sail set on the mainmast.

**MAINSHEET**--The line that controls the angle of the mainsail in its relation to the wind.

**MAST**--The vertical pole or spar that supports the boom and sails.

**MASTHEAD**--The top of the mast.

**MAST SLOT/GROOVE**--(also called sail slot) the opening up the back (aft) edge of the mast in which the mainsail luff rope slides when it is hoisted. Some masts have an external sail track.

**MAST STEP**--The fitting in the bottom of the boat in which the bottom or heel of the mast sits. (The step is on the deck in the boat designs.)

**MAST TANGS**--Fittings on the mast to which the forestay and shrouds attach.

**ON A TACK**--A boat is always on one tack or the other; that is the sail is always on one side or the other.

**OUTHHAUL**--A line used to haul out the clew or after corner of a sail on the boom.

**OVERTAKING**--Passing another vessel.

**PAINTER**--A rope secured in the bow of a small boat, used for tying up or towing.

**PINCH**--To sail too close to the wind so that the sails start to luff.

**PINTELS**--Pins which, with gudgeons, make up the hinge assembly for the rudder.

**PLANE**--When a sailboat rises up on its own bow wave and reaches speeds far in excess of those normally associated with its waterline length.

**PORT**--The left-hand side of the boat as you face the bow.

**PORT TACK**--The tack a boat is sailing on when the wind is coming over the port side.

**PRIVILEGED VESSEL**--One that has the right of way.

**PUFF**--A sudden burst of wind stronger than what is blowing at the time.

**PULPIT**--Metal guardrail at the bow.

**RAKE**--The angle of a vessel's masts from the vertical.

**REACHING**--Sailing across the wind or any course between close-hauled and running (close, beam, broad).

**READY ABOUT**--An expression used to indicate that the boat is about to tack.

**REEF**--The rolled up part of a sail, tied with the reef lines, that is used to reduce sail area for heavy winds.

**REEF LINES**--Short pieces of line fastened to the sail at reef points, used for tying a reef to reduce sail area.

**RIGGING**--A general term applying to all lines, stays and shrouds necessary for spars and sails.

**RUDDER**--A movable flat blade hinged vertically at the transom of a boat as a means of steering. It is controlled by a tiller or wheel.

**RUNNING**--Sailing with the wind coming from behind the boat with the sail out at right angles to the wind.

**RUNNING RIGGING**--The part of a ship's rigging which is movable and reeves through blocks, such as halyards, sheets, etc.

**SAILING BY THE LEE**--Sailing on a run with the wind coming over the stern from the same side as the boom (danger of jibing).

**SECURE**--To make fast; to make safe.

**SHACKLE**--A U-shaped piece of iron or steel with eyes in the ends, closed by a shackle pin.

**SHEET**--A line that controls the angle of the sail in its relation to the wind.

**SHOVE OFF**--To leave; to push a boat away from a pier or vessel's side.

**SHROUDS**--Wire side stays running from the upper part of the mast to both the starboard and port sides of the boat. The forestay and shrouds form a triangle which supports the mast in an upright position.

**SIDE SLIPPING**--When the boat is moving sideways (to leeward).

**SLACK**--Not fastened; loose. Also, to ease off.

**SLOT**--The gap between the jib and the main sail through which the wind is funneled.

**SPREADERS**--Poles used to push the shrouds outboard.

**SQUALL**--A sudden and violent gust of wind often accompanied by rain.

**STANDING PART**--The fixed part of a rope--the long end, when tying knots.

**STANDING RIGGING**--The part of a ship's rigging which is permanently secured and immovable; eg. stays, shrouds, etc.

**STALLING**--The turbulent effect of air on the lee side of a sail when trimmed in too far.

**STARBOARD**--The right side, facing the bow from aft.

**STARBOARD TACK**--The tack a boat is sailing on when the wind is coming over the starboard side .

**STAYS**--Rigging that supports the mast, Shrouds.

**STERN**--The after (back) part of a boat.

**STOW**--To put in place.

**SWAMP**--To sink by filling with water.

**TACK**--Lower forward corner of a sail.

**TACKING**--Turning from one tack to the other as the bow passes through head to wind. (Also called coming about)

**TAUT**--With no slack; strict as to discipline.

**TELLTALES**--Ribbon or yarn strips attached to rigging or sails to indicate wind action or direction.

**THWART**--Support for centreboard trunk and hull across the beam at mid length.

**TILLER**--A bar used to control the rudder.

**TILLER EXTENSION**--Hinged extension of the tiller which allows the skipper to control the tiller while hiking or sitting forward.

**TOPSIDE**--Above the deck.

**TRANSOM**--The portion of the stern to which the rudder is attached.

**TRAVELER**--Line which runs across the transom, and which the mainsheet travels on.

**TRIM**--To sheet in.

**TURNBUCKLE**--A metal appliance consisting of a thread and screw capable of being set up or slacked back and used for setting up standing rigging.

**TURTLE**--To tip the boat over so that the mast is pointing to the bottom of the lake.

**UNDERWAY**--Said of a boat moving and under control of the helmsman. Technically, a boat is underway when not aground, at anchor, or made fast to the shore.

**UPWIND**--In the direction from which the wind is coming. A boat sailing upwind is sailing toward the wind.

**VEER**--A clockwise wind shift.

**WEATHER HELM**--When the tiller has to be held off the centre line and toward the weather side or wind to keep a boat on its course.

**WEATHER SIDE**--The windward side.

**WIND SHADOW**--The area affected by the turbulent air from a sailboat's sails.

**WINDWARD**--The direction from which the wind is coming.

**WING AND WING**--To set the jib on the opposite side of the main when running.

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