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HM Bark Endeavour
Royal Museum Greenwich

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Tidbits from the Past *by Gene Bodnar*

"Minding Your P's and Q's"

At one time or another, most of us have used the phrase "mind your P's and Q's," but few of us realize that the phrase probably had nautical beginnings that can be traced back to the 1600s. In those days, like today, the phrase meant "to be on your best behavior."

In the early days of sail, sailors were paid a pittance, so it was common that for keepers of taverns on the waterfronts to extend credit to their patrons, mostly sailors, until payday. Also in those days, many sailors were illiterate, so keeping track of what they drank had to be a simple as possible.

The tavern keeper kept a tally of pints and quarts consumed by each sailor on a chalkboard located behind the bar. Next to each sailor's name, he would mark a "P" for a pint and a "Q" for a quarter each time the sailor ordered another drink.

When payday arrived, the P's and Q's were counted, and the sailor was liable for the total cost. Of course, the sailor had to remain relatively sober to ensure that the count was accurate, especially if the tavern keeper tried to be unscrupulous. Thus, the sailor had to "mind his P's and Q's."

Another less likely origin of the phrase, but still nautical in nature, is the fact that sailors in the 18th century wore pea coats that were a normal part of their attire, and they also kept their hair in tarred pigtails, known as queues. When the pigtails were dipped, it was essential that they "mind their P's and Q's."

www.dlumberyard.com

Model Ships of the Royal Museum Greenwich

HM Bark Endeavour (1768)

A plank on frame model of HM bark 'Endeavour' as fitted out for Captain James Cook's first voyage of discovery from 1768-71. Built at a scale of 1:48, the model is fully planked on the port side and mounted within a coloured perspex waterline. The starboard side is partially planked with most of the frames exposed, with large areas cut away to reveal the internal layout of the hull and decks. The model is complete with stores, equipment and full complement of crew, all of which can be identified against the known muster list. A number of figures have been mounted at various points to illustrate the scale and show how cramped conditions were on board. The mast and spars are complete with a full suit of sails, all shown at various states of use, together with the standing and running rigging. For details of the actual ship, see **SLR0355**, 'Earl of Pembroke' on the Royal Museum Greenwich website..

Source: Royal Museuems Greenwich

Canada's oldest shipwreck to be resurrected in replica of 16th-century Basque galleon

by Randy Boswell rleighboswell@gmail.com

It's the oldest shipwreck ever found in Canada and one of the most important in the world: a 16th-century Basque whaling galleon that lies at the bottom of Labrador's Red Bay, a sunken relic from the Age of Discovery that symbolizes the early spread of European civilization — and commerce — to the New World.

Now, the 450-year-old San Juan, a jumble of thick beams and broken barrels lying in shallow waters off the site of a 1560s-era whaling station in the Strait of Belle Isle, is to be resurrected by a team of Spanish maritime heritage experts planning to construct a full-scale, seaworthy replica of the original 16-metre, three-masted vessel.

Model of the San Juan, the 16th-century Basque whaling galleon at the bottom of Labrador's Red Bay.

Parks Canada underwater archeologists, who discovered the 250-tonne San Juan in 1978 after following documented clues about a lost galleon traced by federal archivist Selma Barkham, will meet this week with Spanish officials to begin sharing decades of amassed research on the ship's design and construction, Postmedia News has learned.

Then, to mark the Basque city of San Sebastian's year as Europe's "cultural capital" in 2016, Spain expects to christen its floating tribute to the whaling crews that — for several decades during the 16th century — transported millions of barrels of whale oil to Europe from the future Canada, a treasure every bit as valuable at the time as the gold taken by Spanish conquistadors from more southerly parts of the Americas.

"Right from the start, we thought this was a really, really great idea," said Marc-André Bernier, Parks Canada's chief of underwater archeology. "For archeologists, this is basically the ultimate final product. You're taking all of the research from a site that's been excavated, then you take it to the maximum in experimental archeology," physically recreating "what is lost."

For Robert Grenier, Bernier's predecessor as Canada's top marine archeologist and the leader of the Red Bay discoveries more than three decades ago, the planned construction of a San Juan replica is "like a dream."

Basque ship, "San Juan", dating from 1565, one of 5 ships recovered at Red Bay (photo by R. Chane & D. courtesy Environment Canada/Canadian Parks Service).

The 75-year-old Grenier, whose work at Red Bay was featured in a National Geographic cover story in 1985, is now retired but has agreed to serve as a consultant to Spanish shipbuilders on the San Juan project.

He previously collaborated with Basque heritage experts on the recreation of a chalupa — a smaller boat used by whaling crews to pursue and harpoon bowhead and right whales — that was also found at the Red Bay site.

"To the Basques, this is the Holy Grail," he said of the planned San Juan replica on Monday, while visiting a display on Basque whaling operations at the Canadian Museum of Civilization in Gatineau, Que.

The Canada Hall exhibit features a 20-to-one scale model of a Basque whaling galleon, as well as a full-scale reproduction of the stern of the ship.

"They are so thankful to us — Canada and Parks Canada — to have restored to them the glory of their golden age," said Grenier.

The replica galleon to be built in the coming years is expected to travel between European cities during 2016 to mark the San Sebastian celebrations, then set sail for Labrador and other East Coast destinations in 2017 — in time for the 150th anniversary of Confederation — to help spread awareness of the deep historical connection between Canada and Spain.

"It's their heritage," Bernier said of the Basques, who live in the coastal region straddling the border of northeast Spain and southwest France. "But it's also a shared heritage."

Significantly, Bernier noted, the Red Bay wreck dates from an era before European ship-building had developed to the point of creating blueprints prior to construction.

"There were no ships' plans — they were built with traditional knowledge," he said. "Everything was in the shipbuilders' minds. That's why the data from the archeology is so critical."

In the decades following the New World discoveries of Christopher Columbus and John Cabot, the expert shipbuilders, sailors, fishermen and whalers from the Basque country began making transatlantic voyages to exploit coastal Canada's cod and whale populations.

Lamp oil from whales killed in the Strait of Belle Isle became the key commodity for Basque entrepreneurs, who developed shoreline "factories" to render hundreds of thousands of barrels of oil and organized regular shipping schedules between Canada and Europe to deliver the product.

The sinking of the San Juan, which was loaded with thousands of barrels of rendered whale blubber when it foundered close to the Red Bay shore in 1565, was essentially Canada's first oil-tanker disaster. Much of the cargo was, however, recovered before the vessel was crushed by winter ice.

Although the presence of Basque whalers in 16th-century Canada was long known to historians, it wasn't until Barkham presented fresh evidence at an Ottawa archeological conference in 1977 that plans were made to search for physical traces of the whalers' activities in present-day Labrador.

Along with the wreck of the San Juan, Parks Canada archeologists eventually found traces of three other galleon-class cargo ships, as well as the well-preserved chalupa rowboat.

Land-based excavations led by Newfoundland archeologist James Tuck also yielded burial sites, clothing, tools and countless other relics that recalled a time when hundreds of Basque workers might spend a whaling season in 16th-century Canada.

Today, Red Bay is a national historic site and Parks Canada tourist centre. An image of the San Juan is used by the United Nations as its logo to promote the preservation and celebration of the world's underwater heritage, and a five-volume, 2008 compendium of Red Bay archeology written by Grenier and Bernier has been hailed internationally as a model for scholarly research on shipwrecks.

Red Bay is a leading contender to become Canada's next UNESCO World Heritage Site.
rboswell@postmedia.com; twitter.com/randyboswell

The World Heritage Committee inscribed the Red Bay Basque Whaling Station as a UNESCO World Heritage site during its 37th session held in Cambodia from 16–27 June 2013.

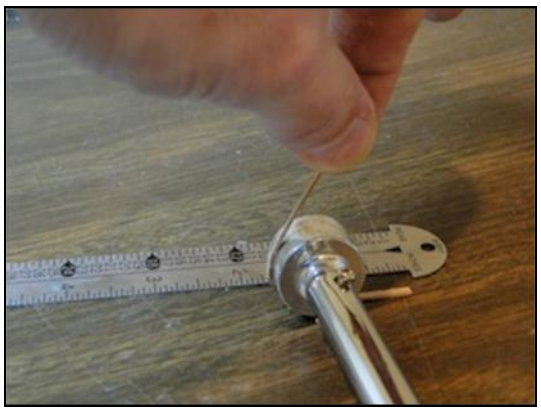
The Sea of Galilee Boat—Part II

In the first part of this series the main construction of the hull was completed. Here we carry on with the build starting with the installation of the frames and taking it through to the final construction of the boat

If you would like to get a kit of the Sea of Galilee boat, you can find out how at Scott Millers website:

http://www.scottsguitars.net

Partial Frames



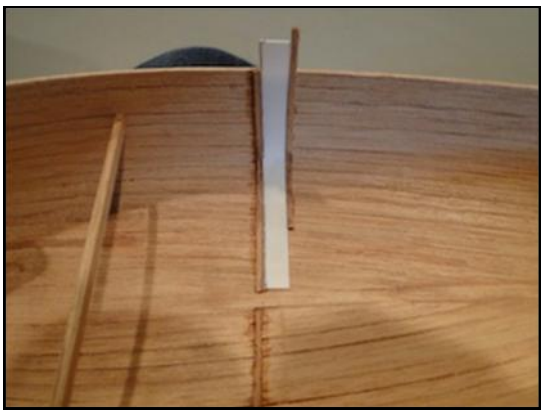
The partial frames are now added to the hull. I've included a couple of pre-bent frames to get you started. There are two different kinds of partial frames in this model, those that extend to the keel and those that only go to the turn of the hull. Each type alternates with each other down the hull. The larger frames are 3 ¾" long and the shorter are 3" long. You can bend these wet or dry as you like. I bend them dry because there is typically enough moisture in the "dry wood" to make this work. Heat your bending iron to full heat and start about 2 inches from the end of the long pieces and 1 inch from the end of the shorter lengths. Place the plank on a surface that is safe for the heat of the iron and bend the pieces. I use a combination of lifting the long end while I roll the iron towards the short end. Each dry piece is only in contact with the iron for about three to five seconds and the iron doesn't stay in one spot for very long. This prevents scorching of the wood.

I typically bend all of my wood at one time to save time. The hull needs around 34 sets of partial frames (depending upon spacing), so this means you will need about 14 pairs of the long frames and 20 pairs of the shorter partial frames. You need more shorter frames because the frames at the bow and stern ends are all short frames.

Measure from each end and place the

first set of partial frames at mid-ship. I start with a long set and be sure that they are perpendicular to the keel and gunwale. I place five or six small dots of thick CA on each frame to tack it in place. I hold each frame in position, being very careful to make sure that it touches the hull on the bottom, side and turn of the hull. Once the frame is solidly in place, run a thin bead of thin CA along the edge. This will wick under the frame and make the hull extremely strong. You might find it helpful to measure from a set point like the stern to these first frames where they meet the gunwale to make sure the distances are the same. This will help assure symmetry. Trim the tops of the frames where they overhang the gunwale, I use the nail clippers for this.

Cut a spacer from the top of a disposable plastic container, like a margarine container. This strip should be 3/16" wide and the sides should be perfectly parallel to each other. Place this strip next to the first frames and use it to locate the next set of frames. Glue these in place just as above with the exception that these frames need a small flat piece that sits on the bottom of the hull (three pieces per frame set as opposed to the two for the long frames). Glue the two side frames so that they extend equally far towards the keel and then cut and fit the flat piece.

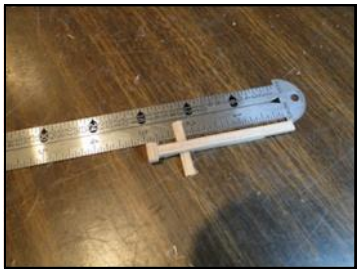


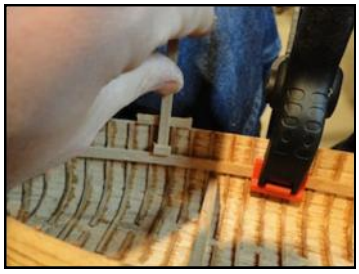
Here are several sets of frames, glued into place. Leave gaps of around 1/8" between each segment of the three-piece frame sets.

As you progress toward the bow and stern you will find that the distance along the gunwale is much longer than the distance at the keel. This means that the frames will have to be slightly warped to conform to the hull. There comes a point near the stern and bow where this warping is no longer practical and the frames now are closer together at the keel than they are at the gunwale. In this case, make sure that you keep the spacing the same at the gunwale and allow the frames to rotate in as seems fit towards the keel.

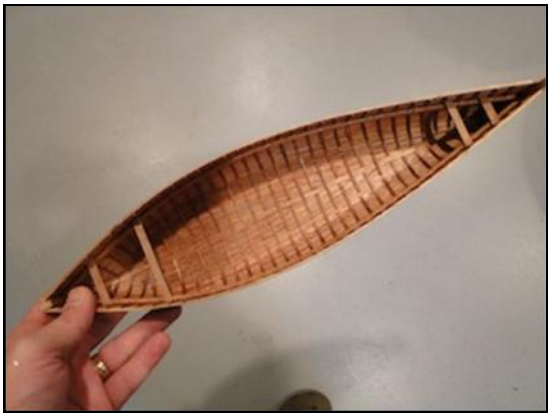
Stringers

Use some scrap planking to make a tool for spacing the stringers 5/8" from the gunwale. Use dots of thin CA between the stringers and the partial frames.





Decking

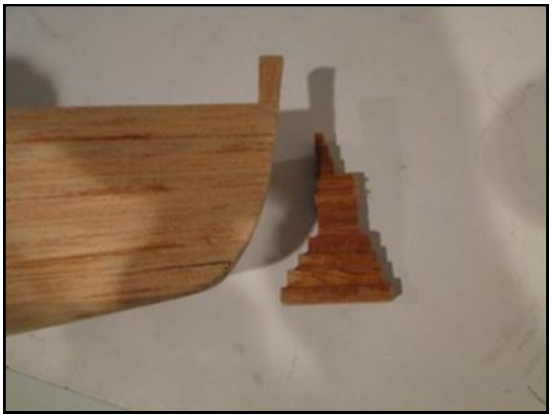


Next place deck supports as shown in the photo. The aft deck is 3 ½" long, so the supports should be located around 1" from the stern piece and 3" from the stern piece (depending upon the locations of your partial frames). I like the look of the decks when the support pieces do not show under the finished ends of the deck boards. The fore deck is 2 ¾" long so the supports are 1" and 2 ¼" from the bow piece (again this depends upon the location of your partial frames).

Start by installing a central deck planks that are perfectly parallel to the keel and but up to their respective end pieces. Install with small dots of thick CA applied to the tops of the deck supports. For the rest of the decking planks, cut a bevel into the ends facing the bow and stern to match the curve of the hull. These planks will need to be notched for the partial fames as shown in the next photo.

I place scrap partial frame material between the partial frames and run a piece outside of this to cover any spaces on the edges. I think it gives a nice finished look to the decking.

Cutwater

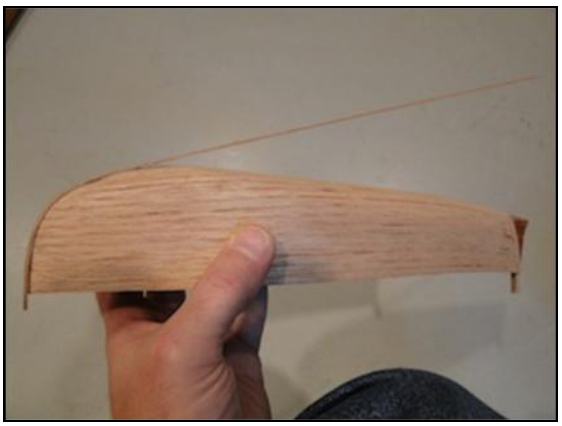


Now take wide thick stock and cut pieces to make the cutwater. I stack these and glue them together with thick CA reinforced with thin CA wicked between the boards. These are held up to the bow section and a line is scribed and cut into the inboard edge to fit the rough cutwater to the hull. You might ask, "why not mark this curve at the beginning of the build by using the bow piece before it is installed onto the strongback?" Good question! You will probably find that the geometry of the bow

has changed very slightly because of sanding the planks at the bow. The process of fitting the cutwater is one that requires multiple small modifications of the curve until it fits perfectly with no light showing through the joint. Use thick CA to bond this and shape the forward profile of the cutwater once the glue and dried.

False Keel

Make sure that the outer surface of the hull is finish sanded. Take the wide and thin false keel strip and bend it with an iron to match the curve of the stern. This piece is wide so that it covers the ends of the planks and also helps hide any imperfections in joints between the planks of the hull and the keel itself. This piece covers the bottom of the cutwater so be sure that this interface is flat to accept the false keel. Several dots of thick CA work well and work in sections rather than trying to glue the entire false keel in at one time. Sand the stern end of the false keel so that it blends in to the sides of the hull.



Cap Rails

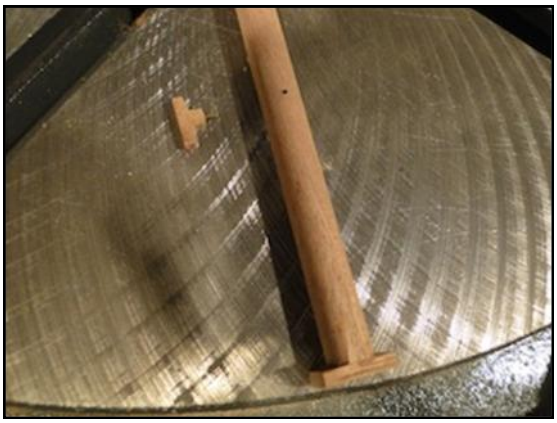
Take one of the pre-bent cap rails and glue it in place starting at the stern. Use small dots of thick CA on the top of the gunwale as well as on the tops of each of the partial frames to glue the cap rails into place. Make the inside of the rail sit flush with the partial frames and allow the rail to overhang outside on the hull. Work in small sections and use your fingers to hold the rail in place until the glue sets. At the bow cut a bevel into the end and glue in place. Cut a bevel into the stern end and make sure that the two rails meet cleanly and evenly at the stern.

Stern Cap

A small triangular piece of scrap plank should be placed on top of the exposed stern piece. This triangle should be sanded flush with the top of the cap rails to make a smooth surface for the stern cap joint. Cut a stern cap and glue this to the top of the stern so that it is even with the outer edge of the false keel and is true to the long axis of the hull, site from the bow to the stern to check for this. Sand the ends of the cap rails so they look pleasing to you.

Mast

Place a mast step onto the base of the mast and cut a cleat from scrap planking. The cleat should be around 3/8" long and cut the profile into the cleat. Drill a hole with a #65 drill bit into both the mast and the end of the cleat. Use a small piece of brass rod to help reinforce the joint.



Glue the mast in place with thick CA glue. The location should be around 7 ½" from the stern and placed between the partial frames. The mast step increases the gluing surface area for a stronger joint. You may have to sand the bottom of the mast step to match the geometry of the bottom of the hull.

Seats

Cut planking to make seats and glue these in place just in front of the mast and midway between the fore deck and the central seat. Make sure to cut notches into the seats to accommodate the partial frames.

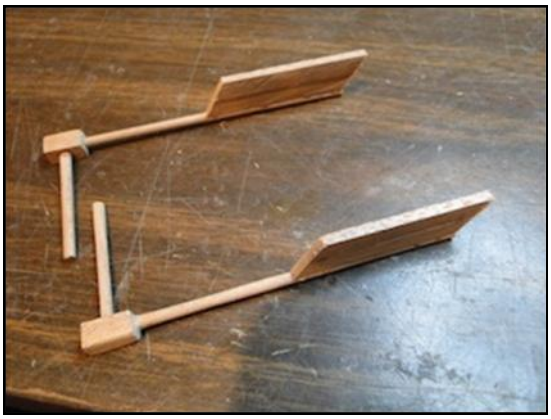
Thole Pins

The thole pins are used as pivots for the oars and these pins need to be placed to the stern side of each seat since boats are rowed facing the stern. To make a pin set, drill a 1/16" hole, 1/8" from an end and place a 5/16" long piece of doweling into this hole. I use a round file to make a groove and glue these ½" to the stern of each seat, with the pins facing the seats.

Quarter Rudders and Oars

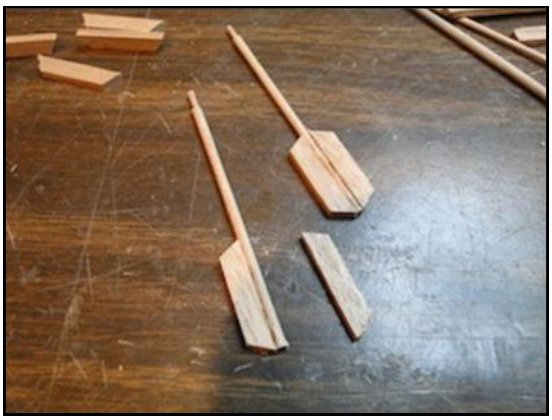
Take the quarter rudder handles and glue them into the shafts of the quarter rudders. Form the blade for the quarter rudder by gluing two pieces of scrap plank together and cut a 60 degree angle into each end so that the blade is 1 ½" long on the edge that will be glued to the shaft. I use a round micro file to cut a groove into edge of the blade to make a clean joint between the two.

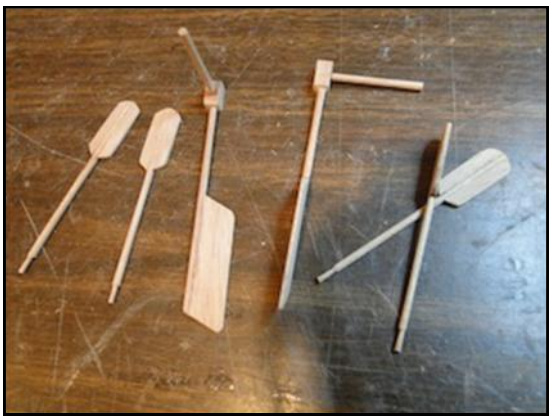
You could make the shaft flat but if you do this you must be sure that the flat edge sits exactly 90 degrees from the handle of the quarter rudder. This is harder than you might think. The quarter rudders should be made as a left and right pair as shown in the photo.



The oars are made by cutting eight pieces from scrap plank that are 1" long and have 60-degree angles cut into each end. Cut a round groove into the wide edge (just as for the quarter rudders) and glue these onto the oar shafts.

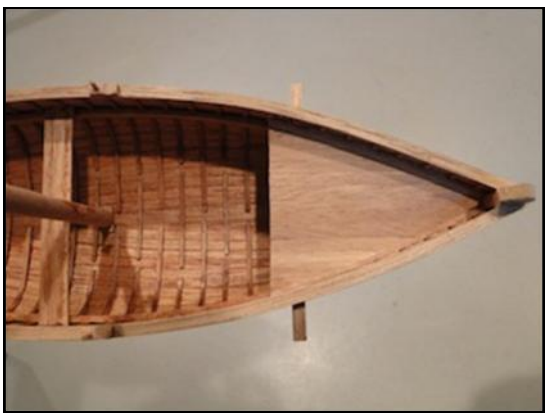
Use a sanding block to round the edges and profile the blades for the oars and quarter rudders as shown below.





Quarter Rudder Davits

These pieces are made from square stock and are ¾ inches long. They support the quarter rudders and are attached to the boat ¼: behind the leading edge of the aft deck and ¾" below the top edge of the cap rail. You will need to cut an angle into the inboard

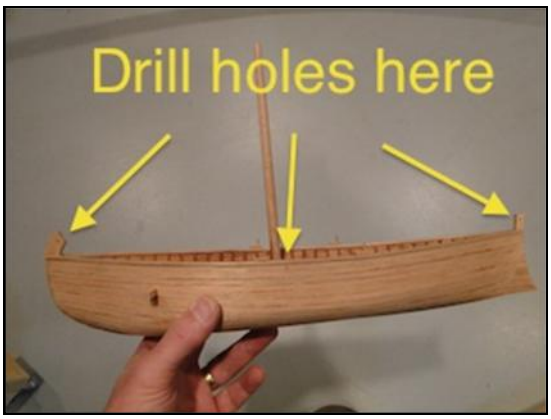


edge of this piece so that it sits at right angles to the keel and is parallel to the waterline. Use a small segment of brass rod as a pin to reinforce this joint. Drill a #65 hole into the inboard end that is perfectly parallel to the long faces of this piece and mount a small segment of brass rod. Place this up next to the hull and make an impression into the side of the hull with the rod (at the measurements listed above). This impression will be the index for drilling a #65 hole into the side of the hull. Use thick CA to glue the davit in place.

Mount the davit on the other side so that it is exactly across from the first and sits the same distance below the cap rail.

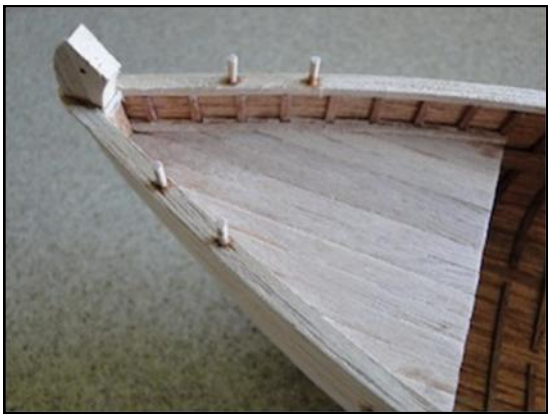
Standing Rigging Holes

Drill 1/16" hole in the tops of the stern and bow pieces for the fore and backstays. The side stay holes are centered between the partial frames that sit on either side of the mast. They should be located 1/16" below the cap rail. This will allow the side stays to stay far enough aft to not interfere with the operation of the yard.



Rigging Pins

These pins are made from 5/16" long pieces of 1/16" wide doweling. Drill holes 1 ½" and 2 ¼ inches from the outer edge of the stern into the top of the cap rail. Glue the pins in place.



Stand

Assemble the stand using thick CA glue. Be sure to glue all the joints at once and true up the right-angled corners with a square. Make sure that the base edges are flat on the bench top so that the stand doesn't rock.

The stern goes toward the flatter end and the notches are there to grab the false keel and keep the model from tipping. If the model does not sit correctly in the cradle, make adjustments to the concave top edges of the stand. If the stand rocks because the bottoms are not properly aligned, place a full sized piece of 100 grit sandpaper on a flat sur-

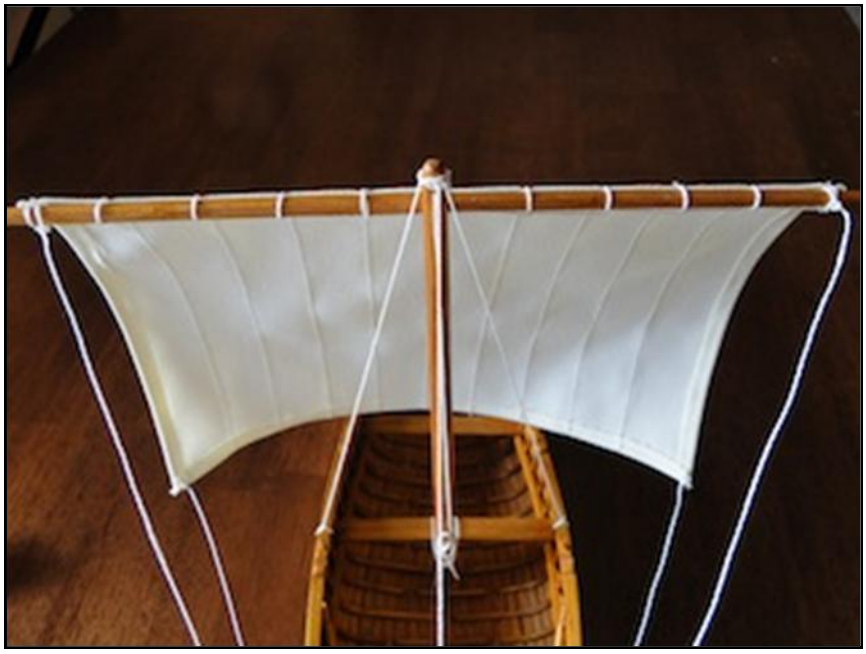
face and run the stand over the paper until it cuts a new flat surface into the bottom.

Finishing

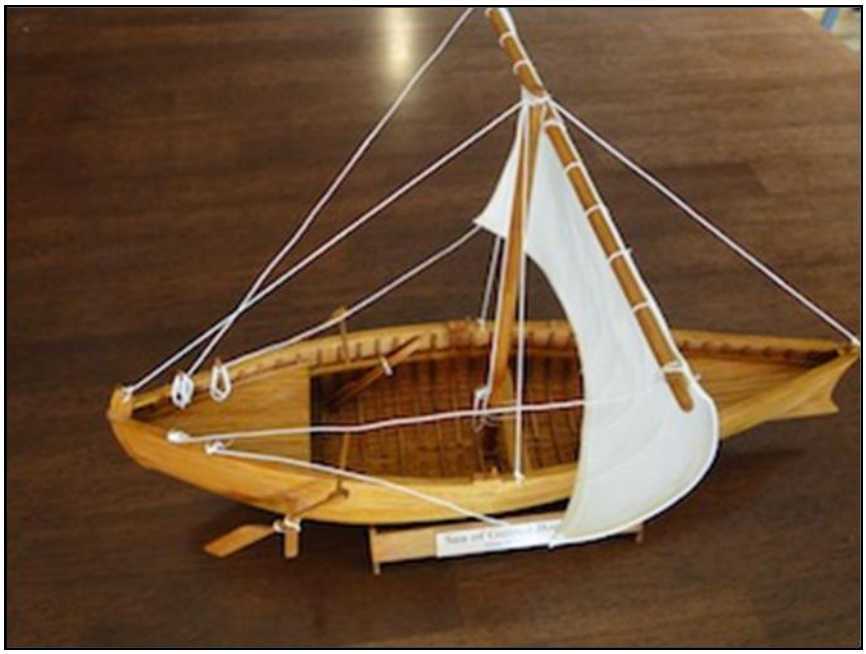
Coat the entire boat and stand with amber shellac. I usually cut the shellac 1:1 with denatured alcohol to make a "2-pound" mixture. You can use it straight out of the can if you like but it will take longer to dry and will leave a thicker finish. Sand the boat and stand with 220-grit paper to knock off the hairs and achieve a smooth finish. Coat the interior of the boat (not the decks, seats, mast or cap rails) with Dullcote lacquer and place a second coat of shellac on the rest of the boat. Buff the outside of the boat with 0000 fine steel wool to a fine matte finish.

Rigging

Bend the sail to the yard by stitching it using rope and a wide-eyed needle. You can tie each loop individually or run a stitch from end to end as in the photo.



The standing rigging consists of two side stays and fore and aft stays. These run from the holes drilled previously and end at the top of the mast. You can use tension from these stays to slightly adjust the angulations of the mast itself.



I use a clove hitch to tile the yard lift onto the center of the yard and then I run this lift through the hole at the top of the mast and tie it off to the cleat on the mast and coil the remainder. Use a 50/50 mixture of white Elmer's Glue and water and brush this on to the rope coil to stiffen it. I then position the coil as if it were hanging with some weight to it and let it dry. This will make your coil look realistic instead of sticking straight out from the mast in a very unnatural way.

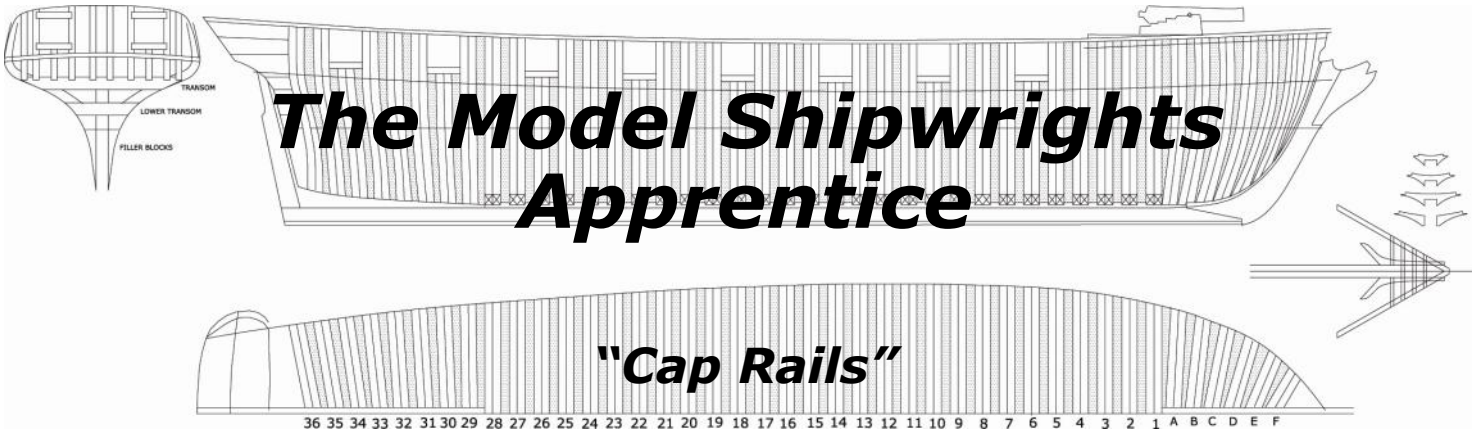
The halyards are attached to the ends of the yard and are secured on the aft-most set of rigging pins. Use the glue trick as above on the coil.

The sheets are made from the wire rope included in the kit. This rope needs to be painted white before installation. Poke a small hole in the lowermost corners of the sail and insert one end of each sheet line through this hole and tie a half hitch to secure. This "rope" is stiff enough to hold the bottom of the sail off of the mast so the sail looks like it is holding wind. Tie and coil the remainder of the rope and hang it from the foremost set of rigging pins. Touch up any chipped paint areas on the rope.

Here ends the main construction of the Sea of Galilee Boat. We hope you have enjoyed following through Scotts practicum on building this piece of history.

To learn more about this kit check out Mario Rangels build log in the forums at www.modelshipbuilder.com where you can also see some construction of furniture and fittings that are not covered here.

or if you'd like to order a kit visit Scott Millers website: http://www.scottsguitars.net.



The Model Shipwrights Apprentice

"Cap Rails"

The cap rail is a large timber which sits on top of the bulkhead stanchions and runs along the entire length of the hull. If you look careful in the image above you can see the wooden peg in the cap rail that holds the rail to the stanchion. A shallow mortise is cut in the bottom of the rail where the top of the stanchion fits in.

Aft Magazine Section Model Plans

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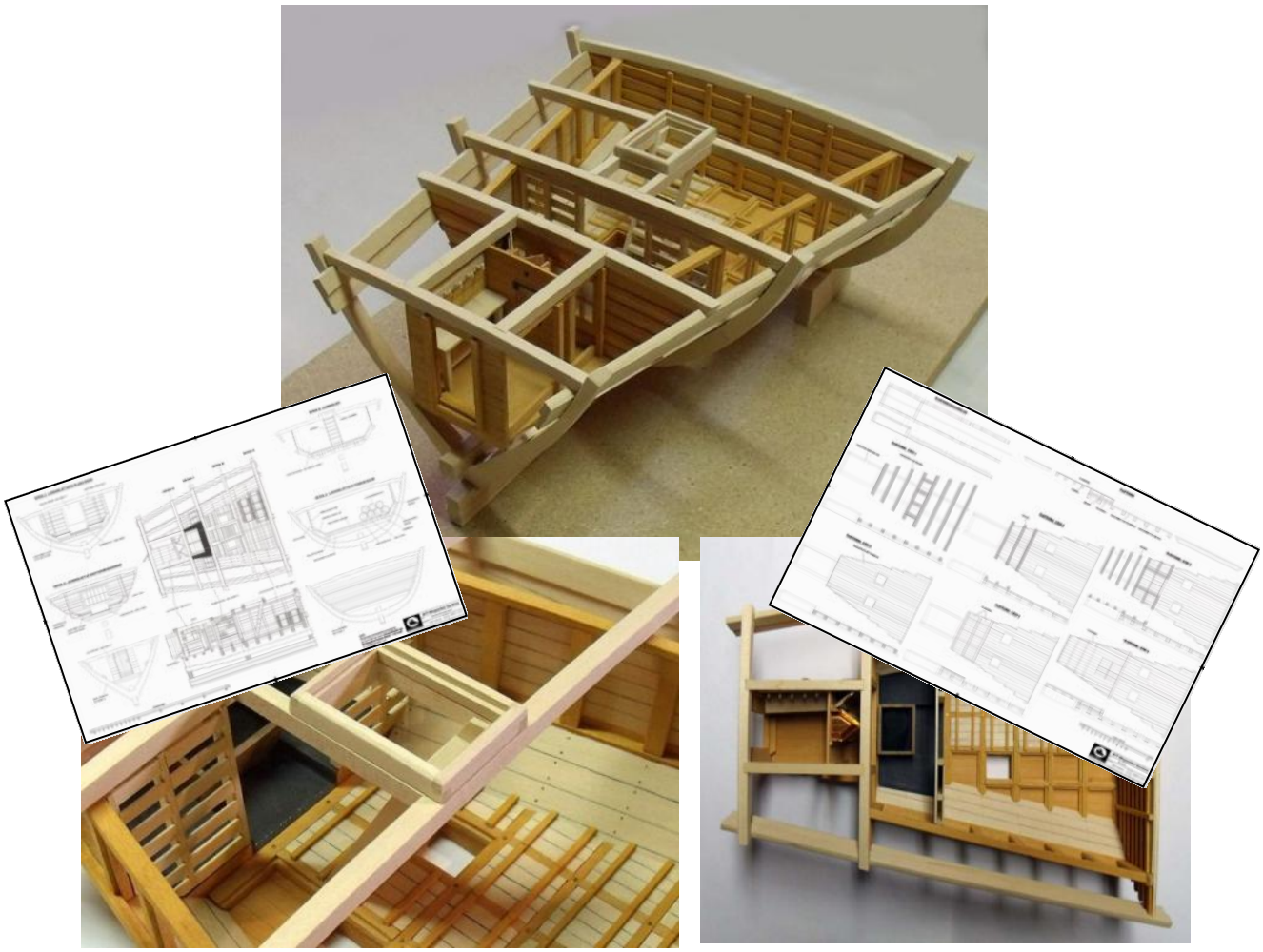

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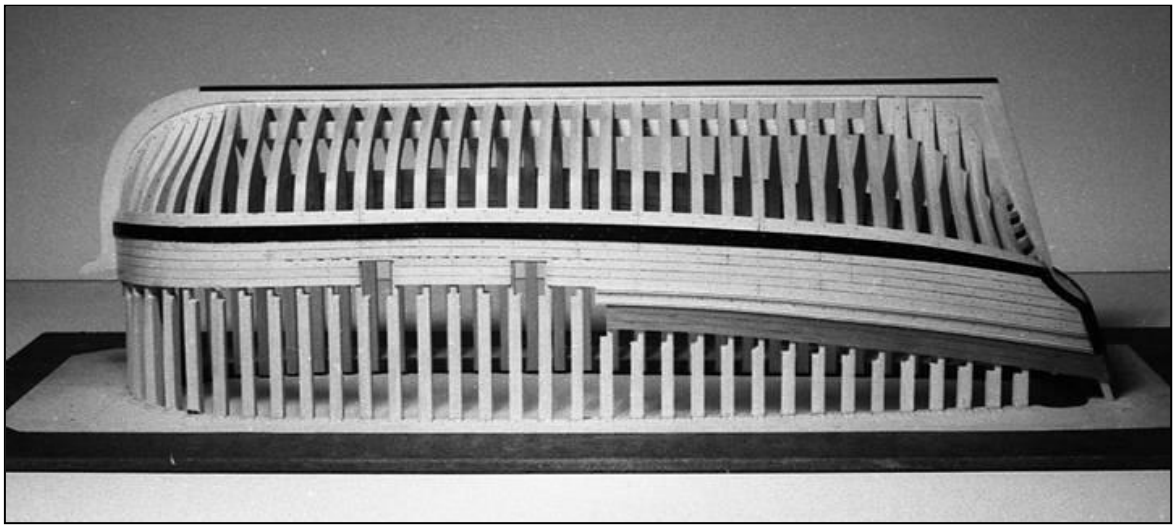
In this model of the Alvin Clark, over all, the cap rail pattern fits pretty close to the top of the bulwarks but taking a closer look we can see the bulwark does stick out beyond the edge of the cap rail in some places.

The photo to the right shows only slight imperfections of the bulwark and in this case the cap rail will cover any distortions.

This is a common problem when building a model out of wood. The hull structure will tend to move and bend out of shape slightly due to various things such as the dryness of the wood, room humidity and a number of other factors. There are a few solutions to this problem.

First you can build the model with heavy oversized stanchions like those used around the bow in the picture below. When your ready to finish the bulwarks the heavy stanchions are sanded and shaped to their finish size.



Another solution invented by master builder Harold Hahn is to build the hull in a jig, thus holding everything straight and in place until the planking is installed. Once the hull is stabilized you cut it away from the jig and continue with the cap rails. This method works very well and insures a distortion free structure.

Because the Alvin Clark model, was not built up side down in a jig, movement in fact did occur in the delicate bulwarks so we will take steps to beef up and straighten out the bulwarks before adding the cap rails.

To begin we want to add the rail clamp shown with the blue arrow. In this photo we are looking at the inside of the bulwark. When the Alvin Clark was raised the outside planking of the bulwarks were removed for some reason or another. The rail clamp on the

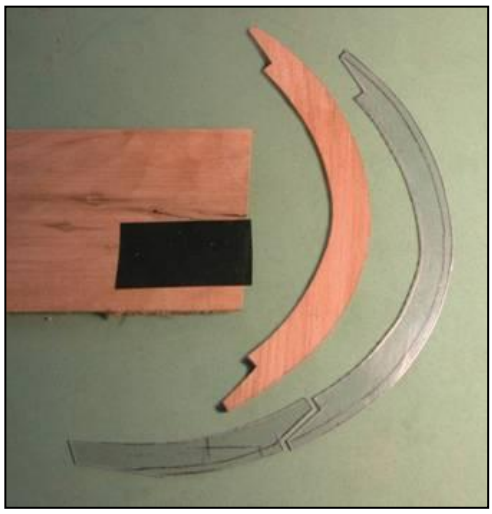
inside and the planking on the outside of the bulwark provides a wider seat for the cap rail to sit on.

On some modeling plans you may find a pattern for the cap rail but as in real ship building the model as built is most likely not be exactly like the plans. The cap rail has a very slight overlap of the outside planking so it has to fit the bulwark exactly. Thus this pattern on the drawings is not of much use to us.

The only way to get an exact fit is to trace the bulwark. Using cardboard the bulwark is traced and the ensuing patter pattern is used as a guide to make the cap rail patterns.

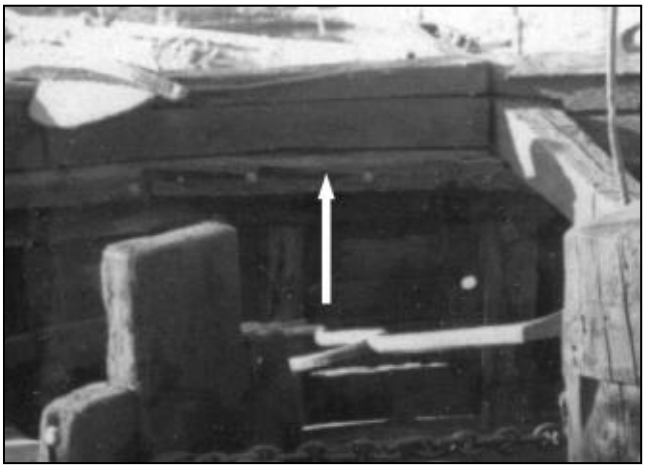
By using clear plastic patterns you can see through it to the tops of the stanchions but cardboard will work just as well.

The plastic used here is the stuff you find millions of products wrapped in, or you can purchase plastic like that used with overhead projectors from your local office supply.



Starting at the bow the first pattern is made and the first cap rail section is cut out.

On the actual Alvin Clark there were a few fancy joints used, and they are being used on this model. The first being a hook scarf used to join the separate ends of the cap rail sections as can be seen in the first image on the next page.



The second is a butterfly joint at the bow where it is covered by the monkey rail . Getting a clear picture was not possible but the inside edge of the butterfuly can be seen in the picture to the right pointed to by the white arrow.

Apple wood was used for the cap rail because it takes a nice polished finish and it has a warm brown color. Apple wood however tends to be a bit hard so you cannot cut the joinery with a knife, and it had to be cut with a small table top scroll saw.

Electrical tape gives you a sharp clean edge to cut to. First use the end of the bow piece and lay it on the black electrical tape. By using a new sharp blade cut along the edge of the joint.

Cut out the butterfly from the plastic pattern and trace around it with the knife to produce the shape in the electrical tape. If your skilled and working slow and steady you can scroll saw your piece right to the edge of the tape. Personally I cut close to the tape, although in the photo it looks like I am a mile away from the edge of the tape, actually, I am only a few file strokes away.

The rest of the joinery along the cap rail is hook scarfs. You can either make these hook scarfs on the model or simplify the joint to a straight scarf.

The cap rail is fitted in sections by first making a cardboard pattern. The pattern begins over size to allow for any adjustments along the way. First cut the scarf to match the scarf on the last section. Then by tracing along the outer edge of the bulwark form the general shape of the cap rail.

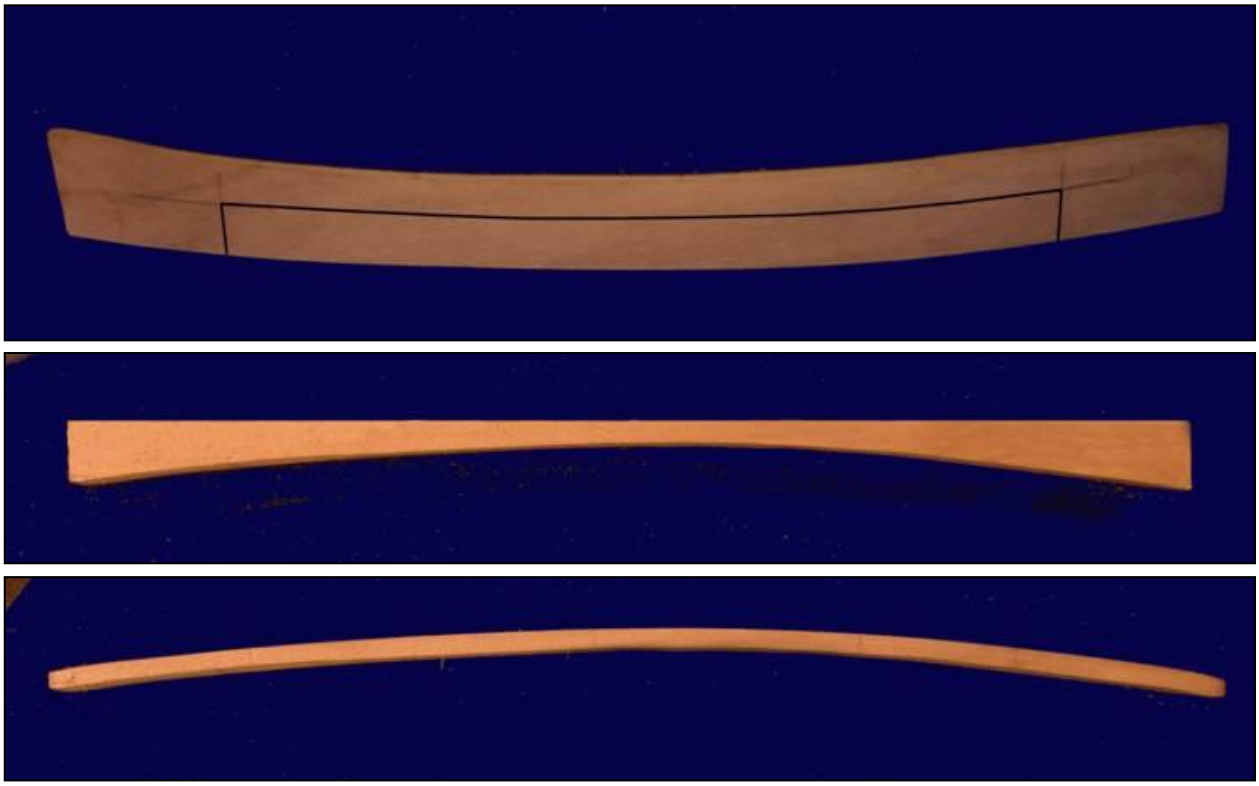
Before fitting the last section of the cap rail we will turn our attention to the shape of the stern section of the cap rail.

The stern has curves in two distinct directions, looking down from the top we can see there is a slight curve to the stern.

Looking at the stern of the model there is an arch to the cap rail. It is possible to bend the cap rail in both directions but it's really not practical and may present problems over time. A solution to the matter is to carve the cap rail.

Starting with an over-size piece of apple wood a piece was cut to the curve of the stern. An over sized piece allows you to creep up on the final size and shape rather than trying to make the piece an exact fit right from the start.

In the next photo the actual size and shape of the stern cap rail is marked out. At this stage only the curve of the stern is cut out, the piece of wood is still flat. The over size piece looks quite large in comparison to the final piece. Consider the actual piece is small to begin with so you are not actually starting with a very large piece of wood.



First sand the piece on the bottom to fit the top of the stern timbers, then sand the top to the final thickness of the cap rail. This may seem like a difficult task to get an even thickness but actually the piece is small and sanding goes quickly.

The finished cap rail is now glued to the top of the stern timbers. Running a stick of wood through the framing then using two rubber bands from the stick up and over the cap rail will hold it down. The rubber bands will tend to pull the cap rail sideways so a clamp is

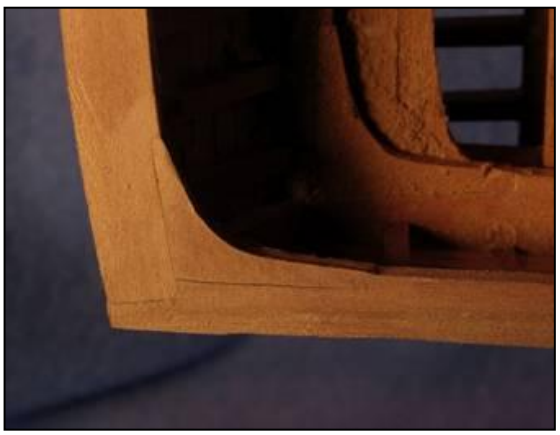
needed to hold it secure. Tops of the stern timbers are a small area so there is very little holding the cap rail in place, any slight bumping of the cap rail will break it loose so care is needed until it can be secured to the cap rails on the sides.

A knee joins both cap rails at the corner. Slip a piece of cardboard under the cap rails and draw the shape of the knee.

In the photo the lower knee joins the cap rail at the side to the cap rail over the stern timbers. The upper knee joins the monkey rail and davit.

Before cutting out the shape of the knee first make sure the joinery between the knee and the cap rails is a nice fit.

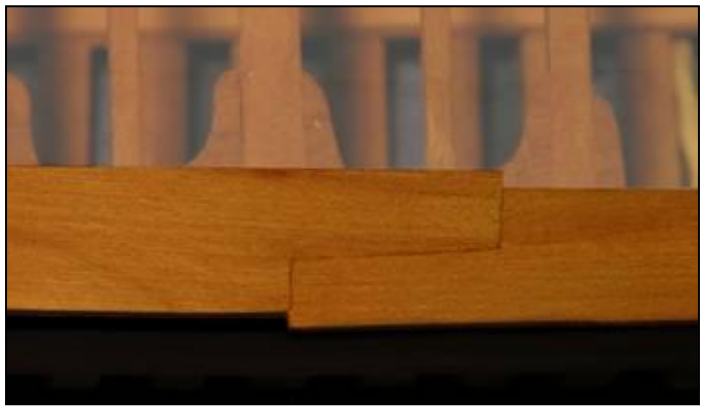
Once the knee piece is glued in place then use a drum sander on the Dremel and shape the knee. Fitting the stern knees are done after the cap rails on the sides are glued in place. The biggest issues to be concerned with the cap rails is making sure all the joinery fits snug before all the parts are glued down. A mockup is first done using cardboard then the cardboard mockups are transferred to wood and cut out.



The process is done by temporally holding all the wood parts in place with rubber bands and clamps. Final placement and gluing down of the cap rails are done with rubber bands.

Just using the rubber bands will pull the cap rails inward and off the bulwarks because in their current state they are over-sized. A trick for holding the cap rails in place and ensuring you have enough material to work with from side to side is to use clothespins. Take the pins apart and use each side. A clothespin has a taper so you can adjust the clamp and control the lap of the cap rail over the bulwark.

Taking a close look at the joinery between the various sections of the cap rail it is clear the widths of the component parts will vary. The extra room at this stage as mentioned above gives the builder enough room to adjust the seams between the parts without running out of material.



Using a sanding block, go around the outside of the cap rail and give the cap rail its final outer edge with an overlap of the bulwark. Attention is directed to getting a smooth outer edge to the cap rail without any sudden dips or waviness to the cap rail. Any imperfections of the bulwark will show up as an unevenness of the lap of the cap rail. The variance of the lap is so slight it will go unnoticed as apposed to an unevenness of the cap rail.

When the outer edge of the cap rail is finished, measure the finished width of the cap rail and sand the inner edge. Going around the bow requires a slightly different approach. First measure the width and make tick marks around the bow. Use a narrow strip of masking tape and follow the tick marks making a smooth curve around the inside of the cap rail. A drum sander is now used to sand the cap rail to the edge of the tape.

And thus ends the process of installing cap rails. I hope you will find the information provided here helpful in your model building.

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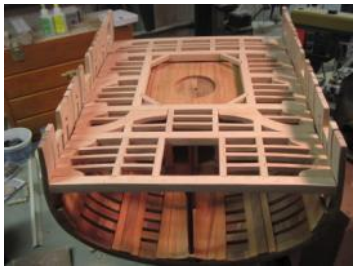


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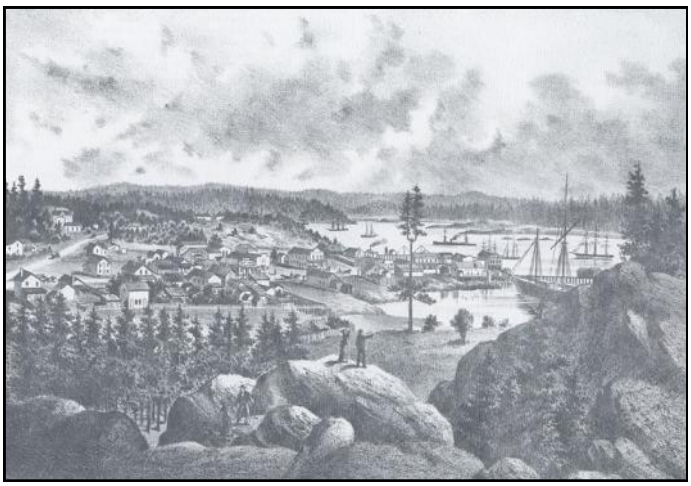
Historic Naval Shipyards

Esquimalt Royal Naval Dockyard



Esquimalt Royal Naval Dockyard was a major Royal Navy yard on Canada's Pacific coast from 1842 to 1905.

The naval dockyard was located in Esquimalt, British Columbia, adjacent to Esquimalt Harbour and the city of Victoria, to replace a base in Valparaíso, Chile as the home of the Royal Navy's Pacific Station and was the only Royal Navy base in western North America.

A hydrographic survey carried out by HMS Pandora around 1842, determined that the location and depth of the Esquimalt Harbour would make it acceptable for use as a British naval port on the west coast of North America. The following year James Douglas went out to Vancouver Island intending to set up a trading post for the Hudson's Bay Company. After looking at the shores of Esquimalt Harbour he decided they were too densely wooded for development so he opted to build what would become Fort Victoria on the shores of the adjacent Victoria Harbour and thereby establish what would become the city of Victoria. Pandora Avenue in Victoria is named in honour of the survey ship, which in turn was named after Pandora of Greek mythology.

In 1848 HMS Constance arrived at Esquimalt and became the first Royal Navy vessel based there. She was commanded by Captain George William Courtenay, after whom Courtenay, British Columbia is named.

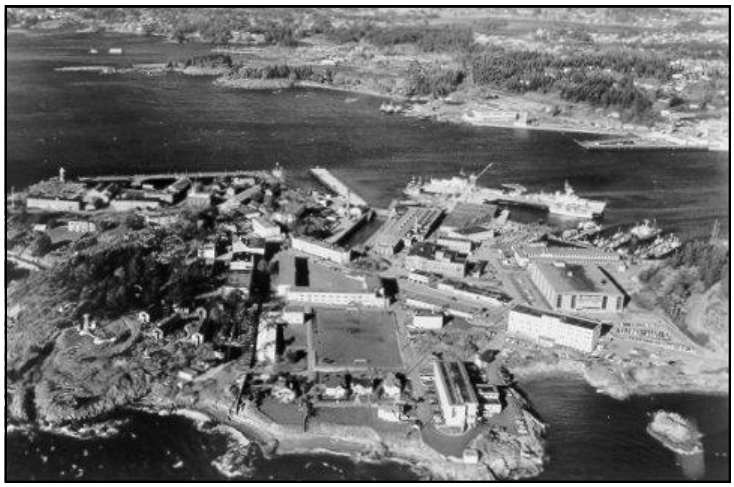
From 3 July 1850 to February 1854 Augustus Leopold Kuper was Captain of HMS Thetis from her commissioning at HMNB Devonport. He sailed her to the southeast coast of America and then to Esquimalt. Kuper Island in the Strait of Georgia, off the east coast of Vancouver Island, was named for Captain Kuper after he surveyed the area from 1851–1853. Thetis Island and Thetis Lake are named for the survey ship. In 1852 sailors from the Thetis built a trail through the forest linking the Esquimalt Harbour with the Victoria Harbour and Fort Victoria. The trail would eventually be paved and is now known as Old Esquimalt Road (it runs parallel to and just north of Esquimalt Road).

In the summer of 1854 several ships, including President, Pique, Trincomalee, Amphitrite, and Virago set out from Valparaíso and sailed across the Pacific Ocean stopping at Marquesas Islands then on to Honolulu where they met a French fleet of warships. In late August the combined fleets sailed to Russia to engage in the Siege of Petropavlovsk at which Commander-in-Chief Pacific Station David Price died. Captain of the Pique Frederick William Erskine Nicolson was brevetted and took command of the British naval forces from 31 August 1854 until the arrival of the next Commander-in-Chief.

On 25 November 1854 Rear-Admiral Henry William Bruce who had been at the West

Africa Squadron was appointed Commander-in-Chief, Pacific. Upon arrival at Esquimalt Bruce asked Governor James Douglas to provide the navy with a hospital to receive the expected sick and wounded from the Crimean War. In 1855 three wooden huts were built on Duntze Head, which would also be known as Hospital Point. The buildings were the first shore establishment of the Royal Navy at Esquimalt.

In 1859 the British Colony of Vancouver Island started to construct lighthouses on the approaches to Esquimalt and Victoria Harbours in part to support the Royal Navy and in part to support civilian navigation amidst the Fraser gold rush and other gold rushes. Fisgard Light was illuminated on 16 November 1860 and Race Rocks Light was lit on 26 December 1860.



In 1865 the facilities in Esquimalt were recognized as an alternate base for the Pacific Station which was based in Valparaíso. The emphasis of the station started shifting more to British Columbia as the United Kingdom's economic interests shifted northward. The move also allowed the Admiralty to avoid involvement in the Chincha Islands War (1864–1866) between Spain, Chile, and Peru.

In the late 1860s and early 1870s any navy vessel in need of hull repair at Esquimalt had to be taken to shipyards in Seattle, Washington in the United States. To remove the dependence on American shipyards a graving dock was constructed at Esquimalt starting in 1876. The graving dock was commissioned in 1887,[1] having cost CAD$1,177,664 to build. HMS Cormorant became the first vessel to use the new drydock on 20 July 1887. In its first seven years of use the graving dock serviced 24 merchant ships and 70 navy ships. From 1887 through 1927 the graving dock averaged work on 21 vessels per year. Although the original graving dock was large enough to accommodate the largest ships in the British Pacific fleet at the time of its construction, by the early 20th century larger ships were routinely being built. In 1924 the government of Canada built a larger graving dock at Esquimalt that could accommodate ships up to Panamax size. The naval graving dock was put out of use until HMCS Coaticook docked there on 31 August 1945.

Esquimalt was vacated by the British Royal Navy at sunset on 1 March 1905. The Canadian Department of Marine and Fisheries took over control of the shore establishment and the responsibility of enforcing control of Canada's maritime interests in the area after the Royal Navy left. After passage of the Naval Service Bill in 1910 there was a Canadian Naval Service (CNS) that controlled the base and the CNS became the Royal Canadian Navy in 1911. In the 1960s a consolidation of defence forces in Canada led to its reformation as the Canadian Forces Base Esquimalt. It is now home to the Pacific Fleet of the Royal Canadian Navy.

The dockyard, along with three nearby sites (the former Royal Navy Hospital, the Veterans' Cemetery and the Cole Island Magazine) were designated the Esquimalt Naval Sites National Historic Site of Canada in 1995.

Masting & Rigging

by Wayne Tripp

The mast, as a part of the sailing ship, is a complex and surprisingly diverse topic, worthy of some review in its own right. This month, I am going to take a short stroll into some of the history of masts and mast making, which I hope will aid in understanding why there are more than one way to mast a ship.

In New England, the Eastern White Pine (Pinus strobus), has the distinction of being the tallest tree in eastern North America. In pre-colonial stands it is reported to have grown to as tall as 70m (230 ft). In 1605, Captain George Weymouth explored the coast of what is now Maine, sailing the Archangel to Monhegan, Camden, and up the Kennebec River. He discovered vast shoals of fish and, as one of his comrades recorded, giant "firre-trees," "out of which issueth Turpentine in so maruellous plenty, and so sweet, as our Chirurgeon and others affirmed they neuer saw so good in England. We pulled off much Gumme congealed on the outside of the barke, which smelted like Frankincense. This would be a great benefit for making Tarre and Pitch."

As the early colonists settled into the region, they found that the lumber from these trees was very light, yet strong. The woodworking properties made it very easy for a builder to cut, shape and finish. In addition, its organic characteristics and slow growth created a fairly decay-resistant material. With these qualities and its abundance, the colonists built their homes, businesses, bridges and countless other structures, along with day-to-day items such as furniture out of Eastern White Pine. The also discovered that the tall, straight Eastern White Pine was the perfect material for shipbuilding, particularly for use as masts for large vessels. Of all the species of wood used for masts around the world, these were the lightest in weight and the largest in size. Other critical shipbuilding components such as frames, planking and knees, pitch and tar for seaming, resins and turpentine for paint and varnish, and spars to hold sails aloft were produced from the wood.

In a short twenty years following the Pilgrim's landing at Plymouth Rock, "Masting" became New England's first major industry as Eastern White Pine quickly became a popular item for export to shipbuilding ports in the Caribbean, England, and as far away as Madagascar.

The Royal Navy had been getting its masts from the Baltic countries and Norway, but the masts they supplied had to be spliced, and the supply was always susceptible to disruption. The discovery of a new source of masts was enough to spur interest in settling New England. By 1623, entrepreneurs in Maine and New Hampshire were milling pine masts for British navy yards, a trade centered out of Portsmouth, New Hampshire's "Strawberry Bank."

After a war with the Dutch closed off British access to the Baltic in 1654, England began to rely on the Colonies to supply masts. The resulting boom in mast wood created a frenzy of cutting which threatened to decimate the old-growth trees. By 1691, the Crown

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had protected almost all white pines more than 24 inches in diameter at 12 inches above the ground. Surveyors marked these potential masts with the King's Broad Arrow.

Use of the broad arrow mark commenced in earnest in 1691 with the Massachusetts Bay Charter which contained a "Mast-Preservation" Clause specifying, in part:

"For better providing and furnishing of Masts for our Royal Navy wee do hereby reserve to us Our Heires and Successors ALL trees of the diameter of 24 inches and upward of 12 inches from the ground, growing upon any soils or tracts of land within our said Province or Territory not heretofore granted to any private persons. We doe restrains forbid all persons whatsoever from felling, cutting or destroying any such trees without the the Royall Lycence from us Our Heires and Successors first had and obteyned vpon penalty of Forfeiting One Hundred Pounds sterling vnto Ous Our Heires and Successors for every such Tree soe felled cult or destroyed without such Lycence "

The Charter of Massachusetts Bay - 1691

Every winter, representatives of the King of England would mark white pines trees with a mark called the "King's Broad Arrow." The colonists were not allowed to cut down these trees for their own use; they were reserved for the crown. Each one was emblazoned (three hatchet slashes) by the King's Royal Surveyors with a mark that became known as the King's Broad Arrow. This signified property of the King and the trees were to be harvested and used solely for building ships for the Royal British Navy.

Harvesting one of these massive trees was no easy undertaking. Unless the intended tree was located near to a village and body of water, the workers first needed to establish a temporary camp nearby. Due to the massive size, a temporary road was established via the most direct routing to a suitable river.

A mast tree would have no limbs within eighty or more feet of the ground and would be in danger of splitting when it fell. A path was cleared from the base of the tree in the direction it was to be felled, for the same distance as the height of the tree. The ground had to be nearly level, the lumbermen would cut down scores of small trees, and so pile them that, when the giant mast crashed down, it would nestle among the upright branches of the smaller trees. Thus the great tree was safely brought to earth. In addition, all the large branches were cut from the Broad Arrow tree before it was felled, and all of the nearby trees were cut to prevent damage to the mast tree as it fell. The small branches were left on to help reduce the force of the fall.

When the tree was on the ground, the task was less than half done. The log was first cut off in the proportion of a yard in length for every inch of diameter. Since each mast was at least twenty-four inches in diameter, it must be at least twenty-four yards, or seventy-two feet, long. If the slightest defect was found, the log might be cut shorter for yards or bow-sprits. If it proved to be unsound, it was either left or sawed up into logs.

Great pines weighed many tons and usually could not be dragged. When possible they were floated down rivers but with great care to avoid rapids and falls. If moved over-

land, they were laced on several pair of wheels and pulled by many yoke of oxen at the front and along each side of the mast log. As many as 40 pair of oxen (or more) may be required for moving the largest mast trees over hilly terrain.

Once the log reached the mast yard, the detailed work of transforming it from a tree into a mast began. An example of this process, in this case from a French publication, is shown below.

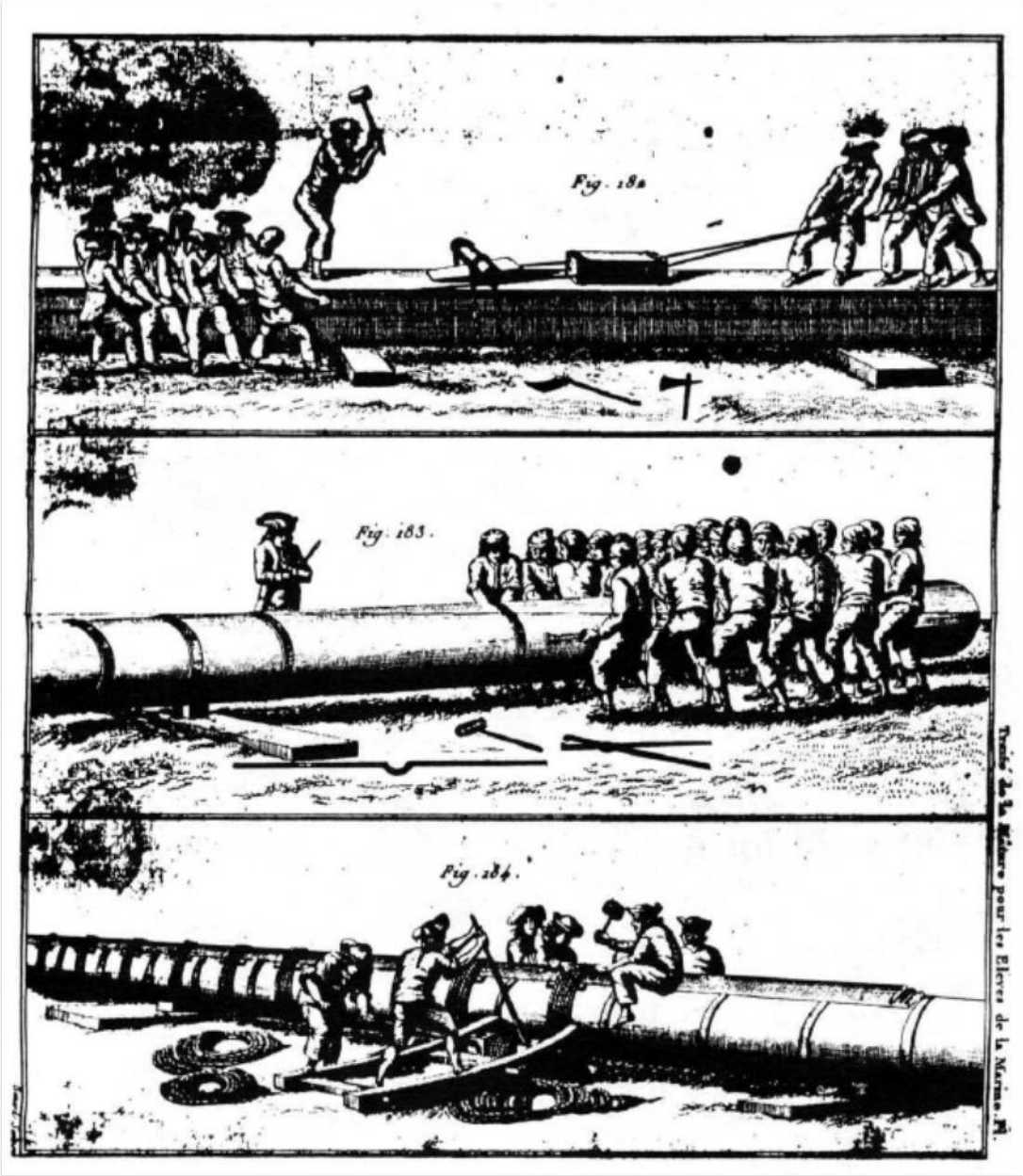

Figure 1. Shaping a mast from a log. Figures 182 – 184 from Traité élémentaire de la mature des vaisseaux: a l'usage des éléves de la marine (Alexandre Laurence Forfait, 1788)

A "mast" pine several hundred years old, 5 feet in diameter at the butt and 120 feet in length might weigh 18 tons. Special, extra-long decks had to be added to existing ships to accommodate the Eastern White Pine mast materials. New England masts, in 1644, were sold to the Royal Navy for from ninety-five to one hundred and fifteen pounds per mast. These masts measured from thirty-three to thirty-five inches in diameter at the butt. A premium of one pound per ton was usually paid on masts by the Royal Navy.

One can but imagine the demand for these masts during a time of war, when there was a continuing need to replace damaged masts and yards. It has been estimated that around 4500 masts were shipped to the Royal Navy between 1694-1775. Prices paid for trees delivered in England varied. Some examples of actual contracts:

24-inch diameter at base, 27 yards long - 35 pounds.
36-inch diameter at base, 35 yards long - 135 pounds.
36-inch diameter at base, 36 yards long - 153 pounds.

For comparison, a first rate ship of the line would need a lower main mast of 40 inches diameter and 40 yards long. A 74 gun would need a mast of 36 inch diameter and some 36 yards in length.

Mast ships also had to be specially constructed, so that they could be loaded through ports in their sterns. They were usually from five hundred to a thousand tons burden and carried from forty to one hundred masts. When loaded, they were rigid and hard to sail. "Our old vessel shipped many seas," wrote a sailor in 1785; "being bound up with long spars, [it] was not nearly as lively as with another cargo."

As would be expected, trees suitable for use as a single pole mast started to become more difficult to find and some alternatives were necessary. As the supply became strained, the use of made masts became more common.

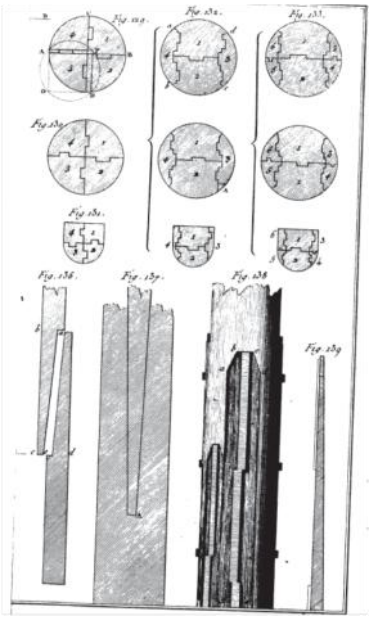

Figure 2. Sections of a made mast from Forfait, 1788

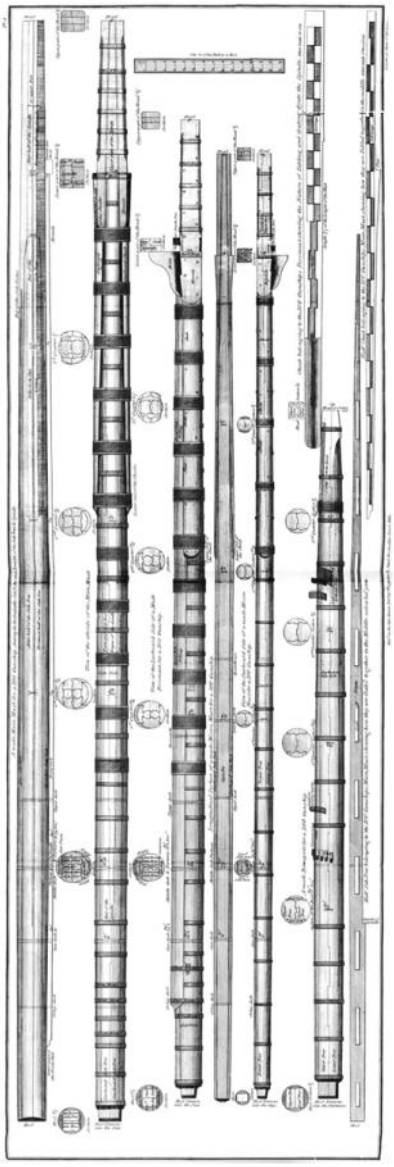

Figure 3. Example of made masts for a British First Rate. Steel, 1794.

Above are just a few parting images of built masts – to be examined in more detail in

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a future installment.

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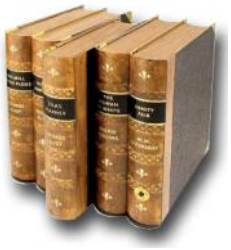

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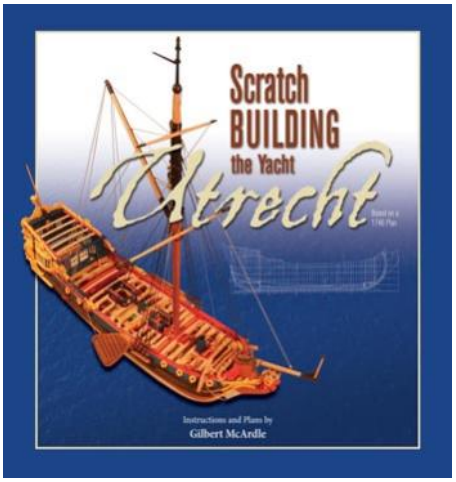
Books of interest for the Model Ship Builder
and ship building enthusiasts



Scratch Building the Yacht Utrecht
By Gilbert McArdle

Sea Watch Books, LLC

ISBN: 978-0-9837532-7-8

In June of 2012 issue of the MSB Journal was a review of the book: The Statenjacht Utrecht 1746 by Ab Hoving (plans by Cor Emke). A wonderful book about the building of a real replica.

For anyone interested in building a model of that yacht, then you will most definitely want to get a copy of "Scratch Building the Yacht Utrecht".

In this book Gib McArdle has taken Cor Emke's plans and created a set of frame drawings which are included as three fold out pages at the end of the book.

The book takes you through the process of how Gib built a 1:48 scale model of the Yacht Utrecht. His narrative is easy to follow and is broken down into eight chapters and is greatly assisted by the use of over 200 black and white photos and illustrations. Gib's model has left the deck unplanked with just some frames showing. He did this so as to display the interior of the yacht which is completely built and furnished.

The appendix includes 10 pages of detailed color photos of the finish model.

The wire ring binding also allows you to open the book to any page and have the book lay flat on your workbench.

Sea Watch Books is currently offering a special if you purchase t both books.

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

Badges: Heraldry of Canadian Naval Ships

HMCS Preserver A0R 510

Description: Azure a life preserver Argent cabled Or charged on the centre chief point with a maple leaf slipped Gules and within the ring a starburst also Argent.

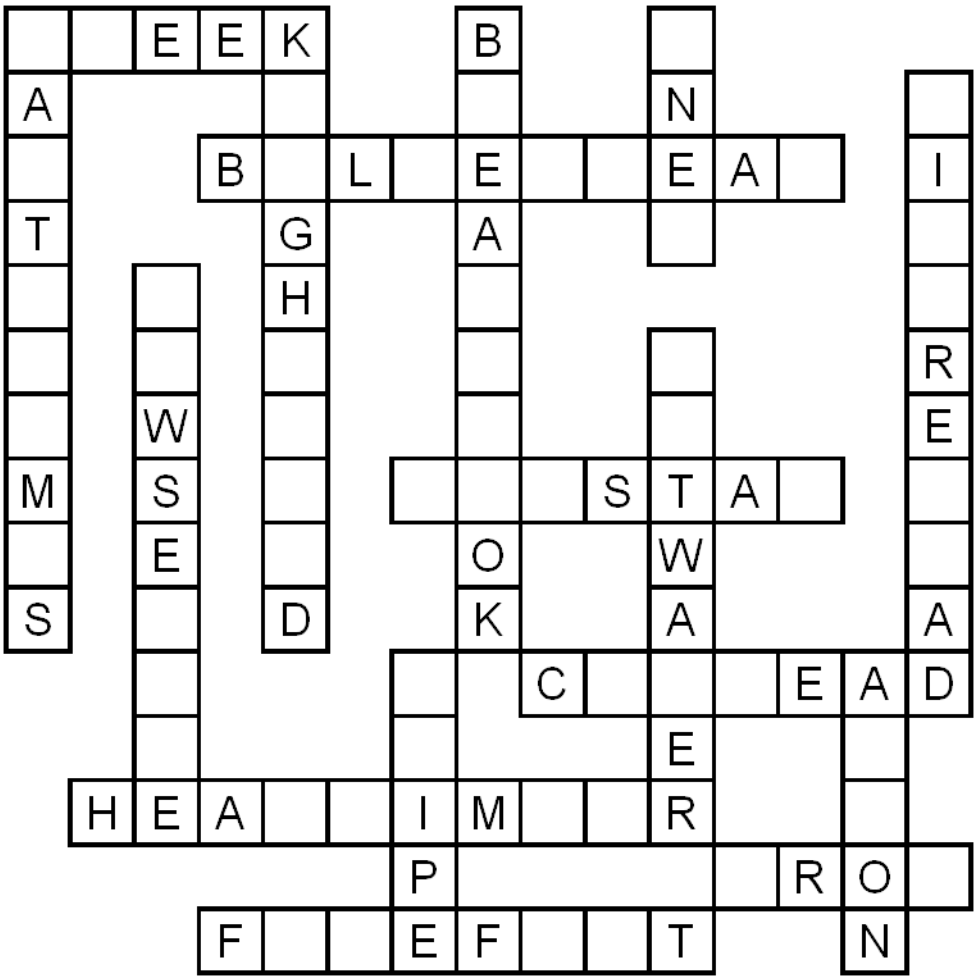
Significance: The life preserver is a rebus on the ship's name and with the red maple leaf gains Canadian identification. The starburst in the centre symbolizes the flare that is automatically ignited when the life preserver touches the water.

Source: Various

Gene's Nautical Trivia

The Head of a Ship

All of the following terms are related to the head of a ship. Can you fill in the missing words from the letters provided for each word, across and down?



NAUTICAL QUIZ

THE END OF FAMOUS SAILING SHIPS

1. _____ American whale ship that sank in the southern Pacific in 1820.

2. _____ French steam battleship that was scrapped in 1883

3. _____ American paddle steamboat that ran aground off Long Island, New York in 1823.

4. _____ Norwegian barquentine that was crushed by pack ice in the Weddell Sea in 1915.

5. _____ English carrack that sank in the straits north of the Isle of Wight in 1545.

6. _____ Dutch square-rigged flyboat that was destroyed during an English attack on Jakarta in 1618.

7. _____ German windjammer that was swept onto rocks and sank near the White Cliffs of Dover in 1910.

8. _____ English extreme clipper that was sunk as target practice by the Portuguese Navy in 1907.

9. _____ Canadian racing schooner that struck a coral reef in Haiti in 1946.

10. _____ English collier that was burned by mutineers in 1790.

TOOLS OF THE SEAMAN

Select the correct tool from the list provided below the last question.

1. ___ Used to punch holes in canvas.
2. ___ Used to clean paintwork.
3. ___ Used to grease masts to allow easier movement for the parrals.
4. ___ Used to cushion the contact of a ship's sides with a quay or another vessel.
5. ___ Used to scrub the desk.
6. ___ Used to secure running rigging.
7. ___ Used as a thimble to force sailmakers' needles through canvas.
8. ___ Use to twist or haul a strop tight.
9. ___ Use to announce the time every half an hour.
10. ___ Used to open and separate strands of role when splicing.

A. BELAYING PIN
B. PRICKER
C. MARLINSPIKE
D. HOLYSTONE
E. HEAVER
F. SLUSH BUCKET
G. FENDER
H. SWAB
I. BELL
J. PALM

ANSWERS:

THE HEAD OF A SHIP

C	H	E	E	K			B			K						
A				N			R			N					F	
N			B	I	L	L	E	T	H	E	A	D			I	
T				G			A			E					G	
F		H		H			S								U	
R		A		T			T			C					R	
A		W		H			H			U					E	
M		S		E		B	O	B	S	T	A	Y			H	
E		E		A			O			W					E	
S		H		D			K			A					A	
		O				G		C	A	T	H	E	A	D		
		L				R				E			P			
	H	E	A	D	T	I	M	B	E	R			R			
						P					P	R	O	W		
			F	O	R	E	F	O	O	T			N			

THE END OF FAMOUS SAILING SHIPS:

1. Essex
2. La Gloire
3. Savannah
4. Endurance
5. Mary Rose
6. Half Moon
7. Preussen
8. Thermopylae
9. Bluenose
10. Bounty

TOOLS OF THE SEAMAN:

1-B, 2-H, 3-F, 4-G, 5-D, 6-A, 7-J, 8-E, 9-I, and 10-C.