

Instruction Manual



Modeling an 18th Century Longboat 1750-1760



Instructions and model
prototype prepared by
Chuck Passaro

Kit No. MS1457
Scale: 1/4" = 1 ft.
Overall Length: 11 3/4"
Height: 10"

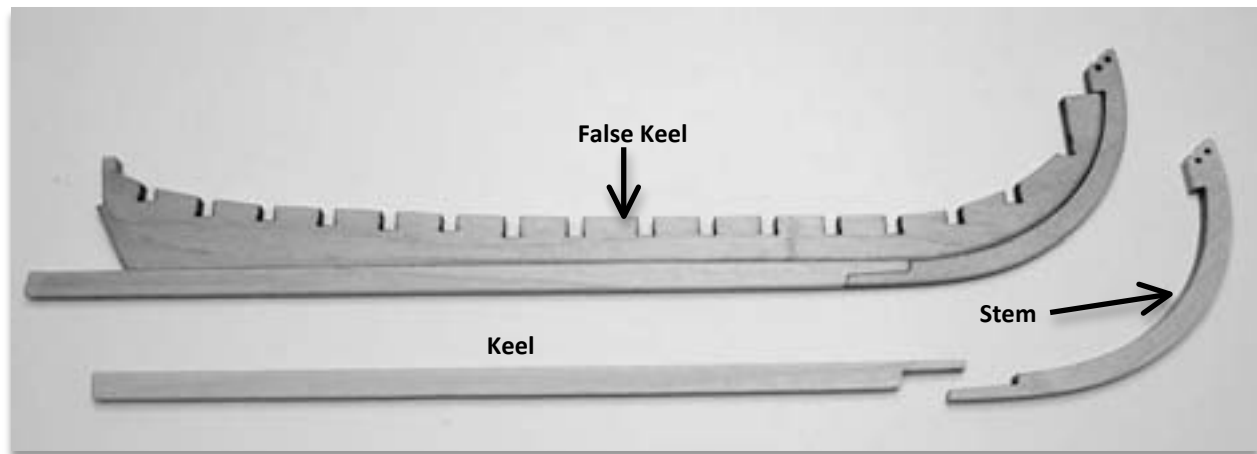
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This 26 foot long boat was designed based on a contemporary model in the National Maritime Museum. This longboat was used circa 1750-1760 and was typical of this type of small craft. Plans for the kit were drafted based on the contemporary drafts from the period. The longboat kit was even decorated to match the NMM model that inspired it. Even though this model was inspired by another, many other color schemes are possible. There are many more contemporary models that show various decorative themes. I would encourage all of you who are building this model to visit the museum's website at www.nmm.ac.uk. Navigate to their online collections where they have an online gallery of ship models from their collection. If you search for the keyword "longboat" or "long boat" you will see many images in high resolution of contemporary long boat models, one of which this prototype was stylized after. Another very good source of information on these small boats is "The Arming and Fitting of English Ships of War" by Brian Lavery. This book discusses the many details you sometimes find on these longboats. Some references to this book will be mentioned throughout these instructions.

Remove the notched false keel from the laser cut sheet (3/32" thick). You will notice that it has a laser etched reference for the bearding line on the aft side. These small parts are very delicate, so handle them with care. You must bevel the false keel from the bearding line towards the outside edges. Remove enough of the material so the keel gradually reduces in thickness to slightly more than 1/32". This needs to be done on both sides with the finished thickness being approximately 1/32". You can continue the bevel towards the bow and up the stem. This will only create a simulated rabbet which will help make planking easier. Even though the edge of the false keel is just 1/32" thick, the edge will still be a sufficient width to glue the actual keel and stem to. If you are worried about needing more "meat" to glue your keel and stem securely, then it would be OK to leave a slightly thicker edge. But not too thick, as the planking will be 1/32" thick and more sanding will be required towards at the stern. Ultimately, the planking will need to be sanded flush with the keel and stern post.

Examine the photo provided that shows the stem and the keel glued to the false keel. Both of these pieces are also 3/32" thick. Glue the stem into position first. Make sure you center it so the rabbet formed by your beveling is equal on both sides. Then add the keel, joining it at the scarf joint. Allow the end of the keel to run off the back edge of the false keel as shown. It should be slightly longer than needed and you will trim it shorter after the stern post and planking is completed. You will soon see how beveling along the keel and stem creates a simulated rabbet. This will help your planks sit properly and cleanly in position. This is especially true at the stern. Note: You may consider staining these pieces before you glue them together so the basswood doesn't get blotchy after gluing.

Gluing in the Bulkheads...

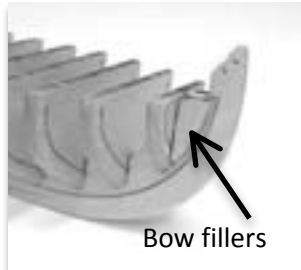
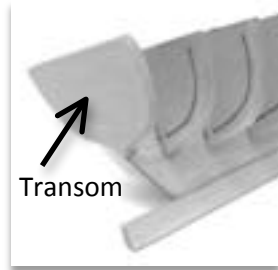
There are sixteen laser cut bulkheads for this longboat. They are 3/32" thick. They should be glued into their respective notches along the false keel. **THIS IS VERY IMPORTANT:** Make sure you leave the center of each bulkhead intact when you glue them into position. The center of each bulkhead is held in place with three small tabs, one on the bottom and one on each side of the top of each bulkhead. The centers should not be removed until after the planking is completed.

As you are adding each bulkhead, make sure you view each one from the bow and stern. Look down the keel to make sure all are centered and lined up correctly. This is a tricky and important step. You should have enough time before the glue dries to make sure that a bulkhead isn't leaning crooked to one side. You can draw a reference line down the center of each bulkhead if it will help you keep them all lined up with the keel properly. The flat tops of the bulkhead centers are another good focal point for observation. They should all be straight and consistent with one another as you glue more of them into position. This is important, as the hull will not be faired properly if they are not lined up. You should view the bulkheads from above to make sure they are glued in at a right angle to the keel and spaced evenly apart as well. You might consider using yellow wood glue for this because the open time is longer. This will give you more time to make adjustments before the glue sets permanently.

Once all sixteen of the bulkheads are glued into position, you can fair the hull. Use very fine grit sandpaper. Start with no less than 220 grit sandpaper. Finish it off with wet/dry 320 grit as well. Anything coarser will grab the bulkheads along the sides as you sand them and possibly split them. Very gently sand the edges of each bulkhead to fair the hull. Take your time with this, especially at the bow.



After the hull is faired, you can add the transom (1/16" thick). This piece was added after the hull was faired because it is only glued to the edge of the false keel. It might split or break off otherwise. It is only 1/16" thick but still needs to be faired with the bulkheads. Please use a very light touch. Carefully glue it to the back edge of the keel. There is a small notch to help you line it up correctly. Just sit the bottom of the transom on top of the notch. Make sure it is straight and at a right angle to the keel before the glue dries. Drawing a line down the center of the transom should help you line it up with the edge of the false keel.



At the bow, there are two filler pieces that will help make the hull planking easier. These 3/32" thick pie-shaped pieces should be glued to the sides of the false keel at the bow. A photo is provided that shows these two pieces glued into position along with the transom. Fair the two bow fillers to get a smooth run of your planks onto that first bulkhead. It's a tight area to work in but this is essential if you want to create the correct shape of the bow while planking. Pay close attention to the rabbet formed at the bow. It should be 1/32" wide and consistent along the stem. You should be able to insert the end of a plank into this rabbet when planking the bow. The longboat is now ready for planking.

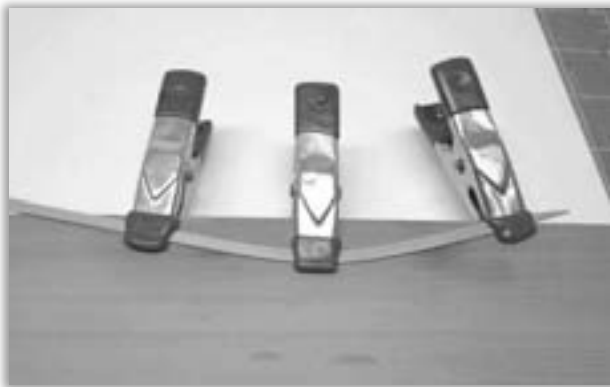
Planking the Longboat...

The longboat will be planked with 1/32" x 1/8" strips of basswood. They should be pre-bent to make planking the bow easier. To some model builders, planking a small hull like this is trickier than planking a larger one. But, if you take your time and treat each plank as a small milestone, your results will be that much better. The planks will need to bend around the bow, but they also bend edgewise. This edgewise bend gets more severe as you plank lower on the hull. One easy



method to bend a plank would be to clamp it around a plastic bottle cap, wet the strip first and clamp it into position. See the photo provided. Then use a hair dryer on the hottest setting to quickly dry the plank. This should only take a few seconds. When you unclamp the plank it will hold its shape with little or no spring back.

You can use this technique to bend a plank edge-wise too. Clamp the planks down on the edge of a table or board in the curved shape you need. Remember to wet the plank first. Then use the hair dryer to dry it. Make sure you use the hottest setting. You can twist and bend the planks to basically any shape you need, if it isn't too severe. Using the hair dryer quickly preserves the curve you want. Another photo shows a plank being "edge bent" in this way.

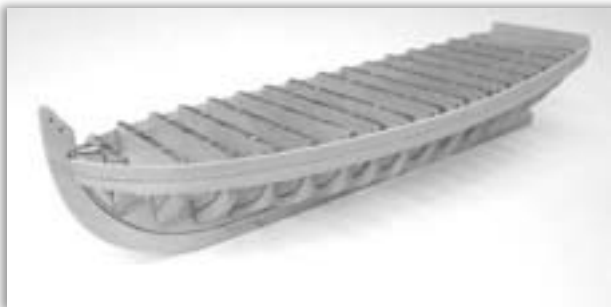


Two planks along the sheer should be added initially on the port and starboard sides. This will strengthen the entire assembly. You will be amazed at just how strong the structure will be after the first plank on each side is completed. Before you glue those first few planks on the model, examine the plans carefully. Note how the top of the sheer plank does not follow the tops of the bulkheads. The top of the sheer plank should follow the line shown on the plans. This is about 1/16" below the top of the bulkheads mid ship. You could also make the center of the sheer plank dip even lower if you prefer a more curved sheer. It's up to you, but the plan shows the sheer as it was created on the contemporary drafts. Longboats from this period had a considerable sheer in contrast to the launches later in the 18th century. These tended to have a very straight sheer. The planks were added in one length rather than



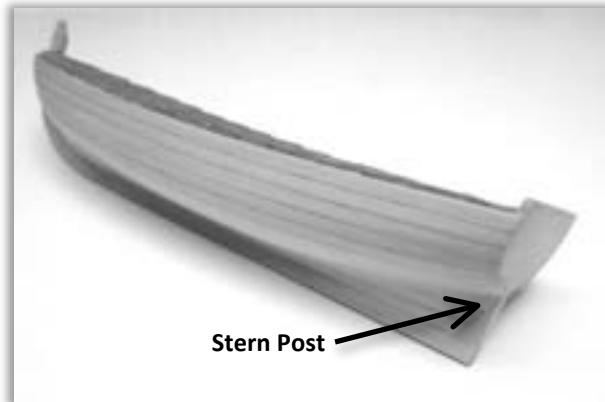
cutting each strake in two pieces. This is a simplified approach. The edges were darkened with pencil to simulate the tarred seams between each plank.

You will probably need twelve planks on each side of the hull. This includes the two initial planks along the sheer line you just added. The ten remaining planks will taper slightly at the bow. There is less area to be covered. The stern shouldn't be an issue. Take measurements to determine how many remaining planks you will need and how narrow they should taper at the bow. To do this, measure the distance along the edge of the center bulkhead from the keel up to the bottom edge of the second plank you added. Divide that distance by ten (assuming ten remaining planks). That should give you the width for each plank in the middle of the hull. Repeat this process on all of the remaining bulkheads and divide by ten as well. You will notice that the strips will start to get narrower as you approach the bow. This will help you determine how much each plank should taper towards the bow. You should also take these measurements towards the stern. Some model builders will even mark the locations for each strip on the outside edges of each bulkhead. It makes it easier to visualize the run of the planks across the hull.

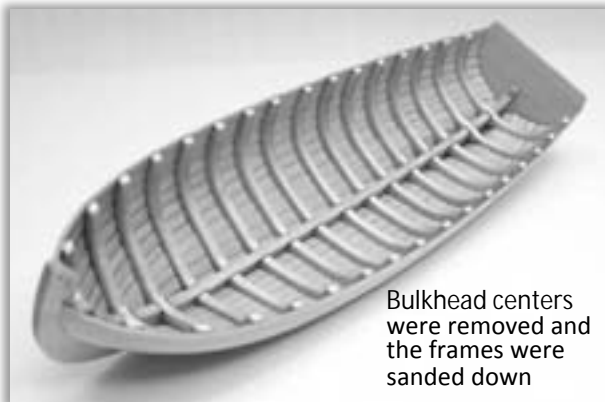


Based on the measurements you gathered, place two strips along the keel. The lowest plank or "garboard strake" has quite an extreme twist to it. It will twist at nearly 45 degrees as it ends up flat against the keel towards the stern. This twist can be pre-formed using the hair dryer as well. Wet the plank and secure one end with a clamp. Then twist the plank as needed by gripping the other end with pliers and twist. While holding the twisted plank securely, dry the plank with the hair dryer. If after you test the plank it doesn't fit because it was over twisted or under twisted, simply wet the plank and repeat the process until you get the correct shape. The garboard

plank should start just ahead of the scarp joint at the bow. Don't start it too far forward because your planks will need to taper too much in order to fit ten strips. Start the garboard strake about 1/8" forward of the scarp joint on the keel. You



can get a good idea of the run of the planking in the photos provided. You can see how the planks would need to be bent and curved at the bow. Let the strips run beyond the stern so you can carefully trim them back afterwards. You can trim each plank flush with the false keel after it is glued in place.



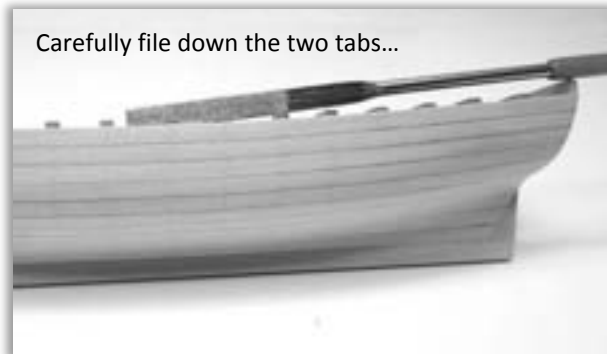
Finish up the planking by adding a few more...work from the keel upwards. Then add a few more planks working from the top down. If you proceed in this fashion, the last plank will be somewhere in the middle of the hull. You will have to shape it to fit. Maybe a slightly wider plank is needed than

1/8", maybe a little narrower? Then slowly shape it to fit. One additional note on the planking would be to mention how the edges of each plank will need to be beveled. In order to set a plank's edge flush against the plank already on the model, you will sometimes have to bevel the edge. This is true where the convex curve of the hull doesn't allow the two edges to sit flush against each other. Use a flat file to bevel the edge until it fits flush against the plank already glued to the hull. This may require some test fitting, reshaping and further test fitting until it fits perfectly.

The hull was sanded smooth when the planking was finished. Trim the ends of all the planks flush with the false keel at the stern. Add the laser cut stern post and trim the keel flush with it. Carefully file all of the hull planks flat so the stern post will sit flush against them.

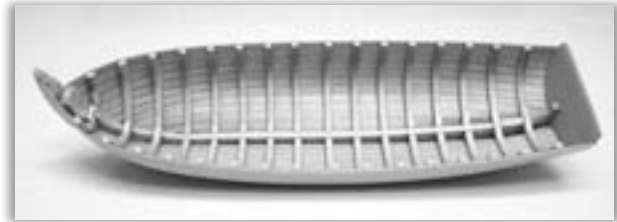
Removing the Bulkhead Centers...

A photo is provided below that shows the longboat after the center tabs have been carefully removed. This can be a very anxious procedure, but it needn't be. Basically, you will be separating the center of each bulkhead from the two tabs at the top of each frame. Resist the urge to grab your hobby saw to cut through them quickly. It is far better to use the edge of a flat needle file. File the tabs gently on each side of the hull and remove the center of the bulkheads one at a time. You can also hold the top of the bulkhead in the center while you file down the tabs. This will give it extra support. The wood



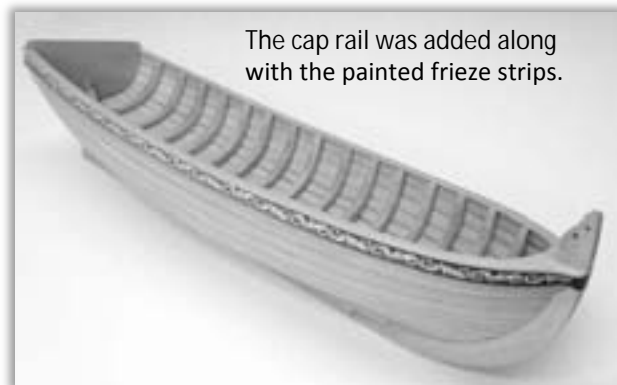
grain is horizontal and the center will want to flex fore and aft as you file away the tabs. Try and hold it vertical and keep it immobile while filing. Before you begin, give the bulkheads a little "wiggle" to check how well they are glued to the top two planks. If you see that the bulkheads are loose, add more glue before you start to remove that bulkhead. It is very important that the bulkheads be securely glued to the top two planks to avoid splitting the frames as you file them. After you file the tabs away, simply bend the center forward and then aft to snap away the tab on the keel. This will free the center completely. Repeat the process to remove all of the centers for each bulkhead.

Then sand the frames and keel to reduce their thickness and fair them inboard. The photo shows the interior after the prototype was sanded and faired.



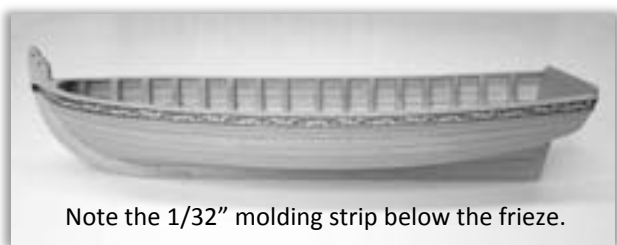
Finishing the Outboard Details of the Longboat...

Sand the tops of the frames and the sheer to get a smooth run bow to stern. The cap rail will be added next. To make the cap rail, hold a 1/32" thick sheet of basswood on the top of the longboat. You will be creating the cap rail for the longboat on one side only. Press the sheet firmly down against the top of the frames. Take a pencil and trace the outboard outline of the



hull. This will give you the general shape of the cap rail. Draw another line 1/8" inside the traced outline to create the cap rail template. Cut out the cap rail with a sharp blade but cut outside of your lines to make it even wider. Leave plenty of extra meat on the cap rail because it will be easier to sand it to the proper width after it is glued on the model.

Repeat the process to make the cap rail for the other side of the boat. You can notch the aft side of the cap rail to fit around the transom. Then glue it on top of the boat's frames



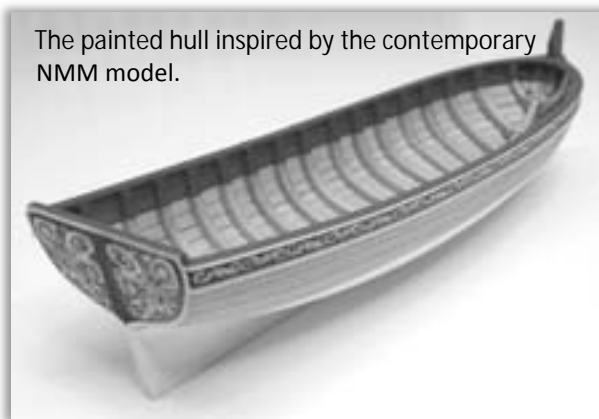
and sheer plank. It will be very wide and out of scale at this point. Carefully sand the outboard edge until it creates an overhang that is 1/64" wide. Then sand the inboard edge until the entire cap rail is 3/32" wide or slightly wider. 1/8" would be too wide. It will flare a bit at the bow and be slightly wider there. Examine the photo that shows the cap rail sanded with the correct shape. You may also note a small filler piece that was inserted between the two halves at the bow (just aft of the stem). There will be a small space there which needs to be filled. You could shape each half of the cap rail so this filler isn't needed but either way is good.

Applying the printed frieze...

This would be a good time to add the painted friezes to the model. You could actually paint them on the model but they are very small. An alternative would be to use the printed friezes provided with the kit. Carefully cut the thin strips out with a sharp blade. Apply them to the model with some spray adhesive. The strips should be placed under the cap rail. You should also carry it onto the sides of the stem. The front of the stem can just be painted black to simulate the frieze wrapping around to the other side of the boat. Directly beneath the frieze, a 1/32" x 1/32" strip of basswood molding should be applied. You can use the edge of the paper frieze as a guide and the molding should sit directly against it.

The stern transom also has a painted frieze. Several sizes are provided in the kit. Cut the frieze to fit on "your" stern transom. The frieze should be cut so there is a 1/32" wide border all along the edge surrounding it. This border should be painted white as shown in the photographs provided. The supplied paper transom frieze has been purposely made oversized so you can cut it so the 1/32" wide border can remain. One way to test this would be to make a few photocopies of the stern frieze. Try cutting it out so it's the proper size that leaves consistent border all around it. When you are satisfied, trace the photocopy shape over the printed color version so you can cut it to match.

Before cutting the painted friezes from the sheet of paper, you should spray it with a protective artist's fixative. This will help prevent it from fading, or smudging over time. The small round painted pieces will be used for the rudder later on in the project, so don't throw away the sheet. Set it aside for now.



Painting the model...

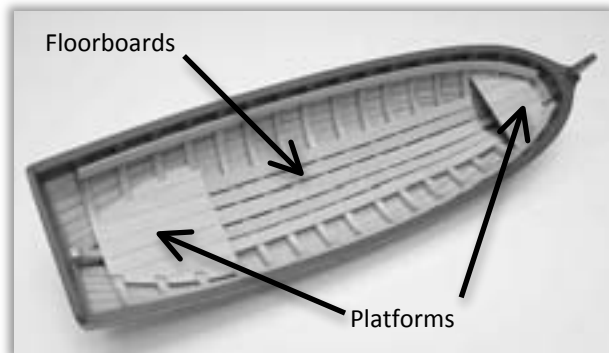
After the friezes are completed and you have added the molding strip on each side of the hull, you can paint it. The colors chosen for the prototype were copied from the contemporary models it was inspired by. The top of the cap rail is painted red. The red paint extends inboard as well. Examine the photos provided. The frames and inboard planking was painted red down to the bottom of the second plank. You can use the seam for the bottom of the second plank as a guide to help you keep the painting neat and crisp. The inboard side of the transom was painted red also along with its top edge. The stem above the cap rail is also red.

The outboard edge of the cap rail is painted white. This must be done carefully to avoid getting paint on the printed frieze. Try and create a sharp clean line separating the white edge with the red top of the cap rail. The molding strip under the frieze should also be painted white. Both of these white stripes are painted along the front of the stem to carry the design to the other side of the hull. This can be seen in the photos provided. To finish off the white trim, paint the 1/32" wide border around the frieze on the stern transom. Once again, try and keep a crisp line separating the top edge of the transom, which is painted red.

Below the waterline, the hull is painted white. This is optional. During this time period, the bottom of the hulls were either painted with white tallow below the waterline OR coated with rosin. The rosin was a protective sealer that allowed the color of the wood show through. Therefore you could leave it natural if you think the "white stuff" is too stark and overbearing.

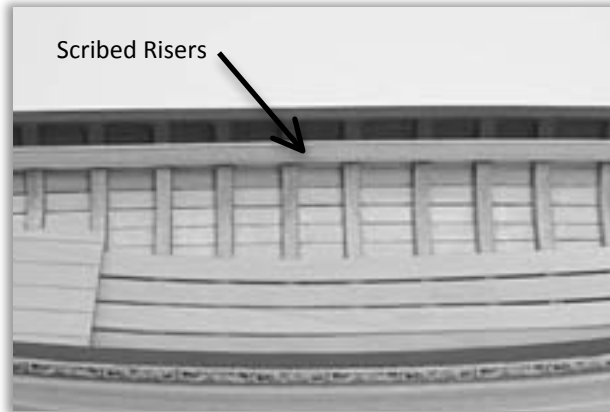
Inboard details...

The floorboards were glued into place first. They are shown in the photos provided. The center floorboard or "keelson" is 3/16" x 1/32". The two on each side of the center strip are 5/32" x 1/32". Leave a consistent air space between each floor board. Cut them to length using the plans as a guide.



The two platforms (bow and stern) are added next. Basswood strips (3/16" x 1/32") were glued together edgewise. A pencil was used to darken the edges before gluing. A paper template was cut using the plan as a guide. Once you determine that the paper template fits in position, you can use it to trace the shape of each platform on the wood you glued together. Glue them into place as shown in that same photo. You may notch each platform edge to fit around the frames as in real practice, but for your model you can simplify the process if you like and omit this detail. You can simply glue the platforms in position without notching them and they will sit flush against the inboard edges of each frame.

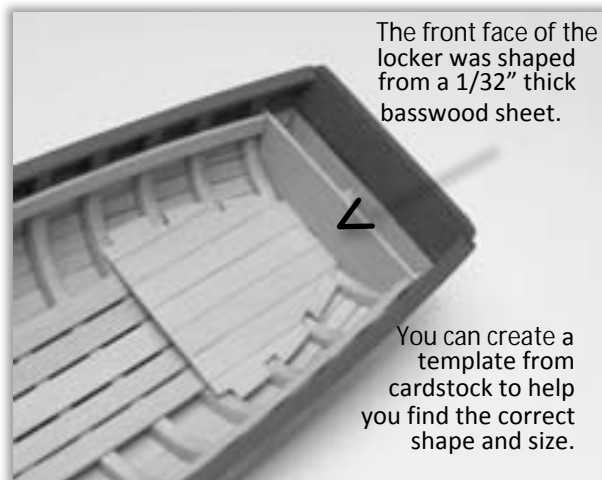
The risers (or risings) were added next. These are support strips for the thwarts (or seats) of the longboat. The risers are made using a 5/32" x 1/32" strip. Cut it to length as shown on the plans and in the photos. The important part of installing this strip would be to make sure it is a consistent distance below the cap rail. Measure and mark this distance on all the frames before you glue it into position. This will ensure that



the risers are the same height on the port and starboard sides. The top edge of the riser should be placed $7/32$ " below the top of the cap rail. On the prototype for the model, the riser was carefully bent edgewise to make it sit properly against the frames at the bow. You can create a card template to help you determine the actual curve needed. This slight downward curve is essential and will help you keep the riser at a consistent distance below the cap rail from bow to stern.

You will sometimes see scribed grooves running down the top and bottom edges of the risers on some contemporary models. This is a wonderful detail to add. The grooves were scratched into the wood strips before they were bent edgewise. You can run the point of a sharp awl against a metal straight edge to create them. Don't apply too much pressure, since they don't need to be very deep grooves. This is just a decorative detail. After you stain the risers, the scribed lines should show even more. A few light passes along the metal ruler should do the trick. You should practice a few times on some scrap wood and stain it. This will give you a good idea of how deep the grooves will need to be.

All of these interior details were stained with a 50/50 mixture of MinWax "Golden Oak" and Minwax "Natural" stain. Mix



the two together in an old glass jar with a lid. This way you can use it to stain all of the parts for this project and keep them a consistent color.

Under the rear seat of the cockpit you will sometimes see a small locker on some contemporary longboat models. The front face of this locker was created next. It will be made from a $1/32$ " thick basswood sheet. The best way to find the shape for this piece is to use the plans as a guide. Trace the shape of the last bulkhead (7) onto some cardstock or heavy paper. Cut it out and test its fit. The front of the locker will sit against the aft side of the frames as shown in the photo below. The template should be slotted to fit over the keel and sit against the aft side of the frames. Once your template is shaped properly, trace it onto the $1/32$ " thick sheet provided. Make sure the wood grain runs across this piece port-to-starboard. Glue it into position as shown in that photo.

The thwarts (or seats) were made from $1/8$ " x $1/32$ " strips. There are eight thwarts on this longboat. One of them is slightly wider because it has a circular notch filed into it for the mast. This thwart was made using a $3/16$ " wide strip. All eight thwarts were cut to length and test fit in position. They weren't glued into position permanently so they could be spaced consistently according to the plans. Their positions along the risers were marked with a pencil. You might notice in the photos throughout this chapter that the thwarts have a molded/scribed edge. This can be created the same way as the scribed detail for the risers. You can do this to a long strip of basswood before you cut the thwarts to length. This will help make the grooves consistent for all of them. NOTE: There is more space left between the thwarts where the windlass will be placed. Carefully place the thwarts with the same spacing shown on the plans. You can also see how the thwart ends are notched around their respective frames when needed.



The wider thwart that is notched to receive the mast was completed entirely off the model. All of the ironwork and belaying pins were added to it before it was glued on to the longboat. Use the plans as a guide to file the circular notch and shape the aft profile of the thwart. The mast will be $5/32$ " in diameter so make sure the mast will sit firmly into the notch when you are done. Use the brass strips ($1/32$ " wide x $1/64$ " thick) to make the iron straps. The iron band that forms the bracket for the mast was glued onto the edge of the thwart first. Simply bend it around the $5/32$ " dowel you will be using for the mast so you have a "half" circle. Then bend back the two ends on either side of the half circle. When placed against the edge of the thwart, it should complete the full circle for the mast, which is again $5/32$ " in diameter. Make sure it will fit before you glue it into position.

Two support straps made from the same brass strips are then pre-bent around a scrap piece of 1/32" thick basswood. The two ends for each strap should be cut to length. Slip the straps onto the thwart on both sides of the mast hole. This detail is shown in the photo on the previous page. This metal work should be blackened or painted black.



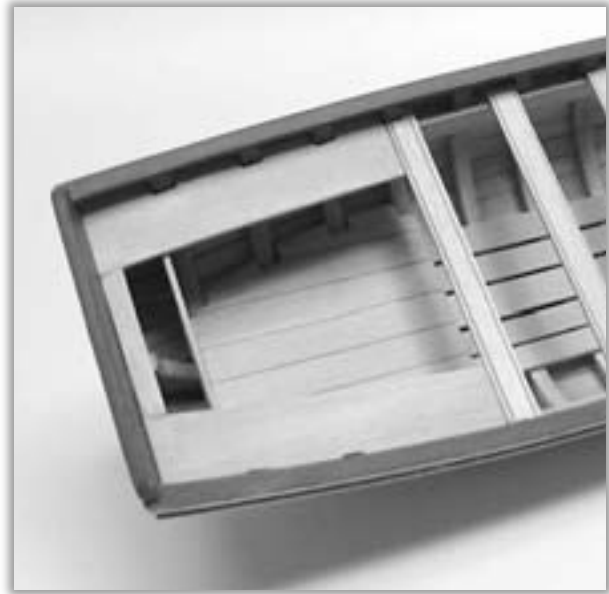
Alongside each of these support straps you will see two belaying pins. Brass belaying pins are supplied for these. They should be painted to resemble wood. Since there are only four belaying pins needed for the kit, you might also consider making new ones out of wood. This will look the most authentic, but you must use a very hard wood like boxwood or maple. You don't want them to break when you are belaying the rigging to them later. Glue them into pre-drilled holes as shown on the plans and photos. This thwart can be glued into position when you are finished.

Finishing off the Cockpit, Locker and Inboard Details...

The seats for the cockpit are laser cut for you. Even so, they were cut longer and wider than you will need them. This was done to give you some extra meat to shape them. They are 1/32" thick.

The seats on the sides of the cockpit should be completed first. They should be shaped to fit snug against the last thwart and the transom. The transom is angled and therefore the aft edge of the seats should be beveled to sit flush against it. Then notch out the sides of the seats to fit the frames as shown in the photo above.

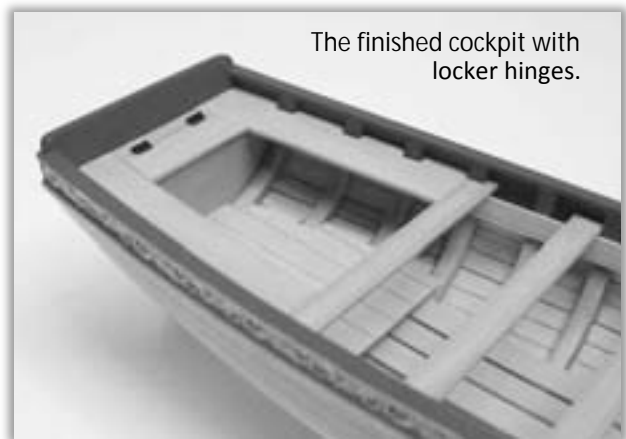
The lid of the locker is hinged with two butterfly hinges. First, glue a 3/32" x 1/32" strip against the transom (and between the two seats) as shown in the same photo. Bevel the back edge so it sits flush against the transom. Then shape the 1/32" thick piece that will become the lid for the locker. This piece should over-hang the front face of the locker slightly. To finish off the lid for the locker, make the two butterfly hinges from small lengths of brass strip (1/32" x 1/64"). On top of these small brass pieces you can glue a tiny length of 28 gauge black wire. This will simulate the hinge pin. Center

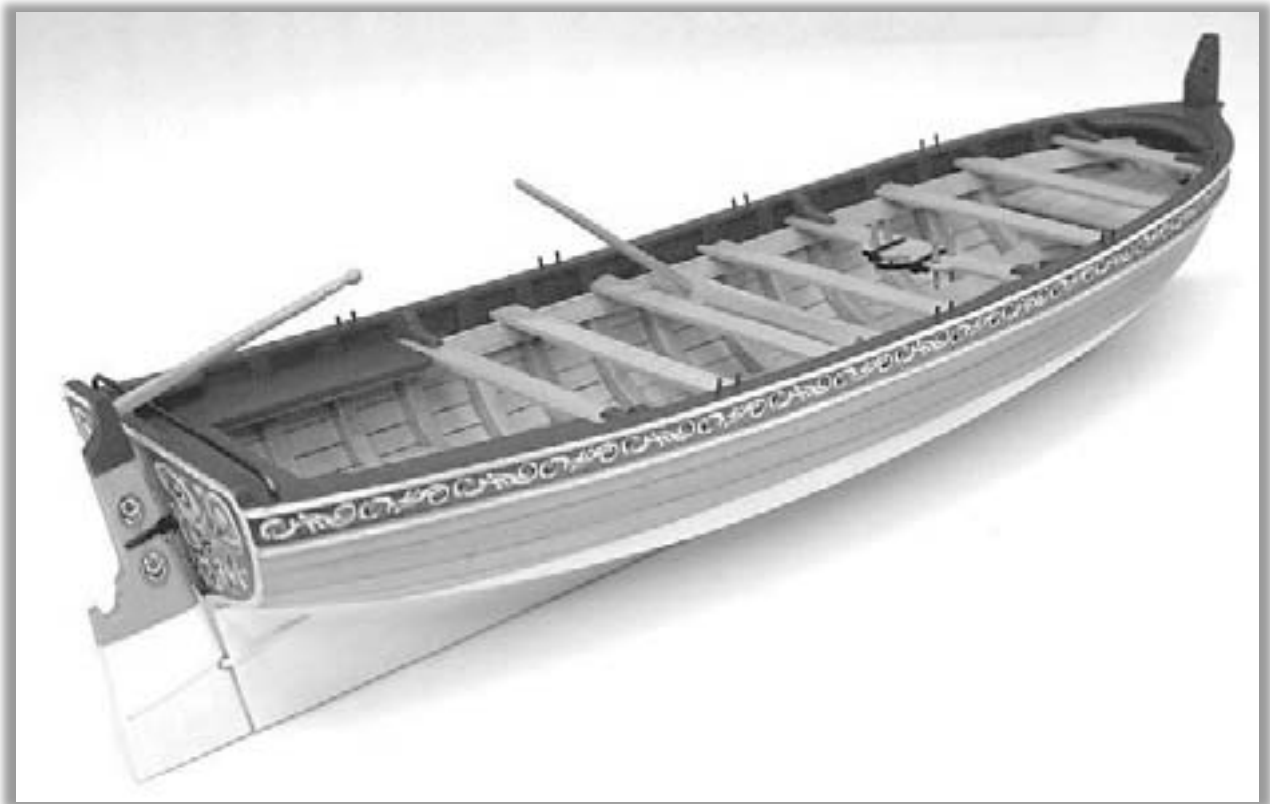


the wire across the brass strips. Paint them black and glue them into position.

On most contemporary models, the tops of the cockpit seats and locker are painted red. You can see how the locker looks if left unpainted in the photo above. The prototype was painted red later to match the contemporary models it was inspired by. The decision is yours.

Various knees are shown on the plans. Six are positioned on top of some of the thwarts and against the sides of the boat. There are more knees at the stern just above the cockpit seats and one additional at the bow. These are all laser cut from either 1/32" or 1/16" thick sheets. Shape them to fit in position. Those shown above the cockpit seats and against the transom (1/32") were painted red. The knees on the tops of the thwarts (1/16") were also painted red. The larger one at the bow (1/32") was painted red as well.





The windlass is made using a 5/32" x 5/32" strip of basswood. Cut it to length. Then mark the locations for the two squared sections of the windlass on all sides of the strip. The area between these squared sections and on the outside ends is eight sided. These sections of the windlass can be filed down to create the eight sided profile. Just file down the four corners of the strip carefully to create an eight sided profile. While filing, be conscious of how you define the two squared sections of the windlass. Drill small holes in the center of each of the squared sections. These holes should actually be square. If you want to make them square, one method would be to find a square metal rod to use as a punch of sorts. On the prototype, the non-business ends of my needle files were actually square and the right size. So they were pushed into the holes which turned them from round to square. Some minor cleanup to the edges was still needed and a sharp blade was used to make them more defined and crisp. Keep the holes lined up on all four sides of the windlass.

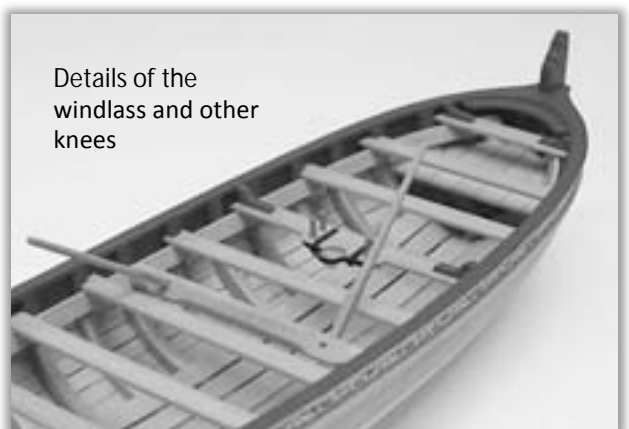
Drill a small hole into each end of the windlass. Insert a length of 22 gauge black wire. You only need a short length

to create a pin on each end of the windlass. Corresponding holes should be drilled into the center of the risers where the windlass will be placed. The windlass should be pushed down until the pins on each side of the windlass are secured in the riser. To do this, the pins need to be very short. Insert one end first and then push the other side down until it slips into the hole in the other riser. The windlass will actually turn as on the real longboat.

The windlass has two handles. These are made using 1/16" x 1/16" strips. Cut them to length and round them off entirely, except for the end that is inserted into the windlass. This area is tapered to a square to fit in the square holes of the windlass. Usually only one handle is shown inserted into the windlass on a contemporary model. The choice is yours. The other one can be stored neatly on top of the thwarts. Whatever you choose, it would be best not to glue them into position now. Set them aside and add them after the rigging is finished. They will be less likely to get damaged this way.



Details of the windlass and cockpit knees



Details of the windlass and other knees

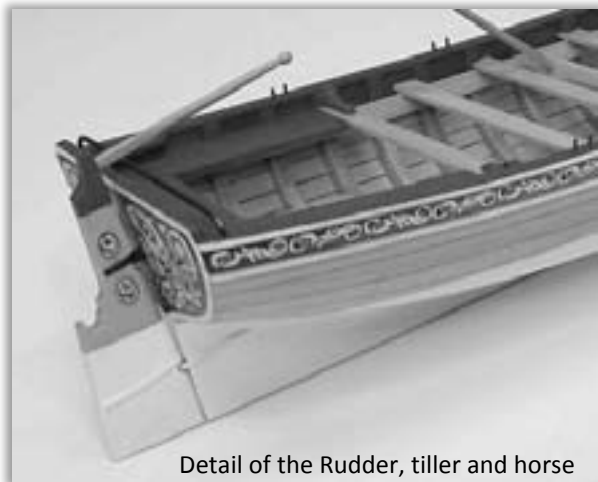


Adding the Rudder and some Misc. Ironwork...

There are two eyebolts with split rings on the longboat. They were glued into the floorboards and were used to lift the boat when being deployed. Add these rings after painting them black. They are made by opening up the split rings and slipping them into the eyebolts. Then glue the “tail” of the eyebolt into a pre-drilled hole in the floorboards. It would be best to cut the “tails” a bit shorter first. They don’t need to be very long. Examine the plans for the exact locations for these two eyebolts.

At the stern you will see the “horse”. The horse is the metal bar that spans across the boat (just forward of the transom). This is made using 22 gauge black wire. Just bend the ends and insert them into pre-drilled holes in the top of the cap rail. The horse allows the sheet blocks to travel port to starboard and thus the boom and sail as well. Up to the mid-18th century, the horse was positioned as shown on the model. This presented a problem while sailing, as the tiller would get in the way. It wouldn’t allow the block to slide effortlessly from one side to the other.

To remedy this, during the second half of the 18th century, they started making the horse so it actually spanned over the tiller. You may opt to do so as well. But since this model is

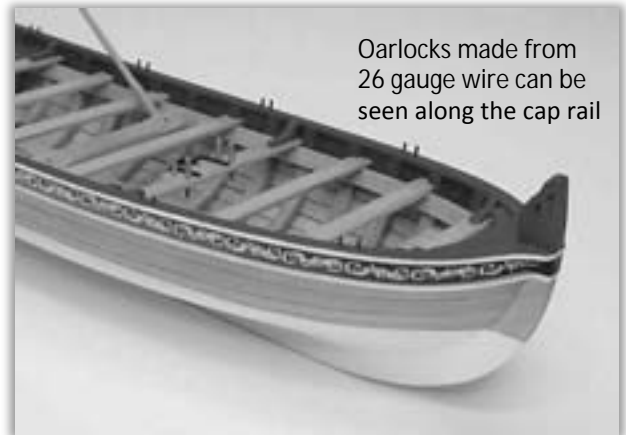


Detail of the Rudder, tiller and horse

inspired by several contemporary longboat models in the NMM, it was created as shown on those models. These contemporary models represent the horse prior to the improvement being made.

The oarlocks are simple to make. These are made using 26 gauge black wire. Just drill the holes on the top of the cap rail. Carefully position them in pairs as shown on the plans. Cut small lengths of wire longer than you will need and insert them into the holes. It’s easier to snip them all down to the same height after you glue them into the holes. You can paint them to look like wood or red (as on the prototype) or leave them black.

The rudder is laser cut for you (3/32” thick). Just sand off the laser “char” and begin tapering the rudder. The rudder tapers



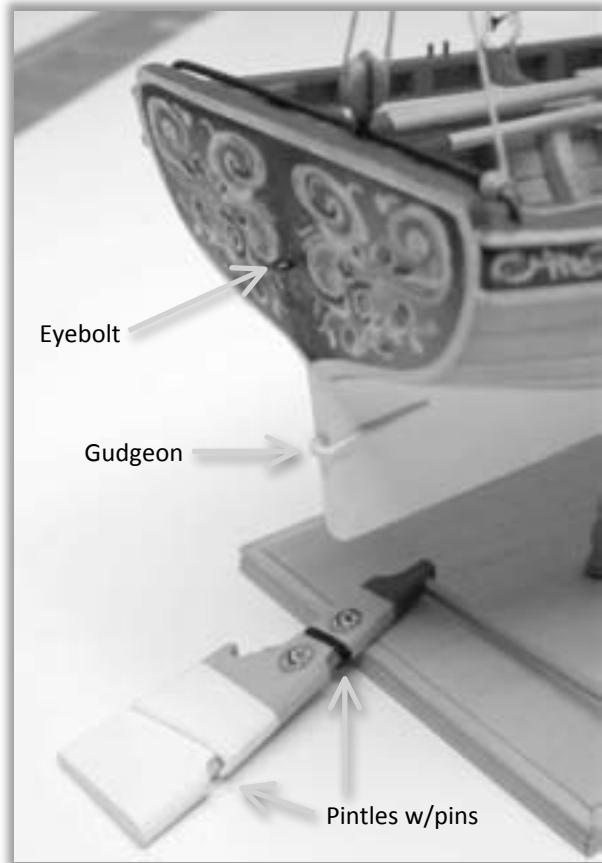
Oarlocks made from 26 gauge wire can be seen along the cap rail

aft below the waterline. It should gradually taper from 3/32” thick to about 1/16” thick in the lower aft corner. If you were viewing the rudder from directly behind it, it would gradually taper down the height of the tiller from 3/32” to 1/16” as well. The forward edge of the rudder that sits against the hull should be rounded off. There should not be a hard edge against the transom and stern post. The rounded edge becomes more pronounced below the top notch for the pintles (rudder hinge).

Paint the rudder as shown in these photos and on the plans. The tip of the rudder head is red and the white stuff is extended across the bottom. The white area should be consistent with the hull as it transitions onto the rudder.

Then create the pintles and gudgeons from the brass strips (1/32” x 1/64”) supplied in the kit. The “pintles” are the half of the hinge placed on the rudder. Bend the brass strip around the rudder so you can cut each leg to length. Examine the plans to find the length for the pintles. Add them to the rudder and use a tiny length of 28 gauge black wire for the pindle pins. Glue the wire pin against the inside of the bend in the

brass strip. This bend in the brass strip should sit flush with the forward edge of the rudder. You may have to file the laser cut notches deeper in order to accomplish this. The pintles should be glued into position at a right angle to the forward edge of the rudder. This detail is clearly shown on the plans. When the rudder is installed on the model, there should be little or no space between it and the stern post and transom. To accomplish this, the pintle should not stick out past the forward edge of the rudder.



Hold the rudder against the stern post so you can mark the locations for the gudgeons. There will actually be only one “gudgeon” on the hull. This is the name of the other half of the rudder hinge that is placed on the hull. Only the lower pintle will have a gudgeon partner. The pin in the upper pintle will simply be slipped into an eye bolt glued into the transom. Basically, you will be setting the pintle pins down into the eyebolt on the transom and the gudgeon. Note how the bottom of the rudder is even with the bottom of the keel. Don’t position the rudder on the model permanently yet. It will be easier to add the tiller before you do so. You can now add the small printed circular pieces to each side of the rudder as shown in the photos and on the plans.

The tiller was made by shaping a length of 1/16” x 1/16” basswood. Traditionally, you will see a straight tiller on these longboats (circa 1750-60), but some of you may prefer one that is curved. Although I haven’t seen a contemporary model or original draft with a curved tiller, many model builders today will add this feature. The more historically accurate version would be to go with a straight tiller. Both versions are shown on the plans for you to choose from.

The tiller should be shaped with a small tenon on its aft end. This tenon will be inserted into a hole you must drill into the rudder head. A drop of glue will secure it well. The forward ¼ of the tiller is rounded while the aft side is left square. The handle has a little ball on the end and you may want to create a fancier handle if you feel comfortable doing so. The tiller does taper very thin as it works its way towards the handle. You should taper it quite a bit to avoid having the tiller look out of scale.

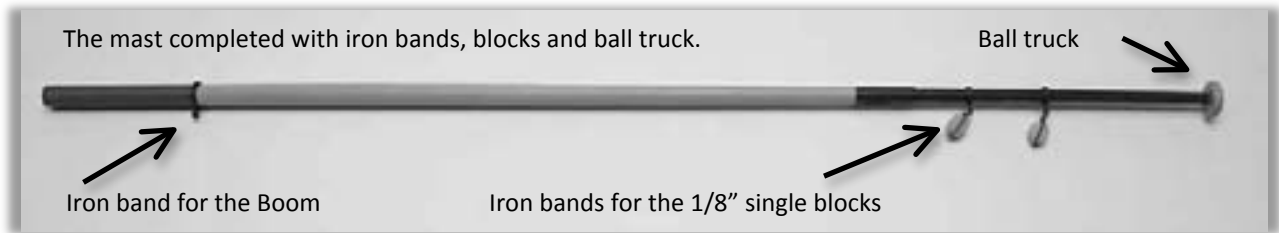
Install the rudder when you are done.

If you haven’t done so already, this would be a good time to consider how you will display the model when it’s finished. The prototype will have two posts that are only 1/8” diameter at the widest point. They taper down to just 1/16” on the top. Two small holes were drilled into the keel so they could be inserted to a depth of about 3/32”. The posts are very simple in design. You could just use a brass rod cut to length. This approach doesn’t “overtake” such a small model and allows it to be the focal point. Using a cradle might be too large and compete for attention. Whatever method you choose, if you need to drill holes into the bottom of the keel this is probably the last “best” opportunity to do so. The photos shown throughout the second half of this guide will give you an idea of how a small and simple display base would look...

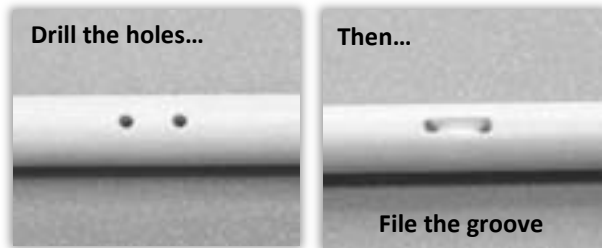
MASTING AND RIGGING

Making the mast...

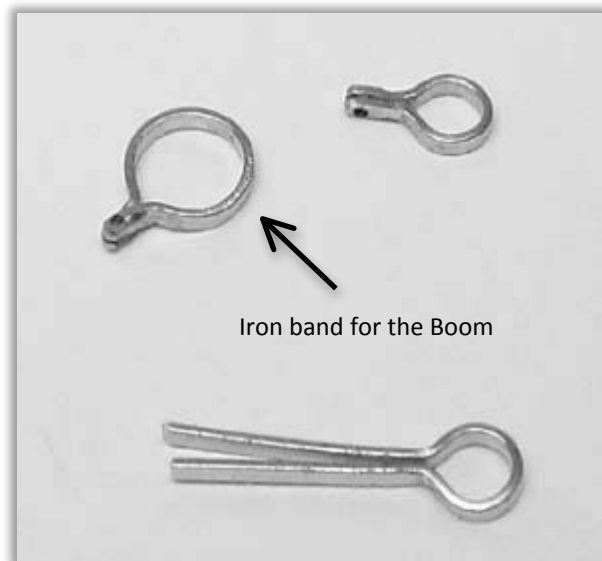
The mast is made from the 5/32” dowel supplied in the kit. The mast is tapered above the thwart. It also has a very slight taper below it. Its widest point would be where the mast strap is located on the thwart. With this in mind, shape and taper the mast as shown on the plans after cutting it to length. One way to do this quickly would be to chuck the mast in a power drill and run some sand paper across it until it is tapered as desired. Just cut the dowel a little longer so the heel of the mast isn’t damaged by the drill chuck. That portion of the mast can be cut off after you are finished. Remember to create a small tenon on the top of the mast which will be used to secure the ball truck in position. You can also create one on the bottom of the mast. This one is optional. You won’t have any problems stepping the mast if you don’t have a tenon there. That will be described later.



There are three sheaves which need to be created. They are all drilled through the mast running fore and aft. To simulate the sheaves, drill two small holes through the mast to define the length of the sheave. Then file or cut a shallow slot connecting the two holes. Don't make it very deep because the mast is not very thick where the sheaves are located. You will need to make this slot on both sides to effectively simulate a sheave. Before doing any carving or filing, some model builders will score a line on each side of the groove (from one hole to the other) with a sharp #11 blade. This makes it easier to keep a nice clean edge to the slot that simulates the sheave. See the photos below.



Once the mast is shaped, you can fabricate the ironwork for it. There are two iron bands around the top of the mast which have 1/8" single blocks stopped to them. Another iron band below those will be used to secure the heel of the boom. The heel of the boom has a hook on it which will rest in the eye of this mast band. Use the brass strips (1/32" x 1/64") supplied in the kit to make these mast bands. Wrap a small length of the strip tightly around the mast where the band will be located. Squeeze the two loose ends together with a pair of



needle nose pliers. The doubling of the loose ends will become the extended portion of the mast bands. They should be cut to length. I found it easier to cut the extension to the correct length after I drilled the hole through it.

The photo (below left) shows the three mast bands. The one on the bottom has just been wrapped around the mast. You can see how the two loose ends were squeezed together. It has not yet been cut to length. You can solder the loose ends together if you feel comfortable doing so. Soldering is not required but it would be the best method for holding them together securely. The two ends were simply glued together on the prototype. Gap filling super glue (CA) was used. When fully dry, the joints were filed down and then sanded with 320 grit sandpaper. The gap filling CA hides the seam and when filed down carefully will look solid. This is especially true after they are painted black.

The two mast bands on the top of that photo are completed. You can see that a tiny hole was drilled through the extended part of the brass ring. This is where you will seize the blocks to the mast bands. The boom iron has a hole drilled through it as well. But this time, the extended portion of the band was rotated so the hole is located on the top rather than running side-to-side. This was done before the hole was drilled through it. The two ends were just twisted with a pair of pliers.

When drilling through brass with small drill bits, you must use a light touch. Let the bit do the cutting. If you try and rush by applying too much pressure, the drill bit will snap. Just take your time and eventually you will work your way through to the other side. To help prevent the drill bit from wandering as you start your hole, use a sharp awl to make a small dimple in the soft brass first.

You can paint the bands black when you are finished. Some people find it easier to paint them after they are glued onto the mast. You should use the method that works best for you. Slip the mast bands into position on the mast and glue them in place. Once that's done, you can paint the mast as shown on the plans.

The top of the mast has a ball truck with two sheaves. It's quite small and 1/16" thick. You can make the truck from a scrap strip of 1/16" thick basswood. Its best to drill the four holes and simulate the sheaves before you cut the truck free from the strip. This will help prevent the small round piece of wood from splitting as you drill the holes. Try and keep the ball truck as round as possible. Its size can be taken from the plans. The small sheaves were used for the flag halyards. Our longboat model will have one flag halyard on the starboard side. Even so, both sheaves should be shown on the ball truck. An additional hole should be drilled "part way" through the

center of the ball truck. This is the hole that will fit the tenon on top of the mast. Glue the ball truck on top of the mast when you are done.

Seize two 1/8" single blocks to the iron bands you added. See the photo below and the plans for details.

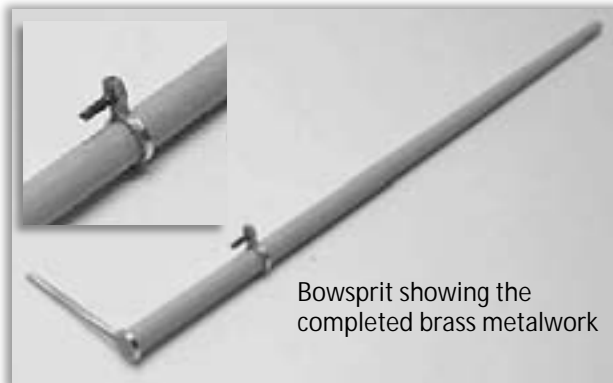


The mast can be installed or "stepped" on your model at this point. The actual mast step is shown on the plans. It is 1/16" thick. You can cut this small square piece from any scrap basswood you have, as it is so tiny. Bevel the four sides. If you created a tenon on the bottom of the mast, you should drill a corresponding hole in the center of the mast step. If you didn't create a tenon that is ok. You don't have to drill the hole in the mast step. Just sit the mast on top of the mast step.

Glue the mast step directly below the opening in the thwart for the mast. The mast has no rake at all and should be perfectly vertical. If for some reason the mast leans aft a little bit, that would be ok too. But try and keep it vertical. With the mast step in position, you can slide the mast through the opening in the thwart and glue it securely to the top of the mast step.

Making the bowsprit...

The bowsprit can be made using a 1/8" diameter dowel supplied in the kit. Cut it to length and taper it as shown on the plans. You should also create a simulated sheave on the end of the bowsprit. The bowsprit is secured to the hull with two iron supports. They should be made using the same brass strips that were used for the mast bands. The process is the same. A band of iron wraps around the heel of the bowsprit

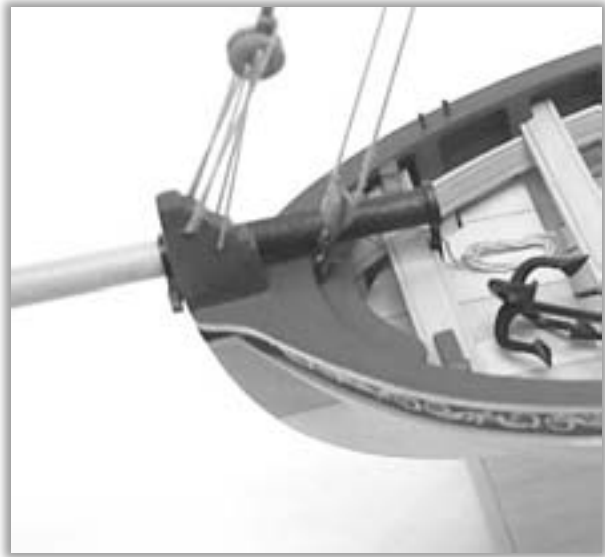


Bowsprit showing the completed brass metalwork

and is supported by a long post. You can squeeze the brass strip around the heel of your bowsprit and create a long doubled extension. Glue or solder the two loose ends together as before. A smaller second band is shown just forward of this one.

The second band is made in the exact same way. This time the extended piece created by gluing the loose ends together is much shorter. A hole is drilled through the extension so a short pin can be inserted. The pin is made from 22 gauge wire. This should be glued or soldered in position. Once both brass pieces are finished, you can test the bowsprit in position. Don't glue the brass bands on the bowsprit yet because they may need to be adjusted.

The bowsprit is positioned on the starboard side of the stem. It sits on top of the cap rail. The longer brass piece or "bowsprit step" is not initially glued to the heel of the



bowsprit. Instead, it is glued onto the model first. Determine the position for it and drill a hole through the forward platform. Drill the hole so the bowsprit step will sit against the edge of the first thwart as shown in the photo above. You may also file a notch into the thwart for it, which will secure it even more.



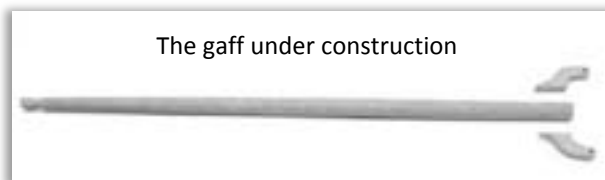
The mast and bowsprit have been stepped

Test the bowsprit in the step to see if it is positioned at the correct height. It should sit on top of the cap rail and against the stem. Then slide the smaller brass band with the pin up against the stem. The pin will be inserted into a hole you must drill on the front side of the stem. It should be centered on the stem and appear just above the cap rail. This will offset the extension so it is angled downward. That's OK...the bowsprit iron should be angled as shown in the photos provided. After making any small adjustments, you can glue everything into place permanently.

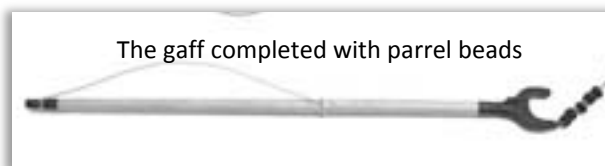
The bowsprit can be painted as shown on the plans or in the photos. Contemporary models show it with either paint scheme. The difference being that the inboard side (between the two iron bands) can be painted either red or black. The ironwork is always painted black.

The boom is quite easy make. It is also made from a 1/8" diameter dowel. Just cut it to length and taper it as shown on the plans. A hook can be fabricated from 28 gauge black wire. Glue the hook into a hole drilled into the end of the boom. The hook will be inserted into the "boom iron" located on the mast. In addition to the hook, a 1/8" single block should be seized to it for the boom sheet tackle. Check the plans for its exact location. You can see this block seized to the boom in the photograph (right). Remember to create an "eye" on the bottom end of the strop when you rig the block. The sheet tackle will originate from this block and will be seized to this "eye". Paint the boom as indicated by the plans.

The gaff is made from 3/32" diameter dowel. It is tapered on both ends. The gaff has a set of jaws which need to be made from 1/16" thick basswood. It is recommended that you drill the hole on each jaw before you cut it from the strip of basswood. This will make it less likely to split when you drill the hole. The heel of the gaff can be flattened out a bit on both sides to accept the jaws. Glue them into position. See the photos below.



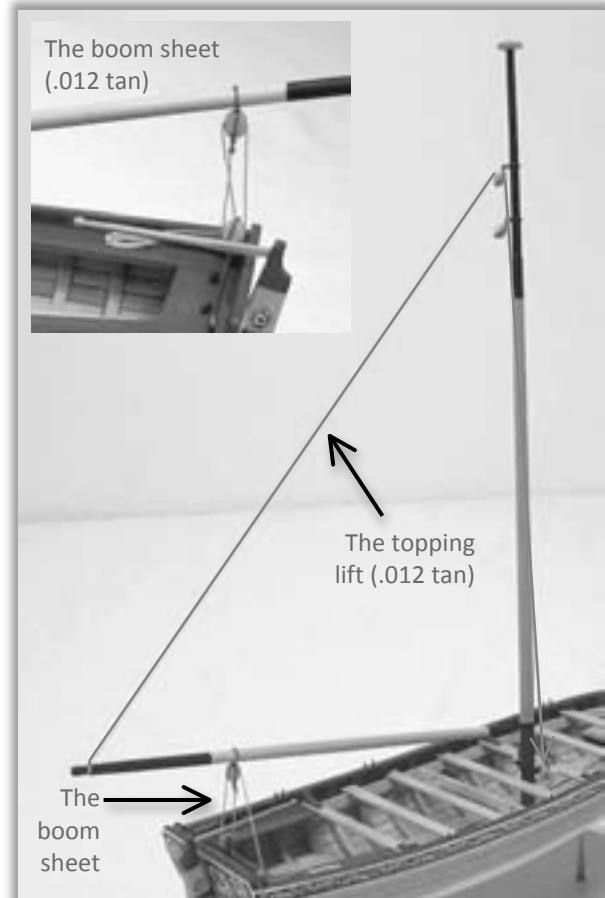
The gaff under construction



The gaff completed with parrel beads

An eyebolt should be glued on top of the jaws for the throat halyard. This detail is shown on the plans. Paint the gaff as shown on the plans and in the photo above. To complete the gaff assembly before rigging starts, a short length of rigging line must be added. You can see in the photo how .012 tan rigging line is seized to the peak of the gaff. The other end is seized to the middle of the gaff. The exact configuration can be taken from the plans. Note in the photo how this span of rigging is left loose.

Seize another length of .012 tan rigging lone to one of the jaws. Then slip 4 or 5 parrel beads onto the line. Don't seize the other end of the line yet. That will be done after the gaff is placed on the mast. Just set it aside for now because you are now ready to start rigging your model.

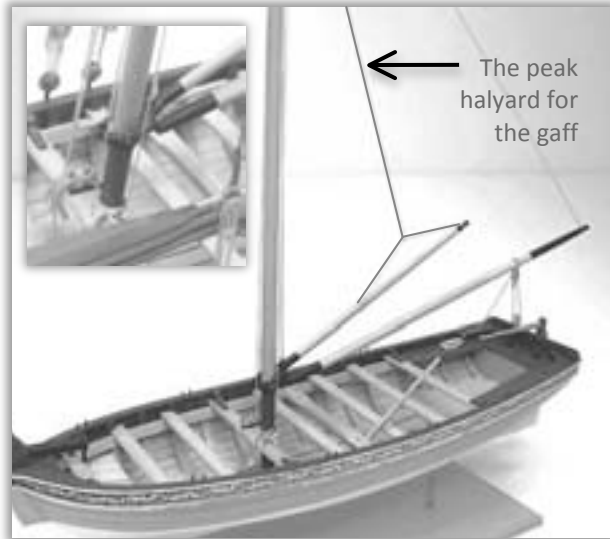


Rigging the boom...

You will be rigging the "topping lift" first. Seize a generous length of .012 tan rigging line to the end of the boom. Then place the boom on the model. Run the loose end of the line through the 1/8" single block on the mast. It is the upper block on the mast. Examine the rigging plan for details. The topping lift is shown in red in the photograph above. Then take the line down to the belaying pin on the "aft" starboard side of the thwart. Make sure you establish the correct angle for the boom as shown in the photographs throughout this guide and the rigging plan. Once the line has been secured to the belaying pin, you should finish it off with a rope coil.

The boom will swing port to starboard until you rig the boom sheet. The boom sheet is shown in the above photographs as well. It is rigged using .012 tan rigging line. Seize another 1/8" single block to the horse. Then seize the rigging line to the block hanging under the boom. Run the loose end through the block on the horse and back up through the block on the boom. From here, the running end is belayed to the horse on the starboard side. Just wrap it around the corner of the horse a few times. Take the running end and drape it down onto the

seat of the cockpit. Glue it down securely and trim the end. Make a medium sized rope coil and glue it on top of the end of the boom sheet so it looks natural and as if it is actually the same length of rope.



Rigging the Gaff...

Position the gaff against the mast. Then bring the rigging line with the parrel beads around the mast so you can seize it to the other jaw. This is tricky because the gaff will be moving around while you try and run the line through the hole. Take your time and when it's finally secured with a drop of glue, snip off the excess line.

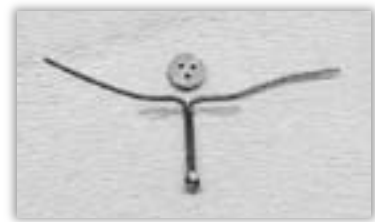
Once the gaff is secured to the mast, you can rig the peak halyard. The peak halyard is rigged with .012 tan rigging line. Seize the line to the center of the short length of line already on the gaff. Then take the running end of the line up through the remaining (lower) block on the mast. From here the line can be brought down to the thwart and belayed. You can belay the line to the "aft" belaying pin on the port side. Finish it off with a rope coil. Before you belay the line, make sure the gaff is angled correctly. Carefully adjust the line until you are happy with the angle and height of the gaff in relation to the boom. View the model from many different angles before you belay that line permanently.

To finish rigging the gaff, the throat halyard (.012 tan) needs to be completed. The throat halyard is seized to the small eyebolt you glued to the top of the gaff jaws. Take the running end through the lowest of the three simulated sheaves on the mast. Then bring it down to the forward belaying pin on the port side. Finish it off with a rope coil. Once again, make any adjustments before you permanently belay the line. The throat halyard actually raised and lowered the gaff. This will happen on your model too. You can glue the jaws to the mast in order to prevent it from riding up and down. Only a tiny drop of glue is needed if you think that would help lock the gaff in the best position.

Chainplates and deadeyes..

Before you can actually rig the shrouds, you must create the chainplates. There is one pair of shrouds on each side of the longboat. That means you must make four chainplates. The chainplates have a deadeye secured to their upper end. They are made from 28 gauge black wire.

You can make a simple jig to help keep all of the chainplates the same size. Cut the head off of one of the little brass nails supplied with the kit. Drill a hole into a piece of scrap wood and glue the pin into it. Basically you will be crimping some 28 gauge wire around the pin. Then squeeze the two loose ends together. Bend back the loose ends as shown in the photo below. You can find the measurements for how long the chainplate should be by examining the plans. But double check that it will be the right length for your model too. You can draw a reference line on the wood so all of the chainplates will be the same length. With both loose ends bent back as shown, you can glue a deadeye in position.

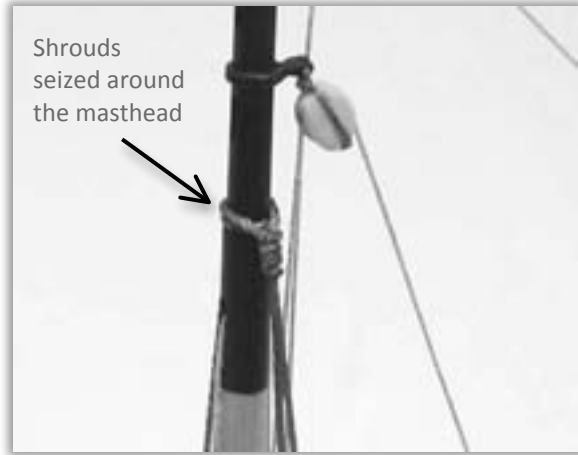
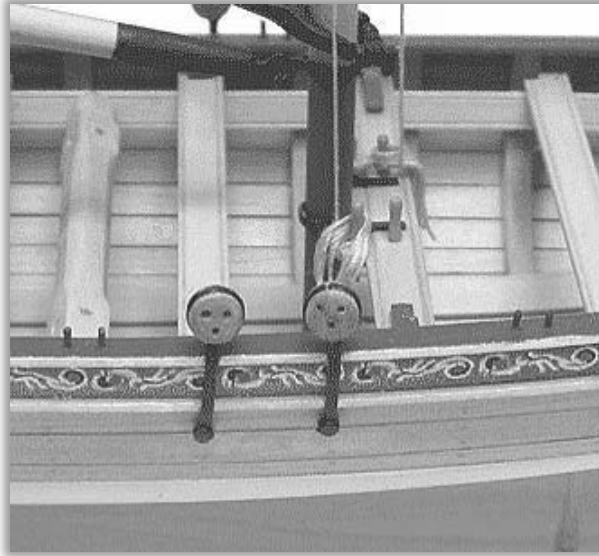


Then bend the loose ends around the deadeye so they cross over each other. See the photo below. Snip off the loose ends so they meet with no gap between them. Place a drop of CA glue on the joint.



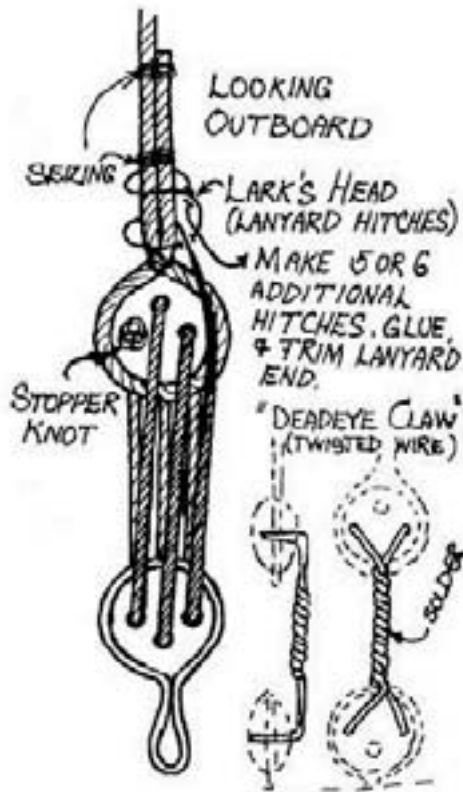
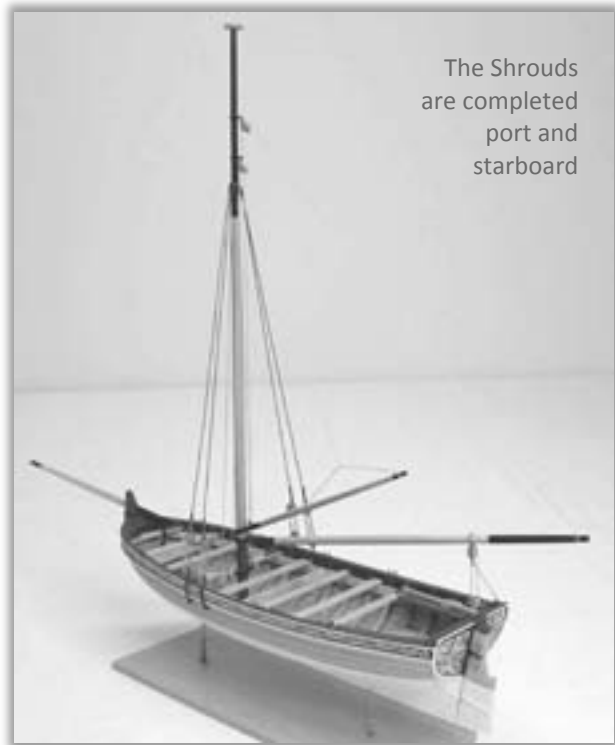
You should also put a bead of gap filling CA down the length of doubled wire below the deadeye. Do this on both sides. The whole idea is to file the glued seam between the two wires flat so it looks like one solid piece. If you need to apply another coat of CA to build it up then that's OK. If you have a spray accelerator for the CA, it will make this task much easier. File and sand the glued seam flat, as shown in the photo above. Then paint the chainplate black while leaving the deadeye natural.

The chainplates are secured to the side of the hull as shown on the plans. They are held in place with the tiny brass nails supplied in the kit. You will need to cut them shorter, since the planking and boat's frames are not very thick. Drill a small hole just below the molding strip that will be a snug fit for the brass nails. The holes should be drilled into the frames. There are two frames that are in the exact locations for the deadeyes. One is directly opposite the mast (maybe a little aft of it). The second frame is right next to the first and aft of the mast. Check the plans for details. You can see the deadeyes glued onto the hull in the photo below.



Rigging the shrouds...

The shrouds are seized to the mast in pairs. Seize the shroud around the masthead with .021 black wire. Then seize a deadeye on the bottom of each shroud so they are both an equal distance from the deadeyes on the chainplates. A lanyard will be rigged between both deadeyes as shown in the illustration.



The "deadeye claw" illustrated is one method that might help you keep the deadeyes spaced an equal distance apart. Repeat the process on the other side of the hull when you are done. See the photos that show the shrouds rigged on the prototype of the longboat. Be careful when you tighten the lanyards on the deadeyes. You don't want them so tight that they pull your mast aft. That would cause your gaff and boom rigging to go slack. You need to get a feel for how much tension should be applied to each line. This will come with practice and adjustments throughout the rigging process.

Rigging the Running Backstays...

The running backstays consist of a 'pendent' which is the standing part of the backstay. They are seized around the masthead over the shroud gang. There is a 1/8" single block seized to the end of the pendent. The pendent is rigged using .018 black rigging line. A second 1/8" single block is used for the other end of the tackle. This is the running part of this backstay. It has a hook stroped to it and will be hooked into a chainplate. This time, the chainplate will not have a deadeye. Instead there is an eye formed on the upper end which will receive the hooked block. See the rigging plan for details.

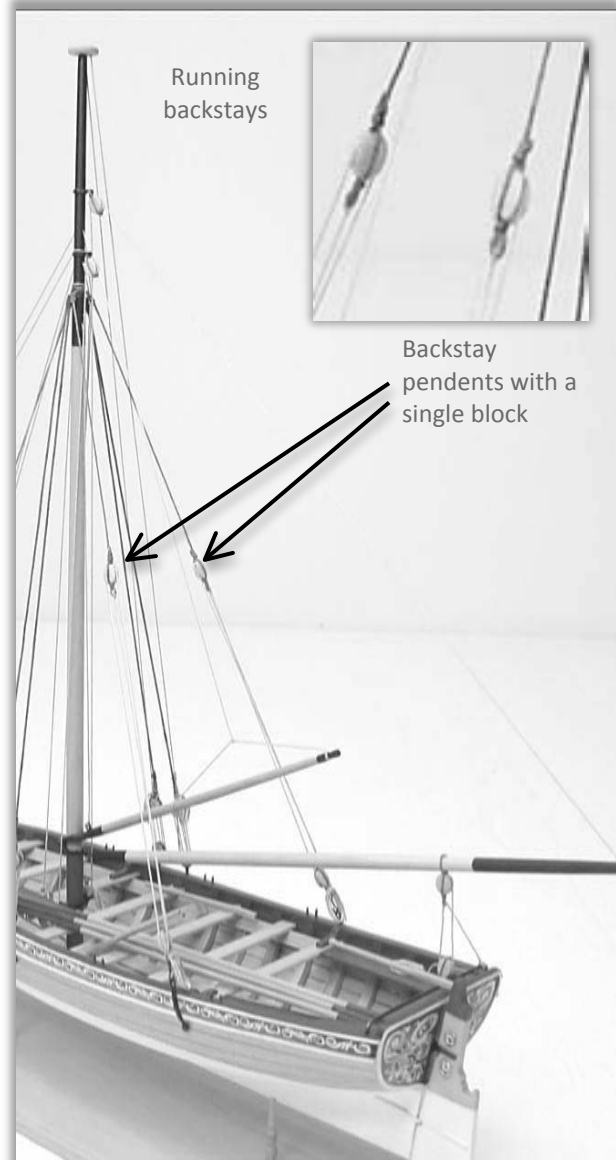
To make the chainplate for the backstay, use the same jig you used earlier. This time, place another brass nail (after you snip off the head) above the other one. You will be wrapping a length of 28 gauge wire around both pins. Crimp them tightly around each nail with needle nose pliers. Then cut the two loose ends where they overlap one another on one side. You will have to squeeze the center of the chainplate and adjust it afterwards. Apply a bead of gap filling CA down the doubled center of the chainplate. Do this on both sides and file them flat as you did before. But be careful not to glue the chainplate to your jig. You should remove the chainplate before you apply the glue, or at least raise it up on the pins so it isn't resting on the jig's base. Paint them black. See the photo.



Drill a hole just below the molding on the hull and secure the chainplate with a brass nail. See the photo below.

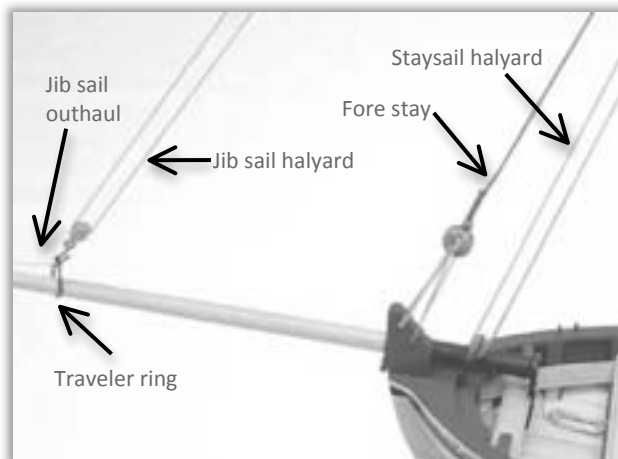


Rig the pair of backstay pendants first. Make sure the pendants are the same length after the 1/8" single blocks are seized to them. You will need to form an eye on the bottom of these blocks when you strop them. This is where you will seize the running part of the backstay. See the photo above. Seize the running tackle (.012 tan) to the block on the pendent.

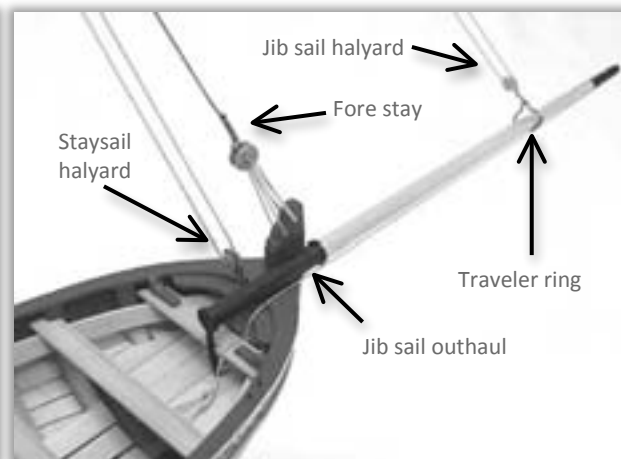


From here it should be run through the other single block/w hook. The hook is formed with 28 gauge black wire. A photo of the hooked blocks is provided for you.

Then take the loose end of the tackle back up through the pendent block. Hook the block into the chainplate as shown on the plans. Carefully tension the tackle until the backstay is taught, but not so much that it pulls the mast aft. The running end of the tackle can be belayed around the base of the hooked block. Apply a drop of glue to the belaying point after you wrap the line around the base of the hook a couple of times. See the photo (left) which shows the belayed line. Snip off the excess line and add a rope coil to finish it off. Just glue the rope coil to the belaying point so it looks like it is hanging naturally.



The fore stay is rigged with .018 black rigging thread. Seize it around the masthead on top of the shroud gang and backstays. The fore stay has a deadeye rigged to the other end as shown in the photos above. You can rig the lanyard between the deadeye and the stem when you are done. Use .012 tan rigging thread. You will notice that the stem only has two holes for the lanyard, so it will be run through the top hole twice. Other than that, the lanyard is rigged just like those for the shrouds.



The staysail halyard is rigged with .012 tan rigging. The standing end is seized around the mast on top of the fore stay. Run it through a 3/32" sing block that has been stropped with a hook. Then bring it back up and through the middle sheave on the mast. The block should be hooked to an eyebolt secured to the front of the knee at the bow. See the photos and plans for details. The eyebolt is located behind the stem. Then bring the loose end of the halyard down to the remaining belaying pin on the thwart. Adjust the tension of the halyard before you secure it permanently. Don't finish it up with a rope coil just yet. The jib sail halyard will be belayed to this pin as well.



Create the traveler ring from 28 gauge black wire. Its shape is shown on the plans. Apply a drop of glue on the seam to help prevent it from opening up. The seam is best positioned on the side of the traveler ring. File down the glue at the joint to make look neat and smooth.

Seize a generous length of .012 tan rigging line to the starboard side of the traveler (jib sail outhaul). Slide the ring onto the bowsprit and position it as shown on the plans. Run the loose end through the sheave on the end of the bowsprit. With the traveler ring positioned where you want it, place a drop of glue in the sheave to lock in the place. Then bring the loose end inboard and wrap it around the first thwart on the starboard side. Apply another drop of glue to wrapped lines to keep it from unraveling. Then drape the loose end onto the platform so it looks natural. Glue it in place and trim off the excess. You can finish it off with a rope coil when you are done.

The jib sail halyard is rigged using .012 tan rigging line. It is seized around the mast above the lower iron mast band for the peak halyard. The running end should be run through a 3/32" single



block. This block has a hook stropped to it like the staysail halyard. The hooks for both of these 3/32" single blocks were made from 28 gauge black wire. The block is hooked to the top of the traveler ring as shown in the photos. The loose end of the halyard is then taken through the remaining simulated

To finish up the model, shape and paint the oars. The oars are laser cut for you and are 1/16" thick. The long handles should be rounded off and the blades should be thinned down. The blades should gradually taper and be very thin on the end when you are done. Only four oars are shown on the prototype because adding all eight would obscure too much detail. But you can display as many you as like. The choice is yours.



sheave in the mast. Belay the running end to the pin with the staysail halyard. Finish it off with a rope coil. You could also run a line from that pin down to the floorboards. It should hang naturally and be finished off with a rope coil. This would be easier than trying to place two rope coils on the small belaying pin and still look natural. This is the way it was done on the longboat prototype.



The flag halyard is rigged with .012 tan rigging line. Run the line through the sheave on the ball truck (starboard side). Then take the loose ends down to the deadeyes on the shrouds. They are each belayed just above the deadeyes. Just wrap the line a couple of times around the shroud just above the deadeyes. Then glue a rope coil dove the belaying point so it looks natural.

Small longboats like this one also carried a grapnel anchor. One is provided for you as a casting. Glue the two parts of the casting together after cleaning them up with some files. Then paint it black. Seize some .012 tan rigging line to the grapnel. Glue it somewhere in the boat that is appealing to you. Drape the loose end of the line onto the floorboards and glue it into position. Snip off the excess line and place a large rope coil on top of the end. Try and make look as natural as possible as if it is all one length of rigging.

Congratulations on completing the model!!!!