

HM Gun Brig Adder

Building Manual

PART NUMBER - VM-15



VANGUARD MODELS
BY CHRIS WATTON

HM GUN BRIG ADDER OF 14 GUNS

HISTORY

The Acute Class was a group of 15 brig-rigged, 14-gun gunboats designed by Sir John Henslow, Co-Surveyor of the Navy, of which 11 were built in Kent shipyards. They were a slight enlargement of Henslow's previous Gunboat design, the Conquest Class.

Gunboats were small inshore patrol and shore bombardment vessels, which carried the heaviest possible armament on the smallest possible hull. The Acute Class were designed to operate under oars when in shallow, inshore waters and for that reason, they were shallow-draughted and flat-bottomed, but so that they could operate under sail, they were fitted with an innovative invention, the Schank Sliding Keel. This is commonplace in small sailing yachts and dinghies today and is commonly known now as a Dagger Board. It is a board which slides through a slot in the keel and the Acute Class gunboats were fitted with two of them, one aft and the other forward.

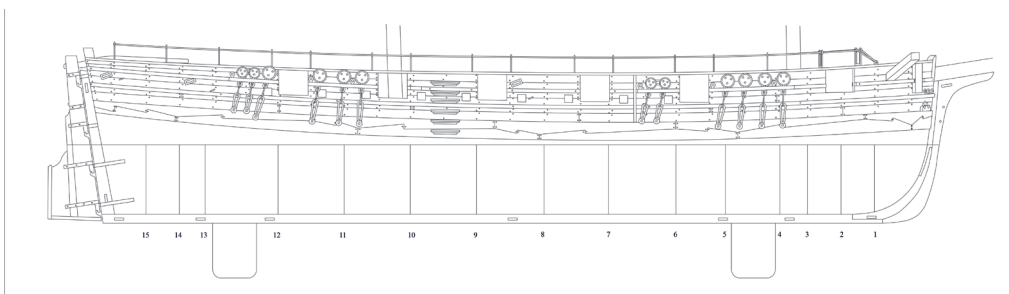
When designed and built, they were not intended to have names, just numbers, but in August 1797, the Admiralty decided to give them names. The vessels were originally ordered as the 1797 Pattern (Henslow) Gunboats and consisted of HM Gunboat No. 4 through to 18.

The Acute Class gunboats were vessels of 160 tons. They were 75ft 2in long on the main deck, 61ft 8in long at the keel and 22ft 2in wide across the beams. Their holds were 8ft deep, they drew 3ft 9in of water at the bow and 6ft at the rudder. This does not include the depth of the Schank Sliding Keels. They were manned by a crew of 50 men and boys. Not being ocean-going vessels, they were commanded by a Lieutenant-in-Command rather someone appointed to be their Master and Commander and he was the only commissioned officer aboard. The vessels were armed with 12 x 18pdr carronades on the broadside, with 2 x 24pdr long guns in the bow.

Adder was ordered on 7/02/1797, and keel laid that same month, and launched on 22/04/1797. In 1798, according to both Dauid Lyon's Sailing Navy List and Rif Winfield's similar work, British Warships in the Age of Sail, Adder was lengthened in 1798 to 97 feet along the deck, so Adder may not have been coppered when first commissioned. She was broken up in 1805.

Reference:

Winfield, Rif (2008). British Warships in the Age of Sail 1793–1817: Design, Construction, Careers and Fates. Seaforth. ISBN 978-1861762467.



THE KIT

Although the kit has many parts, this does not mean it is more complicated than standard kits you may be used to. It simply means that more parts are pre-made/cut than most other kits of this class, meaning you do not have to manufacture the parts yourself from wood stock supplied in the kit.

This model kit is designed to be as accurate as possible for a commercial kit in both scale and detail. Although Adder is as easy to build as we can make it, very basic woodworking skills (and patience) are still required. Estimated build time is between 40 to 60 hours, so a work space will have to be put aside for the job. Do not remove parts from the laser cut sheets until actually required for fitting, as they can be easily damaged or lost. We recommend all planks and laser cut parts that require bending, are 'pre-bent' before gluing.

PLEASE NOTE - This is very important.

Take plenty of time to study this manual until you are confident enough to tackle each stage of construction. Patience is the key word when building any scale model. Treat each stage as a separate project and the overall effect of the completed subject will be much enhanced.

Care should be taken when cutting parts from the laser and brass etched sheets. The sheet from which you are going to cut the parts should be laid on a hard, flat surface. Use a heavy-duty craft knife (a Stanley Knife is perfect and is and always has been my staple for all manner of cutting) with a good strong blade to cut through the tabs holding the parts in place.

It is easier to paint most of the photo-etched parts before removing them from their sheets. They can be touched up again once in place on the model. When painting parts in wood, use multiple coats with fine sanding in-between each coat to help minimise the grain visibility. Never settle on just a single coat, but instead take your time with every single sub assembly. Consider using a coat of flat varnish under your paint too.

We have included a building cradle on the 2mm MDF laser sheet that is for use when building the model. Do not make up the clear acetate cradle until the model is complete.

Any heat discolouration due to laser cutting/engraving can usually be removed with a very light surface sanding with 320/400 grit, being careful not to damage engraved detail. Then to use a stiff brush to remove any dust from engraved details afterwards.

Finally, Adder's skill level is 'Amateur'. This means that it should be well within the grasp of a modeller who has built a slightly simpler kit, such as a number of our fishing boats. However, the more advanced and seasoned modeller will still benefit from an intuitive build with the same levels of detail you would normally find in a more advanced kit.

Disclaimer

In our continuing effort to improve our product we reserve the right to change plans, features, specifications, prices and materials without notice or obligation.

Wood is a natural material and whilst we try hard to attain an even colour/shade in each batch, this cannot always be guaranteed, even with the highest quality materials Vanguard Models uses.

Recommended tool list

(All items listed were used by the modeller to build the Adder prototype model)

- 1: Craft knife (or standard Stanley Knife, which is robust enough for most jobs)
- 2: A selection of needle files
- 3: Razor saw
- 4: Pin vice or small electric drill.
- 5: Selection of drill bits from 0.5mm to 1mm
- 6: Selection of abrasive paper and sanding block (110, 180, 240, 320, 400)
- 7: Selection of good quality paint brushes
- 8: Pliers/wire cutters (Good quality side-cutters are excellent for trimming rigging ends)
- 9: Good quality set of tweezers (For small parts and rigging)
- 10: Steel ruler (300mm - for providing a straight edge for tapering the planking)
- 11: Small clamps (2 inch clamps with rubber tips, are very useful for projects like this)
- 12: Good quality pencil or drawing pen
- 13: Masking tape (Tamiya masking tape is perfect for masking areas around the main wale)
- 14: A Pin Pusher (Or you can just use a pair of pliers to push pins into the planking and bulkhead edges)
- 15: Cutting mat

Recommended tools from Vanguard Models



Our waterline marking tool is supplied in a sheet of laser-cut, 4mm plywood that needs assembly. Assembly time is around 15 minutes and very easy. Metal fittings are supplied to aid the change in position of the pencil carriage. Vanguard Models pencil is supplied with each tool.

The Waterline Marker will mark a level from between 25mm to 150mm, and an engraved gauge will help you achieve the correct level.

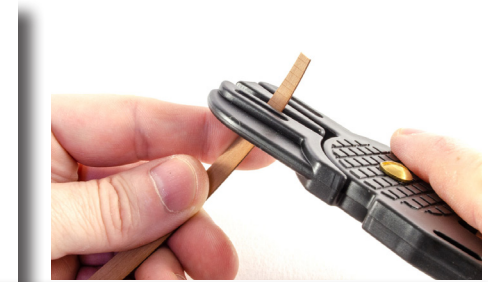


Pin Pusher With Adjustable Depth Stop

This is a slightly larger version of our other pin pusher, and has the added advantage of an adjustable depth stop to ensure that all pins are pushed 'home' to the same depth. It is ideal for model boat/ship hull planking, and setting miniature n-gauge rail track on to board, or for nailing tasks on wooden boat models, dolls houses and picture frames.



Pocket sized Pin Pusher
Can push pins in to 9 mm of plywood or MDF
Ideal for pushing brass pins

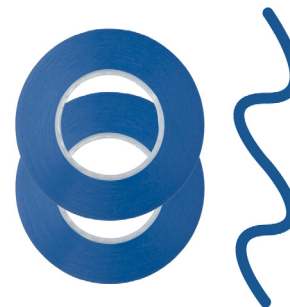


This plank bending tool is the ideal boat modeller's tool for the bending strips to the desired curvature. Used for perfect and precise bending of all wooden strips, such as planking on model boats up to 2mm thickness. For bending at an angle, change the cutting angle and the plank will 'spiral'. The more cuts produced the tighter the bend. Includes a plastic blade stopper.



Spring-Loaded Finger Sanders available in 4 sizes, 10mm, 20mm, 25mm, 40mm (Medium Grade)
Unique shape for flat and curved surfaces
Easy to fit band with spring mechanism

These sanders have a unique shape for working on both flat and curved surfaces and come with pre-fitted medium sander band. The sanders also have an ergonomic shape meaning that they're comfortable when in use.



Flexible Masking Tape x2

This is available in TWO sizes, and there are two rolls in each packet.

3mm wide x 18m long

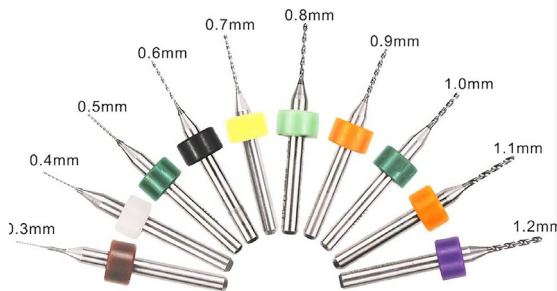
6mm wide x 18m long

Absolutely ideal for masking hull waterlines! These masking tapes are also ideal for general modelling, airbrushing, arts, crafts, and even those smaller DIY tasks. The tape sticks, stays and removes cleanly. This flexible acid-free tape is designed to follow curved lines and contoured surfaces without creasing, tearing or paint bleed.



Pin Vice and Drill set

Pin Vice – Double Ended (0 – 2.9mm)
Handy holder for drills, taps, pins etc. Including: 2 reversible collets, with capacities 0-1.2mm, & 1.3-2.4mm and 0.8-2.0mm, & 1.8-2.9mm. Incorporating an Anti-roll 6-sided body.



Drill bits

Our Drill Bits are made of high quality tungsten steel, have high wear resistance, precision, and are beautifully sharp. This Set contains 10 different size drill bit diameters: 0.3mm, 0.4mm, 0.5mm, 0.6 mm, 0.7 mm, 0.8 mm, 0.9 mm, 1 mm, 1.1mm, 1.2mm.

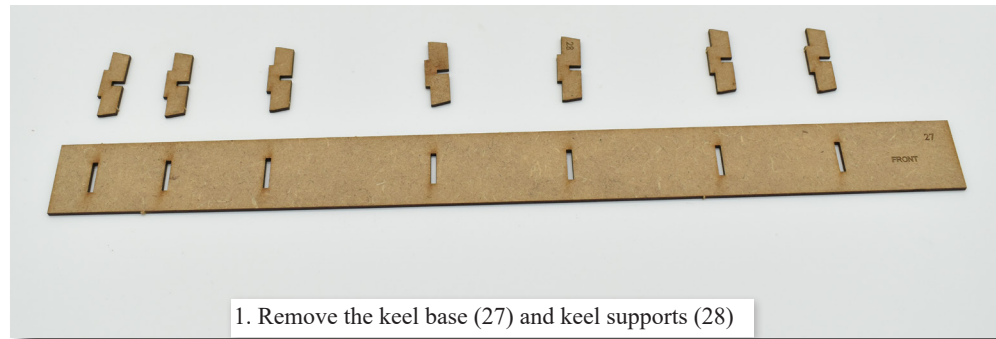
Recommended Paints, stains and adhesives

- 1: White PVA wood glue or suitable Titebond adhesive.
- 2: Cyanoacrylate (superglue) thick and medium viscosity
- 3: Natural colour wood filler (Water based wood filler is recommended as this can be diluted and made thinner)
- 4: Matt polyurethane varnish (Not satin or gloss)

BLACK
OFF-WHITE
MATT RED
VARNISH MATT



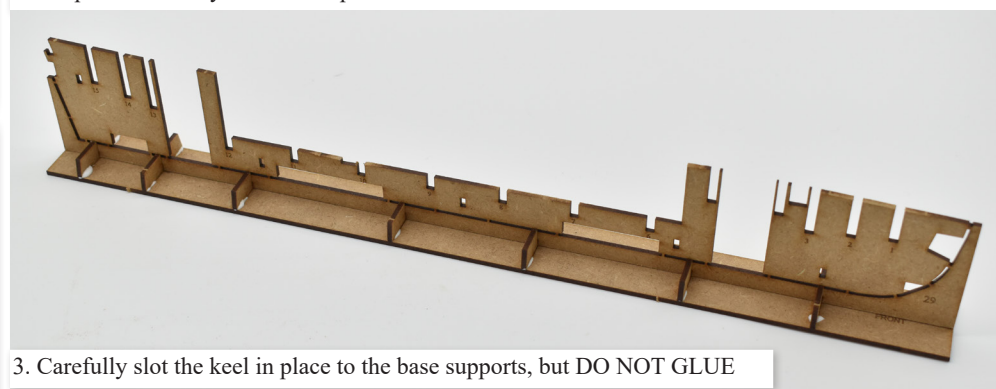
HULL CONSTRUCTION



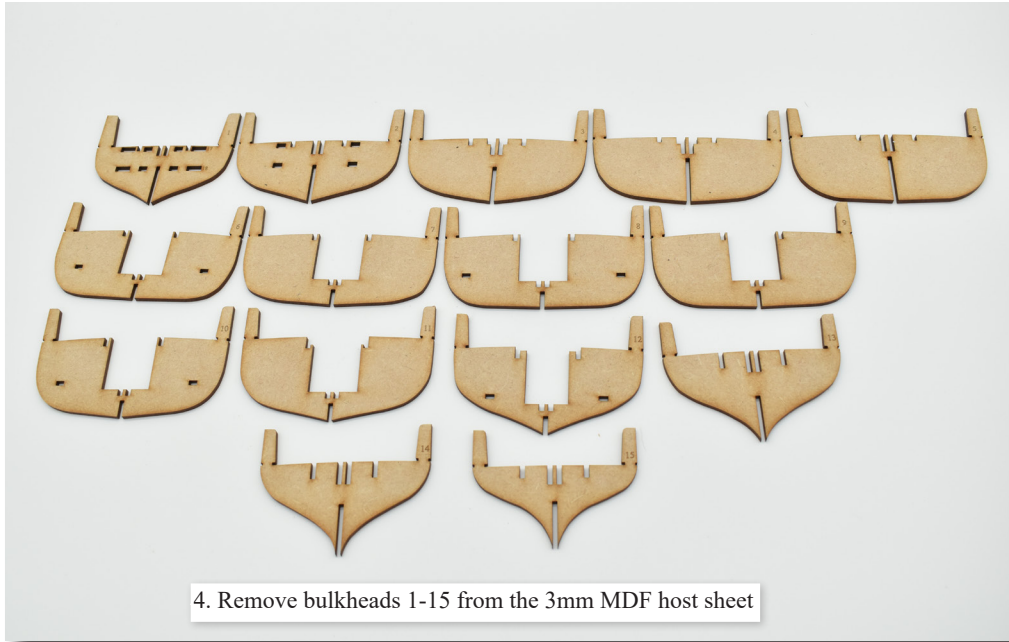
1. Remove the keel base (27) and keel supports (28)



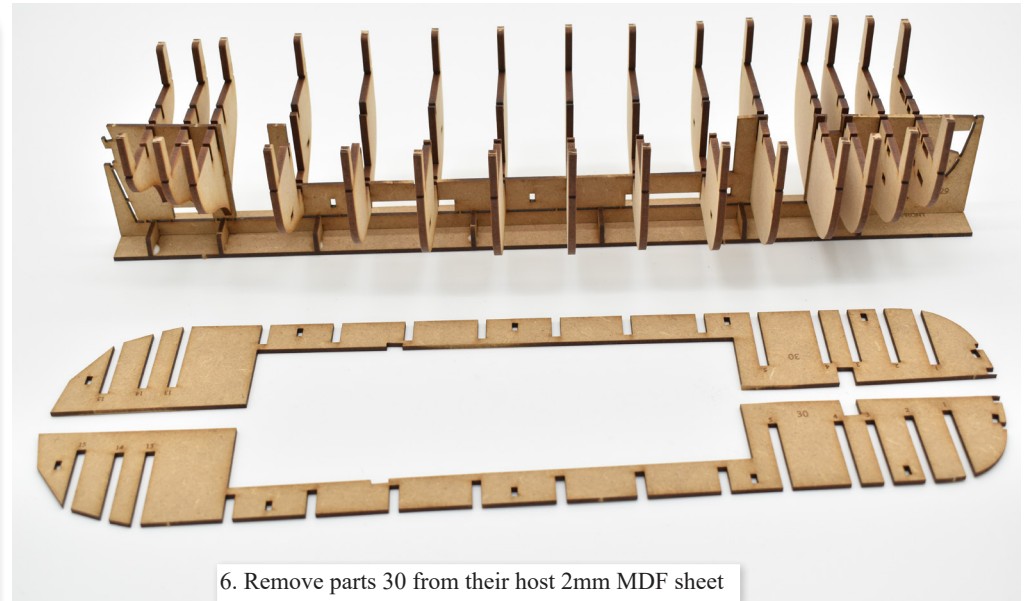
2. Glue the keel supports into the slots in the base. Remove the main keel (29) from the 2mm MDF sheet. Be careful when handling this, as it is in 3 sections, and held together on its jig to keep the sections spaced correctly until built up



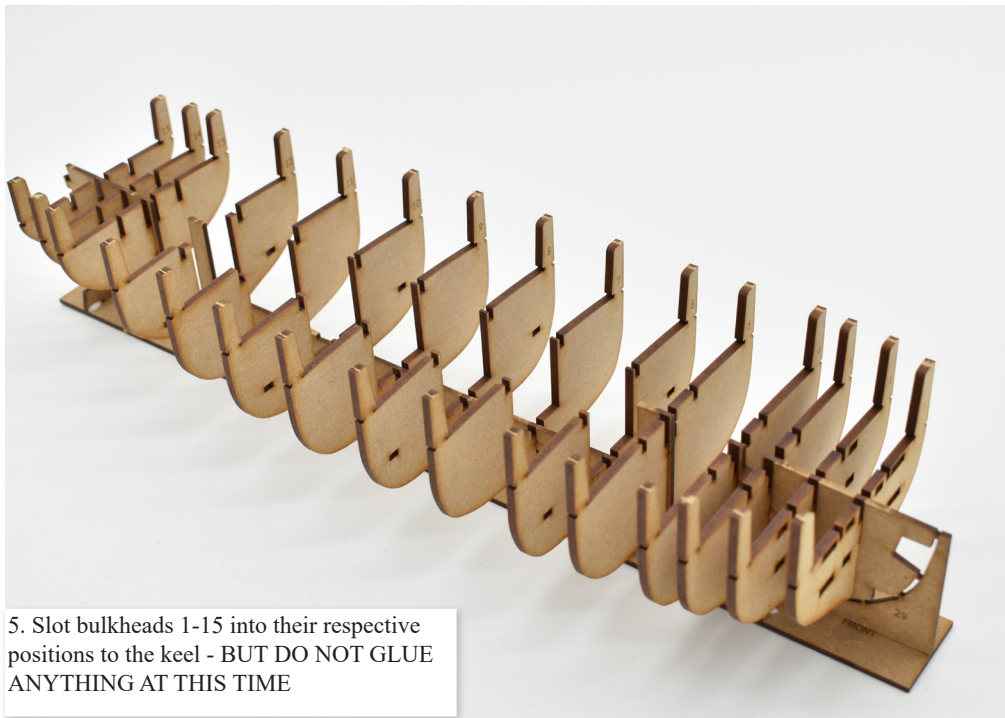
3. Carefully slot the keel in place to the base supports, but DO NOT GLUE



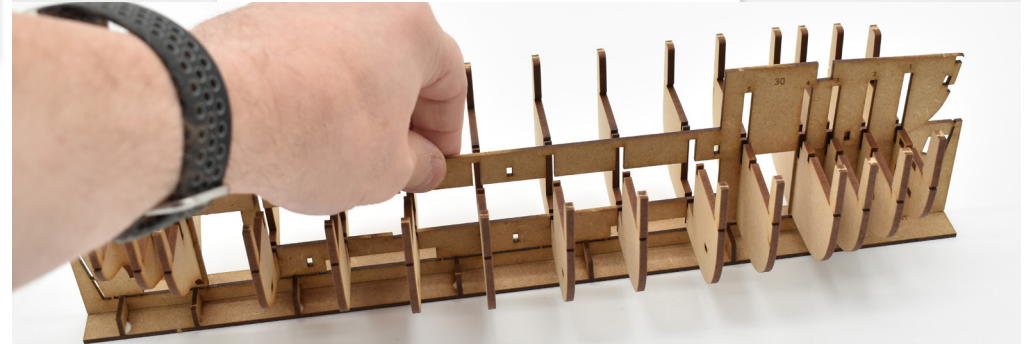
4. Remove bulkheads 1-15 from the 3mm MDF host sheet



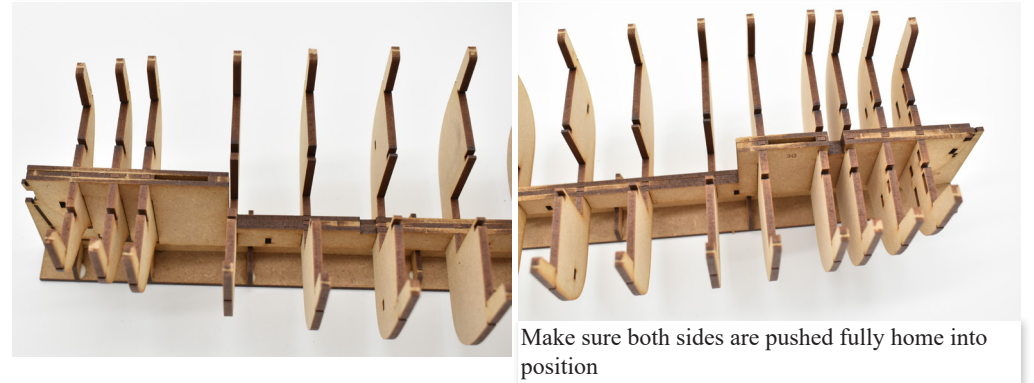
6. Remove parts 30 from their host 2mm MDF sheet



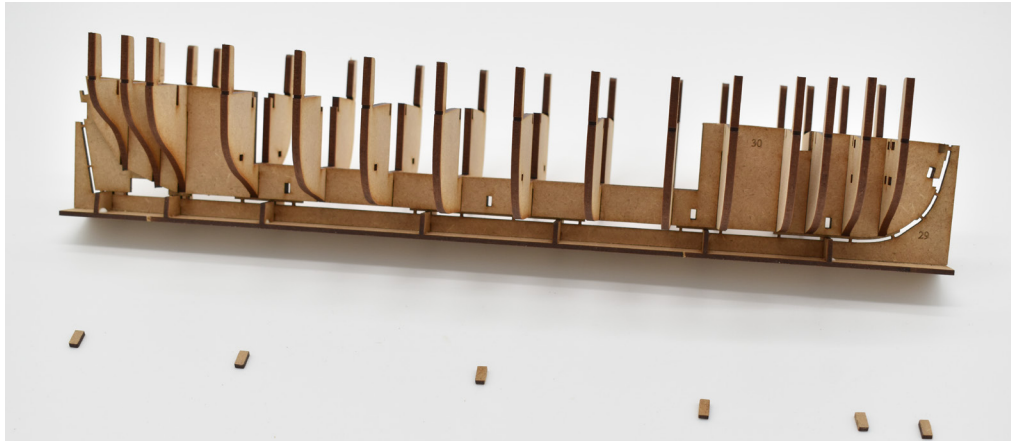
5. Slot bulkheads 1-15 into their respective positions to the keel - BUT DO NOT GLUE ANYTHING AT THIS TIME



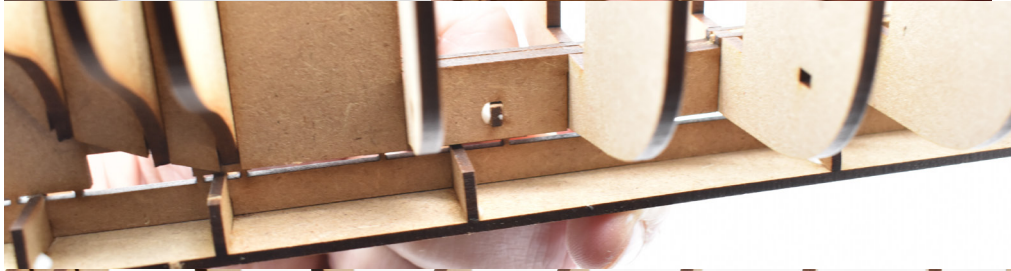
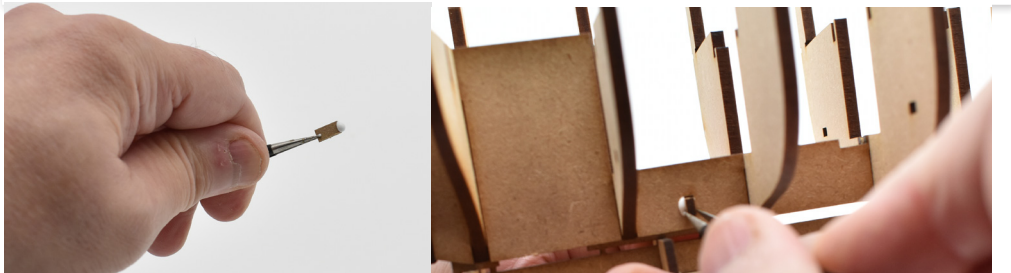
7. Carefully drop and slot parts 30 into place. These secure all bulkheads in place. DO NOT USE GLUE



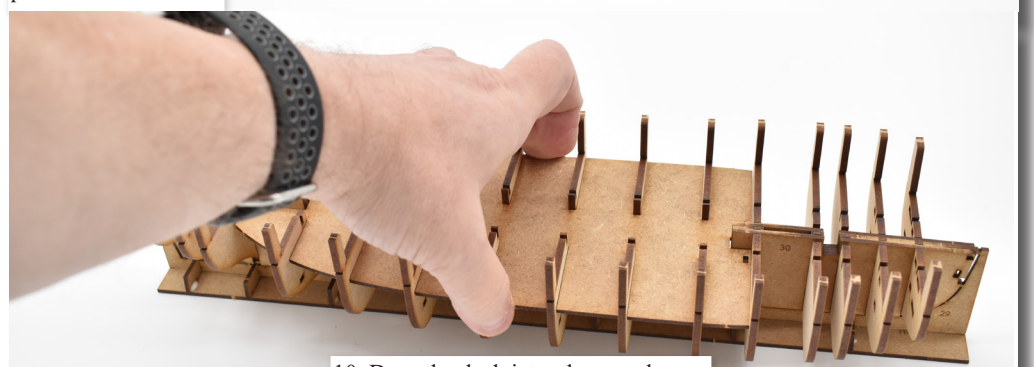
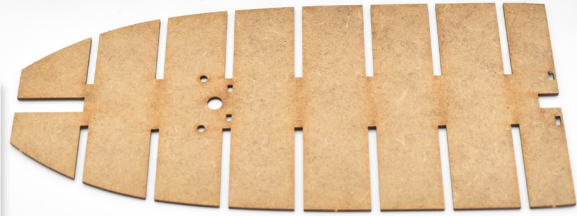
Make sure both sides are pushed fully home into position



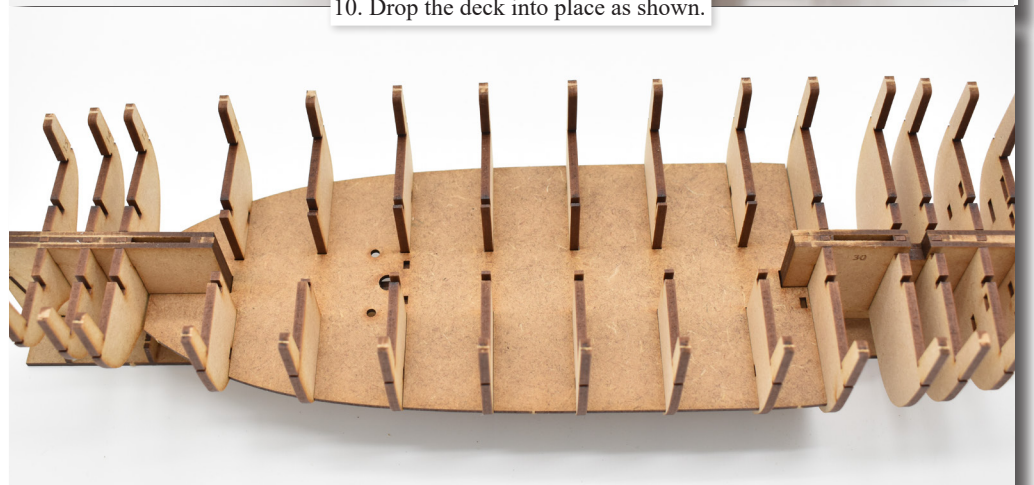
8. Remove the keel keys (K-1) from the 2mm MDF sheet. Slot and glue into each slot along the keel to secure the assembly and ensure all parts are aligned perfectly



9. Remove the lower deck (12) from the 2mm MDF sheet, ready for slotting into place

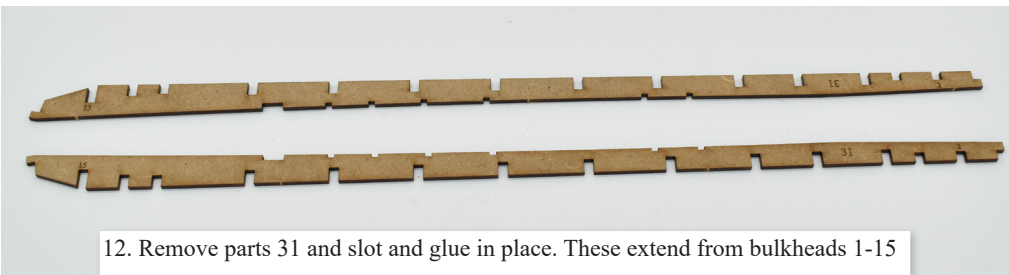


10. Drop the deck into place as shown.

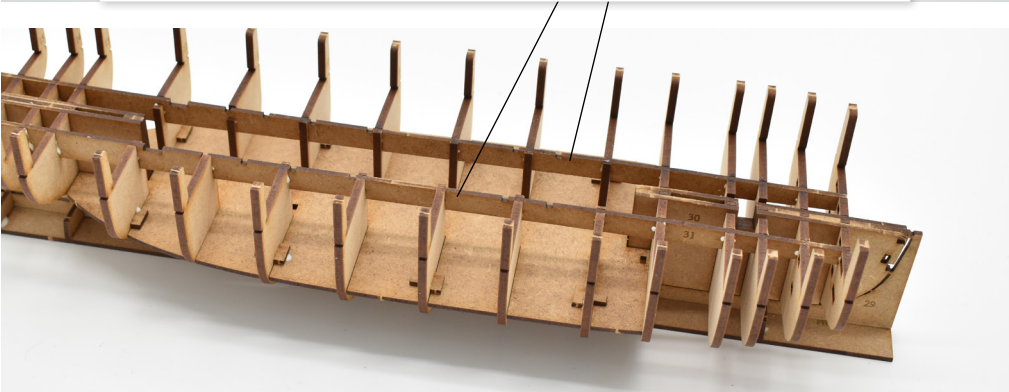




11. Remove the lower deck securing keys (K-2) and slot and glue into place on bulkheads 6, 8, 10 and 12. These will ensure the lower deck is locked into place.

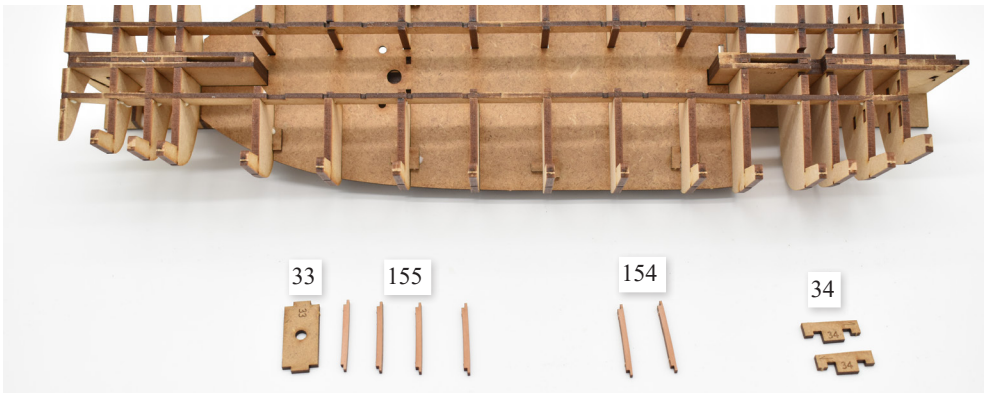


12. Remove parts 31 and slot and glue in place. These extend from bulkheads 1-15

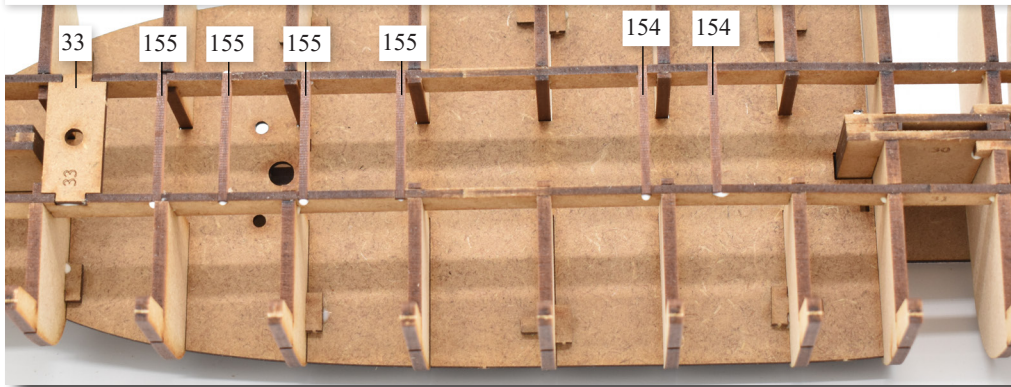


13. Slot and glue bulkhead 153, the rear most bulkhead, in place

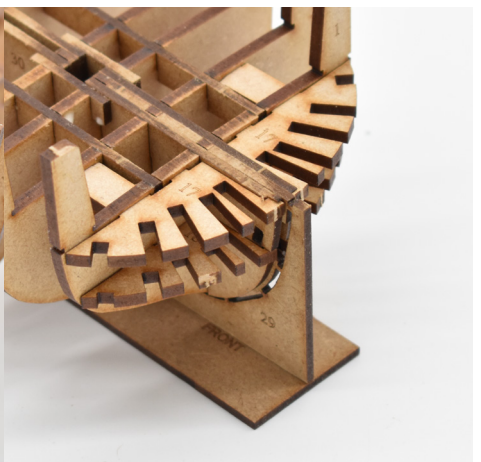
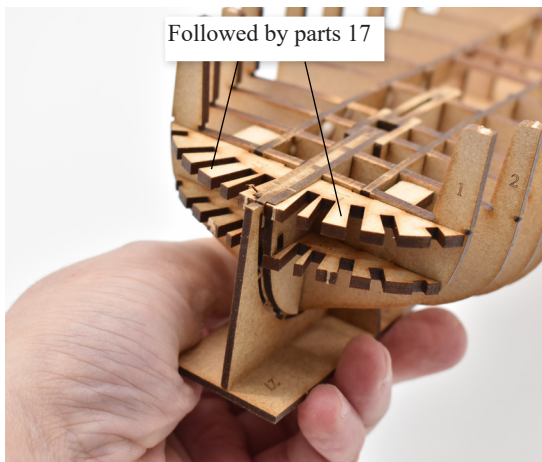
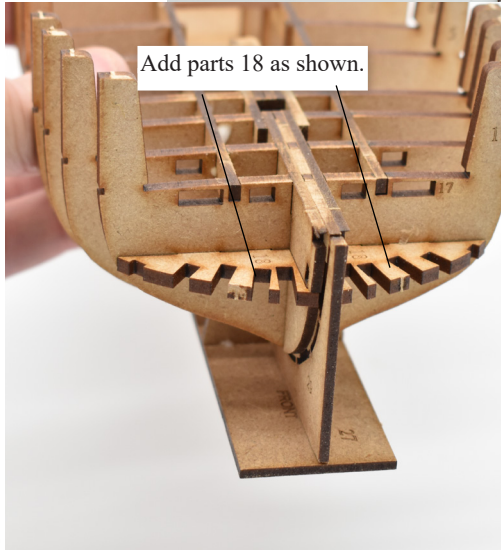


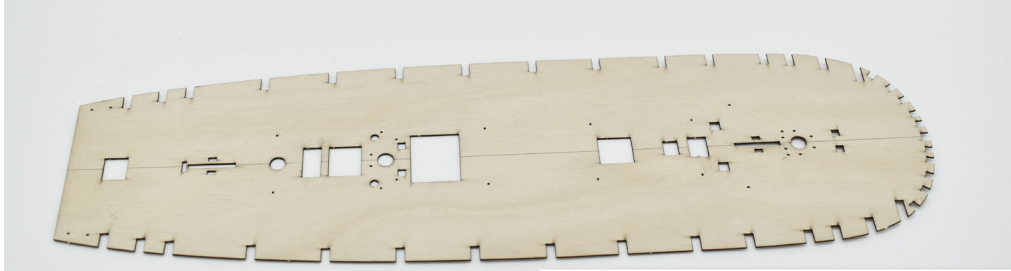


14. Slot and glue 33, 154 and 155 into position. The positions of each part can also be found on Plan Sheet 4



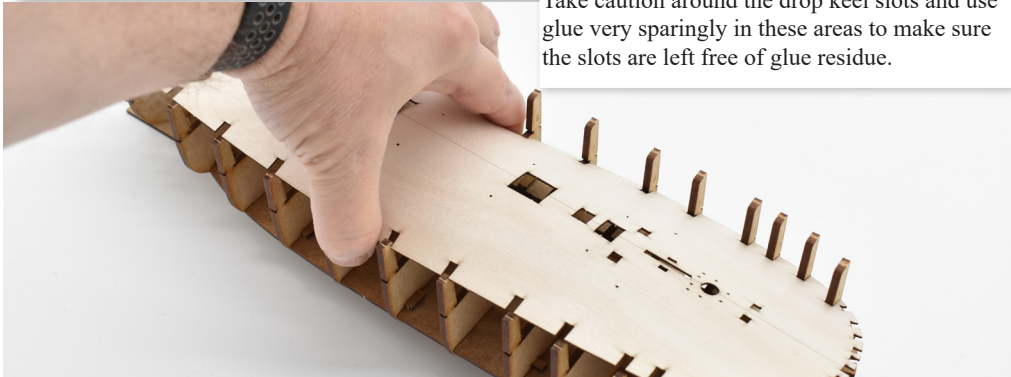
15. Parts 17 and 18 can now be fitted in place.



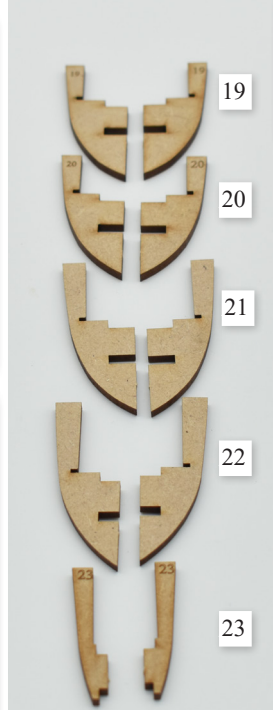
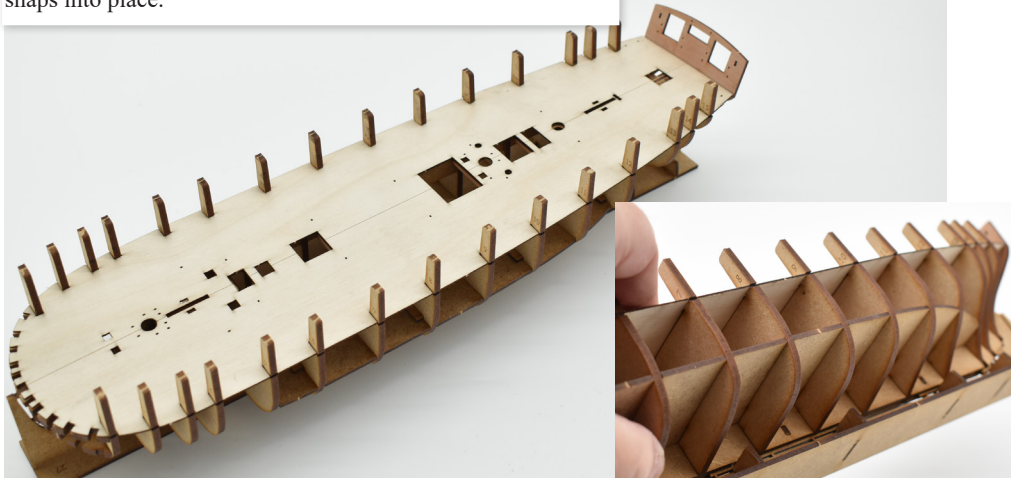


16. Remove the false deck (35) from the 0.8mm ply sheet.

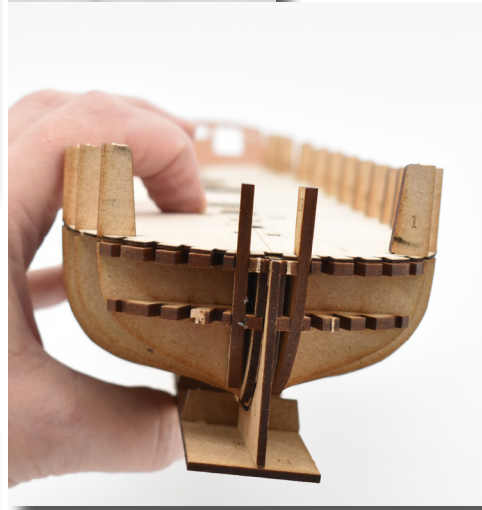
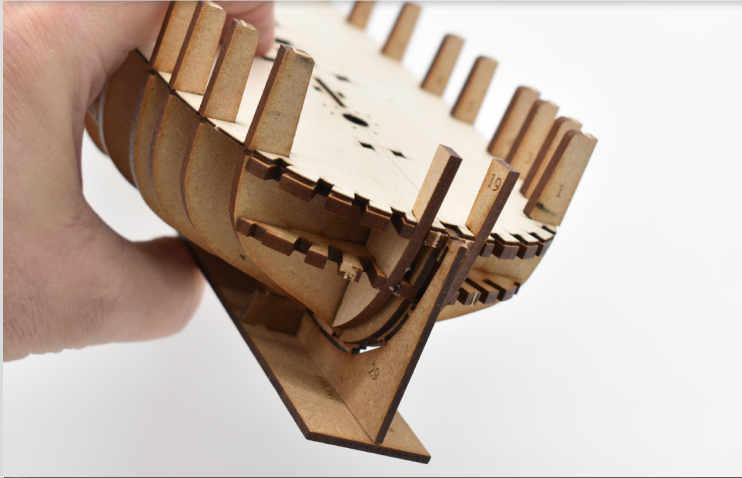
17. Apply PVA wood glue to the top edges of the bulkheads and beams, ready to take the sub deck. (But NOT parts 17 and 18) Take caution around the drop keel slots and use glue very sparingly in these areas to make sure the slots are left free of glue residue.

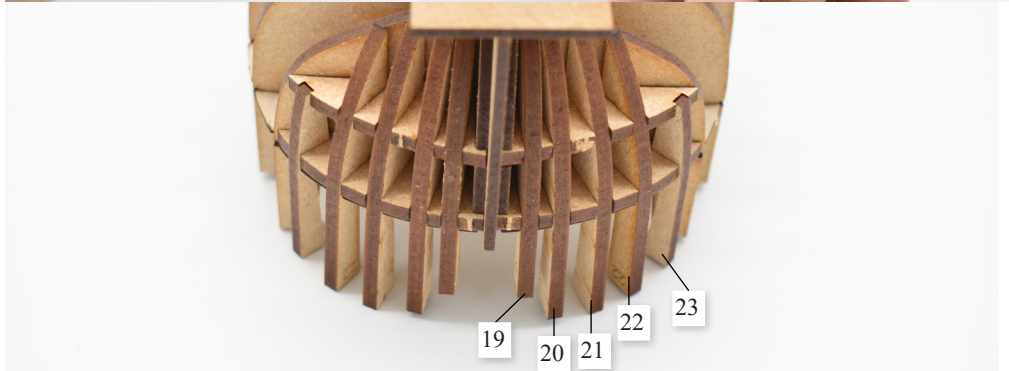
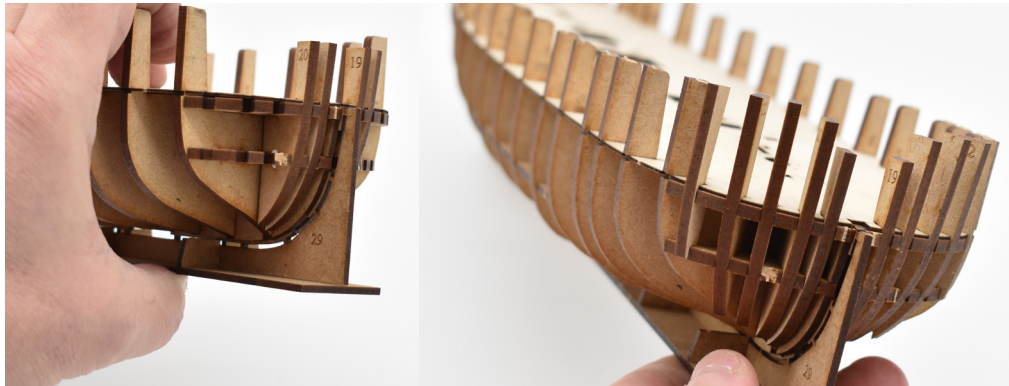


18. Flex the deck and slot it into notches in the bases of each bulkhead ear. Work your way around each bulkhead and ensure it is properly fitted. When this is done, the deck will fit perfectly over the tops of every bulkhead and lie evenly from bow to stern. You'll probably hear a satisfying click as the deck finally snaps into place.

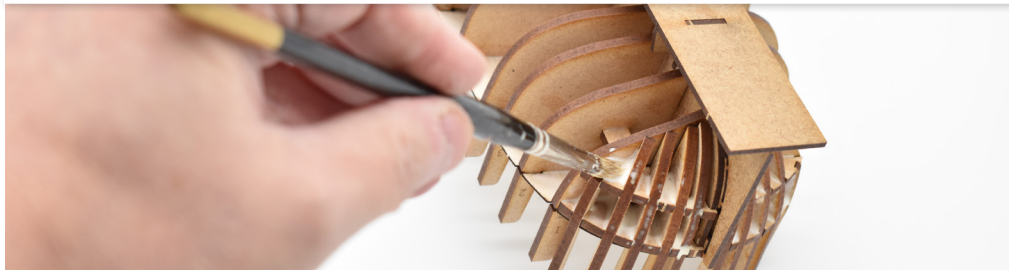


19. The bow frames can now be added. Start with the inner most (19) and work outwards. These bow frames will clamp the foredeck area in place. Plan Sheet 4 shows the correct placing of these parts, as well as the pictures shown.



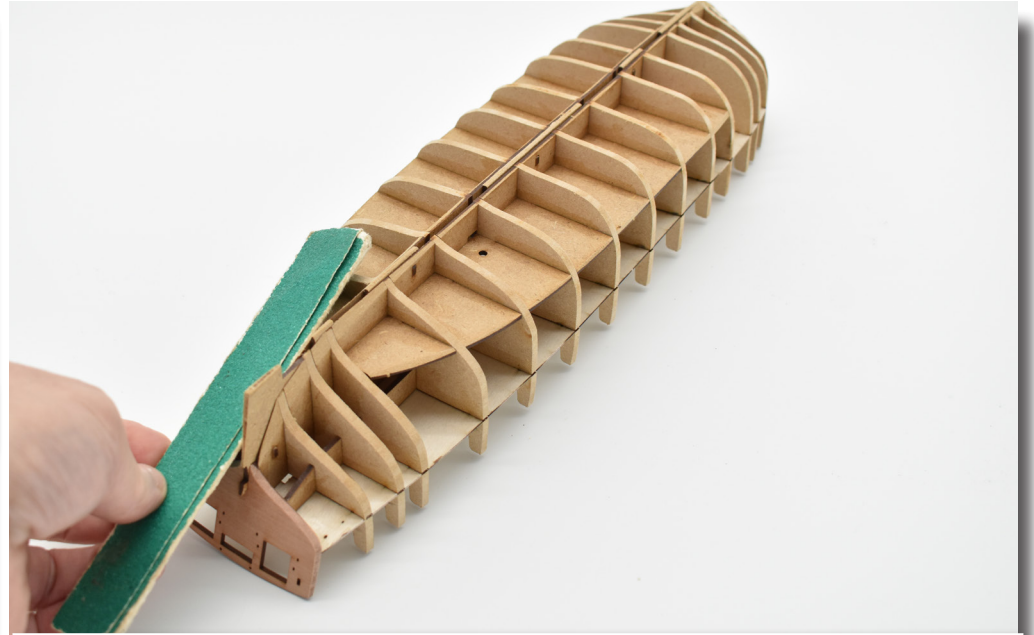
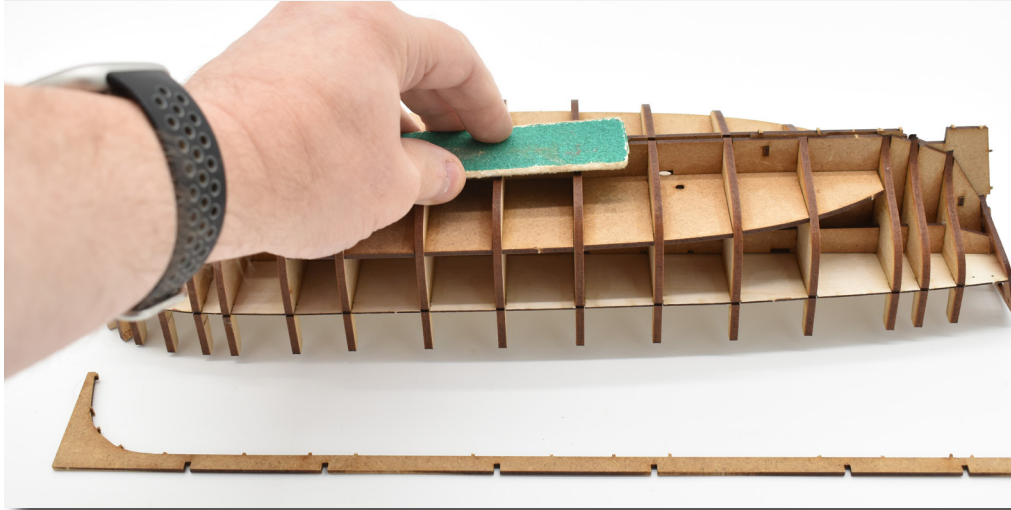


20. To strengthen the hull assembly, you can brush on watered down PVA wood glue under the lower and upper decks as well as in between the bow frames.

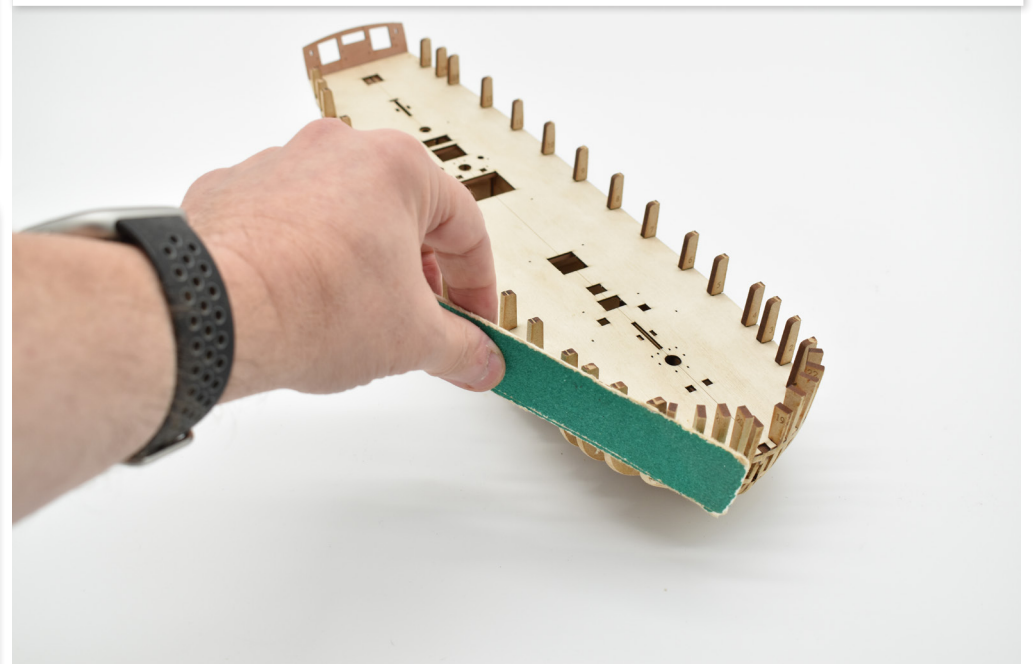


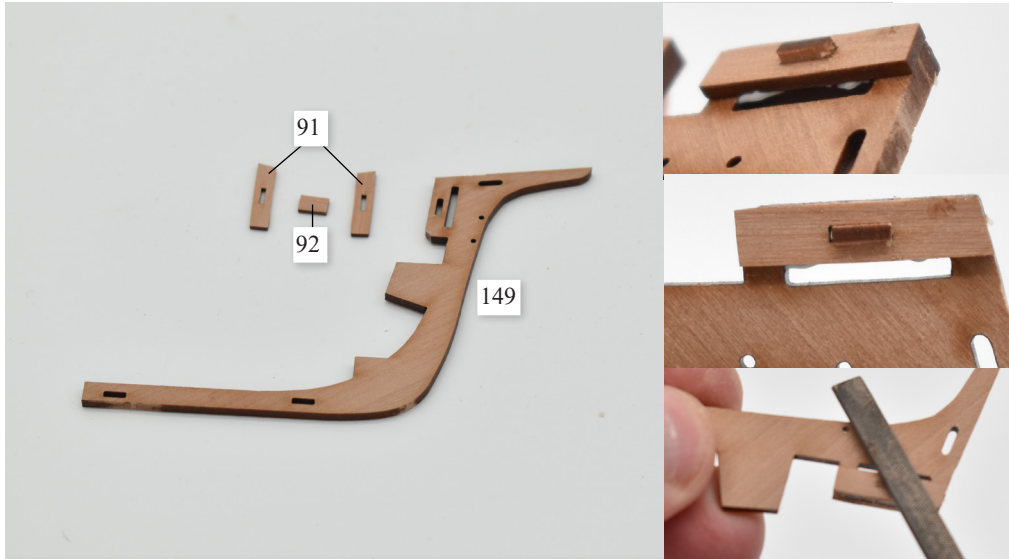
21. The hull assembly will now be very strong. It is now time to remove the keel from its spacing frame. Carefully remove the retaining tabs as shown, followed by filing any remaining bulges from the tabs on the keel flush.





22. The hull can now be sanded to follow the smooth run of the planking and laser cut bulwark patterns. In the pictures, a length of 0.8mm ply was used, which has medium grit abrasive paper wrapped around it. This process takes around half an hour of sanding.

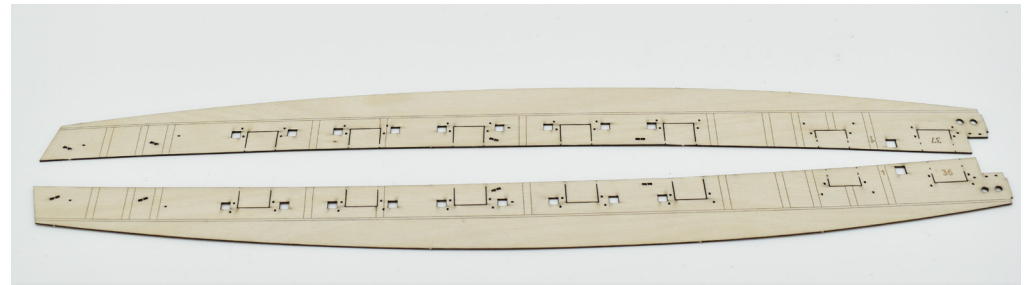




23. The prow can now be made up and fitted in place. The prow (149) is to be fitted with a 'bolster' either side (91). Add these as shown and secure with a locating peg (92). These will give the bulwark pattern more of a surface to fix to.
The forward edge of 91 can be bevelled to match the curve of the bulwark pattern and also file any excess tab (92) so that it is flush with parts 91.



24. Glue the prow in place using PVA wood glue and leave to thoroughly cure.

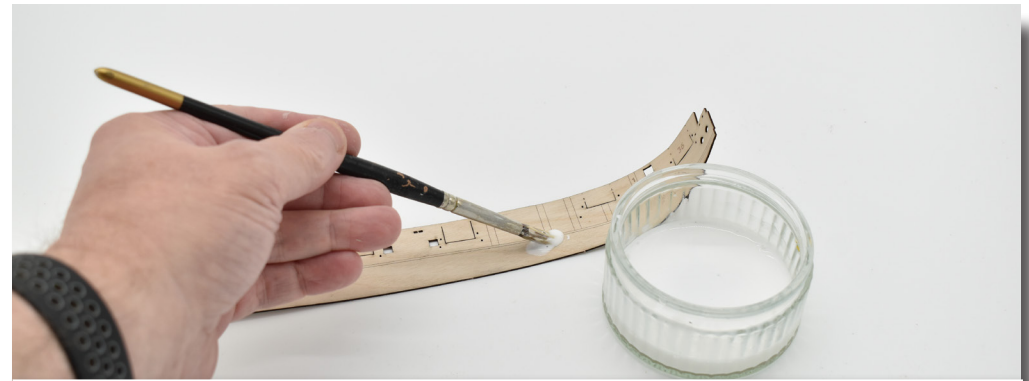
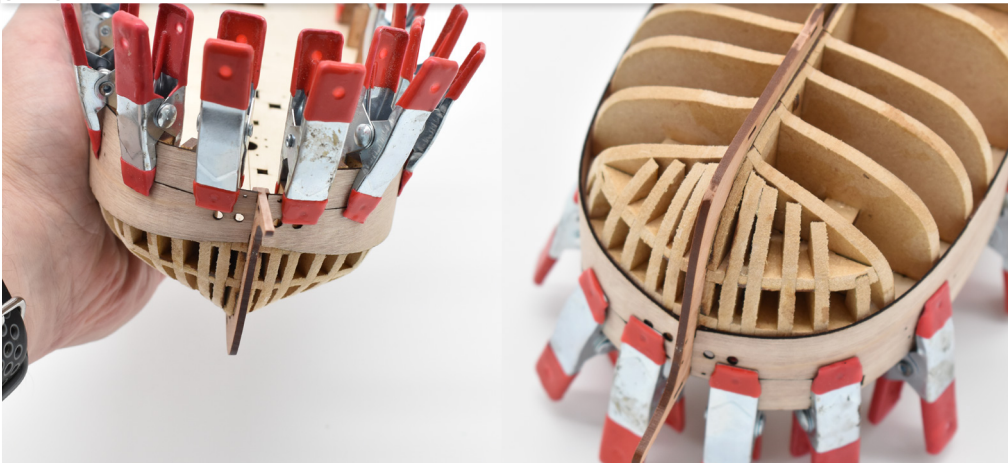


25. The two bulwark 0.8mm ply patterns can now be added (36 - left/port and 37 - right/starboard). The engraved vertical lines should follow quite closely the bulkhead positions, and the lowest horizontal line should be placed at the top edge of the false deck position.
We recommend that these parts are dry fitted several times to ensure correct positioning. Each engraved line may not be a perfect match to each bulkhead tab due to slight variations in the sanding of the bulkheads process. However, if they more or less match from front to back, this will be fine. Always watch for the lower deck line along the deck edges.



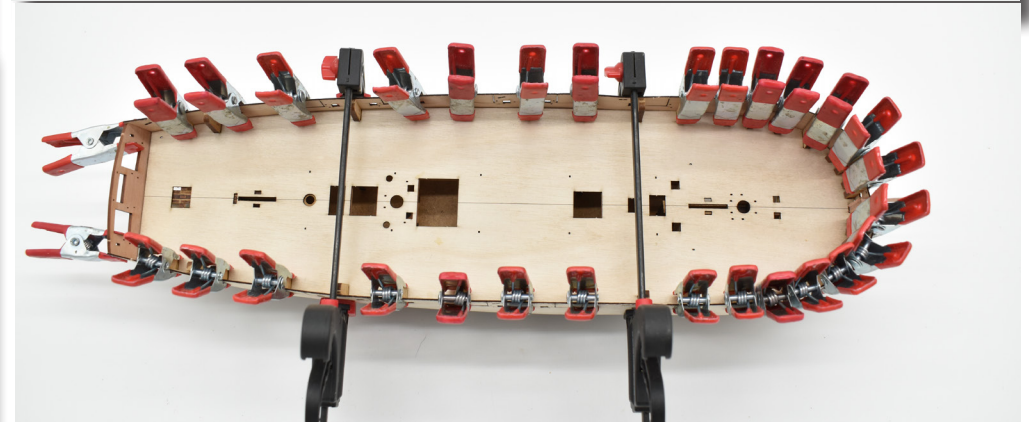
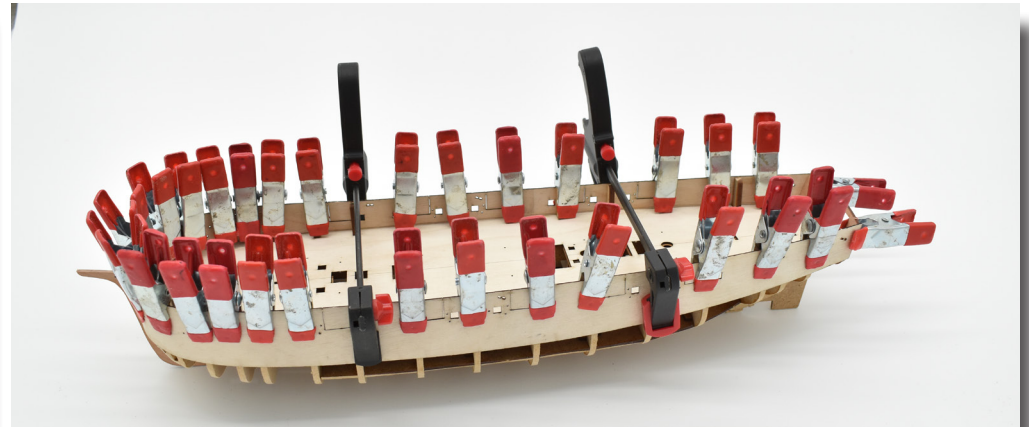


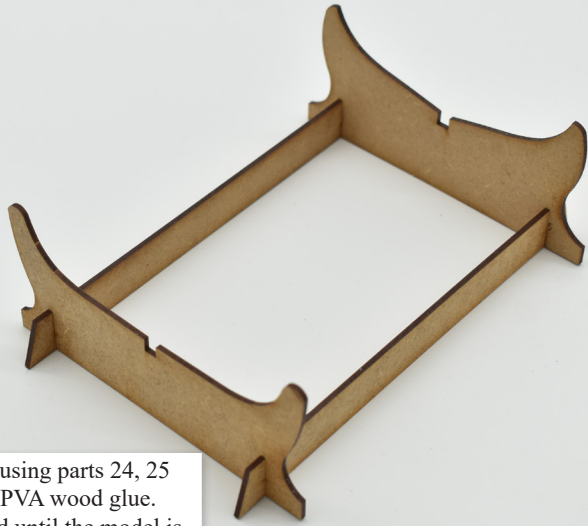
The bulwarks are to be pre soaked in water and then clamped at every bulkhead station. No glue is used at this time, but wait until the patterns are fully dry, so that they keep their bend and remove, ready for gluing.



26. You can brush on watered down PVA to the inner contact surface of the bulwarks. Then carefully place the bulwarks into position using clamps. As the wood glue takes time to cure, there is plenty of time for adjustments if needed.

A couple of pins may be required right at the lower bow area, but on the prototype model, none were required. Once in place, leave to thoroughly cure for 24 hours.



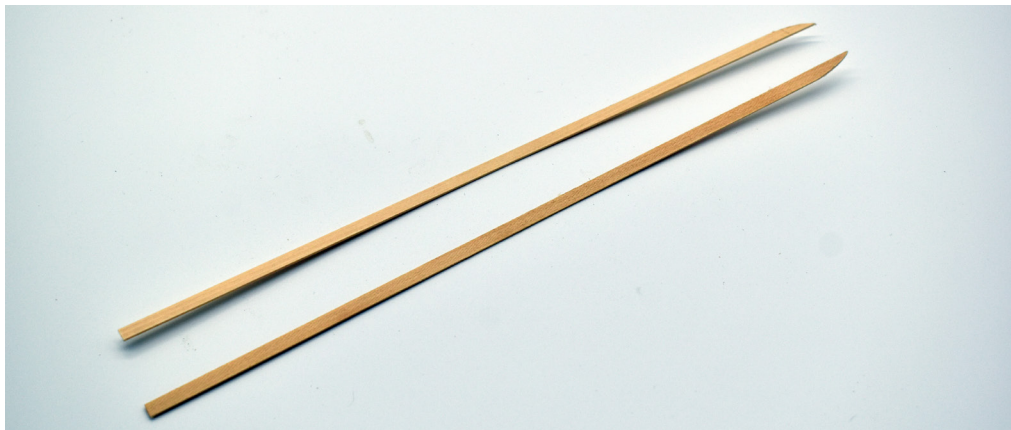


27. Make up the build cradle using parts 24, 25 and 26. It can be glued using PVA wood glue. This is only a temporary stand until the model is complete.



With the glue cured and the bulwarks secured, the clamps can be removed, ready for the next stage.





28. For the start of the first planking (1x5mm lime strip), we recommend starting by adding the lowest plank first. Shape the front of each plank to match the curve of the bow. When gluing into place, use the glue very sparingly near the drop keel slots, just apply a drop of glue to each of their adjacent bulkhead edges. As with all planks for the first planking, pin as well as glue into place. Do not push the pins all the way in, but just about half way. Once the plank is set, the pins can be removed and re used (if not bent..)

Take care to butt the plank edges as tight as possible to each side of the keel



29 - First Planking

The first planking should now be ready to be laid using 1x5mm lime wood strip. The first or 'master plank' is to be laid at the bottom edge of the gun port/bulwark pattern.

When pushing the brass pins into the planks and bulkheads, leave at least half of the pin length protruding so they can be easily removed with the use of a pair of flat nose pliers once the planks are secure. Use PVA wood glue to fix the planks to the edges of each bulkhead.

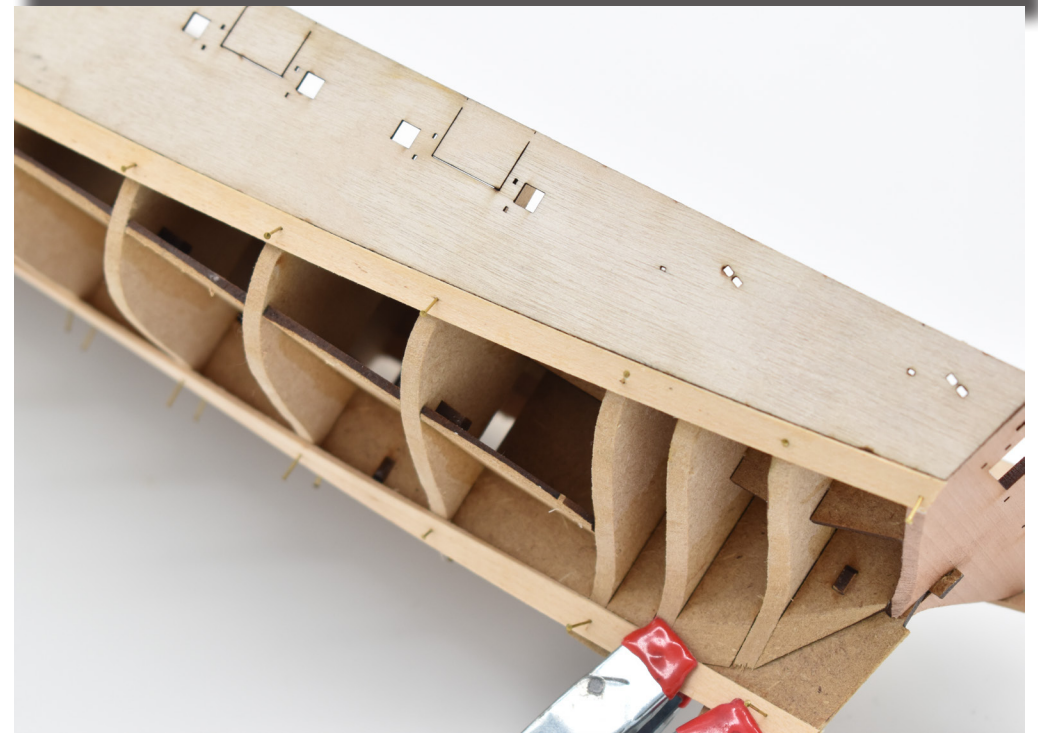
Mild tapering is required for all planks, but there are only 12 per side for this model. To determine the amount of taper needed for each plank to lie naturally, lay a plank at the fourth or fifth bulkhead and then lay it around the bow. Mark the excess area of plank that overlaps the one directly above it. Repeat this technique for the stern also.

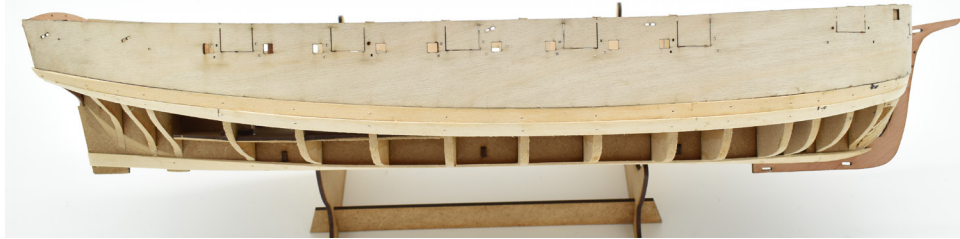
Although the planks may not require tapering at the stern, it is advisable to let the planks run as natural as possible which helps avoid any possible 'springing' of the planks when sanding. Before cutting the taper into the planks, soak them in warm water for a few minutes only, as this minimises the chance of the blade of the knife following the grain of the wood rather than the edge of the steel rule.

Lay the first damp plank to be tapered on a clean, flat surface; (a cutting mat is well suited for this and is highly recommended.) Press firmly with a steel rule onto the marked taper line on the plank and score down the line with a heavy-duty craft knife several times until the excess is cut off. Pin and glue the tapered planks into position on the hull, leaving a little excess at the stern which can be trimmed to shape once the planking is complete. Glue two or three strips each side alternately. This method should prevent any possible twisting/warping of the frames and keel as the glue cures.



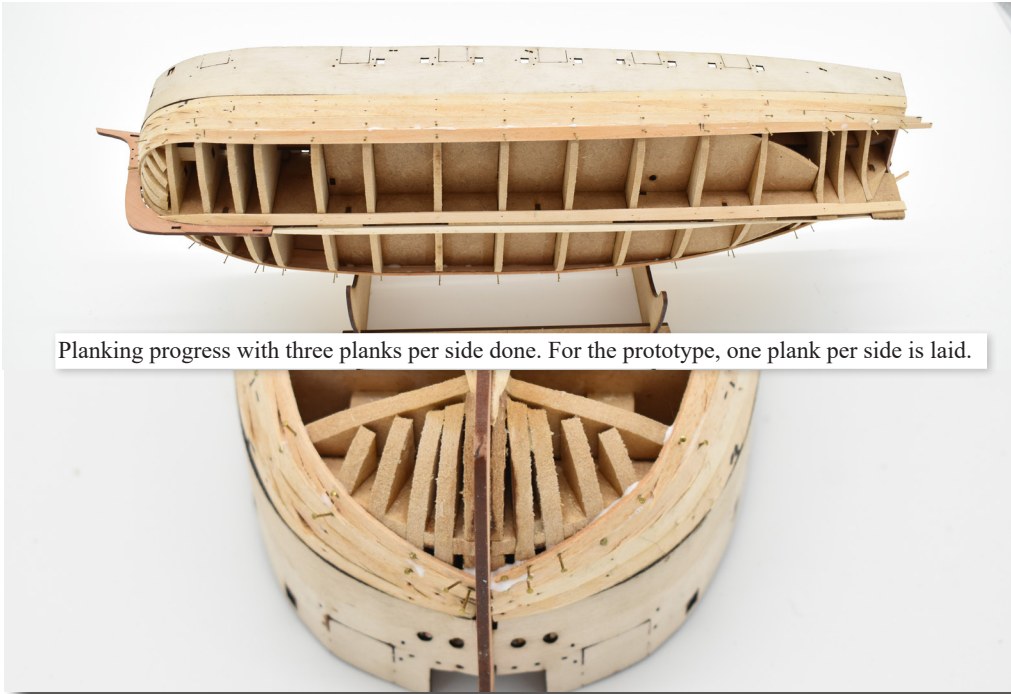
Sand the whole hull that has been planked with a coarse grade abrasive paper, followed by medium grade. This will entail about an hour's work. If possible, sand the hull in a well-ventilated area, ideally in an open space as the dust particles could present both a fire and health hazard. The use of light duty gloves is also recommended to reduce any risk of blisters from sanding. Alternatively, you could use a small electric sander, like a sanding mouse, which will be much quicker.





These two pictures show the planks pre-tapered as well as pre-bent. If the planks are wet, it is very important to wait until the plank is completely dry before adding to the hull, otherwise the plank will shrink and leave gaps in-between each plank, meaning a lot more filling will be required.





Planking progress with three planks per side done. For the prototype, one plank per side is laid.



Planking progress with 4 planks per side done



The forward part of a bevelled and edge bent plank, ready to be glued and pinned into position. The slight edge bend was simply done when the plank was damp, and bent using fingers and thumb.



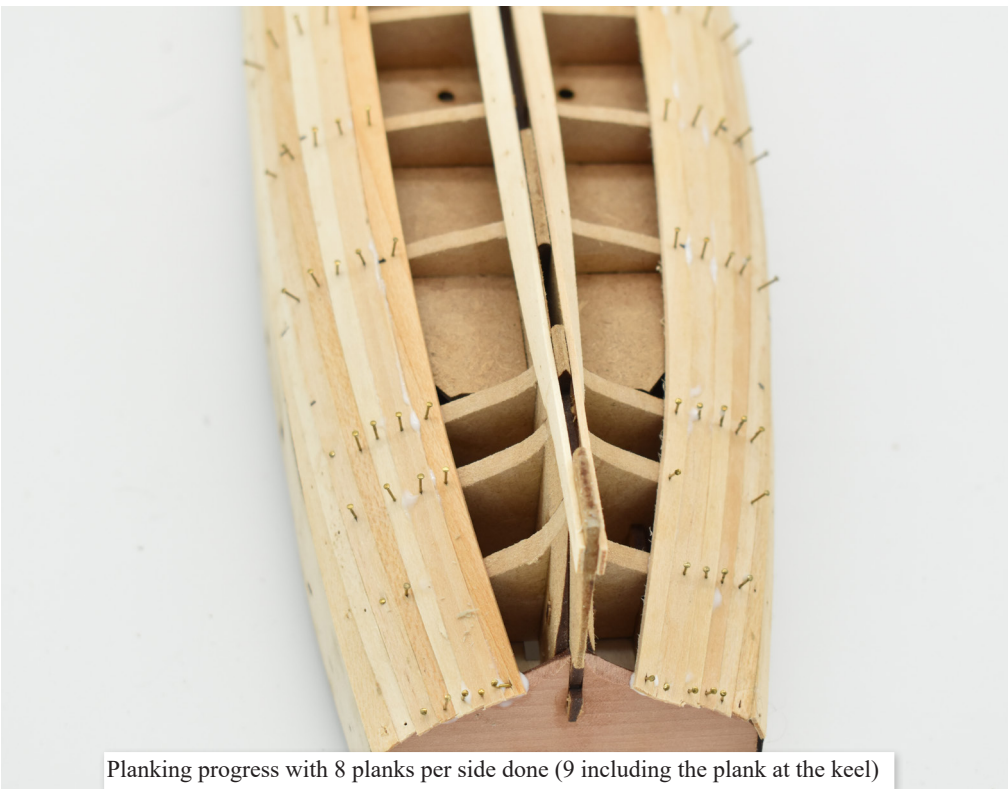
Planking at the stern.



Planking progress with 8 planks per side done



Planking at the stern - Little to no tapering was required for the stern

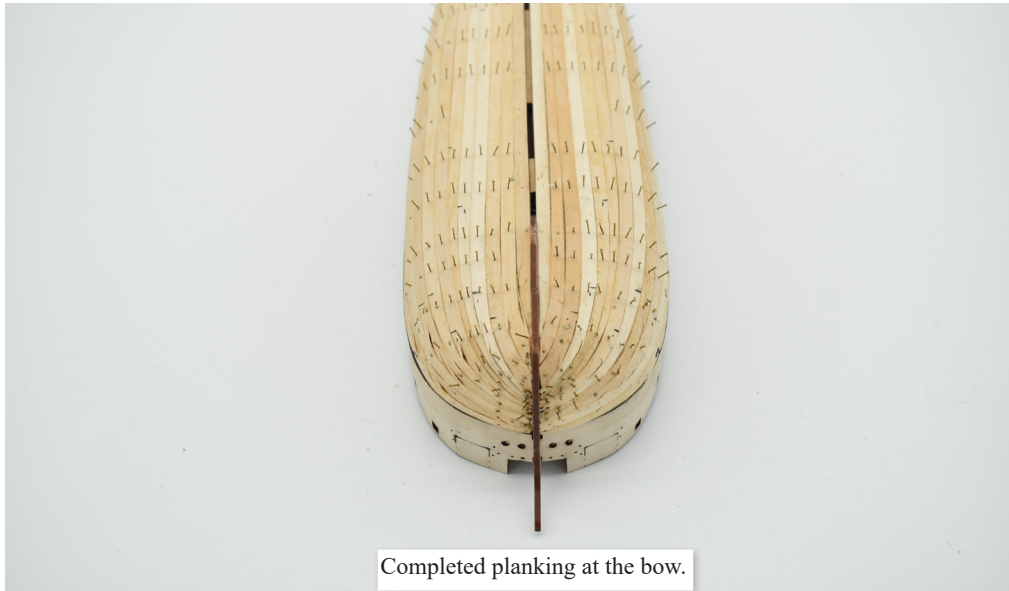


Planking progress with 8 planks per side done (9 including the plank at the keel)



Planking almost complete. There will be a few 'stealers' required (triangular shaped filling planks) for the stern. as seen below with the completed planking.





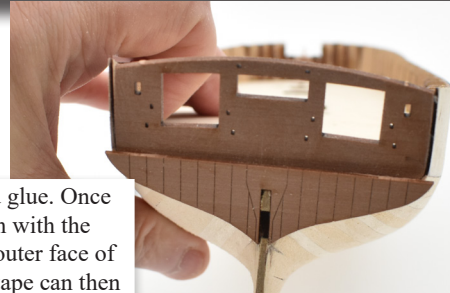
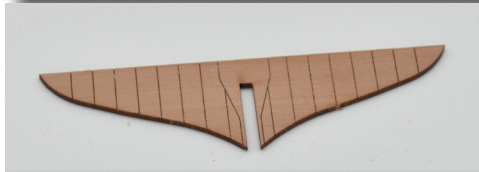
Completed planking at the bow.



Another view of the completed planking at the stern.



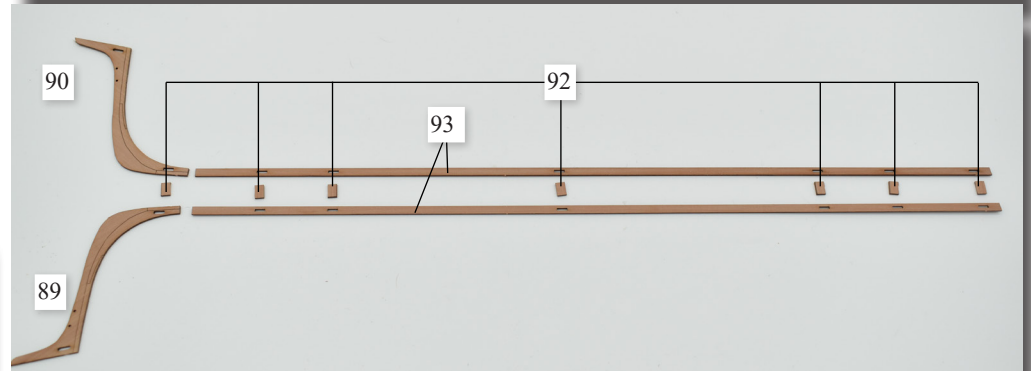
Pins removed and hull sanded and the stern planks trimmed flush with the stern board.



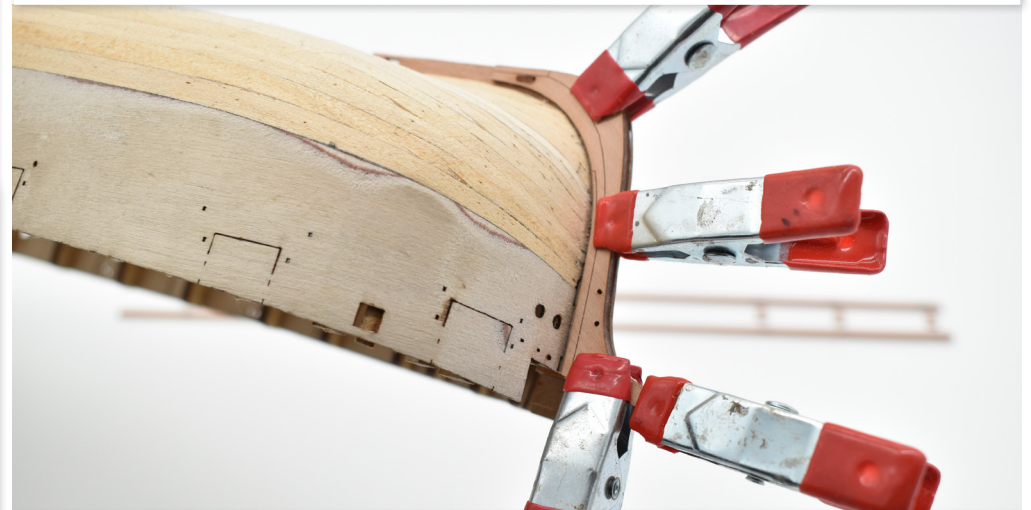
30. Add the lower stern pattern (98) using PVA wood glue. Once dry, carefully file/sand the edges so that they are flush with the hull planking. It is recommended that you cover the outer face of part 98 to keep it free from glue and file marks. The tape can then be removed once second planking is complete.



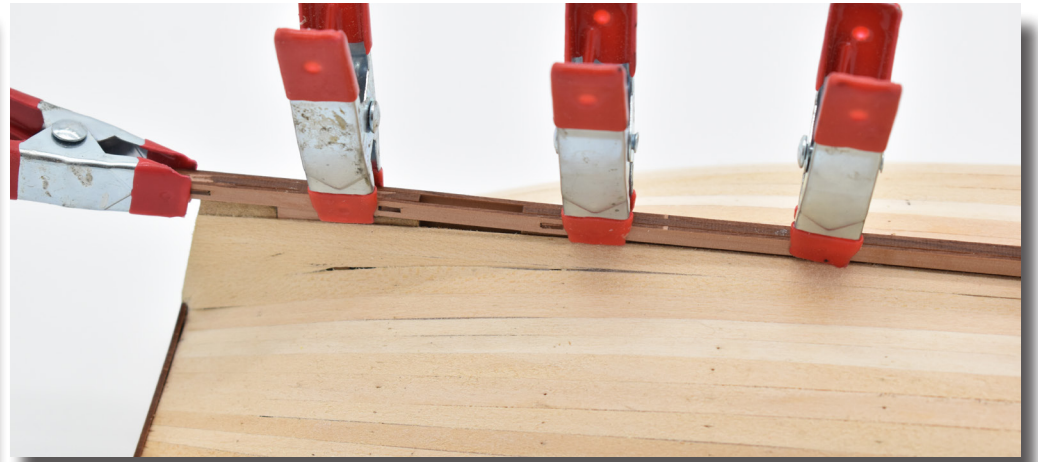
31. The main keel parts (150 and 151) can now be added. Slot and glue into position.



32. Cut out the outer facing for the prow and keel (89, 90 and 93) plus 7 locating pegs (92)



33. Add the outer facings to the prow, 89 right and 90 left. Use parts 92 to lock the parts in place and PVA wood glue to fix. Clamps are shown, securing the assembly until the glue has cured.

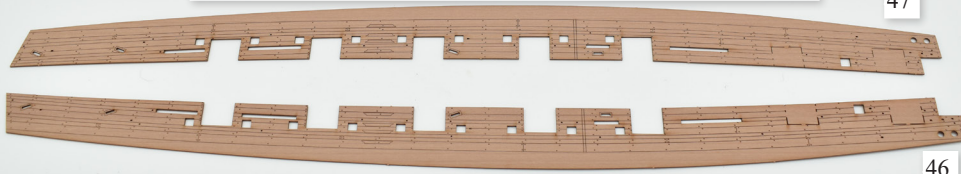


34. Add the lower keel outer facings (93). Use parts 92 to lock the parts in place and PVA wood glue to fix. Clamps are shown, securing the assembly until the glue has cured.



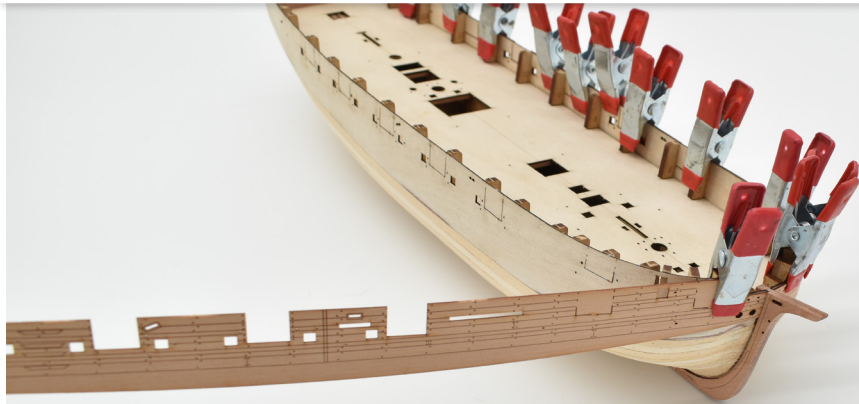
The hull is now ready for the second and final layer of planking

47



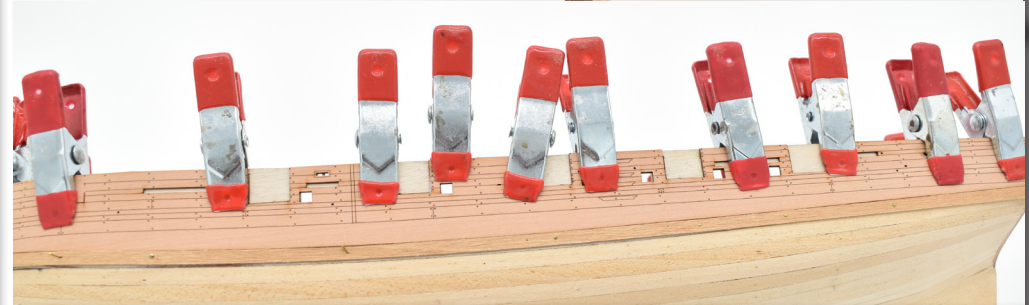
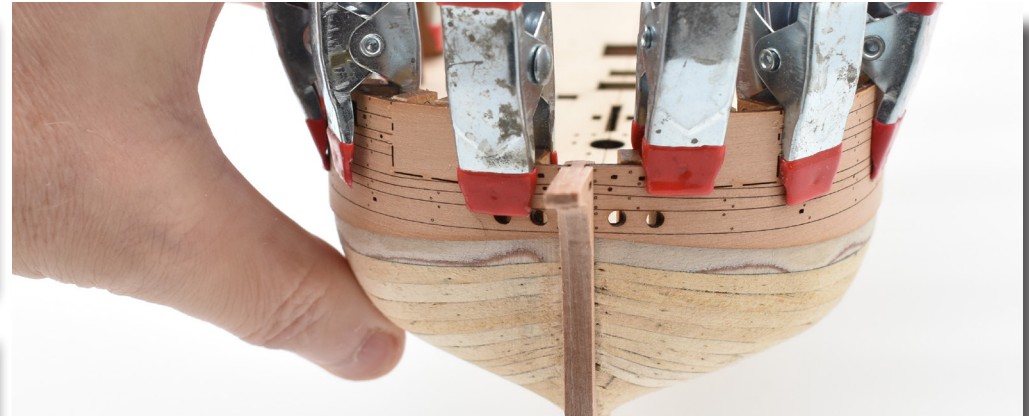
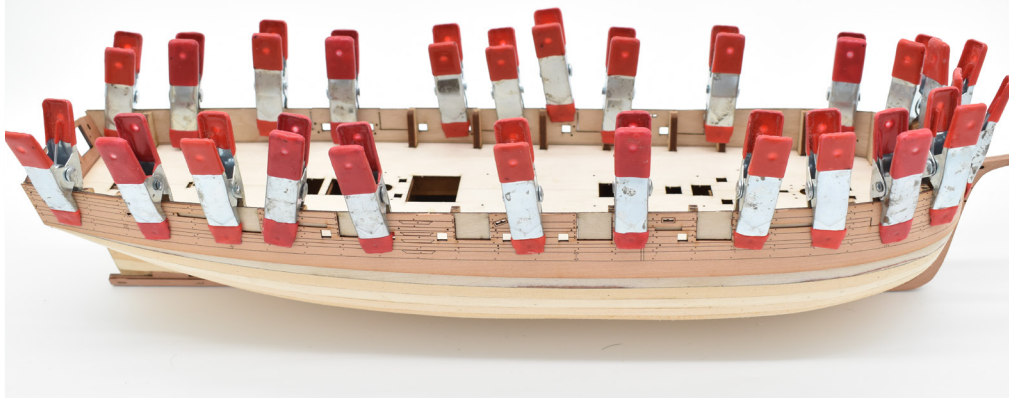
46

35. Remove parts 46 and 47 from their 0.8mm wood sheet. Treat these with care, as these are the outer layer of the hull and require only paint and varnish to finish them.



36. Parts 46 and 47 can be either glued into position at this time, or, as we have done here, just clamped into position. I decided to just clamp and not glue these so that I could just get the correct planking line for the 0.8x4mm planking strips, and then remove the engraved outer bulwark before painting the lower hull white, making sure no paint touches the engraved patterns.

If you do choose to glue them at this time, applying masking tape to the whole outer surface may be beneficial, to avoid any accidental glue marks when planking.



37. The second planking is applied using 0.8mm x 4mm wood strip. Start planking directly below the clamped engraved bulwark patterns (It is better to just pin the first plank in place with no glue, in case glue inadvertently reaches the clamped bulwark patterns) and work down towards and up to the keel. Once planking is complete, the first plank can then be glued with the upper patterns removed. Use the same planking techniques as the first planking, with the exception that the whole under surface of the plank is to be glued to the first planking, as well as edge to edge.

The best glue to use for the second planking is medium to thick cyano gel. This is to avoid any pin holes showing in the planks.





As with the first planking, the planks require tapering at the front (as shown above)
Below - The first 4 planks laid.

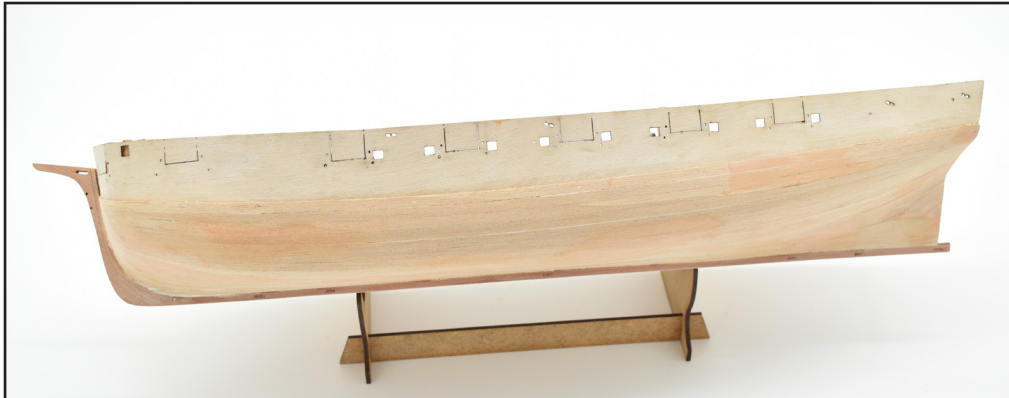


As with the first planking, shape and add the lowest plank to the bottom of the keel as shown.



Progress of second planking. The planks at the bow will require severe tapering.

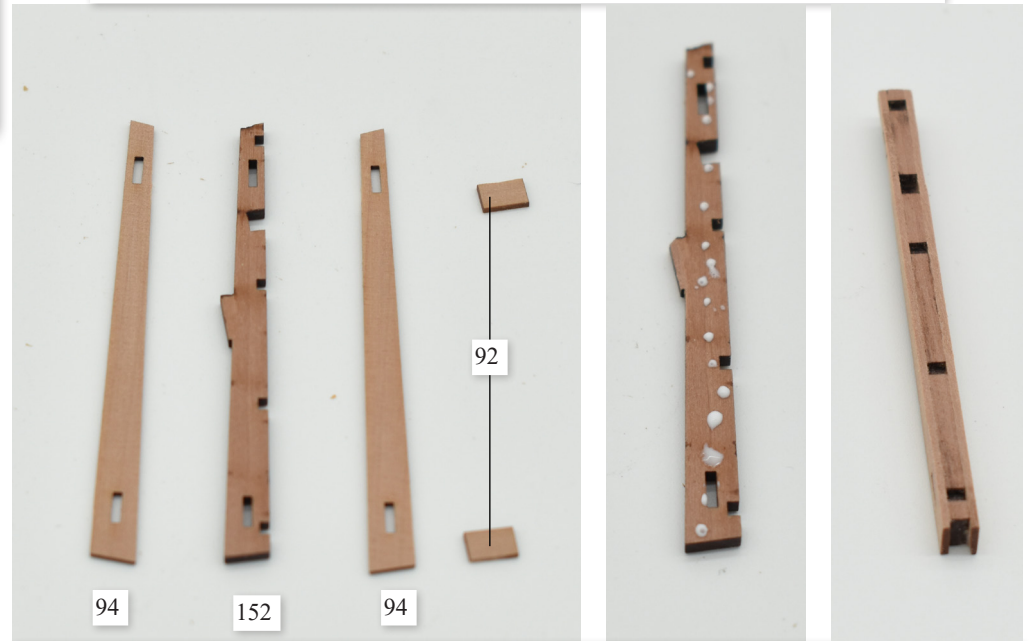




38. Second planking complete, sanded and filled. To get to this stage, several filling and sanding sessions were required. The filler used is a water based type, so it can be diluted and thinned, so it is able to flow into every gap. Before the sanding and filling process started, the engraved upper bulwark patterns were removed and the areas not to be painted white will be masked off.

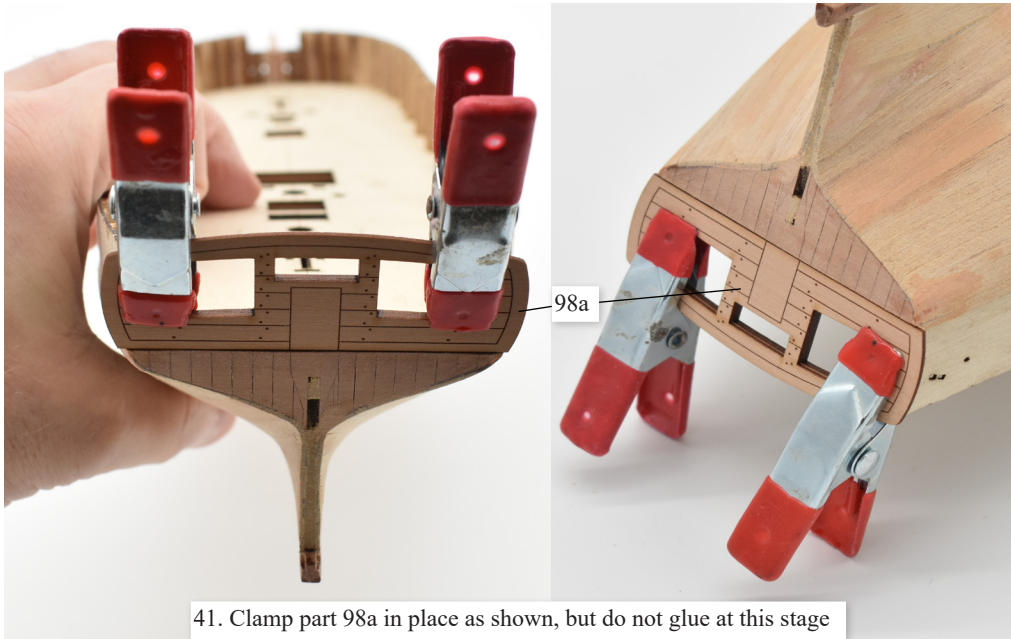


39. File the outer edges of the stern so that the stern/rudder post assembly will fit flush.



40. Make up the stern/rudder post assembly using part 152 at the core, and parts 94 for the outer rabbet parts. Glue and peg (using 92) the parts together and clamp until set, as shown.

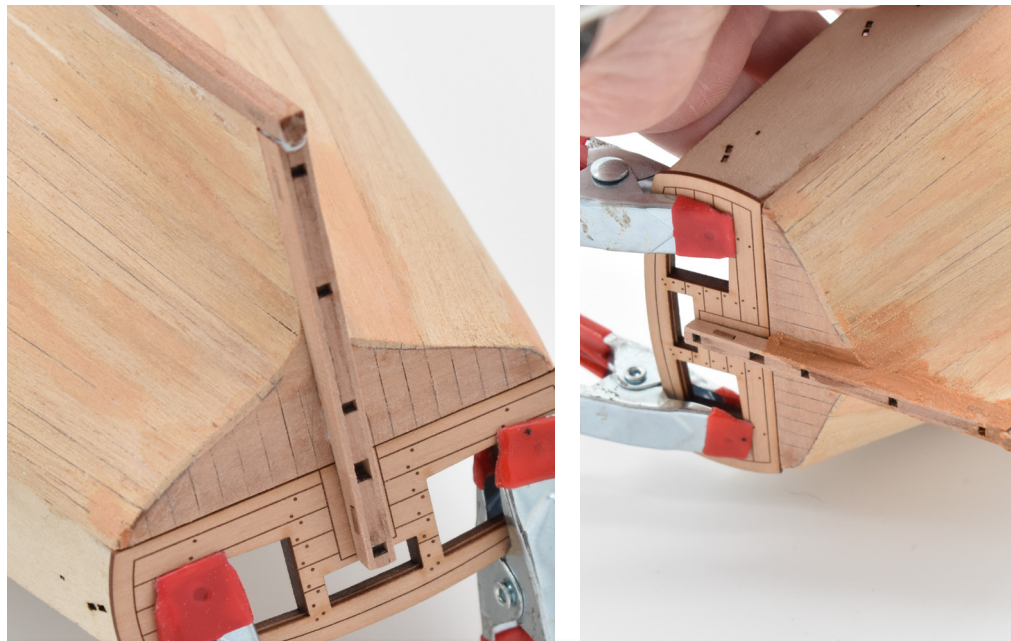




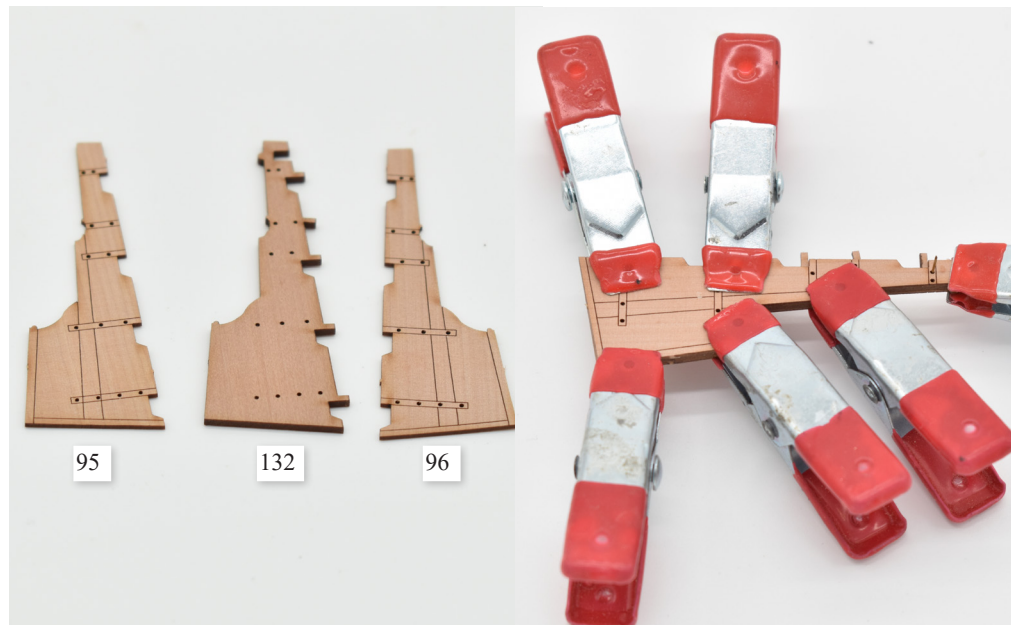
41. Clamp part 98a in place as shown, but do not glue at this stage



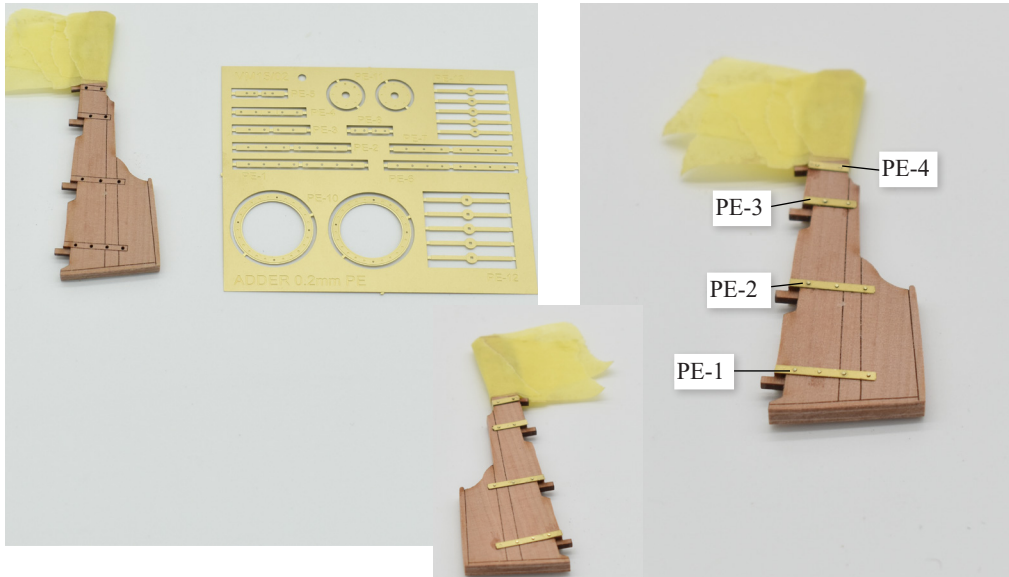
43. Remove part 98a, as this saves it not requiring masking for painting.



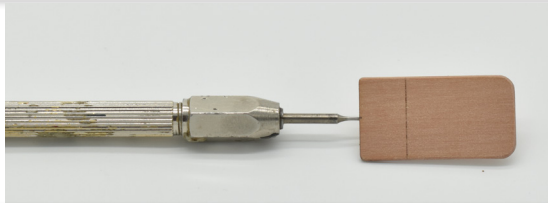
42. Glue the rudder post assembly in place as shown, using PVA wood glue. Because this bottom area is to be painted, filler was used to close any slight gap between the rudder post and hull, and then sanded smooth.



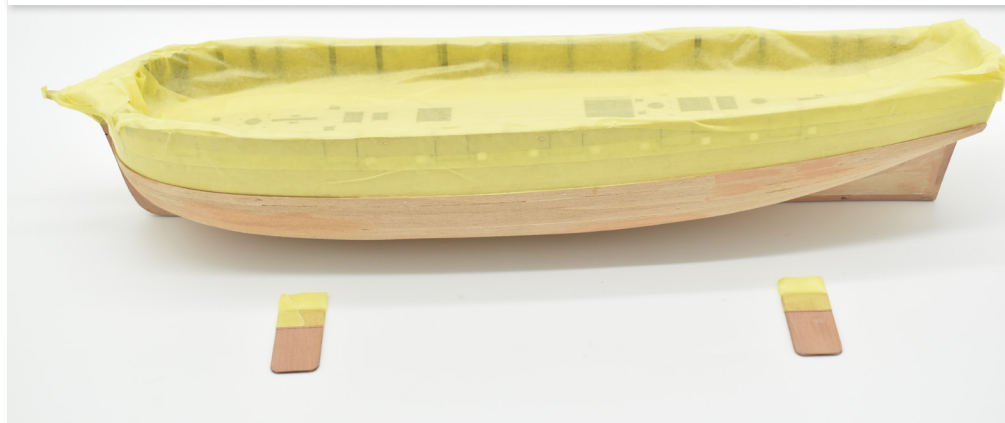
44. Make up the rudder as shown, using part 132 for the core and 95 and 96 for outer facings. Use PVA wood glue and clamp in place whilst the glue cures.



45. Mask the area on the rudder that is not to be painted, and glue the 0.2mm photo etched rudder straps in place as shown (Also shown on Plan Sheet 6)

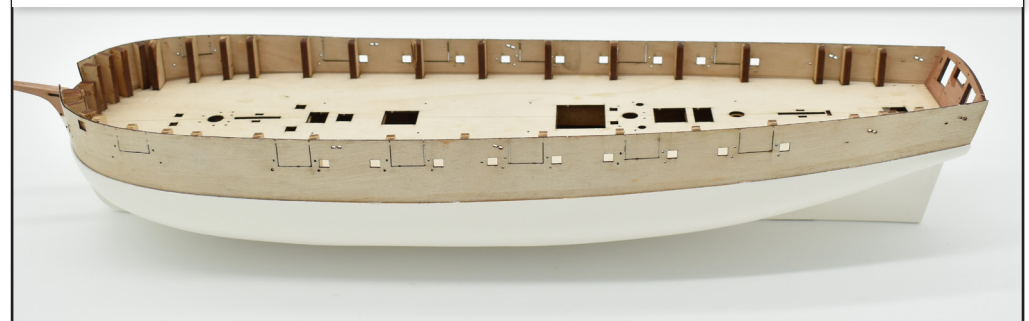


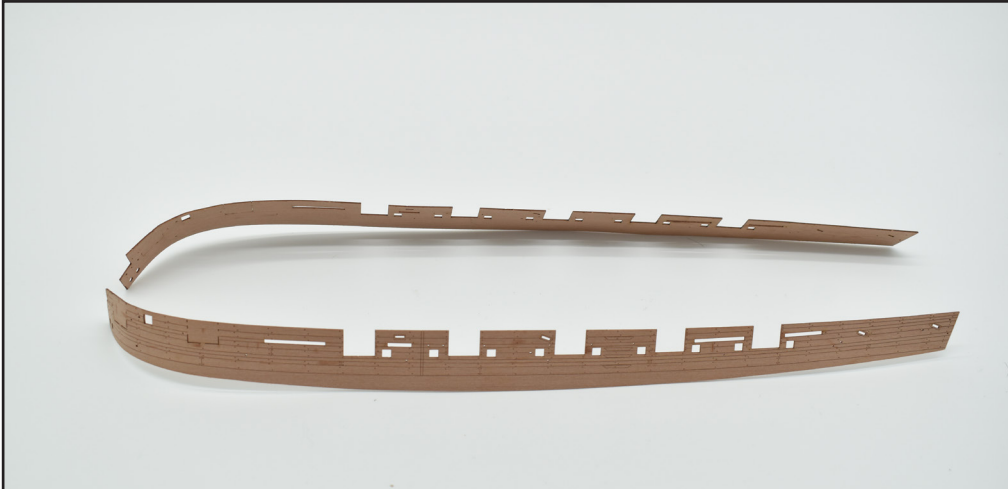
46. Drill a 0.6mm hole in the top edge of each of the two drop keels (138) and glue an eyebolt (PE-14) in each hole for the rope that moves the drop keels. Mask off the area above the engraved line, ready for painting. Also mask off the areas of the hull that are not to be painted, as shown below.



47. The hull will require several coats with filling and sanding in-between most coats. Standard matt white spray paint was used for this model. Before adding the last two or three coats and when final filing/sanding is complete, glue the rudder hinges (PE-6, PE-7 and PE-8) in place as shown on the inset picture.

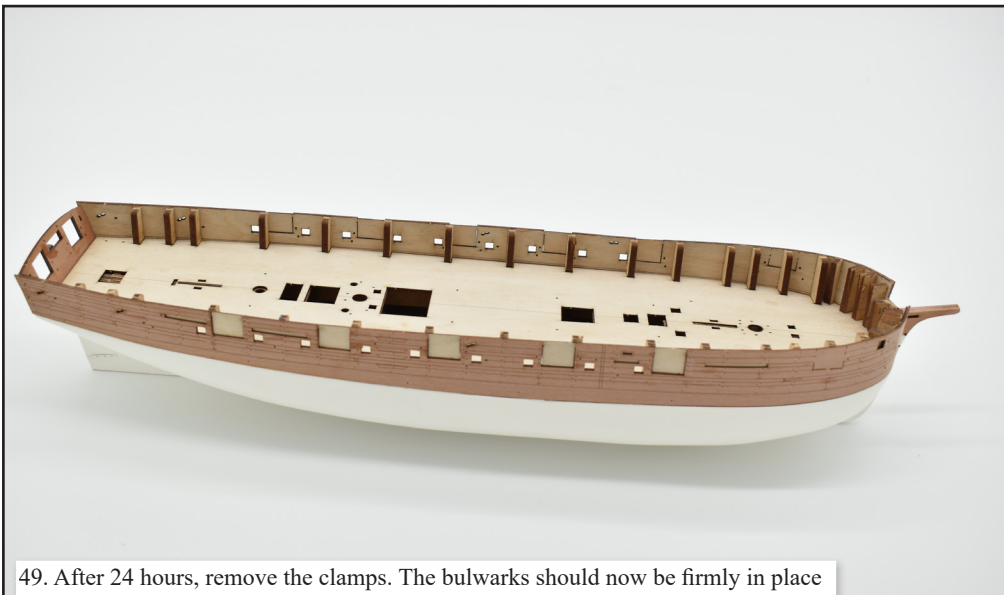
Once complete, remove all masking tape, as shown below.





48. Now that all of the 'messy' work has been done, the outer bulwark patterns can now be glued into place. No pins were used, just clamps. As with almost all wood to wood fixing, PVA wood glue was used. This was brushed onto the ply side using watered down PVA, and the wood engraved bulwark placed and clamped in place, as shown. Again, it may be wise to first mask off the surface of the bulwark patterns to help minimise the accidental marking of the surface.



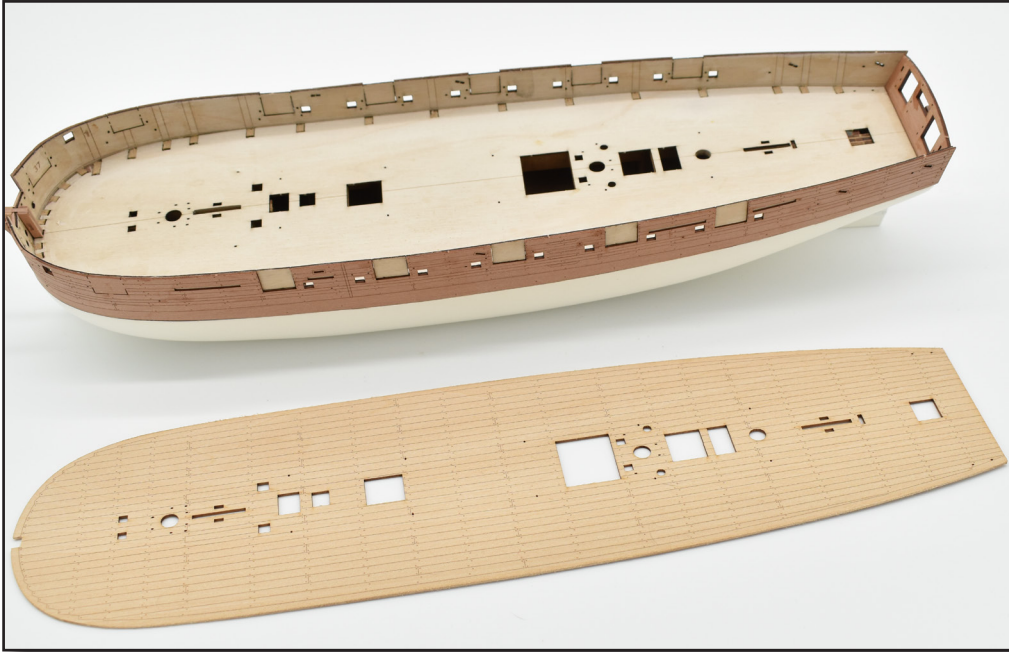


49. After 24 hours, remove the clamps. The bulwarks should now be firmly in place

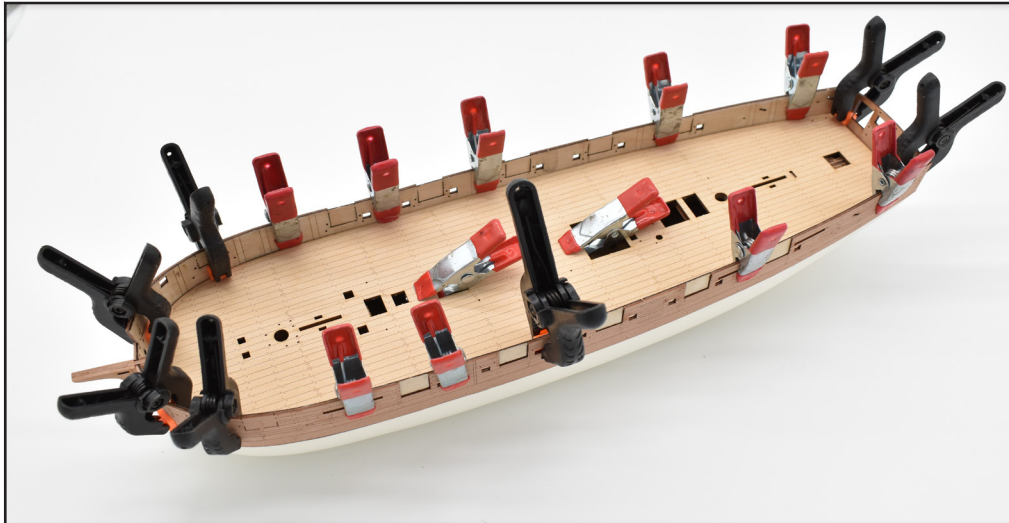


50. Remove all bulkhead tabs above deck level by carefully bending and twisting with a pair of pliers or similar. Once removed, sand any remaining stubs flush with the deck.

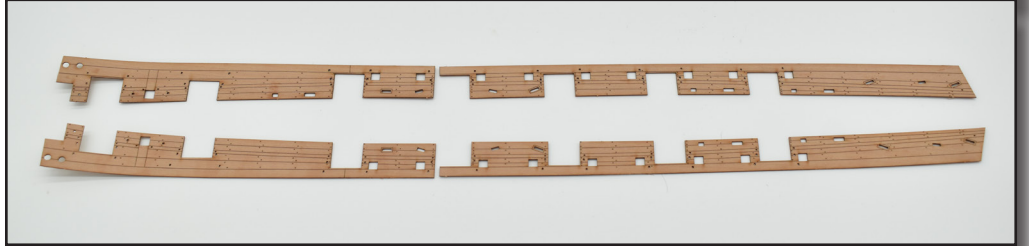
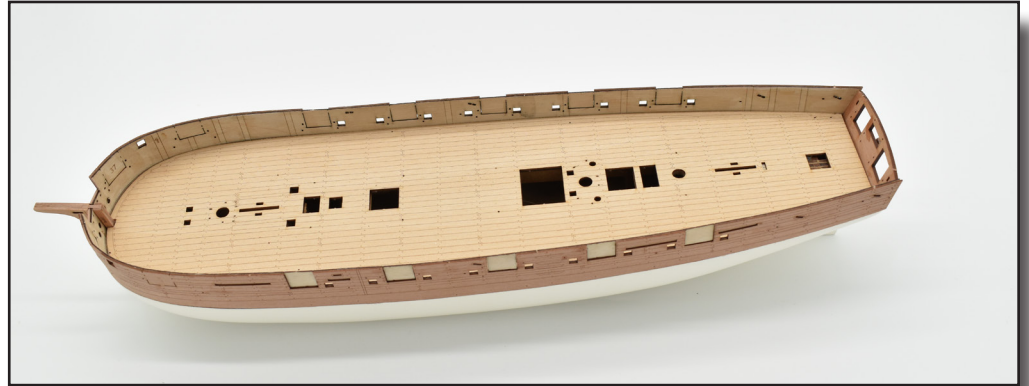




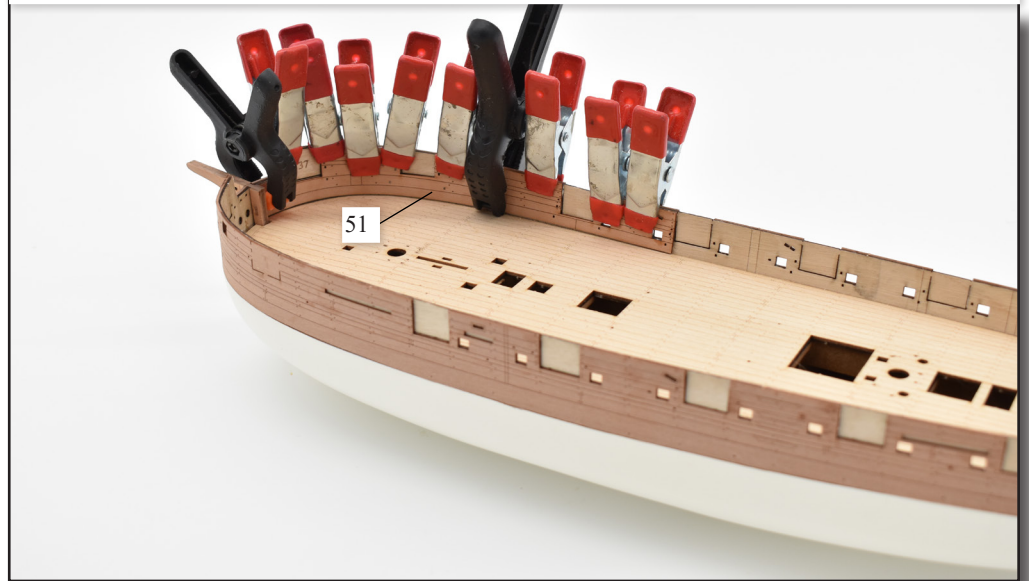
51. The laser engraved 1mm lime wood deck is now ready to be glued in place. Trial fit the deck and sand/file (below) any tight spots around the edges. Because there is another 'spircketing' plank that covers the inner bulwark, it does not matter if there is a slight gap between the deck edge and the bulwark sides.

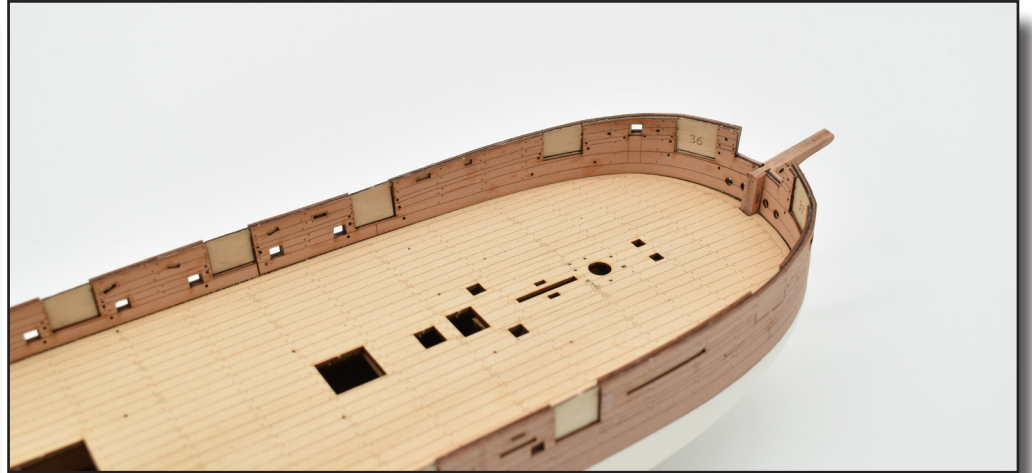
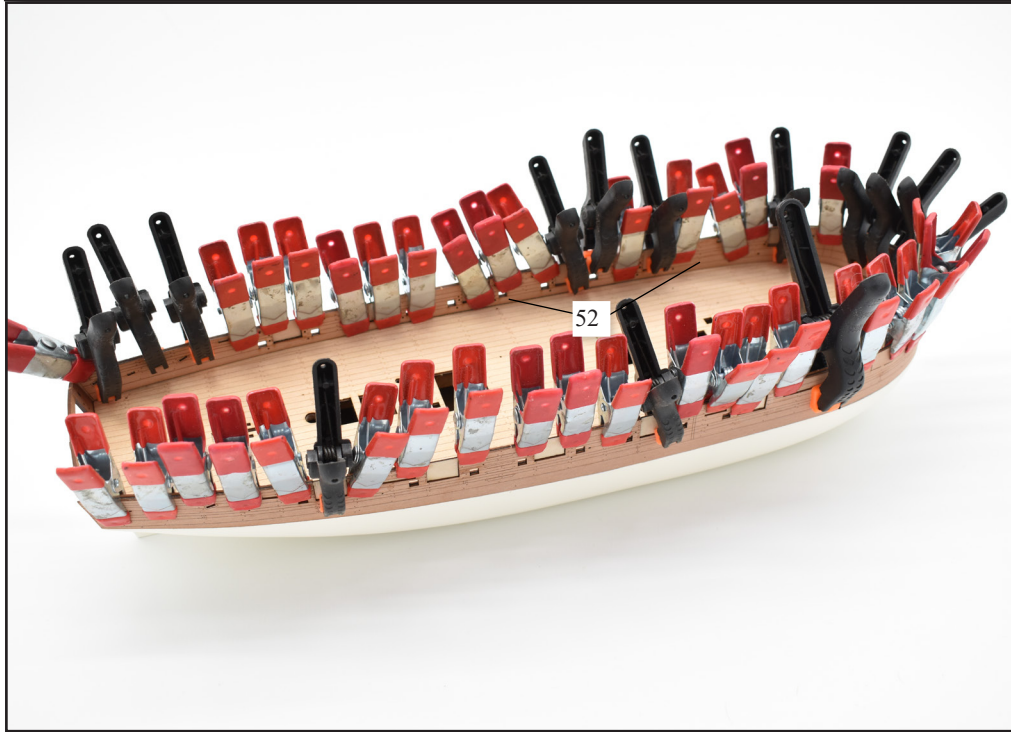
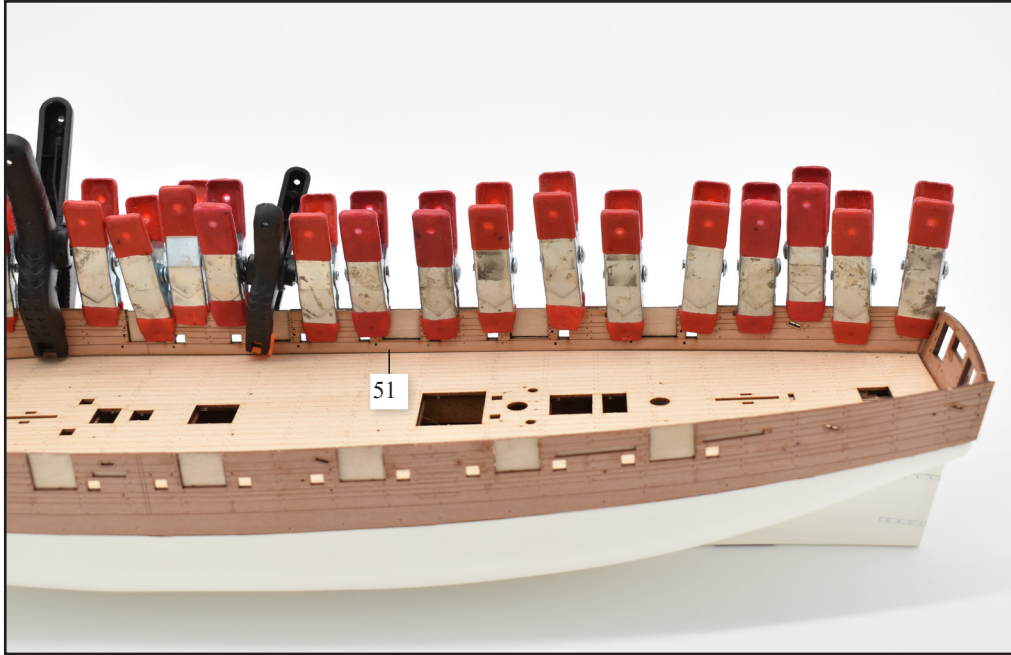


52. Add drops of glue around the near edges of the ply sub deck and around all hatch openings. Carefully place the engraved deck on top of the ply sub deck and then clamp the edges of the engrave deck in place using clamps as shown.

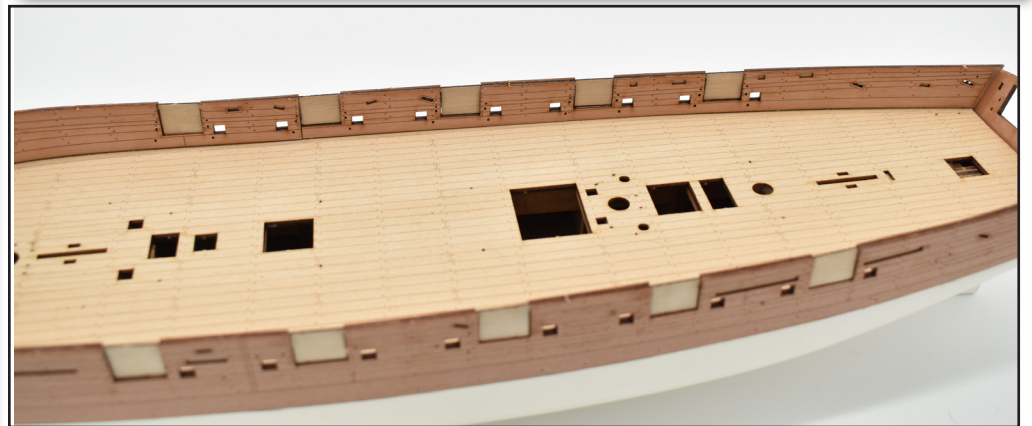
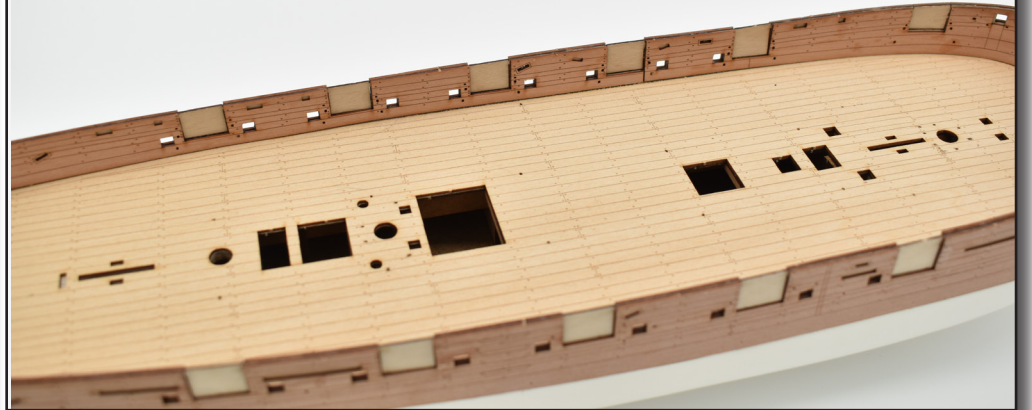


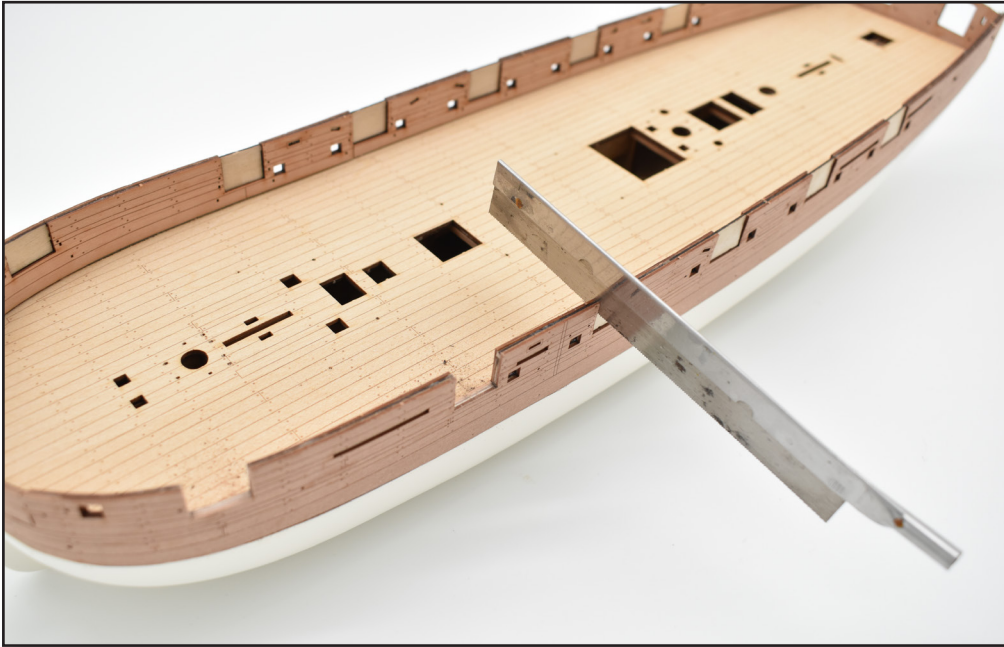
53. The inner bulwarks (51-Right and 50-Left) can now be added. Trial fit the parts before gluing anything. Like the outer patterns, there may be a little trimming required at the front and rear. The patterns are designed to sit just above the engraved deck, so if you find that there is a gap, do not worry, this is intentional; The spircketing patterns cover any gaps. Glue and clamp the inner bulwarks into position as shown below. Each side has been split into two parts, to make them easier to fit.





Inner bulwarks in place. Note the slight gap between the bottom edge of the bulwarks and deck.

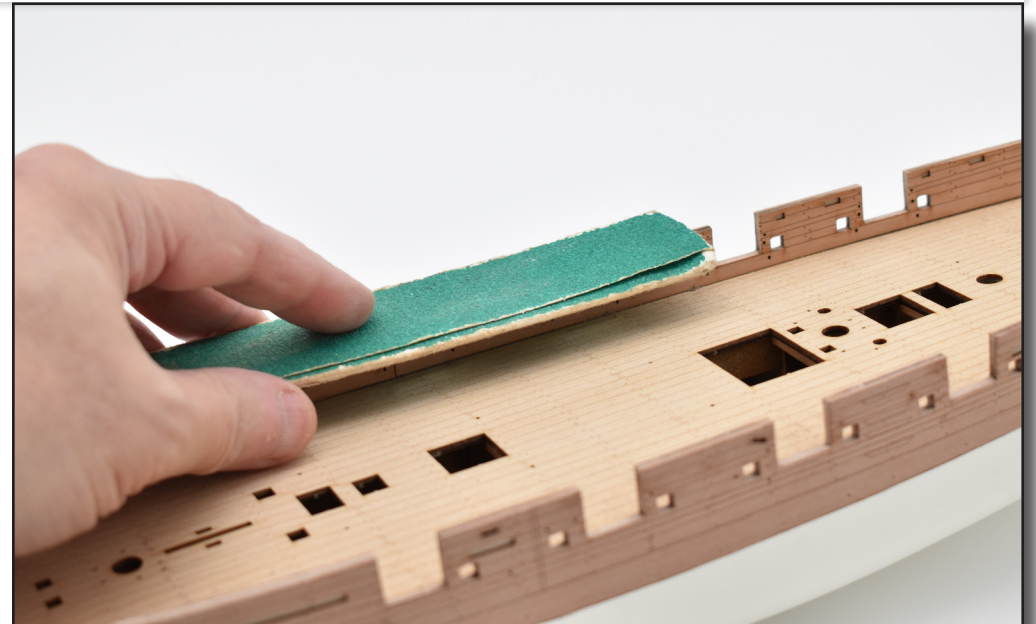




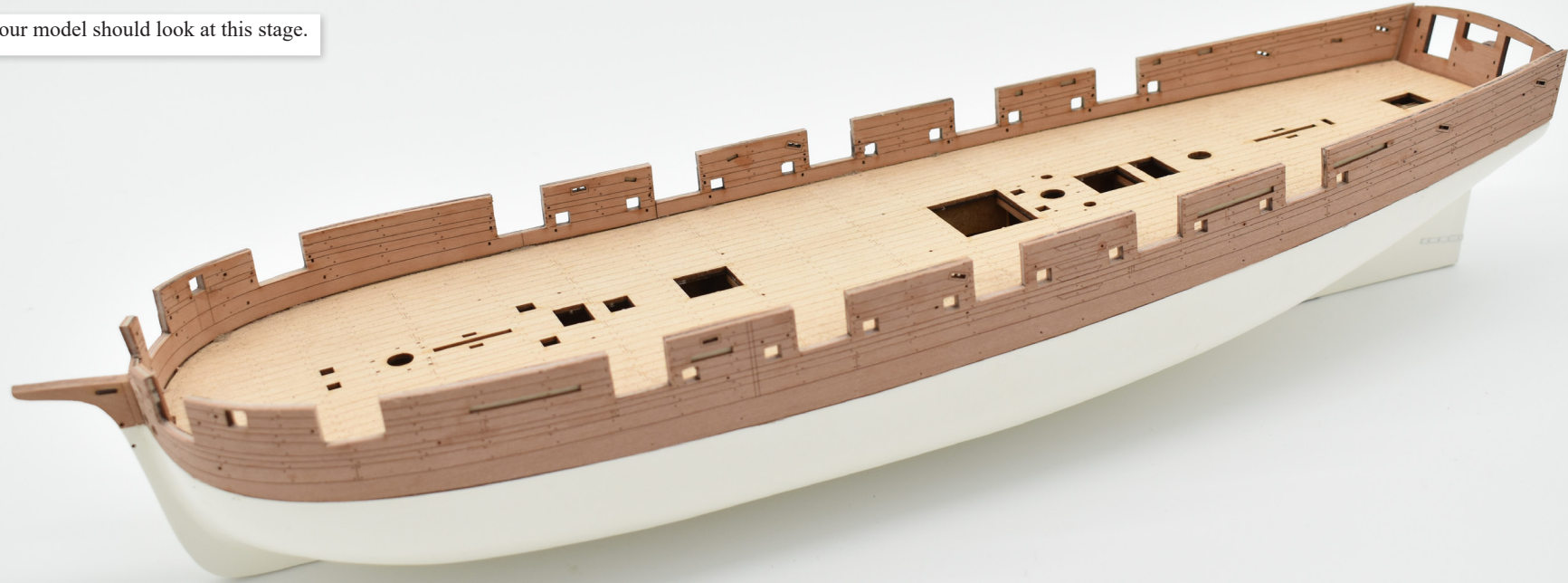
54. Above - Open up the gun ports using a razor saw. Above Right - File the gun port openings so that all three layers are completely flush in the four inner edges, using a flat needle file. Take care not to damage the deck, perhaps add masking tape to the deck for protection in case you slip with the tool.

Below - Do the same for the smaller oar ports, but use a square needle file instead.

Bottom Right - Finally, sand all three layers flush at the top edges of the bulwarks. This is important because the gunwale will need to sit perfectly flush along the whole top edge of the bulwarks.



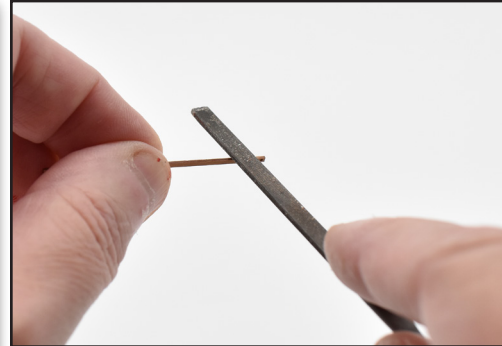
This is how your model should look at this stage.



55. The inner stern board (97) can now be fixed in place. If you plan to paint the inner bulwarks, it is better to paint this before fixing in place, as shown above. Glue the part in place using clamps to secure the parts until the glue has cured.

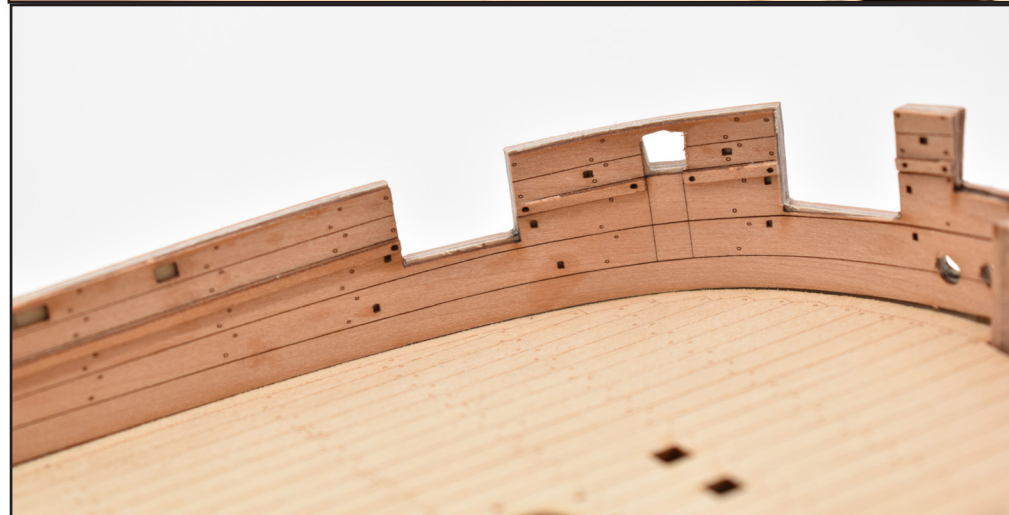


56. Remove the inner bulwark rails from the 0.8mm wood sheet and very carefully file down any remaining tabs marks, as shown below.

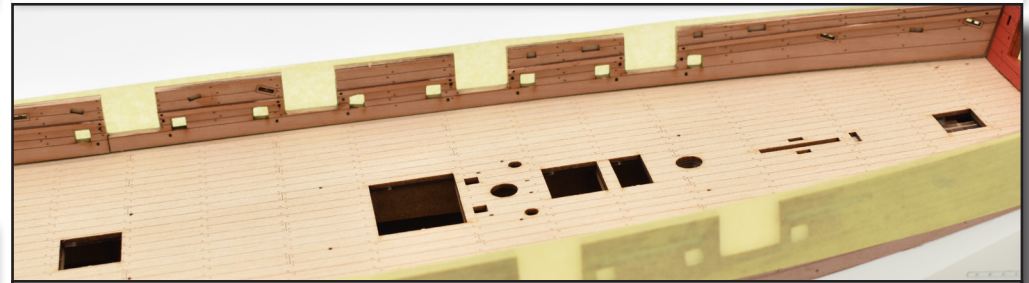




57. Using Plan Sheet 5 for placement, add the inner bulwark rails. For the prototype, PVA wood glue was used, and the rails clamped in place until the glue had cured.



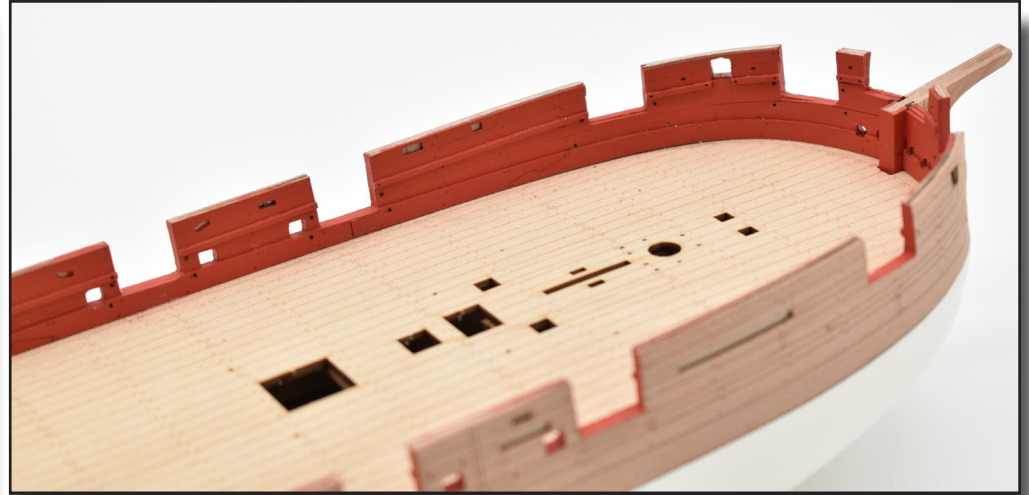
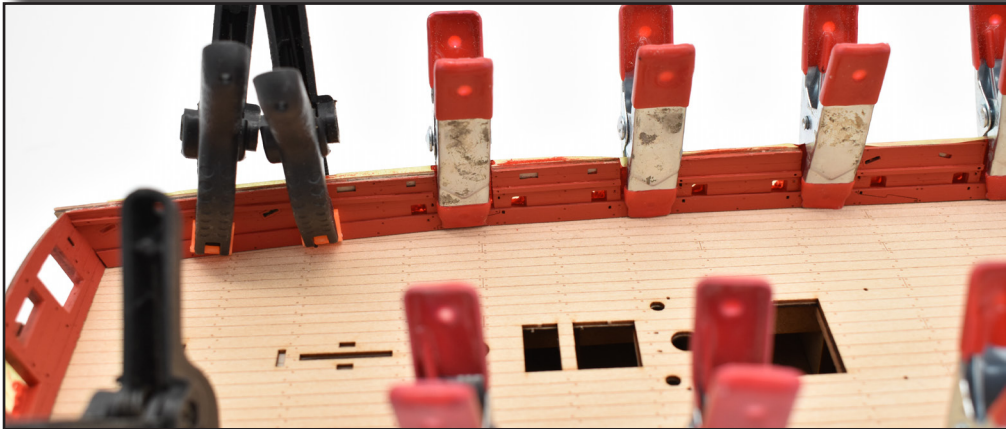
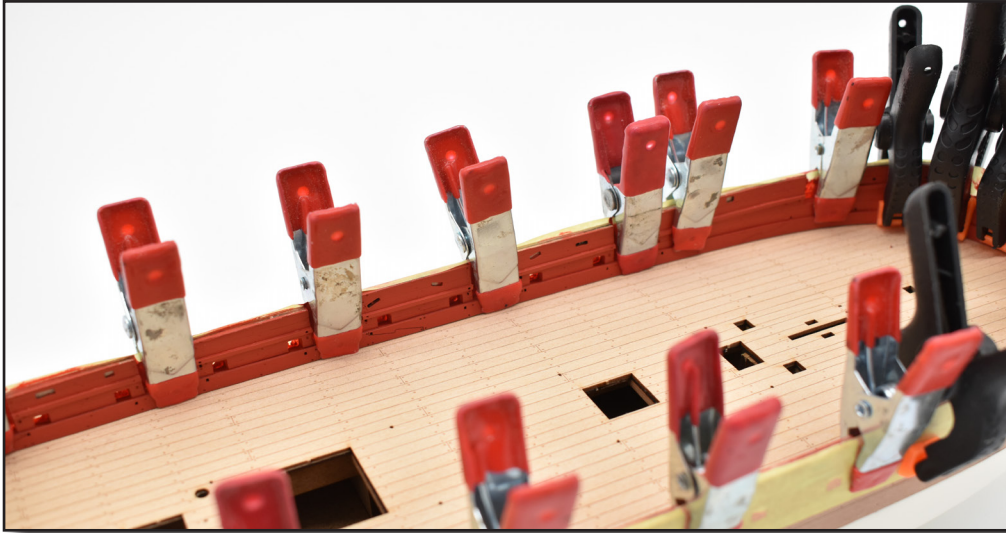
58. The inner bulwarks can be painted red at this point. Cover the outer bulwarks with masking tape, to help stop paint seepage to the outer face. If you are unsure of painting neat, also mask the deck edges. The prototype was brush painted. The paint doesn't need to go all the way to the bottom, as the spirketting will cover this. Make sure all of the inner edges of the oar and gun ports are covered in red. Two to three coats should suffice.



59. Remove the four spirketting patterns (54/55 - left and 52/53 - right) from the 0.8mm wood sheet (Above)
 Double check the fit, the top edges should be just below or on the lower edges of the gun ports, and the lower edge of the spirketting should touch the deck.
 Paint the parts red before fixing in place, this avoids the need to mask off the deck edges and ensures a nice clean line.



60. Again, using Plan Sheet 5 for placement, add the inner bulwark spirketting. For the prototype, PVA wood glue was used, and the parts clamped in place until the glue had cured, as shown.



61. Remove the main wales (48 and 49) from their 0.8mm sheet. Soak them in water and pin/clamp into place on the hull and leave for at least 24 hours, until all moisture has fully dissipated.

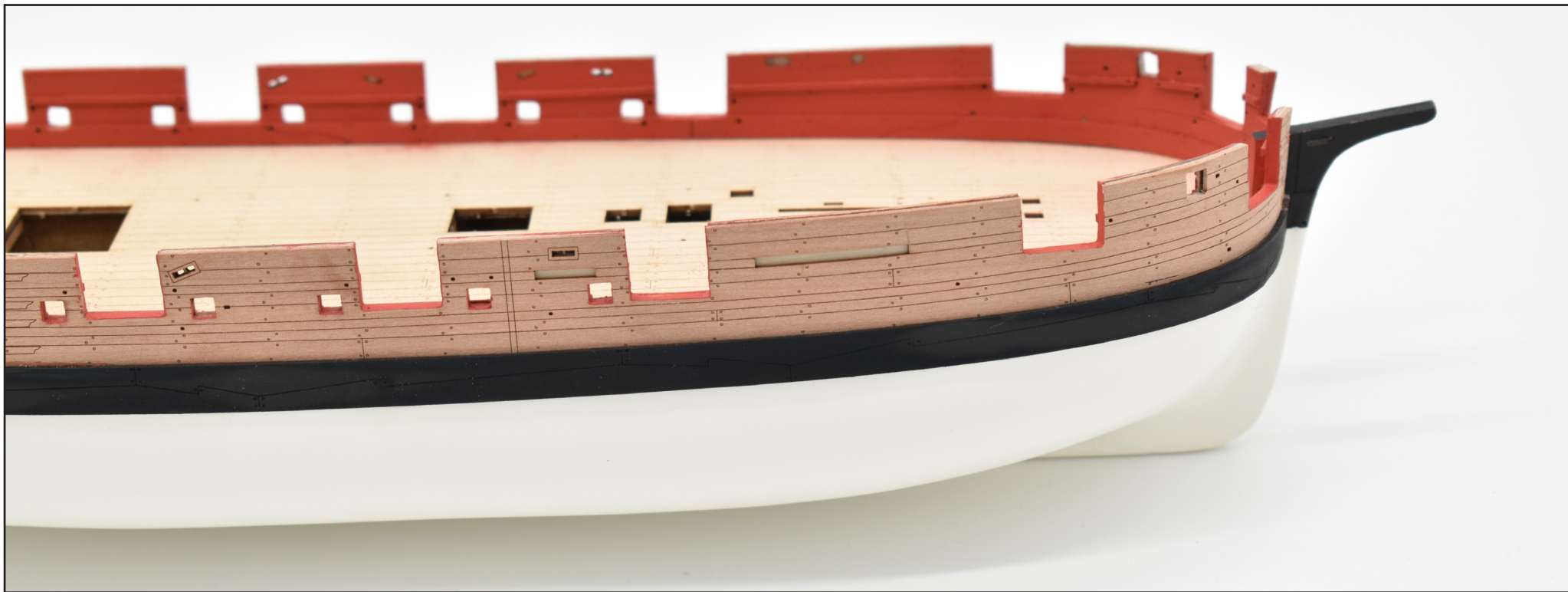


62. The wales can now be painted black before finally fixing into position on the hull.



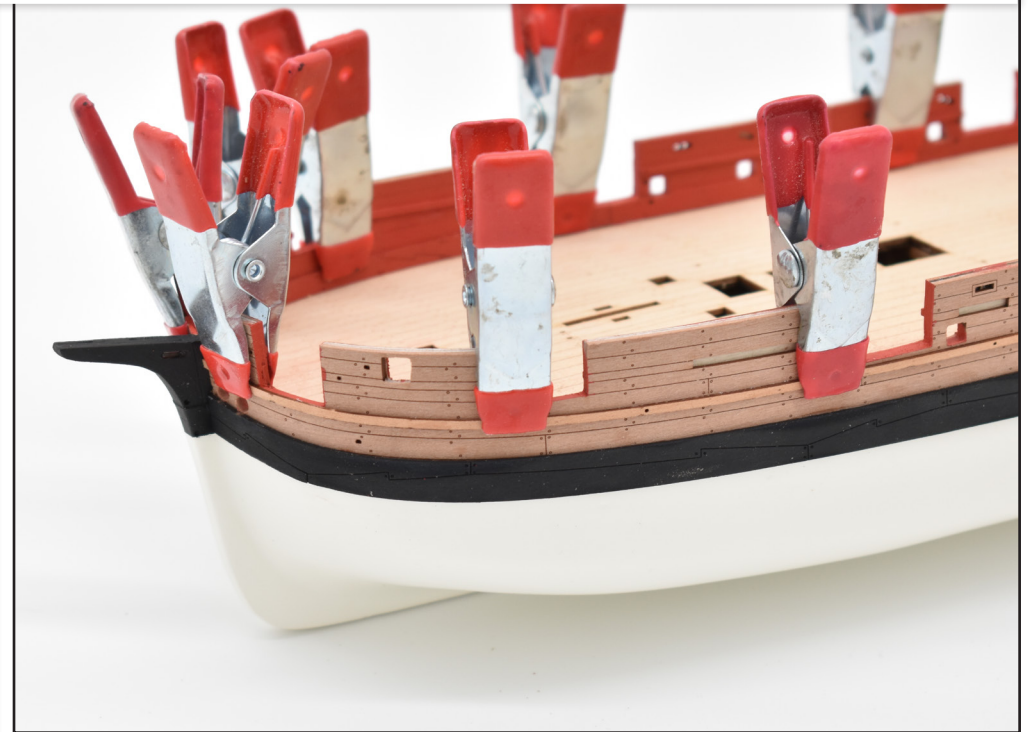
63. The main wales can now be added. The top edge of the main wale follows the lowest engraved line on the outer engraved bulwark patterns - so all you need to do is to keep to this line for the correct placement of the wales.

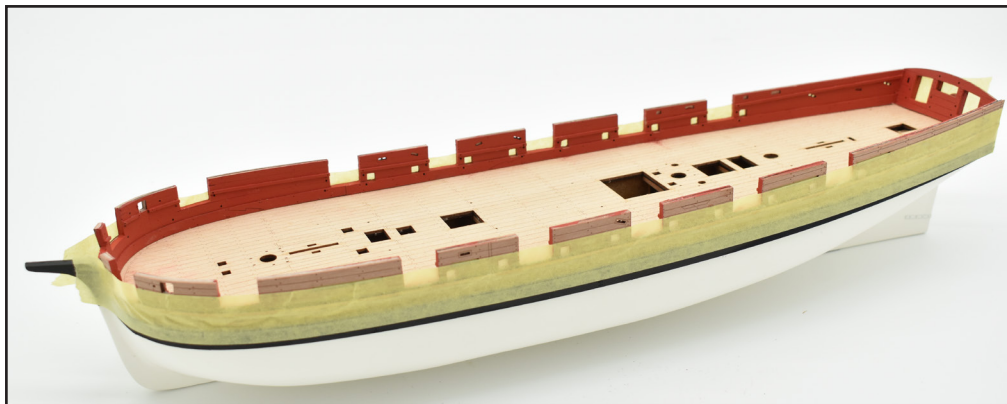
It is better to pin as well as glue in place. If you use Cyano gel, pins will not be needed, but if you use PVA wood glue, pins will be required to fix the wales in place until the glue has fully cured. As the wales are painted black, once the glue has set, you can simply remove the exposed parts of the pins so they are flush with the wale surface, and paint over them.



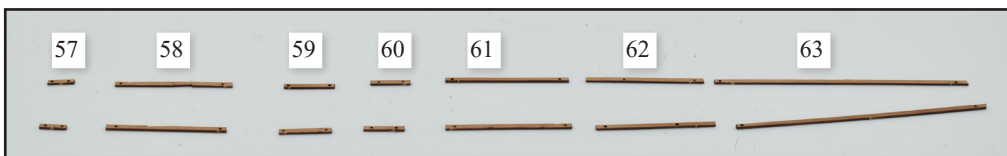
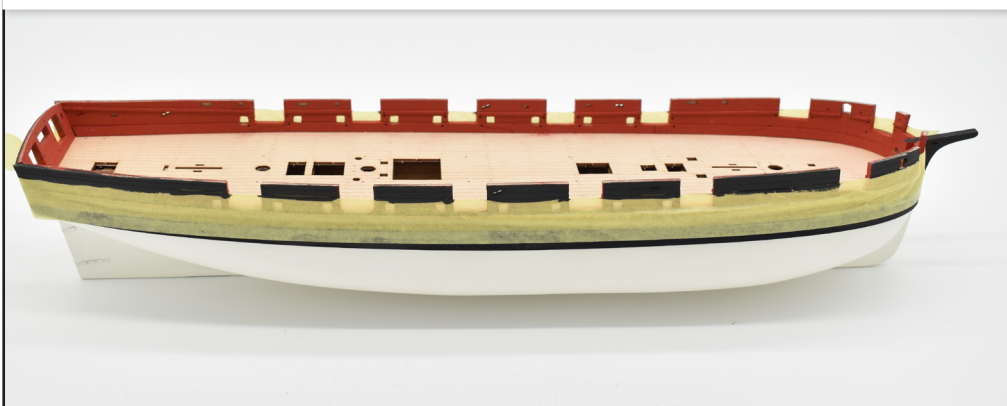


64. The upper rails can now be added. The positions for these (56) are etched to the outer planking sides, and can also be pinned in place using the alignment holes. You can use a small amount of PVA wood glue (Not so much as to have it seeping from the sides when pressed into place), and then carefully clamped in place, as per the prototype model, until the glue has cured. You could even put masking tape at the upper and lower engraved rail line edges, to help minimise the glue marks, and then remove the tape once the rails are firmly in place.

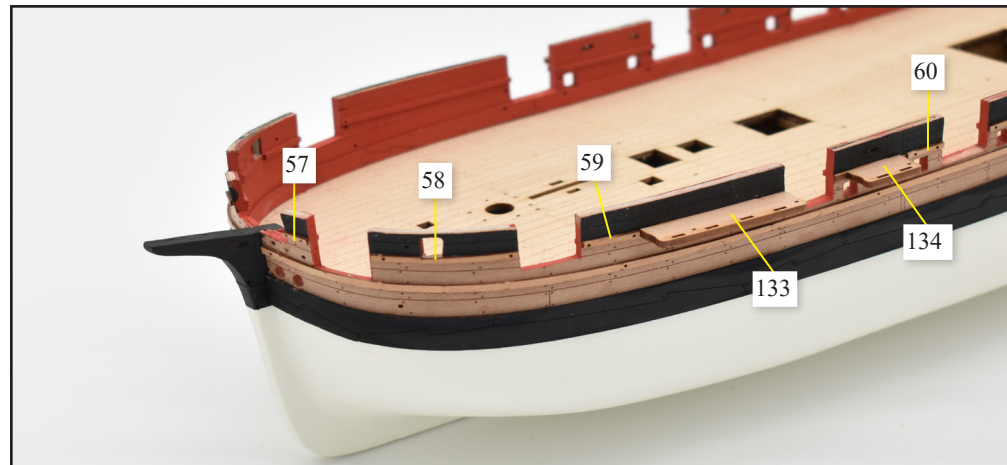
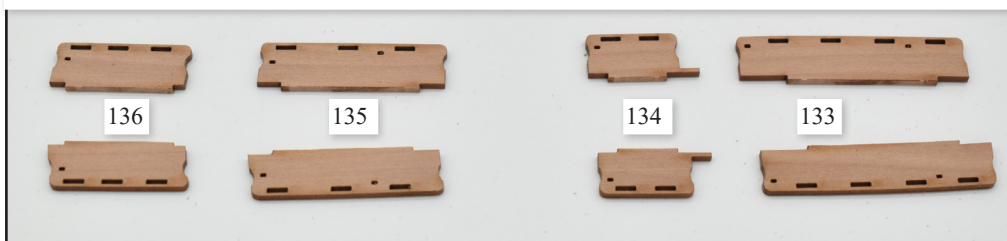




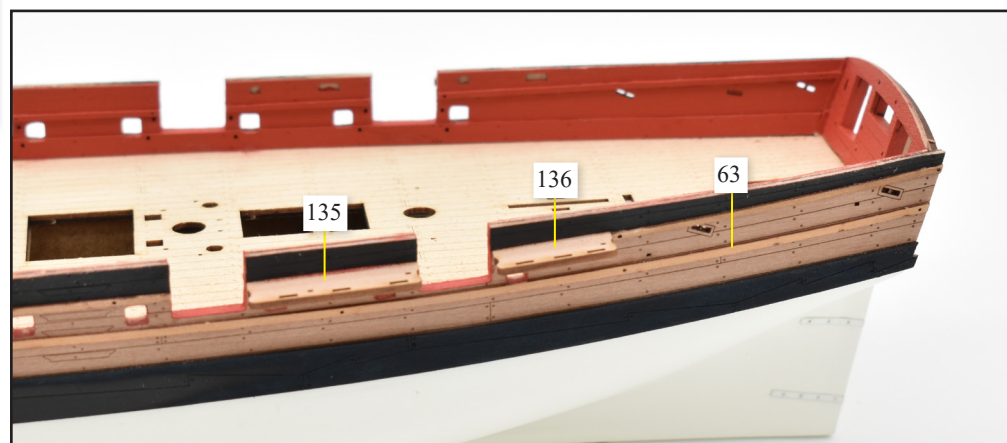
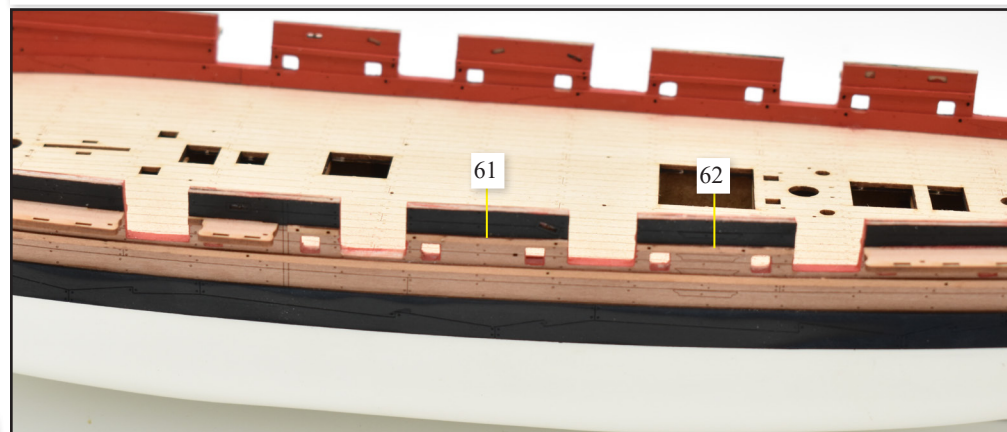
65. If you are to paint the area above the upper rail black, mask the area below the top upper rail line and carefully paint the area above this black, as shown.



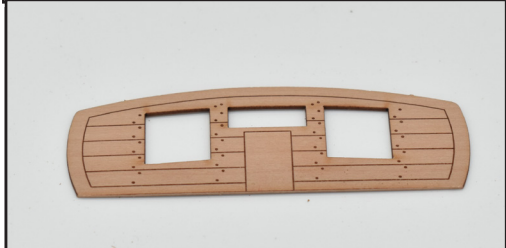
66. The upper rails can now be fitted in place 57-63 in between the gun ports. Glue into place along the engraved rail lines using either cyano or PVA wood glue. There is a small hole at the end of each rail, so you can pin into place if you wish. The channels (below) are also fixed along the same rail line.



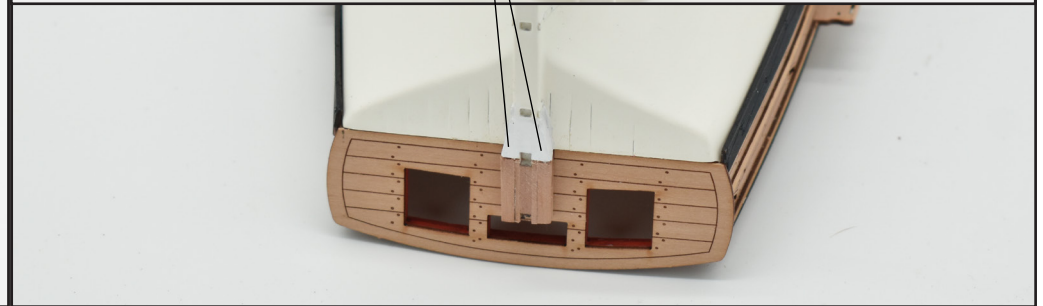
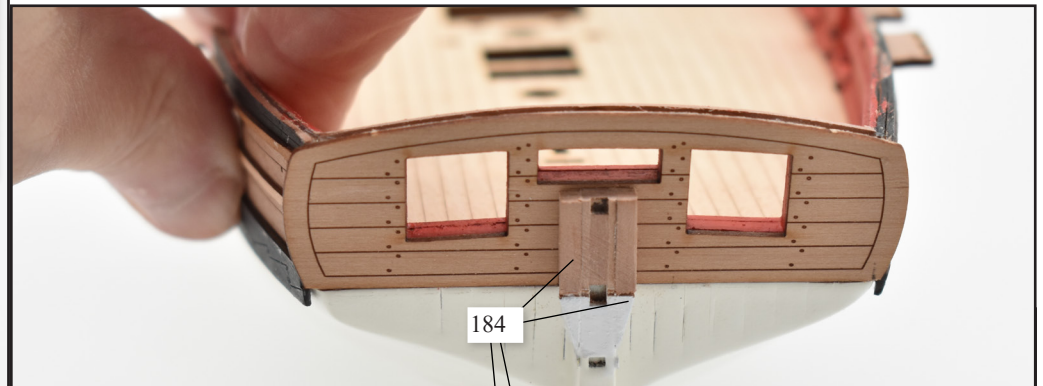
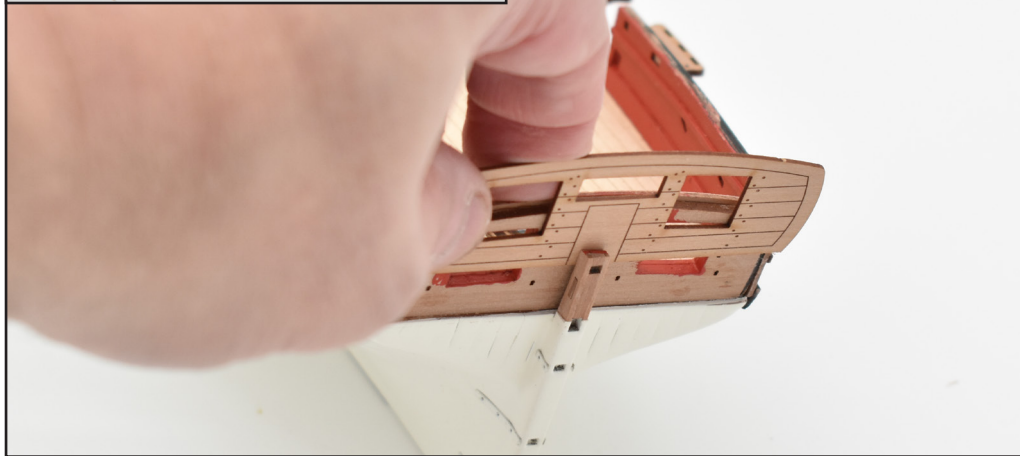
67. Use Plan Sheet 5 for reference for placement. The channels are slotted as well as glued in place.



Overhead view showing channels in place

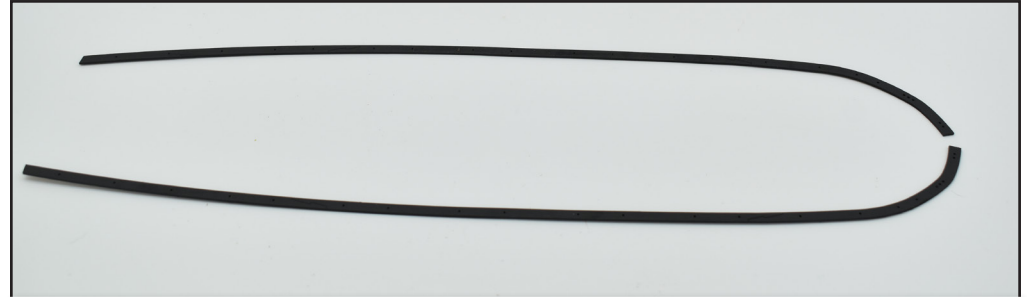
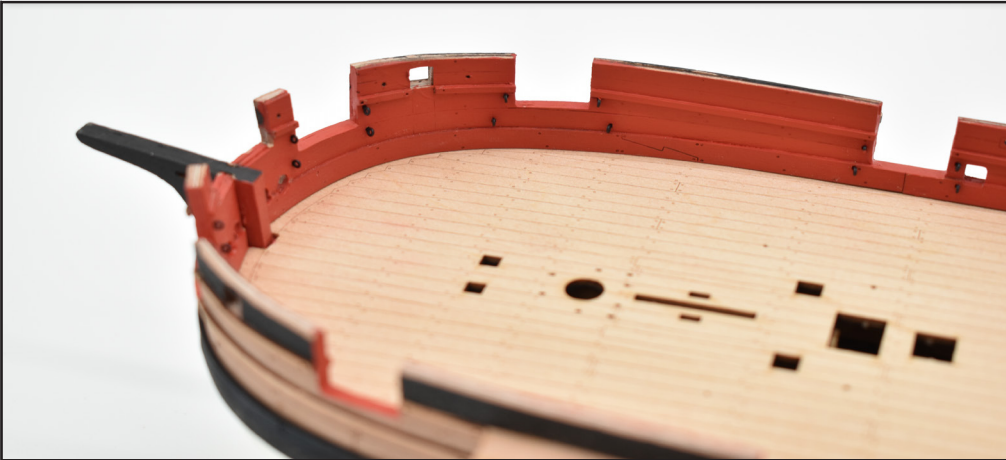


68. The outer stern board (98a) can now be glued into place as shown. The rudder post cheeks (184) can also be fitted as shown. Glue them in place, and then sand/file the edges so that they follow the same angle as the outer edge of the rudder post. Once done, paint the area below white, as seen.





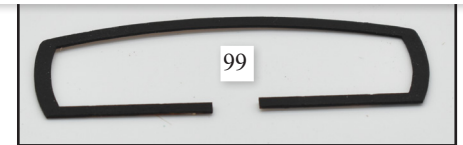
69. While the deck and inner bulwarks are still free from clutter, the eyebolts (PE-14) can be added to each side of each gun port. It is advisable to check each eyebolt hole by drilling using a pin vice and 0.7mm drill bitt, just to make sure the stem of the eyebolt pushes all the way in. Paint the eyebolts black before fixing in place, and fix in place using cyano gel. All positions can be seen on Plan Sheet 5.

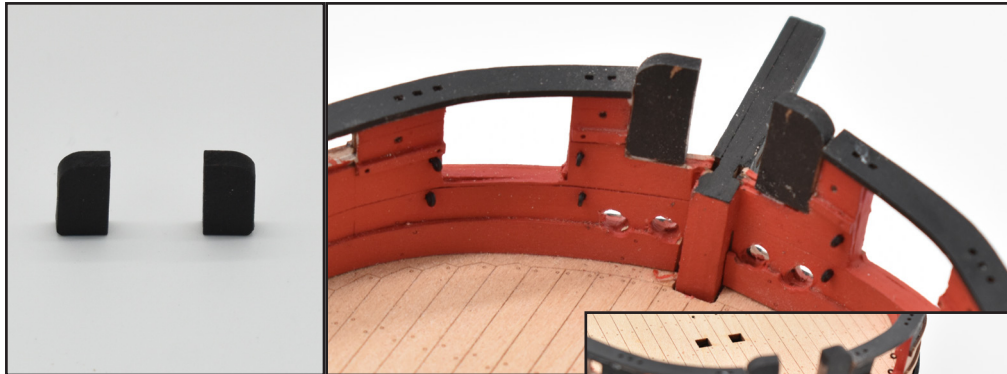


70. The gunwales can now be fitted (72 - Right and 73 - Left). They can be painted black before fixing in place. The holes for the hammock cranes should be more or less equidistant from each gun port. The gunwales can be fixed with either cyano gel or PVA wood glue, with pins securing the gunwale in place as the glue dries. You could even just pin the gunwales in place, as per the prototype model, and then removing the exposed parts of the pins, filing flush with the surface of the gunwales and then repainted black.

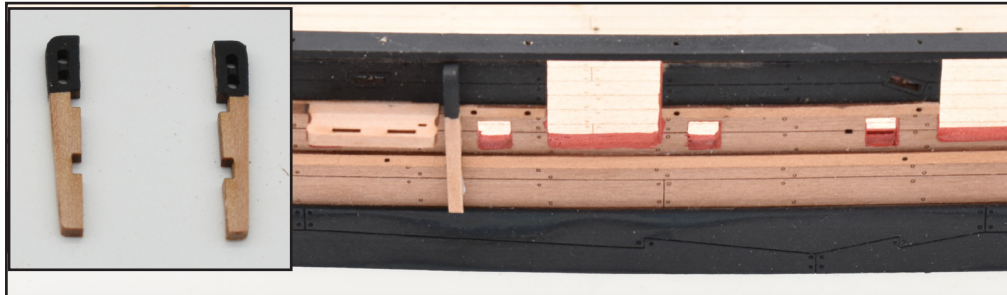


71. Add the stern gunwale (74). Pre-bend the part and dry fit and file the edges if required to allow it to fit neatly between the ends of the rear side gunwales, as shown below.
72. Remove the stern surround (99) from the 1mm wood sheet, paint black and the glue into place to the stern board as shown below right. The stern gunwale can now be painted black.

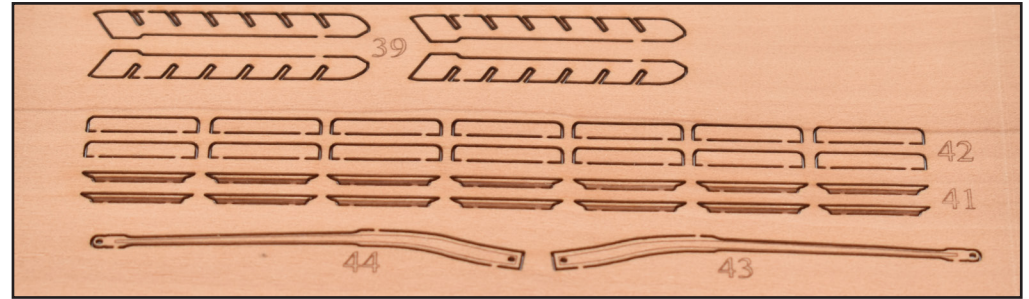




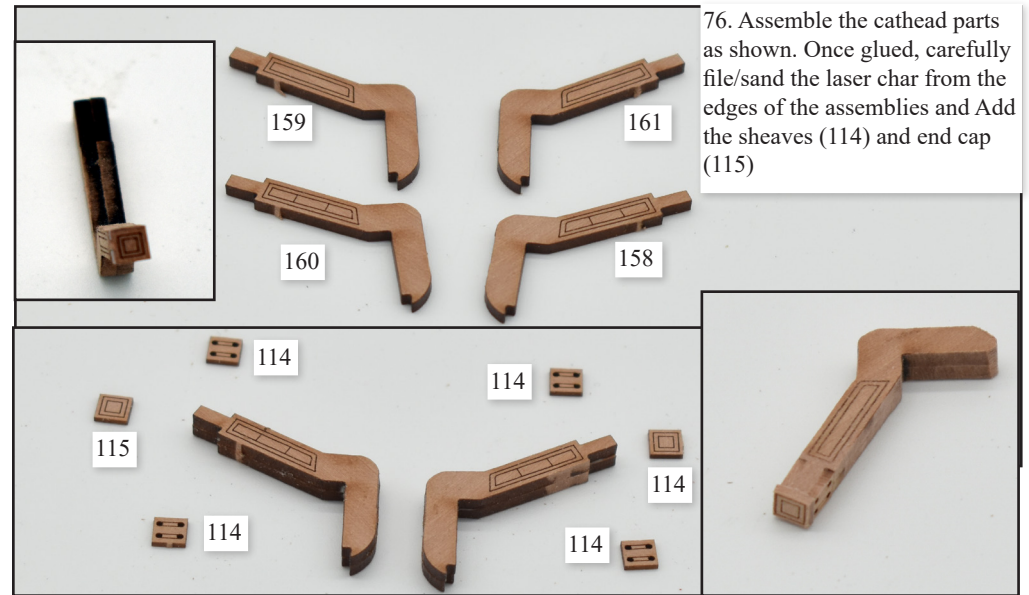
73. Remove the two Bow Timbers (179) from the 3mm wood sheet and paint black. Dry fit and file the edges of the bulwarks if needed, so the bow timbers fit as neat as possible. Cyano gel or PVA wood glue can be used.



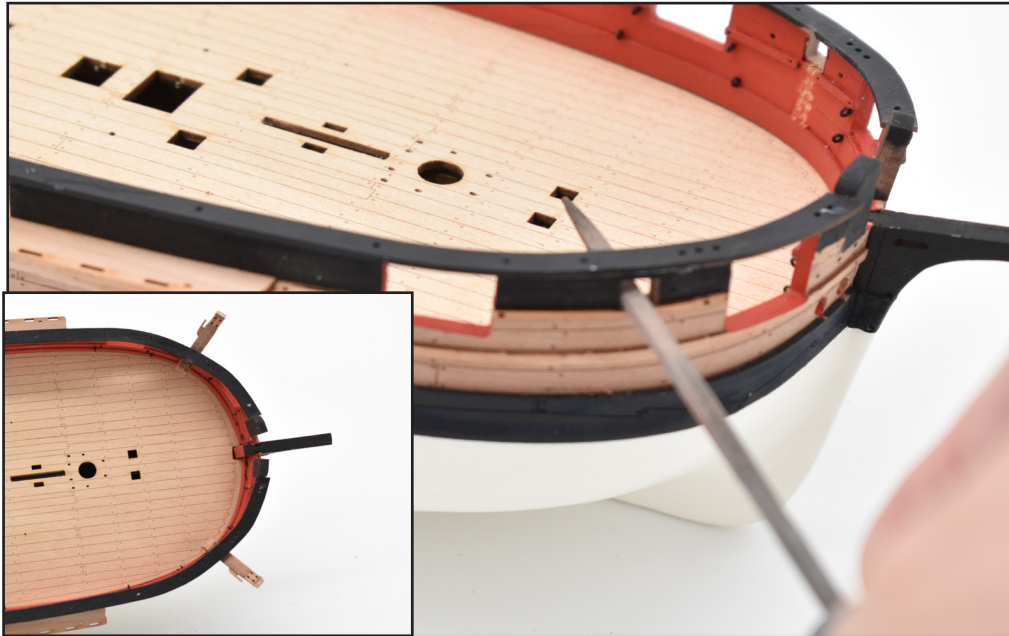
74. The Chess Trees (146 - Right and 147 - Left) can now be painted and added to each side of the hull. The positions are engraved onto the hull sides. Use either cyano gel or PVA wood glue to fix in place.



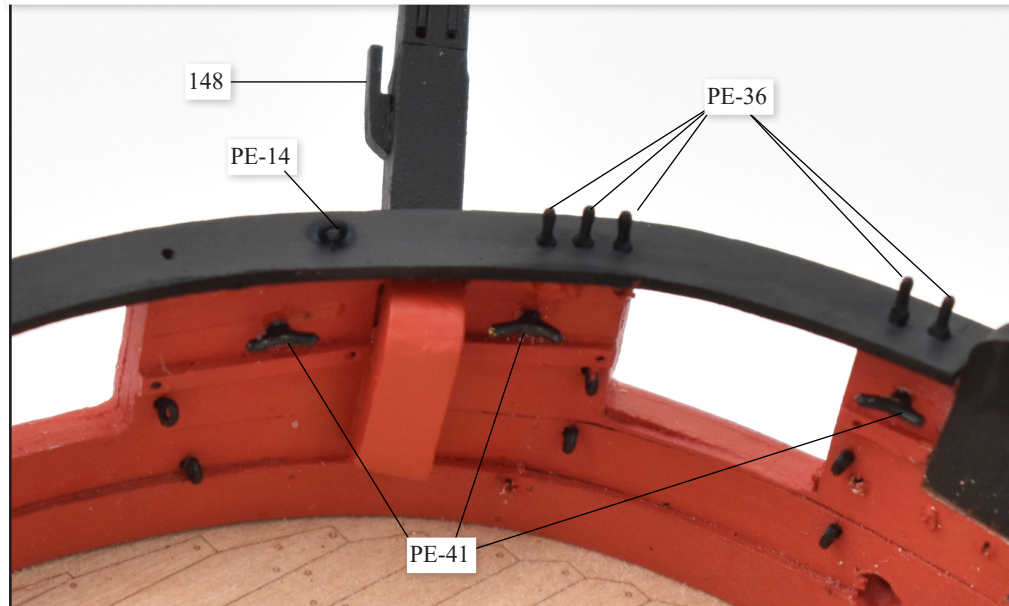
75. The outer hull side steps can now be fitted, These are on the 0.6mm wood sheet, 41 are the lower parts and 42 are the upper parts. The step positions are engraved on the hull sides, so glue in place to these positions using a small amount of PVA wood glue, and tweezers for positioning.



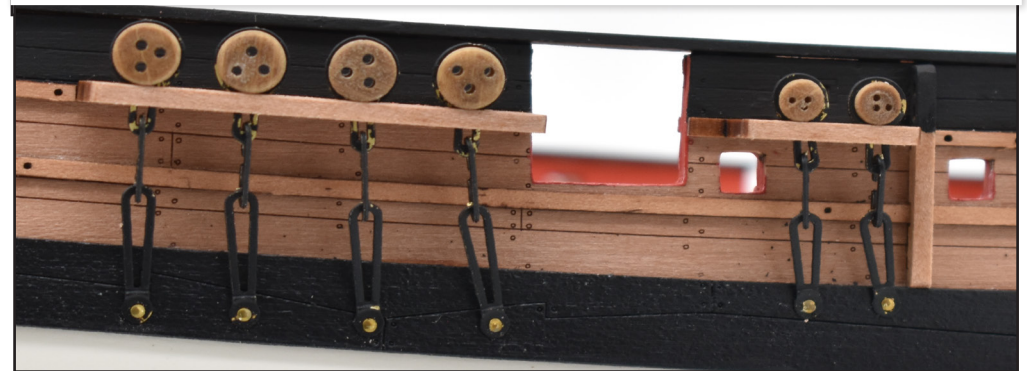
76. Assemble the cathead parts as shown. Once glued, carefully file/sand the laser char from the edges of the assemblies and Add the sheaves (114) and end cap (115)

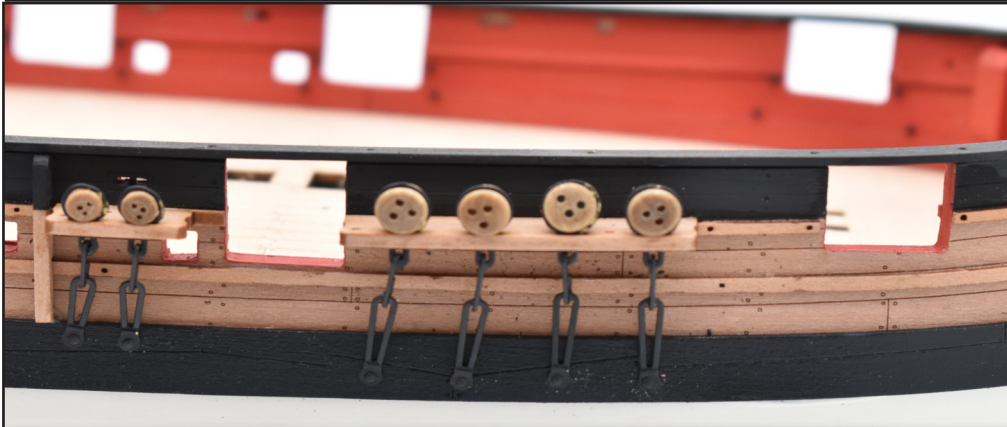
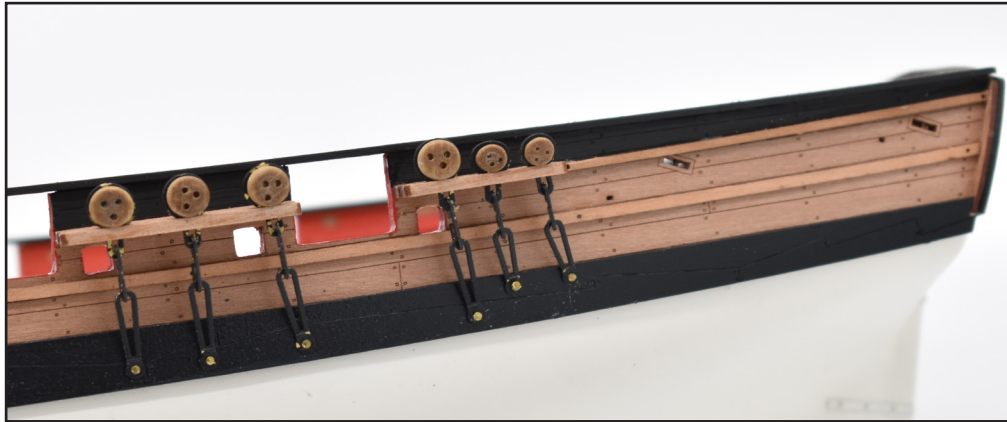


77. Using a square profile needle file, file out the square in the bulwarks while constantly checking the size by inserting the cathead through the hole. Once you have a nice fit, insert and glue the catheads into position using cyano gel or PVA wood glue. Add the cathead cleat (148) and then the catheads can be painted for left in their natural wood. Minor fittings can be added at this time, as per the picture below and Plan Sheet 5.



78. Make up the 3 and 5mm deadeyes and strops as shown in the pictures and Plan Sheet 6. Open up the strops, as seen above, to take the deadeye. Once in place, close the strop back up to secure the deadeye. Add the lower chainplate links and then insert the assemblies through each of the rectangular holes near the edges of the channels. To secure each chainplate assembly, drill a fine pilot hole into the main wale and then push a pin into it along with the lower link to secure the chain plates in place. The angle should follow the angle of the shrouds they are each attached to.

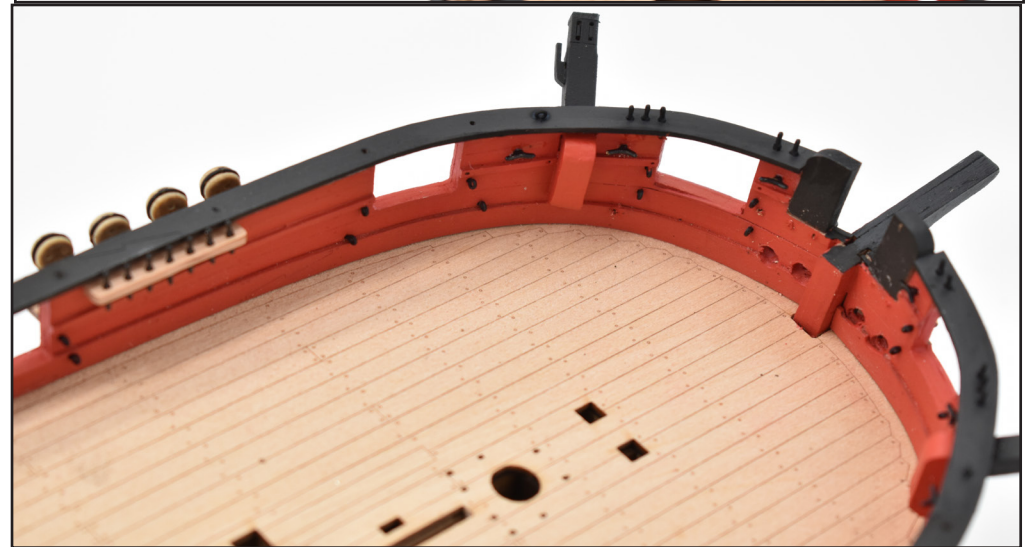


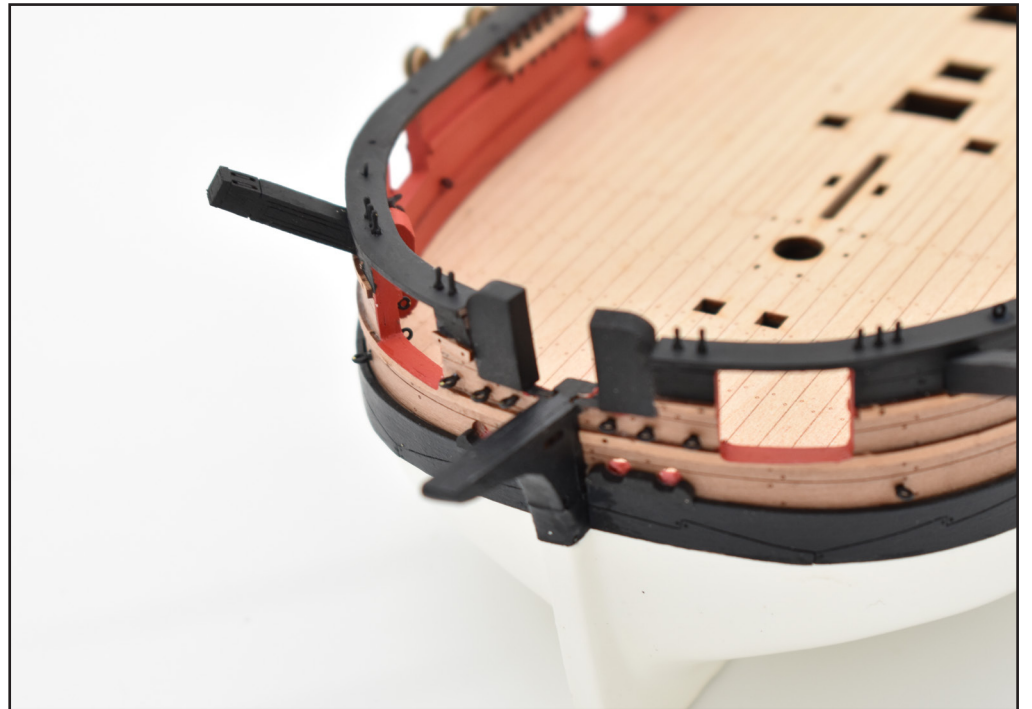
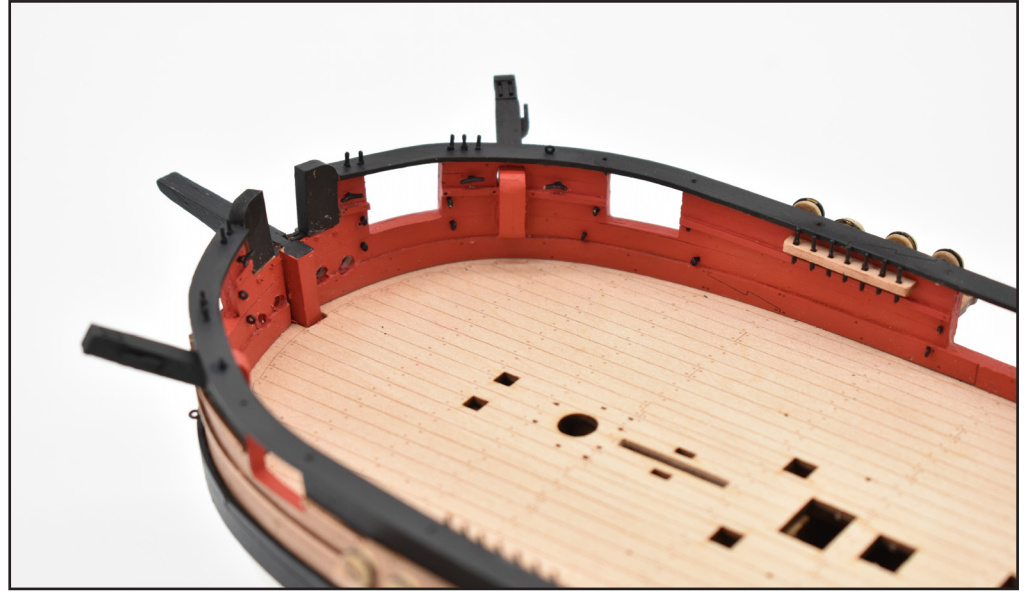
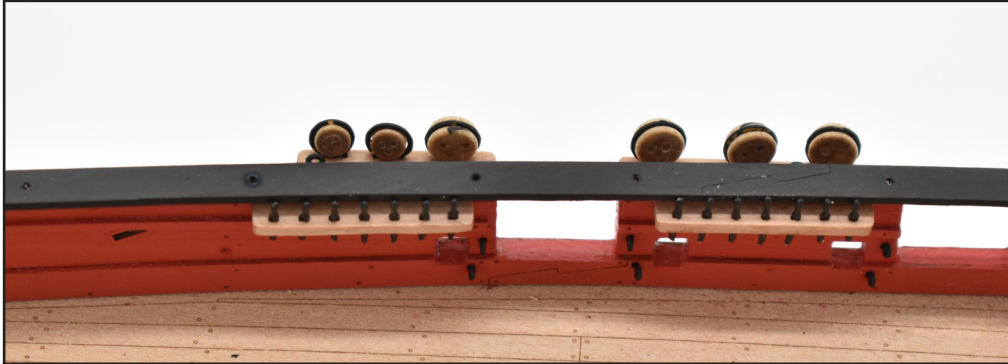
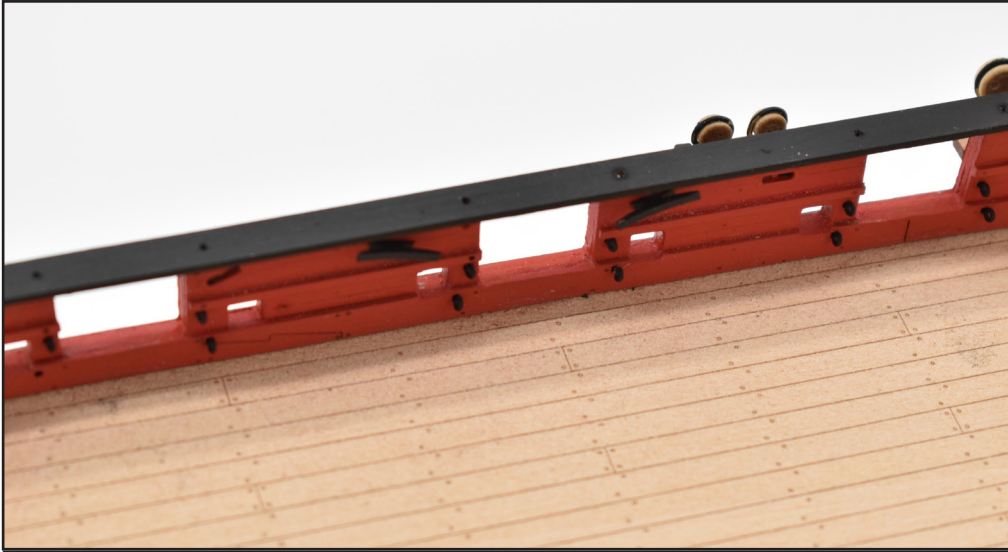


Once all secured, paint the brass pin heads black, and touch up any areas of the chain plates that require it.

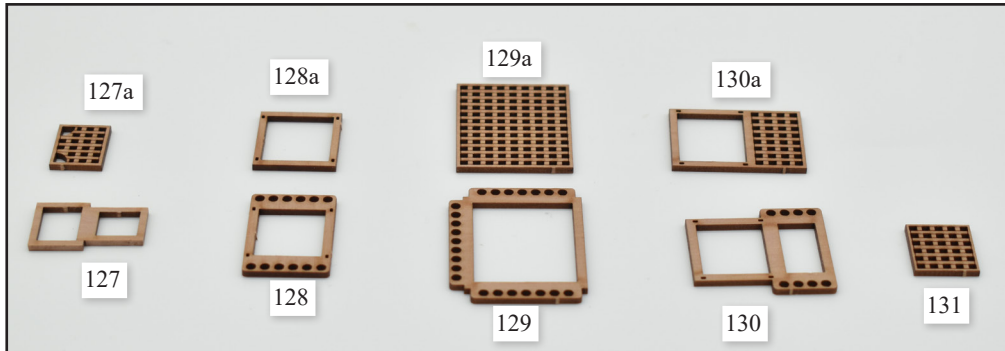


79. Using Plan Sheet 5 as reference, add all of the remaining inner bulwark fittings, the cleats (106), belaying racks (144a) and belaying pins (PE-36 painted black). Each cleat and belaying rack are glued into their respective slots located in the inner bulwarks, and glued using PVA wood glue. Paint black and glue the Main Sheet Iron in place on the inner stern board.

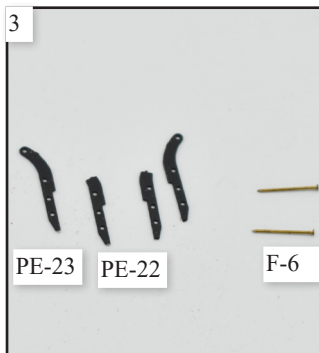
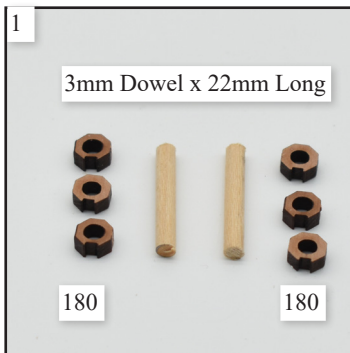
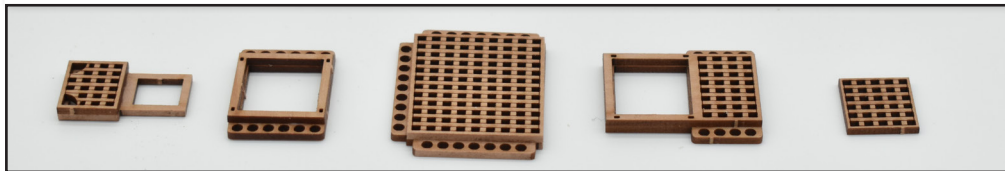




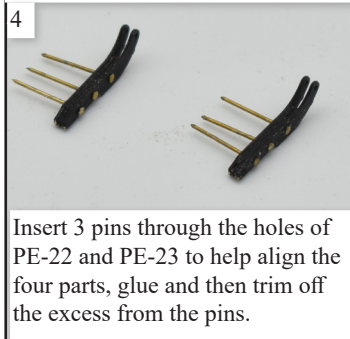
80. Using Plan Sheet 6 as reference, add all of the remaining outer eyebolts (PE-15), again, opening up each hole to ensure each eyebolt pushes all the way in when glued (using cyano gel)



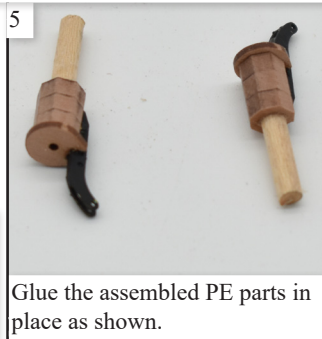
81. Using Plan Sheet 5 as reference, Make up the deck gratings from the parts numbered above. Glue the top gratings to the lower coamings using PVA wood glue and clamp until the glue has set.



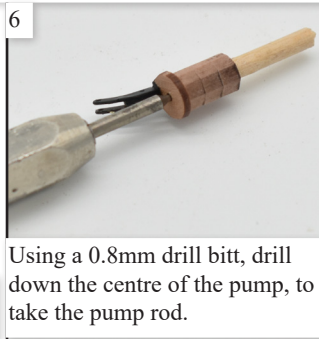
82. Hand Pumps - Using Plan Sheet 5 as reference, Make up the two hand pumps as shown. When assembling wood to wood, use PVA wood glue, and when assembling metal to wood or metal to metal, use cyano adhesive. All PE parts are to be painted black.



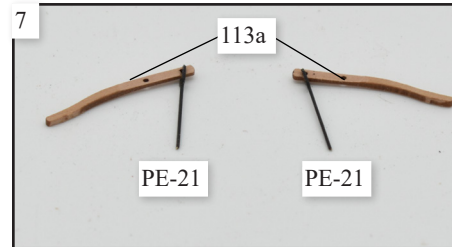
Insert 3 pins through the holes of PE-22 and PE-23 to help align the four parts, glue and then trim off the excess from the pins.



Glue the assembled PE parts in place as shown.



Using a 0.8mm drill bitt, drill down the centre of the pump, to take the pump rod.



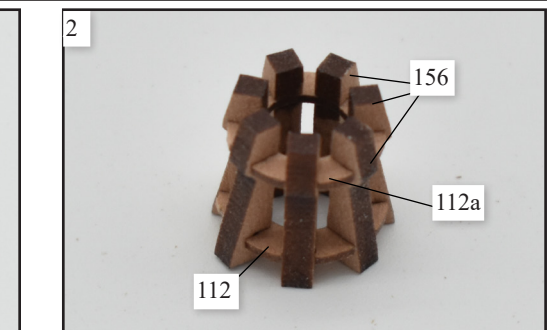
Connect the pump rod (PE-21) to the pump handle (113a) as shown. The pump rods are painted black.



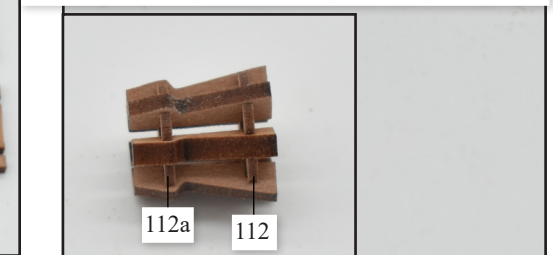
Secure the handle to the bracket using a brass pin (F-6). Glue the end of the pin to secure in place and then trim off the excess pin.

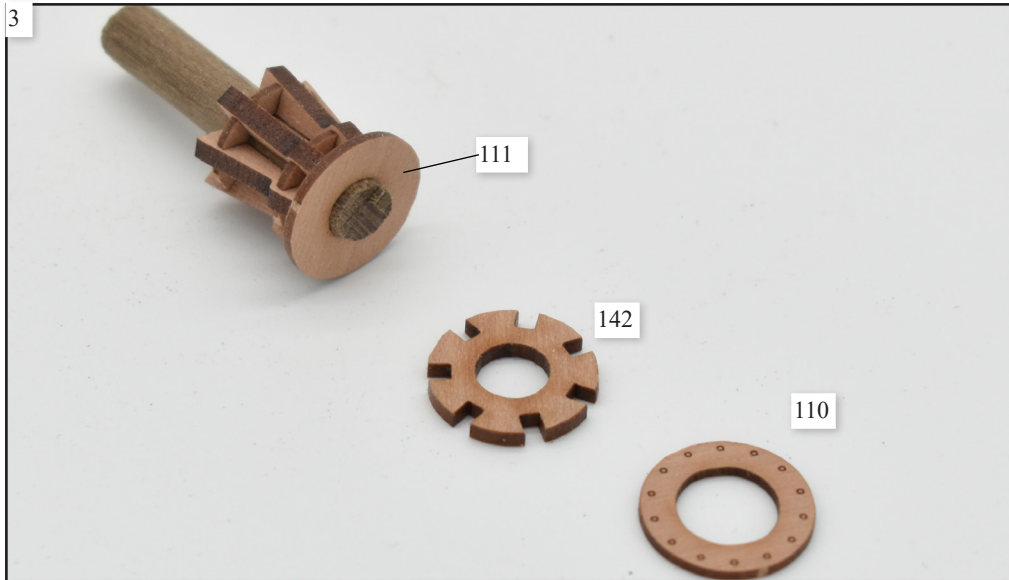


The completed hand pump assemblies.



83. Capstan. Slot and glue the capstan chocks (112 and 112a) to the 7 whelps (156).

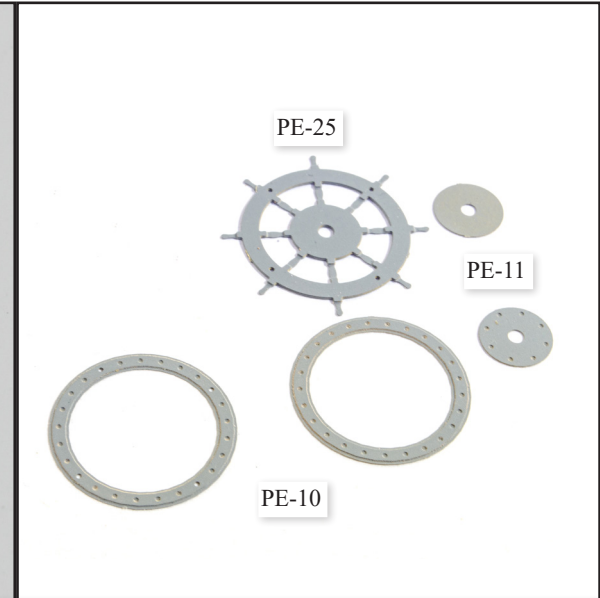
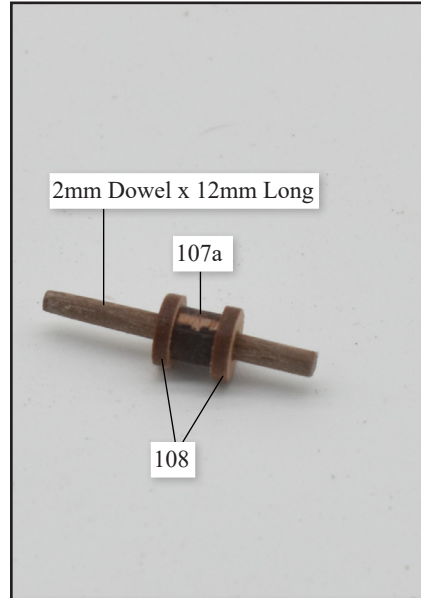




3 Push the 6mm dowel through the whelp/chock assembly and then add part 111, so that 1.5mm protrudes above 111. Next, glue part 142 over the top, followed by 110, using PVA wood glue.

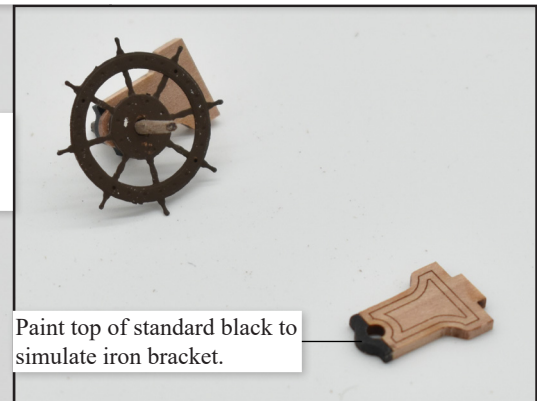


4 Finally, add part 143 into the opening on part 110 to complete the capstan assembly.



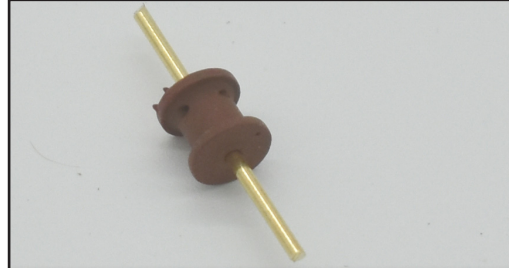
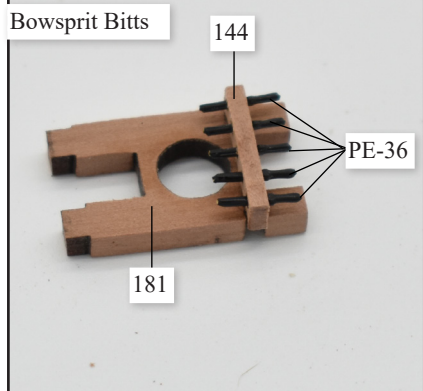
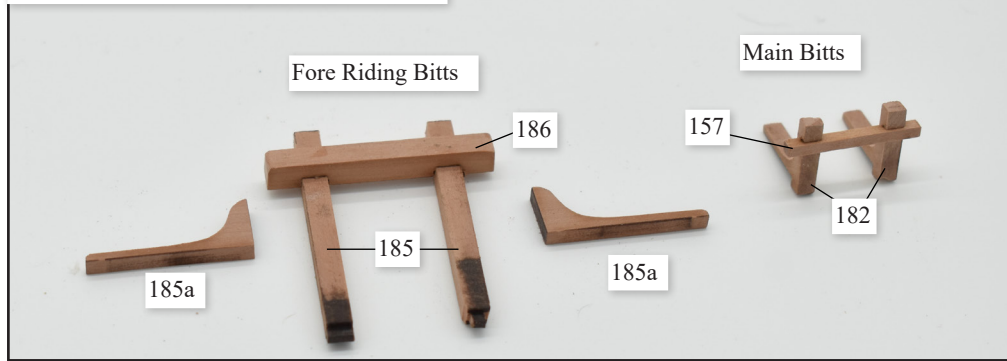
84. Ships Wheel. (Refer to Plan Sheet 5). Make up the wheel drum as seen above using 2mm dowel x 12mm long (or longer, and trim back when in place), with the centre drum (107a) in the middle and the rims (108) either side. Make up the wheel from the photo-etched parts using cyano glue and paint a brown/wood colour. Add the wheel to the drum shaft.

Add the standards but be mindful that 140 is to be placed at the front, as this has a tab to help secure in place on the deck.



Optional - 0.5mm thread. If you add this, you will need to drill 2 small holes in the deck to allow the ends of the thread to pass through.

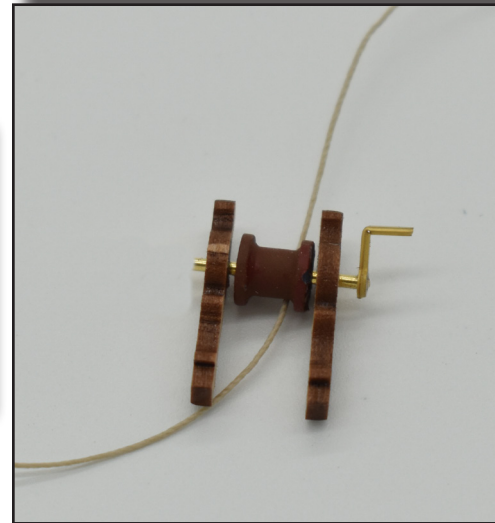
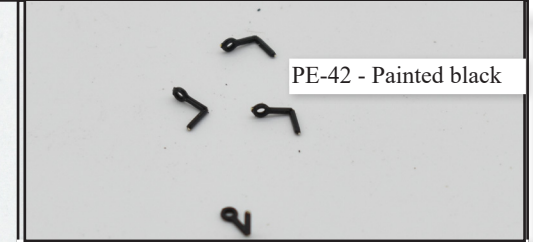
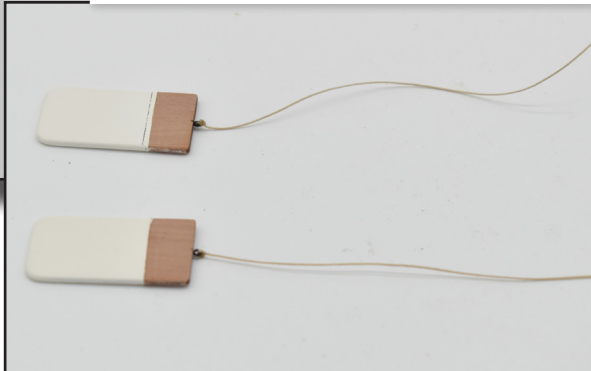
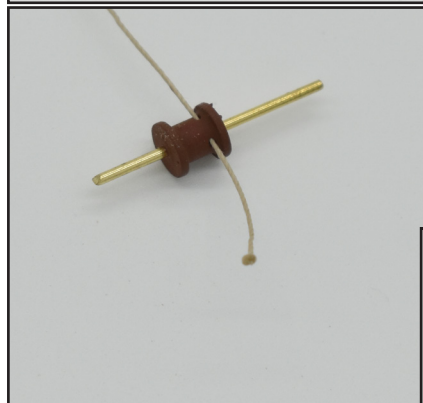
85. Make up the three sets of bits as shown.



86. Drop Keel winch. Paint the drop keel winch drums (F-5) wood colour. Once painted, insert a 15mm length of 0.8mm brass rod through the centre of each (2 required in total)

There is an offset hole in each of the drums, this is for the 0.5mm thread that connects the drum to the drop keel. Tie a knot and secure with cyano, followed by snipping off the excess.

The 0.5mm thread should be about 80mm in length. Tie the other end of the thread to each eyelet located on the top edges of each of the drop keels, as shown below.



87. Remove 4 of part 139 from the 1.5mm wood sheet and slot the winch drum axles through the hole of parts 39, but do not glue.

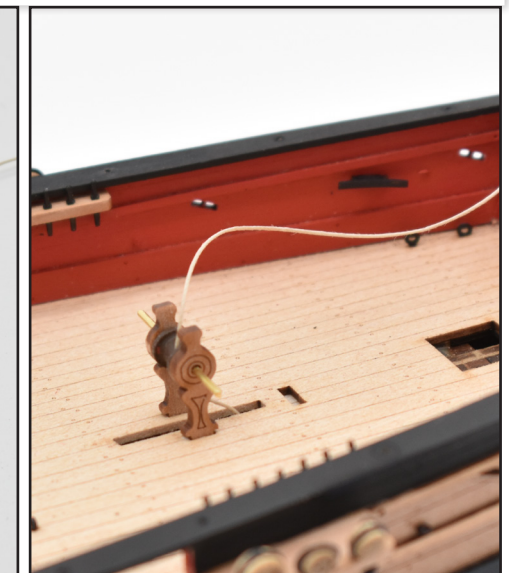
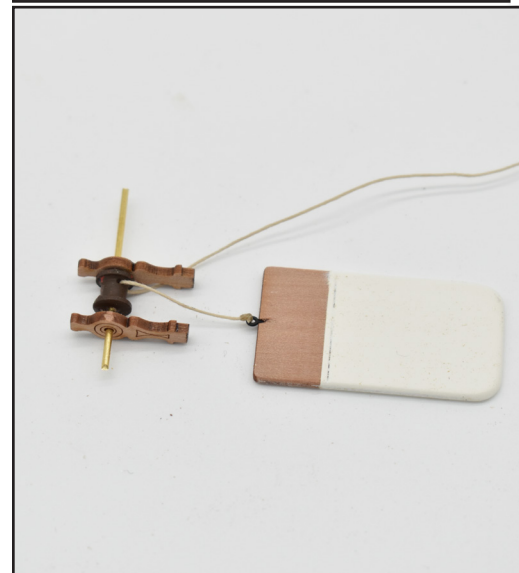
Remove 4 of PE-42 from the 0.4mm photo etched sheet, and bend as the bend line to make the handle for the winch.

Glue the handle to one side of each winch drum axle.

Slot each drop keel through their respective slots through the deck until they come out the other side, as shown below.

The winch standards can now be glued into their positions over the keel slots in the deck.

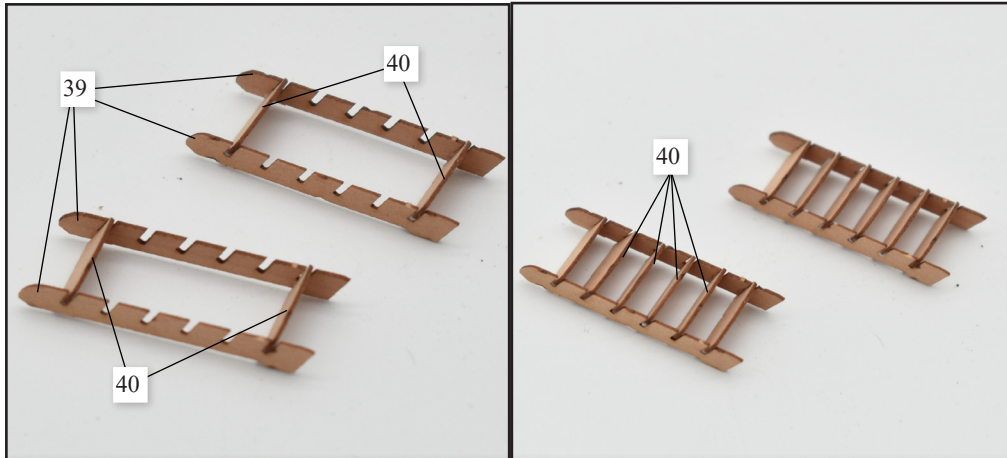
The drop keels can then be 'wound up' to their correct positions. Alternatively, the drop keels can be glued in place to the engraved line, and then the thread would up to take the tension, followed by brushing on watered down PVA to help secure the thread into position.



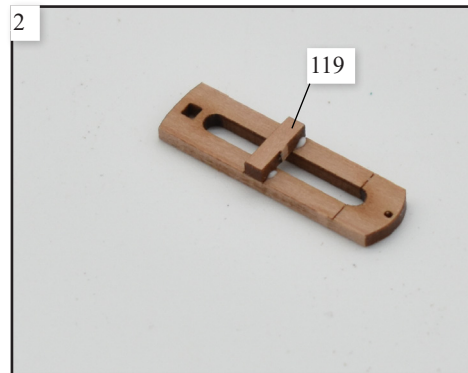
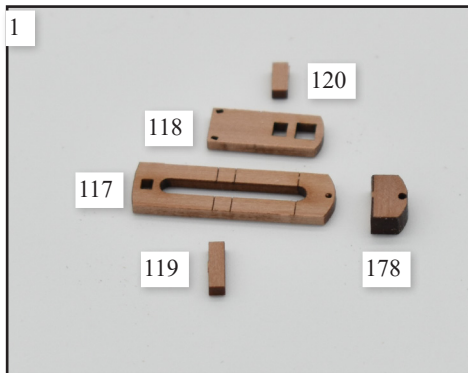


88. Glue the winch standards in place in their slots as shown using PVA wood glue, and set the drop keels to how you wish to display them. The engraved line on each drop keel indicates the lowest position of the drop keels.





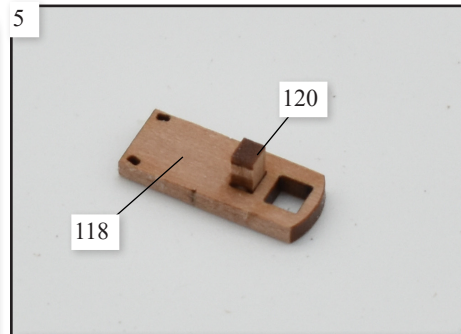
89. Ladders. Make up the two companionway ladder using the sides, 39 and steps, 40. Use PVA wood glue to glue the steps to the sides.



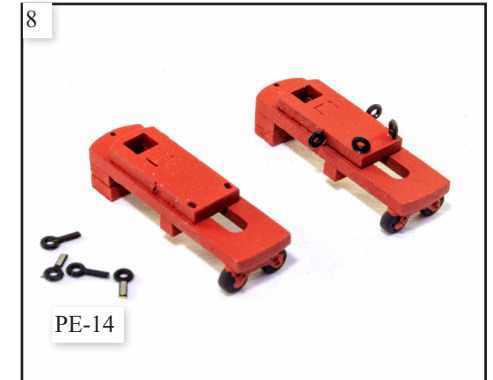
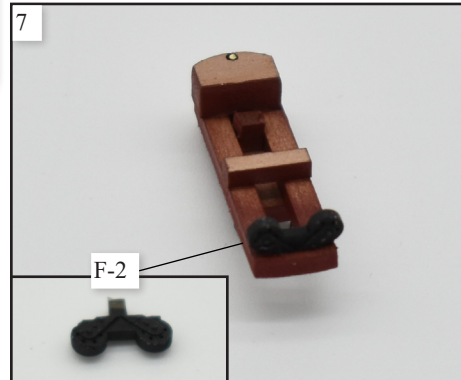
90. 18 Pounder Carronades. Make up the twelve carronades following the assembly sequence. Glue the slide bed cross beam (119) to the underside of the bed (117) between the engrave lines. (PVA wood glue)



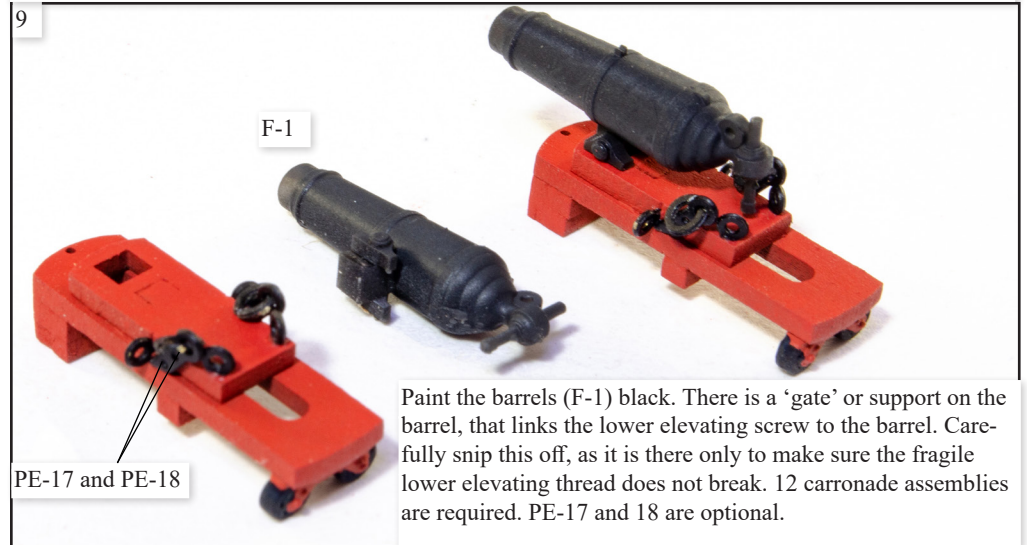
Pin and glue the front chock (178) into position as shown, and then snip off the excess pin.



Glue the slide pin (120) into the carriage (118) and then glue the carriage to the slide bed (Above right)



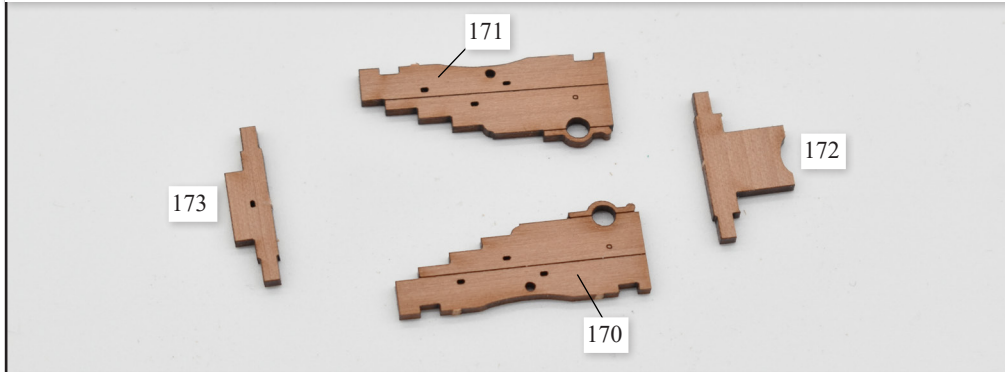
Paint the wheels (F-2) black and insert and glue in place under the slide bed using cyano gel. Add the eyebolts (PE-14) after painting those black.



Paint the barrels (F-1) black. There is a 'gate' or support on the barrel, that links the lower elevating screw to the barrel. Carefully snip this off, as it is there only to make sure the fragile lower elevating thread does not break. 12 carronade assemblies are required. PE-17 and 18 are optional.

91. 24 Pounder Cannons. Paint the two cannon barrels black. Although they are produced in black resin, they still require painting.

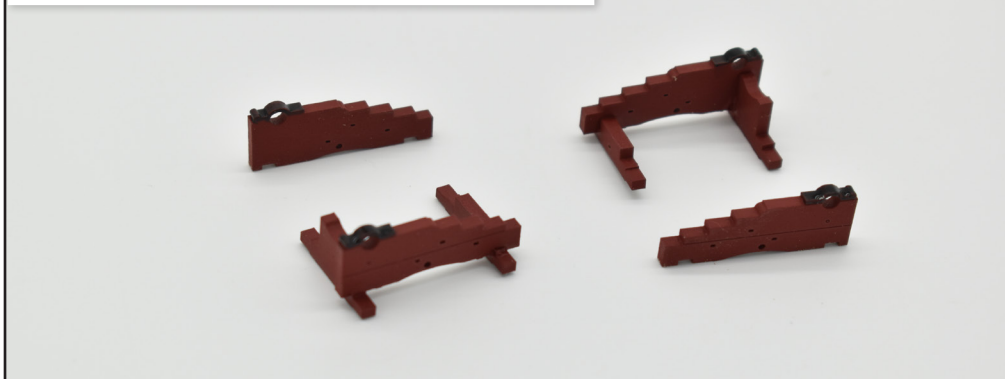
Make up the 24 pounder cannon assemblies as shown below. Paint the sides and axles red (56-59), Glue one side to the axles, and then add the barrel to the other side. Add glue to the axles assemble the carriage side with the barrel to the other carriage side. Insert the PE cross bolt (PE-17), and then glue the quoin (60) to the rear axle and cross bolt, followed by the three eyelets (PE-1) and finally the wheels (61 front and 62 - rear). 8 cannon assemblies are required.



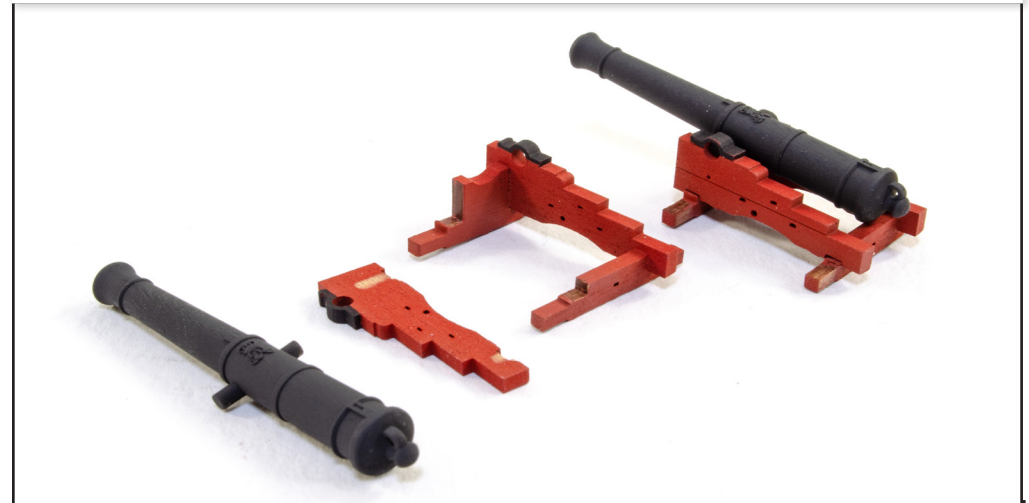
PLEASE NOTE - Only one carriage side is glued, with the other dry fitted only, in order to attain the correct angle. Once the one side is set, remove the unglued carriage side.



Paint the carriages and axles red, and the cap squares black.



Add the barrel to the carriage sides and then fix the unglued side in place, securing the barrels



Add the 'cross bolt' using 0.8mm brass wire, as shown, and then trim any excess on the outer sides.



Glue the carriage stool (174) to the quoin (175), paint red (Or leave natural wood colour) and glue in place so the bottom surface is resting on both the rear axle and cross bolt.



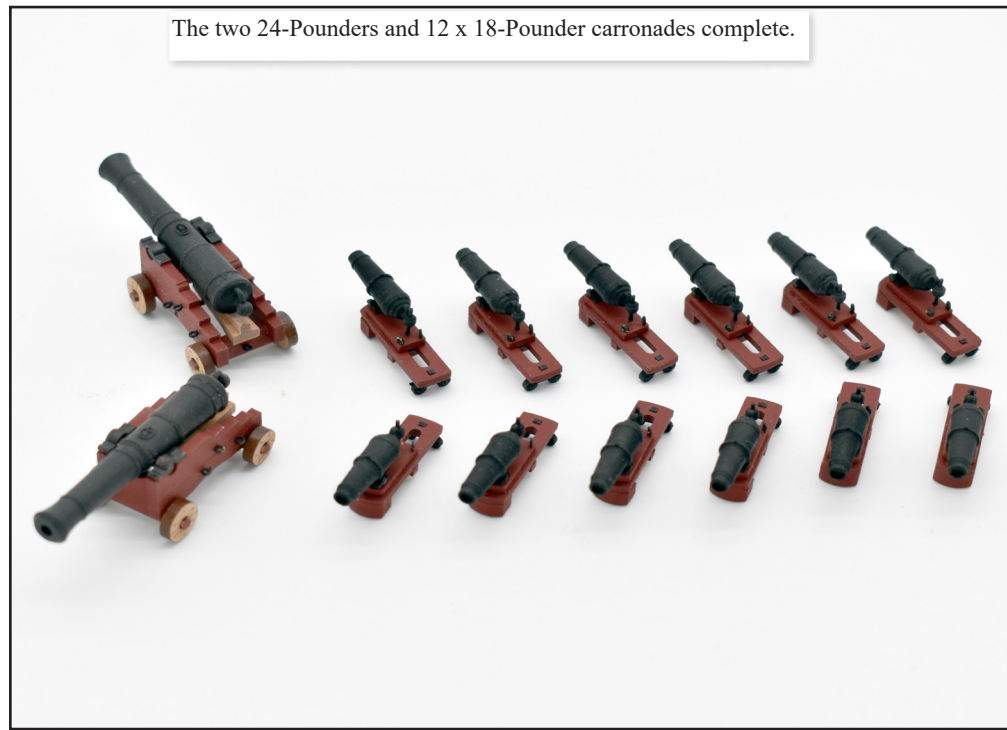
Add the eyebolts (PE-14) to the sides and rear axle of each carriage.

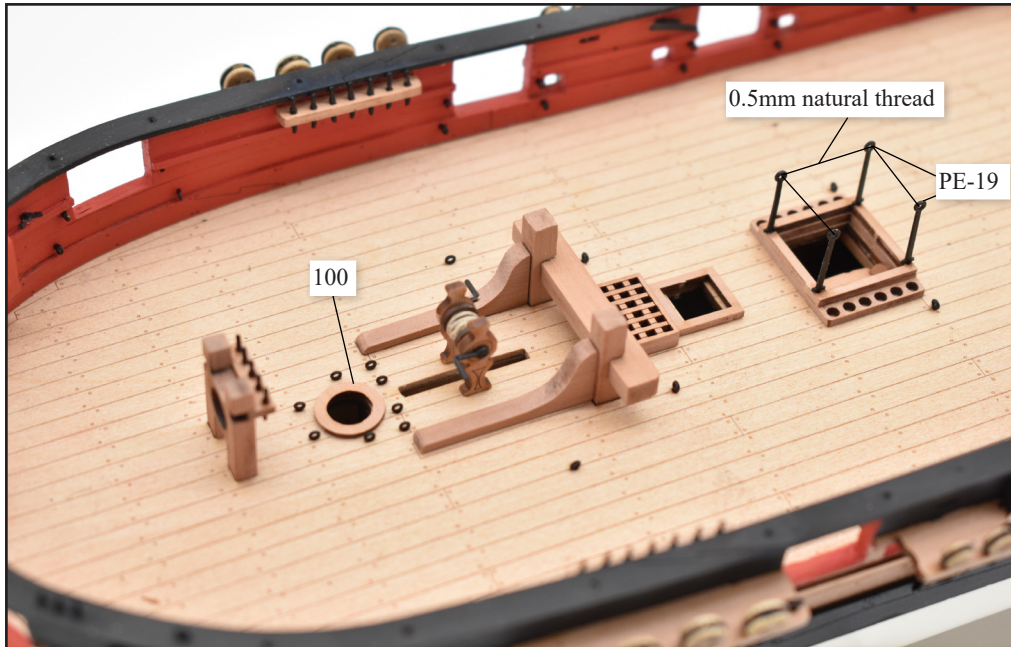


The carriage wheels can now be added. These can be slotted into place on the axles without glue. The larger diameter (176) are to be fixed to the front, and the smaller wheels (177) to the rear.

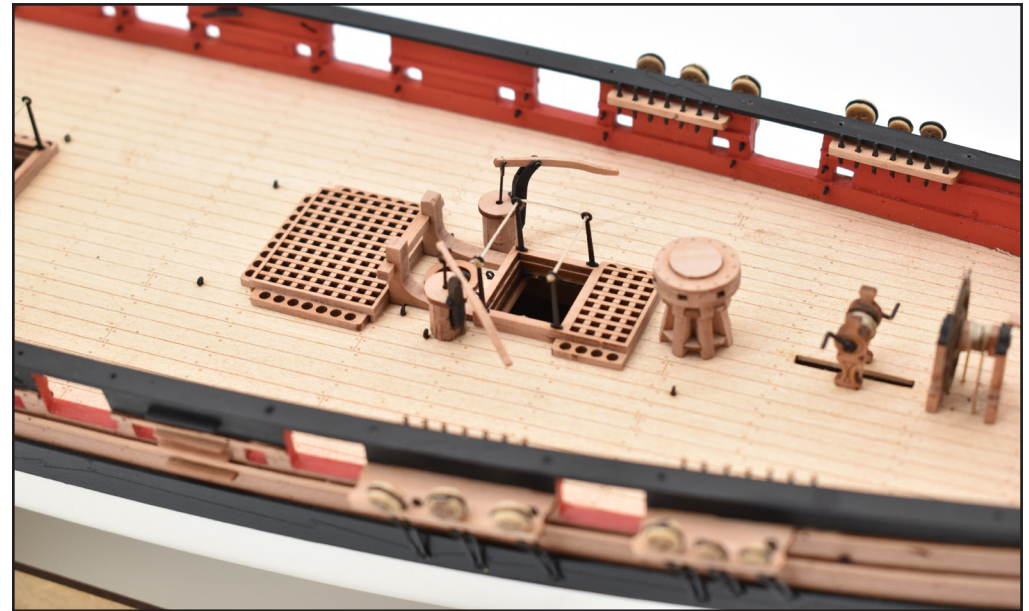
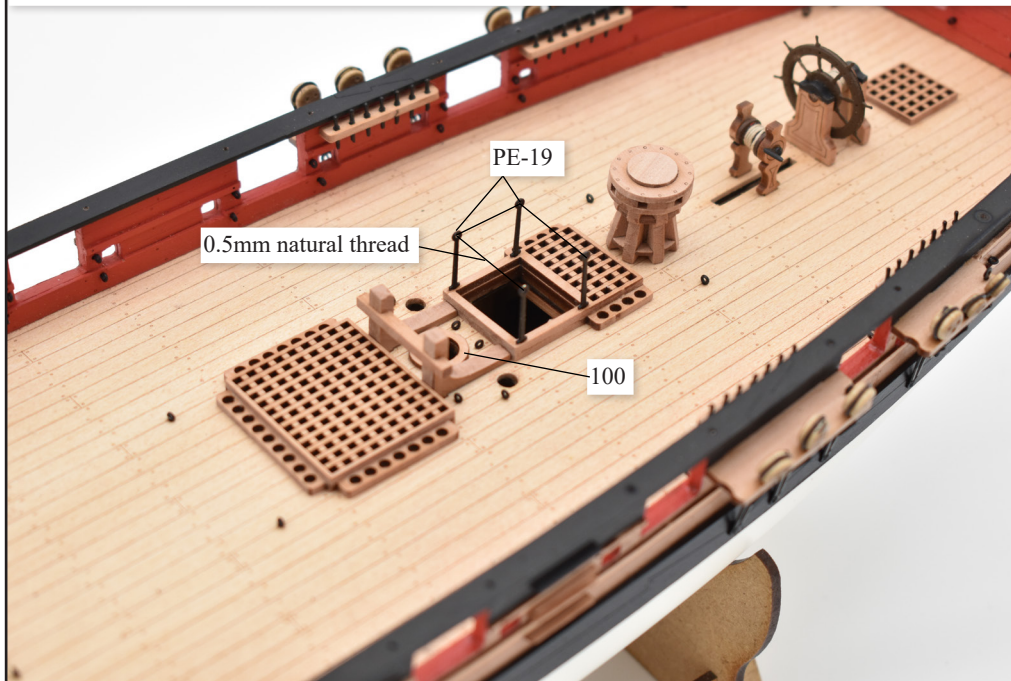


The two 24-Pounders and 12 x 18-Pounder carronades complete.

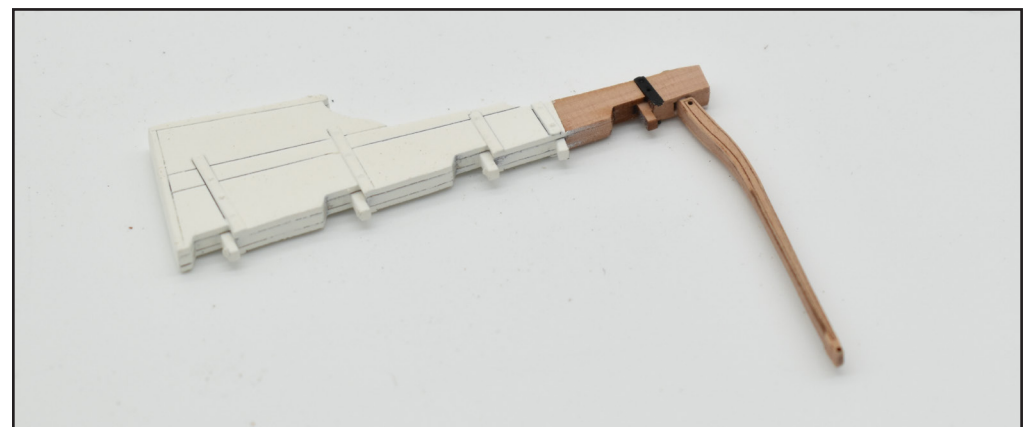


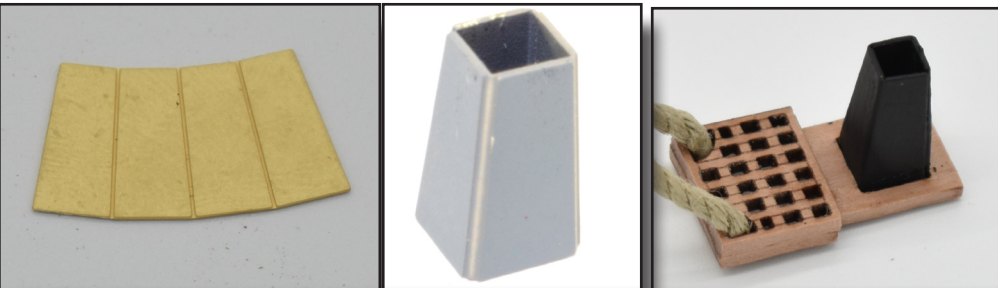


92. Using Plan Sheet 5 and 6 for reference, add the rest of the eyebolts to the deck, followed by all of the previously made deck fittings, gratings, hatches, bits, capstan, and wheel assembly.

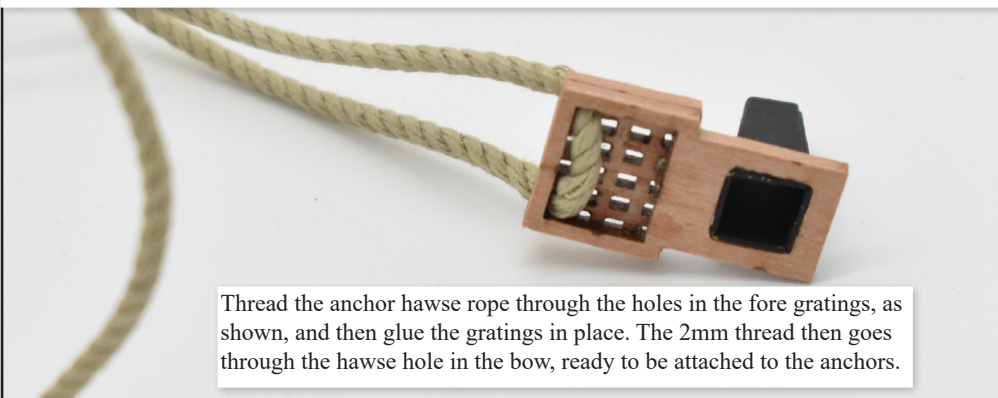


93. Using PVA wood glue (sparingly), glue the two outer parts (43 and 44) to the core tiller arm (126). Insert a brass pin into the holes at each end of the tiller arm to help keep it aligned. When the glue has set, either remove the pins or snip them off flush with the surface. Finally, insert and glue the arm into the rudder.

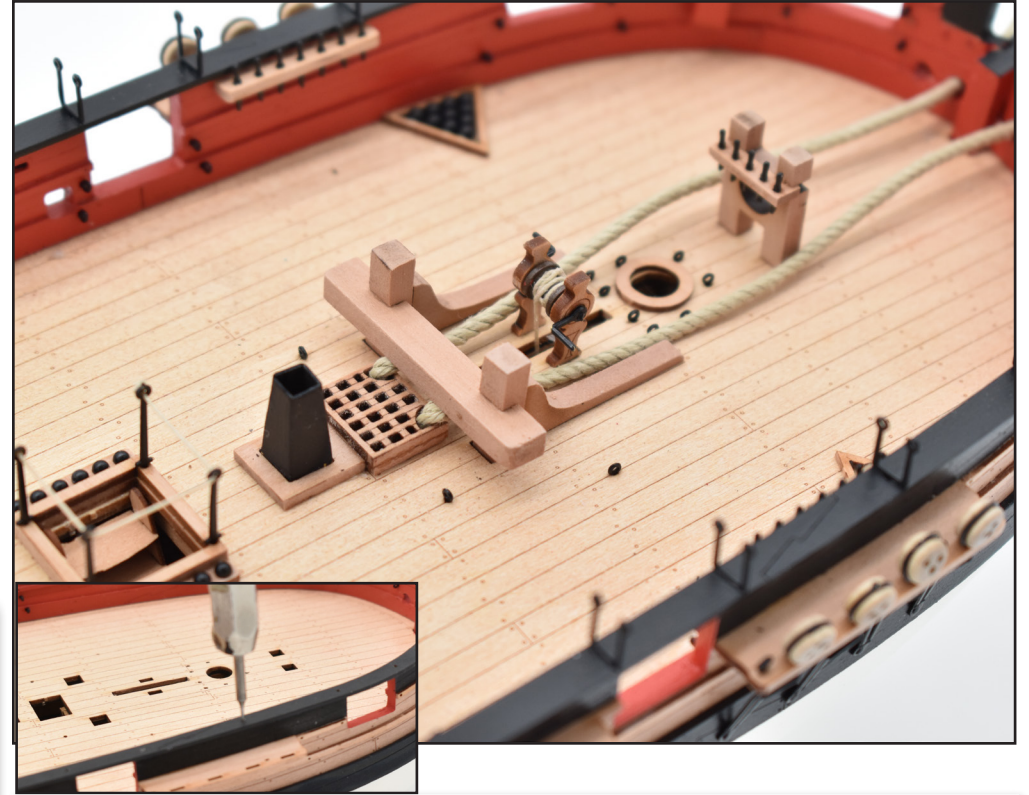




94. Chimney and coaming assembly. Bend the photo etched chimney pattern (PE-24) to create the tapered chimney and apply a little thin cyano to the edges. The chimney can then be primed and painted black. Insert the bottom of the chimney into the coaming as shown. Before finally gluing the assembly in place on the deck, add the anchor hawse (F-25) as shown.

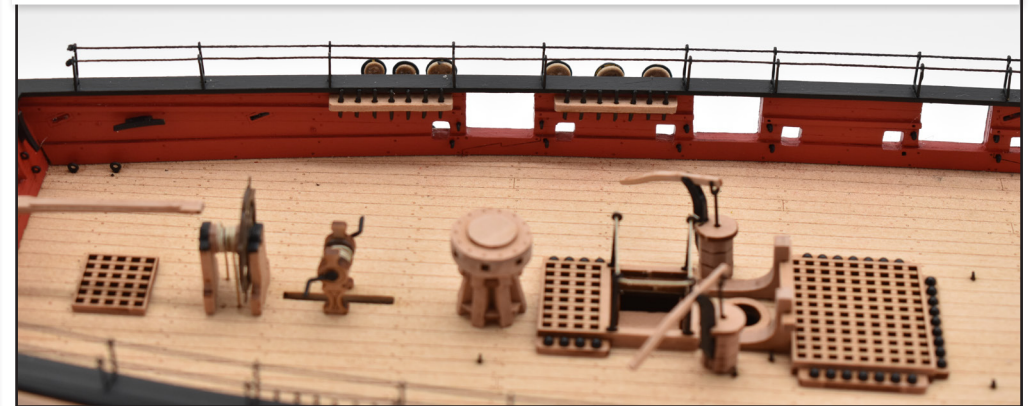


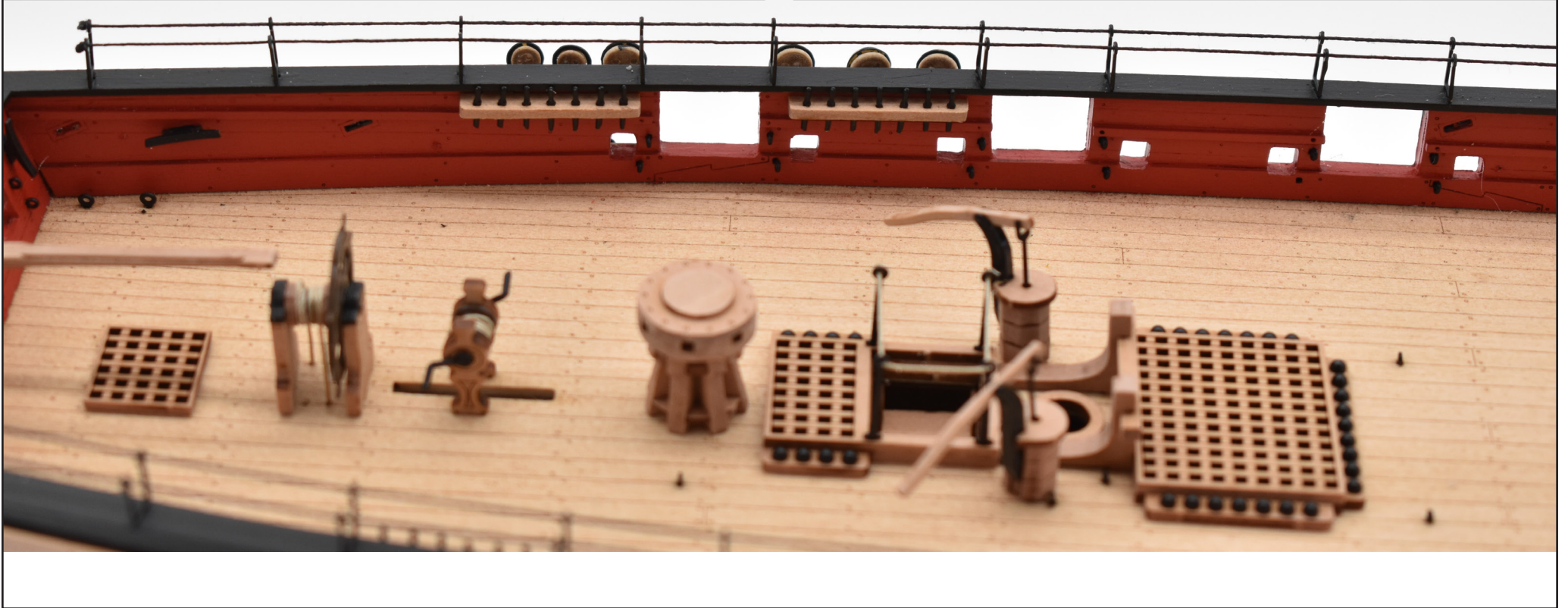
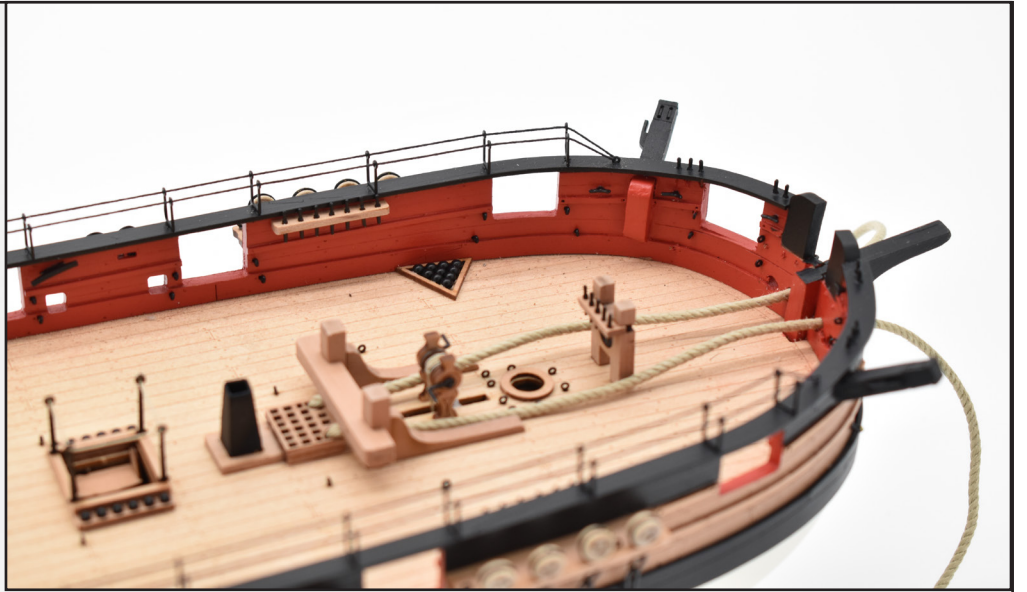
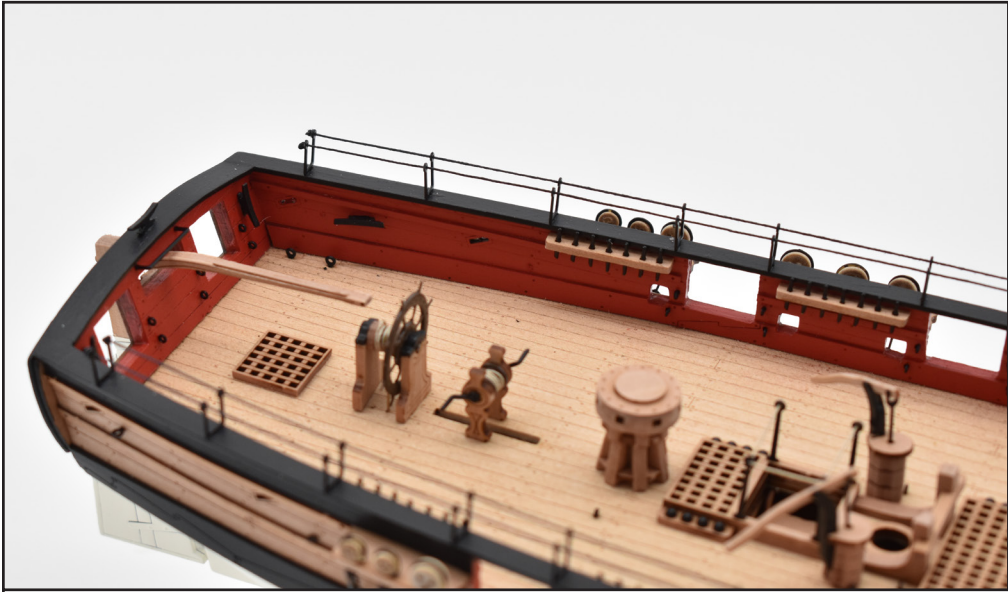
Thread the anchor hawse rope through the holes in the fore gratings, as shown, and then glue the gratings in place. The 2mm thread then goes through the hawse hole in the bow, ready to be attached to the anchors.

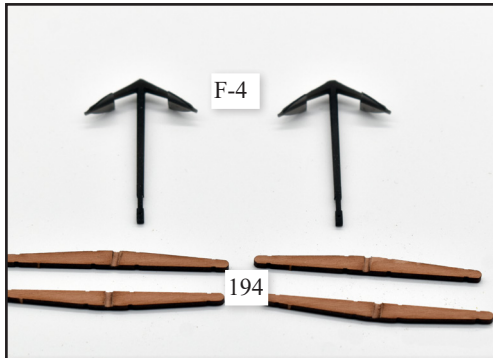


95. Paint black, drill, insert and glue the hammock cranes in place (PE-27) along the top of the gunwale. Thread 0.5mm black thread through each of the holes in the hammock cranes as seen in the pictures.

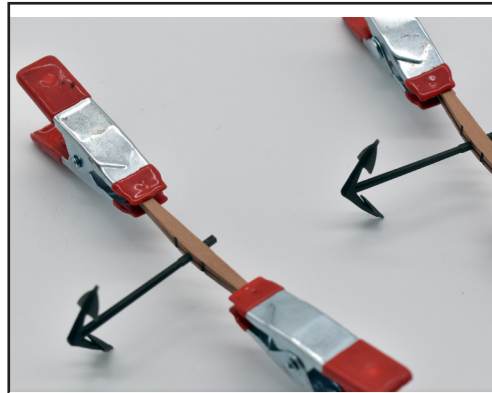
Add the cannon balls. The 2mm diameter balls are to be fitted in the holes in the shot garlands surrounding the coamings, and the 2.5mm diameter balls are for the 24-Pounder cannon, and fit in the triangular shot garlands (116). These can be placed near the 24-Pounder cannon



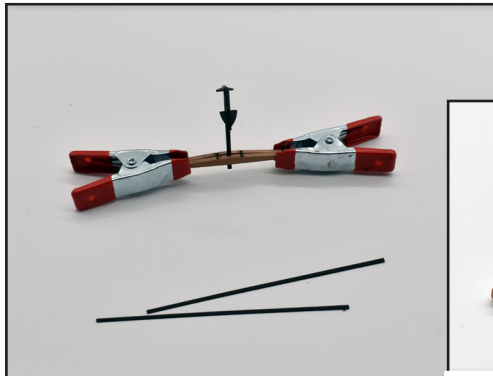




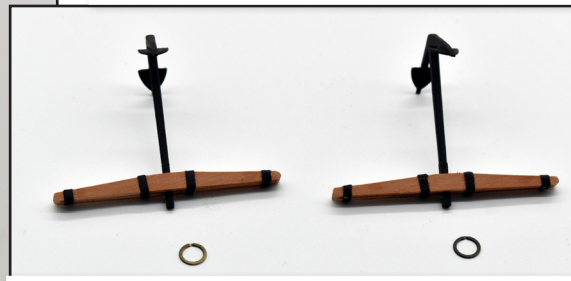
96. From the 2mm wood sheet, remove the four anchor stock parts (194). You will also need both 3D-printed anchors. (F-4)



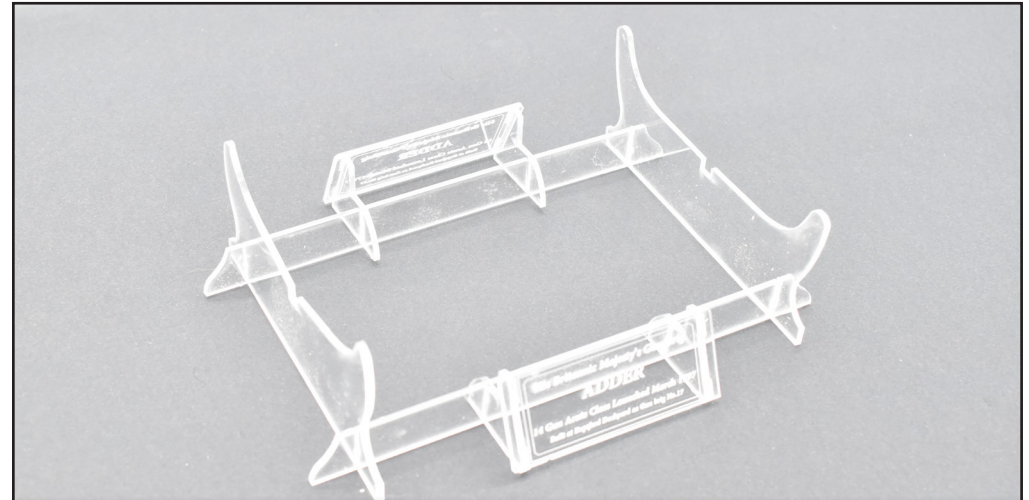
Before gluing the halves of the anchor stocks together, test fit the anchor shaft between them and if necessary, deepen the engraved area a little when the anchor sits comfortably within, remove the anchor and glue the stock halves together.



Cut thin strips of black cartridge paper and glue into place as shown.



Paint the anchor black and then glue it into the stock. Finally, remove the anchor rings PE-40 from the 0.6mm PE sheet. Twist these slightly to open them, then slide into the hole in the anchor before twisting the part closed again.



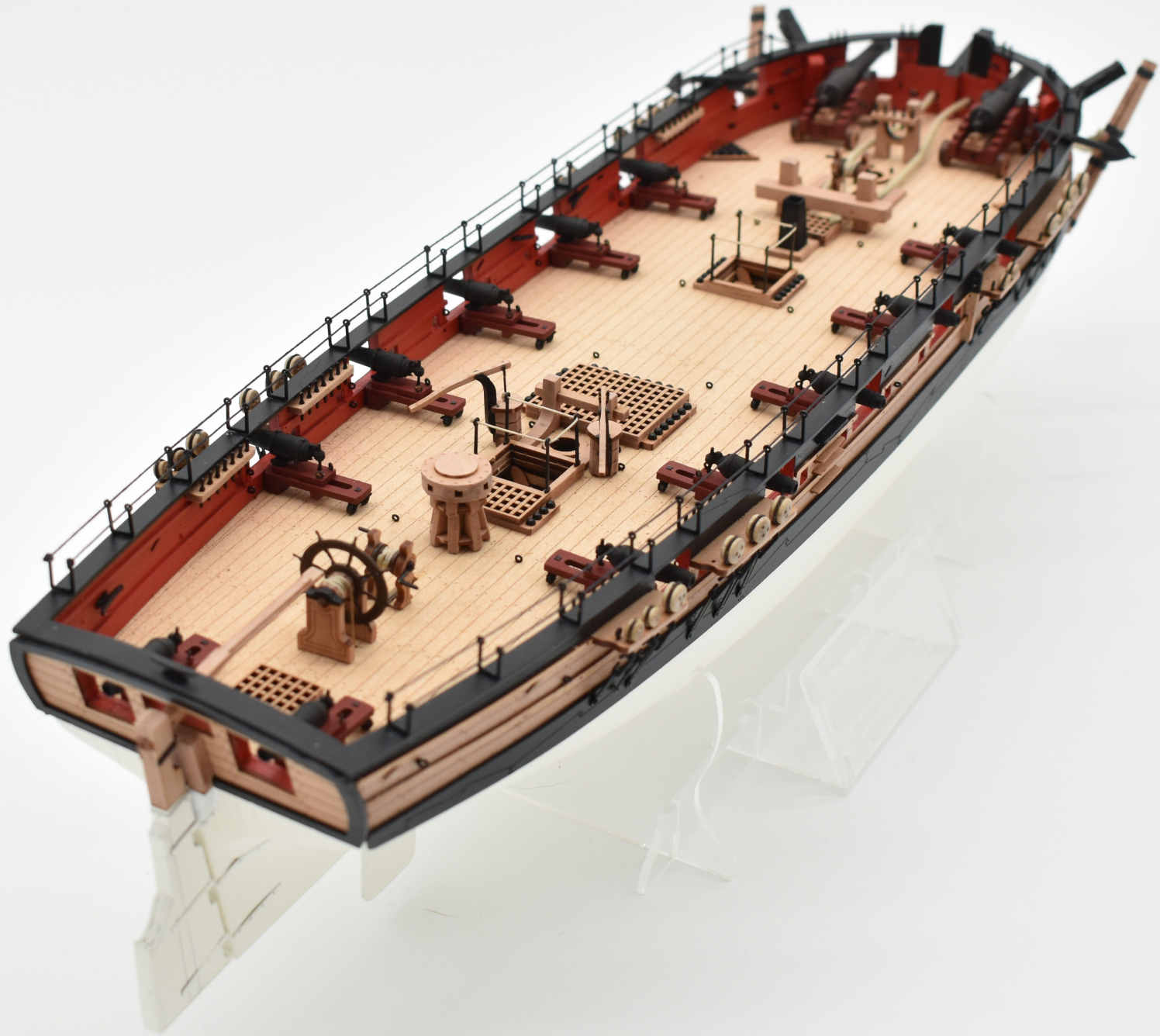
97. Make up the final display cradle from the 2mm Clear Perspex Sheet and make up as shown. A slight drop of glue may be required to fix the parts. If you use cyano gel, just the smallest drop in each slot.



98. To finish the hull assembly, add the cannons and tie the anchors to the hawse rope. The anchors can be tied to the hull once the rigging is complete. Use 0.5mm natural thread to tie the anchor ring to the cathead.

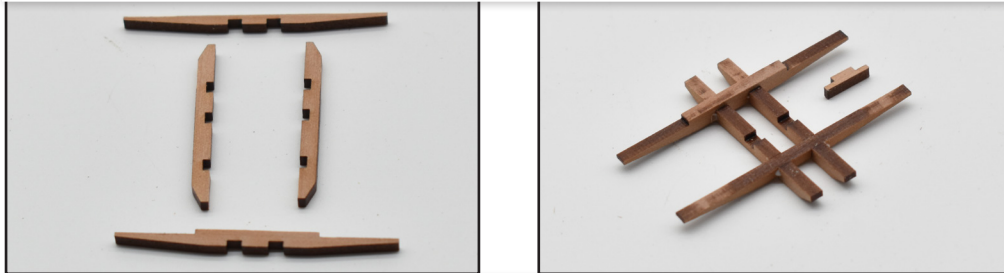




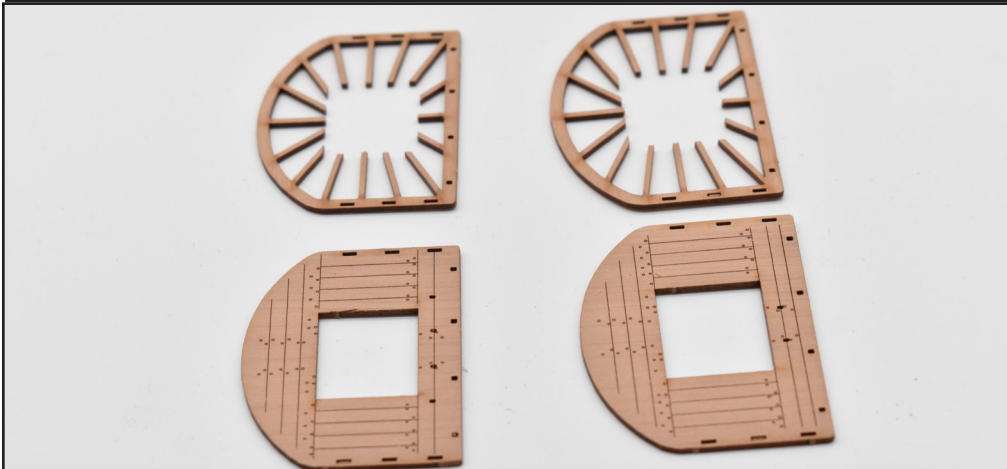
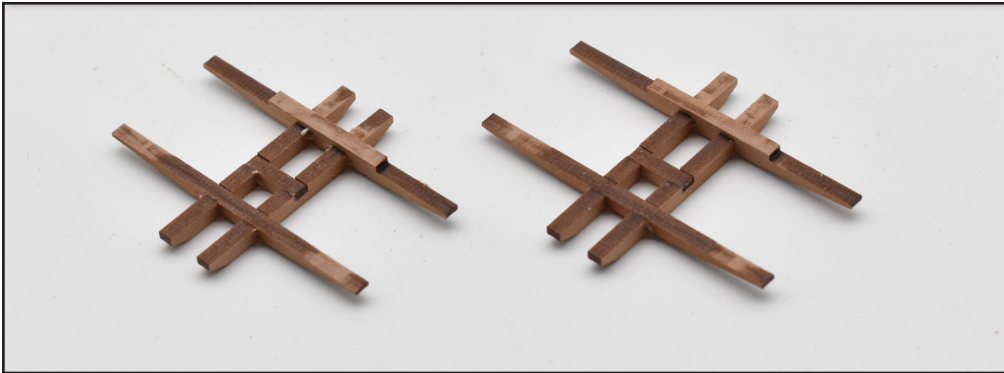




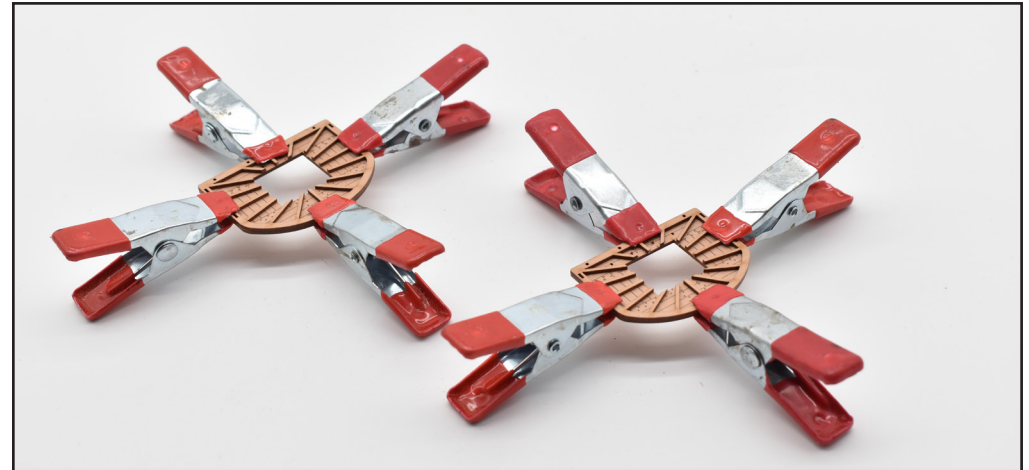
Masting and Rigging - Please note the following stages are supplementary to the plan sets, and it is the plan sets that you should follow for all placements and dimensions.
 For masts, bowsprit and yards use Plan Sheets 7 and 8
 Fore rigging, use Plan Sheets 9, 10, 11 and 12



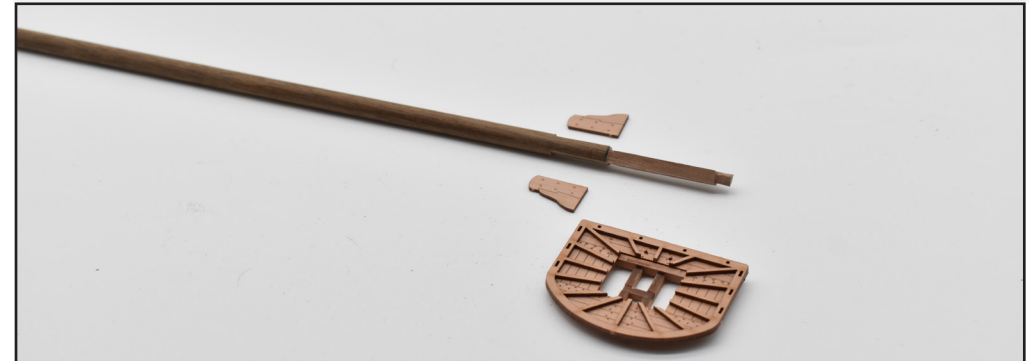
99. Make up the fore and main crossrees and trestle trees as shown, using PVA wood glue. Use Plan Sheet 7 for full reference.



100. Make up the fore and main lower tops as shown, using PVA wood glue. Use Plan Sheet 7 for full reference.



Glue the two halves together using PVA wood glue, and clamp in place until the glue sets.



101. Make up the masts to the dimensions shown on Plan Sheet 7, ready to add the tops and cheeks.



102. Glue the cheeks to each side of the fore and main mast, making sure both sides are aligned correctly.



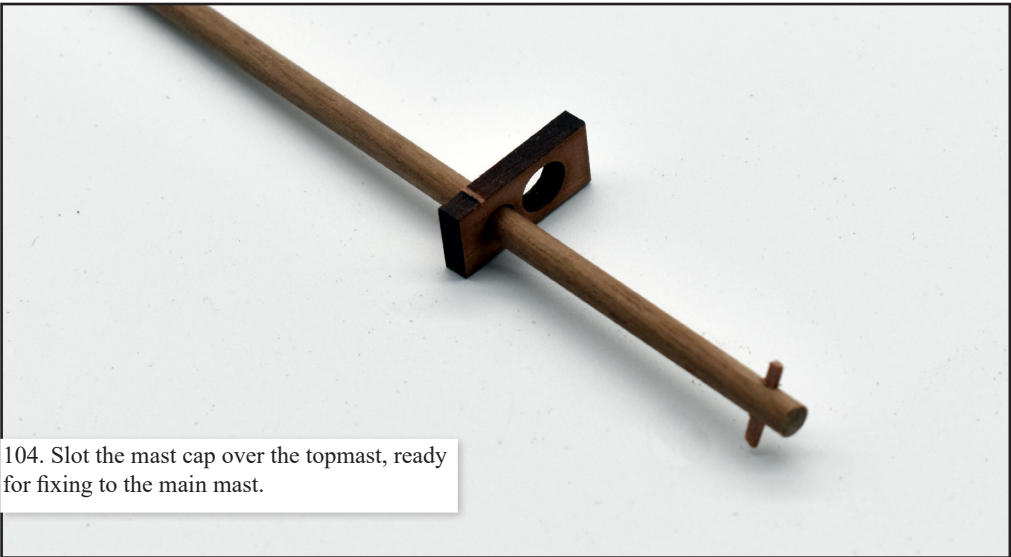
103. Glue the fore and main tops into position as shown



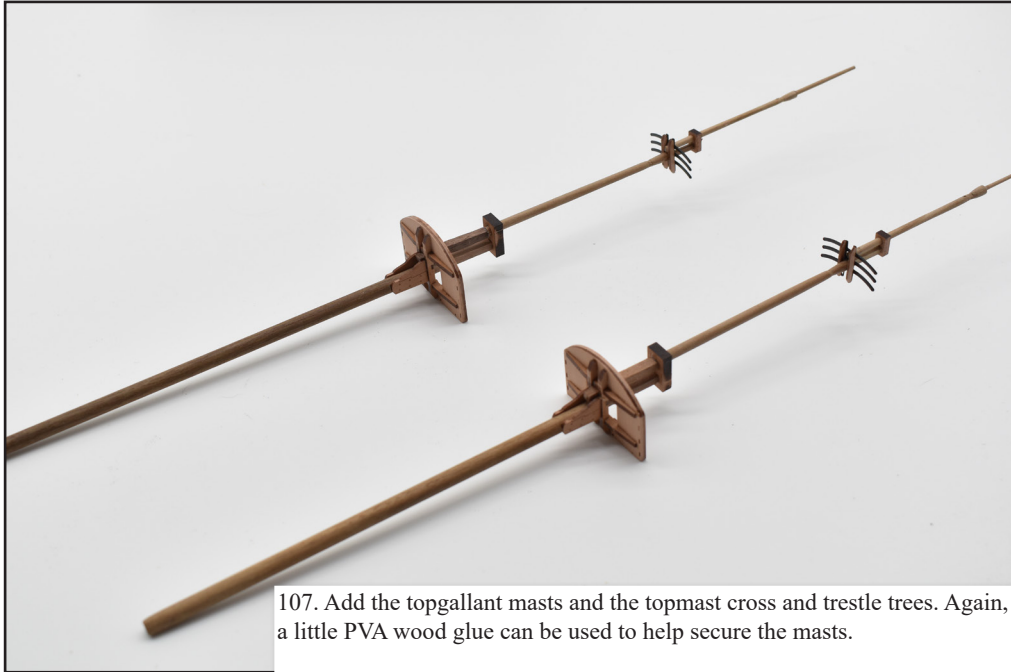
105. Add the topmasts. A little PVA wood glue can be used to help secure the masts.



104. Make up the topmast and drill a 1mm hole near the bottom to take the 'Fid'



106. Slot the mast cap over the topmast, ready for fixing to the main mast.



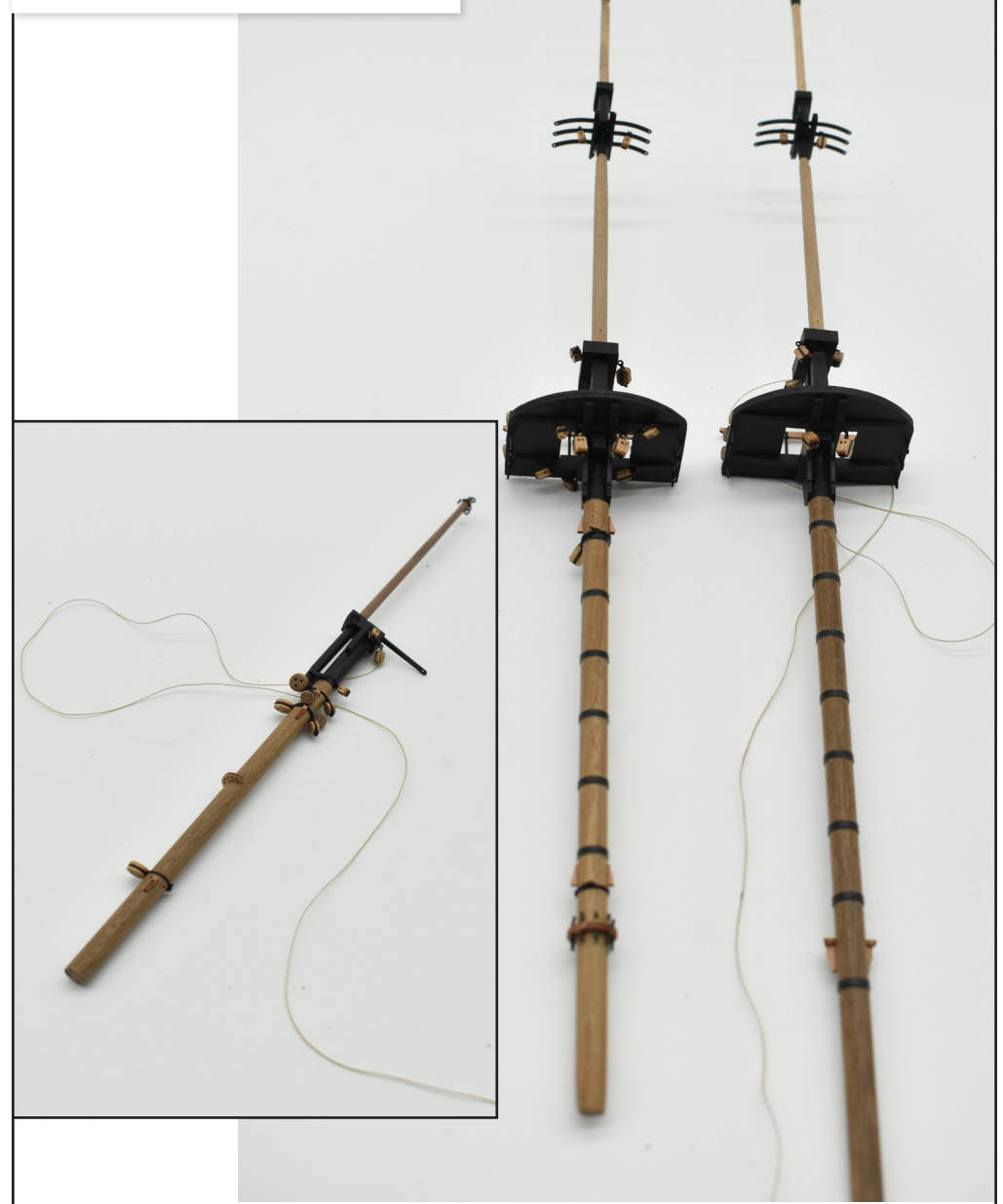
107. Add the topgallant masts and the topmast cross and trestle trees. Again, a little PVA wood glue can be used to help secure the masts.

108. Fore and main mast complete, along with the bowsprit, using Plan Sheet 7 for the masts and Plan Sheet 8 for the bowsprit.

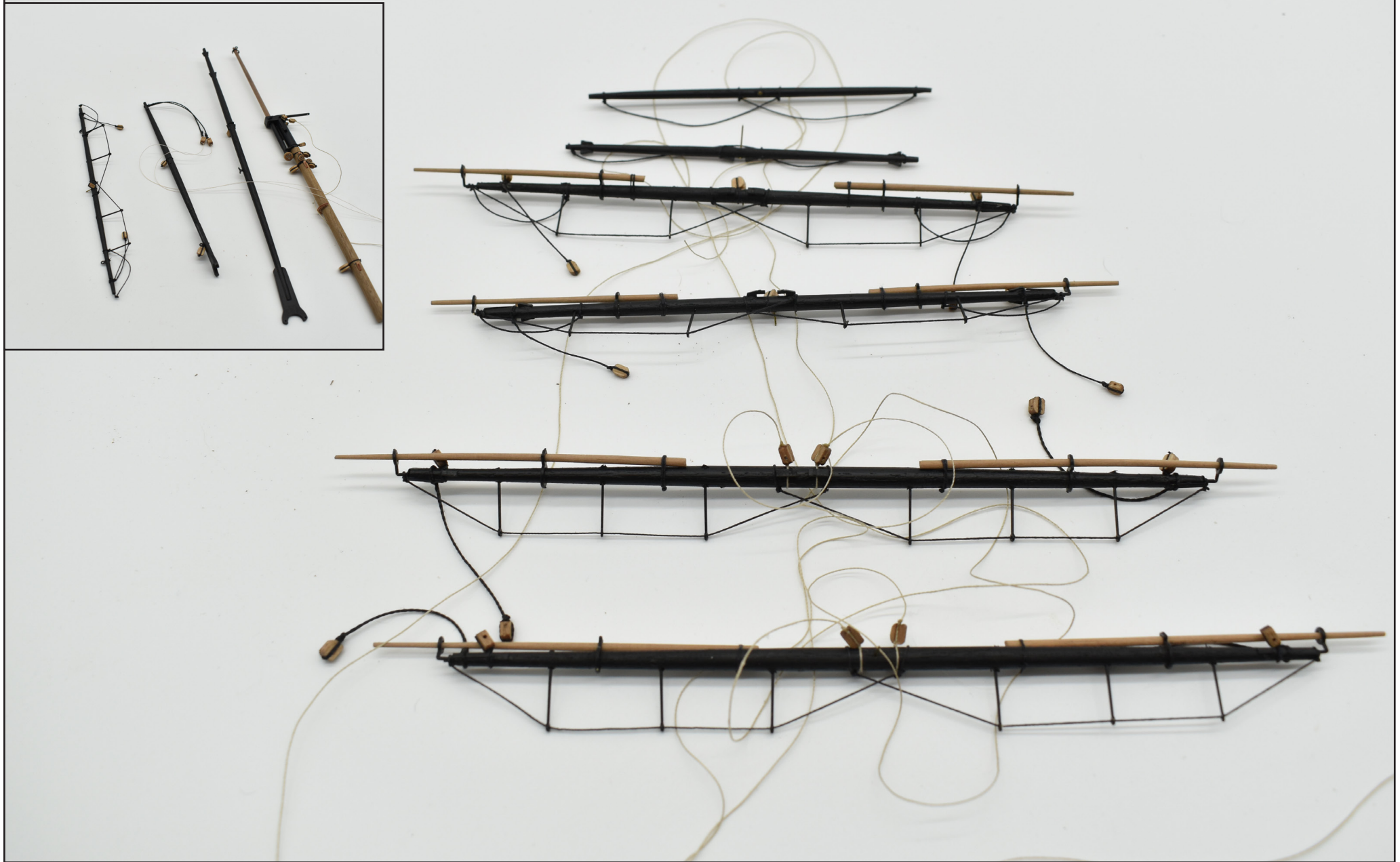


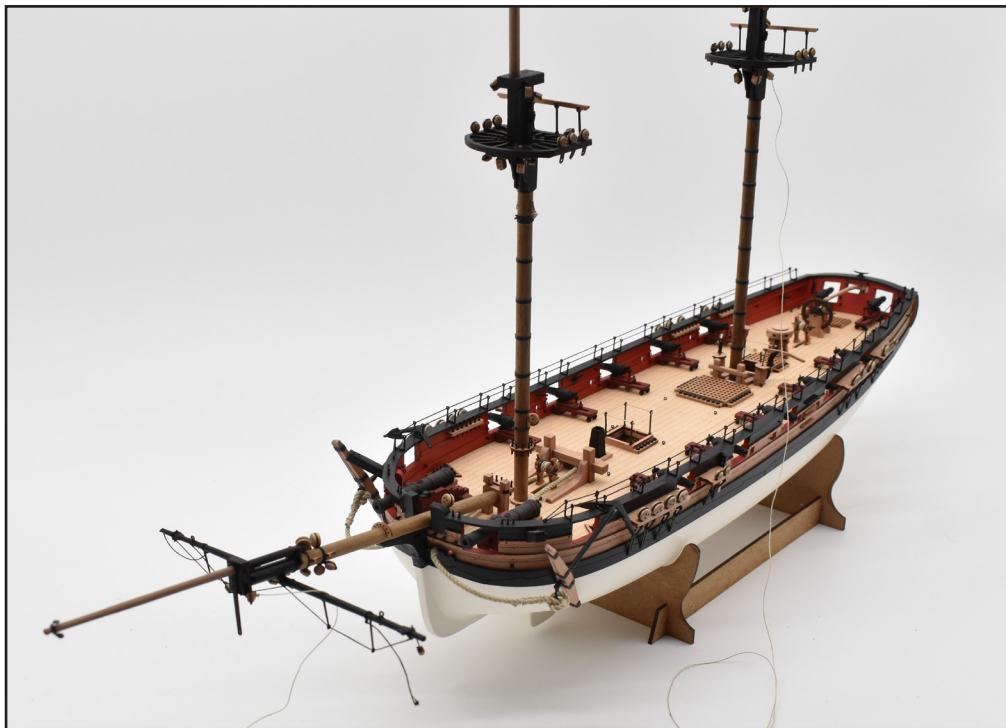
109. Once the masts are complete and painted/ varnished, add all blocks that need to be added as per Plan Sheet 7.

Do the same for the bowsprit, using Plan Sheet 8 for full reference.



110. Using Plan Sheet 8 for full reference, make up the fore, main, gaff and spritsail yards.
Once painted black, add the blocks and stunsail booms.





111. Glue the masts and bowsprit in place using just a dab of PVA wood glue. The spritsail yard can be added at this time, although it may be better to wait until after the bowsprit shrouds are added.



112. Add the mast shrouds and ratlines using Plan Sheet for full reference.



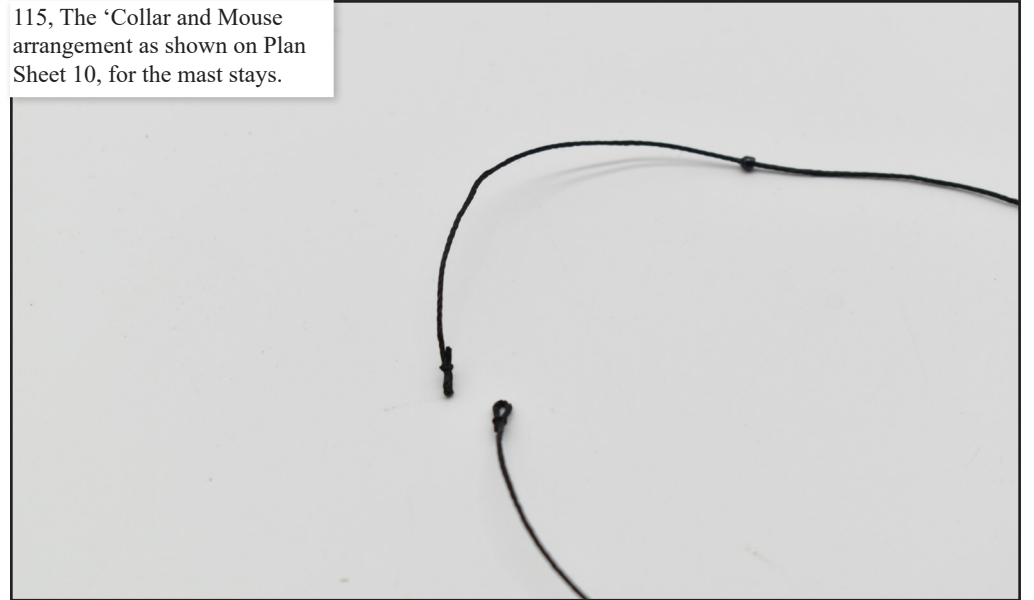


113. Once the shrouds and ratlines have been rigged, add the yards. The gaff and boom can be fully rigged at this time.





115, The 'Collar and Mouse arrangement as shown on Plan Sheet 10, for the mast stays.



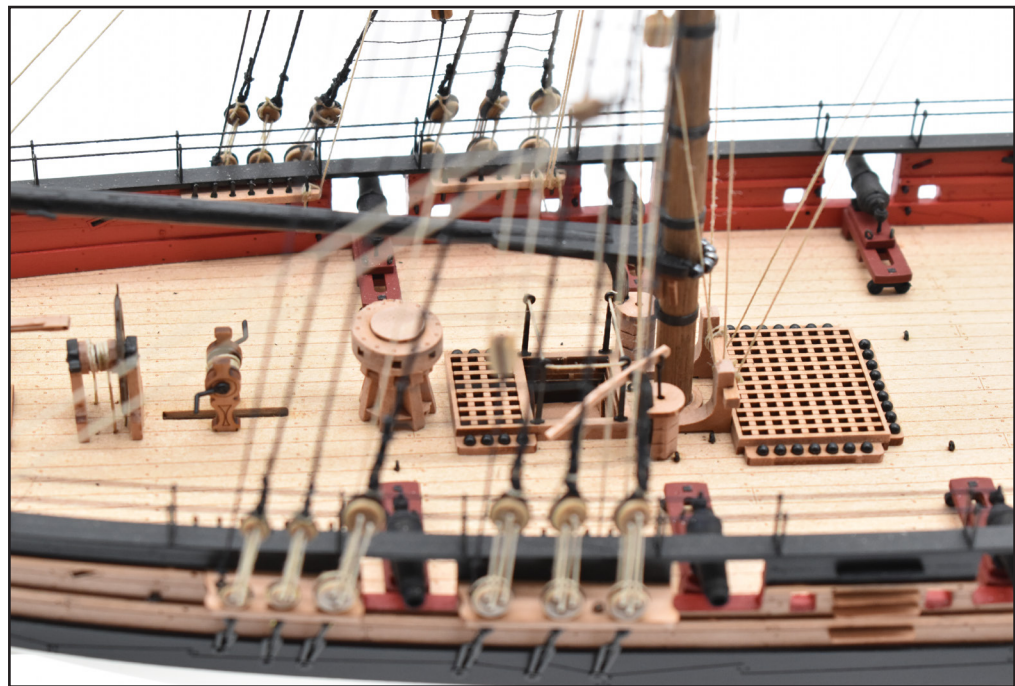
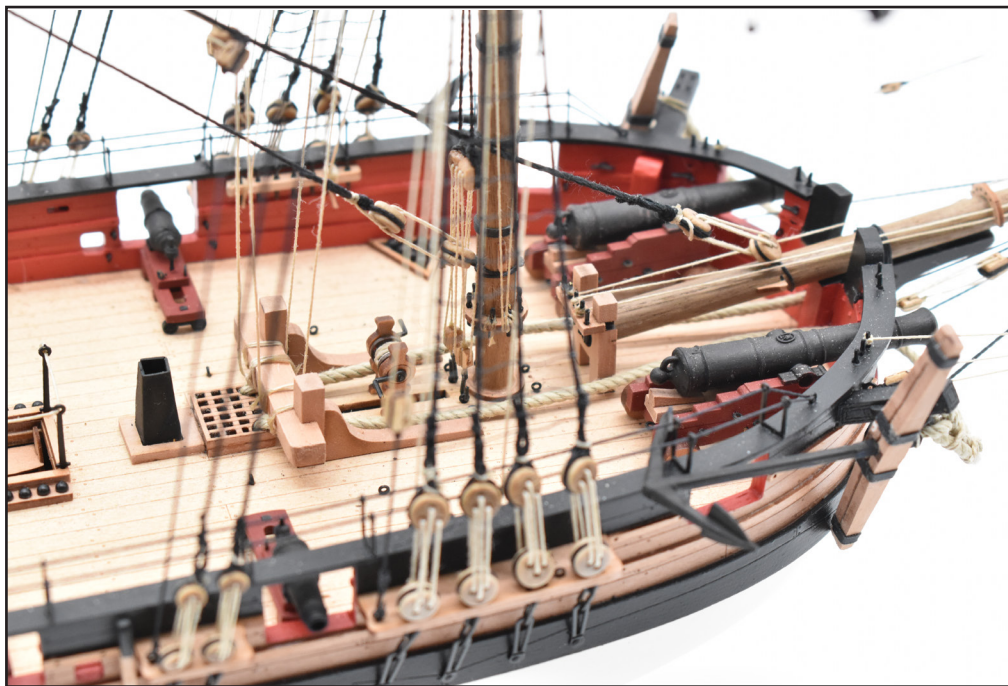
114, The topsail yard lift blocks are fixed into position before the topgallant shrouds are added.

116. Rigging complete after following Plan Sheets 8-11.















ADDER PARTS LIST

3mm MDF

<u>1</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>2</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>3</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>4</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>5</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>6</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>7</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>8</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>9</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>10</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>11</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>12</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>13</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>14</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>15</u>	<u>Bulkhead</u>	<u>3mm MDF</u>	<u>1</u>
<u>17</u>	<u>Bow Frame (Upper Horizontal)</u>	<u>3mm MDF</u>	<u>2</u>
<u>18</u>	<u>Bow Frame (Lower Horizontal)</u>	<u>3mm MDF</u>	<u>2</u>
<u>19</u>	<u>Bow 'Cant' Frame (Vertical - Inner)</u>	<u>3mm MDF</u>	<u>2</u>
<u>20</u>	<u>Bow 'Cant' Frame (Vertical)</u>	<u>3mm MDF</u>	<u>2</u>
<u>21</u>	<u>Bow 'Cant' Frame (Vertical)</u>	<u>3mm MDF</u>	<u>2</u>
<u>22</u>	<u>Bow 'Cant' Frame (Vertical)</u>	<u>3mm MDF</u>	<u>2</u>
<u>23</u>	<u>Bow 'Cant' Frame (Vertical)</u>	<u>3mm MDF</u>	<u>2</u>

2mm MDF

<u>24</u>	<u>Build Cradle Cross Bar</u>	<u>2mm MDF</u>	<u>2</u>
<u>25</u>	<u>Build Cradle (Fore)</u>	<u>2mm MDF</u>	<u>1</u>
<u>26</u>	<u>Build Cradle (Aft)</u>	<u>2mm MDF</u>	<u>1</u>
<u>27</u>	<u>Inner Keel Jig Base</u>	<u>2mm MDF</u>	<u>1</u>
<u>28</u>	<u>Inner Keel Jig Support</u>	<u>2mm MDF</u>	<u>8</u>
<u>29</u>	<u>Inner Keel and Jig</u>	<u>2mm MDF</u>	<u>1</u>
<u>30</u>	<u>Keel Doubler Pattern</u>	<u>2mm MDF</u>	<u>2</u>
<u>31</u>	<u>Longitudinal Support Pattern</u>	<u>2mm MDF</u>	<u>2</u>
<u>32</u>	<u>Lower Deck</u>	<u>2mm MDF</u>	<u>1</u>
<u>33</u>	<u>Capstan Support Board</u>	<u>2mm MDF</u>	<u>1</u>
<u>34</u>	<u>Foremast Support Chock</u>	<u>2mm MDF</u>	<u>2</u>

<u>K-1</u>	<u>Locking Peg for Keel Parts</u>	<u>2mm MDF</u>	<u>8</u>
<u>K-2</u>	<u>Locking Peg for Lower Deck</u>	<u>2mm MDF</u>	<u>8</u>

0.8mm Plywood

<u>35</u>	<u>Sub Deck</u>	<u>0.8mm Ply</u>	<u>1</u>
<u>36</u>	<u>Port Side Bulwark</u>	<u>0.8mm Ply</u>	<u>1</u>
<u>37</u>	<u>Starboard Side Bulwark</u>	<u>0.8mm Ply</u>	<u>1</u>

1mm Laser Engraved Limewood

<u>38</u>	<u>Laser Engraved Main Deck</u>	<u>1mm Wood</u>	<u>1</u>
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0.6mm Wood

<u>39</u>	<u>Companion Ladder Side</u>	<u>0.6mm Wood</u>	<u>4</u>
<u>40</u>	<u>Companion Ladder Step</u>	<u>0.6mm Wood</u>	<u>16</u>
<u>41</u>	<u>Outer Hull Side Step (Lower)</u>	<u>0.6mm Wood</u>	<u>14</u>
<u>42</u>	<u>Outer Hull Side Step (Upper)</u>	<u>0.6mm Wood</u>	<u>14</u>
<u>43</u>	<u>Rudder Tiller Arm Outer facing (Right)</u>	<u>0.6mm Wood</u>	<u>1</u>
<u>44</u>	<u>Rudder Tiller Arm Outer facing (Left)</u>	<u>0.6mm Wood</u>	<u>1</u>
<u>PR-1</u>	<u>Parrel Rib</u>	<u>0.6mm Wood</u>	<u>40</u>

0.8mm Wood

<u>46</u>	<u>Outer Bulwark Side Pattern (Right)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>47</u>	<u>Outer Bulwark Side Pattern (Left)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>48</u>	<u>Main Wale (Left)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>49</u>	<u>Main Wale (Right)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>50</u>	<u>Inner Bulwark Side Pattern (Left)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>51</u>	<u>Inner Bulwark Side Pattern (Right)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>52</u>	<u>Inner Spirketting (Front Left)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>53</u>	<u>Inner Spirketting (Rear Left)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>54</u>	<u>Inner Spirketting (Front Right)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>55</u>	<u>Inner Spirketting (Rear Right)</u>	<u>0.8mm Wood</u>	<u>1</u>
<u>56</u>	<u>Lower Rail (Outer Hull)</u>	<u>0.8mm Wood</u>	<u>2</u>
<u>57</u>	<u>Upper Rail (Outer Hull)</u>	<u>0.8mm Wood</u>	<u>2</u>
<u>58</u>	<u>Upper Rail (Outer Hull)</u>	<u>0.8mm Wood</u>	<u>2</u>
<u>59</u>	<u>Upper Rail (Outer Hull)</u>	<u>0.8mm Wood</u>	<u>2</u>
<u>60</u>	<u>Upper Rail (Outer Hull)</u>	<u>0.8mm Wood</u>	<u>2</u>

60	Upper Rail (Outer Hull)	0.8mm Wood	2
62	Upper Rail (Outer Hull)	0.8mm Wood	2
63	Upper Rail (Outer Hull)	0.8mm Wood	2
64	Inner Bulwark Rail	0.8mm Wood	2
65	Inner Bulwark Rail	0.8mm Wood	2
66	Inner Bulwark Rail	0.8mm Wood	2
67	Inner Bulwark Rail	0.8mm Wood	2
68	Inner Bulwark Rail	0.8mm Wood	2
69	Inner Bulwark Rail	0.8mm Wood	2
70	Inner Bulwark Rail	0.8mm Wood	2
71	Inner Bulwark Rail	0.8mm Wood	2
71R	Inner Bulwark Rail	0.8mm Wood	2

1mm Wood

72	Gunwale (Right)	1mm Wood	1
73	Gunwale (Left)	1mm Wood	1
74	Stern Gunwale	1mm Wood	1
75	Main Top Lower Platform	1mm Wood	1
76	Main Top Upper Platform	1mm Wood	1
77	Main Top Stanchion Rail	1mm Wood	1
78	Fore Top Lower Platform	1mm Wood	1
79	Fore Top Upper Platform	1mm Wood	1
80	Fore Top Stanchion Rail	1mm Wood	1
81	Main Mast Cheek (Left)	1mm Wood	1
82	Main Mast Cheek (Right)	1mm Wood	1
83	Foremast Cheek (Left)	1mm Wood	1
84	Foremast Cheek (Right)	1mm Wood	1
85	Topmast Fid	1mm Wood	2
86	Topgallant mast Fid	1mm Wood	2
87	Mast/Yard Cleat (Large)	1mm Wood	48
88	Mast/Yard Cleat (Small)	1mm Wood	69
89	Prow Outer Pattern (Right)	1mm Wood	1
90	Prow Outer Pattern (Left)	1mm Wood	1
91	Prow Support for Bulwark Front	1mm Wood	2
92	Outer keel patterns locating Key	1mm Wood	12
93	Lower Keel Side	1mm Wood	2
94	Rudder Post Outer Pattern	1mm Wood	2
95	Rudder Side (Right)	1mm Wood	1
96	Rudder Side (Left)	1mm Wood	1

97	Stern Transom (Inner)	1mm Wood	1
98	Stern Transom (Lower Outer)	1mm Wood	1
98a	Stern Transom (Upper Outer)	1mm Wood	1
99	Stern Transom Rail	1mm Wood	1
100	Mast Base	1mm Wood	2
101	Main Boom Saddle	1mm Wood	1
101a	Main Boom Saddle Chock	1mm Wood	4
102	Main Mast Belaying Ring	1mm Wood	1
103	Jibboom Saddle	1mm Wood	1
104	Bowsprit Fairlead	1mm Wood	1
105	Topgallant Mast Cap	1mm Wood	2
106	Inner Bulwark Cleat	1mm Wood	10
107	Ships Wheel Drum End Cap	1mm Wood	2
113a	Hand Pump Handle	1mm Wood	2
110	Capstan Top Drum (Upper)	1mm Wood	1
111	Capstan Top Drum (Lower)	1mm Wood	1
112	Capstan Lower Chock	1mm Wood	1
112a	Capstan Upper Chock	1mm Wood	1
113	Hand Pump Top Cap	1mm Wood	2
114	Cathead Sheaves	1mm Wood	4
115	Cathead End Cap	1mm Wood	2
116	Shot Garland for 24-Pounder	1mm Wood	2

1.5mm Wood

117	18-Pounder Carronade Slide Bed	1.5mm Wood	12
118	18-Pounder Carronade Carriage	1.5mm Wood	12
119	18-Pounder Carronade Slide Bed Cross Beam	1.5mm Wood	12
120	18-Pounder Carronade Slide Pin	1.5mm Wood	12
121	Sling Cleat	1.5mm Wood	24
122	Main Gaff/Boom Jaws	1.5mm Wood	2
123	Topmast Trestle Tree	1.5mm Wood	4
124	Bowsprit Bee (Left)	1.5mm Wood	1
125	Bowsprit Bee (Right)	1.5mm Wood	1
126	Tiller Arm	1.5mm Wood	1
127	Fore Hatch and Chimney Base	1.5mm Wood	1
127a	Fore Hatch Grating	1.5mm Wood	1
128	Fore Companion Lower Coaming	1.5mm Wood	1
128a	Fore Companion Upper Coaming	1.5mm Wood	1

129	Main Hatch Lower Coaming	1.5mm Wood	1
129a	Main Hatch Grating	1.5mm Wood	1
130	Rear Hatch and Companion Coaming	1.5mm Wood	1
130a	Rear Hatch and Companion Upper Coaming	1.5mm Wood	1
131	Stern Grating	1.5mm Wood	1
132	Rudder Centre	1.5mm Wood	1
133	Fore Channel (Front)	1.5mm Wood	2
134	Fore Channel (Rear)	1.5mm Wood	2
135	Main Channel (Front)	1.5mm Wood	2
136	Main Channel (Rear)	1.5mm Wood	2
137	Hawse Hole Bolster	1.5mm Wood	2
138	Drop Keel	1.5mm Wood	2
139	Drop Keel Winch Drum Support	1.5mm Wood	6
140	Ships Wheel Standard (Front)	1.5mm Wood	1
141	Ships Wheel Standard (Rear)	1.5mm Wood	1
142	Capstan Drumhead Centre	1.5mm Wood	1
143	Capstan Drumhead Centre Cap	1.5mm Wood	1
144	Bowsprit Bitts Belaying rack	1.5mm Wood	1
144a	Inner Bulwark Belaying rack	1.5mm Wood	6
145	Capstan Drumhead Centre	1.5mm Wood	1
146	Chess tree (Right)	1.5mm Wood	1
147	Chess tree (Left)	1.5mm Wood	1
148	Cathead Cleat	1.5mm Wood	2
<u>2mmWood</u>			
149	Prow	2mm Wood	1
150	Main Keel	2mm Wood	1
151	Main Keel (Rear)	2mm Wood	1
152	Stern/Rudder Post	2mm Wood	1
153	Stern Transom	2mm Wood	1
154	Deck Camber beam (Mid)	2mm Wood	2
155	Deck Camber beam (Aft)	2mm Wood	4
156	Capstan Whelp	2mm Wood	8
157	Main Bitts Cross Beam	2mm Wood	1
158	Cathead – Right Aft	2mm Wood	1
159	Cathead – Right Front	2mm Wood	1
160	Cathead – Left Aft	2mm Wood	1
161	Cathead – Left Front	2mm Wood	1

162	Fore Trestle Tree	2mm Wood	2
163	Fore Cross Tree (Fore)	2mm Wood	1
164	Fore Cross Tree (Aft)	2mm Wood	1
165	Fore & Main Cross Tree (Short)	2mm Wood	2
166	Fore & Main Bolster	2mm Wood	4
167	Main Trestle Tree	2mm Wood	2
168	Main Cross Tree (Fore)	2mm Wood	1
169	Main Cross Tree (Aft)	2mm Wood	1
170	24 Pounder Carriage Right Side	2mm Pear	2
171	24 Pounder Carriage Left Side	2mm Pear	2
172	24 Pounder Carriage Front Axle	2mm Pear	2
173	24 Pounder Carriage Rear Axle	2mm Pear	2
174	24 Pounder Carriage Stool Bed	2mm Pear	2
175	24 Pounder Carriage Stool Quoin	2mm Pear	2
176	24 Pounder Carriage Front Wheel	2mm Pear	4
177	24 Pounder Carriage Rear Wheel	2mm Pear	4
194	Anchor Stock	2mm Pear	4

3mm Wood

107a	Ships Wheel Centre Drum	3mm Wood	1
178	18-Pounder Carronade Front Chock	3mm Wood	14
179	Bow Timber	3mm Wood	2
180	Hand Pump Body	3mm Wood	6
181	Bowsprit Bitt/Post	3mm Wood	1
182	Main Bitts	3mm Wood	2
183	Topmast Cap	3mm Wood	2
185a	Fore Riding Bitt Knee	3mm Wood	2

4mm Wood

184	Rudder Post Cheek	4mm Wood	2
185	Fore Riding Bitt Post	4mm Wood	2
186	Fore Riding Bitt Cross Beam	4mm Wood	1
187	Fore and Main Mast Cap	4mm Wood	2
188	Bowsprit Cap	4mm Wood	1

2mm Clear Acetate

189	Display Stand Fore Cradle	2mm Acetate	1
190	Display Stand Rear Cradle	2mm Acetate	1
191	Display Stand Support	2mm Acetate	2
192	Display Stand Nameplate Support	2mm Acetate	4
193	Display Stand Nameplate	2mm Acetate	2

0.2mm Photo-Etched Brass

PE-1	Rudder Strap	0.2mm PE	2
PE-2	Rudder Strap	0.2mm PE	2
PE-3	Rudder Strap	0.2mm PE	2
PE-4	Rudder Strap	0.2mm PE	2
PE-5	Rudder Strap	0.2mm PE	2
PE-6	Rudder Strap	0.2mm PE	2
PE-7	Rudder Strap	0.2mm PE	2
PE-8	Rudder Strap	0.2mm PE	2
PE-9			
PE-10	Ships Wheel Outer Rim	0.2mm PE	2
PE-11	Ships Wheel Inner Rim	0.2mm PE	2
PE-12	Lower Stunsail Boom Strap	0.2mm PE	5
PE-13	Upper Stunsail Boom Strap	0.2mm PE	5

0.4mm Photo-Etched Brass

PE-14	Eyebolt (Inner Hull)	0.4mm PE	167
PE-15	Eyebolt (Outer Hull)	0.4mm PE	20
PE-16	Rigging Hook	0.4mm PE	23
PE-17	18 Pounder Carronade Ringbolt Strap	0.4mm PE	30
PE-18	18 Pounder Carronade Breeching Ringbolt	0.4mm PE	30
PE-19	Stanchion	0.4mm PE	12
PE-20	Yard Footrope Stirrups	0.4mm PE	28
PE-21	Deck Pump Rod	0.4mm PE	4
PE-22	Deck Pump Main Body	0.4mm PE	5
PE-23	Deck Pump Outer Pattern	0.4mm PE	5
PE-24	Chimney	0.4mm PE	1
PE-25	Ships Wheel Main Body	0.4mm PE	1
PE-26	Jibboom Iron Band	0.4mm PE	1

PE-27	Hammock Crane	0.4mm PE	38
PE-28	5mm Deadeye Strop	0.4mm PE	18
PE-29	Chainplate Middle Link (For PE-28)	0.4mm PE	20
PE-30	Chainplate Lower Link (For PE-28)	0.4mm PE	17
PE-31	3.5mm Deadeye Strop	0.4mm PE	11
PE-32	Chainplate Middle Link (For PE-31)	0.4mm PE	12
PE-33	Chainplate Lower Link (For PE-32)	0.4mm PE	12
PE-34	3.5mm Deadeye Futtock Strop	0.4mm PE	14
PE-35	Futtock Shroud Hook	0.4mm PE	15

0.6mm Photo-Etched Brass

PE-36	Belaying Pin	0.6mm PE	64
PE-37	Rudder Pintle and Gudgeon (Not Used)	0.6mm PE	4
PE-38	Main Sheet Iron	0.6mm PE	1
PE-39	Dolphin Striker	0.6mm PE	1
PE-40	Anchor Ring	0.6mm PE	2
PE-41	Small Cleat	0.6mm PE	19
PE-42	Drop Keel Winch Handle	0.6mm PE	6
PE-43	Stunsail Boom Iron (Outer)	0.6mm PE	10
PE-44	Lower Stunsail Boom Iron (Inner)	0.6mm PE	5
PE-45	Upper Stunsail Boom Iron (Inner)	0.6mm PE	5
PE-46	Lower Top Stanchion	0.6mm PE	10
PE-47	Main Topmast Cross Tree and Trestle Tree	0.6mm PE	1
PE-48	Fore Topmast Cross Tree and Trestle Tree	0.6mm PE	1

Fittings and Materials

F-1	18 Pounder Carronade Barrel	3-D Print	14
F-2	18 Pounder Carronade Wheels	3-D Print	14
F-3	24-Pounder Cannon Barrel	3-D Print	2
F-4	Anchor	3-D Print	2
F-5	Drop Keel Winch Drum	3-D Print	2
F-6	Small pin	Brass	200
F-7	2mm Diameter cannon ball	Acetate or steel	50
F-7a	2.5mm Diameter cannon ball	Acetate or steel	22
F-8	2.5mm Thimble Block	Wood	30
F-9	3.5mm Deadeye	Wood	36
F-10	5mm Deadeye	Wood	44
F-11	3mm Single block	Wood	60
F-12	4mm Single Block	Wood	30
F-13	5mm Single Block	Wood	12
F-14	4mm Double block	Wood	24
F-15	Lower Stay Mouse Bead	Plastic	5
F-16	Parrel bead	Plastic	50
F-17	0.1mm Diameter natural thread		50m
F-18	0.25mm Diameter natural thread		40m
F-19	0.5mm Diameter natural thread		20m
F-20	0.25mm Diameter black thread		20m
F-21	0.5mm Diameter black thread		20m
F-22	0.75mm Diameter black thread		20m
F-23	1mm Diameter black thread		20m
F-24	1.3mm Diameter black thread		5m
F-25	2mm Diameter natural thread (Anchor hawse)		0.5m
F-26	6mm Dowel x 500mm long	Wood	2
F-27	5mm Dowel x 500mm long	Wood	3
F-28	4mm Dowel x 500mm long	Wood	2
F-29	3mm Dowel x 500mm long	Wood	2
F-31	2mm Dowel x 500mm Long	Wood	1
F-32	1mm x 5mm x 500mm strip - Limewood	Wood	30
F-33	0.8mm x 4mm x 500mm strip - Second planking	Wood	40
F-35	0.8mm Diameter brass rod x 250mm long	Metal	1
F-36	Black Card for Anchor Stock and Masts	Card	1

Adder Cutter Laser and PE Sheet Quantities

3mm MDF Laser Cut	1
2mm MDF Laser cut	2
2mm Clear Acetate	1
0.6mm Pear Wood	1
0.8mm Pear Wood	2
1mm Pear Wood	2
1.5mm Pear Wood	1
2mm Pear Wood	2
3mm Pear Wood (Small)	1
4mm Pear Wood (Small)	1
0.8mm Plywood	1
1mm Wood laser etched deck	1
0.2mm Photo Etched Brass Sheet	1
0.4mm Photo Etched Brass Sheet	1
0.6mm Photo Etched Brass Sheet	1

VANGUARD MODELS

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HM Gun Brig Adder was designed and developed in the UK by Chris Watton

Finished prototype model made and photographed (including construction manual text) by Chris Watton

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