The MSB Journal

December 2013

www.modelshipbuilder.com



The MSB Journal

ISSN 1913-6943

December 2013

© www.modelshipbuilder.com

All rights reserved.

Published by www.modelshipbuilder.com

How to Contact The MSB Journal

By email: winston@modelshipbuilder.com

By Snail-Mail

Canada

The MSB Journal c/o Winston Scoville 2 St. Charles Place RR5 Clinton, Ontario, NOM 1L0 Canada

Article / Content Contributions

Please submit all article and content contributions to:

Articles and General Submissions: winston@modelshipbuilder.com





Table of Contents

<u>A Note from the Editor</u>	4
Tidbits from the Past	6
Model Ships of the Royal Museum Greenwich	7
Shipwrecks of the World	8
Framing of a Hull—Part 1	10
Historical Naval Shipyards	18
The Book Nook	20
Badges: Heraldry of Canadian Naval Ships	21
Gene's Nautical Trivia	22

A Note from the Editor

Another year appears to have come and gone in the flash of an eye. Seems they go by quicker every year.

Before the year ended, I just wanted to pass on some special thanks to a number of people whom, without, might not have seen The MSB Journal published again this year.

One of the main backbones of the Journal has bee Gene Bodnar. With the exception to the past couple of issues I think Gene has contributed something to every single issue of the Jour-



nal since it started back in early 2007. Whether it be practicums, simple articles or to his Monthly Trivia I don't know where he gets the time or the energy. Wishing you all the best in the new year Gene.

A few other notable mentions. When it seems I get hard up for an article to fill out an issue, two people always have something in reserve or are able to put something together rather quickly. They are Wayne Tripp and Dave Stevens. For Dave I know its not too much trouble as he has boatloads of information that he has collected and saved over the years. I don't know how Wayne does it though. He always seems to be on the road. Thanks guys, your assistance is greatly appreciated.

A couple of other member projects were conducted at the site. The biggest of which was the transcribing of the Humphreys Papers. While there were a number of the regular members of the site who were involved in this project. Perhaps the biggest contributor to the works was Ro Stewart our Mystery transcriber. She single handedly transcribed almost half of the documents herself. In addition she brought all of the work everyone has done into one document. You'll be seeing this document on the site early in the new year. Thanks Ro!!!

This year we've seen a number of people start off with us but moved on due to time constraints and personal commitments. Hopefully we'll see them come back when their time and schedule permits.

As you know, at the MSB site we have a number of great projects that members can take on. Whether it be the Battle Station model, the Batteau model, the Bomb Vessel Cross Section or the Aft Magazine Section model they all have one thing in common. They were all developed from the ground up by Jeff Staudt. Jeff has done a wonderful job in producing what are perhaps the most detailed modeling plans I have ever come across. With his us of 3d renderings they are some of the very few drawings that I know of that an instruction manual is not required to build a model. Thank you Jeff, you're a big part of what makes MSB a special site.

There are numerous others that I should make mention of here. Please forgive me, I certainly don't mean to overlook you. Thank you for your help and assistance.

This upcoming year we have some special projects coming up for the Journal. The most notable at present will be a multi-issue practicum on building the HMS General Hunter (aka General Hunter, Hunter), a kit developed specifically for the MSB site and based on the wreck and historical research of an actual War of 1812 era brig. This truly unique project started when a few timbers were seen protruding through a sandy beach. Initial research notes and drawings of the wreck site were provided by Ken Cassavoy and his archaeological team. Based on the information at hand and some additional research, conceptual drawings were developed for the model kit. The next stage in this process will be the actual construction of the proto-type model. This build was initially to be covered in a build log on the MSB site, but after some discussion we thought too much background information would be left out as build logs tend to be pretty dry. So it was decided that we would run a series of articles on the build in the MSB Journal. So keep your eyes open for them. We'll be publishing them early in the new year.

Another highlight of this past year is the growing popularity of The MSB Journal. When I first started putting this together I was thinking that gee, it would be nice if we had 75-100 readers or so every month. I thought, that would sure make my time at least well spent. I had no idea that I would see the day come when we'd see the reader base that we enjoy today (in excess of 4,000 monthly readers and growing). I only hope that we can continue to provide you with the content you want. So if you have thoughts, ideas or suggestions please feel free to pass them on to us. We'll do our best to bring them to you.

It would be amiss of me if I didn't send out an offer for you to submit any content you think others would find interesting/helpful. This after all is your Journal, I merely facilitate its assembly and method of distribution.

From our family to yours I hope you all have an enjoyable and save Christmas and New Years.

Okay, time for you to get on to this issue. See you all in the new year!!

Winston Scoville The MSB Journal

Tidbits from the Past by Gene Bodnar



"The Smoking Lamp"

The exact date and origin of the smoking lamp has been lost. However, it probably came into use during the 16th Century when seamen began smoking on board vessels.

The smoking lamp was a safety measure. It was devised mainly to keep the fire hazard away from highly combustible woodwork and gunpowder. Most navies established regulations restricting smoking to certain areas.

Usually, the lamp was located in the forecastle or the area directly surrounding the galley indicting that smoking was permitted in this area.

Even after the invention of matches in the 1830s, the lamp was an item of convenience to the smoker. When particularly hazardous operations or work required that smoking be curtailed, the unlighted lamp relayed the message. "The smoking lamp is lighted" or "the smoking lamp is out' were the expressions indicating that smoking was permitted or forbidden.



The smoking lamp has survived only as a figure of speech. When the officer of the deck says "the smoking lamp is out" before drills, refueling or taking ammunition, that is the Navy's way of saying "cease smoking."



www.dlumberyard.com



Model Ships of the Royal Museum Greenwich



Ocean Harvester (1946)

Builder: Graham Caird, Petts Wood, Kent England

Scale: 1:16. A working model of a fictitious 75-foot motor fishing vessel 'Ocean Harvester' (1946) of a type built during the Second World War for the Admiralty as a fleet tender and subsequently sold to the fishing industry. It is built from scale drawings and information contained in the Transactions of the Royal Institute of Naval Architects, 1946, and is the fruits of three years' research and seven years of building. The trawl winch, made from original construction drawings, is fully working and the trawl itself has been made to scale. It was also built as a working pond model though the engine and radio receiver was removed by the previous owner. The years of research and construction produced results as in 1974 the model won the Model Powerboat Association prototype cup for the best scale working model. On balance it is very competently made with some nice touches, like the realistic ageing, scuffs and partial 'repainting' of the hull.

Source: Royal Museums Greenwich



The Loch Ard

The Loch Ard was a ship which was wrecked at Mutton bird Island just off the Shipwreck Coast of Victoria, Australia in 1878. The name was drawn from Loch Ard, a lake which lies to the wast of the willage of Aberfould and

to the west of the village of Aberfoyle, and to the east of Loch Lomond. It means "high lake" in Scottish Gaelic.

The Loch Ard belonged to the Loch Line, a major shipping line operating between Great Britain and Australia. It was a three-masted clipper ship, of 263' in length, with a ton-nage of 1693 tonnes, and was constructed by Barclay, Curdle & Co. of Glasgow.

The Loch Ard departed England on 1 March 1878, bound for Melbourne, commanded by



Captain Gibbs and with a crew of 17 men. It was carrying 37 passengers and assorted cargo. On 1 June, the ship was approaching Melbourne and expecting to sight land when it encountered heavy fog. Unable to see the Cape Otway lighthouse, the captain was unaware how close he was running to the coast. The fog lifted around 4am, revealing breakers and cliff faces. Captain Gibbs quickly ordered sail to be set to come about and get clear



of the coast, but they were unable to do so in time, and ran aground on a reef. The masts and rigging came crashing down, killing some people on deck and preventing the lifeboats from being launched effectively. The ship sank within 10 or 15 minutes of striking the reef.

The only two survivors of the wreck were Eva Carmichael, who survived by clinging to a spar for five hours, and Thomas (Tom) R. Pearce, an apprentice who clung to the overturned hull of a lifeboat. Tom Pearce came ashore first, then heard Eva's shouts and went back into the ocean to rescue her. They came ashore at what is now known as Loch Ard Gorge and sheltered there before seeking assistance. Coincidentally, Tom Pearce was the step son

of James Pearce, captain of the ill-fated SS Gothenburg.

The Loch Ard's cargo included a range of luxury goods, including a large decorative porcelain peacock made by Minton in England, intended to be displayed in the Melbourne International Exhibition in 1880. Remarkably, the peacock was recovered completely intact and was eventually able to be displayed a century later for the Victoria Pavilion at the Brisbane 1988 World Exposition. It is now on display at the Flagstaff Hill Maritime Museum in Warrnambool, along with a number of other relics of the wreck.

Source: Wikipedia

Aft Magazine Section Model Plans

Another Exclusive from Model Ship Builder



Six highly detailed sheets of 1:32 scale drawings allow you to build a truly unique model for your collection.

Plans come in digital format allowing you to print them at the scale you wish.

You can get your set today simply by making a small donation to help support the ModelShipBuilder website.

For more information on how to order visit <u>www.modelshipbuilder.com</u> and visit the Projects Page

FRAMING OF A HULL

by William B. Worthington

On various model ship building web sites and forums terms such as "*stylized fram-ing*", "*admiralty model framing*" and "*old style framing*" being used but seldom are ever defined. Other terms we see used include "*true framing*" or *framed like the real ship*. If the actual ship or archaeological data on the framing is not presented from the keel to the cap rail then the statements "*framed like the real ship*" can not be factual. At best we can only offer the framing approximation hypothesis.

Quoting from an article by Clayton Johnson in the March 2007 issue of Model Ship Builder:

"Since ships of different periods, different countries and different sizes employed different framing practices and rules, no two ships framing is going to be exactly the same. In some plans you are lucky enough to get information on the framing of the vessel that you are building. Some plans show positions of all framing members and may even give you frame tracings to work from. Most plans, however, do not even provide a hint of this service and it is up to you to figure out the framing pattern that your model is going to take. When not given much information on frames, you must use all resources at your disposal in order to come up with a reasonable approximation given the time period, vessel size, and practices under which your subject was built. This forces the model ship builder to make sacrifices in accuracy but still allowed the builder to get the framing accurate in a general way. Getting the framing correct in a general way is what will likely happen with most ships that you attempt to frame, especially ones where documentation is scarce or of sketchy quality. Even if there is good documentation on the framing of the ship that you are building, who is not to say that plans changed somewhat right before or during construction and never got recorded on the original plan? This is known to happen with any kind of construction project."

In an attempt by model ship builders to reproduce historically accurate hull framing in their models, they have taken various aspects of frame construction and framing systems put everything in a bag shook it up and tossed out on the table to come up with a generalization of how a hull could have or might have been framed. There are basic principals for the framing of a hull but in practice it was left up to the master shipwrights practical experience and materials at hand which produced the final out come.

These bits and pieces of historical information produced a hodgepodge of jumbled information of how ships were framed and as time went on this information became accepted as historically accurate and in many cases model builders did not do original research on their project to reach a new or individual conclusion as each builder would tend to repeat what was done before and based their building on accepted information regardless if it pertained to their project or not.

Rather than fall in line with the generally accepted methods for framing a model ship this article will explore the different methods used over the years in North America by

examining ship wrecks and known data.

To get a base line for ships framing systems we will begin in Europe during the 18th century with an eye witness. Blaise Ollivier was a French shipwright who traveled to Dutch and English shipyards recording in detail the framing practices and construction methods in use and compared them to the methods used in French yards.

At the beginning of the 18th century an attempt was made by the British to standardize shipbuilding by the introduction of approved designs through the establishments which forbid any experimentation during this period.

Few books were published in the early 18th century on ship building and those that were pertained more to theory, hydrodynamics and hull lines and little attention to the practices of construction, timbering sizes and joinery of timbers. These early book were never meant to be used by the shipwrights in the yards but were intended for the educated officers and gentlemen. For the most part shipwrights and ship carpenters could not read or write and worked from experience and practical knowledge.

Another reason for the lack of published works on ship building was due to the fact ship building was a very competitive market place where construction methods were considered professional secrets handed down from father to son or from master shipwright to an apprentice.

Contemporary books may claim various techniques and building methods as standard practices and valid for the most part of the 18th century.

History shows ship building was an international industry in a constant state of change where master shipwrights and ship carpenters often moved from shipyard to shipyard and from country to country.

In Holland the Dutch had no single centralized body responsible for the construction of ships. In the Dutch shipyards senior positions were held primarily by English shipwrights (a large number of English ship builders worked in Spanish shipyards), in North America British shipyards employed French and Irish ship builders. In England different methods of shipbuilding were used at Deptford, Woolwich and Chatham. As the 18th century went on the strict rules of the Admiralty and the establishments were relaxed and shipwrights were allowed the freedom of design and building methods resulting in practically every ship being built as one of a kind.

As recorded by Blaise Ollivier there were three fundamental methods of hull framing and building of a ship.

The frames of the Dutch ships are about two inches greater than those of French ships in their molded dimensions only. The floors, futtocks and top timbers which go to make up the frames are not fastened with bolts as they are in French ships; they are simply placed one next to the other as they are in the English ships. The Dutch arrange their floors along the keel room and space, so that the first futtocks fill the space between the floors; in the same way the second futtocks fill the space between the first futtocks, yet in their ships the second futtocks do not meet the rungheads, neither do the third futtocks meet the first futtocks; all these timbers overlap each other by at most four feet leaving above and below this overlap single timbers separated by a space, the breadth of which is equal to the sided dimension of the frames. The method described by Blaise Ollivier is placing of the floor timbers evenly spaced along the keel. when all the floors are in place planking is run inside and outside the floor heads then the first futtocks are wedged between the floors and the planking. A hull under construction would look like the photo.



This system of hull construction looked like the following examples:



None of the framing timbers were fastened to one another and only the hull planking held the framing structure together. Once the planking was removed the hull would fall apart. Even though this system was described in an eye witness report we need to verify it with actual archaeological data which we just so happen to have.



This wreck is believed to be the remains of the San Juan, a Basque galleon with three full decks and three masts that sank in Red Bay North America in 1565. A few thing we can surmise from the wreck, first the date, we now know this method of construction dates back before 1565 and second, it was not only a method used by Dutch shipwrights but also used in Spanish shipyards because the shipwreck was a Spanish ship.



This same method of hull construction was also used by the English and a very clear description is found in the work titled "Treatise on Shipbuilding 1625" and in contracts of the time. The same method of framing is also present in a majority of Admiralty models which show little difference in the framing of the models and the full size construction. By the time Blaise Ollivier visited English shipyards in 1735 actual hull framing had changed but the model builders continued building the Admiralty models using the older method.



Blaise Ollivier describes the English method of hull framing as follows. "The English shipwrights set up molded frames which the set along the keel 7 to 9 feet apart according to the size of the ship. These frames are made up of a floor timber, two first futtocks, two second futtocks, third and fourth futtocks; these timbers are fastened together one to the other at each scarf. At first they cross only the floors of these molded frames, and having places the first floor ribband and shored it at its place, and having crossed the floors of most of the filling frames, they raise the first and second futtocks of the molded frames; they place the second ribband, raise the third and fourth futtocks, place the third ribband and the height of the breadth ribband, and timber the ship as far as the height of breadth before rising the toptimbers of the molded frames. After having crossed the floor timbers of the filling frames and



placed the ribbands, they raise the second futtocks on the rungheads of the of the floor timbers, and the fourth futtocks on the heads of the second futtocks. That which i have explained for the first futtocks applies to the third futtock which rests on the head of the first futtock, and the top timber rests on the head of the third futtock. Following this arrangement of the frames, the futtocks do not form pairs of frames; these timbers are not fastened in any way one to the other; they are maintained in their place only by the planking of the hull and of the ceiling. Only the moulded frames are assembled in pairs."

What we have as shown in the graphic are double moulded frames built up along the keel then ribbands used and loose filler timbers placed between the mould frames. These filler timbers being held in place by the hull planking, when the planking is removed the filling timbers would fall out. Placement of the mould frames and number of filling frames depended on the size of the ship being built. There were no chocks or scarfs between the ends of the filler frames they simply sat one on top the other. Another observation made by Blaise Ollivier the frames are set up so they all touch one another in the bottom of the hull or if there was a space between the floors and lower futtocks filled creates a sold



hull preventing water from collecting and setting in the space between the frames and also acts as ballast. The next graphic shows the filled areas in blue which fills the spaces only as far as the heads of the floors. In another shipyard the practice is different and from the heads of the lower futtocks up to the waterline the frames tough one another in places, while in others there is a space of 1,2 or 3 inches at first sight one would say they are all spaced at chance. At the waterline and up to the lower sills all frames touch each another; from there to the planksheer there are spaces. yet they are drawn out in the loft and indeed spaced equally one from the other. This statement does suggest the framing drawn on plans is more stylized and does not necessarily reflect the actual random frame construction in the ship.

To sum it up the English framed their ships using double mould frame fastened together and places along the keel. The areas between the mould frames were filled in with timbering either solid or randomly spaced according to the preference of the ship builder. The filler timbers were not attached to one another and held in place by the planking. This gives us an unmistakable pattern of framing a hull. Now it's off to search for evidence of English ship builders in North America.

There are several shipwrecks we could take a look at that were unmistakably built by English trained shipwrights that date to the early part of colonial America. The first is the Reader Point wreck.



The framing system of this vessel consisted of mold frames joined using treenails which are the darker frames in the graphic. At the midship these frames were placed every third frame, at the bow and stern they are placed every second frame. The filler frames are unattached to each other and held in place by the planking. none of the frame timbers were joined at the foot or head to each other.



The second example is the Nancy built for the Great Lakes at Detroit, which was a British government shipyard. The Nancy was built the same way as the Reader Point wreck with mold frames bolted together and loose filler frames held in place by the planking.

The final framing system we will look at used in Europe in 1737 is the French system of hull framing. This system used all sistered frames bolted to one another forming a complete solid frame. There were no filler frames or framing held in place by the planking.



As sample of this type of framing is the north American shipwreck La Belle of 1685.



In part two of this article we will focus on the evolution of hull framing in north America.



Join Model Expo's mailing list! Text MODELEXPO to 22828 to get started!

Historic Naval Shipyards

Amherstburg Navy Yard

Amherstburg Navy Yard was designated a national historic site of Canada in 1928 because:

the Navy Yard served as the British naval station for Lakes Erie and Huron, 1796-1813;
in the War of 1812-14 the naval force built here enabled the army to retain control of this frontier.

Amherstburg Navy Yard was constructed in 1796 after British forces vacated Detroit and relocated downstream to the eastern side of the Detroit River. The yard, used to construct and repair vessels, served as the hub of the British Naval presence on the Upper Great Lakes. The yard's facilities included a large storehouse, two blockhouses, a timber yard with a saw pit, and a wharf. To the north of the naval yard, the British built Fort Amherstburg, at what is now Fort Malden National Historic Site of



Canada, and to the south, a settlement, which became known as Amherstburg, sprang up to supply the fort and naval yard. For almost 20 years, the yard produced vessels ranging from small, open bateaux, to full-sized, three-masted, ship-rigged men-of-war. Amherstburg Navy Yard played a significant defensive role during the War of 1812, as the ships it produced enabled the British to maintain control of the area.

Following the British defeat at the Battle of Lake Erie in 1813, Amherstburg was evacuated and both the fort and the navy yard were burnt prior to the American capture. The Americans later built an installation named Fort Malden on the ruins of Fort Amherstburg. Although Fort Malden was returned to the British in July 1815, the area never regained its pre-war importance as a fort and naval yard. The fort was used briefly during the rebellions of 1837-38 before its closure in 1858.

Sources: Historic Sites and Monuments Board of Canada, Minutes, 1928, 2009.

The Bomb Vessel Cross Section Model

An exclusive Model Ship Builder Modeling Project





"...This is the finest set of drawings I ever worked with!" Mike. Rohrer—Proto-type builder





"Extremely detailed plans for a model. I have to

say, I'm very impressed. Great Job!"

Alfred Anderson—U.K.

"These drawings are amazing! I'm looking forward to building this model" Daniel Richardson–USA

"Plans arrived today... They far exceeded my expectations... Thank you! Tristan Rockstrom—Canada

A 1:48 scale model based on Peter Goodwins "Anatomy of the Ship—Bomb Vessel Granado and original Bomb Vessel drawings by Thomas Slade.

Contains 63 pages of detailed drawings and templates of every part of the model.

Numerous 3-dimensional constructional drawings provide you all the information you need to know to build this model. As well, it is supported by an online forum where you can ask questions, view other builds as they occur and even display your build if you wish.

Plans: \$57.50CND set + Shipping/Handling

Available at <u>www.modelshipbuilder.com</u>



The Book Nook

Books of interest for the Model Ship Builder and ship building enthusiasts



The Naiad Frigate (38) 1798, Vol. 2 By Edward J. Tosti

Sea Watch Books, LLC

ISBN: 978-0-9837532-8-5

If you enjoyed the first volume of this set you are thoroughly going to enjoy this book. With 326 pages and 771 photos Mr. Tosti covers the building of the interior of the Naiad model. The book also contains nine additional drawings and CD containing tables, templates and patterns.

While we generally see a lot of detail shown on the main deck of models of special note in this model is the highly detailed work that he has done below the main deck, an area we often only see minimally done by a lot of modelers.

For anyone interested in building the Naiad Frigate, this volume will come in quite handy. On the other hand, for those not building this model you will find a lot of very useful information that can be carried over into your build. For us novice builders in the world it will provide inspiration and give us a level of detail to reach in our future builds.

This book (as well as Volume 1) can be purchase at <u>www.seawatchbooks.com</u>.

Don't forget to check out the Model Ship Builder Amazon Bookstore.

Badges: Heraldry of Canadian Naval Ships

HMCS Kingston MM700





Gules a griffin Or armed and langued Azure issuant from a crown vallary Argent holding in its claws an anchor Argent.

Significance: The crown vallary represents the various fortifications built since Kingston's foundation. The griffin comes from the Coat of Arms of Count Louis de Buade of Pallau and Frontenac, the City's founder, and is found in the City's Arms. The anchor alludes to the City's rich naval affiliations. The main colours are from the City's Coat of Arms.



Gene's Nautical Trivia

Christmas Gift Ideas

Find and circle all of the words that are hidden in the grid. The remaining 13 letters spell an additional Christmas gift idea.

R S оскѕс Е F В Т Р вD Е С G Е Н NHRO Е R С Е А R L Μ 0 U Т S Е Т S Ο Ο А А Α Κ U А Μ L L А R С Κ С А L А С L F Е Ν А L F Т Ο S S 0 R Е R K Е Ν Т L Μ Η W Е Т Е F Ο L R Е Ο F С G Е Т S S Ν Т F Е V Ρ F С Ν Е R Κ Μ L Е Е S В S S А Е Т Е А Ε 0 Ν А 0 Ν Н С R Ο Е С L D G Н L D N Α Н J А Т Ν Е Е L S С С E D Т Е Е Υ В M Е R мw Ρ F Т Т Ο Т Т W Ν Ο А А Ρ А L Ο Κ С Ο F Ρ Е Κ S Μ L А F E С С А Ν Е А U V А U Е Е Ο W L Е R Т Κ S Μ В R G R А Ν L N G С S F Е R S Е Ν М Т L Ο w Κ Ν Ε Y S S Т REE Ο R Ν А Μ Е Ν Т Y D А YG ΙF TCARDBN ЕСКТ Ε BAKING ELECTRONICS PERFUME BELT **FLOWERS** PLANT BOOK GAME SCARF BRACELET **GIFT BASKET** SHIRT CANDLES GIFT CARD SLIPPERS CANDY HERBAL TEAS SNEAKERS CHOCOLATES JEWELRY SOCKS CLOTHES MONEY STUFFED ANIMAL COFFEE MAKER MOVIE SWEATER COFFEE MUG MUSIC TELEVISION COLOGNE NECKLACE TOOL SET COOKIES TOY NECKTIE DOLL PANTS TREE ORNAMENT EARRINGS PENDANT WATCH WINE



Nautical Quiz

- 1. Port refers to:
- A. The left side of a boat looking forward
- B. The right side of a boat looking forward
- C. The top of the boat
- 2. The ship with the right of way is referred to as:
- A. Privileged vessel
- B. Burdened vessel
- C. Giveaway vessel
- 3. The rear part of a boat is called the:
- A. Deck
- B. Cockpit
- C. Stern
- 4. The flat surface at the stern of a vessel is called:
- A. Transom
- B. Aft
- C. Bow
- 5. The line and chain that connect the anchor to the boat is called:
- A. Rode
- B. Cordage
- C. Rope
- 6. A knot is a measure of:
- A. Speed
- B. Depth
- C. Length
- 7. The upper edge of the side of a vessel is known as:
- A. Chine
- B. Bow
- C. Gunwale

ANSWERS:





Hidden Message: Christmas Cake

Nautical Quiz

- 1) The left side of a boat looking forward
- 2) Privileged vessel
- 3) Stern
- 4) Transom
- 5) Rode
- 6) Speed
- 7) Gunwale