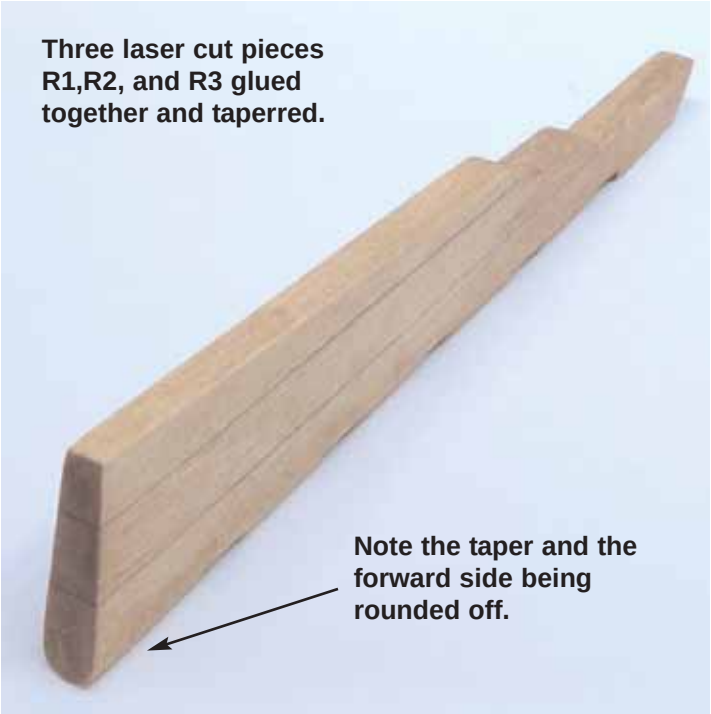
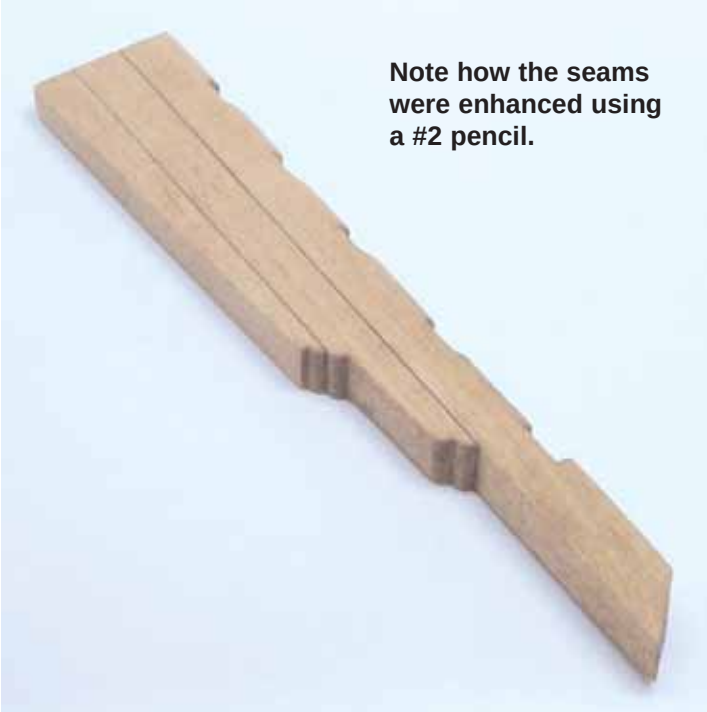
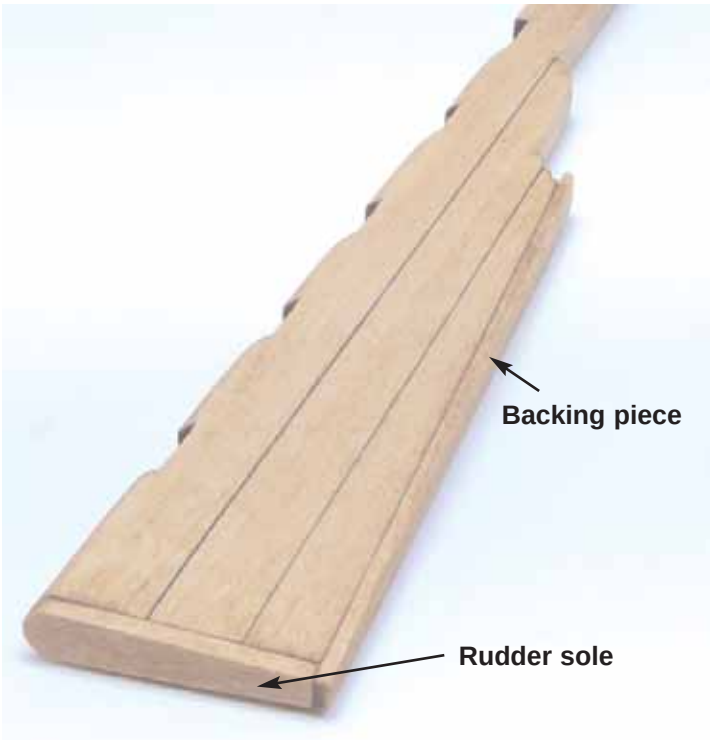




Chapter Eight

Constructing and Installing the Rudder

There are three laser cut pieces for the rudder. They are ¼" thick (R1, R2, and R3). Sand off the laser char and glue them together as shown in the photos provided. You should accentuate the seams between the three pieces with a pencil just like you did when assembling the stem parts. Once assembled, the rudder should be tapered as it progresses aft. This taper should also slowly transition from ¼" to around 1/8" thick as it works its way to the keel. The rudder is tapered from the top and the forward edge (1/4" thick) down to approximately 1/8" thick at its lower aft edge.



The forward edge of the rudder should be rounded off where it will sit against the stern post. You can see this clearly in the photos. This would allow the rudder to more easily swing port to starboard on its hinges (pintels and gudgeons).

Adding the Backing Piece and Rudder Sole-

Add the backing piece first. This will be added to the aft side of the rudder. Use a 1/4" x 1/32" basswood strip. Cut it to length and glue it into position. Note how the top of the backing piece extends above the top of R1. This creates a nice detail that can be seen on plan sheet one. Then sand the backing piece flush with the edges and bottom of the rudder.

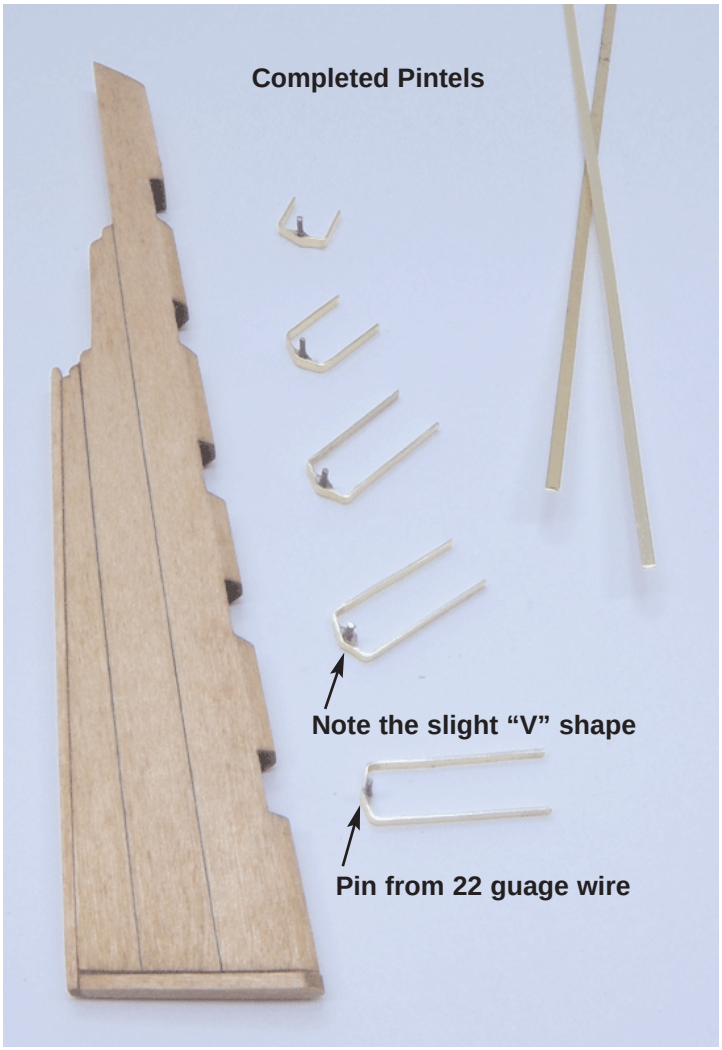
The rudder sole is added next. It protects the bottom of the rudder much like the false keel does on the keel. Use a ¼" x 1/16" basswood strip. Sand it flush to match the shape of the rudder.

Creating the Pintels-

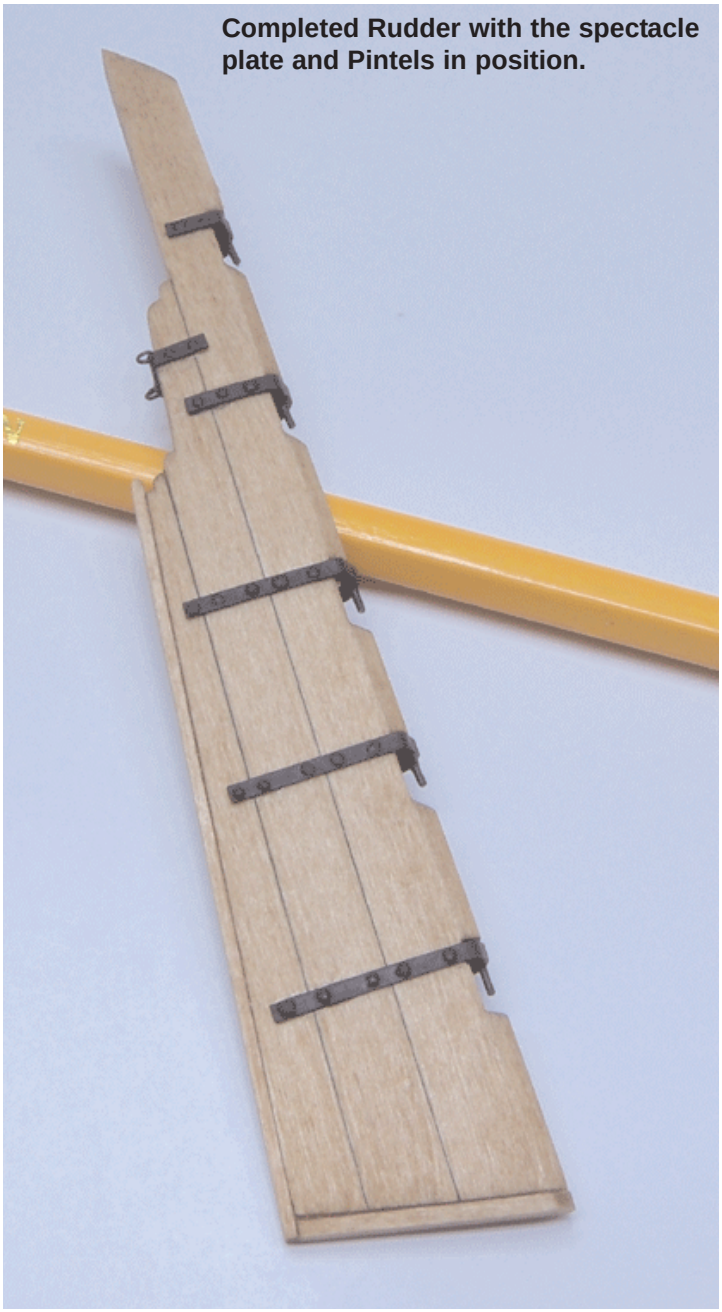
The half of the rudder hinge that attaches to the rudder is called the pintel. The gudgeons are the other half. The gudgeons are secured to the ship's hull. The pintels are made using the wider brass strips supplied with the kit. There will be five pintels attached to the rudder. Cut five extra long strips from the brass. Make them a lot longer than you need them to be. After you shape them initially, you can cut each side of the pintels to their correct length using the plans as a guide.

Use a scrap piece of wood that is ¼" thick to bend the pintel strips into shape. Bend the strips around the wood being careful to create a nice sharp bend. Note in the photo that there is a slight "v" shaped profile for the inside edges of the pintels. You can leave the legs (straps) of the pintels extra long and cut them evenly only after you are satisfied with their overall shape.

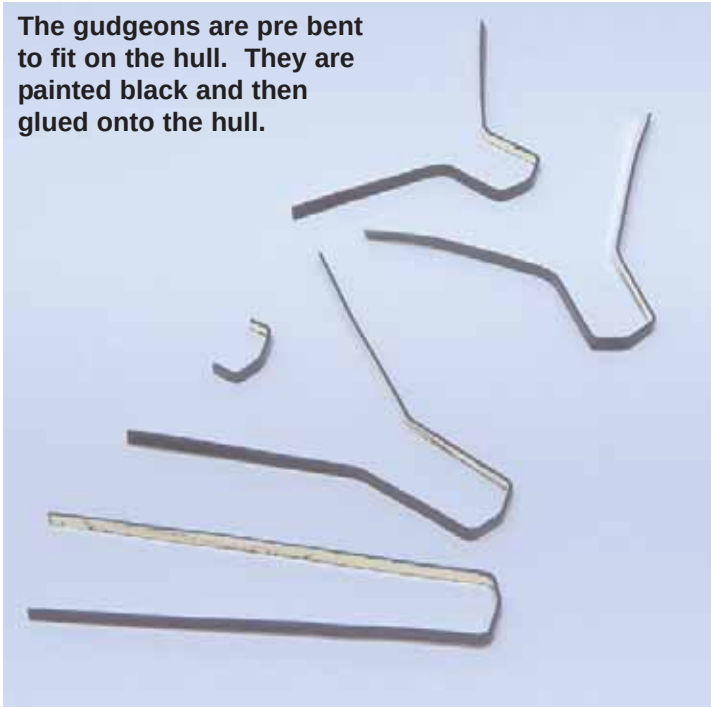
The pintels have a small hinge pin glued or soldered on their inside edge. They should be positioned in the "bend" of "V" shape you created which should be centered on the inside edge. The hinge pin was made from 22 guage black wire. Cut a small length of wire and glue/solder it into position. See the photo provided. Paint the pintels black before you glue them onto the rudder. When gluing the pintels on the rudder, position them carefully so that they are all at the same angle. They should be aligned at a right angle to the forward edge of the rudder. There are small notches along the forward edge of the rudder. The pintels are glued against the top of each notch with the "pins" facing downward. Examine the plans and the photos of the completed rudder for the details.



You might also decide to simulate the bolt heads that hold the pintels and gudgeons onto the hull. To do this, simply use an applicator like a sharpened toothpick or a length of 22 guage wire. Dip the end in some CA (super glue) and then dab a small droplet on top of the pintel. The droplet will dry in the shape of a round raised dot. Once painted over it does a good job of simulating the bolt heads. Wait until the droplets are completely dry before you paint them. You can use a CA accelerator to speed up the process. The accelerator comes in small spray bottles and can be sprayed onto the droplets to instantaniously cure them. This technique does take some practice. Experiment on some scrap and try to form droplets that are evenly spaced and consistent in size and shape. If you are happy with the results



Completed Rudder with the spectacle plate and Pintels in position.



The gudgeons are pre bent to fit on the hull. They are painted black and then glued onto the hull.

you can give it a try on your pintels, gudgeons, spectacle plate, and gunport hinges, etc.

The spectacle plate –

The spectacle plate is shown on the aft side of the rudder. The rudder pendants (rudder preventer chains) are attached to it as a safeguard. Should the rudder lift free from hull in rough seas, the pendants prevent it from drifting away. The spectacle plate is basically an iron strap with two eyebolts on each corner. See the photo provided. To make the spectacle plate, use the same brass strip you used for the pintels. Before you bend it however, drill two small holes through the strip. The holes are located in each corner (or at each bend) of the strip. Just hold the strip against the rudder where it will eventually be placed. Mark the location for both holes (they will probably be ¼" apart).

Bend your strip along the holes and "test fit" the spectacle plate on the rudder. You can solder two eyebolts into each hole now or add them after the strip is glued onto the rudder. If you choose the later method, simply drill into the rudder itself - through the holes you made in the brass strip. Then glue the eye bolts into those holes. The spectacle plate should also be painted black. See the photo of the completed rudder. Set it aside while you prepare the hull in order to mount it.

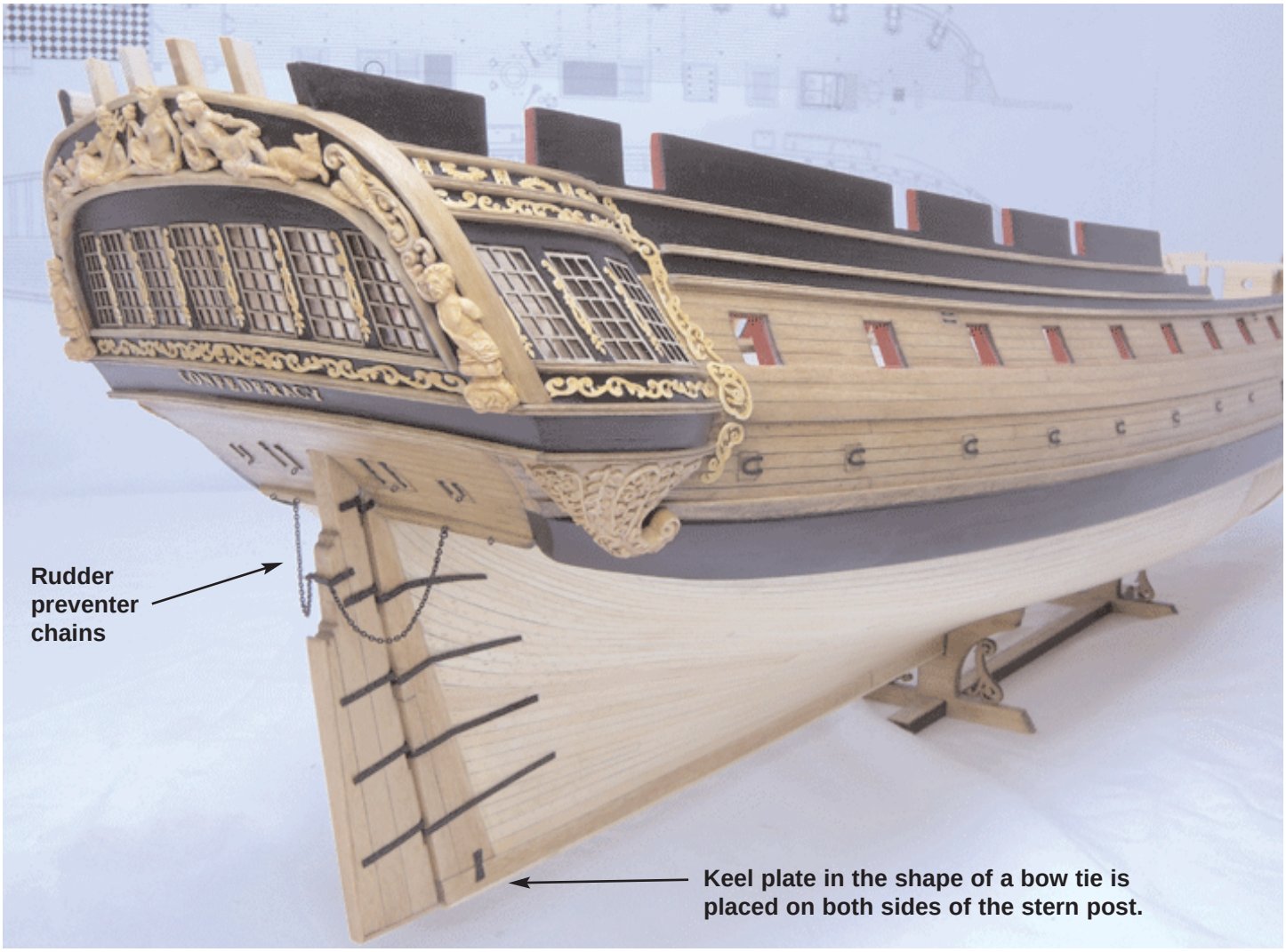
Making the hole in the lower counter for the rudder

Drilling the hole for the rudder into the lower counter-

The rudder will fit into a hole that must be made in the lower counter. Turn the model upside down to make this hole. Make sure you support the model properly when doing so. Start by drilling a smaller hole in the center just abaft the stern post. Then use a round needle file to enlarge the hole and shape it. See the photo provided. Periodically check that the rudder fits well enough into the opening. The opening should be large enough that the rudder can swing freely from side-to-side.

Making the Gudgeons –

The gudgeons are made the same way as the pintels. Use the same size brass strips. Bend them around the scrap piece of wood and create the same v shaped end. When that is completed, take each gudgeon and bend its legs to the approximate shape of the hull where they will be glued. You can find the locations for them by holding the rudder against the stern post so you can mark their positions. You should also mark the angle for each gudgeon as well. Then you can test-fit each one in position and pre-bend it so it will fit properly. This is especially important where the legs of each gudgeon transition from the stern post onto the hull. See the photo provided that shows all of the gudgeons for the prototype painted and pre-bent. Glue them onto the hull afterwards. The hinge pins on your pintels should be short enough that you can place them into the gudgeons once the gudgeons are glued into place. You should be able to lift the rudder up and off the model once the gudgeons are in position as well. Make any adjustments to your pintel pins so this is possible. The rudder should swing freely back and forth. Examine the photos of the model with the rudder in position.




CONFEDERACY

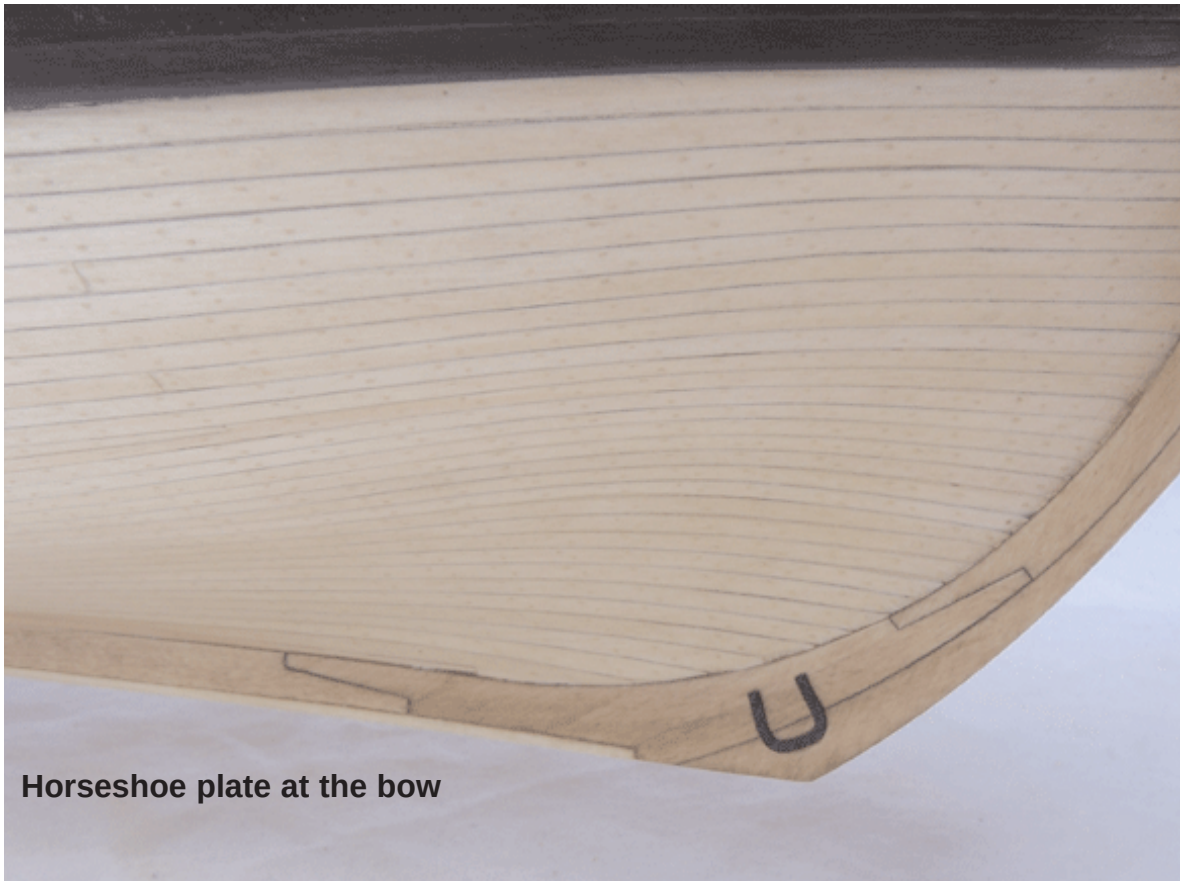
Adding the Rudder preventer chains –

A small length of chain is supplied with the kit. The chain is brass and will need to be chemically blackened or painted black. Cut it into two short lengths as shown in the photos. One end of the chain is attached to the eyebolt on the spectacle plate. From there, the chain is taken up to another eyebolt glued into the molding of the counter. Make the chain long enough that you create a nice “drape” in it as shown. Try and keep the drape of both preventer chains even and consistent. Also note in the same photo that an additional eyebolt is glued into the same molding (under the smaller stern ports). These additional eyebolts were used for various things and its a nice additional detail to show.

Adding more photoetched details –

With the rudder completed, you can now add some additional photoetched details. The stern port hinges can be painted black and glued into place. Also glue an eyebolt on the bottom of each stern port lid. If you decide to show this feature, a small length of rope (.018 tan rigging line) can be seized to the eyebolt and then inserted into a small hole drilled above each port. There is also a small “bow-tie-shaped” plate that can be painted black. This keel plate should be added to both sides of the stern post as shown on the plans. Another “horse shoe” plate can be added at the bow. Paint it black and position it as shown in the photo provided. These plates helped fasten the various pieces of the stern post and stem together.

Finally, to finish off this chapter, you can add the sweep port hinges along the sides of the hull. Note how the open end of the sweep port hinges faces the bow. The hinges for the ballast port lids should be painted black and glued into place. Add an eye bolt on the ballast port lids as well. After you glue them into a pre-drilled hole, bend the “eyes” downward. These rings would normally be attached to smaller eye bolts and allowed to fall naturally with gravity. Bending them downward will simulate this look. Should you want to show the halliard (.018 tan rigging line) used to open the lid, seize it to the eyebolt and insert the other end into a little hole drilled above the port. Examine the photos provided.



Horseshoe plate at the bow