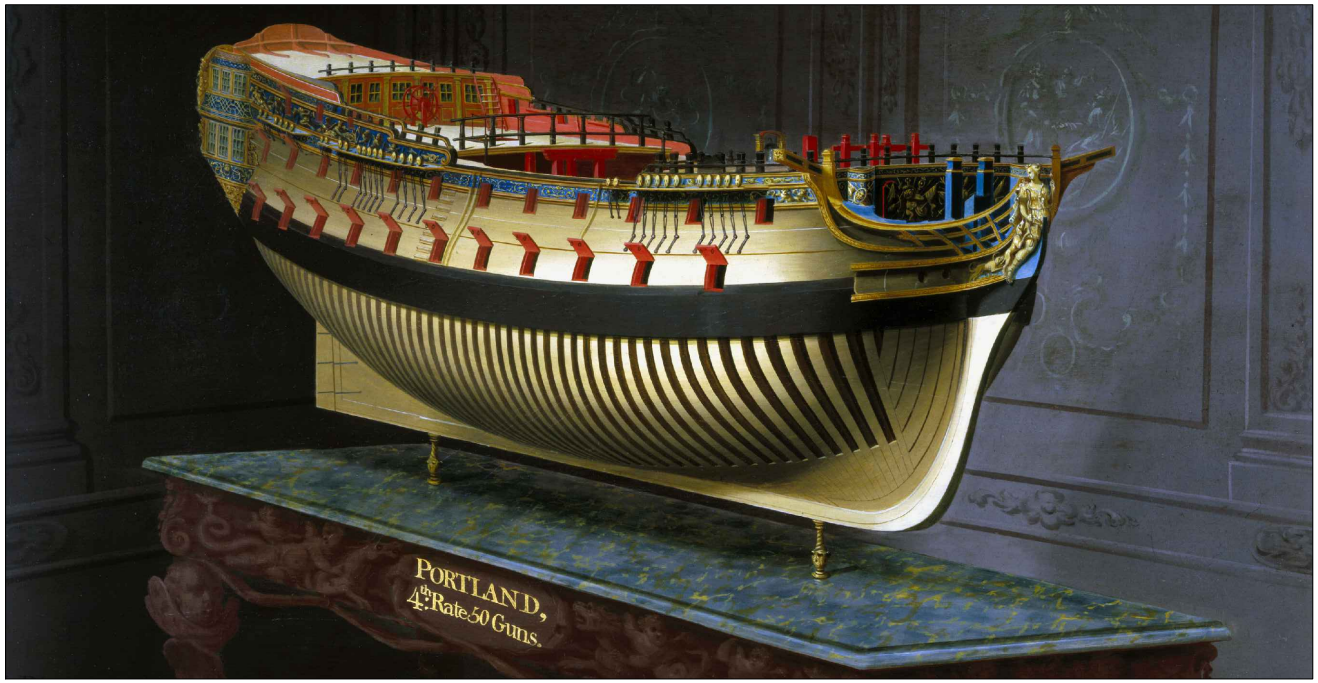
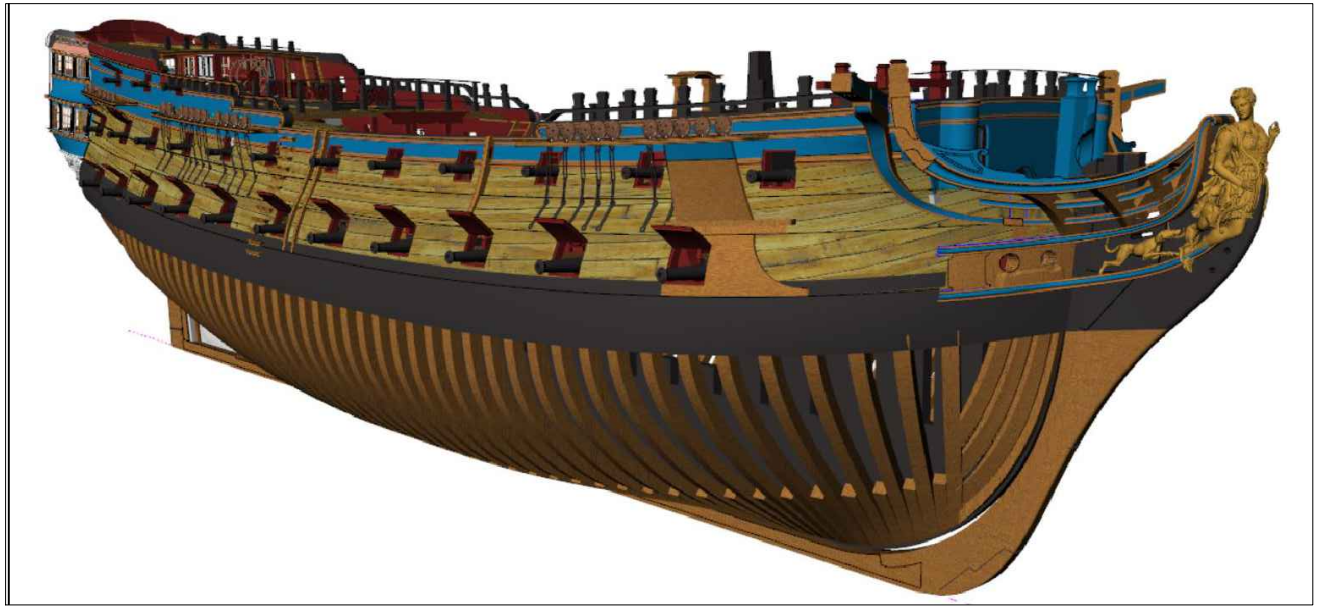
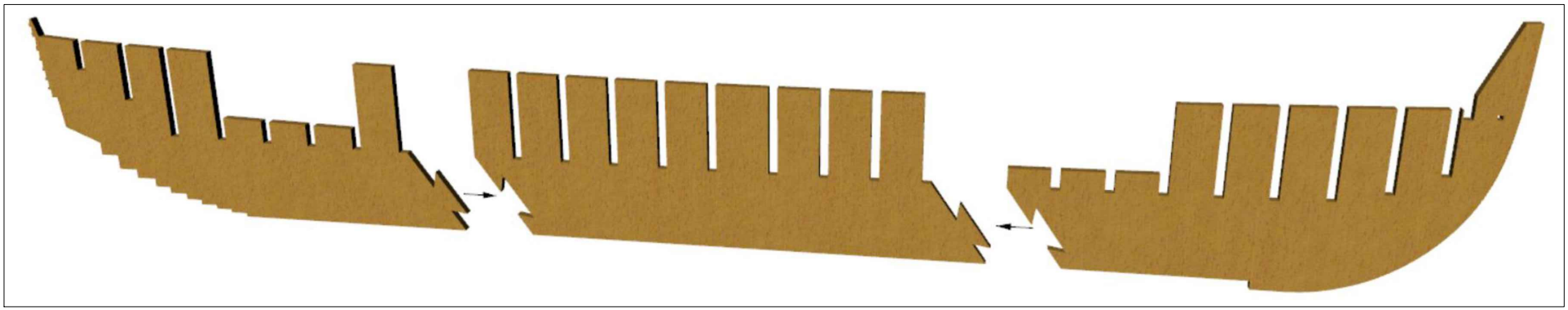


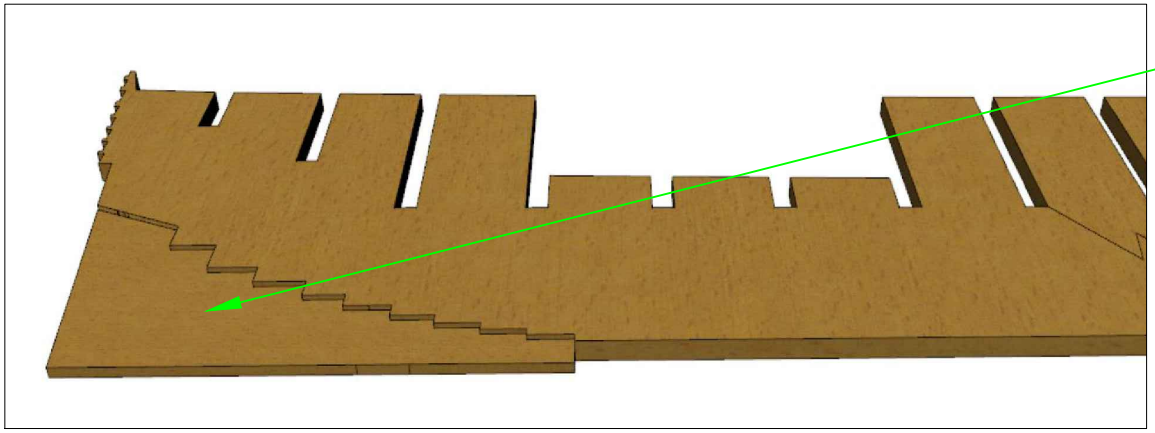
Welcome to HMS Portland 1770. The objective of this model kt is to replicate Portland as a Navy Board model as she was painted by Marshall in 1774. With these paintings and a large resource of original draughts dated back to 1766 I have designed to the best of my knowledge, a kit that faithfully reproduces the Navy board model of Portland, likely built alongside the real ship in 1770.

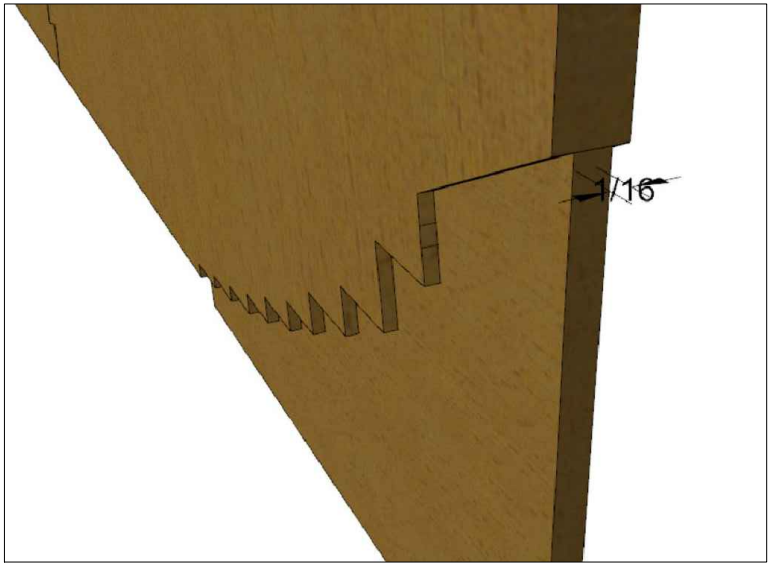


To begin construction of Portland start by gluing the three bulkhead former sections together on a flat surface. Make sure they are straight on the bottom and laying perfectly flat. I used a flat butcher block table with wax paper so it wont glue to whatever surface you choose to assemble on.



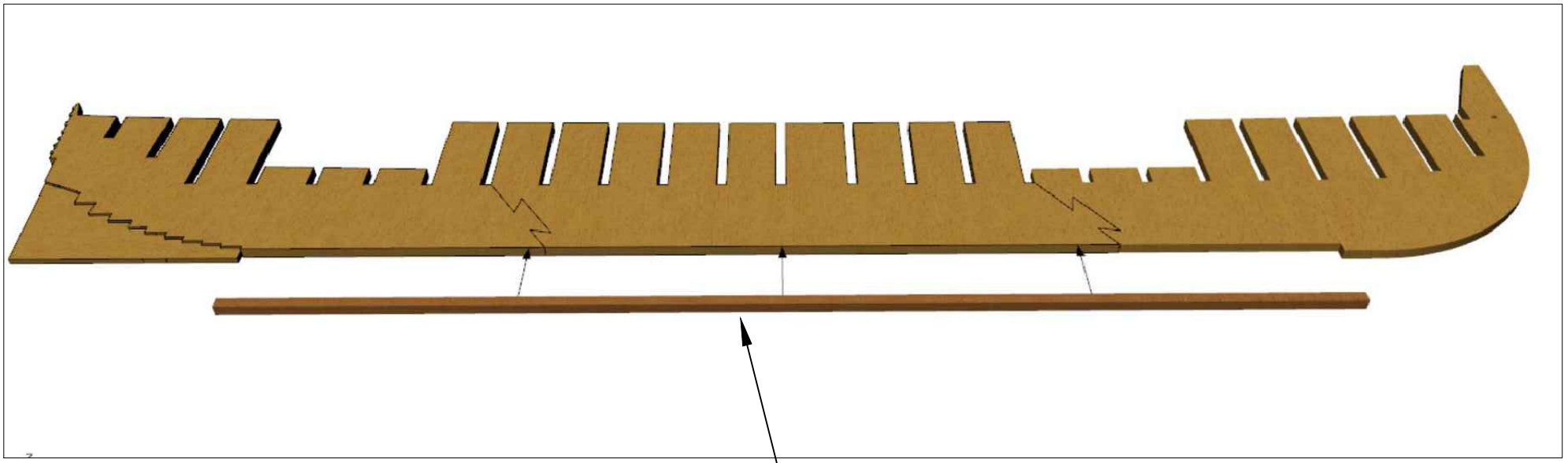
Install the $\frac{1}{8}$" MDF deadwood section, the easiest way to do this is install a shim that is half the difference in thickness between the deadwood section and the buklhead former. In theory it should work out to be $\frac{1}{16}$" but just double check before you glue as the MDF is usually just under $\frac{1}{4}$" and $\frac{1}{8}$".





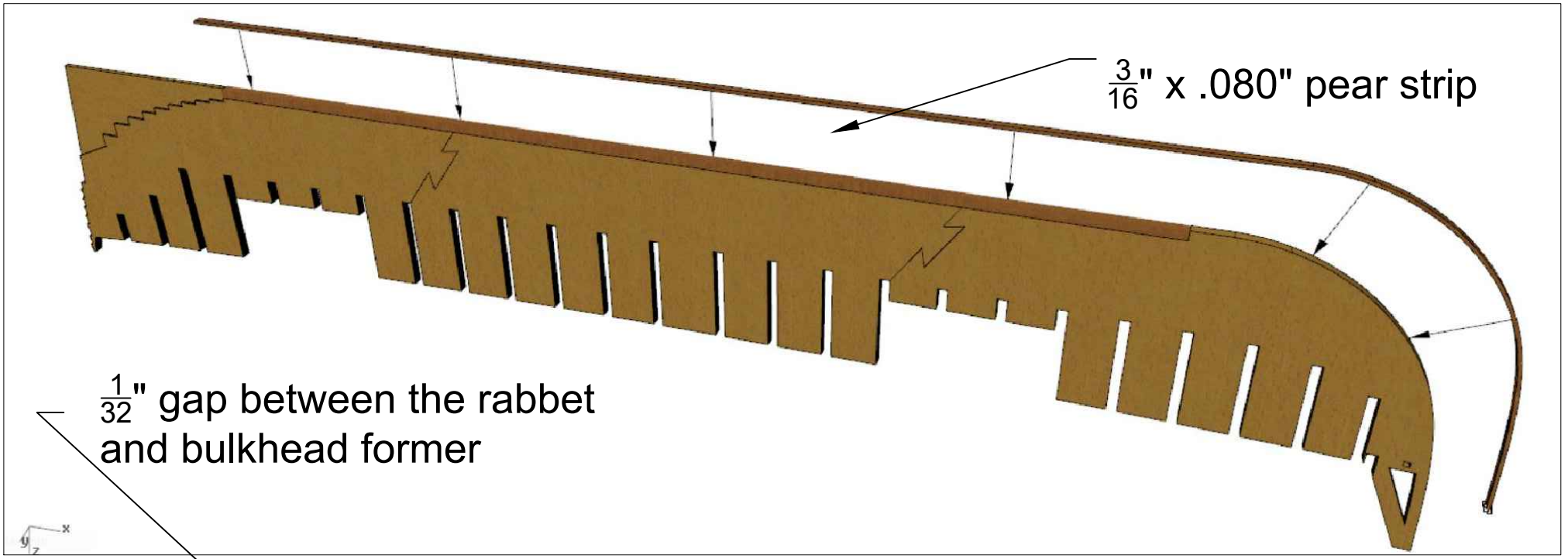
You can see the deadwood filler piece to the right, centered on the aft end of the bulkhead former, it should sit centered with $\frac{1}{16}$" on each side of it. Make sure it is consistent front to back.

Below you can see the pear sections going in on the bottom of the bulkhead former, these are to simulate the keel structure behind the frames and wont be seen much. There are two pieces of $\frac{1}{4}$"X$\frac{1}{4}$" of pear provided in the kit, do not confuse them with the 3 $\frac{1}{4}$"x$\frac{5}{16}$" keel pieces that span the bottom.

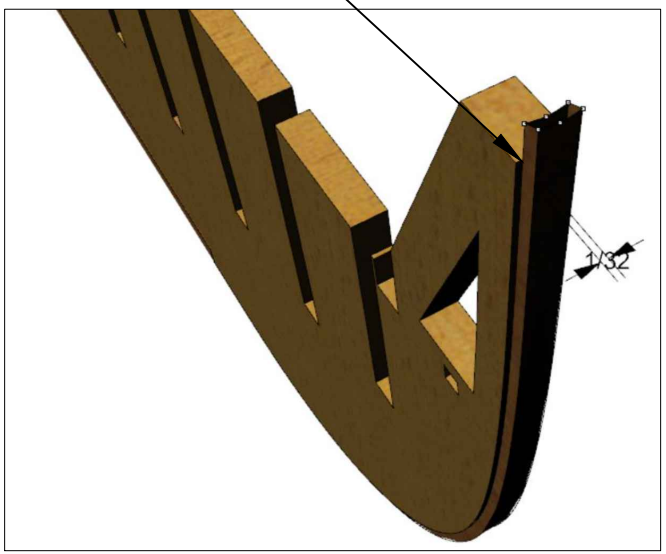


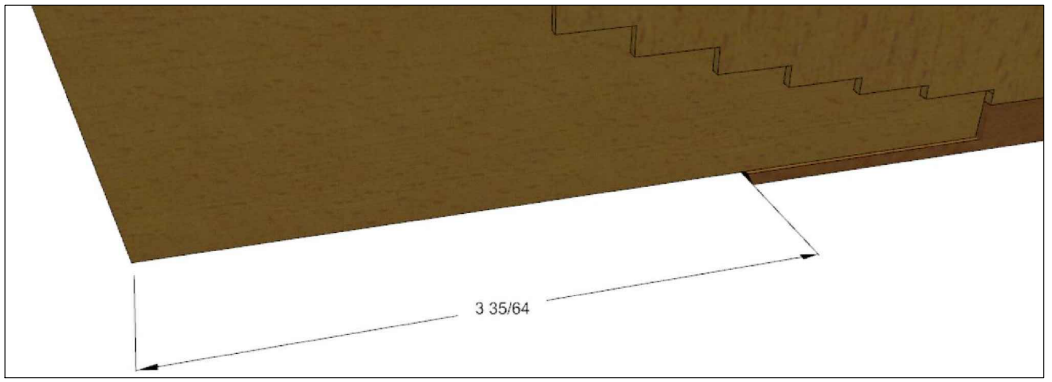
$\frac{1}{4}$" x $\frac{1}{4}$" pear

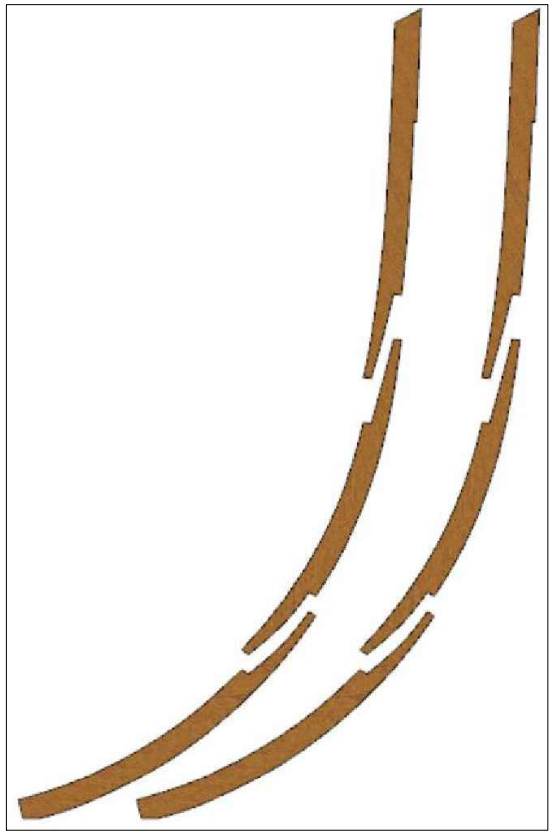
Below you can see the rabbet strip installation. Included in the kit is a $\frac{3}{16}$" x .08" thick pear strip. it needs to be glued along the center of the bulkhead former. using a $\frac{1}{32}$" shim to center it would work, you could also carefully eyeball it.



In the photo below you can see where to terminate the rabbet strip, it needs to be 3" and $\frac{35}{64}$" (90.08mm) from the back of the MDF deadwood. I left mine slightly long and trimmed as necessary. Id recommend you leave it $\frac{1}{4}$" long.



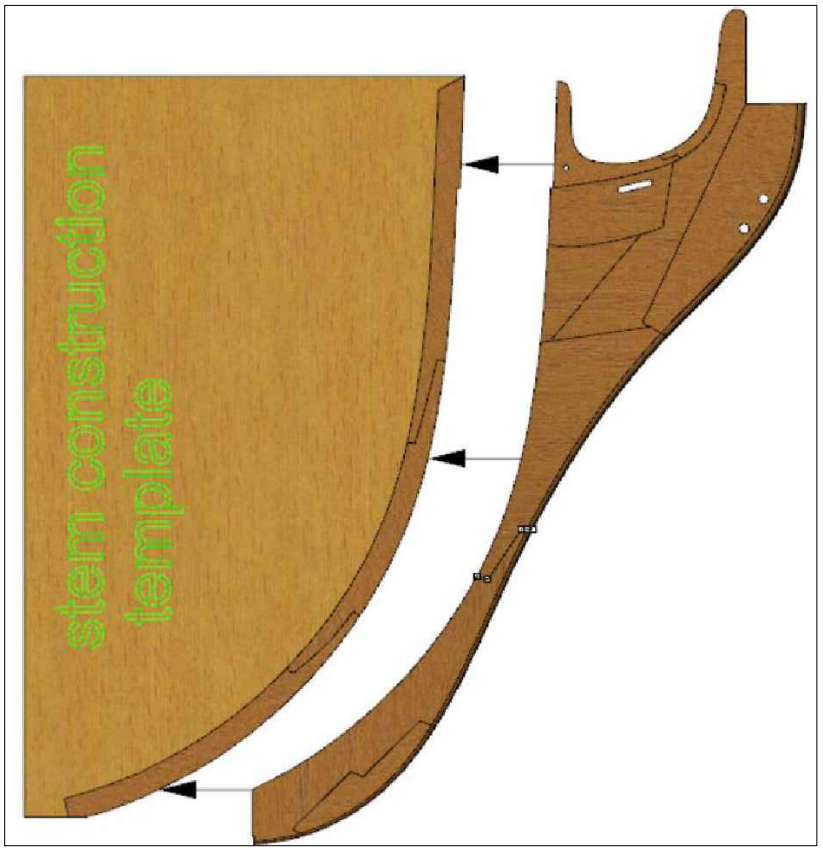


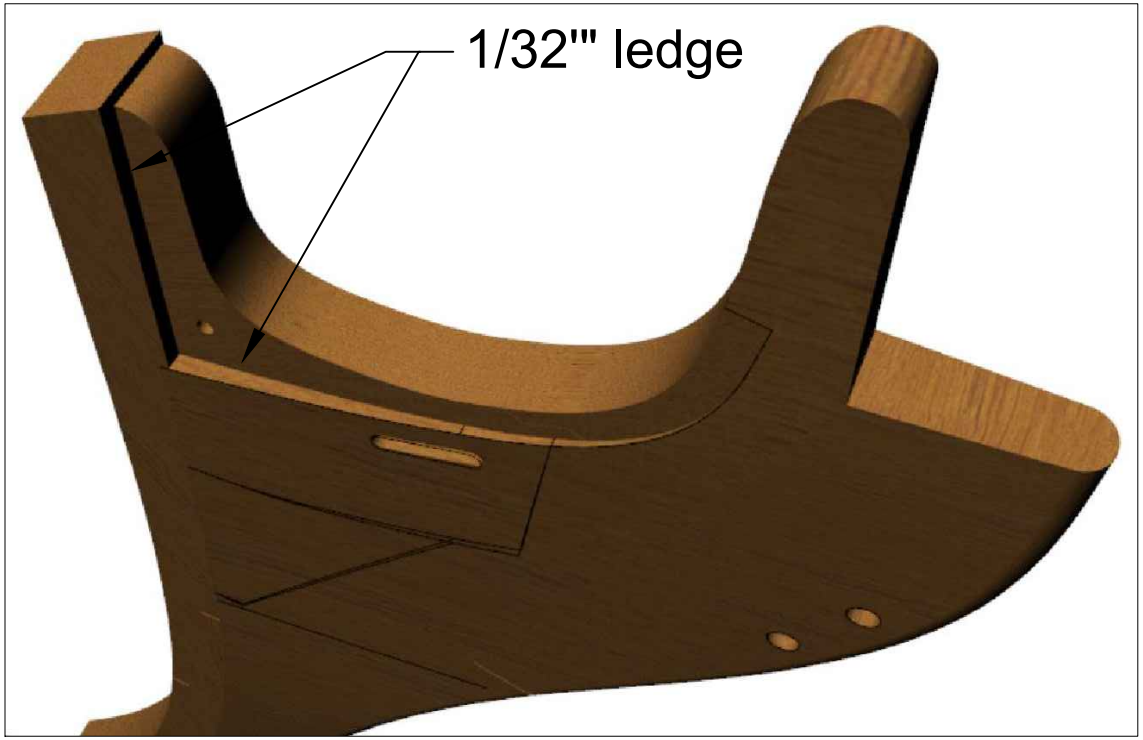


The knee of the head parts consist of two sets of parts in $\frac{5}{32}$" AYC that will be glued together to make $\frac{5}{16}$". i found that the pieces would not cut very accurate in one single $\frac{5}{16}$ sheet. As you can see to the left, glue the duplicate parts together to form the $\frac{5}{16}$" pieces, on the right you can see the $\frac{1}{4}$" MDF stem construction template, you can assemble the inner pieces of the knee against this as shown, careful not to actually glue it to the template.

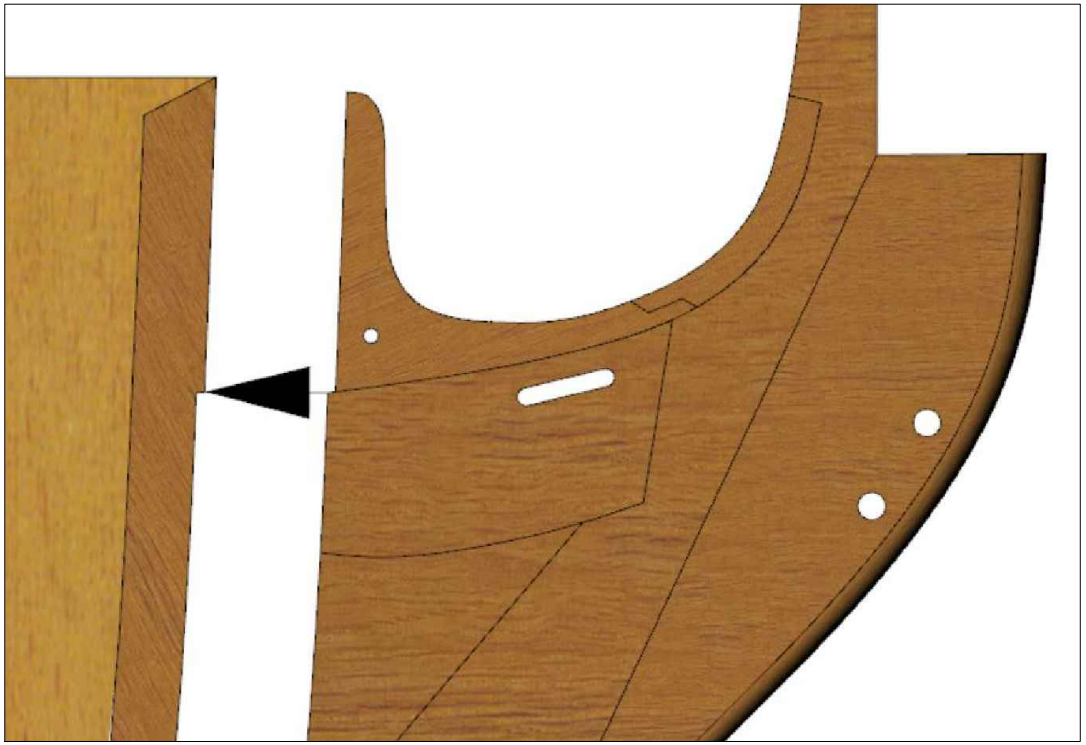
On the left you can see the pieces that make up the knee, they can be assembled individually into single $\frac{5}{16}$" pieces and then assembled with the stem against the template, As shown on the next page.

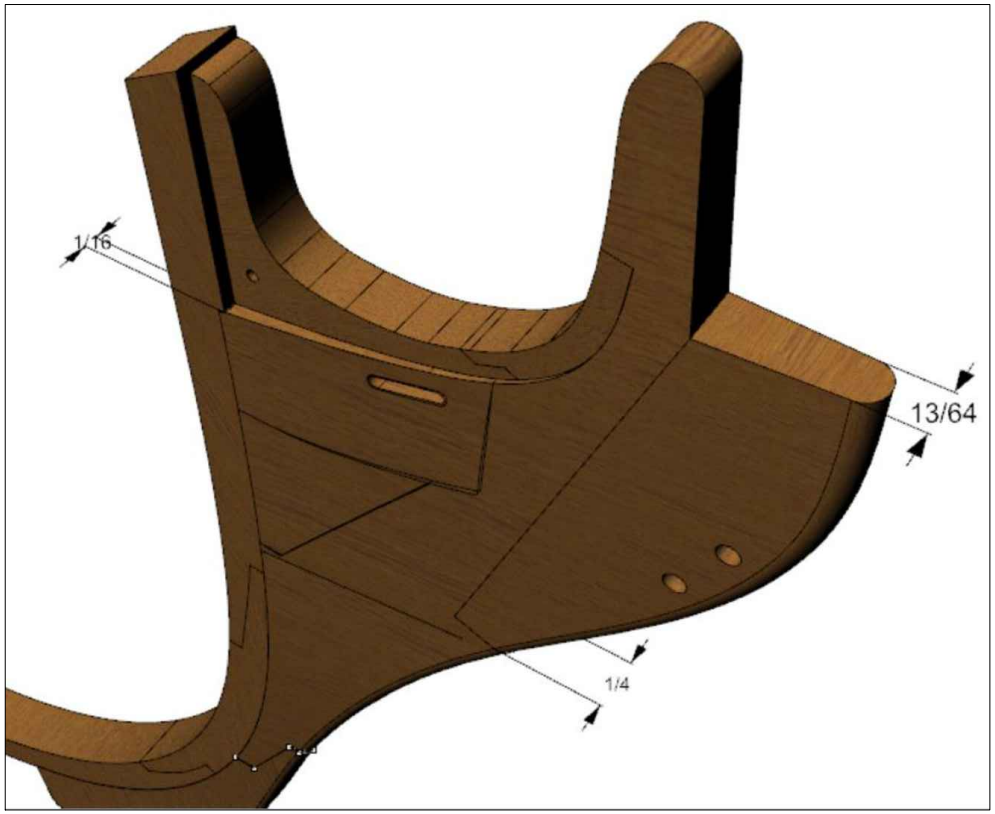
To the left we have all the pieces glued up to form single $\frac{5}{16}$" parts of the knee, the photo on the right shows the assembly going together against the stem pieces that were assembled earlier using the template. But before you attach the gammon knee you will have to taper it to fit. since it is assembled from the same material it will require some slight sanding. In the photo to the right we can see the gammon knee is slightly thinner towards the stem but it appears to taper further at the front, you will actually taper the front of the knee to match the gammon knee. This will also coincide with fitting of the figurehead. In this step we are looking for a $\frac{1}{32}$" gap.





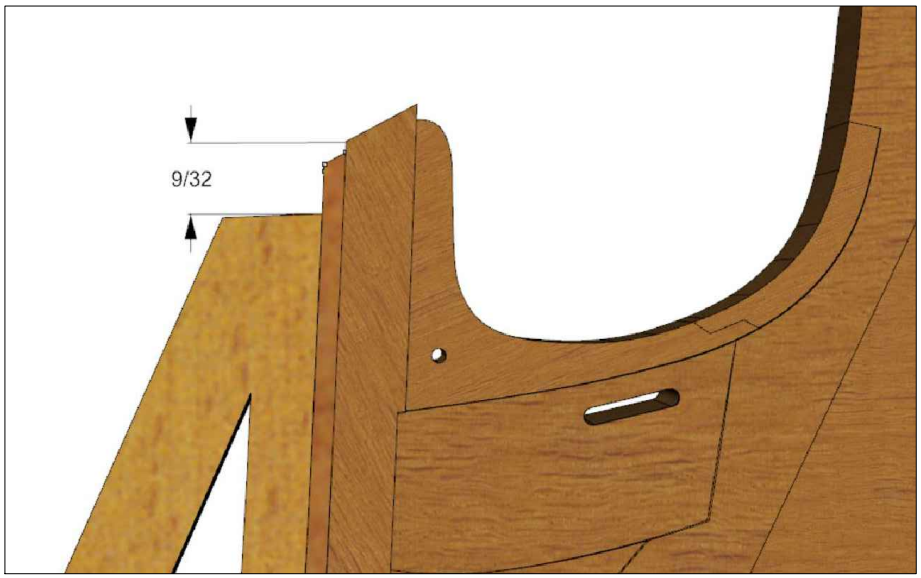
To the right i just want to point out when joining the knee to the stem, there is a ledge that helps all the components align during assembly, make sure not to overlook this. it wont fit otherwise.





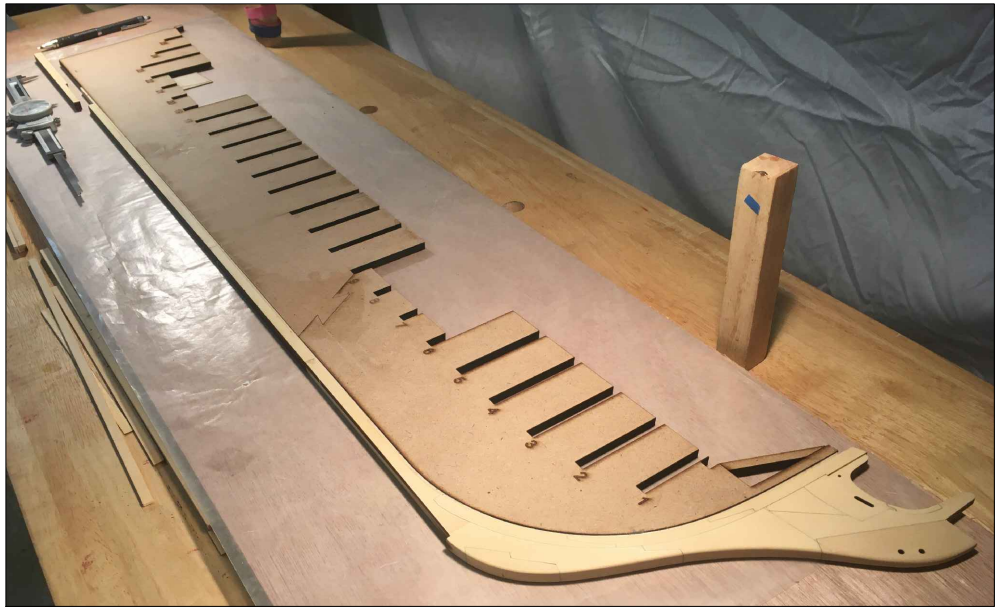
To the left i have the dimensions to taper to, i do recommend carefully sanding and checking with your figurehead for exact fit. The boxwood figurehead will come machined to fit a tapered knee.

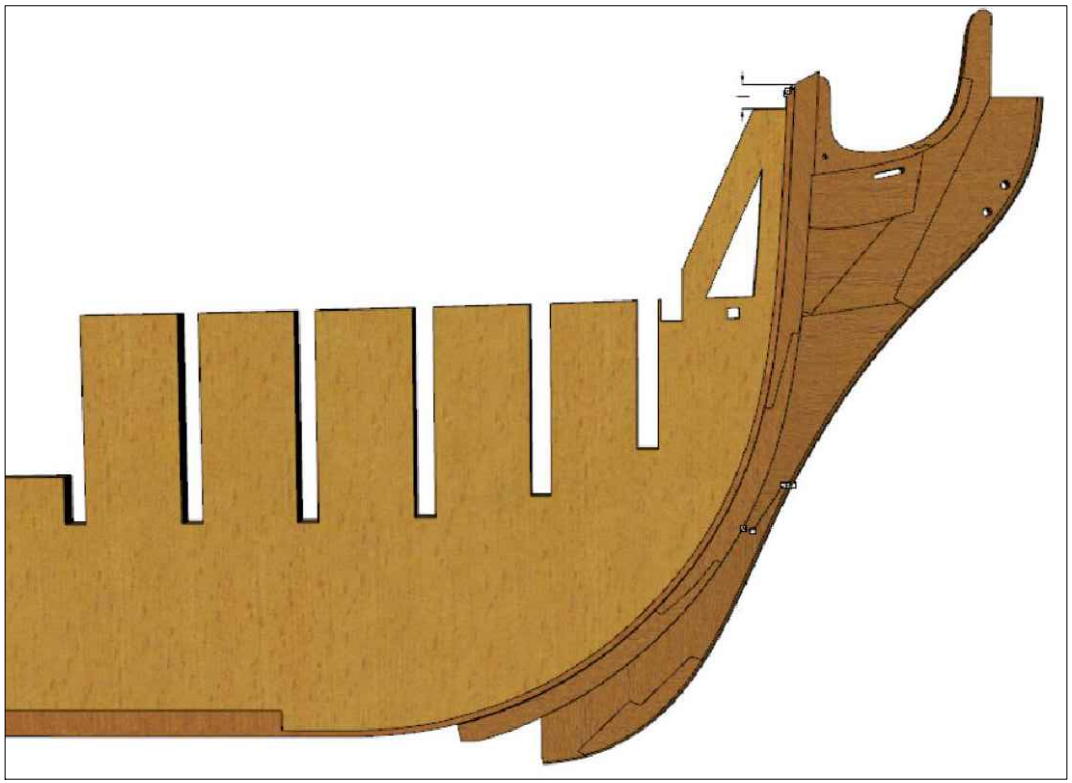
The completed knee can now be added to the model. keep in mind that the knee is $\frac{5}{16}$" thick where as your bulkhead former is only $\frac{1}{4}$". I attached mine with the bulkhead former laying down flat and elevated by approximately $\frac{1}{32}$' shims in order to keep the knee perfectly aligned and centered on the former.



Before you attach the knee make sure to check the distance between the top of forward edge of the former and lower edge of the stem, the dimension as shown above is $\frac{9}{32}$". the Knee will fit best when positioned here but it would also seem to fit ok if this dimension were to be ignored so pay extra attention.

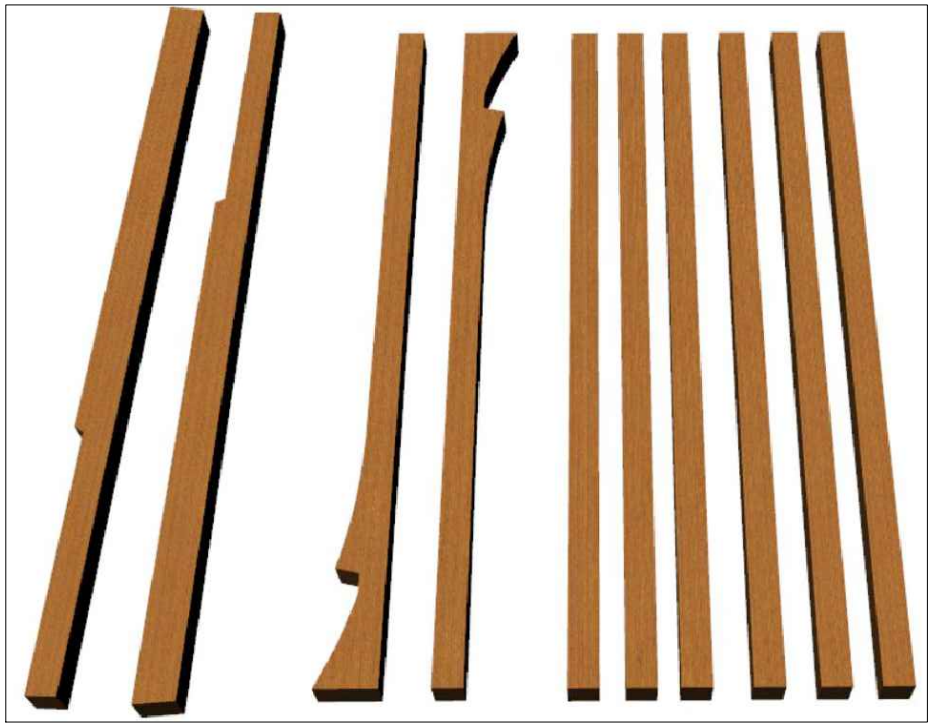
To the right you can see the former (a few steps ahead) with the knee attached, you cant see it but i have thin $\frac{1}{32}$" shims under the former to help center it on the thicker $\frac{5}{16}$" knee assembly.



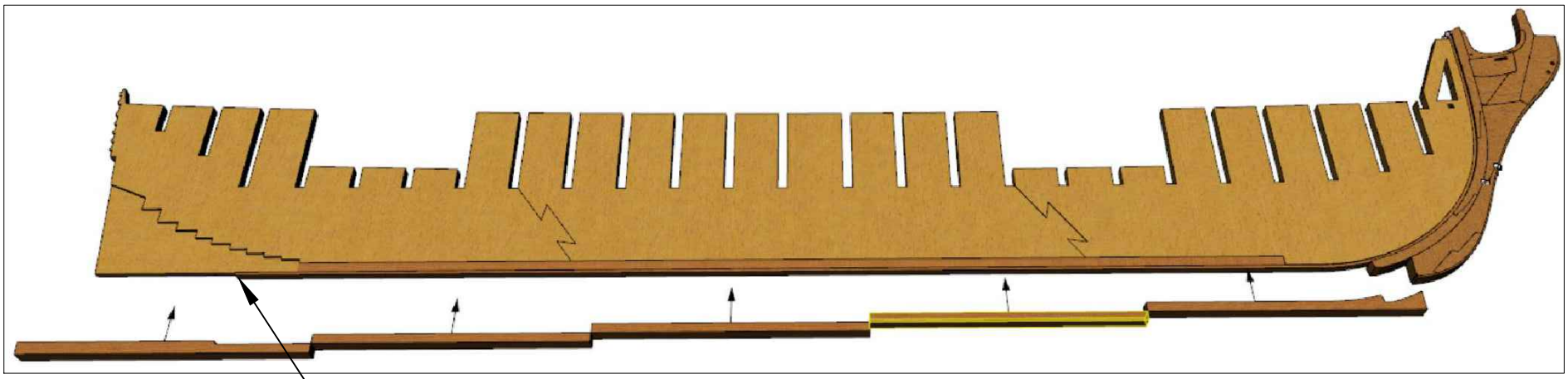


If all the parts are assembled corectly and the knee is properly glued then you should end up with something looking like the photo to the left.

The parts required to finish the rest of the keel are assembled similar to the knee, they are all $\frac{5}{32}$" and require two parts for each required piece. to the right you can see all 10 parts. Carefully glue them to their mate.

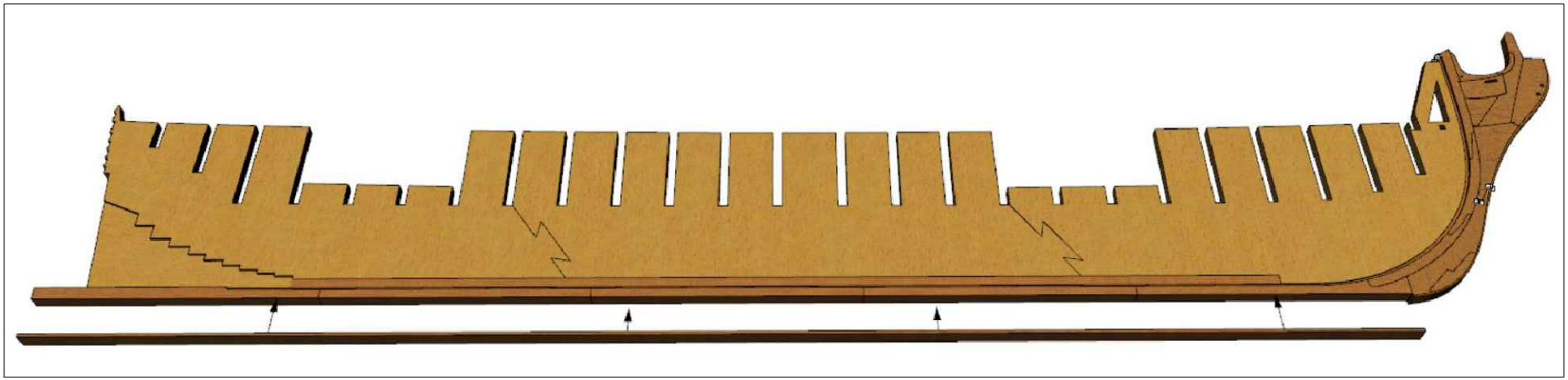


Below shows the assembly of the former in sequence, the forward part that forms the boxing joint has a little extra material on the front face, carefully trim as necessary.

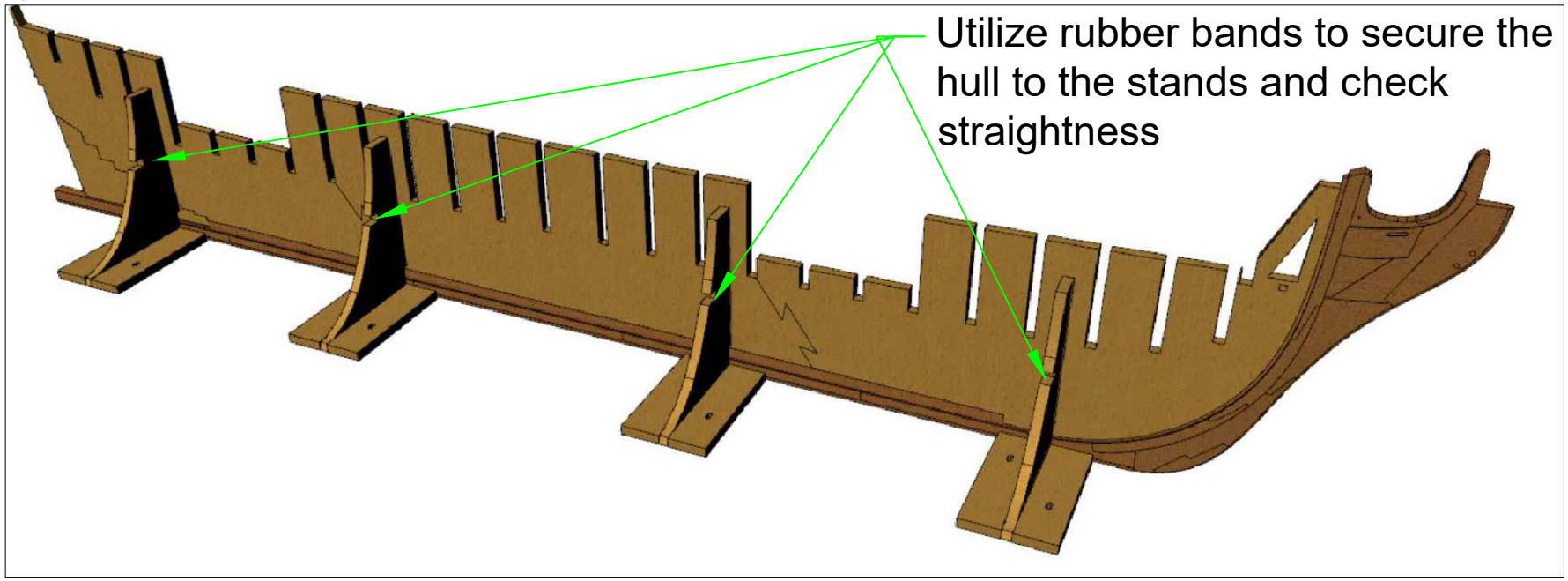


If you left your rabbet strip slightly longer you will have to trim it before the last piece of the keel can be attached, it will also require an angled cut to match the AYC keel piece.

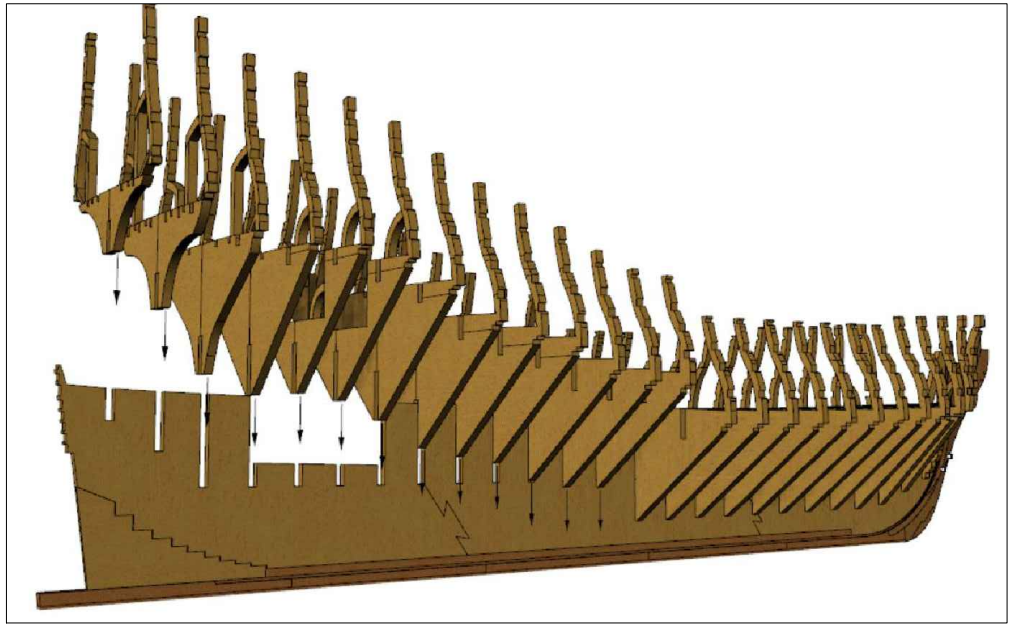
The false keel can be added now, a strip of $\frac{5}{16}$" x .0830" AYC is required.



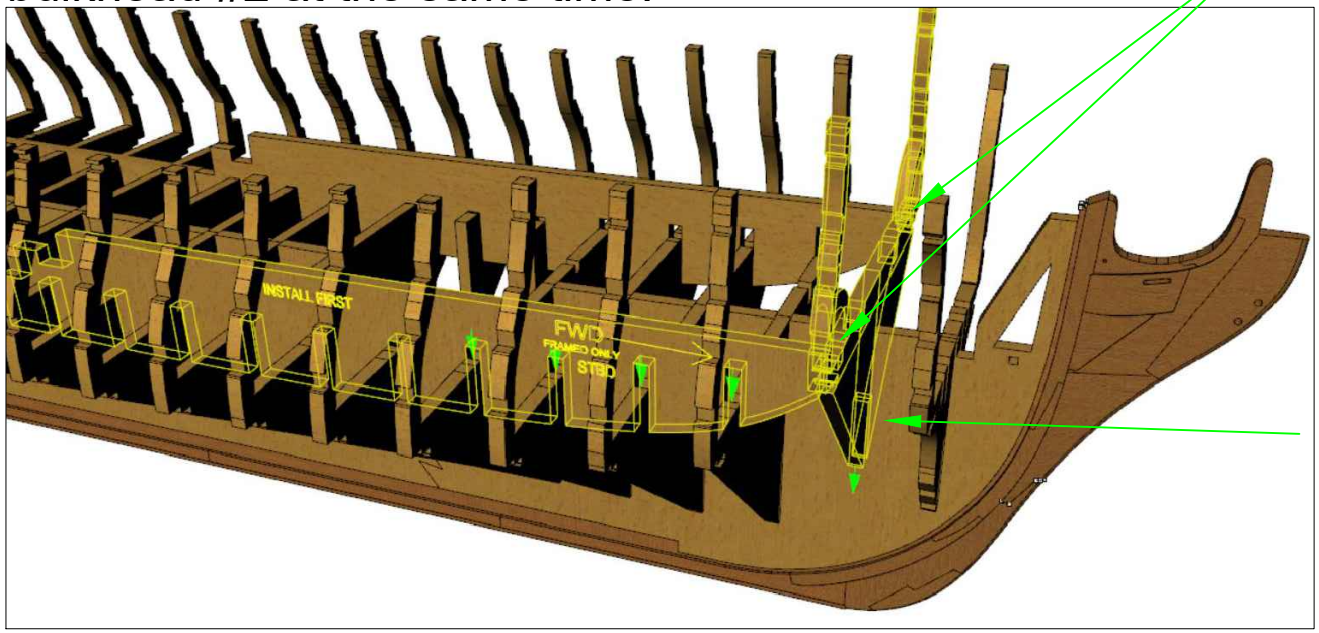
You can now stand your model up with the stands provided in the kit. Assemble them all and use a right angle to make sure they are all vertical, i used a straight edge to place them all in a straight line. The stands have notches in them so you can attach the model with rubber bands and double check the keel is stright before adding the stands on the other side.



At this point you can start dry fitting all the bulkheads, DO NOT glue any of them at this stage, from here forward we will be assembling the structure **without any glue** until everything structurally is in place and aligned . There will be a few exceptions and i will point them out.



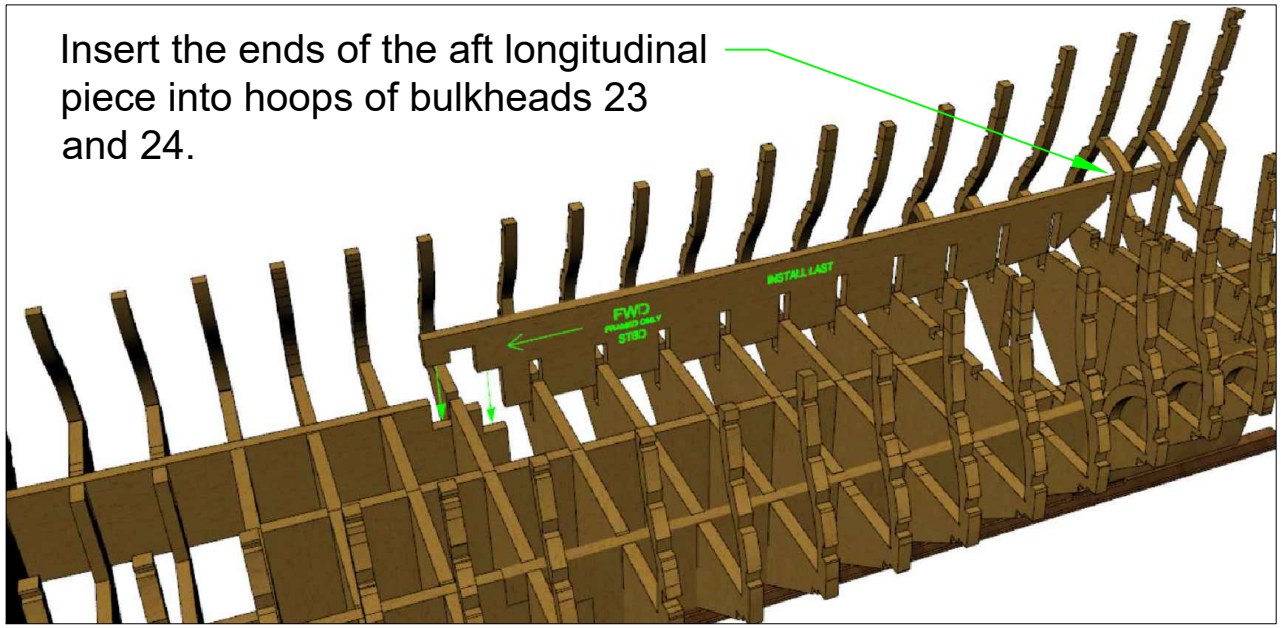
Below we have the first two of four longitudinal stiffeners that keep all the bulkheads straight. They are marked which ones go in first and their direction, so pay close attention. Look closely at the photo and you can see that you must set the longitudinal's down with them slotted into bulkhead #2 at the same time.



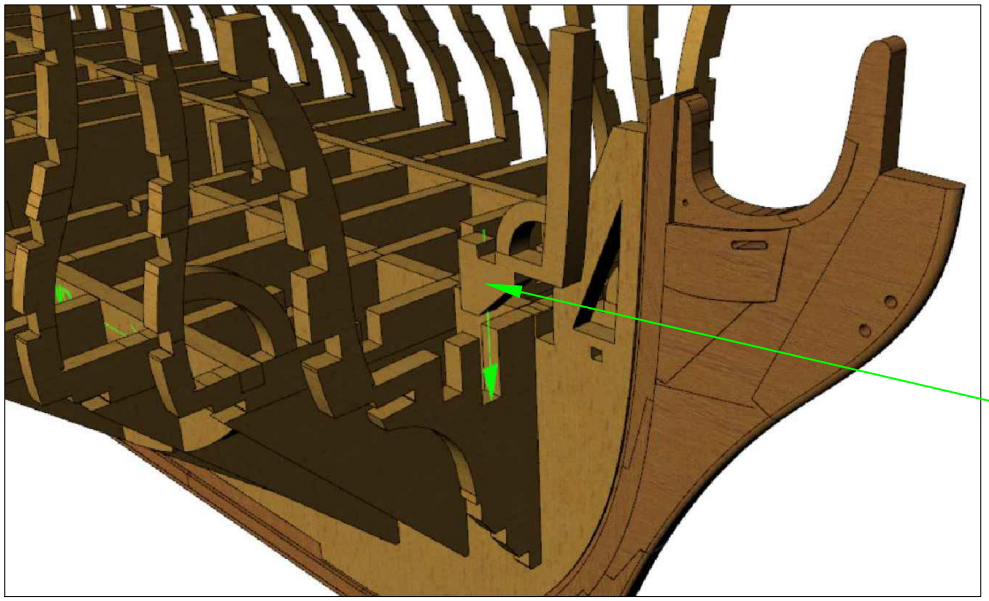
Insert the forward ends of the stiffeners into the support hoops on bulkhead #2 while still elevated

Gently set all three pieces into their respective slots at the same time, the fit will be tight so a light tap is ok. NO GLUE!

Below we continue with the longitudinal structure, here we have the aft two longitudinal's going in place, note that the aft end of the structure needs to fit into two reinforcing hoops on bulkheads 23 and 24 before it can be installed into its bulkhead slots. The joint between the two longitudinal's will be tight so you have have to lightly tap them together with a small hammer, adjust surfaces if too tight.

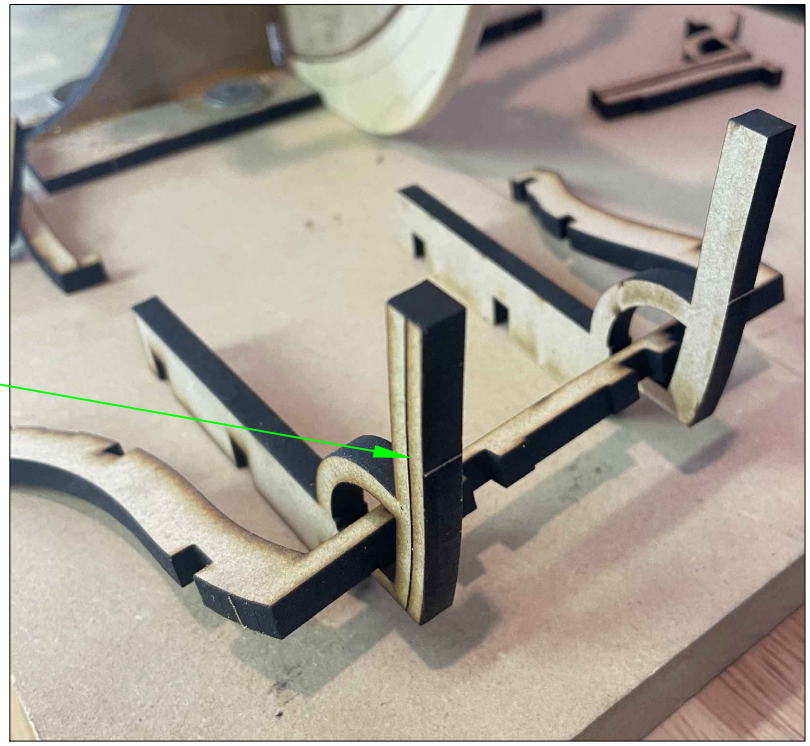


Moving forward its time to begin working on the bow, start by adding the forward inboard bow frames, these will undoubtedly attempt to fall out so you can lightly glue them in place, the next step will lock them down until the whole structure is glued into place.

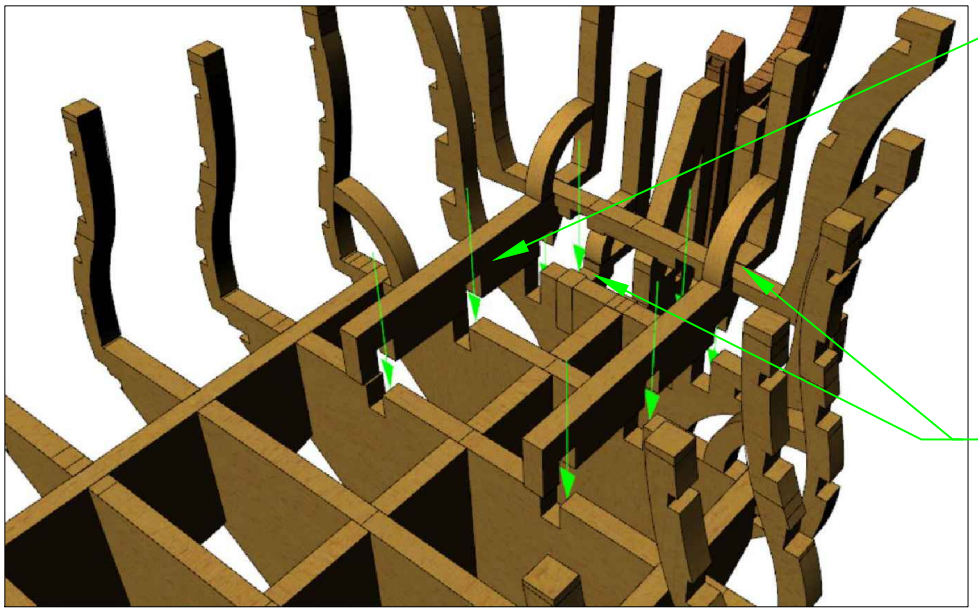


Install inner bow frame on both sides, glue lightly if necessary so it can still be manipulated.

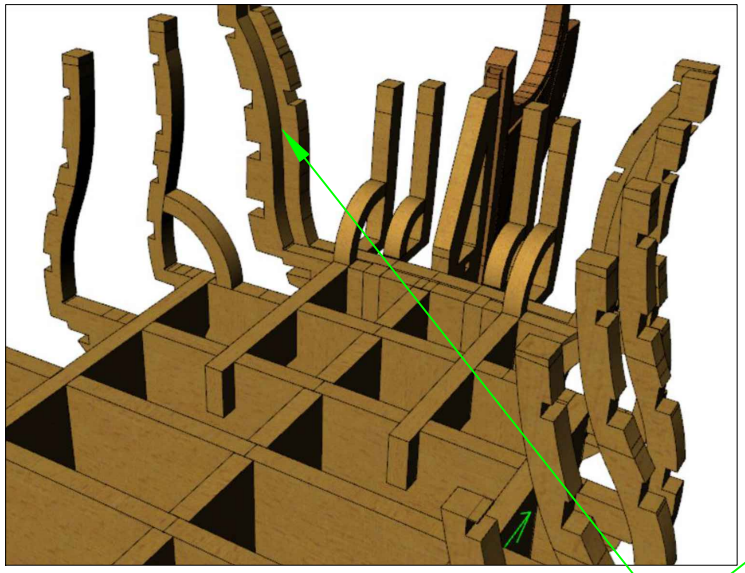
Now onto the fwd beakhead support bulkhead, you can see in the photo on the right we need to first place the two outboard bow frames onto the bulkhead first through their support hoops. Notice the fairing line facing outboard. These bow frames slot into bulkheads 1,2 and 3.



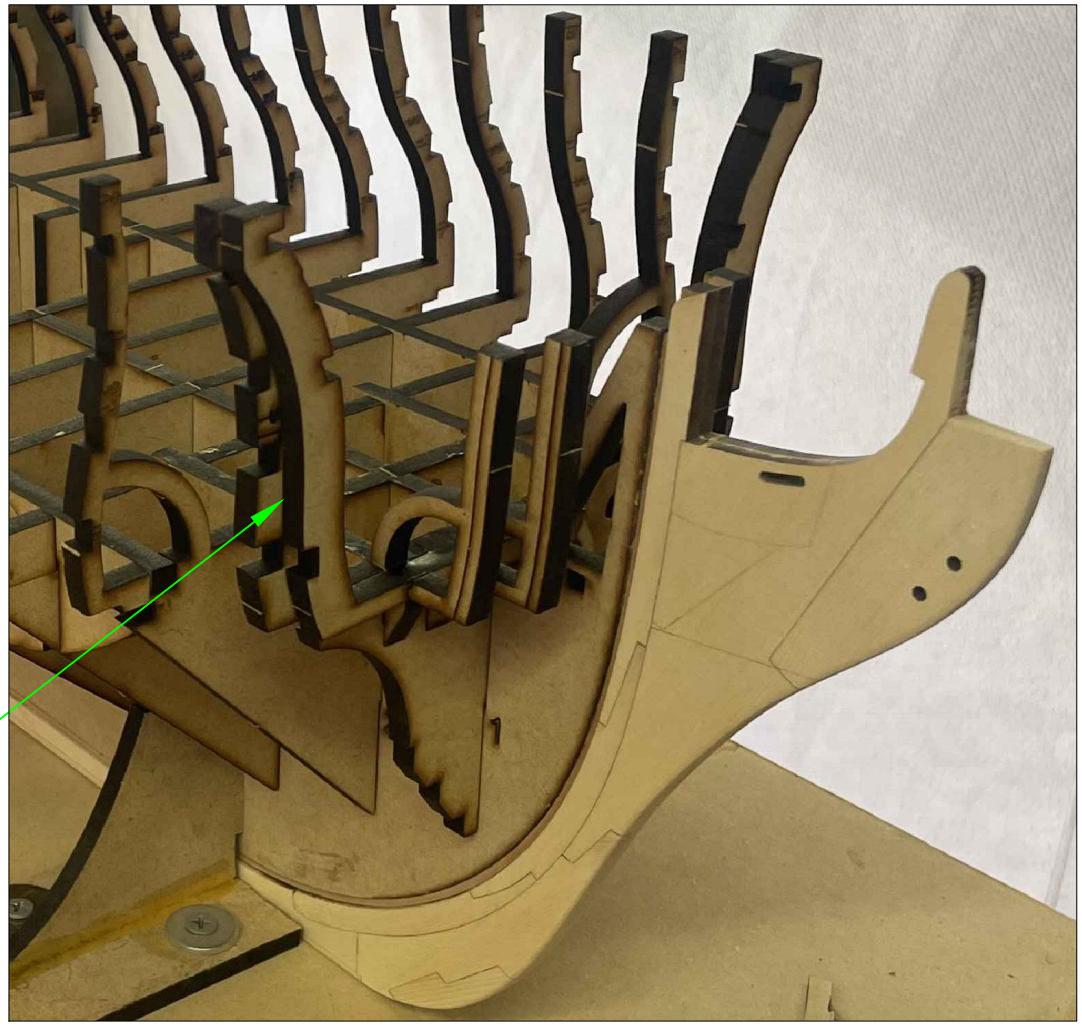
Below the forward beakhead support bulkhead can be seen dropping into place. Once the support bulkhead is in the hoops of the two bow frames it can remain floating until the bow frames are locked into their respective slots on bulkheads 1-3.



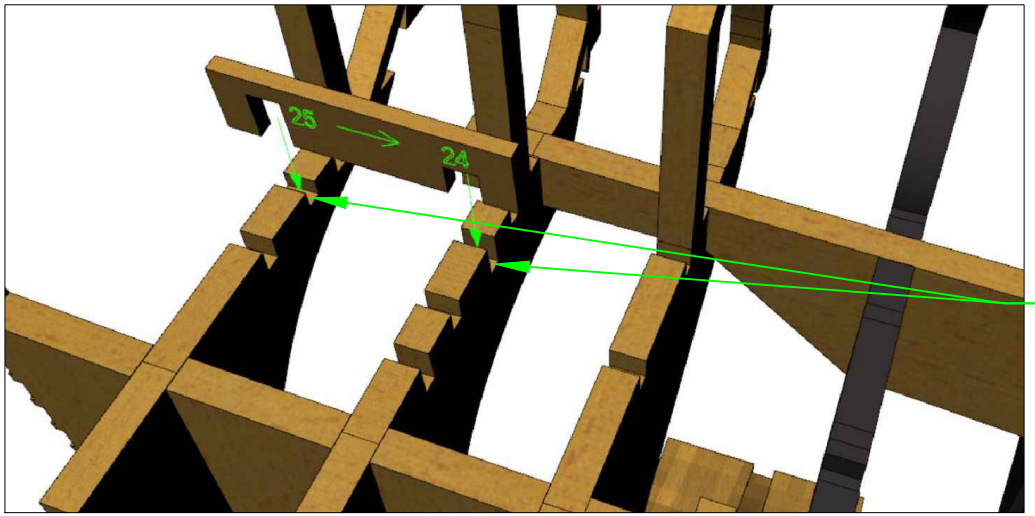
Photos of assembled views of the beakhead support bulkhead with bow frames. Note There should be a slight gap between the beakhead support bulkhead and bulkhead 1.



Small gap between two bulkheads, just slightly over $\frac{1}{32}$".

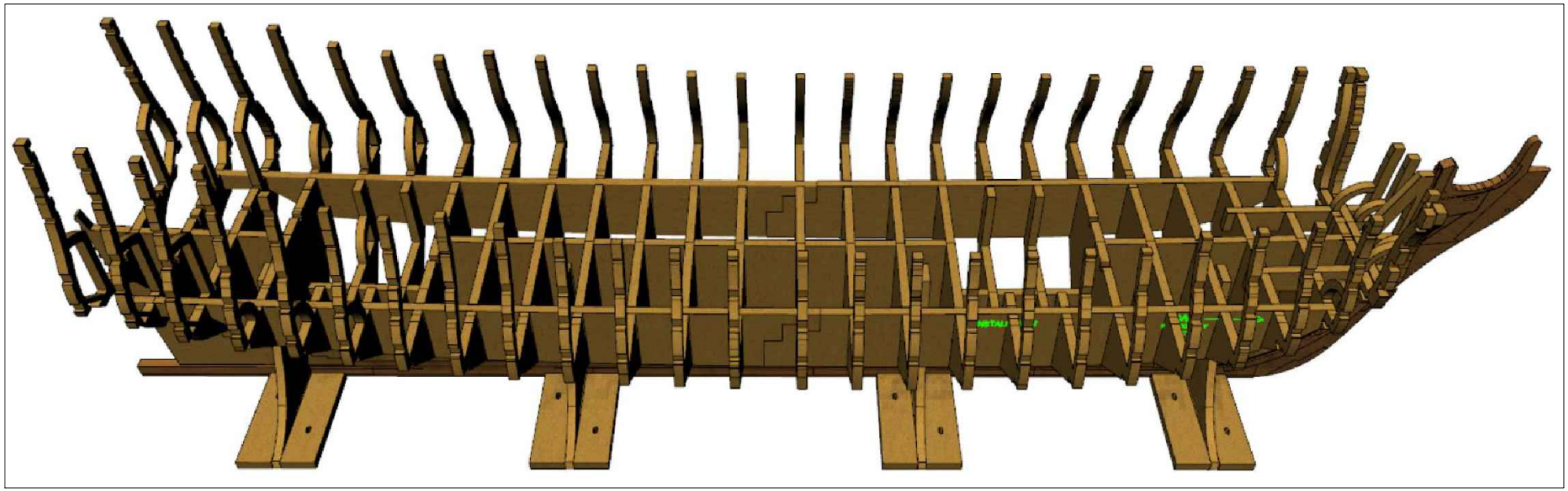


To the right there are two additional longitudinal pieces that tie bulkhead 25 to 24, pay attention to the slots you install them into. These two pieces are $\frac{1}{8}$" MDF and can be found with your $\frac{1}{8}$" MDF sheets.

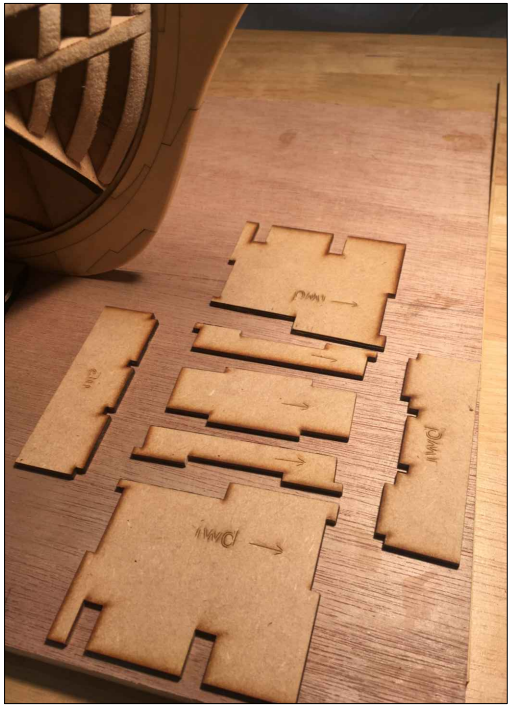


Pay close attention to the slots you place the bracket into on bulkheads 24 and 25.

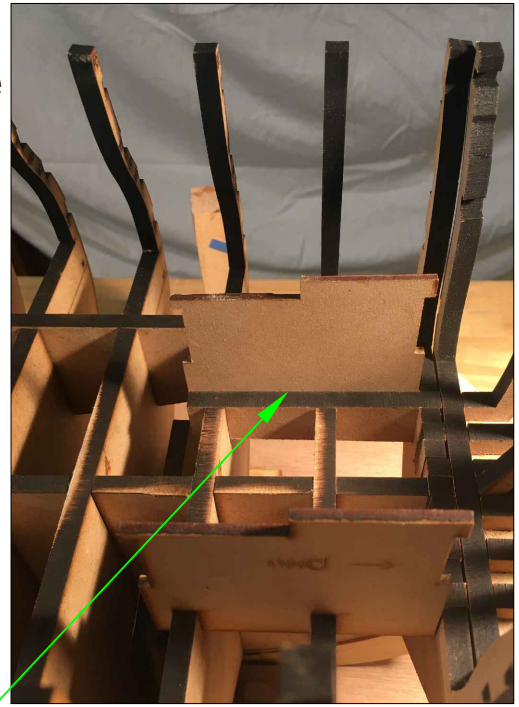
At this point your model should look like the rendering we see below, you'll notice that its getting quite large and is getting close to its overall dimensions. Now everything in the structure should be lined up and straight, if no adjustments need to be made then it can all be glued together.
I decided to use a small paint brush (small by home improvement standards) and simply brush titebond onto all the joints between the former and the bulkheads as well as the joints between the longitudinal brackets, this will hold plenty well and there's also much more



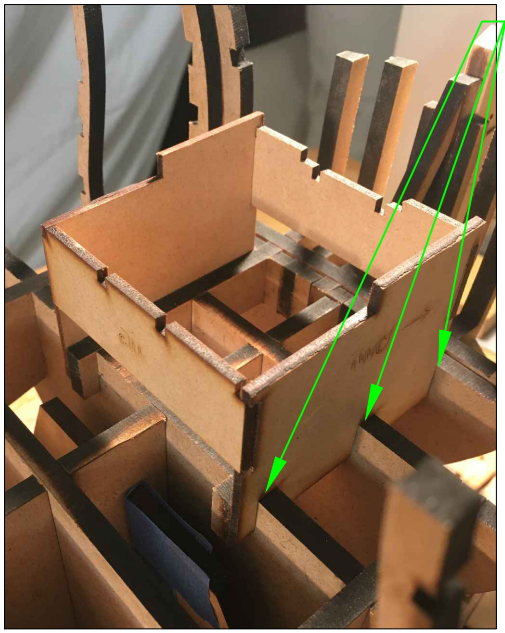
structure to add to the model in the coming steps.
Now we are going to move into the onboard jigs that will support the upper bulkhead former extensions, these are quite long and easily snapped off, also they need to be perfectly aligned for the gunport framing and eventual upper deck construction. The stern frames will also have a complex jig to align and securely hold them as well.



Lets begin with the forward jig foundation construction, the parts you see to the left are $\frac{1}{8}$" MDF, they are etched where they go at which way they face. The photo on the right shows the first pieces being placed , they fit snug between bulkheads 1-3, do not glue these as you will be removing them later. Below left we have the forward transverse ends that form the box, these can be glued in place as you see them. The next photo there are additional supports, they have directional arrows on them indicating forward, go ahead and glue these as well. Bottom right is the final component which the jig will screw into, it can be glued as well.

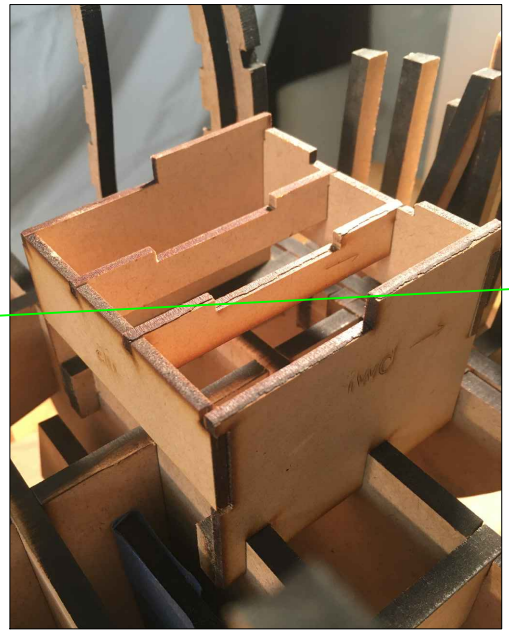


Pieces fit snug between bulkheads and on the outside of inner bow frames, do not glue to model!

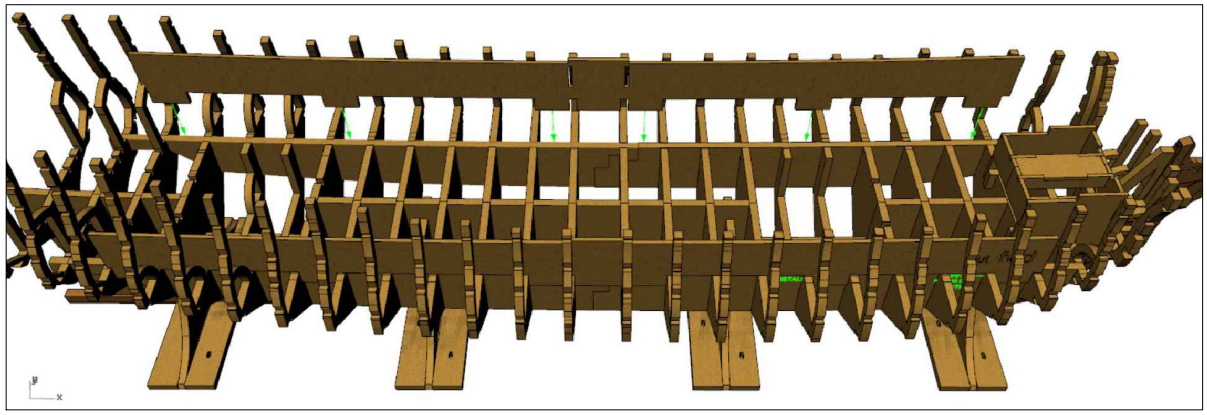


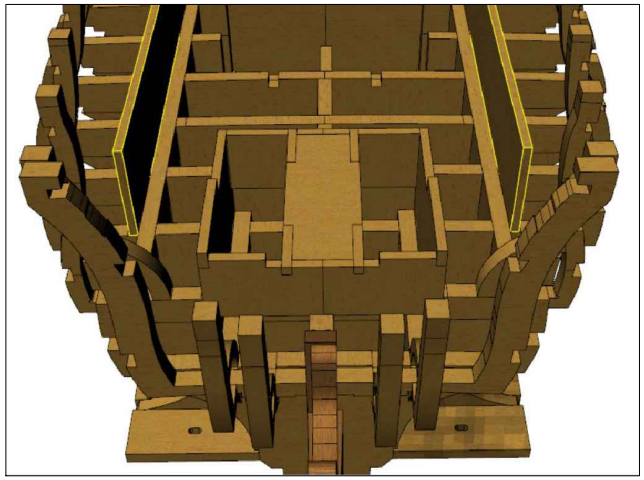
Do not glue this to the model structure, it will need to lift out after planking is completed.

Screw down location for FWD frame jig. refer to jig half attachment.



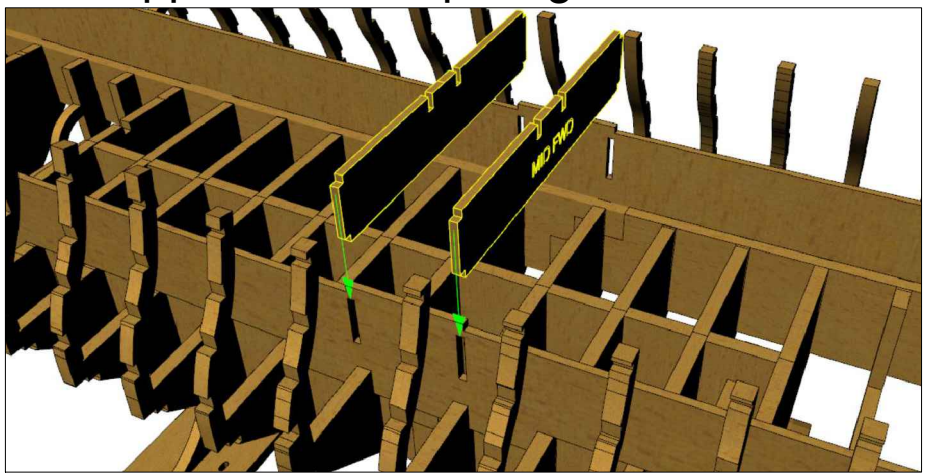
Below there are two long $\frac{1}{8}$" MDF supports that run most of the gun deck length, these will hold the frame jig up and maintain the proper sheer. these also will not be glued to the model, they should fit snug on the outside edge of the two longitudinal structural pieces, they start at the backside of bulkhead 3 and run aft. Note that all the pieces we are working with now are $\frac{1}{8}$" MDF unless specified otherwise.

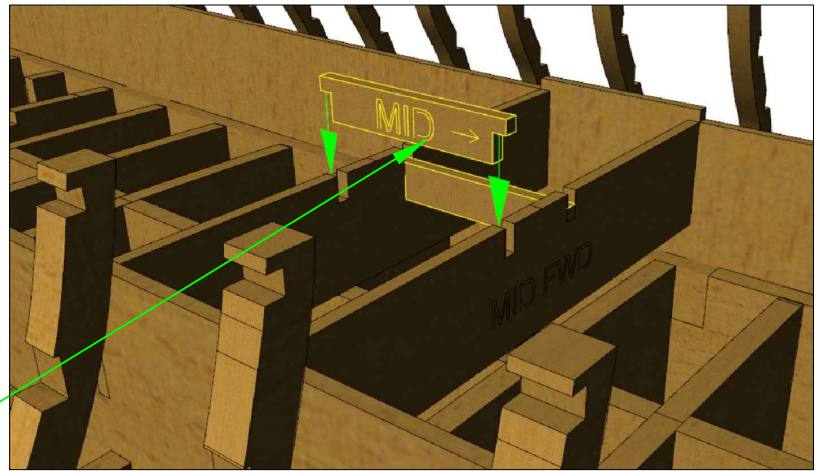




Above you can see in detail, the jig supports highlighted in yellow and how they fit on the outside of the longitudinal structure.

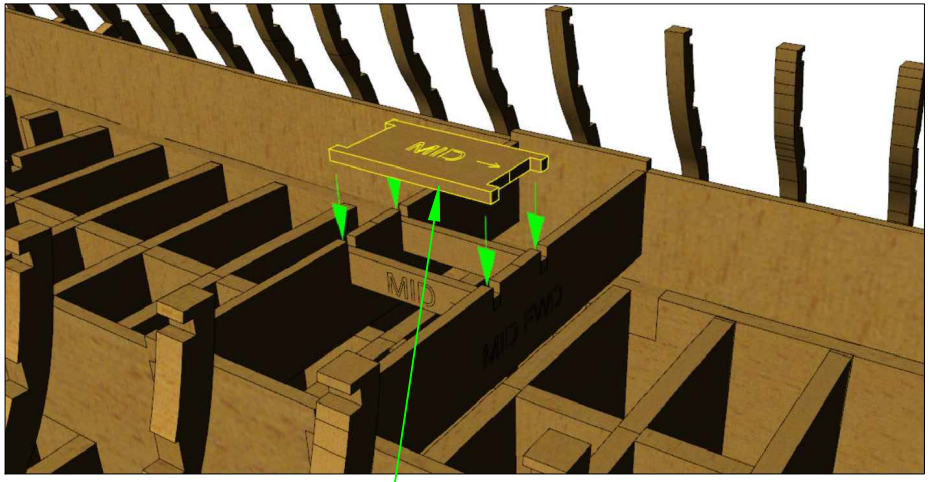
In the photo below you can see two transverse brackets that tie the two supports together, they fit into the slots on the supports and require glue.





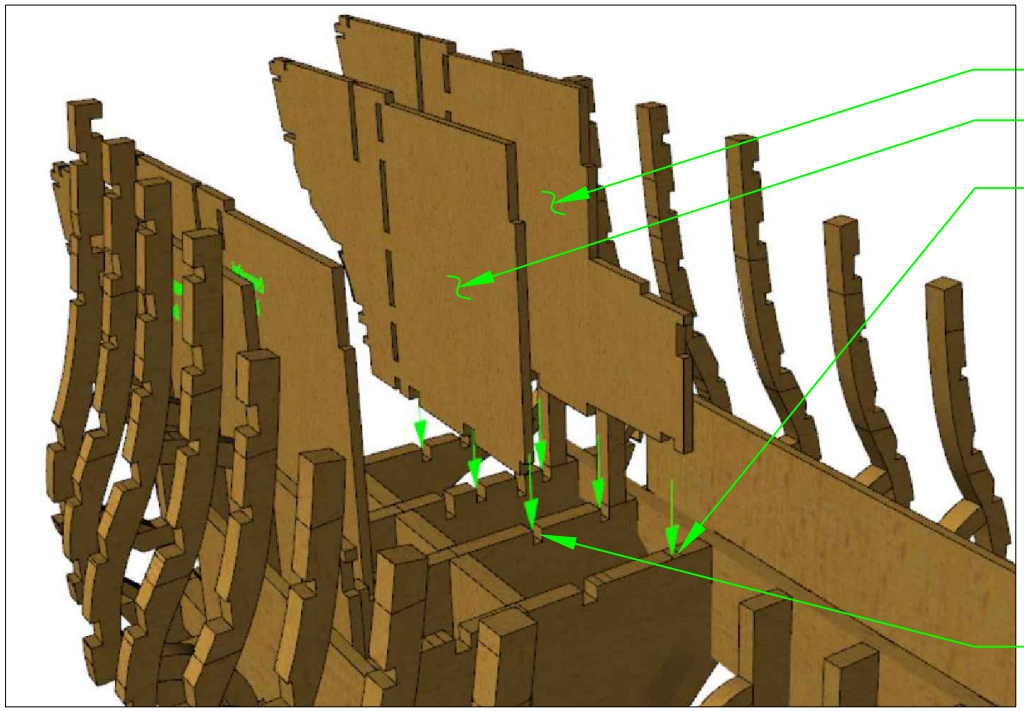
Tie the two transverse pieces together with the two brackets etched "MID" pay attention to their direction.

Finally we finish the center support with the last panel that the frame jig will screw into, set it in place and secure it with glue.



Middle bracket for screwing jig down

Now we will move to the stern frame jig, this is a bit more complicated so pay close attention to the assembly. Below you can see the formers going into place that will support the stern frames and keep them in position as designed.



"Outboard Port"

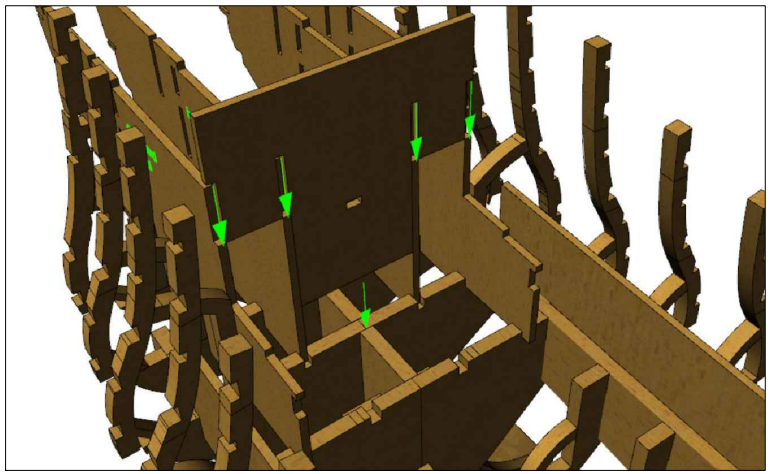
"Inboard Port"

Pay close attention to the slots that each former drops into, the outboard former should be up against the bulkhead support hoops and should begin on bulkhead 22

The inboard former should begin at bulkhead 23 in the slot closest to the centerline.

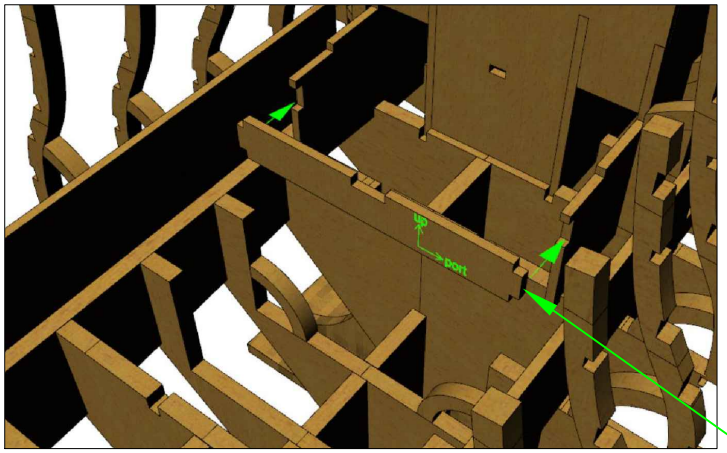
The formers are all etched where they belong, there is an inboard and an outboard for each side. Install with etching facing outward. DO NOT glue to the model! they should fit in their slots very tight and will be removed later in the build.

Moving forward, to the left we have a T shaped bulkhead that aligns and holds the formers together, it is slotted to fit into each former and can be glued to the formers but not the model.



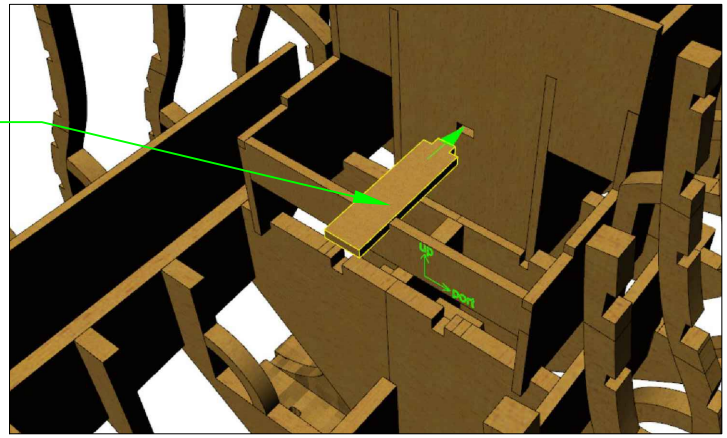
After the forward bulkhead is installed there is a small bracket that will tie the ends of the outboard formers together, go ahead and glue it in as shown below.

Next the final piece that will be used to screw the jig onto needs to be installed, it fits snug into two slots as show in the photo lower right go ahead and glue it down.

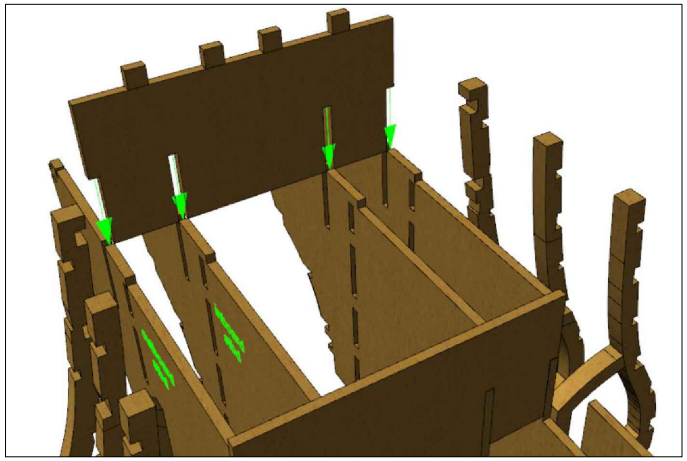


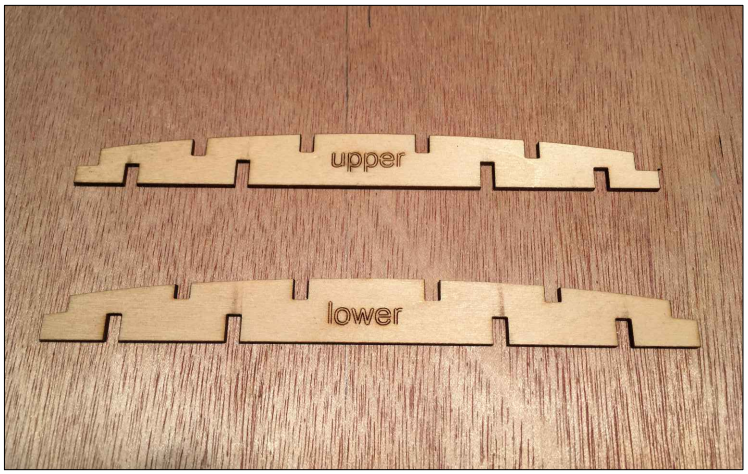
Shown above is the transverse bracket that ties the two outboard formers as shown.

Glue and install bracket in place as shown. You will screw down the jig halves to this bracket.



Moving aft, to the right we have another transverse bulkhead that aligns the aft part of the four formers together, go ahead and glue this to the four formers once slotted in place.



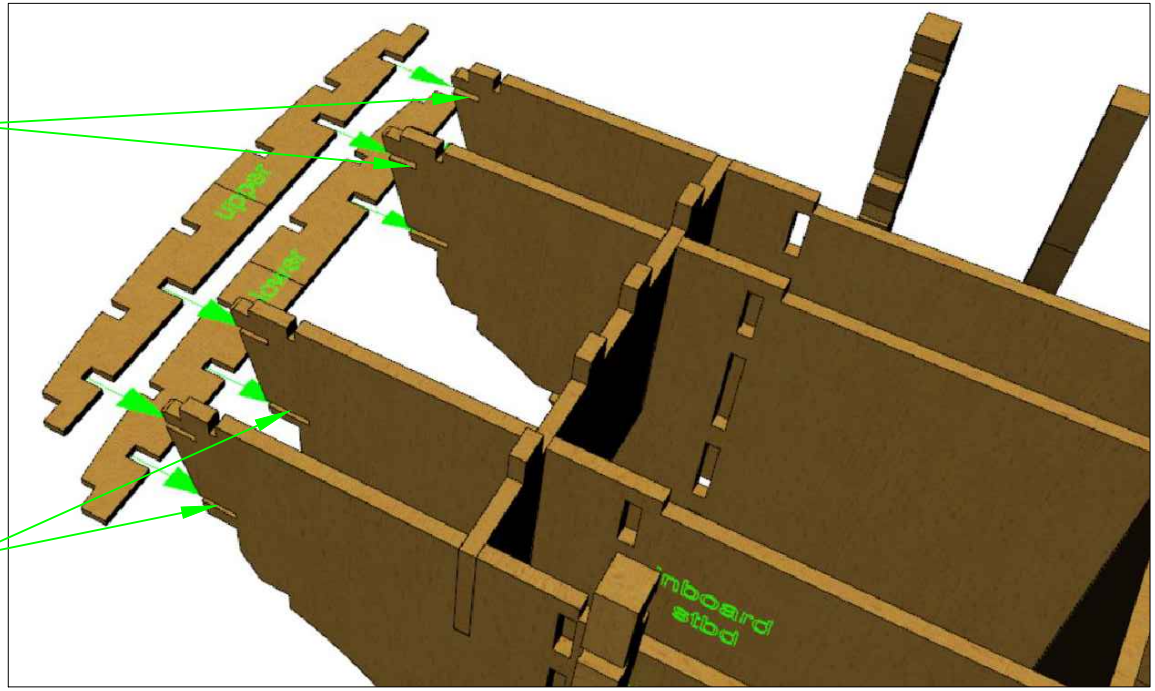


Moving to the aft end of the frame jig, we need to install the brackets that will retain the stern frames, there are an upper and lower piece, they are cut from $\frac{1}{16}$" basswood.

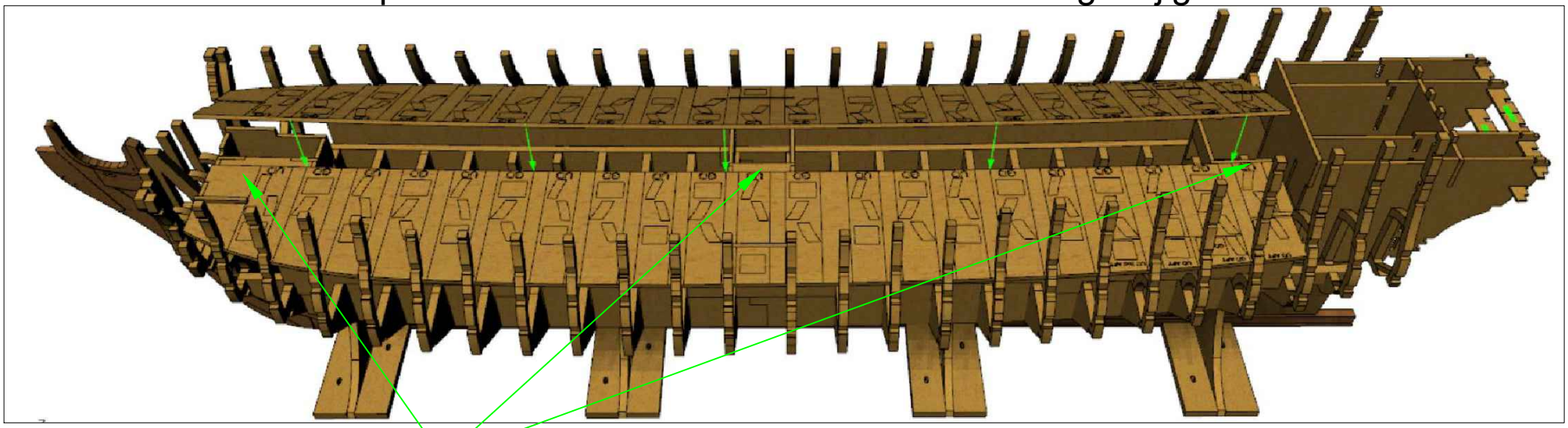
You'll see in the back of the formers there are slots for the brackets to fit into, go ahead and test fit and then glue them in place.

Slots for the upper bracket

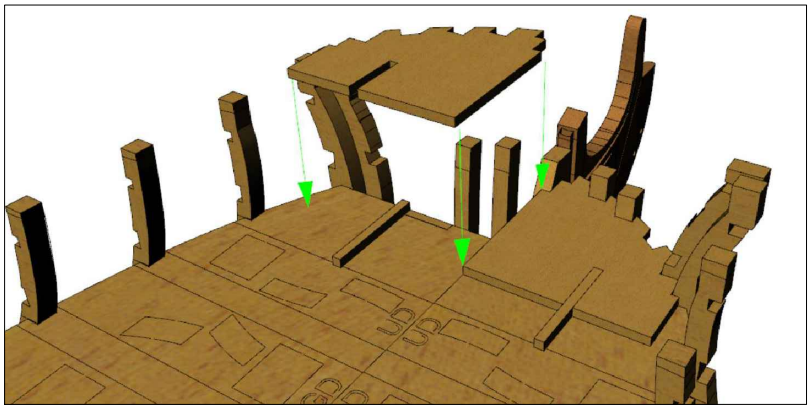
Slots for the lower bracket



We can now begin to install the bulkhead frame jig, this is also $\frac{1}{8}$" MDF. the best way to install is to roll it into place as seen below, go ahead and place the outboard end down and the notches into their respective frames and slowly work it down into place and repeat on the other side as shown. Each half has three slots that will snap into place and center each frame jig, this will ensure correct vertical position of each frame extension. DO NOT glue jig.

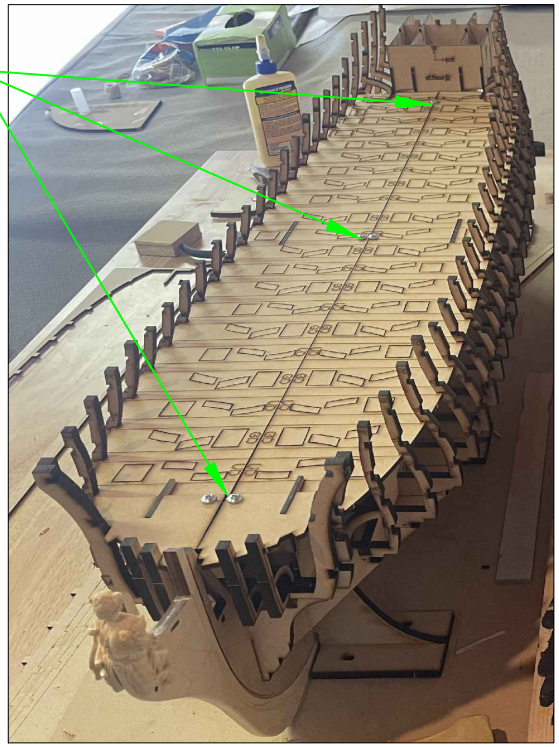


Note screw down locations

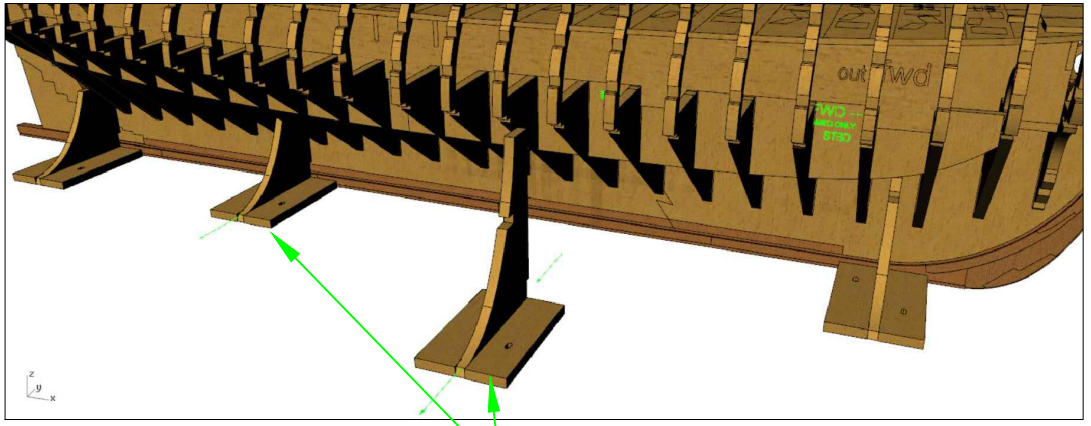


There are two brackets that retain the bow frames, like the others they have slots as shown above, put them in place but do not glue.

Note the locations of screws to retain the jig until removal. Each jig support box has a surface meant for screwing into.

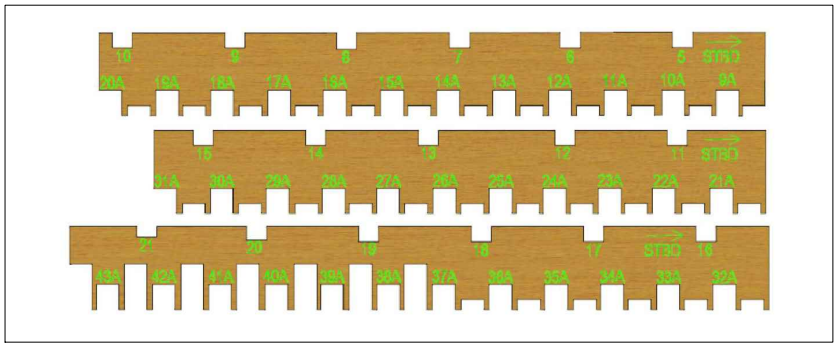


We now need to install the lower brackets to retain the frames, start by removing your two middle support stands as we need to get into this area to work.

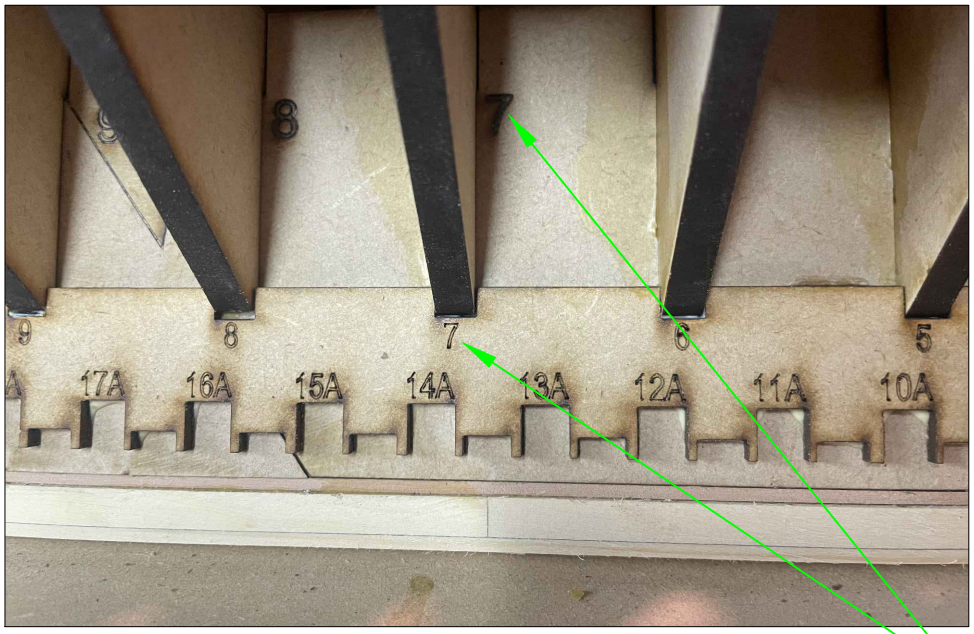


Remove the two middle stands on each side

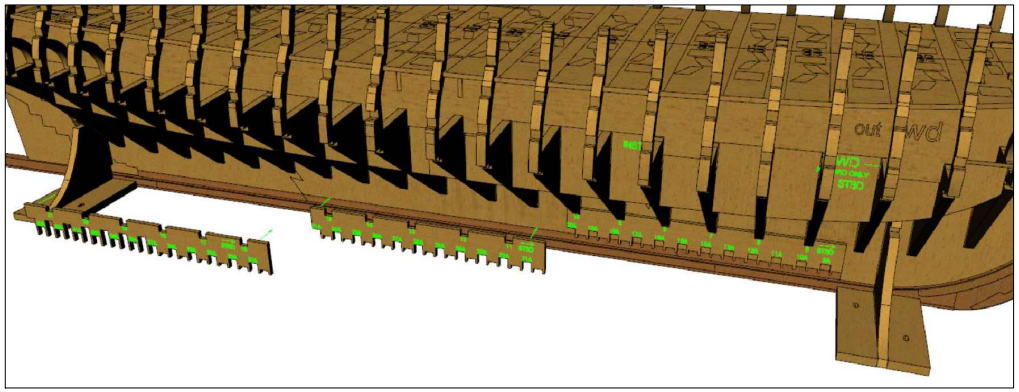
Below in the rendering we can see the stbd lower frame brackets, the upper number represents the bulkhead it corresponds to while the lower one is the "A" frame that it receives. Below you can see how they attach to the bulkhead former and how they fit under their respective bulkhead.



stbd side lower frame brackets

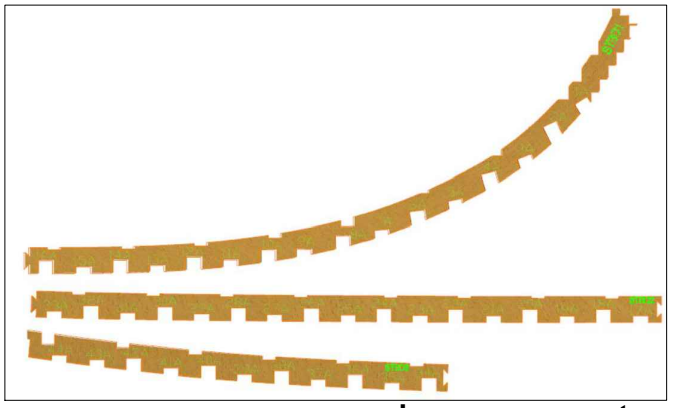


You can see how the brackets correspond to the bulkheads, make sure to fit them correctly all the way up tight against the bottom of the bulkhead.

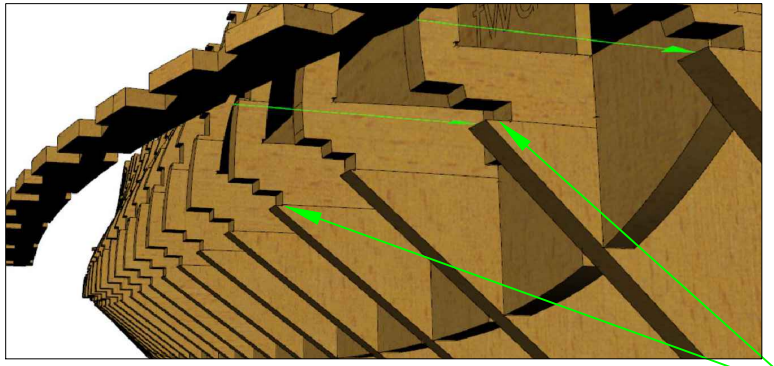


Go ahead and install all three lower brackets, repeat on port side as well. I used CA in the middle and the corners to keep things tight and PVA in the middle.

On to the upper frame retaining brackets, to the right we can see the three pieces that will hold the frames in place. These are just a bit more tricky as they follow the sheer of the lowest plank of the main wale.

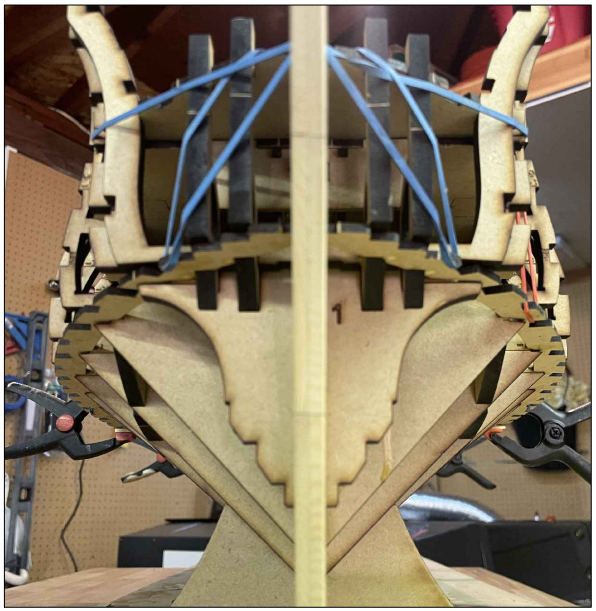


The bulkheads have notches laser cut into them to glue these brackets too. In the rendering below you can see the bulkheads with all the frame notches for these specific brackets, they fit in to the lower notches not the upper ones so make sure not to get them confused. The upper notches actually hold the ends of some of the frames in place.

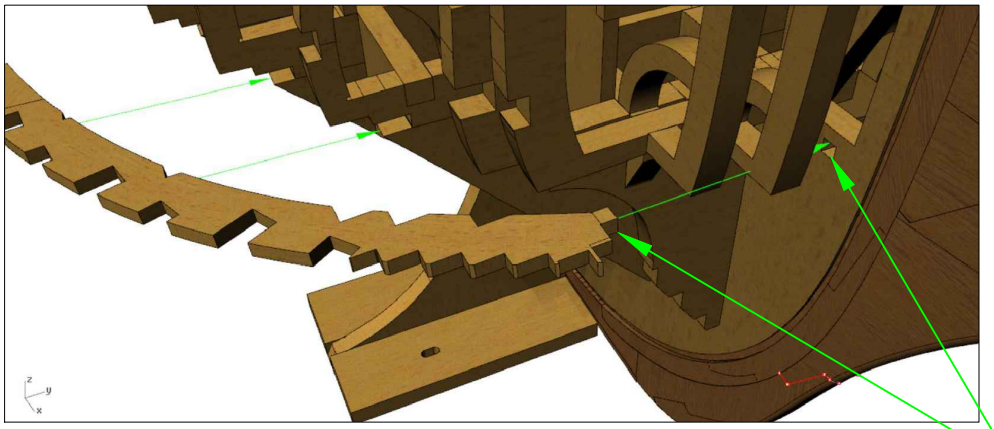


From this view you can see the notches that hold the brackets the arrows indicate where they sit.

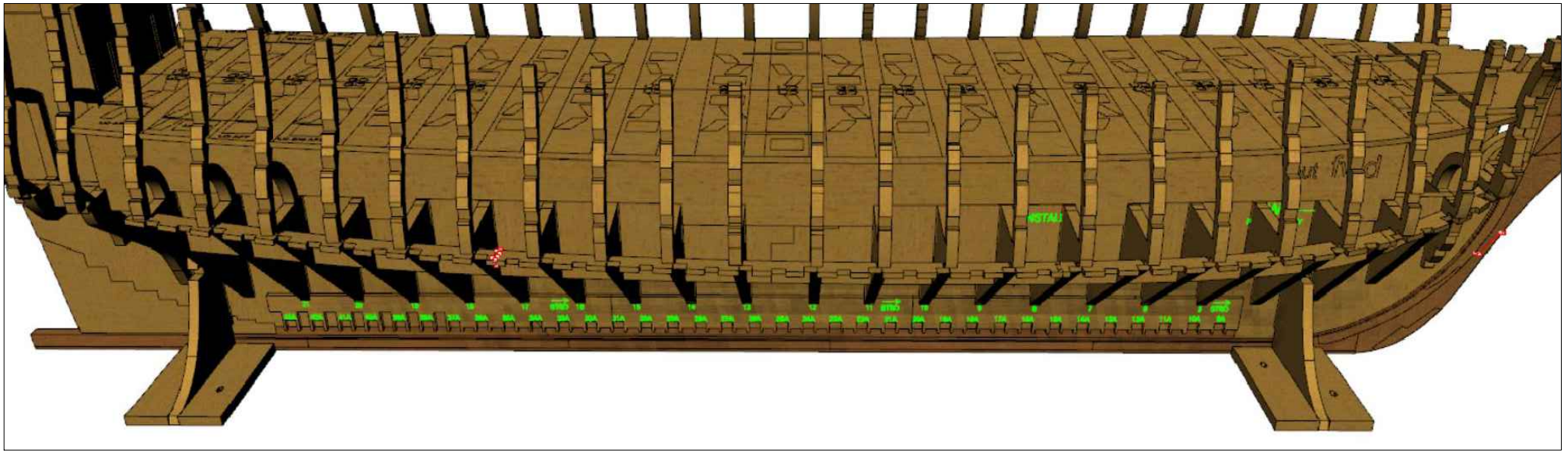
In the rendering below right you can see the first upper bracket going in, this is the most tricky one as it has a tight curve in the front as well as a notch that fits into the former, take your time to get these right, use as many clamps and rubber bands as necessary.



The photo to the left shows the upper frame bracket installed on both sides, you can see i have it held with rubber bands. The notches in the frames should keep it formed with the sheer but the rubber bands will ensure a proper fit.

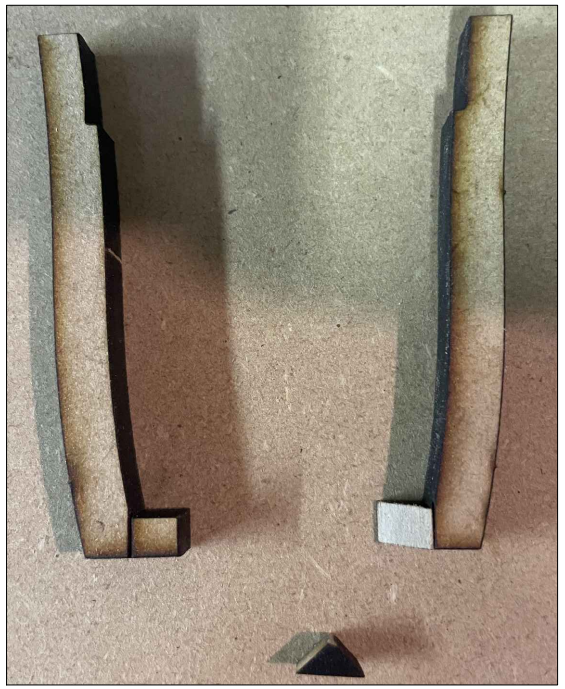


The forward upper bracket has to fit around the bow frames and the bulkheads plus it has a notch that fits into the bulkhead former.

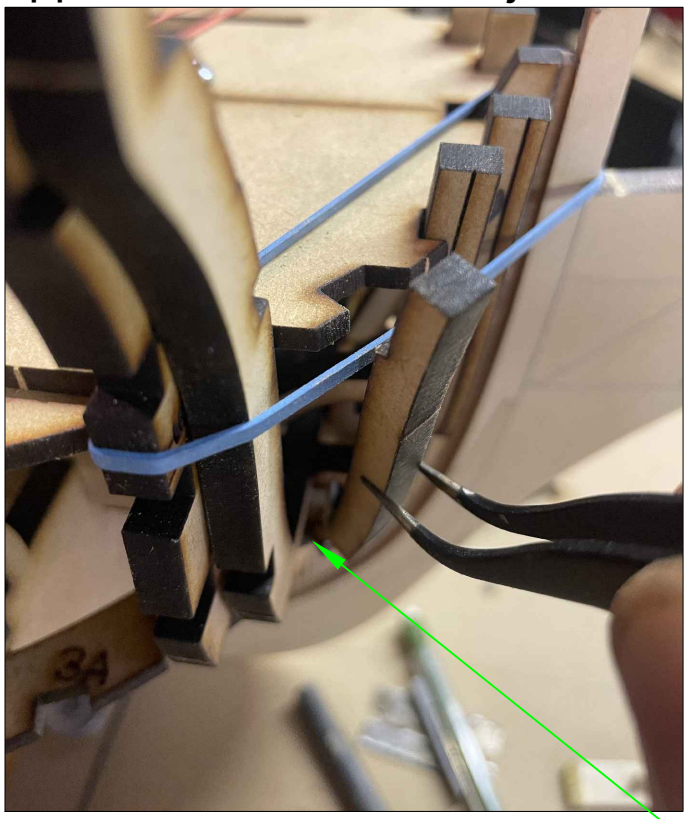


With all the upper and lower frame brackets in place your model should now look like the rendering above, notice how the upper frame brackets do not extend all the way aft, this is by design as they started to encroach into the visible gun deck so the remaining frames will attach differently, you'll see as we proceed with the remaining structure..

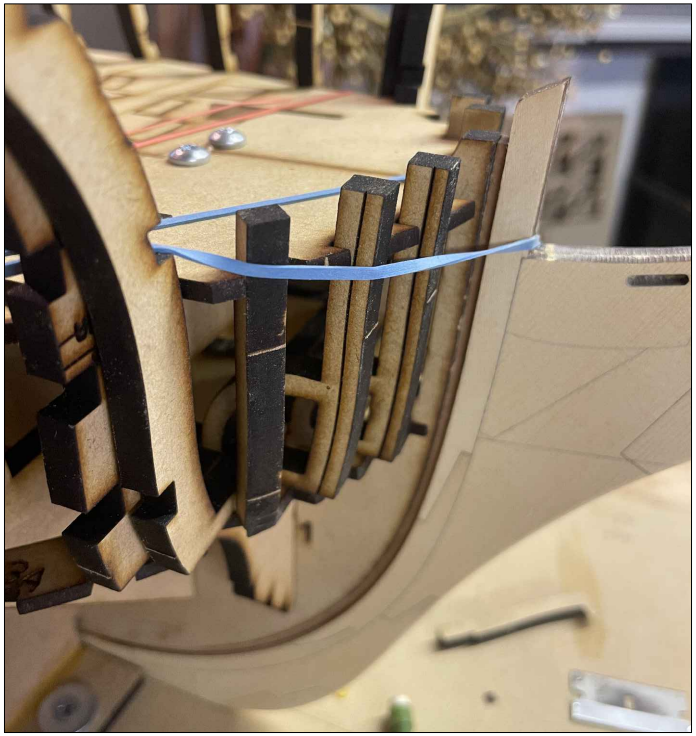
We have two more bow frames to install, you can see in the photo on the right the etched angle reference lines. Go ahead and block sand or cut to the angle as shown on the right frame.



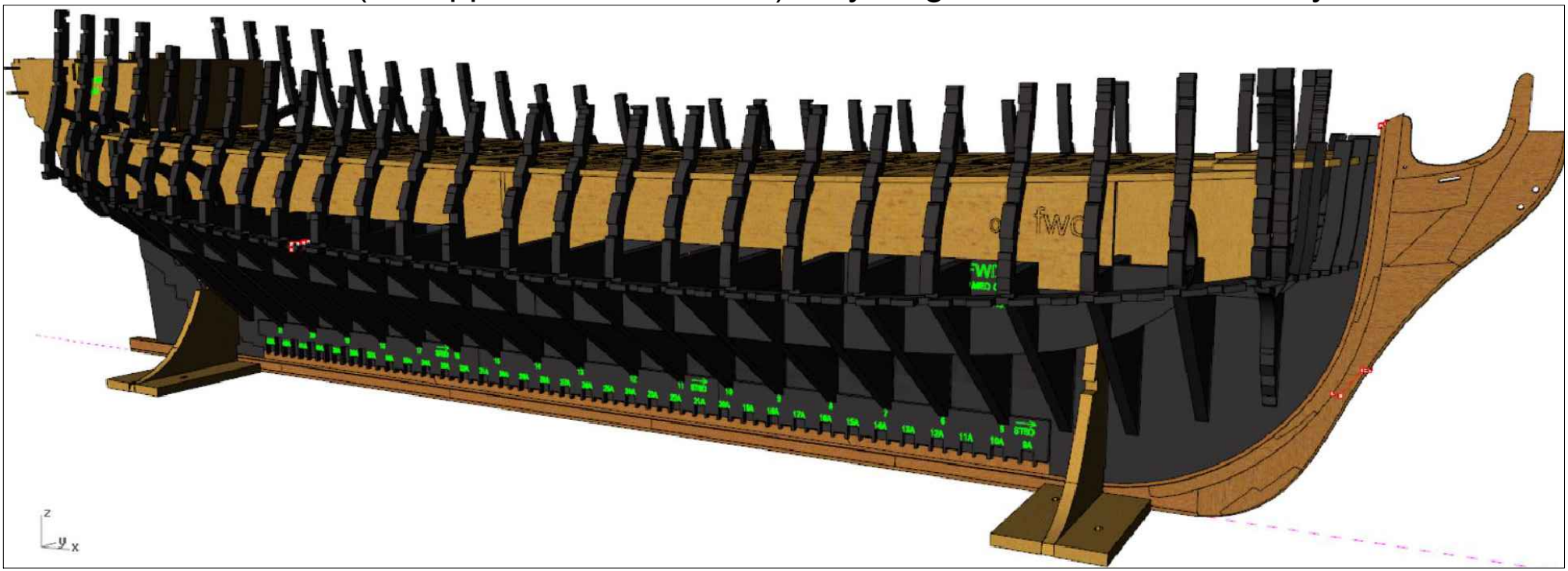
In the photo below you can see how the frame fits into the upper fwd jig piece we installed earlier, the angled cut should rest up against the beakhead support frame and on top of the forward upper frame bracket we just installed. Do not glue it to the upper jig piece, just restrain it with the rubber band as shown so it sets properly.



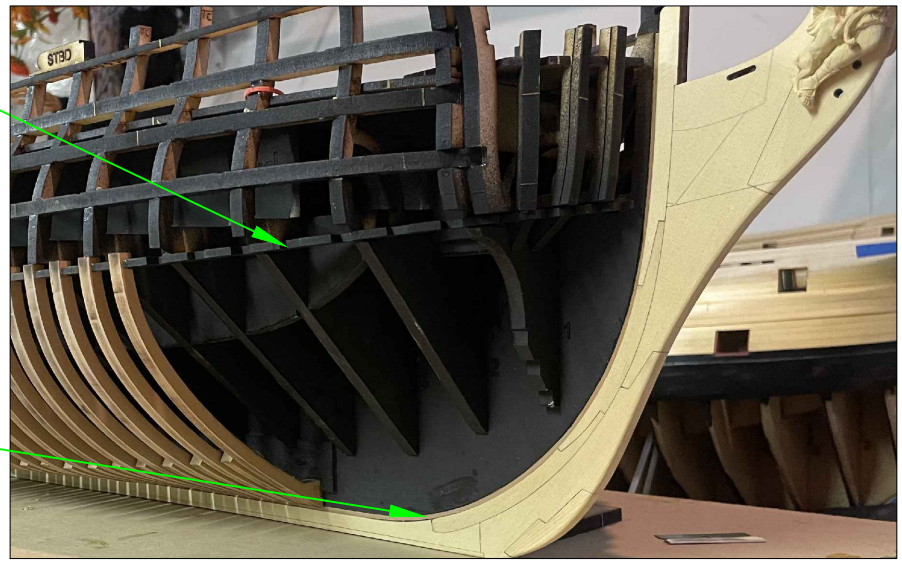
Only glue the frame at the bottom where it rests against the beakhead support and the upper frame bracket and let it rest in the upper jig piece.



Before we go any further we need to paint the internal structure black so it wont be seen once the frames are all in place. Obviously the rendering below depicts what it should look like but the actual model will have much overspray on the jig pieces, dont worry about this just make sure to mask off the parts that will be visible once complete and everything that is below the wales is blacked out (the upper frame brackets), anything above is not necessary.

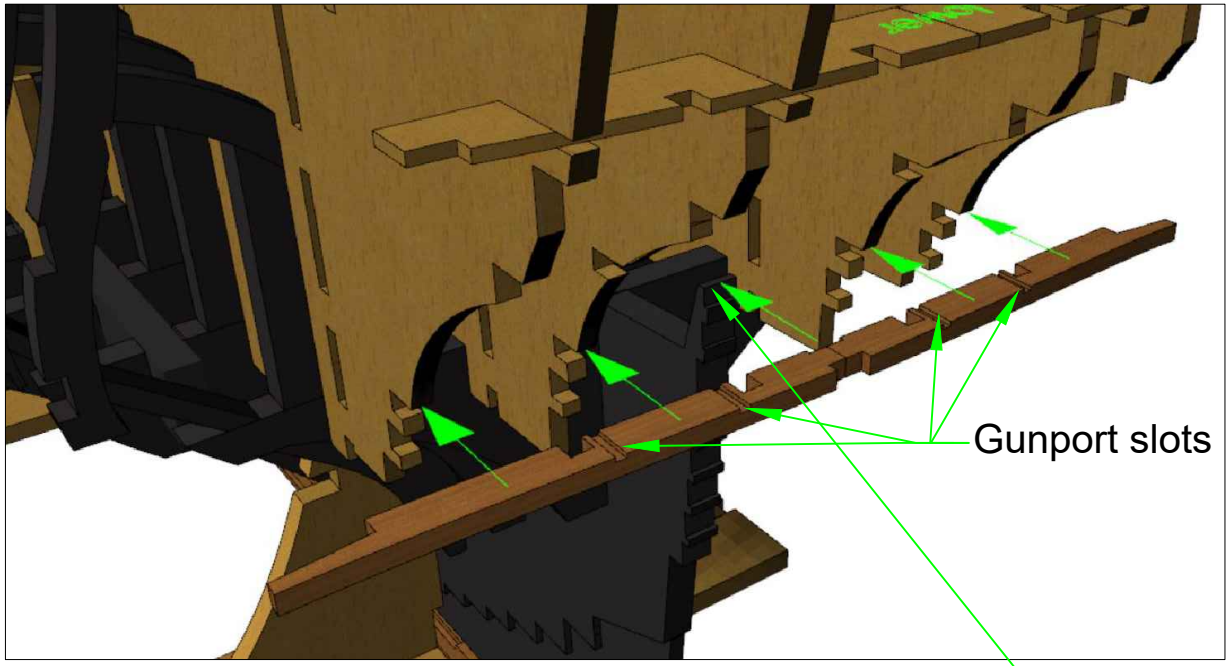


You can see on my model where i masked and concentrated on painting, you can also see a few steps ahead with the frames in place and where its critical that the internals are blacked out. As long as its blacked out from the upper jig down and the undersides if you plan on looking at your model from the bottom up.



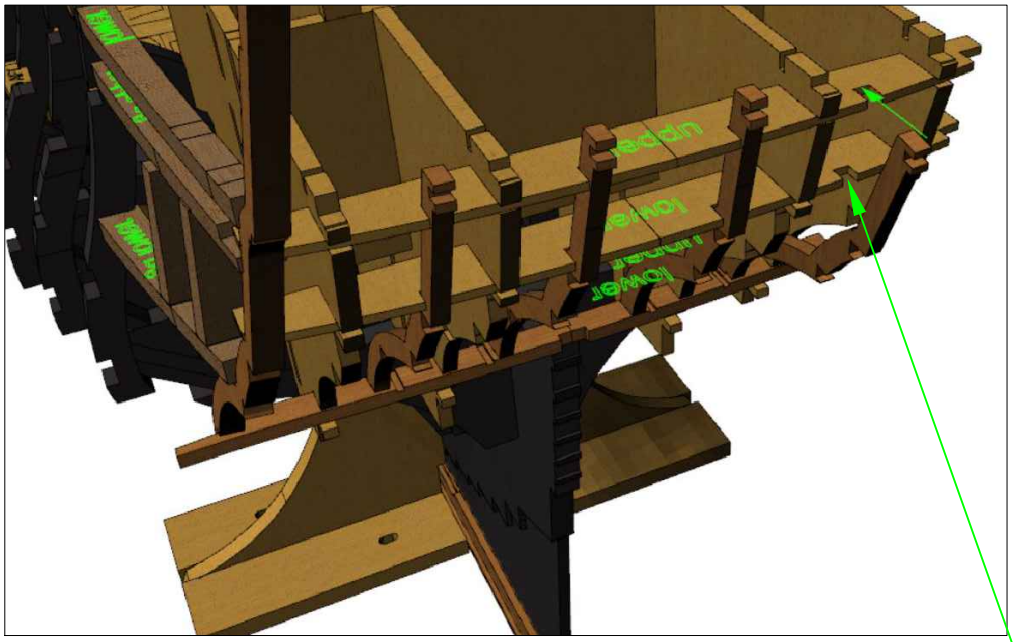
Carefully mask the rabbet strip and all the knee and keel parts basically anything on the model that is not MDF.

We now need to return to the stern and start placing the stern frames, this is made easy by all that work we did with the jigs earlier in the build. We begin with the upper most wing transom shown to the right, this primarily fits into the jig with a center location notch that fits into the back of the bullhead former. Absolutely do not glue this to any of the 4 MDF jig pieces they are meant to hold its shape while the frames go in place, only glue it to the former where it fits in place. The upper wing transom #7 is $\frac{3}{16}$" pear and is laser cut and etched for the aft gunport frames, make sure they are facing up. You can use heat to help arch the frame to fit in the jig easier.



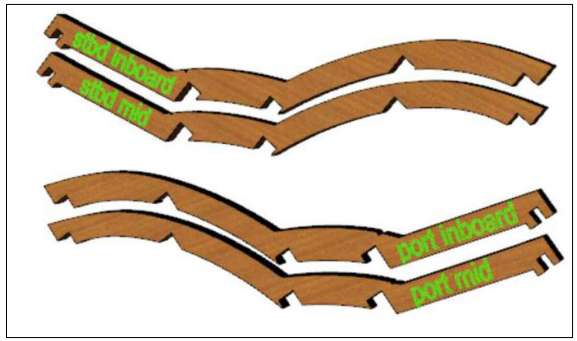
Only glue the transom where it fits into the bulkhead former. Be sure to also pay attention to the gunport frame slots.

To the right you can see the stern frames going in, you'll see to the far right one going in place. You will first need to test fit them into their slots, sand and adjust for thickness as necessary but make sure they fit the slots snug, once the fit is good you can set them into their slots on the wing transom and gently roll them into place on the jig. The stern frames are all etched with

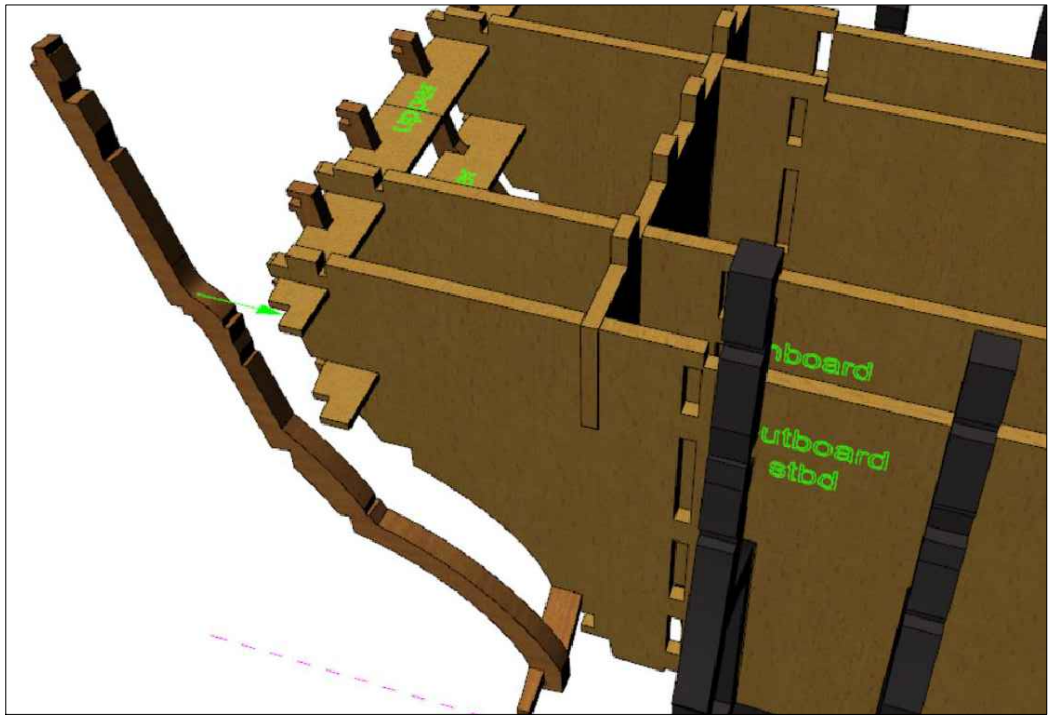


Jig slots for frames DO NOT glue to MDF or basswood jigs just the wing transom!

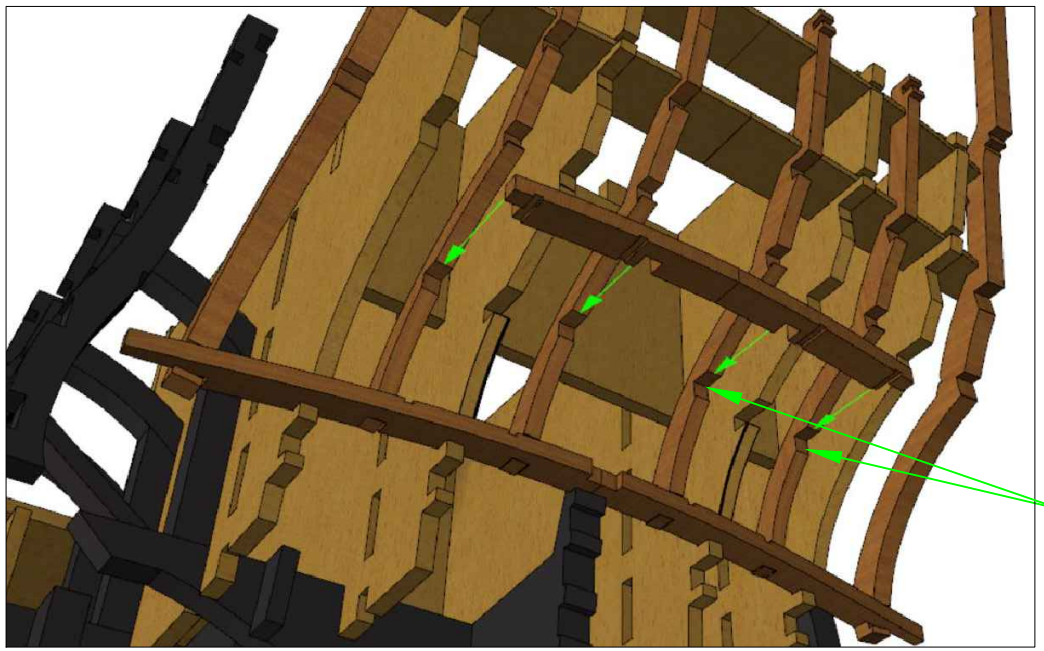
where they go, port inboard, port mid, stbd inboard and stbd mid they are all $\frac{1}{8}$" basswood, be careful as they are very fragile until completely glued in place.



$\frac{1}{8}$" basswood frames shown above



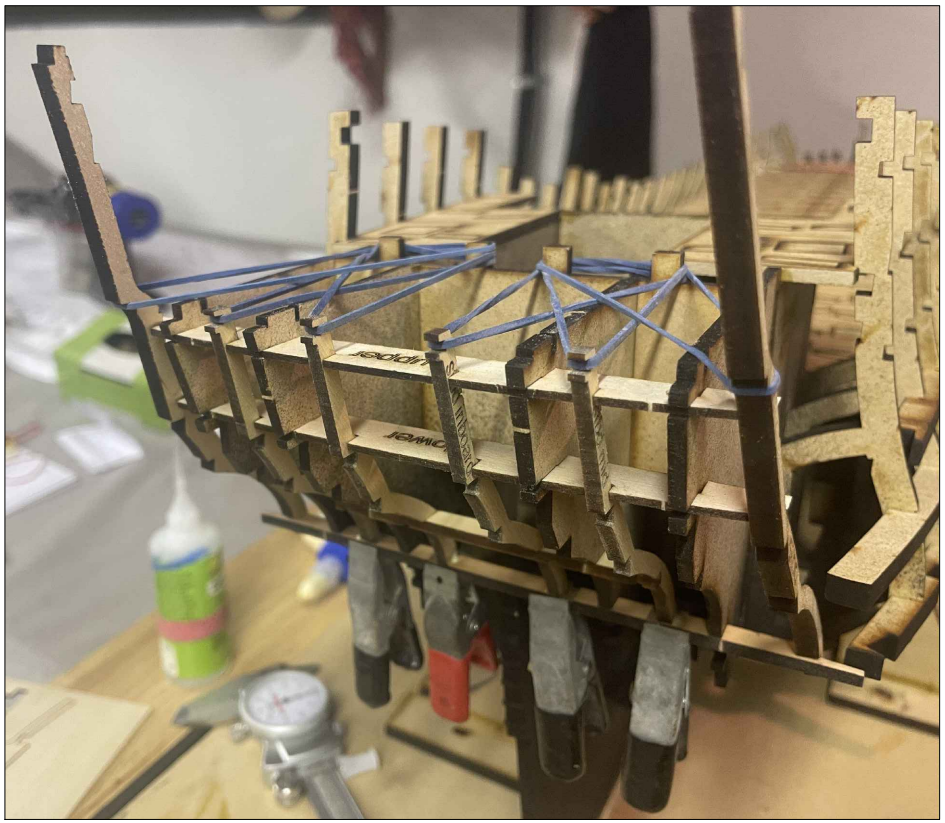
To the upper right we can see the outer stern frame going on, assembly is similar to the middle and inner frames but its $\frac{3}{16}$" basswood. Only glue it to the wing transom, it should fit tight up against the notch, utilize rubber bands to hold it tight against the jigs while gluing in place.



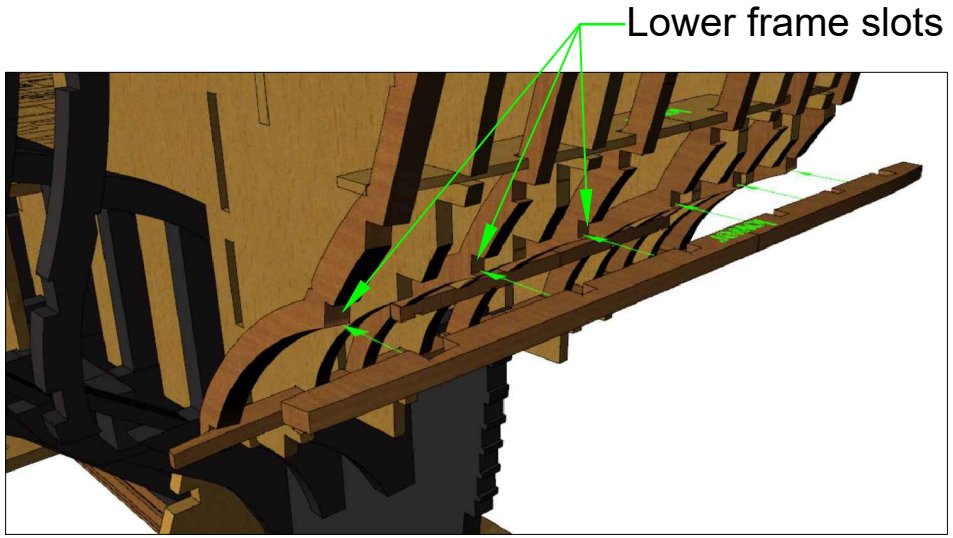
The photo on the left shows all the frames in their positions to this point, we now have to install the upper horizontal frame for the gunports as well as tying all the middle frames together. This part is $\frac{1}{8}$" pear and it has slots that match up to the frames, also fits within the jig but do not glue to the jig. Notice the inverted slots for the gunport framing make sure these face down to match up with the ones below on the wing transom.

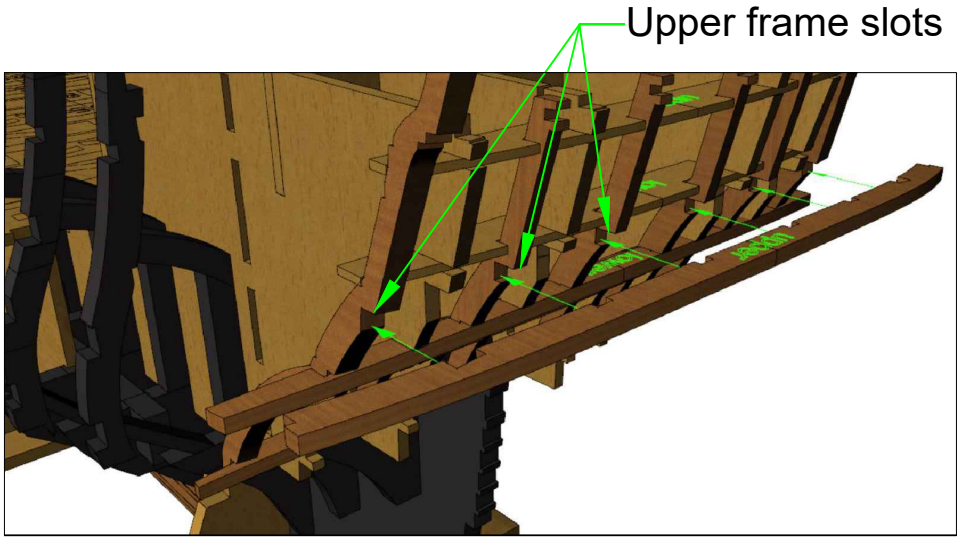
Only glue to the middle frames and not the jig, use heat to form a curve in the frame.

At this point my model looks like the photo to the right, you can see the myriad of rubber bands keeping everything in place snug within the jigs, we are now going to further tie all these frames together and eventually into the main structure. Take care not to snap the tabs off the tops of the middle frames if you run the rubber bands through them as i have.



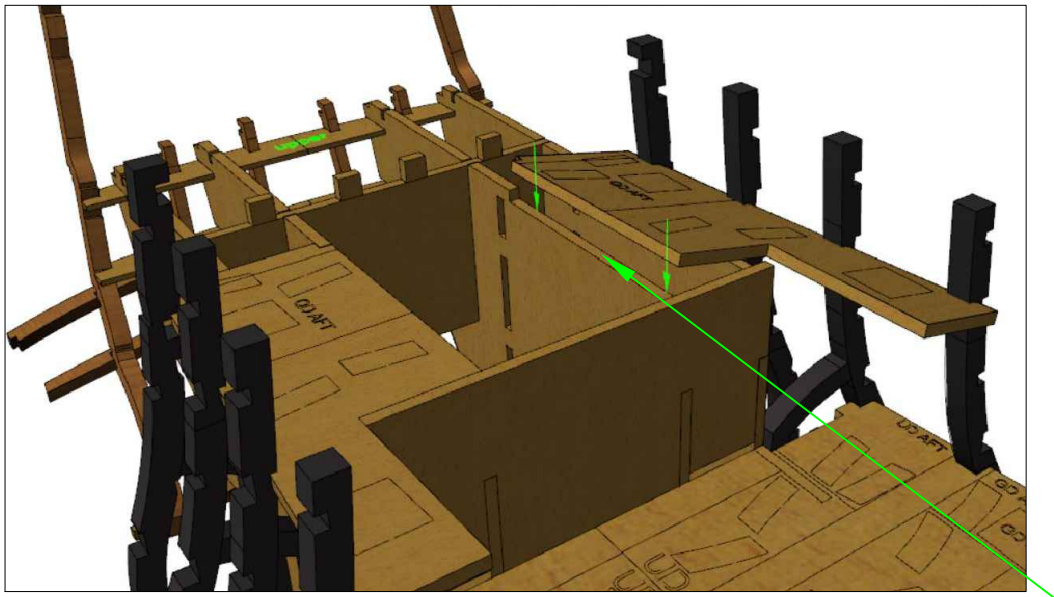
Above we have the two transom frames that define the upper and lower counter, they are etched upper and lower and fit into their respective slots on all the frames. Below we can see the lower one being installed and lower right we can see the upper one going in. These can be glued to the frames. You can utilize rubber bands to hold these as well, remember they also have a curve to them that the jigs wil help define.



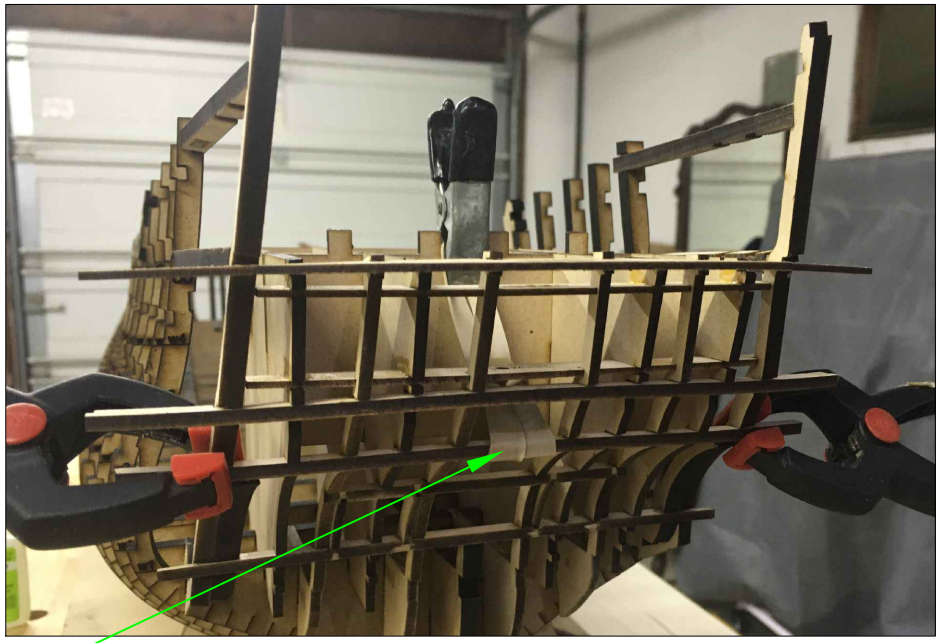


To the right you can see how i used rubber bands to secure the transom frames while they set on the frames, this will also help curve them. I would still recommend heating them first.

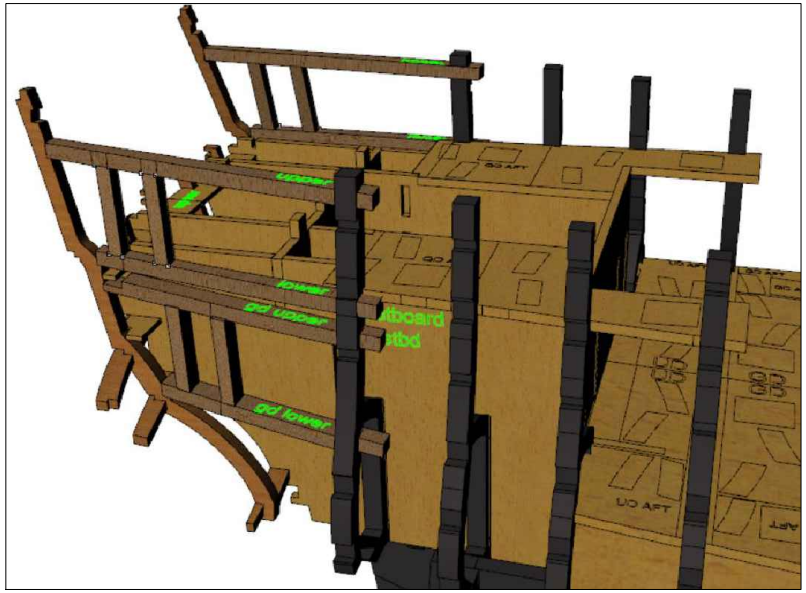
Moving forward we need to assemble the QG framing which also ties the stern frames into the main structure but first lets add the upper frame jigs to ensure we don't break or have anything fall out of alignment. These bulkhead extensions rise quite high at the QD so we need to further protect them. Below you can see them in place on the fwd side of the stern frame jig they are a very simple fit. lightly glue them down as you will have to remove them later.



Upper bulkhead extension jigs in place, lightly glue them to the stern frame jig but not to the extensions!

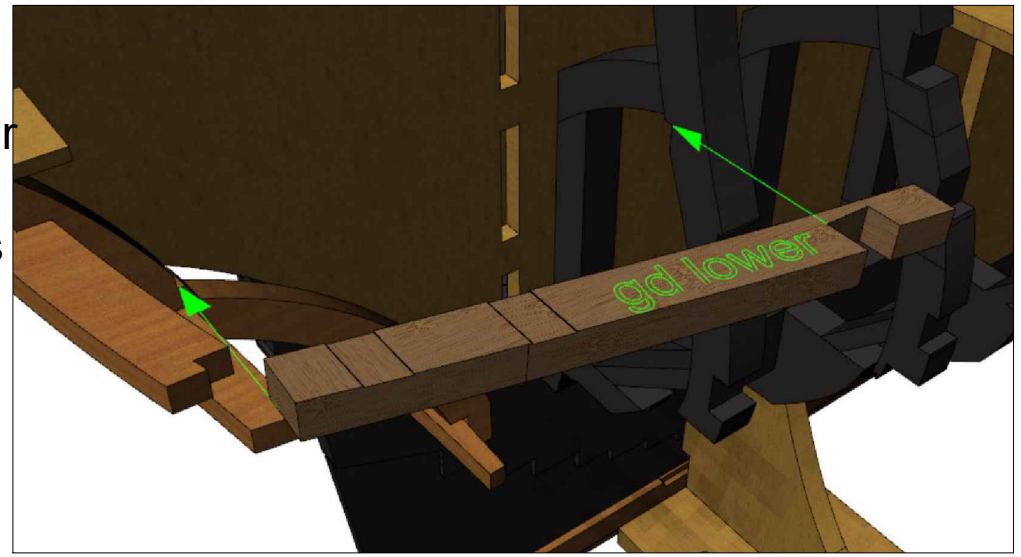


Wrap rubber bands around the transom frames before install and just cut them away after the glue dries.

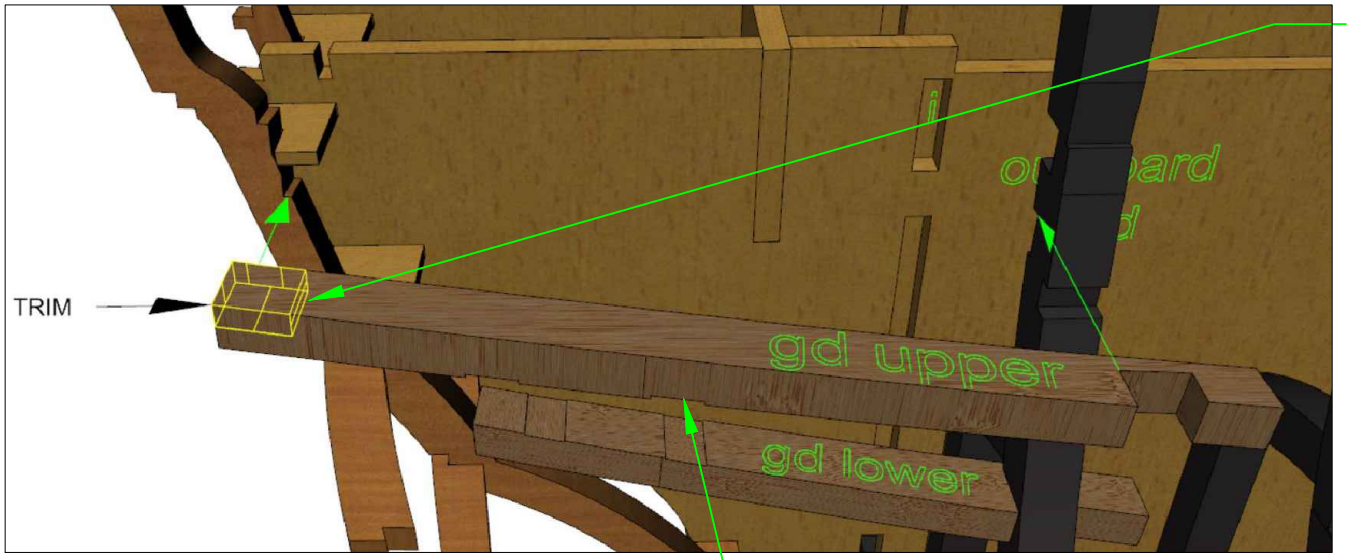


Completed QG framing shown above, you"ll notice they hook to the backside of the extensions. These are $\frac{3}{16}$" basswood

Lets begin with the lower gun deck QG frame, it hooks into the back of bulkhead 25 extension just under the support hoop, theres a small laser cut notch and the aft end will sit on a notch on the outer stern frame, also notice it has grooves etched in for the door framing, make sure these face up as shown! Glue it in securely.



Below we have the gun deck upper frame this installs the same except it requires some trimming, you'll habe to trim it to fit around the upper stern frame jig. This frame also has channels etched into it, they need to face down at the lower frame.



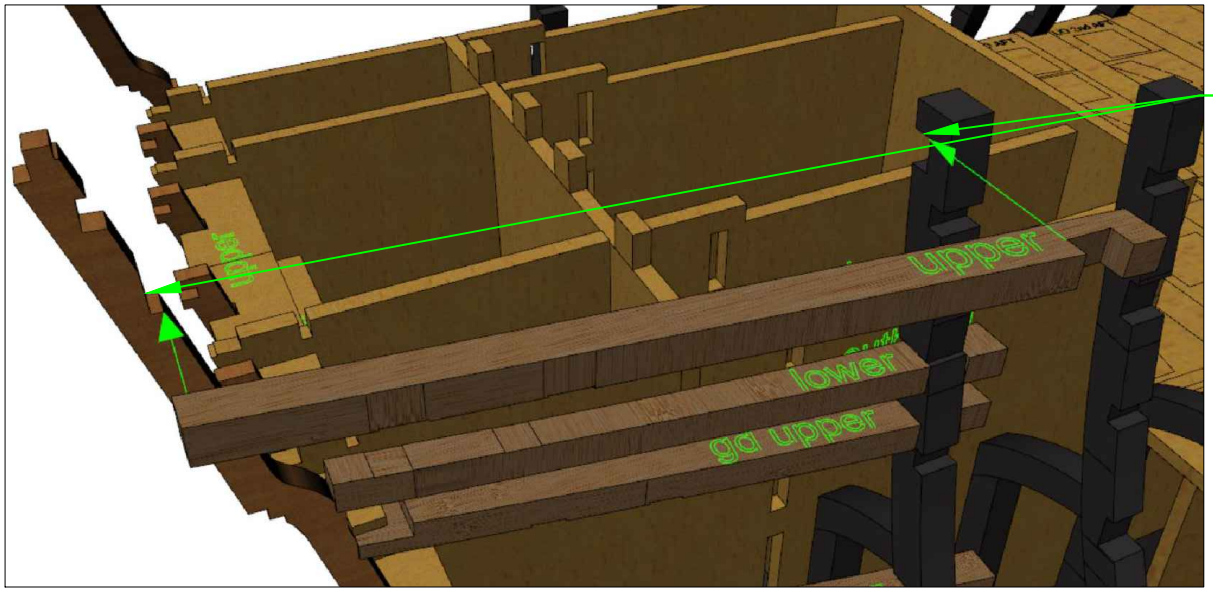
Door frame channels facing down.

Notch the end of the frame roughly $\frac{3}{32}$" until it clears the upper frame jig. Make sure to install with the channels facing down.

To the right you can see the upper deck, lower QG (etched with "lower") frame going in, its installation is the same as the others, this one does not require any trimming and should sit in similar notches like the others.

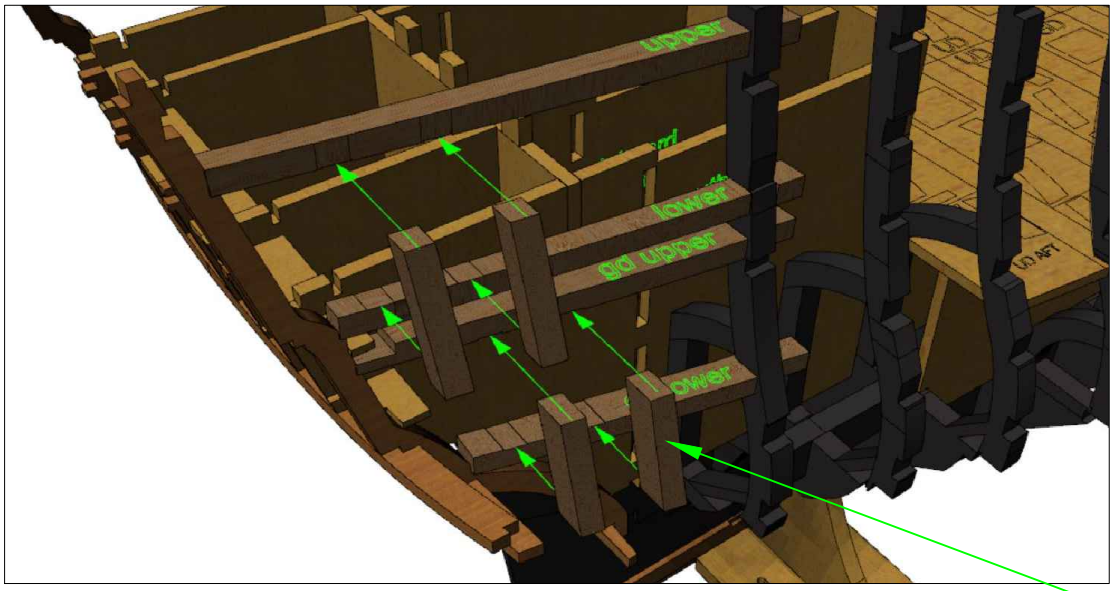
The inside edge of the "lower" frame will require a slight bit of trimming so it doesn't interfere with the upper extension jig.

In the photo below we have the final QG frame going in, its etched "upper" and has channels for the doors as well, make sure they face down.This frame will also hook from the back into bulkhead 25 extension and sit on a notch in the stern frame as shown below. Glue in securely.

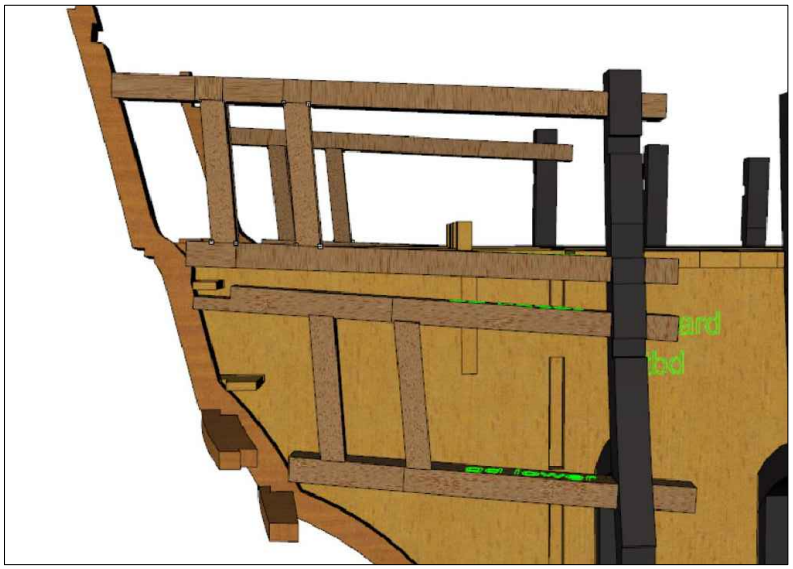


Notches for the upper frame to sit in, these pieces are designed to fit perfectly into place between bulkhead 25 extension and the outer stern frames, you shouldn't have to manipulate them to fit and if so very little.

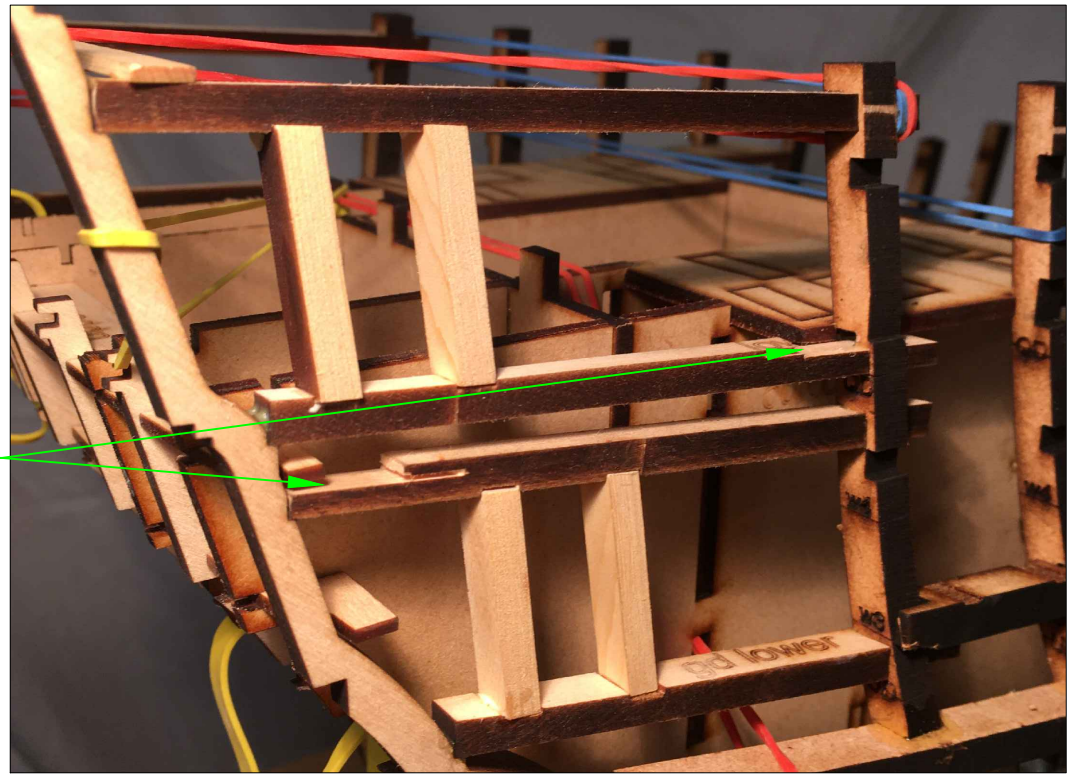
Finally lets add the vertical frames for the QG doors, these should be cut from $\frac{3}{16}$" x $\frac{5}{16}$" AYC or basswood and measured out to fit between the channels in the frames. They should fit in the etched channels snug, you don't want a loose fit because it could throw off the angles of the door frames.
Once complete your frame structure should look like the photo below.



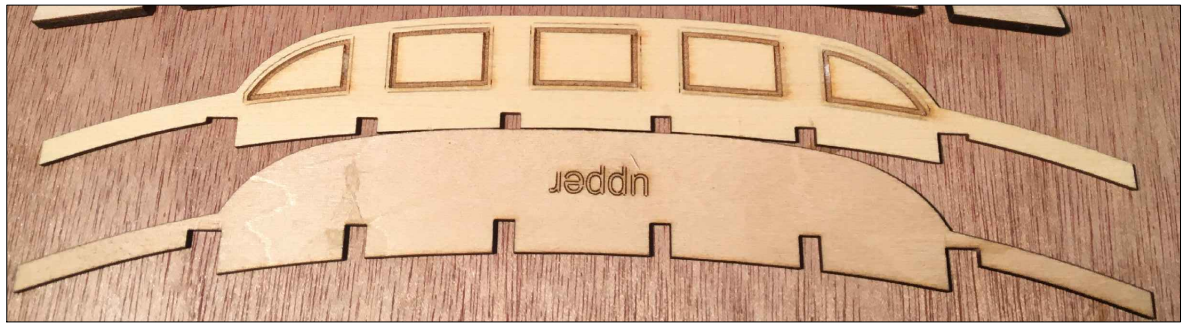
Install the vertical door frames $\frac{3}{16}$"x$\frac{5}{16}$" into the channels, make them a snug fit and glue in place.

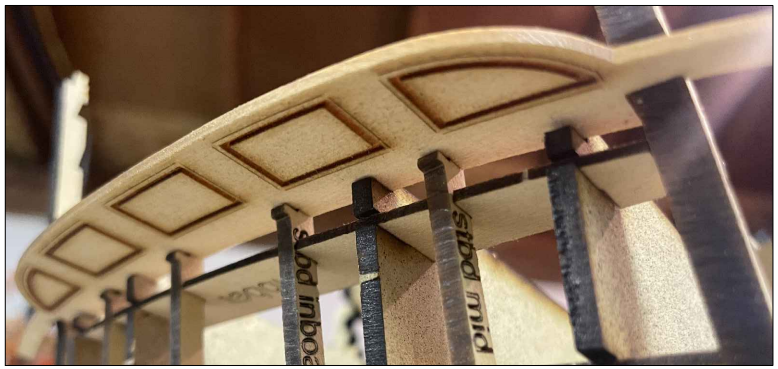


To the right you can see the completed framing with the doors in place You can also see where i had to slightly trim the two frames to get them to fit, your Byrnes saw will make quick work of this.

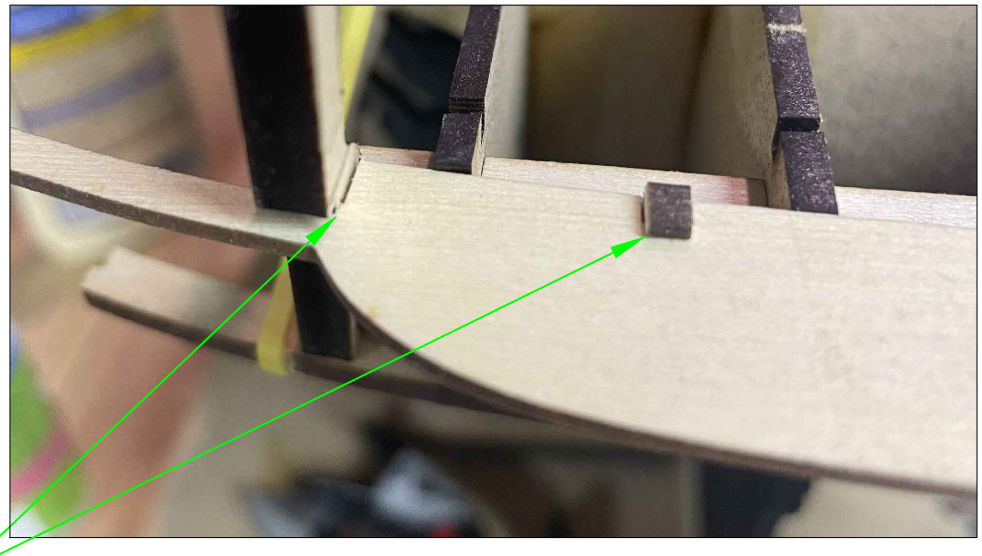


We now need to return to the stern frames and add the balcony pieces, these are the final pieces that tie all the frames together, the upper one is $\frac{1}{16}$" basswod and the lower one is $\frac{1}{16}$" AYC, it is a finished panel so we need to make it look pretty. After you have sanded the panel side smooth and applied WOP to protect it go ahead and test fit it, it should be a pretty tight fit all around. Notice in the photos below it sits on the ledges in the stern frames as well as into the notches that used for rubber bands earlier. Make sure it fits as you see it in the series of photos below, once satisfied glue in place on the frames only, the jig will just assist in holding it in place.

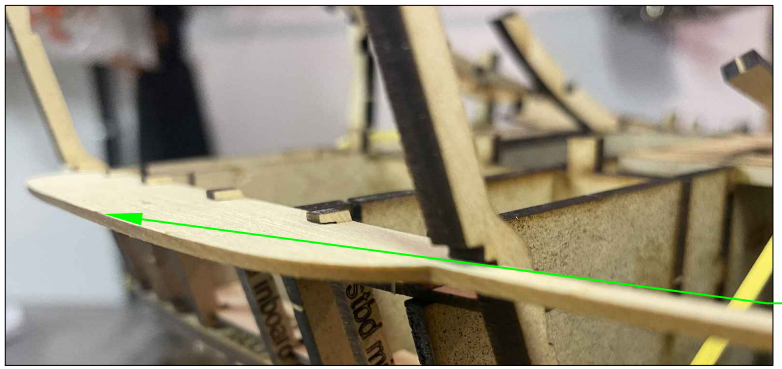




Above and below you can see the fit of the lower balcony floor, gently push it in so it fits in the slots tight.

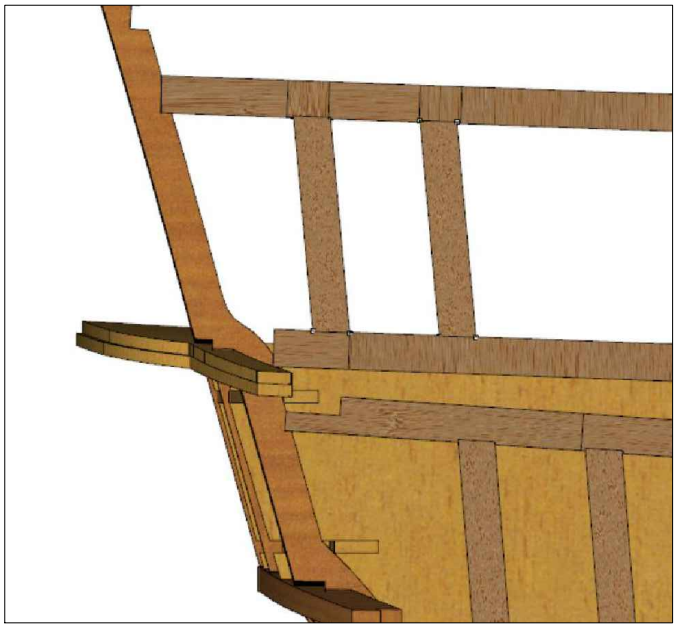


Notice the tight fit between the frames, you shouldn't have to do any sanding to fit this part, once in place secure with glue to the 6 frames. To maintain the deck camber some CA may be necessary at the outer frames.



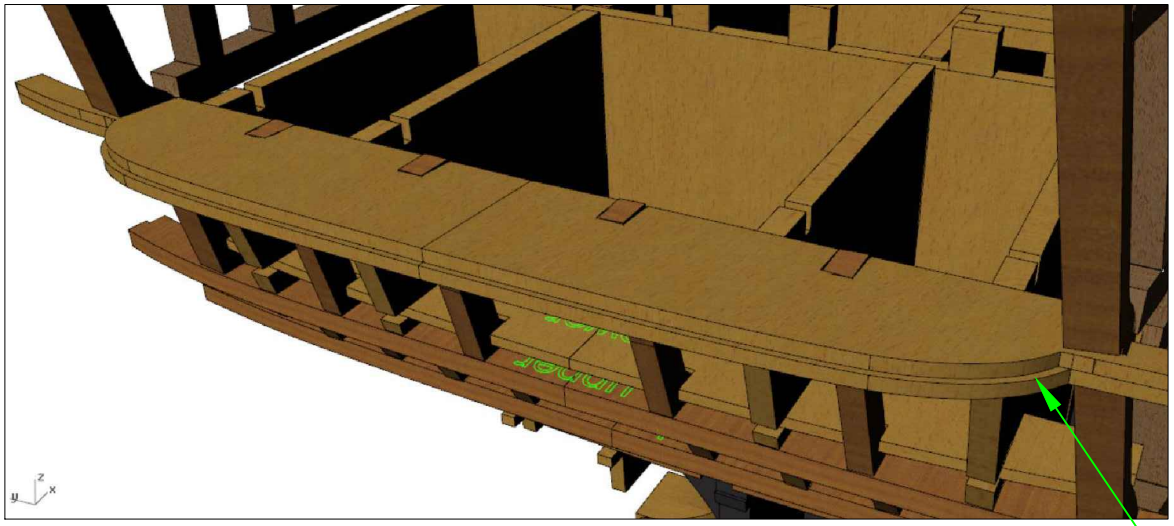
The balcony pieces should gently slope upwards and the end, the notches in the frames will give you this angle (see next page)

To the right you can see in 2D the slight upward angle of the balcony pieces, once you set the first one then the second just laminates on top of it. This angle will be consistent with the poop deck to be installed much later.

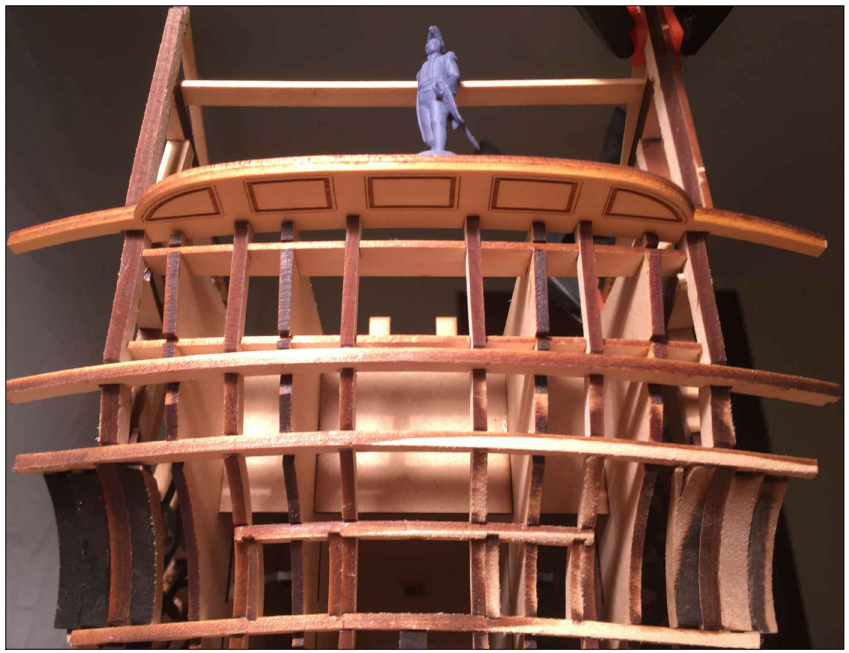


Above you can see the angle of the balcony represented in 2D

Below you can see the upper balcony piece installed, this will form the sub-deck for the balcony, notice how it fits tight against the tops of the frames and fills the gap at the outer frames. This should also be a tight fitting piece and should leave a slight ledge at the back, about $\frac{1}{32}$", this ledge is where the balcony rail works will install later in the build. Once satisfied with the fit laminate it to the lower piece using a generous amount of clamps.

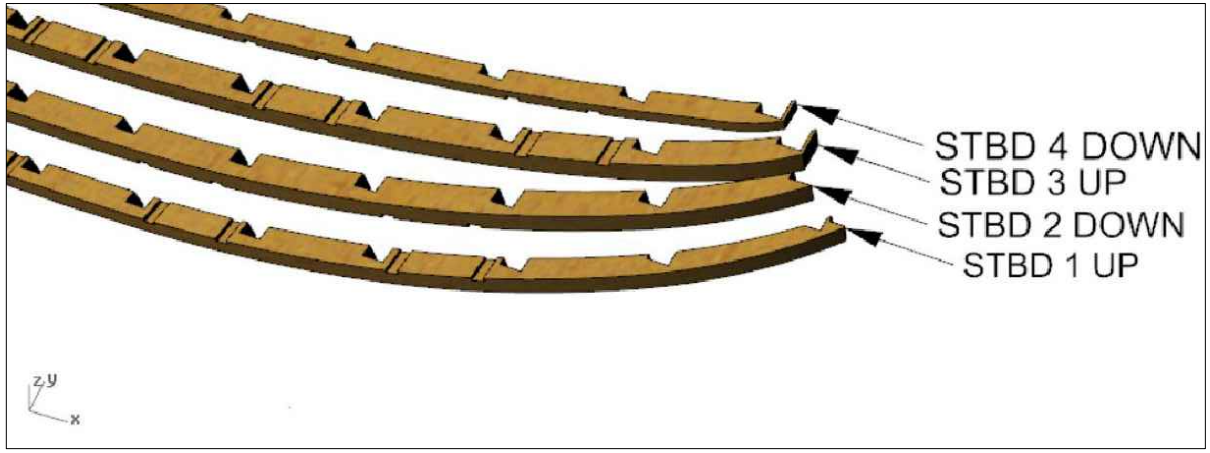


The upper balcony piece installed and laminated to the lower one, it should be flush with the tops of the frames. Make sure that you have a small ledge below the upper piece for the balcony railing to sit on.

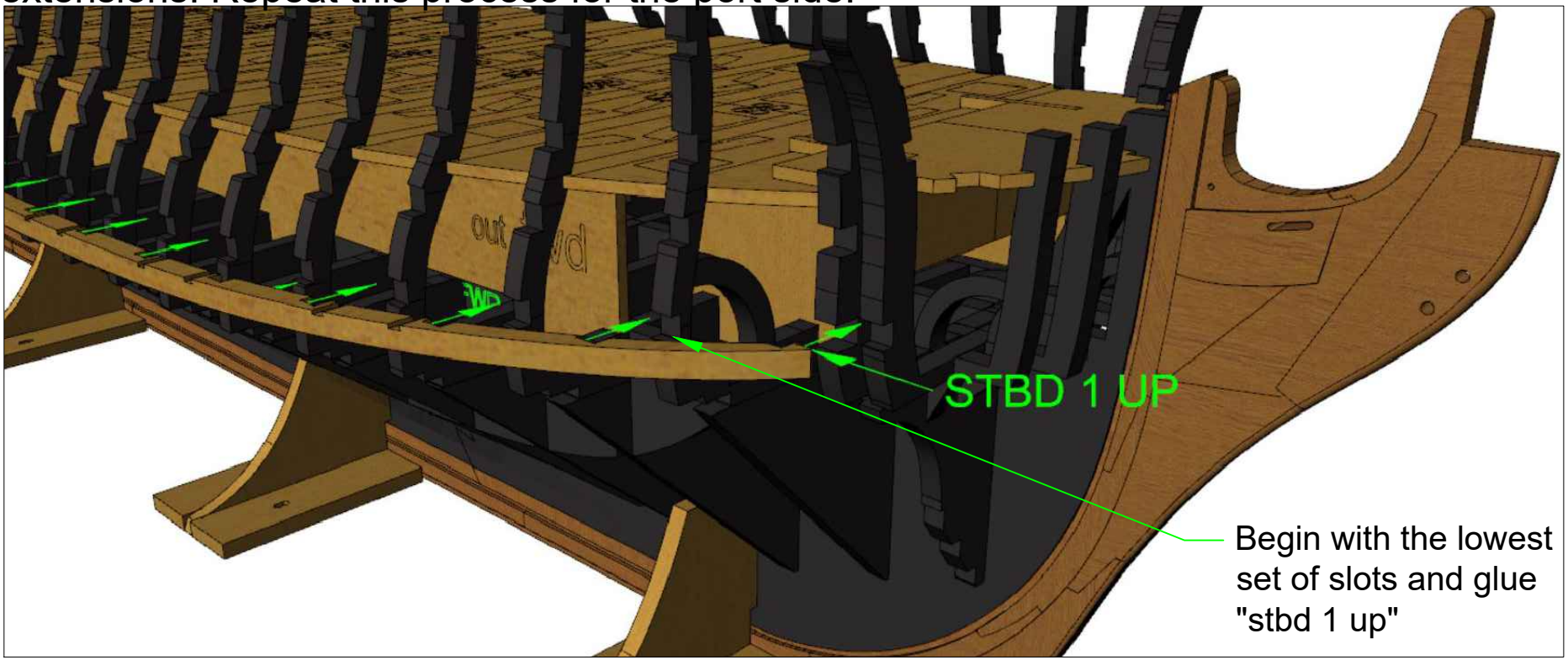


The completed balcony pieces with all the stern framing in place.

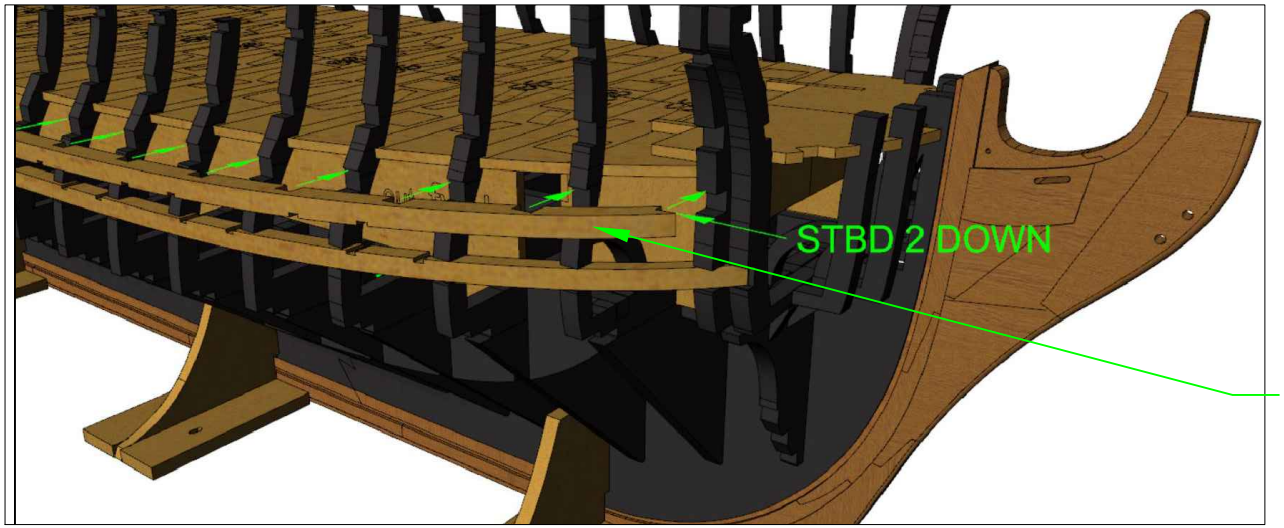
Now we begin the gun port framing, since Portland is so large and the bulkhead extension locations are critical and fragile i decided to integrate longitudinal structure into this step but it also makes the framing of the ports...all 56 of them, a little easier. So we begin with the pieces you see to the right,



these are single strips and very long pieces, i thought about making them multiple pieces but one continuous piece reduces the potential margin for error. You will find six long $\frac{1}{4}$" MDF pieces and two long $\frac{1}{8}$" pieces, they are all etched with the side they go on and which side they face. Lets begin at the main gundeck level with "stbd 1 up", you can see all the etched gunport frame slots are facing upwards as the piece indicates, go ahead and carefully fit and glue to all the extensions. Repeat this process for the port side.

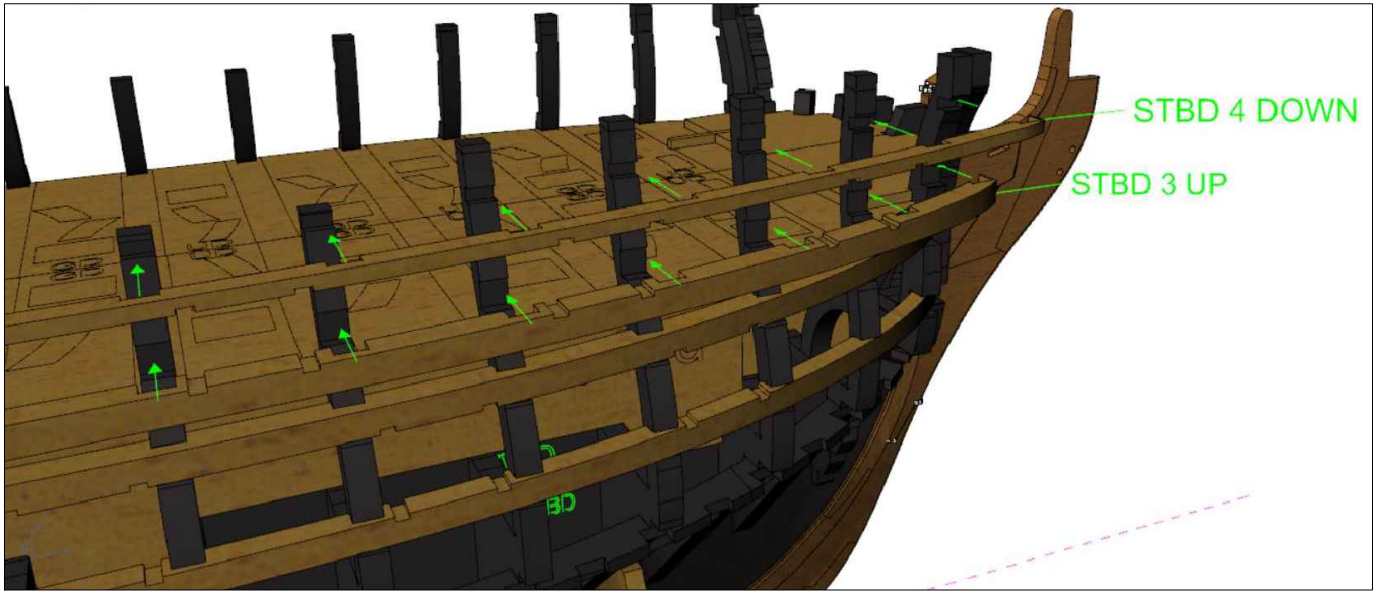


Moving onto "stbd 2 down" its basically the same process except the etched gunport frame slots face down as the part indicates. Glue this one in as you did the last also clamp if necessary. We can now move up to the upper deck ports for the 12 pdr's which will be slightly smaller.

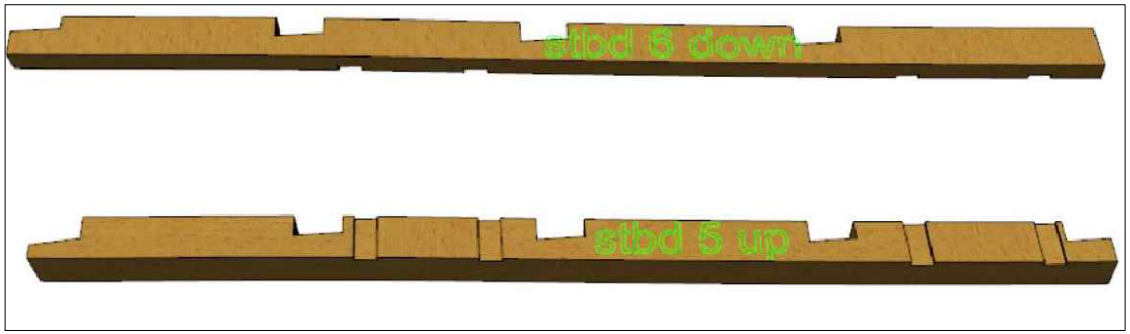


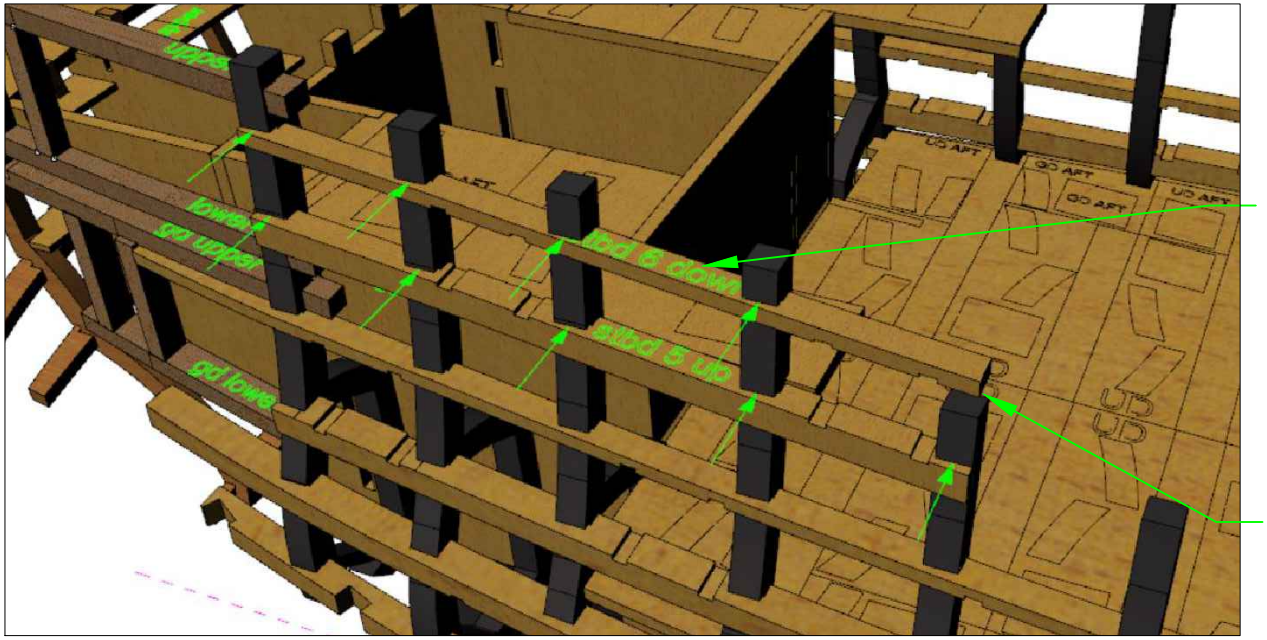
Continuing on with the second piece, follow the notches on the extensions and glue in place, clamp where necessary.

The upper deck battery is comprised of stbd 3 up and stbd 4 down, the 4th and final piece being $\frac{1}{8}$" mdf, go ahead and install these as you did with the other two previously.



The quarter deck has four framed gunports, you'll find the final longitudinal pieces in $\frac{1}{4}$" and $\frac{1}{8}$" MDF, two for stbd and two for port. These install just like the ones we did prior, use clamps as necessary but you shouldn't have to over manipulate the extensions.



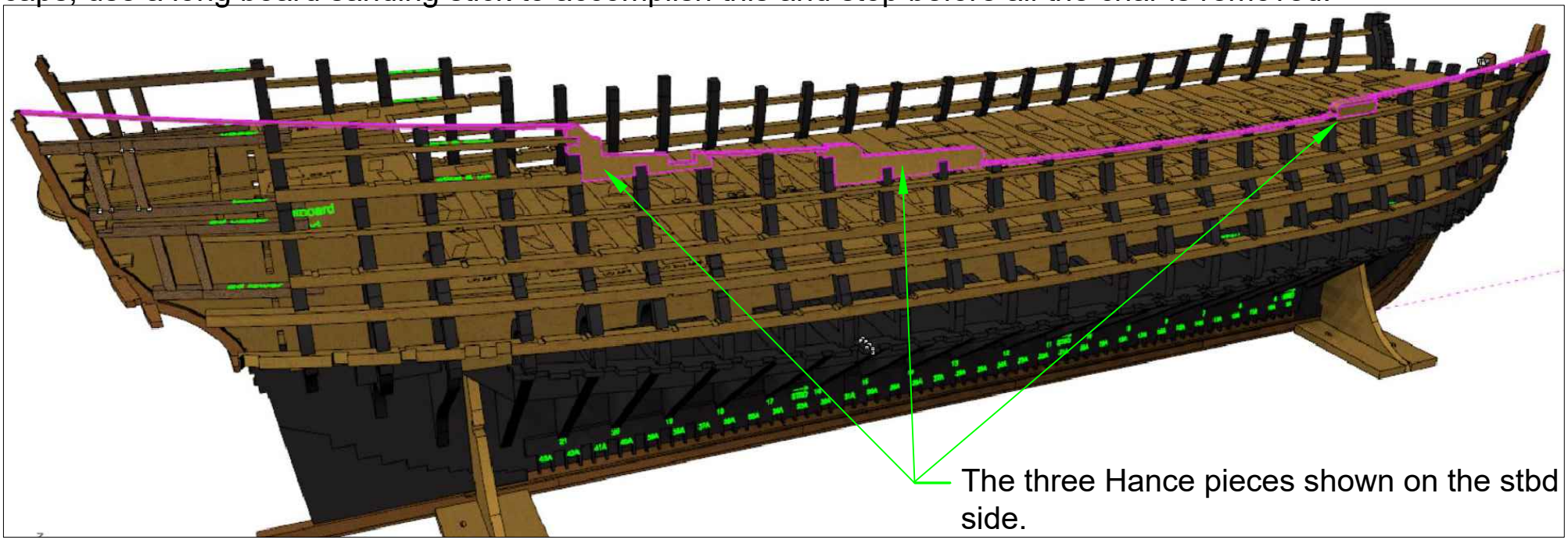


stbd 6 down etching shown on wrong side for clarity

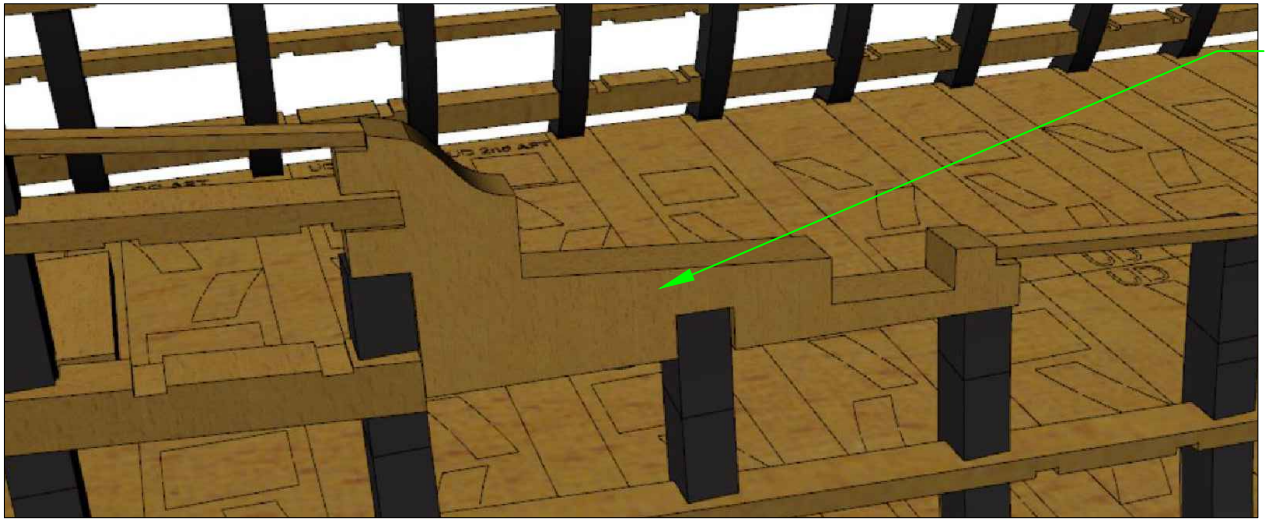
Notice the small gap between the end of 6 down and bulkhead extension 21, this is fine and we will address this soon.

Lets now move on to the hance pieces and the fairing caps. I've highlighted them in magenta so you can get an idea of the scope, its quite simple really. We will need to take a small side quest and temporarily install the beakhead bulkhead as a reference, but lets begin with the hance pieces. For those of you who built Chucks Winchelsea this will be a familiar step, I've taken a very similar route because it works well. There are three pieces on each side and two of them nestle right on top of bulkhead extensions the other is just placed on top carefully.

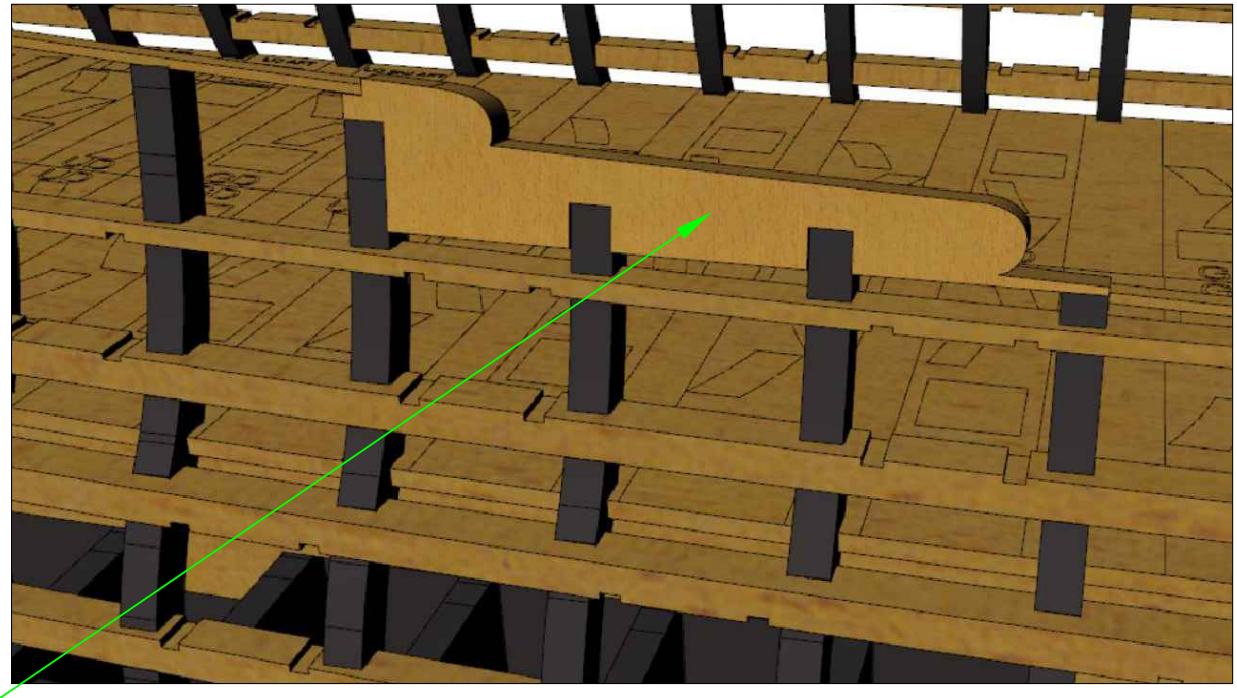
Note that the tops of the bulkhead extensions will need to be slightly sanded to match the angle of the fairing caps, use a long board sanding stick to accomplish this and stop before all the char is removed.



The three Hance pieces shown on the stbd side.



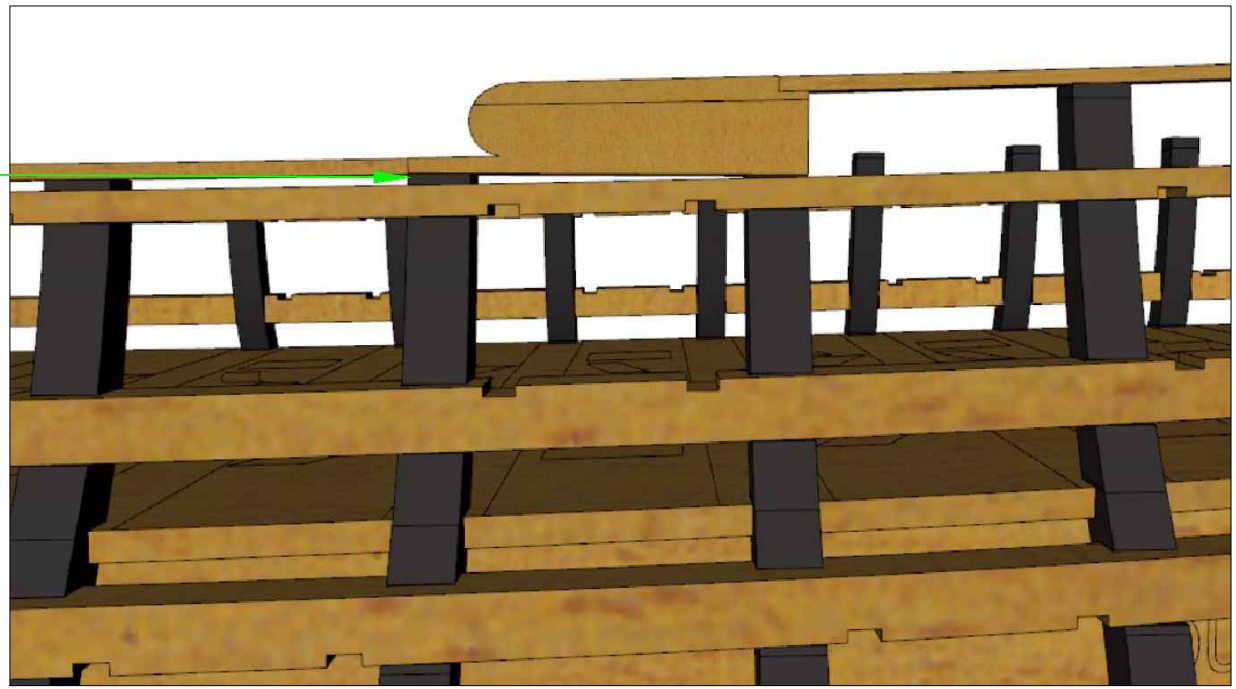
Lets begin with the QD piece, it sits on top of bulkhead extensions 19-21 as shown. I set mine proud outboard and in slightly angled inboard.



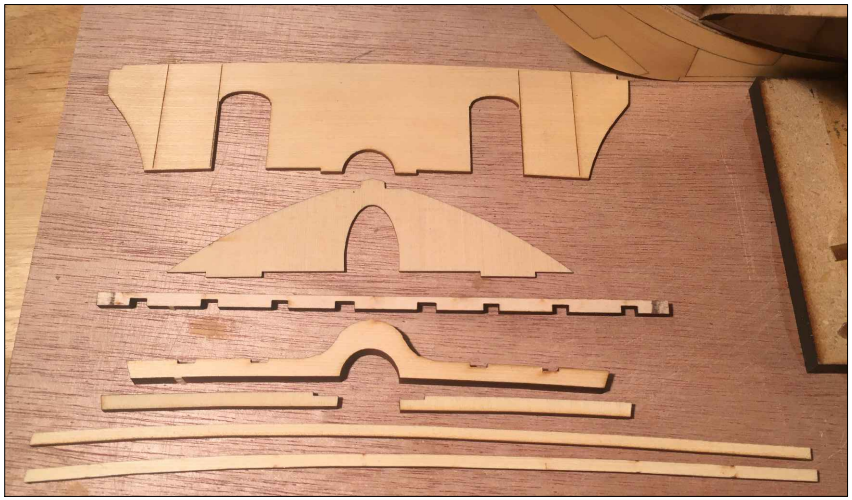
Middle hance piece spanning bulkhead extensions 14-17.

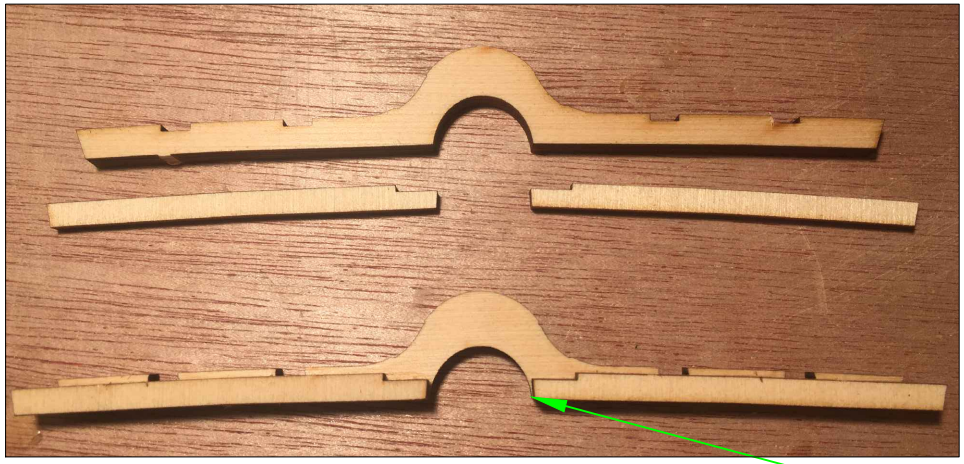
Moving to the Midships Hance, it spans from bulkhead 14 extension to 17, I also angled it inboard. The tops of the bulkhead extensions are cut at the correct angle so just glue them down. we will sand the tops later.

The Forward hance sits flat on top of extensions 6 and 7, it should perfectly fit between the two and have no overhangs as shown to the right.



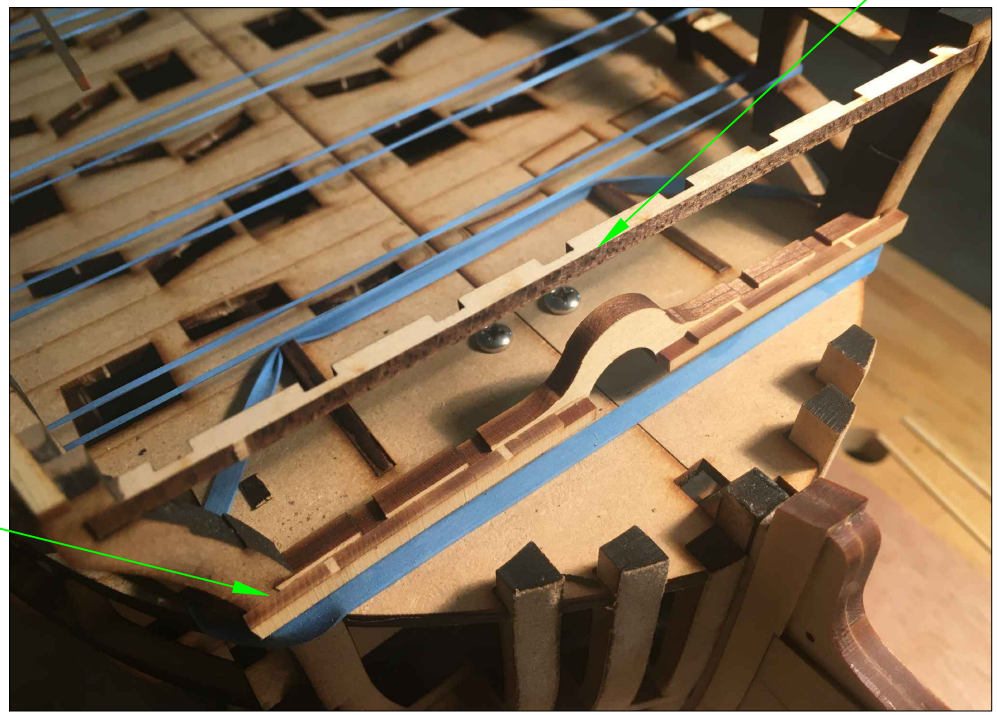
We need to move over to the beakhead bulkhead assembly in order to set up the fairing caps for the bow, it does not need to permanently attached but we can set it temporarily. We will also be using the foredeck as a plank and fairing guide so it can also be set in place temporarily. To start we need to assemble the forward beam that supports the bulkhead. The support beam is made up of three parts, go ahead and glue them together so the bottom edges are flush and the beakhead bulkhead support pieces start at the edge of the bowsprit radius as shown in the photo below. Be as precise as possible!





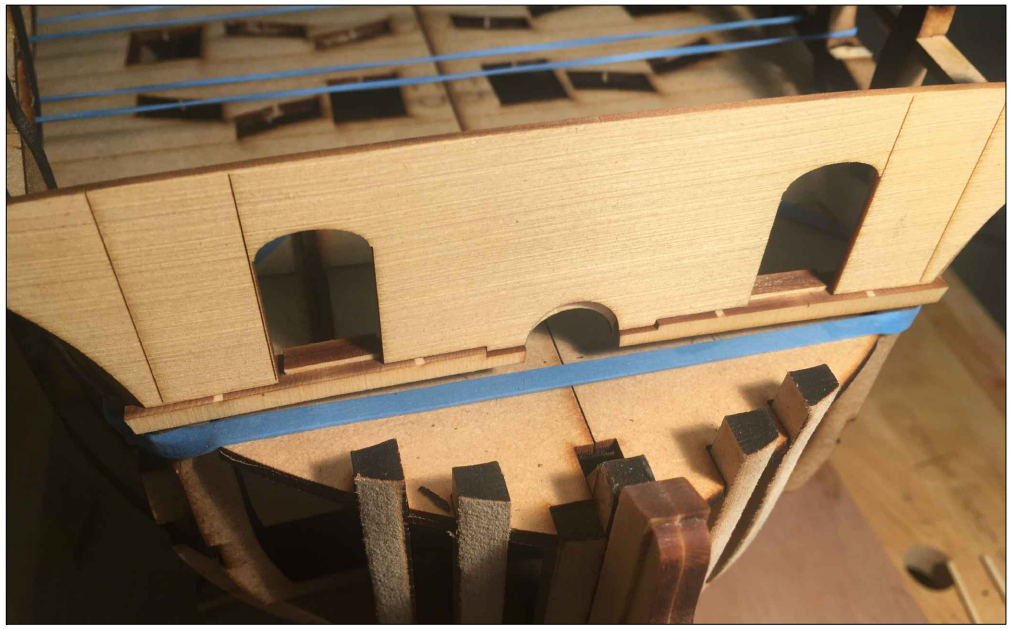
Attach the edges of the support brackets at the very edge of the bowsprit radius.

The upper beam can also be put in place, like the lower beam it will slide into slots in the support bulkhead.

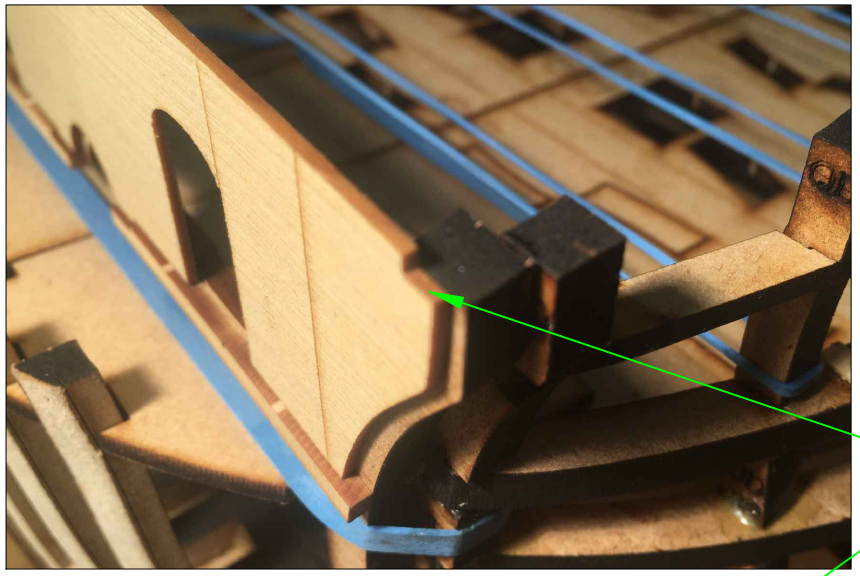


You can now slide the support beam in place into the laser cut slots on the beakhead support bulkhead, the brackets will act as a stop. No need to glue at this point, we need to eventually remove the lower jigs and fair below.

Go ahead and set your bulkhead in place, you'll see that it fits snug into the beam support brackets. We can now move onto the fairing caps, the forward ones are laser cut for you and they fit into the ends of the beakhead bulkhead and end at the forward hance piece.

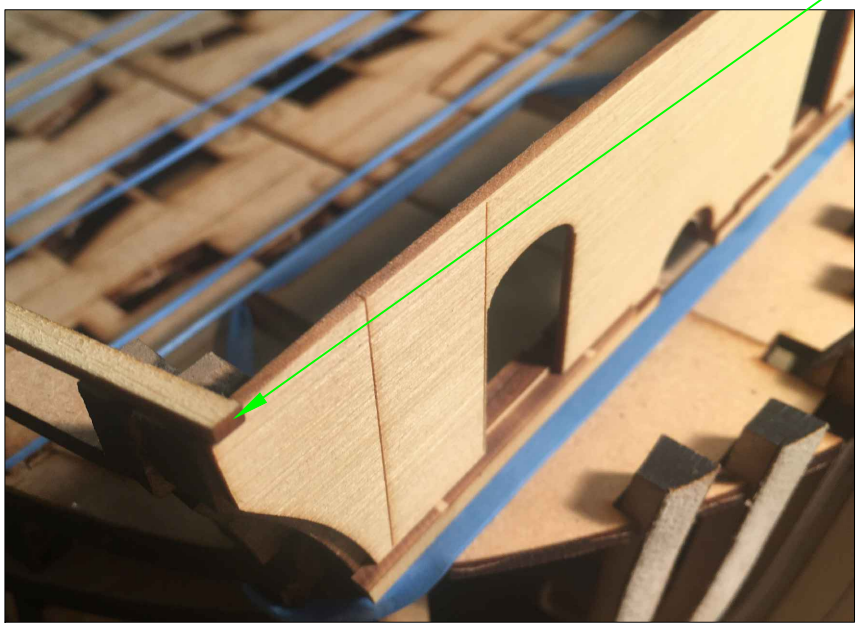


Fit the bulkhead into the notches on the beam, if you assembled it correctly it should fit centered with the bowsprit hole and snug without glue.

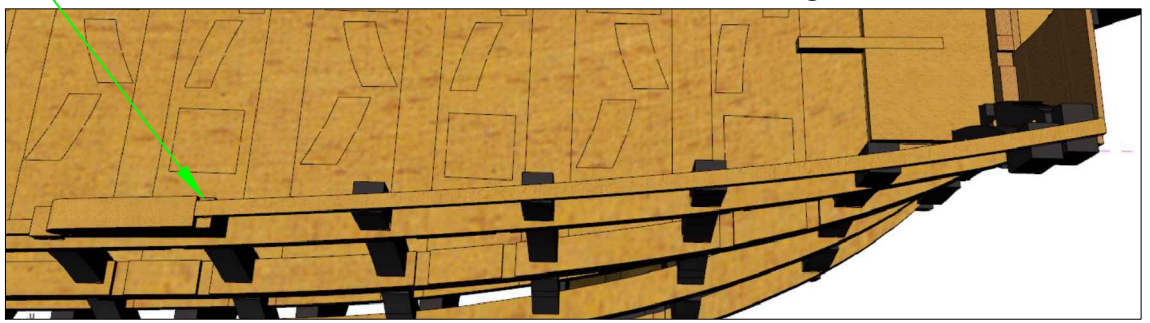


Notch in bulkhead for fairing cap to sit.

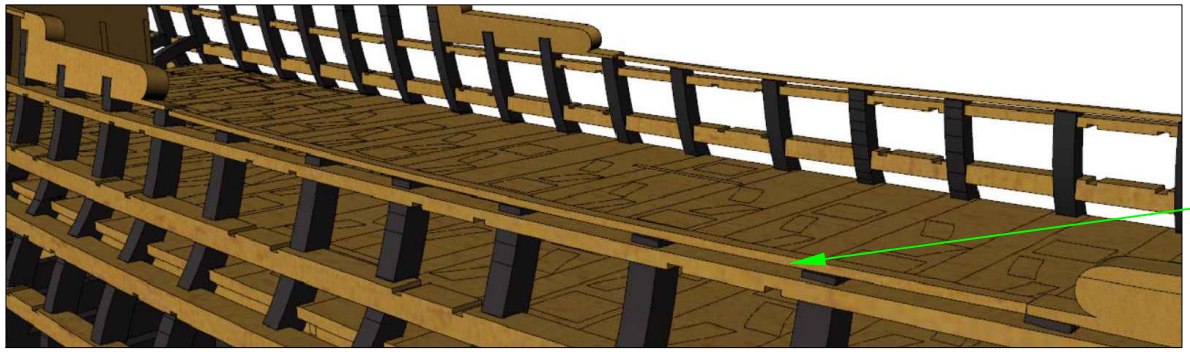
The fairing cap should rest in the notch and flush with the bulkhead face, its ok if it protrudes a little.



Set outboard from inside of hance edge about 1mm.

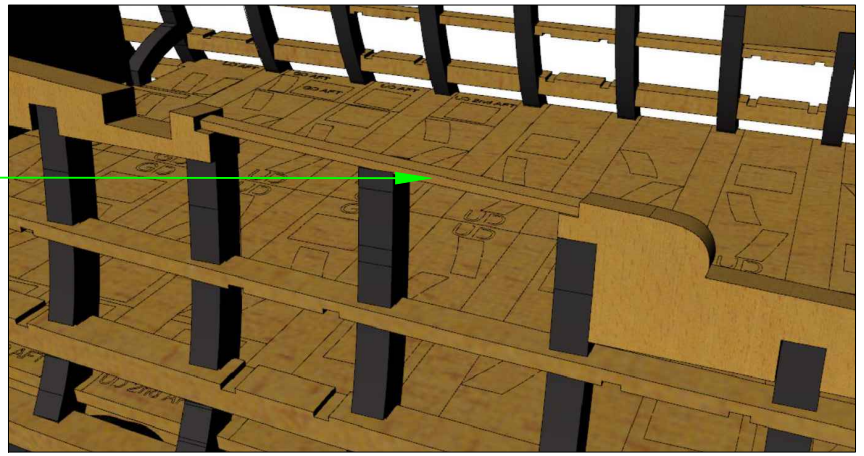


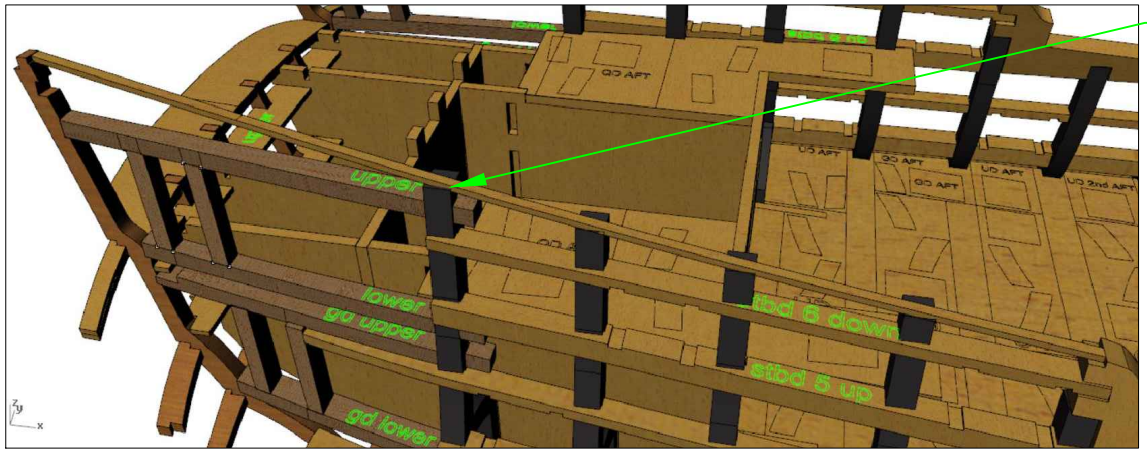
Notice how the fairing piece fits, except for the hance piece its mostly on the outboard side of the extensions. Set the cap just a bit over 1mm from the inboard edge of the fairing cap. Glue this piece down but not to the beakhead bulkhead.



The center fairing cap should be $\frac{1}{8}$"x$\frac{1}{16}$", you can use any material you have laying around as it wil be covered eventually.

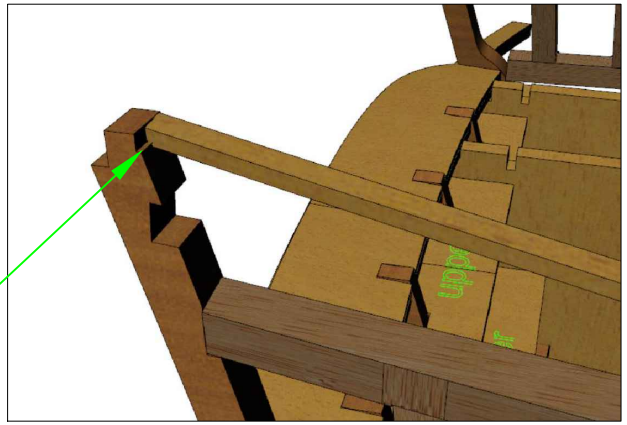
The short cap between the two hance pieces is also $\frac{1}{8}$"x$\frac{1}{16}$". Keep it on the outboard edge of the extensions as shown.



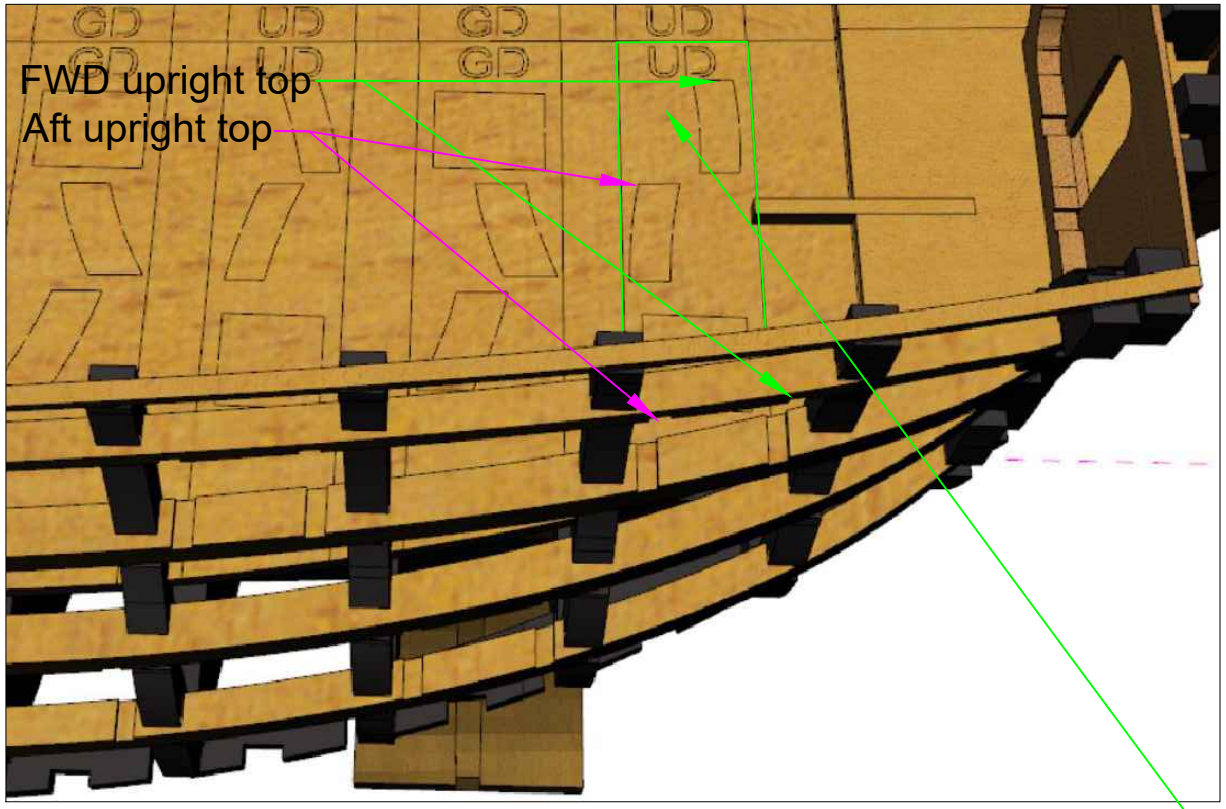


The aft fairing cap is slightly smaller as it rises up to the poop deck, use a .990" (2.5mm)x .0620" (1.57mm) strip.

Note the small notch that the cap fits into on the stern frame.



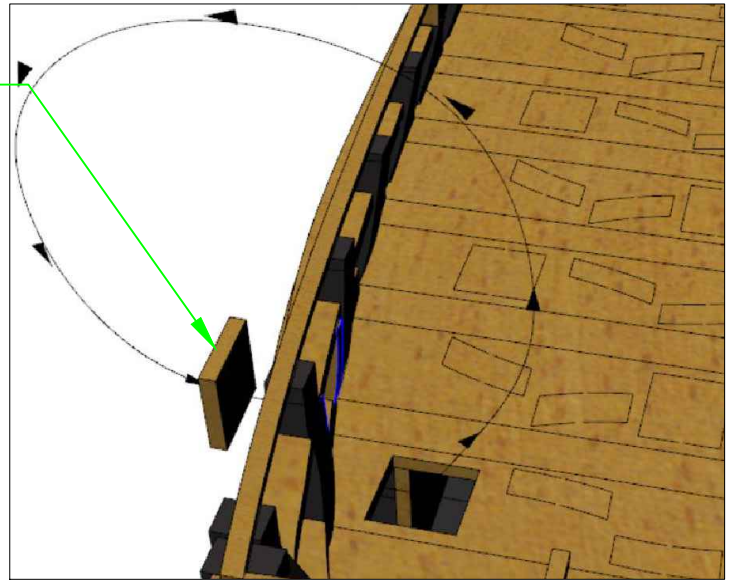
Lets move on to framing the gun ports, you have probably wondered what all the parts are for on the bulkhead extension jigs, they will be used to make the gunports. They are lined off to correspond with each port they belong to, There is UD (upper deck) and GD (gun deck) and they each line up with the port they belong to. Also you will notice that each one also contains a template for each port, these are used to ensure your port is shaped correctly. Also you will see the gunport sides or uprights are laser cut as well, pay attention to where they are located, the aft ones are the aft end of the port and the forward ones face forward. The gunport trapezoid squares are laser cut facing down so the outboard edge faces up. With the uprights, the tops are facing the centerline.



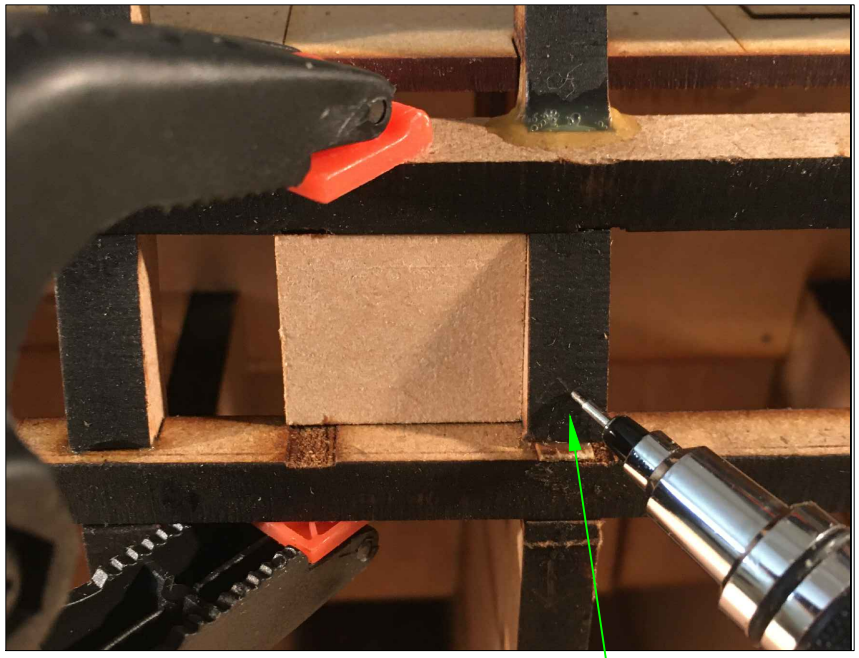
UD would go to the forward most gunport on the upper deck

Photo to the right shows how the port templates are lifted and installed.

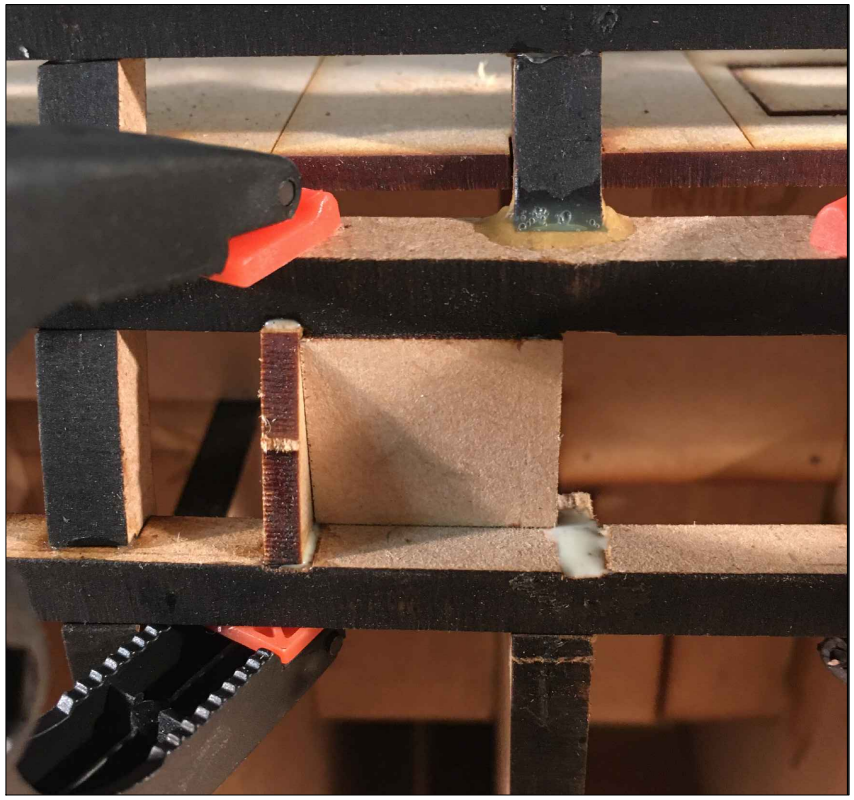
Photo to the left shows main gun deck ports going in, I drew some oreintation lines on them as i took them on and off until satisfied with port shape. do not glue in and remove when port uprights are dry.

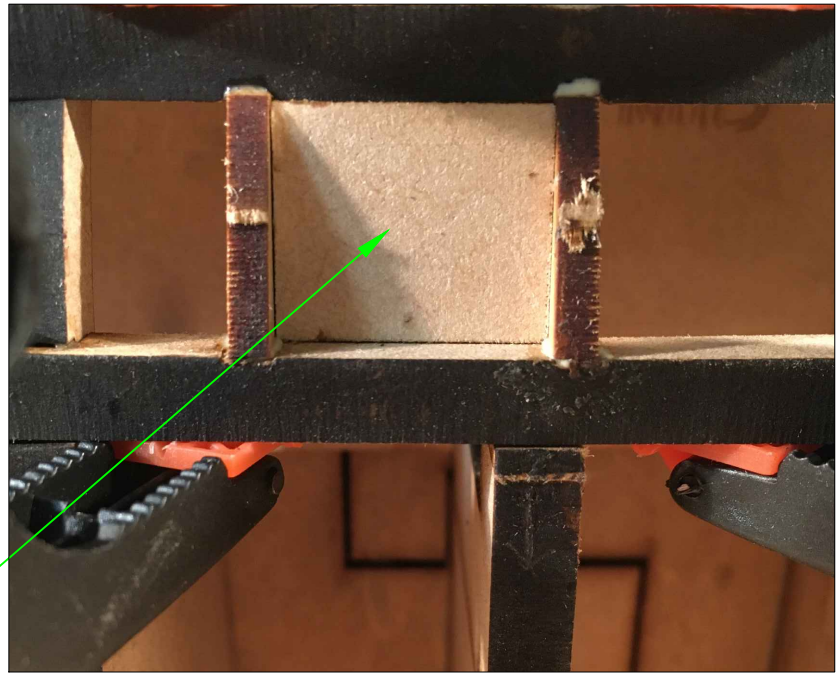


You're going to encounter an interference at bulkhead 13 as you can see to the right. Now that the structure is all tied together with the longitudinal pieces we can remove this section of the extension. Go ahead and cut it out and clear the channel for the upright. With the section of the extension removed you can go ahead and assemble the port like the rest. This will be the only instance of an interference with an extension.



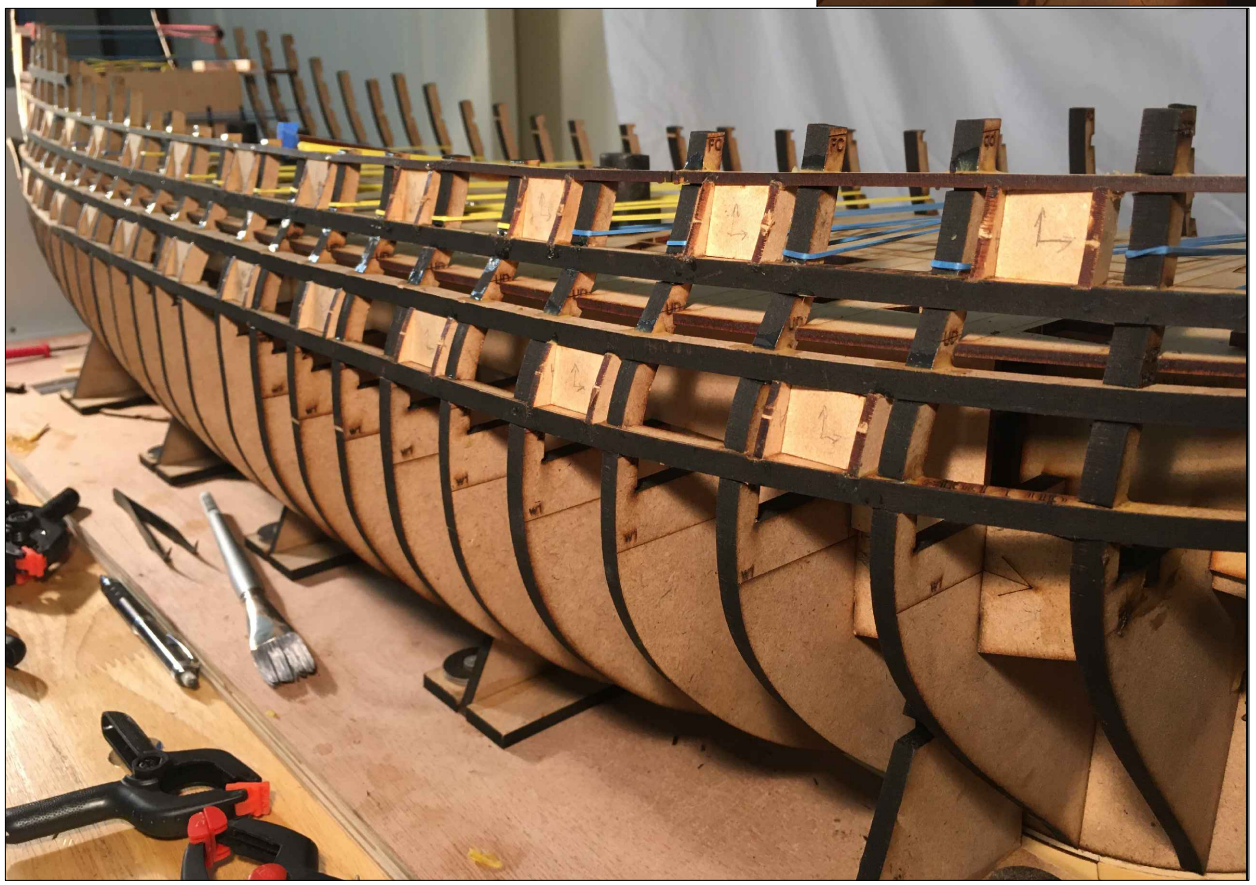
Trim bulkhead 13 extension.





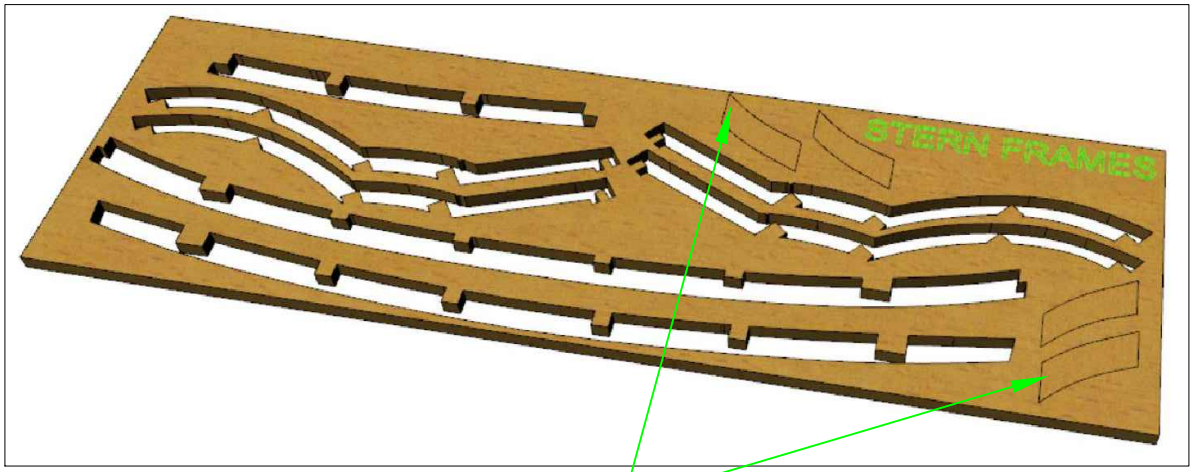
Completed gunport, make sure not to glue in the template. If you get a little on the corners it should still pop out.

The first five gunports completed from the side. Once they were all set i went along and gently tapped out the templates.

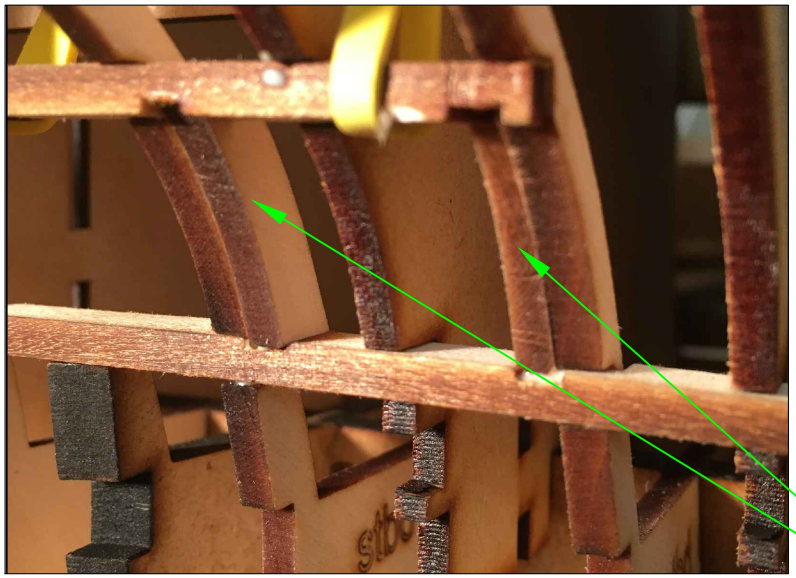


One side almost complete, just the quarter deck remains. This model is the bulkhead version but the ports and framing are the same between the two models.

Finally lets finish with the stern chasers. Your $\frac{1}{8}$" basswood stern frame sheet contains the uprights for these parts. They will fit in to the slotted transoms we installed earlier just like the other gunport uprights.



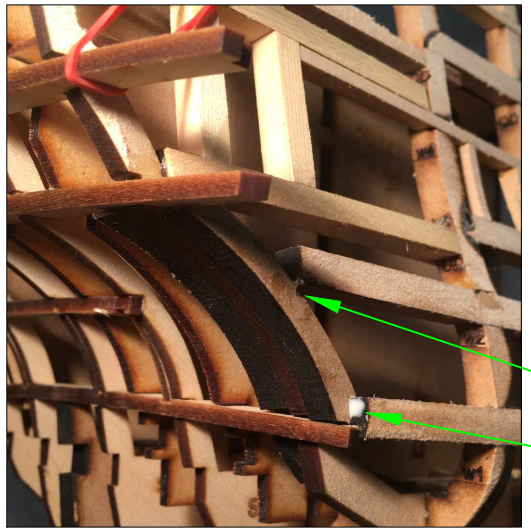
Ends of the frames that face up.

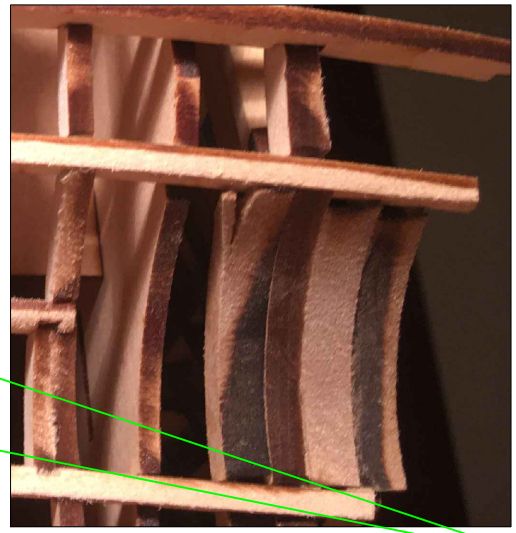


The stern chaser port uprights installed, you may have to sand down the outboard upright a little to get it to fit next to the stern frame.

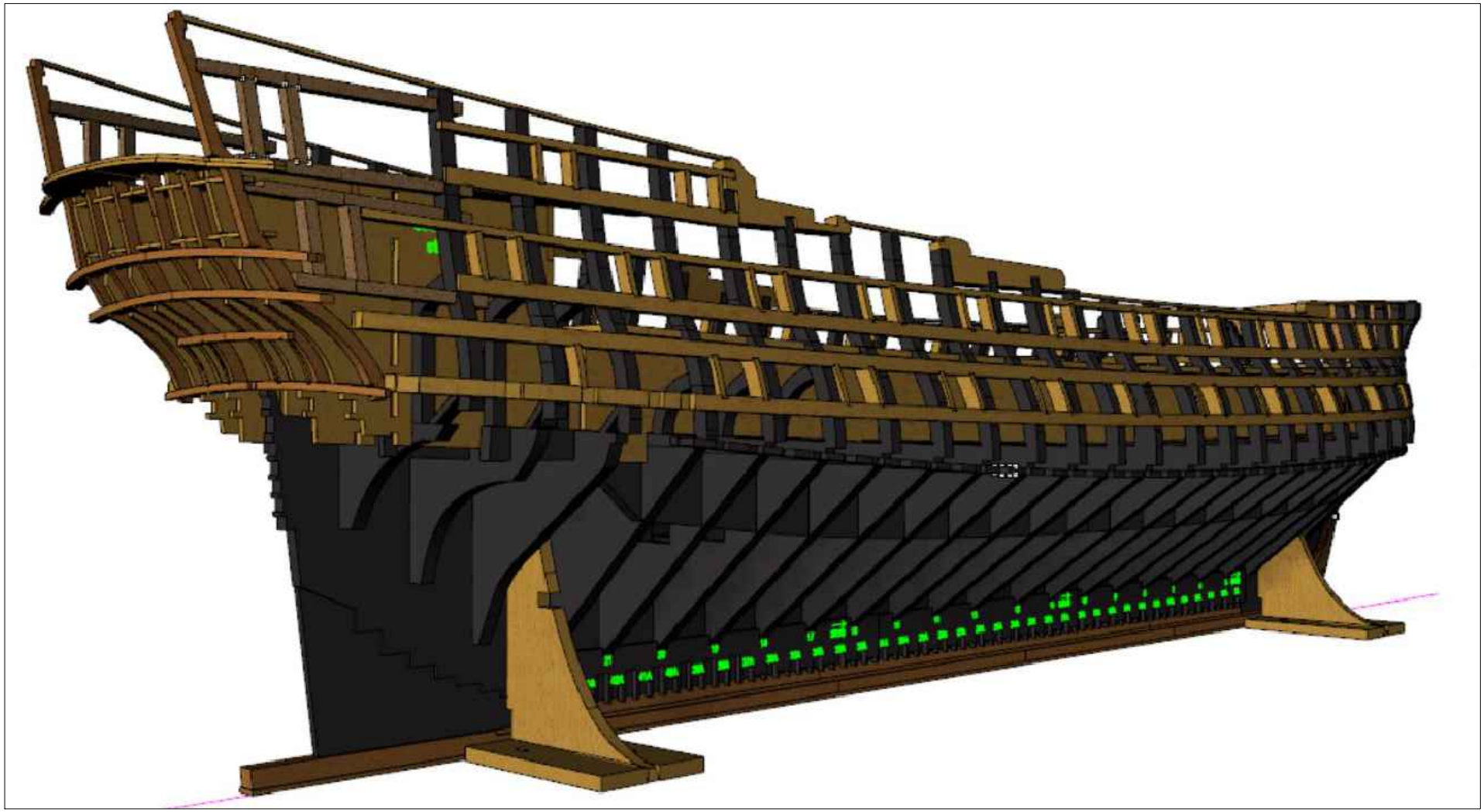
Fillers shown how they attach to upper and lower counter structure.

While we are still at the back of the model lets go ahead and add some filler pieces, these pieces will be what the lower counter glues to and also provide a landing for your wales. They are comprised of three (two extras) MDF parts per side and they sit on the upper wing transom we installed earlier.

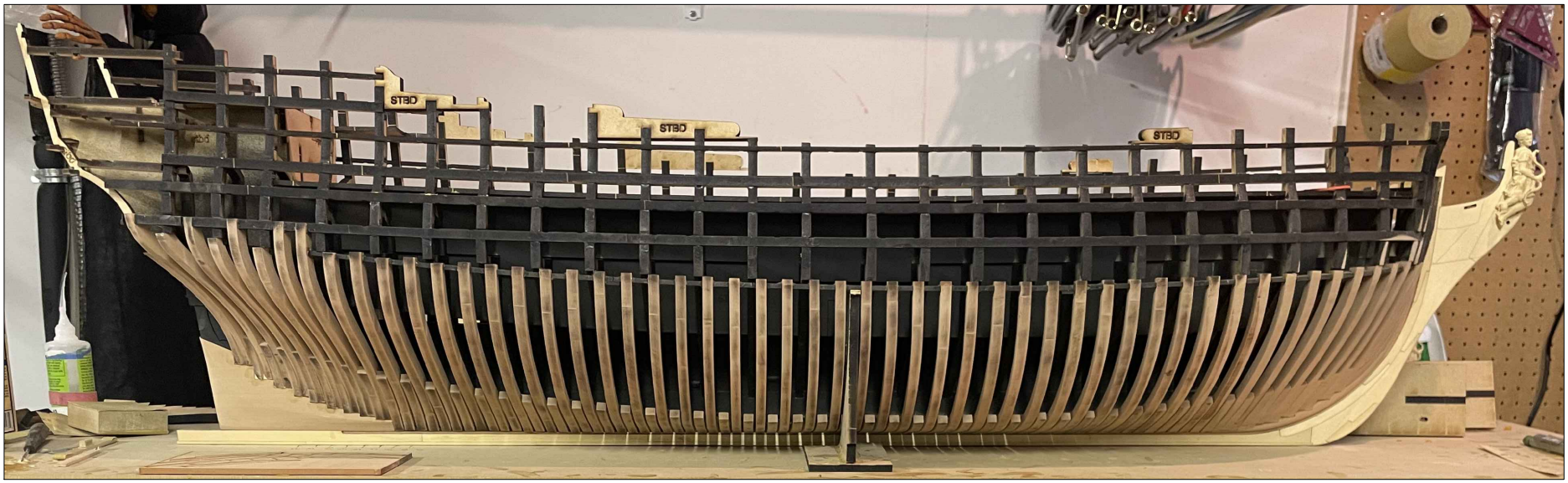




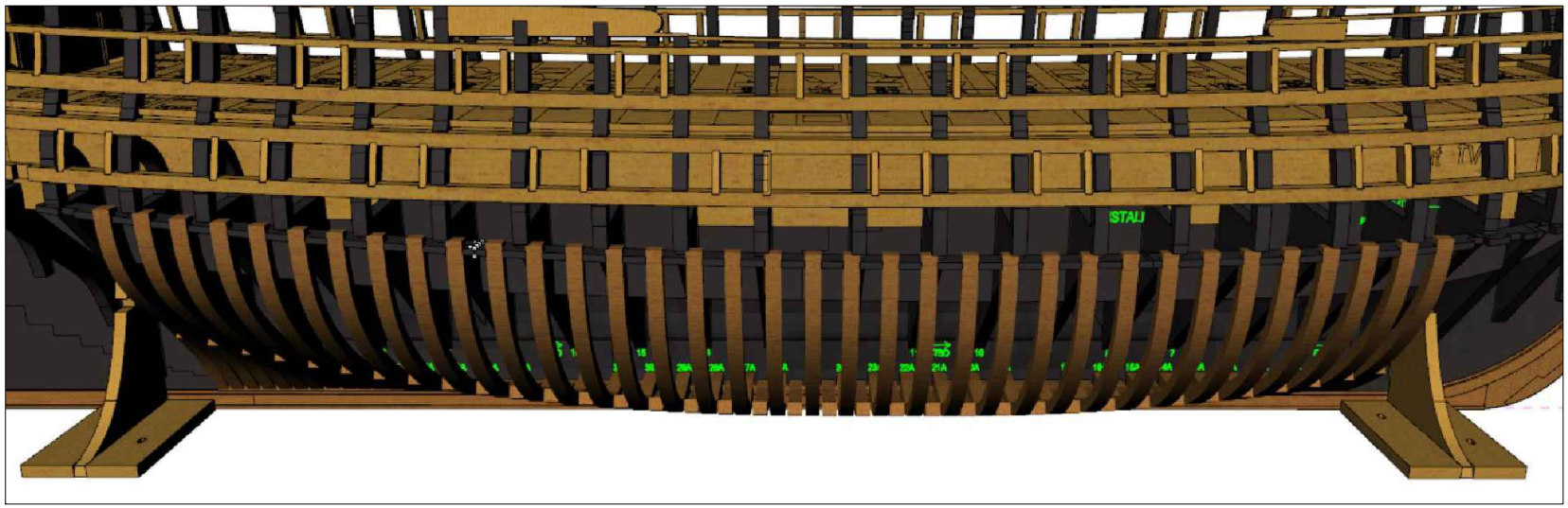
Here you can see in detail how the fillers fit. in the photo to the lower left the fillers are orientated in the direction they fit the structure.

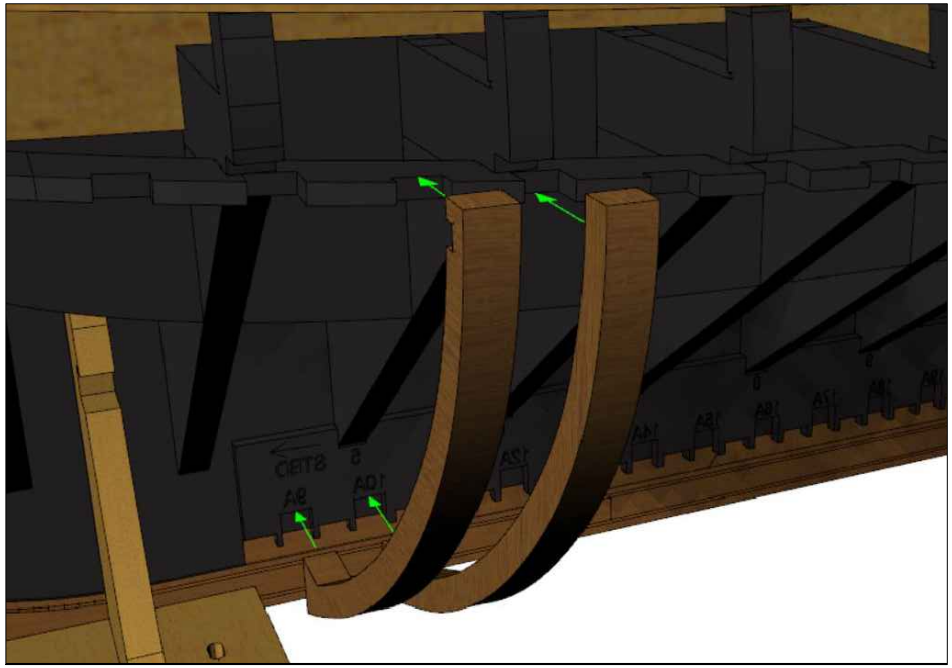


With your all your gunports framed and all the structure now assembled we are ready to move onto the final steps of chapter one and add the hull framing. This will be done in three stages, we will begin with all the frames that are perpendicular to the former followed by the forward frames and cants and finally the stern frames and wing transoms which will be the most challenging.

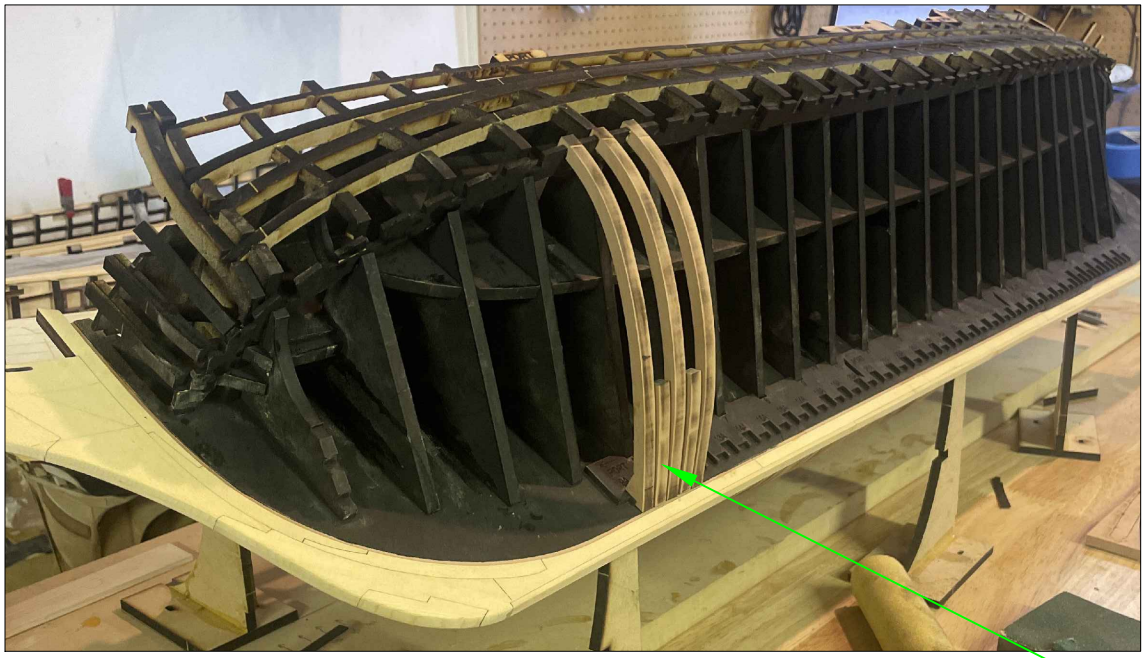


Portland is designed to replicate the Navy Board model of the painting of Portland, dated 1774. Several contemporary examples appear with single piece frames. The aim is to achieve that appearance without fully framing the entire hull only to plank over more than half of it, covering hundreds of dollars worth of fine pearwood. The process will actually be quite simple as all the jigs and brackets will help achieve a nice modern replica of a framed navy board model from 1770. Let us begin with perpendicular frames 8b-43b as shown below. These frames will utilize the entirety of the brackets we installed on the lower former.

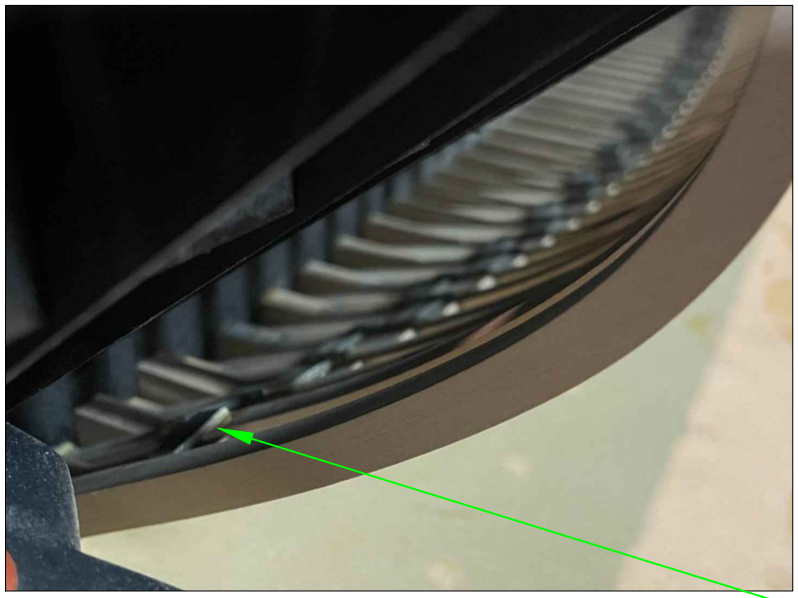




The concept is quite simple, to the left we have two types of frames, one with a hook a the top and the other without. The ones with hooks do not attach to the bracket under a bulkhead extension and the ones without are vertically supported by the bulkhead itself. Each full frame is an "a" and each short frame is a "b", all are numbered and correspond to a number on the bracket. To the left we have frames 9a and 10a. This is where i started adding my frames, once two "a" frames are in place i will then add the "b" that fits between them. In this case it will be 9b, also be sure to sand the char off the tops of the "b" frames before you install them!

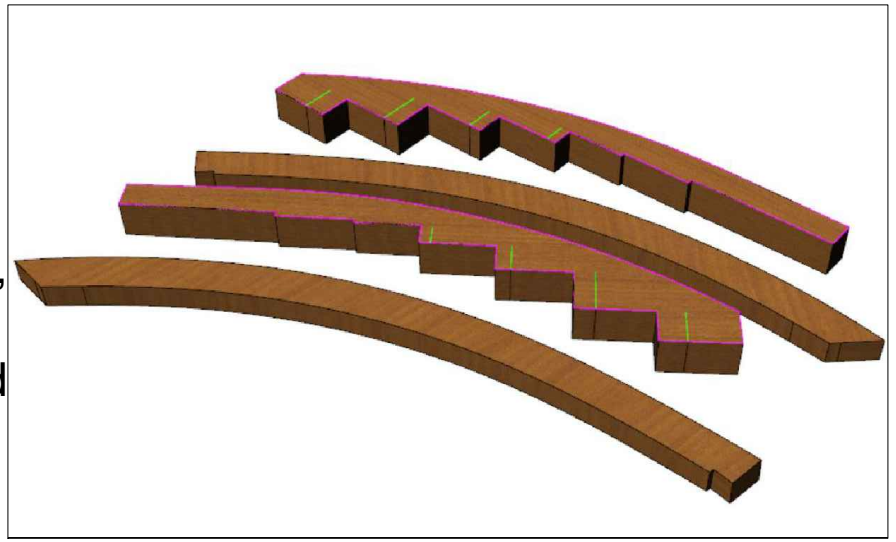


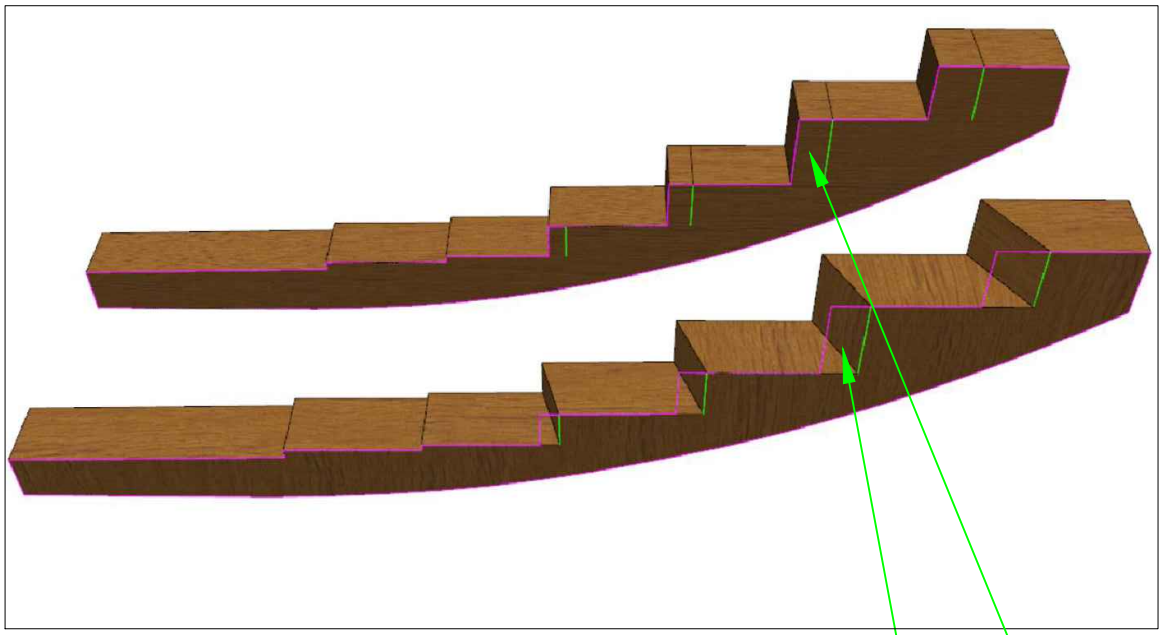
Frames can now start being added, the photo above shows 9a-11a. Note i scraped off as much char as possible, front and back as you will be able to see the inside of most frames. You can also see that I am starting to add the "b" frames.



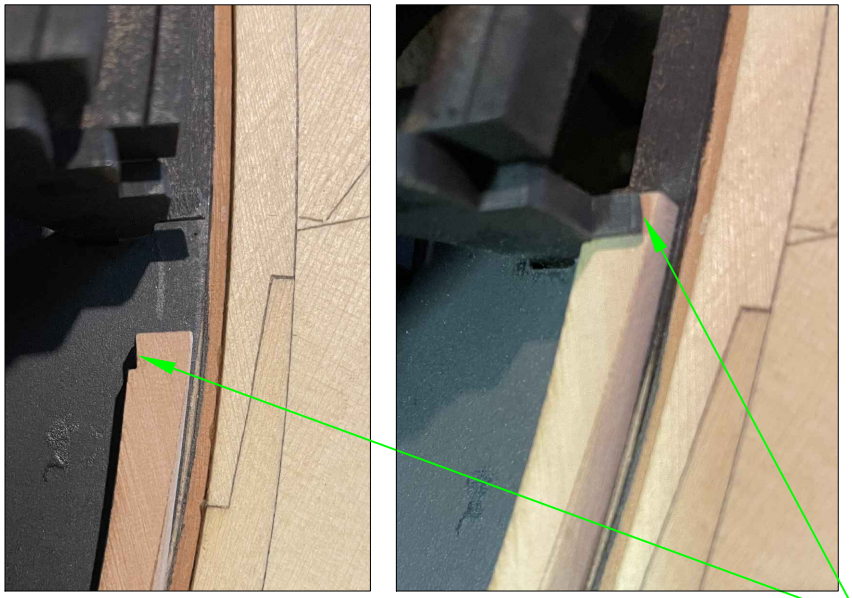
Above you will notice a series of short pieces of black strip wood. I used these to tie a "b" frame between two "a" frames, just below the top of the b frame. Mine are not visible from the outside.

Now that you have frames 9-43 complete, lets move to the remaining forward frames. These frames progressively angle forward from 8 on to 1 and will require angles and tapers we will also install them differently, with all the "a" frames going in first followed by the "b" frames. But first we need to install the apron, shown to the right is all the components for the two aprons, I found the lower half needs to start at 1/4" and the upper part is $\frac{5}{32}$". Like the Knee lets go ahead and assemble the two lower sections into one.

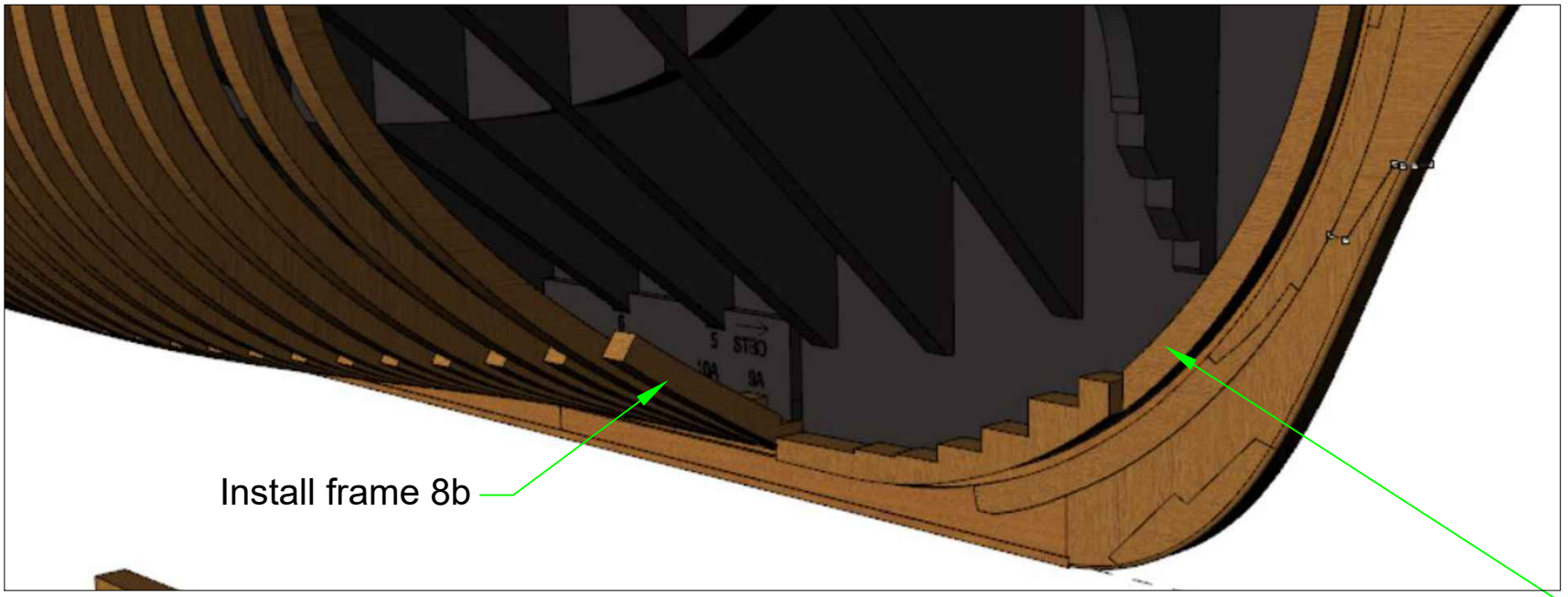




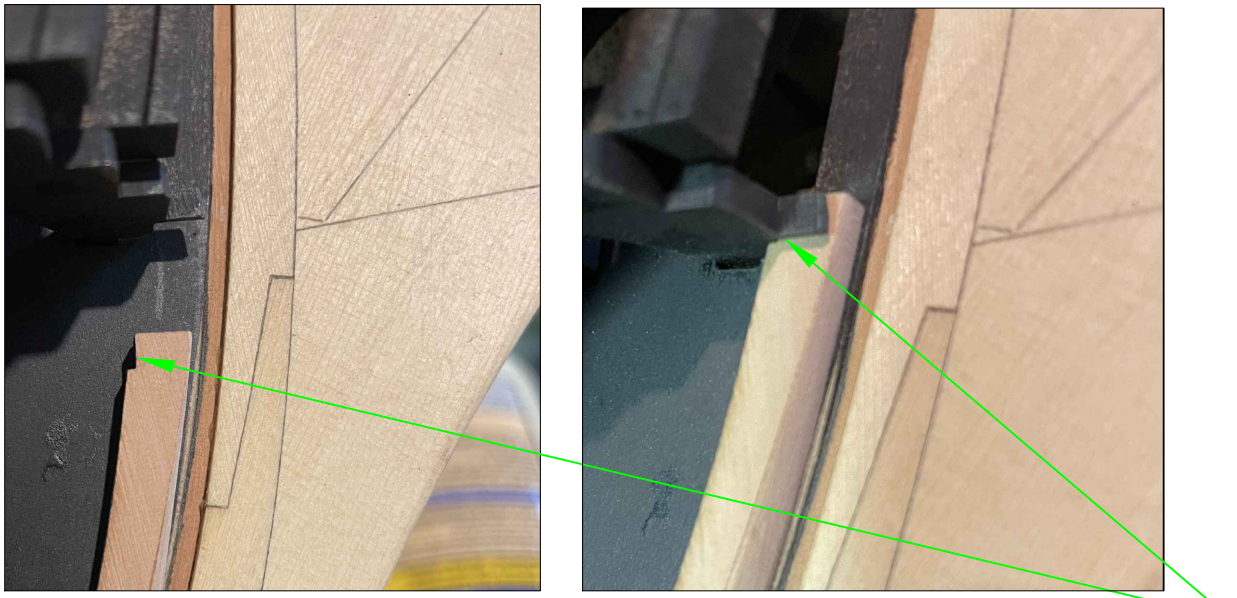
Tapering the apron. you will see reference lines for tapering the apron, shown to the right we have the laser cut piece and the tapered piece below it. This will allow the proper fairing of this area without opening up unwanted gaps.



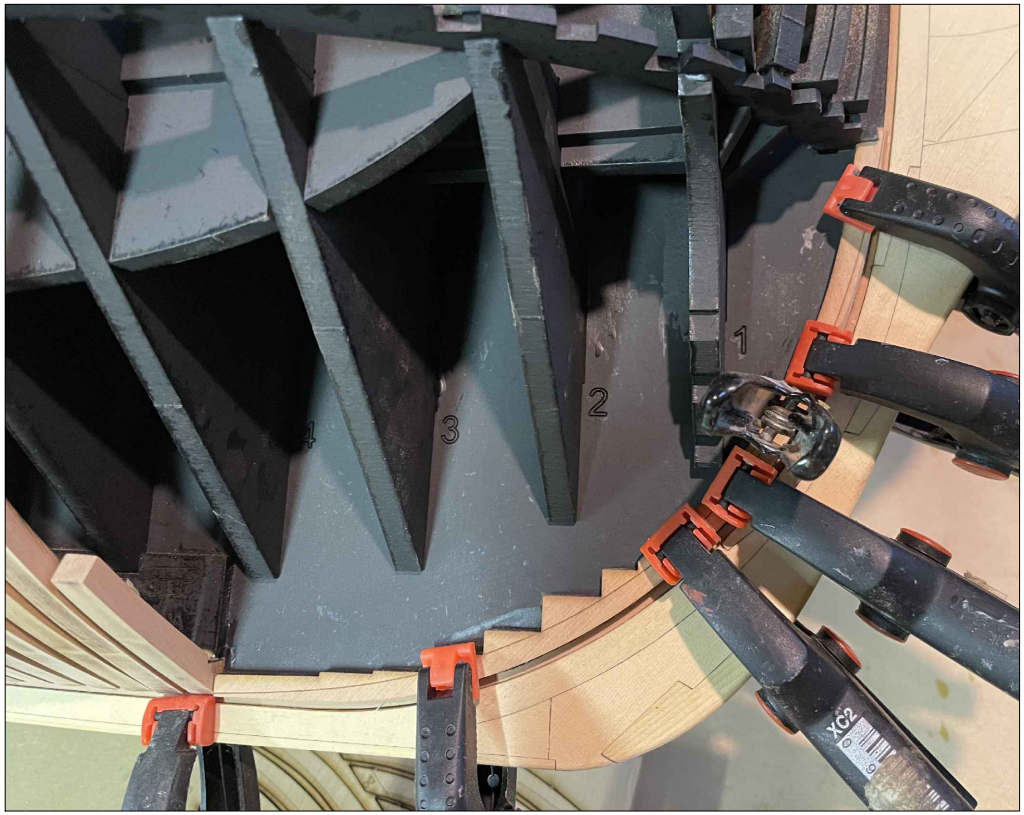
Above you can see the notch in the top of the apron, it fits nicely into the edge of the upper frame bracket.



Above we have the completed apron sections as well as it installed on the model. But first we need to install frame 8b as the apron butts right up against it, 8a sits on the apron so we will worry about that later. I would advise assembling the apron into one piece before install.

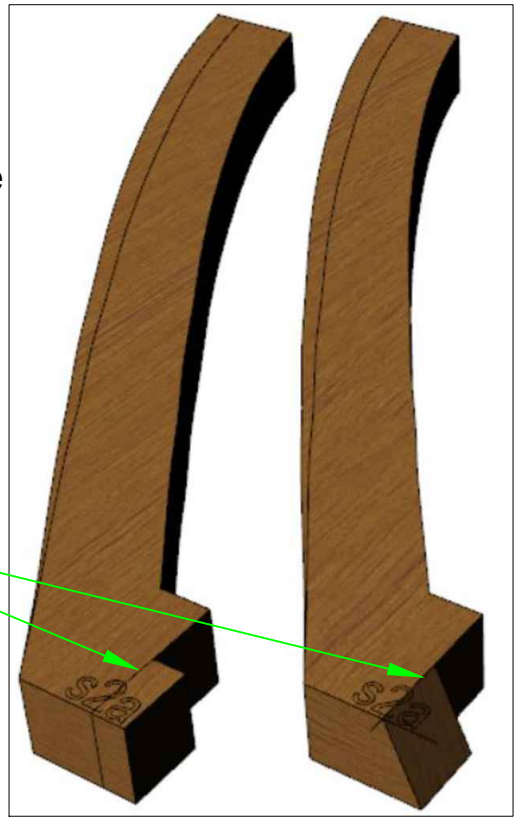


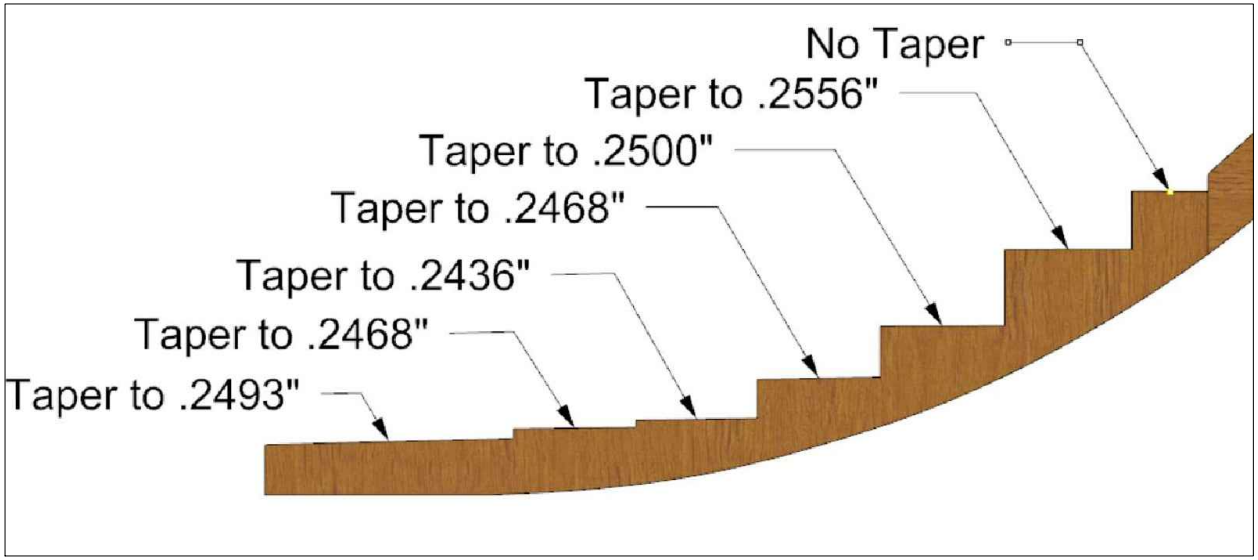
Above you can see the notch in the top of the apron, it fits nicely into the edge of the upper frame bracket.



The apron glued in place, it should follow the edge of the former perfectly. Also notice how it butts up tight against frame 8b.

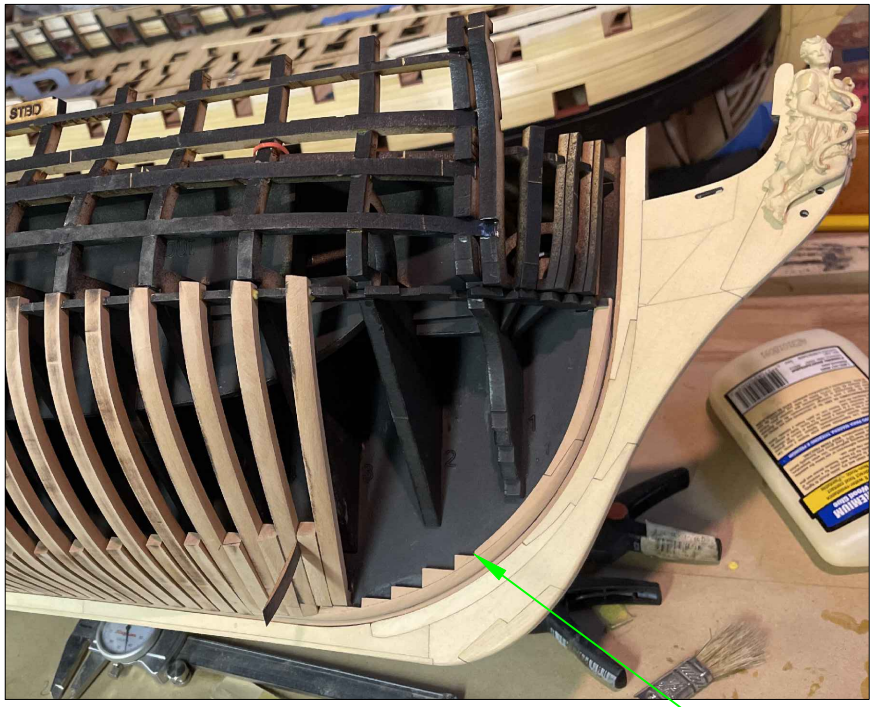
Notice the etching reference on the forward frames, this will give you the required angle. All the forward and aft frames will have these marks on them, sand them as shown to the right, use the char as a reference as to when to stop sanding.



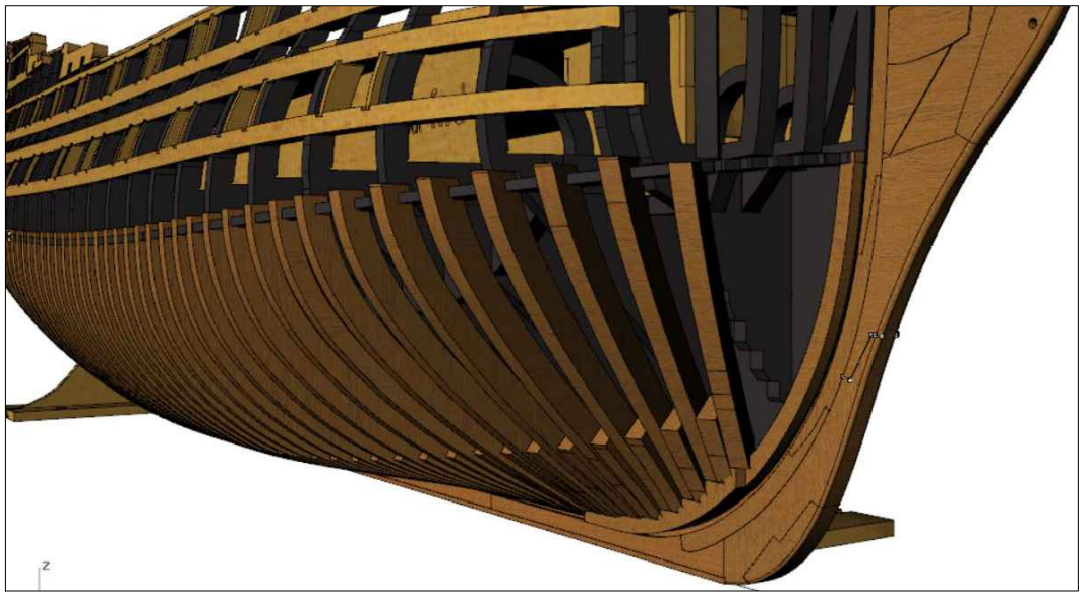


Lets start adding frames 8-1. i found it much easier to begin with adding all the "a" frames first followed by the "b" frames where i could just sand them until they wedged in. All these frames will require a taper and specific angle at the bottom to sit on their step on the apron.
Note: before gluing in your b frames, make sure their taper fits tight against the bevel on the apron and runs parallel to the a frame!
To the left I've given the required tapers at the lower ends of the frames so they all fit together evenly on their respective steps.

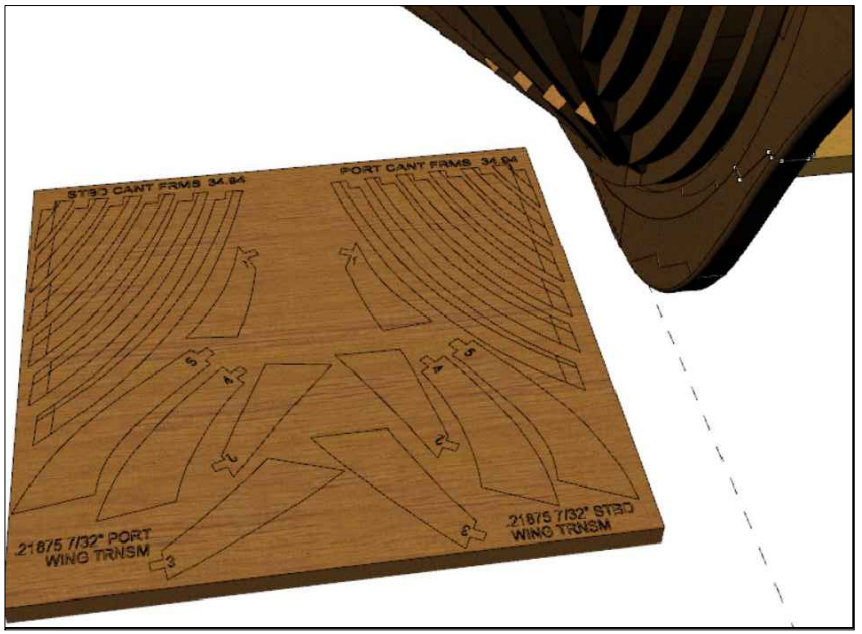
I tried to be as close to the taper dimension as possible, i gently tapered the frames about $\frac{1}{3}$ to $\frac{1}{2}$ their length and most of the b frames.



I slightly beveled the leading edge to accommodate the angle of frame 1.

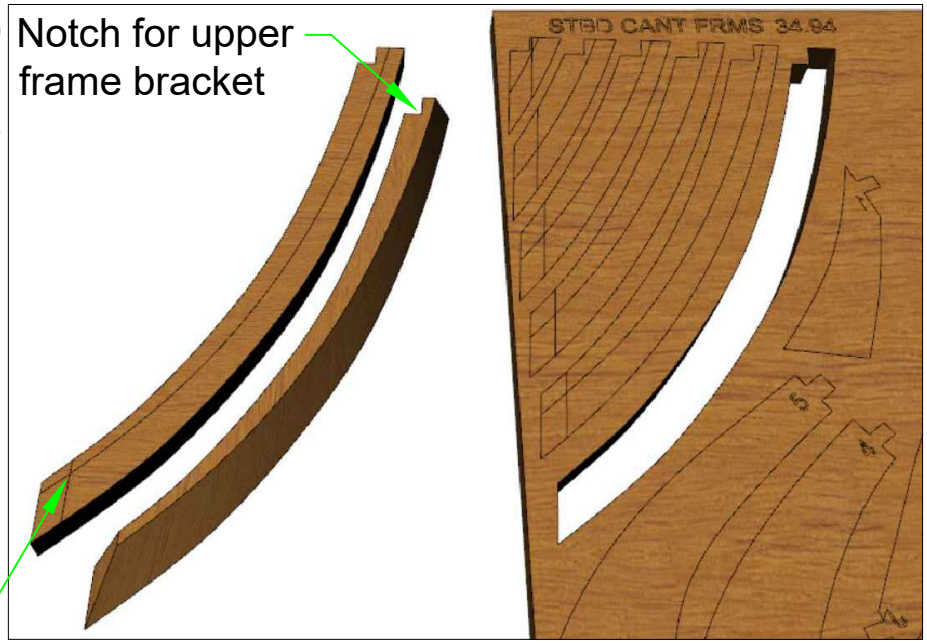


Once the remaining forward frames are complete we can move onto the bollard timber and hawse pieces, these actually go together quite easily but require some careful sanding. If you have a Byrnes sander then it should be pretty easy.

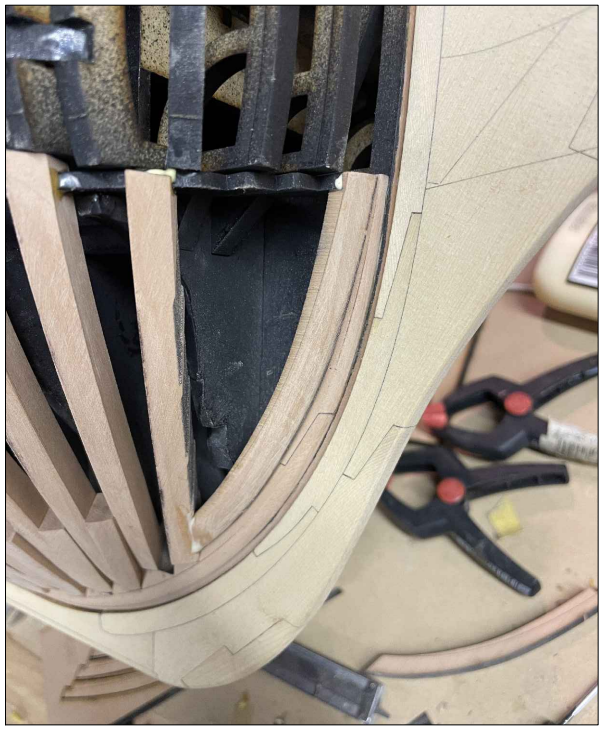


.21875" Pear sheet of hawse pieces and wing transoms.

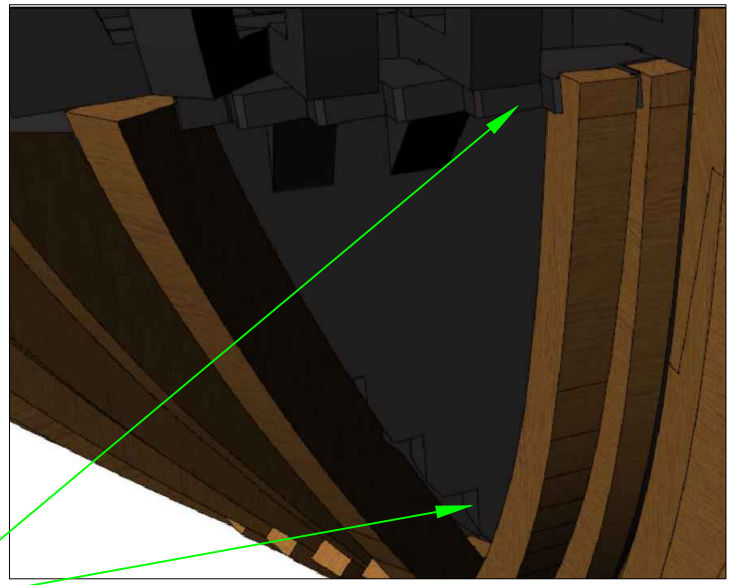
The bollard timbers and hawse pieces come with two reference lines, one is the required angle at which they meet frame 1a and the other is the reference for fairing. I set the angle first but left some extra material while I test fit dry several times. If frame 1a is slightly off and set back slightly it could require some additional material at the end of the hawse piece, So go slow and carefully when removing material. Once satisfied with the fit you can start fairing it down.

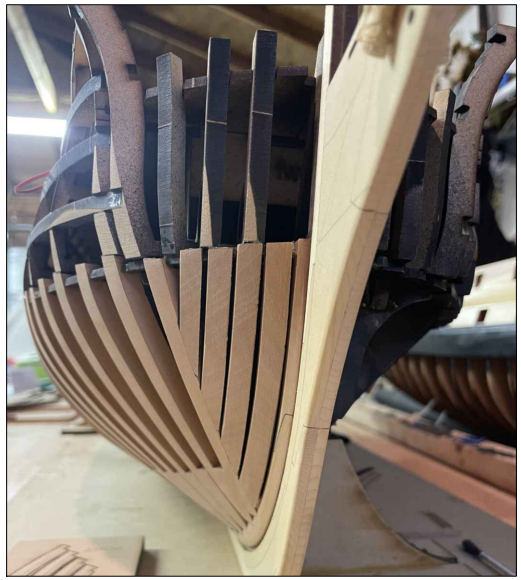


Angle reference to bollard timber s1a as well as fairing, fair it down but don't go all the way, leave some extra material to work with.Its just easier to remove the bulk of the material off the model.



Once the bevel to attach to frame one is good and the joint appears tight attach to the model.

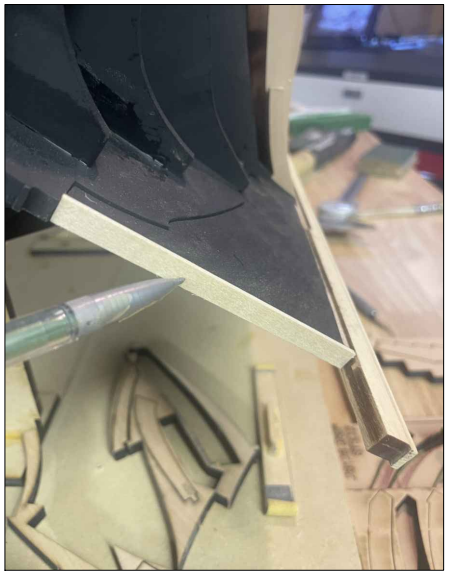


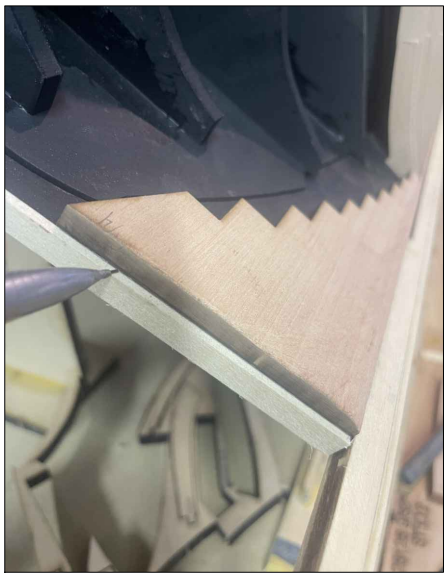


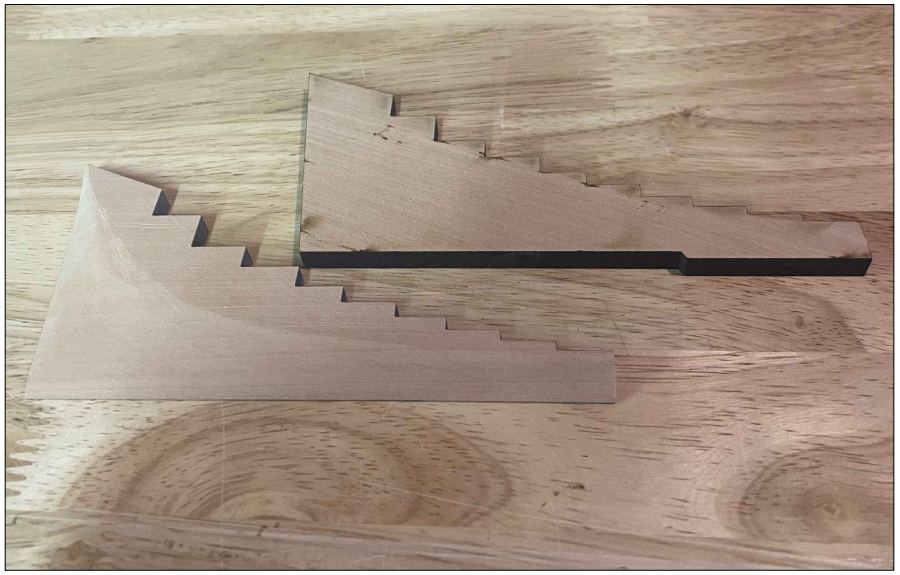
The upper frame bracket and bulkhead 1 have locations for each hawse piece to rest on, these ensure the proper spacing between the hawse pieces which is set to about $\frac{1}{32}$".

With our hawse pieces complete its now time to move on to the aft remaining frames, these are similar to the bow with a few different methods of fixing them to the model. Similar to the forward frames and the apron, with the stern we begin with the deadwood.

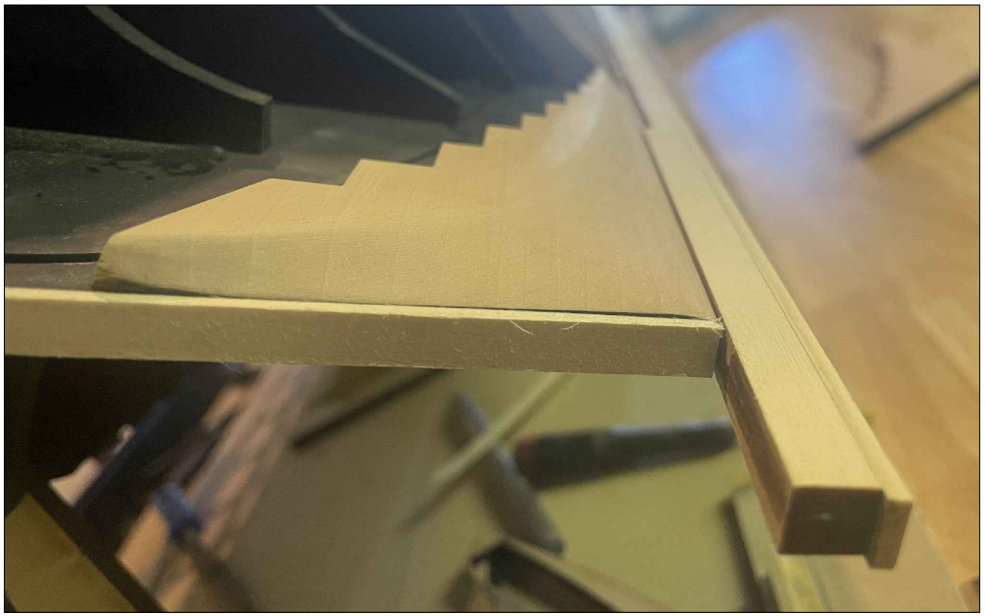
We need to attach a $\frac{1}{4}$" wide scrap strip to the end of our false MDF deadwod filler in order to establish how much material needs to be removed from the laser cut deadwood sections we are about add. Below you can see the strip i added to the back of the $\frac{1}{8}$" MDF deadwood piece. With this in place we can pencil in a line so we know where to stop sanding. you can see the part i removed material from below, i didn't go overboard and will fair the rest out when the frames are on but at least get the lower and back part as close as possible as they will be harder to sand once the stern post is on and the keel is in the way.





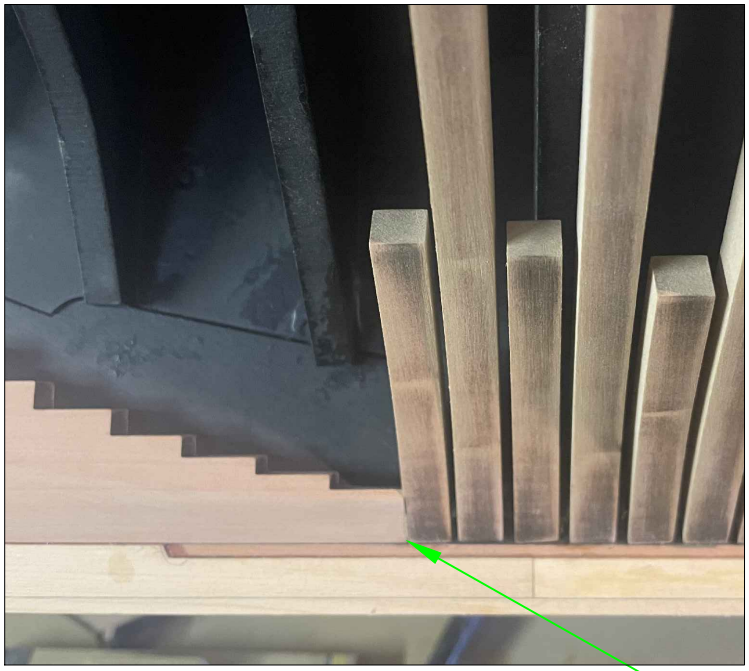


Note: The deadwood is similar to the apron, is etched and also requires bevels.

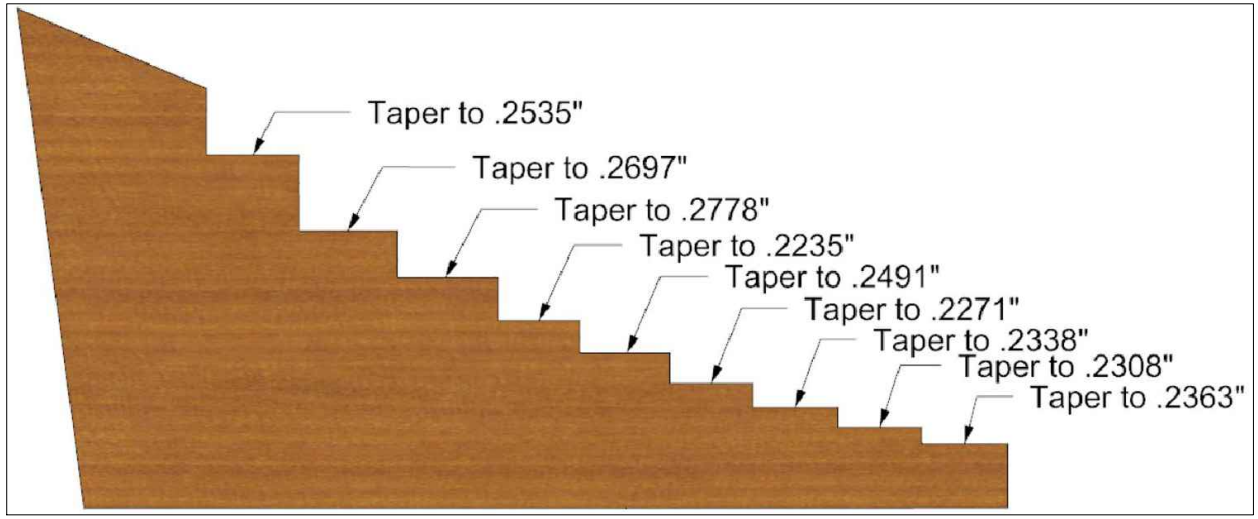


With the deadwood in place, you can see that the edges are sanded down to fit within that $\frac{1}{4}$" strip and also the lower part where it meets the keel is set back and you could fit a plank in there. More material will come off later once i begin fairing the hull.

Below you can see the deadwood butts right up against the aft end of frame 43b. Make sure the joint between the two is tight. go ahead and secure it. I used PVA and noticed that it wanted to curl up a little so i removed and used CA along the perimeter with as many clamps as i could use and it worked out fine.

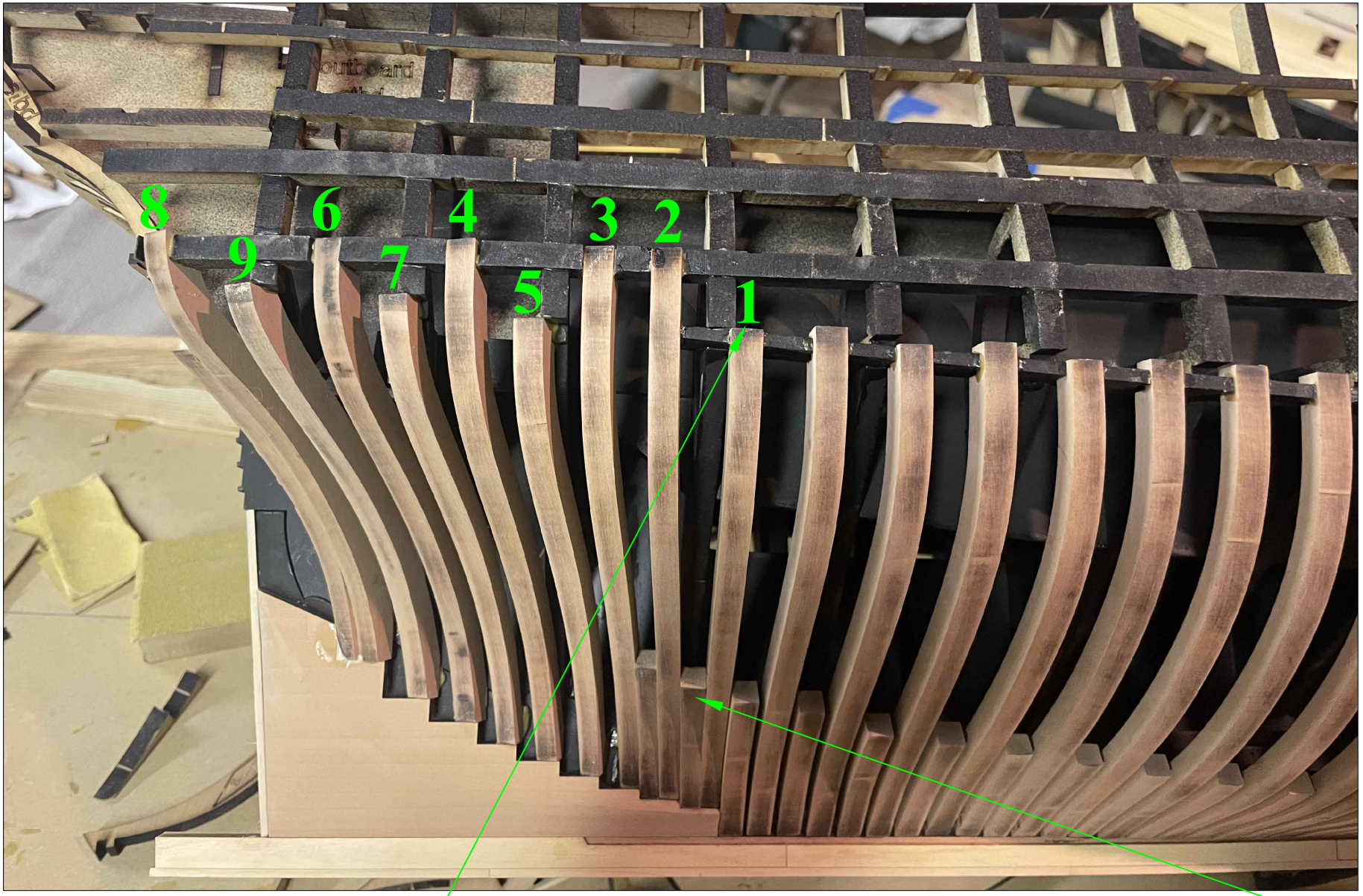


Deadwood butted up to frame 43b



Above, like the Apron I've given the required tapers at the lower ends of the frames so they all fit together evenly on their respective steps. The reference lines for the bevels are there as well. Like the apron, carefully fit the b frames to be parallel to the a frames and tight to the bevels.

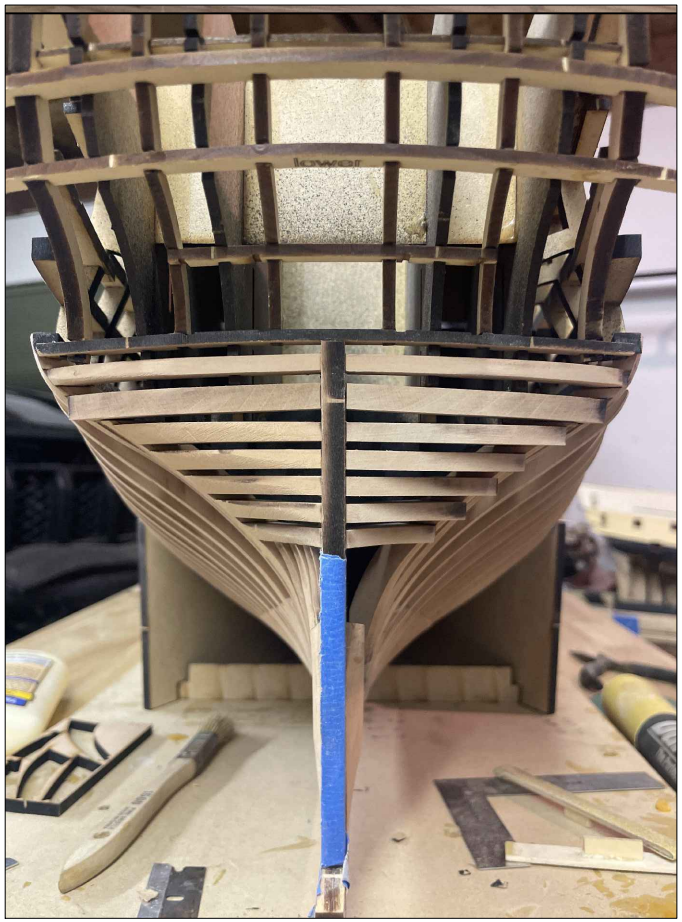
Moving forward with the aft frame installation I installed all the full frames first but i did them in a certain order as there are three full frames that do not have a bracket that retains them, by installing the retained frames first it will allow you to evenly space the ones in between.

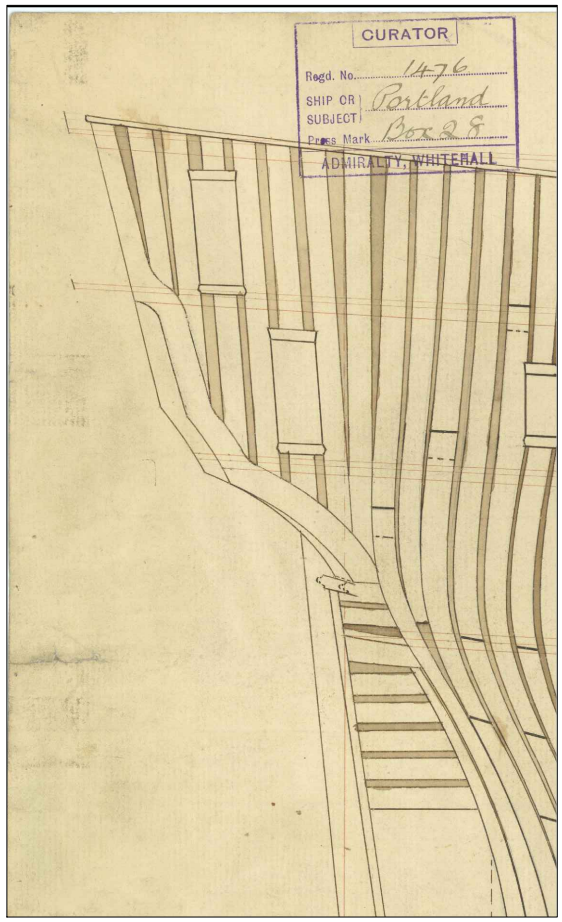


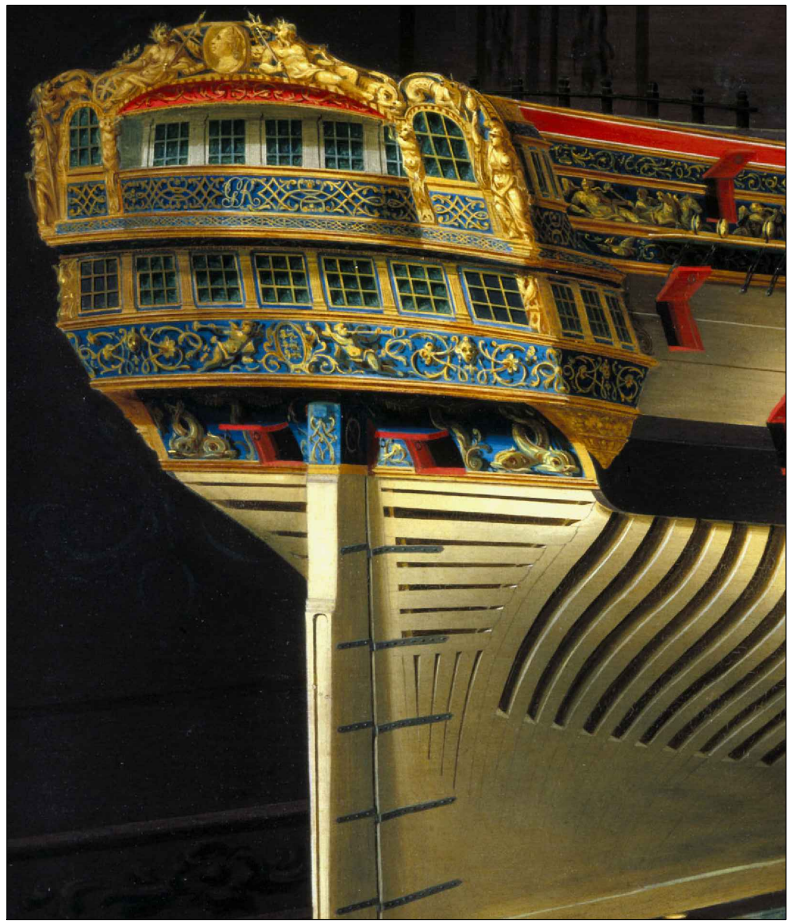
Frame installation sequence beginning with44a.

install "b" frames after all the full ones are installed. if your tapers were done correctly on the "a" frames then you should be able to sand the b frames to fit and wedge them in place.

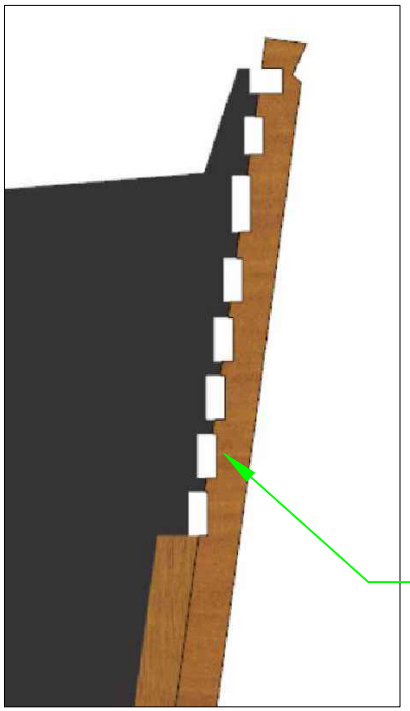
The final structural element of the hull is the wing transoms and the vertical fillers, they are of four different thickness of wood ranging from $\frac{1}{8}$" to $\frac{9}{32}$". Below you can see the completed transoms with the port side already partially faired with vertical fillers installed. Next we have the framing plan for Portland showing a pretty good detail of the wing transoms, compare the contemporary painting for reference. Upon studying the painting, the details match the framing drawing pretty well, to me this indicates a detailed model of Portland existed or possibly still exists and was used as the basis of Marshals work.







Lets begin with the inner post, this should fit up against your deadwood squarely and snug under your bulkhead former as shown to the right, when happy with the fit go ahead and glue in place.

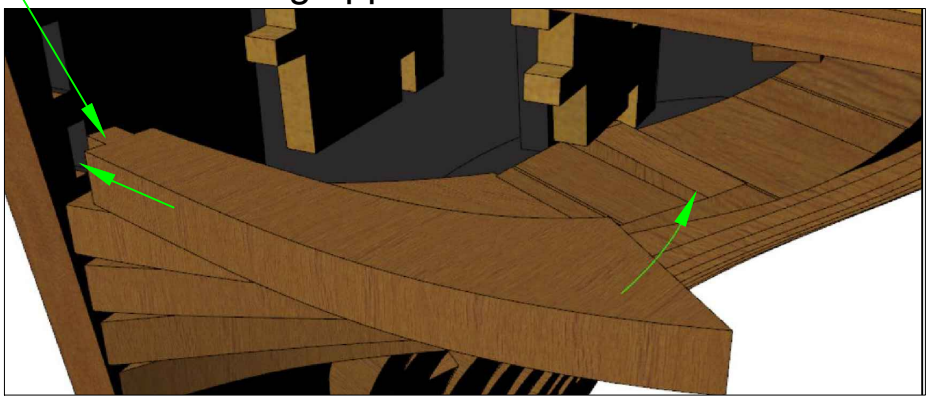


The outer post lined up with the bulkhead former to form receivers for the wing transoms.

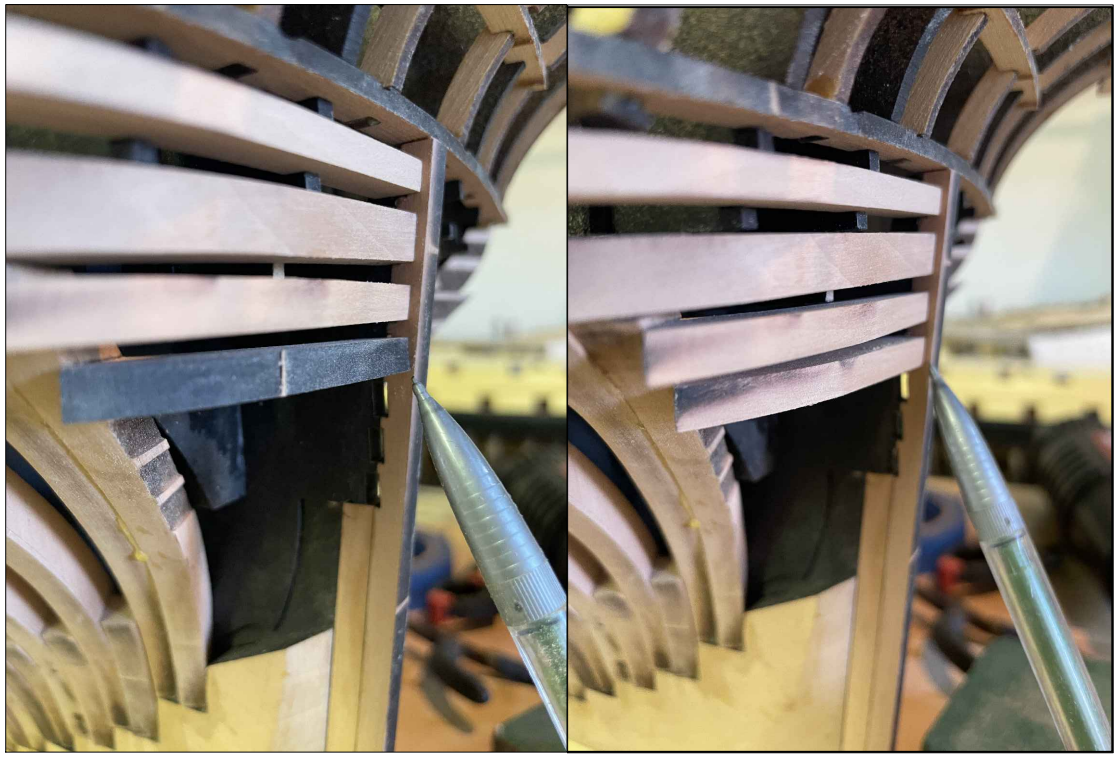
Now to the outer post, this should fit tight to the inner post but also notice how it fits to the bulkhead former to make the receivers for the wing transoms, you may have to slightly trim it to get it to line up perfectly. See the photo to the left as well as the rendering above. Keep in mind that these parts are all $\frac{1}{4}$" so you want to keep the posts centered with the former and deadwood.

The wing transoms are pretty straightforward, they require some test fitting before going on the model. The upper transoms will be visible from the gun deck so I removed the char on both sides but also keep in mind that we will need to fair the inside of them as well that's why they are so thick and bulky looking.

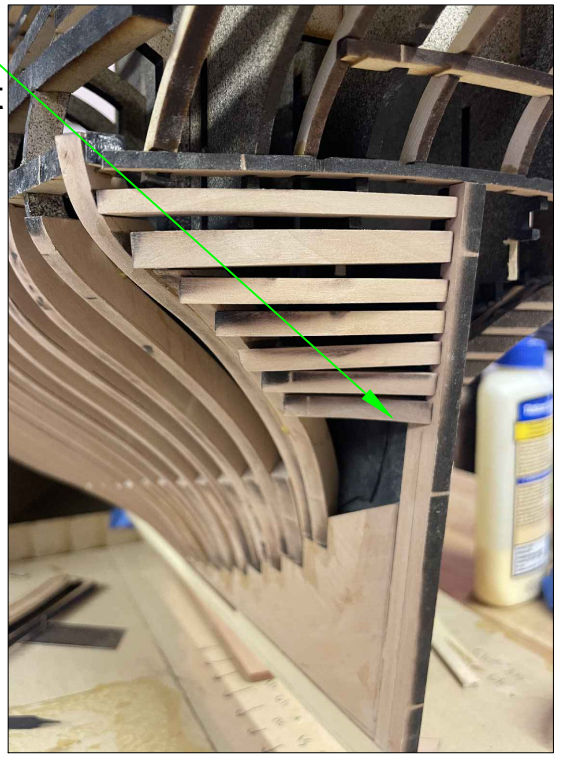
You may have to trim the tabs on the other side when installing opposite transoms.



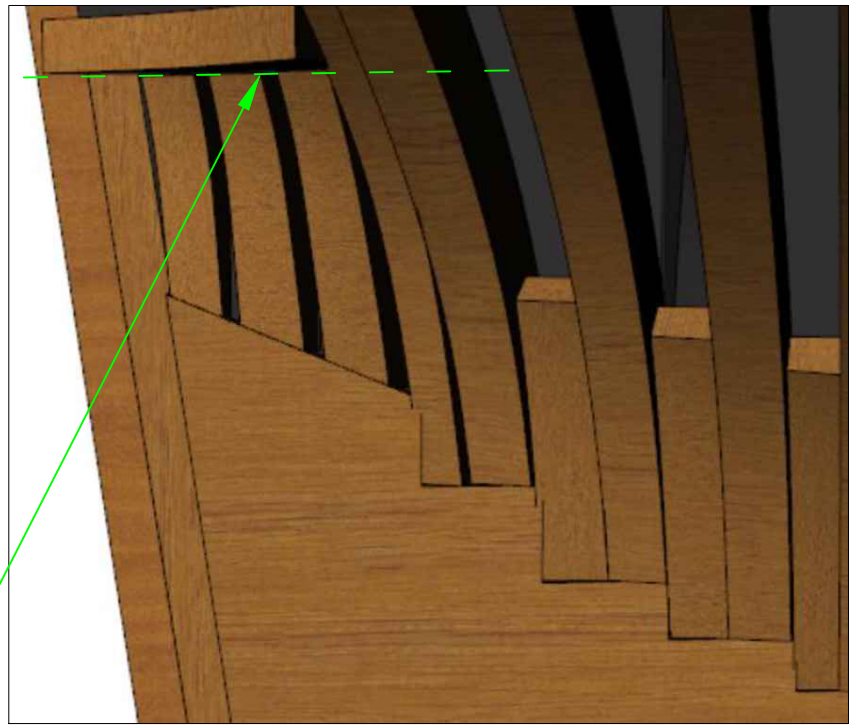
In the photos to the below left, the fourth transom down is being test fit, you'll notice that it needs to be beveled so that the face runs parallel to the outer post, carefully block sand the transom until it follows the line of the post. In the upper right rendering we can see then same transom being fitted, the end with the tab on it should fit to the post first and it will roll into position on frame 53 where there is an etched position for it to sit. When dry fitting the transoms, if you carefully sand them smooth on both sides they should stay in place dry without glue. You may have to slightly adjust the angle at which the sit on frame 53.



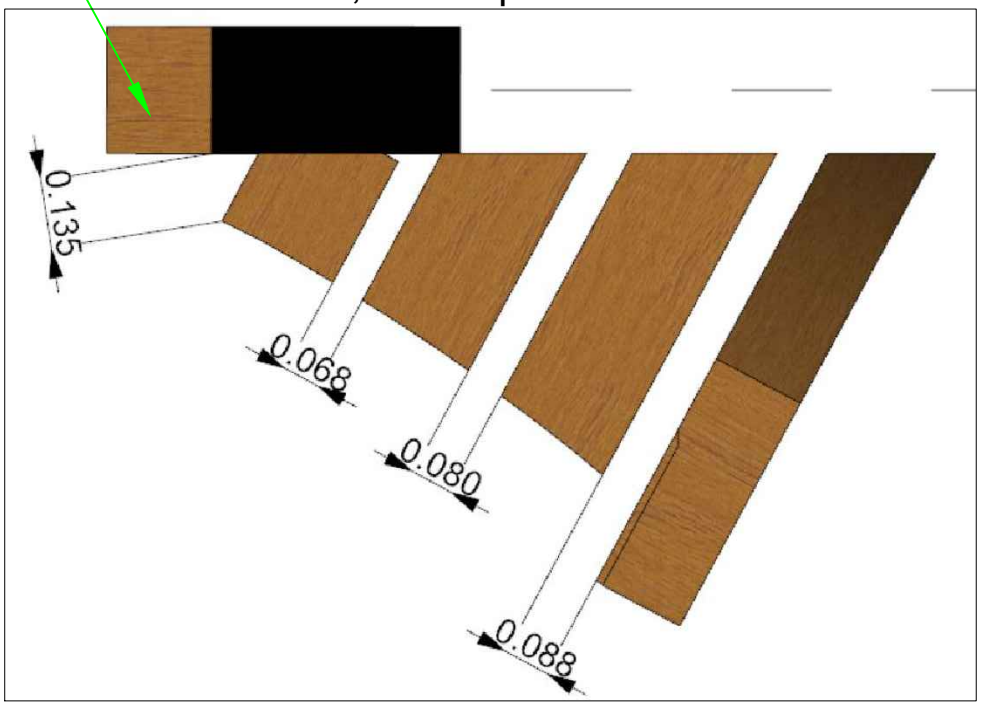
Once you are satisfied with the fit of the transoms go ahead and glue them in, I worked from the bottom up, it was much easier to install them in that order.



The vertical fillers are the last part of the framing and they are tricky so go slow, I have included two sets. They have etchings on the back side to give you the angle to the former but you have to also sand the angle at which they sit on the deadwood and that is where it get tricky because the fillers, like the frames angle aft so that has to be accounted for when sanding to fit the deadwood. The fillers are numbered V1,2,3 with either P or S in front, depending on the side. The etch line faces aft as they angle that direction. The spacing at the top of the fillers between the post and frame 53 is given in the lower right rendering. Since its a complex piece and fit also make sure they pass the eyeball test more than anything.



Cross section A between filler tops, inner post and frame 53, from top.



Chapter 1 is now complete, next we will move on to fairing the hull, so buy lots of sanding tools and be prepared for a massive mess. Once faired we will dive into the planking both sets of wales and the precut upper frieze panels. I am building my model with the garboard strake and one additional above it as well as two below the main wale.