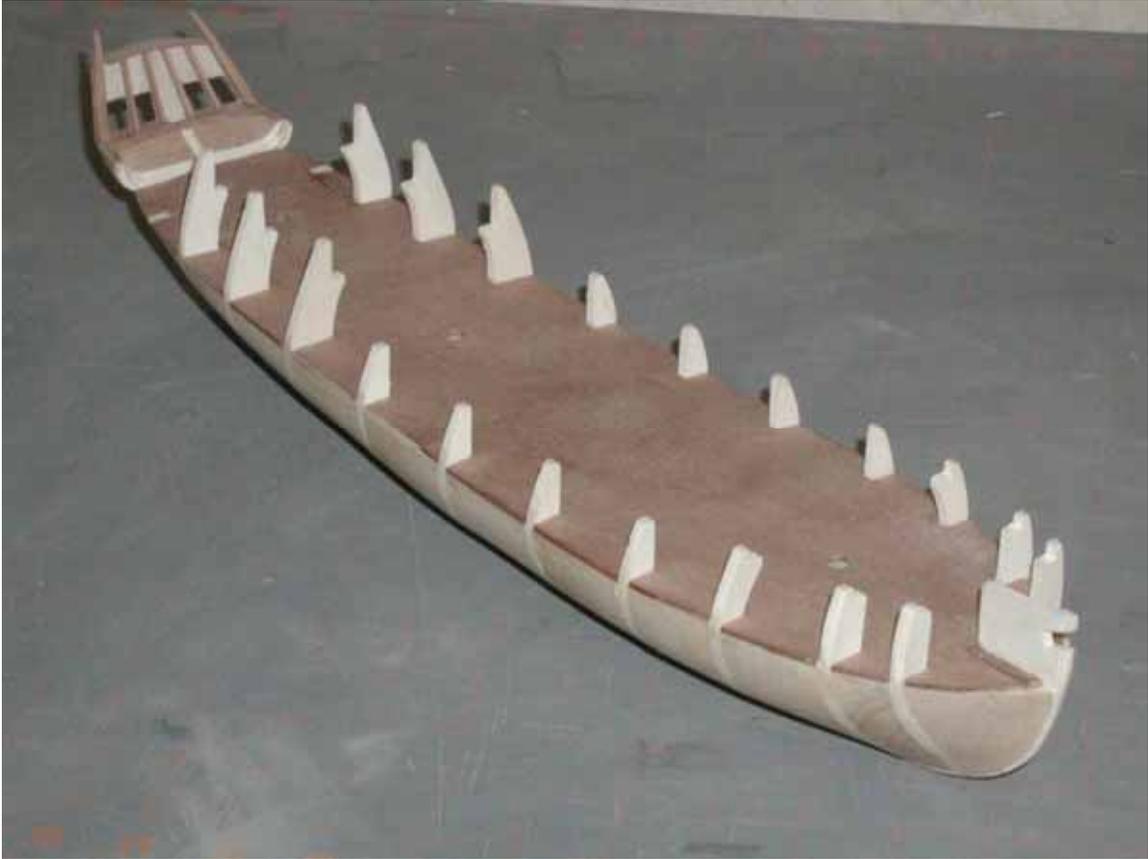


# Modeling the Rattlesnake

## Chapter 1, Supplement



A Practicum by Robert E. Hunt

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## **1. Building The Framework, Scratchbuilt**

We begin construction of the model with the framework. The framework consists of a keel made from basswood plywood, bulkheads also of basswood plywood, and a thin plywood false deck made from mahogany. Before we can start gluing bulkheads to the keel, we must first do a number of preparatory things.

### ***1.1 The Plywood Keel***

The scratchbuilt version of the model follows the same instructions as building the kit out of the box for this section. See the main chapter for additional information on this construction.

## **1.2 A New Stem**

For those adventurous modelers who would like to enhance the look of their model, I will show you how to make the portion of the keel that will be seen, using some other hardwood. For those who do not wish to make this modification, you do not need to follow this section.

This modification will require you to own a set of Harold Hahn's plans of the Rattlesnake. Since this is copyright protected material, I cannot provide you with a copy of his plans. You will have to purchase the plans directly from Mr. Hahn. You can order the plans from him by writing to him at:

Harold Hahn  
1212 Gordon Road  
Lyndhurst, OH 44124

I'm not sure what his current charge is for this particular set of plans. The plans come in 1/4" scale. Our kit is in 3/16" scale.

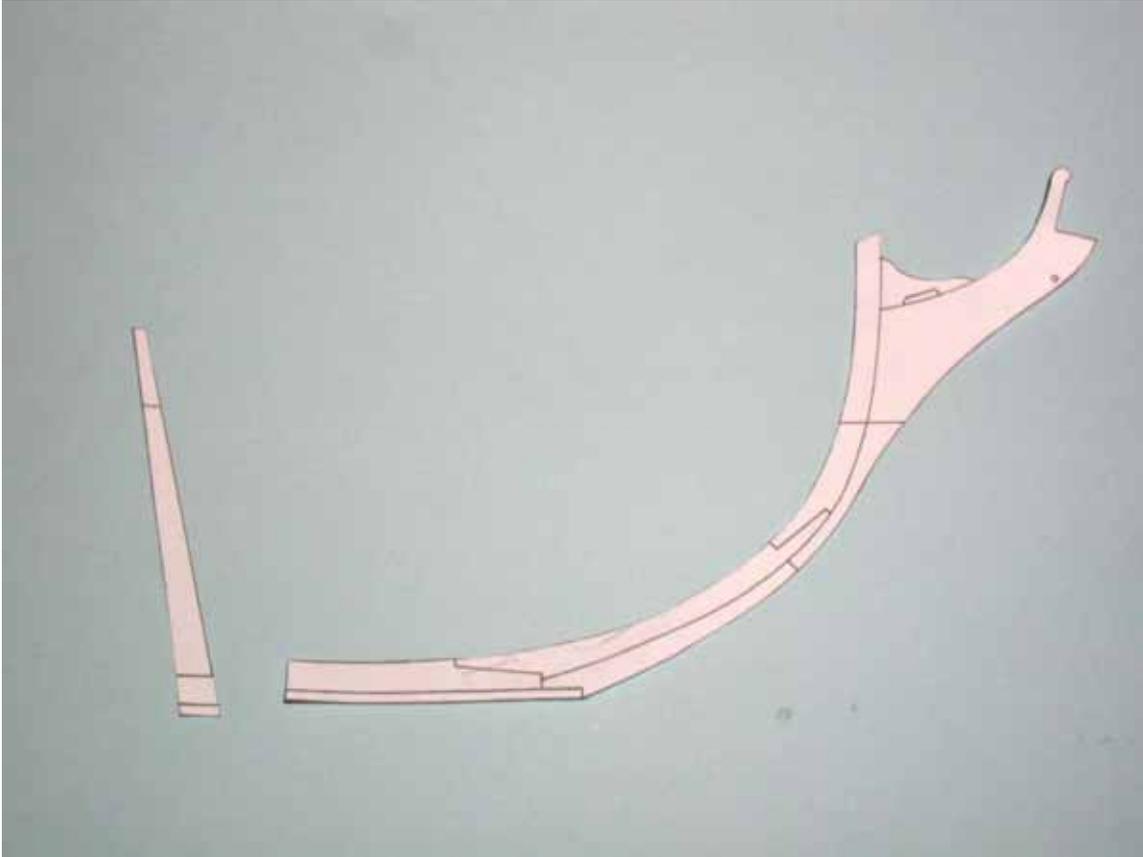
First, let me explain a little bit about scales. Typically, model ships were built in 1/4" scale. This means that 1/4" on the model was equal to 1' on the real ship. This is a ratio of 1:48. Admiralty draughts were always drawn in this scale. However, as kit manufacturers are looking for ways to keep production costs down, most kits are designed in some smaller scale.

Our Mamoli kit comes in 1:64 scale. This equates to 3/16" scale, meaning that 3/16" on our kit is equal to 1 scale foot on the actual ship. So the first thing we must do is reduce the Hahn plans to 3/16" scale. If you set a copier to 74% reduction, you can copy the original Hahn drawings to the same scale as our model.

I took the reduced Hahn drawing and compared it to the kit's plan, sheet B. I found that the kit's drawing was fairly accurate compared to the Hahn drawing. However, the kit's placement of the masts are inaccurate and the shape of the stem is inaccurate. We will be correcting the mast placement when we reach that stage. We will be correcting the stem problem in this section.

The area we will be using to make this modification is from the profile frame drawing of the ship. You will need to make at least two reduction copies of this drawing in its entirety if using the Hahn drawings. I have a scanner/copier/printer connected to my computer and was able to copy the drawing in three parts and tape all of the parts together. If you purchased the Hahn drawings, you will make copies of his profile plan at 74% reduction.

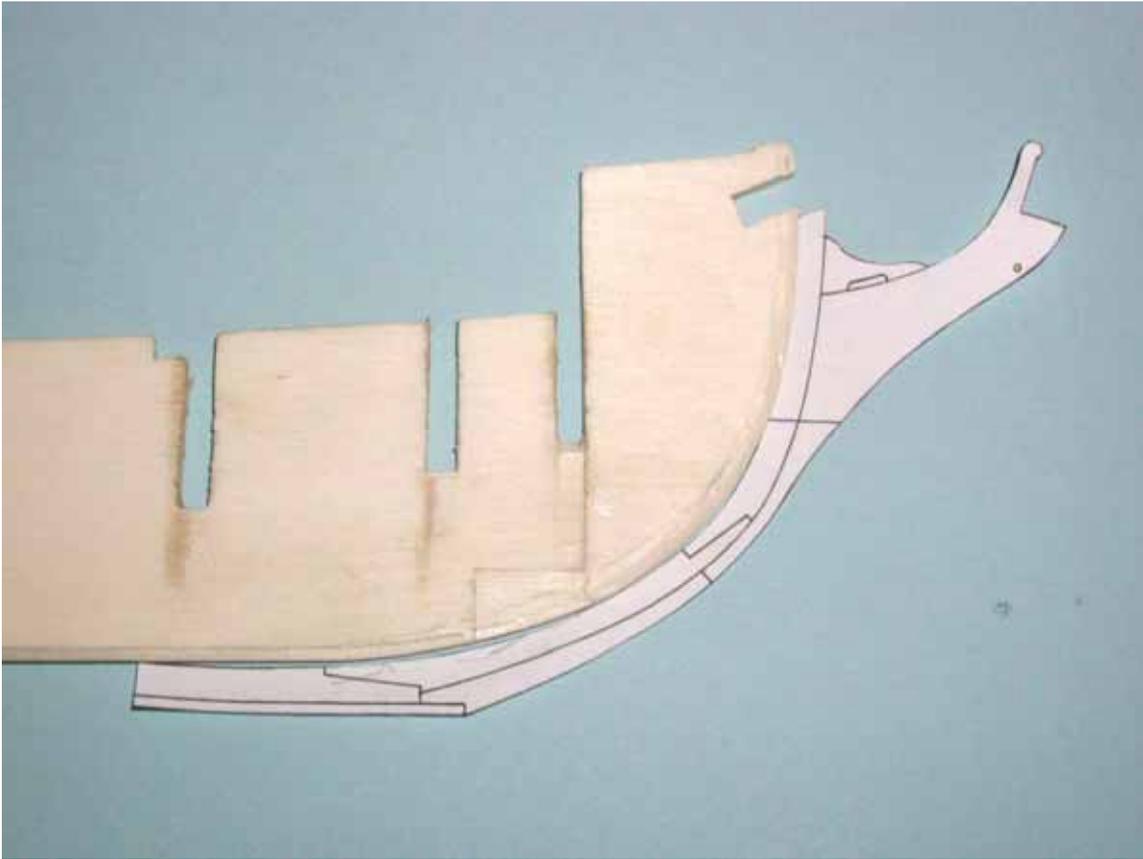
After reducing the Hahn plans to 3/16", you will need to cut out the stem area on the rabbet line. Photo P1.2-1 shows the portions of the Hahn plans you will use.



**P1.2-1**

As you can see in this photo, I stopped where the rabbet straightens out. This pattern will be used to match the new stem to the kit's plywood keel. However, before doing that modification, **you must complete** sections 1.3, 1.3.1, and 1.3.2 first. That is the procedure I followed.

Photo P1.2-2 shows the stem of the kit's keel, how it has been removed, and how the new scratchbuilt stem will be attached. Section 1.3.2 covers the removal of the kit's stem, keel and sternpost.

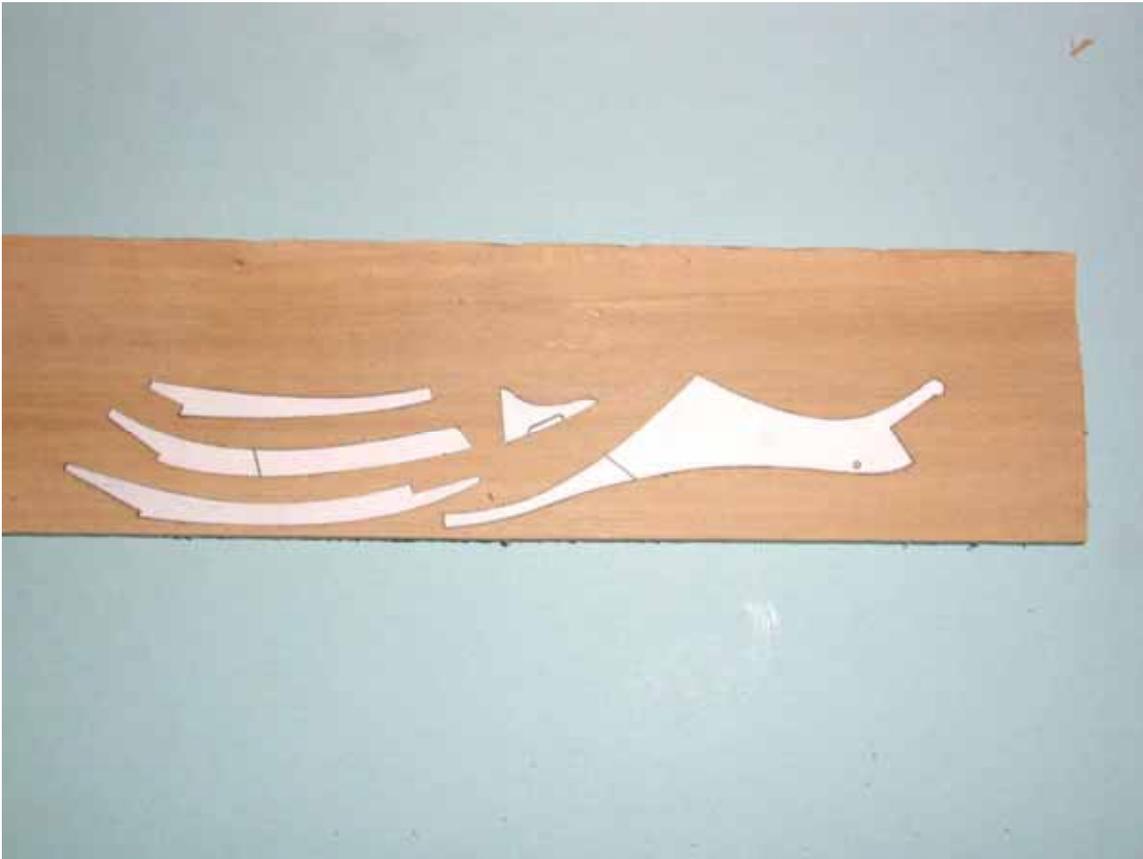


**P1.2-2**

There are two ways to make this new stem. One way is to cut the entire piece out as one solid piece. The more difficult alternative is to cut the individual pieces out and then glue them together as I have done.

If you do not have the means to mill your own wood, you can use pre-milled wood that is  $\frac{5}{32}$ " thick. The actual thickness of the stem is .145". Pre-milled wood that is  $\frac{5}{32}$ " thick is a more common size. This is about .010" thicker than it should be but will suffice for this application. If you have the Rattlesnake wood package, your package should contain several pieces of  $\frac{5}{32}$ " x  $\frac{3}{4}$ " boxwood which is used to make the stem pieces. Basswood could be used and provides certain advantages. Being softer, it can be cut by hand with a #11 Exacto or jewelers saw. If you have power tools, such as a scroll saw, you can use a harder wood.

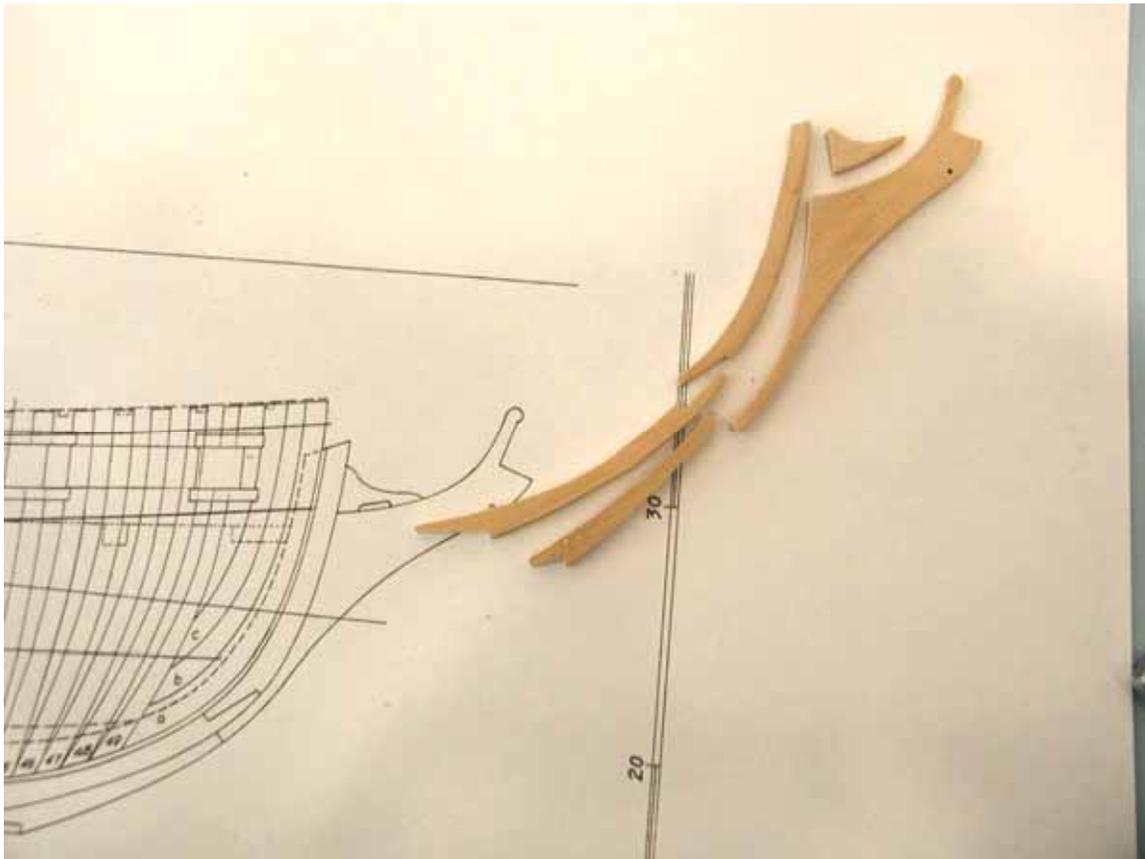
I used boxwood to make my stem. You can make the stem in one solid piece by rubber cementing the entire pattern to the stock. Or, you can cut the pattern pieces out with a pair of scissors and rubber cement the individual pieces to your stock. Photo P1.2-3 shows the pattern pieces cemented to a piece of boxwood for my model.



**P1.2-3**

Next, cut the pieces out on a scroll saw or use a jeweler's saw to cut them out by hand. This would not be an easy task to perform by hand unless you are very skilled with a jeweler's saw or coping saw. The edges absolutely must be at a 90 degree angle to the surface. If you are using basswood, it is possible, but not easy, to cut them out with a #11 Exacto.

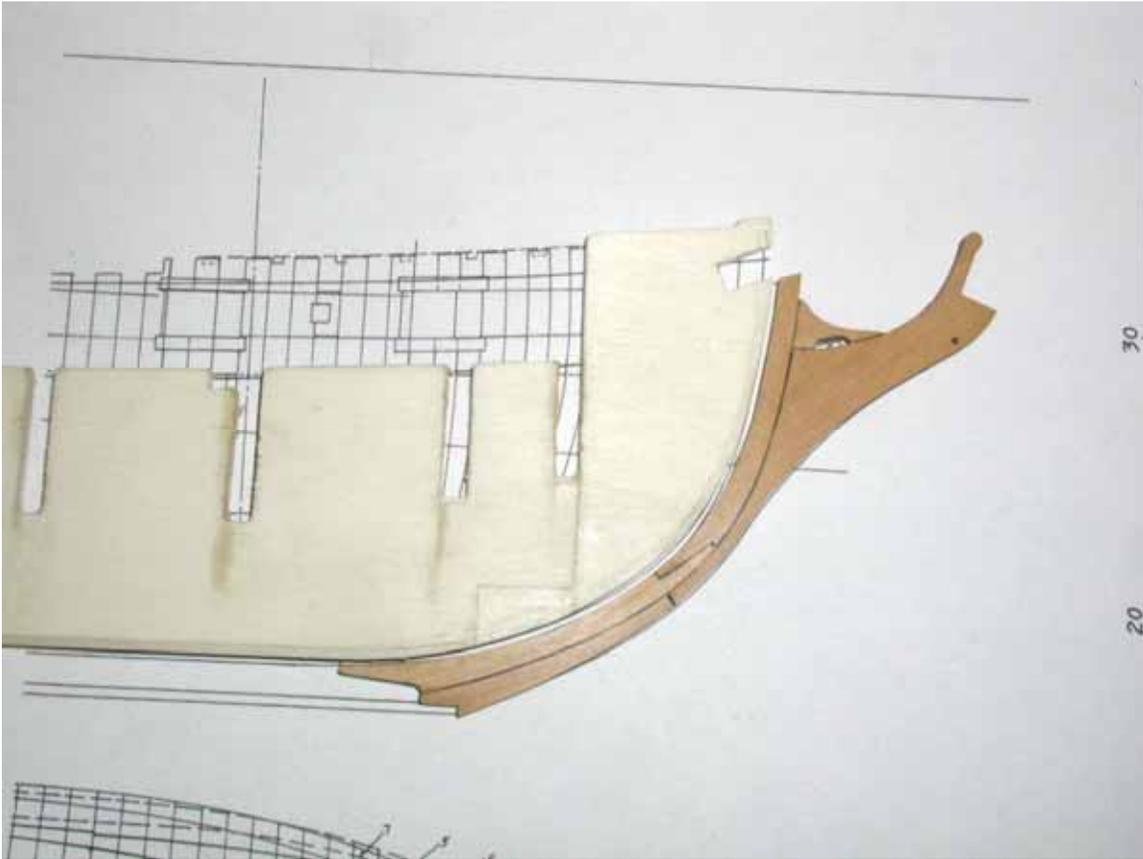
Once cut out, you will have to clean up the edges and test fit the pieces making adjustments with minor scraping and sanding until a reasonable fit is obtained. You should have a second copy of the pattern on hand and use it as a guide in fitting the pieces together. By holding pieces that join together up to a light source, you can see any areas that need adjustment by looking for gaps where the light shines through. Photo P1.2-4 shows the individual pieces after they have been cut out and cleaned up to fit together well.



**P1.2-4**

When you are satisfied with the fit of the pieces, darken the surfaces that get glued together. I like to use a soft artist pencil that looks like a piece of artist chalk but is much harder. It produces a very black surface that will simulate the tar caulking.

I used Weldbond to glue my pieces together. Photo P1.2-5 shows the stem glued up and placed on top of the Hahn drawing with the kit's plywood keel in place with it. Be sure and use a copy of your drawing as a guide, gluing one piece at a time and test fitting it to the pattern. If you see that things are not fitting the pattern well, you will need to stop and assess what the cause is. That's why it is best to dry fit the pieces over the pattern before gluing.

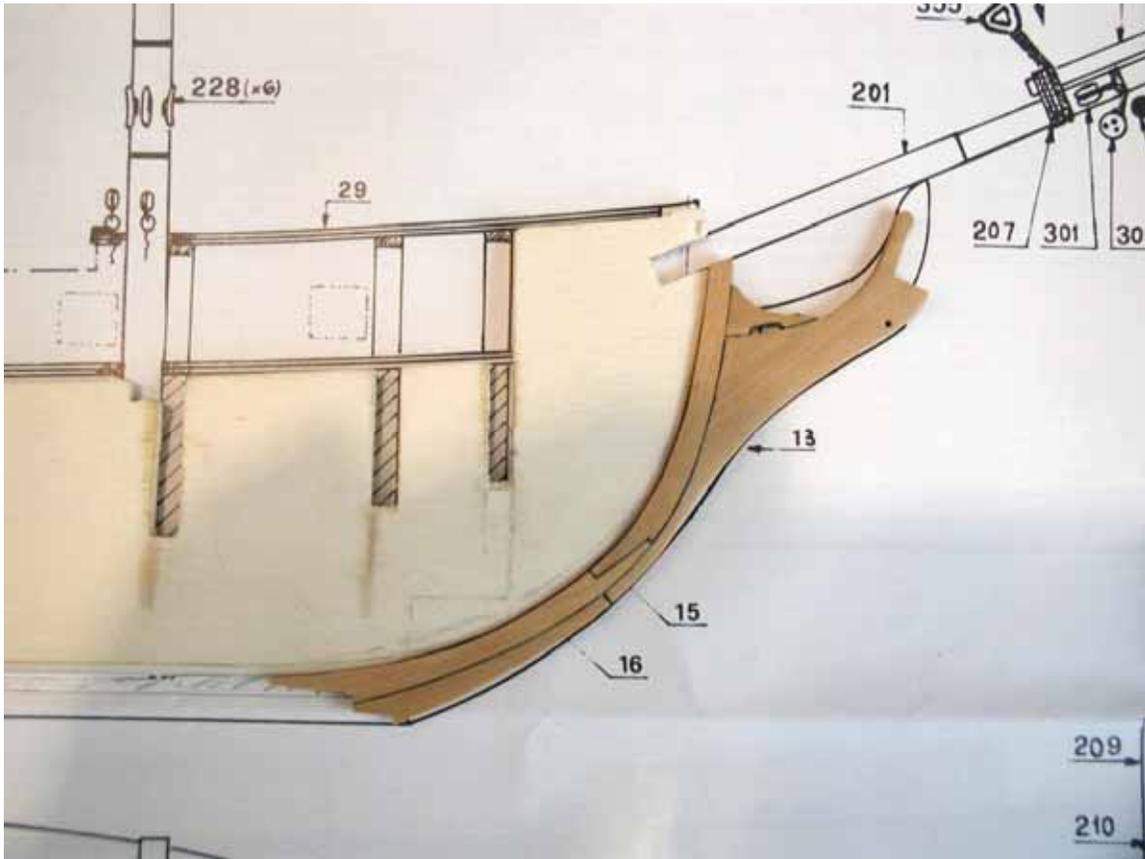


**P1.2-5**

Photo P1.2-6 shows the piece on top of the kit's plan. As you can see in this photo, the actual shape of the stem is somewhat different than the kit's stem. You could trim the kit's stem to this correct shape if you purchased Hahn's plans and did not want to make a new stem. However, the actual figurehead is somewhat different than the kit's figurehead and any modification to the kit stem would require you to carve the figurehead from scratch as I plan to do.

You want to give the stem at least 3 coats of Minwax Wipe On Polyurethane finish or your favorite finish. I prefer the Minwax because it is very thin and goes on with an old piece of a T Shirt. I use the satin finish and rub it out after drying with #0000 steel wool between each coat. It leaves a very nice, not heavy looking finish on the hard boxwood. If you made your new stem out of basswood, use Minwax Polycrylic instead. This is a water based finish and just works better on the soft basswood than the Wipe On Poly does.

Set the stem assembly aside for now, we will not attach it to the model until later in the construction process.



P1.2-6

### **Summary**

- ❑ Reduce Hahn's profile plan on a copier to 74% and test fit to the kit's plans checking for scale more than anything else.
- ❑ Mill boxwood or some other hard wood to a thickness of .145" or purchase at this dimension. Or, use 5/32" thick basswood stock.
- ❑ Cut out the individual patterns that make up the stem and rubber cement to your wood stock. Or, use the pattern of the entire stem either from Hahn's plans
- ❑ Cut the pieces out on a scroll saw. Or, cut out the pieces using a #11 Exacto or jeweler's saw.
- ❑ Sand and scrape until a good mating of pieces is obtained. Ignore this step if you made your stem one solid piece
- ❑ Blacken the edges of mating pieces and glue together with Weldbond. Ignore this step if you made your stem one solid piece.
- ❑ Sand and finish with Wipe On Poly. Give it 3 coats and rub out each coat after dry with #0000 steel wool. If using basswood, use Minwax Polycrylic instead.
- ❑ Set aside for later construction.

### ***1.3 Lofting The Rabbet And Bearding Lines***

Regardless of your construction method, this section is applicable to both scratchbuilt as well as out of the box construction. See the main chapter for additional information on this construction.

#### **1.3.1 Transferring The Lines**

See the main chapter for details on transferring the lines to the plywood keel.

#### **1.3.2 Cutting The Rabbet Joint**

See the main chapter for details on cutting the rabbet joint on the plywood keel.

## **1.4 Assembling The Bulkheads**

Regardless of your construction method, this section is applicable to both scratchbuilt as well as out of the box construction. See the main chapter for additional information on this construction.

### **1.4.1 The False Deck**

See the main chapter for details on the main deck construction.

### **1.4.2 Additional Bow Bracing**

This construction is replaced by balsa filler blocks covered in section 1.4.3.

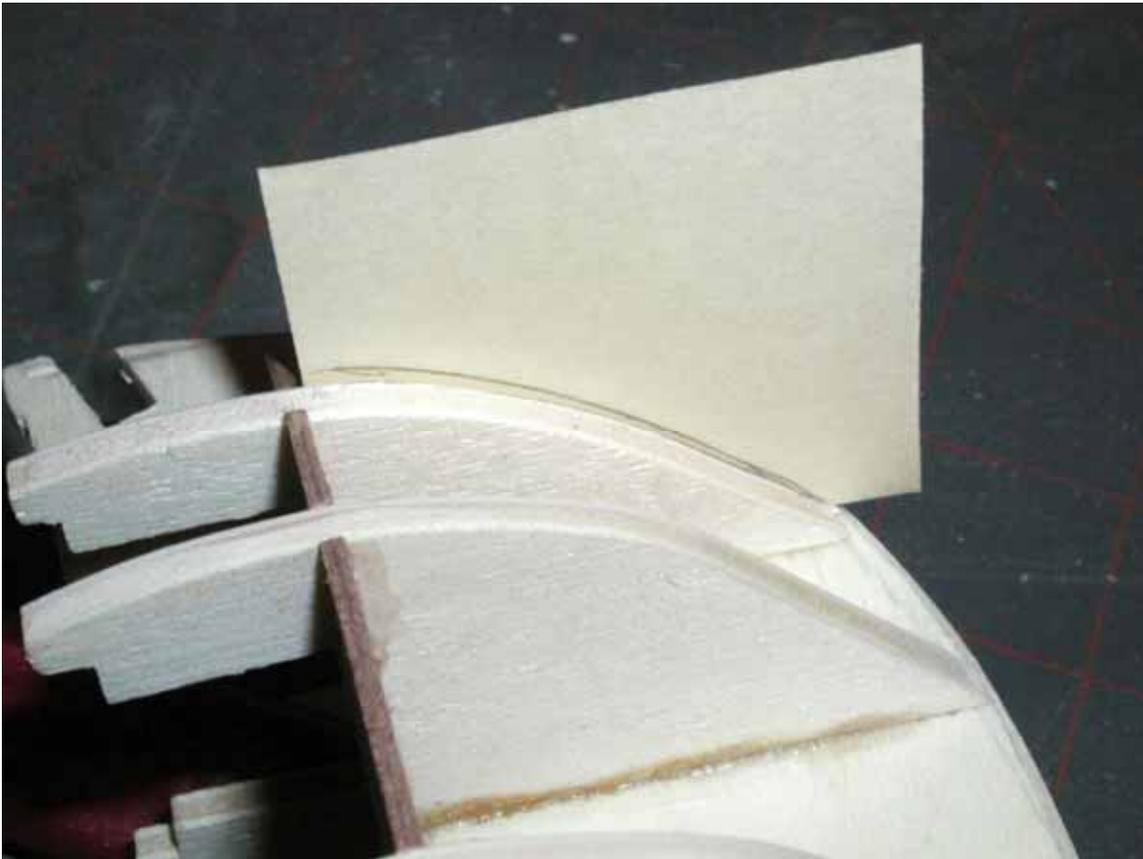
### **1.4.3 Balsa Filler Blocks**

For those who wish to add a balsa filler piece at the bow, you will need to obtain some 2" x 3" balsa blocks. I purchased three 12" lengths of Midwest Balsa from a local craft store. The part number is 7014. You can purchase these blocks from Mainline Hobby Supply Inc., <http://www.mainlinehobby.com>.

In addition to the bow filler block, we will be using balsa filler blocks between each of the bulkheads. This serves two purposes. First, it makes the entire hull a solid block of wood giving it added strength and providing a surface to attach planking so that double planking will not be necessary. Second, it makes it much easier to fair out the bulkheads and give us a good and fair hull for planking. Since the gunports are all above the deck line, we can make the bottom of the hull a solid block of wood.

The bow filler is a little tricky. You will need a scroll saw or you will need to be able to cut the curves with a coping saw while clamping the block of wood somehow.

Start by taking a square piece of card stock and placing it against bulkhead 1 so that you can trace the outline onto the card stock as shown in photo P1.4.3-1



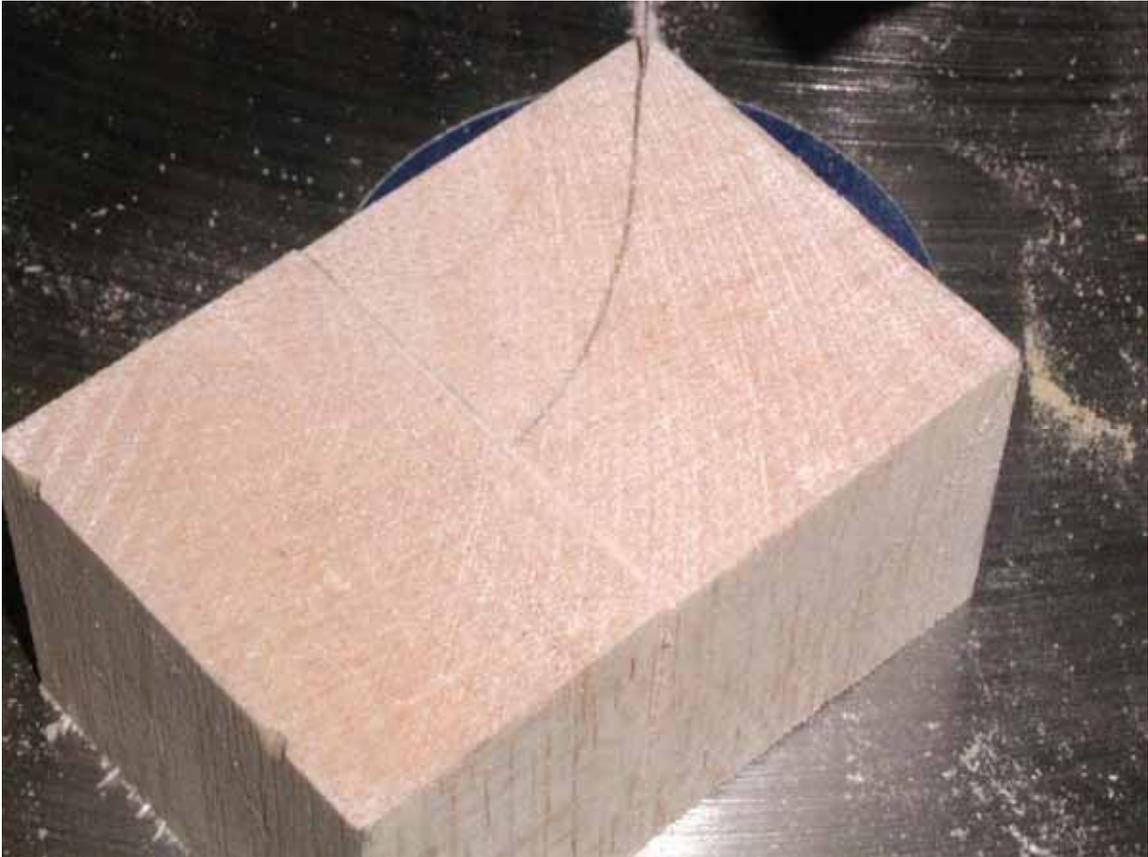
**P1.4.3-1**

Next, cut out the template and transfer this shape to the piece of balsa wood. You want to align the edge with one edge of the balsa wood and the tip with the corner. Make another template of the rabbet joint. On my model, because the stem has been removed, I simply placed the card stock against the side of the plywood keel and traced where the rabbet joint was in the same manner I traced the bulkhead. Photo P1.4.3-2 shows the patterns transferred to the balsa block.



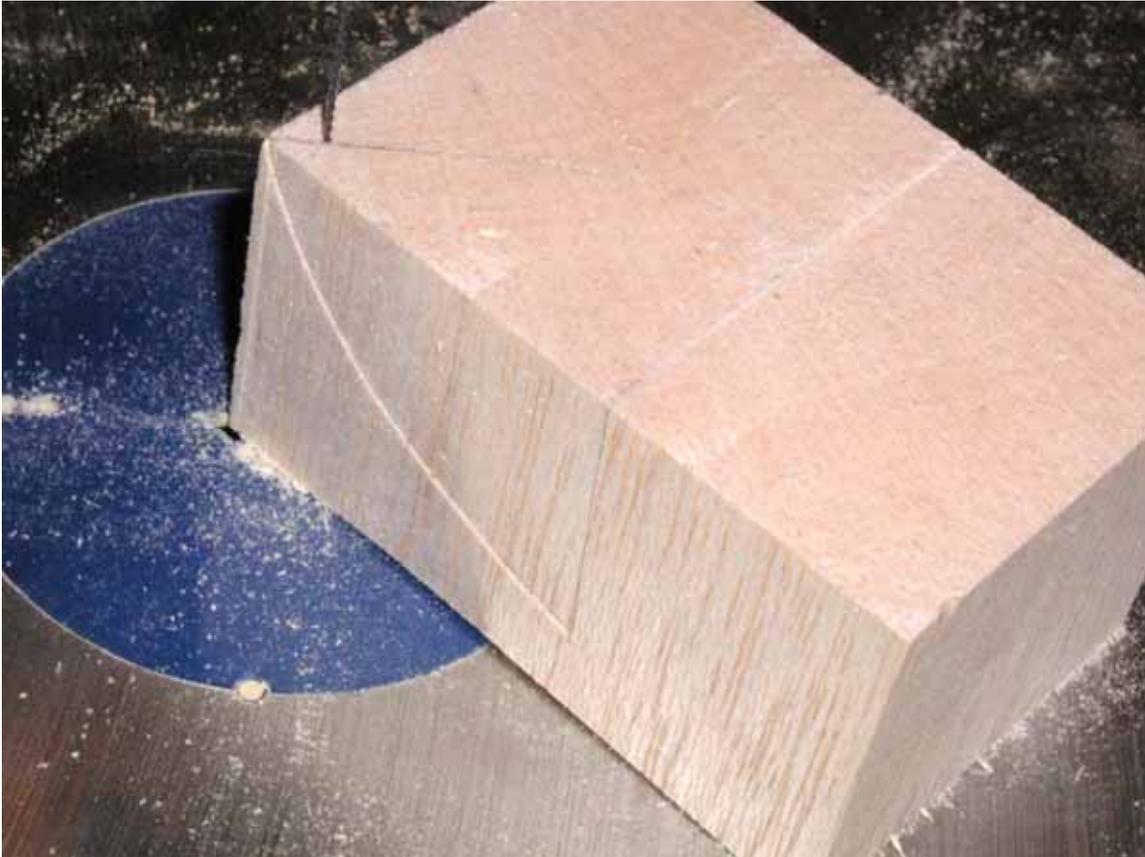
**P1.4.3-2**

Now cut the one side out on your scroll saw as shown in photo P1.4.3-3.



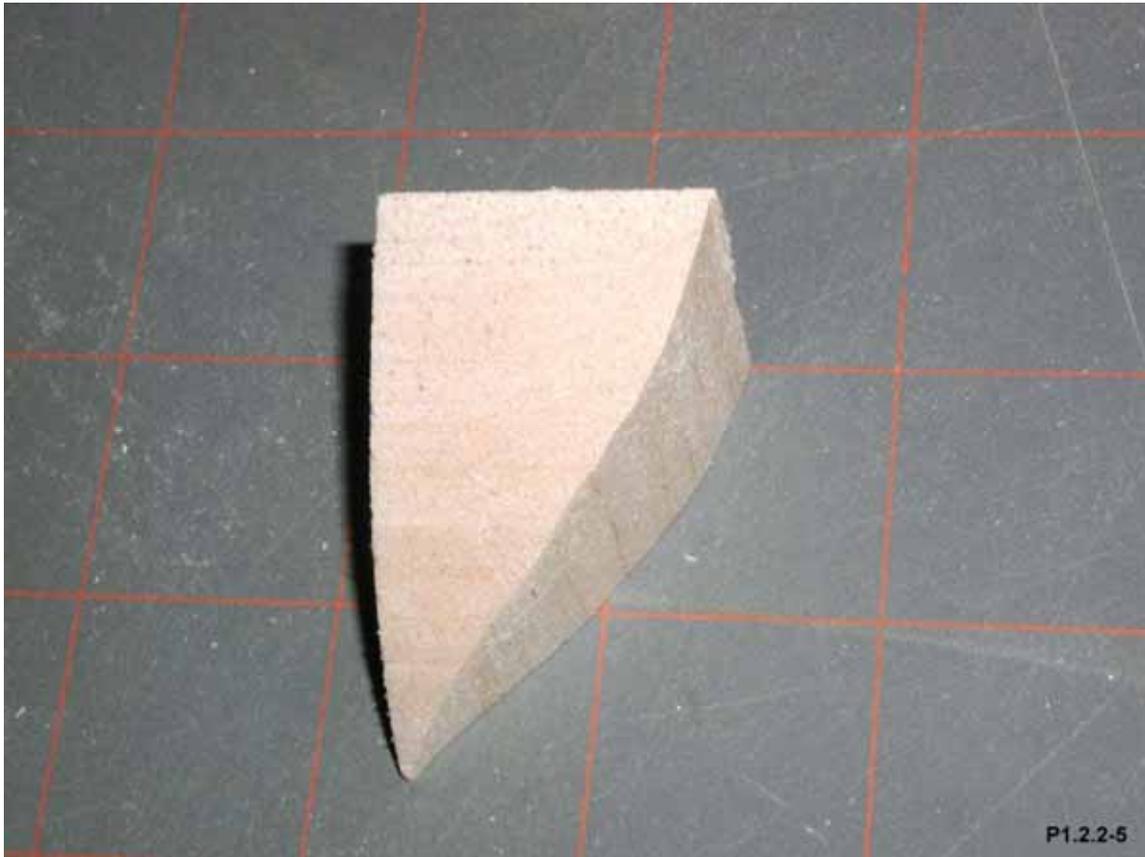
**P1.4.3-3**

After cutting the part out, put it back into the block of wood and flip the wood over so that you can cut the other side as shown in photo P1.4.3-4.



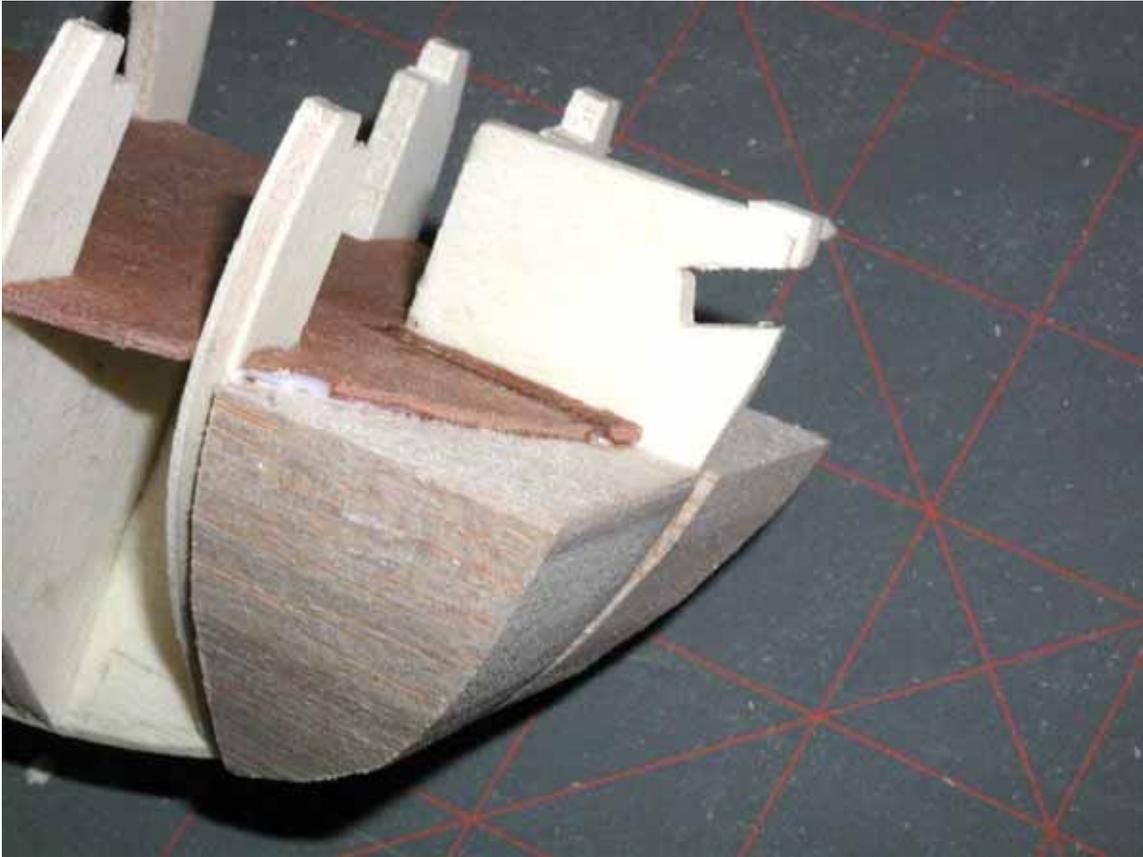
**P1.4.3-4**

Here you can see the first cut on the side of the block. The piece was put back into the block and the block turned to the next side and the cut is made on that side. When finished, you will end up with a block that looks something like photo P1.4.3-5.



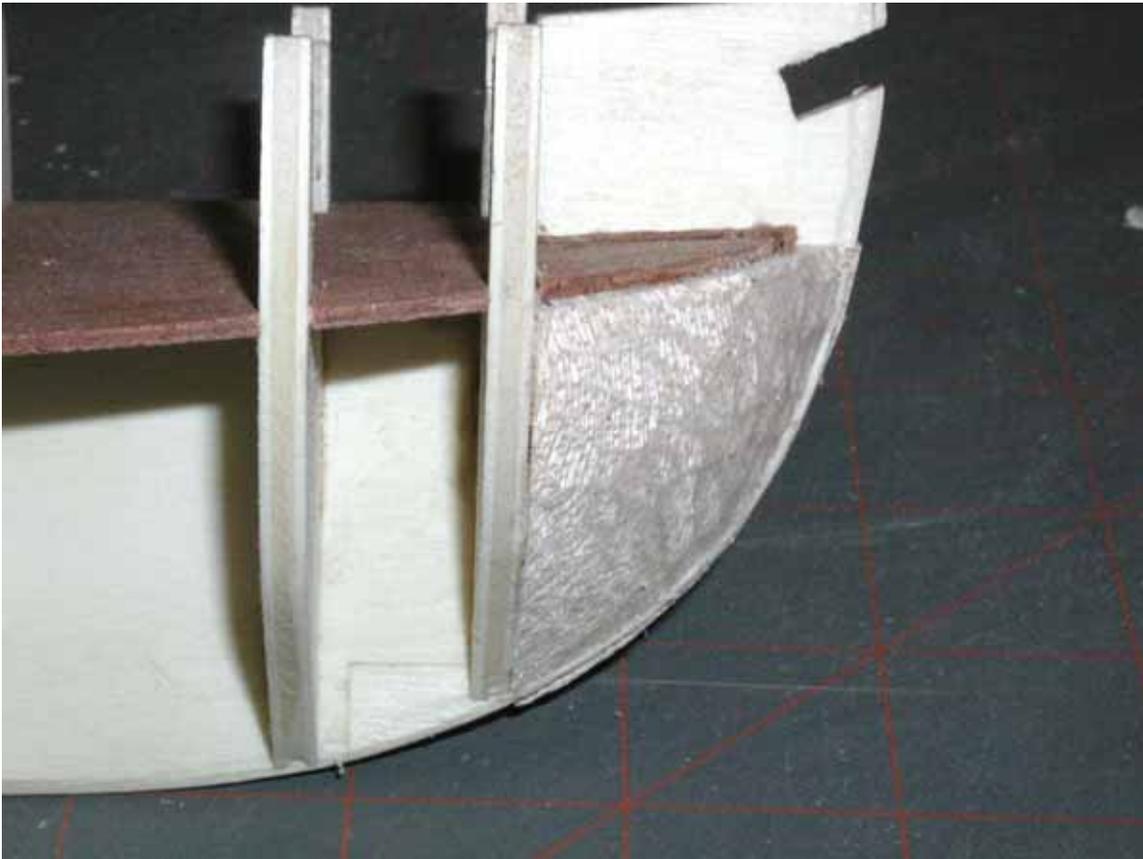
**P1.4.3-5**

Now glue the piece to bulkhead 1 and the plywood keel. Photo P1.4.3-6 shows the pieces glued to the bow under the deck and to bulkhead 1.



**P1.4.3-6**

Now all that is left is to use your #22 or #11 Exacto and carve the blocks to match the bulkhead and rabbet joint. Photo P1.4.3-7 shows the piece after carving.



**P1.4.3-7**

Photo P1.4.3-8 shows the block from above. You can see that the deck does not protrude far enough forward to meet the rabbet joint. This is ok for now though.



**P1.4.3-8**

Now all that is left is to do this on the other side.

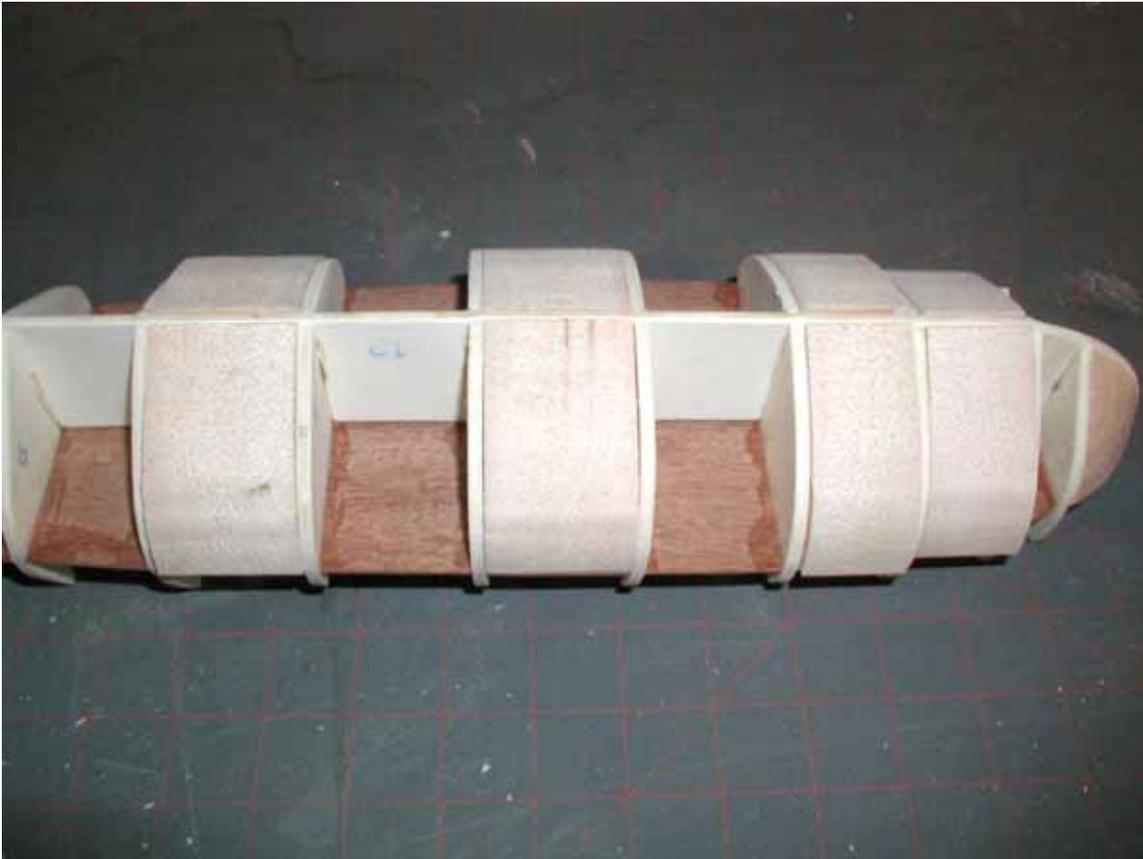
### ***Summary***

- ❑ Use card stock to make a template of the edge of bulkhead 1 and the edge of the rabbet joint.
- ❑ Transfer the two templates to the sides of your balsa block.
- ❑ Cut the block out with a scroll saw or coping saw.
- ❑ Glue the block to bulkhead 1 and the plywood keel.
- ❑ Trim the blocks with a #22 Exacto to form the curvature of the bow from the bulkhead to the rabbet line. Bulkhead 1 will also be curved back to front.

### **1.4.4 Additional Balsa Filler**

To give the hull additional strength and provide a solid surface for planking, balsa filler is also used between each bulkhead. You will have to first cut the balsa to the width needed to fit between a given pair of bulkheads. Once cut to width and height, you can place the piece between the bulkheads and trace the bulkhead outline on one side. For filler pieces aft of the center area of the hull (bulkheads

5/6) draw your line on the forward side of the filler block. For the forward area, draw your bulkhead lines on the aft side of the filler block. You must do this because the aft area gets narrower as the shape of the hull changes dramatically. The bow is similar in that the bulkheads forward of bulkhead 5 get narrower at the bottom and more pointed. If you draw the line on the wrong side, when you cut the part out it will fit well on one bulkhead but be undersized on the other. Photo P1.4.4-1 shows some of the balsa filler pieces in place but not yet glued.



**P1.4.4-1**

Once all of the filler pieces have been cut out and fitted, glue them to the underside of the deck, the plywood keel and the bulkhead sides.

After the glue has had time to dry, you have to start trimming them with a #22 Exacto where your bulkheads change shape, such as bulkhead 4 to bulkhead 3, 3 to 2, 2 to 1 and so forth. The balsa is soft and with a sharp blade cuts easily. Cut it flush with the tops of the bulkheads. Afterwards, use 100 grit sandpaper to sand the hull and contour the bulkheads and balsa filler. Sand again with 150 grit sand paper. Photo P1.4.4-2 shows some of the pieces after trimming.



**P1.4.4-2**

Photo P1.4.4-3 shows the blocks after sanding.



**P1.4.4-3**

Photo P1.4.4-4 shows the stern area which can be confusing as to its shape. The counter blocks are already glued in place but will be covered in the next section.



**P1.4.4-4**

It is a very smooth flow from bulkhead 11 to bulkhead 12. You can also see that the blocks and bulkheads are faired against the deck edge all the way back. Photo P1.4.4-5 shows the bow area.



P1.4.4-6

### ***Summary***

- ❑ Cut balsa blocks to fit between each bulkhead.
- ❑ Mark the bulkhead outlines on each block. From bulkhead 6 forward, mark on the backside of the block. From bulkhead 7 aft, mark on the forward side of the block
- ❑ Cut the blocks out with a scroll saw or coping saw.
- ❑ Glue them to the plywood keel, bulkheads and deck underside.
- ❑ Trim the balsa flush with the top of the bulkheads.
- ❑ Sand with 100 grit sandpaper, then 150.

### **1.4.5 The Stern Counter**

See the main chapter for information on the construction of the stern counter.

### **1.5 Stern Transom**

Now, for those adventurous modelers, we will be making quite a major modification to our transom and stern area. This modification is not for the timid. You will be venturing into the world of kitbashing on a major scale here, so I warn you now, if you do not feel confident in your abilities to complete this work, stick to the standard procedure outlined in the main document of this chapter. However, read these instructions thoroughly before jumping into the construction I will be describing.

First, a little bit of historical information is required. The Rattlesnake was originally built by Americans and was an American ship. However, it was later captured by the British Navy and taken into the British fleet and given the name Rattlesnake.

Typically, many British warships had a checkerboard canvas laid down in the Captains quarters. This canvas served as a rug, so to speak, and even to this day, it can be seen in photographs of the famous British warship, HMS Victory.

Mr. Hahn adapted this feature in many of his models using wood to simulate the checkerboard, specifically, ebony and holly. Since ebony is naturally black in color (gaboon ebony) and holly is naturally white in color, their use produced a very pleasing result. I've used this method in my own models over the years. If you have Mr. Hahn's book, *Ships of the American Revolution and their Models*, you can see numerous photos of his parquet floors.

Since Mr. Hahn drew the plans for this ship, and it became a British war ship, I have decided to model the parquet checkerboard as well. Now there is absolutely no evidence that this ship had this canvas. This is purely speculation and may or may not be historically correct. My intention is to model a fully framed quarterdeck and leave the majority of planking off exposing the framework as well as giving a view to the deck below and the parquet floor. You will also be able to look through the stern transom windows and see the interior of the ship. I also feel that this is a good teaching aid for future work in my later practicums.

I want to reiterate that to make these modifications, you must have a set of Mr. Hahn's plans. They will be used to correct the hardwood block that serves as the counter, as well as establish the proper shape of the stern transom. I cannot produce copies of the plans in this practicum as it would violate Mr. Hahn's copyrights.

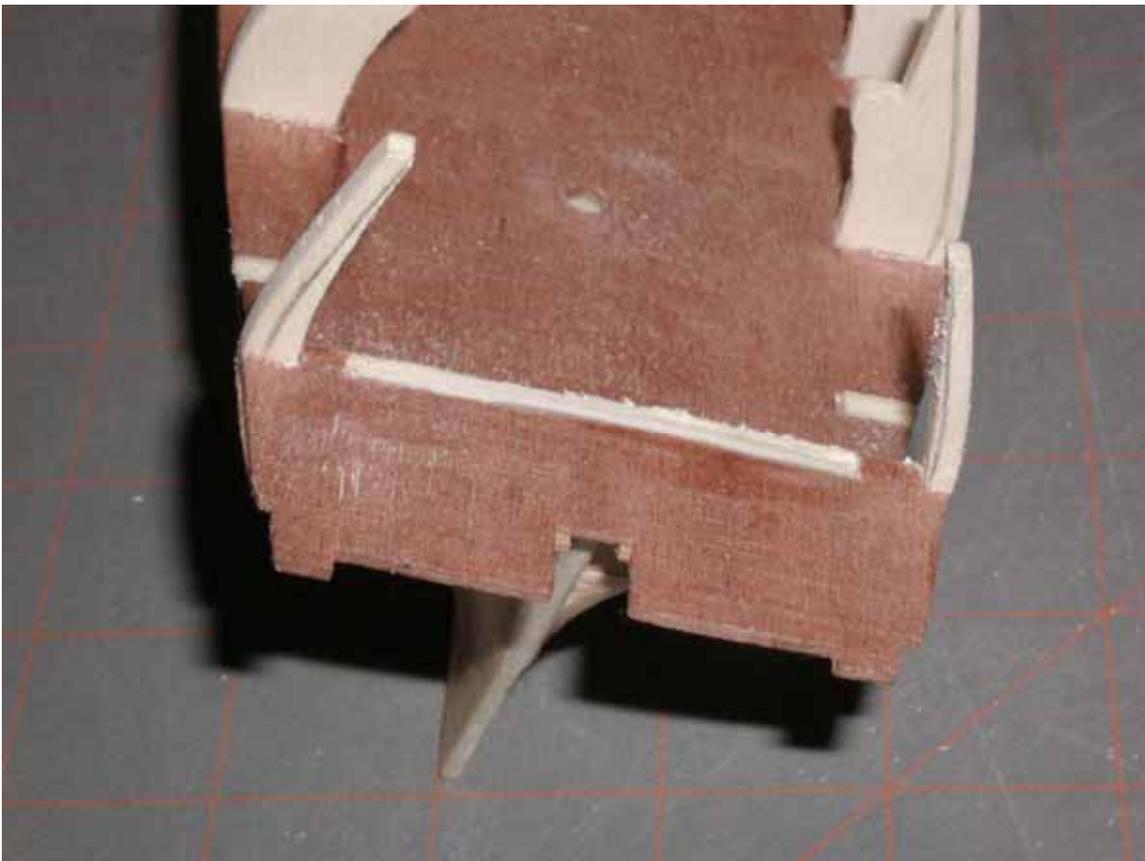
The following wood will be needed for this modification:

1. 1 piece of Midwest Birch Aircraft Plywood, 1/64" x 6" x 12"

2. 1 piece of 1/8" x 5/32" x 24" Swiss Pearwood
3. 1 piece of 1/8" x 1/16" x 24" Swiss Pearwood

Again, you can purchase the Midwest plywood from Mainline Hobby Supply Inc., <http://www.mainlinehobby.com>. The Swiss Pearwood will have to be purchased elsewhere. I would recommend Warner Woods West, owned and operated by NRG President, Lloyd Warner. I find Lloyd to be a very honest and sincere man and would highly recommend him for all woods used in this practicum. Lloyd does not have a website, however, you can reach him by phone at (435) 652-4400. His address is P.O. Box 100, Ivins, UT 84738. You could also use kit walnut and trim it to the dimensions given (use the 5/32" x 1/16" stock that came in your kit for the purposes intended).

So let's begin. The first thing we must do is remove bulkhead 12 at the point where it joins part 22. My first inclination in constructing this area was to leave a portion of bulkhead 12 on each side to serve as the frames that will hold the planking when it is attached. Photo P1.5.1-1 shows bulkhead 12 removed and these frame portions still in place.

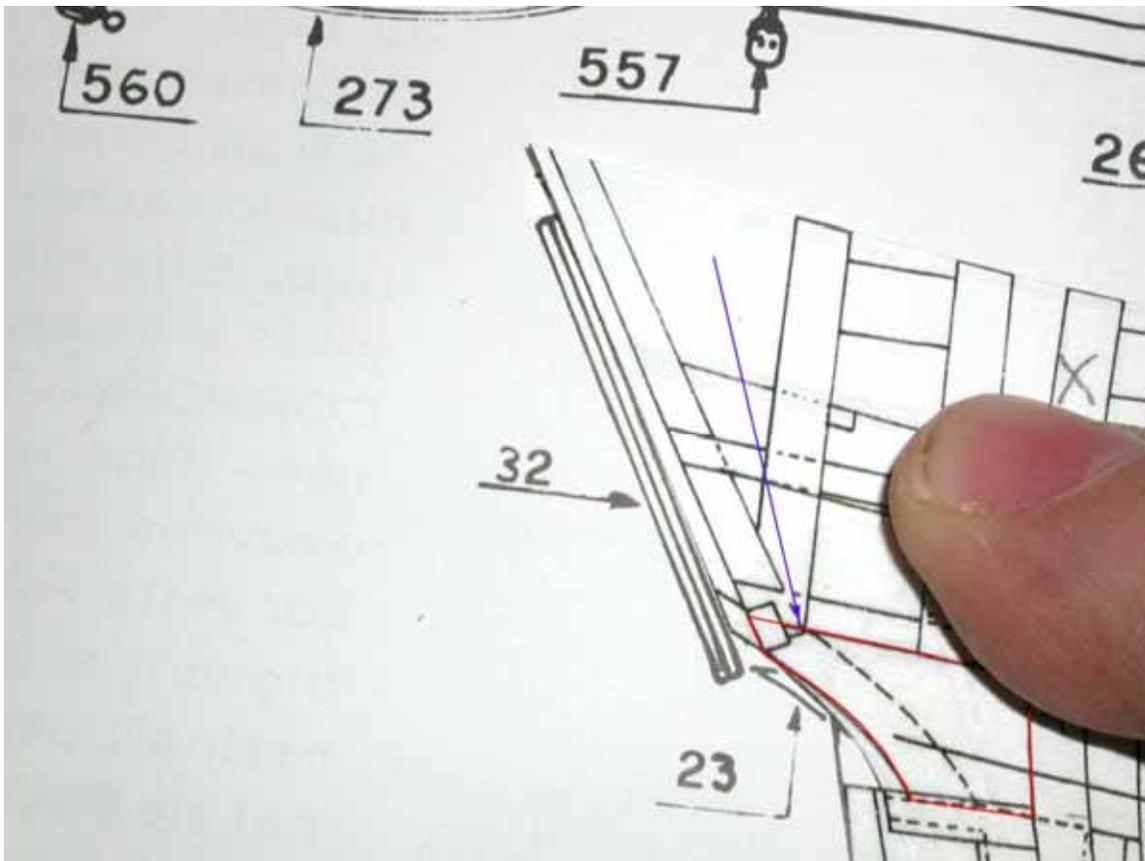


**P1.5.1-1**

However, I quickly found that the soft plywood was just too delicate and they quickly broke off. So I then decided to take a slightly different approach. Therefore, you will need to completely remove bulkhead 12 at the line where it intersects with part 22 as you can see in the photo. Since the wood is very soft, you can easily cut through it with a #11 Exacto. Don't worry if the cut is on a slight angle. That will be dealt with in a moment.

Earlier we attached two hardwood blocks that formed the counter area of the ship. These blocks are glued to the bottom side of part 22. We are going to have to make some major modifications to this construction now to make the interior of the Captain's quarters more accurate. You will need a Dremel tool and the sanding drum attachment to perform this modification.

Look at photo P1.5.1-2. This photo shows Hahn's profile plan laid over top of the kits profile plan (sheet B). As you can see, a portion of Hahn's plan is outlined in red. First you will need to take a tracing of this area and make a card stock template by gluing the tracing to the card stock with rubber cement.

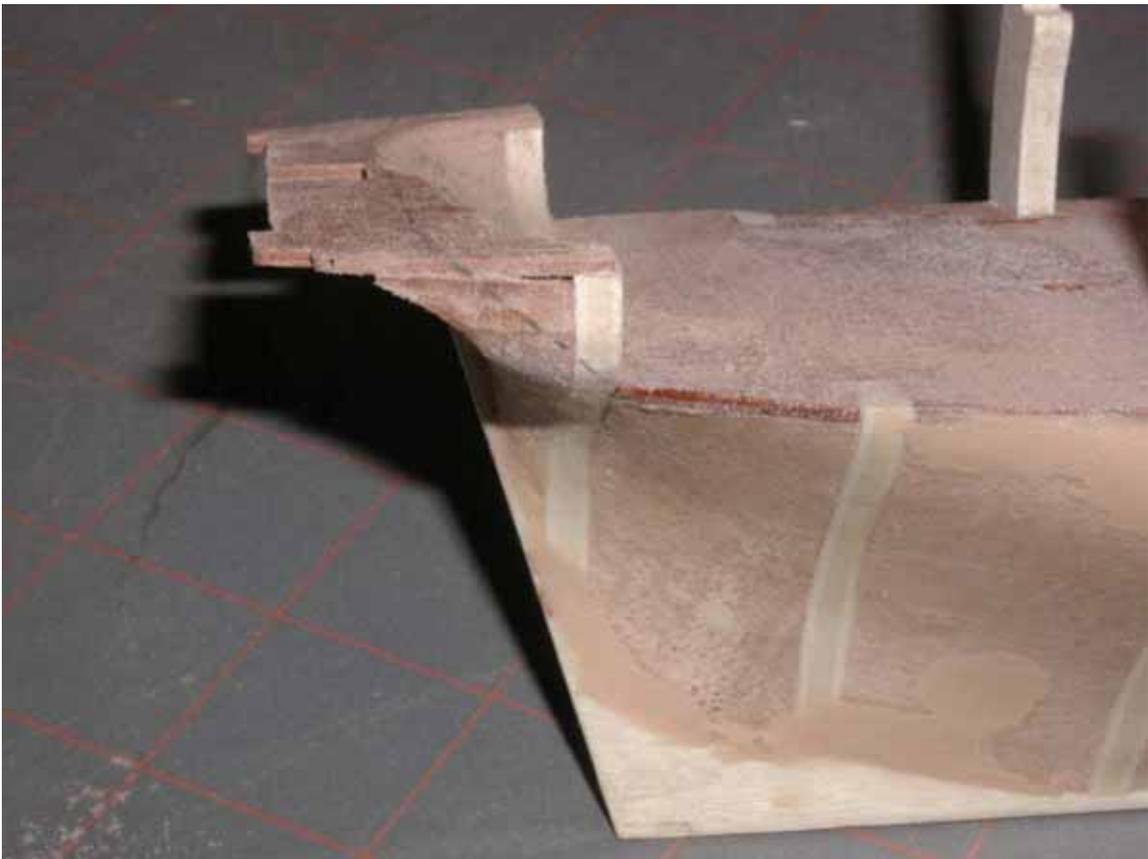


**P1.5.1-2**

The forward edge of this template (the portion my finger is covering up) is the aft edge of frame 43. Frame 43 matches bulkhead 12 (how convenient). You can

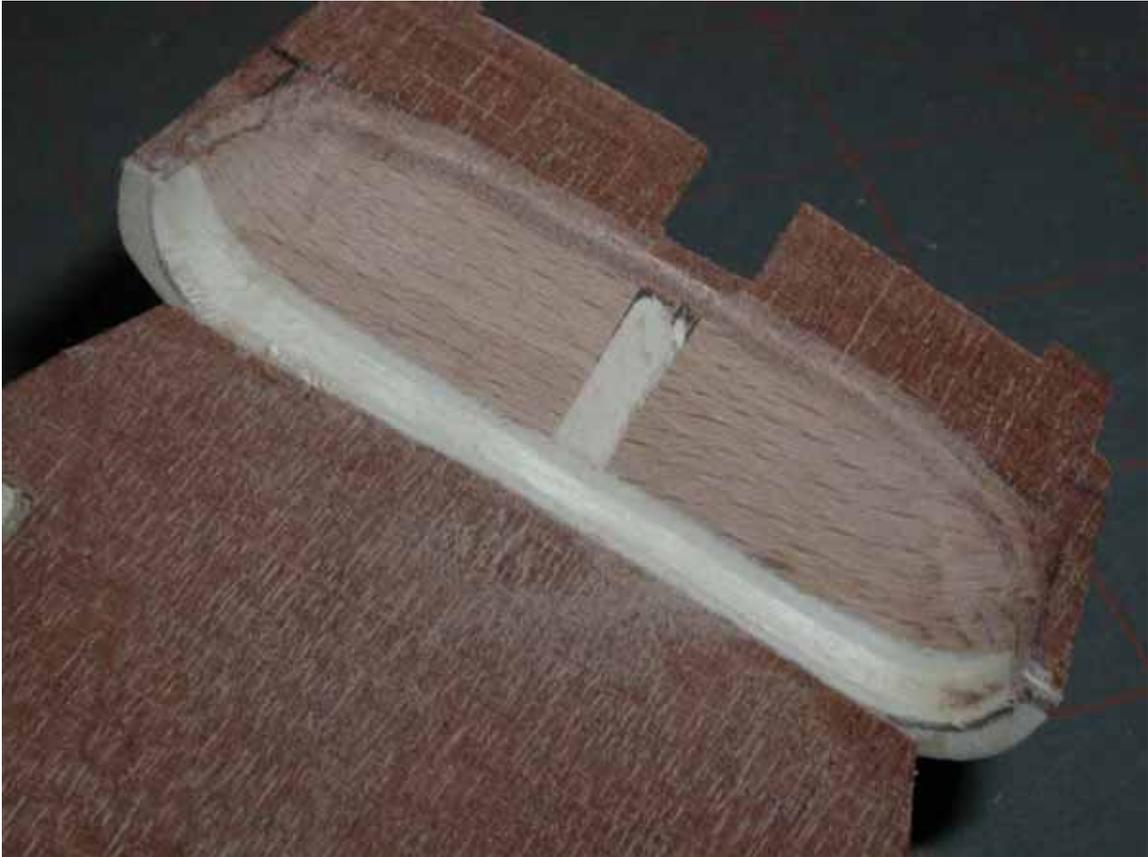
also see a blue arrow in the photo. The arrow points to the backside of the frame that was actually made in Hahn's model. That back edge needs to be transferred to our model so you will need to make a tick mark on your pattern so that you can transfer it to the model.

Photo P1.5.1-3 shows some pencil lines on the hard block counter as well as the top of part 22. These lines represent this back edge of the timber pointed to (blue arrow) in photo P1.5.1-2 above. You need to transfer these lines to your model. The line across the top of part 22 is slightly arched front to back. In other words, it is not a straight line from one side to the other, but a curved line with the line being farther from bulkhead 12 in the center than on the edges.



**P1.5.1-3**

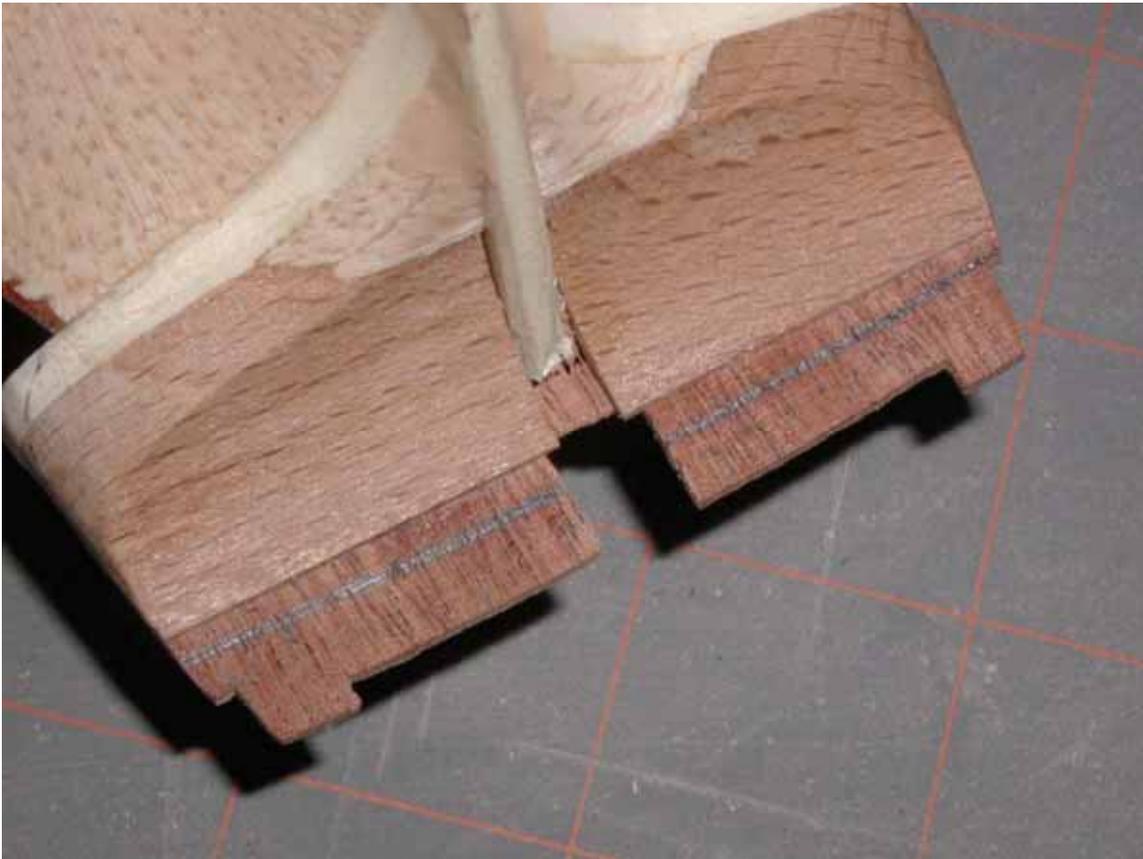
You can see in this photo that I have started sanding out the interior of the counter with my Dremel tool with sanding drum attachment. What we want to do is sand out a slanted surface in the hard wood block that is more representative of the interior of the counter. Photo P1.5.1-4 shows how the area should look after sanding.



**P1.5.1-4**

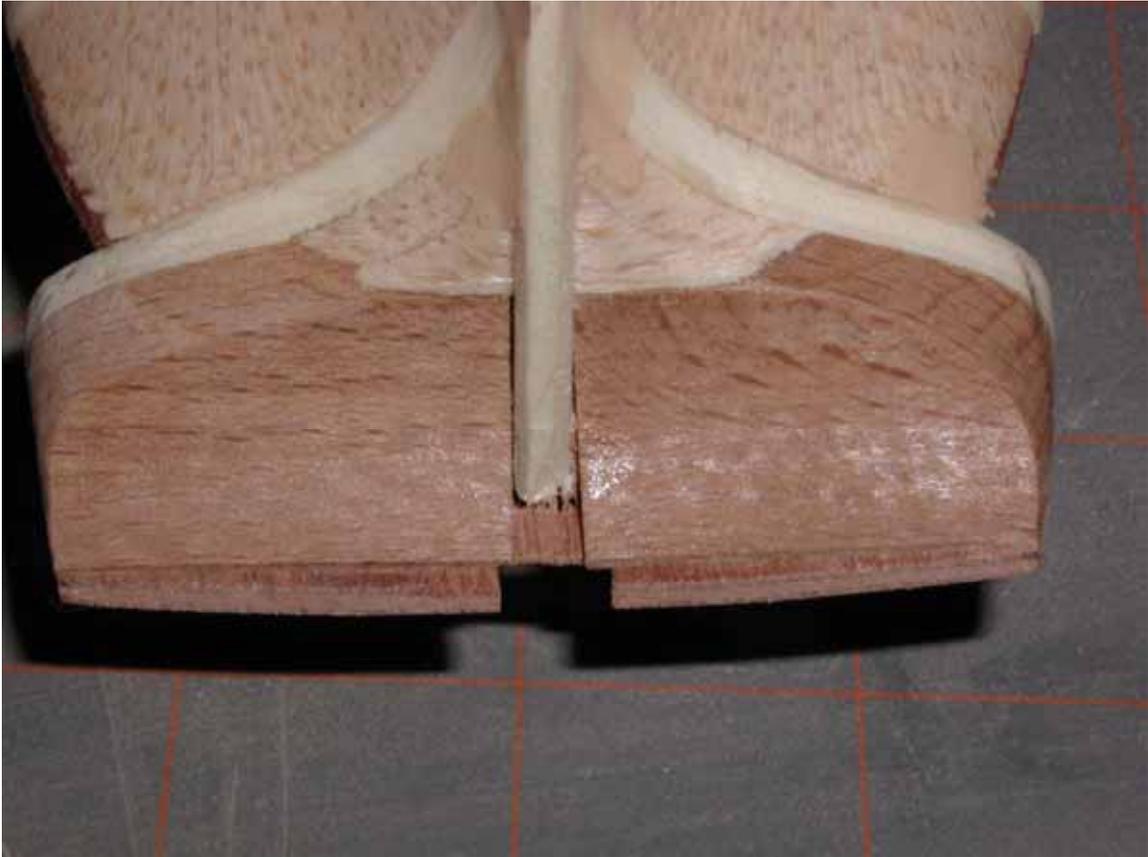
As you can see, the sides of the area are approximately 1/8" wide (bulkhead 12). Later, we will affix new framework onto this area.

The next modification we will make is the length of part 22. It is too long. Looking at photo P1.5.1-5, you see a curved line has been marked on the underside of part 22. This line is approximately 1/16" from the hard blocks that make up the counter. Draw this line and cut part 22 off with your Exacto. I used a #22 blade and placed the top side of the part onto my work bench to cut it.



**P1.5.1-5**

Photo P1.5.1-6 shows the piece after cutting. In this photo you can see that I have beveled the edge of part 22 so that it more closely matches the angle that the stern transom sits in relation to the part.



**P1.5.1-6**

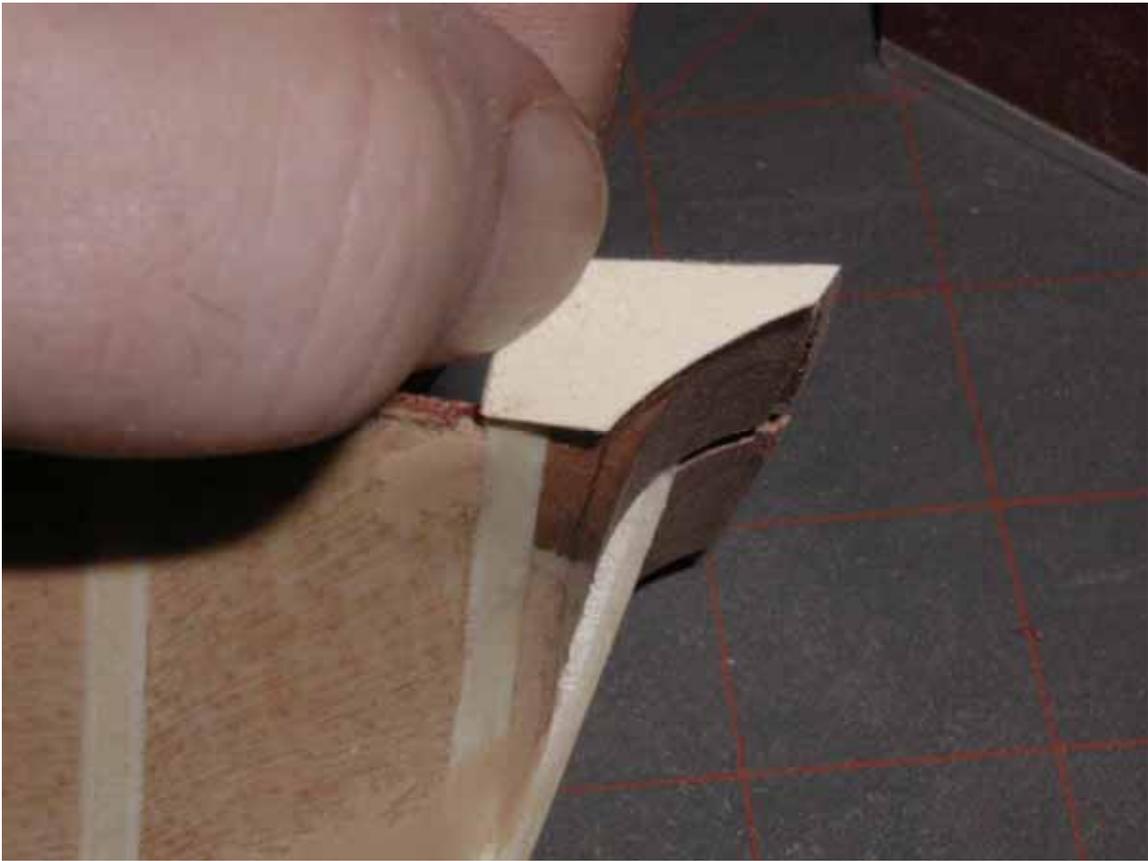
You can also see that part 22 is arched or curved from front to back.

Two additional adjustments need to be made to the hard blocks that form the counter. In photo P1.5.1-7, you can see my card stock template and another line that I have transferred to the counter block. The top of the counter block on the sides (not in the middle) need to be trimmed to an angle or beveled to the line drawn. Again, you can use your Dremel or just trim it with your Exacto. Start about 1/2" in from the side and trim. This will give the back edge of the top surface of the counter, a more arched shape from top to bottom. Be sure and make this modification to both sides of the model.

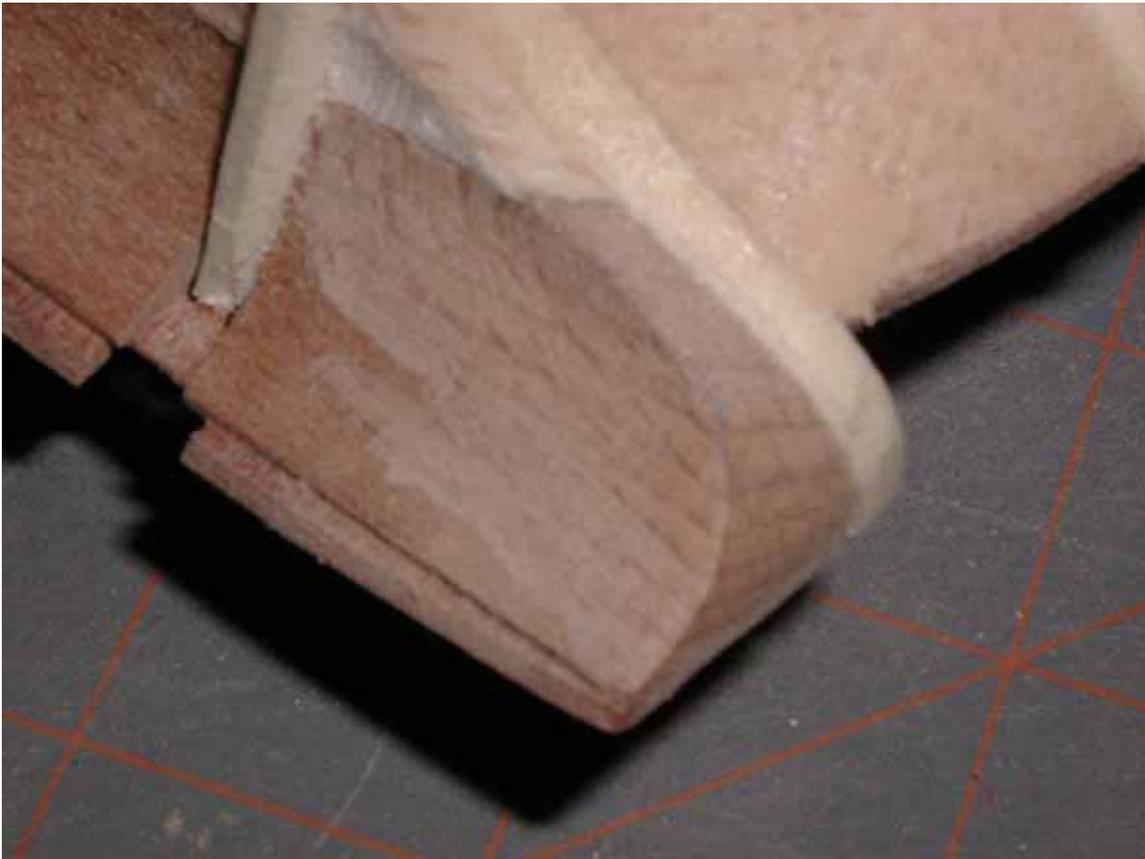


**P1.5.1-7**

The second modification we need to make to the counter blocks is the curvature of the counter. Looking at photo P1.5.1-8, you can see that the template, when placed against the profile of the counter, shows the counter to have more of an arch in it and end a little bit thinner. Mark this shape and use your Dremel with drum sanding attachment to reduce the thickness and change the curvature of the counter. Do this across the entire surface but to a slightly lesser degree near the keel. Photo P1.5.1-9 shows the counter after reshaping.



**P1.5.1-8**



**P1.5.1-9**

Repeat this modification on the other side as well.

Now we are ready to make the transom. For this operation, you will need the 1/64" plywood I mentioned earlier and Hahn's plans.

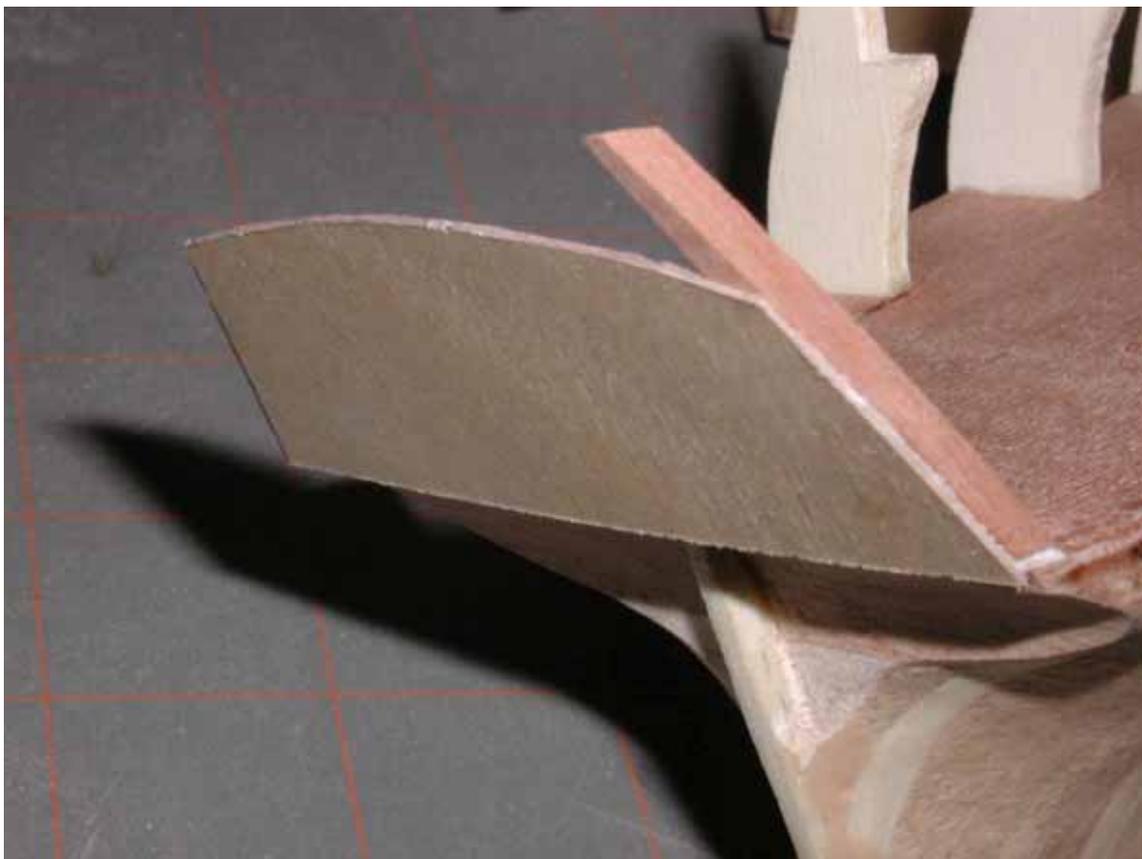
Photo 1.5.1-10 shows a copy of the stern transom taken from Hahn's plans (reduced to 3/16" scale). It was used to cut out a piece of the plywood for the stern transom. Because of the manner in which we must build this area, I have decided to use this very thin material for the basis of our transom, much as the kit provides but using a thinner material. Typically, this area would have been built up with frames as shown on Hahn's plans and the counter would not have been a solid block of wood. However, once completed, this will not be visible or an issue.



**P1.5.1-10**

The beauty of Hahn's plans and the kit is that everything basically fits. When you attach the thin plywood transom to your counter blocks, the fit in width should be perfect or very close.

In photo P1.5.1-11, you see that I have glued this plywood transom to the back side of part 22 and tilted on an angle. The angle is determined from Hahn's plans. If you refer back to photo P1.5.1-2, which shows the profile of the transom from Hahn's plans, you can easily see that a cardstock template can be made that matches this angle and used to set the angle on your transom when you glue it.



**P1.5.1-11**

On the starboard side you can also see that I have glued the timber that makes up the outer frame of the transom. This timber is the same part referred to earlier for the basic construction of the transom, but is made from Swiss Pearwood. Use 1/8" x 5/32" stock cut to a length of about 1 5/8" to 1 3/4". It will be trimmed later to its proper height.

I like the Swiss Pearwood because it has a nice pink color. When finish is applied, the pink is much darker. The wood has no visible grain and is fairly hard and holds a nice edge. It also contrasts nicely against the other woods we will be using like boxwood, holly and ebony. I chose this wood for the transom frames because the upper side planking will also be done in Swiss Pearwood.

This piece is not 5/32" wide throughout it's entire length. If you look at Hahn's drawing of the stern transom, you can see that this timber is wide at the bottom where it rises from the counter but gets narrow at the top. The top is only 1/16" wide. The taper begins about 1/2" up from the bottom.

You will also have to bevel the timber from side to side as described in section 1.5 so that it matches the angle of the transom plywood. Make two of these

timbers using Hahn's plan to make a card stock template. And glue them to the transom plywood and counter top with Weldbond.

There are four additional frames to make from the 1/8" x 1/16" Swiss Pearwood stock. The frames are beveled to match the tilt of the transom and are trimmed flush with the top of the plywood transom.

There is one thing I found in Hahn's plans regarding the location of these timbers. If you've ever followed Hahn's style of construction and the design of his plans, you will find that his transoms are all constructed in the same basic manner. The transom frames generally form the location of the transom windows. If you take his transom drawing and extend the lines that make up the sides of the windows using a ruler, you will find that they do not coincide with the visible portions of the timbers shown on his drawing. My theory is that traditionally, the transom was built up using many timbers of the shape shown in Hahn's drawings. After this basic framework was fashioned, I believe that depending on the layout of the windows, some of the frames were cut away and served as supports for the window sills much like houses in America are built today. The only real purpose the upper timbers serve in our model is to give support for the taffrail.

Therefore, it is my opinion that we need to cut these inner four timbers off at the top of the transom plywood piece. We will add a thin piece of Swiss Pearwood to cap off the top area and later on, we will add the four additional support frames that fill in between this cap and the taffrail. This is basically what the kit does by its design.

It's probably easiest to cut the angle at the bottom of these four timbers first and get them in position with the transom. You can then mark the top edge and cut them to length before attaching to the inside of the transom plywood piece.

The window locations can be derived from the Hahn plans as well. I first drew a centerline on the inside surface of the plywood transom piece. That will be your basis for measurements to establish the line of the other four timbers and the location of the windows.

The inside edge, that is, the edge closest to the centerline, for the centermost windows is 1/4" either side of the center line at the bottom and 7/32" either side of the centerline at the top of the plywood transom.

The inside edge of the outer window is 3/4" either side of the centerline at the bottom and 11/16" at the top. Once you make these marks on the inside edge of the plywood transom, you can line your timbers up on the marks and glue them to the inside surface of the plywood transom.

Photo P1.5.1-12 shows the four timbers set in place. After marking them at the top where they meet the top edge of the plywood transom, they will be cut off and permanently glued to the inside of the plywood transom and to the top of the counter piece.



**P1.5.1-12**

After gluing these timbers to the inside surface of the plywood transom, and allowing time for the glue to dry, you will need to use a sanding block and sand the upper surface of these timbers on the inside to reduce their thickness to 1/16". You are sanding the side of the timbers, including the two outer timbers, that are facing you and shown in photo P1.5.1-12. If you look at Hahn's profile drawing of the ship (not the frame profile but the profile that shows interior and exterior details), you can see that these timbers are thinner at the top where they are visible. That's what you are sanding and why you are sanding them.

Photo P1.5.1-13 shows the cap that goes on top of these timbers. It is made from 1/32" Swiss Pear. I milled my own stock to a width of 7/16". But I do not think you can purchase this dimension from Lloyd Warner. Instead, you can edge glue two pieces of 1/4" x 1/16" stock. You can also construct this with basswood instead of the exotic Swiss Pearwood. This cap is made oversize so that it can later be trimmed down to follow the curvature of the transom. Photo

P1.5.1-14 shows the piece glued in place from below so that you can see how the transom is curved in the center. Later, we will add planking to the thin plywood transom. The cap piece will be trimmed flush with this planking later on.



**P1.5.1-13**

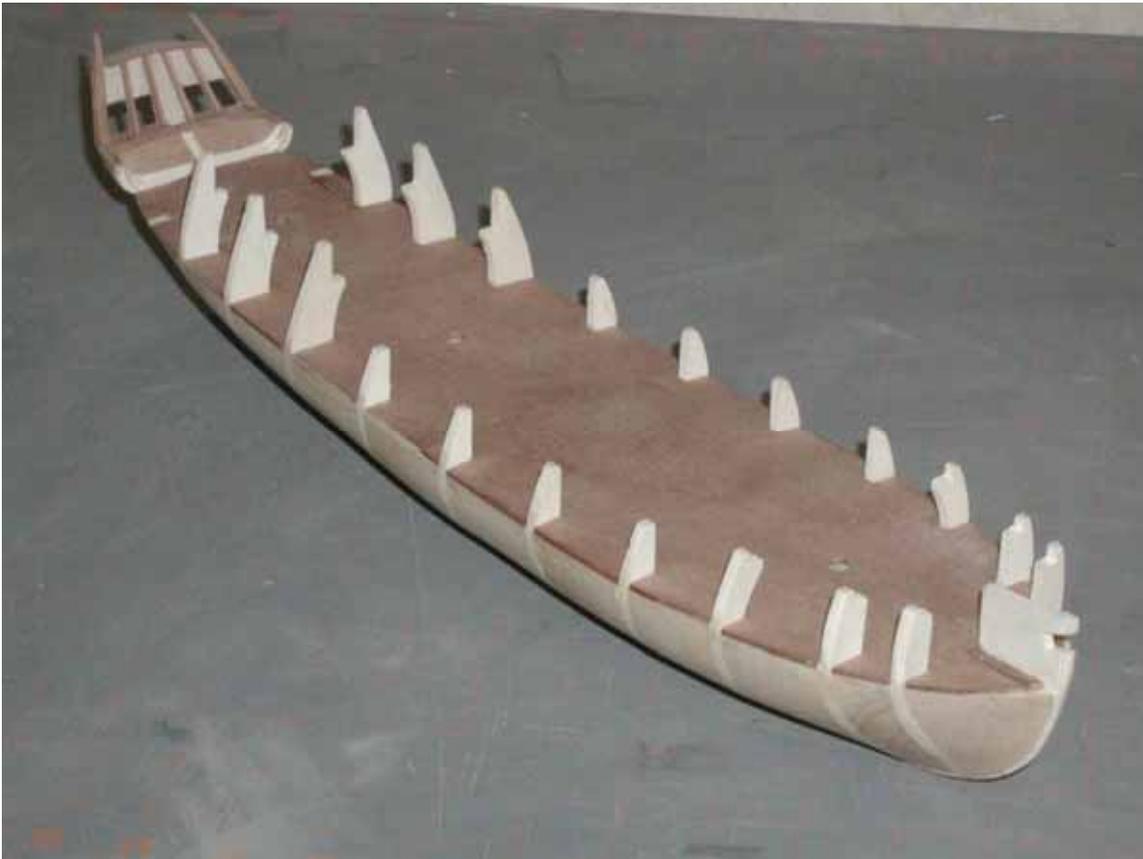
The windows have been cut out by first using the copy of the plans to locate the area of the windows, then drilling a few small holes through the plywood with a pinvise. A #11 Exacto was use to enlarge the windows out to the timbers. The top of the windows is exactly 1/2" up from the bottom edge of the plywood transom taking your measurement from the backside.

The Swiss Pearwood can be bent very easily if you soak it in warm water for about five minutes. You will have to place it across the transom top from the outside and bend it to the proper shape first after soaking it. It will hold the shape. Then you can mark the length, cut it and glue it in place. I used some small office strips pressing down on the edges of the piece and clamped to the outer timbers to hold it in place. Again, photo P1.5.1-14 shows the piece after removing the clamps and looking at it from below.



**P1.5.1-14**

And finally, photo P1.5.15 shows the model at this stage of construction. If you have followed both construction procedures, you can see that if you built the model out of the box, your transom still looks very much like the scratchbuilt transom. The principals of construction are very similar.



P1.5.1-15

### ***Summary***

- Cut bulkhead 12 flush with part 22.
- Make a cardboard template from the framing profile of Hahn's plans as shown in photo P1.5.1-2 and transfer the inner transom frame line to the side and top of the hard block counter pieces. The line should have a slight curve across the top of part 22 to reflect the arch from side to side in the transom.
- Using a Dremel tool and drum sanding attachment, sand out the inside of the counter from this line to the main deck forming a slanted hollow across the inside of the counter.
- Use the same template to adjust the angle of part 22 and the curvature of the counter. Use the Dremel tool to adjust the curvature of the counter.
- Make a card stock template of the angle of the transom in relation to the top of the counter. It will be used to align the transom.
- Make the transom from 1/64" Aircraft Plywood taking it's shape from Hahn's stern transom drawing.

- Glue the plywood transom to the back of part 22 after beveling part 22 with a sanding block. Use the card stock template made earlier to align the angle of the transom.
- Once the glue has dried, use 1/8" x 5/32" Swiss Pearwood or other wood cut to a length of approximately 1 5/8". Bevel the bottom and top and glue to the side edges of the transom and to the top of the counter block.
- Mark a centerline on the inside surface of the transom plywood.
- Measure 3/16" and 5/8" each side of the centerline at the bottom and make marks.
- Measure 1/8" and 1/2" each side of the centerline at the top and make marks.
- Cut 4 pieces 1/8" x 1/16" Swiss Pearwood or other wood to fit along the marks made and stop at the top of the plywood transom.
- Glue them in place.
- Edge glue 2 pieces of 1/32" x 1/4" Swiss Pearwood together, or use a single piece 7/16" x 1/32" and soak in water for 5 minutes.
- Shape this piece in an arch to match the arch in the plywood transom.
- Cut to length so that it will fit between the two outer transom frames and on top of the four inner frames.
- Use Weldbond and some office clips to glue and clamp this cap to the top of the transom. Allow overhang in both the front and back which will be trimmed later.

### **1.6 Chapter Summary**

This chapter has taken the basic framework of the kit and modified it for future kitbashing and scratch work. The kit's bulkheads and plywood keel were used with the stem removed and rebuilt following conventional stem construction. Later we will replace the keel and sternpost with new parts that also follow more standard construction.

A new stern transom was built and the counter that came in the kit was modified to open the Captain's cabin for future work. In our next chapter we will add additional frames from the Hahn drawings, framing out our gunports in a more conventional manner and we will complete the upper planking using a nice combination of hard woods that contrast well. I hope that those who have followed the changes in this chapter were successful and are enjoying these lessons in kitbashing.