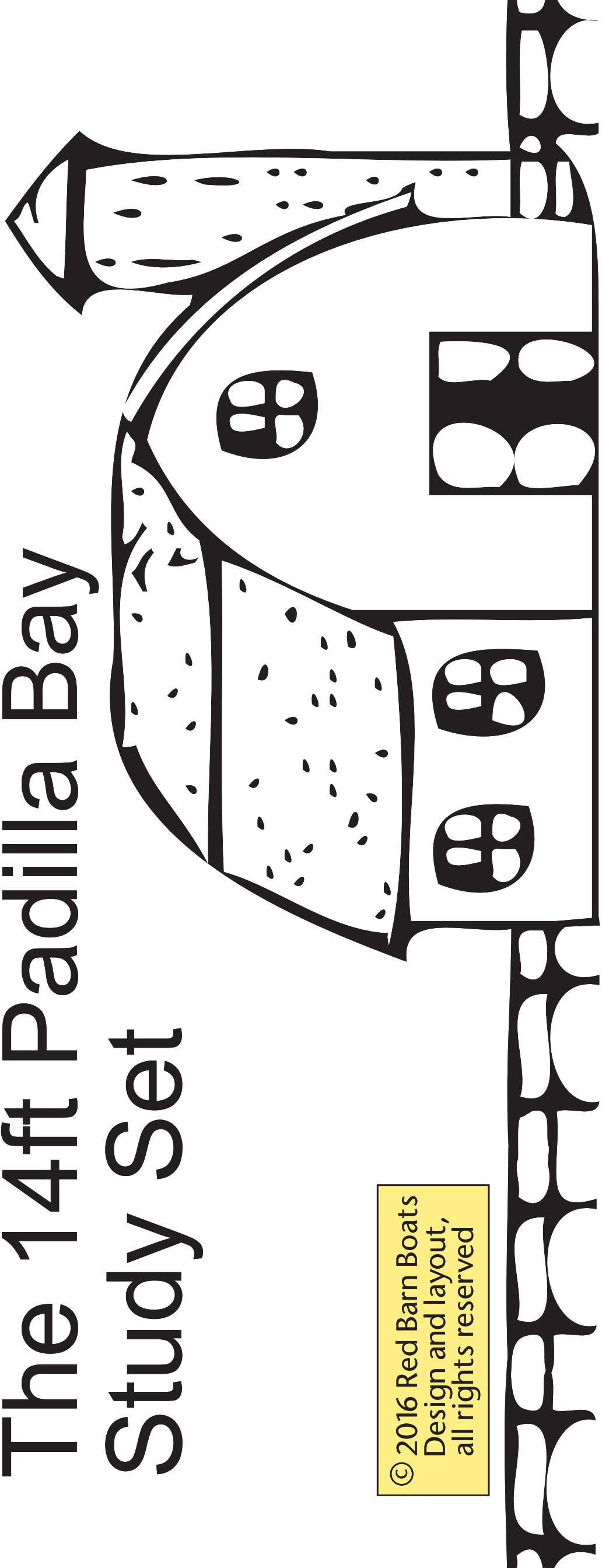


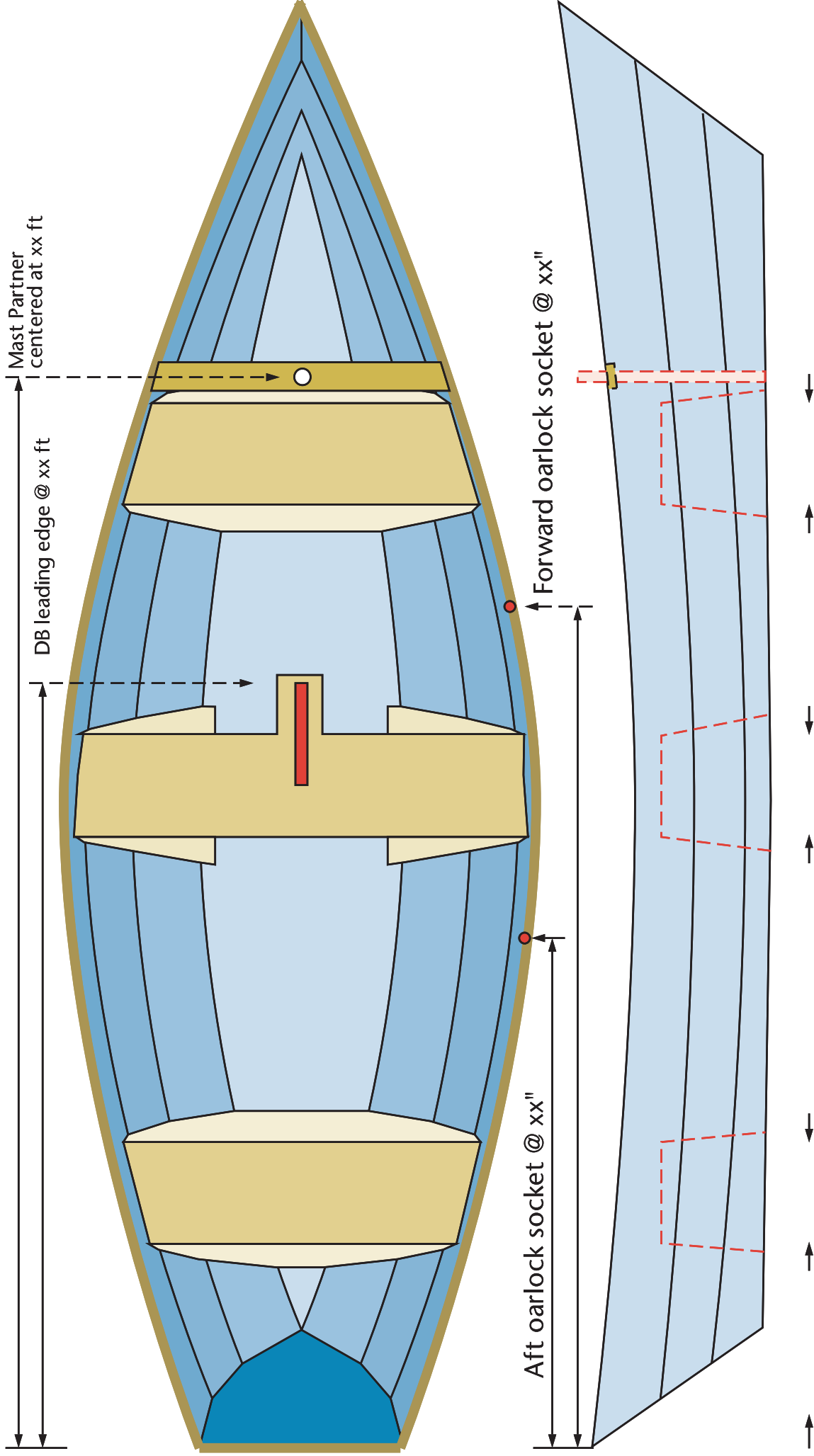
RED BARN BOATS

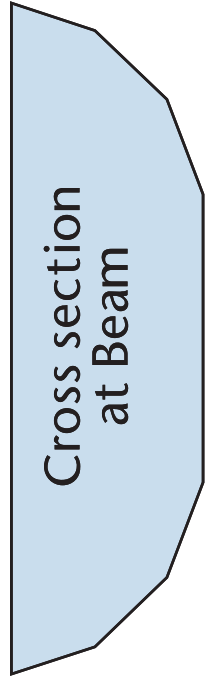
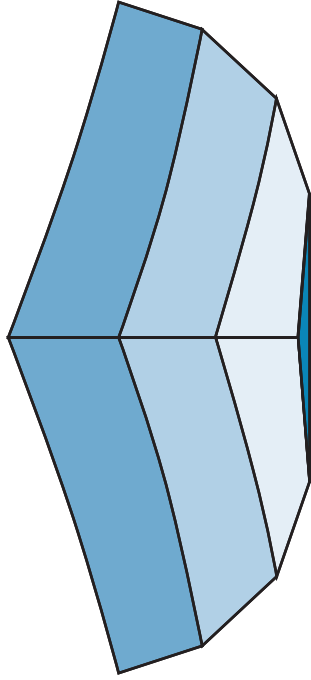
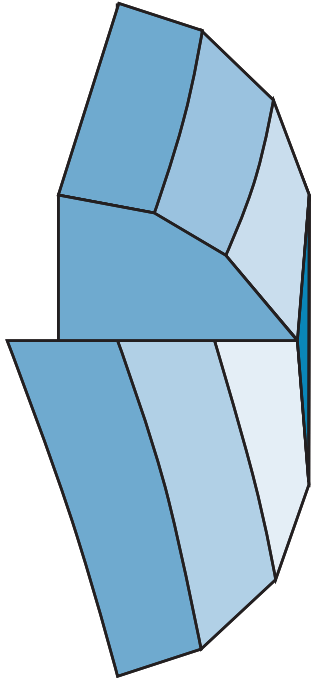
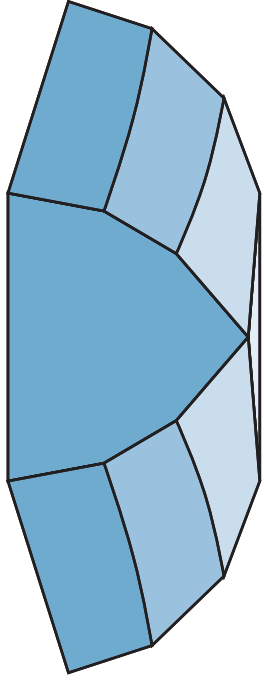
The 14ft Padilla Bay Study Set

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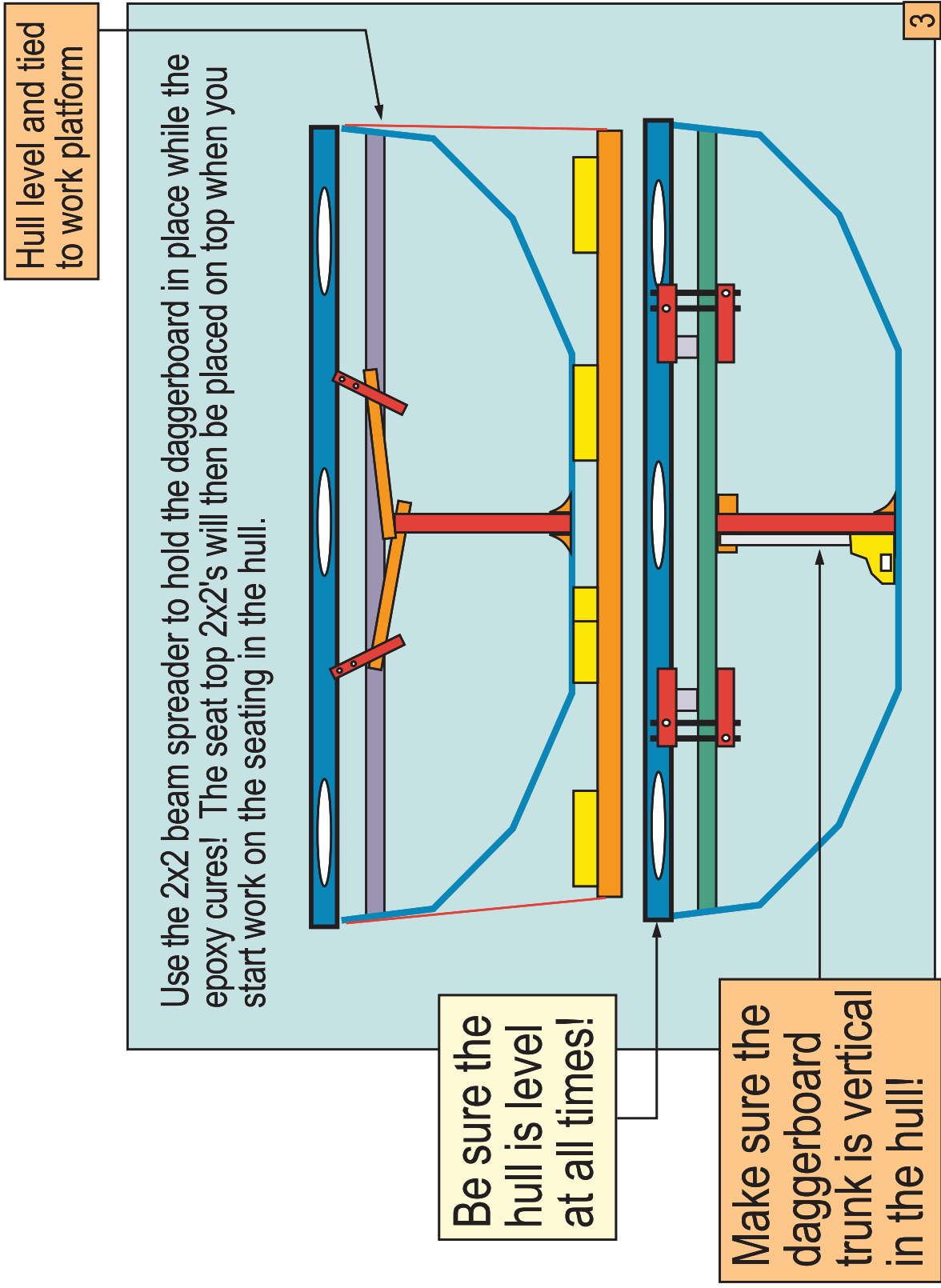


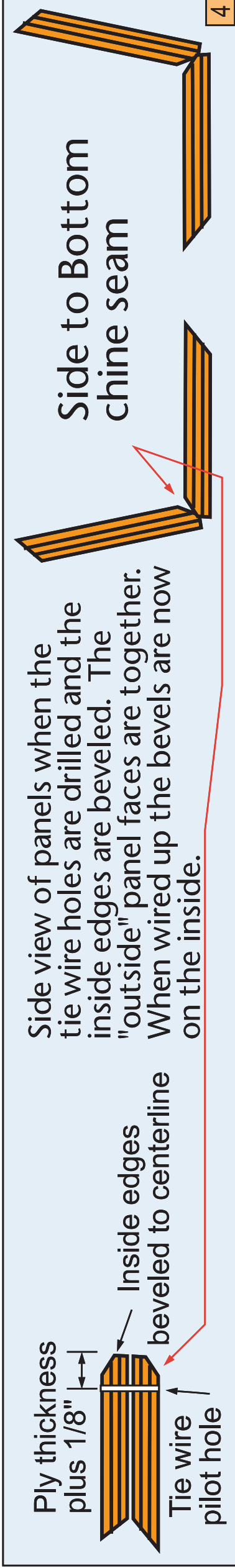
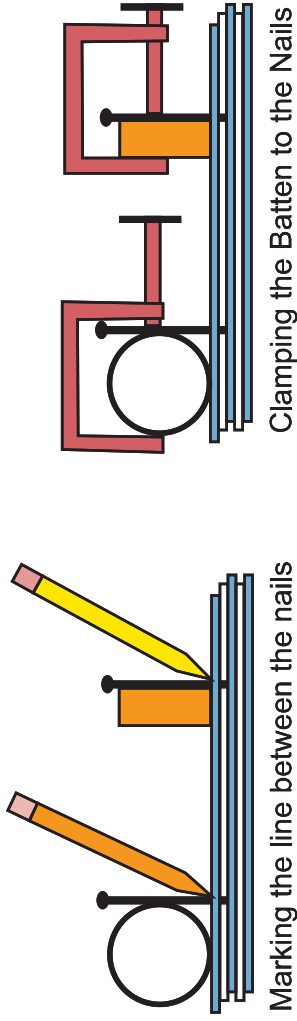
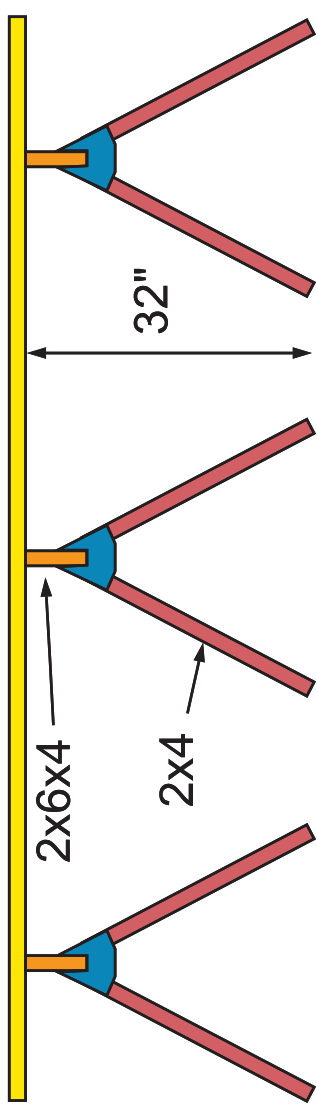
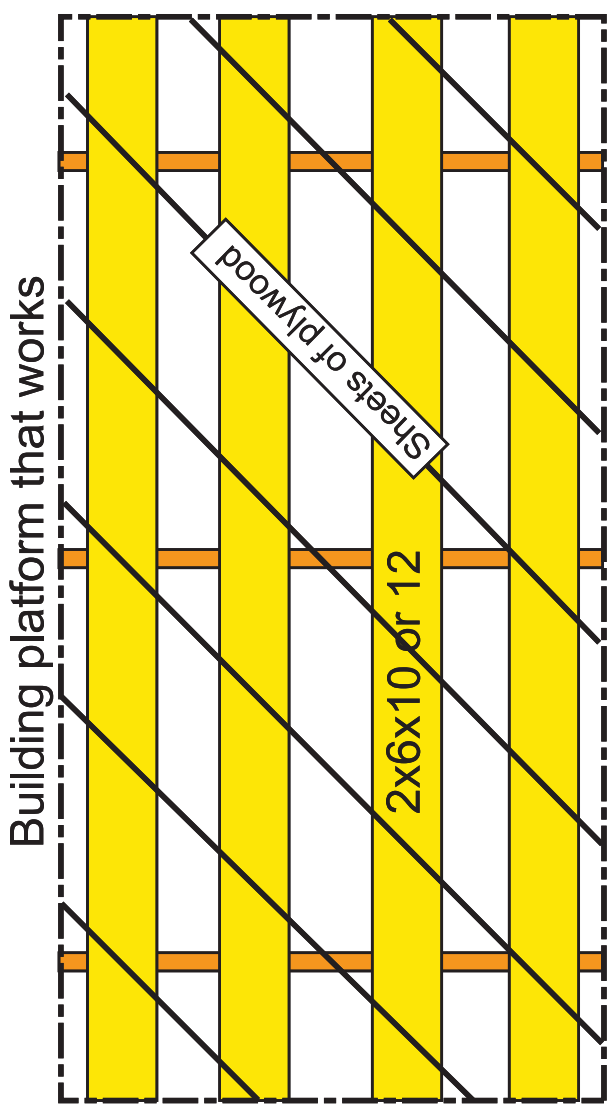
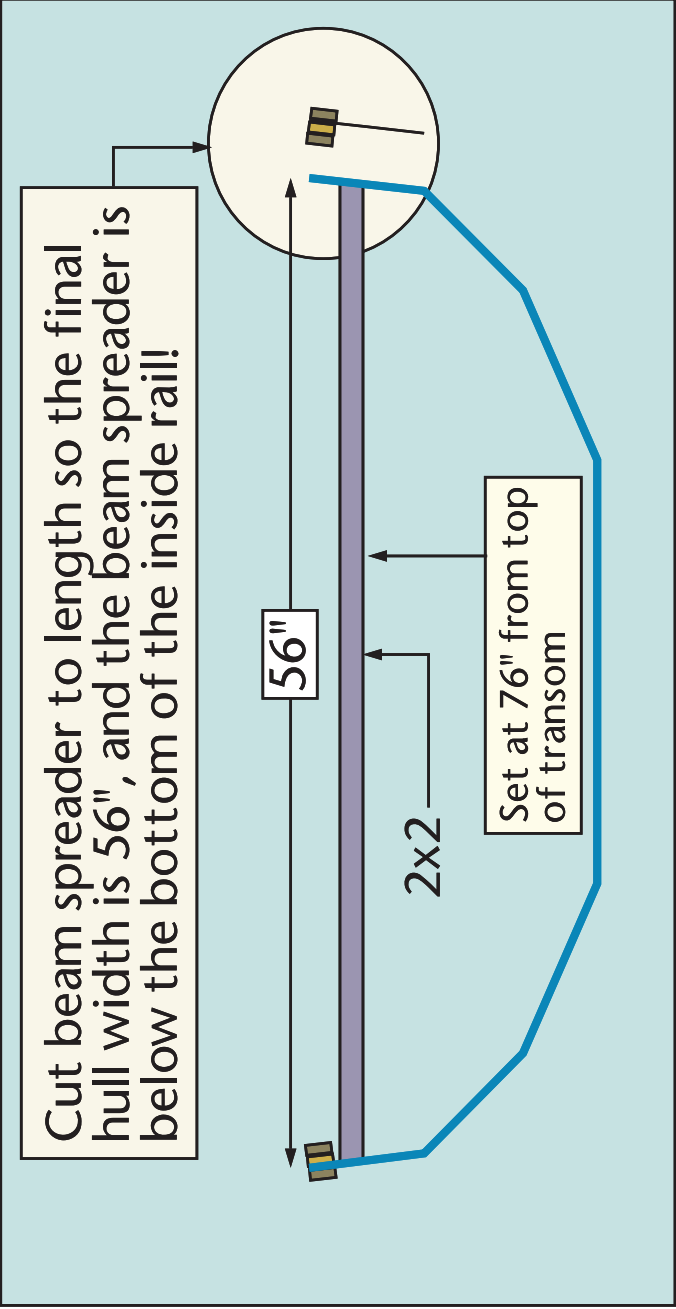
www.youtube.com/redbarnboats

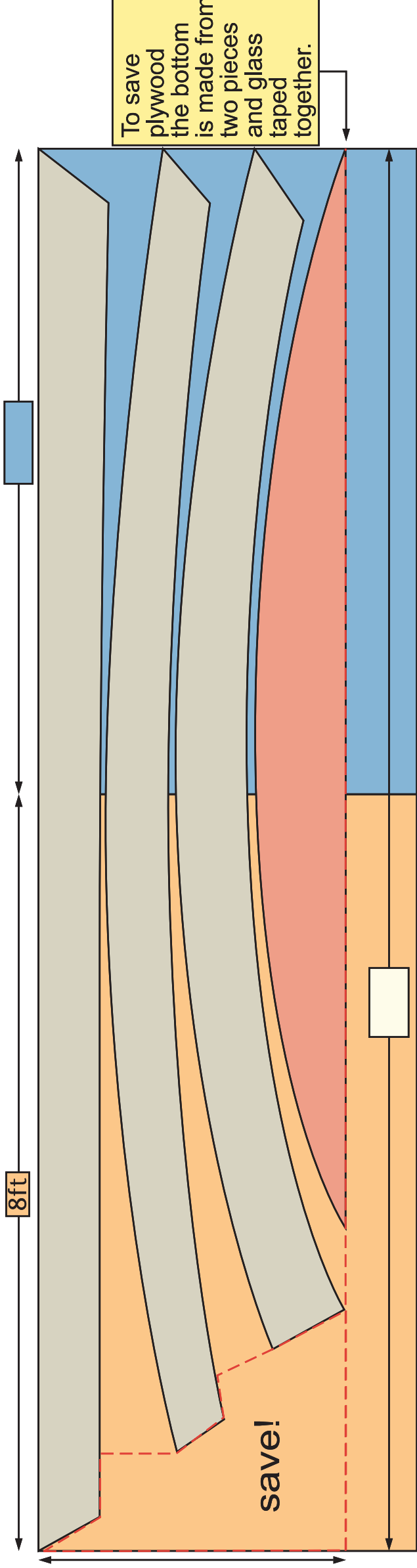




Cross section
at Beam

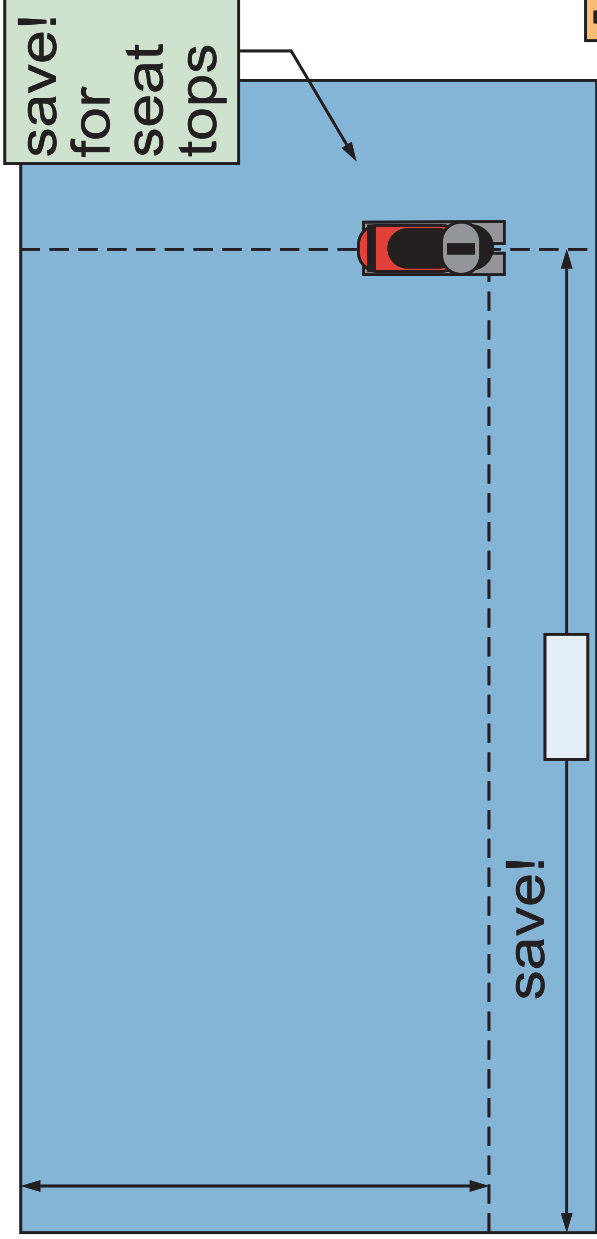
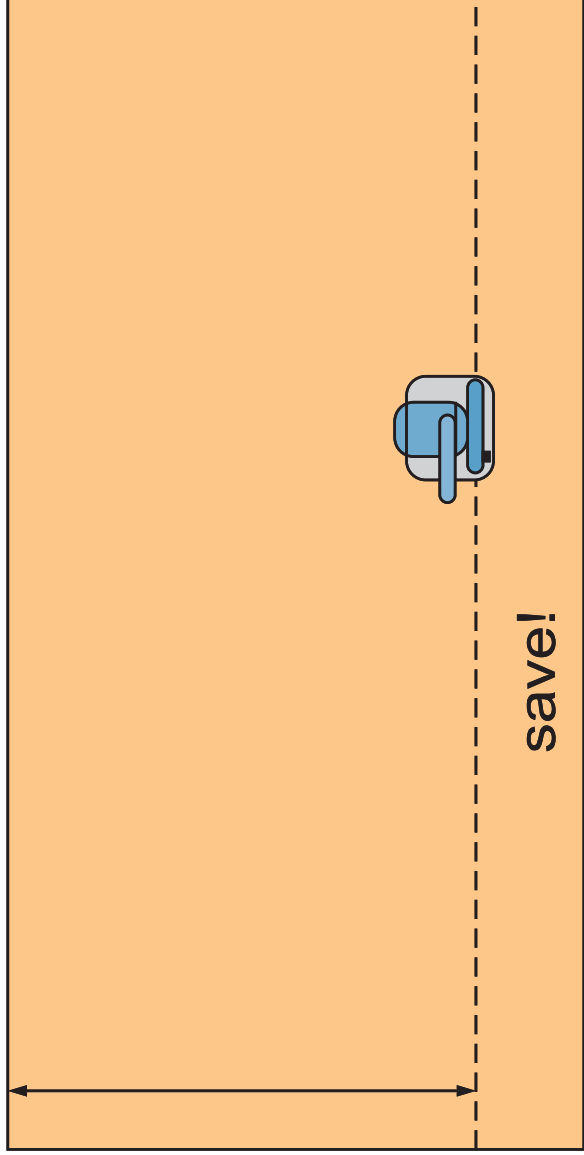


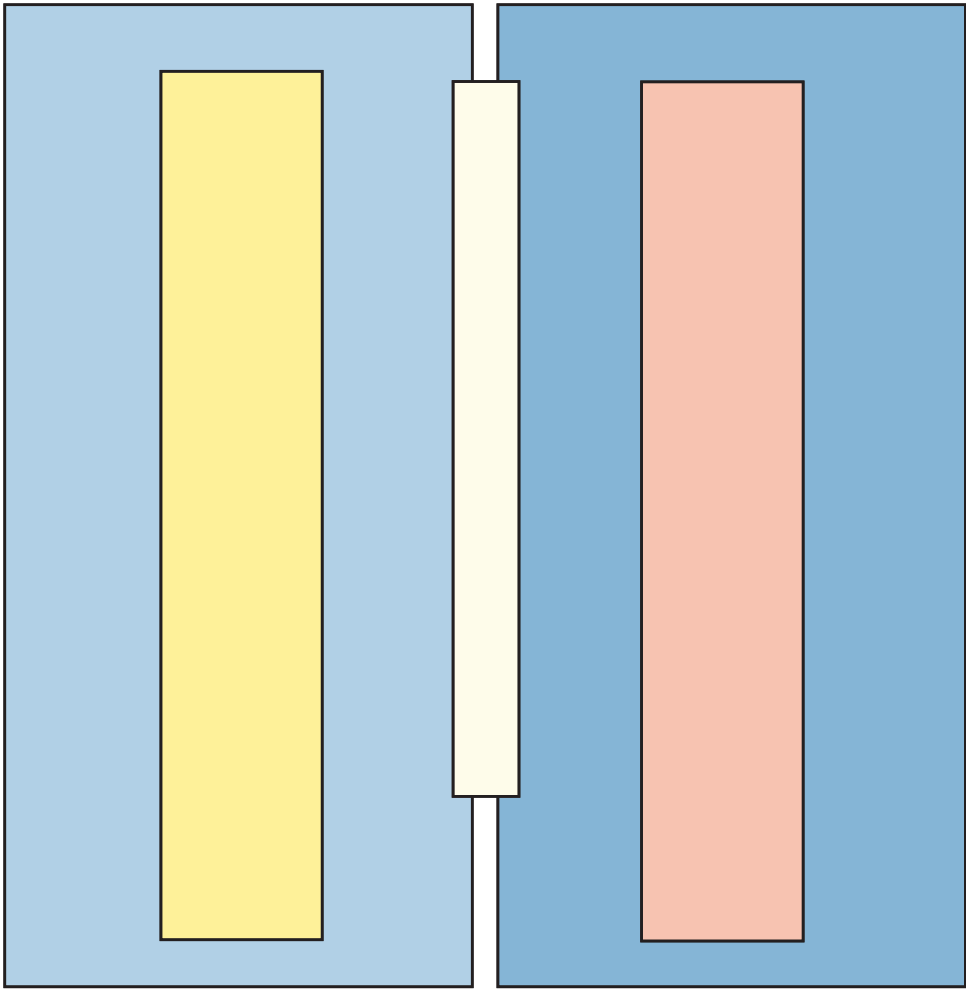
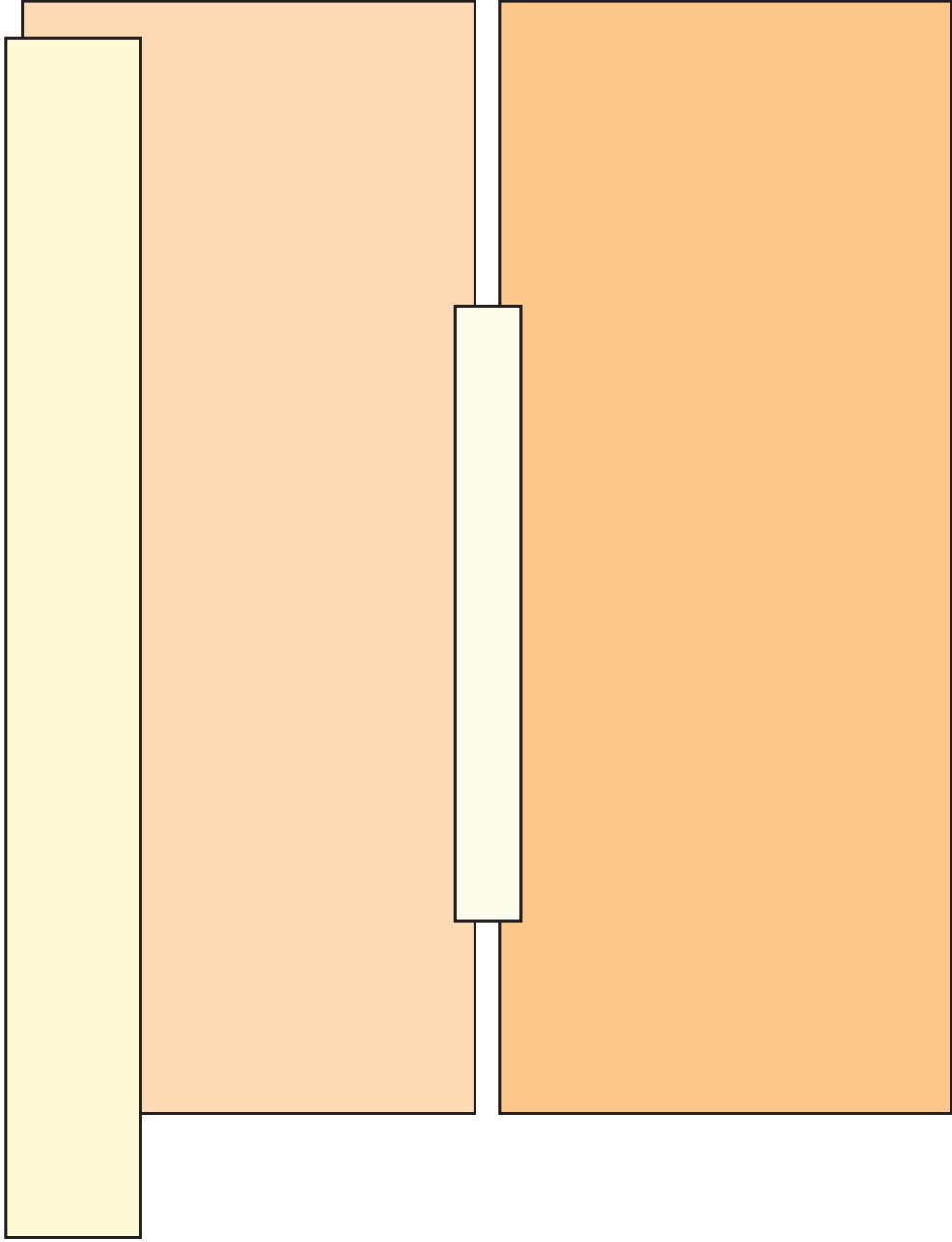




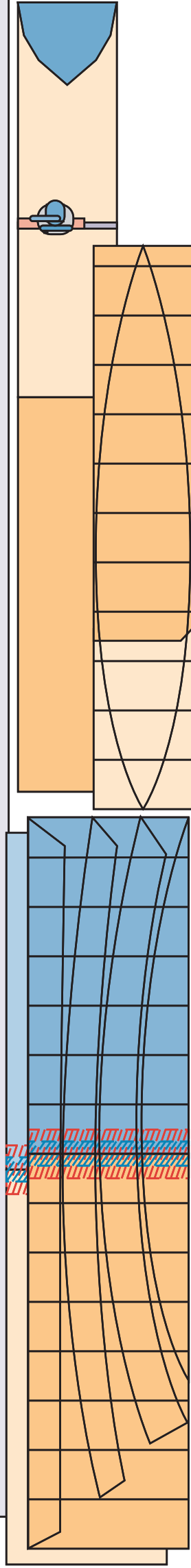
This drawing shows the 4x8 plywood panels and the "cut dimensions" to reduce their size for the lofting process.

Note: You will need two sets of panel pairs for this hull. One panel pair for each side!

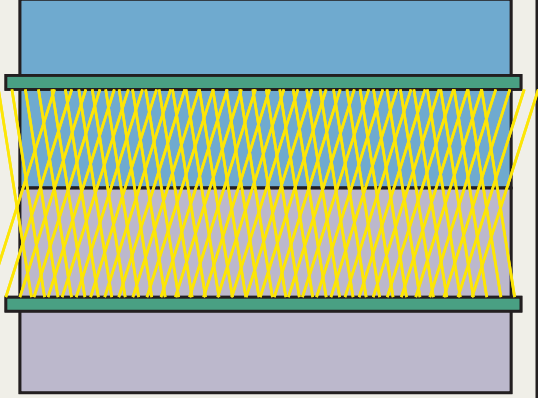




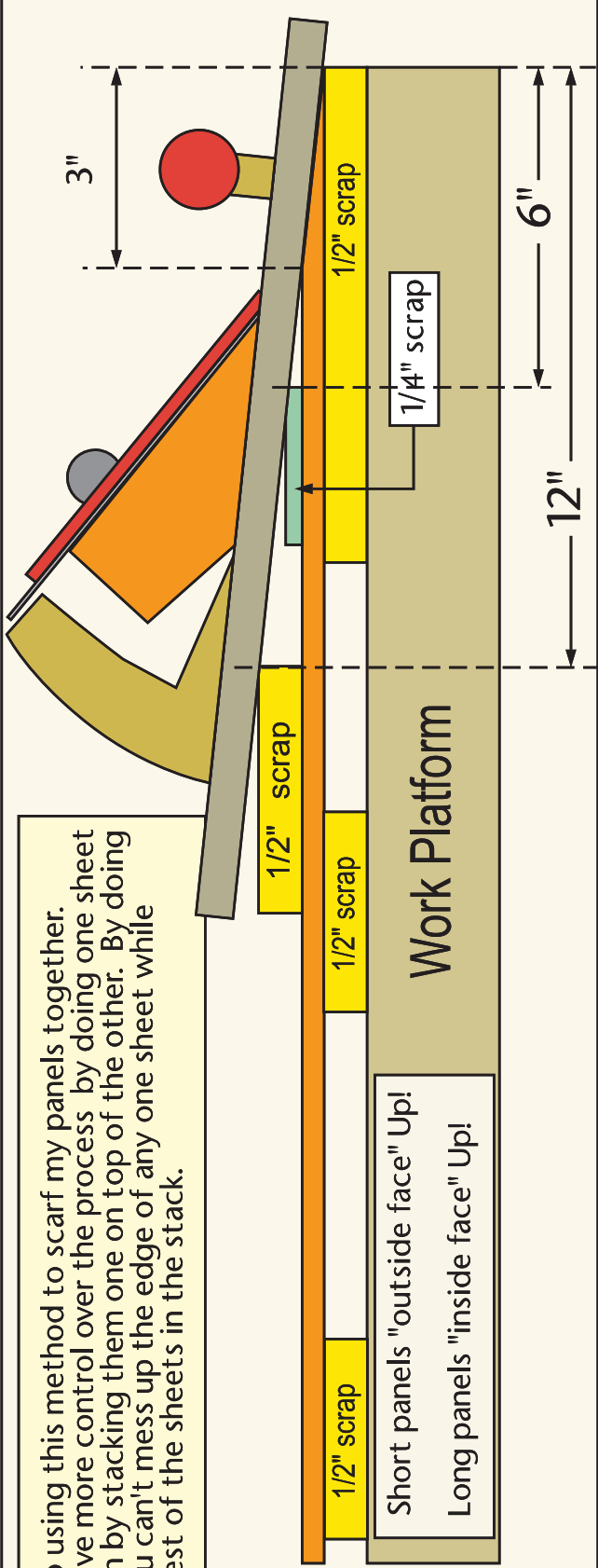
Note: The hull panels will require 4 sheets if you cut the bottom panel as halves and join them together. You will need 5 sheets if you cut the bottom panel as a single piece; which leaves enough for the transom. You will need at least two more sheets for the interior of the hull, but you might be able to get those pieces from the leftovers from the other cuts. If you live close to the store, order them as you need them.



Masking tape to set limits of glass cloth on both sides of a scarf or finger joint!

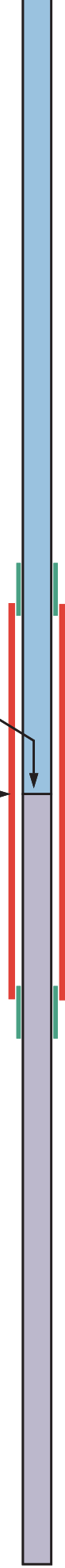


I have gone to using this method to scarf my panels together. I find that I have more control over the process by doing one sheet at a time, than by stacking them one on top of the other. By doing it this way, you can't mess up the edge of any one sheet while scarfing the rest of the sheets in the stack.



Butt Joint with a layer of glass cloth on each side

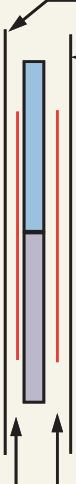
Be sure to apply enough epoxy to "wet out" the mating edges of the plywood!



Something to spread the weight and a Weight on top

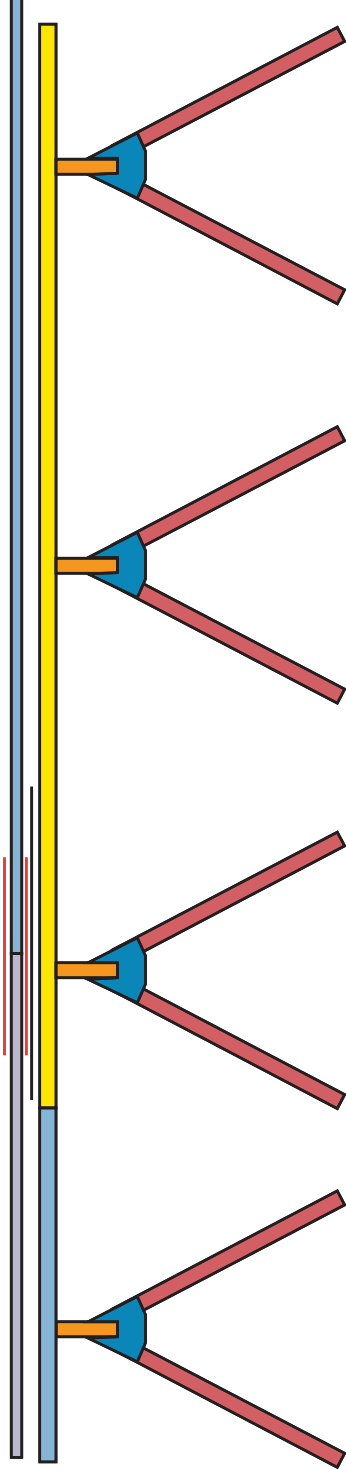


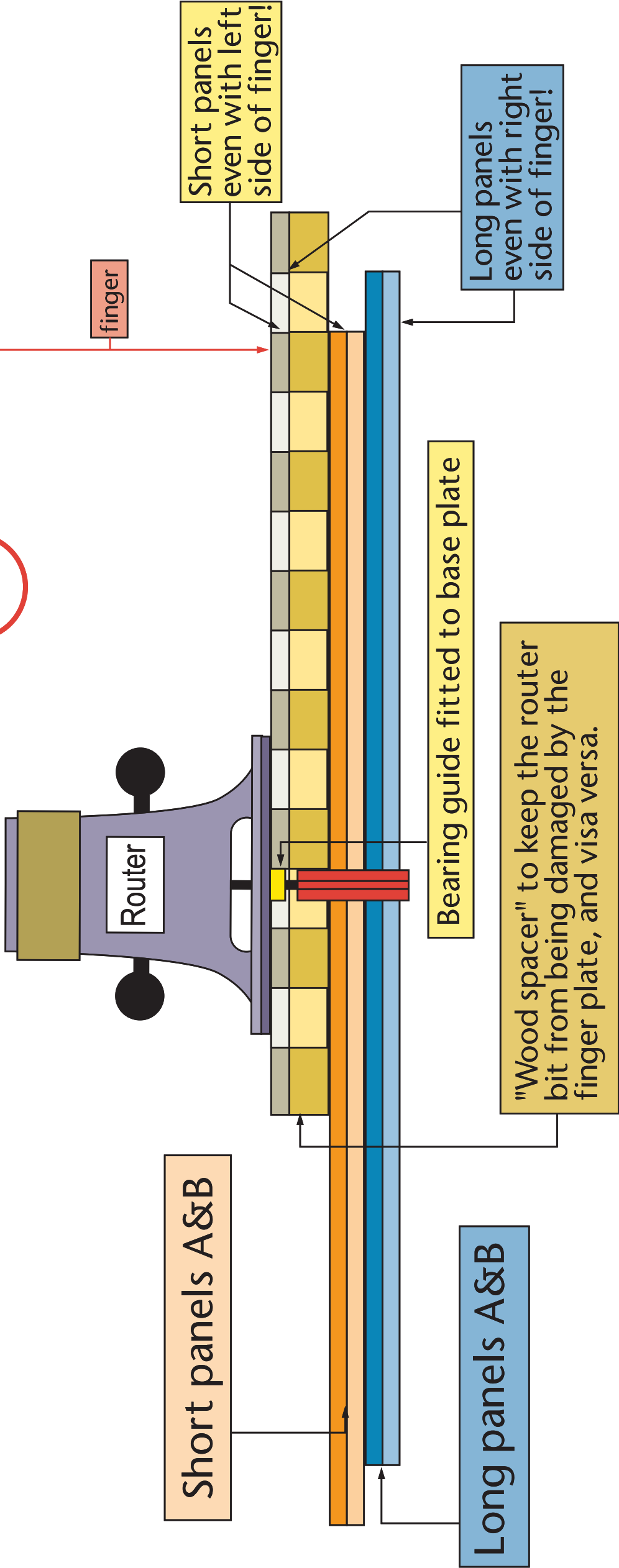
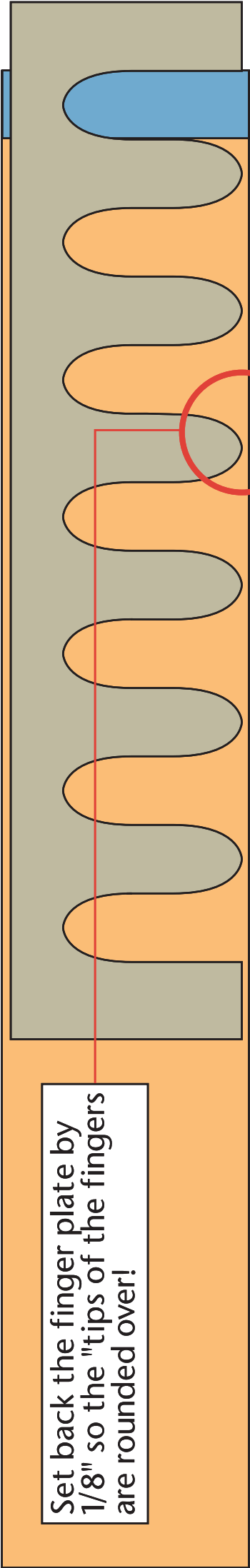
Glass Cloth "wet out"



Black plastic or "Peel Ply"

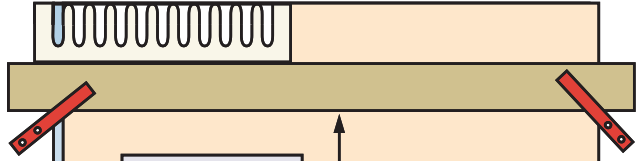
Payson Joint



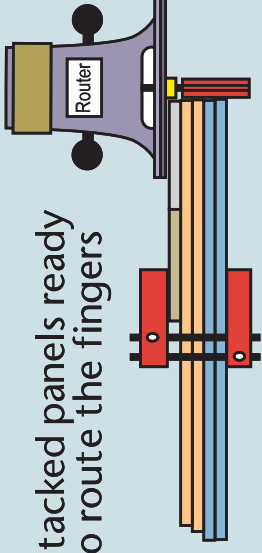


Using a 1/2 finger plate, you would offset the top panel set by 1/2"

Be sure the straight edge is lower than the finger plate so it doesn't interfere with the base of the router!



Stacked panels ready to route the fingers



Note: Number of fingers on either panel will be set by the width of the panels!

1/2"

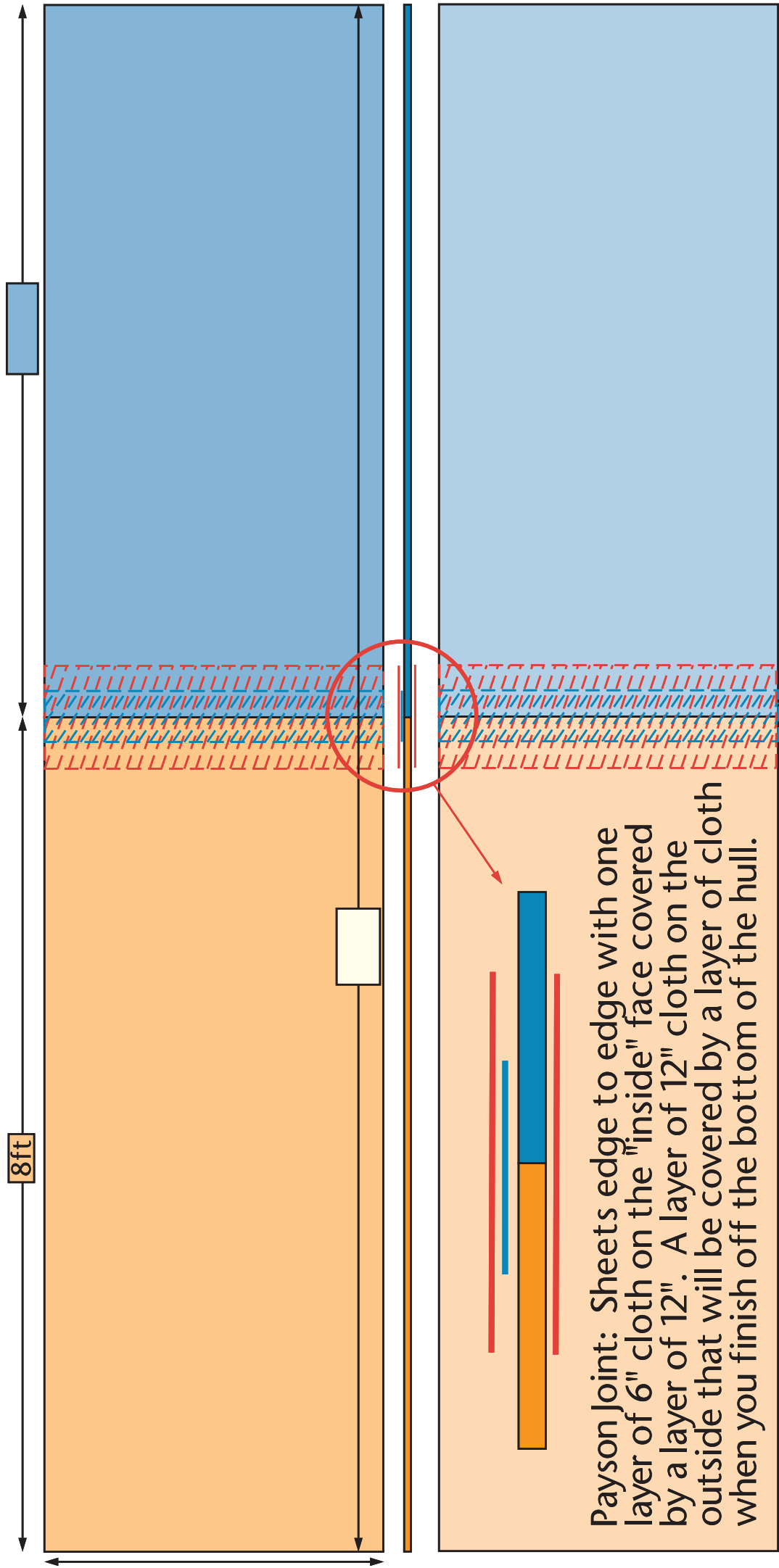
1/2" Finger plate is best to keep "fractions" to a minimum!

1/2" offset

male finger

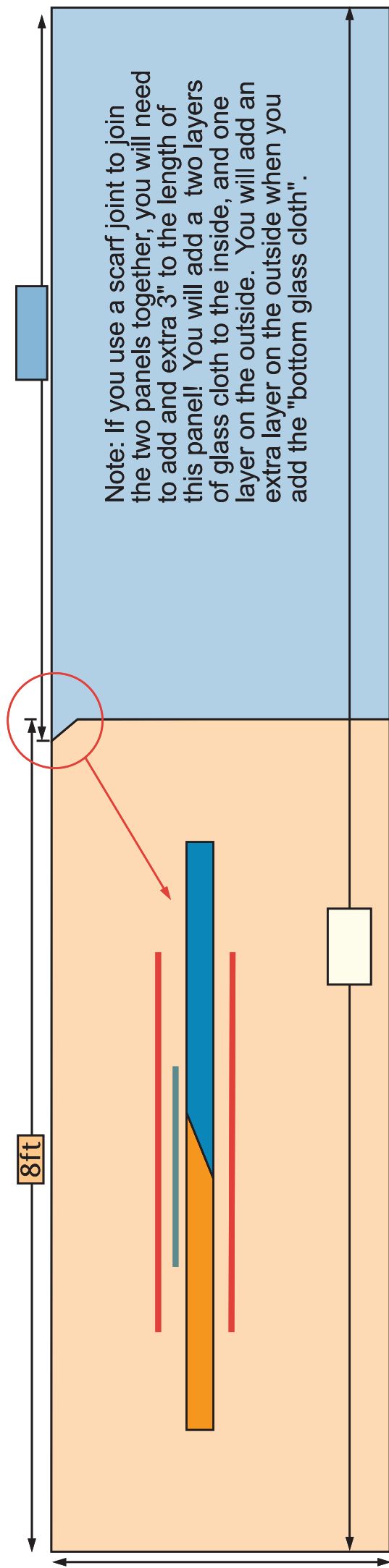
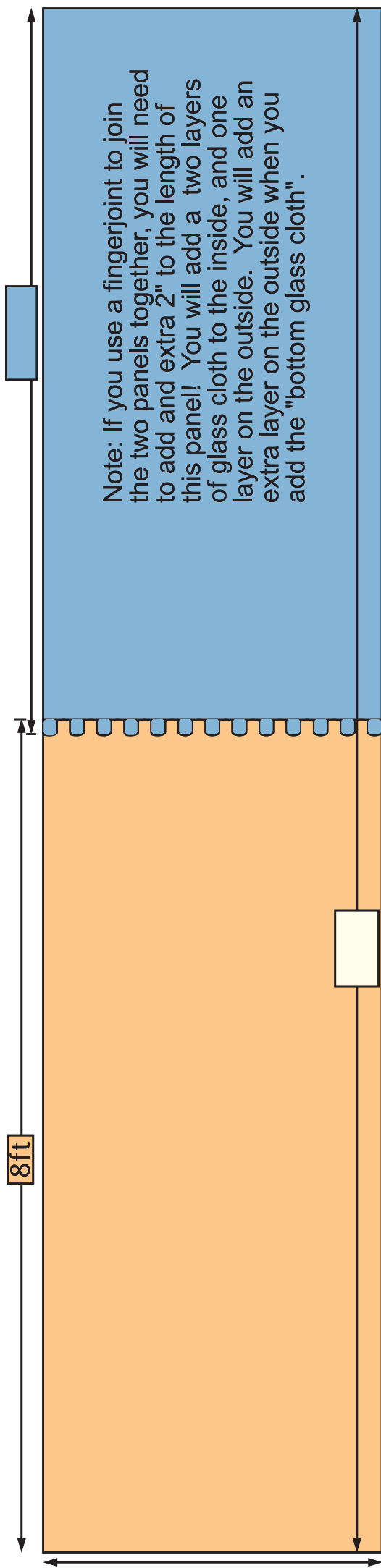
female cut

Two sets of joined panels needed for the lofting of this hull

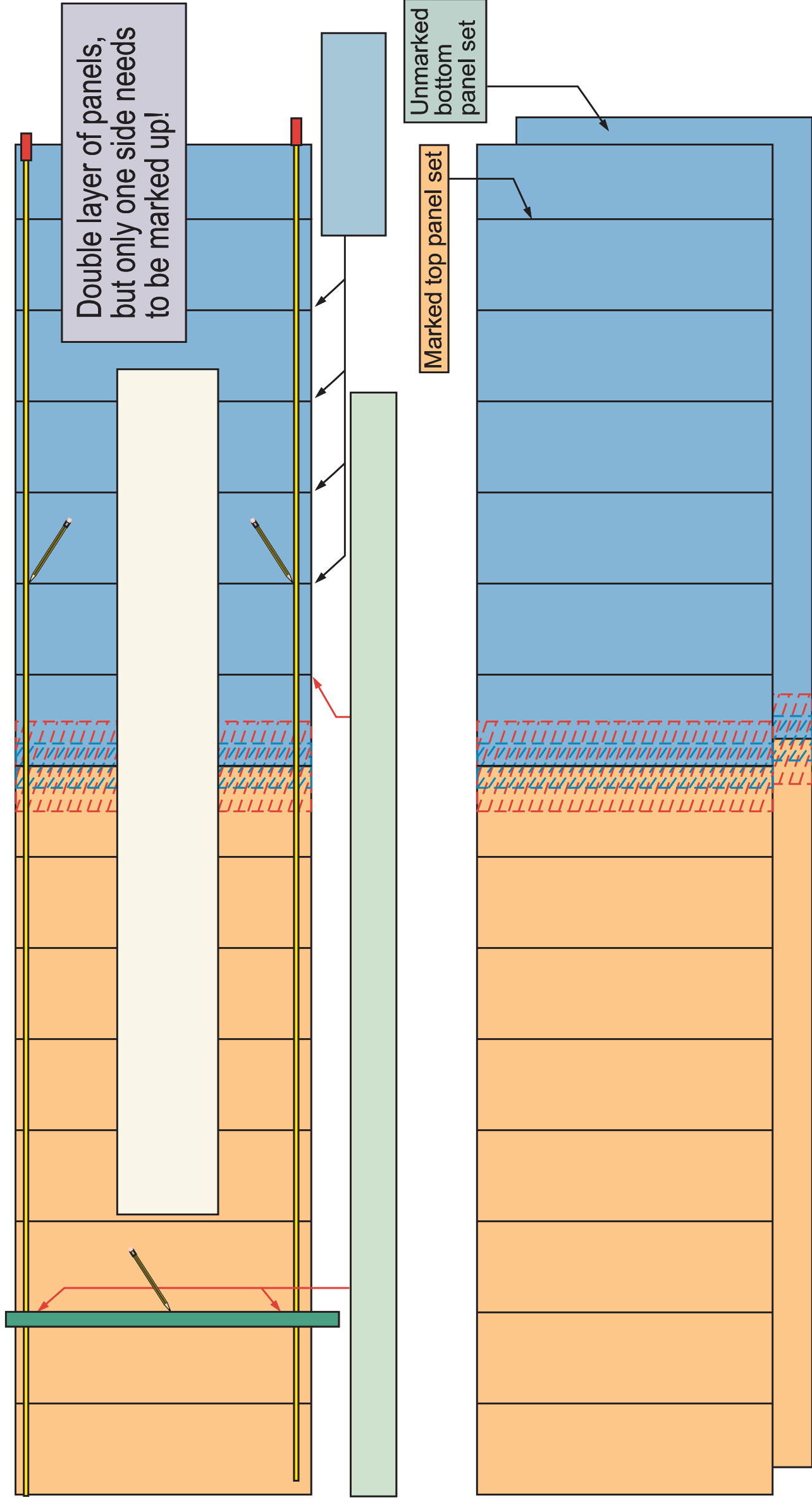


Showing the use of the Payson Joint

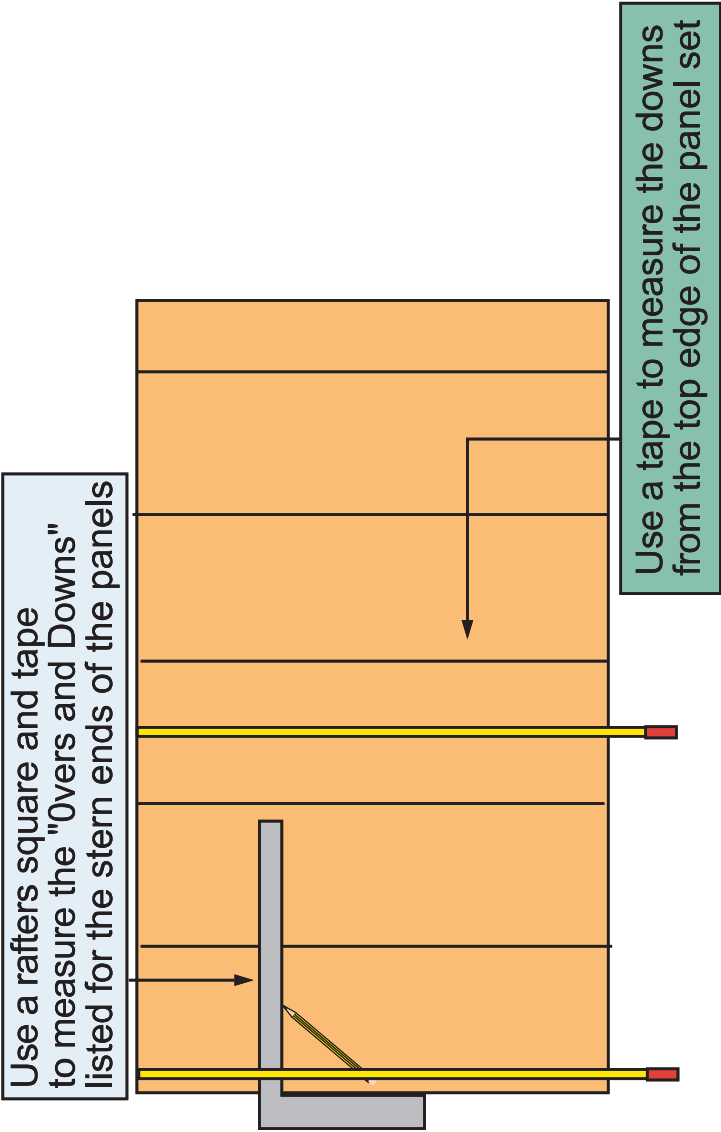
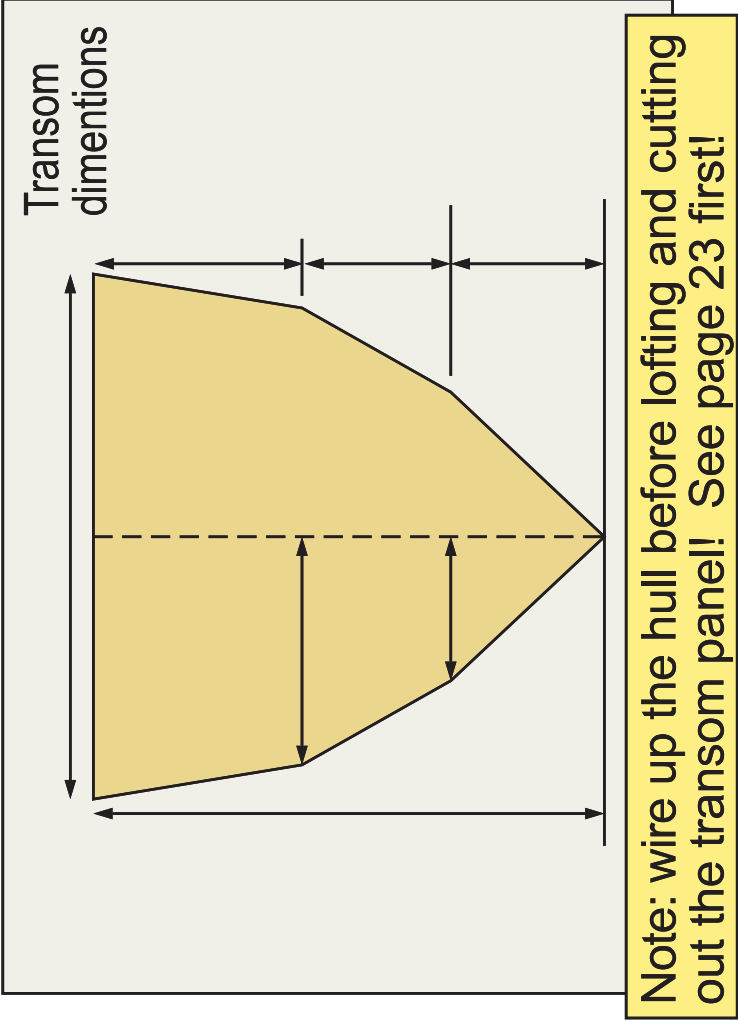
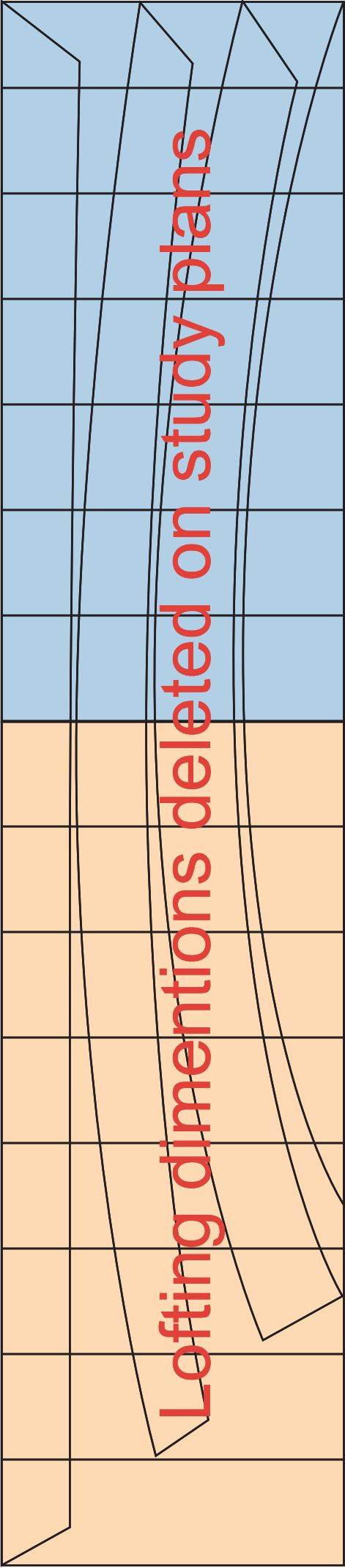
Showing the use of a Finger Joint

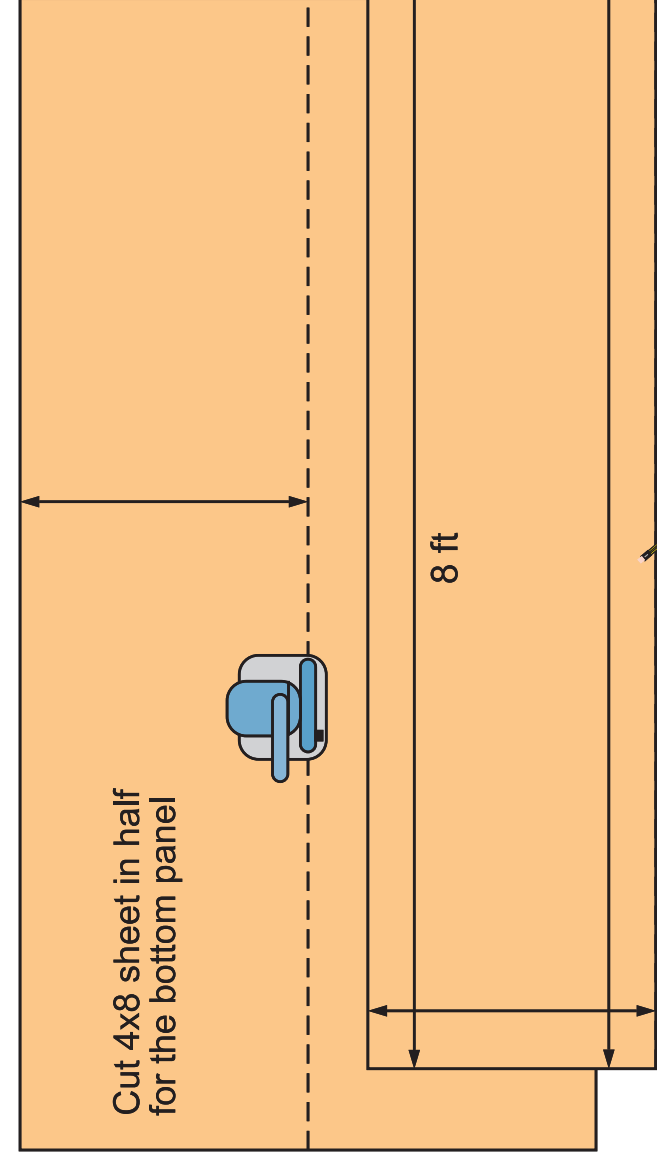


Showing the use of a Scarf Joint

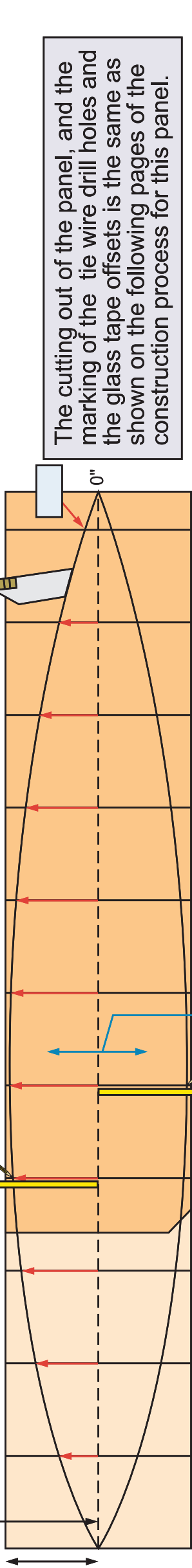
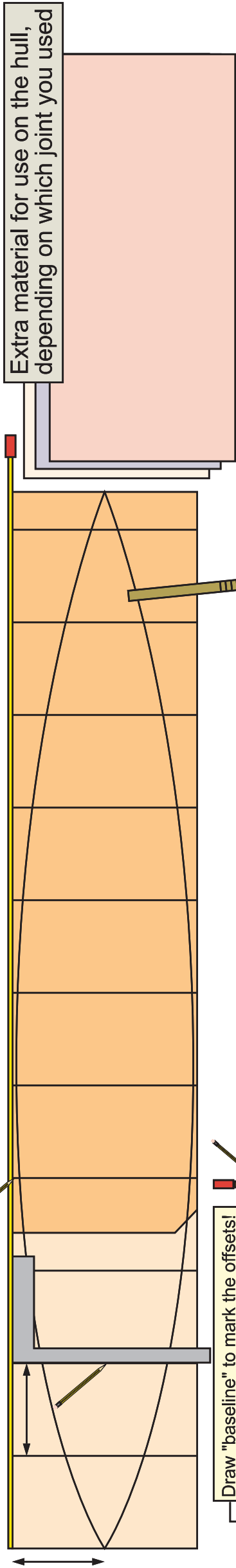
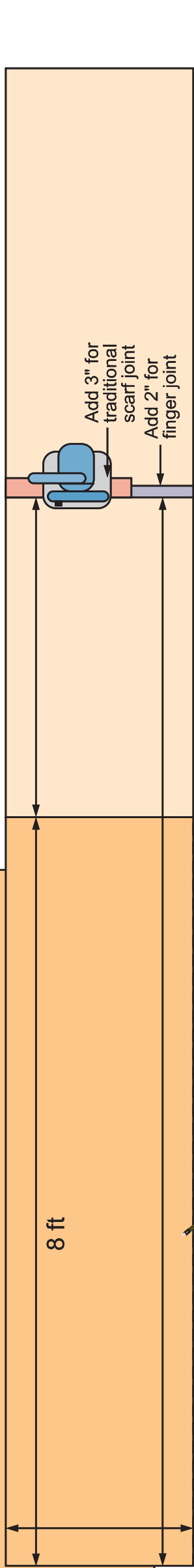


Finished panel sets ready to add the lofting offset marks to determine the outlines of all the hull panels!





For those who want to make this hull with a solid, one piece bottom, this page shows how to cut, mark, and loft up this panel from one sheet of 4x8 plywood. You use an extra sheet, but you do have leftover wood for the interior. The extra plywood you have from removing the upper panels in the previous pages can also be used in the interior.



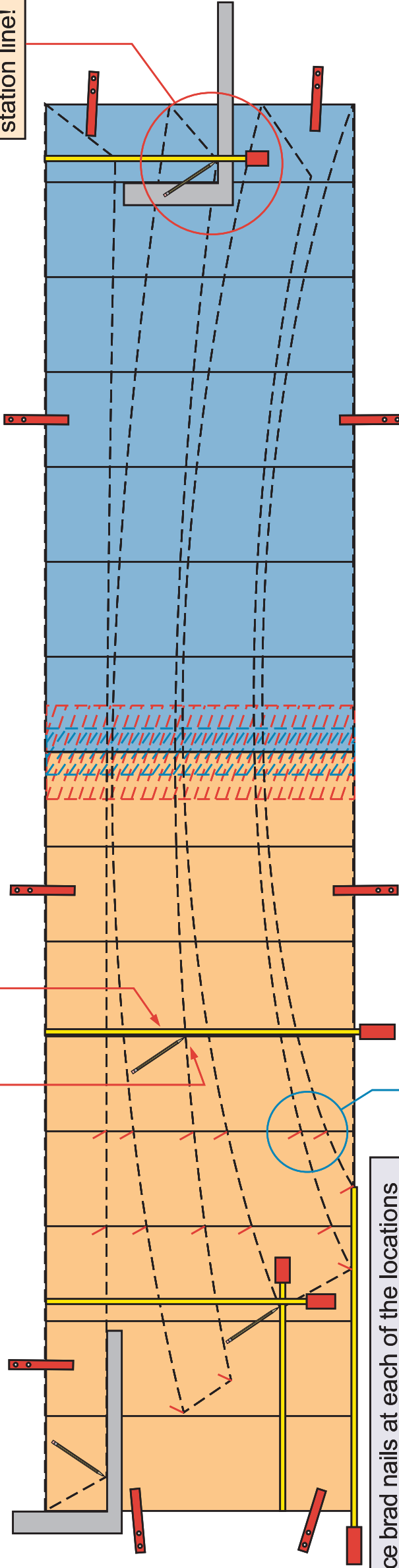
The cutting out of the panel, and the marking of the tie wire drill holes and the glass tape offsets is the same as shown on the following pages of the construction process for this panel.

Measure off the baseline on the grid lines to locate the lofting points of the curve

Draw "baseline" to mark the offsets!

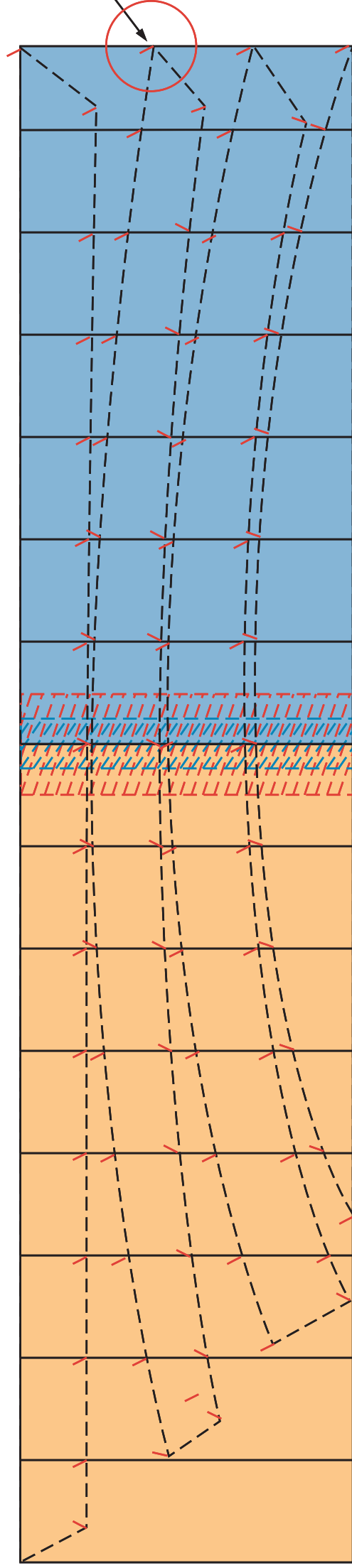
Use the tape and mark off all the offsets listed on the lofting page for that "station"

Using the down from the top and over from the station line!

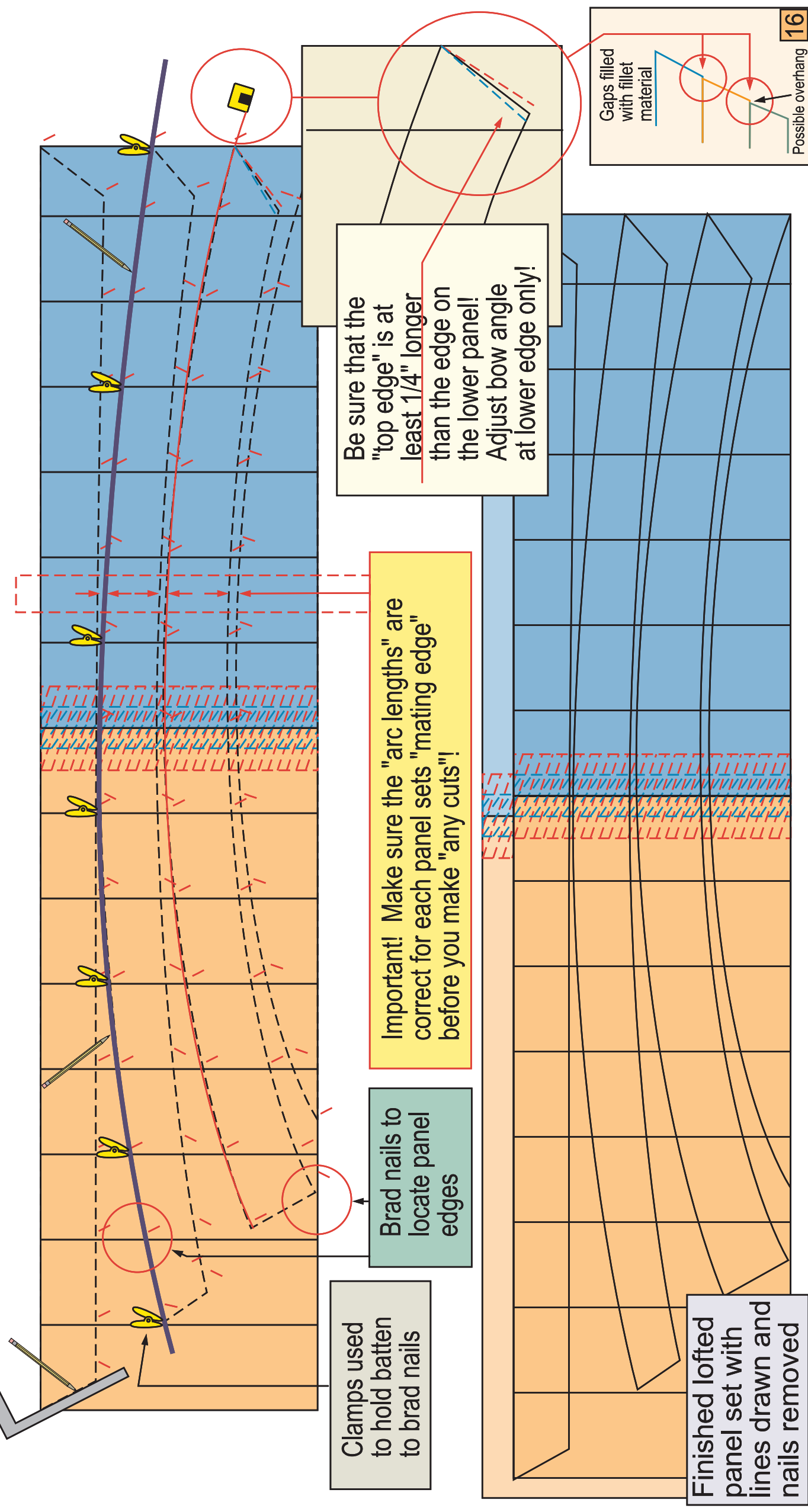


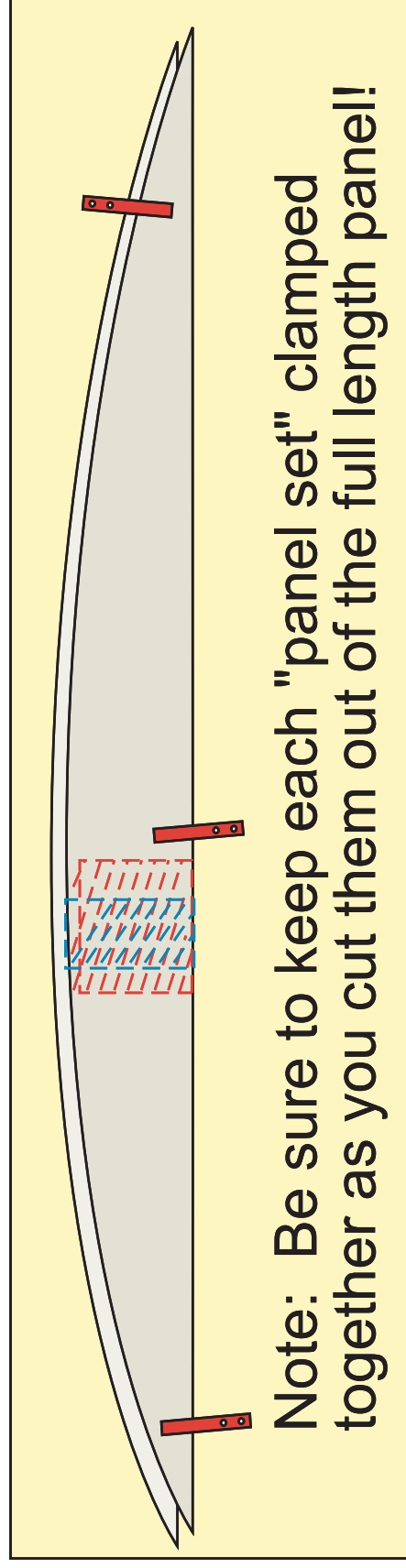
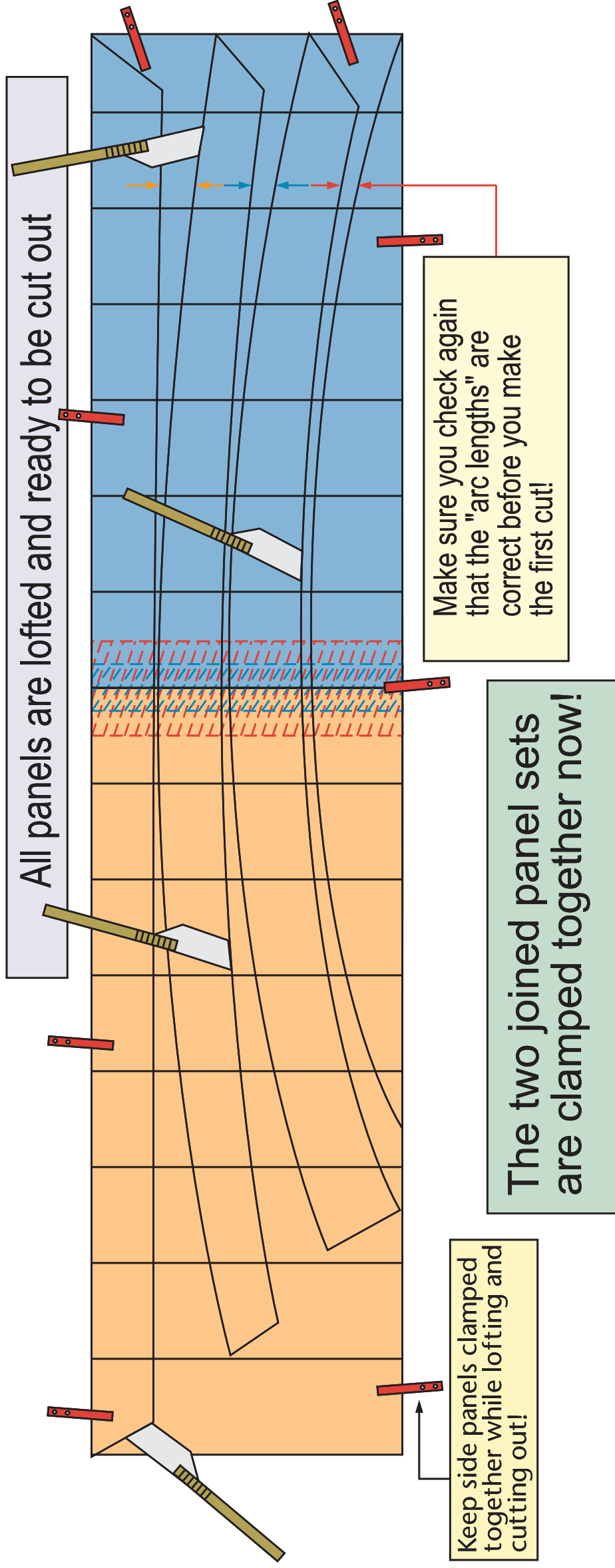
Place brad nails at each of the locations that you made a tic mark with the pencil. This will locate the spot on the plywood where the "curve point" is located on the arc of the panel.

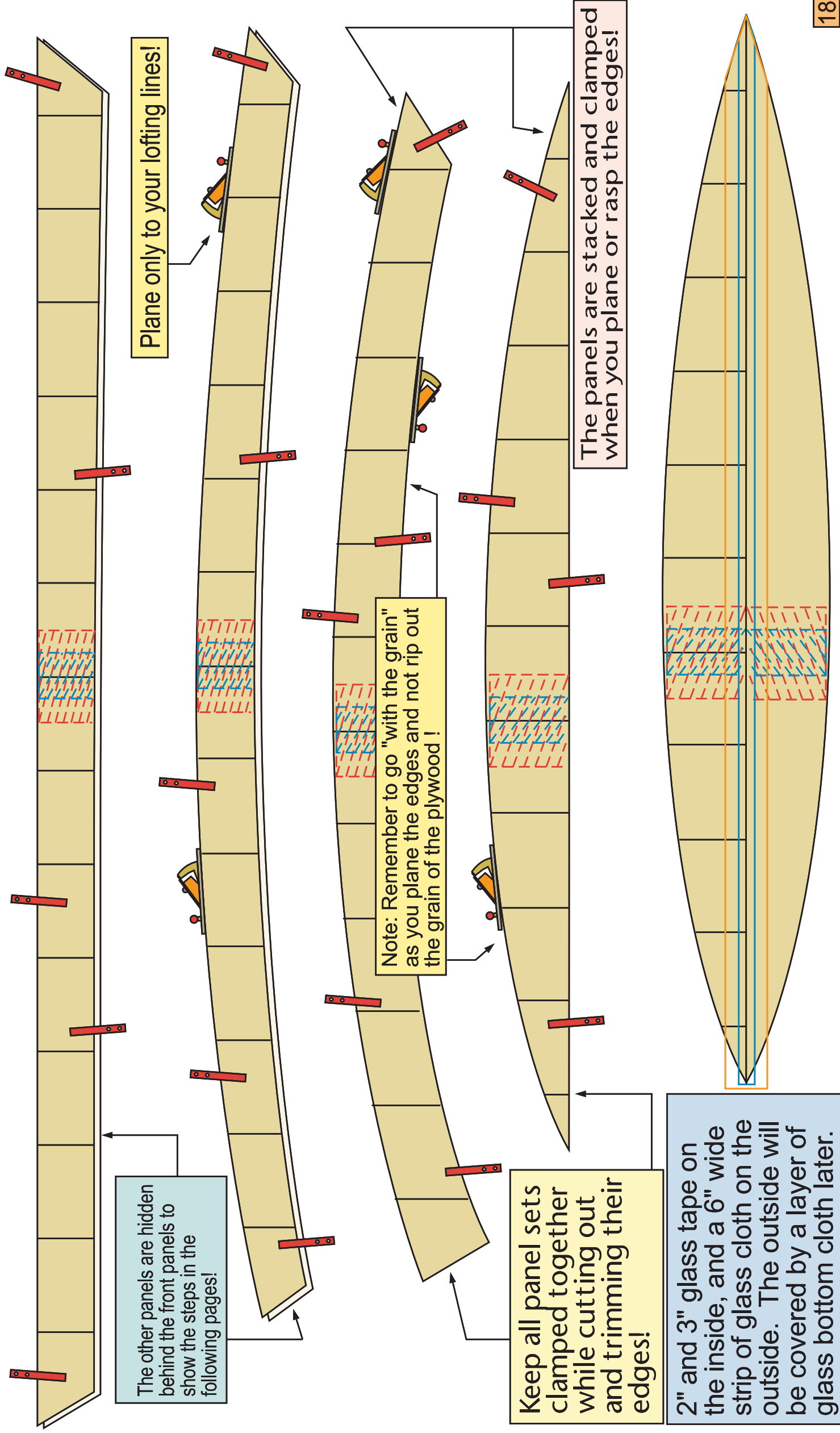
Brad nails located at all the intersections of the listed station lines and the prospective hull panel outlines

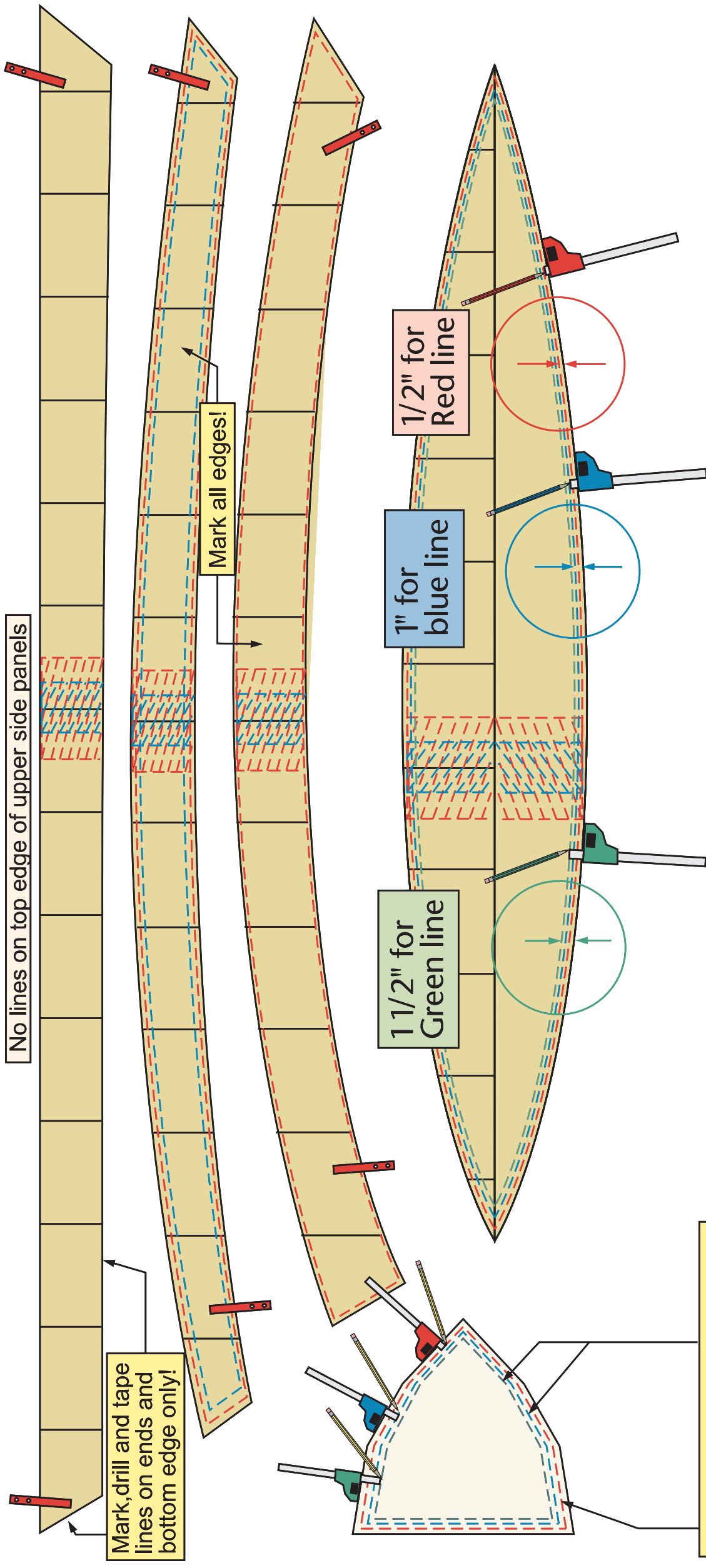


Once you are happy with the arc lengths and the shape of the curves, use a pencil to draw the outlines







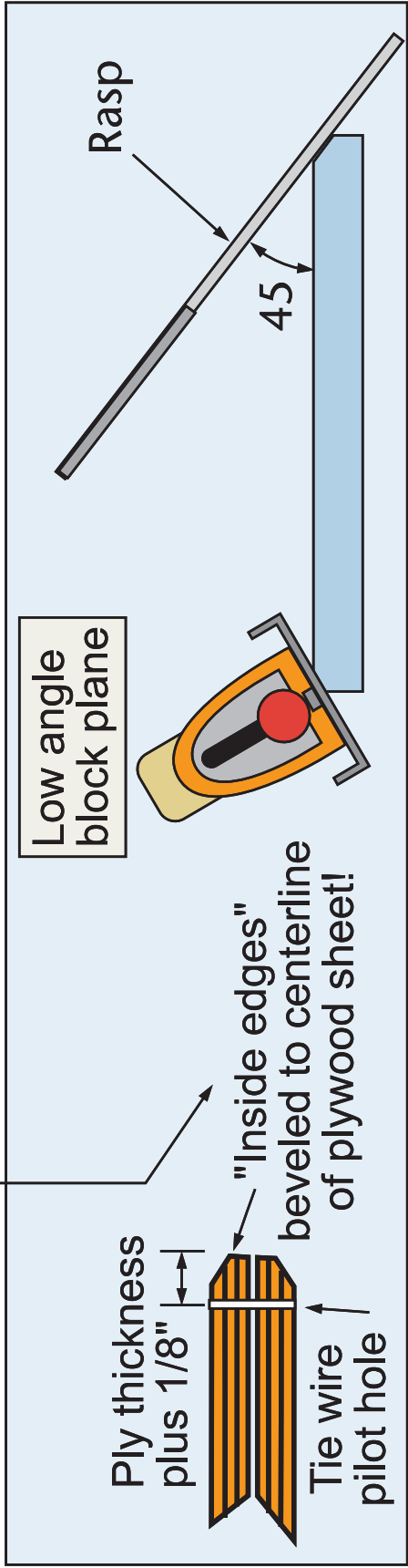
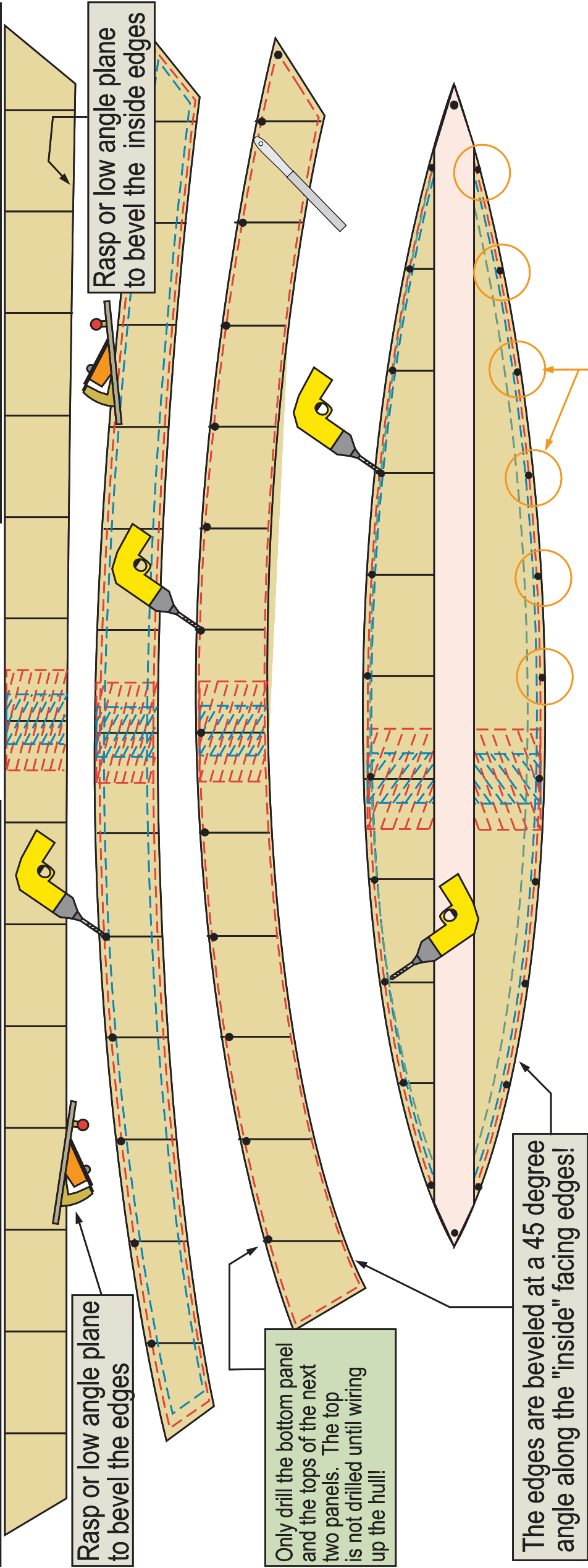


Lines drawn to mark the locations of the wire holes, and the edges for the 2" & 3" glass tapes.

1/2" offset for the tie wire
 1" offset for the 2" glass tape
 1 1/2" offset for the 3" glass tape

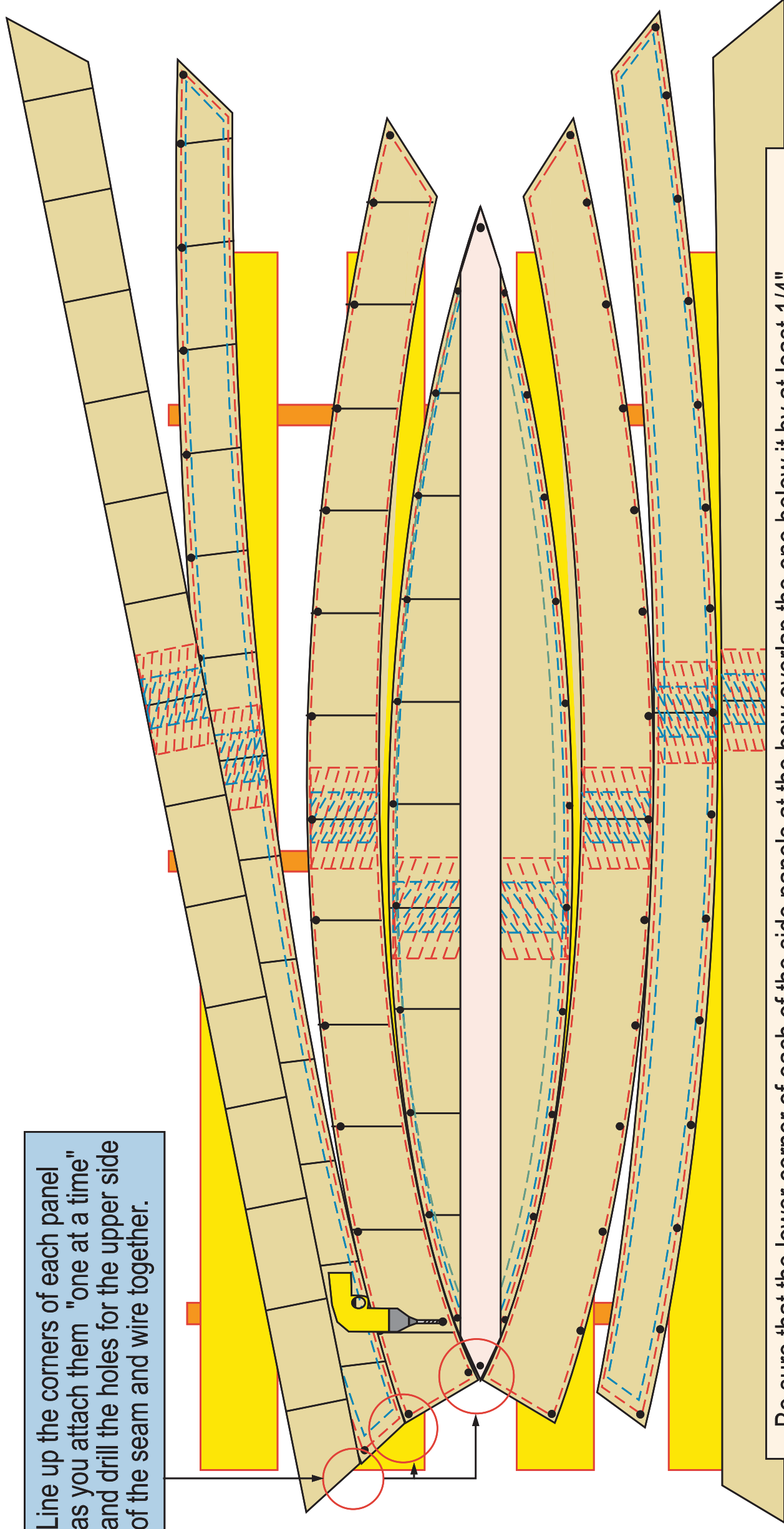
Note: The "inside" faces are exposed at this point. The "outside" faces are touching/hidden.

Drill no holes in the top panels until you are wiring up the hull!

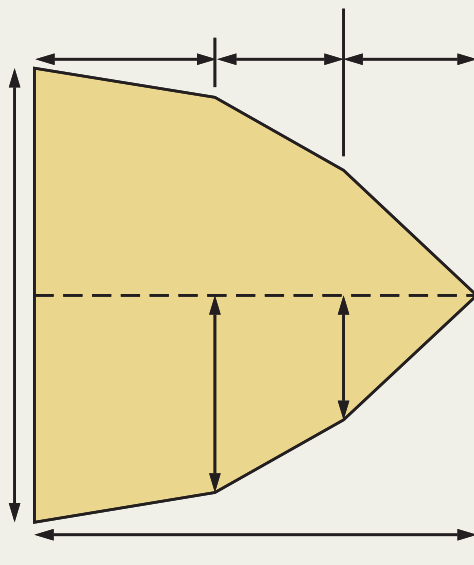


Drill holes for the tie wire size that you use, and all the way around the stacked bottom panels except for the transom. Drill on the station lines to use them as a guide.

Line up the corners of each panel as you attach them "one at a time" and drill the holes for the upper side of the seam and wire together.

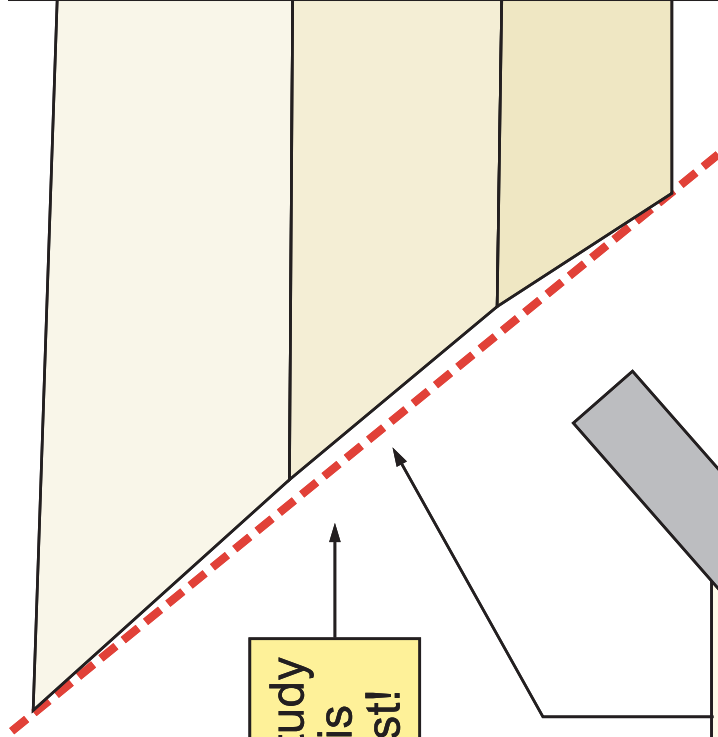


Be sure that the lower corner of each of the side panels at the bow overlap the one below it by at least 1/4" this should have been checked when you did the test for "arc length" when you cut out the panels. You will want to be sure that this is correct before you drill for the 1/4" bolts/nuts that will hold the panel edges in place along the length of the hull panels. If you have to re-drill a hole, don't worry as the fillets and glass tape will cover them!

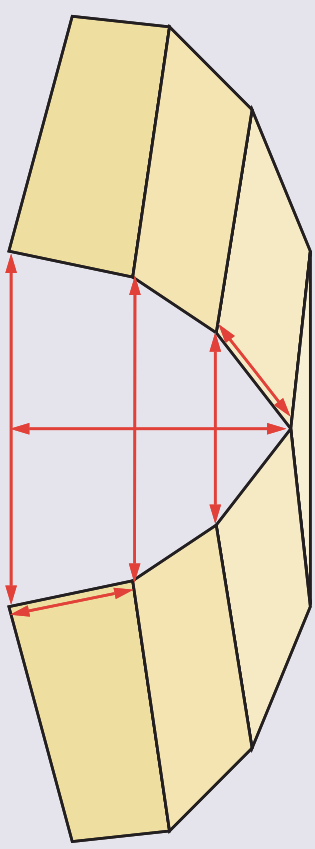


Use these dimensions to cut out a cardboard template first, before you use any plywood for the transom!

Study this first!



Do not cut out the transom panel until you have wired up all the hull panels and have checked the "edge lengths" in the hull against the layout shown to the left!

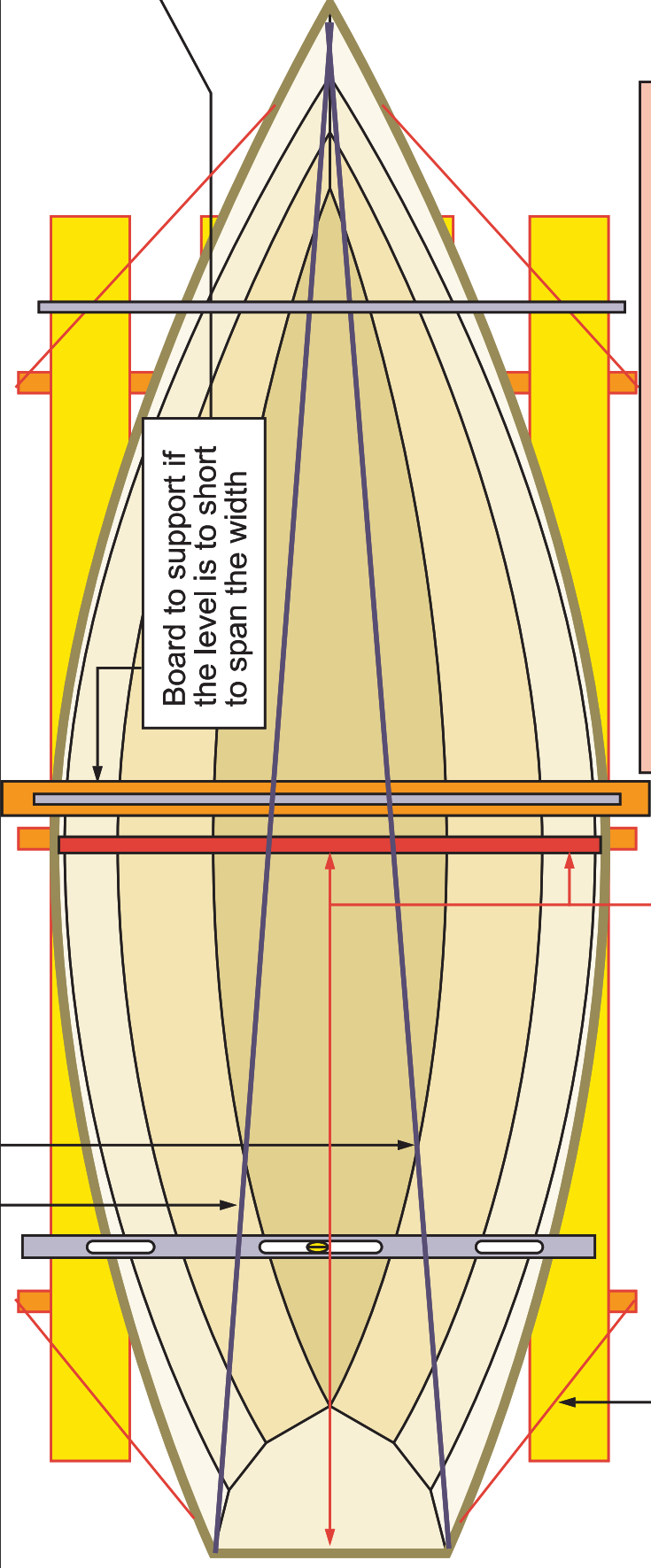


Note: If after you have wired up the hull and try to install the transom panel and you find that there is a slight curve to the ends of the side panels; then fit the top and bottom of the transom panel to a "best fit" position in the hull and wire it in that position. Do all the jump stitching, fillets, and glass taping on the inside seams, and do the trimming on the edges on the outside when you flip the hull over to work on the bottom. Just make sure that the transom panel is "square" in the hull on both sides! I haven't made this hull so I have not "adjusted" the stern end points of the corners. I cannot see that fine a detail when I make the models, as a line from the printer can be 1/4-3/8" wide.

Check that the transom panel is going in straight up and down, and side to side!

Wire in the transom panel to it's "adjusted position" so it will be square and flush on the ends of the side panels!

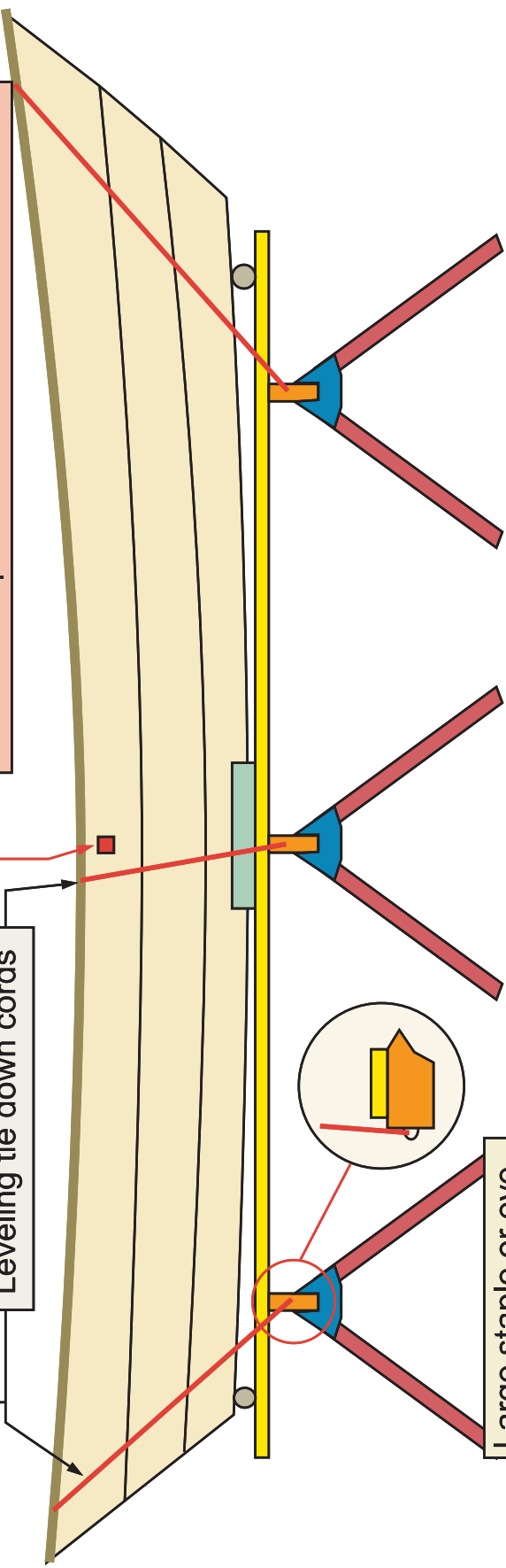
Cross hull tension lines used to "square up" the hull. Adjust until the "cross hull distances" are the same!



Board to support if the level is to short to span the width

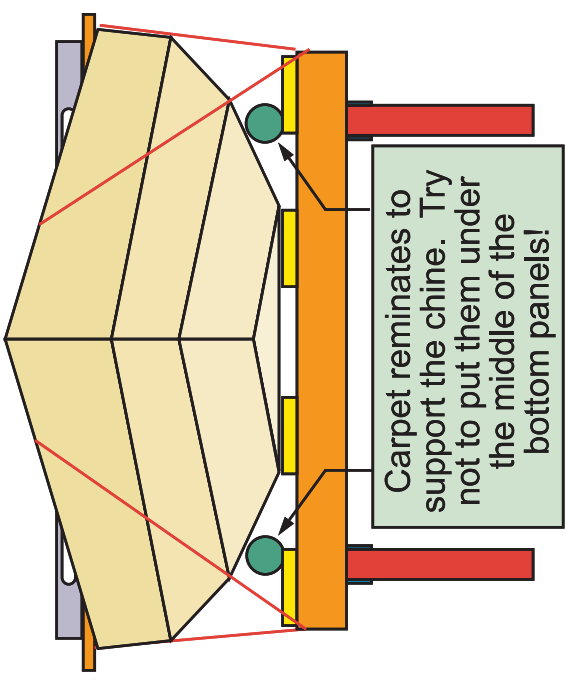
2x2 beam spreader set at 76" from transom!

Leveling tie down cords



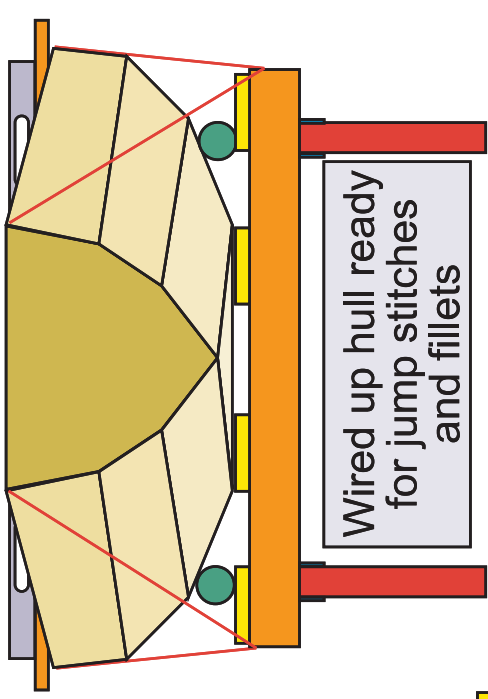
Large staple or eye screw in end of 2x6

Level the hull prior to doing the "jump stitch" and seam fillets!

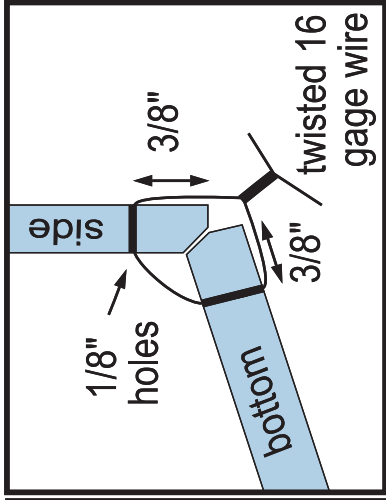
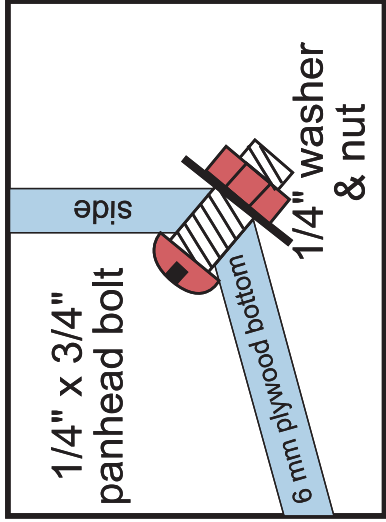


Carpet remnant to support the chine. Try not to put them under the middle of the bottom panels!

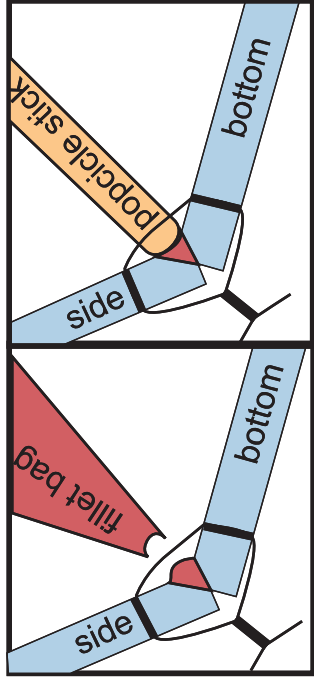
Leave the beam spreader 2x2 in place until you have all the interior seat 2x2's installed in the hull.



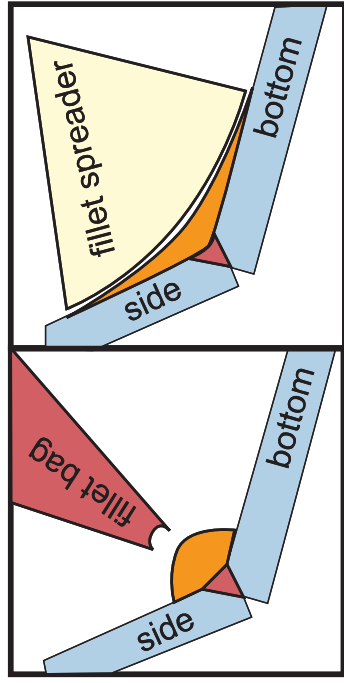
Wired up hull ready for jump stitches and fillets



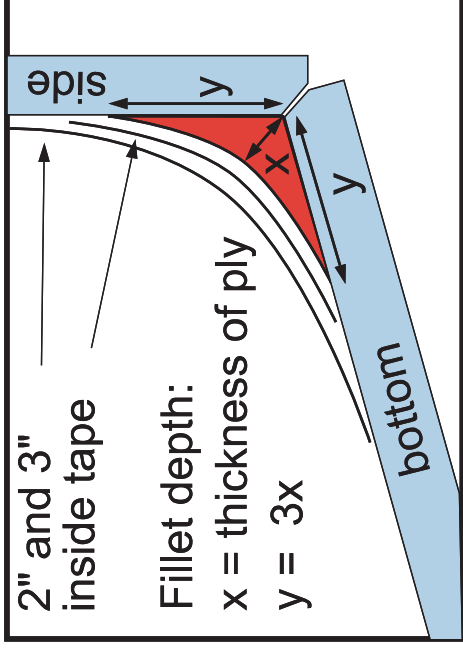
Wiring and bolting the panel sections together



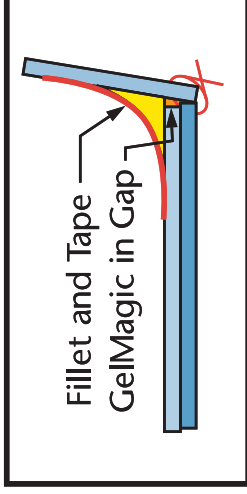
Jump Stitch



Applying and Spreading the Fillet

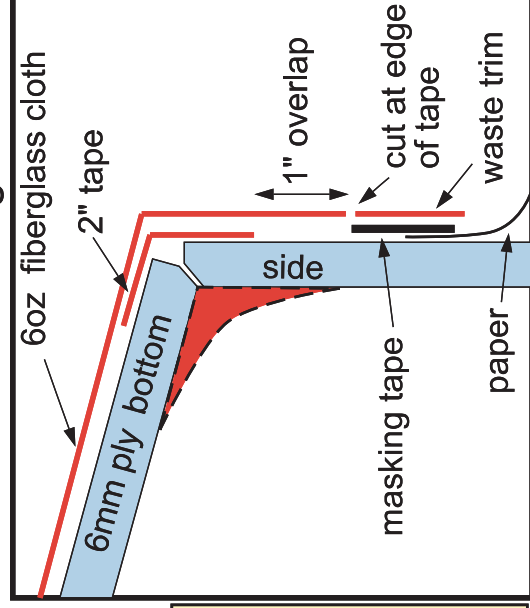


Cross section of taped seam



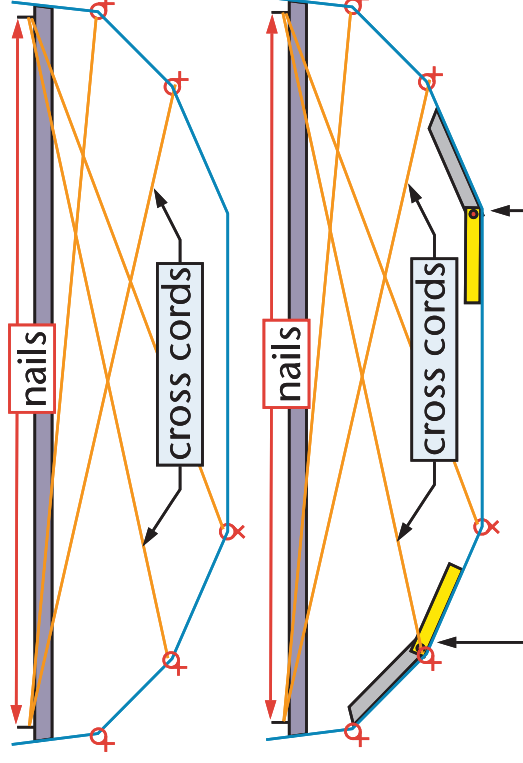
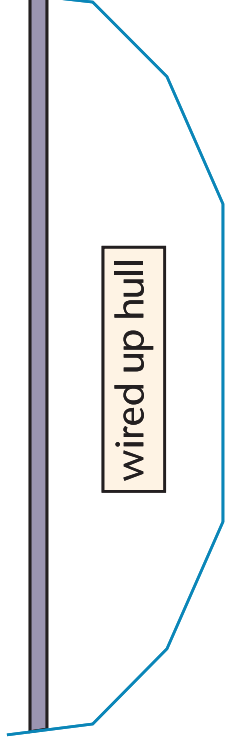
Double Transom Panel

Bottom outside edge details

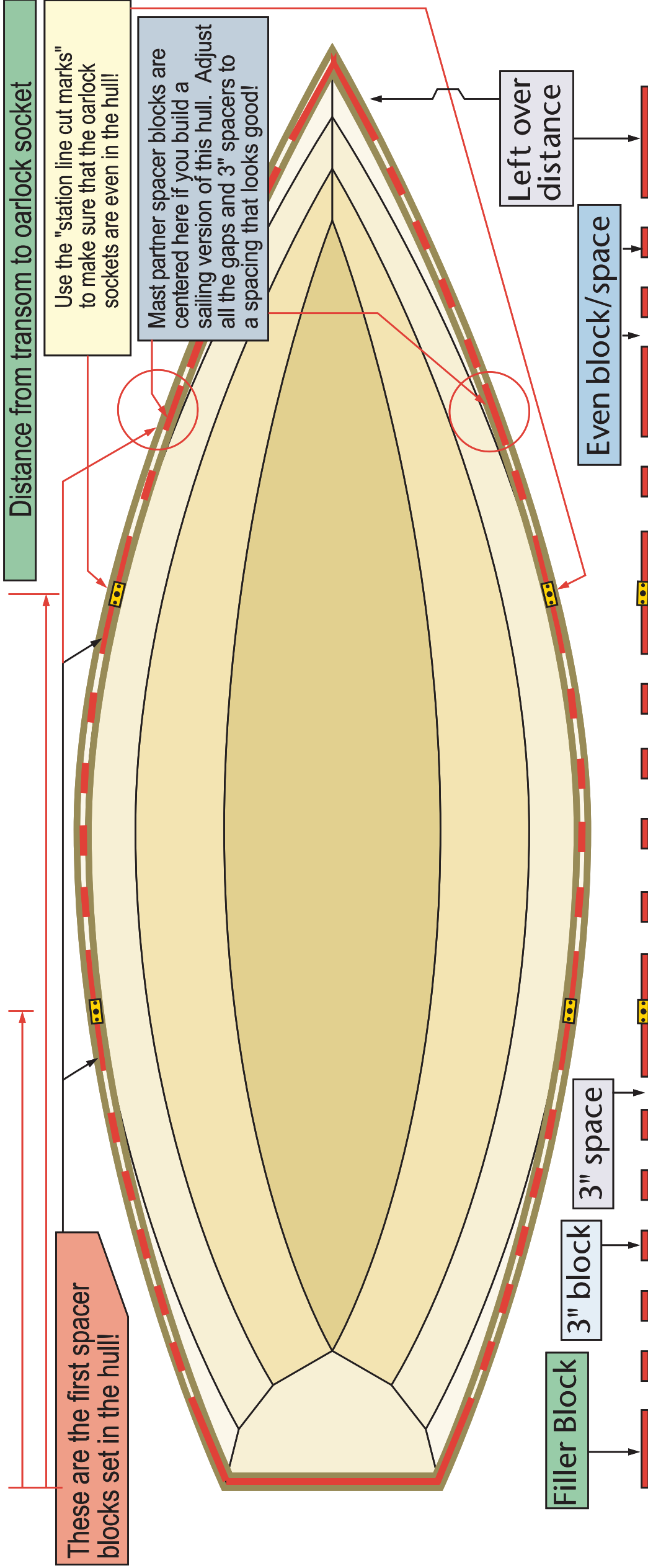


Read the instructions as you study these drawings. Each picture tells a story. Use the cardboard model you made to visualize the directions.

Squaring up the side to bottom panels at the beam of the hull



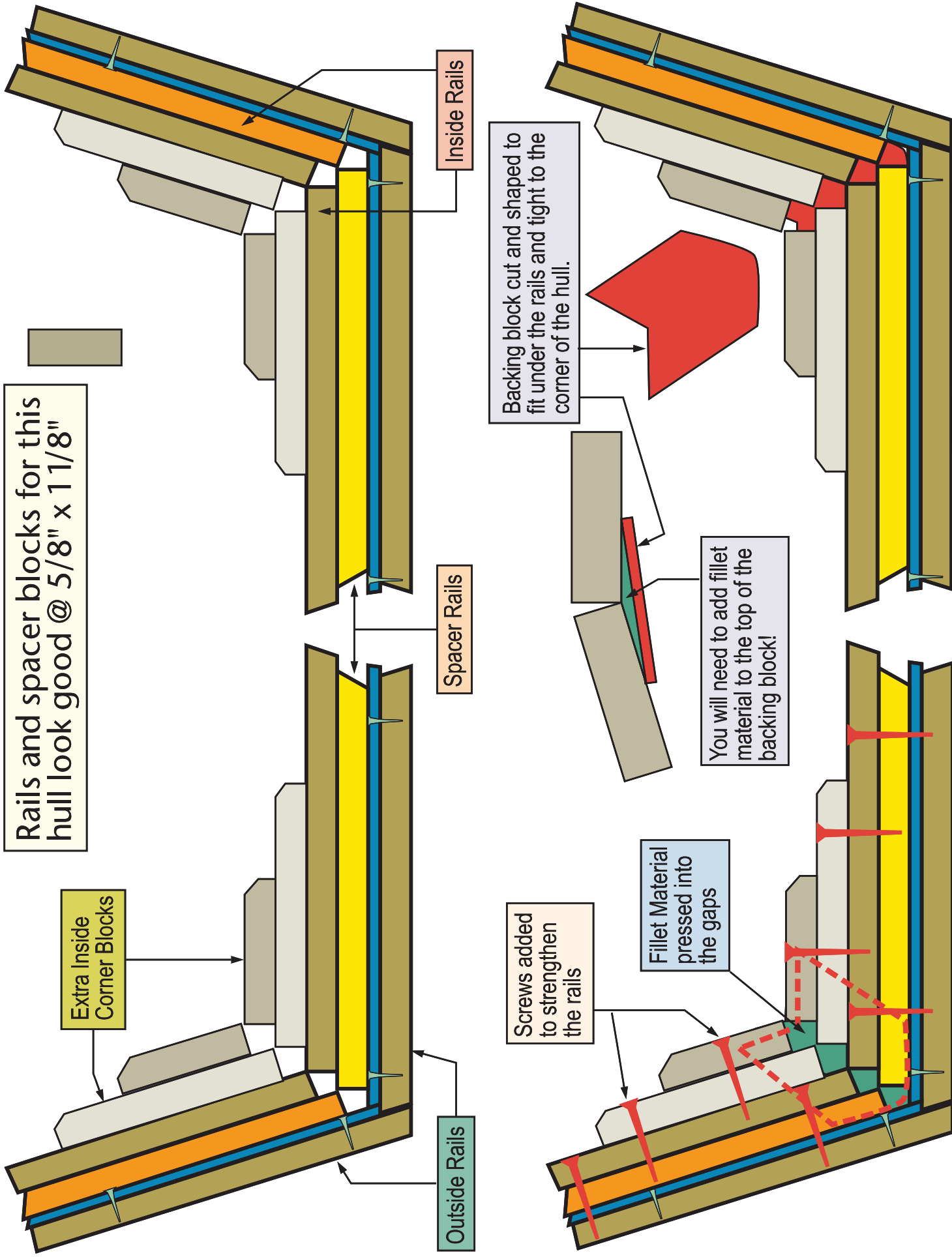
Compare the angles on both sides and tighten or loosen one or both "cross cords" until the angles are the same. Recheck the level and square of the rest of the hull after you do this. Recheck again if those need adjusting too; until you are happy and the hull is level and square!



The oarlock spacer block sets the position of all the other blocks and spaces. Mount the oarlock blocks, then the first spaces on either side, then continue to the ends. After the last "even space", fill the rest of the distance with a "filler block" to meet the bow and transom rails.

The 12" oarlock spacer block needs to have "cuts" placed ever 1" and half the depth of the spacer block. This lets the block bend to the hull and not distort the side panels. This must be done!

The small screws will be located at the station line cut marks, so mark their locations on the hull so you don't drill into them when you drill for the other screws. Place 4 screws along the oarlock block, and one at each of the smaller spacer blocks. Epoxy both sides of the blocks.



Note: I do not know what you will do with your hull, but this is one way to strengthen the bow joints. There are many ways to do this and you can chose which works best for your boat.

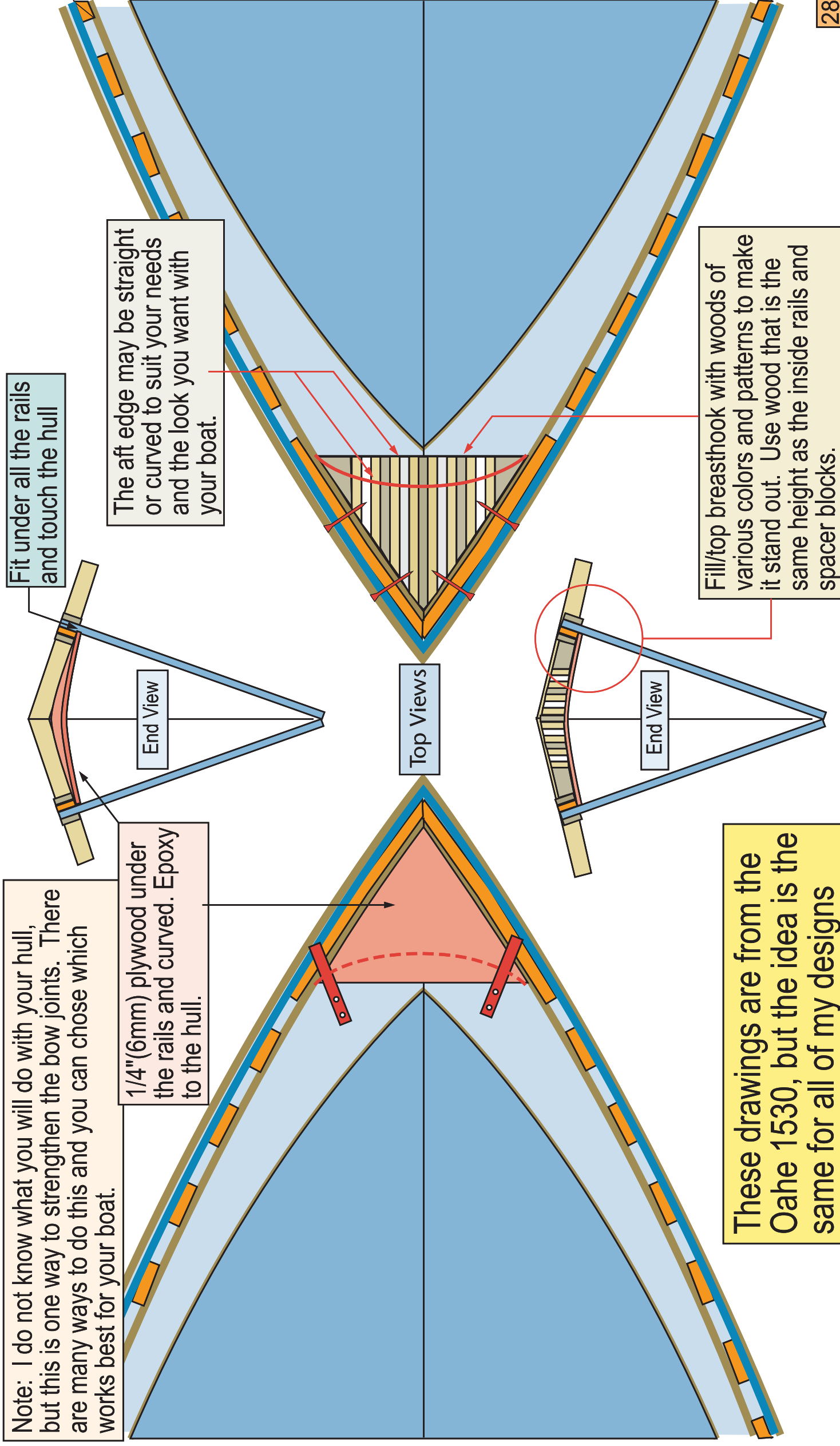
1/4"(6mm) plywood under the rails and curved. Epoxy to the hull.

Fit under all the rails and touch the hull

The aft edge may be straight or curved to suit your needs and the look you want with your boat.

Fill/top breasthook with woods of various colors and patterns to make it stand out. Use wood that is the same height as the inside rails and spacer blocks.

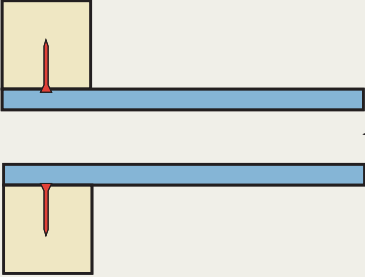
These drawings are from the Oahe 1530, but the idea is the same for all of my designs



Trunk box
for a 12" DB

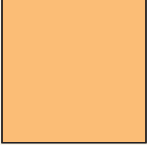
Epoxy the surface
between the
plywood sheets
and the 2x2's
where they meet

Add the top
2x2's first, then
the vertical ends

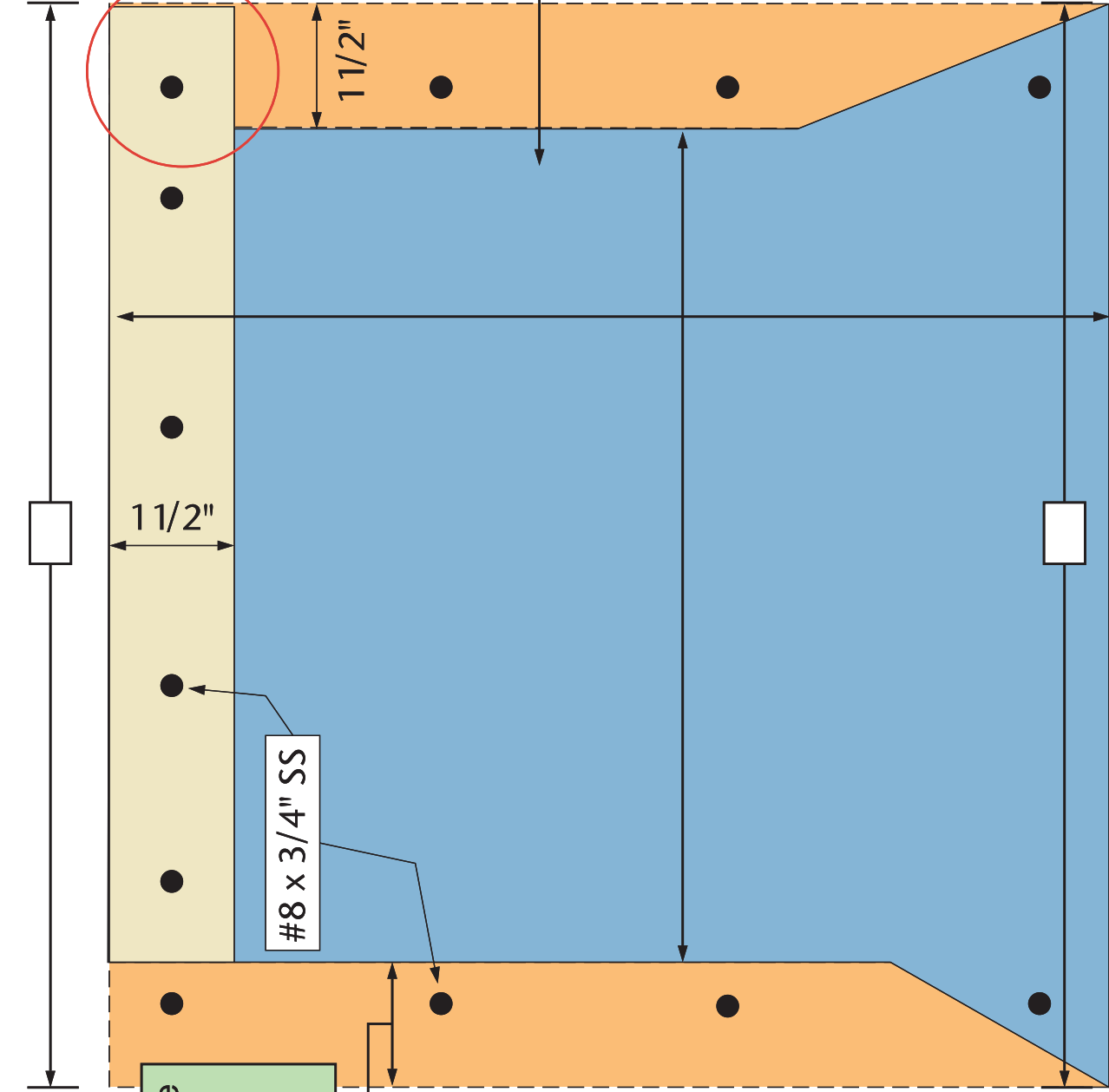


Note: Do this first!

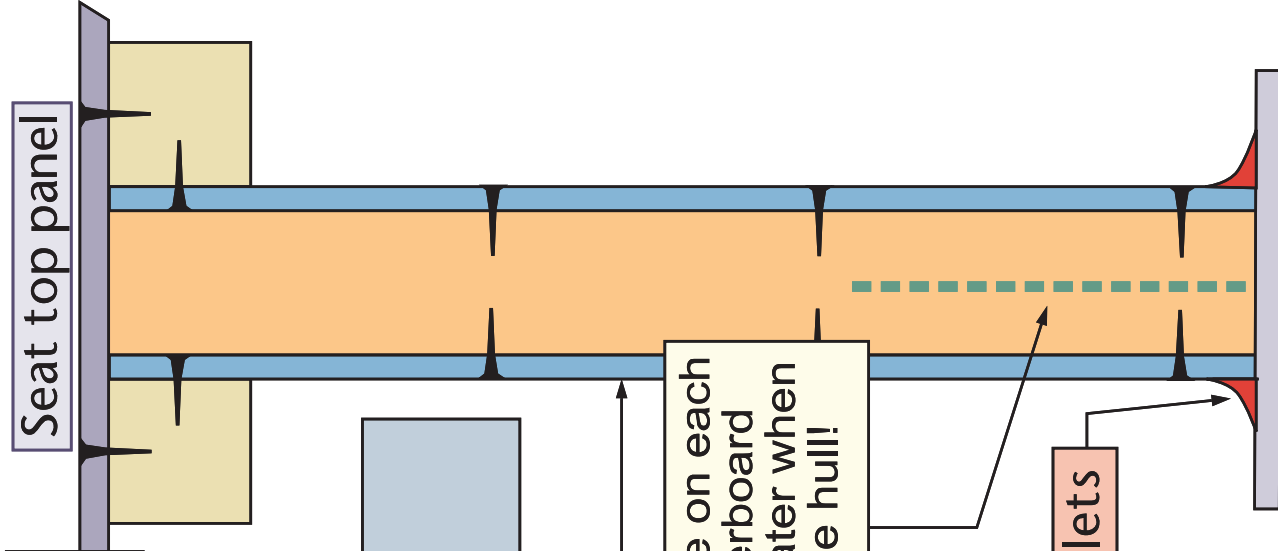
Standard 2x2



1 1/2" x 1 1/2"



See the next page
for a vertical view
of this corner!



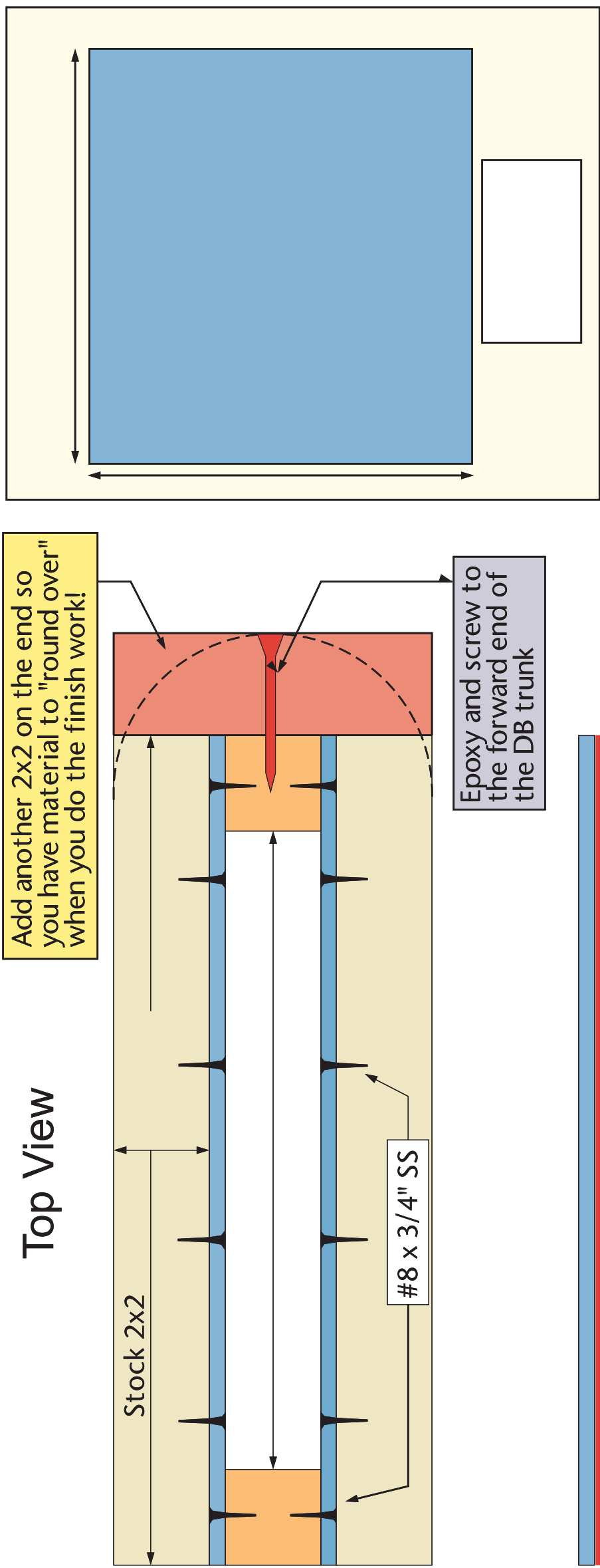
Mark a centerline on each
end of the daggerboard
trunk to align it later when
you install it in the hull!

Epoxy Fillets

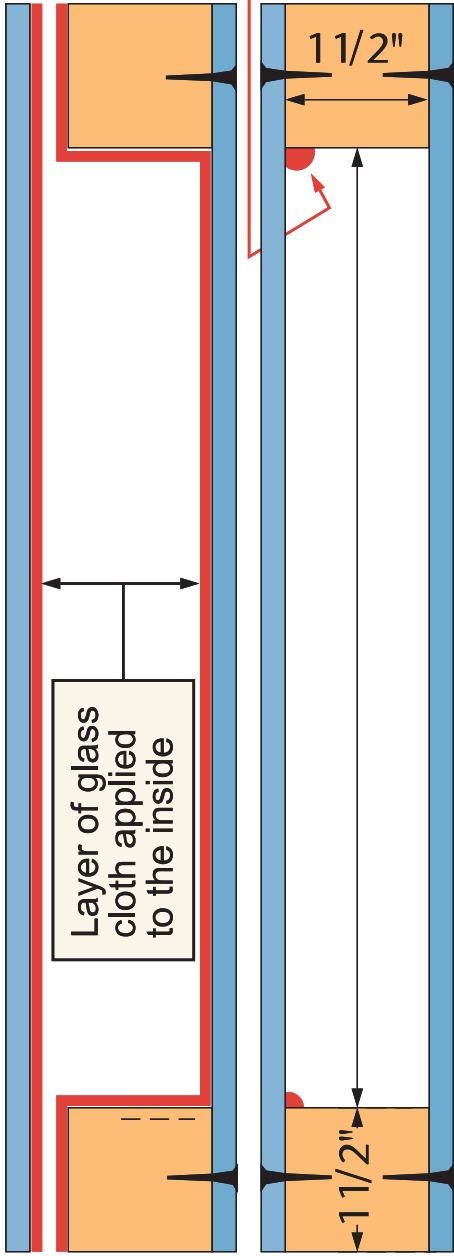
Side View of Daggerboard Trunk

End View

Top View



Epoxy together, and make sure that a small bead forms on the inside corner.



Bottom View

Daggerboard trunk has to be set first, before any 2x2 seat support rails are installed in the hull. See previous page.

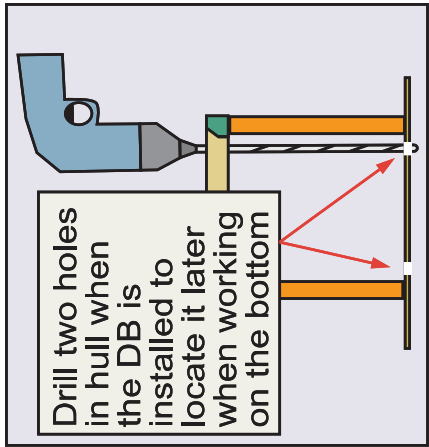
Beam spreader 2x2 can be used to align/epoxy DB trunk

Make sure the hull is level when you install the 2x2's!

Long side is Aft on both center seat 2x2's

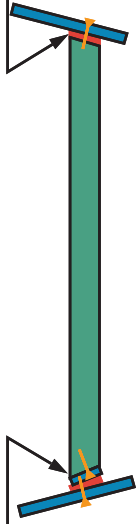
Note: The long side of the 2x2 is on the forward side of the stern seat support rails!

Note: read this!



Epoxy and screw square of 1/4" ply to end of 2x2 on excessive gaps. It looks bad, but it works, and will be covered on all sides by plywood for strength.

Note: The DB will be notched when you install the middle seat 2x2's in the hull later!



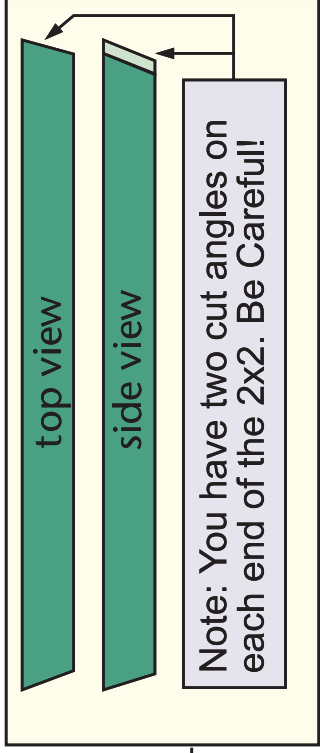
Use GelMagic to fill the gap between the 2x2 and the hull. Use a screw to hold alignment until cured.

The center seat supports are mounted first

daggerboard centerline mark!

Note: The long side of the 2x2 is on the aft side of the bow seat support rails!

Note: Cutting the notch and trimming the ends of the 2x2's for the center seat, can be problematic. Take your time, and try not to make bad cuts. Measure 3 times cut 1



Use the "station line cut marks" to make sure that the seat 2x2's are placed even in the hull!

Always check for level!

See the next page for the seat 2x2 spacing, all dimensions are measured from the transom!

Install the aft seat support 2x2 first, then measure, cut, and set the forward seat 2x2 next. Make sure that all the pieces are square and level in the hull before you go on and add the rest of the seat supports!

Set this 2x2 in the hull first

The first middle seat 2x2 must be level in the hull!

Use some 2x2's to level, and hold the seat 2x2 in place while the epoxy cures

Notch DB 2x2 and end of seat 2x2 to fit together. Epoxy in place

Be sure to wrap plastic around ends of 2x2's so the epoxy does not glue the clamps to the seat!

Use the "station line cut marks" to make sure that the seat 2x2's are placed even in the hull!

Always check for level!

See the next page for the seat 2x2 spacing, all dimensions are measured from the transom!

side view
bevel to fit
top view

Use two "straight" 8ft 2x2's to locate the positions of the rest of the seat support 2x2's "after" the center seat support 2x2's are in place. Be sure to make them level and square with the hull first!

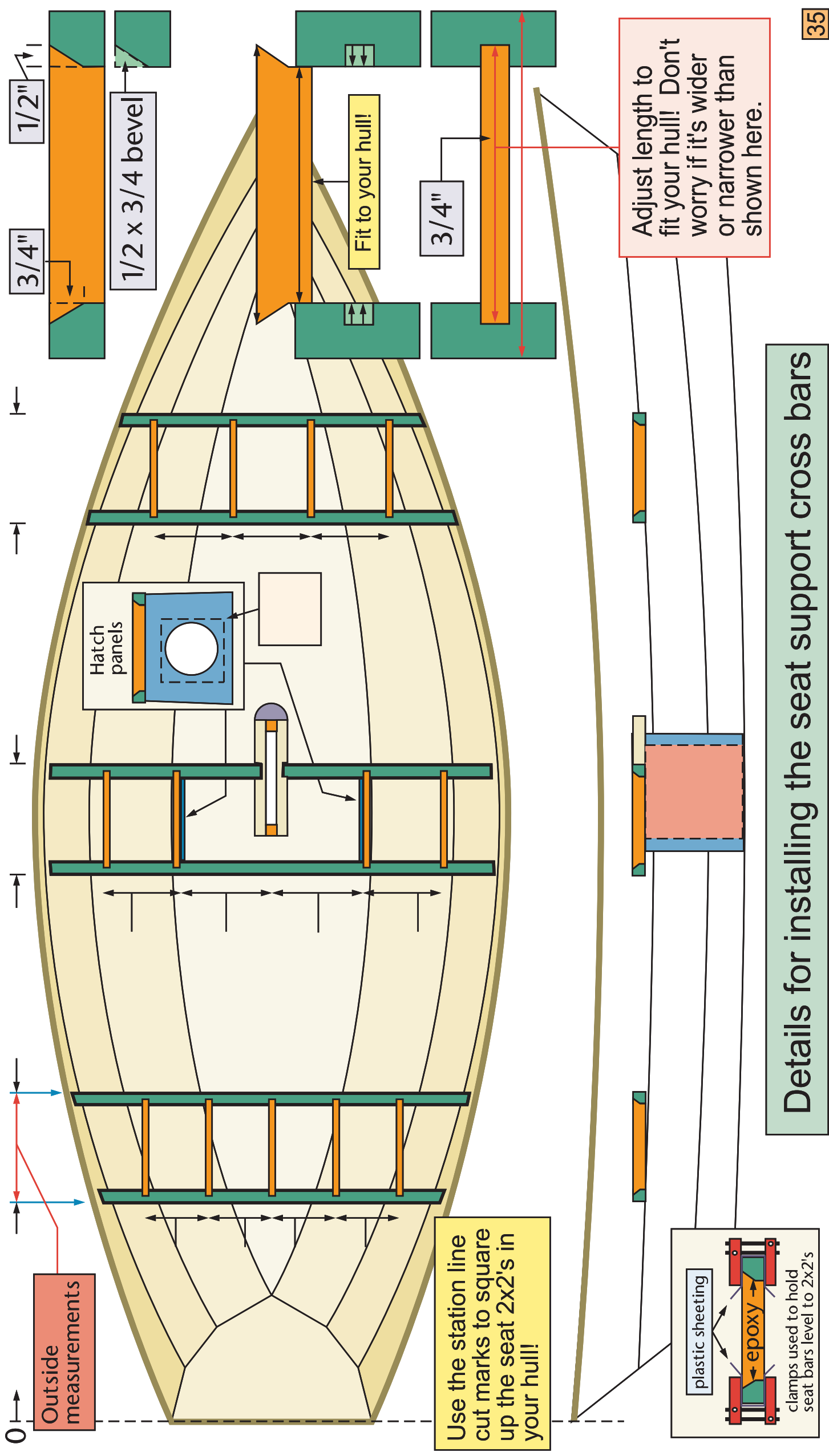
Position, center, level, and align the daggerboard trunk first!

With backing block

Towing eye

Daggerboard trunk is installed first and 8ft 2x2's are used to set the height of the rest of the 2x2 seat supports

Always check for level!



As long as most of the seat top panel is sitting on the 2x2's, scrap can fill the edges! 

Coat all inside panel faces and all 2x2's, backing blocks, and seat support bars with two coats of epoxy before you cover up the seats!

can be made from pieces
joined by glass tape

Easier and better looking method

Overlap and radius top of side panels

Two pieces may be used for the center seat tops

For easier painting and construction you may want to place a cover panel under the seat support 2x2"s

Small hatches on each side!

Wood filled epoxy fillet

See the panel layout pages for details on saving scrap for using on the seat tops

3" glass tape

Seat facing panels

Layout of the fore and aft sides of the center seat

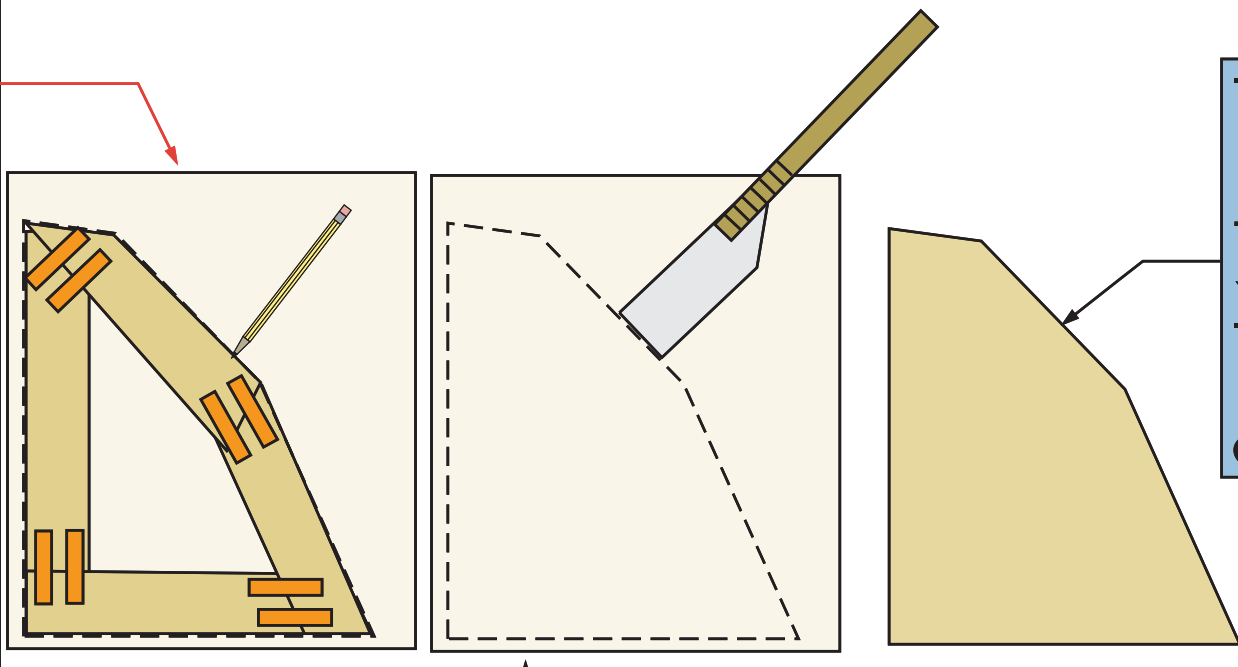
Completed panel

Cardboard strips cutout and taped together

filler strip

Use this technique for each of the seat panels in the hull

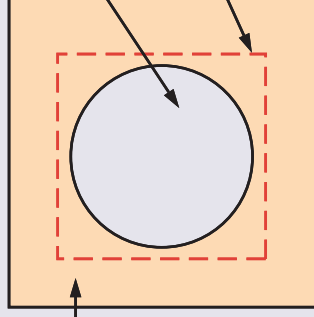
Cardboard template is laid on a section of scrap plywood and marked off



Completed panel

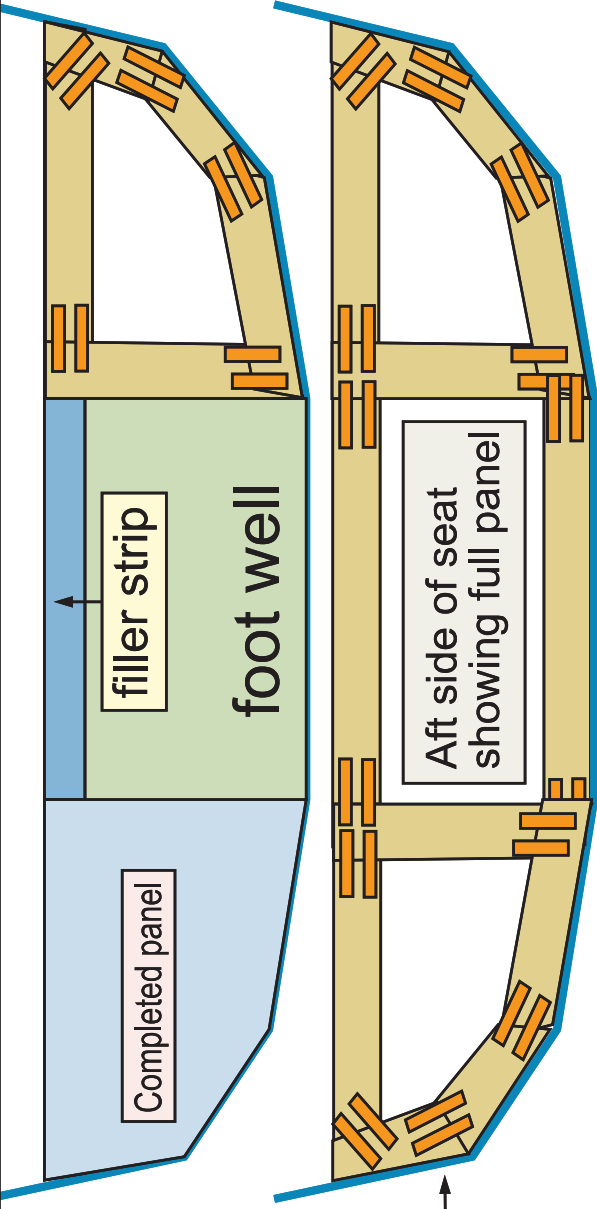
Filler strips used to cover the gaps on the 2x2 supports between the port and starboard seat panels on both the fore and aft sides of the seat sets.

A 6" hatch should fit, and it will need a backing plate so there will be enough material for the hatch screws - 5/8" x #10's



Cut and fit a panel for a small hatch to access the space to either side of the center seat. It will add storage and more flotation!

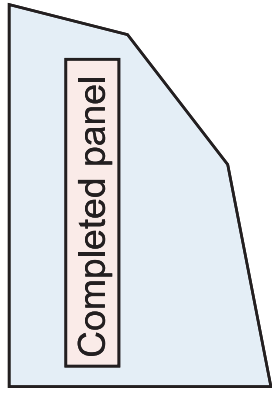
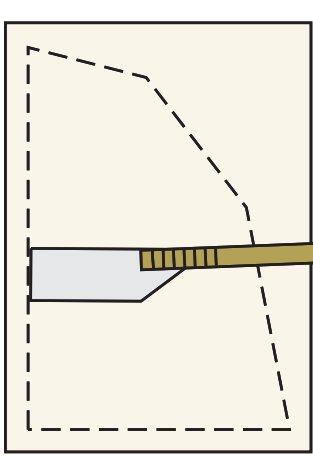
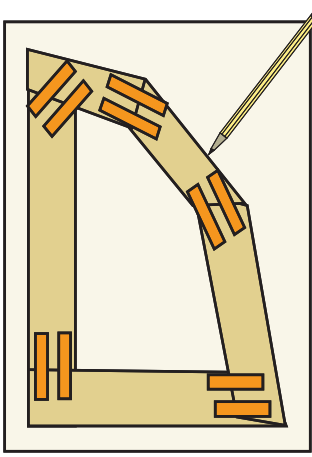
Forward side of the stern seat showing the foot well



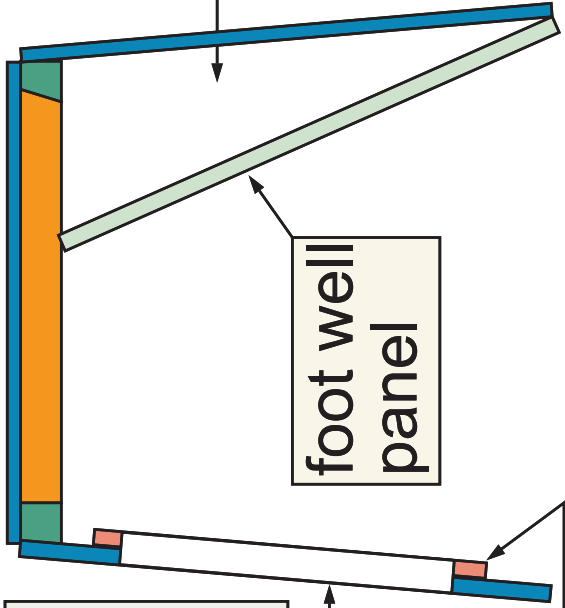
The rest of the seat panels will be laid out the same way as these panels!

Cut out and tape together strips for the rest of the seat panels and mark on your plywood and cut out. Make sure to check several times that you have the correct dimensions before you cut out the plywood!!!

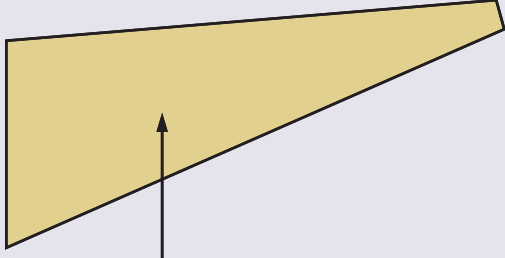
Cardboard template is laid on a section of scrap plywood and marked off



View of aft side of seat showing how to use cardboard strips to find the layout of the panel. Remember that small gaps along the edges can be filled with fillet material!



Filler panels for either side of the foot well panel. The foot well can be made out of the hull and installed after the seat panels are in place, but before the seat top is installed!



Note: This page was taken from the 12ft version. The foot well was needed to give the rower extra foot/leg room. This hull is longer, but if you are really tall, or move the aft seat forward, this will help.

Paint all the faces of the 2x2 seat supports with paint except the top, tape covered face

Add masking tape around the edges of the seat tops to protect the epoxy areas from paint when you seal off the bottom faces!

Bare wood for coating of epoxy!

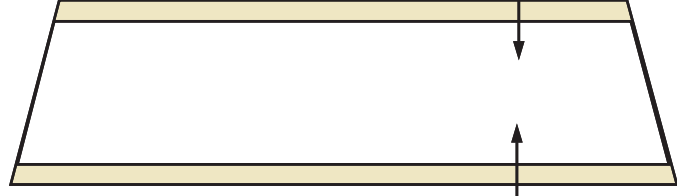
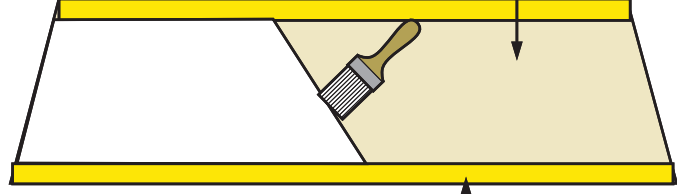
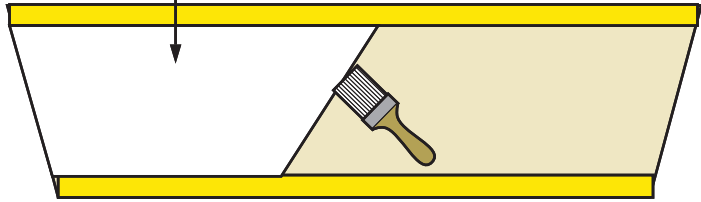
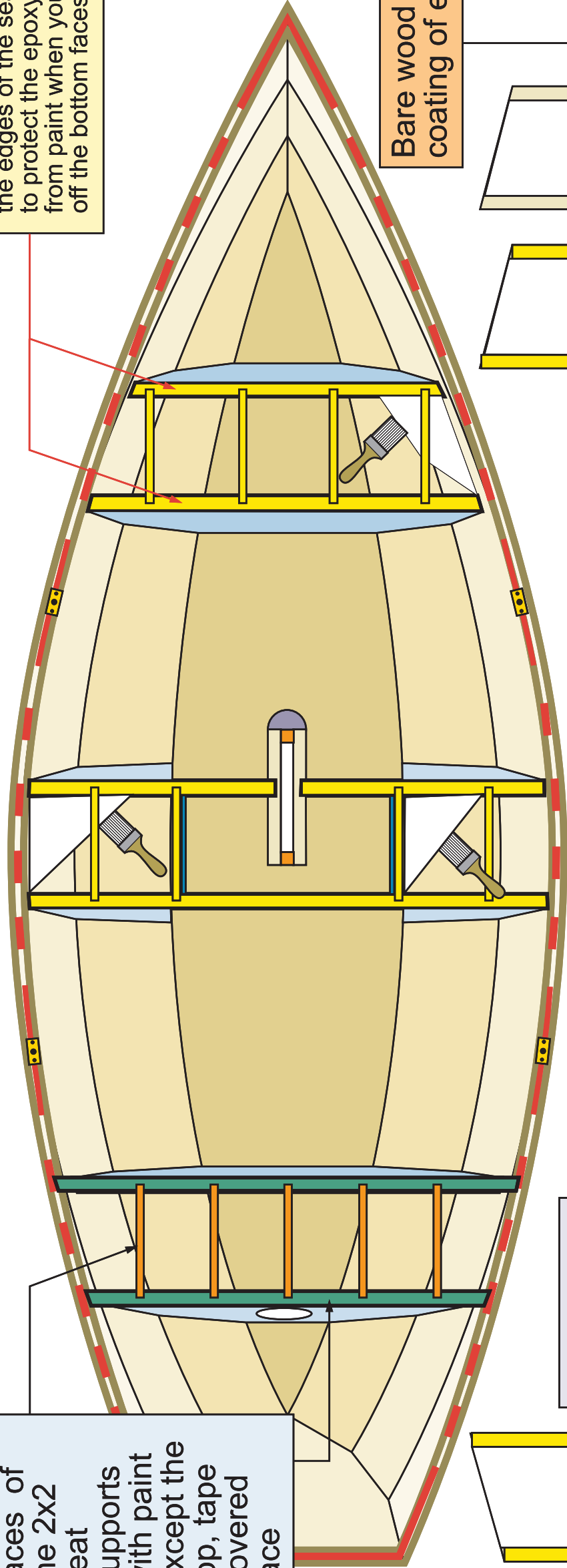
Painted face!

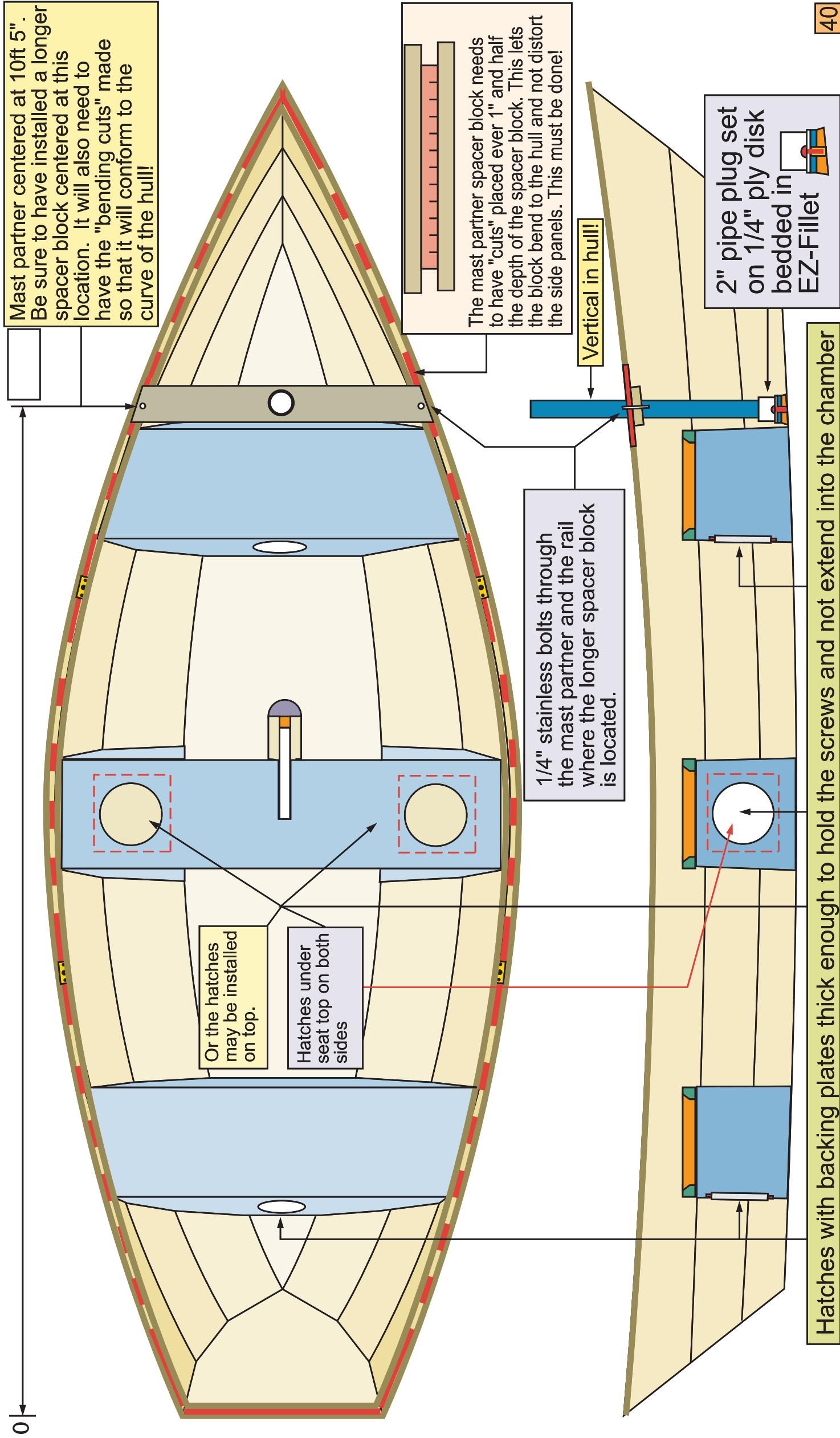
Prime and paint all the interior parts of the hull with at least two coats of primer and as many coats of a good quality paint!

Painted face!

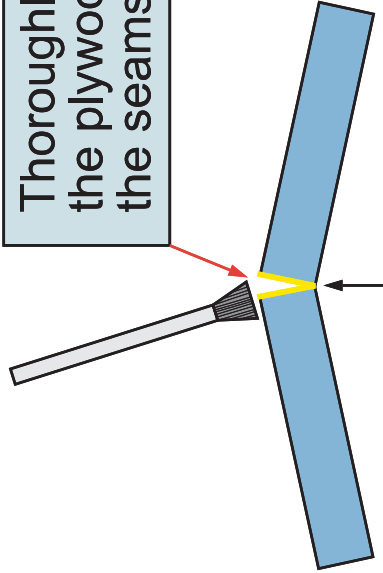
Add masking tape around the edges of the seat tops to protect the epoxy areas from paint when you seal off the bottom faces!

Backing blocks if you install the hatches on top of the seats and not in the foot wells

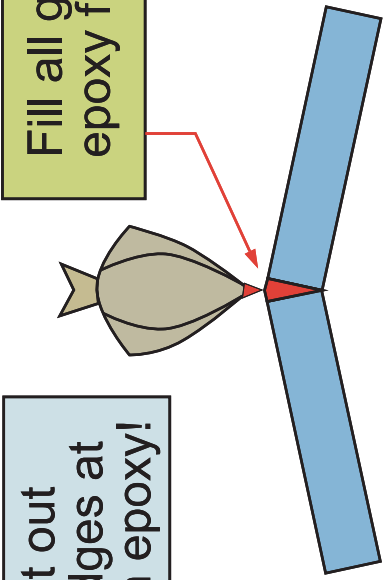




Thoroughly wet out the plywood edges at the seams with epoxy!

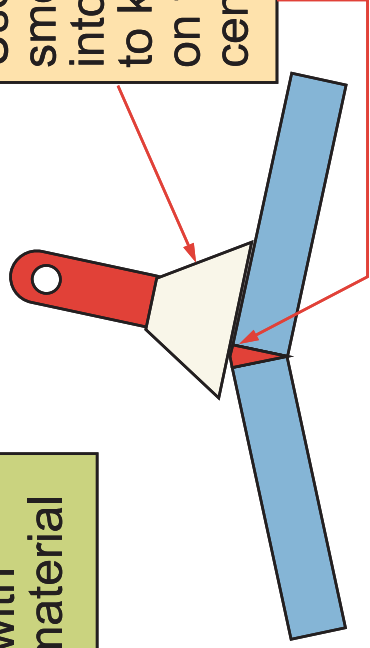


The epoxy will seal the seam edges and prevent water from seeping in and rotting the wood

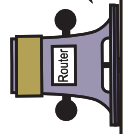


Fill all gaps with epoxy fillet material

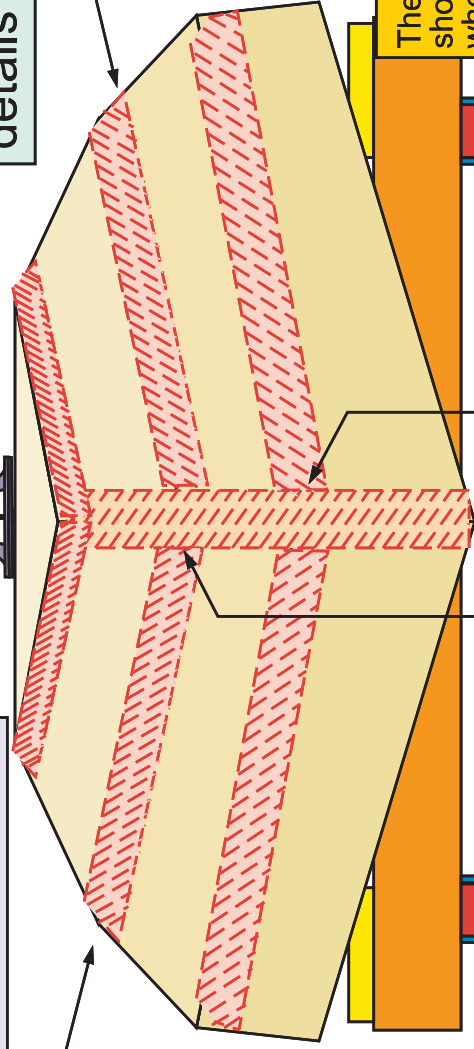
Use a wide putty knife to smooth the fillet material into the groves. Make sure to keep most of the blade on the plywood to "fill the center" of the gap!



Use router with "guide bushing" to open up DB

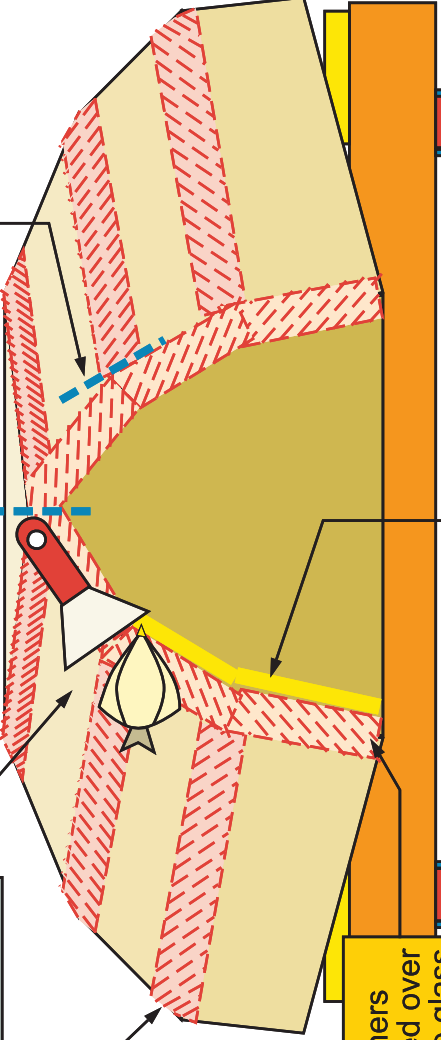


2" glass tape centered on all outside seams

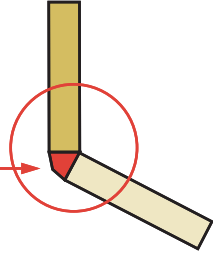


See page #42 for more details on the seams!

Trim tape ends to match the corner angles!



The transom corners should be rounded over when you add the glass tape to the seams

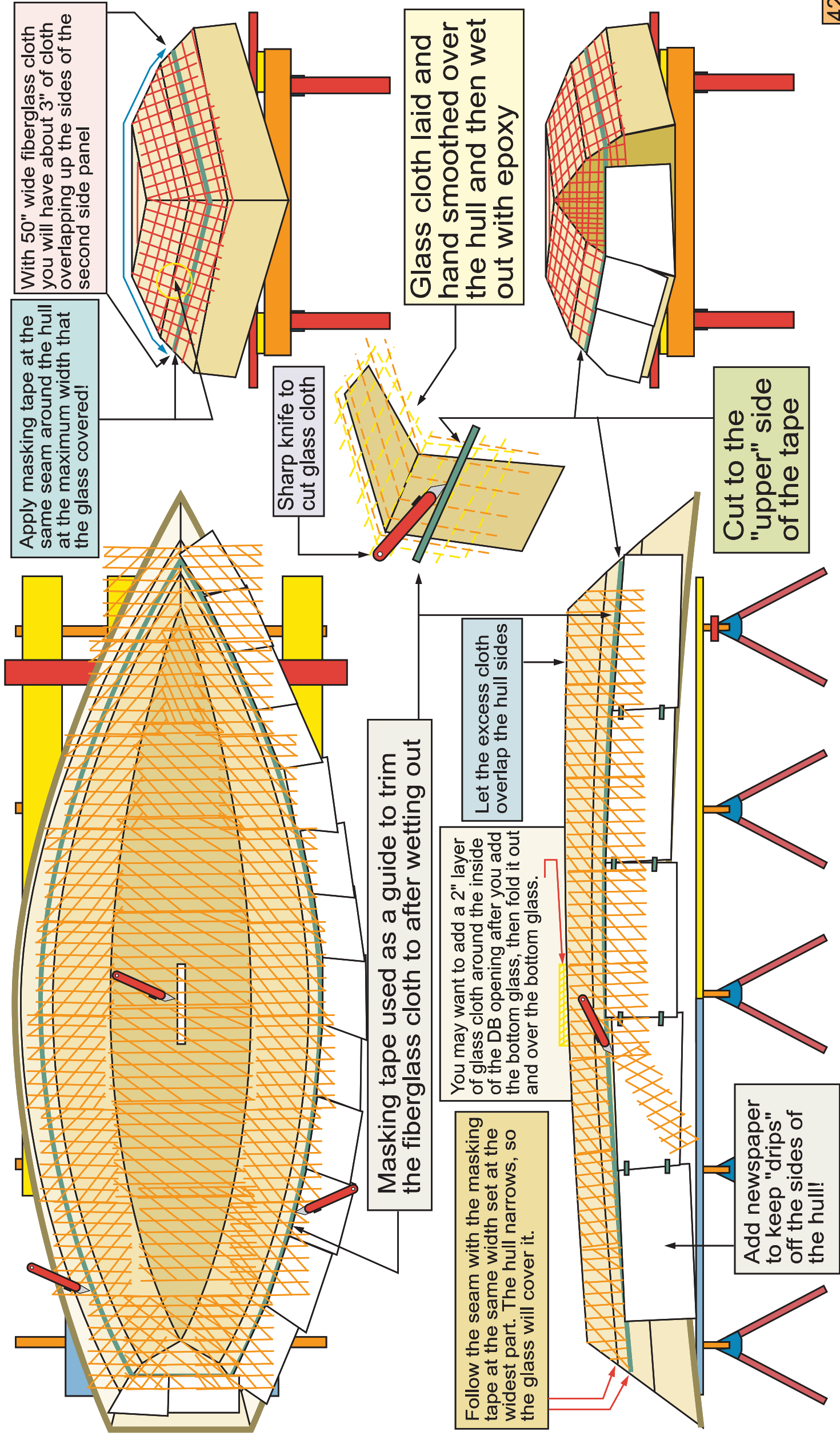


Trim tape ends to match the edge of the bow seam tape

Outside seam details

Or 3" tape if you used that on the inside of the hull

Fairing compound to fill in the edges of the glass tape for a smooth seam



With 50" wide fiberglass cloth you will have about 3" of cloth overlapping up the sides of the second side panel

Apply masking tape at the same seam around the hull at the maximum width that the glass covered!

Sharp knife to cut glass cloth

Glass cloth laid and hand smoothed over the hull and then wet out with epoxy

Cut to the "upper" side of the tape

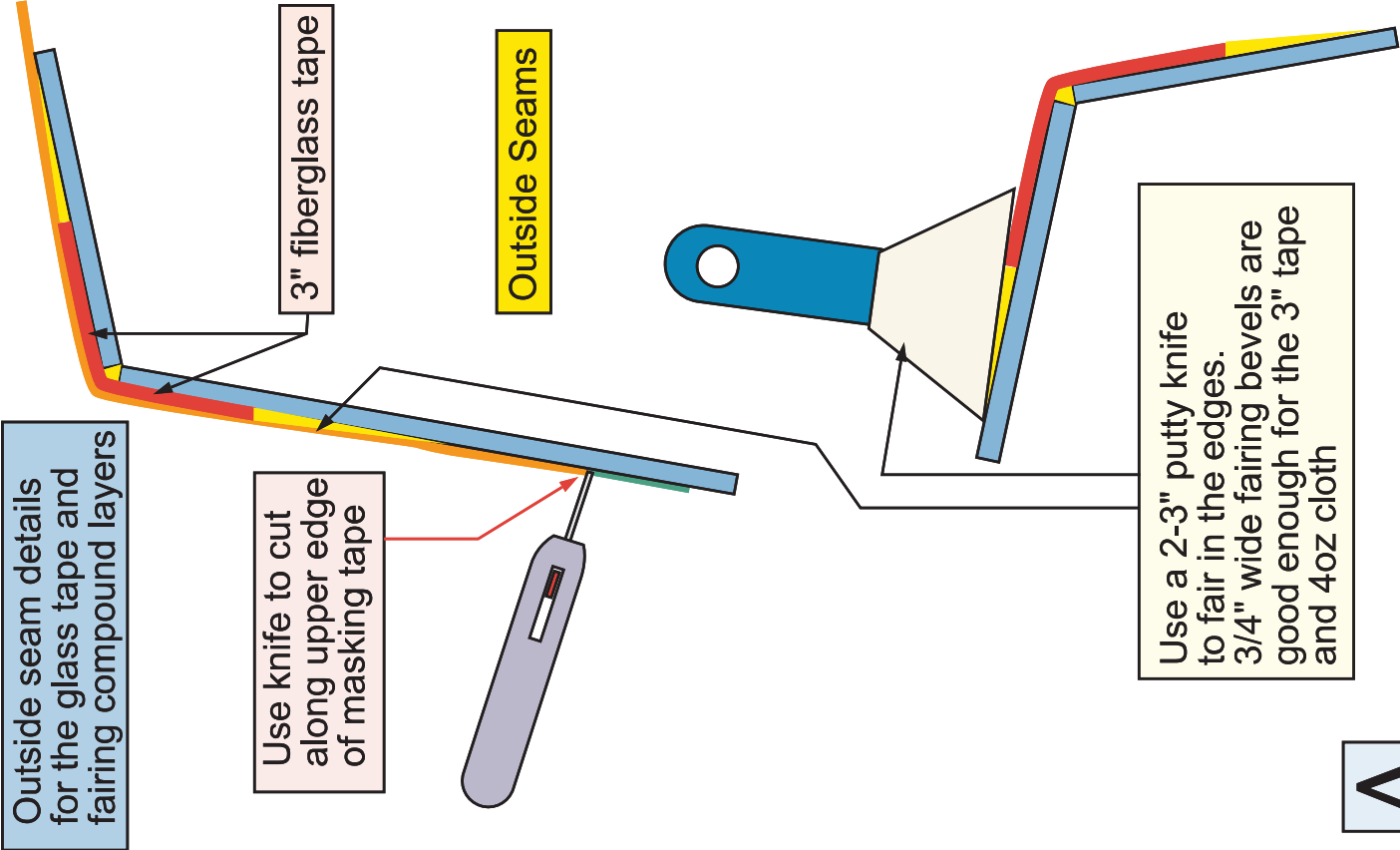
Masking tape used as a guide to trim the fiberglass cloth to after wetting out

You may want to add a 2" layer of glass cloth around the inside of the DB opening after you add the bottom glass, then fold it out and over the bottom glass.

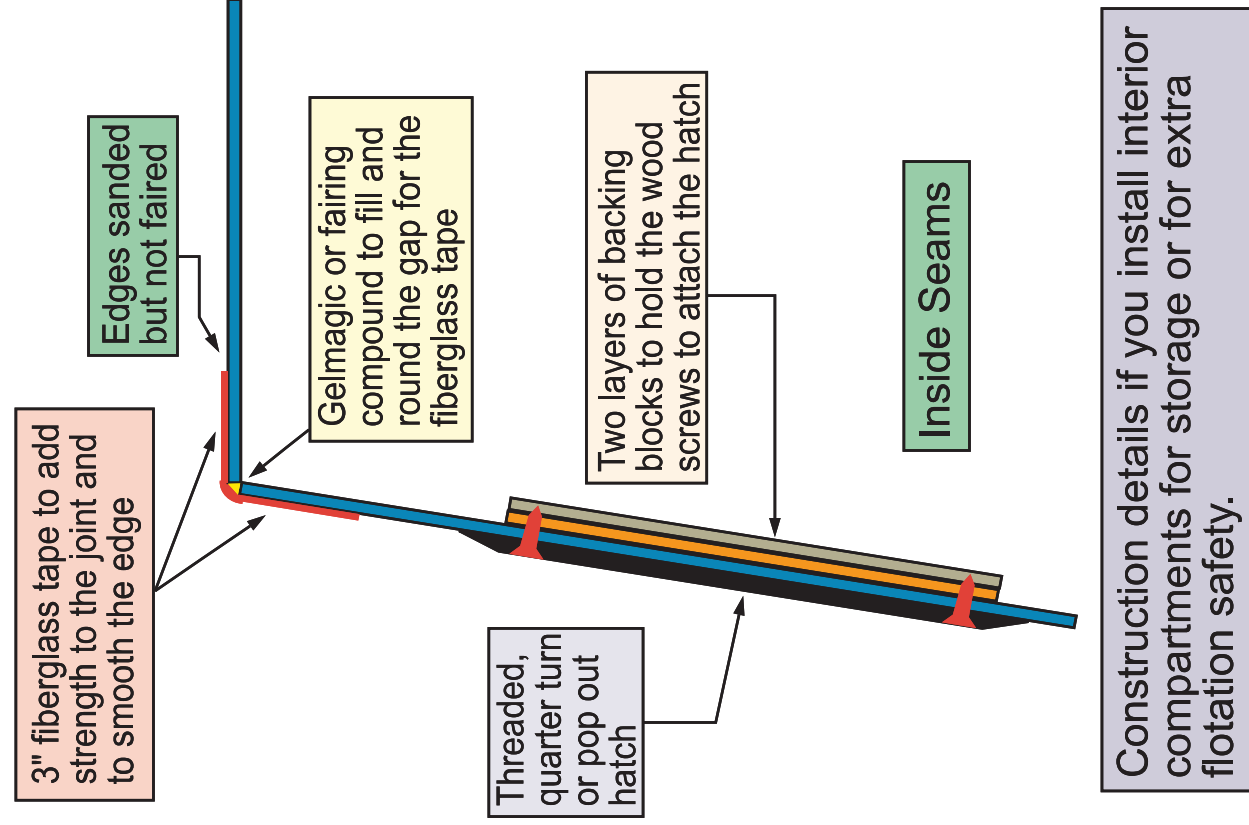
Follow the seam with the masking tape at the same width set at the widest part. The hull narrows, so the glass will cover it.

Let the excess cloth overlap the hull sides

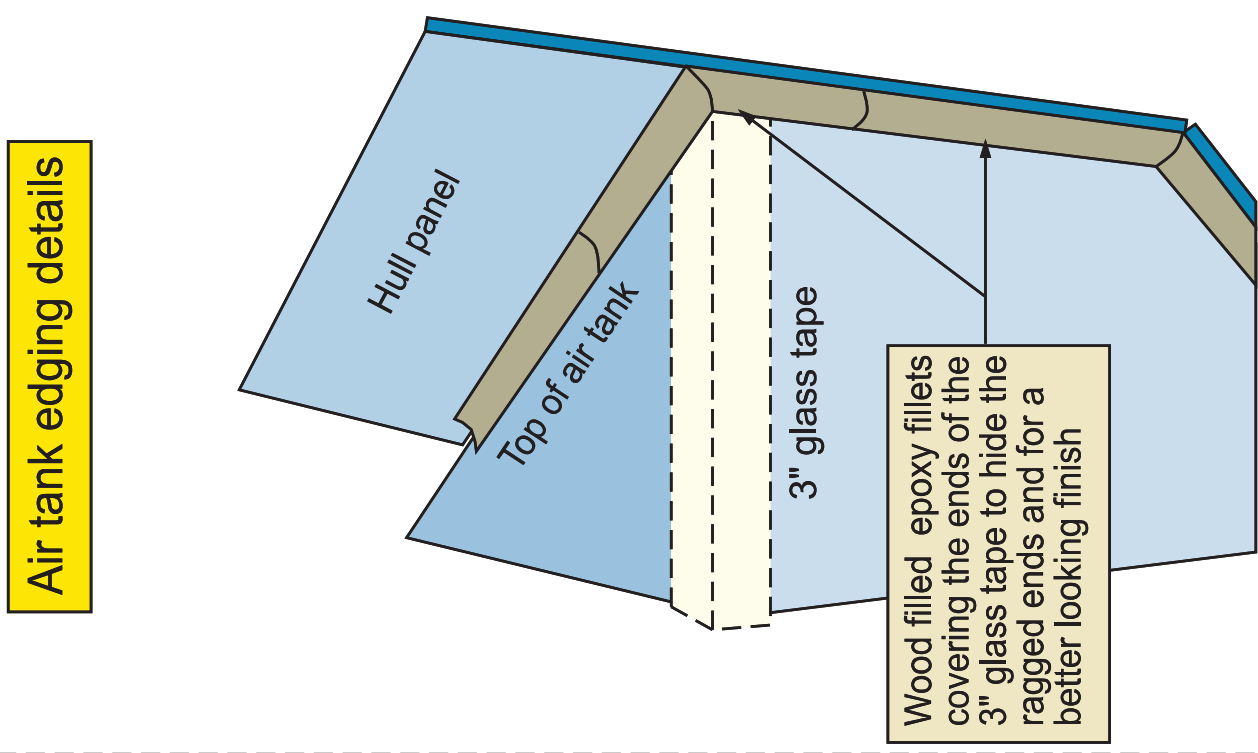
Add newspaper to keep "drips" off the sides of the hull!



A



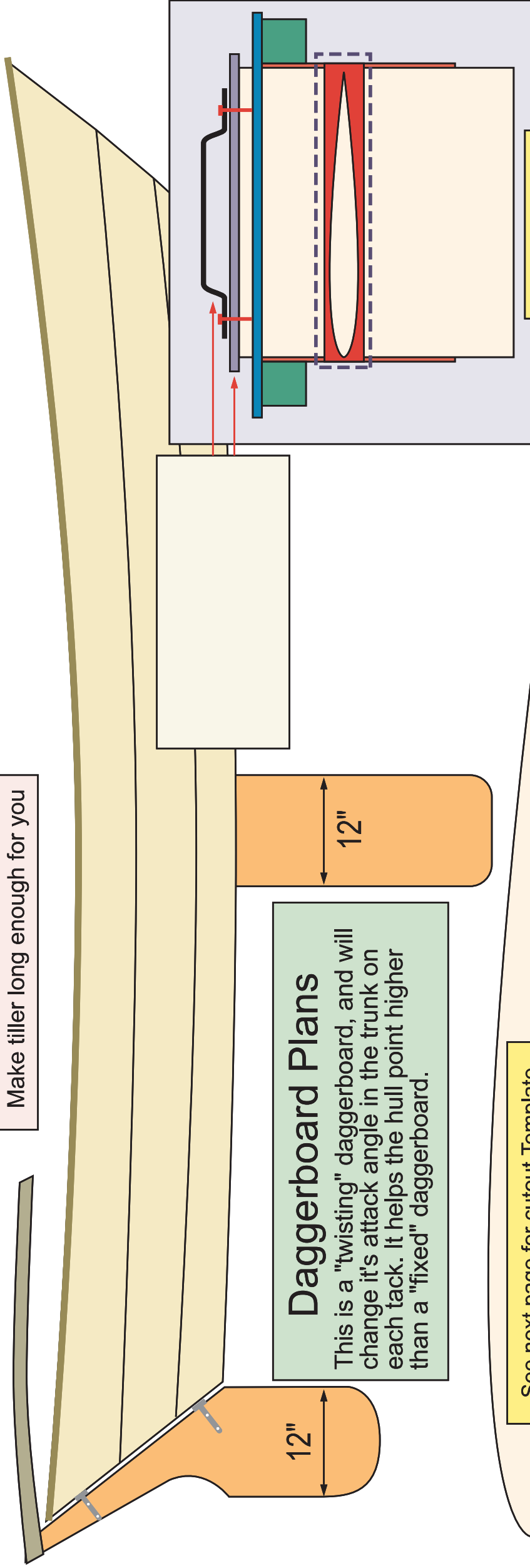
B



C

Air tank edging details

Make tiller long enough for you



Daggerboard Plans

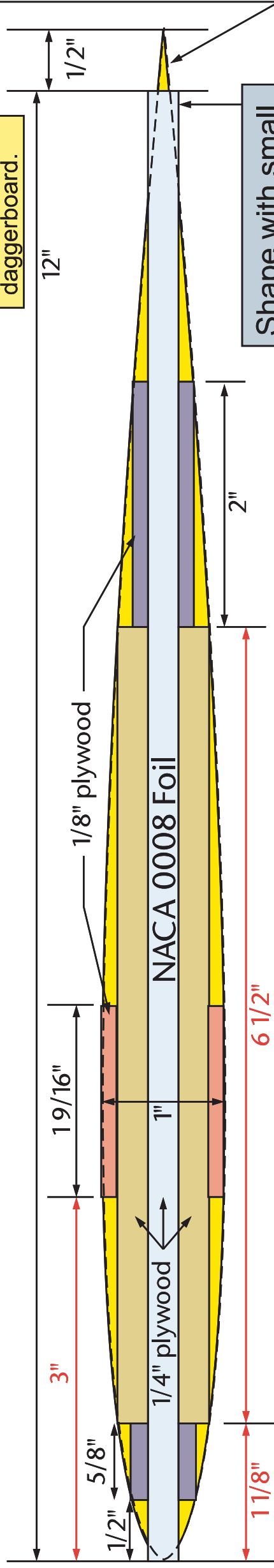
This is a "twisting" daggerboard, and will change it's attack angle in the trunk on each tack. It helps the hull point higher than a "fixed" daggerboard.

12"

12"

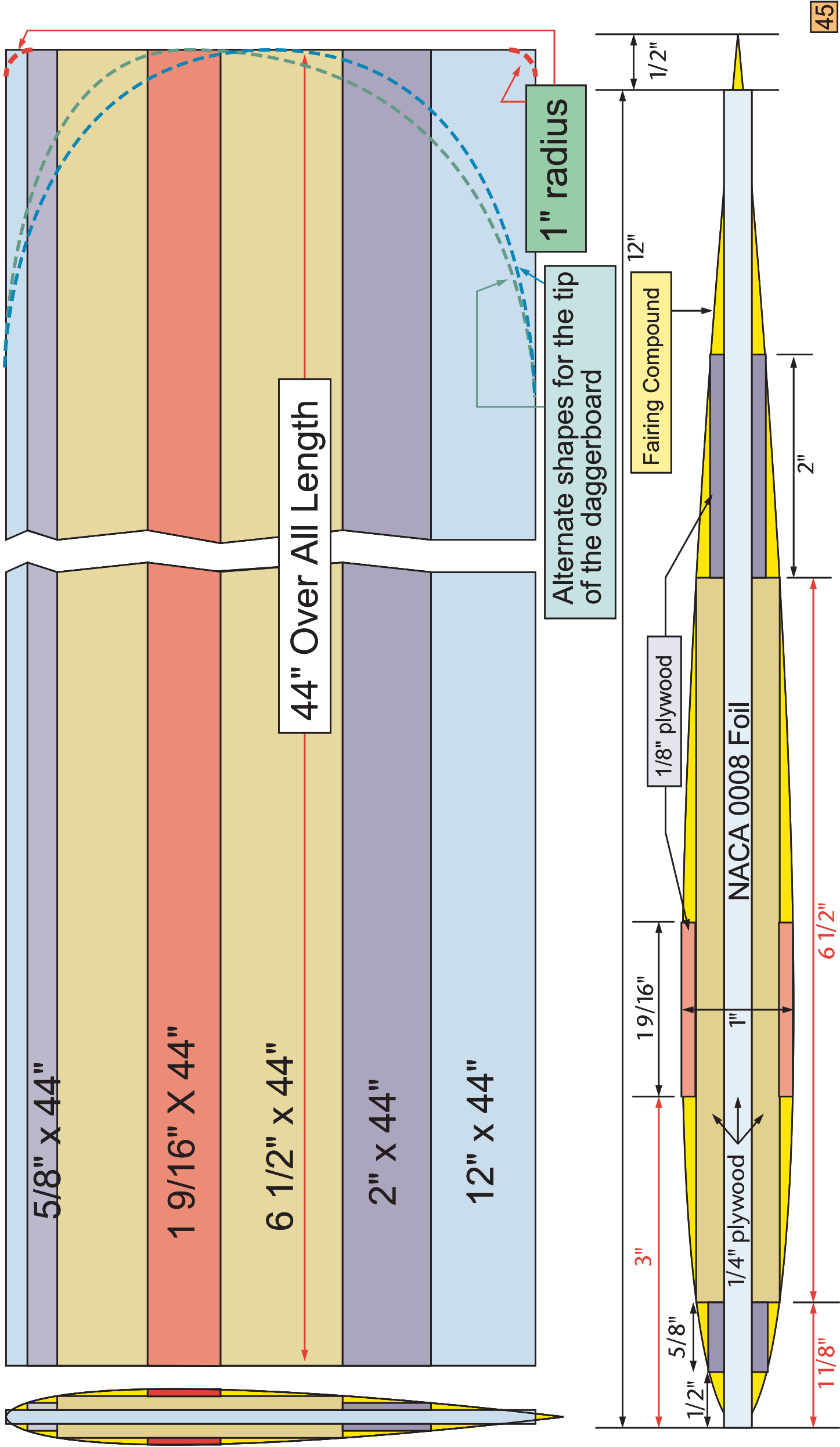
See next page for cutout Template

Shown for effect only, not part of daggerboard.



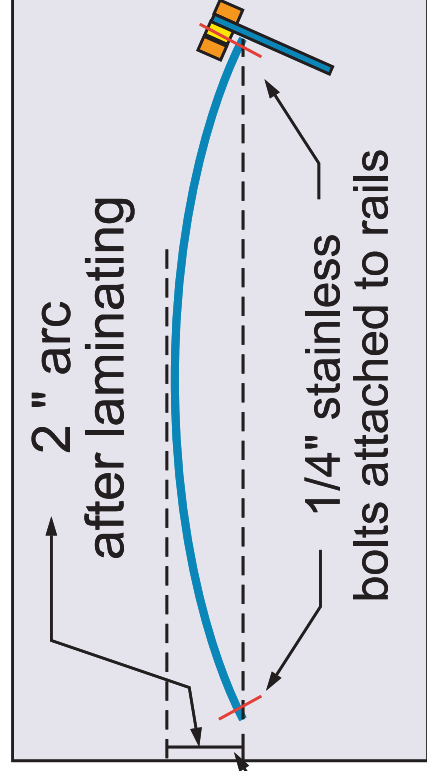
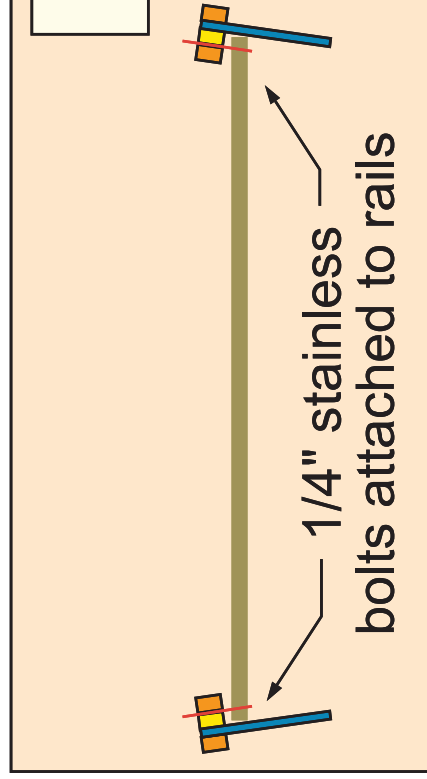
Shape with small hand plane.

Fair in yellow areas with EZ-Filler or QuickFair Sand and shape after cured.

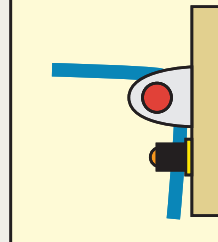


Rudder/Daggerboard Cutout Template

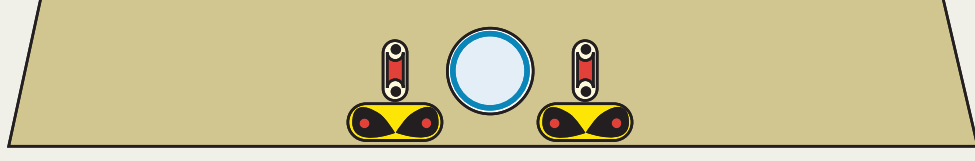
Make copy, paste to cardboard or scrap plywood, cut out center and use to "shape" your rudder and daggerboard.

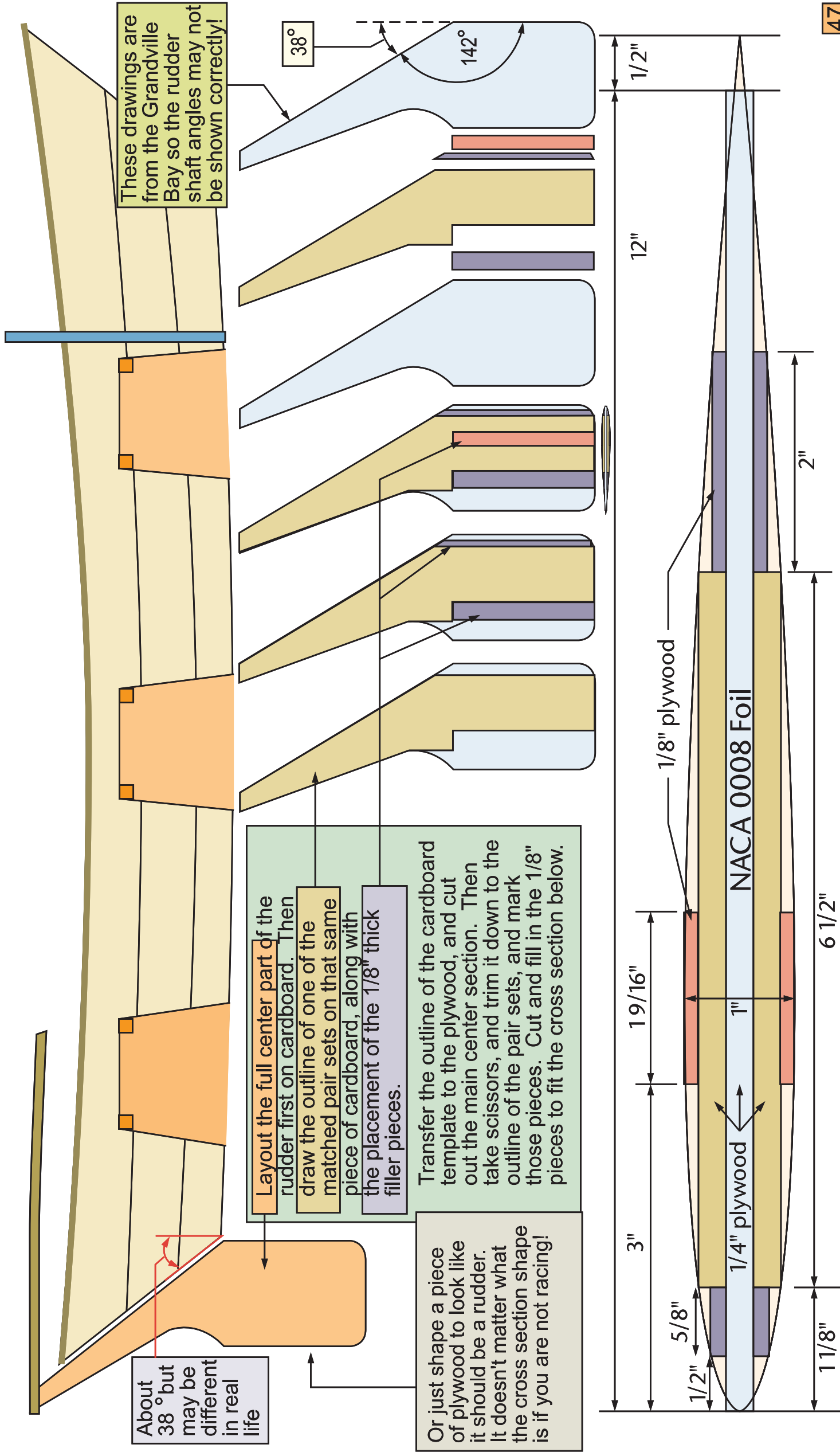


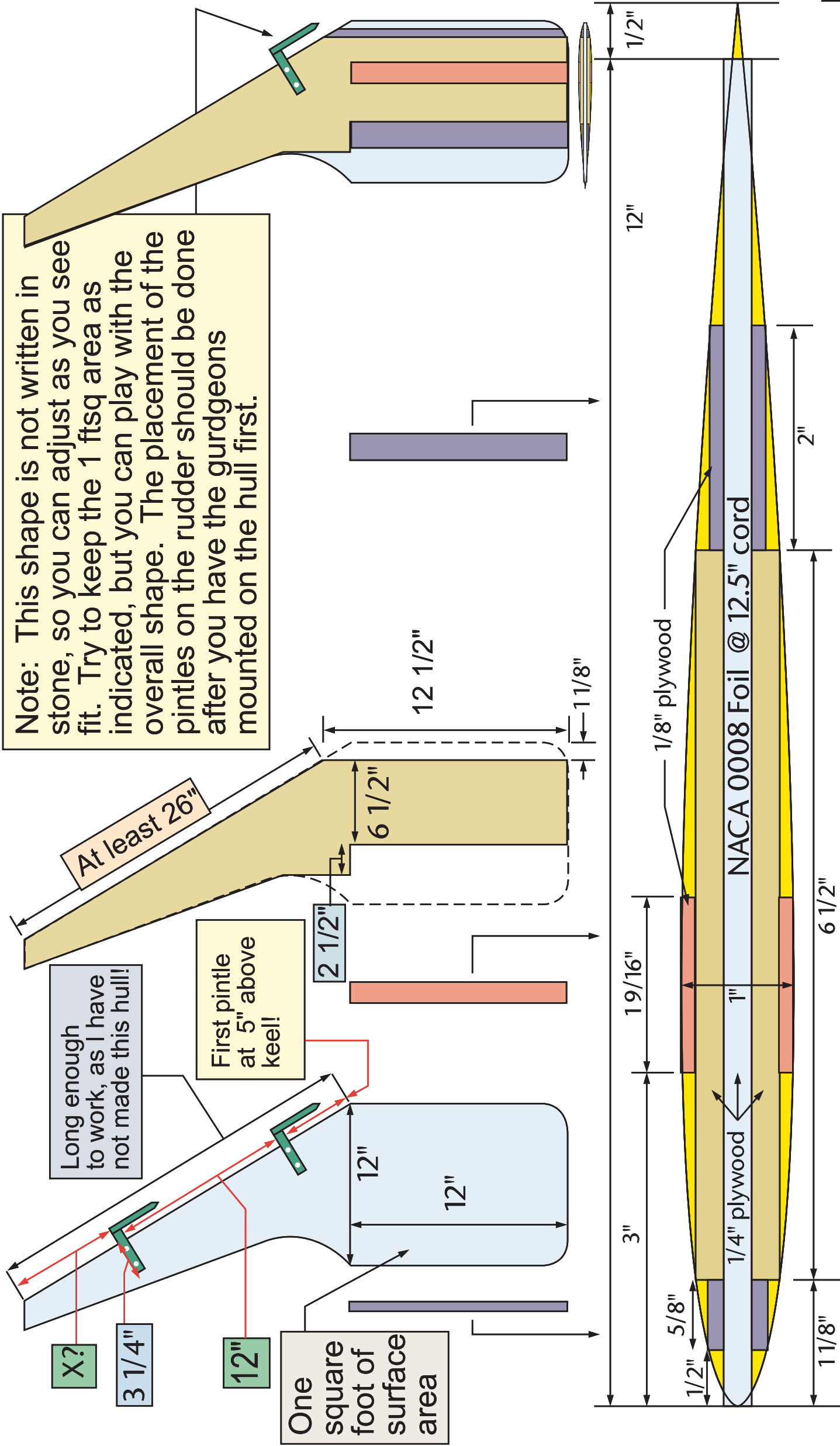
Arched or straight works either way!



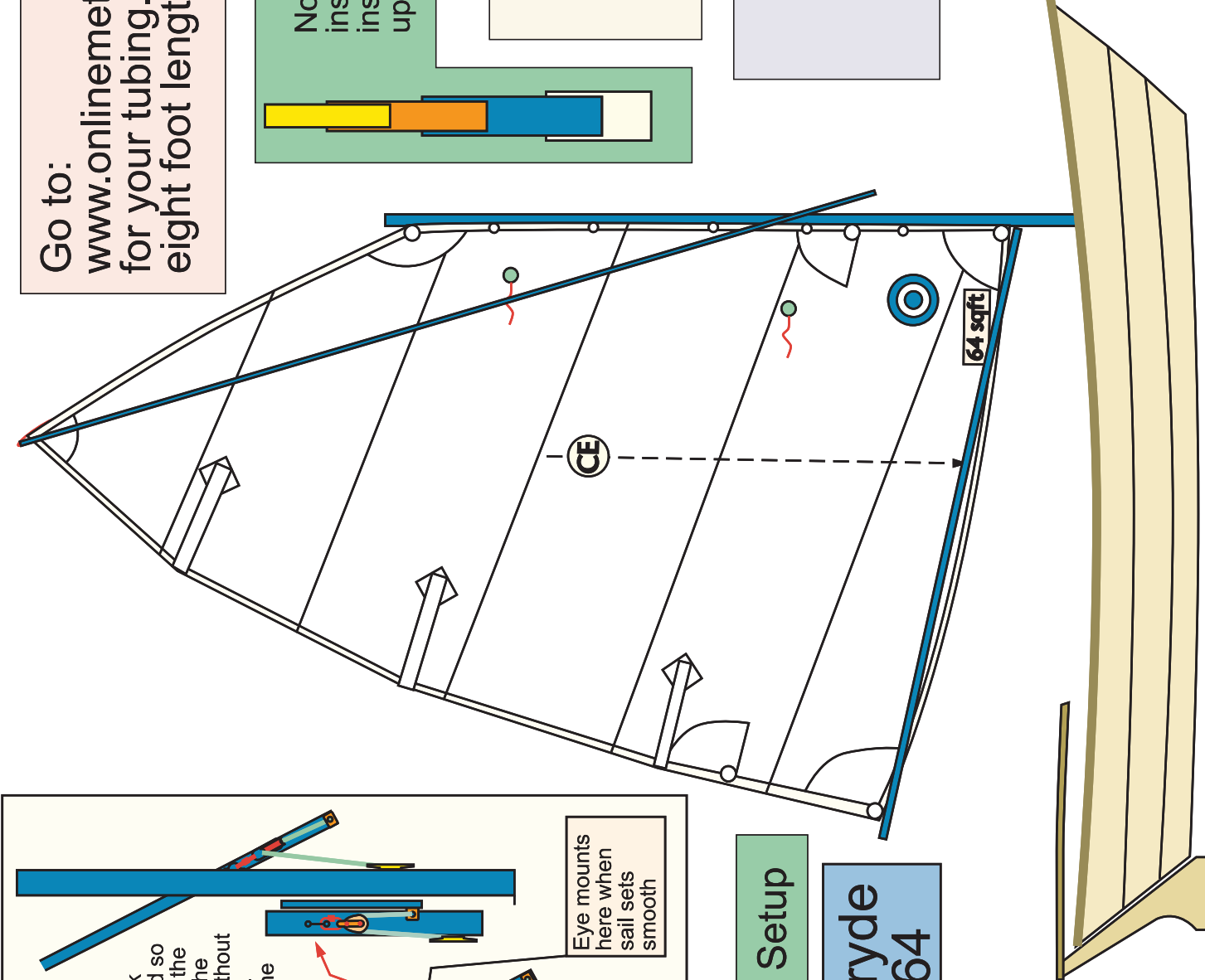
Mast Partner
Use turning blocks and camcleats instead of straight cleats on the sides of the mast. They also hold mast in boat.







Note: This shape is not written in stone, so you can adjust as you see fit. Try to keep the 1 ftsq area as indicated, but you can play with the overall shape. The placement of the pintles on the rudder should be done after you have the gurdgeons mounted on the hull first.



The snotter block must be mounted so it lays inline with the sprit pole when the sail is set and without any creases in it. Slide a looped line up and down the mast to find this location.

Eye mounts here when sail sets smooth

Sprit Rig Setup

Neil Pryde
Pram 64

Go to:
www.onlinemetals.com
for your tubing. Ships in
eight foot lengths via UPS.

1/2" or 3/4" laminations

2" arc after laminating

1/4" stainless bolts attached to rails

Can also be made straight!

Note: You can use 0.058" wall instead. 0.058 wall fits tight inside/outside it's next up/down size in diameter!

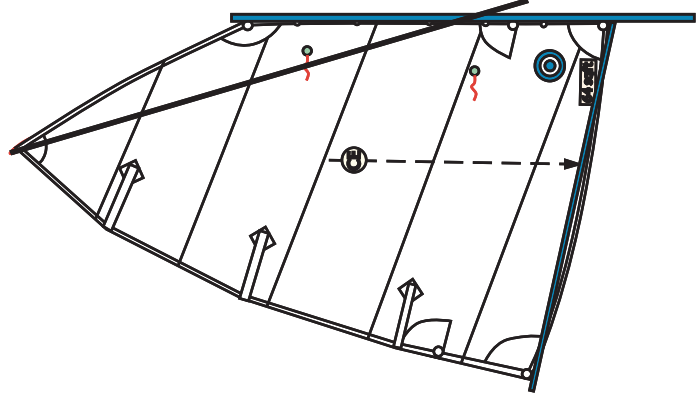
Lengths

Diameters/Wall

Mast Partner

Use turning blocks and camcleats instead of straight cleats on the sides of the mast. They also hold mast in boat.

Sprit Rig Setup



SD-082016 screwed into wooden plug inside boom tube.

RL-302A
Single becket
block

SD-081102
Reshape and
attach sideways

RL-312-0
Small shackle

RL-301A
single block

RL-307A
Traveler Block

Mount block 4" aft of daggerboard trunk

Rotated to use shackles and simple blocks.

**All cleats: 4"
SD-043040**

Rotated to use shackles and simple blocks.

Boom hardware is the same for the Gaff Rig shown on the next page!

5/8" ss track

10ft mast
tube

RL-327 gooseneck w/3/8" pin fitted to 12" of 5/8" SS track. Pin rotates in hole drilled in wooden plug held in boom tube with SS #6 x 3/4" screws.

5/16 to 1/2" dowel fitted to drilled hole in wood plug held in place with #6x3/4" stainless screw.

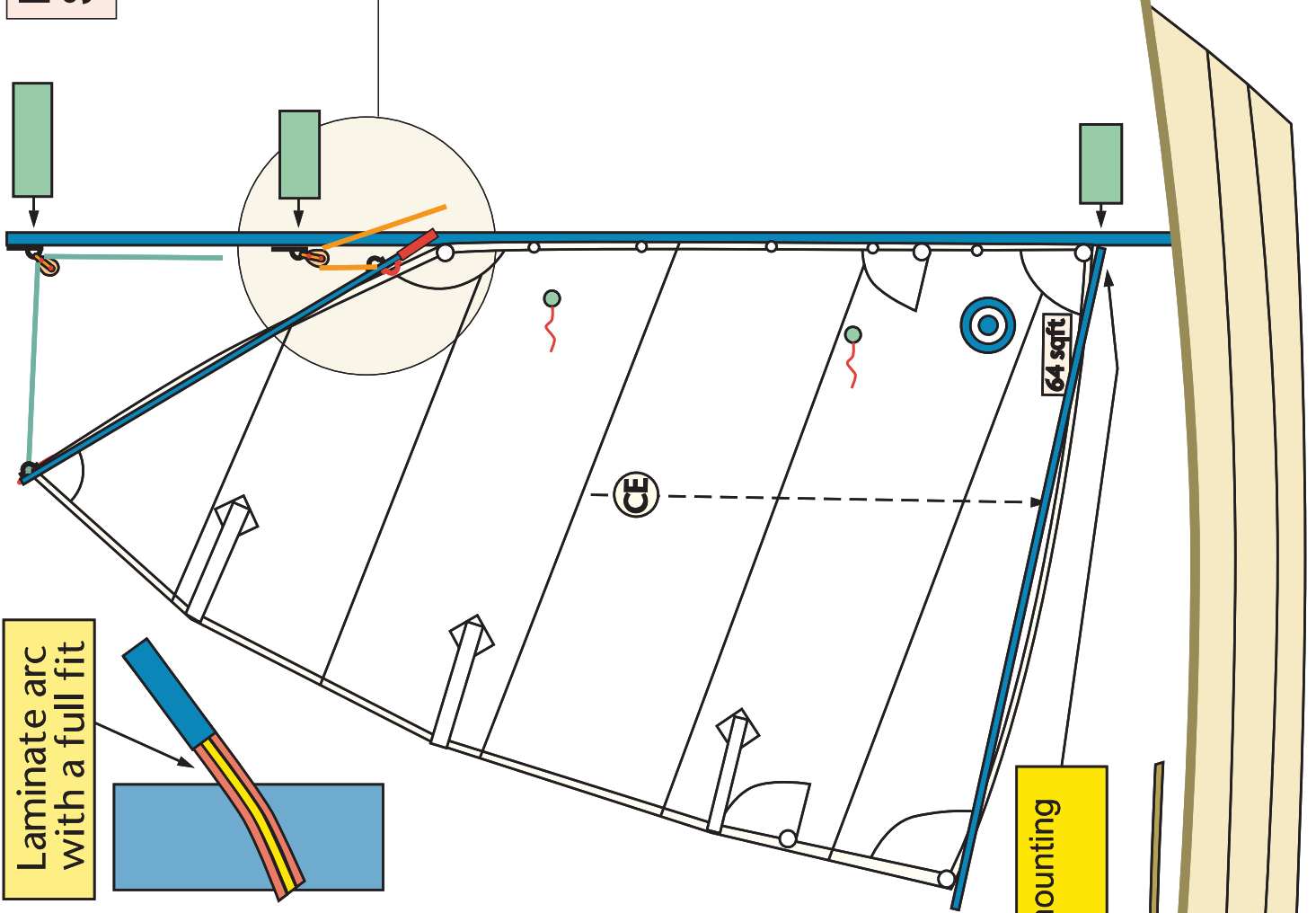
SD-082010 fairlead screwed into wooden plug. 

SD-082016

Extra reefing

2" pipe plug set
on 1/4" ply disk
bedded in
EZ-Fillet

SD-081102 eye
3/16" SS shackle
RL-301A block
SD-082010 fairlead
4" Cleat



Note: You may want to raise the strap with a small piece of wood to give the block more room to twist!

RL-318
SS Spin Strap

RL-205
Blocks

SS Trigger
Snap Shackle
SD-146048

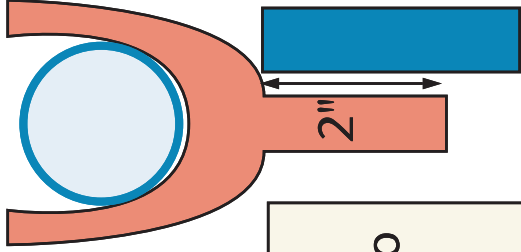
SS Swivel Eye
Boat Snap
SD-146131

RL#'s are RaceLite (made in USA)
SD #'s are SeaDog (all available)
at www.duckworksbbbs.com

Diameters/Wall

Mast: 2" / 0.065"
Boom: 1 1/2" / 0.065"
Gaff pole: 1" / 0.065"

Laminate arc
with a full fit



Gaff Jaws sized to fit your mast.
3/4" of plywood scraps works fine

Lengths

Same boom hardware and mounting heights as pervious page

Neil Pryde
Pram 64
is the sail shown