Construction Notes on The Side Paddle-Wheeler

Ticonderoga

Part 2

By Alex Derry

Photo 1. *Ticonderoga's* final resting place in the Shelburne Museum.

Welcome back, we left off at the point where the hull had been prepared for plating and the first 1/16th plywood deck had been prepared attached and faired into the sides of the hull. The next step will be the application of the simulated plating. At 1/48th scale the riveting patterns are not a concern as the method of attachment to the steel bulkheads was done with flush heads. **Photos 1** and **2** show the forward arrangement of the plate lines on the actual ship.

It is interesting to note that there are six plate lines visible at the stem but just a ways abaft, the fourth plate splits to form two plates making the total seven. Also, their arrangement is not joggled rather they are laid in a pattern of inner and outer strakes. The top strake is out as well as the third while the second is inner. The fourth starts out as an inner at the top but over laps the fifth strake until it splits. Then the lower half over laps its upper to be come an outer both top and bottom. Finally, the sixth

Photos 1 & 2. Notice the arrangement of the plating and the lack of rivet evidence.

strake is outer to the garboard seam. I presume that the fourth strake does this to help accommodate the curvature of the hull.

To locate each strake on the model's hull, I needed to mark the frame lines since the bulkhead locations used to shape the hull are too far apart to be used alone. I chose an arbitrary spacing since to draw in every frame line would be unnecessary. To do this, I used an inexpensive laser marker to illuminate the surface at each chosen location which then, allowed me to trace it for permanent marking later. This worked well, however, the set up to ensure the line of light was truly vertical, took some time. The best and most spacious surface used for this job was provided by our dining room table as is shown in **Photo 3**. One end of the laser had to be mounted on a block to ensure that the light would project around the hull and was aligned with a meter stick shown in **Photo 3 & 4**. The meter stick ensured that the location of the laser remained constant and perpendicular to the hull. **Photo 5** shows the light pattern, and in this case, it happened to line up with one of the internal body form bulkheads.

I chose to represent the inner strakes with the established hull surface. So I needed to draw in the plate lines for each outer strake. **Photo 6** shows the results. I had to assume some dimensions here as one does when spiling. The plate dimensions are NOT a consistent width, so I assumed that their width would proportionately enlarge as did the hull surface area. Once I was satisfied with the outlines, I used tracing paper to create a transferable plate section as is seen in **Photo 7** and **8**. In **Photo 8** the polystyrene sheet is below the carbon paper ready to be marked while tracing the plate shape from the tracing paper. These are then cut out to shape and then adhered to the hull in the appropriate location as is shown in **Photo 9**. The tape is there to prevent glue over run into the inner strake's space. **Photo 10** shows the finished plating.

The choice of the plating material was one that took some thought. I used Evergreen Scale Models polystyrene plain (#9015) sheets at 0.4 mm thickness. My choice was based on many factors scale being one. The thickness in the real world would be 19.2 mm. This is at scale, is a bit thin, but its flexibility is agreeable enough to allow the gluing process to work well around those places where there is a significant curvature. Also, it is thick enough to avoid any issues of crinkling an issue of a too thin material when forcing it around demanding curvatures. All surfaces must be washed to remove the releasing agents to

Photo 3. The dining room table surface for the operation.

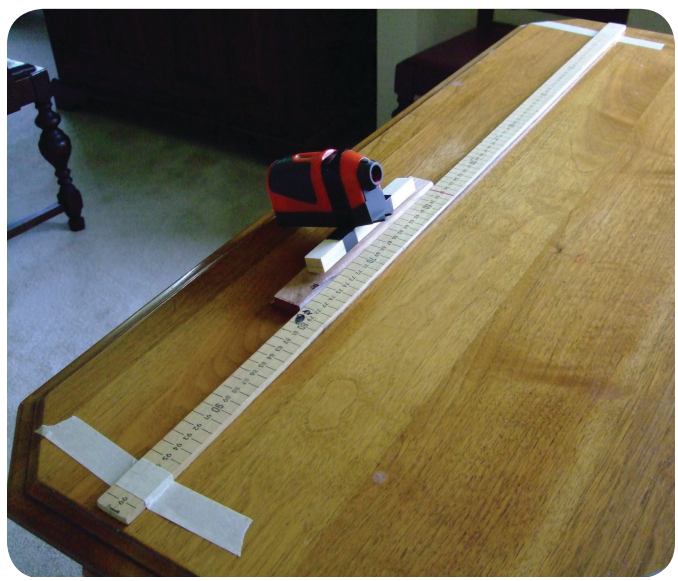


Photo 4. The laser is mounted on the block to ensure that the light wrapped itself around the hull. The meter stick guides the position of the light source.

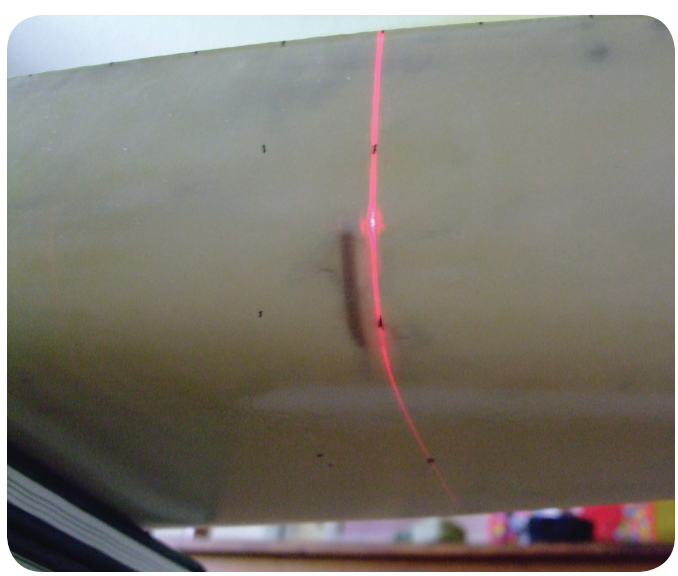


Photo 5. The light pattern on the hull.

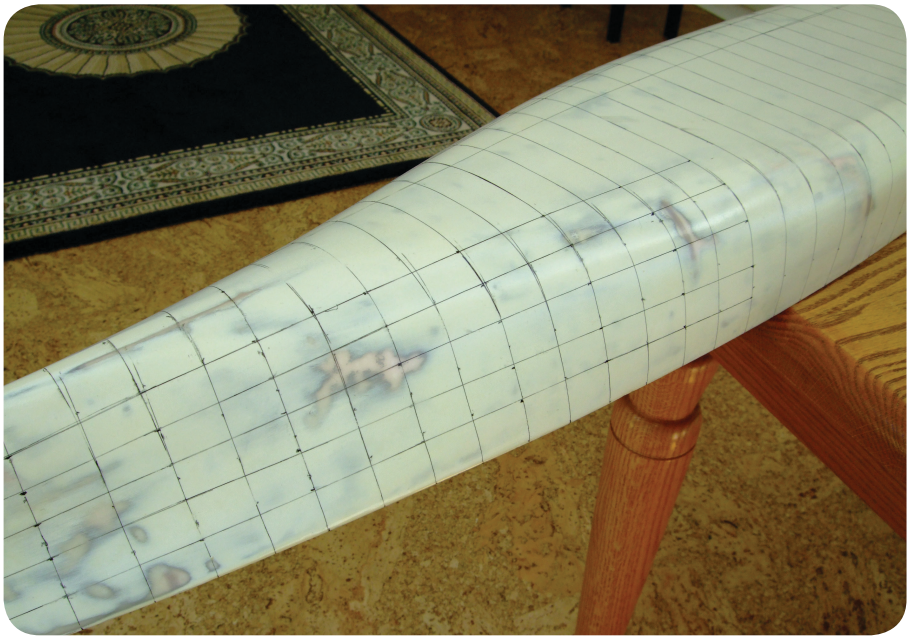


Photo 6. The location of the outer strakes are in place.

Photo 7. Tracing paper is used to create a transferable image of a section of outer plating)

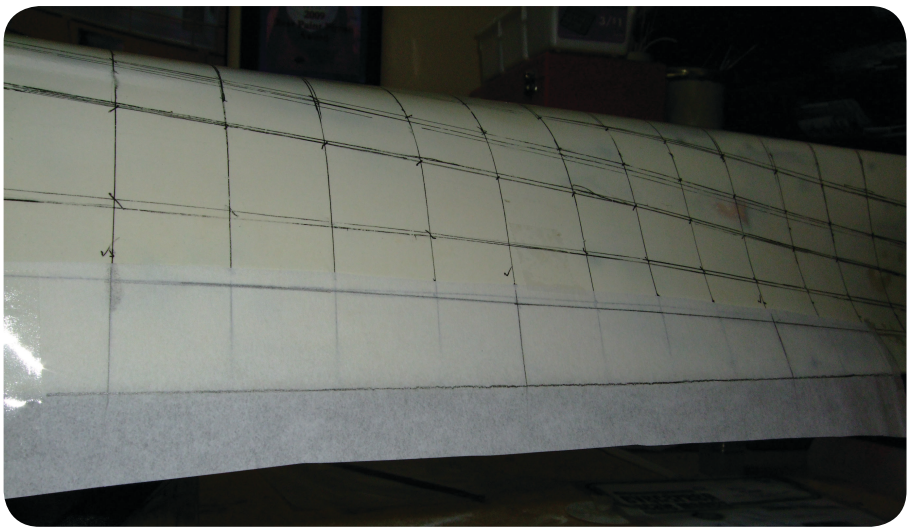


Photo 8. The polystyrene sheet is placed below the carbon paper so that an image can be transferred onto it.

ensure there is an immediate and strong adhesion. I used medium thickness Cyanoacrylate or Super Glue for this job since epoxy glues do not provide a strong enough bond. I had to be sure all was ready before application since there is not much time to make any adjustments. A light sanding with wet fine sand paper put the finishing touches on the hull. It was then airbrushed with Polyscale Acrylic Reefers White paint. Sanded again with wet very fine sand paper and painted again.

A word to the wise here, this model took three and a half years to build and during this time Polyscale Paints a division of Testors were discontinued!!! One should be very careful about which products you choose for your project as there may be a time when you will need more of that specific color and you will not be able to get it, or you need to search to find more. At the time I did the hull paint it was still available but not consistently. I did make a note of this but since it was and is the best paint I had found I continued to rely on its availability. It is a sad situation that no longer do we have the benefit of this fine product.

Once the hull was painted, I marked the waterline and painted the antifouling. To do this, I used a retort stand which has a base that will easily slide on a smooth surface. An adjustable clamp held a pencil as shown in **Photo 11**. The hull has a flat bottom which when placed on my dining room table held the hull perfectly horizontal for the application of the line. When painting a contrasting color over another, we use a masking tape of some sort. I used Frogtape designed for delicate surfaces. This tape has a crisp edge and gives you the best chance for a clean line. Even so, I always paint the delineating edge

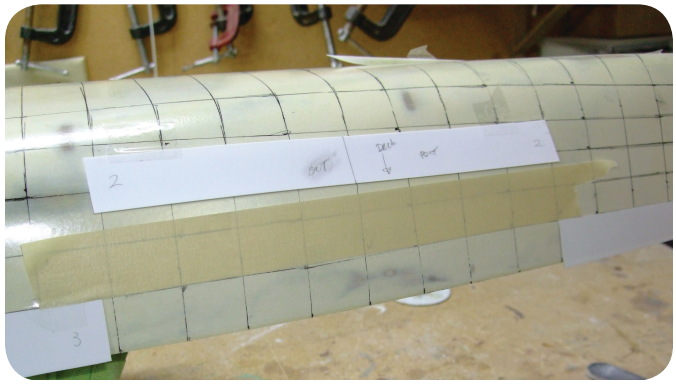


Photo 9. The plate is glued to the hull while a tape barrier prevents any glue from entering the inner strake space.

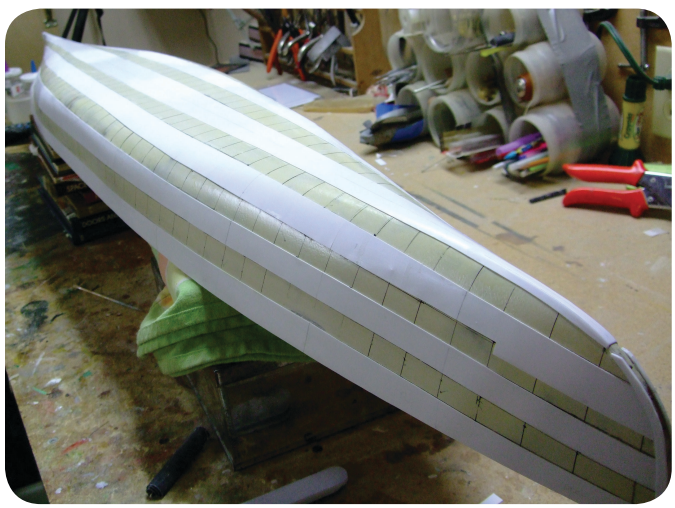


Photo 10. The finished plating.

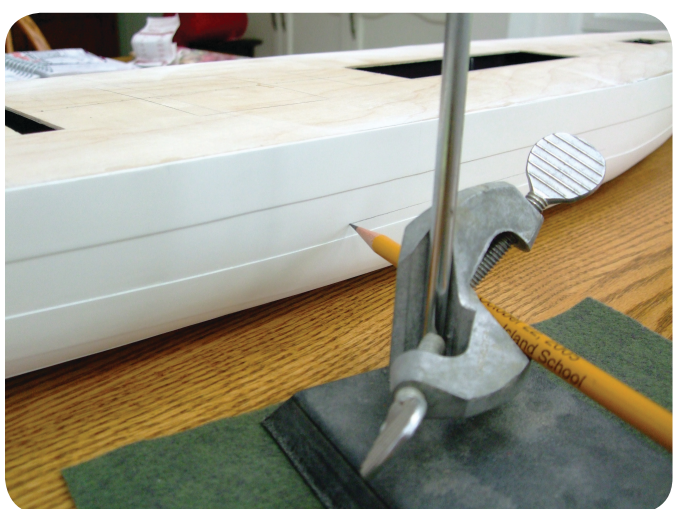
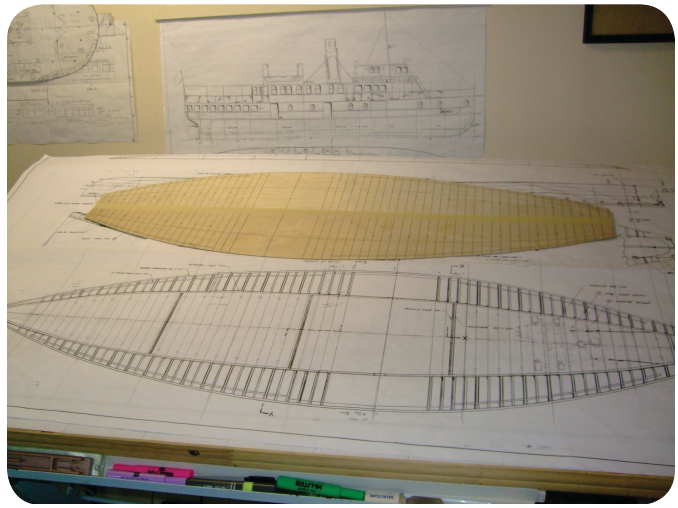
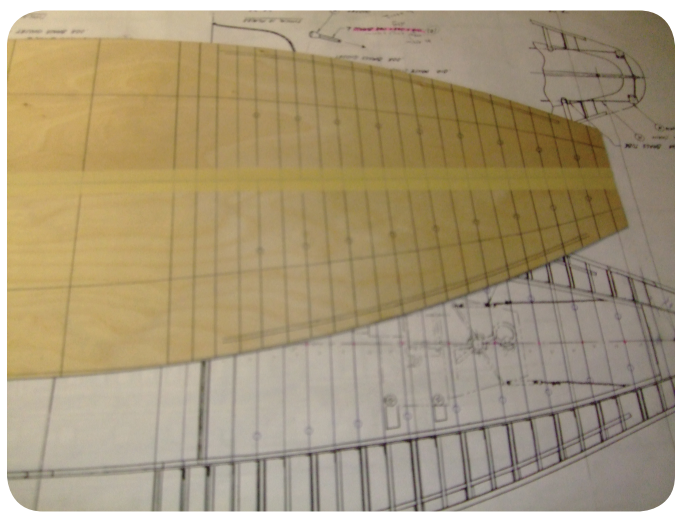


Photo 11. Marking the water line using a retort stand and clamped pencil.

with a light coat of the paint that will be below the antifouling paint. In this case, I painted the edge with the Reefers White. This ensures that if there is any paint creep under the tape, the white will fill it in. A light coat is enough to ensure that there isn't an unsightly build-up of paint.



Photos 12 & 13. The drawings from the plans show the dimensions of the next layer of decking. Plywood was cut to size and then marked as to where openings and support structures should be located.



It was now time to build the next 1/16" plywood deck. **Photo 12** shows the plan drawing of this deck from which the plywood deck can be cut to size. This deck overlaps the sides of the hull since the paddle-wheels protrude and needed to be housed. This would also serve to expand the first deck's surface area. The dimension of plywood that I could purchase would not allow a single sheet to do the job although most of the area was covered, so some patchwork was needed. **Photo 14** shows the necessary locations for the support frames that would appear on the underside of the deck. The locations for the Paddle-wheels, the opening for the engine, the stairway opening from the salon to the galley, a forward opening for a stairway to the boiler room and another stairway opening to the crew's quarters were needed to be cut.

These drawings did not include the openings for the engine or stairways as it wasn't the intention

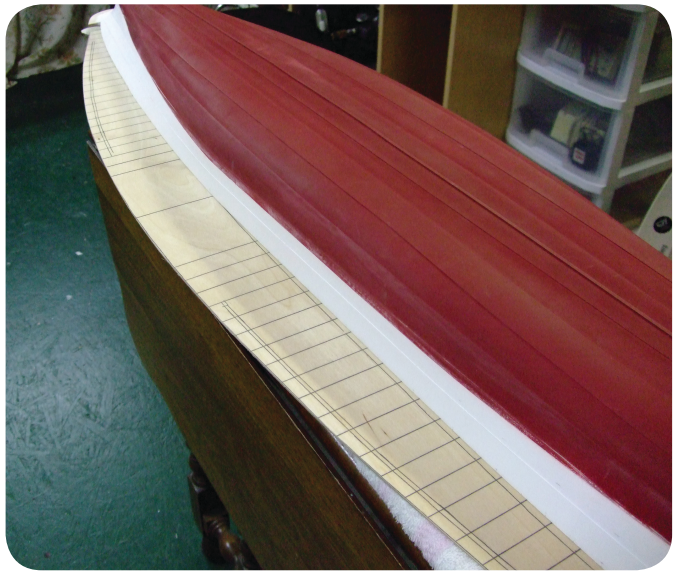
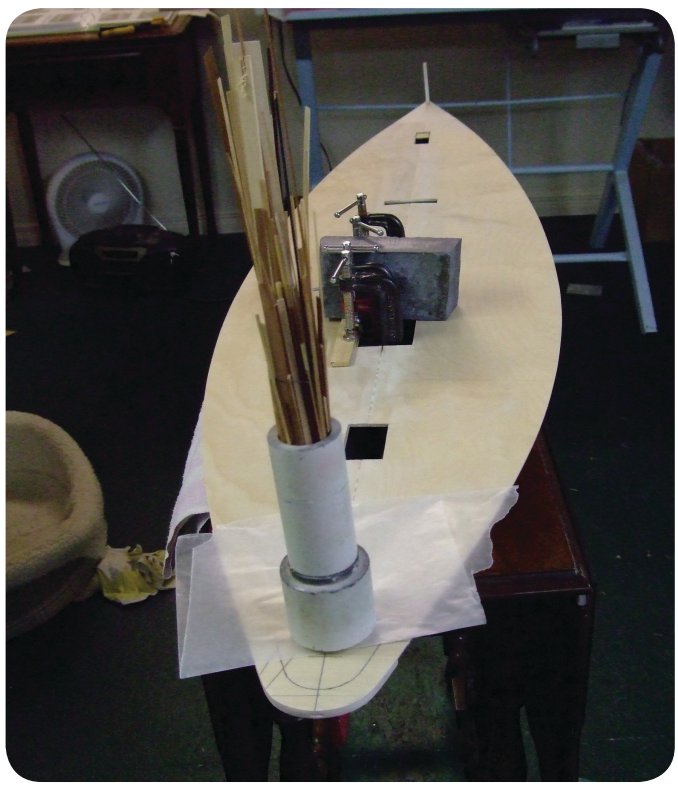


Photo 14 (above) & 15 (below). The next layer is glued onto the hull.



of the architect that the interior be built. Not many modelers wish to include the interiors but, I had decided that in this case, it was essential. These details were generated by my measurements taken on site and transferred on to the drawings. This process had to be used for the next deck as well. There will be more discussion on this later. The deck once prepared was carefully attached to the hull as is shown in **Photos 14** and **15**. Since the deck is curved, it needed to be weighted to ensure that the new layer would conform to that shape during glue setup.

Photo 16. The bracing on the underside of the deck.

Photos 17 & 18. There were triangular support structures required forward and abaft of the paddle-wheel openings. A total of seven on each side were required.

Photo 19. The next type of brace for the deck was made of wood and nesting square Evergreen tubing.

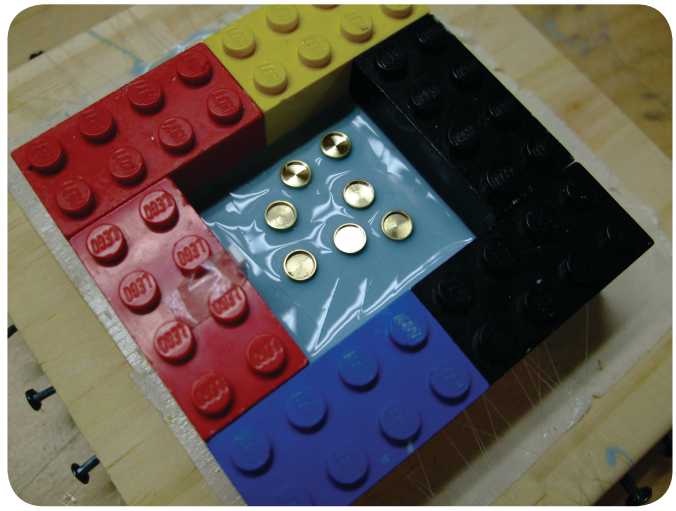


Photo 20. Porthole brass masters are used to make a mold to supply enough for the hull.

Photo 21. The portholes are in and the painted braces are mounted.

The horizontal bracing under the deck was constructed out of Evergreen Styrene products. Each station consisted of the horizontal "L" brace fortified by a semi-triangular vertical brace. Each location needed to be custom made since the hull curve changed in each case. This was a long and tedious task. **Photo 16** shows a section of these braces.

At the location of the paddle-wheel openings as seen in **Photos 17** and **18**, triangular supports were required, four forward and three abaft. The supports closest to the openings were a different design and as a result strength. The remaining five were less complex but the same in form.

By this time I was getting a bit tired of braces, however, there was more to be done. **Photo 19** shows the design of the remaining supports. These were built from pine cut to exactly the inside dimensions of Evergreen Styrene square tubing. The size I chose was 4.8 mm squares. At each end of these braces there needed to be a mounting boot. The square tubing sizes are telescoping so I selected the next size up to form the flange of the boot. This structure had to be cut to a length so that it would

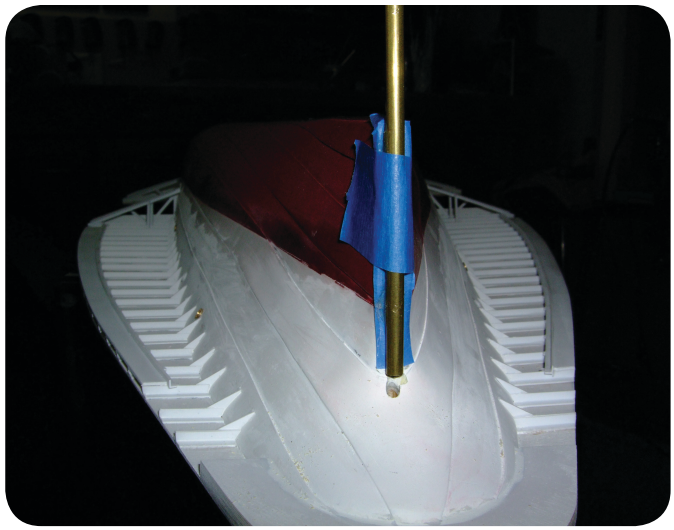
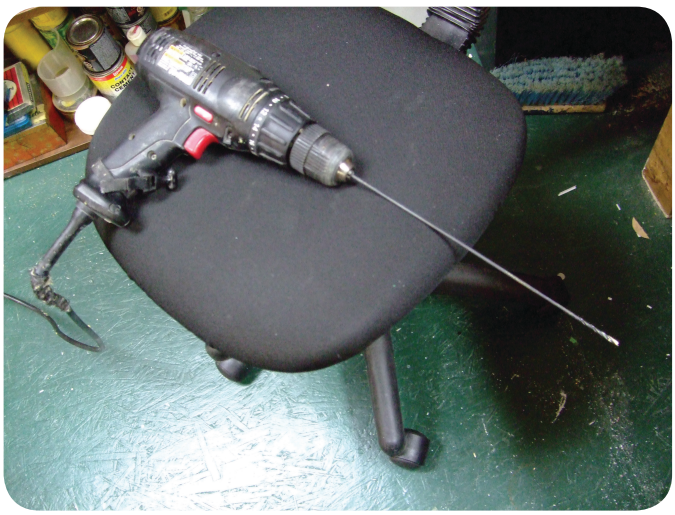


Photo 22. The jig is for the purpose of cutting the hole for the rudder shaft.

Photo 23. The drill bit is required to be long, but the jig serves to do a good job of guiding the cutter true to the vertical.



3it on an angle from the hull to an outboard "L" brace that ran along the outside edge of the deck. **Photo 19** shows the arrangement of the brace. The difficulty here was to ensure that the brace end on the hull remained a constant depth from the deck. The lower edge of the first outer plate acted as a guide. Unfortunately, this meant that each boot needed to be filed to fit over the lip of this plate edge. This proved to be challenging.

These braces were not glued in place until they were all fabricated. They then were removed and painted. While they were off being painted, I milled on the lathe porthole frames masters, made a mold and cast enough to insert into the required locations in the hull. **Photo 20** shows the mold partially finished and **Photo 21** shows the newly painted braces and the portholes installed.

The last task for this stage of the build was to locate and cut the rudder hole in the hull. **Photo 22** shows the jig that I put together to ensure that the drill bit will locate properly and cut true to the vertical. The brass tube was taped onto the vertical edge of the hull where the attachment hinges for the rudder would be located. This acted as a guide since the long drill bit shown in **Photo 23** just fits within it. The tool is a bit gruff but with the help of the jig worked well.

After all the brace work I was able to return the ship hull to its proper arrangement, that is to say, right side up. I decided, after all, this, I needed a diversion. Chip Stulin the curator at the Shelburne Museum had found me a set of 1/48-scale plans for the Walking-Beam Steam Engine. So I decided to build up a full engine to be used in the model. This leads me to a bunch of new adventures that I will share with you in Part 3.