

# **INTRODUCTION: SOME THOUGHTS ON BOAT DESIGN**

Each summer, at camps, resorts, and vacation rentals worldwide, thousands of youngsters and adults are introduced to rowing in boats which were never designed for rowing. The inevitable result is that the not-so-happy camper will spend an afternoon struggling to row a boat that resembles an unresponsive floating box, using heavy, clumsy oars, and will soon reach the lifelong decision that rowing is inefficient and not fun.

Modern box- or balloon-shaped boats have wide, flat bottoms and large square transoms to furnish sufficient flotation to keep the weight of a large outboard motor from sinking the boat when it is not moving. When running at speed the motor furnishes enough power to overcome the inefficient hull form and lift the boat out of the water onto a plane.

The shape of true rowing craft, however, evolved from centuries of experience and experimentation by master craftsmen who used rowboats to earn their living. This process reached its pinnacle in the mid-1850's with remarkably efficient boats like the Whitehall. In calm water, a Whitehall will glide 50 yards or more between strokes and can maintain very efficient speed using as few as four strokes per minute.

These boats were not created on a computer program and lofted on a laser printer; rather, they are the end product of trial and error by generations of master craftsmen. Even the most modern, computer-generated, 12-meter racing boats will undergo many design changes after they are built and analyzed in the water.

There are numerous variations of rowing craft, each best suited for a specific task. However, a common characteristic linking all good rowing boats are a fine entry, flowing lines, and a narrow or raised transom so the hull can flow through the water with a minimum of friction and turbulence. The shape between the bow and stern may be long and lean to make a fast water taxi, as in the Whitehall; or full-bodied with high freeboard to make a seaworthy fishing boat with high carrying capacity, as in the Jersey Skiff or Lobster Boat.

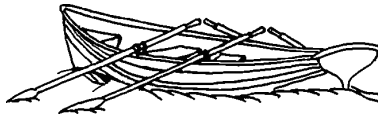
Our Point Defiance model is a good example of an evolution of boat design which will both row and sail very well. It also has very full lines aft so that even though it does not have a broad transom at the waterline, it can support a reasonable size outboard motor. As no true rowing boat will plane there is no point to attempt the use of a large motor. Traditional rowing craft will attain "hull speed" (as fast as the laws of physics will allow them to move through the water) with one person rowing, and the average human generates less than ¼ horsepower.

Given similar hull shapes, a longer rowing boat will always perform better than a shorter boat. Minimum size for a boat with good "carry," or distance it will glide between strokes, is about ten feet. However, a boat only two to four feet longer will have increased general seaworthiness, made evident by a remarkably increased "carry," increased ability to punch through waves without being stopped, and more weight carrying capacity.

Stability is also directly affected by hull shape and size. A flat-bottomed boat will have more initial stability than a round-bottomed boat, but a round-bottomed boat of the same size and beam will have more ultimate stability. In calm water the flat bottom boat will seem more stable, and a round bottom boat of the same dimensions may seem somewhat 'tippy' by comparison.

If you were to take the same two boats into rough water, you would witness an interesting transformation. The flat-bottomed boat will want to remain flat on the surface of the water; and when the surface of the water tilts, so does the boat. It will pitch and roll, pound up and down with waves, and will capsize with little warning. In the same conditions, the round-bottomed boat will allow the waves to slide under the hull with little consequence. An old-time working fisherman would never consider taking a flat-bottomed, slab-sided boat into rough water.

We commonly have customers who come to us looking for a tender for their yacht. Initially, they usually want the smallest boat they can get, but after trying several models on the water the vast majority will purchase the largest boat they can comfortably handle. When asked the reason for their choice, they usually say something like, “we’re more comfortable in it,” or “it just feels better.”



# CARE OF YOUR BOAT

All of our boats are built with the most up-to-date materials available, and require little maintenance.

**HULL EXTERIOR:** Wash with fresh water and wax with a good quality marine wax. If after a few years the gel coat starts oxidizing and getting dull, polish the gel coat with a fiberglass cleaner/rubbing compound and then wax it to preserve the luster.

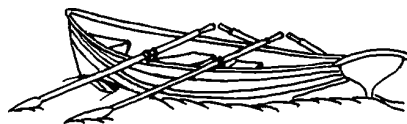
**HULL INTERIOR:** Wash with mild cleanser (non-abrasive) using a nylon brush. Do not use wax as it will leave a slippery finish.

**OARS:** The oars will not normally need attention for many years. If you re-varnish the oars, do not varnish the looms as varnished handles will blister your hand under heavy usage.

**MASTS:** The masts are made from a corrosion resistant high tensile aluminum alloy. Masts are powder-coated which fuses a non-corrosive finish to the metal and needs no maintenance. Be careful not to bend or dent the telescoping sections as there is only 0.015 tolerance. Also, be careful not to get sand on the tubes as they are assembled because the tubes could get jammed together.

**SAILS:** Our sails are made from very high quality ultraviolet-resistant Dacron, which will remain serviceable for decades when given good care,. When not in use, keep the sail in its bag, out of the sun. Never store it wet. When used in a salt water environment, it should be hosed with fresh water and then dried before storing. Fold the sail, don't just stuff it in the bag. You can fold the sail without removing the battens if you make the first folds from head to outhaul, not head to tack.

**WOOD SHEER:** We apply two coats of epoxy saturation to the wood sheer before the boat leaves production. When refinishing, do not sand to bare wood. Use a 3M pad (gray abrasive pad) and a light touch to roughen and dull the existing surface. It is helpful to remove all hardware before refinishing. Refinish with Detco "Crystal" gloss varnish. If the surface has severely deteriorated, contact our shop for instructions.



# OPERATING YOUR BOAT

**SAFETY:** Our boats are designed to have the most stability possible within the hydrodynamic parameters of a good rowing and sailing craft. A light boat that slips easily through the water will not have the initial stability of a heavy boat that is shaped like a box. However, a bit of common sense can go a long way towards boat handling.

Safe use of any small boat basically consists of three elements: *Balance, Control, and Common Sense.*

**BALANCE:** Think of any boat as if it were a child's teeter-totter. If you put a heavy weight on one side, it goes down and the other side goes up. Then complicate the equation by also balancing end to end, not just side to side. Any time you get into small boat you should always put your weight in the center third of the boat. If you are getting into the dinghy from a dock or another boat, keep one hand on something solid until you are seated safely in the dinghy. Ideally the heaviest passenger should get in the dinghy first and sit in the center. That person will then be able to steady and balance the boat for subsequent passengers. It is a dangerous practice to stand in a small boat as waves and boat movement are magnified due to the center of gravity. Conversely, when you sit down, the center of gravity is low and the boat becomes more stable. For example, sailboats have their ballast down low to get maximum stability. In a small, unballasted boat your body is the ballast, so keep yourself low and centered in the boat.

**CONTROL:** We feel that the best way to appreciate our boats is to row. Our boats have a long, straight glide between strokes so you don't have to expend extra energy by taking more strokes than necessary. Most people who have only rowed inflatables or box shaped boats take lots of short, choppy oar strokes because when their oars aren't pushing water, the boat stops. When rowing our boats, take a full, smooth stroke, and then take your time on the backstroke; the boat will keep moving forward. Our 12' and 14' boats will glide 50 yards or more between strokes in flat water.

When rowing tandem, best results are achieved by seating the heavier person in the aft position. The person sitting forward is in a position to see better, and hence is usually expected to call cadence and give instruction. (Example, to turn to starboard [left, facing aft]: "*Right oar: stroke...stroke...stroke...stop. Both oars: stroke. . . stroke. . .*")

Another concern when rowing tandem is what is referred to as the "Faster and Faster Syndrome." Rowers are used to a certain amount of resistance on the oars, and with two rowers, the resistance is halved; the tendency when rowing tandem is to pull harder and faster to create the resistance the rower is used to. *Don't do this!* Rowboats will not plane; they have a finite top speed ("hull speed") and once they have reached hull speed they will go no faster, no matter how hard you row! You will only tire yourself out. Our boats row with a minimum of effort; relax and enjoy the trip.

As our boats are primarily designed for rowing, the use of outboard motors over 4 HP will not result in increased speed. The bow will rise, the stern will drop and cause a large wake, but the boat will not plane. Our 8-10' boats will achieve maximum speed with a 2 HP motor. Also, most 2 HP motors weigh only 20-25 pounds so they won't upset the trim and have more

than adequate power to exceed hull speed. (If you put a 45 pound motor on the back of a 75 pound boat, there is an obvious balance problem.) Extension tiller handles are a good idea when using an outboard on one of our boats, as they enable the operator to sit in the center of the boat, keeping it level when under power.

Our 12' and larger boats can handle up to a 4HP motor, and the 15' Maine Lobster Boat is our only planing hull. The Maine Lobster Boat is certified for up to a 10 HP motor.

#### **SAFETY CHECK:**

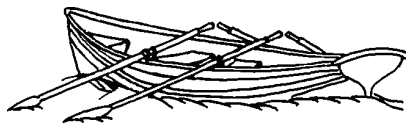
- **When operating the 15' Maine Lobster Boat under power, the centerboard must be retracted.**

Our favorite method of mechanical propulsion is a good quality electric outboard. There are no gas fumes, vibrations, or noise, just the sheer joy of watching and feeling the water slip past. Very little power is required to get our boats to hull speed, so a 40 pound thrust electric motor will power most of our boats to hull speed at only ½ throttle. Generally you can expect 4-6 hours' use from a fully charged battery. The battery can be placed in the bottom of the boat to help maintain balance.



## COMMON SENSE:

- Plan ahead and think about what you are going to do.
- Don't overload your boat.
- Don't go out in severe conditions.
- Always use a life vest or jacket.
- Be ready for anything. (The water may be like a mirror now, but conditions change fast. Also, you never know when some dimbulb will come blasting through the anchorage in his shiny new ski boat.)
- Even when you are sure you have the right of way, remember that you are in a vulnerable condition and yield to the "Rule of Superior Tonnage."



## CAPACITY INFORMATION

The following Safe Loading and Powering Capacities are computed in compliance with the formulas and standards as issued by the United States Coast Guard COMDTPUB16761.3B, issued under Chapter II Title 46 of USCG Code Subchapter 1, Title 33 (USCG, DOT) Code of Federal Regulations.

It should be specifically noted that these precise computed capacity specifications apply ONLY to pure rowing versions of all boats of this type. These capacities should only be used as general – not exact – recommendations for SAILING versions because all good sailboats have a daggerboard or centerboard which is absent in rowing versions of the same craft; the presence of a daggerboard- or centerboard trunk can affect the boat’s capacity. Therefore the United States Coast Guard (USCG) recognizes that because there are infinite variations in daggerboard or centerboard styles, one formula can NOT be applied to all designs and have valid ‘real-world’ results. The specific exemption from the USCG standards quoted above is listed under USCG CFR 33, COMDTPUB16761.3B, pg 36: “Sailboats, canoes, kayaks, inflatables and raceboats are exempted from all requirements except for the Hull Identification Numbers.”

Please contact us if you have any questions about how this relates to your intended use of any of our (or any similar) small sailing craft.

<b>Boat</b>	<b>HP Rating</b>	<b># Passengers</b>	<b>Wt. Passengers (lbs)</b>	<b>Max Total Weight (lbs)</b>
8' Nisqually	2	3	452	530
9.5' Capt's Gig	2	3	452	530
10' Navigator	2	3	452	530
12' Pt. Defiance	4	4	579	632
14' Whitehall	2	3	492	575
15' Lobsterboat	15	4	622	750
16.5' Melonseed	2	4	650	735
17' Jersey Skiff	4	4	697	750

# SAILBOAT RIGGING

Assembling the rigging of our boats has been made as basic and efficient as possible. The sequence below corresponds to *Fig. 2*, below. Italicized words can be found in the Glossary on page 10.

- 1) Slip the two sections of the mast together. The top section has a nylon cap with a *halyard block*; the lower section has the gooseneck track. (1)
- 2) If your boat has a *jib*, see “**RIGGING JIB ON BOATS EQUIPPED FOR A JIB OR GENOA,**” below.
- 3) Insert the mast into the mast step (2) on the boat. (This is called “stepping the mast.”)
- 4) Install the gooseneck (3) on the gooseneck track on the *mast*. Lock it in place using the thumbscrew on the bottom of the gooseneck.
- 5) Affix the sail to the mast by first inserting the gooseneck tack pin into the grommet at the *tack* of the sail, and then snap each mast ring (4) around the mast and through the grommets on the *luff* of the sail. (Affixing the sail to the mast is called “bending the sail.”)
- 6) Raise the sail by tying one end of the *halyard* (5) to the top of the sail and pulling on the free end. The free end of the *main halyard* will go through a *block* at the base of the mast and then to a quick-release cleat on the daggerboard trunk (6). The *halyard* will fasten to a black nylon cleat mounted on the mast if your boat is equipped with a *jib*.
- 7) Tie the *outhaul* line (7) to the grommet at the back of the sail, lead through the *fairlead* at the end of the *boom* (8), then forward to the jam cleat (9). Don’t pull it too tight. The *foot* of the sail should have some curvature. The 5/8” stainless steel slide (10) must be on the track to allow the sail to have the correct shape.
- 8) Tie the end of the mainsheet (11) to the brass ring on the *traveler* (12) using a *Sailor’s Knot* (*Fig.1*). Lead it up through the *block* at the back of the boom, then forward on the boom to the front *block*, then down to the *block* that sits atop the daggerboard trunk (6), and finally back to the cleat.
- 9) Install the rudder (13) and daggerboard (14).

## RIGGING JIB ON BOATS EQUIPPED FOR A JIB OR GENOA (*Fig. 3a*)

Before you step the mast, insert the ‘S’ hooks on the *shrouds* (1) and the ‘S’ hook on the end of the *jib halyard*, into the corresponding holes in the mast; the *jib halyard* leads toward the *bow*, the *shrouds* lead to *starboard* and *port*.

Step the mast.

Each *shroud* attaches to a cleat on the inside of the *gunwale*. Loop the *shroud* around the cleat, up through the stainless steel ring, then back down to the cleat. (Inset 3b.) This furnishes a ‘block and tackle’ principle and makes it easier to tension the shroud. Apply enough tension to tilt the top of the mast *aft* approximately 2”-3”.

Then fasten the *jib* to the eyestay at the *bow* (or bowsprit, if a high-performance option on 9.5 or 10’ boats), using the quick release shackle.

Tie one end of the *jib halyard* to the top of the *jib*. The free end of the *jib halyard* will go through the *block* at the base of the mast and then back to the quick release cleat on the centerboard trunk. Apply enough tension on the *jib halyard* to pull the mast forward until it is straight.

*Jib sheets* are led *aft* through the *sheet block* and then to the cleat.

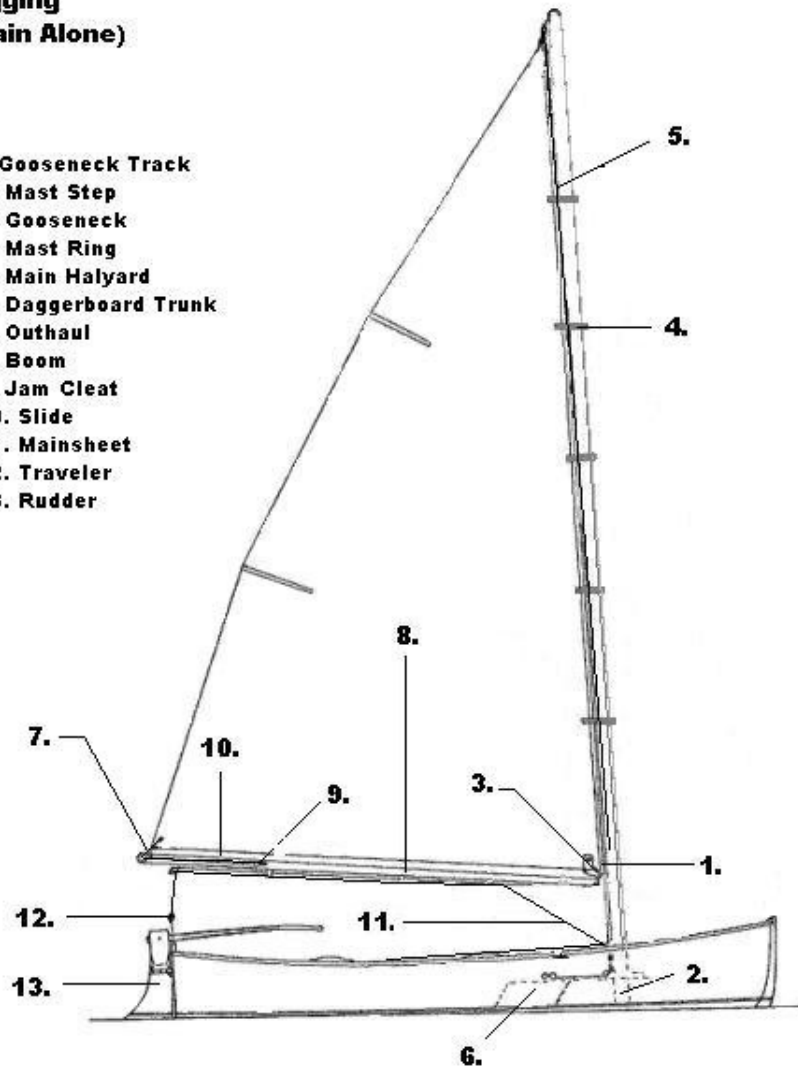




Fig. 1. Sailor's Knot

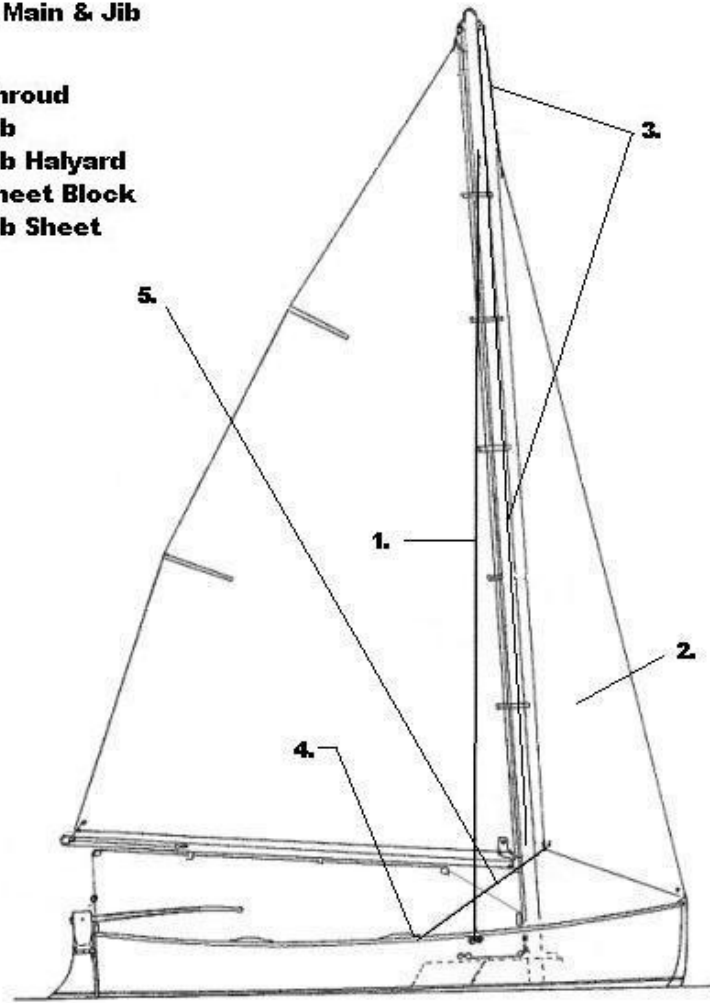
**Fig. 2**  
**Rigging**  
**(Main Alone)**

- 1. Gooseneck Track
- 2. Mast Step
- 3. Gooseneck
- 4. Mast Ring
- 5. Main Halyard
- 6. Daggerboard Trunk
- 7. Outhaul
- 8. Boom
- 9. Jam Cleat
- 10. Slide
- 11. Mainsheet
- 12. Traveler
- 13. Rudder

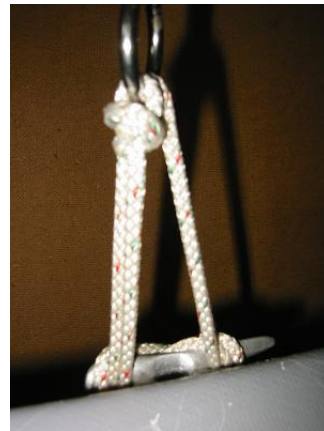


**Fig. 3a**  
**Boat w/ Main & Jib**

- 1. Shroud**
- 2. Jib**
- 3. Jib Halyard**
- 4. Sheet Block**
- 5. Jib Sheet**



*Fig. 3b: "BLOCK & TACKLE" PRINCIPLE WITH SHROUDS*



## GLOSSARY

**Aft:** The rear of the boat, also called the *stern*.

**Batten:** Stiffeners in the *aft* edge of the *main*.

**Block:** Pulley

**Boom:** Horizontal attachment for a sail.

**Bow:** The front of the boat.

**Fairlead:**

**Foot:** Bottom of the sail.

**Gunwale:** (pronounced “Gunnel”): The boat’s railing.

**Halyard:** Line used to raise the sail.

**Jib:** Auxiliary sail, attached to the *bow*.

**Jib sheet:** Line used to control the position of the *jib* when sailing.

**Luff:** Leading edge of the sail.

**Main:** The main sail.

**Mainsheet:** Line used to control the position of the *boom* when sailing.

**Mast:** Vertical support for a sail.

**Outhaul:** Line used to tension the *foot* of a sail.

**Port:** left, looking at the *bow*.

**Sheet block:** Pulley for *mainsheet* or *jib sheet*.

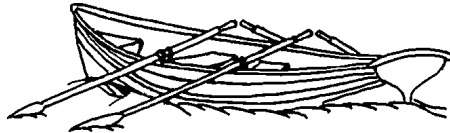
**Shroud:** Line or wire used to support the *mast*.

**Starboard:** right, when looking at the *bow*.

**Stern:** See *Aft*.

**Tack:** The grommet at the bottom of the leading (forward) edge of the sail; also, sailing at 45 degrees into the wind.

**Traveler:** Line across *stern* which controls the angle of the *mainsheet*.



## SAILING

If you are new to sailing, we recommend that before you go out for the first time you read a good primer on basic sailing such as *The AB Seas* or *The Sailor's Bible*. These books will give you a good understanding of how -- and just as importantly, why -- a sailboat works. In addition, here are a few tips pertaining not just to our boats, but to any small sailing dinghy.

**BALANCE:** Re-read the section on page 4 about balance. In a small, lightweight boat, you are the *ballast*, the counterweighing force that reacts against the pressure of the wind in the sail to keep the boat from tipping over. It is vital that the ballast (your body) is in the correct location. That location is low in the boat, preferably a cushion on the floor. You can shift your weight from side to side as you tack, but keep the weight centered fore and aft. If two or more people are sailing in the boat, the weight should be equally distributed so that one end of the boat isn't sticking up in the air.

**SAIL TRIM:** Sail power is generated by the flow of air across the curved portion of the sail. If you pull so hard on the outhaul or mainsheet that the curvature of the sail is flattened, you will not have any power and the boat will be very unresponsive. Always use a light touch when adjusting the outhaul and mainsheet, particularly when the wind is light.

Good sailing! We welcome your photos and and comments, and will be glad to answer any questions. Our location address is 9905 Peacock Hill Ave, Gig Harbor, WA. Please send all correspondence to PO Box 765, Gig Harbor, WA. 98335, or call (253) 851-2126. Email us at [boatshop@ghboats.com](mailto:boatshop@ghboats.com).

