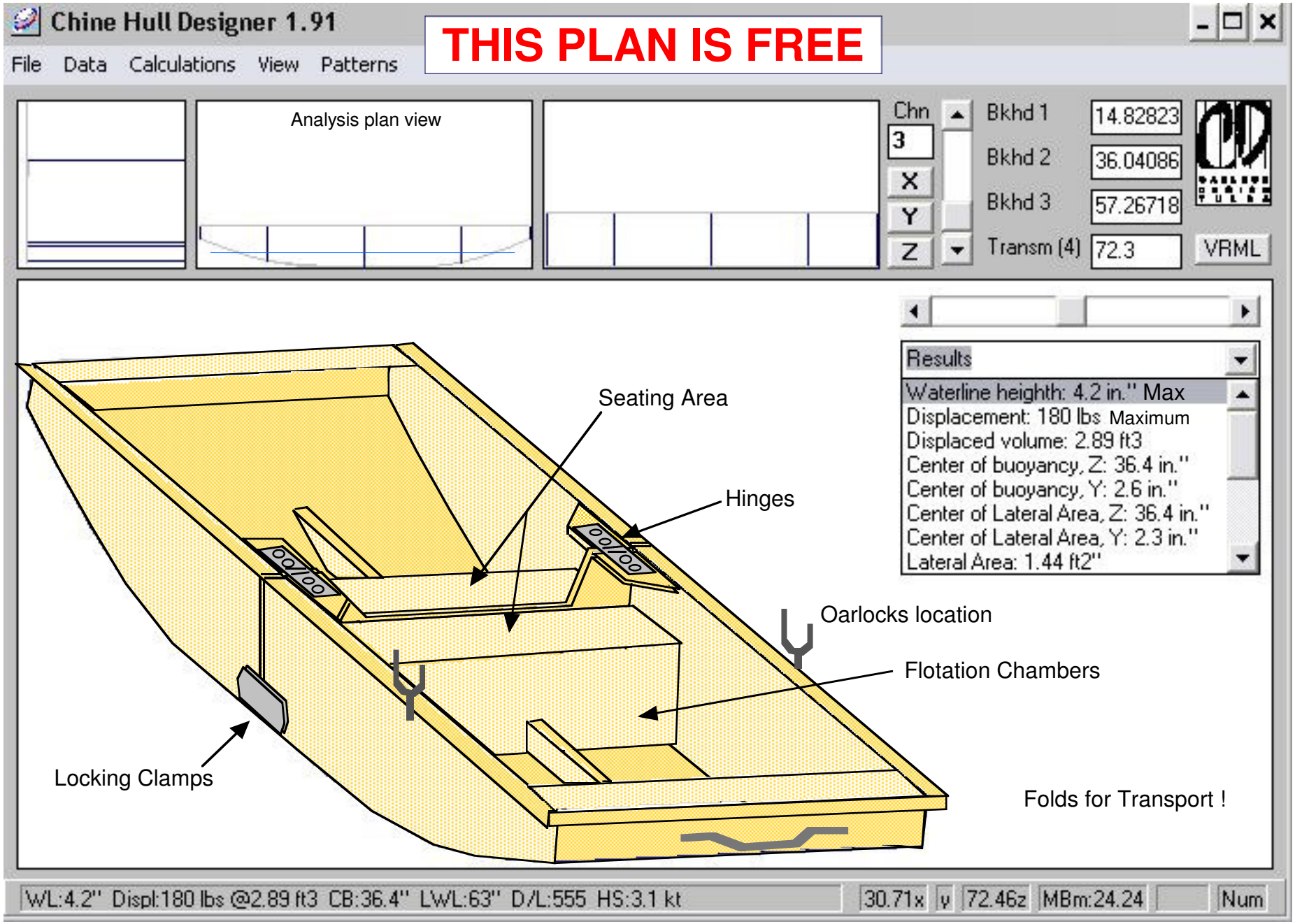
The P O D

Paddle **O**n **D**emand

A small Punt ideally suited for children and young adults.
Easy to build from One sheet of Plywood.
Cost to build hull is under $100.
POD fits IN the car.

090909 rev

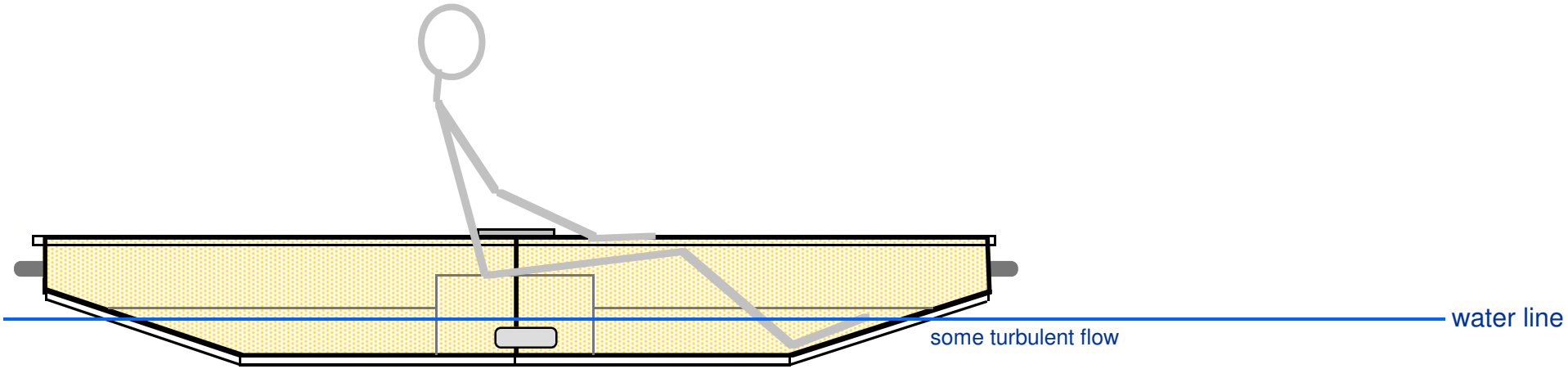
Kid friendly !



The POD

A brief description of the origins of the POD and an option available to the builder.

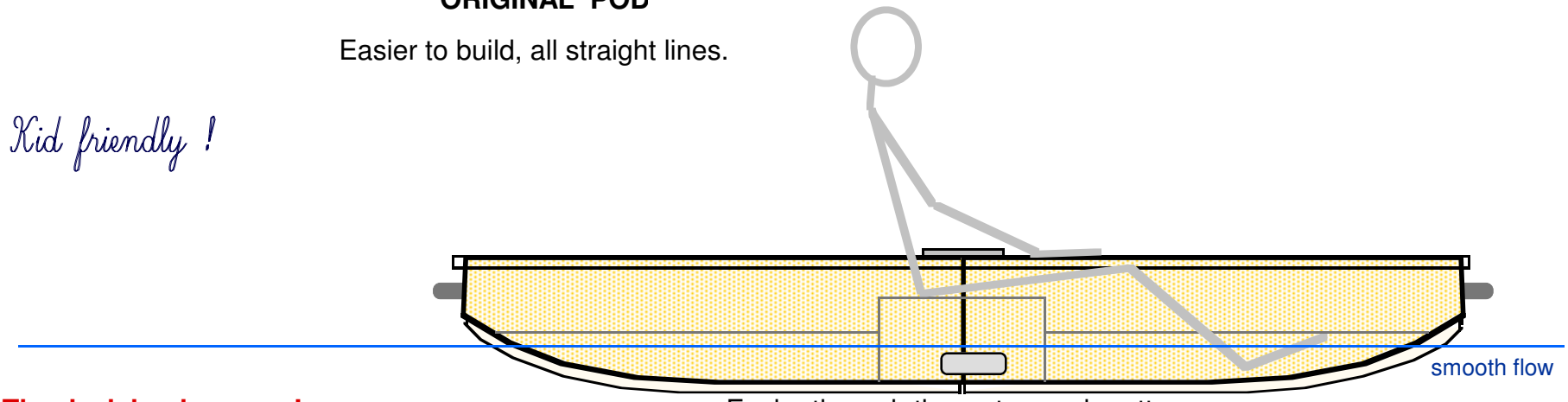
This small little boat was conceived with idea that kids should enjoy boating as much as their parents and grandparents. They should also learn first hand about boat building, and appreciate working with an adult to complete a project that is intended for their use alone. Certain design elements had to be adhered to: lightweight, portable, safe, easy to build, and low cost. Having met these goals with POD, there was still something missing. Looks. With it's square sides and angled bottom it just wasn't pretty. So, to pacify the purists, me included, we are offering two options to the builder. Make it as designed with angled bottom, which is the easiest of designs to build, or with a nicely curved bottom, a little more difficult. The choice is yours. The plans include both versions, and the assembly techniques are very much the same.
The following sketches should easily highlight the two designs. The plans will show the differences where required.



ORIGINAL POD

Easier to build, all straight lines.

Kid friendly !



The decision is yours !

Easier through the water, and pretty.

PRETTY POD

POD

Paddle On Demand

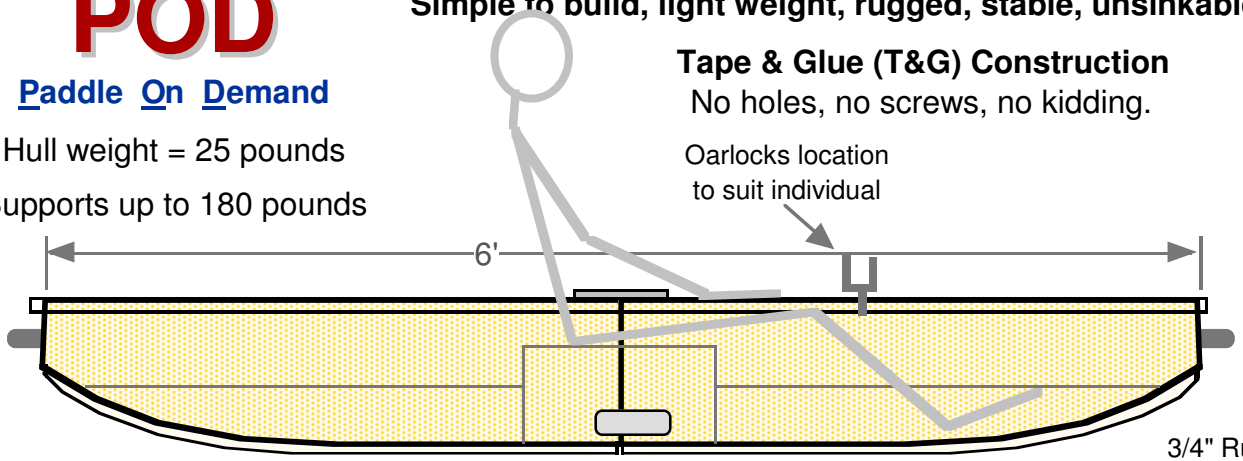
Simple to build, light weight, rugged, stable, unsinkable, & kid friendly !

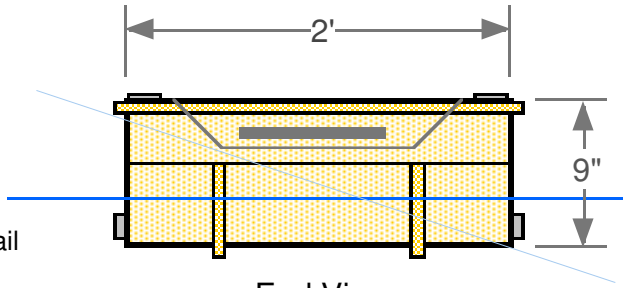
Tape & Glue (T&G) Construction

No holes, no screws, no kidding.

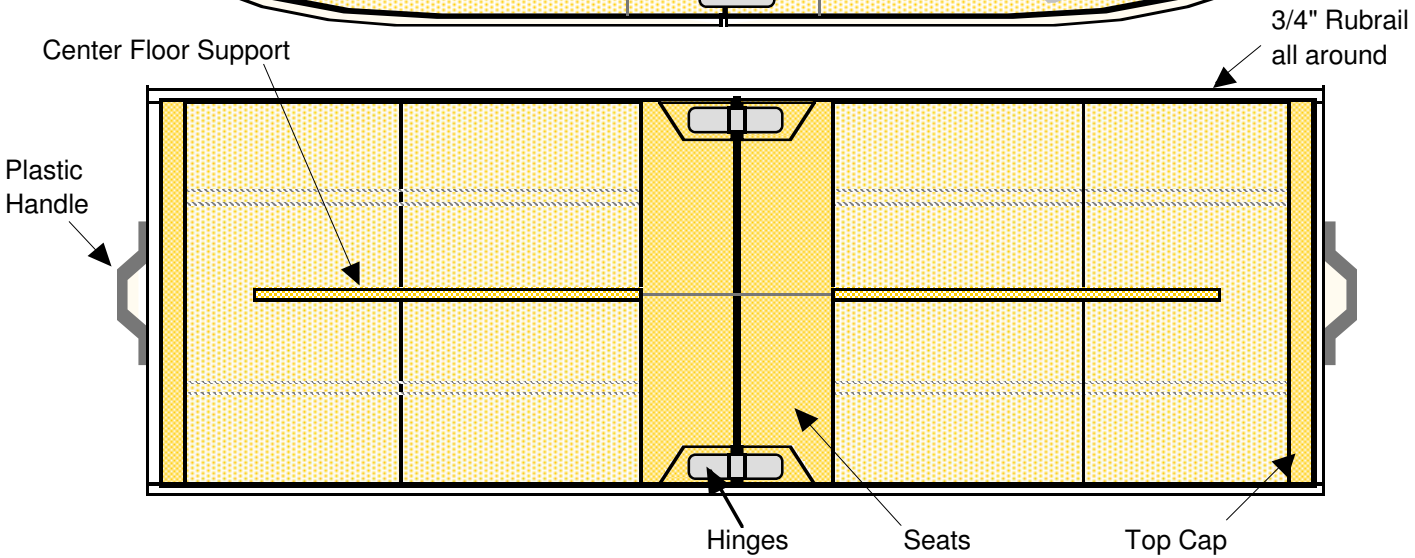
Hull weight = 25 pounds

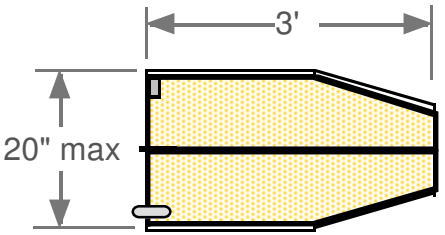
Supports up to 180 pounds





End View





Folded for Transport

SPECIFICATIONS:

Size Open: 6 feet long, 2 feet wide, 9 inches deep
Size Folded: 3 feet long, 2 feet wide, 20 inches high
Weight: Approx. 25 pounds
Supports: Approx. 180 pounds max.
Propulsion: Paddles or Oars (no motor)
Intended for children or young adults to build and enjoy.
Safety flotation chamber, will not sink.
Fits in the back seat of all cars, RV's, SUV's & trucks.

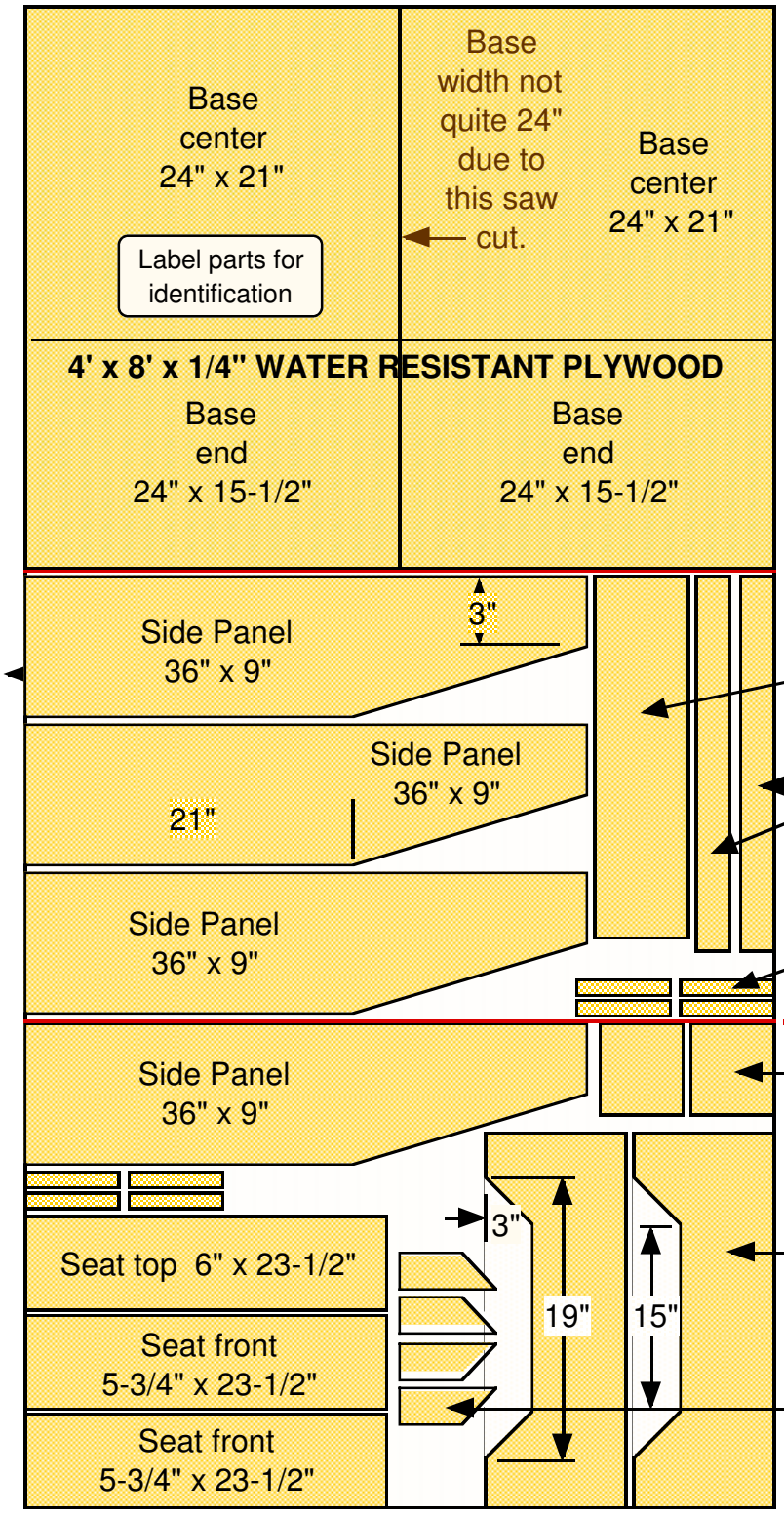
Kid friendly !

B.O.M.	Est.
1 - 4 x 8 x 1/4" ply	$15
4 - 3/4 sq x 8' hardwood	$12
2 - 1/4 x 3/4 hardwood	$ 5
1 - Roll of Poly Tape	$12
2 - 16oz TB3 glue	$18
1 - Qt. Spar Varnish	$12
2 - 3 x 1-1/2" Hinges	$ 4
2 - Snap Lock Hasp	$12
2 - 1 x 4 x 8' lumber	$ 8
Total hull =	$98

Designed by: Ken Simpson

Read assembly instructions thoroughly !

Original POD



Check-off each of these steps as you progress through the assembly of POD.

Cut on Red Lines at lumber yard to get panels home. (Optional)

Seat top 6" x 23-1/2"

Top Cap Fore & Aft 24" x 2-1/2"

Seat edge supports (8) 1" x 5-1/2"

Seat center supports (2) 5-3/4"square

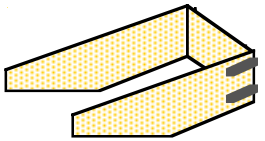
Bulkhead (2) 9" x 23-1/2"

Hinge Mount Covers 2-1/4" x 6" make 4

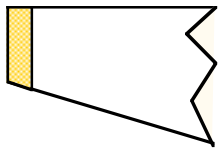
PLYWOOD LAYOUT and ASSEMBLY PROCESS STEPS:

Follow the assembly diagrams below for the build sequence and process. Both sections identical.

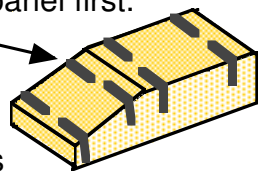
☐ **Step 1** Sides to Bulkheads.
Use the Corner Alignment Tool .
Apply glue, TB3, to loose panel joints.
Close, nail & Duct Tape outside corners. Insure squareness of corners. Allow glue to cure.



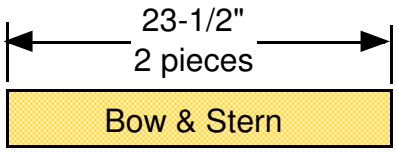
☐ **Step 2** Bow & Stern to Side Panels.
Cut 22 degree angle on bottom edge of Bow & Stern panels to conform with angle of side panels.
Glue and nail in place. Insure squareness.
Can be done at same time as Step #1.

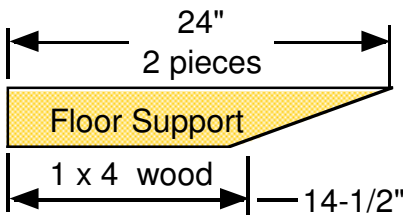


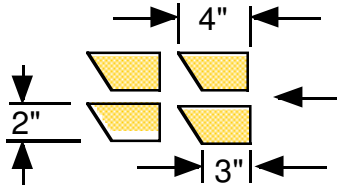
☐ **Step 3** Turn assembly over and prepare bottom panels. Glue and Duct Tape the larger panel first.
Glue and Duct Tape the forward panel.
Insure fit and allow glue to cure.



☐ **Step 4** Lightly sand all exterior surfaces and corners. Prepare for the T&G process.
A minimum of **3 layers of Tape & Glue per joint** will be required for strength and long term durability.





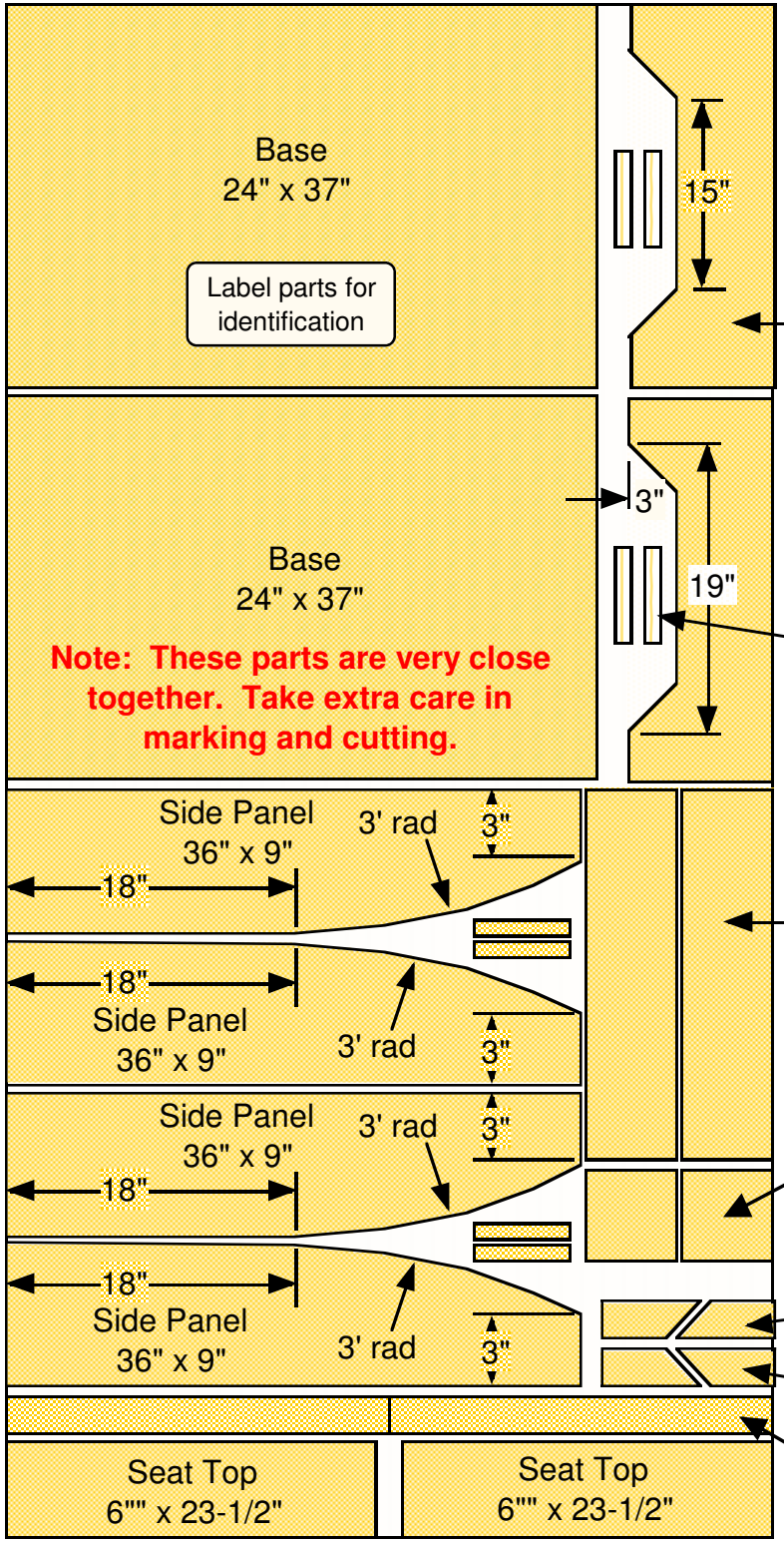


Hinge Mounts (4) 1" x 2" wood, cut from 1 x 4

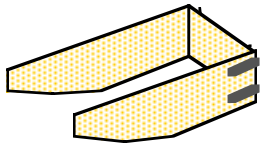
Pretty POD

PLYWOOD LAYOUT and ASSEMBLY PROCESS STEPS:

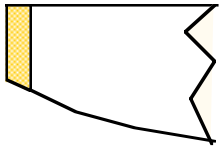
Follow the assembly diagrams below for the build sequence and process. Both sections identical.



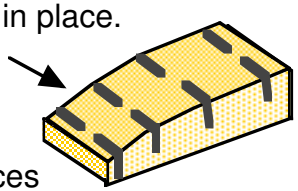
☐ **Step 1** Sides to Bulkheads.
Use the Corner Alignment Tool .
Apply glue, TB3, to loose panel joints.
Close, nail & Duct Tape outside corners. Insure squareness of corners. Allow glue to cure.



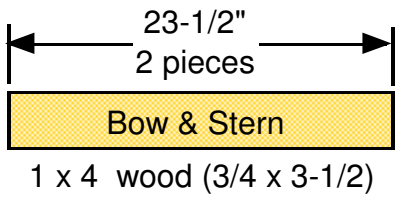
☐ **Step 2** Bow & Stern to Side Panels.
Cut 24 degree angle on bottom edge of Bow & Stern panels to conform with angle of side panels.
Glue and nail in place. Insure squareness.
Can be done at same time as Step #1.

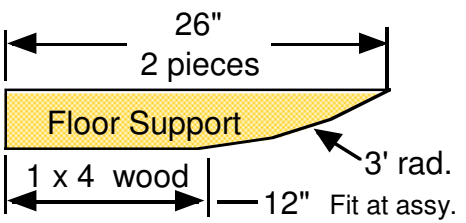


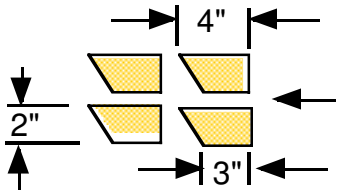
☐ **Step 3** Turn assembly over and prepare bottom panel. Glue and Duct Tape the panel in place.
Nail to Bow panel necessary to hold.
Insure tight fit and allow glue to cure.



☐ **Step 4** Lightly sand all exterior surfaces and corners. Prepare for the T&G process.
A minimum of 3 layers of Tape & Glue per joint will be required for strength and long term durability.



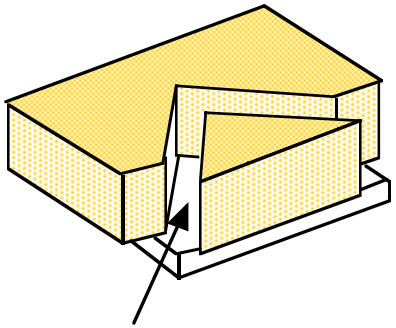




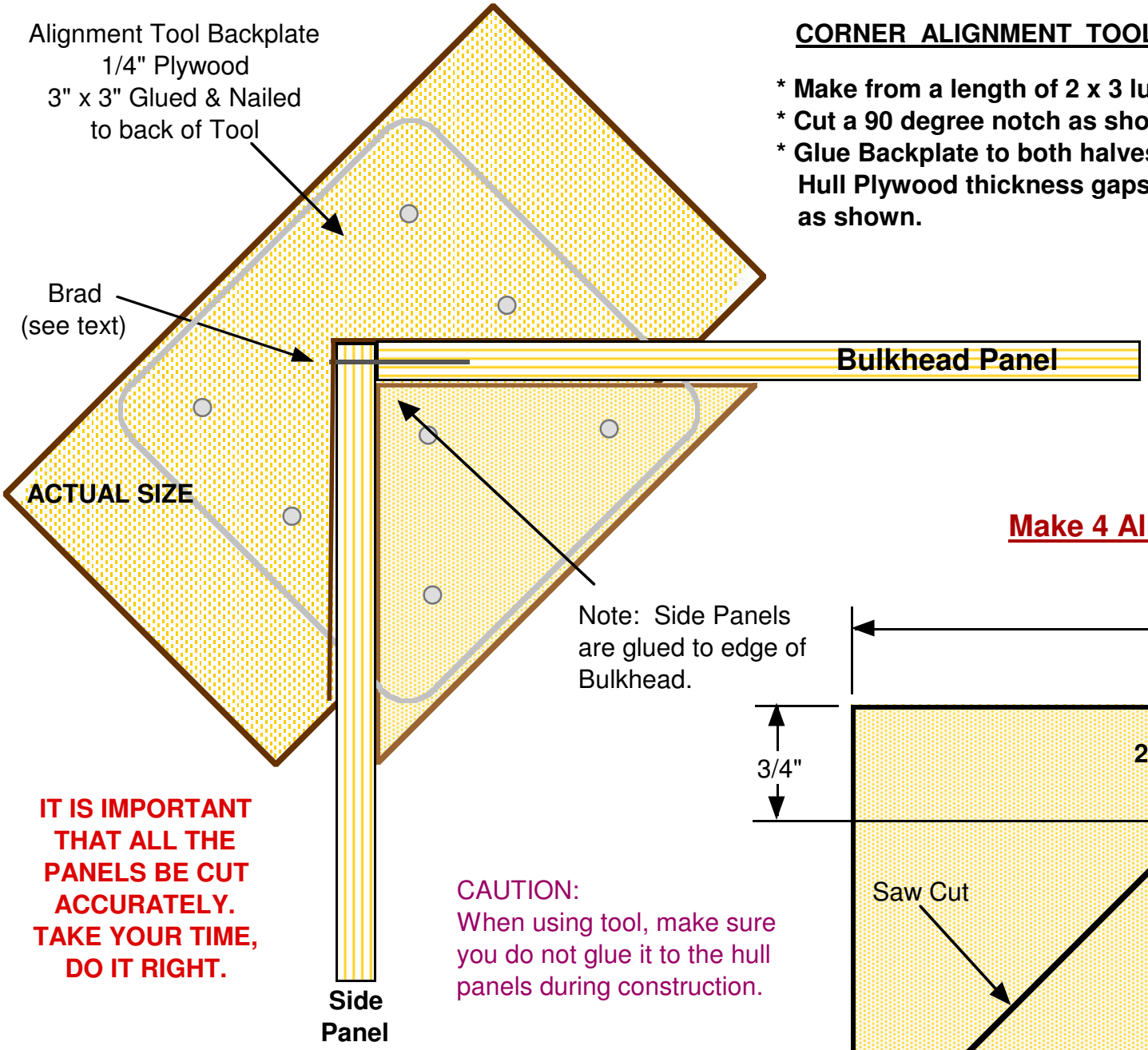
Hinge Mounts (4)
1" x 2" W wood,
cut from 1 x 4

CORNER ALIGNMENT TOOL

* **Make from a length of 2 x 3 lumber.**
* **Cut a 90 degree notch as shown.**
* **Glue Backplate to both halves, with Hull Plywood thickness gaps, as shown.**



Gap equal to thickness of Hull Plywood, but not binding. (use scraps as gauge)

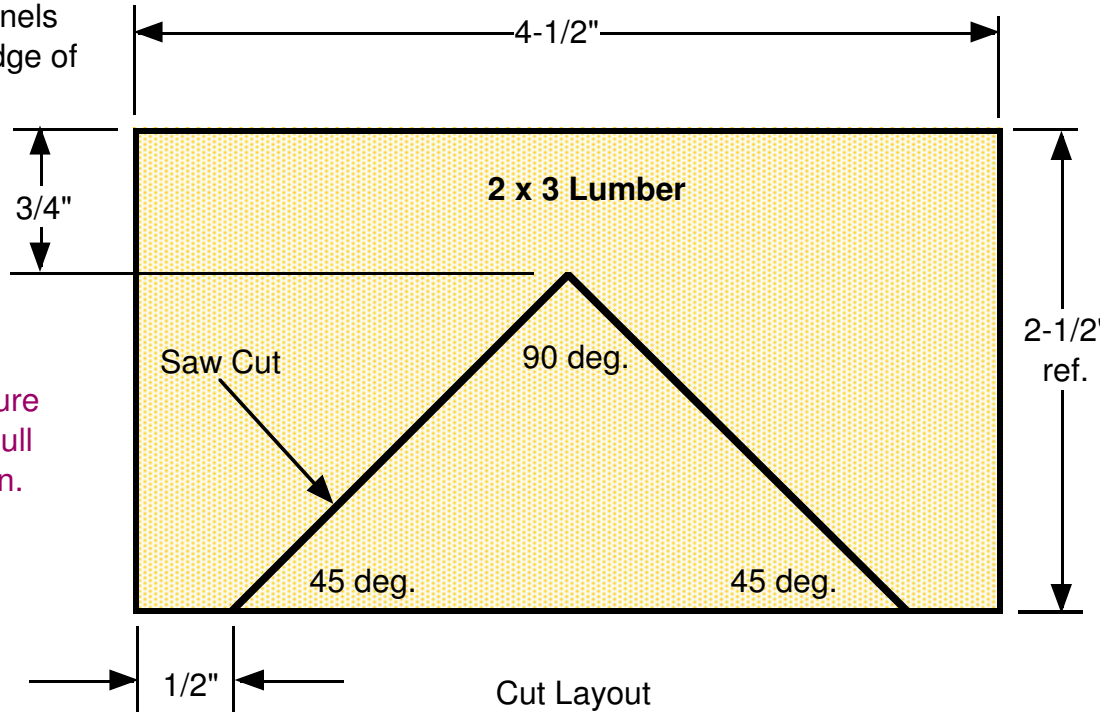


Note: Side Panels are glued to edge of Bulkhead.

IT IS IMPORTANT THAT ALL THE PANELS BE CUT ACCURATELY. TAKE YOUR TIME, DO IT RIGHT.

CAUTION:
When using tool, make sure you do not glue it to the hull panels during construction.

Make 4 Alignment Tools



Cut Layout

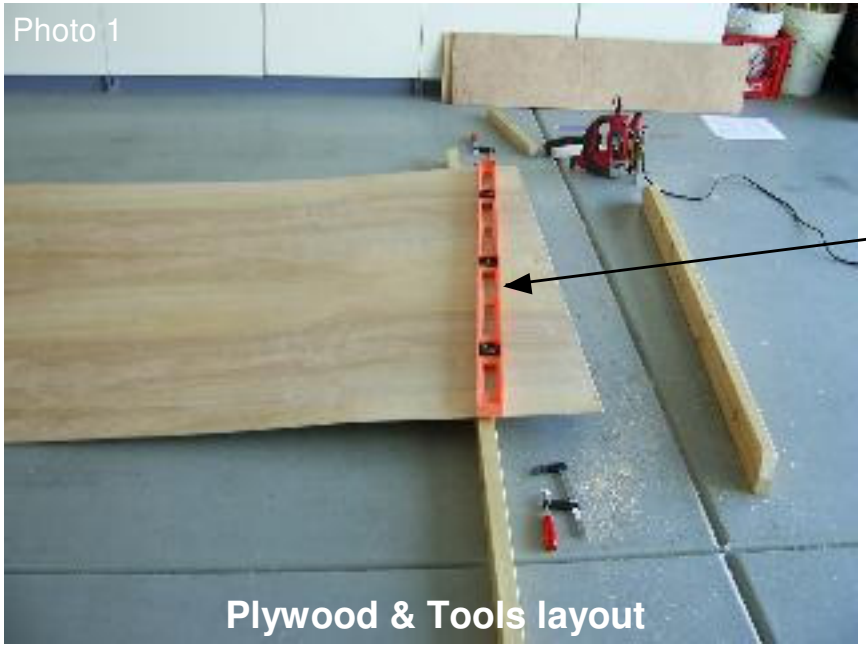
Use of a large Carpenters Square can also assist in determining square corners.

Other similar commercial tools can also be used.

Plywood - Cutting a Straight Line

It is important that all hull panels fit together with even edges. A good cutting set-up will insure this. And a good Jig-Saw is the only power tool needed for this project. Pencil mark the plywood with panel layouts, clamp on a straight-edge and cut a straight line.

Photo 1

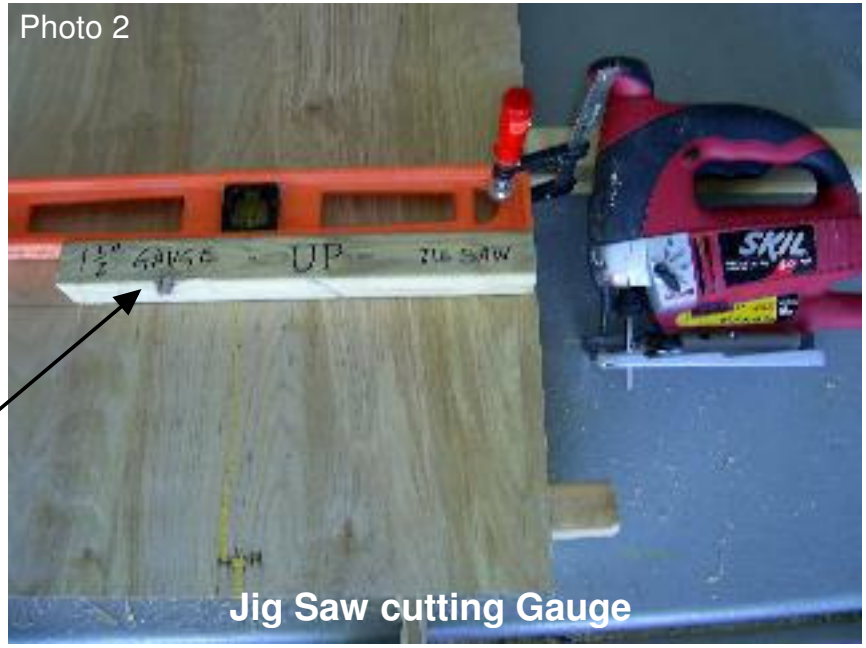


Plywood & Tools layout

Note: Straightedge necessary for Jig Saw to cut in a straight line.

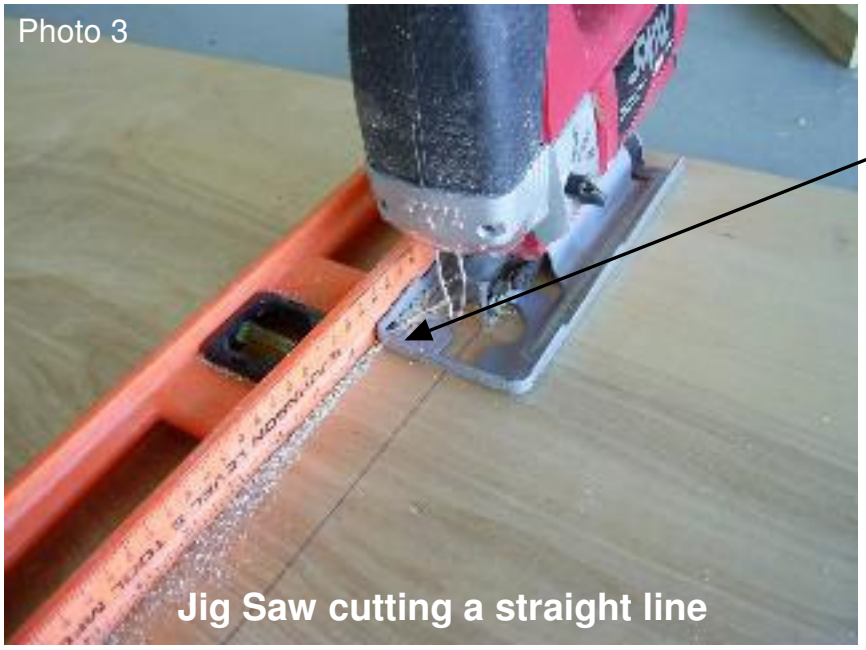
Make gauge to consistently position straightedge from panel marked line.

Photo 2



Jig Saw cutting Gauge

Photo 3

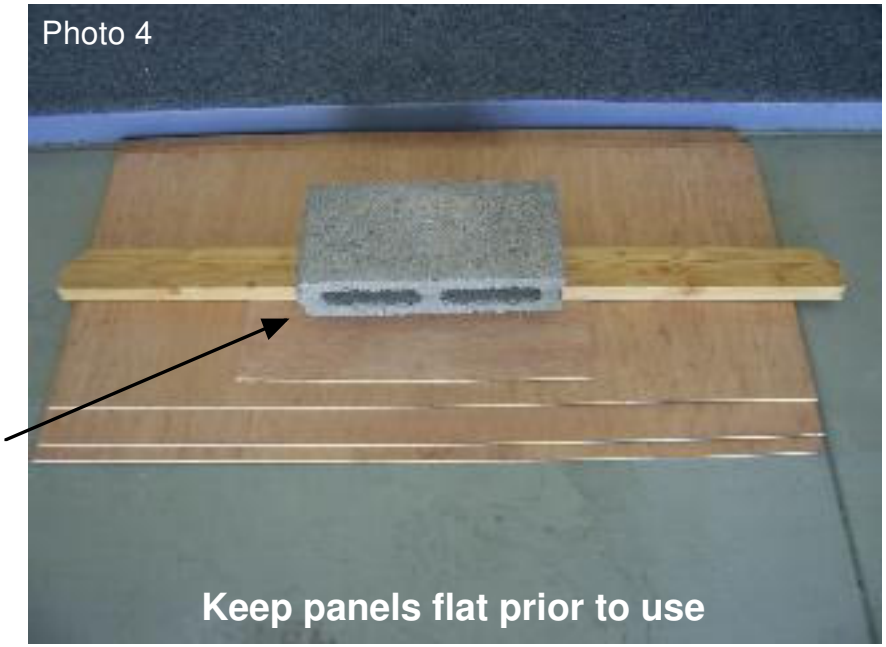


Jig Saw cutting a straight line

Jig saw placed firmly against clamped down straightedge while making a cut.

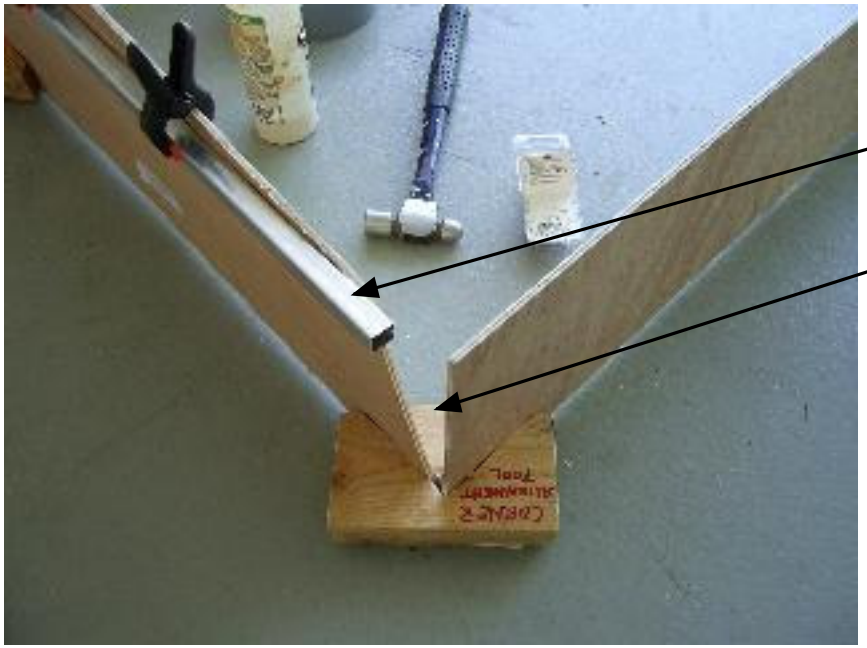
Weigh down panels to prevent warpage prior to use.

Photo 4



Keep panels flat prior to use

ASSEMBLY HIGHLIGHTS



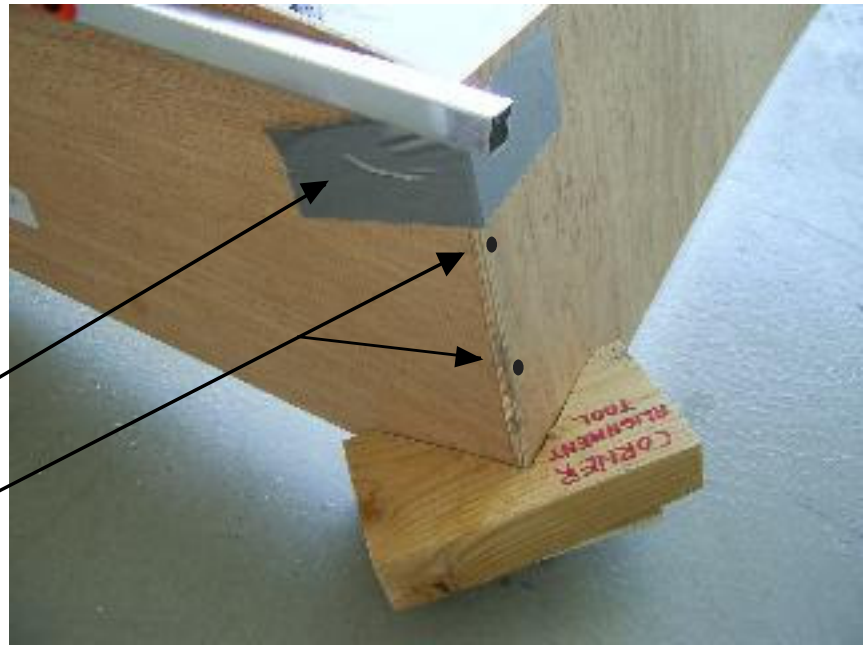
Start of Panel construction with Corner Alignment Tool

The use of a panel stiffener can assist in the squareness.

Apply Glue here, then close & tape.

Duct Tape used to hold panels together.

Small brads (3/4" long) can help hold panels in alignment during the gluing process.



Corner (Bulkhead & Side Panel) assembled & glued

It is important that you cut all panels prior to starting construction. Use a saw blade intended for plywood. Sand smooth all surfaces and edges to eliminate any splinters, and to prepare for the gluing process.

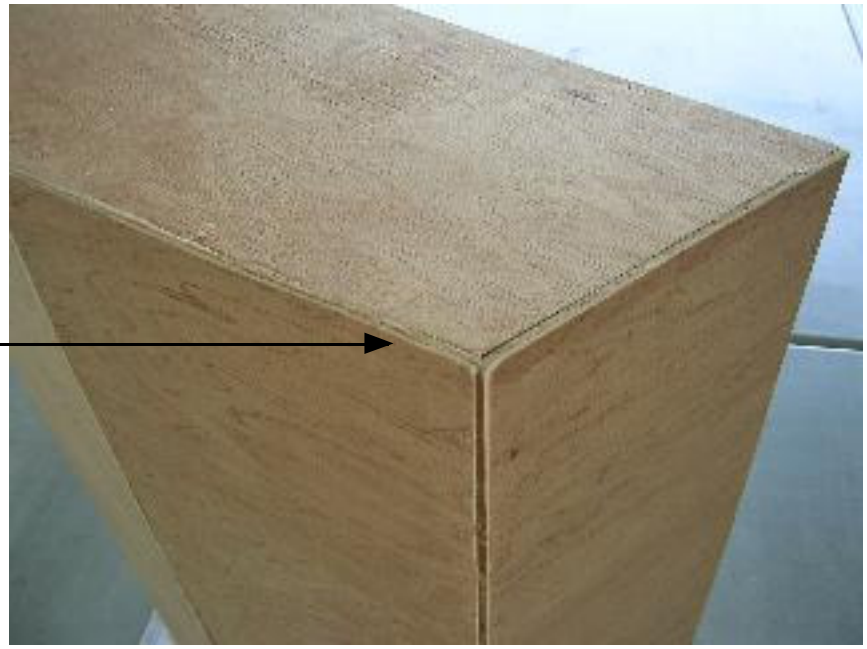
These pictures depict a typical panel assembly method, using the Corner Alignment Tools you made. The alignment of the corners of the hull assembly is critical to the overall quality of the finished boat.

The use of a large carpenters square is recommended to insure the fit and squareness of all panels.

Follow the instructions carefully.
Do not rush the process.

Good luck !

For best results, slightly rounded edges and corners are easier for the application of the T&G process.



Finished corner waiting for sanding and T&G process.

Note: These pictures are from a similar boat project.

The pictures may be of a different boat that uses the same Tape & Glue process.

TAPE & GLUE PROCESS

Version: ***07-30-09***

The following small boat assembly process was developed out of the need for an easy, lightweight, cost effective and health friendly method of providing a structurally sound and sealed small hull assembly. Let it be said up front that it is n the solution to everyones needs. In fact, to do it right, the boat should be designed with this process in mind.

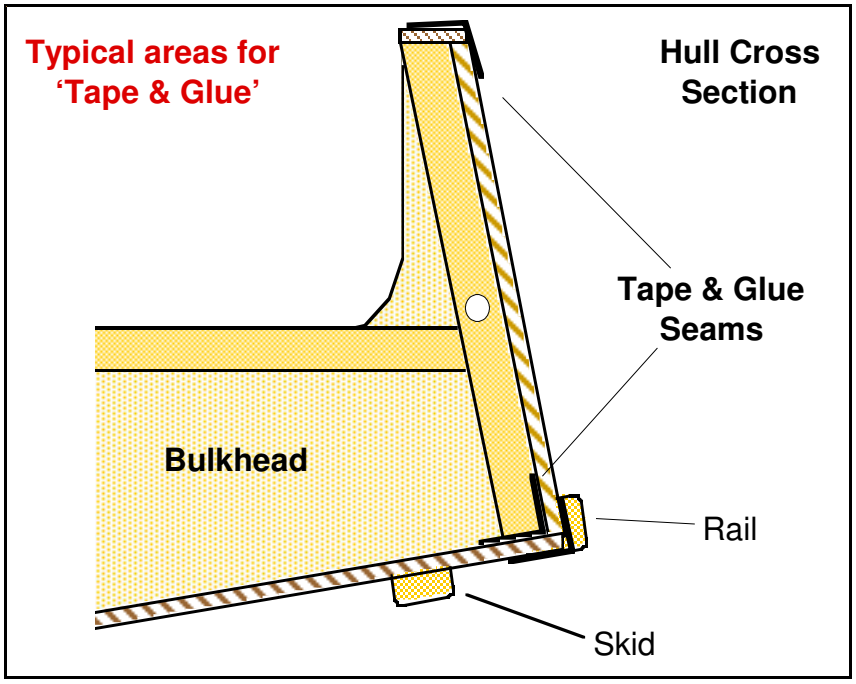
Basically, 'Tape & Glue' is a method for sealing and strengthening all seams of a small boat to the elements. It is not unlike Stitch & Glue, except it is not used to actually construct the boat. 'T&G' (as it will be referred to) is applied after the boat is fully assembled, minus a few appendages, such as skids and rubrails. For this reason alone, it is best if the boat i designed to utilize the 'T&G' process. It should also be stated that the outer seams are naturally subject to damage from rocks and beaching the boat, so protective skids or rails at or near the joint are strongly recommended. The 'Tape & Glue process has been used on boats such as an eleven foot Canoe, a nine foot pram, an eight foot rowboat and a 10 foot sailboat. Each of these applications used the same materials and process, and all have performed safely.

To best take advantage of 'T & G', the hull design should be capable of being constructed by gluing and screwing the various parts together, to make a self-supporting structure. Additionally, the base panels, and any decking, should always overlap the side panels and end bulkheads. This means the various hull elements should fit together in such a way that heavy structural elements (stringers, gussets and forms) will be minimized, reducing hull weight while maintaining hull strength and integrity.

Then, Taping and Gluing the various inside and outside hull seams with *glue impregnated fiberglass cloth tape* will add the necessary structural bond and joint sealing that will complete the build cycle. This is a relatively easy process. It does not use toxic materials, and cleans up with water prior to curing.

If you have question regarding this process, email me and I will respond promptly to your input :

kensimpsonaz@yahoo.com



T & G CONSTRUCTION SUPPLIES:

*** Fiberglass Cloth, 3.25 Oz., 60 inch wide, cut into 2-1/2" to 3" x 60 inch strips for seam sealing.**

*** TiteBond III Waterproof Wood Glue - 16 oz ($8)**
(available in larger 1 Gal. container ($30)

Options:
Epoxy Resin - Gallon : Duckworks BBS
Glass Cloth Tape, 4" , Roll : Duckworks BBS

Note: About 200 ft. of 2-1/2 inch cloth tape is required for average small boat assembly.

*** Not recommended for bonding:**
Polyester Resin (poor bond to wood), OK for molding fiberglass.

FINISHING:
The choice of finishing is that of the builder. However, it is not just a matter of sanding and sealing all the wood surfaces, and applying a coat of durable paint, it is also about personalizing the boat. Color or natural finish? Fancy trim or camouflage? The important elements are the needs of the builder; you built it, you enjoy it, you earned it !

Insure that all surfaces are protected, that skids are applied as needed, and that hull weight is always kept in check.

Recommend a minimum of 2 layers of tape per joint.

Optional Glue Mixing & "Tape & Glue" Instructions

TiteBond-III, which is easy to work with, does not require any thickening agent, unless used in a very hot environment. You should mix only enough woodflour to prevent excessive vertical running.
If necessary, Wood Flour can be purchase from *Duckworks Boat Builders Supply* in pound containers .
It acts as a thickening agent that produces a more viscous glue that will not run easily. Mix only enough by volume (container of choice) of glue to wood flour to minimize running. Mix thoroughly.

Tape & Glue Process:
Apply Glue in thick beads, first in the corner of a joint, and then about 3/4 inch away from each side of the corner. Smooth glue evenly over the panel surface in the area the Glass Tape is to be applied, and let dry for a few (2 to 3) minutes. Cut strips of Glass Tape (2-1/2" wide) the length of the joint, and centrally place in the corner of the joint. Smooth out over the length of the Tape. Apply Glue over the Tape, wetting Tape completely. Again smooth evenly over the entire Tape surface. Remove any bubbles. Insure edges are wet and that the Tape is completely saturated with TB3 Glue. Repeat the process for all exposed outside & inside corners and joints.

Allow to cure 4 hours minimum. Repeat the process for any additional layers that may be required.

Note: Temperature and humidity may affect mixing ratios and glue cure time. Do not rush the process.

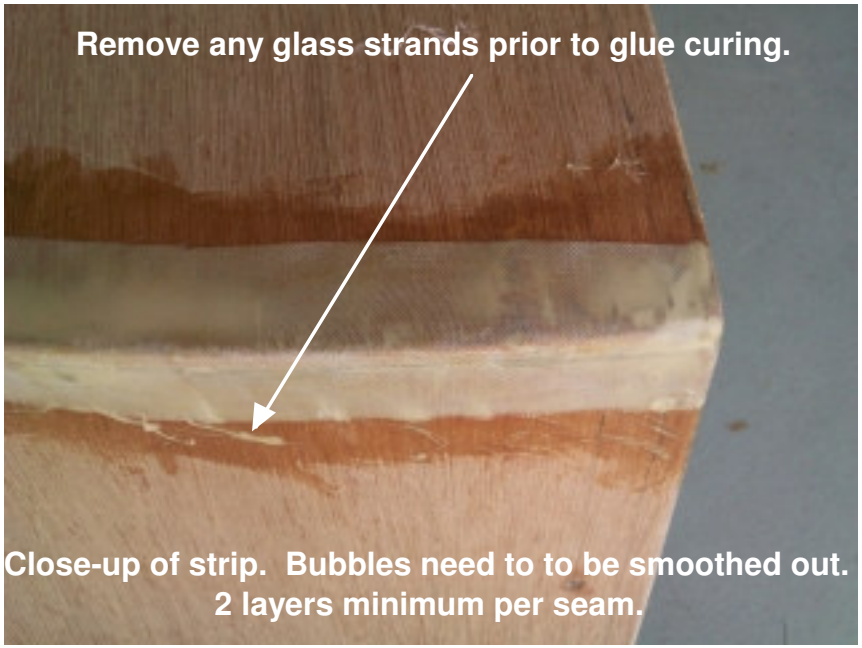
Always wear Latex Gloves during the gluing process.

TAPE and GLUE Process Pictures

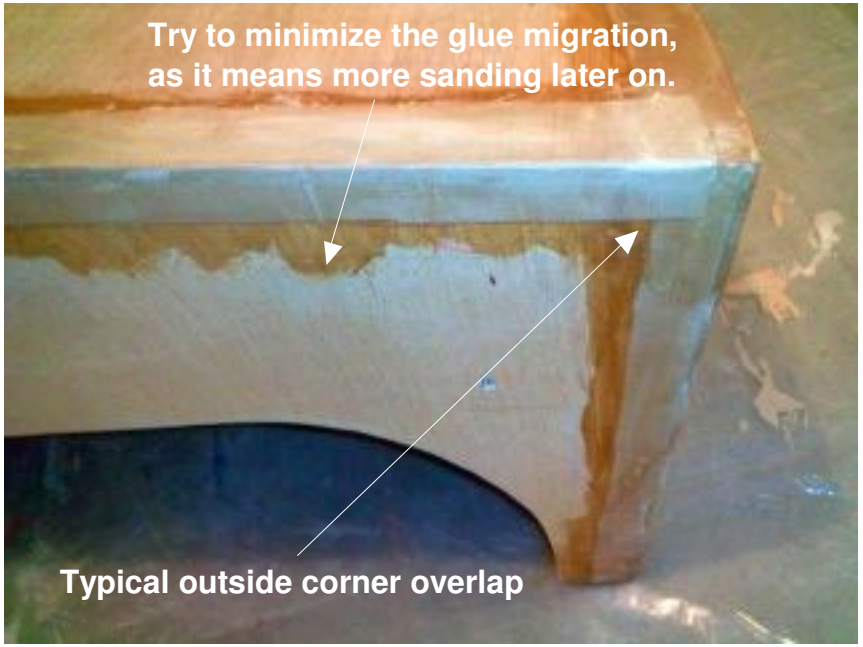
Cutting of strips is easy, 2-1/2 to 3 inches wide.

Strip laid on hull for length fitting

Typical bead of glue. Smooth with finger to wet surface.
Apply at Bottom (as shown), Edge and Side Panel.



Close-up of strip. Bubbles need to to be smoothed out.
2 layers minimum per seam.



Application Notes

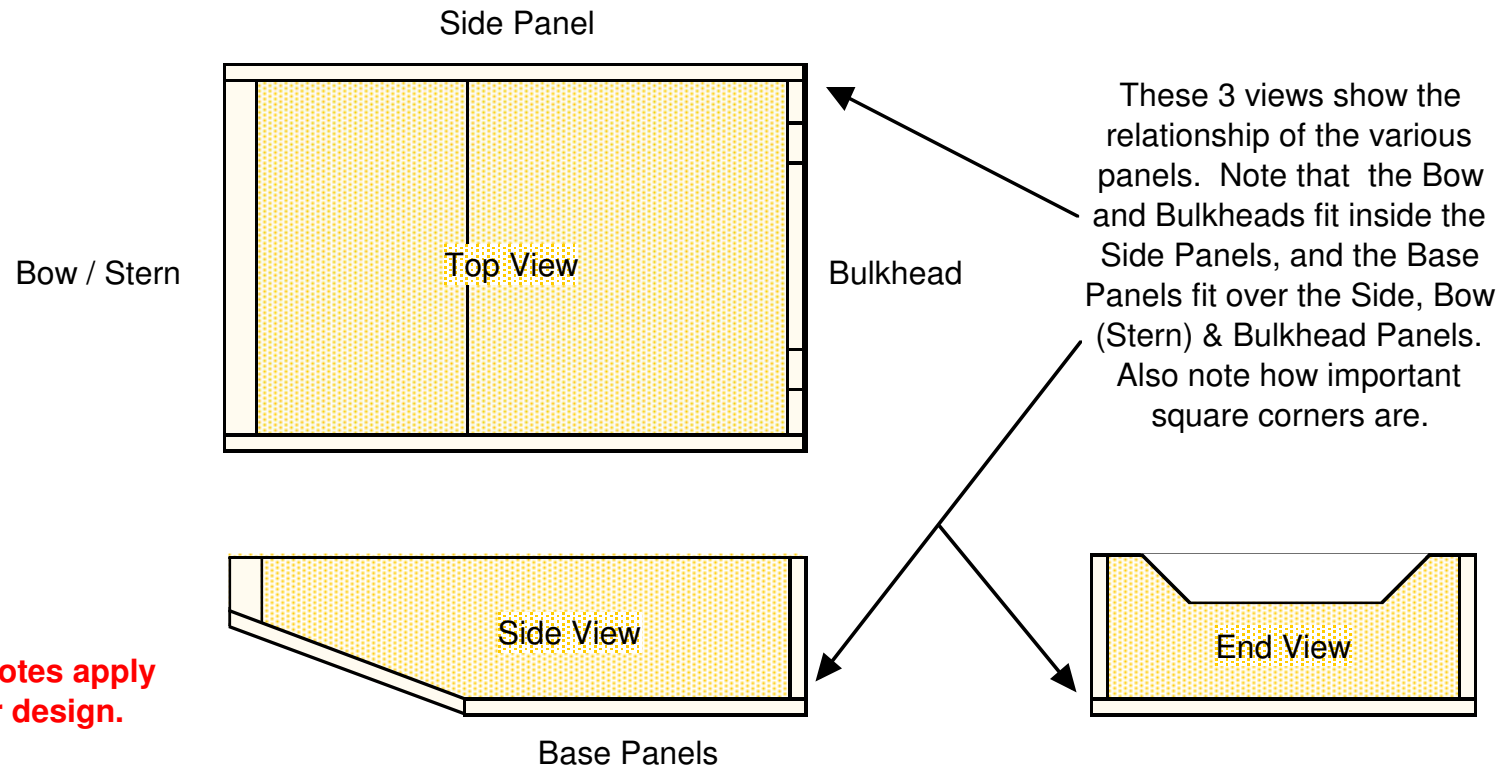
Finishing of the surfaces can be a time consuming process, but the end result it well worth it. Sanding the taped areas requires some technique. If you sand too aggressively the TB3 glue may heat up, soften and clog the sandpaper. In this regard it is not like epoxy, which hardens and never softens. Nevertheless, with some practice, and the right sandpaper (good quality), smooth surfaces can be developed and the taped edges flared.

I usually start with 100 grit black (silicon carbide) drywall sandpaper, and work my way up to 180 grit. Be very careful not to sand through the fiberglass corners, but if you do, repair the area with TB3, and possibly a fiberglass patch, immediately.

KenSimpsonDesigns

PANEL RELATIONSHIPS

Kid friendly !

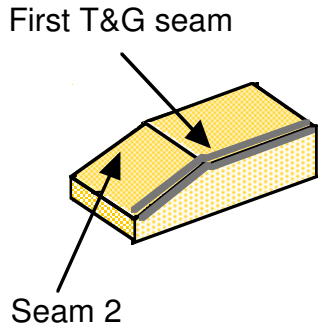


These notes apply to either design.

☐ **STEP 5** Starting the Tape & Glue Process:

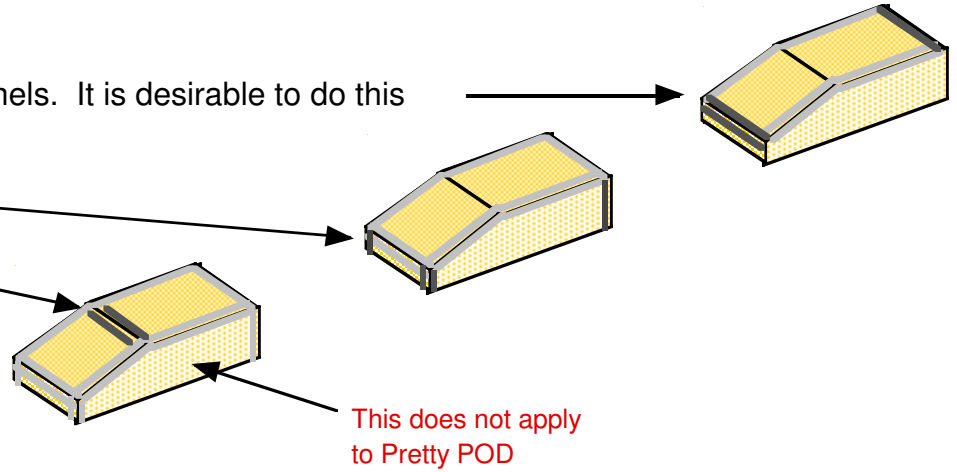
Here it is important that you read and re-read the T&G Process on pages POD 6 and 7. It describes the process, and shows a couple of pictures. But it is probably more important that you understand the critical nature of the process by first performing it on some scrap wood, before you start on the actual assembly. **Remember, this is what holds the whole boat together, and prevents it from leaking.** Doing it right is critical. Fortunately, the process is easy and somewhat forgiving, so don't be fearful. Just pay attention.

Now you are ready. Place the cured and sanded assembly upside down on a plastic drop-cloth-covered flat surface (basement or garage cement floor). Start at the outside corners. Apply a continuous bead of glue to the seam of 2 of the panels. Then apply another bead 1/2 inch away on either side of the joint. If you mixed the glue properly for the environmental conditions, the glue should not run much on the vertical panel. Quickly apply the pre-cut length of Poly Tape to the seam. Smooth out over its length, pressing it into the glue. Remove any bubbles that may appear. You may have to slit the Tape, with a razor blade, at the bend in the hull joint. When satisfied with the appearance, repeat the process for the other side (Seam 2).



POD

☐ **STEP 6** Continue the T&G Process:
Next, T&G the Bulkhead and Bow / Stern Panels to the Base Panels. It is desirable to do this at the same session as the side seams described above.
Also, T&G all 4 corners of the hull section.
Finally, T&G the joint at the Base Panels.



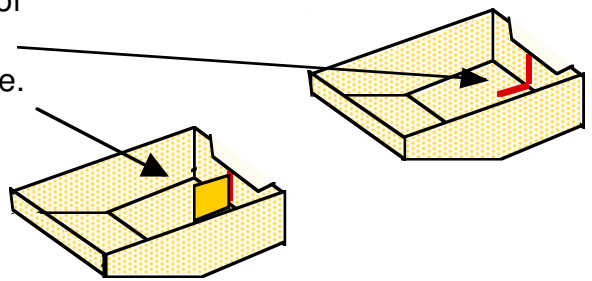
Allow the assembly to cure, preferably overnight.

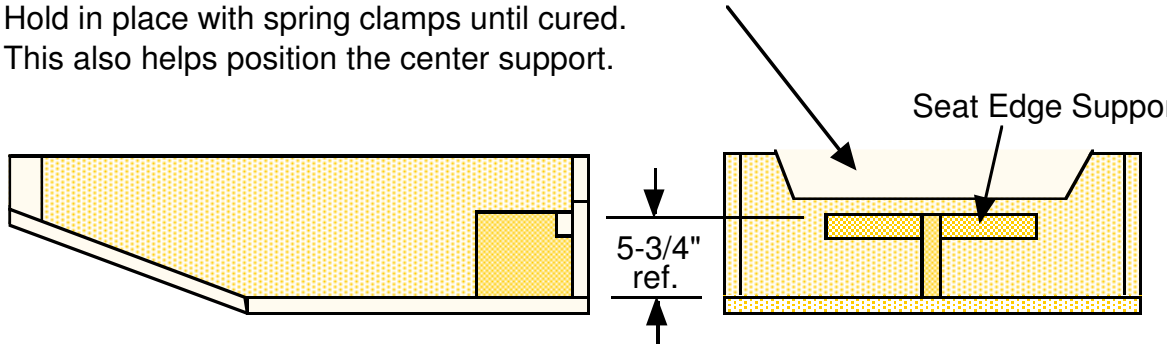
☐ **STEP 7** Light sanding between layers.
Using a fine grit sandpaper, lightly sand all T&G seams.
Take special caution not to sand through the tape, as this would weaken the joint. Sanding is important for best bonding from layer to layer.

Repeat this process 2 more times, for a **total of 3 layers per joint**. The final layer need not be sanded at this time.

Note: If bubbles or inclusions (voids) exist in the T&G areas, you must fix them. Using a Utility Knife, cut an opening into the void area, spread the opening, apply TB3 glue into void, close and allow to cure, and then sand smooth.

☐ **STEP 8** Start of the inside of the hull.
Turn the assembly over and rest it on the base. The Seat assembly is first. Mark the center of the hull at the Bulkhead. Draw a **6" line** at a right angle, on the base and on the bulkhead.
Apply TB3 Glue to 2 adjacent edges of the Seat Center Support, and place on the marked line.
Hold in place with Duct Tape.
Next, using TB3, glue 2 Seat Edge Supports on the Bulkhead with the top edge in line with the top of the center support (1/4" below the bulkhead cutout).
Hold in place with spring clamps until cured.
This also helps position the center support.



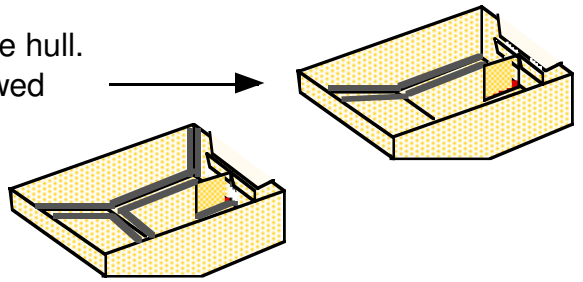


Next, you will start the T&G Process to the inside of the hull panels.

POD

☐ **STEP 9** Start of the T&G Process inside of the hull.

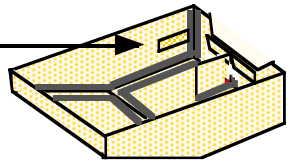
Once the seat support is cured, you can start on the Tape & Glue for the inside of the hull. Follow essentially the same process as for the outside, the bottom seams first, followed by the bulkhead and bow / stern panels. Finally the vertical corners. Also T&G the seat support corners on the bulkhead and base.

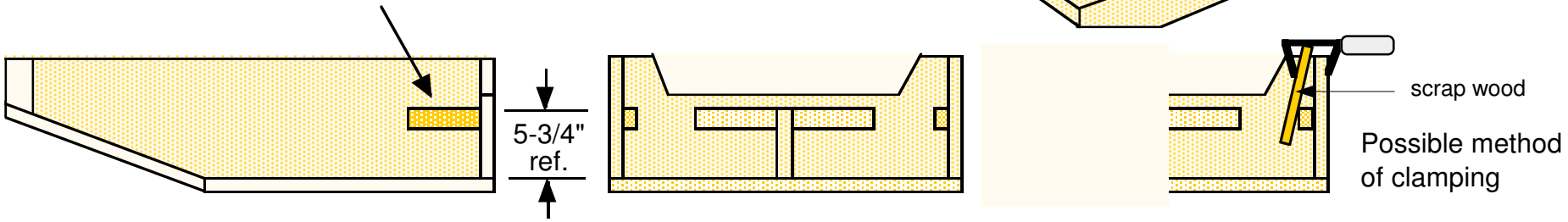


Again, follow the curing and sanding steps previously described. Remember, 3 layers of T&G are necessary.

☐ **STEP 10** Additional seat preparation.

Two more seat supports remain to be Glued in place, on the inside of the side panels in line with the previously installed seat supports. These will support the outer sides of the seat when complete. Hold in place with clamps until cured.

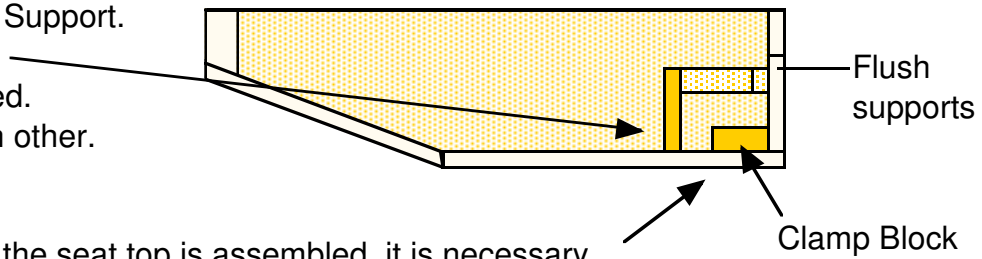




Note: The seat assemblies also act as buoyancy chambers, as they will be sealed watertight.

☐ **STEP 11** The Seat Front Support.

Install the Seat Front Support in place to check for a good fit. The outside edges may need to be trimmed to clear the T&G previously applied. Next, mark, with pencil, the Seat Front Support location on the base and side panels. Remove the support. Apply TB3 Glue along the lines just marked, and on the front edge of the Seat Center Support. Install the Seat Front Support, adding glue where voids exist. Hold the Seat Support in place with Duct Tape until glue is cured. Note: All top edges of Seat Supports should be flush with each other.

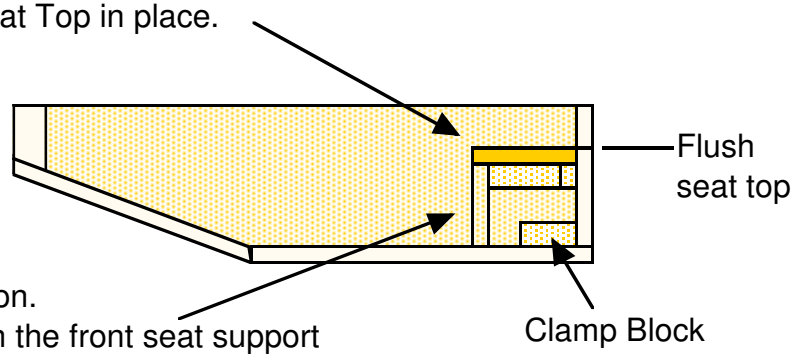


☐ As the last step before the seat top is assembled, it is necessary to add Clamp Blocks in each back corner of the hull as shown above. Cut 4 pieces, 4 inches long of 1x4, and TB3 glue each to the side panel and bulkhead corner. Allow to cure.

The next process will be the installation of the Seat Top.

POD

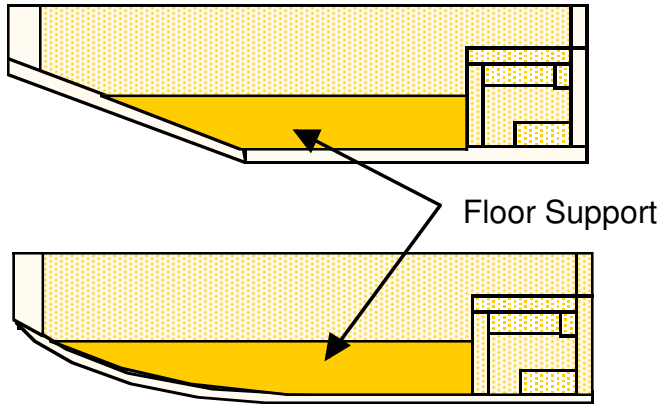
☐ **STEP 12** Seat Top installation.
Place the Seat Top on the seat supports previously installed. Check to make sure it is in contact with the supports. If the seat is slightly warped, you can place weights on it during the gluing process. Also note that the Seat Top should be flush with the opening edge of the bulkhead; this is intentional. If it is slightly under flush, you will trim the bulkhead to be flush after the seat cures.
Now, apply TB3 glue to all seat support top surfaces and slowly lower the Seat Top in place.
Small weights (books) will keep it in position until the glue cures.



☐ **STEP 13** Once the seat is fastened, T&G all corners to the base, side panels, front edge and including along the bulkhead and opening area.
2 layers of T&G are all that are necessary for this part of the assembly.
Allow the Seat assembly to cure.
This should provide a good, watertight buoyancy chamber for each hull section.
Note: Small watertight screw-out plastic inspection ports could be installed in the front seat support if there were any concern, or evidence, that water could enter this area. This is a builder option.

☐ **STEP 14** Sanding the entire hull assembly.
Using a fine sandpaper, sand all T&G areas lightly, taking care not to break through the poly-cloth.
Next sand all other surfaces and exposed edges of the hull. This will provide a clean surface for the finishing of the boat.

☐ **STEP 15** The floor (base) support.
Place the pre-cut floor support in place, insure it fits properly.
Trim as necessary. Mark, with pencil, a line defining the center of the floor area. Apply a generous bead of TB3 along the pencil line, and also on the end of the Support. Lower the support onto the glue, and against the seat support. Press to squeeze out excessive glue, and add additional TB3 glue if necessary. Allow to cure.



This completes the basic hull construction.

Additional items remaining are: the hull Connector assemblies, the Rubrails around the hull, and the Skids.

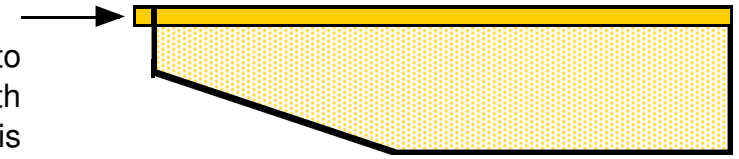
Optional items include: Lift Handles, Oarlocks, I/O carpeting for the floor, and a Line-tie hook.

FINAL CONSTRUCTION

STEP 16 Rubrails.

Cut to length from the 3/4" square hardwood, 2 Rubrails, the exact length of the hull (approx. 3 feet). Apply TB3 glue to one side, fit to top edge of hull, hold in place with spring clamps. Make sure it is flush to the side top edge. Repeat the process for the other side.

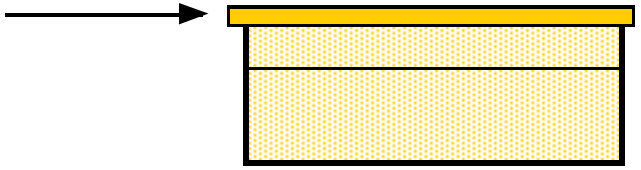
2 Side Rubrails



Side View

Next, cut a length of 3/4" stock the exact width across the outside of the side rubrails (approx. 25-1/2"). Apply TB3 glue to one side, align to top edge of Bow and ends of side Rubrails. Hold in place with spring clamps. Cure assembly.

1 Front Rubrail



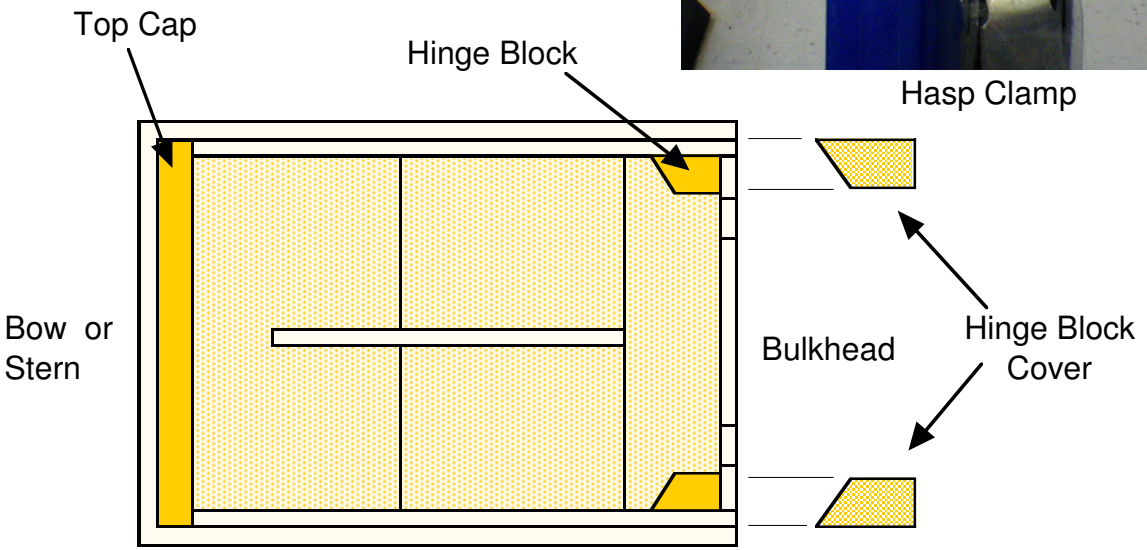
End View

Strap Hinge

Hasp Clamp

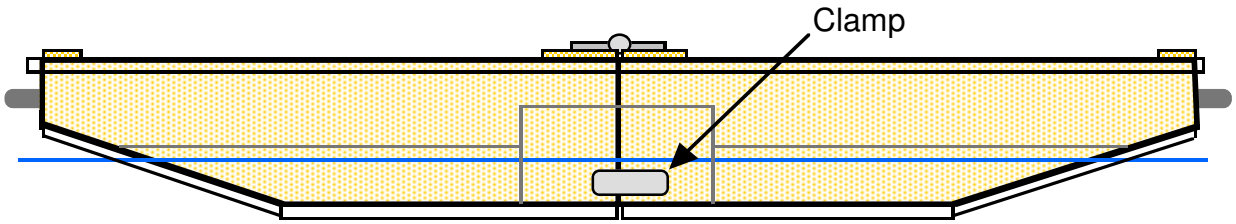
STEP 17 Hinge Blocks.

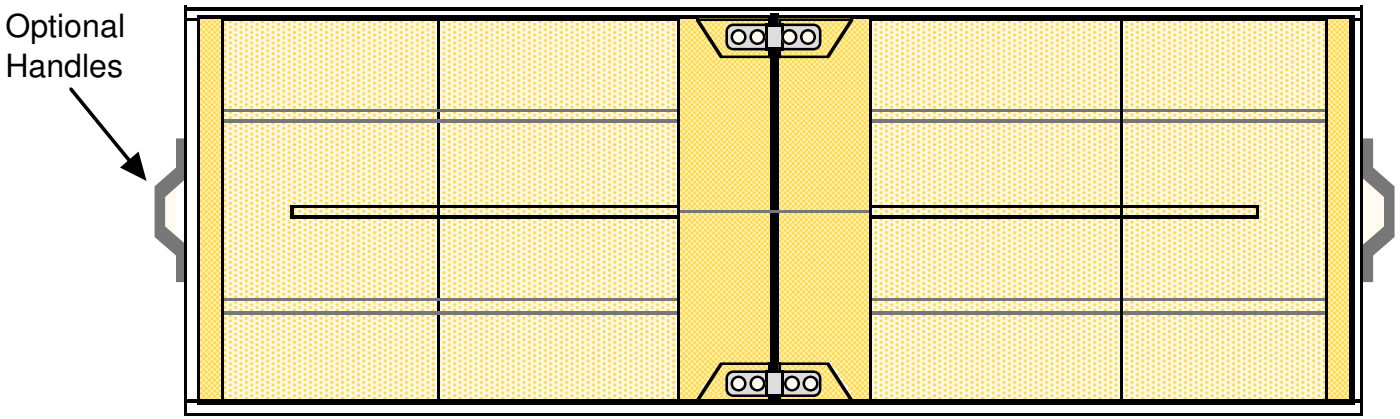
Place Hinge Block in corner, flush to top edge of panels. Note if back corner needs trimming to clear T&G previously applied. Trim if necessary, then apply TB3 to the 2 back surfaces and press into position. Hold with clamps until cured. Then remove clamps and apply TB3 to the top surface of the blocks and adjacent hull edges. Place the Block Covers in position, and hold with duct tape until cured. Also position and glue in place the front Top Caps. Allow to cure.

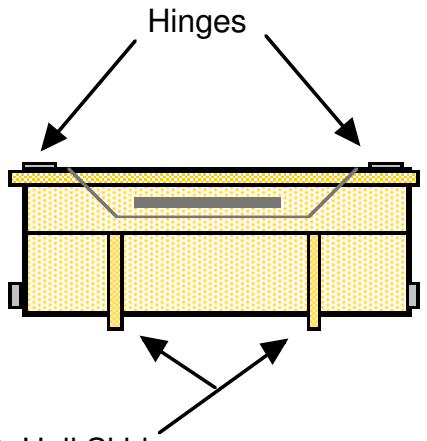


☐ **STEP 18** Hinges and Clamps (see photos previous page).
The Hinges suggested for use are 3" Zinc Plated Strap Hinges (about $4 a pair @ Ace Hdw.).
They should be aligned and screwed to the hinge blocks with 1" Zinc Plated Screws.

The hull Clamps are Heavy Duty Lockable Hasps, Zinc Plated (about $6 each @ Ace Hdw.).
They should be screwed into the hull at the Clamp Block location with 1" Zinc Plated Screws.
It is also recommended that TB3 be applied to all Screws while installing them.







☐ **STEP 19** Hull Skids.
The 2 skids are cut from 3/4" hardwood, and are placed 12" apart on the bottom of the Hull, as shown above. They extend the entire length of the bottom. Mark the location and TB3 glue them in place. Secure with Duct Tape until cured.
These skids protect the hull during transport and launching.
Skids for the round hull version will have to be cut from 1 x 6" board stock .

☐ **STEP 20** FINISHING :
Insure that all hull surfaces are clean and sanded smooth. It is the builders choice what finish the boat is to have.
The designer's recommendation is to use a good Spar Varnish, as it offers good water protection, but oil based paint, or even acrylic latex will do the job. The little boat can easily be personalized with a Name, a Saying or just bright colors.

Some will ask if POD can be made any larger ? Of course; the plans can be scaled-up, either in length, width or both.

This is a simple to build, durable and transportable little boat, especially designed for the younger generation.

Wishing You a Happy and Safe Boating Experience !

Ken Simpson, Designer

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