

# *Lady Isabella*

*80 Foot ZULU*

*Circa 1900*

## Building Manual

VANGUARD MODELS  
BY CHRIS WATTON

Designed, developed and produced in the UK



PART NUMBER – VM-03



## Zulu Fishing Boat History

*Written by James A Pottinger for the Vanguard Models Lady Isabella kit*

In tracing the origins of the two main constituents of the Scottish fishing boats up to the advent of the Fifies and Zulus, we are inexorably drawn to the Viking influence of boat design and construction. This is characterised by a broadly similar bow and stern shape and balanced waterline section fore and aft, sweeping sheer and clinker planking. This lineage can be still be traced, even though little is known about the Scottish fishing industry until near the end of the middle ages. We do know, however, that the importance of fishing is indicated by the considerable encouragement given by James IV (1488-1513) The Scaffies, a boat that had a rounded fore stem and steeply raked sternpost and relatively slack bilges, being either half decked, or later fully decked, generally operated on the north east coast of Scotland. This was the favoured type of fishing boat in the Moray Firth from the beginning of the 19th century. Fitted with two masts setting a tall dipping lugsail and a mizzen sail, or on smaller boat, a single foresail. The short keel gave them good manoeuvrability in good weather, but they tended to be more skittish in rough weather and were usually crewed by six men. Given the lack of suitable harbours, they were light enough to be hauled up onto a beach. Being wholly or partially undecked they gave little shelter to the crew, and as such usually fished only a few miles offshore. They were gradually built bigger and could be as much as 42ft in overall length, and partially decked.

Further south, fishermen tended to favour a deeper hull with almost vertical stem and sternpost, initially clinker planked but later carvel planked. These were known as Baldies, said to be in deference of Garibaldi, a popular Italian hero of that era. The connection being at best tenuous, it would seem. These boats typically had a 21 foot keel, with a beam of 8 feet, and were generally accepted as being the ancestor of the much larger Fifies. In rig, they differed in that they carried a lofty lug sail on a single mast, stepped well forward, whereas their bigger sister presented the classic profile of a high peak dipping lug sail set on a very heavy unstayed foremast, and a smaller lug sail on the mizzen mast. The limitations of the Scaffies were obvious by the need to fish further offshore for herring, and by the late 1870's it was recognised that bigger and more seaworthy boats were needed. Additionally, the gradual development of sheltered harbours allowed bigger boats to be used without the need for them to be hauled up onto beaches. It was natural that the respective qualities of the Scaffie and Baldie would be incorporated, and credit is generally as attributed to William Campbell of Lossiemouth, who ordered the NONSUCH, which was built between 1878 and 1879.

A tale, perhaps apocryphal, was that the skipper and his wife, who was contributing half of the cost, disagreed on the design of the boat. One favoured the shape of straight stem and sternpost, which was typical of a Baldie, and the other the Scaffie shape of raking stern post and rounded bow. The result was a compromise, as is usual in any successful marriage. As a result, the boat had a straight stem and a raking sternpost. Thus, the Zulu was born.

Other sources state that Messer's Slater of Portessie had built and fished a smaller Zulu which was used as a prototype for the larger NONSUCH. That leaves some doubt as to the exact evolution of what was to be the pre-eminent type of vessel for many of the succeeding years on the Moray coast. The straight fore stem was naturally easier to fashion on a much larger boat than replicating the curved stems used on the small Scaffie. With a similar overall length, and with the hull having a raking sternpost, it gave more or less same deck area as a Fifie, but the shorter waterline length allowed for more handiness under sail, especially with the relatively unhandy dipping lug sail which had to be lowered and re-set on the opposite side when tacking.

Construction of this new type still employed clinker planking, with a keel length of 40 ft and a cost of around £170. The first carvel planked Zulu was built around 1887 by George Innes at Portknockie, being the FAVOURITE BF 556. To gain experience in handling the 2 inch thick planks used on carvel planked boats, in contrast to the 1 inch planks on clinker boats, he used carpenters from the boatyards along the mouth of the River Spey at Garmouth and Kingston On Spey, who had been building much larger merchant sailing vessels such as schooners and ketches.

Such was the popularity of this new type of boat with the Moray fishermen that they started being built exclusively in this area. By 1901, no less than 480 were registered in Buckie alone. The size was progressively increased until the keel was around 60ft long, giving an overall length of 80 ft, and an indication of the tremendous rake of the sternpost. Inevitably, the cost also increased as additional fittings were added to the basic boat. The complete hull with sails and steam capstan was now in the region of £800--£830. These dimensions were matched by their tall and impressive masts and standing lug, similar to that on the Fifies.

It is difficult today to envisage the scope of boatbuilding activity along the shores of the Moray Firth, and in the creeks and villages ranging from Cullen, Portknockie, Findochty, Portessie, Buckie and Portgordon, where most builders worked in the open. The McIntosh family built over 1,000 boats ranging from Scaffies, Zulus and steam drifters at Portessie, and latterly at Iainstown, over the course of a century. Whilst few Fifies were built in the NE, activity was almost wholly given over to the construction of Zulus. However, it was Portknockie that was the site of the most prolific of boatbuilders, where William "Beal" Geddes, who started building steam drifters in 1903, was launching one drifter each month until the yard closed in 1915.

The last sailing Zulu to fish was the MUIRNEAG SY486. She was ordered by Alexander McLeod of Knock Point, Stornaway, in 1903, from William McIntosh at Portessie. She fished under sail until 1939. In 1945, at the age of eighty, he took her to sea for the last time. After being laid up in 1947, she was then sold at a public auction for £50 and broken up at Balallan Beach at Loch Erisfort, for fencing posts. A number of manufacturers competed to develop a suitable engine for these boats. In the end, Kelvin and Gardner engines were the most popular, and by 1909 a few Zulus had engines installed. The fleet gradually became motorised and reached its peak around the end of WWI.

Installation of the engines wasn't easy in the beginning, as the existing original stern post was not thick enough to take the bore of the propeller shaft and tube, a number had the engines installed in the aft quarter with varying success. Eventually, the most logical solution was to extend the keel aft and thicken the deadwood to take the shaft.

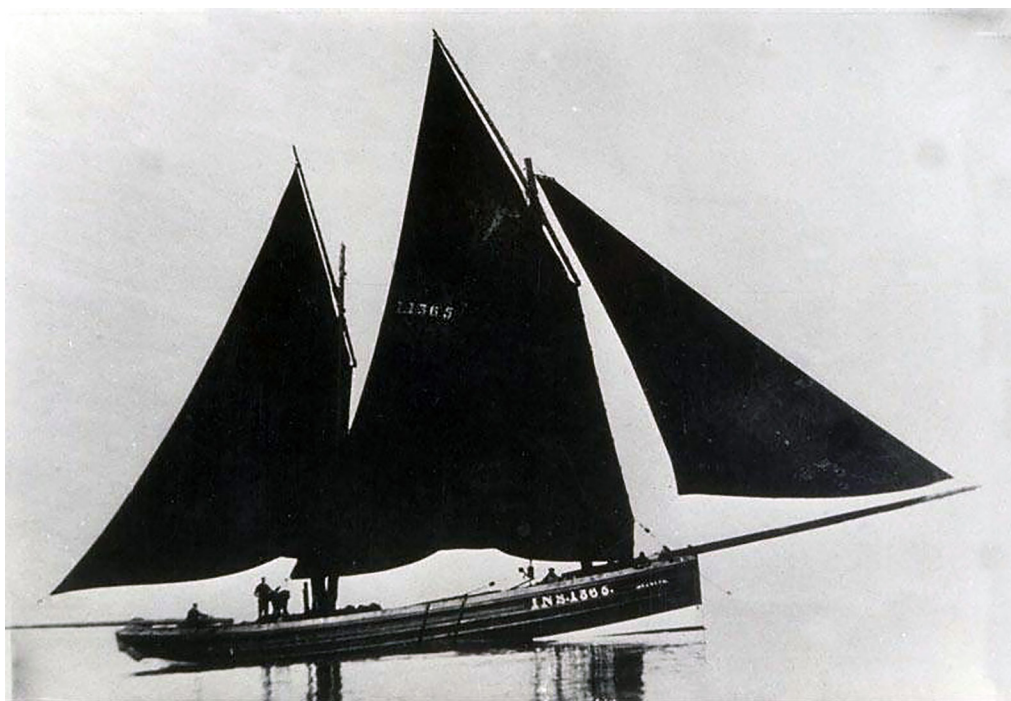
Currently, the only surviving relic of a big Zulu in Scotland is the hull of the RESEARCH. She was built by W. & G. Stephens at Banff as the sailing Zulu HEATHER BELL BF1206, for Alexander Paterson. She was launched in April 1903, being 78ft 6ins in overall length, and having a beam of 19ft 10 ins. In April 1912, she was sold to William Ritchie of Roseheart, and took the number FR498. In February 1917, she had a 30 bhp Kelvin auxiliary installed, and in 1919 another motor engine was fitted. She changed hands twice in 1919; that is in February and May. Two higher powered 60 bhp Kelvin engines were fitted the following year. It is possible that she was then wholly motorised with only a steadying mizzen sail. The wheelhouse was probably fitted at that time. Sold again in the 1920's, she fished from the North East of Scotland until April 1935, when she was sold to John George Anderson and Gibbie Williamson of Whalsay, Shetland, for £300. She took the name of the owners earlier sailing Fife called



RESEARCH, and new number LK62. She fished with a herring drift net until being requisitioned by the Admiralty in WWII for various harbour duties.

She was handed back to her owners in 1945, when a Seine net winch was installed to allow her to take part in winter white fish fishing, alternating with drift net fishing in the summer months. On the impending retiral of her owners in 1968, it was decided to lay her up. On her last night at the herring drift nets, she landed a catch of 46 crans of herring.

Various schemes were put forward for her possible restoration to original rig, after being bought by John Phillips of Lerwick. However, the lack of finance curtailed any meaningful work on her, and she lay derelict in Hay's Dock in the town. It was then that the Scottish Fisheries Museum took a hand, and she was towed down to Anstruther. In 1983, sufficient funds were made available to have some repairs done at the James Miller boatyard at St Monans in Fife, where the keel and some planking were replaced. Funds did not allow any further meaningful repairs and she then lay derelict at Anstruther, eventually sinking and lying on the bottom with much of her fabric gradually being destroyed. Now in danger of breaking up, her salvage became imperative. By mid-December 1996, she was finally raised and encased in a protective steel framework cradle which allowed her to be eventually brought inside the Scottish Fisheries Museum at Anstruther where it is still possible, despite much of the original structure being lost, to appreciate the massive timbers used in her construction and characteristic raking sternpost.



## THE KIT

The Zulu was an innovative hybrid which fused the extreme rake of the sternpost of the 'Scaffie' and the near straight stem of the 'Fife'. This produced a unique and highly successful class of fore and aft rigged fishing vessels during the last decades of the herring sail fishery.

Tillers gave way to the steering wheel, operated via a worm screw gear system. The sail area was large for the size of vessel, and the Zulu's could reach 10 knots with little problem, and it is of this pinnacle of Zulu development that the Lady Isabella is based upon.

Interestingly, the Zulu had no standing rigging on its fore and aft masts, instead relying on support entirely upon their sail halyards and a burton stay tackle, set up to windward. This did mean that any failure would have been catastrophic.

The model kit is designed to be as accurate as possible for a commercial kit in both scale and detail, and has been developed with the beginner to intermediate modeller in mind, with some aspects simplified for ease of construction. More experienced modellers can modify the kit how they wish

Although the kit of Lady Isabella is as easy to build as we can make it, very basic woodworking skills (and patience) are still required. A small work space will have to be put aside for the assembly. Do not remove parts from the laser cut sheets until actually required for fitting, as they can be easily damaged or lost.

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. Before removing the wooden parts from their sheets, they should be numbered by reference to the cut file identification drawings. 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. For the Lady Isabella prototype model, some of the photo-etched brass was left unpainted to highlight some aspects of the vessels detail.

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 take your time with every single sub assembly.



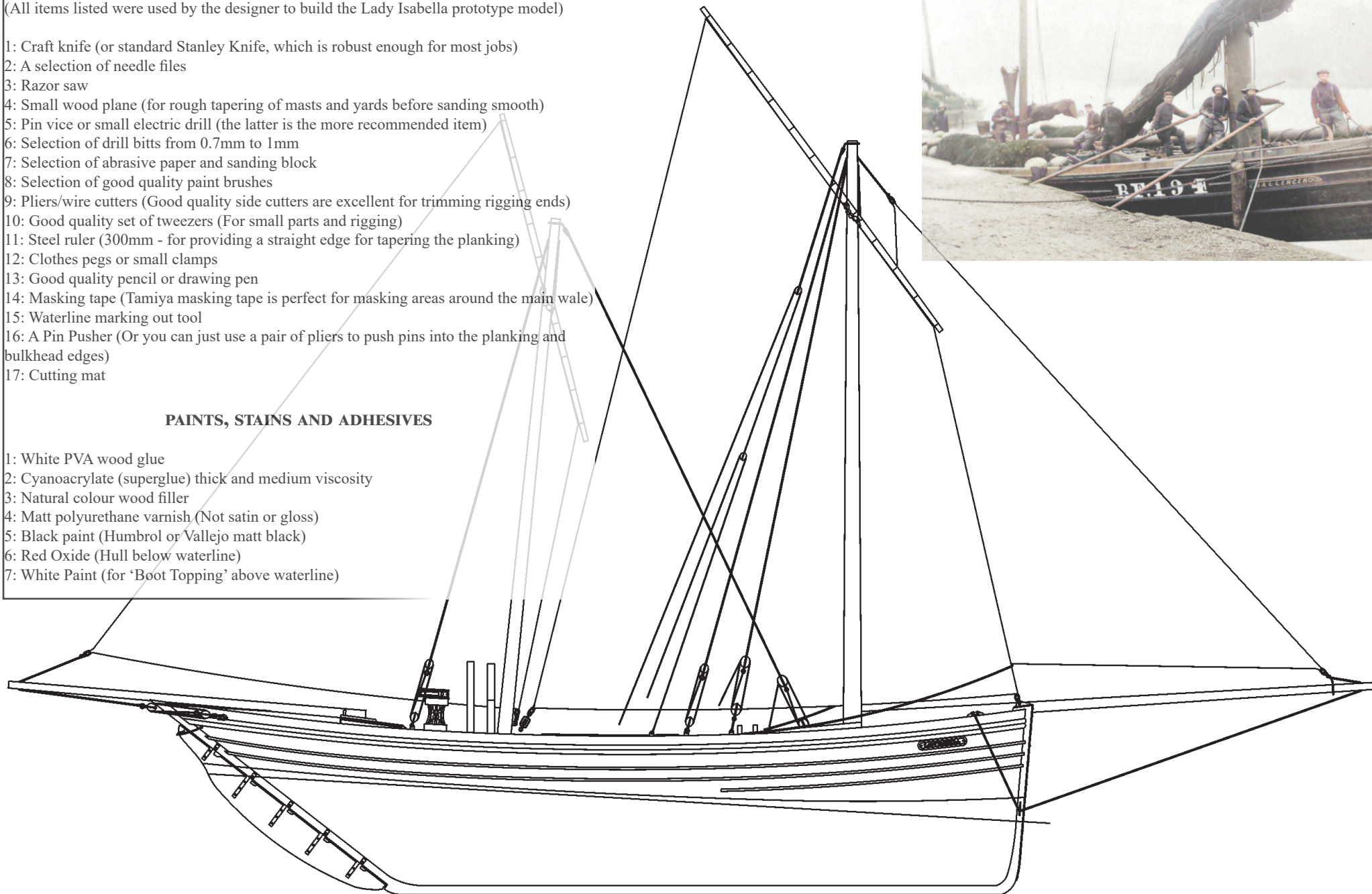
## RECOMMENDED TOOL LIST

(All items listed were used by the designer to build the Lady Isabella 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: Small wood plane (for rough tapering of masts and yards before sanding smooth)
- 5: Pin vice or small electric drill (the latter is the more recommended item)
- 6: Selection of drill bits from 0.7mm to 1mm
- 7: Selection of abrasive paper and sanding block
- 8: Selection of good quality paint brushes
- 9: Pliers/wire cutters (Good quality side cutters are excellent for trimming rigging ends)
- 10: Good quality set of tweezers (For small parts and rigging)
- 11: Steel ruler (300mm - for providing a straight edge for tapering the planking)
- 12: Clothes pegs or small clamps
- 13: Good quality pencil or drawing pen
- 14: Masking tape (Tamiya masking tape is perfect for masking areas around the main wale)
- 15: Waterline marking out tool
- 16: A Pin Pusher (Or you can just use a pair of pliers to push pins into the planking and bulkhead edges)
- 17: Cutting mat

## PAINTS, STAINS AND ADHESIVES

- 1: White PVA wood glue
- 2: Cyanoacrylate (superglue) thick and medium viscosity
- 3: Natural colour wood filler
- 4: Matt polyurethane varnish (Not satin or gloss)
- 5: Black paint (Humbrol or Vallejo matt black)
- 6: Red Oxide (Hull below waterline)
- 7: White Paint (for 'Boot Topping' above waterline)

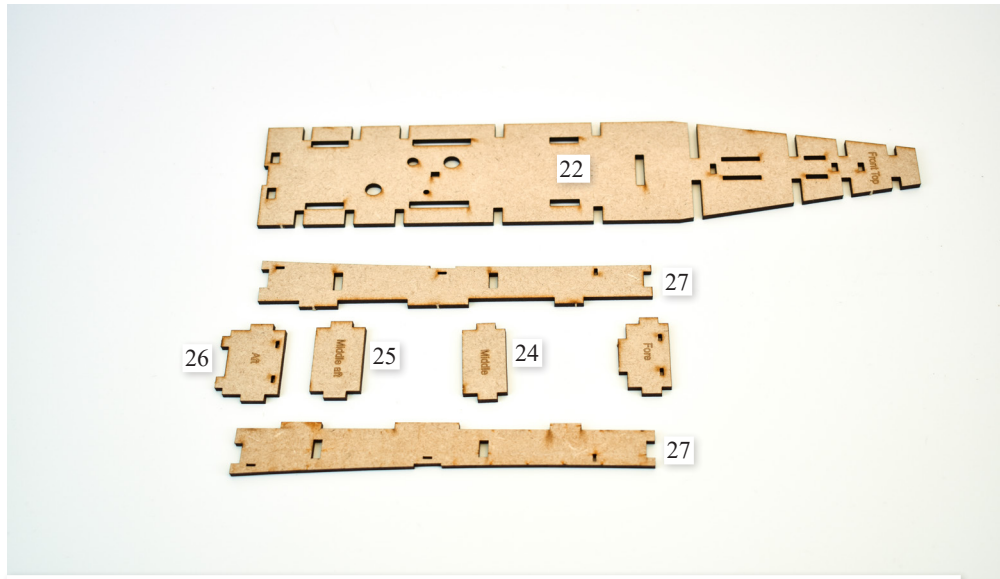




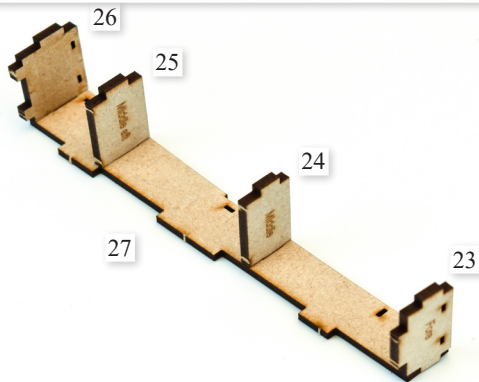




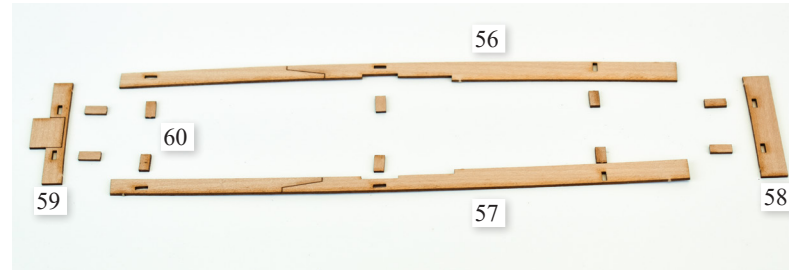
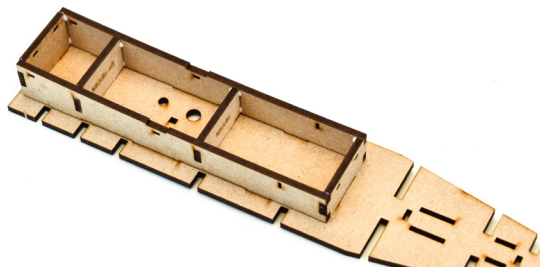
## HULL CONSTRUCTION



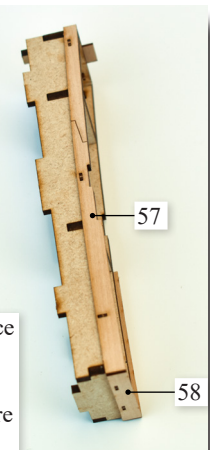
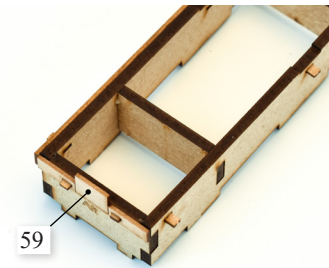
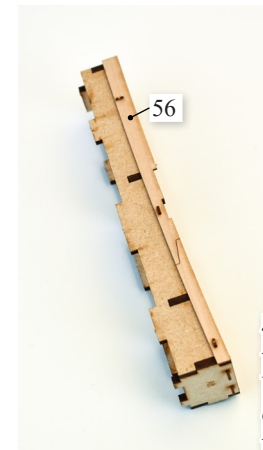
1 - To ensure the superstructure assembly will fit perfectly into the slots in the lower deck pattern (22), slot and glue the superstructure parts together (Parts 23-27)



2 - Slot and glue the 4 parts (23-26) into their corresponding slots in the superstructure side (27), and then slot and glue the other side in place and place the assembly into its position, slotted into the lower deck pattern. Once the glue has cured, removed the pattern from the lower deck.



3 - The outer panels of the superstructure can be added at this point. Add the 10 locating pegs (60) by slotting them into the superstructure and then slot and glue the 1mm panels (56-59) in place. Parts 60 will ensure the panels are perfectly located, just make sure the panels are pushed completely flush with the 3mm superstructure sides. Once fitted, trim off any excess showing from the locating pegs and sand smooth.

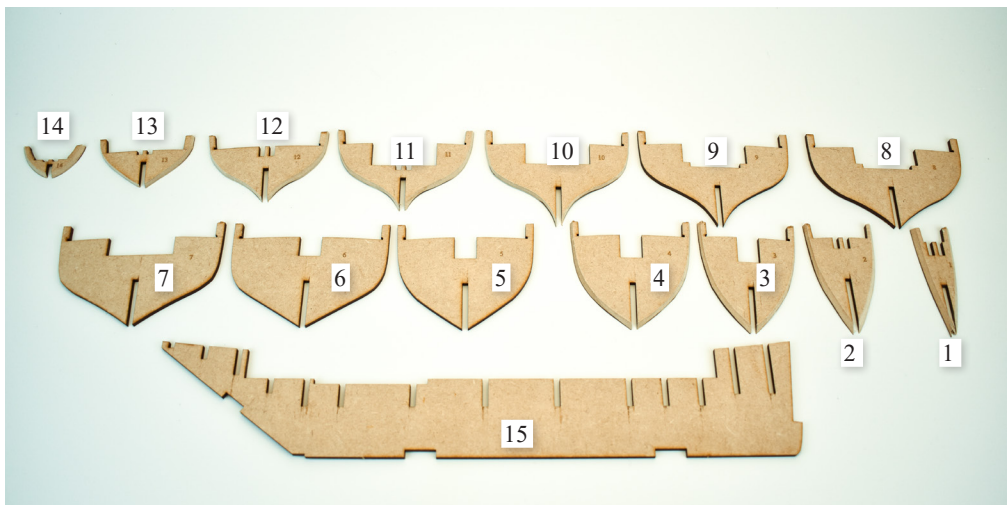


4 - The superstructure deck (61) can be added once the sides are complete. Use PVA wood glue and tape or clamp the centre of the deck down until the glue has cured to ensure the curved is retained.

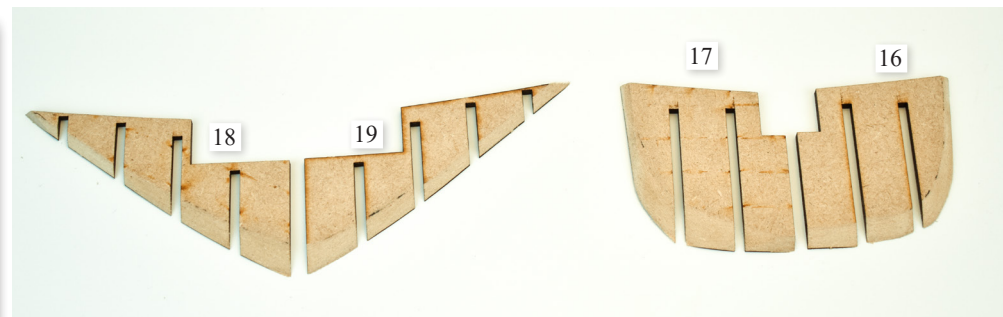
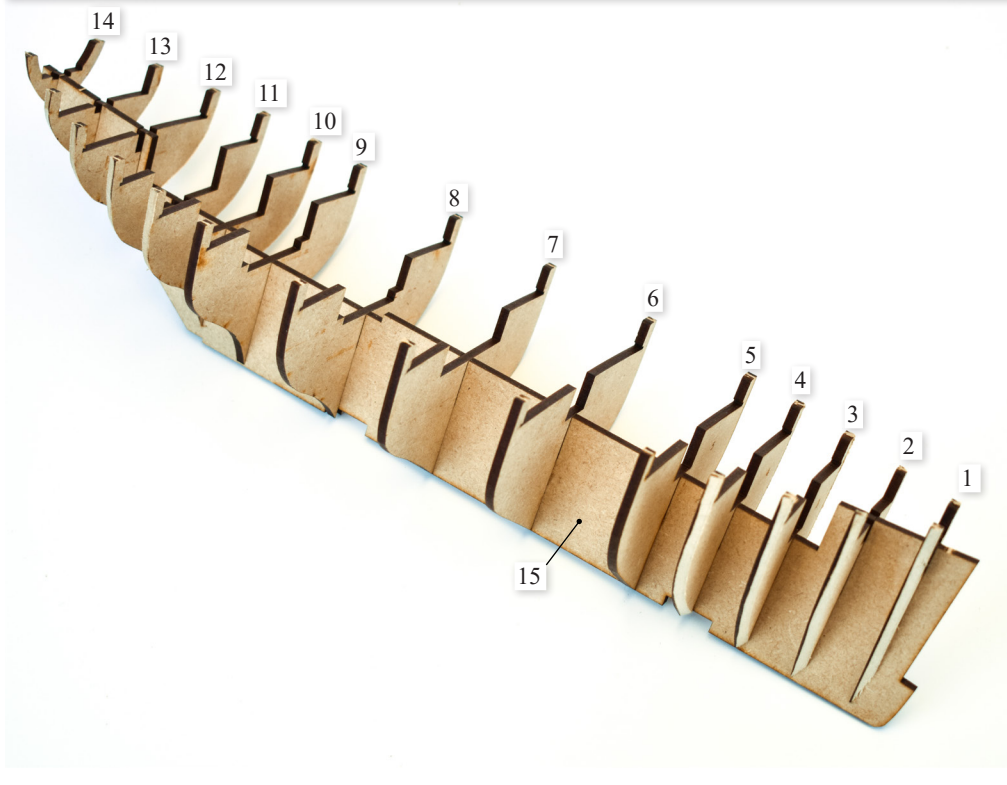
Now that the assembly is made and we know it fits perfectly into the slots on the lower deck, the structure can be put aside (in a safe place) until required at a later stage of the construction.







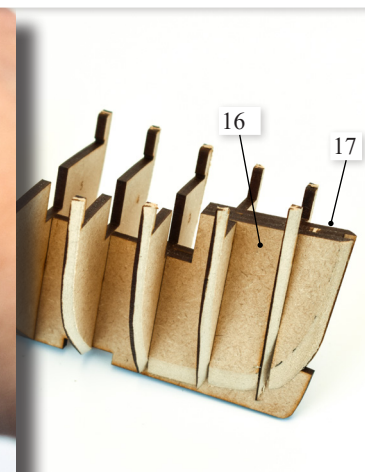
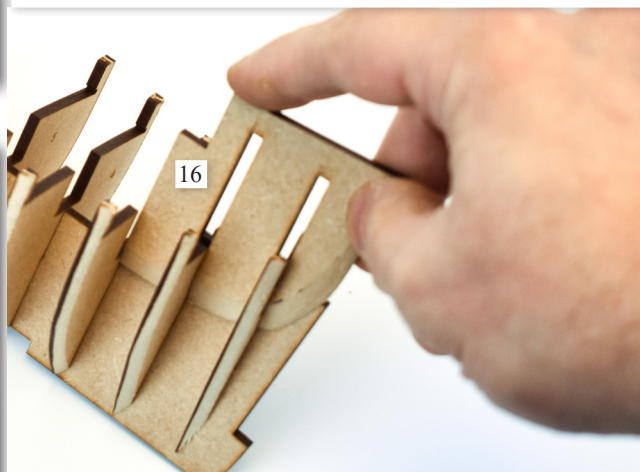
5 - Remove the bulkheads (91-14) from the 3mm MDF sheet, along with the keel (15). The front and rear bulkheads have an etched bevel line. You can rough bevel the edges of these bulkheads before slotting and gluing in place, meaning you do not have to bevel as much later.

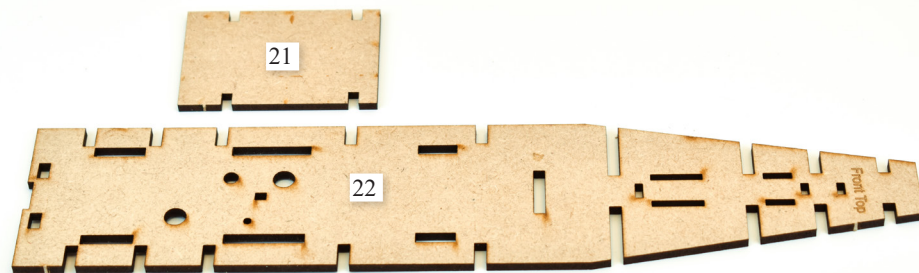


6 - Remove the fore filling patterns (16 & 17) and aft filling patterns (18 & 19) and bevel the edges to the marked bevel line as shown above.

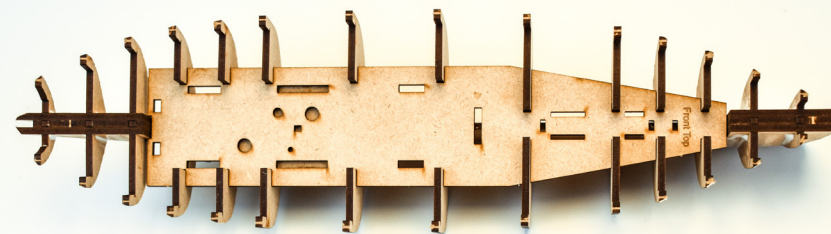
Slot and glue the fore patterns (16 & 17) in place as shown, followed by the stern patterns (18 & 19).

Try not to glue areas of the patterns that are exposed, as the laser cut wooden stem and stern post are to be slotted in between the patterns.





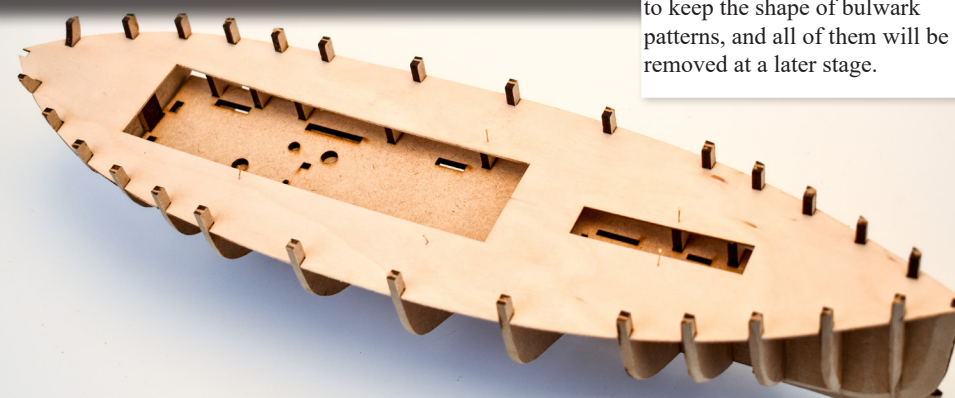
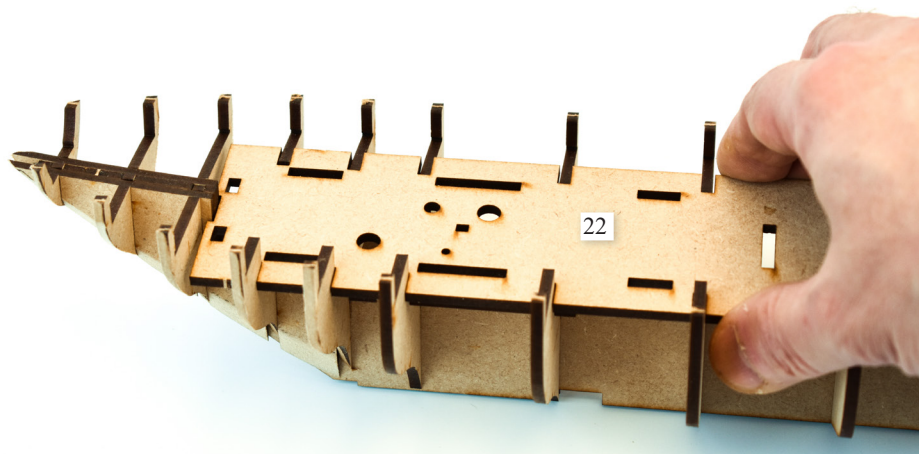
7 - Slot and glue the 'Lower Floor' (21) into position in-between bulkheads 8 & 9. This is for the base of the aft mast and other fittings.  
When part 21 is in place, slot and glue the 'Upper Floor' (22) in place, making sure that it sits flush on the top edges of the bulkheads



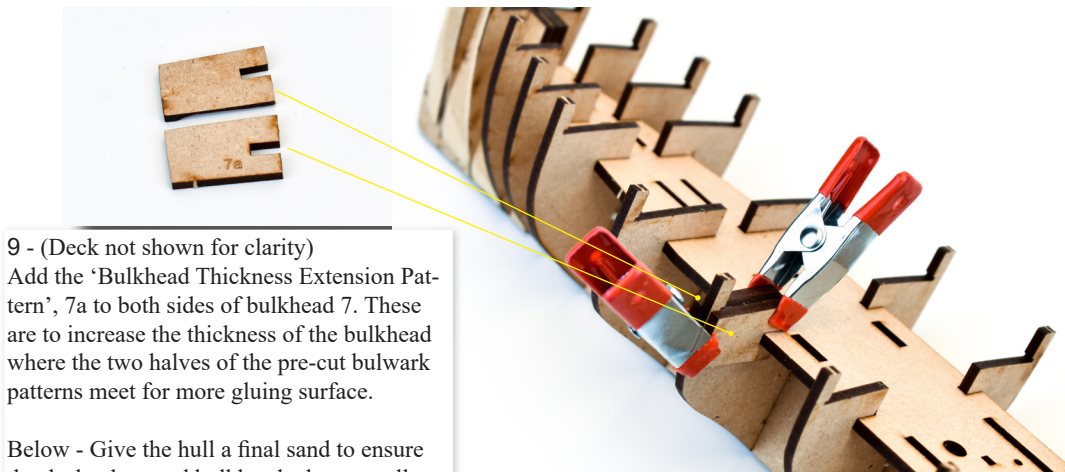
8 - Once the 'Upper Floor' is securely in place, the main sub deck (33FD) can be slotted and glued in place. There is no need for pins at the deck edges, as the deck slots under the bulkhead tabs, but a couple of pins may be required for the centre of the deck.



Do not be afraid to bend the 0.8mm deck, as it is very flexible. Use PVA wood glue to secure the deck permanently, with a few pins to secure the deck around the openings until the glue has cured.  
If you do inadvertently lose a bulkhead tab, do not worry too much, as there are still plenty to keep the shape of bulwark patterns, and all of them will be removed at a later stage.

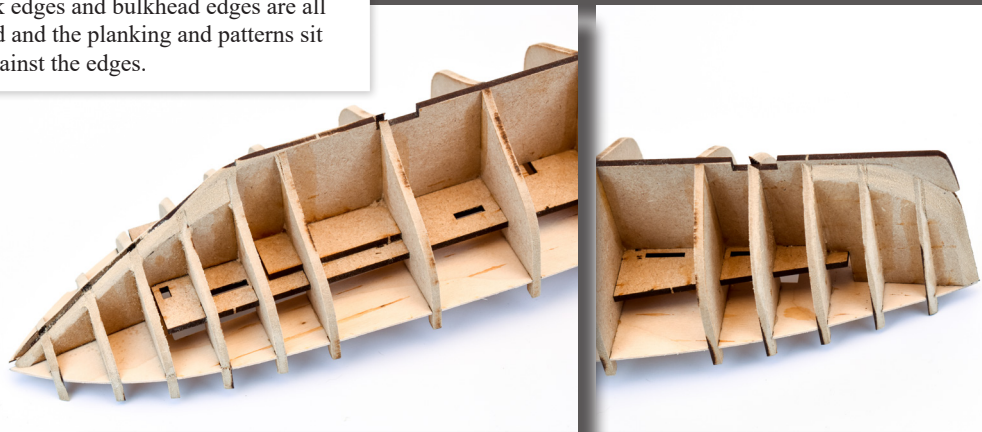




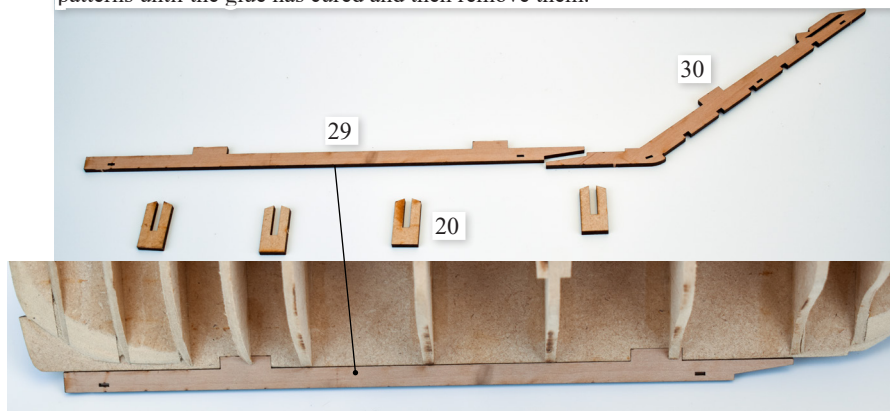


9 - (Deck not shown for clarity)  
Add the 'Bulkhead Thickness Extension Pattern', 7a to both sides of bulkhead 7. These are to increase the thickness of the bulkhead where the two halves of the pre-cut bulwark patterns meet for more gluing surface.

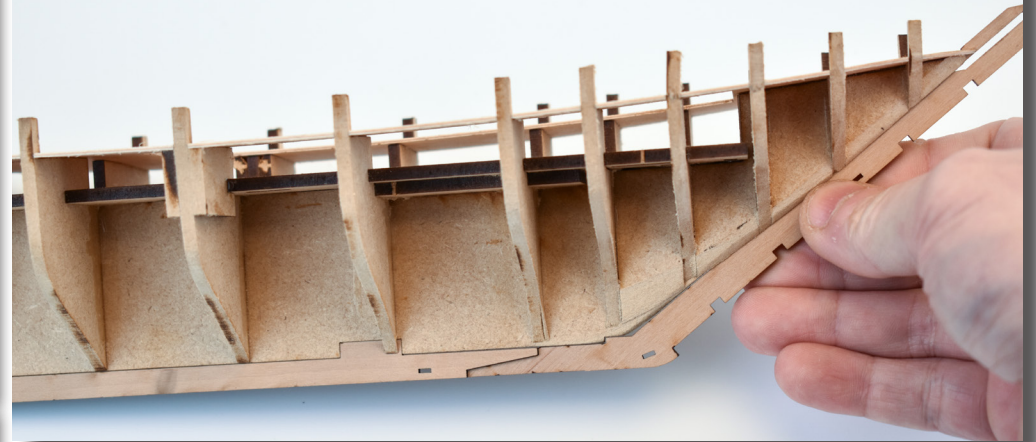
Below - Give the hull a final sand to ensure the deck edges and bulkhead edges are all bevelled and the planking and patterns sit flush against the edges.



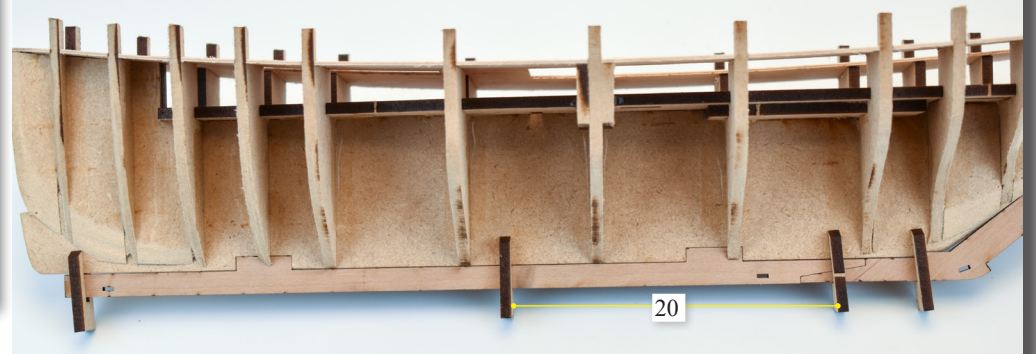
10 - Remove the keel (29), rudder post (30) and the keel alignment patterns (20). Slot and glue part 29 in place first, followed by part 30, and then add the alignment patterns until the glue has cured and then remove them.



Rudder post (30) shown being slotted and glued into place.



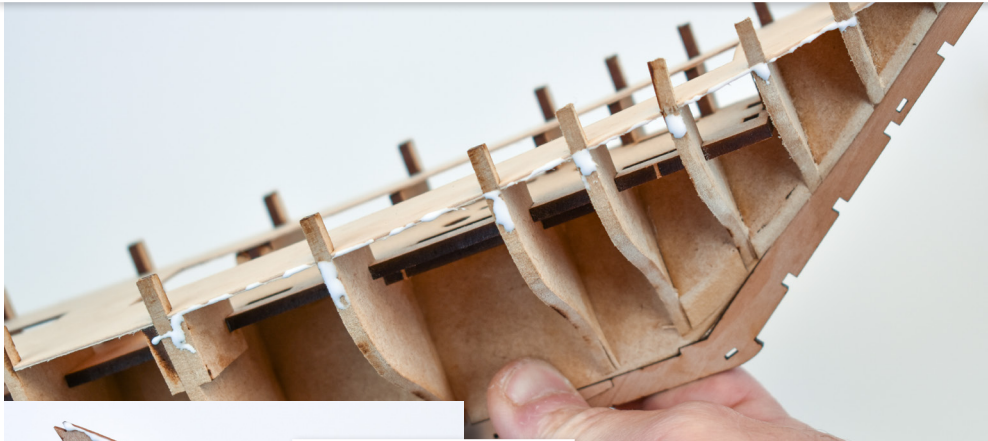
Parts 20 temporarily added until the glue has cured



11 - The first planking is almost ready to be added. Before this, the pre-cut bulwark patterns (39-42) need fitting in place. It is advisable to first soak the patterns in water for half an hour or so, and then dry fit into position and clamp in place until the patterns are dry. They will retain most of the curve when removed, ready for gluing in place.



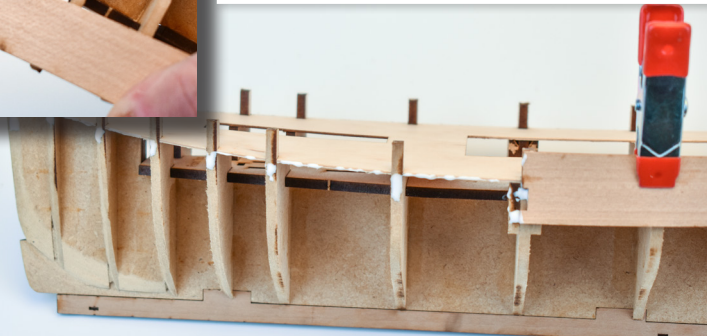
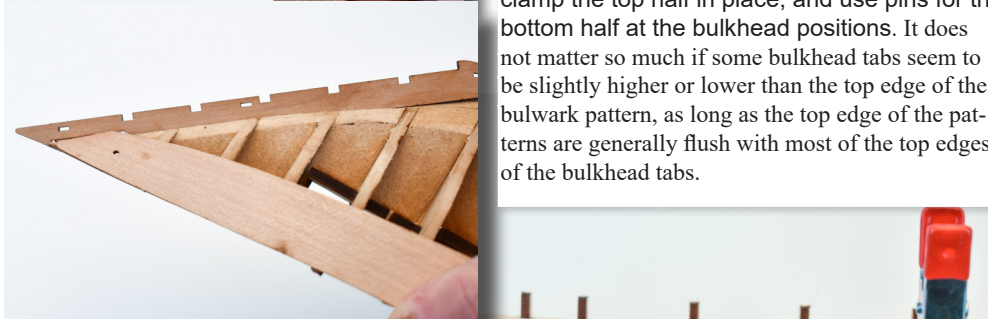
When gluing the bulwark patterns in place, **DO NOT** add glue to the tabs above deck level, as the inner bulwark patterns with etched lines is the final inner finish. Start at the stern by slotting the ends of parts 40 (Rear left) and 42 (Rear right) into the slot at the top of the rudder post to help anchor the bulwark patterns in place.



Apply a small amount of glue to the edge of the rear bulwark patterns and then slot into place in the rudder post



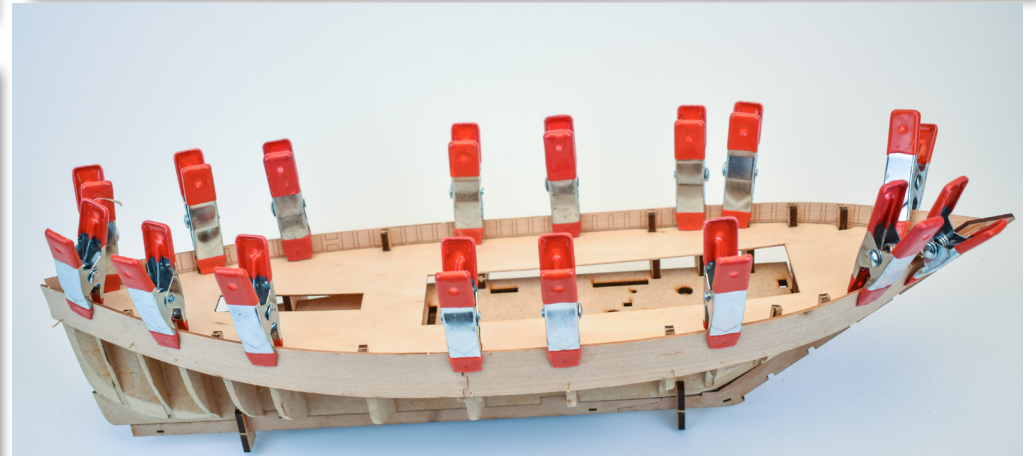
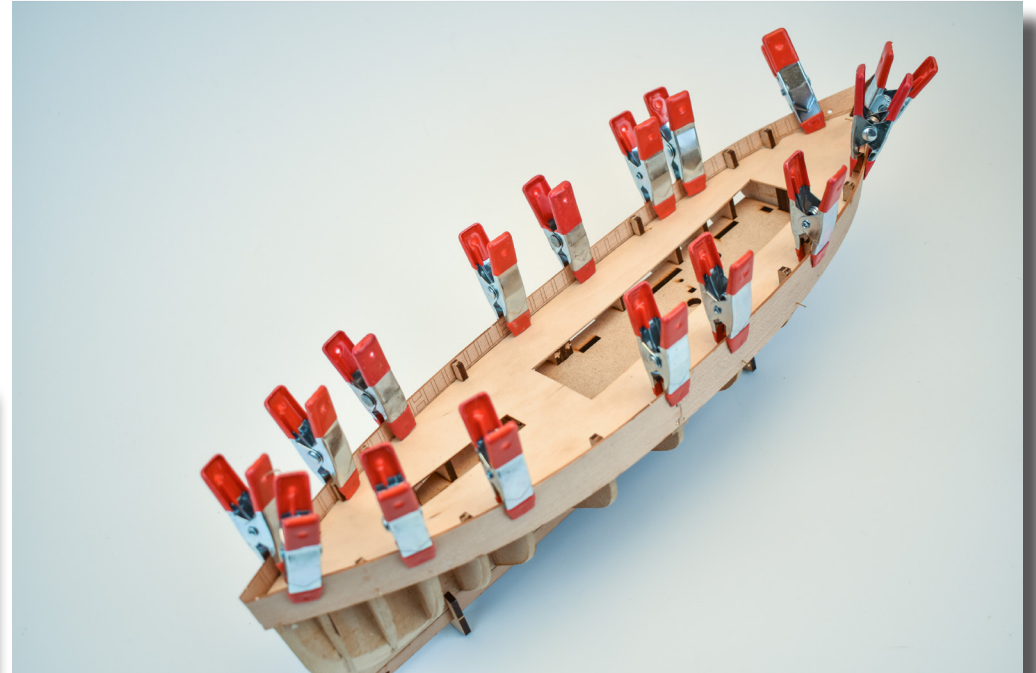
Bend the pattern around the bulkheads and clamp the top half in place, and use pins for the bottom half at the bulkhead positions. It does not matter so much if some bulkhead tabs seem to be slightly higher or lower than the top edge of the bulwark pattern, as long as the top edge of the patterns are generally flush with most of the top edges of the bulkhead tabs.



Bulwark patterns clamped, glued and pinned in place.

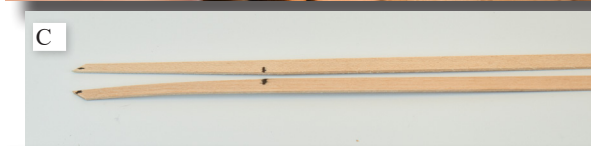
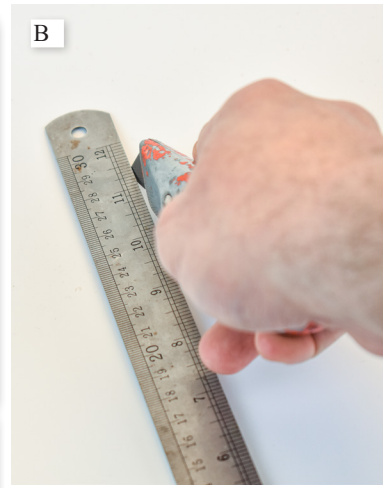
The front will be a little longer than required (as no two builds will ever be the same and there will be slight variations in how much the bevelling of the bulkheads was done), so this will need to be trimmed down when the glue has cured.

Once cured, remove all clamps and any pins used, ready for the first planking, which is done using 1x5mm limewood strip.

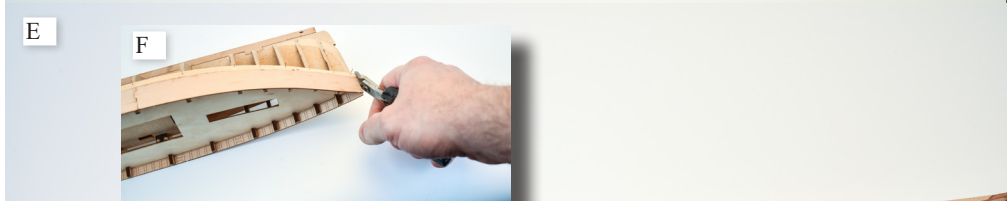




## 12 - First Planking



- A - Marking the taper starting point onto the 1.5mm lime wood strip.
- B - Cutting the taper using a steel rule and only Stanley Knife.
- C - The stern planking tapered.
- D - The first plank per side tapered at both ends, ready to be fixing in place.
- E - The first plank pinned and glued in place at both sides.
- F - The excess plank can be cut off once in place using a pair of side cutters.



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 bulwark pattern as shown.

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 as well as edge to edge.

The first couple of planks each side should be relatively straight forward to apply as only mild tapering is required. As you start down and along to the curved side of the bow and stern, the planks will need to be tapered to follow the natural run of the planks.

To determine the amount of taper needed for each plank to lie naturally, lay a plank at the second or third bulkhead and then lay it around the stern (Usually, this applied to the bow first, but with the shape of the Zulu hull, planking starts at the stern). Mark the excess area of plank that overlaps the one directly above it. Repeat this technique for the bow also.

Although some planks may not require tapering, 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 half an hour or so 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 wet 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. The planks can be soaked in water for 10 minutes or so to make them more pliable when bending around the curves of the hull. Pin and glue the tapered planks into position on the hull, starting at the stern, leaving a little excess at the bow which can be trimmed to shape once the plank is fixed in place. Glue one or two strips each side alternately. This method should prevent any possible twisting/warping of the frames and keel as the glue cures.

Use this planking technique right down to the pre-cut planking at the keel. When planking is almost complete, triangular shaped gaps at the stern will be apparent. This was also the case in full size practise, although not so simplified. The use of triangular shaped planks is needed for the gap in-between the top and bottom edges of the planks, usually near the stern. The correct name for these triangular shaped planks is called stealers. Cut these to shape using the excess lime wood from the ends of the planking and glue them into the gaps. Trim off the excess bow planks to shape and leave the hull for the glue to fully cure for at least 24 hours

Sand the whole hull that has been planked with a coarse grade abrasive paper, followed by medium grade, being careful not to damage the laser cut wood keel and stern post. 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.



Planking progress continued. Do not wet the planks too much because if they are too soaked with water, as the planks lose the water content, they shrink, which will leave large gaps in between each plank.



First planking progression. Take your time and try to not leave too large a gap, if any, between each plank. Pay careful attention to the planking at the stern, as the angle of the end of the planks is quite severe due to the rake of the stern. In some areas the planks may look as though they are 'clinker' planks (especially near the stern area), but do not worry, this is normal and will be sanded smooth once first planking is complete.



This slight overlap appearance is normal and will be sanded out when planking is complete.

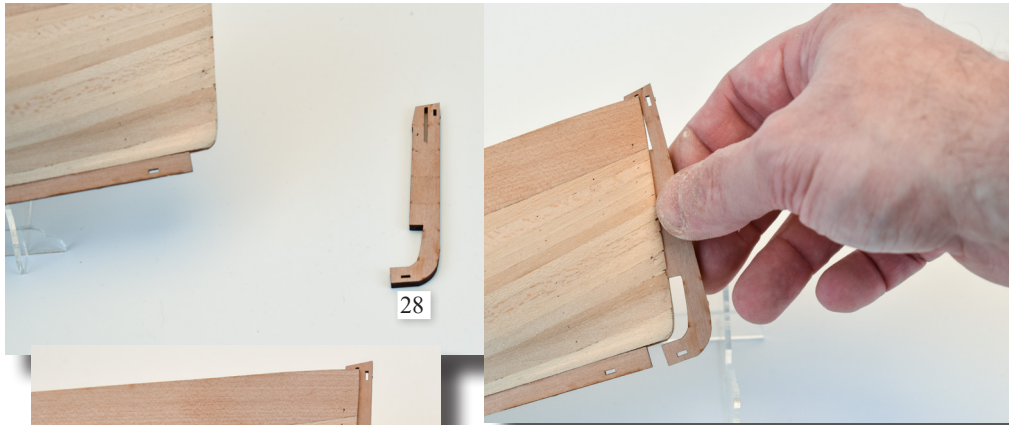


The first planking is now complete. Once the glue has set fully, the pins should be removed. Take care to remove all pins, as any left in place may cause injury when sanding the hull smooth



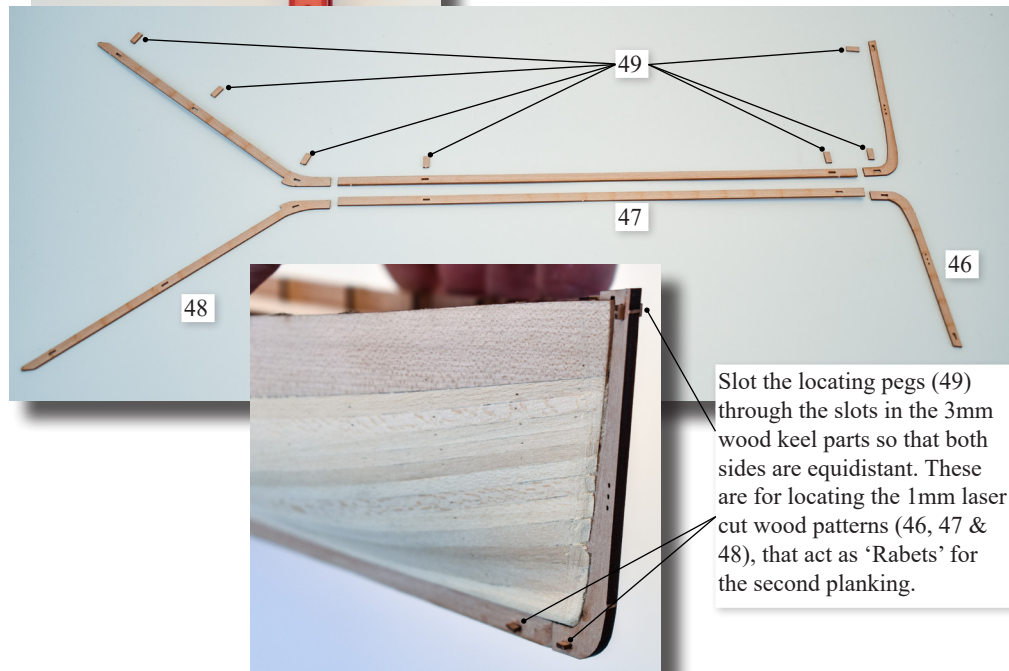
The first planking is now sanded. A small sanding mouse was used initially with 80 grit abrasive paper, followed by sanding by hand using 120 grit abrasive paper. Make sure there is enough of a gap (3mm) at the prow (Bottom photo) for the 3mm laser cut wood prow pattern to slot into. This will be the next stage.





28

13 - The prow (28) can now be slotted and glued into place. Try the fit first, to check that the part pushes all the way in and the bottom edge butts up the keel end. When you are happy that it fits as it should, glue in place.

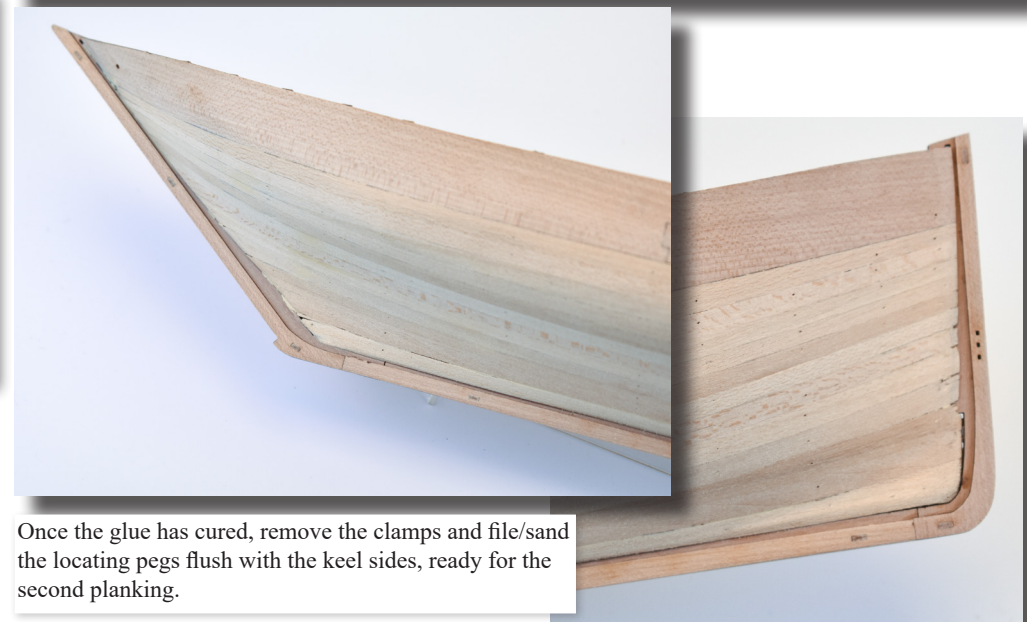
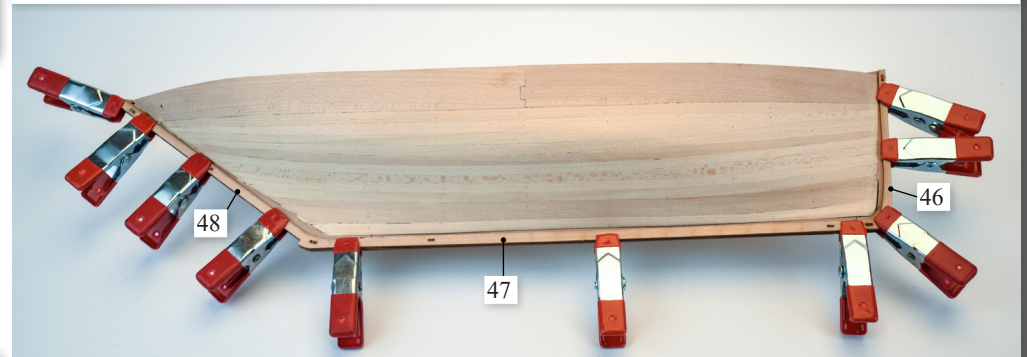


Slot the locating pegs (49) through the slots in the 3mm wood keel parts so that both sides are equidistant. These are for locating the 1mm laser cut wood patterns (46, 47 & 48), that act as 'Rabets' for the second planking.



Above - parts 49 pushed into place through the slots in the wood keel parts.

Below - parts 46, 47 & 48 slotted and glued in place, Clamps are also used to ensure all parts are flush with the 3mm wood keel parts.

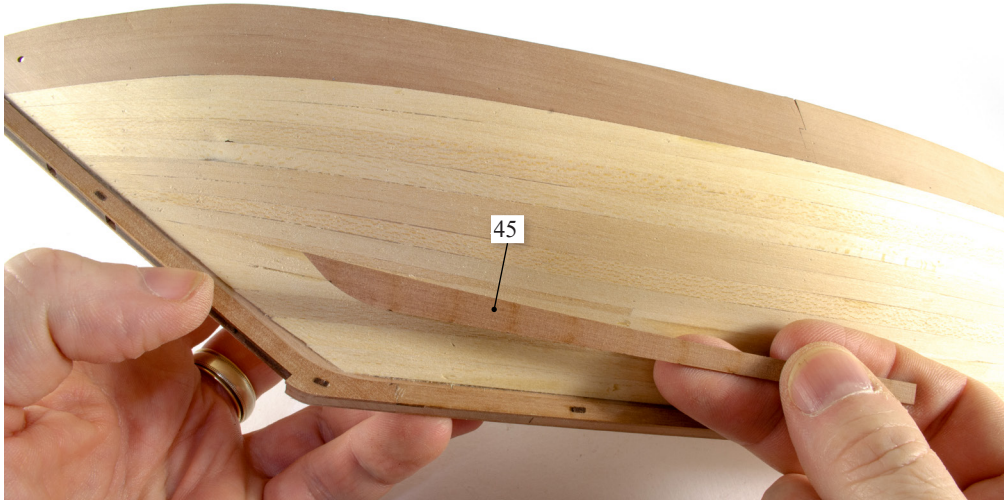


Once the glue has cured, remove the clamps and file/sand the locating pegs flush with the keel sides, ready for the second planking.



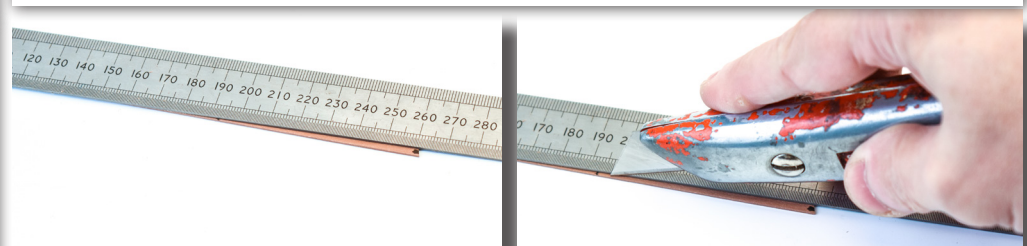
#### 14 - Second Planking

Start the second planking by first laying the pre-cut lower plank patterns (44 front and 45 rear). The patterns should be laid flush against the 1mm rabbet keel parts (46, 47 & 48) on both sides of the lower hull. Cyano thick viscosity or gel can be used to fix them in place, but dry fit first to ensure the fit is correct.

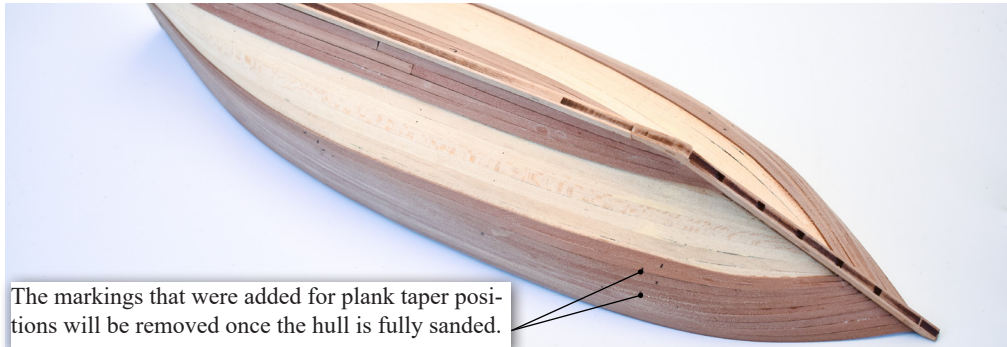


#### 14 - Second Planking

The second planking is applied using 1mm x 4mm wood strip. Start planking at the main wale position markings, which are shown on the gun port patterns and work down towards and up to the keel. 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.







The markings that were added for plank taper positions will be removed once the hull is fully sanded.

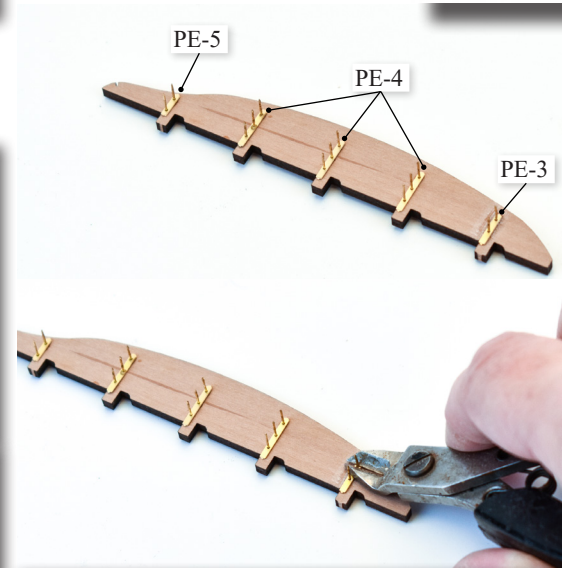
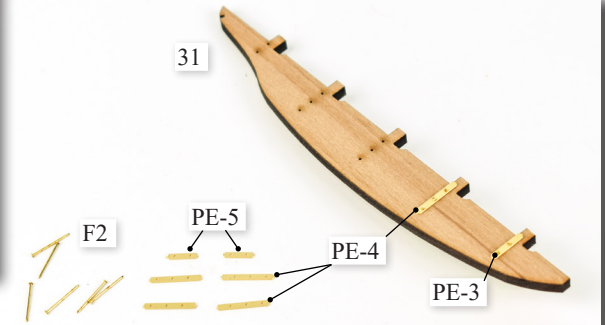
Take your time and take care to attain a very neat finish to minimise the need for filling. If slight filling is required, it is recommended that you use a water based filler that is a good match for the colour of the second planking. Water based filler is recommended because it can be thinned down using water, which helps the filler enter even the smallest gaps.



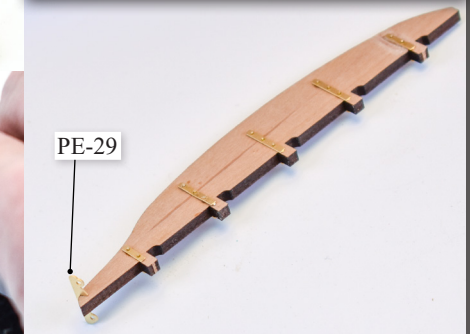
When planking is complete, sand smooth and fill and sand again until all gaps are filled.



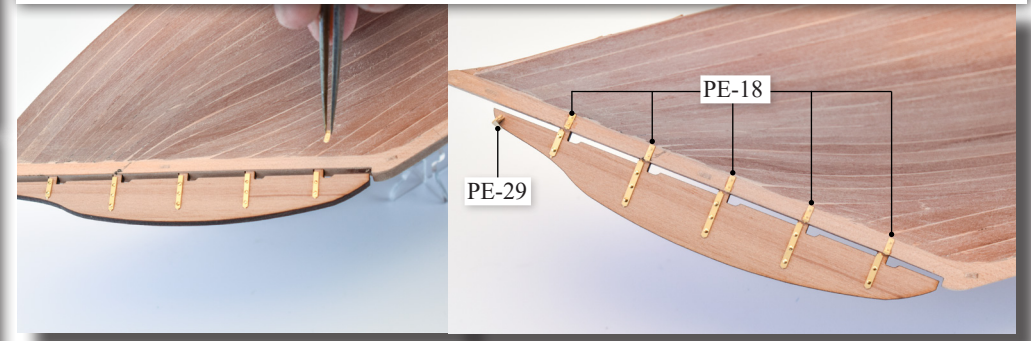
15- Remove the rudder (31) and the rudder straps (PE-3, 4 & 5). The rudder straps are to be pinned and glued using the small brass pins (F2) into their positions on the rudder. The holes for the strap positions are pre-cut. Once all hinges are pinned into position, snip off the ends of the pins using side cutters.



Alternatively, if you would like the domed pin heads to be visible on both sides, pre-cut the pins to no more than 1.5mm lengths and glue into the holes at either side of the rudder. Finally, slot and glue the tiller arm (PE-29) into its slot at the top of the rudder

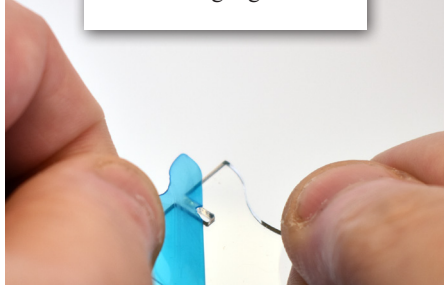


Below - Once the straps have been fixed to the rudder, slot the rudder in place so that the rudder tabs slot into the holes in the end of the rudder post. Glue the straps (PE-18) to each side of the rudder post so that the top edge of each strap is immediately below the bottom edges of the straps on the rudder, as shown below.

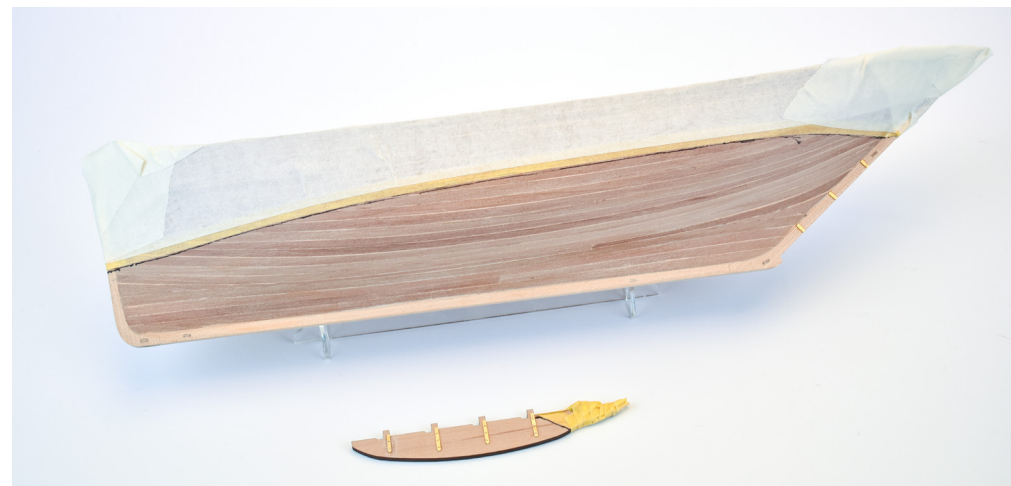
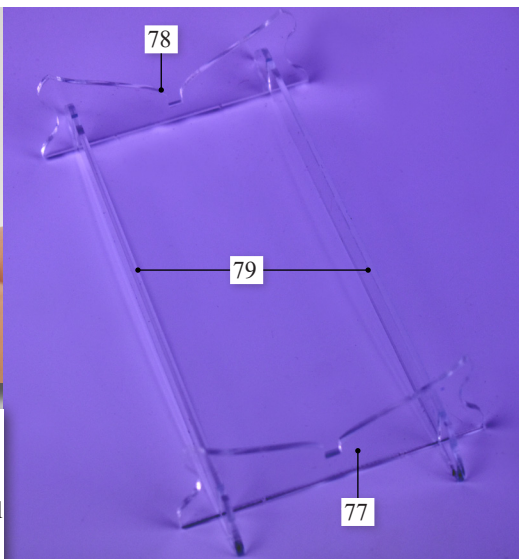




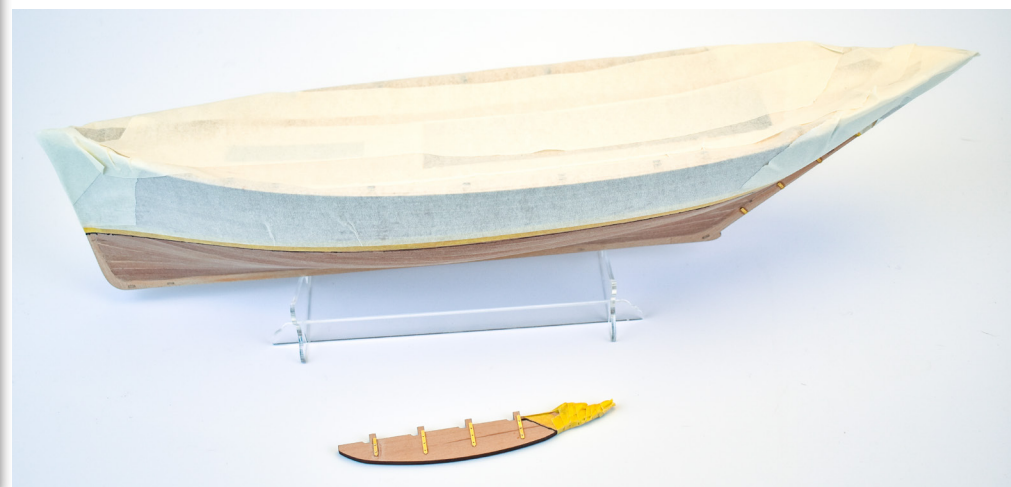
Peel off the protective film on the clear acetate parts before slotting together.

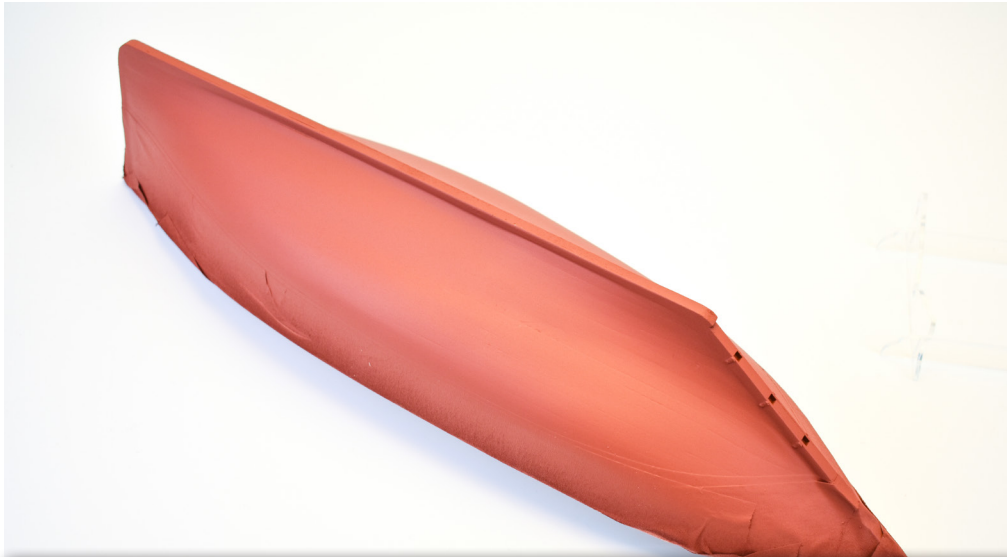


16 - Slot the stand parts together (77, 78 & 79) and rest the hull onto the stand, ready for marking the waterline. The keel angle's downwards towards the stern. Using the full size profile drawings, mark onto the prow and rudder post the waterline positions and then carefully mark out the waterline as shown. An Amati Waterline Marker was used for the job, which is shown in the picture.



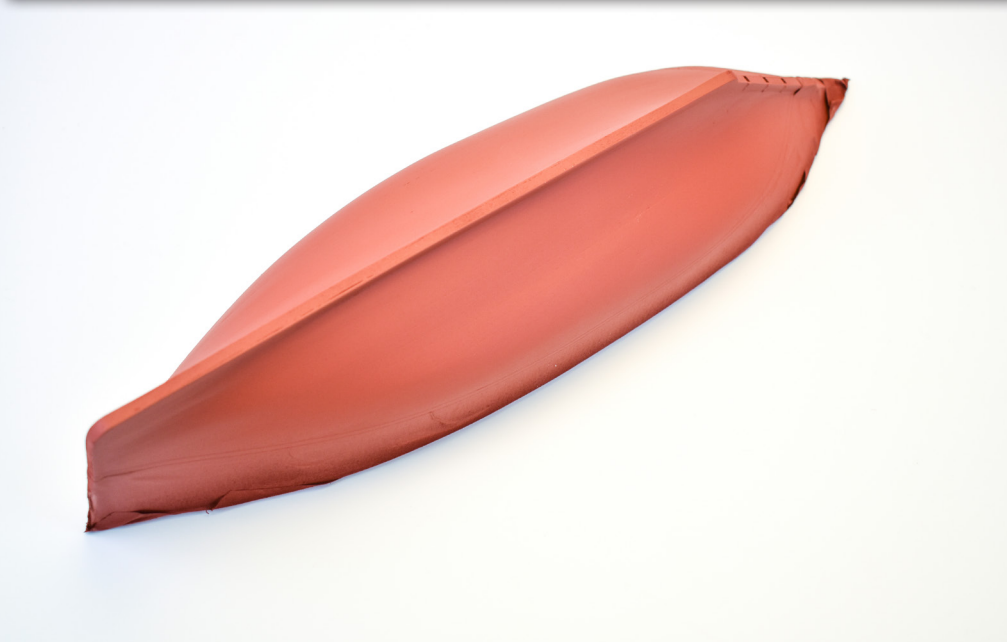
17 - Once the waterline level has been marked onto the hull, mask off all areas above the waterline level. Tamiya masking tape was used for the waterline, followed by standard masking tape for the rest of the hull. The hull below waterline colour is red oxide, and it was a standard spray can of red oxide primer that was used for the prototype model. Because the prototype model was sprayed, the whole of the hull not being sprayed was masked. If you plan to brush paint the hull, less masking would be required. The rudder should be painted at the same time, and masked as shown.





The hull sprayed with red oxide. Five coats were applied, with sanding and filling with diluted wood filler in between each new coat of paint. The first couple of coats show all of the areas in between the planking very well. Do not worry, this is normal, and is the reason for so many coats and sanding and filing. The rudder is removed and sprayed/painted separately.

How much care and attention you take at this stage will reflect in the overall finish of the completed model, so please take your time, and if you feel you need more coats of paint, then add more coats.



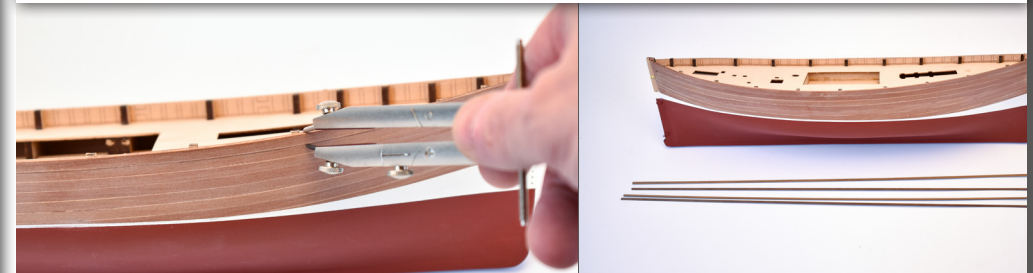
Once the bottom of the hull has been painted, mask off the hull from the waterline down, and mark out, using the full size profile plans, the white 'Boot Topping'. It does not have to follow the drawings exact, as long as both sides are the same. Once the top curve is marked out, mask off the area above this. If you are going to spray the area white, then everything apart from the spraying area needs to be thoroughly masked off. As with the red paint, add as many coats as is necessary to eliminate any slight gaps in between the planking.



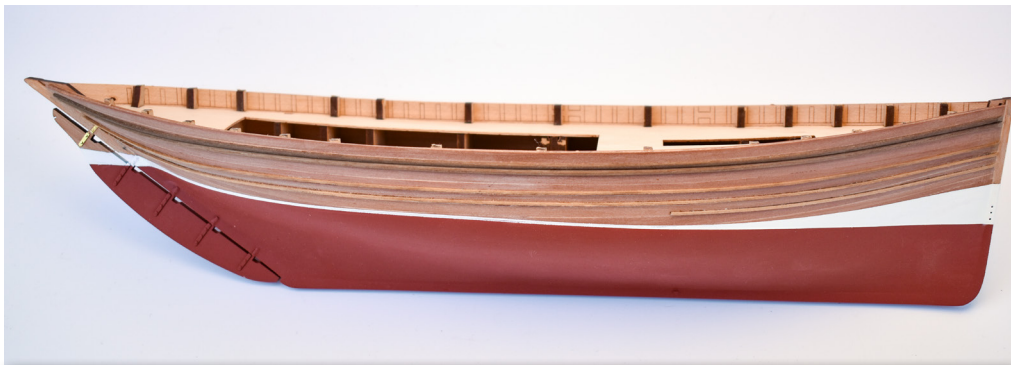
18 - Once the hull has been painted, the 'Rubbing Strakes' can now be added.

Use the hull profile plans for correct positioning. The Rubbing Strake nearest the top is made up from 2mm half round dowel, positioned edge to edge. The top edge of the dowel should be 4mm from the top edge of the bulwarks. You can use a compass (as below) to mark the line. Soak the half round dowel in warm water to help manipulate the curves, and glue in place using thick cyano gel or similar. You can use PVA wood glue, but the strips will require pinning in place until the glue has cured.

The lower two strakes are 1x1mm wood strip and are laid the full length of the hull, with the one below the lower edge of half round strake being about 5.5mm down, and the lowest full length 1x1mm strake being about 4mm below the bottom edge of the upper 1x1mm strake. There is one more strake at the lowest level, which does not go to the end of the hull, and is about 140mm long from the bow to the end. Cyano gel is the best glue to use to fix the 1x1 strip in place, but make sure their positions are properly marked onto the hull before committing to gluing them in place.



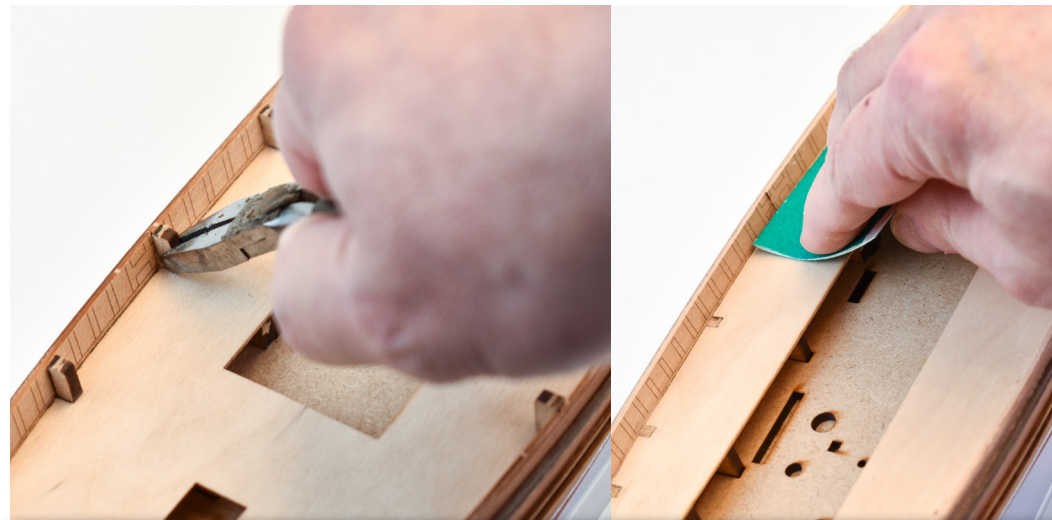




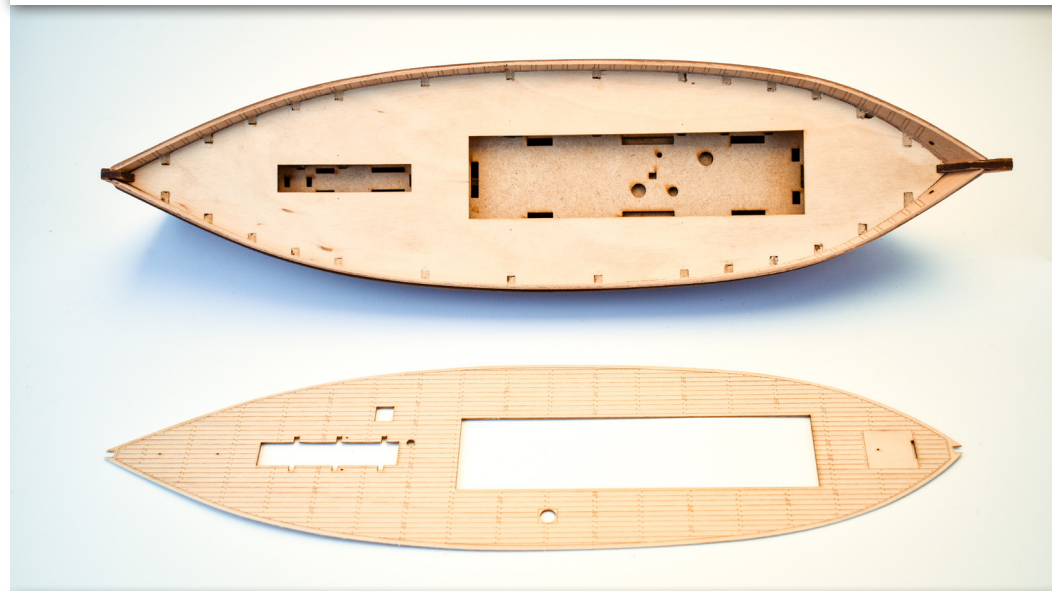
Above and below - The rubbing strakes added, and then the rudder glued into place. If there are glue marks showing, now is the time to sand them off, or use a needle file against the strakes to file any unwanted glue away.



Below - The hull has been brush varnished with a clear matt polyurethane varnish. Alternatively, the hull can be painted black, as was the norm for this type of vessel, with a different colour added above the highest rubbing strake. There were no two vessels painted the same. Once the deck and other fittings have been added, the whole model can be spray varnished to give the whole hull an 'egg shell-like' finish.

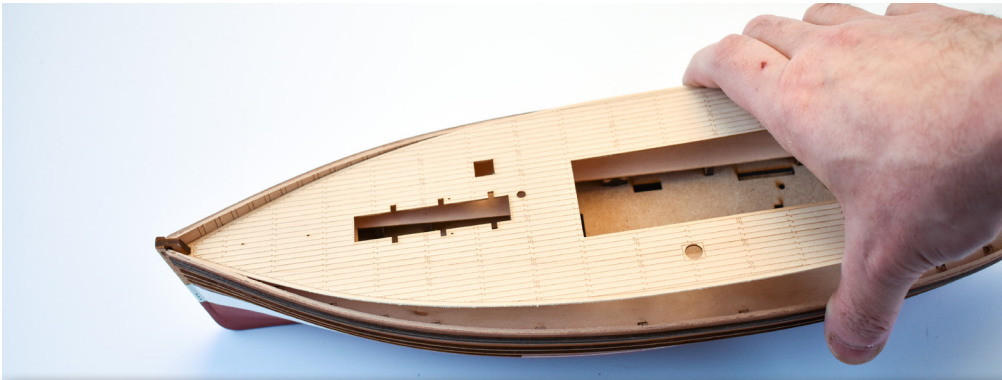


19 - Carefully remove the exposed bulkhead tabs by twisting them off with a small pair of pliers or cutting them off with a razor saw. Sand the remaining stumps that may protrude above deck level, so that the edge of the deck is flush, ready for the laser engraved deck that sits on top.



20 - Dry fit the deck (128) before committing to glue. Sand any edges that may not fit perfectly. Once the deck fits as it should, use PVA wood glue to fix the deck in place, plus a few brass pins along the near edges to ensure the deck sits flush with the false deck.

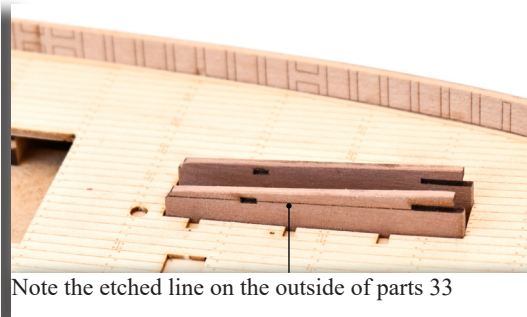
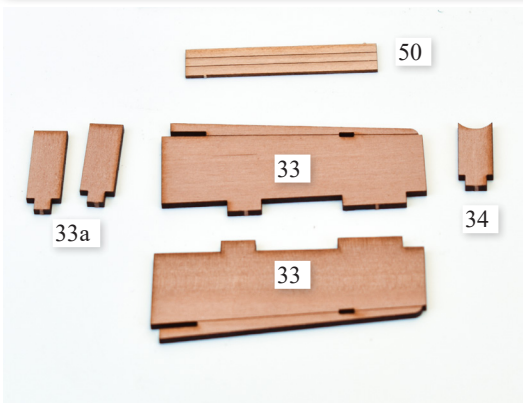




Above - Checking the deck for fit, and sanding any edges that need attention.  
Below - Deck finally in place using PVA wood glue and a few brass pins to keep in place until the glue has cured.



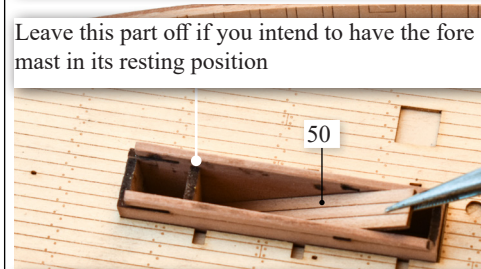
21 - Below - Remove the parts that make up the fore mast housing. Take note, parts 33 are handed, and the laser engraved line should be on the outside face of each pattern. Slot and glue parts 33 into position in the fore deck and into the slots located in the lower platform.



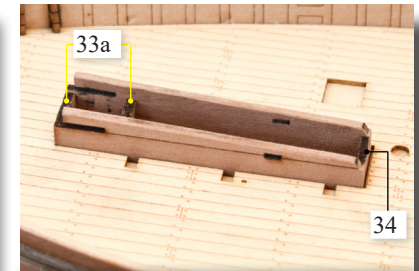
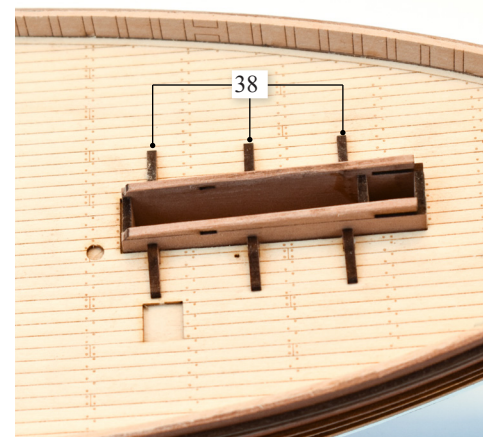
Note the etched line on the outside of parts 33



Above - Slot and glue part number 34 into the rear of the fore mast structure.



Leave this part off if you intend to have the fore mast in its resting position.  
Glue the floor planking in place once parts 33a & 34 are fitted in place.



Above - Add part numbers 33a. These secure the fore mast in place. If you plan to not rig sails, or have the fore mast in its resting position, do not add the inner 33a, as this part secures the mast in its upright position

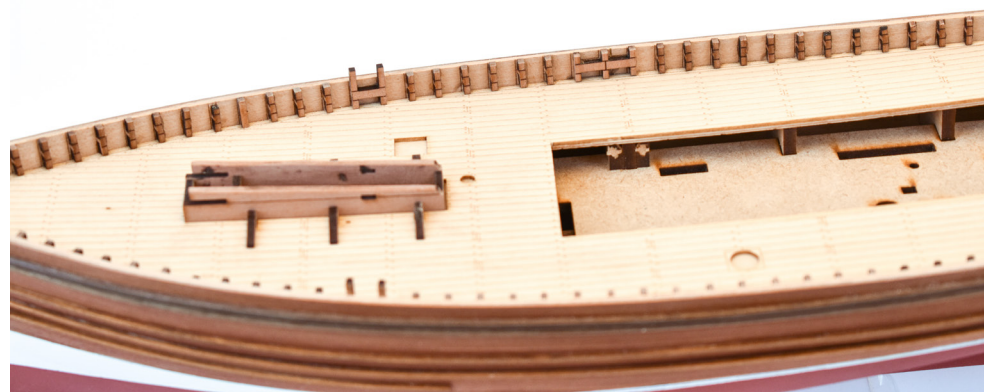


Above - Add part numbers 39, the Fore Mast Opening Side Cheeks. Slot and glue into place as shown above and left.  
Below - Slot and glue the cleats (71) in place on the outside all of the fore mast housing sides.

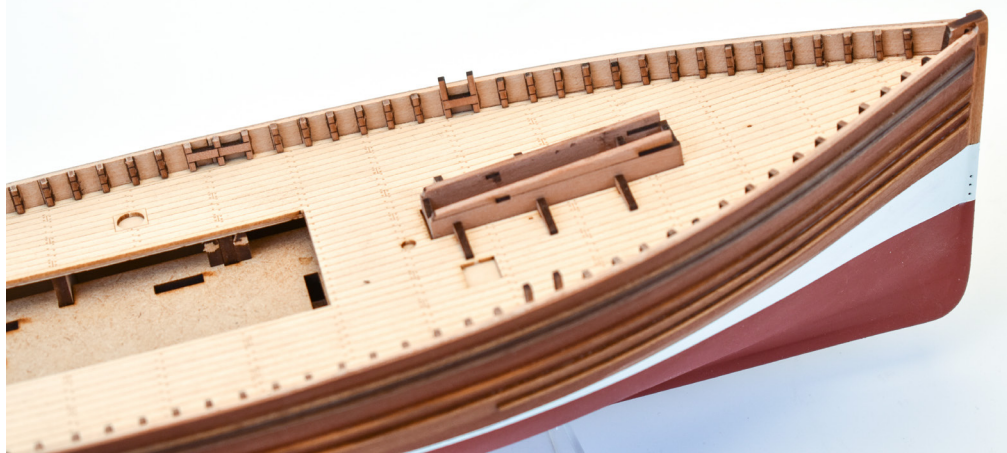




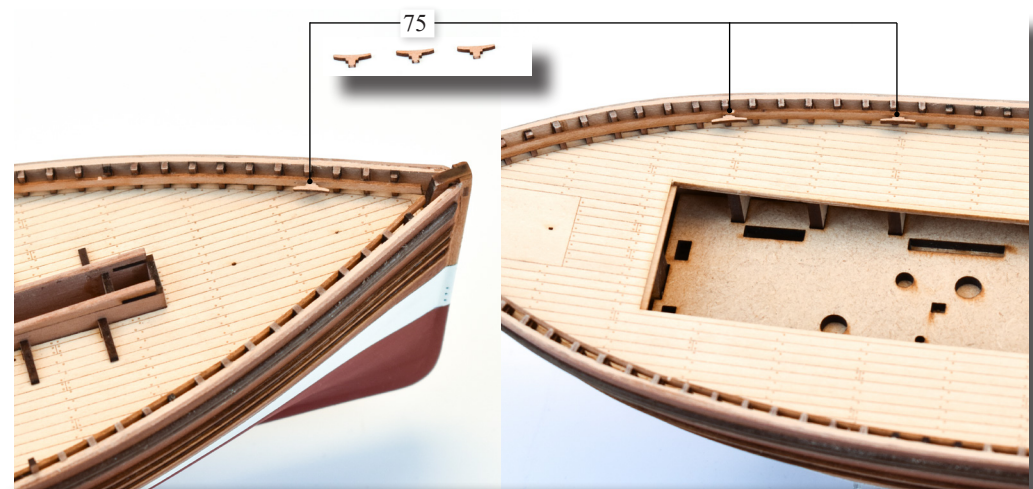
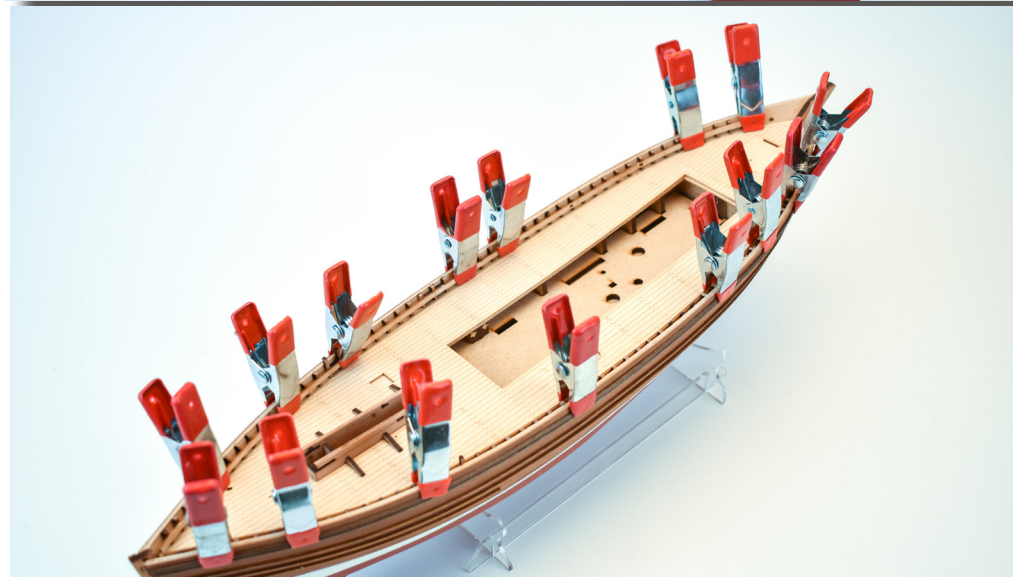
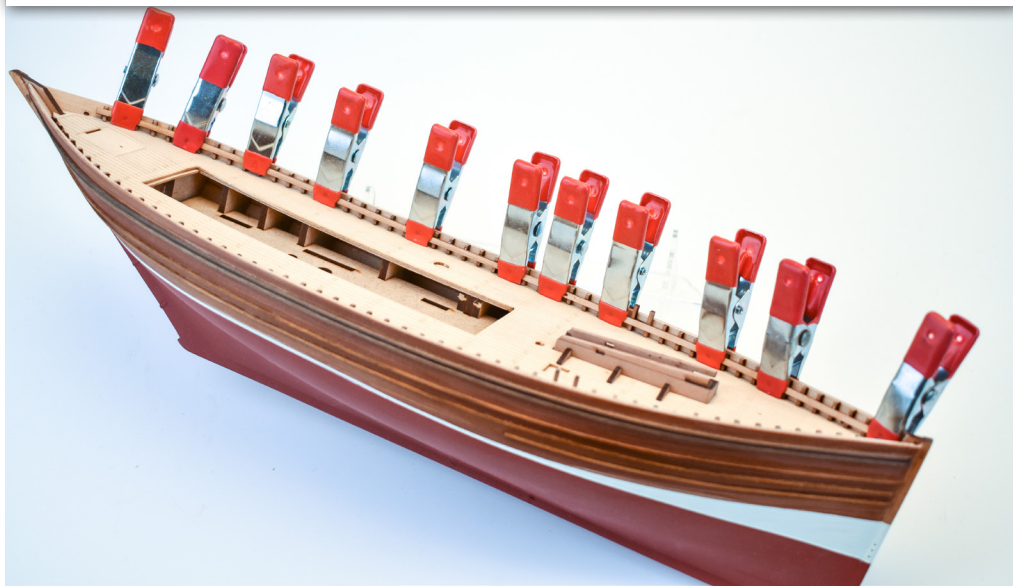
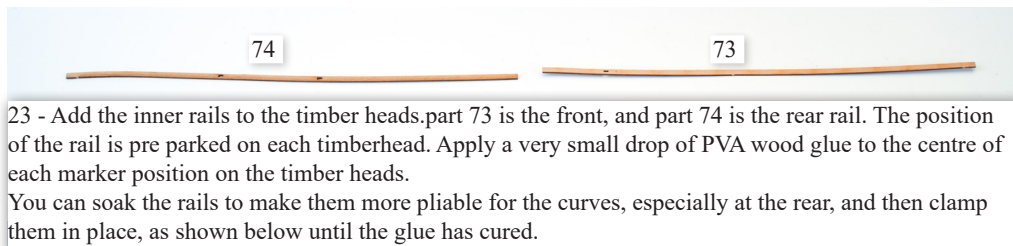
22 - Add the pre-cut timber heads (L1-L50 for the left side and R1-R50 for the right side). Correct placement is shown on Plan Sheet 2, but the timber head positions are pre etched on the inner bulkheads, and each timber head is glued inside each vertical etched line.



Use a spot of PVA wood glue or cyano gel to fix each timber head to the bulkheads. Because of the angle of the stern bulkhead, the bottom of some timber heads will need slight bevelling, so the bottom of the timber heads sit flush on the deck edges.







To finish off the timber head/rail assembly, glue the cleats (75) into the slots located on the sides of the rails using PVA wood glue.



24 - using a 1mm drill bitt, open up the hole at each side near the stern to take the rudder tiller rope.



25- Remove the Bow Plate (PE-31) from the photo etched brass sheet and bend the top so that it fits the top of the stem post.

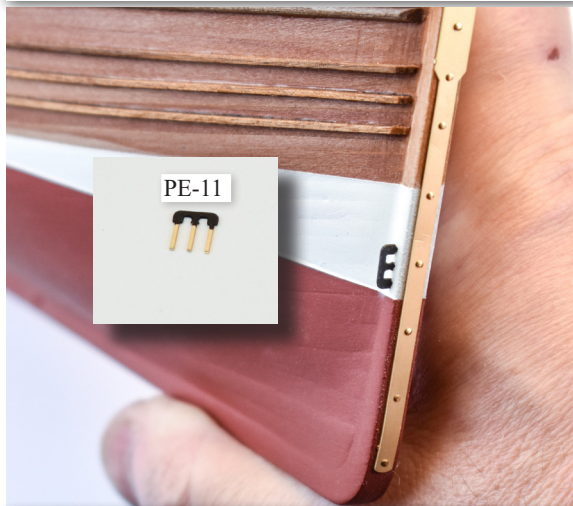
Left - Using a 0.6mm drill bitt, dry fit the bow plate into position at the front of the bow and drill the holes into the bow.

Next, the brass pins (F2) can be pushed, or very lightly hammered into the holes to secure the bow plate in position.





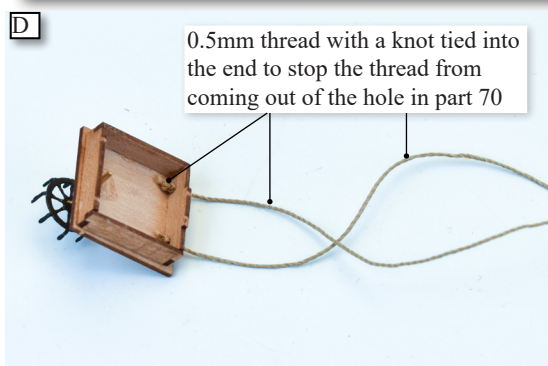
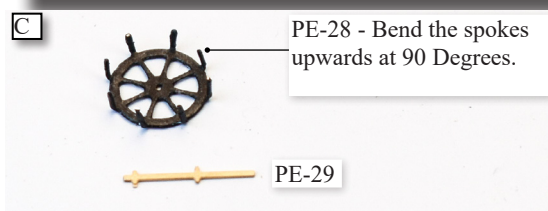
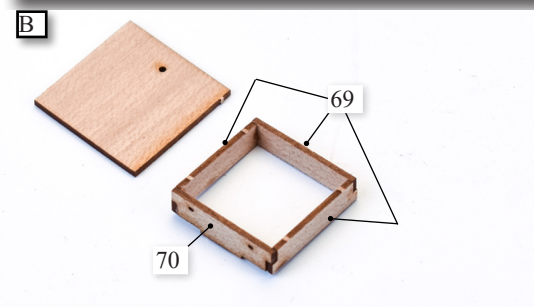
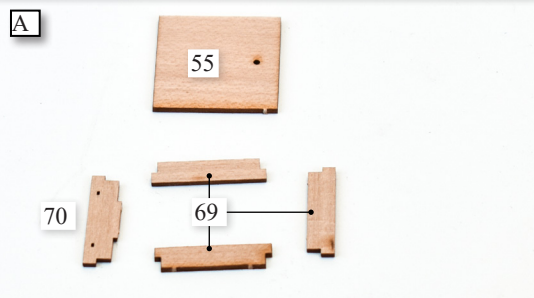
24 - Using a 0.7mm drill bitt, drill a hole for the bow eye-bolt (PE-32) stem, and insert and glue part PE-32 in place.



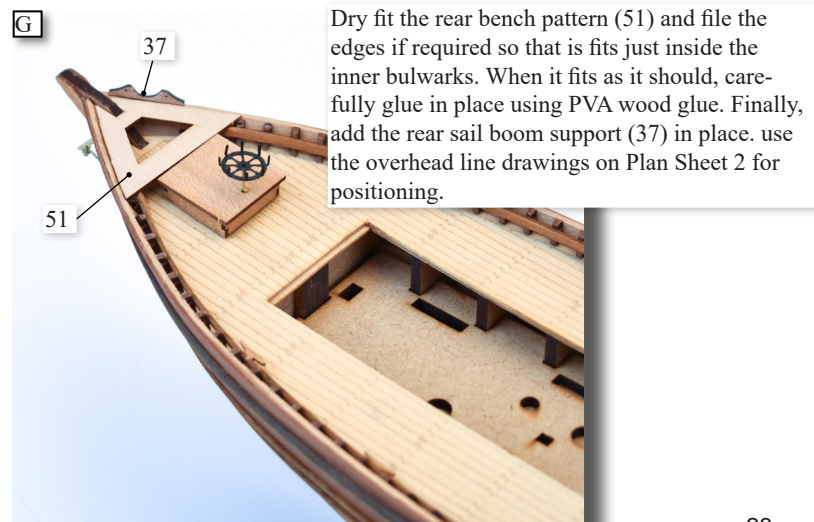
25 - Add the photo etched stem post cleat (PE-11) to the right side of the stem post. It should locate into the three holes in the stem post. The part can be painted black before fixing, or simply left unpainted,

26 - Steering wheel and box assembly. Make up the assembly as shown below. The tiller rope is simply 0.5mm thread, which is threaded through the inner holes in part 70 (with a knot tied in the end to prevent the thread from pulling out), and then through the holes in the hull, and then tied to each side of the tiller arm. use PVS glue to secure in place and then trim off any excess.

Glue the wheel stem (PE-29) into the slot on part 55 and finally add the wheel (PE-28)

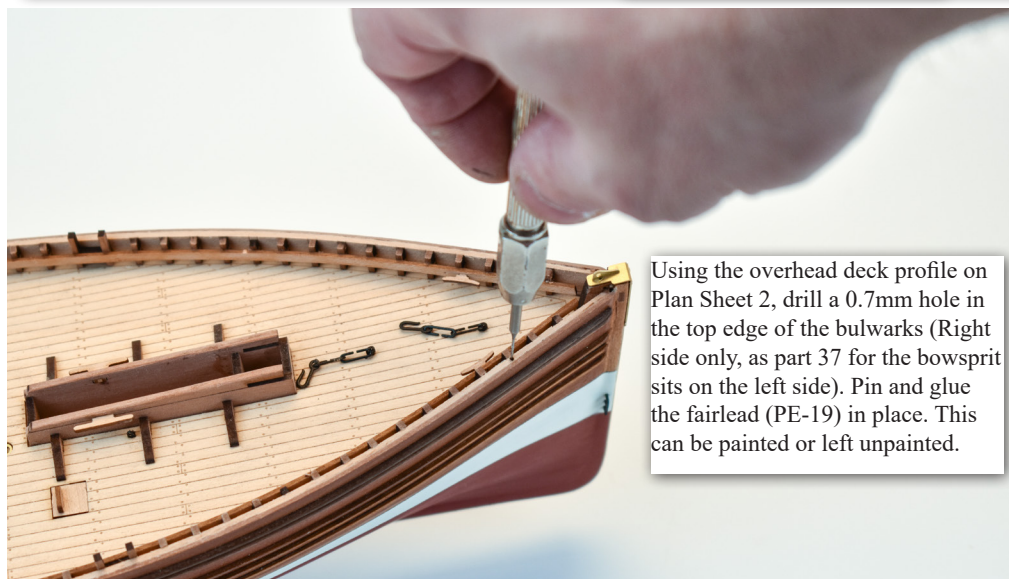
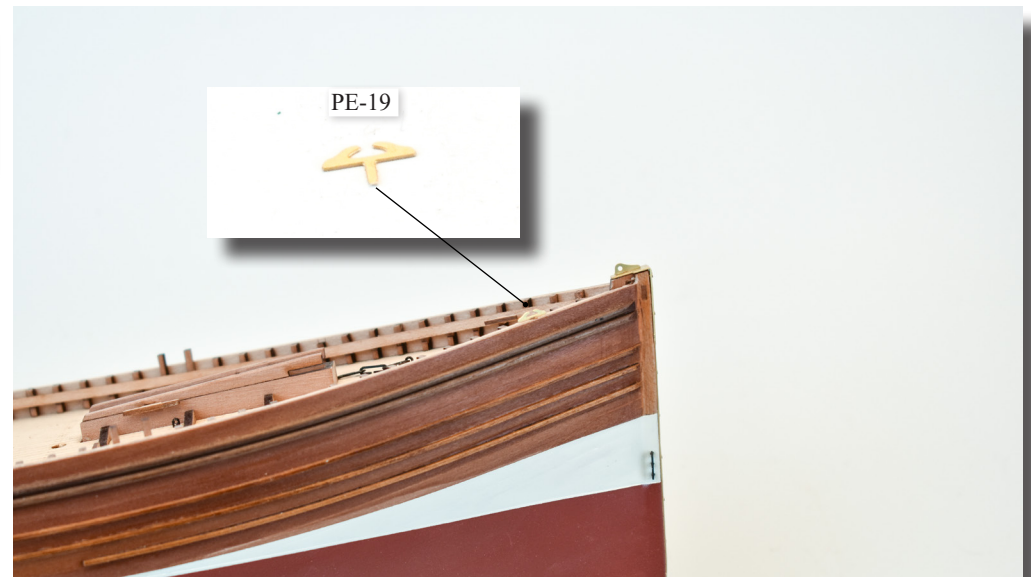
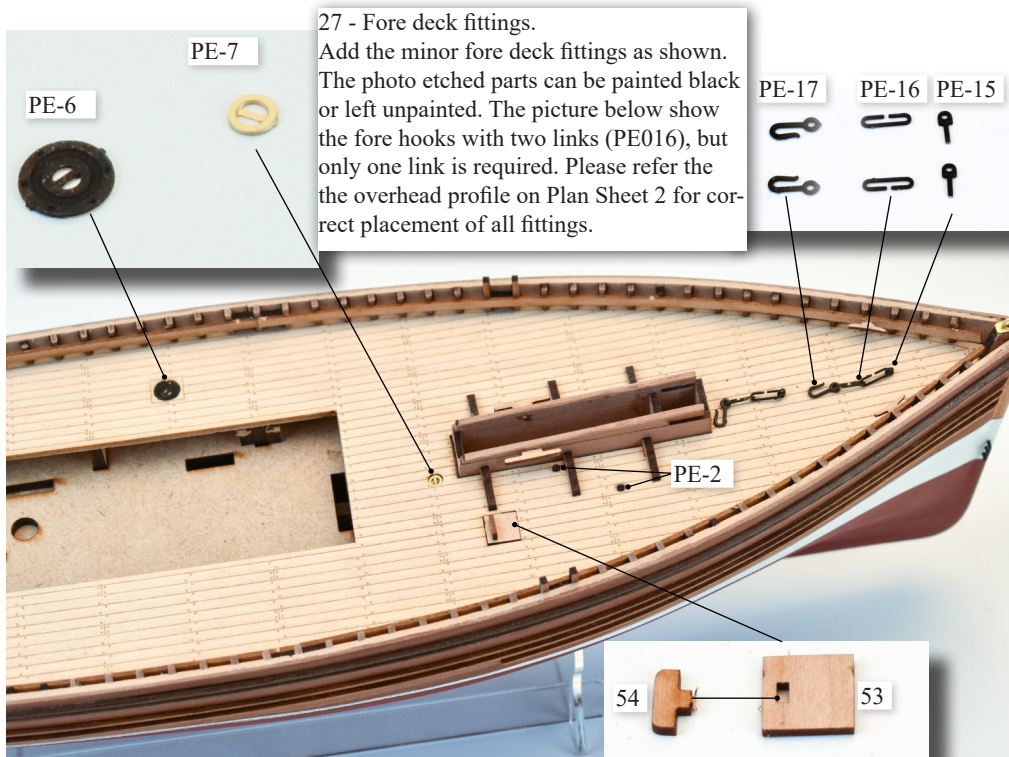


Trim off excess thread once secure in place on tiller arm.



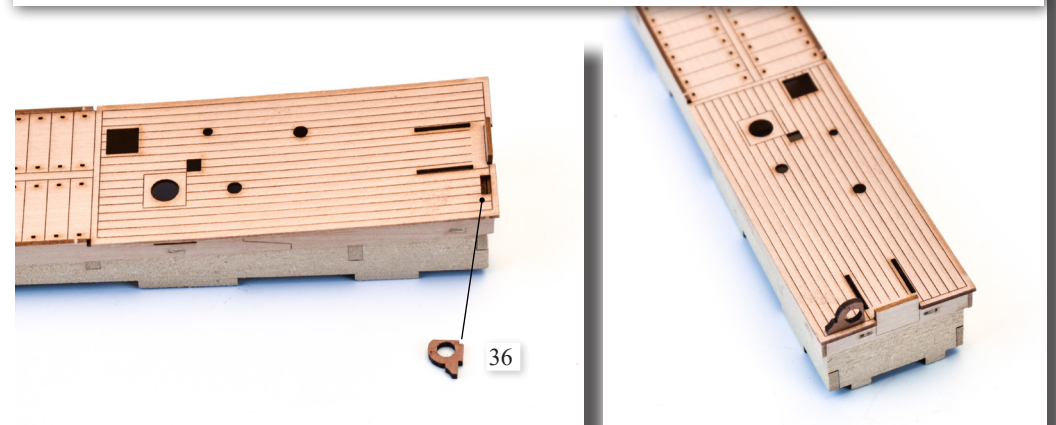
Dry fit the rear bench pattern (51) and file the edges if required so that it fits just inside the inner bulwarks. When it fits as it should, carefully glue in place using PVA wood glue. Finally, add the rear sail boom support (37) in place. use the overhead line drawings on Plan Sheet 2 for positioning.



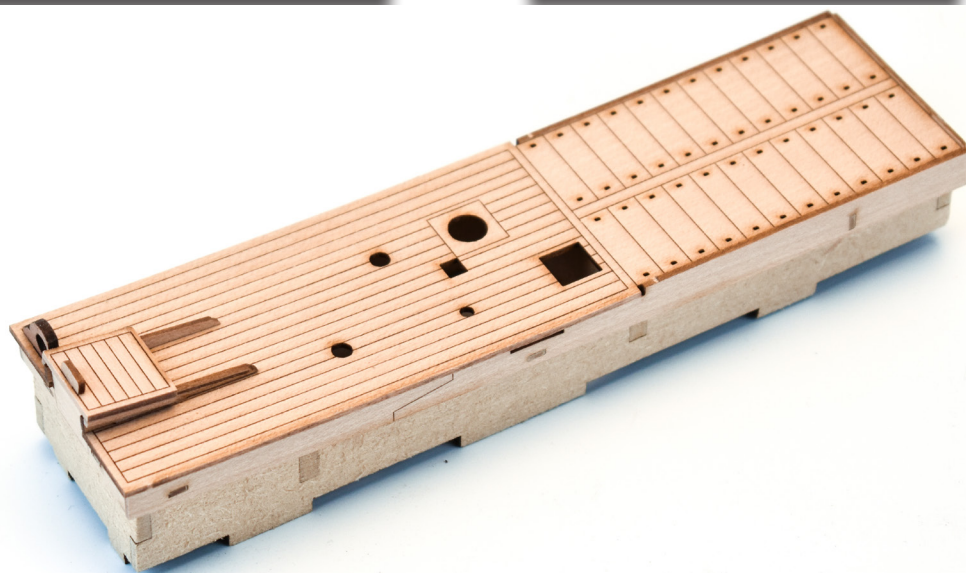
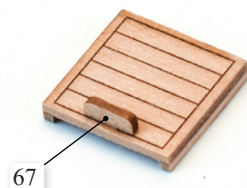
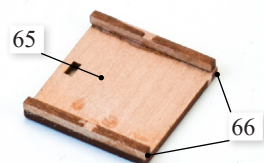
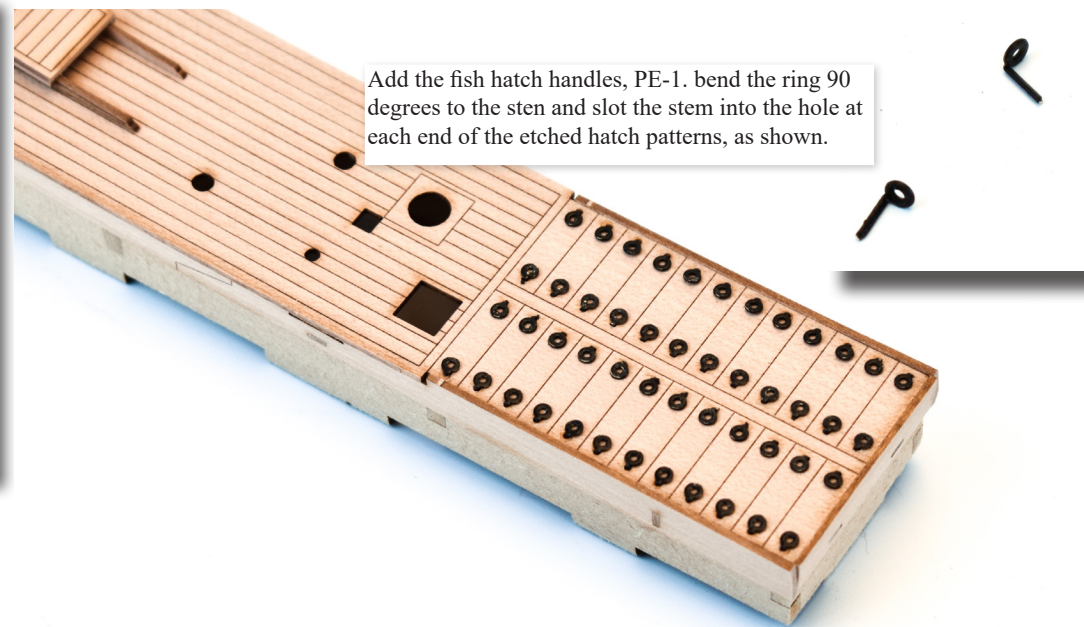
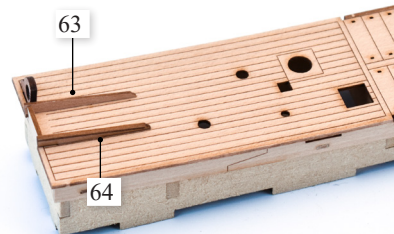
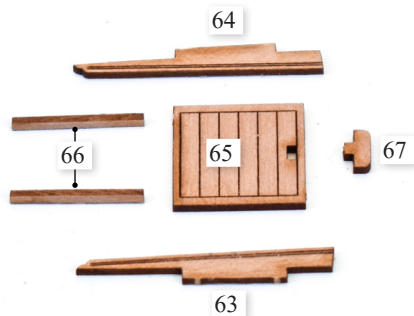


## 28 - Superstructure and fish hatch fittings.

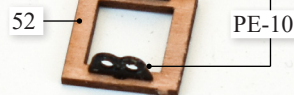
Add the aft sail boom bracket (36) into its slot at the end of the superstructure deck as shown below. Next, identify and cut out all parts relating to the aft companionway sliding hatch. Slot and glue parts 63 (left) and 64 (right) in place. Add the sliding hatch runners (66) to the underside inside edges of part 65, and then glue the handle (67) to the yop surface of part 65. Glue the sliding hatch to parts 63 and 64 to complete the hatch assembly.



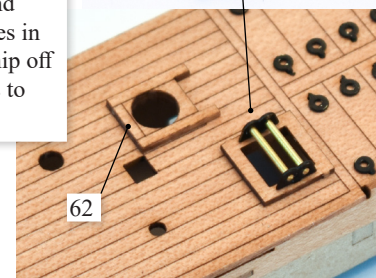




Make up the two sizes of chimney/flues from the 2 and 3mm diameter aluminium tube provided. Use the drawings on Plan Sheet 2 for correct sizes.  
The 3mm flue has a base, PE-8m and the 2mm flue PE-9. Paint the flue's black, and the bases can be painted black or left unpainted.



Make up the roller hatch housing. Paint black (or leave unpainted) the roller brackets (PE-10) and glue them into position on part 52.  
Cut a couple of short lengths of 1mm brass rod (F4) and slot each through the holes in PE-10. When in place, snip off the ends with side cutters to complete the assembly.



A - Identify and cut out all of the parts that make up the top of the steam winch.

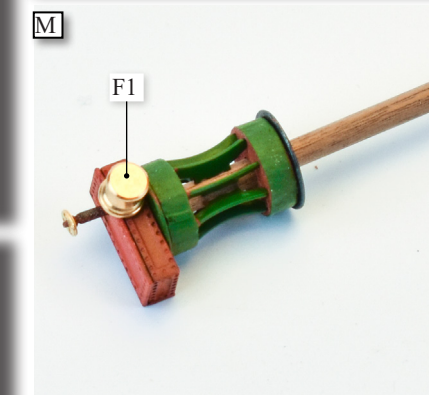
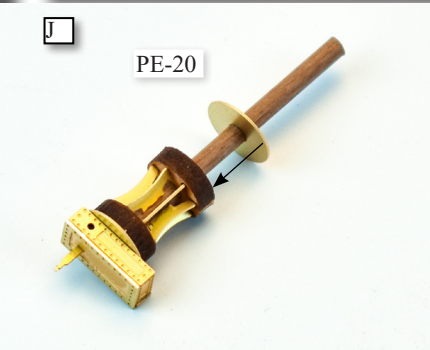
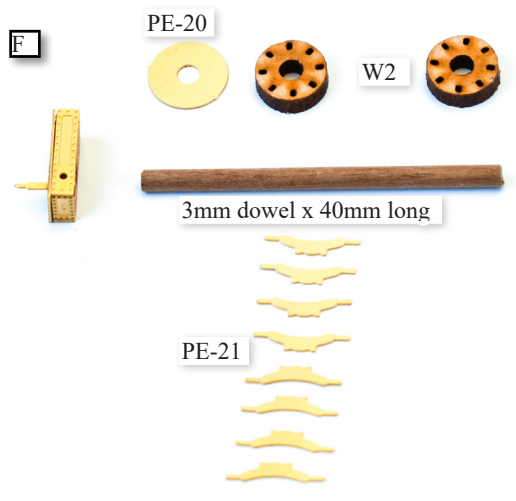
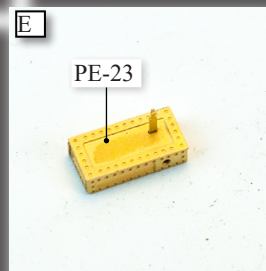
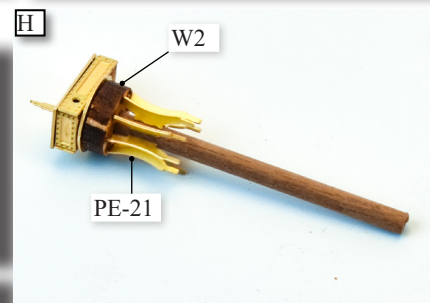
D - Slot and glue part PE-25 into the pre cut slot into the top of part W1.

F, G & H- Cut 3mm diameter dowel to a length of 40mm. The assembled head that you have just made up fits at the top of the dowel. The next parts to go on are PE-20, followed by W2.

I - Push the second drum, W2 up from the bottom of the dowel and locate the whelp ends into the slots in W2. This should ensure perfect alignment of the whelps.

L & M - The assembly can be painted how you wish, but what is shown were quite popular colours for the period, green and red.

Add the small circular handle (PE-26), followed by gluing the winch drum (F1) to the left side of the upper winch housing to complete the assembly.

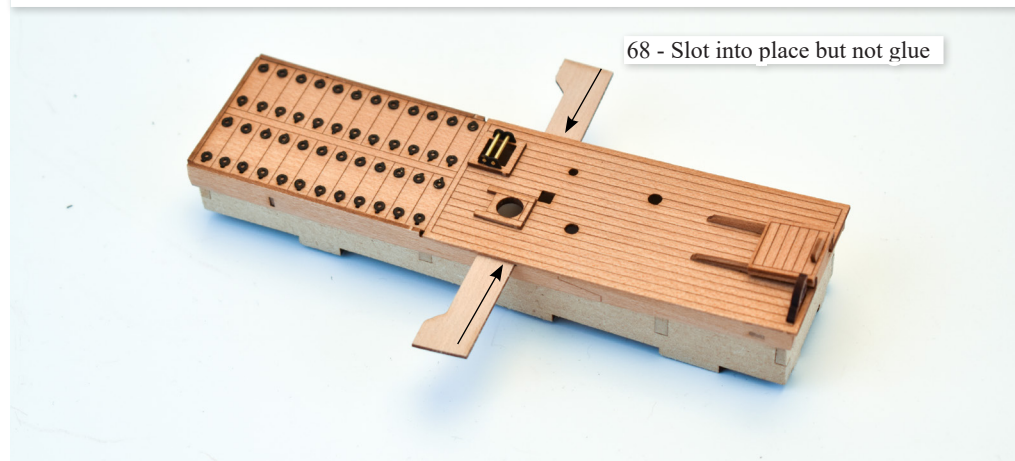




30 - Finishing the main superstructure assembly.

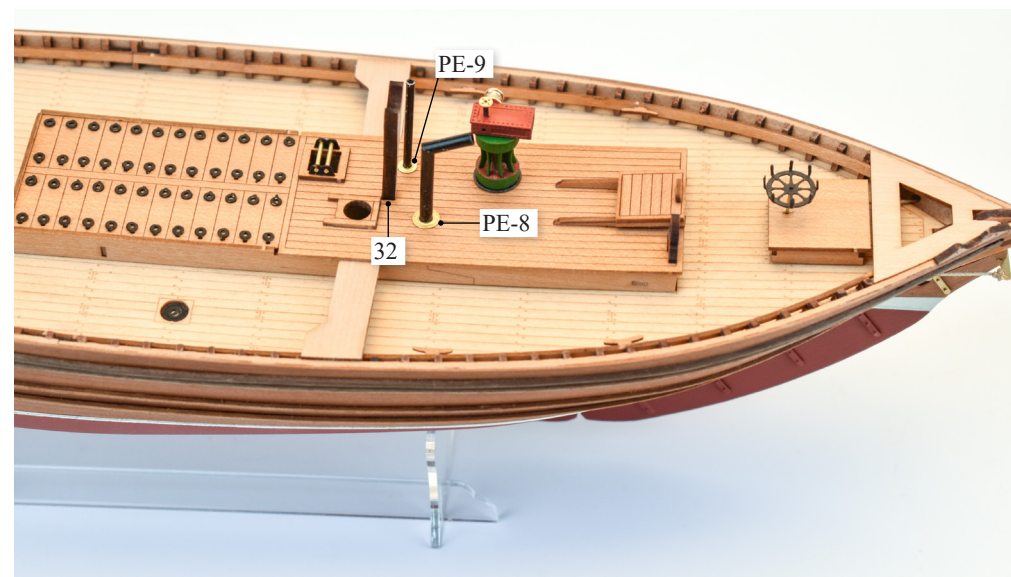
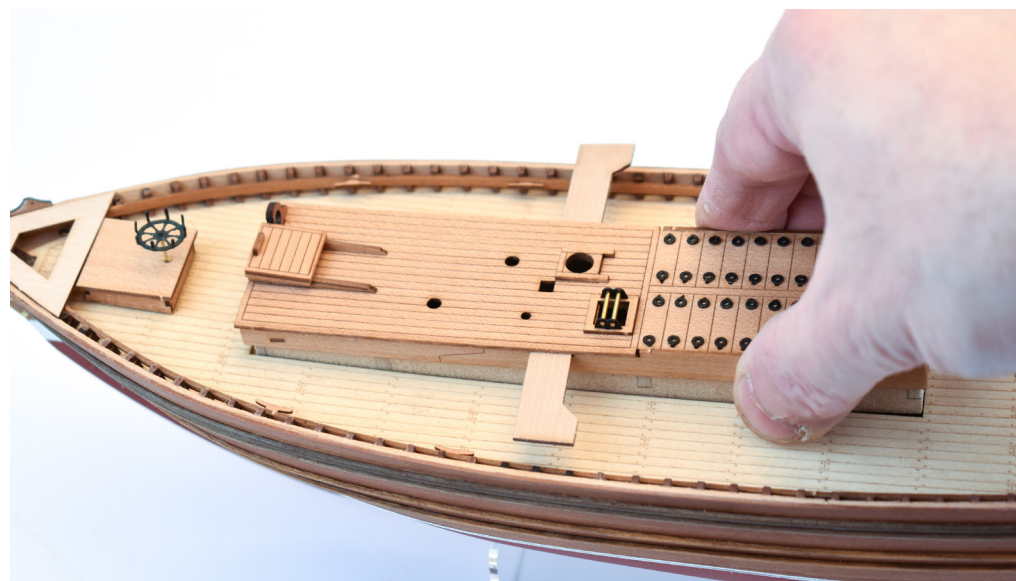
Push parts 69 into the slots located in the superstructure sides, just under the superstructure deck. Do not glue them, as they can be altered to fit the width of the bulwark sides once the superstructure assembly is glued in place.

Carefully push the superstructure assembly into position so that the tabs at the bottom locate into the slots in the lower floor. Once in place, move parts 68 until they are touching the inner edges of the bulwarks. A drop of PVA wood glue can be used to secure them in place.



Above - Superstructure now securely in place, along with parts 68.

Below - The flues, steam winch and fore mast crutch (32) can now be added into their respective slots in the superstructure deck. They all locate into another slot in the lower floor to ensure proper alignment.



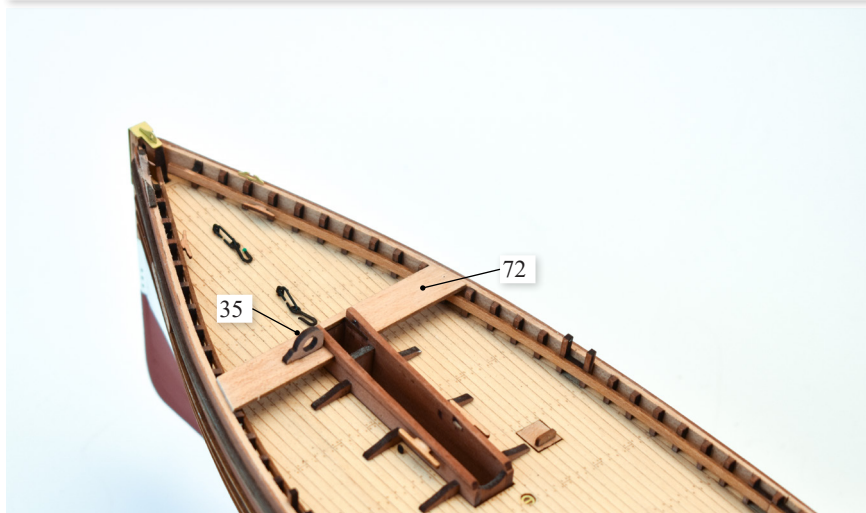


31 - Add the front bench pattern (72) by pushing it into the slots in the sides of parts 33. The ends of the bench should sit flush with the inner edge of the bulwarks, and may need slight sanding to fit perfectly.

There should be no need to use glue for this part.

Once securely in place, add the bowsprit bracket (35) by slotting and gluing in place on the left side of part 72.

Using the profile drawings on Plan Sheet 2, add the rest of the eyebolts to the deck and bulwark tops to complete the hull assembly.



32 - Masts. Please note the following pictures are supplementary to the detail line drawings from Plan Sheet 3 to Plan Sheet 7, which you should use as the main source.

Using the drawings on Plan Sheet 3, make up the two masts, bowsprit and aft sail boom. The fore mast is made from 8x8mm square walnut. The lower part is left square and the rest is tapered.



Above - Tapering the fore mast, note that the foot of the mast is left square.



Above - Drilling the 2 holes near the top of the fore mast, as shown in the plans.



Above - Tapering can be gauged by slotting the mast rings in place. Once it fits tightly, the taper is enough.



Above - End of fore mast showing mast ring and the 1mm holes for the fore and main sail lifts.

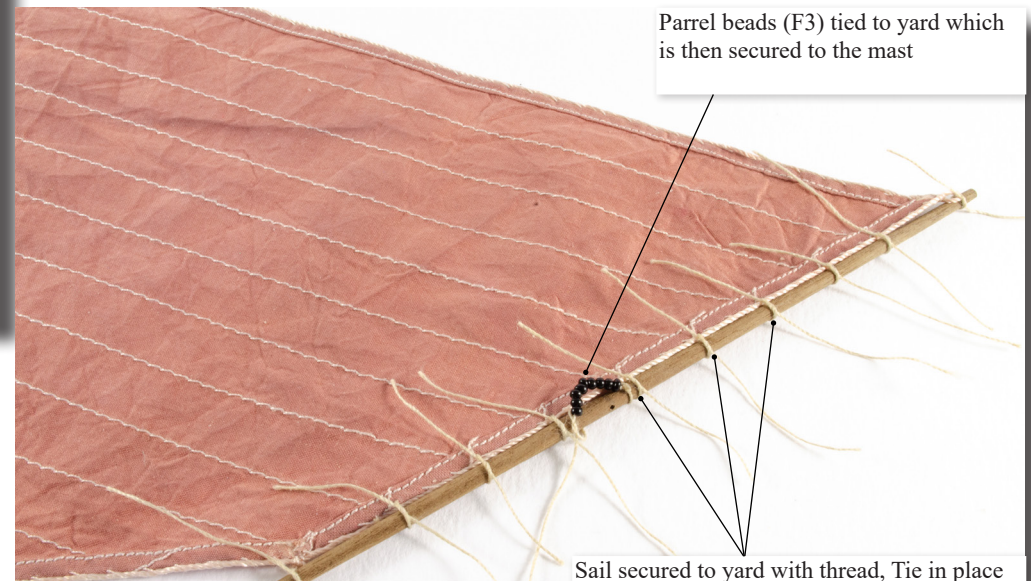
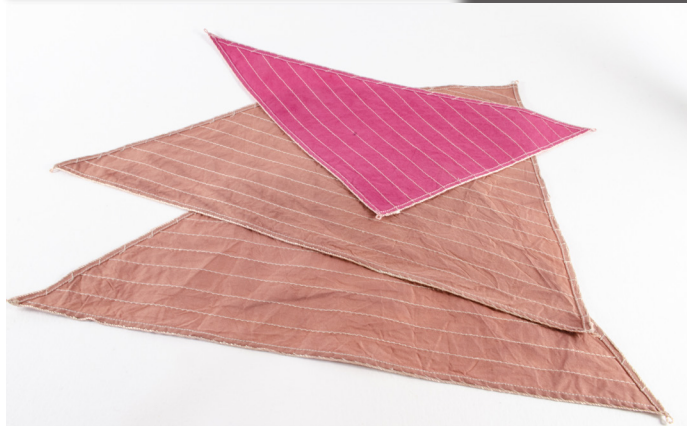




### 33 - Sails (Optional)

The three sails can be dyed if desired. The sails for the prototype model were dyed using the products shown, but any material dye product can be used. the two colours chosen were 'Cocoa brown' for the main and aft sail, and 'Wine' for the fore sail.

Use Plan Sheet 3 for the thread and block locations on the sails and Plan Sheets 4, 5 & 6 for the rigging of the sails to the masts and yards.



Sail secured to yard with thread, Tie in place and secure the knots with watered down PVA wood glue, When set, trim off the excess thread.







The Zulu Lady Isabella – 1:64<sup>th</sup> scale

PARTS LIST

<u>Pt. No</u>	<u>Description</u>	<u>Material</u>	<u>QTY</u>
<b>3mm MDF</b>			
1	Bulkhead	3mm MDF	1
2	Bulkhead	3mm MDF	1
3	Bulkhead	3mm MDF	1
4	Bulkhead	3mm MDF	1
5	Bulkhead	3mm MDF	1
6	Bulkhead	3mm MDF	1
7	Bulkhead	3mm MDF	1
7a	Bulkhead Thickness Extension Pattern	3mm MDF	4
8	Bulkhead	3mm MDF	1
9	Bulkhead	3mm MDF	1
10	Bulkhead	3mm MDF	1
11	Bulkhead	3mm MDF	1
12	Bulkhead	3mm MDF	1
13	Bulkhead	3mm MDF	1
14	Bulkhead	3mm MDF	1
15	Keel	3mm MDF	1
16	Right Side Fore Filling Piece	3mm MDF	1
17	Left Side Fore Filling Piece	3mm MDF	1
18	Right Side Aft Filling Piece	3mm MDF	1
19	Left Side Aft Filling Piece	3mm MDF	1
20	Keel Alignment Clamp	3mm MDF	12
21	Lower Floor	3mm MDF	1
22	Upper Floor	3mm MDF	1
23	Superstructure Bulkhead (Fore)	3mm MDF	1
24	Superstructure Bulkhead (Middle)	3mm MDF	1
25	Superstructure Bulkhead (Middle-Aft)	3mm MDF	1
26	Superstructure Bulkhead (Aft)	3mm MDF	1
27	Superstructure Side	3mm MDF	2
W1	Steam Winch Top Plate	3mm MDF	1
W2	Steam Winch Upper and Lower Drum	2mm MDF	2
<b>3mm Wood</b>			
28	Prow	3mm Wood	1
29	Keel	3mm Wood	1
30	Stern Post	3mm Wood	1
31	Rudder	3mm Wood	1
32	Fore Mast Crutch	3mm Wood	1

<u>Pt. No</u>	<u>Description</u>	<u>Material</u>	<u>QTY</u>
<b>2mm Wood</b>			
33L	Fore Mast Opening Side (Left)	2mm Wood	1
33R	Fore Mast Opening Side Right)	2mm Wood	1
33A	Fore Mast Opening Bulkhead	2mm Wood	2
34	Fore Mast Opening Aft Bulkhead	2mm Wood	1
35	Bowsprit Bracket	2mm Wood	1
36	Aft Sail Boom Bracket	2mm Wood	1
37	Bowsprit and Aft Sail Boom Resting Cheek	2mm Wood	2
38	Fore Mast Opening Side Cheek	2mm Wood	6
R1-R50	Bulwark Timberheads (Right)	2mm Wood	1
L1-L50	Bulwark Timberheads (Left)	2mm Wood	1
<b>1mm Wood</b>			
39	Bulwark Pattern (Front Left)	1mm Wood	1
40	Bulwark Pattern (Rear Left)	1mm Wood	1
41	Bulwark Pattern (Front Right)	1mm Wood	1
42	Bulwark Pattern (Rear Right)	1mm Wood	1
43	‘Lady Isabella’ Nameplate (2 Required)	1mm Wood	4
44	Lower Second Planking Strake (Front)	1mm Wood	2
45	Lower Second Planking Strake (Rear)	1mm Wood	2
46	Prow rabbet Pattern	1mm Wood	2
47	Keel rabbet Pattern	1mm Wood	2
48	Stern Post rabbet Pattern	1mm Wood	2
49	Locating Keys for 46, 47 & 48 (7 Required)	1mm Wood	12
50	Fore Mast Opening Floor	1mm Wood	1
51	Stern Seat Pattern	1mm Wood	1
52	Roller Hatch Opening	1mm Wood	1
53	Fore Hatch Lid	1mm Wood	1
54	Fore Hatch Lid Handle	1mm Wood	1
55	Steering Box Top	1mm Wood	1
56	Superstructure Side (Left)	1mm Wood	1
57	Superstructure Side (Right)	1mm Wood	1
58	Superstructure Front Panel	1mm Wood	1
59	Superstructure Rear Panel	1mm Wood	1
60	Locating Keys for 56-59 (10 Required)	1mm Wood	21
61	Superstructure Deck Pattern	1mm Wood	1
62	Aft Mast Surround	1mm Wood	1
63	Aft Companionway Side (Left)	1mm Wood	1
64	Aft Companionway Side (Right)	1mm Wood	1
65	Aft Companionway Sliding Hatch Top	1mm Wood	1
66	Aft Companionway Sliding Hatch Runner	1mm Wood	2
67	Aft Companionway Sliding Hatch Top Handle	1mm Wood	1
68	Mid-Deck Bench	1mm Wood	2
69	Steering Box front and Sides	1mm Wood	3



<u>Pt. No</u>	<u>Description</u>	<u>Material</u>	<u>QTY</u>
70	Steering Box Rear Pattern	1mm Wood	1
71	Cleats for 33L & 33R	1mm Wood	2
72	Fore Bench Pattern	1mm Wood	1
73	Bulwark Inner Rail (Front)	1mm Wood	2
74	Bulwark Inner Rail (Rear)	1mm Wood	2
75	Cleats for 73 & 74	1mm Wood	6
<b>1mm Limewood</b>			
76	Laser Engraved Deck	1mm Limewood	1
<b>0.8mm Birch Plywood</b>			
33FD	Sub Deck	0.8mm Birch Plywood	1
<b>2mm Clear Acetate</b>			
77	Fore Cradle	2mm Clear Acetate	1
78	Aft Cradle	2mm Clear Acetate	1
79	Cradle Spacer	2mm Clear Acetate	2
<b>0.4mm Photo Etched Brass</b>			
PE-1	Eyebolt/Fish Hatch Handle	0.4mm Photo Etch	68
PE-2	Eyebolt (For Rigging)	0.4mm Photo Etch	24
PE-3	Rudder Strap	0.4mm Photo Etch	2
PE-4	Rudder Strap	0.4mm Photo Etch	6
PE-5	Rudder Strap	0.4mm Photo Etch	2
PE-6	Round Hatch Plate	0.4mm Photo Etch	1
PE-7	Pump base	0.4mm Photo Etch	1
PE-8	Base for 3mm Aluminium Flue	0.4mm Photo Etch	1
PE-9	Base for 2mm Aluminium Flue	0.4mm Photo Etch	1
PE-10	Roller Hatch (Part 52) Bracket	0.4mm Photo Etch	2
PE-11	Stem post Cleat (Fitted to Right Hand Side)	0.4mm Photo Etch	1
PE-12	Bowsprit Sail Ring	0.4mm Photo Etch	1
PE-13	Fore Mast Top Ring	0.4mm Photo Etch	1
PE-14	Aft Mast Top Ring	0.4mm Photo Etch	1
PE-15	Fore Deck Hook Tackle Eyebolt	0.4mm Photo Etch	2
PE-16	Fore Deck Hook Shackle (2 Required)	0.4mm Photo-Etch	4
PE-17	Fore Deck Hook	0.4mm Photo Etch	2
PE-18	Brackets For Rudder Post	0.4mm Photo Etch	10
PE-19	Fairlead (1 required on Right Side Only)	0.4mm Photo Etch	2
PE-20	Steam Winch Ring	0.4mm Photo Etch	2
PE-21	Steam Winch Whelp	0.4mm Photo Etch	8
PE-22	Steam Winch Top Plate Side	0.4mm Photo Etch	2
PE-23	Steam Winch Top Plate End	0.4mm Photo Etch	2

<u>Pt. No</u>	<u>Description</u>	<u>Material</u>	<u>QTY</u>
PE-24	Steam Winch Top Plate	0.4mm Photo Etch	1
PE-25	Steam Winch Handle Stem	0.4mm Photo Etch	1
PE-26	Steam Winch Handle	0.4mm Photo Etch	1
PE-27	Steering Wheel Stem	0.4mm Photo Etch	1
PE-28	Steering Wheel	0.4mm Photo Etch	1
PE-29	Tiller Arm For Rudder	0.4mm Photo Etch	1
PE-30	Rigging Hook (More than required)	0.4mm Photo Etch	16
PE-31	Bow Plate	0.4mm Photo Etch	1
PE-32	Eyebolt for Part PE-31 (Fore Sail)	0.4mm Photo Etch	1

### Fittings & Materials

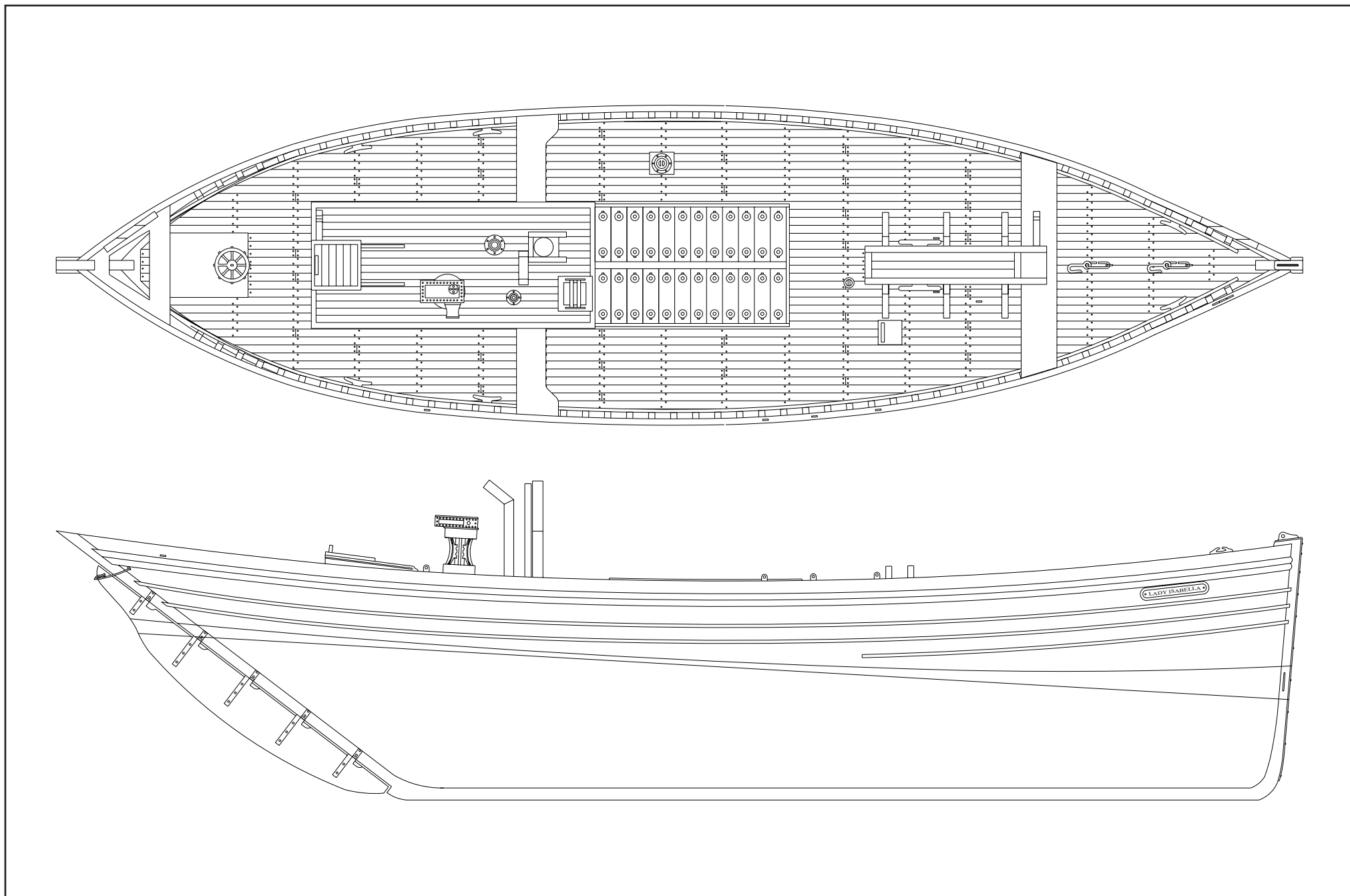
F-1	Steam Winch Drum	Brass	1
F-2	Fine Brass Pins	Brass	200
F-3	Parrel Bead	Plastic	20
F-4	1mm Brass Wire x 40mm Long	Brass	1
F-5	3mm Aluminium Tube x 70mm Long	Aluminium	1
F-6	2mm Aluminium Tube x 70mm Long	Aluminium	1
F-7	3mm Single Block	Wood	8
F-8	4mm Double block	Wood	10
F-9	5mm Triple block	Wood	4
F-10	0.25mm Diameter natural thread	DD 36//8243	20m
F-11	0.5mm Diameter natural thread	DD 25//8243	10m
F-12	8mm Square Dowel x 300mm long (Fore Mast)	Wood	1
F-13	6mm Dowel x 250mm Long (Aft Mast)	Wood	1
F-14	4mm Dowel x 410mm Long	Wood	1
F-15	3mm Dowel x 410mm Long	Wood	1
F-16	1 x 5 x 410mm Long Limewood	Wood	30
F-17	1 x 4 x 410 mm Long Second planking	Wood	44
F-18	1x1 x 410mm Wood Strip	Wood	5
F-19	2mm x 410mm Long Half Round Wood Strip	Wood	4
F-20	Sail Set (Optional)	Cloth	3

### Laser Cut Sheet Quantities

3mm MDF Laser Cut Sheet	2
3mm Wood Laser Cut Sheet	1
2mm Clear Acetate Laser Cut Sheet	1
2mm Wood Laser Cut Sheet	1
1mm Wood Laser Cut Sheet	3
1mm Wood Laser Cut Sheet (Laser Etched Deck)	1
0.8mm Birch Plywood Sub Deck	1
0.4mm Photo Etched Brass Sheet	1







# VANGUARD MODELS

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The Lady Isabella was designed and developed in the UK by Chris Watton

Finished prototype model with sails made and photographed by James Hatch

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15/04/2020