

Modeling the HMS Victory

Chapter 1



A Practicum by Robert E. Hunt

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1. The Framework

This chapter will deal with the basic framework of your model. With a proper framework, all future details can be assured of correctness and accuracy. Extensive modifications will be made to the kits framework to enable us to add details not in the original design of this kit. And because this practicum is the 4th in a progressive series of practicums, these modifications will help you understand some of the basic structure of a ship and prepare you for the final in the series, a fully scratchbuilt 1/4" scale warship.

1.1 Introduction

First, let me say welcome to all who are participating in this practicum. Together we will build one of the most modeled ships of the 18th century, HMS Victory.

This practicum is the fourth in a series of five practicums I have been writing. These five practicums make up what I call *The College Of Model Shipbuilding*. Each of these practicums is designed to teach the modeler new skills and techniques. Each practicum delves more into the art of scratchbuilding and this practicum is the last in the series to use a kit for the basis of the model.

The kit this practicum is based on is the Mantua/Panart 1:78 scale kit #738. However, there are several other Mantua/Panart/Sergal kits of the Victory that may be used instead. The practicum will take you into some major kitbashing. Many modifications will be made to the kit to improve quality and accuracy and improve the appearance of the model.

This kitbashing will require certain power tools. Most often a scroll saw will be needed. Although I will attempt to supply you with a list of woods that will be needed along with their dimensions, it is very difficult to determine such needs ahead of time when the ship is so large and so detailed. Therefore, a miniature table saw and thickness sander is recommended for the milling of scale stock when needed. My personal recommendation would be the Preac brand.

A forum has been set up for this practicum and on my website. This forum is for participants in the practicum only. It is an unmoderated forum so you may post your questions, comments or methods there so that other participants may benefit from them as well. To register for the forum, go to <http://www.lauckstreetshipyard.com/forum.html> .

If you encounter problems or don't understand a particular part of the practicum, post a question in the forum so that it benefits others. I will do everything I can to assist you and help you in building this model.

We will be building the model based on it's appearance and configuration at the battle of Trafalgar. I will be referring to several sources of reference including Anatomy of the Ship, The 100-gun ship Victory by John McKay, HMS Victory, Her Construction, Career and Restoration by Alan McGowan, and The Anatomy of Nelson's Ships by C. Nepean Longridge. I strongly recommend you obtain a copy of these books so that you may follow along more easily. You will definitely need the John McKay book to make copies of certain drawings in the book that will be used as patterns for making parts.

1.1.1 Format of This Practicum

I will be using a special format throughout this practicum. First, each chapter will be broken down into sections and sections will be broken down into subsections. For example, Chapter 1 is on **The Framework**. That chapter is broken down into several sections:

- 1.1 Introduction
- 1.2 The Keel
- 1.3 The Bulkheads

Sub sections will be numbered according to their section numbers:

- 1.1.1 Format of This Practicum
- 1.1.2 A Word About Tools
- 1.1.3 Some Supplies you will need

At the end of each sub section, a summary will be provided with checkboxes that you can use to check off the construction as it is completed.

Summary

- Remove all of the parts indicated on sheet 1 of your plans.
- Surface glue each pair of parts and clamp with office clips.
- Lay clamped parts on a level surface to prevent warpage.

This will enable you to first read the section/sub section to understand what you must do, and then keep track of your completion as you progress. It is hoped that this format will help to simplify the complexity and completeness of this practicum.

Should you encounter a problem or have a question you wish to post in the forum for the groups benefit, or to me directly, you can then reference the section or sub section by number making it easier to know exactly what area of the practicum you are having trouble with.

1.1.2 A Word About Tools

I guess I should say something about tools. Over the years I have accumulated a number of tools and have become accustomed to their use. That is not to say that the list I'm going to give you is gospel. These are tools I like to use and it took me years to acquire them. I am not saying you need to rush out and buy all of these tools before starting this practicum. If you've been building model ships for a while, you probably have a lot of these tools or equivalents. Some of these tools are a must, some make the job go much easier. So I only list these because many modelers have asked me what tools I use to build my models. Where possible, I list the Micro Mark catalog numbers as I find that source to be invaluable to the modeler. You can reach Micro Mark at (800) 225-1066 or <http://www.micromark.com>. I am in no way affiliated with Micro Mark nor do I receive any benefits from them by mentioning them in this practicum.

Here are the tools that I've acquired over the years and use frequently:

1. No. 5 Exacto knife handle (Micro Mark #36117).
2. No. 2 or equivalent Exacto knife handle (Micro Mark #14351 or 70233).
3. #10, #11 and #22 Exacto blades (Micro Mark #14360, 36102 and 36113).
4. Micro Saw Blades (Micro Mark #14346)
5. Dremel Rotary Tool (Micro Mark #82592)
6. Helping Hands (Micro Mark #21120)
7. Single edge razor blades
8. Weldbond white glue. (Home Depot or Lowes)
9. Zap A Gap mid cure super glue (Micro Mark #80877 or 80878)
10. Z Ends for Zap A Gap (Micro Mark #80890)
11. Five minute epoxy (Home Depot or Lowes)
12. Delta Scroll saw or Jewelers Saw (Micro Mark #22105)
13. Byrnes Miniature Table Saw (Jim Byrnes)
14. Swiss style watchmakers tweezers (Micro Mark #19101)
15. Deluxe pin vise (Micro Mark #82110)
16. Dimensioned mini square (Micro Mark #82147)
17. Ponce wheel (Micro Mark #15200)
18. Steel machinist square (Micro Mark #10117)
19. Angled high precision micro shear (Micro Mark #80334)
20. Tweezer nose pliers (Micro Mark #80338)
21. Mid size file set (Micro Mark #81063)
22. Stainless steel 6" ruler (Micro Mark #10114)
23. True Sander (Micro Mark #14475)
24. Micro drill bit set (Micro Mark #60362)
25. 3" Toolmakers angle plates (Micro Mark #60626)
26. Office clips, small and medium size
27. Pan vise (Micro Mark #21123)
28. Delta bench top mini disk/belt sander (Micro Mark #82218)
29. Preac tablesaw
30. Preac thickness sander

31. 9" bandsaw
32. Mini wood lathe with duplicator
33. Turbo carver with all available bits and compressor
34. Pasche single action air brush with compressor

There are probably other tools I use infrequently and did not mention. Every tool in the list above will probably be used during the course of this practicum. Even though we are building a kit, I must emphasize that since this practicum is the Senior course in my College of Model Shipbuilding, I will be pulling out all of the stops, so to speak, and doing some extensive scratchbuilding and major kitbashing. This practicum is meant to prepare you for the final two practicums in the series, the Graduate course and Doctorate course. Those courses will be semi-scratch and scratchbuilt plank on frame models in 1/4" scale. The Graduate course will be the Hannah, first armed ship in George Washington's navy and the Doctorate course will be the famous ship of John Paul Jones, the Bonhomme Richard.

1.1.3 Some Supplies You Will Need

There are several items I use regularly in my model building that do not come in your kit. So that you will be prepared when the time comes, here is a list of certain supplies you will find yourself using routinely:

- Weldbond White Glue
- Zap A Gap Super Glue
- Z Ends (for Zap A Gap)
- Five Minute Epoxy
- Thirty Minute Epoxy
- Tracing Paper
- Thick Card Stock
- #10, 11, 22 Exacto Blades and Knife
- 100, 150, 220, 330 and 400 Grit Sandpaper
- Polyurethane Satin, Wipe On Poly or Sanding Sealer
- Toothpicks
- Office Clips
- Rubbing Alcohol

Other items may be needed as we progress and I will try and give some advance notice of these items when they come up.

1.1.4 Copyright Notice And License Notice

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Ok, that's the legal mumbo jumbo. It is hoped that you all understand that to build a model ship is no easy task. To build the model and go into descriptive detail with photos to explain the entire process is even more work and challenging. The monthly subscription fee for this practicum is small and barely covers costs when you consider the amount of time and work that goes into writing and building the model. I do hope that you all will respect these copy rights and license agreement and abide by them. If you find it absolutely necessary to not adhere to them, please contact me first and explain your situation. I'm pretty darn easy to get along with if I understand the problem. Thank you.

1.1.5 Summary

In summation, I hope that you will find this practicum useful and wish you success in completing the model. I will attempt to steer you clear of problem areas and keep the sequence of construction in a meaningful and useful fashion so that we don't paint ourselves into a corner and accept mistakes that could have been avoided.

Good luck and thank you for subscribing.

Bob Hunt

1.2 The Keel

We will begin our construction with the keel. The kit provides a walnut keel with notches in it to accept the bulkheads that make up our skeleton. Since this model is going to look more like a scratchbuilt model with little or no resemblance to the kit when it is finished, we will start our modifications with the kits walnut plywood keel.

This chapter will require the following supplemental woods:

Basswood

1/4" x 1/2" x 24" (1)

3" x 6" x 12" (1)

3/8" x 3" x 24" (1)

Ebony

3/8" x 3/8" x 24" (1)

Poplar

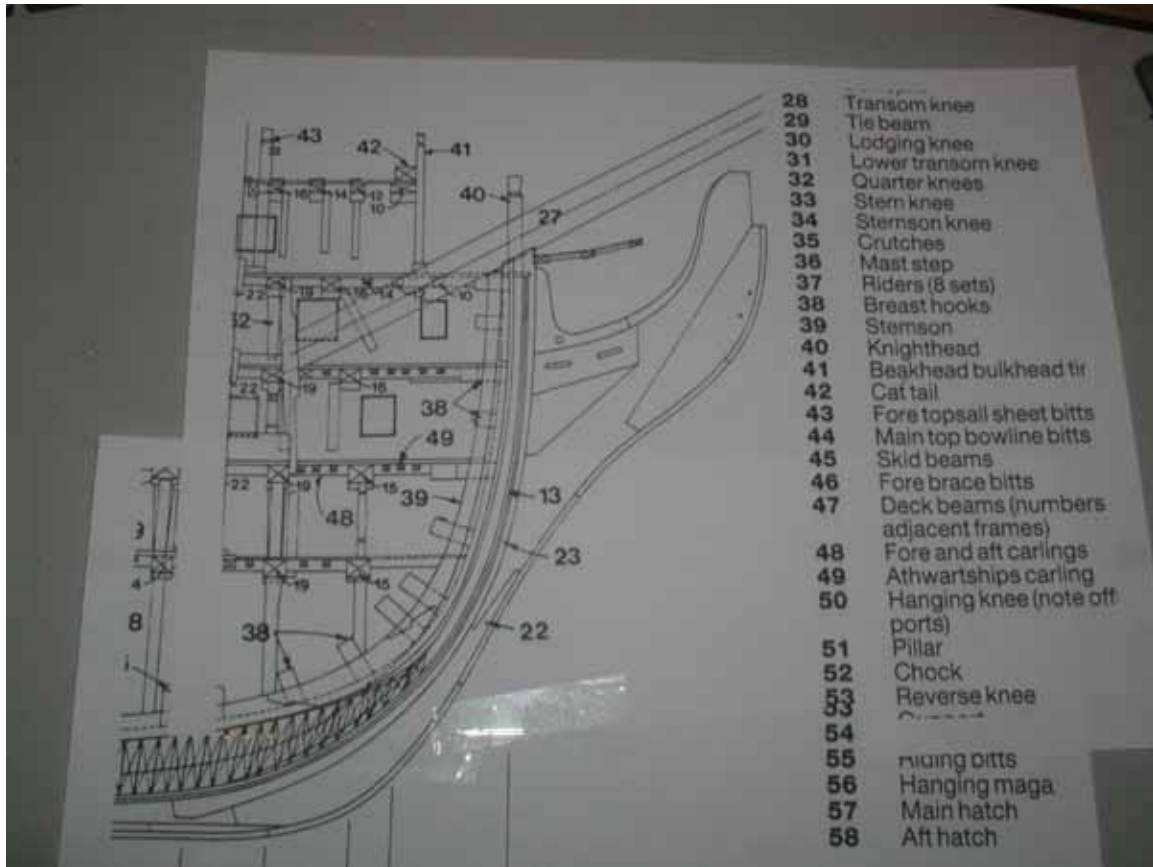
1/4" x 1/2" x 24" (1)

1.2.1 The Stem And Sternpost

You will need John McKay's book, Anatomy of the Ship, The 100-gun ship Victory or his drawings to modify the stem and sternpost. We will be cutting away the stem and sternpost area of the walnut plywood keel and building new pieces. Our new pieces will be scaled and shaped correctly and made from ebony using McKay's drawing found on page 50/51 in the book.

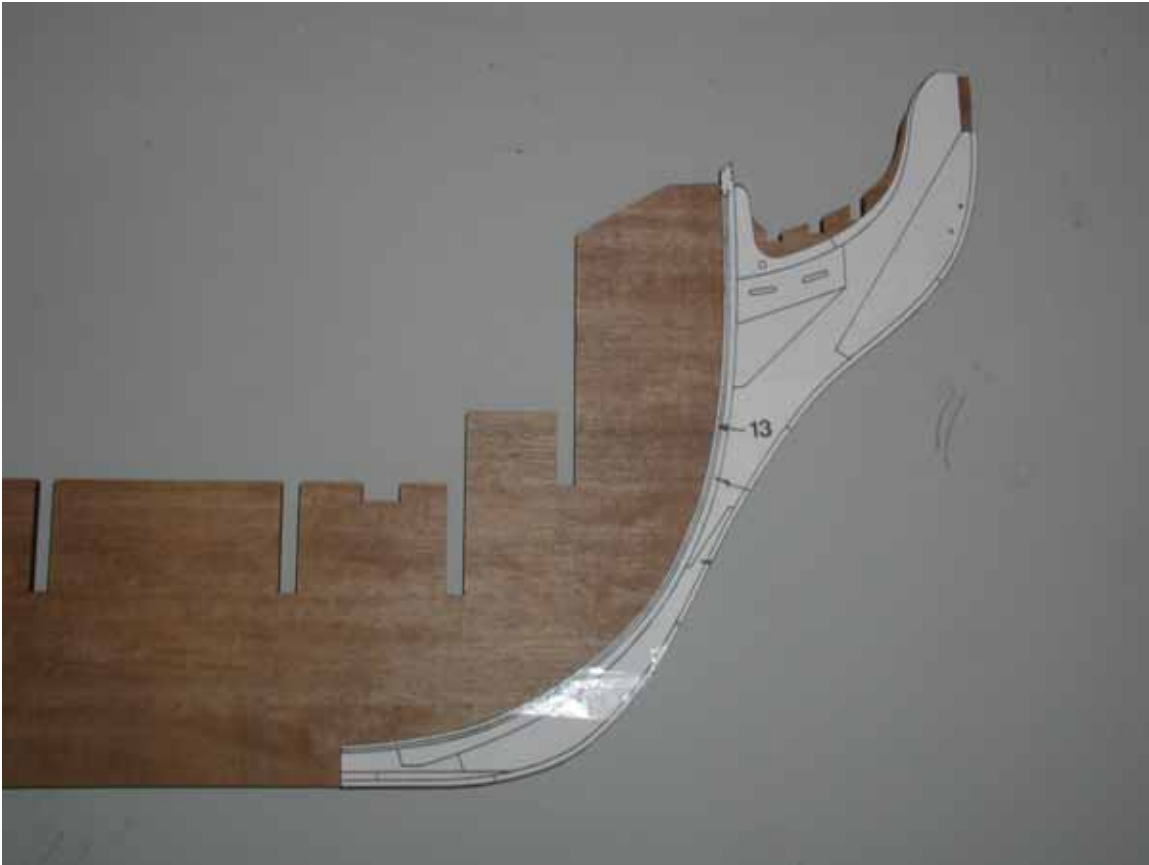
This drawing is labeled B2/2 (or you may use drawing B2/4) and is 1:192 scale. Our kit is in 1:78 scale. We must enlarge the stem and sternpost to the scale of our model. To do that I used a Hewlett Packard OfficeJet G55 printer/scanner/copier but any similar printer/scanner/copier may be used. If you do not own a copier you will have to use a commercial service to make your copy.

To achieve the 1:78 scale from the 1:192 drawing in McKay's book, you must enlarge the McKay drawing by 246%. You only need the stem and sternpost portions of the drawing. Photo P1.2.1-1 shows the stem enlarged from the McKay drawing B4.



P1.2.1-1

Once you have made your copy, you will cut it out. Photo P1.2.1-2 shows the portion of the stem that you need to cut out from this drawing.



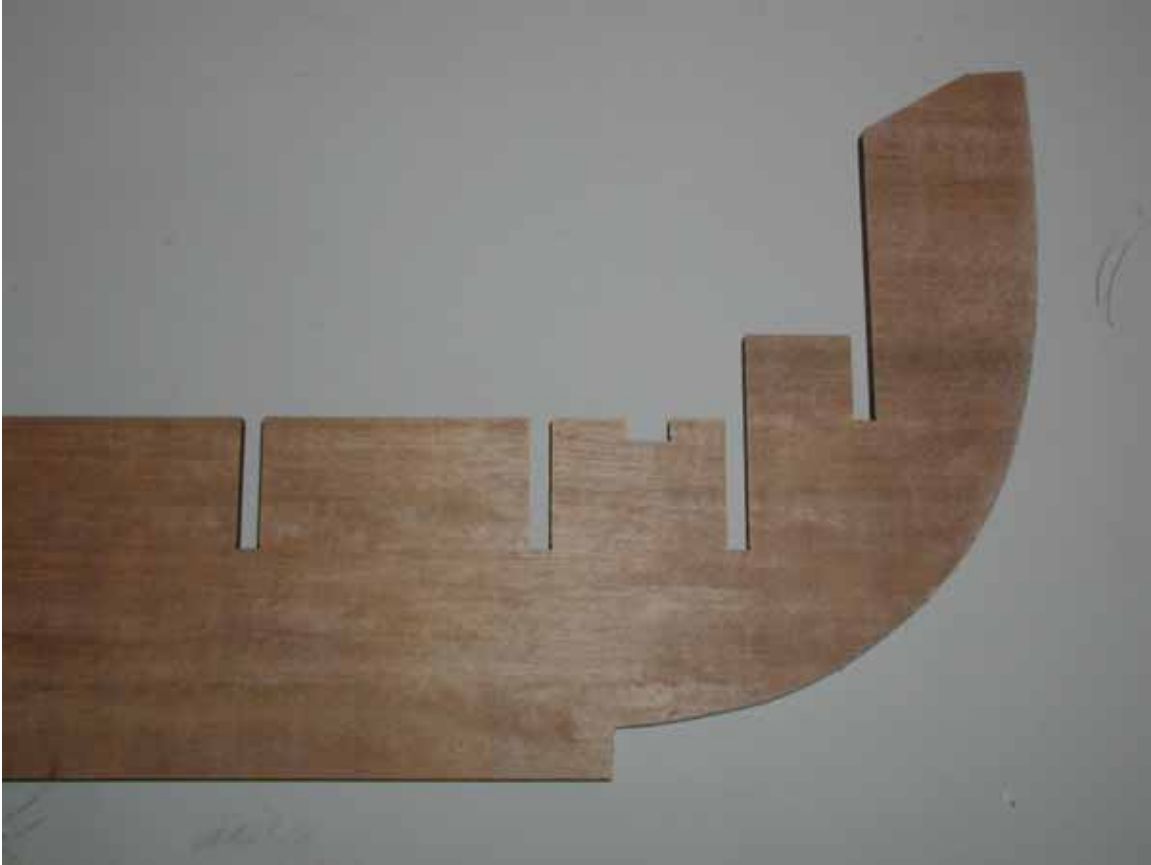
P1.2.1-2

You can see that the stem is cut on the rabbet line. You can also see that the stem drawing does not match the stem of the kit. This was expected frankly, as most all kits seem to be inaccurate.

We will be removing the stem area from the walnut plywood keel and replacing it with a scratchbuilt stem made from ebony. Why ebony? Good question.

It is my desire to build this model entirely in natural woods. The Victory is well known for its black and yellow ochre paint scheme. We could easily use another wood for our stem and simply paint it black. But nothing captures the smoothness of natural hardwoods on a model and gaboony ebony can be sanded and polished to a very fine luster. All black areas on the model will be made from ebony. To simulate the yellow ochre, we will use boxwood. These two woods contrast beautifully and provide the visual effect we are looking for.

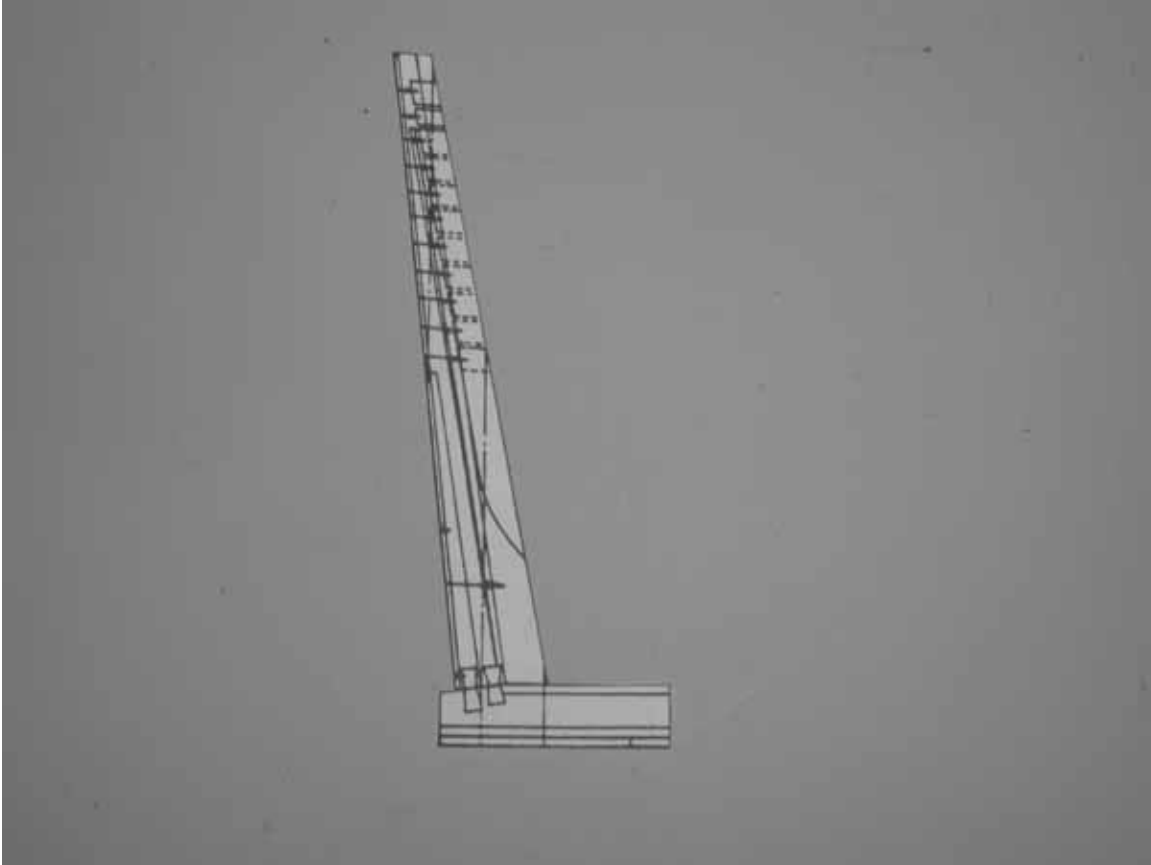
Trace the rabbet line onto the plywood keel just as it is shown above and cut the stem off of the plywood keel with a scroll saw. Photo P1.2.1-3 shows our keel after surgery.



P1.2.1-3

Use the True Sander to smooth out the rabbet surface of the plywood keel making sure it is a smooth curve and the edge is 90 degrees to the surface of the keel.

Next, we will need to do the same to our sternpost. Make another copy of the sternpost in drawing B2/2 on page 50/51 of McKay's book. Be sure to enlarge it by 246%. Photo P1.2.1-4 shows the portion you will need. Cut on the forward edge of the inner sternpost, item 14. Cut along the upper edge of the rabbet (lower edge of the stern deadwood) to station 29.

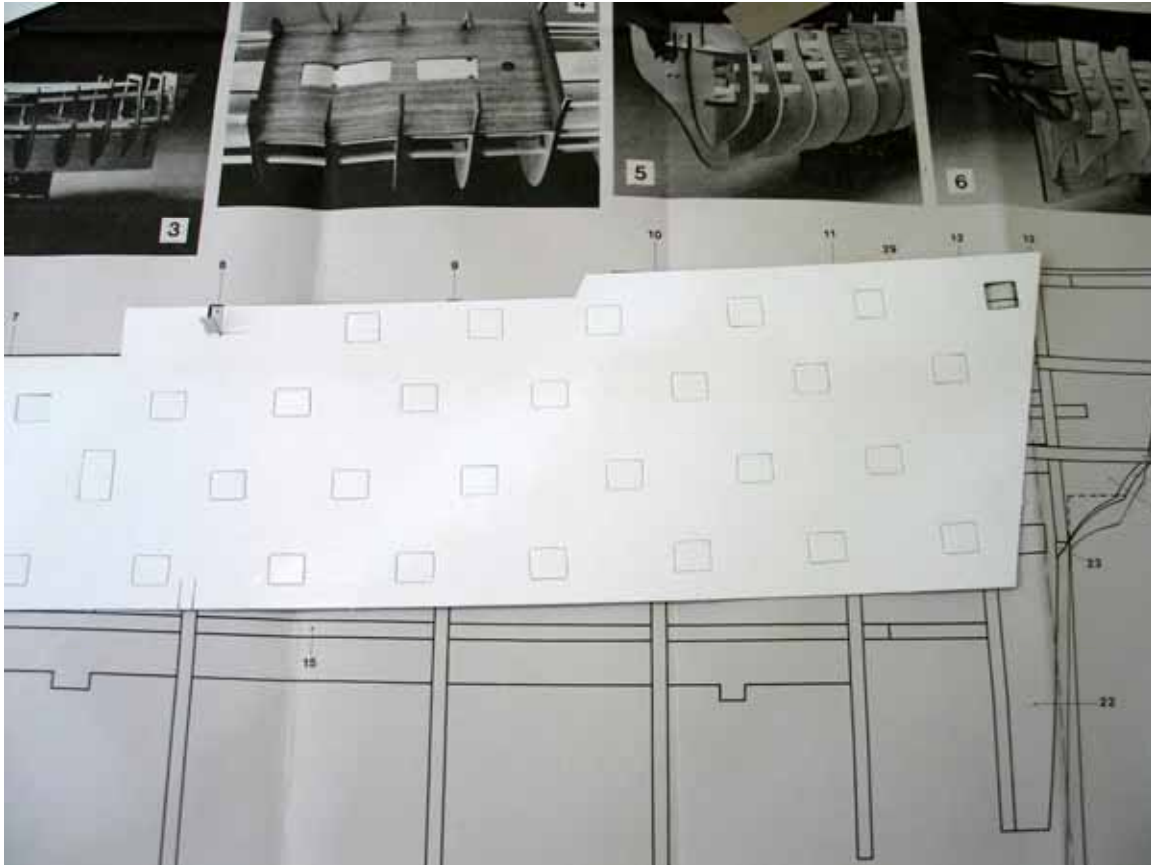


P1.2.1-4

The sternpost area of the walnut plywood keel is also inaccurate. The angle is not correct and the protruding keel/false keel does not even exist.

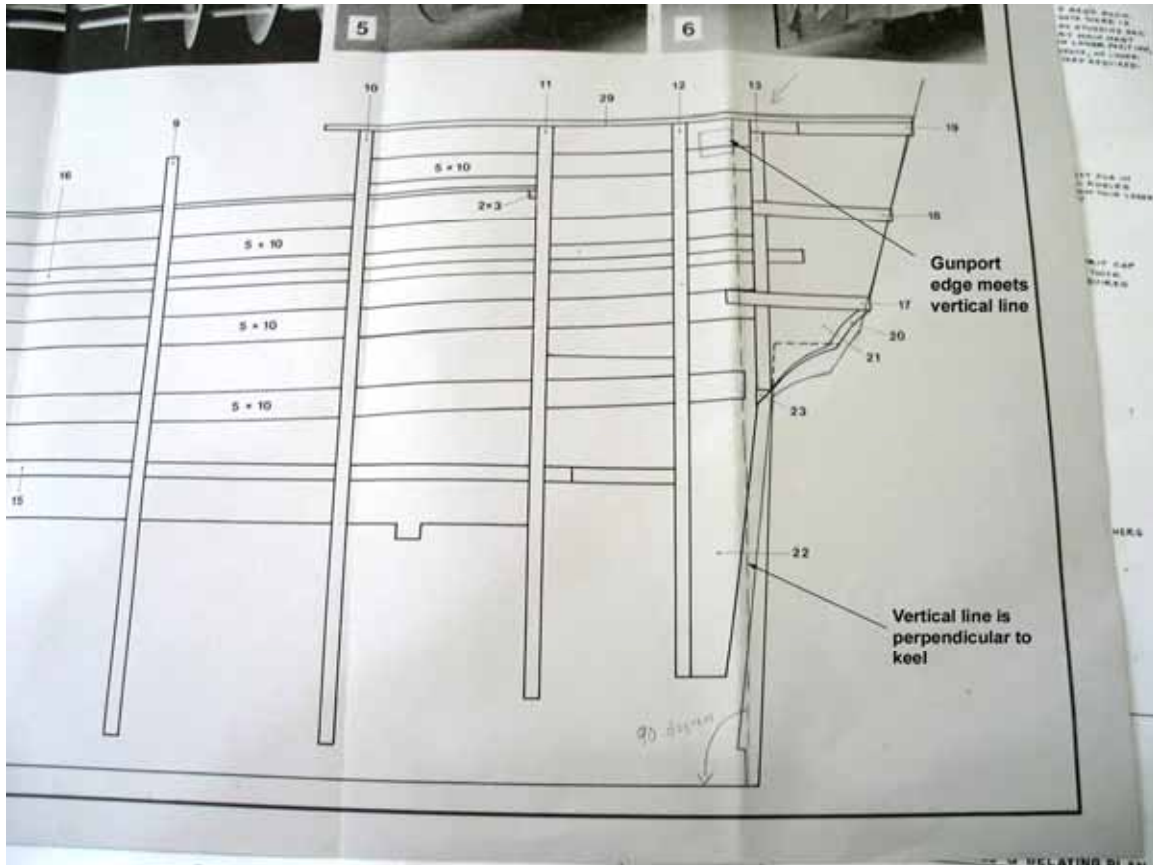
We need do some analysis of the kit's plans in comparison to McKay's plans. The stern area is not a simple area to modify. I wanted to open up this area to allow for detailing and adding lighting to it. The kit's design was such that extensive modifications needed to be made.

Looking at photo P1.2.1-5, you see the kits plans with the gunport template overlaid.



P1.2.1-5

There are two significant areas of concern in this photo. First, where bulkhead 8 is, you see that the template has a small tab, which I have bent downwards and used to align the template over the plans. Second, you see that the last and topmost gunport has been punched out. I have gone over the outline of the template with a pencil transferring the gunport opening onto the plans. Let's look at photo P1.2.1-6.



P1.2.1-6

Several things have been added to the plans in this photo. First, at the bottom of the keel, you see where I used the template from photo P1.2.1-5 and placed it on the keel aligning the top edge with the junction where bulkhead 13 meets the walnut plywood keel. I then dropped a vertical line to the bottom of the keel (the dotted line shown in the photo) as this is a key reference point. Looking at McKay's plans, you see that the back of the last gunport aligns perfectly with the aft edge of the keel. Relationships, this is one of them. Then, using McKay's sternpost drawing, I traced the outline to show the new angle of the sternpost and the slight protrusion of the keel/false keel.

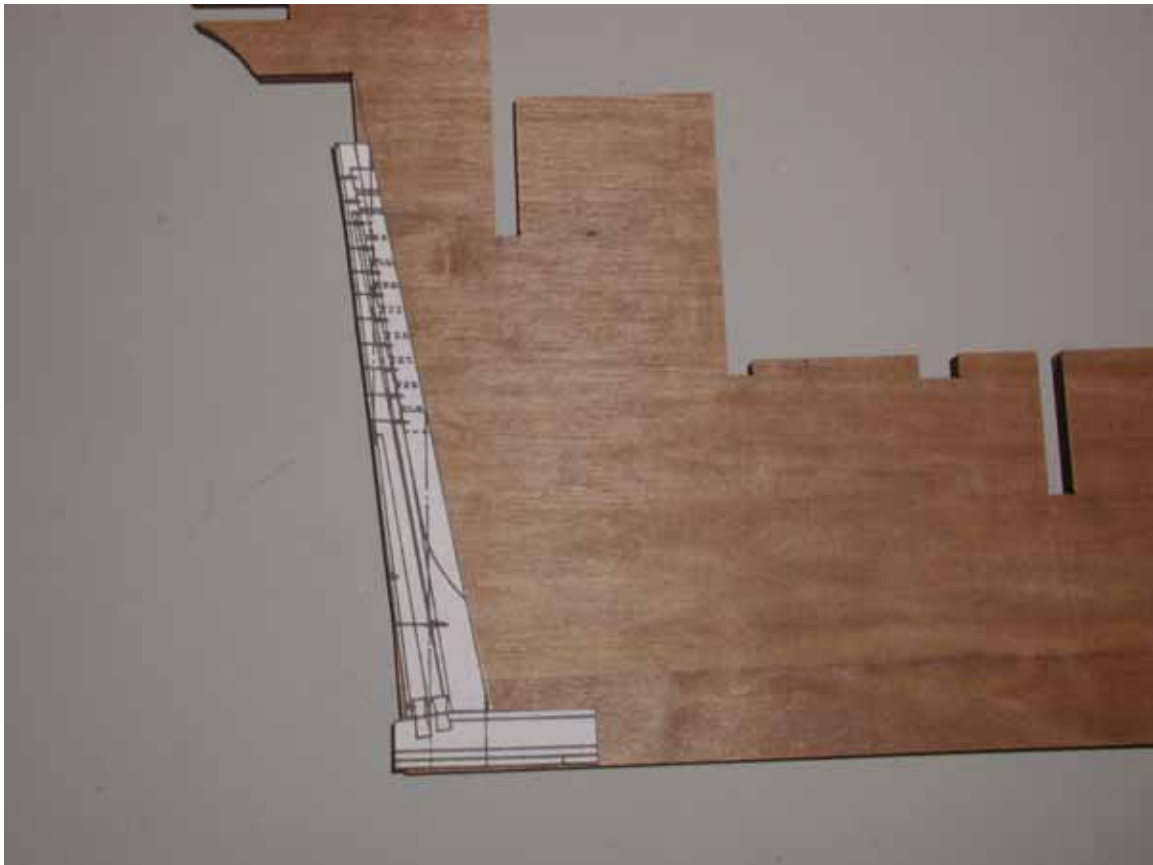
Next, I extended a line vertically at the end point of the new keel making sure that the line was perpendicular to the keel. You can see that this line intersects the aft edge of that last gunport. If you go to McKay's book, page 50/51 and extend a line in the same fashion you will see that his aft keel tip also meets the aft edge of the last gunport. That is a good thing.

So what we want to do is construct everything aft of this point. I went through numerous methods and my model and photos will show some anomalies that I hope I can save you from making unnecessary changes.

You will recall from my previous practicums that typically I would locate the bearding line and rabbet line and transfer those lines to the model before construction began. The rabbet joint is the area of wood removed between those two lines. This joint allows the planking to be tucked into the keel sealing the hull from water and forming a good bonded joint.

Because kitbashing as we will be doing to our Victory model is not an exact science but more of an exploratory method of construction, I chose to hold off on cutting the rabbet joint. I was not sure how things would fit together or how I might be modifying the model. This is not to say we will not be cutting a rabbet joint on the model. We will cut it later in our construction using a few chisels. You will find that this set of chisels will become very invaluable to you for future projects of kitbashing and scratchbuilding. So the investment now will be a wise one later on. I will give you the specifics on the chisels I use later on.

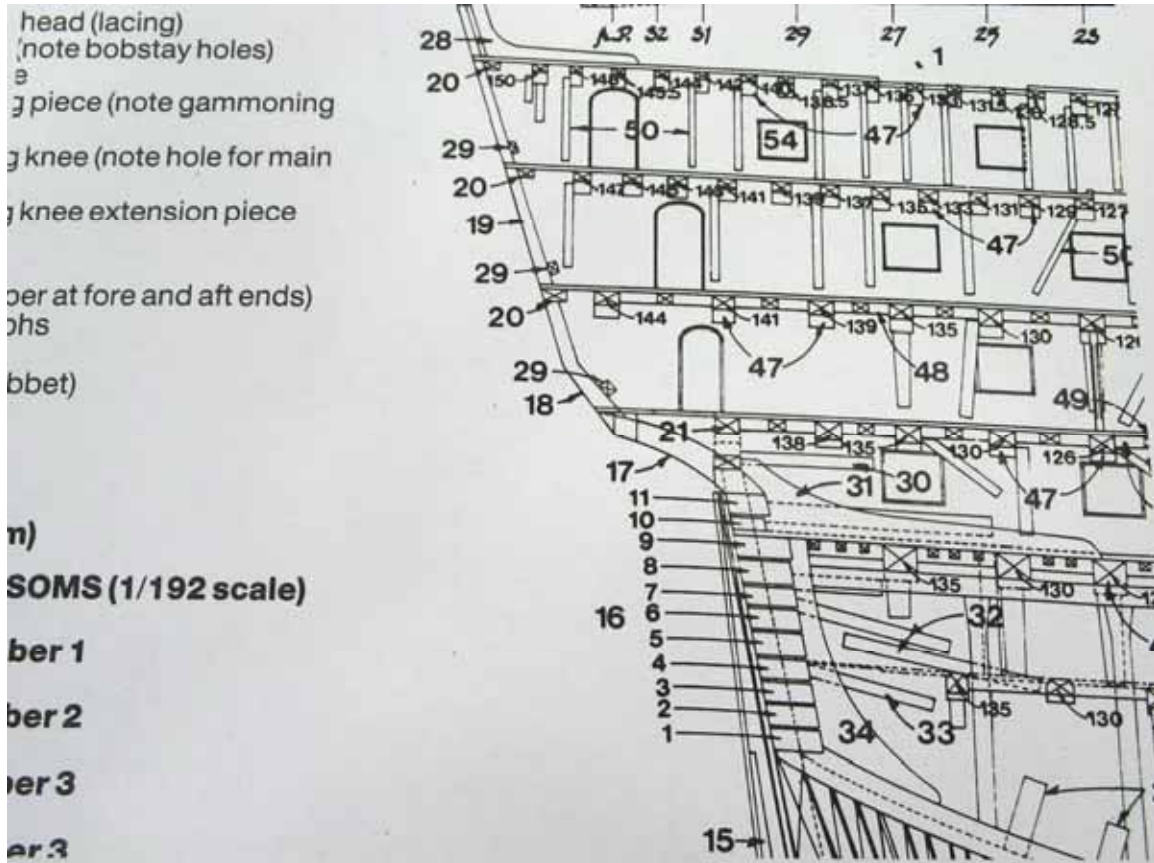
Referring back to the plans and the modified drawings I did to them using the template from McKay's book, you now need to modify your walnut plywood keel at the stern. You should rubber cement the drawing in photo P1.2.1-4 to a piece of card stock and transfer the drawing to your plywood keel. Photo P1.2.1-7 shows the template placed on the plywood keel.



P1.2.1-7

Notice how the inside edge is extended upwards and stops at the point in the keel where the 90 degree angle is formed under the counter. This is not correct! Later I realized that I should have aligned the outside edge first with the point where the counter ends, then traced the inside edge accordingly. It is the inside edge that you will cut out on the scroll saw but it is vital that you get it properly aligned. I ended up later having to glue some wood back on as I had made the cut too deep. You should position your drawing so that the inside top edge is approximately 1/8" past the point in the keel where the 90 degree angle is formed under the counter. Final adjustment to the sternpost may be necessary later on when the sternpost is attached with the wing transom and counter block. Any adjustment will be made by adding a small strip of wood or shaving the center keel down more.

Let's look at photo P1.2.1-8, which is an enlargement of the stern area from page 50/51 of McKay's book.



P1.2.1-8

You can see that the inside edge of the sternpost ends at the underside of the counter and the keel actually extends slightly beyond the counter. So to determine this location, you will need to make a template of this portion of the drawing. By aligning the bottom counter edge with the aft edge of bulkhead 12 on the plywood keel, you can then determine how to mark the inside edge of the

sternpost template. Basically I did that on the plans as you can see above in photo P1.2.1-6.

Once you have marked the keel, cut out the area on your scroll saw. It should look something like mine as shown in photo P1.2.1-9. Keep in mind, I had originally oriented the template incorrectly and cut too much off so that later I had to add some additional stock to rebuild the area I had removed.



P1.2.1-9

Once you have removed your bow and stern areas, you can set the plywood keel aside for now. Next, we need to address the bulkheads.

Summary

- Using John McKay's drawing B2/2 on page 50/51 of his Anatomy of the Ship/Victory book, enlarge the stem area and stern area by 246%.
- Cut the enlarged drawings out as shown and rubber cement them to card stock to make templates.
- Transfer the stem area to the plywood keel and mark the inside line.
- Cut the stem area out with a scroll saw

- Sand the edges with your True Sander sanding block to clean up the edges.
- Using the ships plans and McKay's stern area drawing, locate the proper place on the plywood keel to transfer your stern template. Keep in mind that the inside edge is the portion you will cut out and that the inside edge of the sternpost meets the lower counter.
- Cut the stern area out on your scroll saw and clean up with your sanding block.

1.3 The Bulkheads

Before we proceed with assembly we will need to make some changes to our bulkheads. My intent is to fully detail the quarterdeck and forecastle area as well as the upper deck. The kits design is to only show the upper deck details in the open area at the waste. So let's do some more kitbashing.

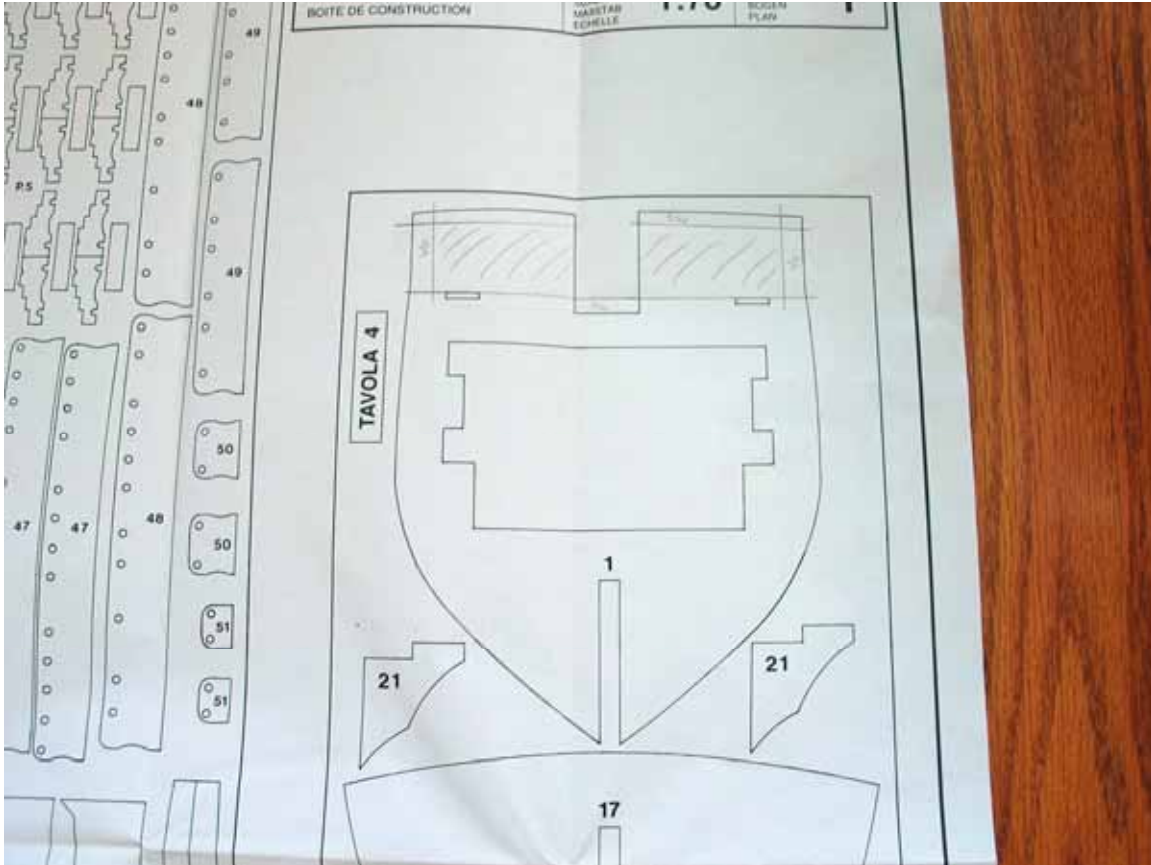
First you will need to remove the bulkheads from their plywood sheets. You can use a #11 Exacto to cut through the tabs that hold them in place. Cut some on one side, then flip the plywood over and cut the other side. Be careful that you do not break anything. Number each bulkhead by matching them up with their respective drawing found on sheet 1 of your plans.

1.3.1 Modifying The Bulkheads

To open up the upper deck area, we need to make some changes to the bulkheads. In studying the plans, one thing I discovered was that the deck levels are not correct. By enlarging McKay's plans I found that the decks and total height of the model is off to a considerable degree. Since the intent of this practicum is to show you how to kitbash the model and not totally scratchbuild it, I will not attempt to correct the deck placement but to a certain degree. Instead I will show you how to adapt McKay's plans to the kit's design.

Initially we will modify the bulkheads as shown here leaving temporary deck beams from the bulkheads. But when we start to modify the upper deck and install a false deck for the entire area, I found that these plywood pieces interfered with my construction and decided to just remove them. Below are photos and descriptions of the initial modifications I made to the bulkheads. You should go ahead and make these modifications as described but I wanted to tell you now that as the model progressed, I decided to eliminate the plywood deck beams created here so that real deck beams could be added later.

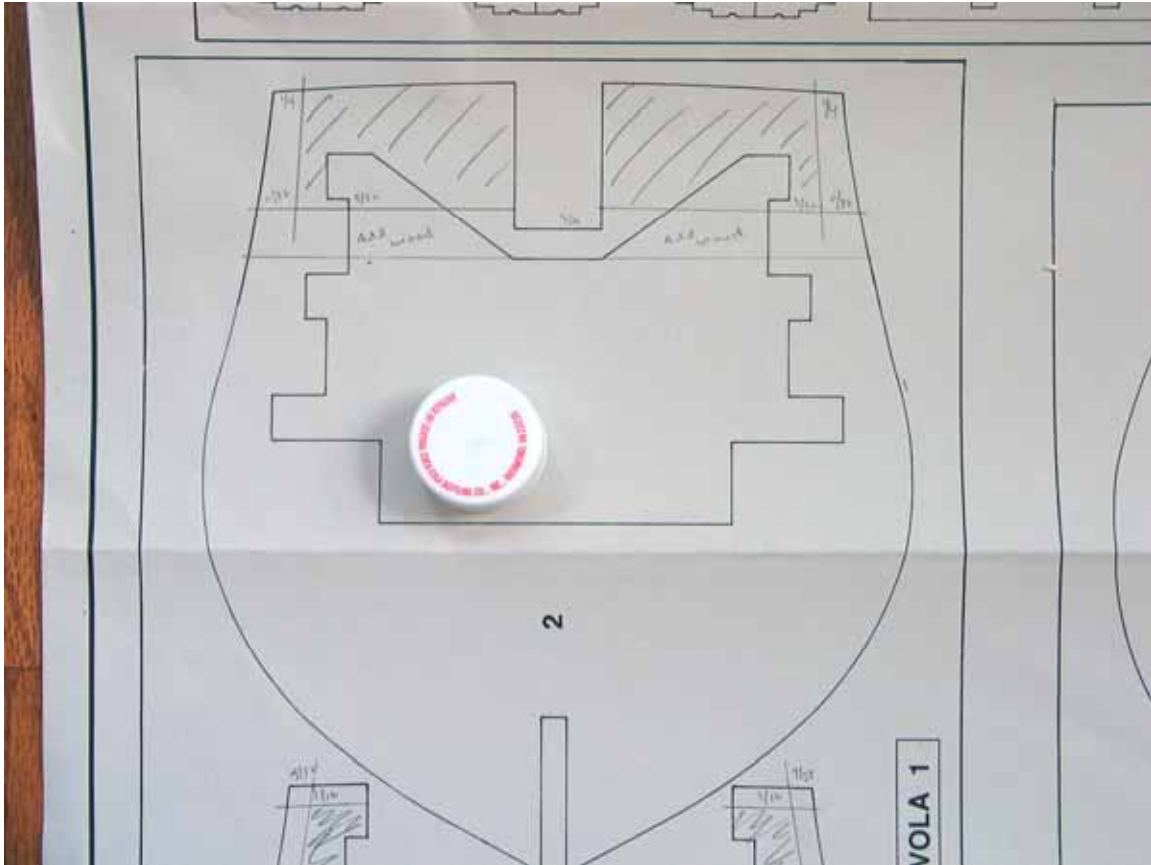
We'll start with bulkhead 1. Photo P1.3.1-1 shows the bulkhead drawing on sheet 1 of your plans.



P1.3.1-1

The bottom line is drawn $\frac{3}{16}$ " up from the center notch and extended side to side across the tops of the two small rectangular holes. The vertical lines are $\frac{1}{4}$ " from the sides of the bulkhead. The top line is $\frac{3}{16}$ " parallel to the top surface of the bulkhead. The area in between is removed with the scroll saw. This opens the bulkhead and leaves a beam across the top portion for the forecastle deck to sit upon.

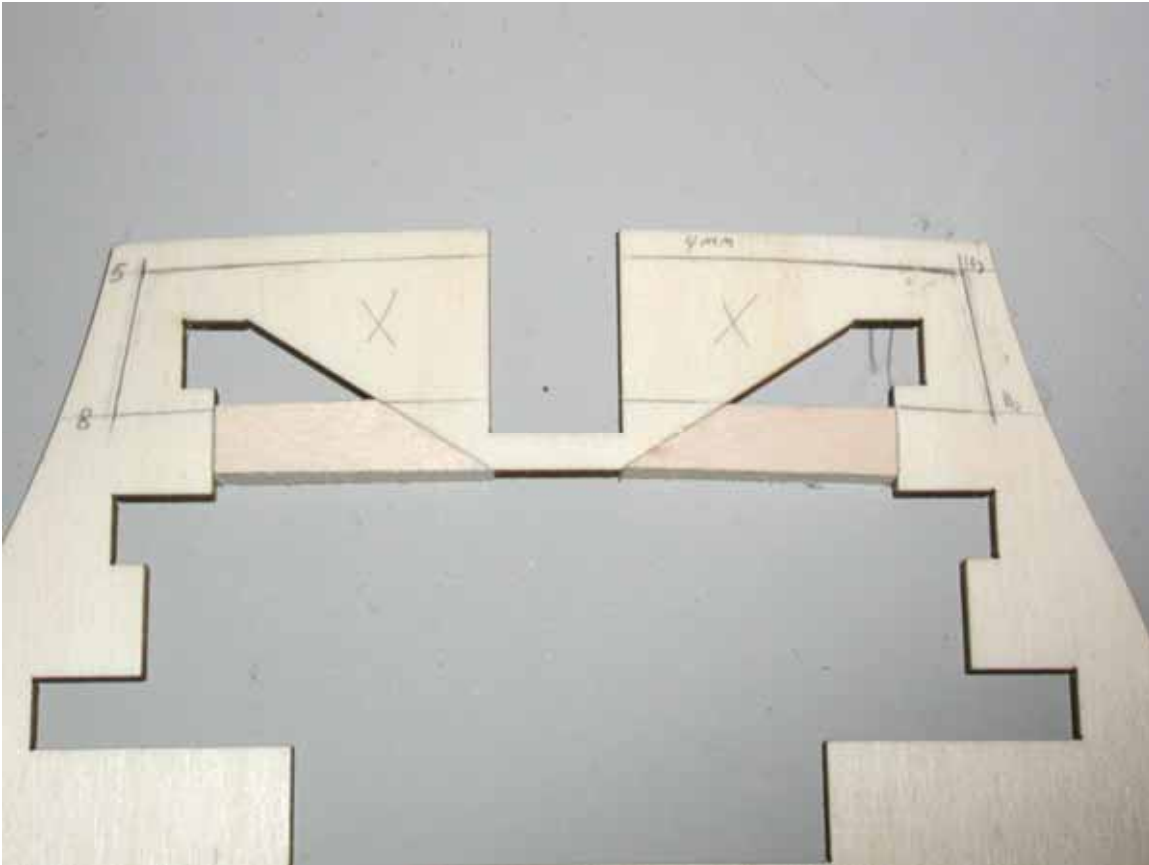
Photo P1.3.1-2 shows bulkhead 2.



P1.3.1-2

This shows that the sides of the upper bulwarks area are $\frac{1}{4}$ " wide at the top and $\frac{11}{32}$ " wide at the bottom. First measure $\frac{3}{16}$ " up from the center notch as you did on bulkhead 1. Extend lines outward but keep $\frac{3}{32}$ " down from the topside notch. Then measure $\frac{11}{32}$ " in from the side and draw your vertical line that represents the bulwarks.

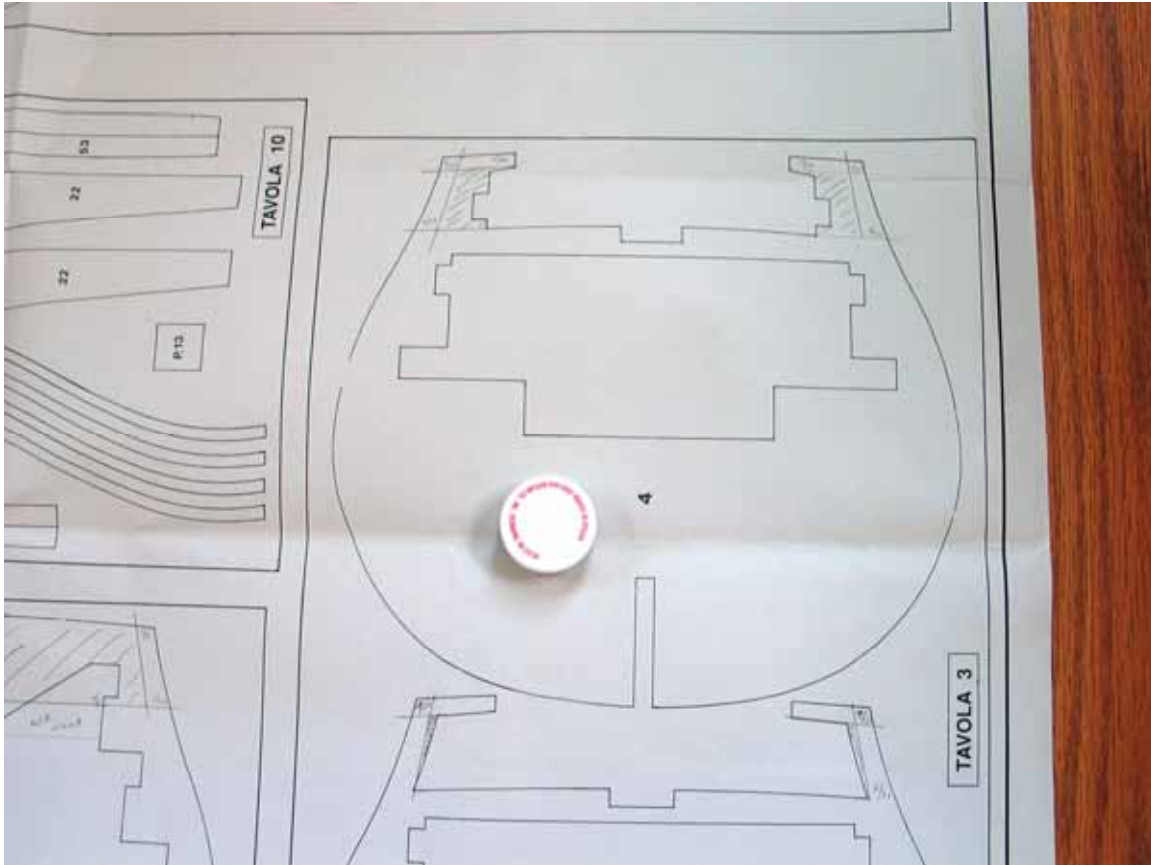
The top line is parallel to the top surface and $\frac{3}{16}$ " down. I added a piece of wood on both sides before I cut the shaded area out so as to retain the proper orientation and location of the center notch. There is a plywood piece that fits into this notch and locks all of the bulkheads together. Photo P1.3.1-3 shows the piece cut out with the filler blocks.



P1.3.1-3

Bulkhead 3 is made in the exact same fashion and using the same dimensions.

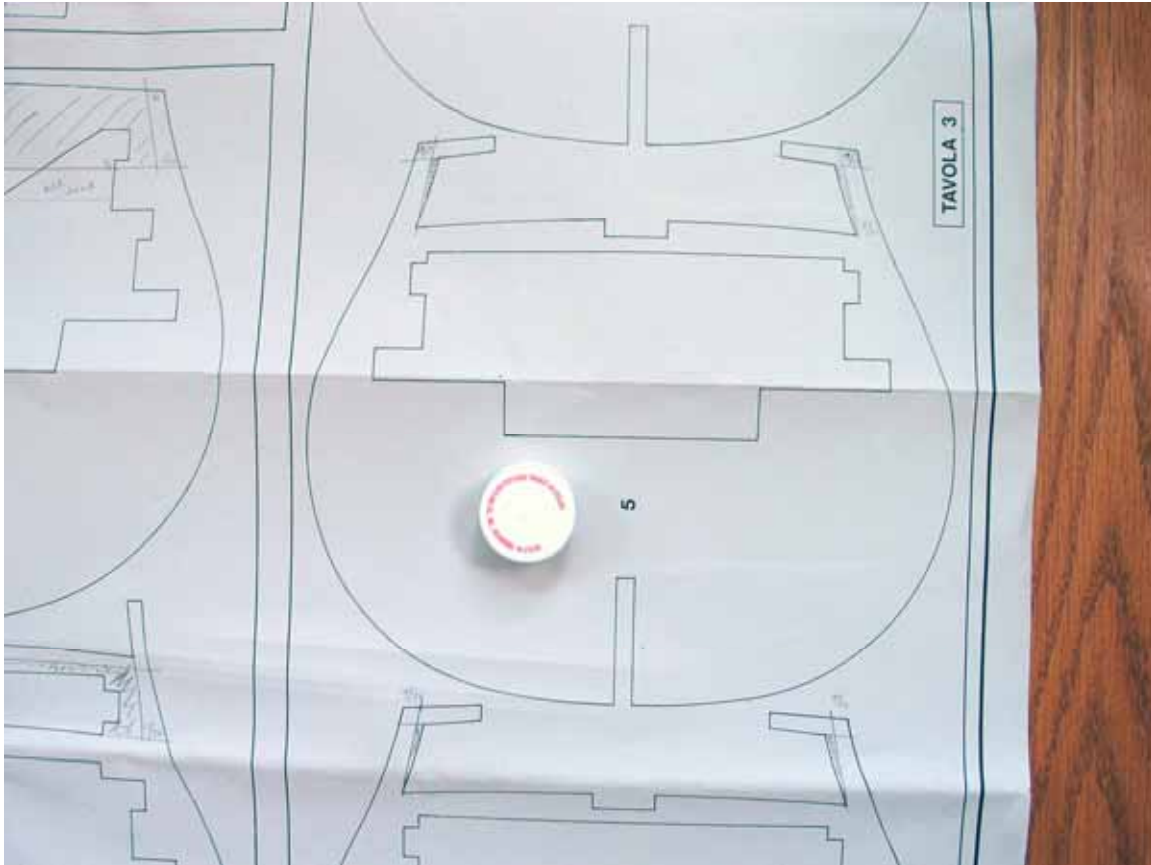
Bulkhead 4 is shown in photo P1.3.1-4.



P1.3.1-4

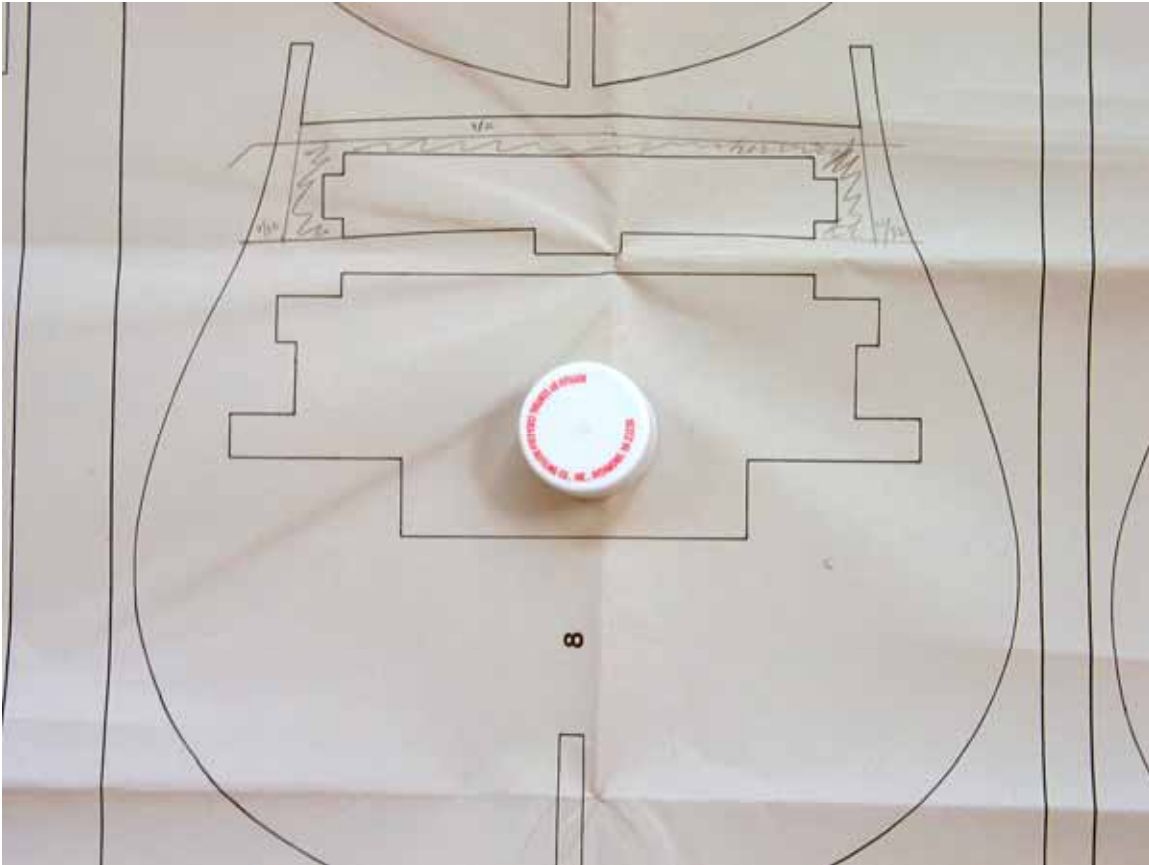
The first thing you want to do is extend the deck line across on both sides. The top of the bulwarks side is $7/32$ " wide and the bottom is $11/32$ ". **Note: The photo shows the measurement to be $9/32$ " but it should be $11/32$ ".** Make these marks and then draw your vertical lines. Cut out the shaded area.

Bulkheads 5, 6 and 7 are at the waste of the ship and all that is needed is to measure in $7/32$ " on each side at the top and extend that line down to the deck line and trim. Photo P1.3.1-5 shows bulkhead 5.



P1.3.1-5

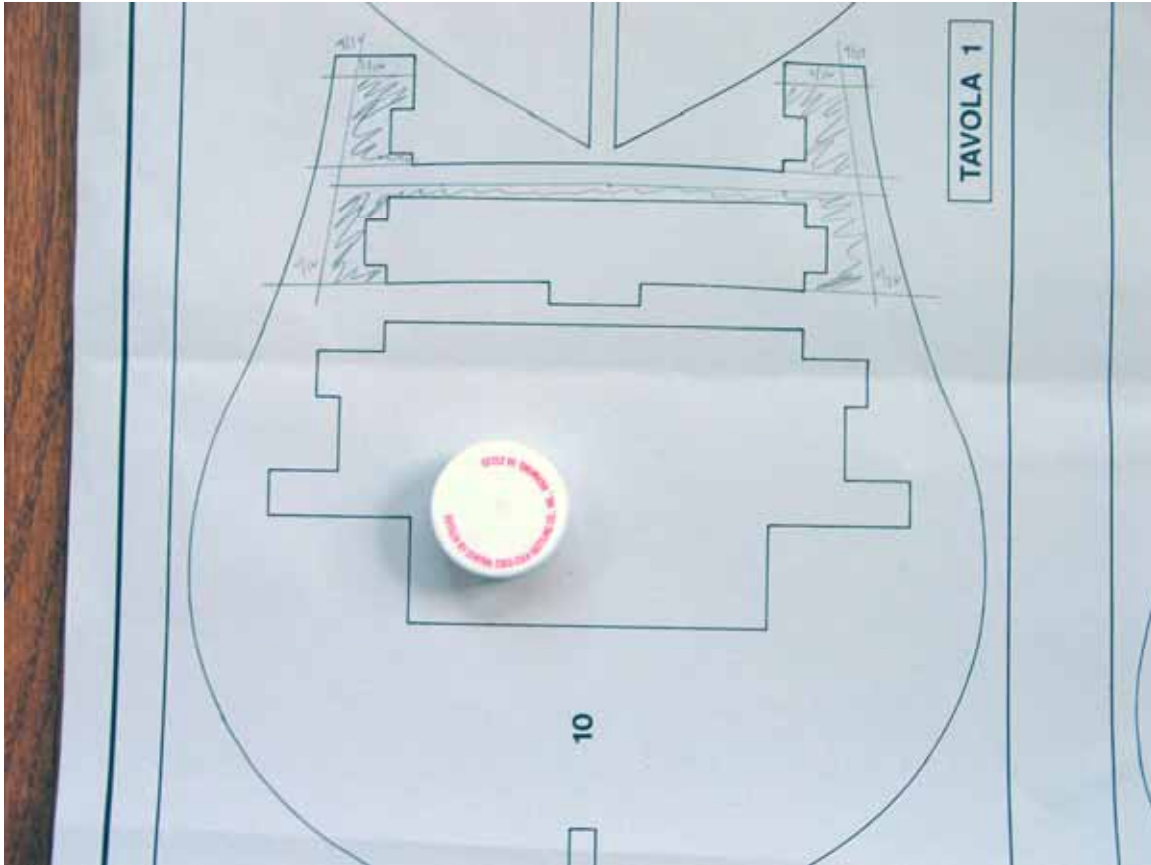
Photo P1.3.1-6 shows bulkhead 8.



P1.3.1-6

The top beam is $\frac{3}{16}$ " thick. Draw your line parallel to the top surface. Extend the deck lines outward. Measure $\frac{11}{32}$ " from the sides and then extend the vertical bulwarks lines downward. Cut out the shaded areas. Bulkhead 9 is cut the same way.

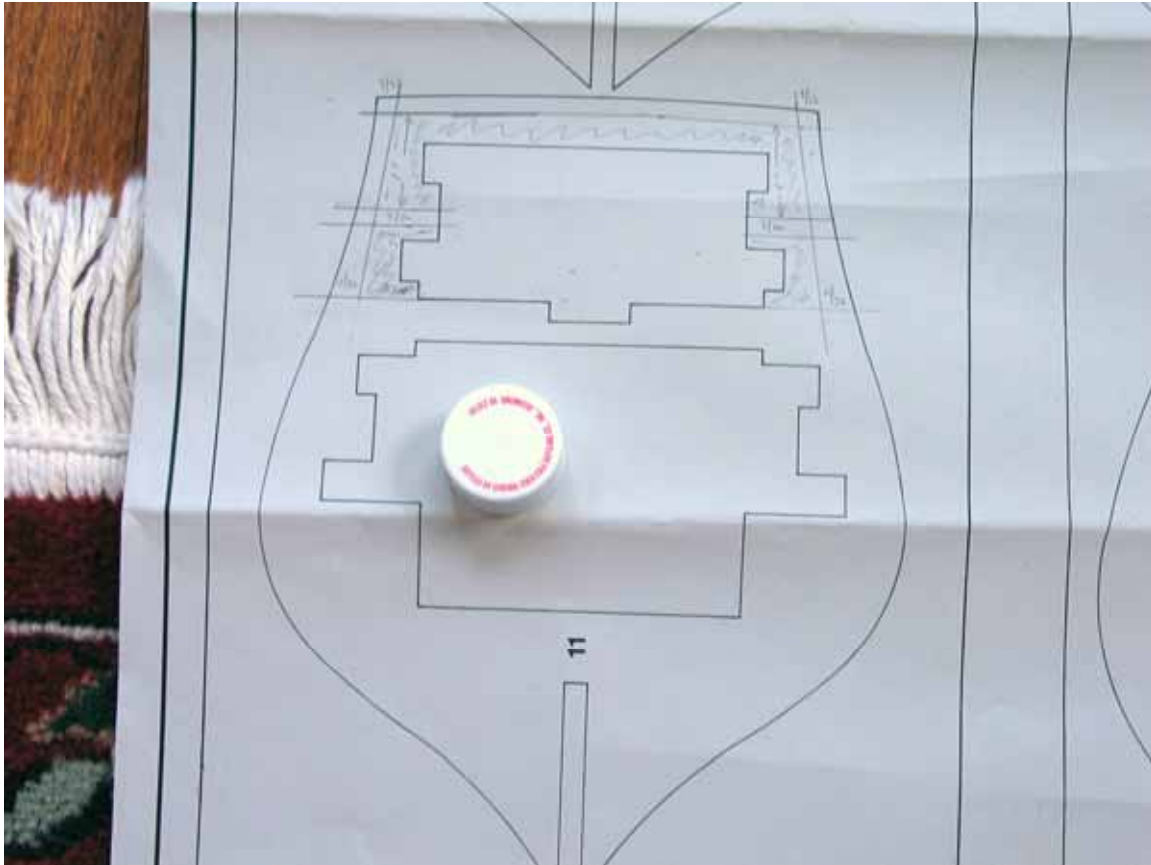
Photo P1.3.1-7 shows bulkhead 10.



P1.3.1-7

Extend the top surface of the upper deck line to each side. Extend the lower deck surface to each side. Measure $7/32$ " in from the sides at the top and $11/32$ " in from the edge at the bottom deck line you just extended. Then draw vertical lines to form the bulwarks sides. Measure $3/16$ " down from the top edge and draw parallel lines to form partial deck beams for the poop deck. Draw a parallel line under the quarterdeck line that is $3/16$ " wide. Cut out the areas that are shaded.

Photo P1.3.1-8 shows bulkhead 11.



P1.3.1-8

Drawing a line $\frac{3}{16}$ " down and parallel to the top surface to form the top beam. The bottom deck is extended to the sides and then measured in $1\frac{11}{32}$ ". Measure in $\frac{7}{32}$ " at the top and connect to form the vertical lines that make up the bulwarks. The top deck is the poop deck so we need to create partial deck beams for the quarterdeck. Measure down 1" from the bottom of the poop deck beam and make a mark. Measure $\frac{3}{16}$ " down and make another mark. Then draw parallel lines to form the quarterdeck beam. Cut out the shaded area. Bulkhead 12 is cut with these same measurements and in the same fashion. Bulkhead 13 will not be used.

After cutting all of your bulkheads out as described, you are ready to start some assembly.

Summary

- Mark each bulkhead as shown and described and cut out with a scroll saw.

1.4 Assembling The Framework

We are now ready to assemble the framework. We will hold off on cutting the rabbet joint before assembly. It will be a little more difficult to do it this way but it is wise to cut the joint with the framework assembled and the sternpost fitted to ensure that it is cut properly.

The secret to assembly is building the bulkheads with their plywood support pieces as one assembly and then gluing it all to the walnut plywood keel. This is contradictory to the kits instructions.

There is a plywood piece with notches along each side. Locate that piece first. It's shown on your plans as part 15. Remove it with the Exacto as you did the bulkheads. There's a smaller piece with it as well, part 16. Remove that piece also.

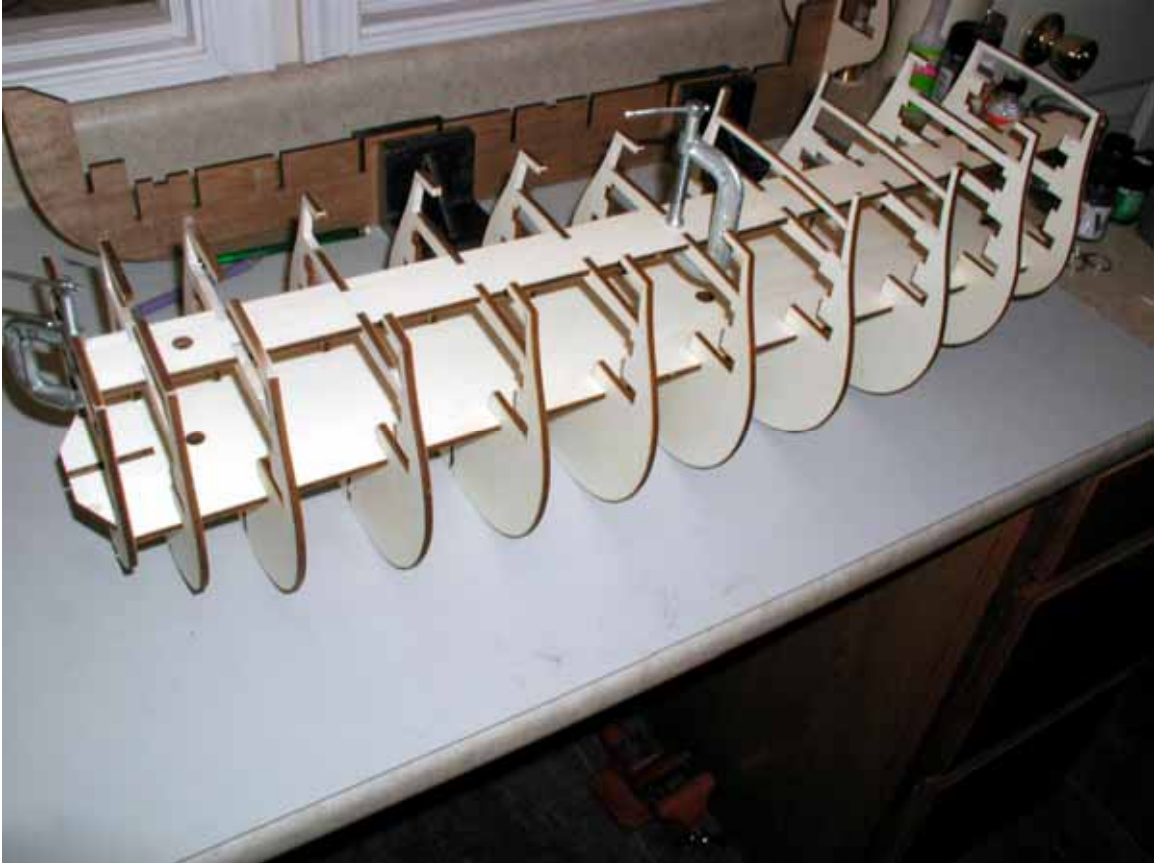
I found the fit of everything to be quite well and did not have to trim or open up any notches. But you should test fit things before gluing them up. This also helps in understanding how to assemble the structure.

Basically you should start at the stern and insert bulkhead 12 into the proper notch in part 15. Make sure you have it in the correct notch, as we are not using bulkhead 13. Don't make the mistake of putting it in the notch for bulkhead 13. Slip bulkhead 12 into its respective notch, then slip the plywood part 15 in place in the opening. Make sure you align the proper set of notches on it as well. The aft end of part 15 is the end with the smallest mast hole.

Continue to add bulkheads slipping them over part 15 and sliding them into position and down into their respective notches. When all the bulkheads have been added, push part 16 down locking them in place. If everything fits together well, remove the bulkheads and part 15 and 16 and repeat the process with glue.

When you glue the bulkheads into part 15, put some glue on the surface area where part 15 will lock in place and in the notches on part 15. Just keep working your way from stern to stem gluing bulkheads to part 15. You will find that as you approach the bow, the bulkheads aren't as tall and you'll need to put something under them to hold them in place.

Once all the bulkheads have been glued in, you can then put glue on the surface of each bulkhead where part 16 fits down onto the plywood keel. I used Weldbond as it allows for ungluing with the use of alcohol if you have to take something apart later. Photo P1.4-1 shows the basic framework glued up.



P1.4-1

Here you see the second plywood piece, part 16, also in place and clamped. Again, make sure that it is properly oriented. The notches in part 16 fit into the center notches of each bulkhead. I found it necessary to use some C clamps to hold the part down and tightly in the notches until the glue had dried.

You can see that the entire structure has not been attached to the plywood keel yet. Allow this structure to set up first.

If you study the photo closely, you'll notice that I had not cut out bulkheads 11 and 12 when I assembled the structure. My mistake, I got my deck lines mixed up. Don't make that mistake!

Once the glue has dried, you can then glue the bulkheads onto the plywood keel. You want to coat each notch in the plywood keel with glue and put some on the sides just above each notch. Then slip the bulkheads into their respective notches and push down making sure they seat properly. Photo P1.4-2 shows the bulkheads being pushed down into the plywood keel notches.



P1.4-2

Photo P1.4-3 shows the bulkheads all glued up.



P1.4-3

You'll notice a plank lying across the fore-castle and quarter-deck. This is just to check the alignment and make sure that the bulkheads are properly aligned.

Summary

- Test fit the bulkheads to parts 15 and 16 first.
- When satisfied with the fit, glue the bulkheads to part 15, then glue part 16 in place, clamp and allow the glue to dry. Check alignment of the decks with a plank laid across the beams.
- Glue the entire structure to the plywood keel making sure all of the bulkheads seat properly.

1.5 The Stern Transom Area

Now we come to the most difficult and complicated area of the models basic framework. We've omitted bulkhead 13. In doing so, we cannot use parts 17 – 21 and we don't want to either. The kits transom area was not correctly designed. The counter is off and the bulky plywood parts (17, 18 and 19) will not make for proper side gallery construction if we are to learn new skills and make this kit more accurate. So we turn to kitbashing and scratchbuilding once again.

1.5.1 The Wing Transom

Probably one of the most critical timbers of the stern area is the wing transom. The stern of a ship is built up with a number of horizontal timbers called transoms. These transoms fit into notches cut into the sternpost. The sternpost in turn consists of an inner and outer sternpost. This can be seen on page 50 of McKay's book. Drawing B4 shows 11 transoms. Transom 11 is the wing transom. The shape of this transom can be found in drawing B1/1 on page 48/49 which you should have 2 copies of.

Making the transom is straightforward. Rubber cement the pattern to a piece of 1/4" basswood and cut it out with your scroll saw.

The transom has a slight arch to it. The pattern for this arch is shown on page 52, drawing B5 in McKay's book. It's the timber marked number 11. Make a copy of that timber enlarging by 246% and cut the pattern out and making a template. You can then trace the template on the wood. Use your scroll saw or a #22 Exacto knife and cut the arch on both the top and bottom surfaces of the wing transom.. Sand with your sanding block to smooth it out. Photo P1.5.1-1 shows the wing transom sitting on top of the counters block. We will cover the counters next.



P1.5.1-1

Summary

- Use drawing B1/1 on page 48 and drawing B5 on page 52 of McKay's book to make the wing transom.
- Use 1/4" basswood to cut the part out.

1.5.2 The Counters

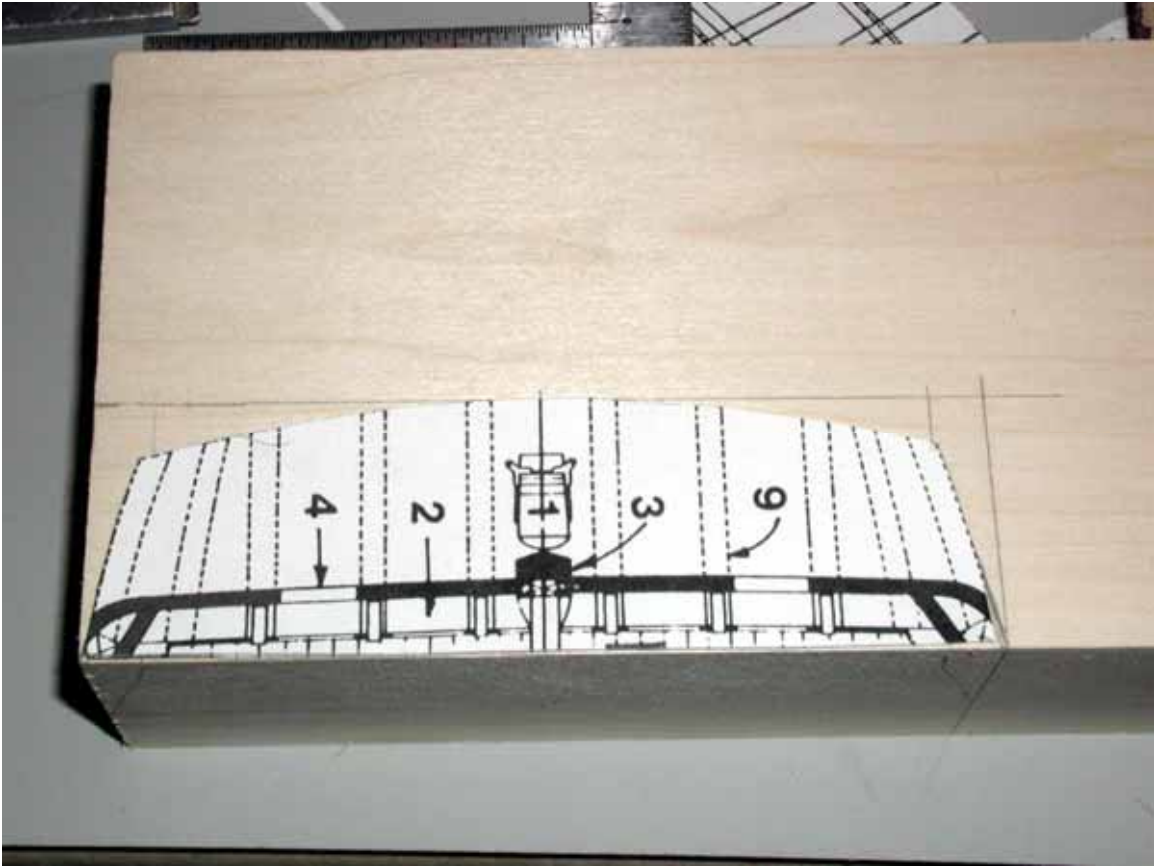
The stern area of the ship has two counters. The upper counter has the ships name across it while the lower counter has two gunports. We will start by making these two counters out of a solid block of basswood. You will need a block of 3" x 6" x 12" basswood to cut these counters out.

To arrive at the proper shape of the counters we need 3 drawings. First, we need to know the shape as seen from above. This shape is shown on page 44/45 of McKay's book. Drawing A9 shows the stern transom frames extending outward from the wing transom. The wing transom is shown on page 48/49 in drawing B1/1. You will need to make at least 2 copies of the stern area of each of these drawings from station 27 aft. Remember to enlarge the drawings by 246%.

The second drawing we need is a view from the rear looking forward. You can find this drawing on page 52, drawing B5. You'll need at least 2 copies of this entire drawing. You will later cut the drawing down and use just the area that defines the profile of the counters.

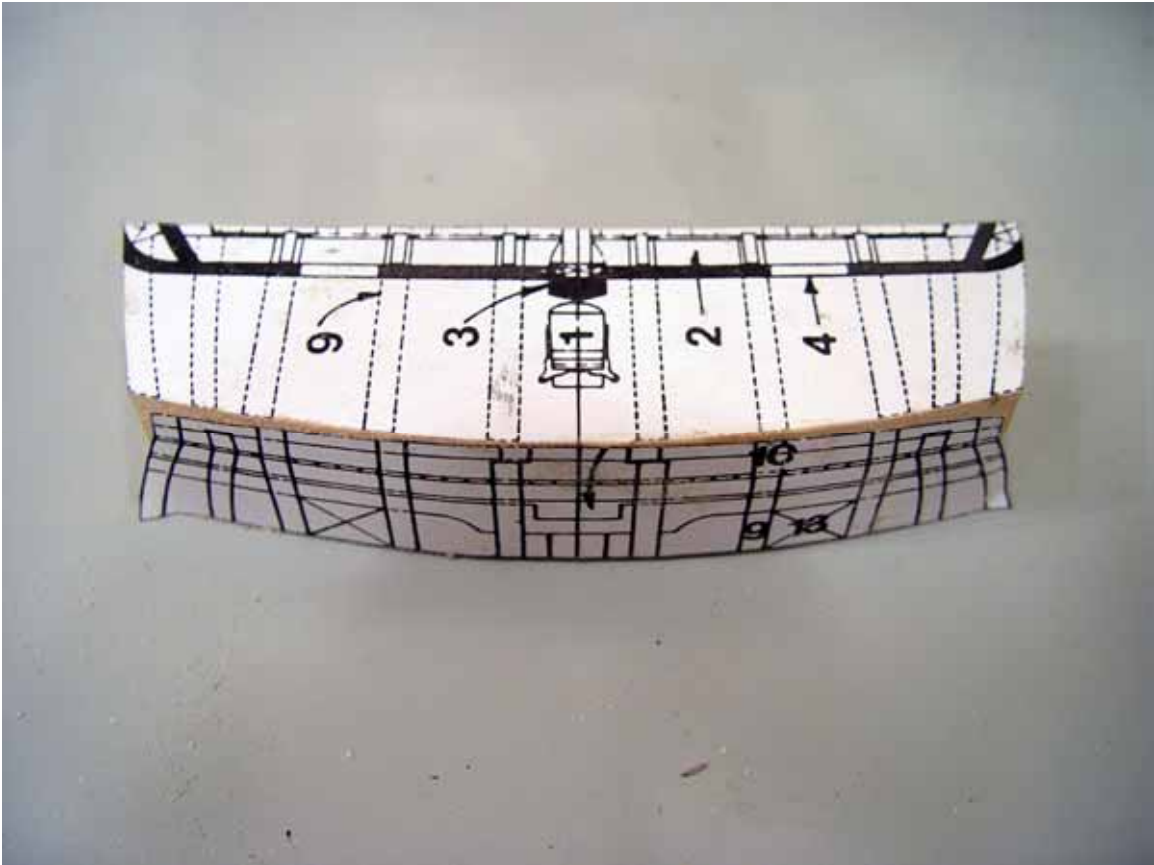
The third drawing we need is a profile view. This can be found on page 53, drawing B6. You'll need at least 2 copies of this drawing showing the stern area from station 27 aft.

Next, let's isolate the particular areas we are interested in. Photo P1.5.2-1 shows the basswood block with the first drawing rubber cemented to the top surface.



P1.5.2-1

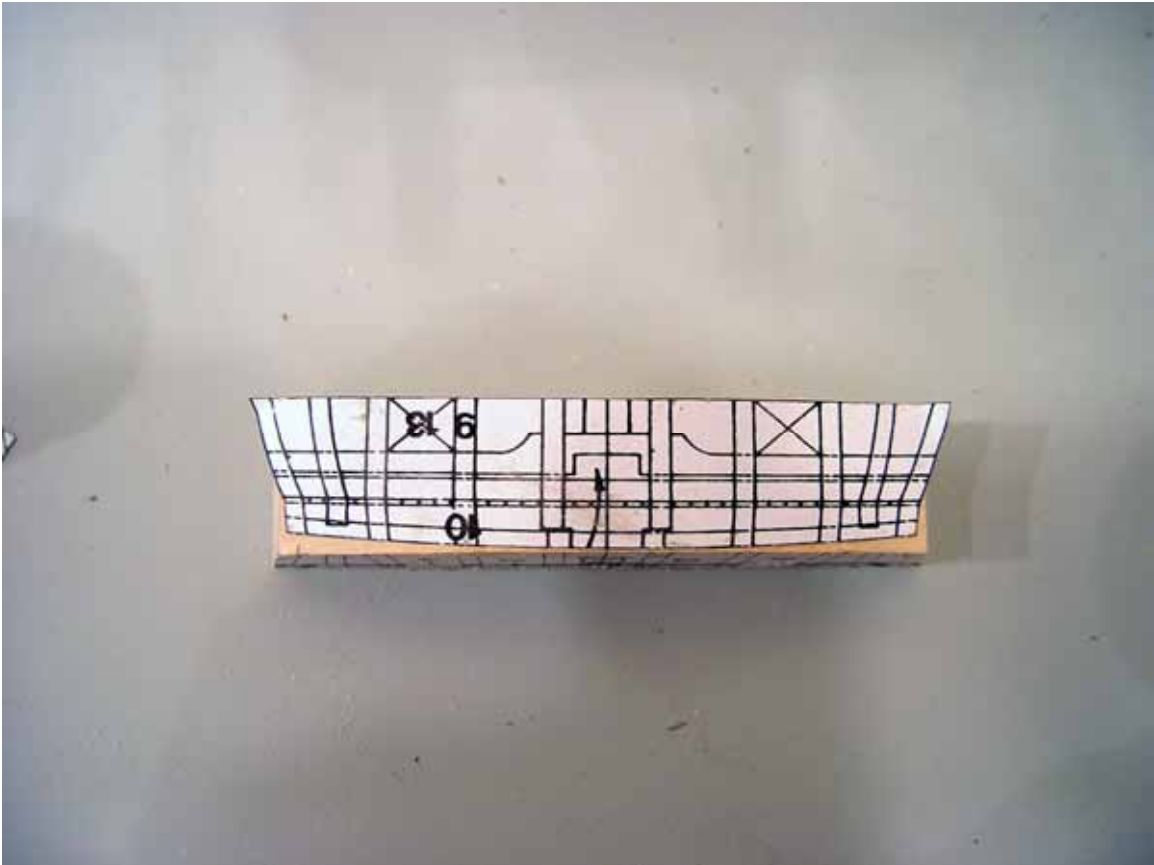
Use this photo to cut out the portion of the drawing shown and rubber cement it to your block of basswood as I have done. Then cut the block out with your scroll saw. Photo P1.5.2-2 shows the block cut out and the second drawing cemented to the backside.



P1.5.2-2

The trick here is to align the centerline of the first drawing with the centerline of the second.

You can see that the second drawing has an arch to it. It also is wider at the bottom than it is at the top. Photo P1.5.2-3 shows a different view of our block.

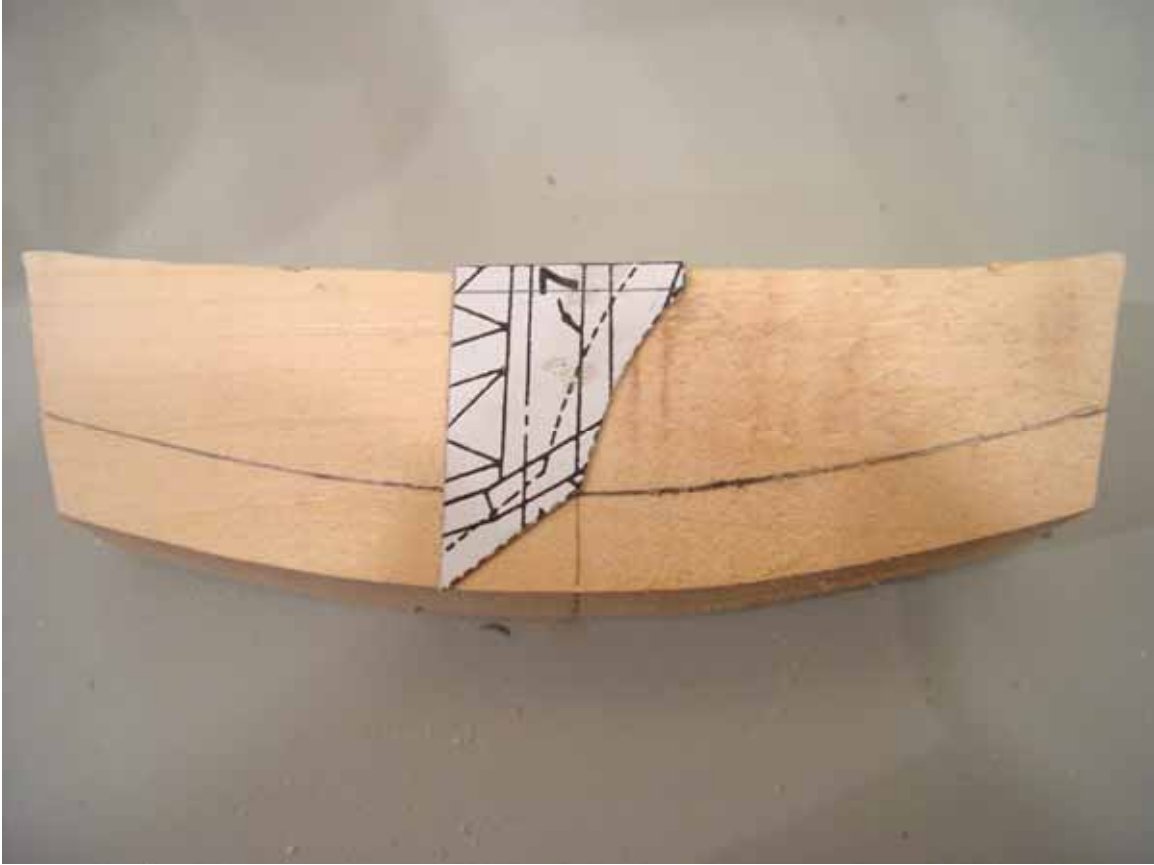


P1.5.2-3

Now turn the block so that drawing 2 is on the top surface and cut out the arched area with the scroll saw. This will remove the first drawing. After cutting it out, redraw the centerline. You will also need to transfer this arch to the opposite surface and cut it as a concaved surface. The second drawing does not show this.

The third drawing defines the profile of the counters. But we cannot simply put the pattern on each end and trim the wood. That won't work because the ends are not as wide as the center is. So we must take a different approach.

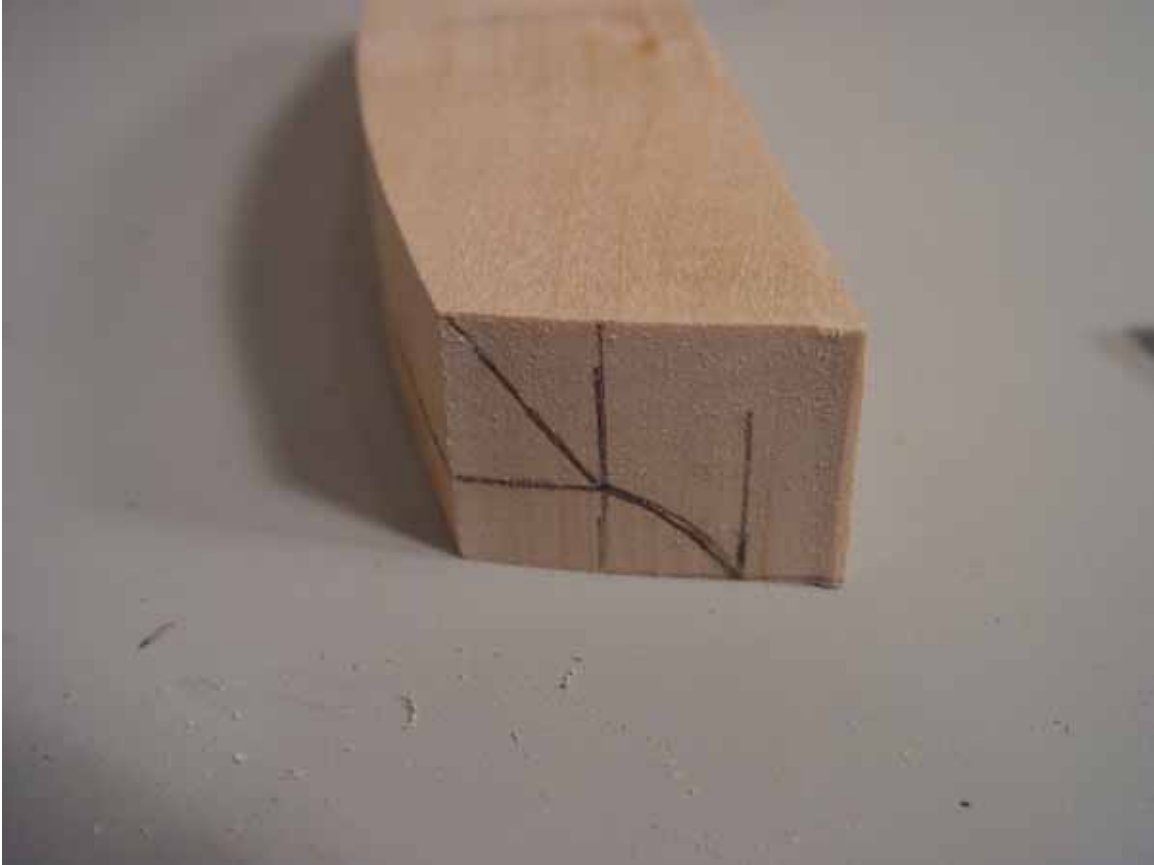
Start by placing the portion of the profile pattern shown in photo P1.5.2-4 across the top surface of your block at the centerline. Photo P1.5.2-4 shows this. You will notice that the forward edge of the block has a slight arch in it in this photo. This arch matches the curve of the wing transom as this counter block will sit on top of the wing transom. You may use your wing transom made earlier to mark this curved area aligning the outer edges with the two sides of the block and the forward edges of the wing transom with the forward edges of the block and cut the block to match the wing transom curve on your scroll saw.



P1.5.2-4

You can see a line that is parallel to the aft side of the block. That line is equal to the depth of the upper counter as shown by the template placed on the centerline.

This line represents the upper counter but we also need the lower counter. First extend the line across both ends keeping it parallel to the back and front edges. Photo P1.5.2-5 shows this.



P1.5.2-5

By now taking the profile template and placing the bottom edge of the upper counter, you can project the bottom edge of the lower counter. It should coincide with the aft edge of the wing transom. You can then draw a line across the bottom of the block parallel with the aft edge to mark the bottom edge of the lower counter.

By connecting the vertical mark for the bottom edge of the upper counter to the outside corner as shown in the photo, you now have the profile of the counter across the side, a mark for the location of the bottom edge of the upper counter on the bottom edge and the mark for the bottom edge of the lower counter as shown in photo P1.5.2-6.



P1.5.2-6

You're looking at the bottom of the block. You'll notice that I've extended a line horizontally across the end and aft edge where the upper counter meets the lower counter. We will use that line for reference purposes in carving the block.

You will recall earlier that I told you that you would need some chisels. The time has come! I purchased my chisels years ago from a mail order company which I no longer get catalogs from. But I believe the numbering of chisels is uniform. There are three primary shapes that I use most often. They are, D12/2, D5/3 and D5/8. The 12/2 chisel is a small V shaped chisel. The other two are small gouges. D5/3 is about 1/8" wide while D5/8 is about 1/2" wide. They are not flat but have a very small concave shape to them. They are Swiss made, very sharp and very nice. I believe I paid \$30.00 each for them.

You will need to purchase a set of good chisels. A company called Lee Valley is one source. Their website is <http://www.leevalleytools.com>. A much better source is Woodcraft. They have a set of Swiss made chisels by Pfeil. These are the chisels I purchased. The complete set with a cloth tool roll is available for \$249.99. Their address is 560 Airport Industrial Park, Parkersburg, WV 28102. Their phone number is (800) 225-1153. They have a website at <http://www.woodcraft.com>. The item number for this chisel set is 13D15. Photo P1.5.2-7 shows the chisels I used on my model.



P1.5.2-7

To keep your chisels sharp, you will need some sharpening stones. I chose two Japanese water stones, also sold by Woodcraft. The set I purchased consisted of an 800 grit and a 4000 grit stone. The item number for the set is OBT41 and they cost \$25.99. They should last a lifetime and I have used them several times to keep the chisels nice and sharp. For gouges, the Japanese water slipstones help to take burrs off the top surface of the gouge. The set I purchased was item 140567 for \$47.75. You might also consider a special jig to hold the chisels in a set position such as the oar sharpener, item number 142390 for \$27.99. In all you can see that a good set of working chisels and sharpening system can be as costly as any power tool. But for my modeling needs, I could not do without my chisels. They have come in hand a number of times.

You will also need some sort of vise to clamp your block for carving. I use one that has a swivel ball and can be rotated in most any direction. Photo P1.5.2-8 shows the block clamped.



P1.5.2-8

You can see the chisel and how I've started chiseling the piece. You want to take the piece down to the line across the back first. This forms the bottom counter. After shaping the bottom counter, you can redraw the line across the surface of the block and carve the upper counter.

Photo P1.5.2-9 shows the bottom counter completed except for sanding.



P1.5.2-9

Photo P1.5.2-10 shows the line redrawn and I've started to carve the upper counter.



P1.5.2-10

And photo P1.5.2-11 shows the finished piece before sanding.



P1.5.2-11

You can see one of the chisels in this photo. The bottom edge will sit on top of the wing transom. You can see that the bottom and top surfaces have an arch in them. And from the shape of the counter there is also an arch front to back.

Once you have carved the basic shape, check the fit with the wing transom to see that the two fit together properly. Sand the transom block good with 100, 150 and 220 sandpaper. It doesn't have to be finished, as planking will be applied over it later on. Just be sure you have a smooth, finished surface on all sides.

Photo P1.5.2-12 shows the wing transom temporarily in place with the counters block sitting on top of it. Do not install yours just yet. Set it aside for now and soon we'll bring it all together.



P1.5.2-12

This should give you a good understanding of how all of this fits together. Next, we'll tackle the sternpost.

Summary

- Make 2 copies (enlarged) of drawings A9 (page 44/45), B5 (page 52) and B4 (page 50) in McKay's book.
- Use 3" x 6" x 12" basswood to make the counters block.
- Cut out the pattern you made from drawing A9 and rubber cement it to the basswood block.
- Cut out the pattern with your scroll saw.
- Cut out the pattern you made from drawing B5 and rubber cement it to the side of the block you just cut out.
- Cut the arch on the top and then repeat on the bottom of the block.
- Using the third pattern B4 at the centerline, mark where the upper counter meets the lower counter.
- Using the outside edge, extend that line across the block parallel to the outside edge.
- Extend the line down the two ends.
- Place the third pattern on one end locating the junction of the lower and upper counter on the vertical line you extended. Mark the location

where it sits on the wing transom and extend the line to the junction of the two counters showing the lower counter arch.

- Extend a line horizontally from that point out to the backside of the block, then across and parallel to the arched bottom meeting on the other side.
- Extend a line from the junction of the two counters straight and to the outside top corner to mark the upper counter.
- Clamp the block in a vise and use chisels to carve away the lower counter.
- Redraw the line that is the junction between lower and upper counter drawing it across the area just carved.
- Carve the upper counter with chisels.
- Sand the block with 100, 150 and 220 sandpaper and set aside.

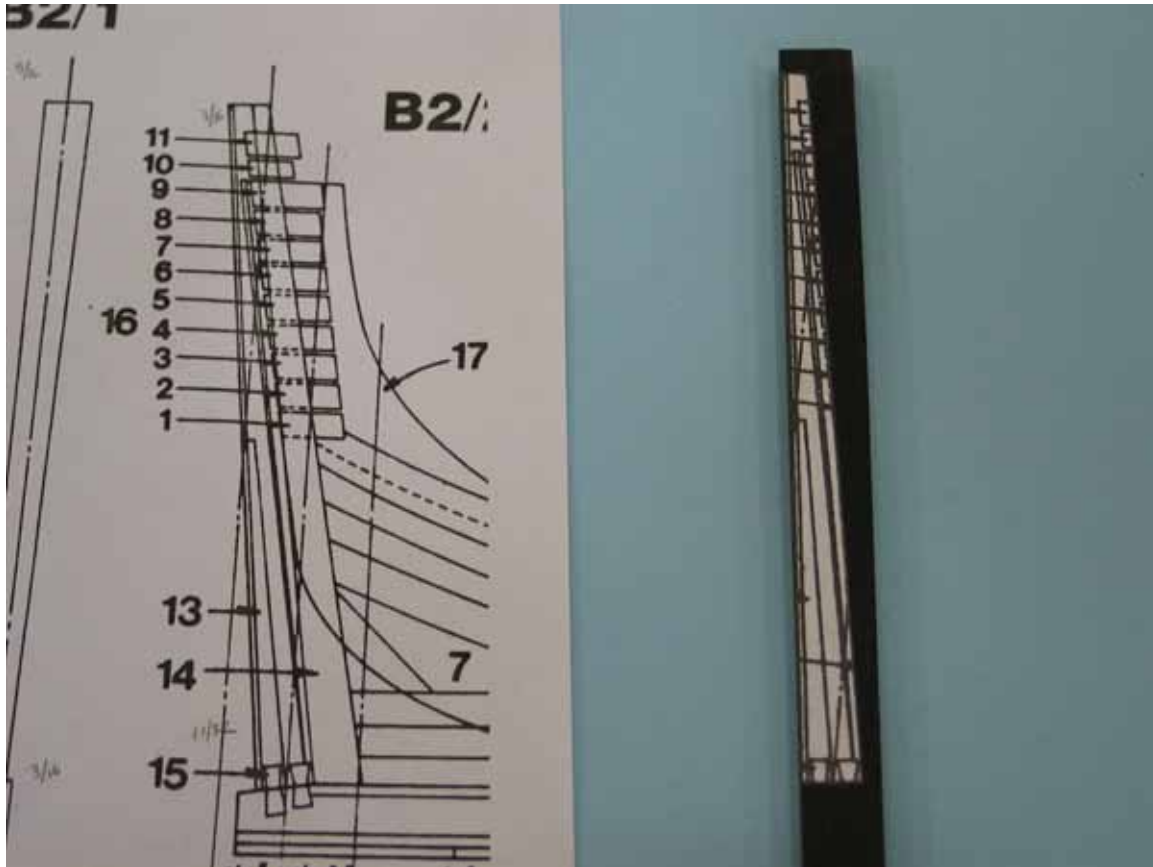
1.5.3 The Sternpost

Our sternpost will show on the finished model. As such, we are going to make it out of ebony. As I mentioned earlier, the model is going to be constructed entirely in natural wood and to simulate the black and yellow color scheme, we will be using ebony and boxwood.

Earlier you made an enlargement of drawing B2/2 on page 50/51 of McKay's book. You'll need that drawing now.

The drawing actually shows both the sternpost and inner sternpost. The sternpost is attached to the keel using a mortise and tenon and two fish plates are attached on the outside. These are shown as item 15 in the drawing. The inner sternpost is connected to the stern deadwood and the sternpost itself is connected to that entire structure. The portion of the drawing that you are interested in is the sternpost only.

To make the sternpost you will need a piece of 3/8" x 3/8" ebony. Photo P1.5.3-1 shows the drawing and a copy of the drawing rubber cemented to the ebony.



P1.5.3-1

You can see that the portion you are interested in stops on the line where the metal fish are. Cut the part out with the scroll saw. **CAUTION: EBONY EMITS A FINE DUST THAT MANY PEOPLE ARE ALLERGIC TO. PLEASE WEAR BREATHING PROTECTION WHEN WORKING WITH THIS WOOD, SUCH AS A DUST MASK OR RESPIRATOR.**

After cutting the sternpost out, you need to taper it. For that you need drawing B2/1 on the same page as B2/2. The sternpost tapers from $\frac{5}{16}$ " at the top to $\frac{3}{16}$ " at the bottom. This means that the keel is also tapered at the aft end where it meets the sternpost. You will recall that we cut away the portion of the keel where the sternpost mates and about 1" forward of that location. We will make a new keel section in a moment but first we need to finish shaping the sternpost.

Photo P1.5.3-2 shows the sternpost with this second drawing rubber cemented to the side for tapering. This is the backside as seen if you were standing behind the ship. The wider portion at the bottom where the fish are is the narrow end of the sternpost. The sternpost is wide at the top and thin at the bottom when looking from the stern of the ship, whereas it is wide at the bottom and thin at the top when looking at it from the side of the ship.



P1.5.3-2

Note: This photo shows both drawings on the ebony wood. The top drawing should be applied after you have cut the wood out based on the side view drawing B2/2.

Ebony is hard stuff and not easy to work with. The taper is about 1/16" on each side and is probably too narrow to cut with a saw. I scraped mine with a #22 Exacto first scraping one side, then the other until I was close to the finished size. Then I used my True Sander to finish off the taper on both sides.

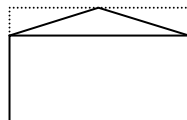
To check the taper, I used calipers. Remember, the top is 5/16". That equates to .310" (.062 x 5 = .310). The bottom should be 3/16" or .186". Photo P1.5.3-3 shows how I test the dimensions with the calipers, top and bottom.



P1.5.3-3

If you study drawing B2/2, you'll see that the aft edge of the sternpost has a thin bevel on it from each side forming a point down the aft edge. This is like a flattened out A. The next thing you want to do is draw a centerline down the aft side of the sternpost. It's important to distinguish which side is the aft side. Remember, the sternpost slants from the bottom upward. Look at drawing B2/2 again and be sure and orient your sternpost correctly before drawing the centerline down the backside. The backside is the side you would be looking at if you were behind the ship looking forward.

Measure 1/32" in from the aft or backside and draw a line parallel to the aft side on both sides of the sternpost. Figure F1.5.3-1 shows what the sternpost would look like looking down from the top. The end is tapered to the centerline. The dotted lines represent the shape before tapering. Keep in mind that the bottom of the sternpost is tapered so as this beveled edge goes down it gets narrower.



F1.5.3-1

Photo P1.5.3-4 shows the bottom of the sternpost outer edge with the A shaped bevel from each side.



P1.5.3-4

Photo P1.5.3-5 shows the finished sternpost.

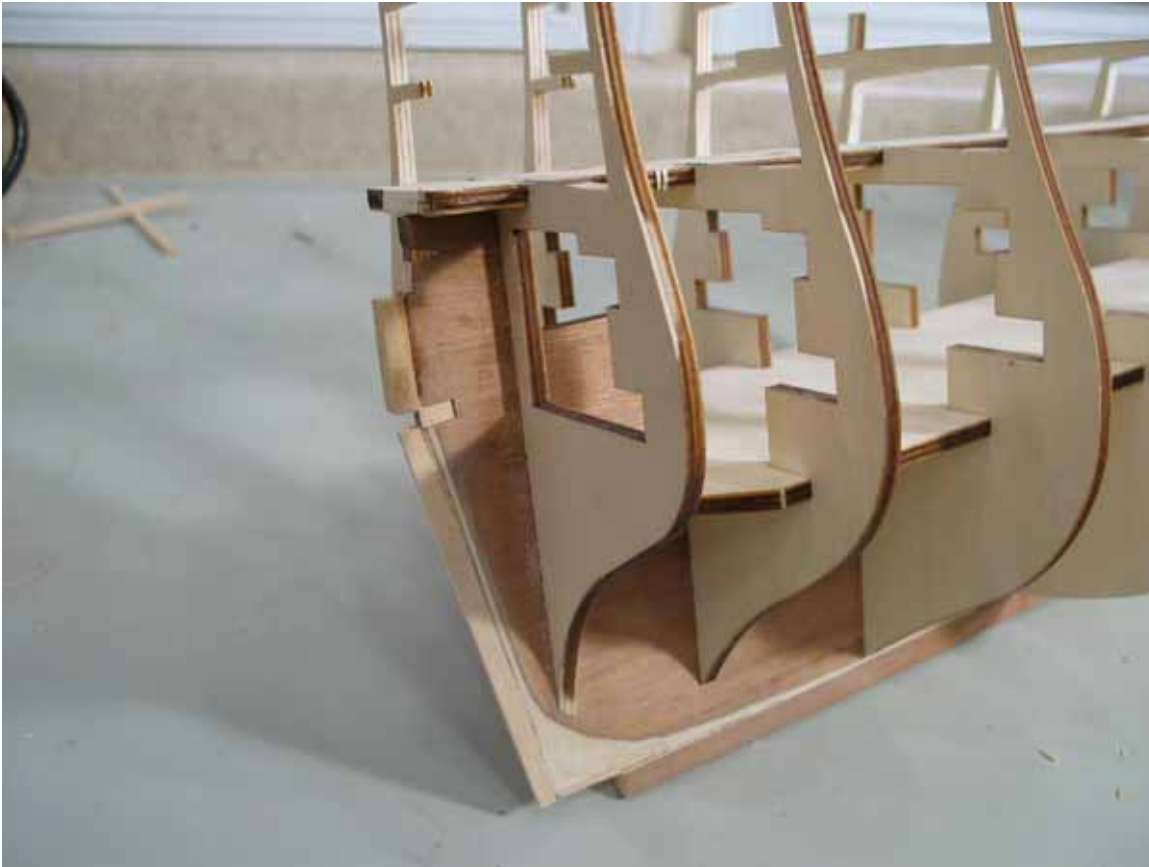


P1.5.3-5

It's a little difficult to see the beveled A shaped edge on the top surface. But you can see the piece is thinner at the lower left end of the photo which is the bottom of the sternpost and wider at the top. The top is not as thick as the bottom also.

There is one other thing we need to do to the sternpost. A small notch needs to be cut at the top for it to fit under the wing transom. This is not exactly correct construction but it was necessary to do it this way to get it to fit the model. The kit is not totally accurate. The keel is actually too tall and as a result, the decks are too high. Instead of making the sternpost longer, I opted to just notch the post at the top. I'll show you this in a minute. Typically the inner sternpost had rabbet joints for the transoms to fit into. The sternpost, as seen in drawing B4 on page 50 of McKay's book, protrudes slightly right at the wing transom where the counter meets the wing transom. There's actually a gap between the end of the sternpost and the counter. We will be duplicating that feature on our model.

Let's look at photo P1.5.3-6. There are several things I need to point out here.



P1.5.3-6

First, you can see that I have modified the keel to add a rabbet joint. I'll get to that in a moment. You'll notice that there is not bulkhead 13. The entire upper portion of the plywood keel has been removed here. I used a #13 Exacto blade (which is a miniature saw) to cut that area of the keel off. Now on my model, I had to add some strips of 1/4" x 1/4" basswood to bring the plywood keel out far enough to align the counter correctly. These strips represent the inner sternpost. You will recall that we cut away the plywood keel at the forward edge of the inner sternpost so we must add one back. I'll talk about what this is all about in a moment also. First I wanted to point out the modification to the plywood keel.

Let's go back and look at the plywood keel and compare it from the factory to the modification we will make. Photo P1.5.3-7 shows the before and after.



P1.5.3-7

Basically the portion behind the notch where bulkhead 13 goes was removed. I also removed a part of the plywood centerpiece. In the photo on the right, you see a notch that had been cut in the plywood keel but later I had to patch that notch when I added the 1/4" square strips. The notch is located where the wing transom goes. How do you know where the wing transom goes? Easy, from drawing B2 that you used to make your sternpost.

Go back to McKay's drawing in the book and look at the item marked 11. Don't be confused by his labeling, items 1 through 11 are actually a subset of item 16 which he labels Transoms (1 – 11). Number 11 is the wing transom. If you go back to the original template you used to cut out the stern area of the keel, you can easily locate the wing transom.

Again, let me point out the exception and modification we're making to the kit. The wing transom on the template you made is located down from the top of the sternpost. However, because the kit's plywood keel is slightly taller than it should be, rather than make the sternpost taller, I chose to mount the sternpost under the wing transom at the top end of the sternpost. The end result is the same, just saved a little bit of wood by not making the sternpost longer.

So, dig out your template (it's in that trash can next to your workbench, right?) and place it against your keel and make a pencil mark at the very top edge of the pattern. That marks the **top edge** of the wing transom. Since the wing transom is 3/16" thick, mark another line 3/16" down from the first line to denote the notch where the wing transom will go.

This is very critical. It defines the entire stern transom area. For now, just mark where the wing transom goes. Don't do any cutting.

Give your sternpost a good sanding down to 400 grit sandpaper and use that True Sander, you want smooth sharp edges. After a good sanding, buff it out with #0000 steel wool. You can give it a finish of Wipe on Poly to bring out the blackness but that's all that's required. Set it aside for now.

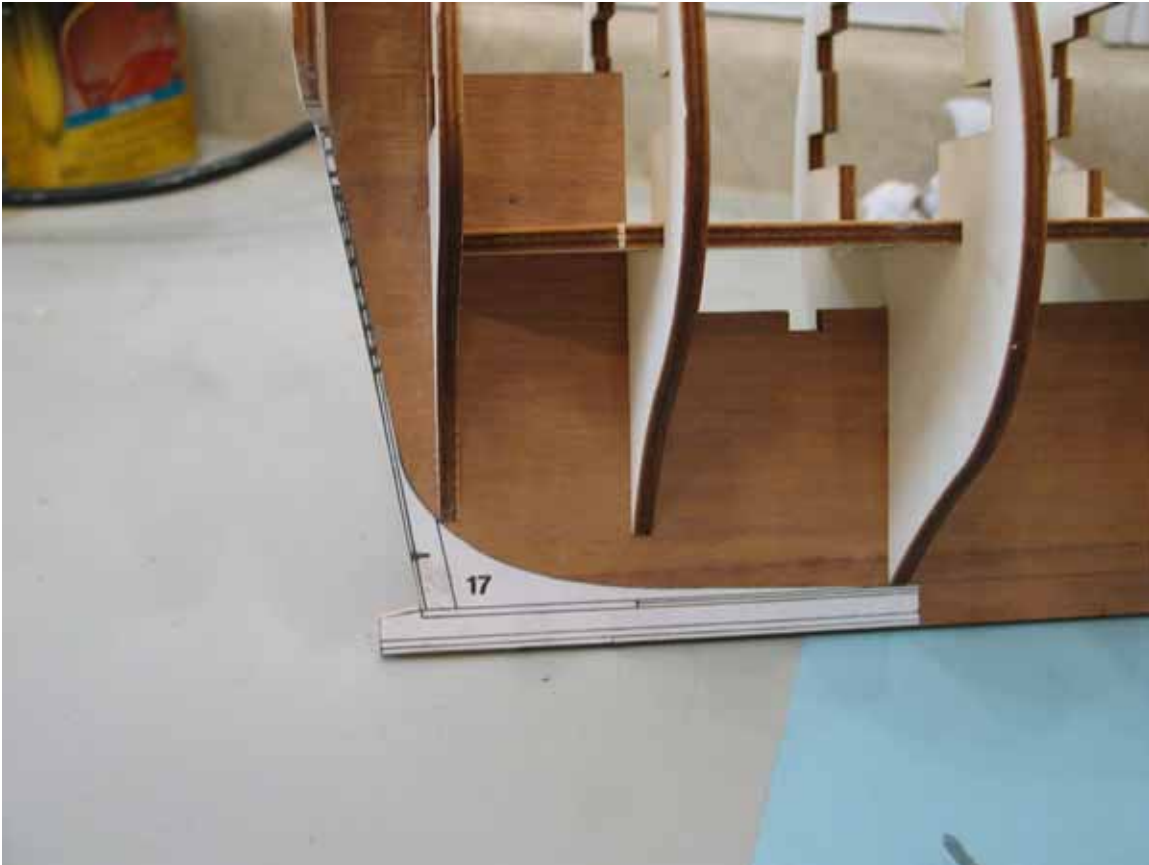
Summary

- Make 2 copies (enlarged) of drawings B2/1 and B2/2 sternpost on page 50 of McKay's book.
- Use 3/8" x 3/8" ebony to make the sternpost.
- Cut out the sternpost portion from drawing B2/2 and rubber cement it to the wood and cut out the profile side of the sternpost.
- Rubber cement drawing B2/1 to the aft side centering it with 1/16" on each side at the bottom for tapering.
- Use a scraper to scrape the wood and taper the bottom half to 3/16" width.
- Remark a centerline down the aft side of the sternpost.
- Mark a 1/32" line on each side just in from the aft edge for beveling.
- Bevel an A shaped aft edge from each side to the centerline.
- Sand with various grits of sandpaper down to 400 grit and then rub out with #0000 steel wool.
- Set aside for now.

1.5.4 The Rabbet

Before we can start adding the counters block and sternpost, we need to cut a rabbet joint. You'll recall that I did not cut the rabbet before assembling the bulkheads as I normally do. Although a little bit more difficult to do, I am glad I waited as the stern area gave me trouble working out the details of how to construct it. If we were building this model straight out of the box, certainly I would have cut the rabbet first. But this is kitbashing on a major scale and you don't always know how things are going to turn out. Fortunately for you, I've figured all of that out and you won't have to.

You can take the shape of the rabbet straight out of McKay's book. Once again, we turn to page 50 and make an enlargement of drawing B4. You might have a copy already from previous work. Photo P1.5.4-1 shows the area we are concerned with.



P1.5.4-1

Looks like a pretty good match. The keel of the drawing meets bulkhead 10 okay and bulkhead 12 ok but bulkhead 11 should have extended downward more. We'll have to do something about that later on or it will throw the shape of the hull all out of whack.

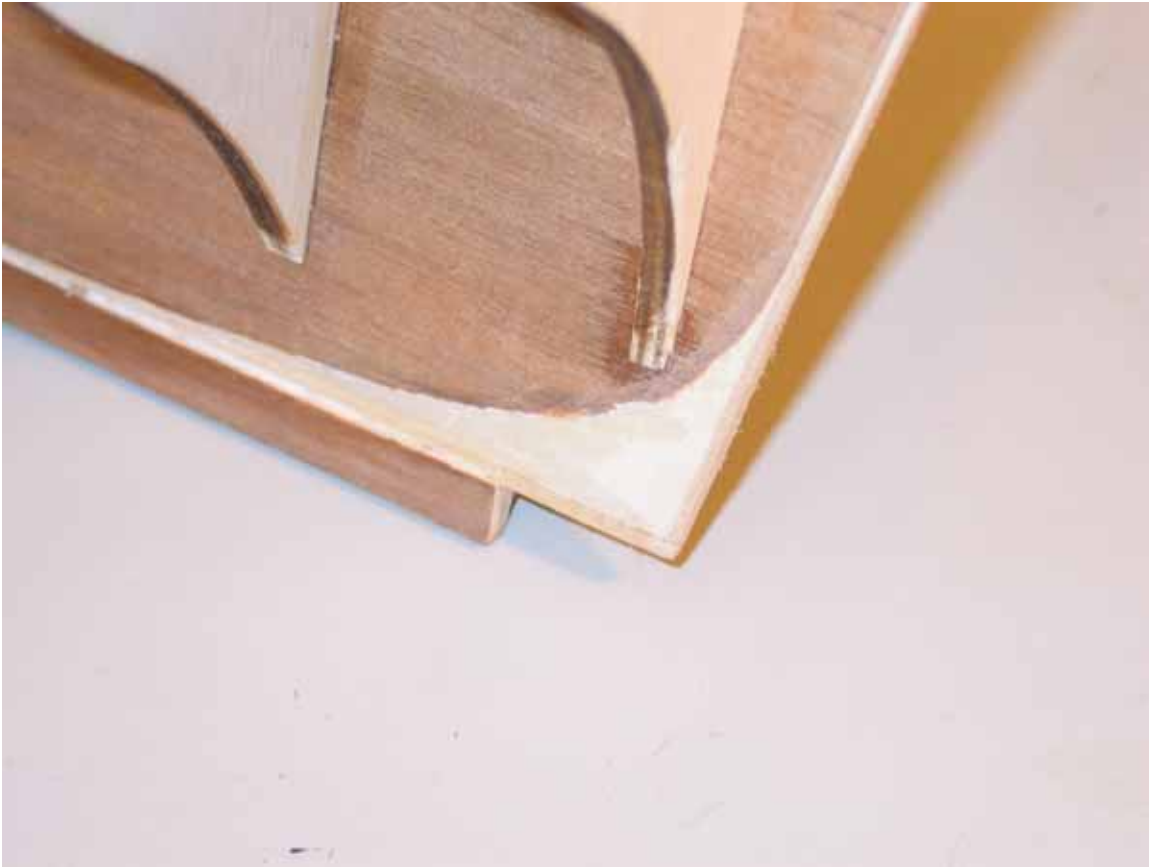
You want to transfer the inner edge of the pattern to the plywood keel. We will be shaping and removing wood from that line outward.

At the bottom where bulkhead 10 is, the rabbet joint is a V shape. The line defines the bearding line actually and the rabbet line is 1/16" below that line. First extend the bearding line all the way forward to bulkhead 3. You can do this by placing a ruler up against the bulkheads and just running your pencil along the edge. From bulkhead 3 the bearding line connects to the point we cut away.

The rabbet line is 1/16" below the bearding line. Use your ruler and mark the rabbet line 1/16" below the bearding line all the way down the keel and parallel to the bearding line. This is your rabbet joint.

I used a small V gouge to start the bearding line at bulkhead 10 forward. For now I just cut a portion of it to get things started.

Aft of bulkhead 10 the rabbet joint turns into an L shape. It's a gradual turn and fully L shaped where the deadwood rises. You can see this on McKay's drawing where the area becomes more clearly defined. Going up the sternpost the rabbet joint again is L shaped at the bottom and turns to a V shape where the transom frames are located. It's not important to get this exactly right as we can make adjustments when we plank. I simply used my sanding block and sanded a bevel on the stern area where the stern post will be later applied and used a small chisel to chisel away the lower area where the curve is. Photo P1.5.4-2 shows my stern rabbet.



P1.5.4-2

Again, you see some filler strips on the edges. You may or may not need them but don't worry about them yet, we have to fit things still and that will determine what filler you might need. And I will explain why you might need these fillers in a moment, I promise.

Cut your rabbet on both sides of the plywood keel. Where the curved area is, the rabbet tapers outward being thinner at the edges. The edges of my keel were about 1/8". Since the keel is about 1/4" thick, you'll be taking off about 1/16" on each side.

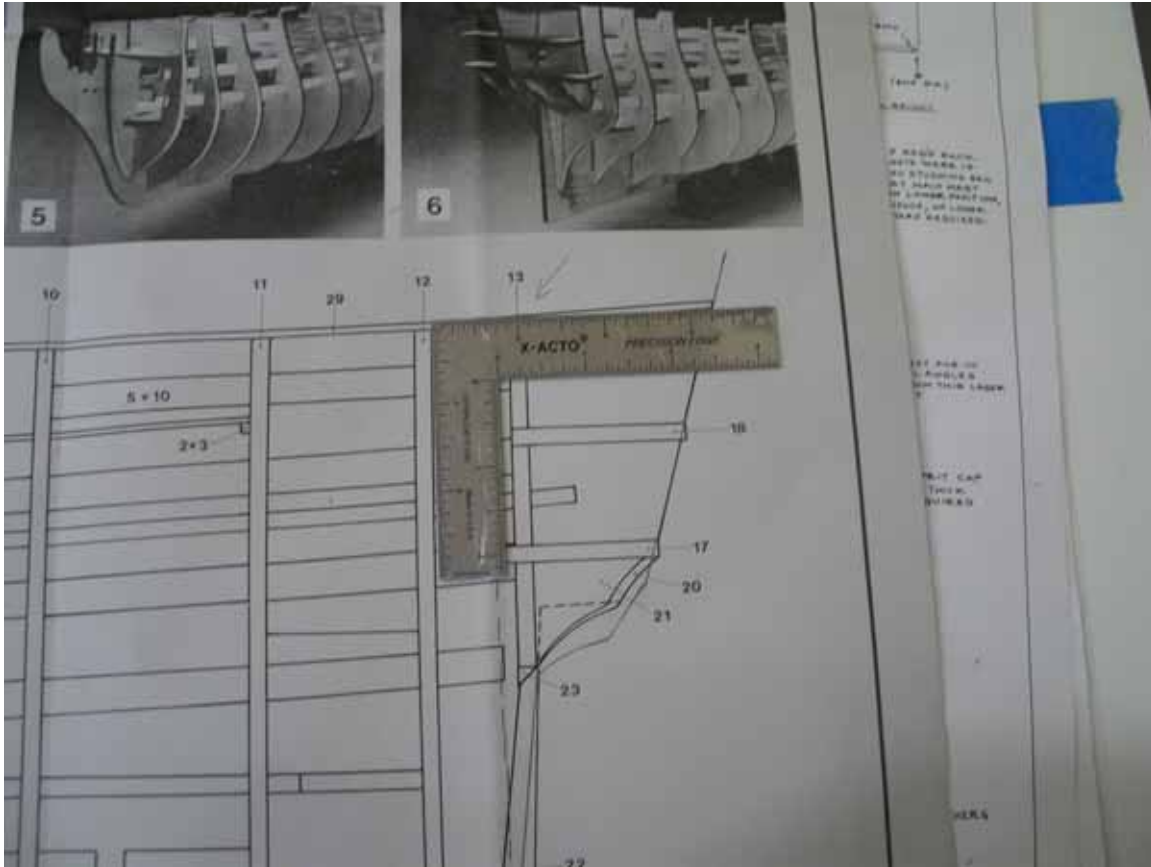
Summary

- Make 2 copies (enlarged) of drawings B4, rabbet joint from McKay's book on page 50.
- Cut out the rabbet joint and use it as a template to transfer to both sides of your stern area. This is actually the bearding line.
- Use a ruler to draw out the bearding line across the bottom of the bulkheads to the bow and connect to the cutaway we made earlier.
- Measure 1/16" down from the bearding line and draw a parallel line to the bearding line. This is the rabbet. The area between the bearding line and the rabbet is the rabbet joint.
- Use chisels to cut the rabbet joint on both sides. Leave about 1/8" keel at the aft edge. Dress with sandpaper.

1.5.5 Tying It All Together

Okay, we'll now bring our work together but first some analysis. If you look at drawing B4 on page 50 of McKay's book, you'll see the last gunport on the quarterdeck. The number 54 is in the center of that gunport. Remember earlier we found that the kit's gunport template matched the McKay drawing as far as placement of that gunport. That gunport becomes a critical point of reference for us and many things will later be related and dependent on the location of that gunport.

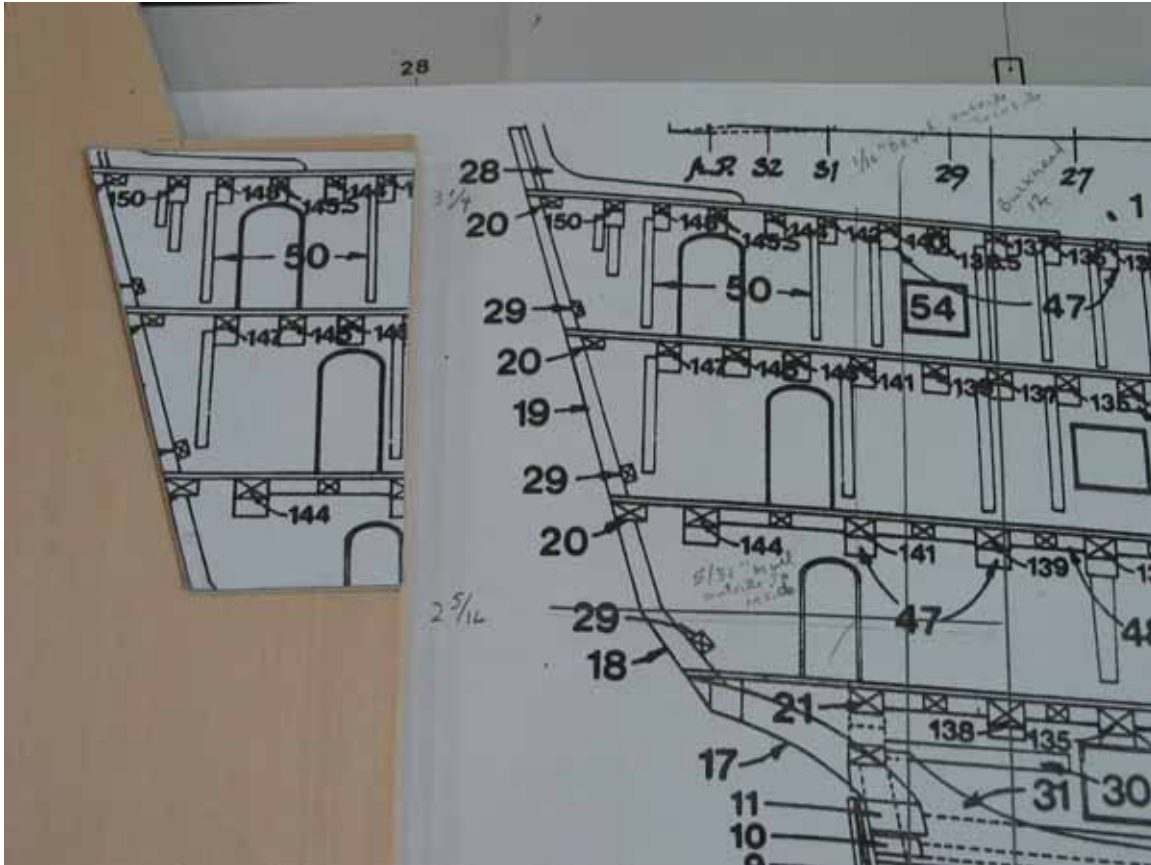
You will once again need some copies of the stern area of drawing B4. If you go back to photo P1.2.1-6, you see that bulkhead 12 is just forward of that gunport. If you measure from the aft edge of bulkhead 12 on your plans, to the very back edge of the stern transom, you will see that it is 3 1/4". Photo P1.5.5-1 shows this.



P1.5.5-1

Next, if you take the drawing from McKay's book and enlarge it, you can then measure $3 \frac{1}{4}$ " from the aft edge of the stern transom forward and make a mark. Drop a vertical line parallel to the hanging knees and you now have the portion of the drawing that you will use as a template to frame out the transom area.

Now look at photo P1.5.5-2.



P1.5.5-2

You see two vertical lines. The one on the left is drawn from the aft edge of that last gunport down and perpendicular to the keel. The one on the right represents bulkhead 12. From these lines, you can determine the point where the counters block we carved earlier should end where it sits on top of the wing transom. See the horizontal line that cuts through the lower doorway? That line is perpendicular to the two vertical lines and it cuts right through the top edge of the carved counters block we made earlier. You can then take a measurement from the bulkhead 12 reference line to know where the counter needs to be located. If the counter is properly located, then the top of the transom will also be properly located when we use this drawing to make some basswood blocks to form the sides of the hull in this area. By the way, that measurement is $2 \frac{5}{16}$ ".

One other thing to note here. This drawing represents the side of the ship. Because our counters block is arched the measurement at the centerline will be close to $2 \frac{1}{2}$ ".

Here's where you may need to adjust your stern as I did. You know where the wing transom goes. On my model, the top edge of the counters block was 3" down from the top of bulkhead 12. What you want to do is first cut a notch into the plywood keel where you made your two marks for the wing transom. Fit the wing transom in the notch. Then sit your counters block on top of it and measure

from the outside edge at the corner to the aft side of bulkhead 12. If it's shorter than 2 5/16", you'll have to add some filler as I did. If it's longer, then you'll have to cut the notch deeper. The wing transom should extend 1/16" past the aft edge of the plywood keel. The key to all of this is to have that the proper measurement from the aft edge of bulkhead 12 (2 5/16") and with that proper measurement, have the wing transom extending 1/16" past the plywood keel. Adjustments may have to be made to the plywood keel to achieve this 1/16" extension but the key is the 2 5/16" measurement. Once you get the wing transom properly fitted so that the counters block gives you that measurement, stop! Don't glue the wing transom in yet.

On the backside of the counters block, I cut a notch the width of the keel and on the centerline so that the counters block would fit onto the keel. This helps in aligning the block vertically. You have many directions that this block can move on and you want to get it as absolutely close as possible if not perfect. If it tilts to one side, it will throw things off. If it tilts forwards or backwards, it will throw things off. And you already know that if it's too far forward or too far back, it will throw things off.

After cutting your notch about 1/4" deep on the scroll saw, you have some leeway to position it. Once satisfied with the position, I glued the wing transom to the counters block first so that I could clamp it. Then I glued the entire assembly to the keel with the wing transom fitting in the notch that sets the height and the notch in the counters block that sets its side to side, and horizontal position. Photo P1.5.5-3 shows mine fitted in place before I glued everything up.



P1.5.5-3

Once the wing transom and counter blocks are in place you can fit the sternpost. The key to fitting it is to align the bottom edge with the bottom of your rabbet joint. The top should extend slightly past the wing transom and end half the thickness of the wing transom. Mark it at the bottom of the wing transom for cutting a notch in it. The notch should be about $\frac{3}{32}$ " deep on the inside edge. Be sure and center it side to side. Photo P1.5.5-4 shows the sternpost attached. See how the rabbet joint is formed for the planking to tuck in.



P1.5.5-4

You can see the notch at the top that strikes the bottom of the wing transom leaving a small amount to protrude but not touch the counters block. This is exactly what you want. A moulding will be attached later on and the wing transom will have a rabbet cut on it's aft, bottom edge for the planking to tuck into there. The moulding will cover the ends of the planking giving it a neat appearance.

Summary

- Make an enlarged copy of drawing B4 on page 50 of McKay's book.
- Measure 3 1/4" from the aft edge of the transom top forward and make a mark.
- Extend that mark down to the keel keeping it perpendicular to the keel and parallel to the hanging knees.
- Take a measurement from that line to the top edge of the counters. This is where you want to place your counters in relationship to the aft edge of bulkhead 12.
- Check your counters and wing transom fit after cutting a notch in the plywood keel for the wing transom and a notch in the center of the counters block to fit the plywood keel.

- Use any filler basswood strips necessary to bring the counters into proper position in relationship to bulkhead 12.
- Glue the wing transom to the counters block and then the entire assembly to the keel. Check both sides with a ruler to make sure the counters block is properly aligned.
- Check your sternpost in relation to the bottom of the rabbet to mark the location where it intersects the wing transom.
- Cut a notch about 3/32" deep and test the fit.
- Glue the sternpost to the stern of the ship fitted down to the rabbet joint and up to the wing transom.

1.5.6 Transom Side Pieces

Now that we have the counters block, wing transom and sternpost in place, we are ready to build up the sides of the transom. The sides will be made from blocks of basswood. Let's look at the final assembly first.



P1.5.6-1

In photo P1.5.6-1 you see the side pieces sitting on top of the counters block. The counters block sits on top of the wing transom. Not installed yet on my model, the wing transom sits on top of the sternpost. You can also see how the

stern area is opened up for full detailing. The blocks look a bit funny because they were built up from two separate pieces of basswood on each side. First a block of 3/8" basswood was attached to bulkhead 12, then an additional block of 3/16" basswood was attached to the outsides of the first block to give sufficient area to carve the transom sides.

The reason I did it this way was because the sides have a very peculiar shape. If you look at bulkhead 12, you see that it has an inward curve to it. Starting at the top of the bulkhead, it curves inward, then back outward as it approaches the counter area, then back inward tapering down to the keel. However, if you look at photo P1.5.6-2 shot straight on from the stern, you can clearly see that the transom at the very edge is straight. This can be seen by the template placed against the back of the ship shown in the photo.



P1.5.6-2

On the right hand side, you can see some of the outward bulge in the bulkheads. The upper counter is clearly visible with its arched top or camber, the lower counter is just visible and the wing transom is clearly visible. This is what we are striving to achieve.

So, to begin we go back to McKay's drawings and make some copies for templates. You will recall in our earlier discussions how I determined on

McKay's drawings that it was 3 1/4" at the top from the aft edge of the transom to bulkhead 12. You should have made some enlargements of that section. I also determined that where the counters block started it was 2 5/16" from the counter top outer edge to the aft side of bulkhead 12. You will need to make a template of that portion of McKay's drawing B4 on page 50. You can see the area I am referring to in photo P1.5.5-2.

You will also need a copy of drawing B5 on page 52. I cut away the sides of the drawing and top leaving just the area from the top of the counters upwards. You'll notice that in photo P1.5.6-2, the sides of the transom are taller than the drawing. This is because the kit is not totally accurate as I mentioned earlier. The ship is taller than it should be and the decks are not correctly placed. However, I felt that correcting that flaw would have required complete re-cutting of the bulkheads and did not want to take this through a complete scratchbuilt construction. The purpose of this practicum is to show how to modify a kit to add details and improve accuracy. My next practicum will show you how to build a model completely from scratch.

Begin by using the template to cut a 3/8" piece of basswood to the shape needed. You will have to bevel the forward edge that meets bulkhead 12 and the lower edge that meets the counters block. The forward edge bevel came out to 1/16" on my model while the bottom bevel came out to 5/32".

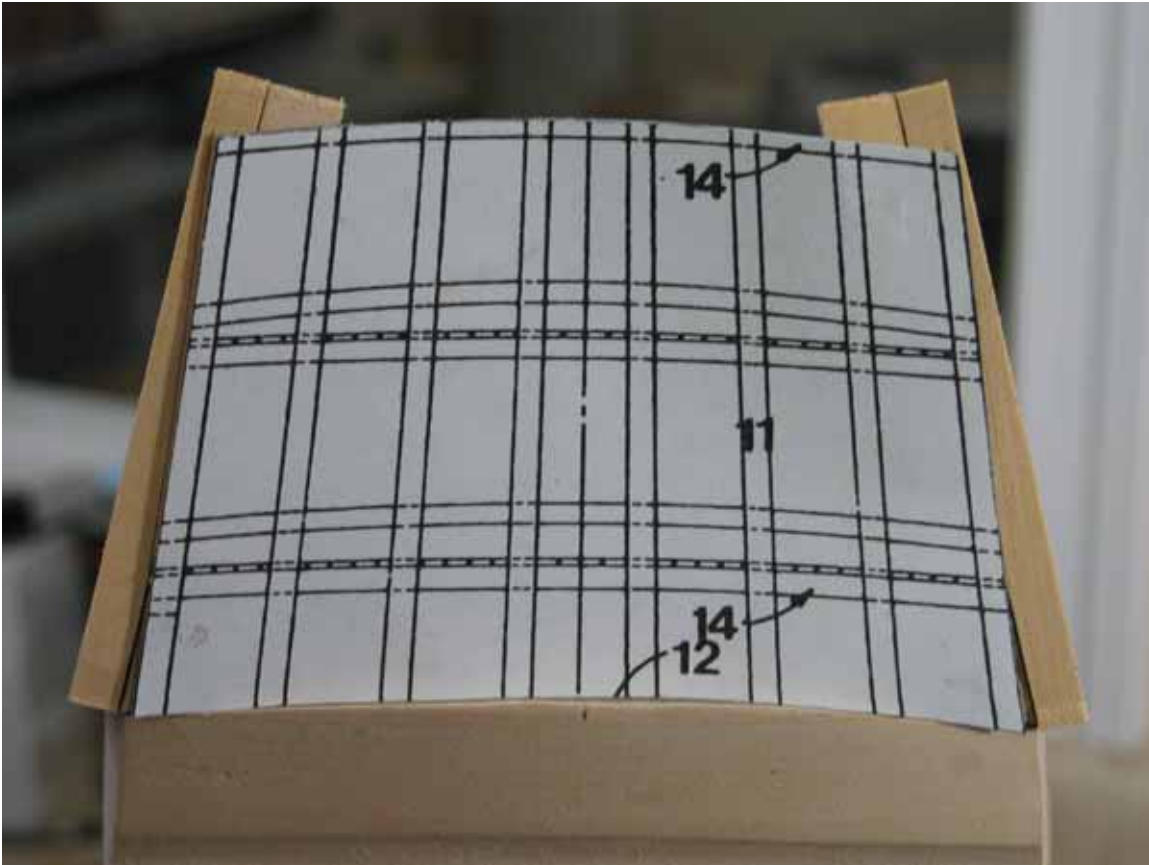
Once you've made your bevels, check the fit and when satisfied, glue the piece to the aft edge of bulkhead 12 and to the counter. You'll need some clamps to hold it all in place until the glue sets up. Photo P1.5.6-3 shows my pieces clamped up.



P1.5.6-3

You want to align the top edge with the outside of the bulkhead and the bottom edge with the outside edge of the bulkhead. This leaves the piece protruding in the center area, which we will carve away later. Because your basswood is only 3" wide, you will have to edge glue two pieces together before cutting out. You want the grain of the wood to run vertically.

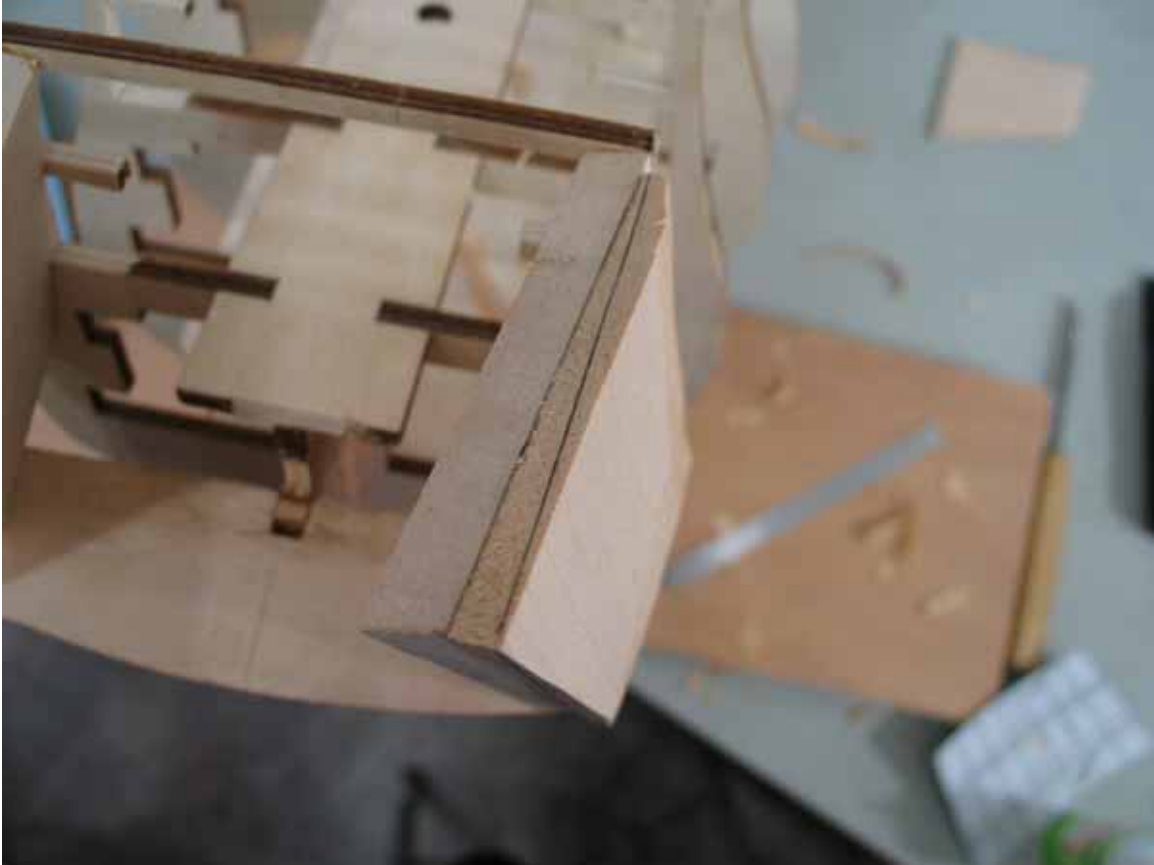
Once the glue has dried, remove the clamps. If you take the pattern from drawing B5 in McKay's book and place it up against the aft end of the stern you'll see that the pieces fit the drawing at the bottom but not at the top. On my model, I found that I needed additional wood at the top to match the drawing. That is why I added another layer of 3/16" basswood to the outside surface of the first piece. After adding the second piece, place the template against the stern of the model and while holding it in place (keep it on the centerline of the counters block, trace the edges across the surface of the two side blocks. Photo P1.5.6-4 shows the pattern placed up against the two blocks.



P1.5.6-4

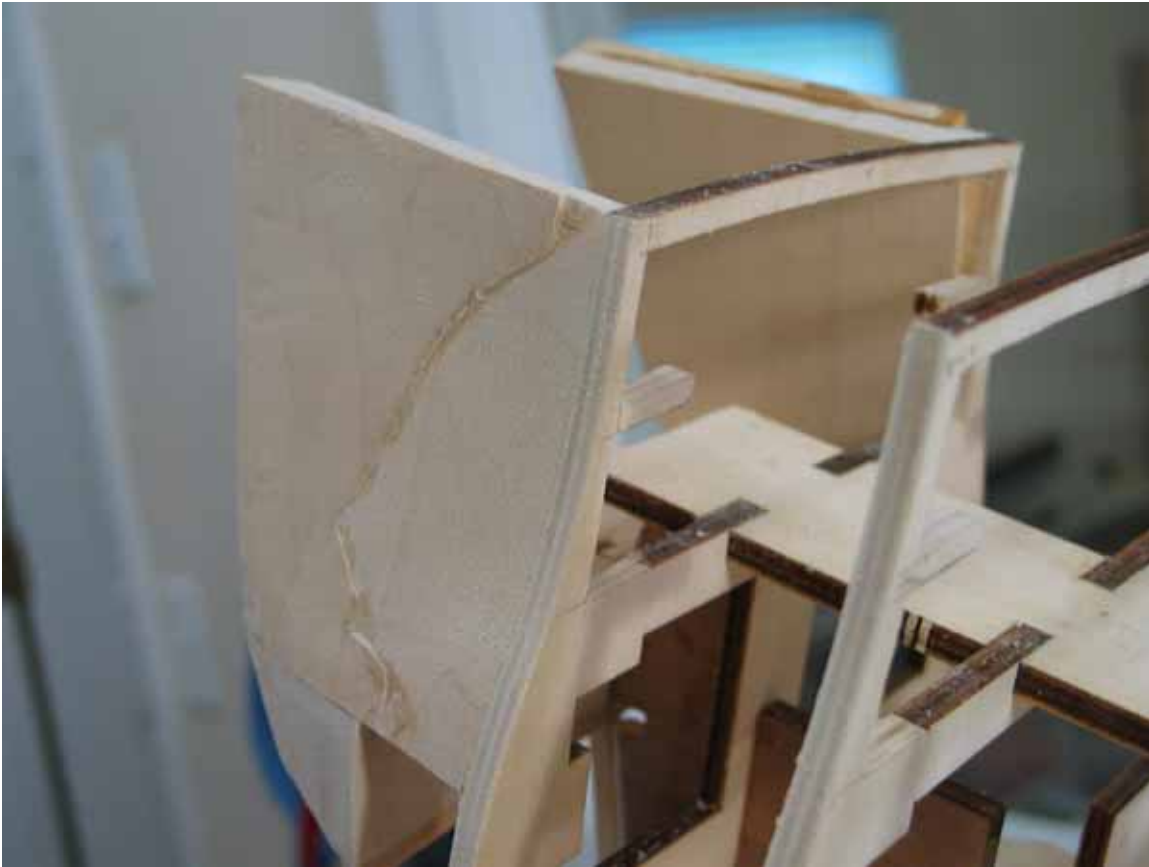
You can see how the lower edge just catches the first 3/8" block but the upper edge goes out onto the second block. The lower edge is also inside the outside edge of the counters block. If you go back and look at drawing B5 in it's entirety, you can see that the counters bulge out and there's a definite change in the direction of the outer timbers that make up the transom. That shape will come about when we carve the outside surface of these blocks.

After transferring the lines across the back surface of the blocks, connect the line across the top surface of the blocks to bulkhead 12. Photo P1.5.6-5 shows this.



P1.5.6-5

Now you have the reference points needed to carve the blocks. You'll need your chisels to do so. Photo P1.5.6-6 shows the block carved and sanded on the starboard side.



P1.5.6-6

Notice how the piece is curved inward to match the bulkhead. Now look at photo P1.5.6-7.



P1.5.6-7

You can see that the edge is straight and drawn parallel to it is a second line. This line denotes the inside edge and again, was derived from drawing B5. A second line was drawn across the top surface connected to bulkhead 12.

At this stage, I decided to remove the portions of bulkhead 12 that make up the deck beams. As a matter of fact, it was at this stage that I decided we would eventually be removing all of these portions on all of the bulkheads and constructing real deck beams. But don't do that just now, they help to stabilize and strengthen the thin sides of the plywood bulkheads and won't be removed until the outer planking has been applied. For now, just remove them at bulkhead 12 with your Exacto or some nippers.

Carve the inside surface as you did the outside surface and mate it up with bulkhead 12. Sand it as you did the outside but don't worry too much about achieving a perfectly smooth surface as it will get faired up even more when we begin work inside the hull. Photo P1.5.6-8 shows my starboard side completed.



P1.5.6-8

Now all that is left is to shape the port side. Once completed, your drawing B5 template should match up perfectly as mine did in photo P1.5.6-2 above. Now for the ultimate check of our transom, find the kit's plywood transom piece and place it on the counter and against the two side pieces we just carved. You'll have to bow or bend it slightly as it arches across the back just as the counter does. You should have a perfect fit with the two side pieces fitting the surface area between the outer windows and second windows. The outer windows are in the side galleries, which we will construct from scratch later on.

We have now taken accurate drawings of the stern area of the ship and adapted them to the kit to make it more accurate and to enable us to add additional details inside. This is what kitbashing is all about!

Summary

- Make an enlarged copy of drawing B4 on page 50 and B5 on page 51 of McKay's book.
- Measure 3 1/4" at the top on drawing B4 and 2 5/16" at the bottom where the top edge of the top counter meets the stern transom surface

and connect the two lines to show where the aft edge of bulkhead 12 is.

- Use that area as a template to make two blocks of basswood 3/8" and 3/16" thick for each side.
- Bevel the 3/8" thick piece 1/16" on the fore edge and 5/32" on the bottom edge and glue it to the aft side of bulkhead 12 and the top of the counter clamping as needed.
- Glue the second 3/16" piece to the outside surface of the first pieces once the glue has dried.
- Use the template from drawing B5 to mark the outside edges of the transom and carve with chisels. Sand and blend into bulkhead 12 but leave the end straight, not concave.
- Use the template from drawing B5 again to mark the inside of the timbers on your transom side blocks and carve the inside. You should remove the beam portions of bulkhead 12 at this time.
- Test the template from drawing B5 once the blocks have been carved. Also use the kit's plywood transom to test it's fit with these blocks. The blocks should fall between the outer windows and second windows.

1.5.7 Bottom Keel Piece

We have one other detail to tend to and our stern area will be complete. You will recall that our sternpost ended at the bottom of the rabbet but there is still a block of wood needed where we cut away the bottom portion of the keel. I made this block out of some scrap 1/4" poplar I had. There should be a piece in your wood package.

Place the strip of wood against the side of the sternpost and flush with the rabbet to mark the slight angle where the sternpost meets the keel. You want to cut the piece so that it extends past the sternpost by about 3/32". Photo P1.5.7-1 shows my piece attached and sanded.



P1.5.7-1

This photo shows several things. First, the piece is tapered from the joint where it joins the existing plywood keel to the sternpost. As you recall, the sternpost tapered to 3/16" wide at the bottom. Our rabbet was 1/16" deep so that the planking would lay in it and be flush with the sternpost on it's outside surface.

You'll also notice that the poplar piece extends beyond the sternpost and that it is rounded. Where it mates to the sternpost, it has a slight angle to match the angle of the bottom of the sternpost. You can see this in drawing B6 on page 53 of McKay's book.

You can shape the piece after gluing using your Exacto and True Sander sanding block.

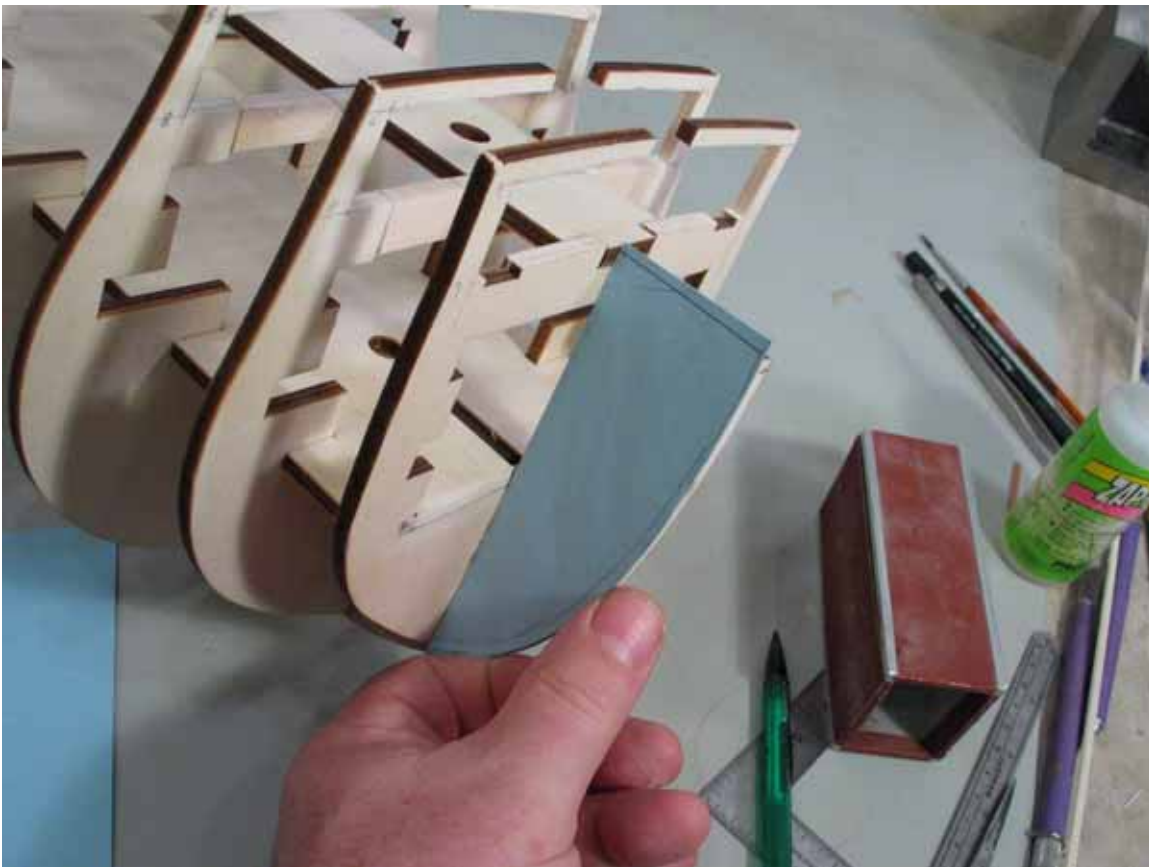
Summary

- Make the bottom keel filler piece from 1/4" x 1/2" poplar.
- Cut it about 3/32" longer than the aft edge of the sternpost.
- After gluing in place, taper the piece from the point where it mates to the plywood keel to outs aft edge making it the same thickness at that point as the sternpost and round the aft end on both sides.

1.6 The Bow Area

We have one additional area to take care of before our basic framework is complete. The bow of the kit was meant to have a plywood part attached to the plywood keel. However, the shape of that piece does not match the proper shape of the bow and will not be used. As a matter of fact, I checked the shape of the bulkheads to McKay's drawing and the entire hull shape at the bow is slightly out but would require remaking most of the bulkheads from scratch. Again, I chose to instead, adapt McKay's drawings to our kit rather than build it all from scratch.

We will make the bow blocks out of our 3" x 6" x 12" basswood blocks. To do so, we need three templates. The first two will come from our existing framework. Photo P1.6-1 shows the first template.

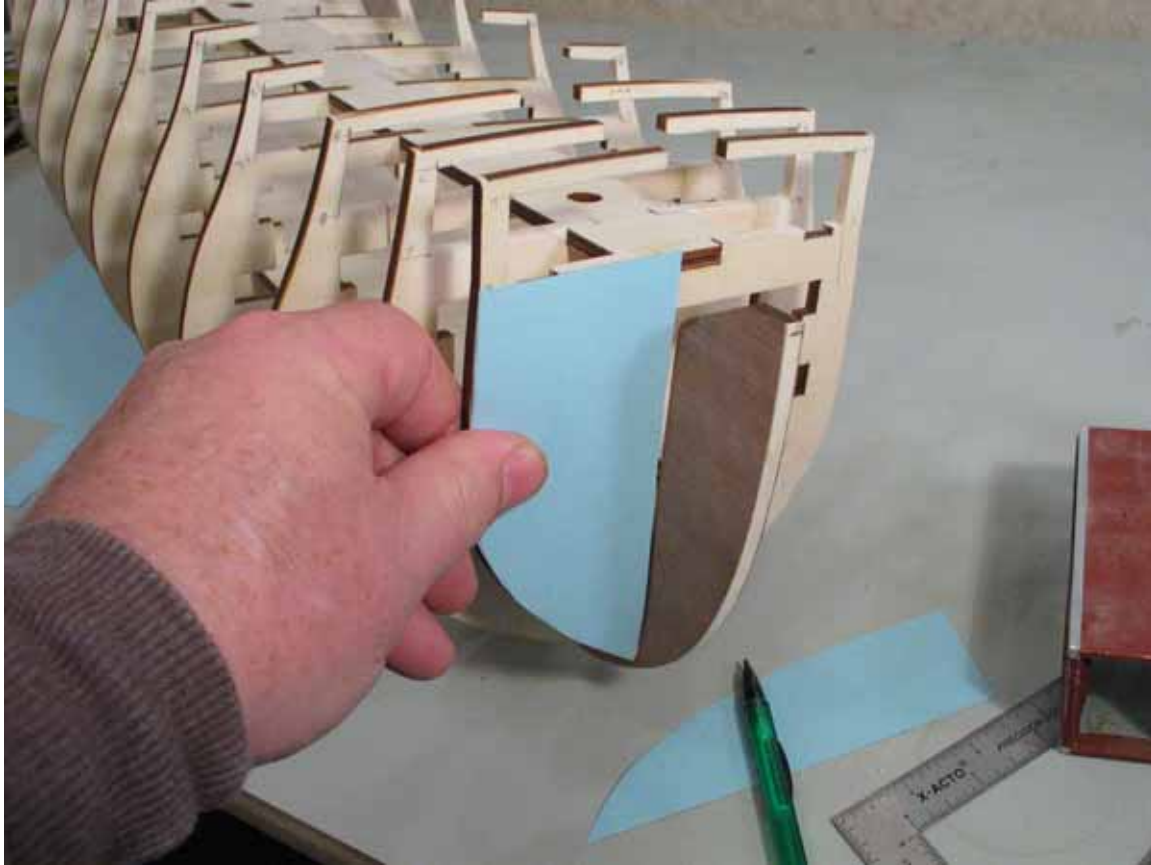


P1.6-1

As you can see, the shape was derived from the shape of the plywood keel from the fore side of bulkhead 1 to the outer surface where we cut the keel away. Also note that the top of the piece is flush with the top surface of the center plywood piece and has a slight upward slant to it to match the flow of the deck

area. The bottom of the piece does not end at the bottom of bulkhead 1. Bulkhead 1 was short on my model and we'll address that later.

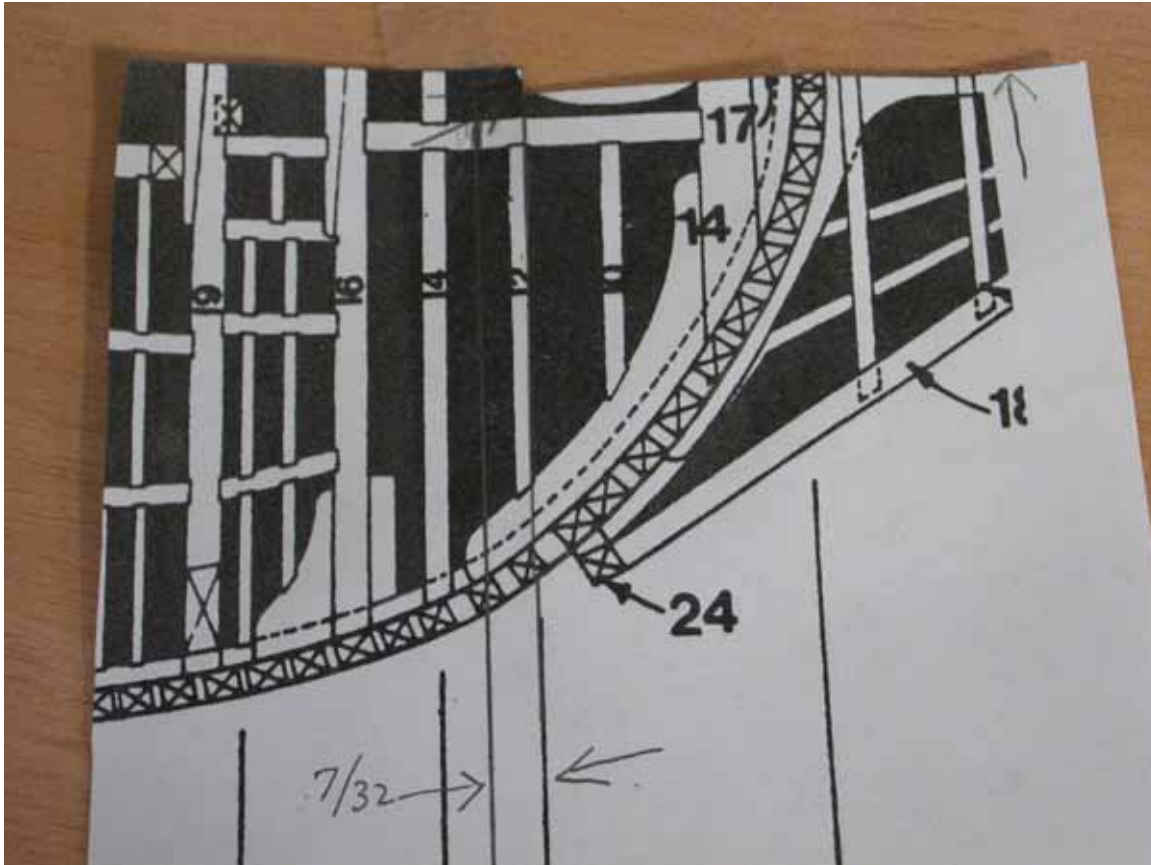
Photo P1.6-2 shows the second template.



P1.6-2

This template comes from the shape of bulkhead 1 from the outer surface of the plywood keel to the bulkhead's edge. I found that bulkhead 1 did not meet the rabbet line edge we used to cut the front of the plywood keel. It was about 1/8" short. You want to make your bulkhead template long enough to meet the plywood keel at the cut edge, not to meet with the bottom of the bulkhead. We will add some strip wood later to bring the bulkhead down more and mate with our block of wood. The top of the template also meets the deck surface and follows the camber in the deck.

The third shape we need is the shape at the deck or top surface of our filler block. This can be obtained from drawing B10 on page 55 of McKay's book. You'll need at least one enlargement of this area. Photo P1.6-3 shows the portion we are concerned with.



P1.6-3

You'll notice I've drawn a second line just aft of station & that is $7/32$ " aft. This denotes the location of bulkhead 1. You'll also notice that I cut the drawing on the line that is shown to be the outside edge of the keel. Cut the outside edge of the drawing on the line that represents the outside of the frames.

Now, using the first two templates, drawn lines on your basswood block as shown in photo P1.6-4. Extend the top of the lines by about $1/8$ " as we will true up the top surface after the blocks have been glued in place.



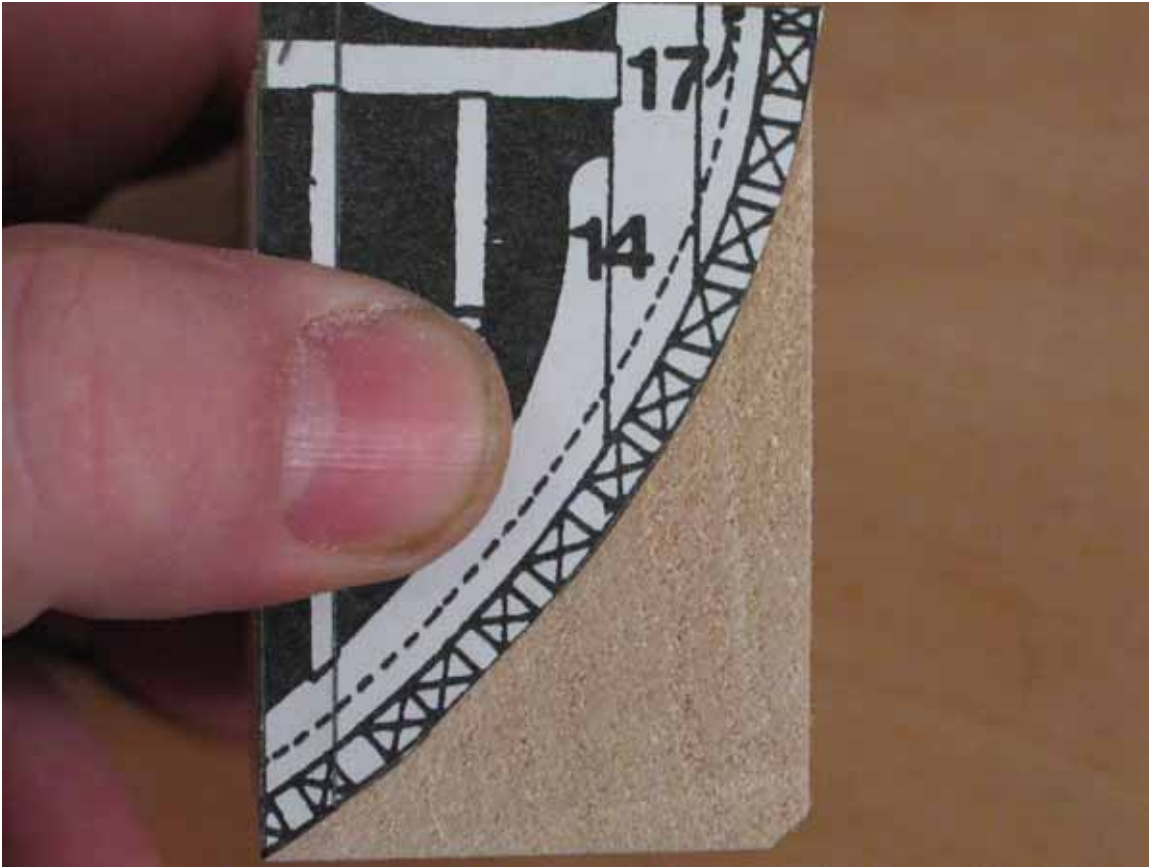
P1.6-4

Cut the block out with your scroll saw. I found I was able to cut the side that makes up the bulkhead shape first. Even though the side is curved, it had sufficient flat area to hold it on the table of the saw while I cut out the keel surface area. Photo P1.6-5 shows the basic block cut out.



P1.6-5

Now we can use the third template across the top of the block to show the shape of the block at the deck level. Photo P1.6-6 shows me transferring the third template to the block.



P1.6-6

You will find that the template is too wide. As I mentioned earlier, the bulkheads are not accurate. I aligned the outer edge with the outside edge of the bulkhead side and just let the pattern hang over on the inside keel part. Transfer the frame line to the top of the block.

Once again we turn to our chisels and clamp the block in our vise. Photo P1.6-7 shows the start of my chiseling.



P1.6-7

This is the starboard block. The top surface was cut to match the bulkhead side and the front surface which is in the vise was cut to match the keel. We need to bring the deck surface down to these two surfaces forming a sort of triangular shape. Photo P1.6-8 shows how the upper area has not been chiseled to the deck line.



P1.6-8

Photo P1.6-9 shows the bottom of the block, which still needs work.



P1.6-9

And finally, photo P1.6-10 shows the piece fully carved but not yet sanded.



P1.6-10

Once the piece has been carved, glue it to the model. Apply Weldbond to the surface of bulkhead 1 from the deck down and to the surface of the plywood keel. Then press the block in place keeping the edges aligned and applying pressure at the keel and the bulkhead. Because of its curved shape, you will not be able to clamp it. If you hold it for a minute or so, the glue starts to set up. Keep the entire model in a flat plane until the glue dries or it might slip out of position. Photo P1.6-11 shows the block glued in position.



P1.6-11

You can see that the bottom of the block meets the cut portion of the keel but the bulkhead does not. We will have to add some strip wood to the surface of our bulkhead to bring it flush to the block. We will also blend and sand the block and bulkheads fairing them up. Later, when we make the stem, it will have the rabbet joint carved into it's mating surface and we will use your V gouge to finish carving out the rabbet along the bottom portion of the keel. You can see the pencil lines on my bottom keel showing where the rabbet line will mate to the stem.

Photo P1.6-12 shows both blocks sanded. Photo P1.6-13 shows the bottom where extra wood was added to bulkheads 1 and 2 to bring them up to the bearding line where the keel was cut.



P1.6-12

You can see how the top has been trimmed down to the deck line



P1.6-13

When you sand the blocks, sand and bevel bulkheads 1 – 3 blending them into the bow blocks.

Summary

- Make an enlarged copy of drawing B10 on page 55 of McKay's book.
- Make templates of the front side of bulkhead 1 and the side of the keel to derive the basic shape of the basswood filler block.
- Use your 3" x 6" x 12" basswood block and transfer the two templates that make up the bulkhead and keel sides of the block.
- Cut the block out on the scroll saw.
- Use drawing B10 to arrive at the top deck shape of the block.
- Carve the block with chisels from the deck line mating to the two cut sides forming a sort of triangular shape.
- Glue the block to the fore side of bulkhead 1 and the plywood keel keeping the bottom point even with the bottom of the plywood keel where bulkhead 1 should be extended. The top should extend a little beyond the deck line and will be trimmed later.
- Repeat on the other side.

- Add some filler wood to bulkhead 1 and 2 and then sand. You want to bevel bulkheads 1 – 3 with your sanding block blending them all into the bow filler pieces.

1.7 Chapter Summary

Our first chapter has shown you how to use accurate historical plans and adapt them to a kit model. We have modified the bulkheads to open up the upper deck area and have built a new stern transom that is more accurate and open for detailing. The stem has been removed and a new and more accurate stem will be made. We've added a new sternpost also made of ebony.

In our next chapter we will continue our work on the frame adding false deck pieces to completely open the upper gundeck for detailing.