

# SHIP'S BOATS IN SMALL SCALE

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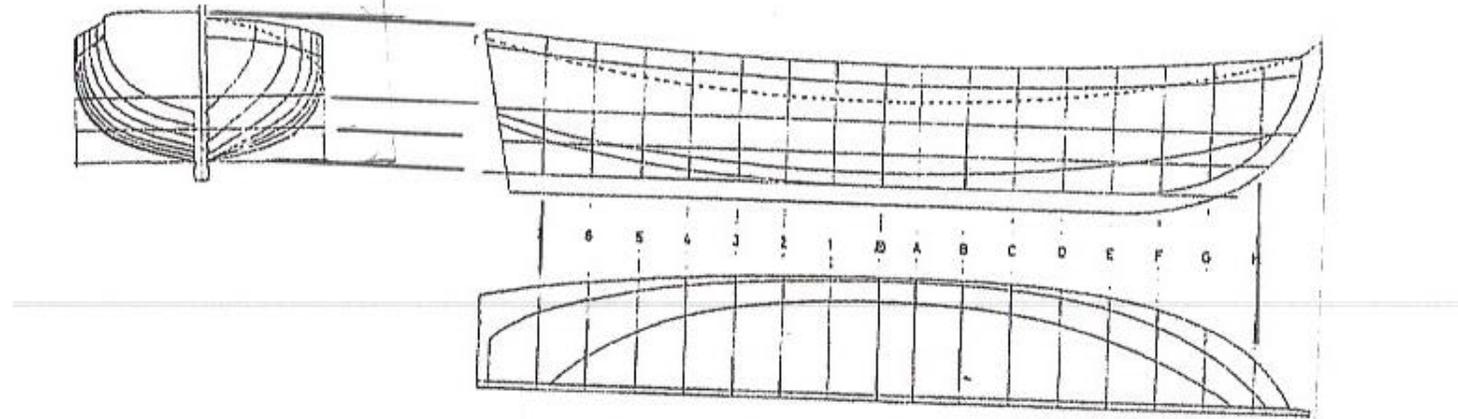
A method to make open boats in scales 1:64 and smaller

# BACKGROUND

- There are many methods to make open boats that are typically carried on ships. However, smaller scales present a problem
- Consider that the plank of a typical open boat is about 2 inches
  - In 1:64 that works out to  $1/32$ " (0.031); in 1:96 – 0.021"
- That means that you would be very hard pressed to plank in anything but card, or paper.
- For those small scales, I use a carved hull

# THE LIFT METHOD

- Depending on how small the boat is, you can choose to simply carve the hull from a single block of wood. That requires a good deal of estimating of the shape of the hull is and few guidelines that you may need. The method that I use is the Lift method. This has also been called “Bread & Butter”
- The lift method slices the hull (usually on the horizontal plan) into what are called lifts. This horizontal line is shown on most ship plans.
- As an aside, I use this method for full ships as well. Many of the models in the Rodgers Collection at Naval Academy were built using lifts.



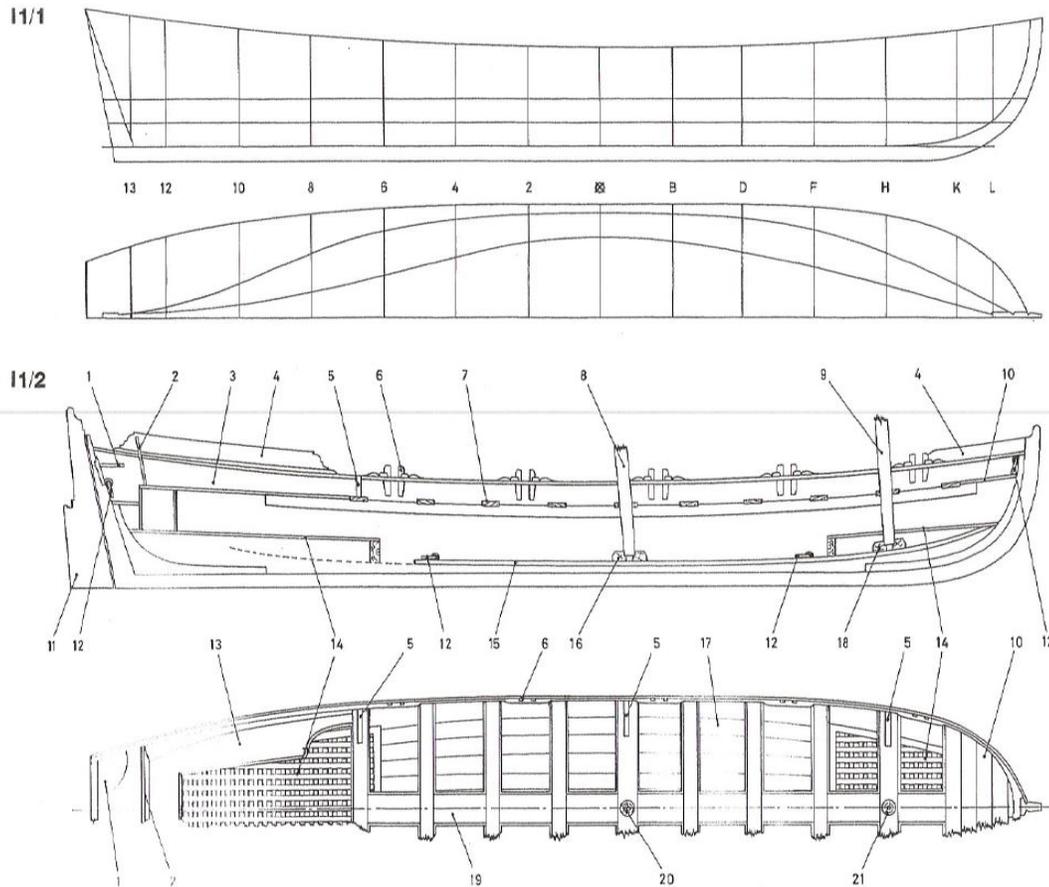
## THE TYPICAL PLAN

- This plan is for a 24' Launch. When each horizontal slice on the shear plan at top is extended to the left it defines the point where that slice intersects a station line.
- The intersection between the station line and the horizontal slice define a point that is carried down to the body plan at the bottom.
- The distance between that point and the hull centerline is measured onto the body plan. When all of those points are connected together you get the shape of each lift.

# SELECTING A PLAN

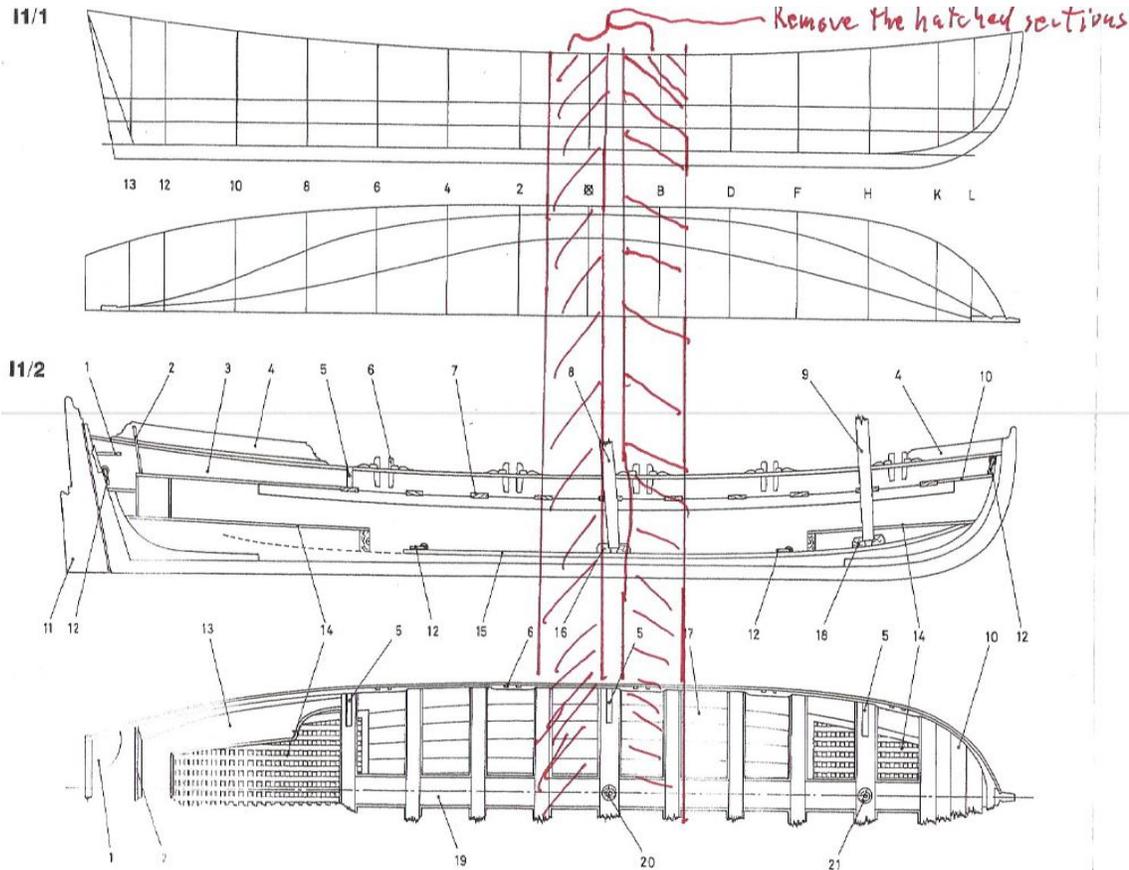
There are four boats on my model. The Anatomy of the Ship Series usually has plans of open boats that are detailed enough for our purposes. However, boats are of various sizes based on the length (size of the crew) of the ship. The best plans were in HMS Dianna. However, Dianna is larger than Liverpool and had larger boats. So, I needed to convert the plan of the two largest boats to meet the needs for a 28 gun sixth rate frigate.

# A 32 FOOT PINNACE

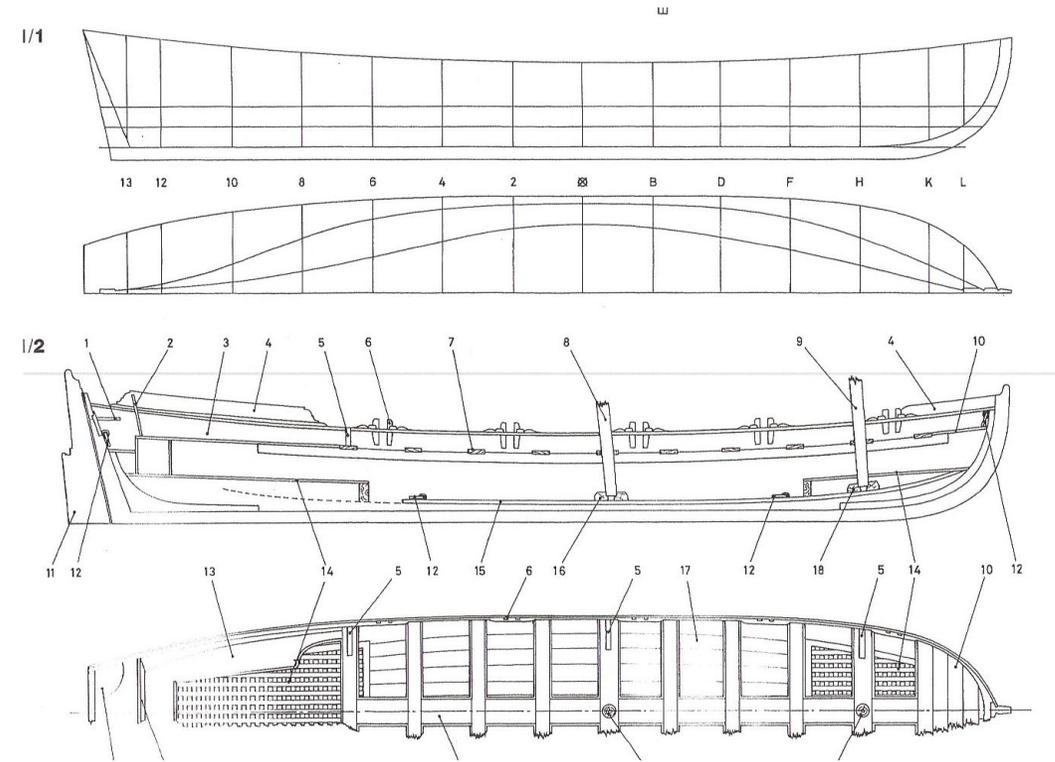
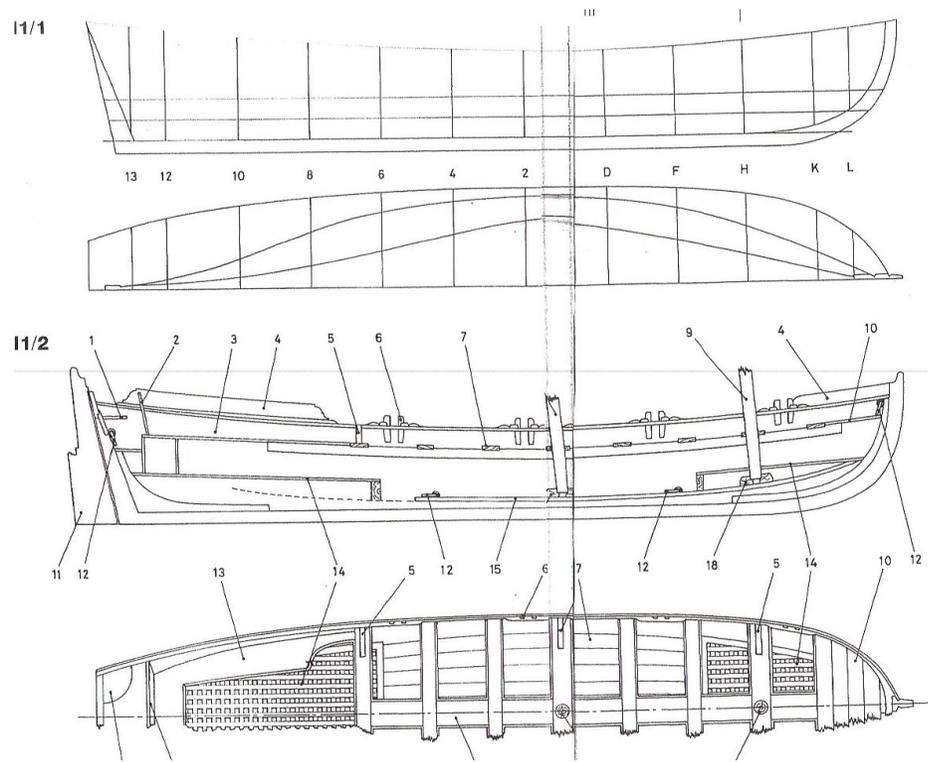


- This is a plan for a 32" Pinnace. It is in 1:48 scale. My scale is 1:96 so I just need to reprint it at half size. The problem is that I need a boat that is four foot shorter with two fewer thwarts.
- So, you just can't reduce it further. You need to modify the plan before you reduce it.

# REMOVING 4 FEET FROM THE BOAT



- To reduce the boat 4 feet, I need to remove 1" on a 1/4" to the foot plan. I also need to remove two thwarts. It is most straight forward to remove the extra length from the mid section. There is also the assumption that the beam stays the same. That was modeler's license.
- The cross hatched sections need to be removed.



# THE 28 FOOT PLAN VERSUS THE 32 FOOT PLAN

- The plan on the left is the 32-foot pinnace. The one on the right is the 28-ft pinnace. They are 1:48, so all that remains is to reprint the plan at 50% reduction to get it to 1:96 scale.

# NOW WE CAN START CUTTING WOOD

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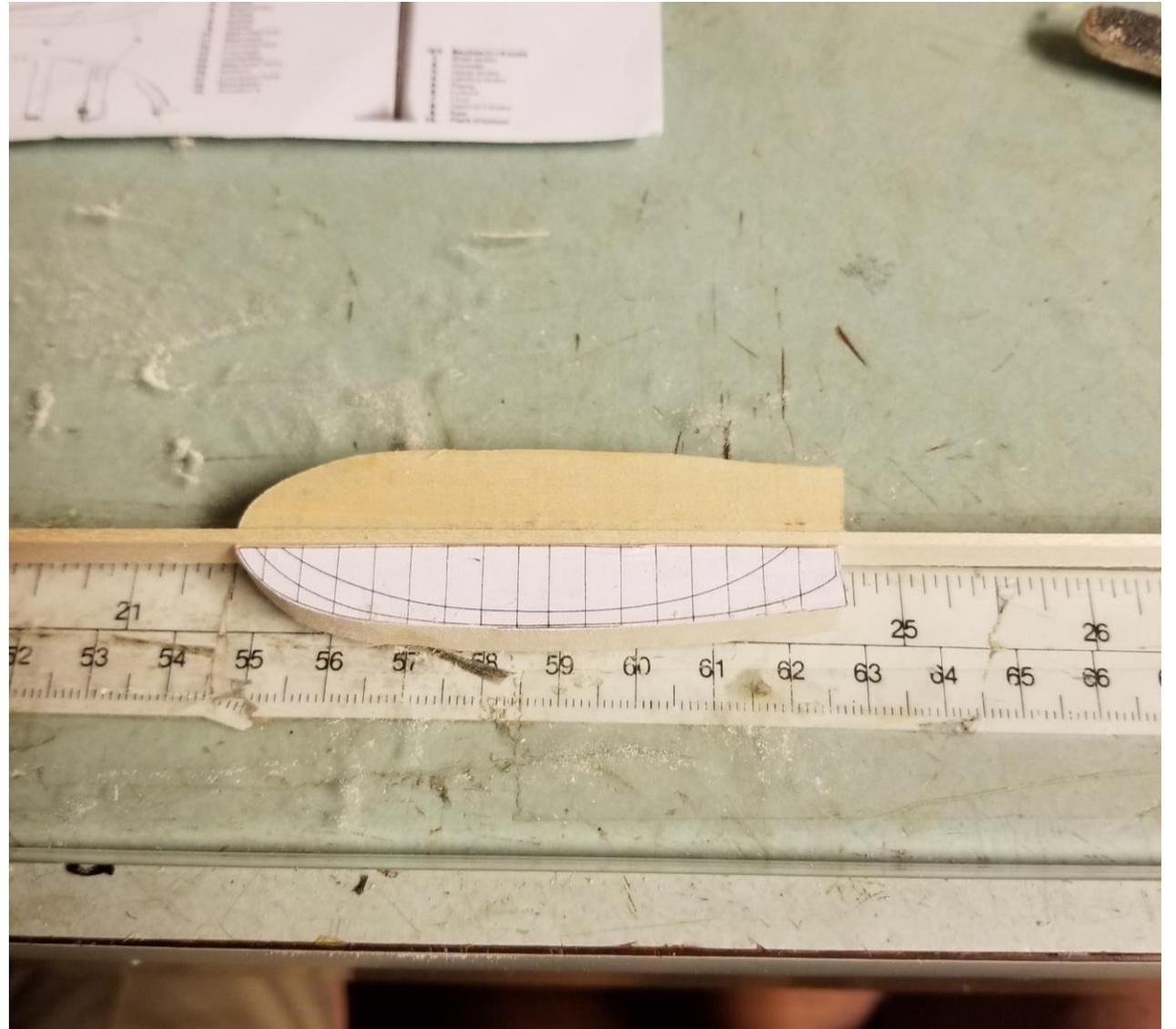
- At this point we will cut out each lift and glue it onto a piece of wood. I need wood that carves easily. It should have no knots or sap. It should be of uniform color if I decide not to paint the finished product.
- For me, basswood works best.
- I also typically cut two sides of the hull rather than a one piece for each lift. This gives me a flat surface that makes holding it for carving much easier.

## LIFTS (CONT'D)

Now you need to decide how thick to make each lift. In general, the narrower each lift is, the easier it is to carve out a final shape.

For a rounded hull bottom, it is usually better to make the bottom lift thinner. However, for this open boat, the lift defined already in the plan is good.

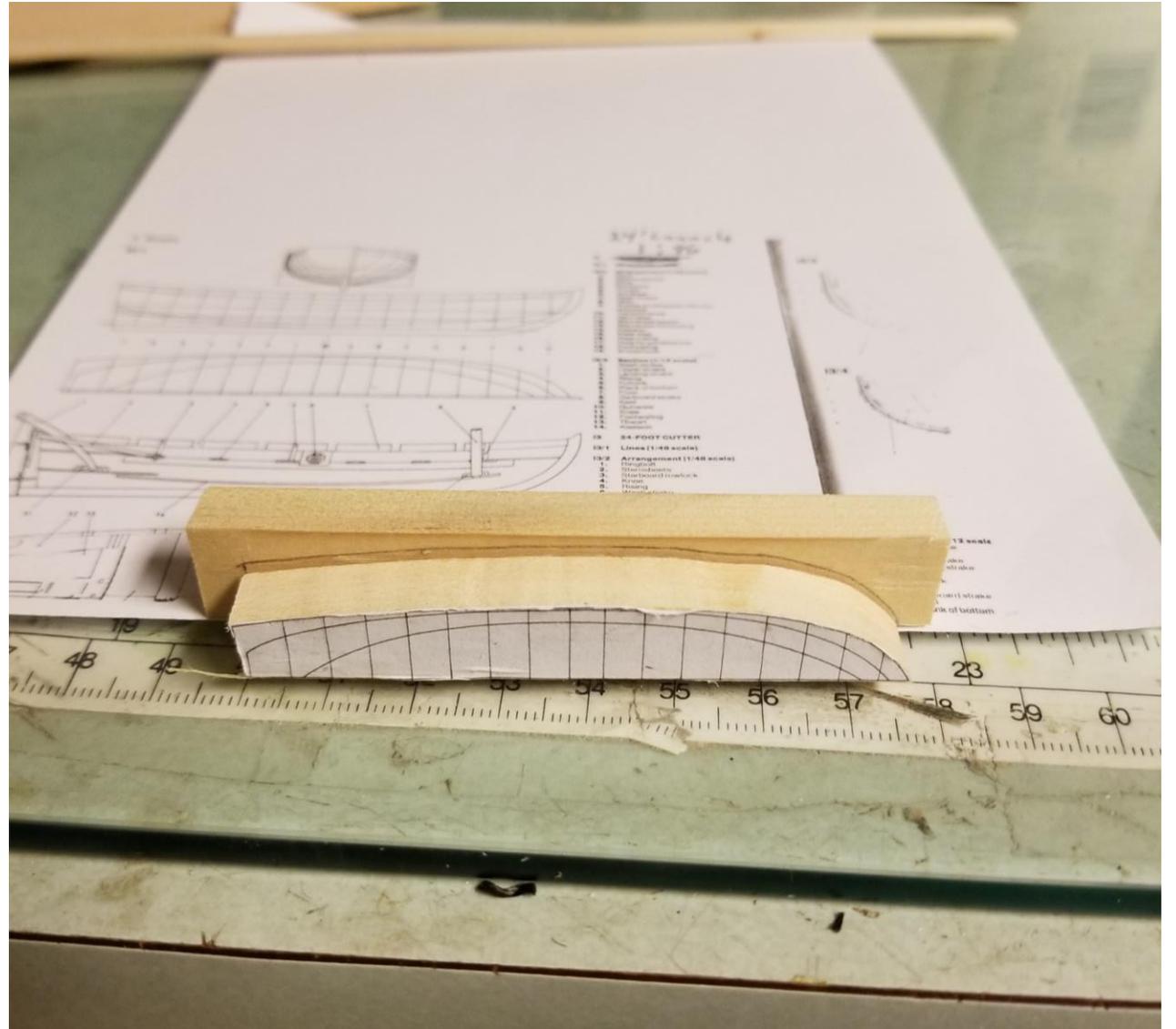
For the top lift, you will be drawing a line that spans the highest points of the hull. That is so you can cut out the shear.



# LIFTS CUT OUT

I cut the lifts using a scroll saw. It is very delicate work, and you can do the same thing with a copping saw or jewelers saw.

Notice that for the top lift, I am careful to save the piece that is cut off. I reinsert the cut-out lift so that I have a flat surface to cut out the sheer.



# CUTTING OUT THE INSIDE OF THE LIFT

To minimize the amount of carving and sanding later, I cut out the inside as well. Be careful that you do not cut too much away at the bottom of each lift. The way to prevent that is to put one lift on top of the other and trace the lower lift on the next one above. You need to stay about  $\frac{1}{64}$ " away from the traced line.





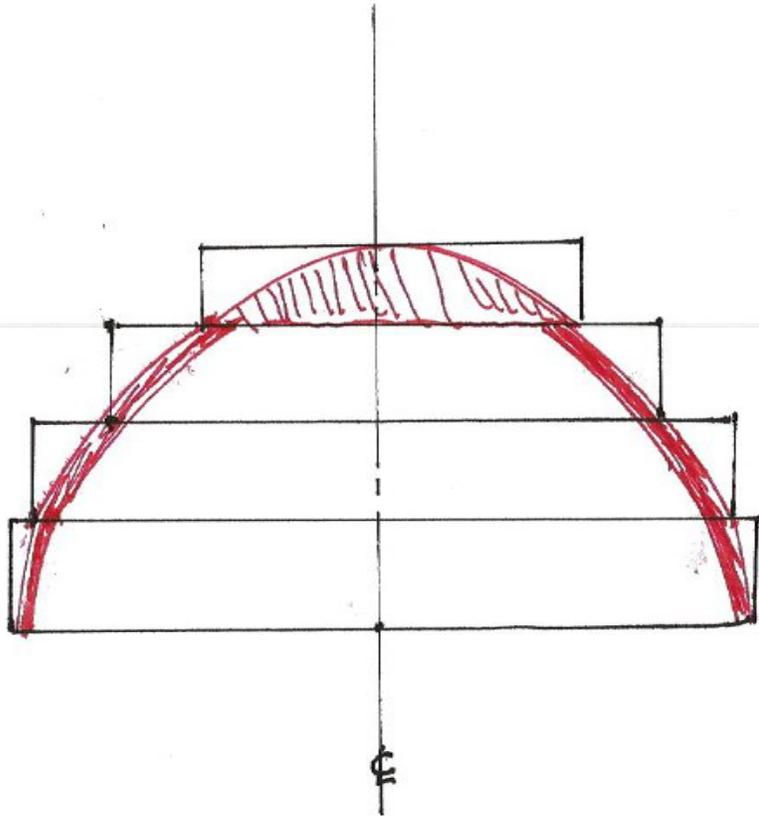
# GETTING READY TO CARVE

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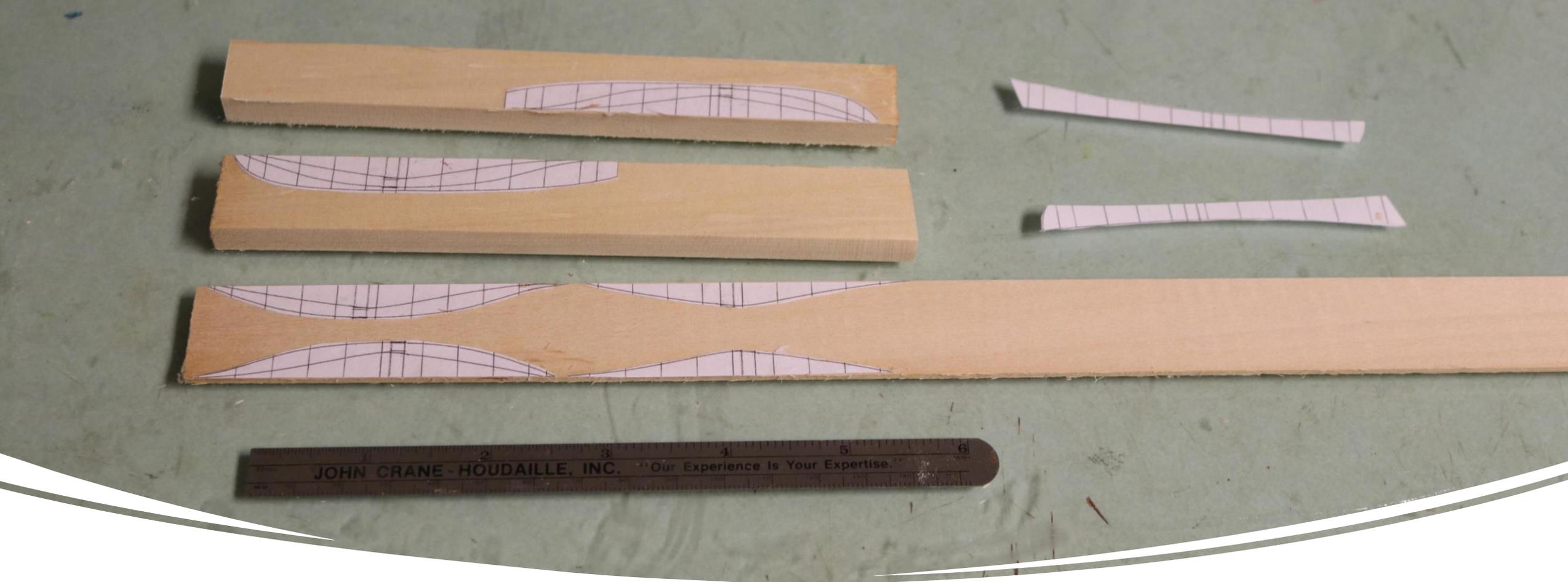
- Note that the hull is in two halves. The reason for that is that the Stem, keel and stern post is sandwiched between the two halves when I glue it back together.
- Note also that the lowest lift is left solid. There really is no reason to hollow it out because floor boards are in the bottom of the boat.
- Before you carve the inside, it is important that you completely carve the outside. This is especially the case at the sheer (top) of the hull.

# WHAT STAYS, AND WHAT GOES!

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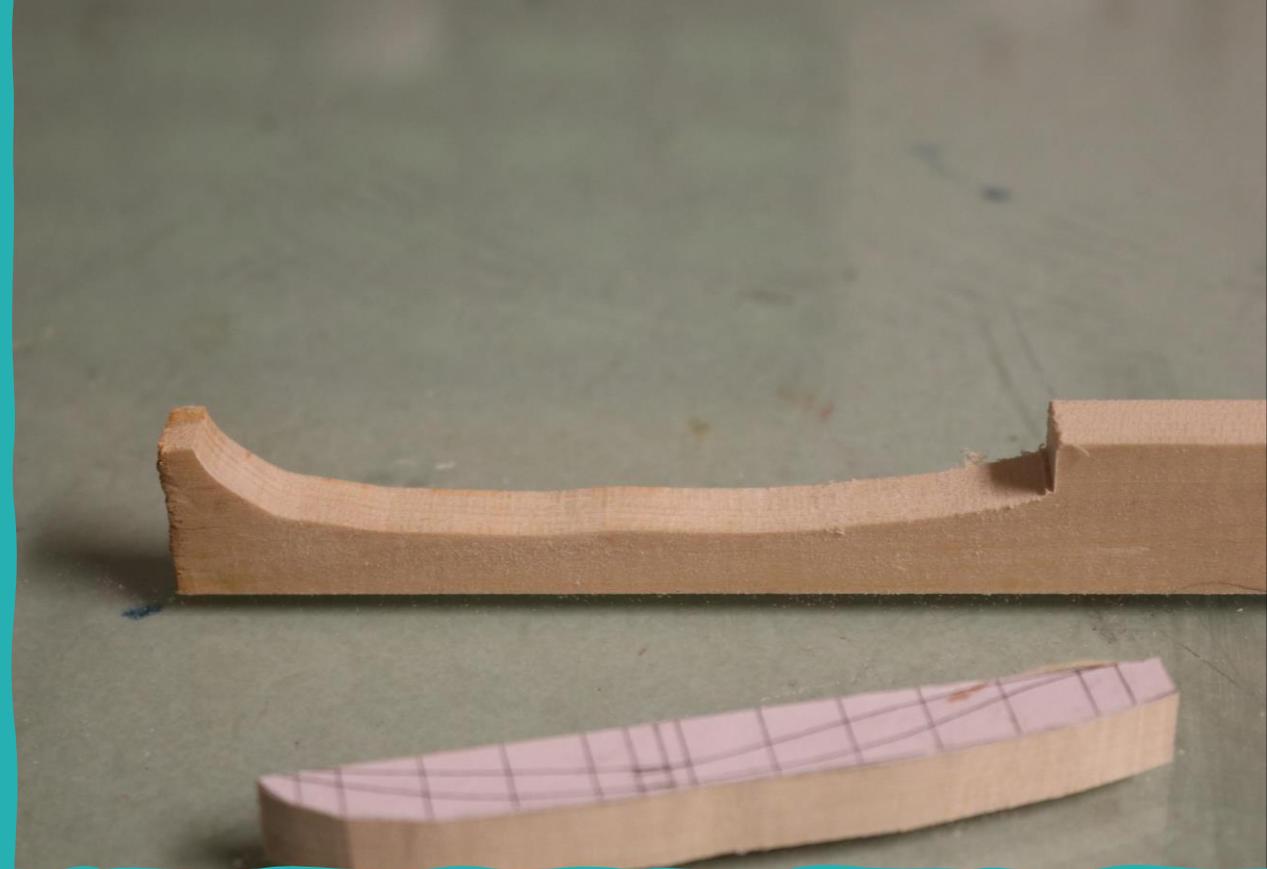
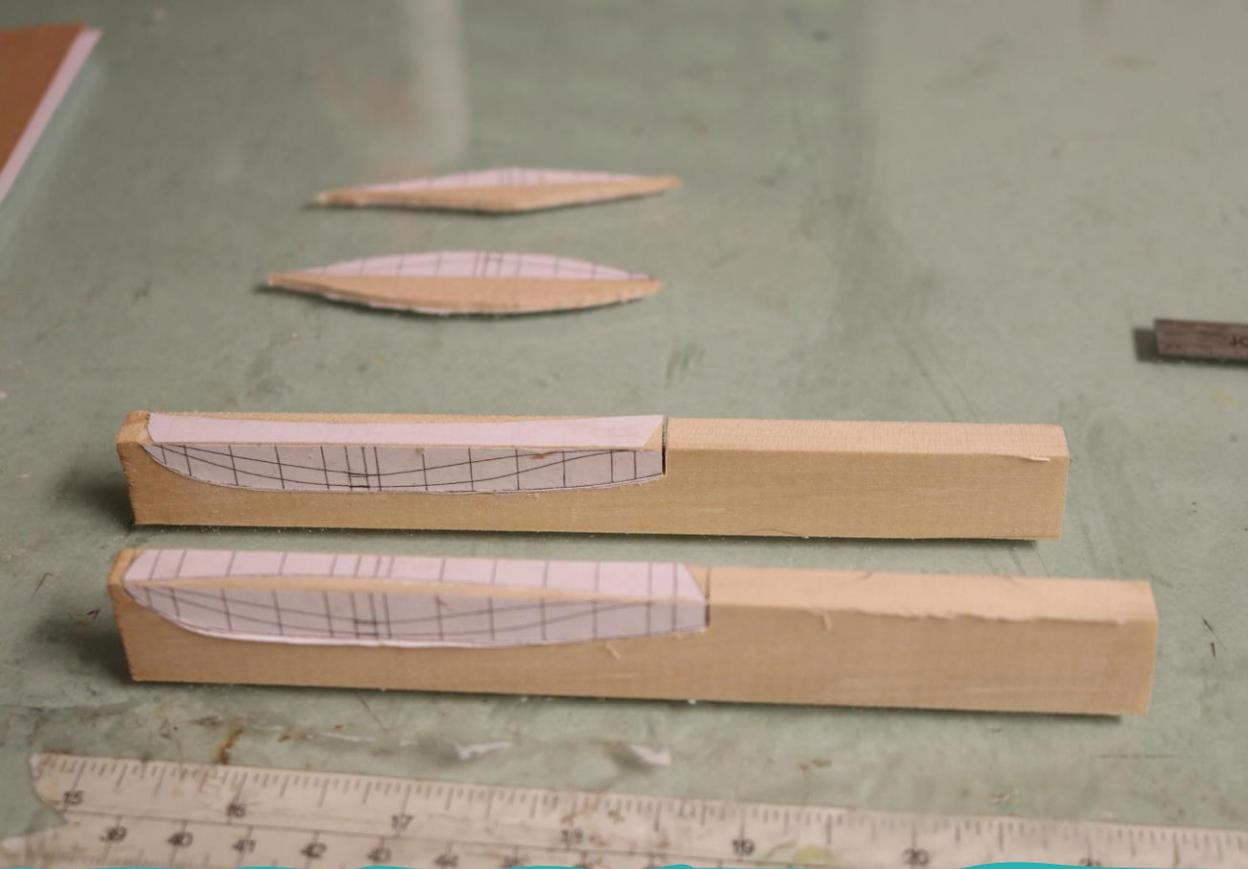


- When you stack up the lifts, the black line is what you have. The red stays, and everything else is removed.
- Once you finish the outside, it is good practice to mark the thickness of the hull at the top of the boat shear, with a compass.



## PREPARING TO CUT OUT THE LIFTS

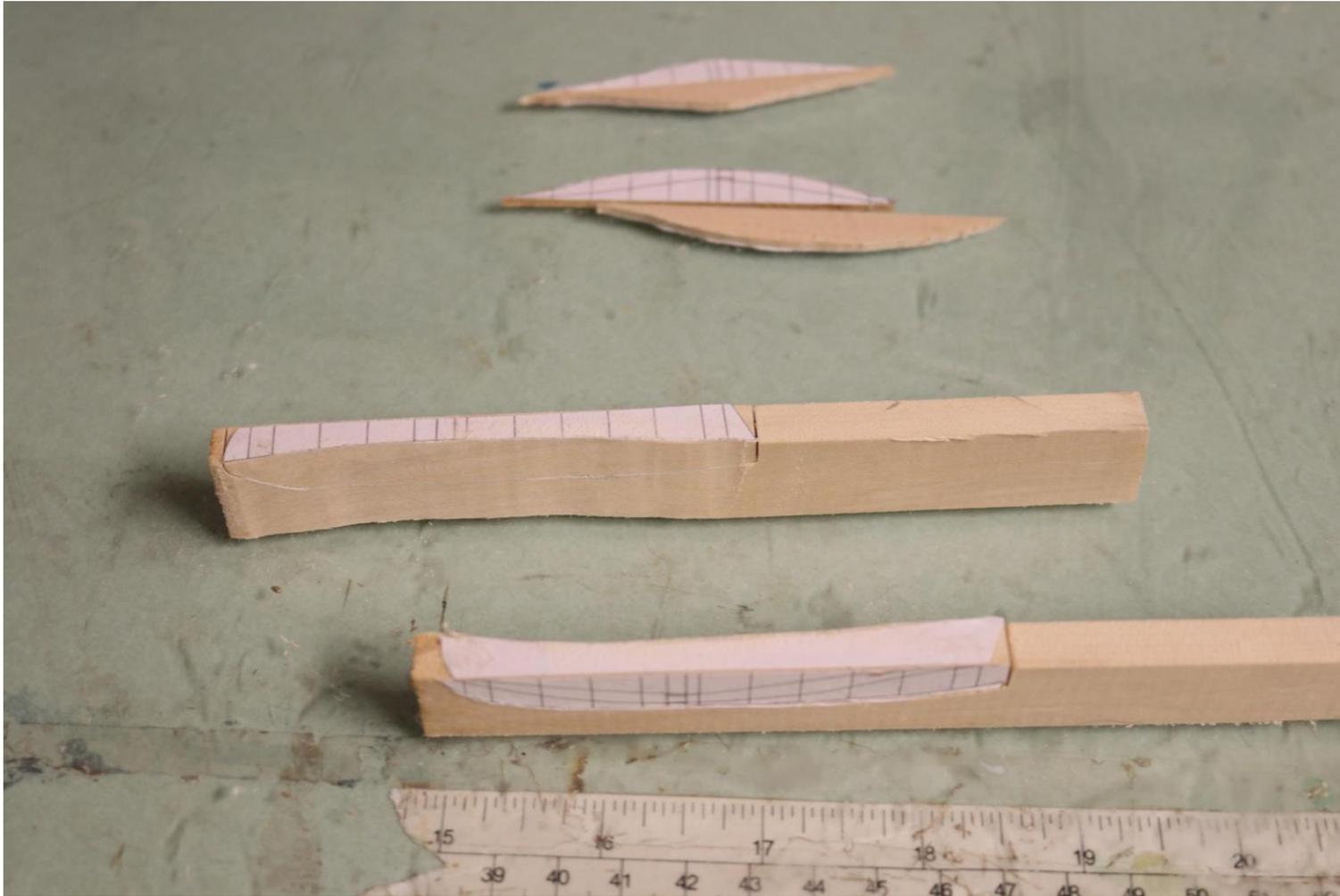
- Here are the patterns for the lifts for the Pinnacle laid out on basswood of the appropriate thickness.
- Note the patterns for the shear on the upper right.



TOP LIFT PLACED BACK TO  
ALLOW THE SHEAR TO BE CUT



- The top lift is carefully cut out (right). It is then put back in the removed piece to allow the shear to be cut.



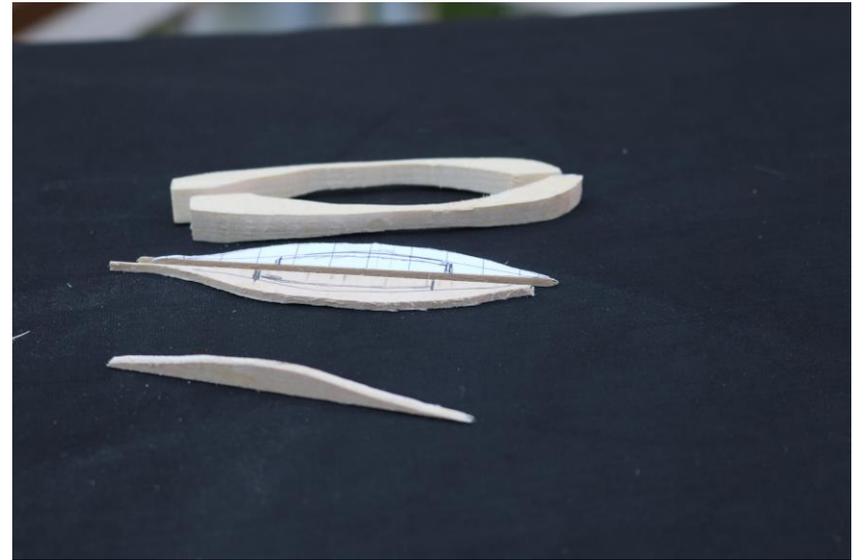
## THE SHEAR IS CUT

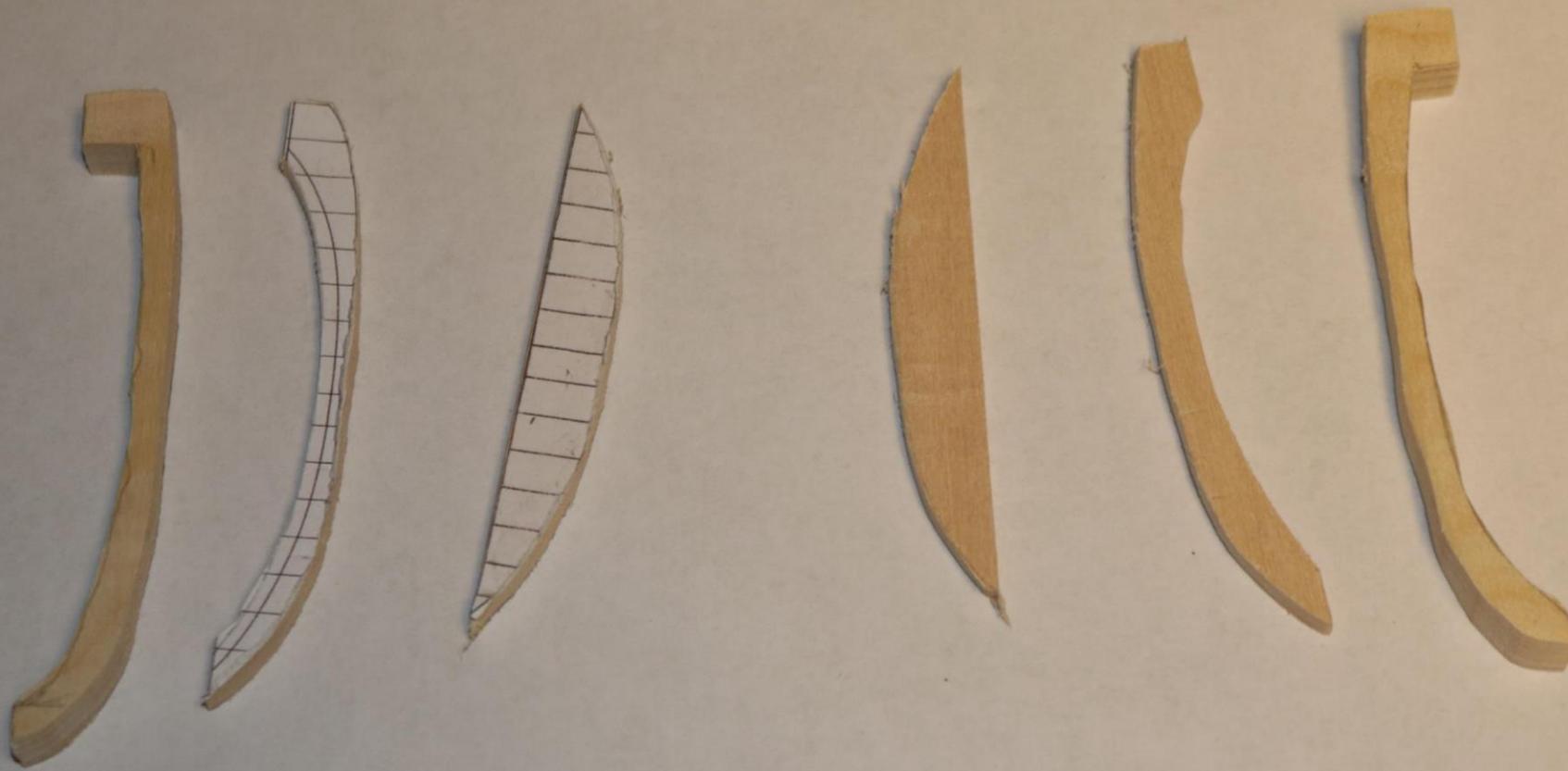
Here the shear has been cut into one of the two top lifts.

# IT STARTS TO COME TO SHAPE.

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- These are the lifts for the pinnace. Note that the bottom lift does not have the interior removed. The next one up has the area in the center that will be removed.





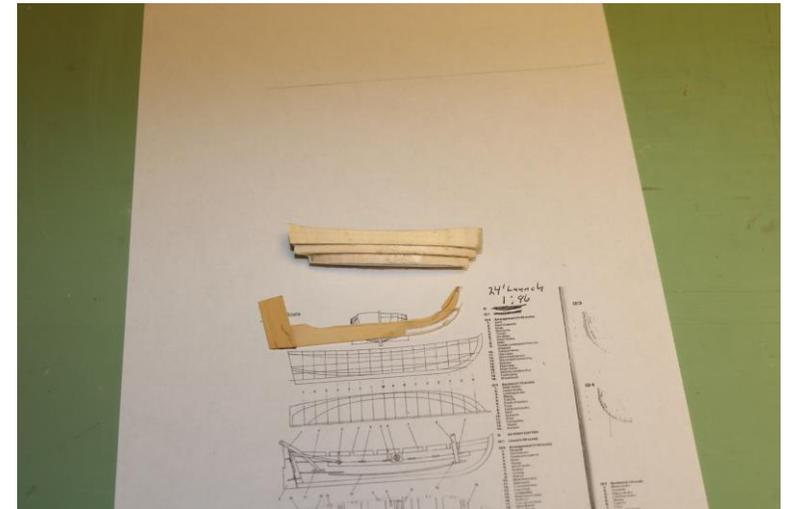
## ANOTHER BOAT

- These are the lifts for the launch.

# MAKING PROGRESS

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- The top photo shows the lifts trial placed together with the stem, stern and keel sandwiched between them. The outside of the hull has been carved out. Note that the lifts interior was sawed out to lessen the amount of carving required.
- The bottom photo shows the starboard side lifts with the trial stem, keel and stern piece.



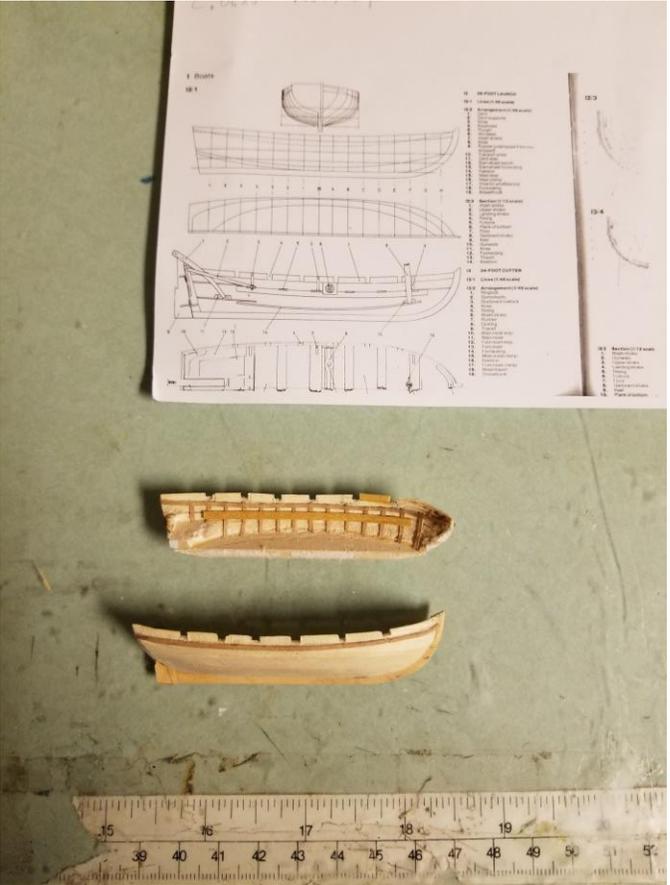
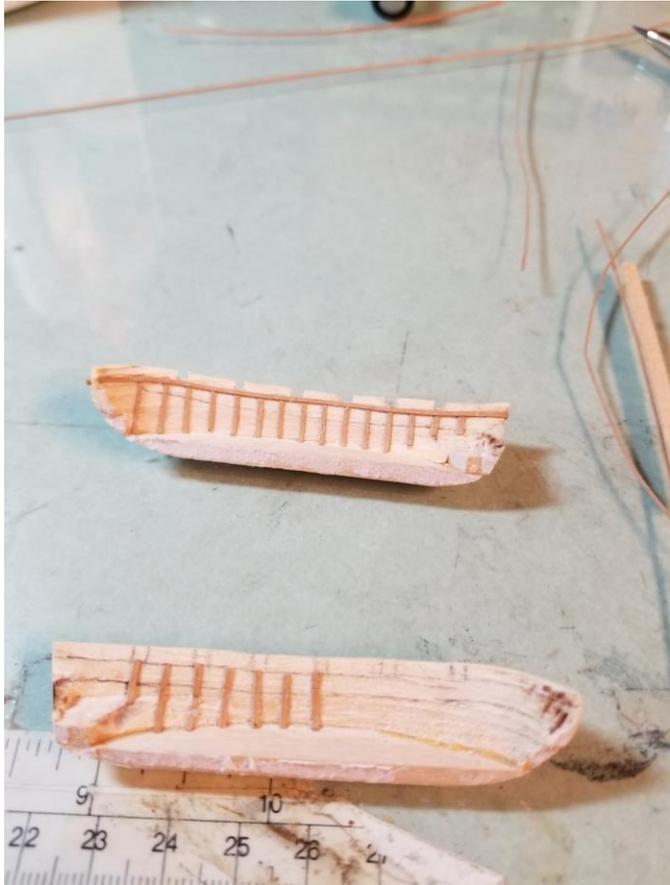
A photograph showing two long, thin wooden carvings lying on a grey workbench. The carvings are light-colored wood with a smooth, finished surface. One carving is slightly longer and more curved than the other. The background is a plain, light-colored surface.

# CARVING COMPLETE

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- The carving is completed with dental burs of various shapes. Sanding with various diameter drums, and scrappers.
- Note how the interior of the bottom lift is not carved and how a recess is the only interior opening on the next lift. That is because the floorboards cover those sections.

# ADD RIBS AND OTHER INTERNAL STRUCTURES





## THE COMPLETED BOATS

### - 24 FT. LAUNCH

- The knees and ribs were made from brown card stock. The Thwarts and stern sheets of parmarfim. The floorboards from basswood premade plank stock sanded thin.

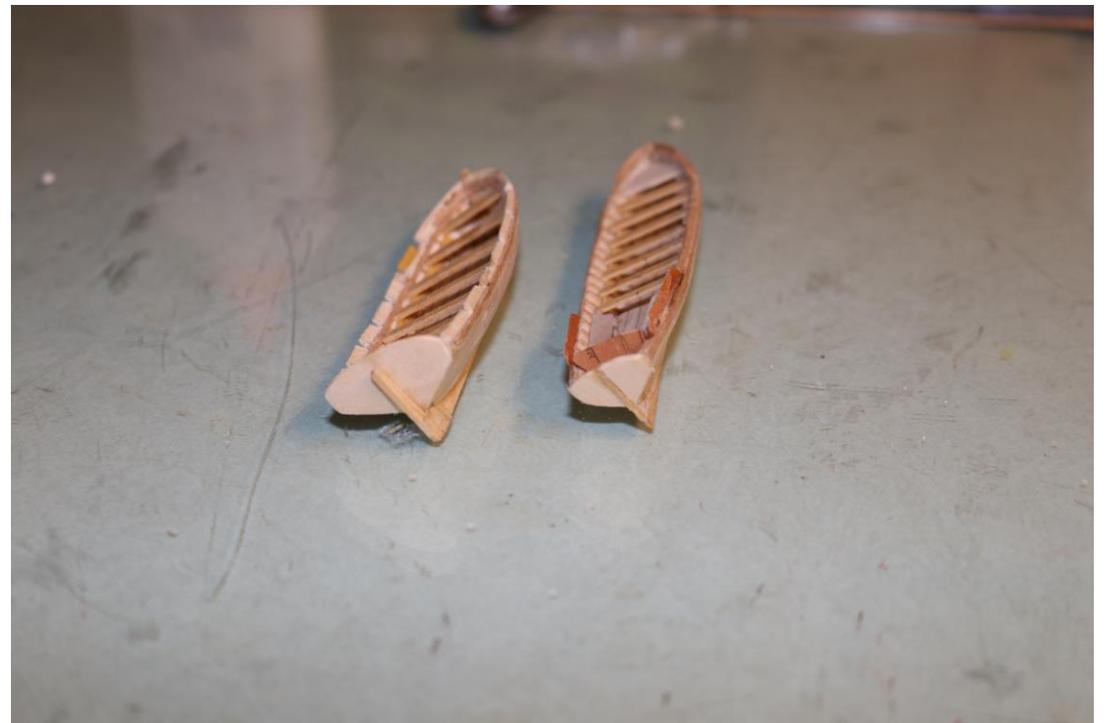


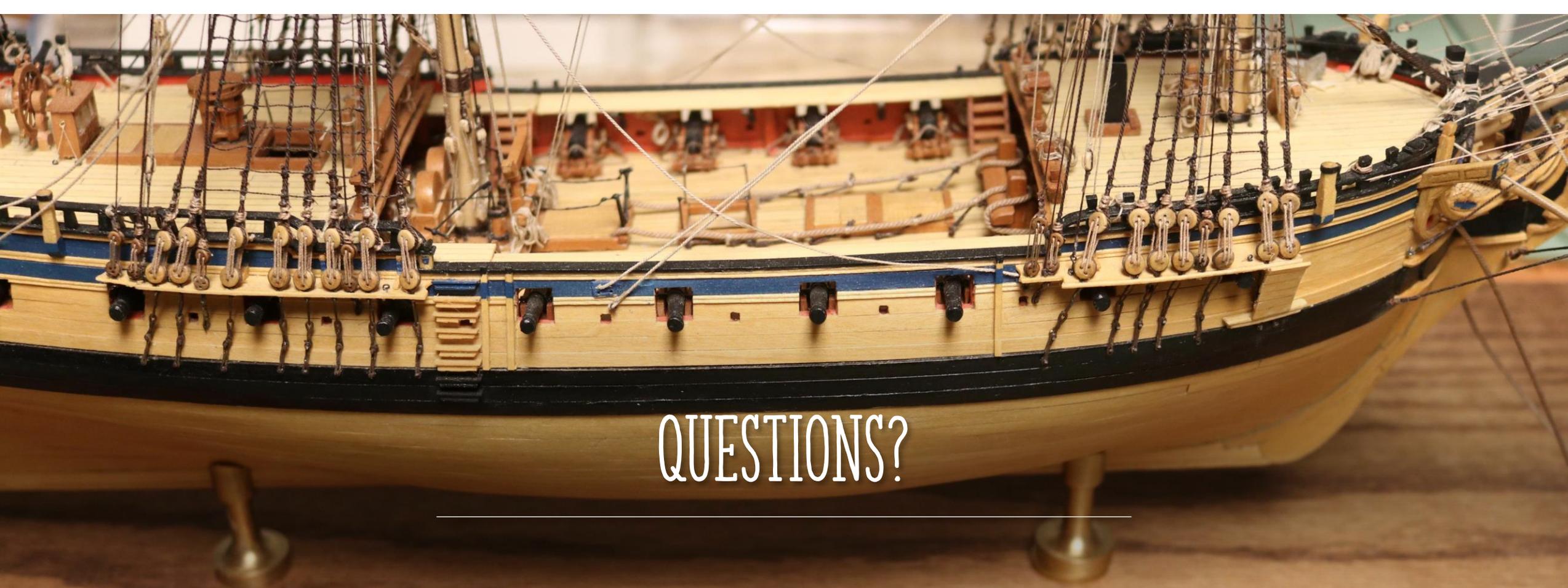
## COMPLETED BOATS – 28 FT. PINNACE

- The stern sheets are 1/64 birch plywood. The washboards are old SMSNJ ID cards. They are two ply pear. As with the launch, the sheer plank, cap rails and ribs are card.

# COMPARISON

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QUESTIONS?

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