POD 2

Paddle On Demand
&
POD 2-XL Adult
(Page 17)

Simple to build, light weight, rugged, stable, unsinkable, & designed for the younger generation !

Kid Friendly !

Nov. 2010

SPECIFICATIONS:

Glue & Screw Assembly

Hull Size: 6 feet long, 30 inches wide, 10 inches deep
Size Folded: 3 feet long, 32" wide, 22" high, maximum
Weight: Approx. 40 pounds, Draft 3 inches
Supports: Approx. 200 pounds max.
Propulsion: Paddles, Oars, Sail or small Trolling Motor
Intended for children or young adults to build and enjoy.
Safety flotation chambers (120#), will not sink.
Easy to transpot, fits in the back of most any vehicle

Hull halves can be bolted together, rather than hinged.

Unfinished Hull Assembled

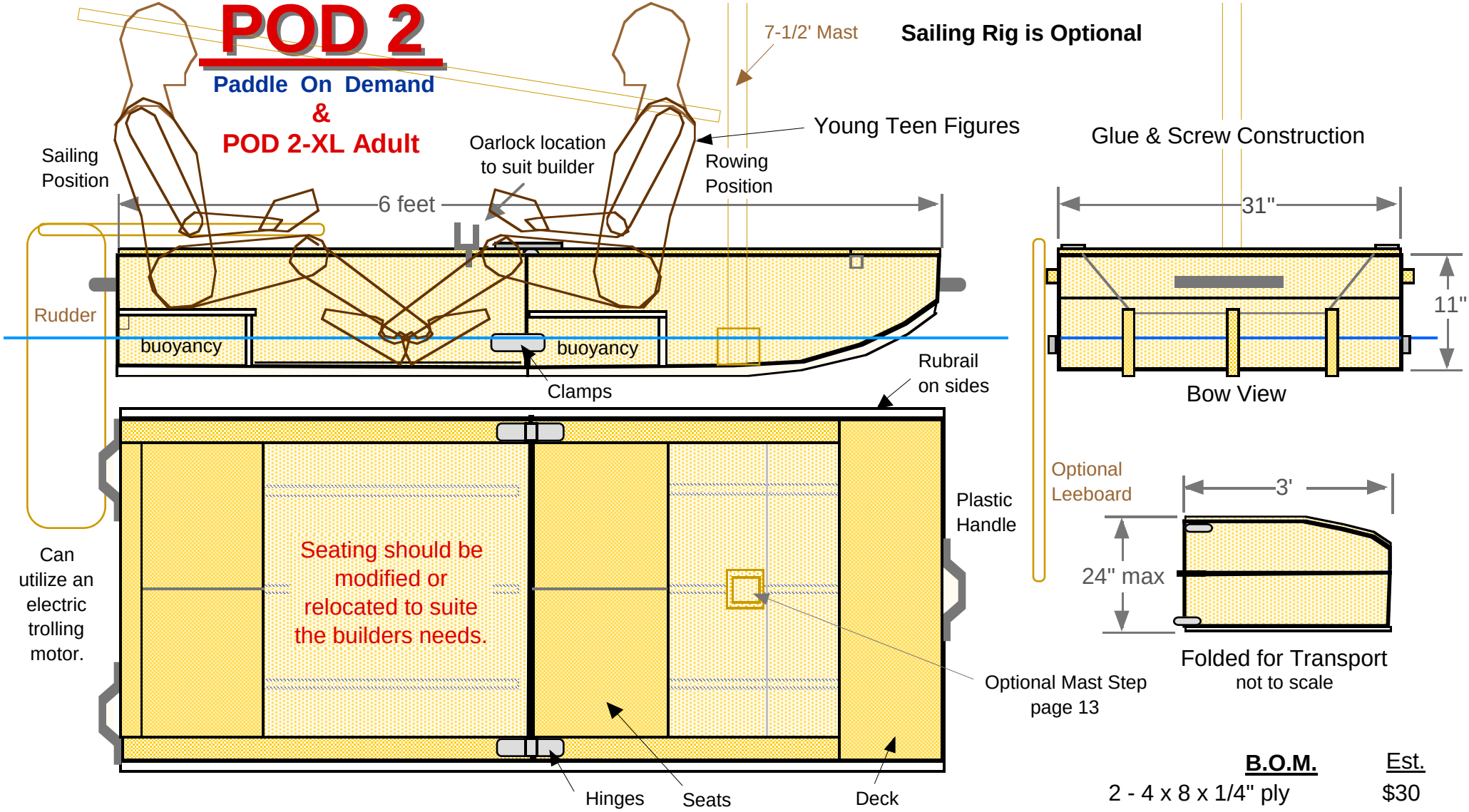
Original POD-XL

The whole purpose of the POD 2 design is to provide an easy to build and easy to use small, safe boat for children and/or young teens. It uses readily available tools, and no high tech or toxic materials. It can be put together in just a few weekends, and will withstand the normal abuse that kids can dish out. The design includes the option of a small sail, intended for beginners to learn on. With built-in buoyancy, the POD-2 is a great start into the boating experience.

The scaled-up version, POD-2-XL (also included) is intended for older teens or an adult to enjoy. It can be equipped with a sail or a trolling motor, of the builders choice. Sample photos are included for reference.

POD 2

Paddle On Demand
&
POD 2-XL Adult



SPECIFICATIONS:
Hull Size: 6 feet long, 30 inches wide, 10 inches deep
Size Folded: 3 feet long, 32" wide, 22" high, maximum
Weight: Approx. 40 pounds, Draft 3 inches
Supports: Approx. 200 pounds max.
Propulsion: Paddles, Oars, Sail or Electric Trolling Motor
Intended for children or young adults to build and enjoy.
Safety flotation chambers (120#), will not sink.

Kid Friendly !

Print in Landscape mode.

B.O.M.	Est.
2 - 4 x 8 x 1/4" ply	$30
6 - 1x2 x 8' lumber	$12
1 - Roll of Masking Tape	$7
1 - Fiberglass Tape	$15
2 - 16oz TB3 glue	$18
2 - 3 x 1-1/2" Hinges	$ 4
2 - Snap Lock Hasp	$12

Total hull =	$98

POD 2
Young Peoples Boat

Plywood Layout
2 sheets of 1/4"
4' x 8'

Rear Side Panel
36"L x 10"W

Rear Side Panel
36"L x 10"W

Rear Base Panel
36"L x 30-1/2"W

Remember: Measure Twice, but Cut Once !

Transom
30" x 10"

Transom
30" x 10"

Rear Side Support 2" x 36"

Rear Side Support 2" x 36"

Front Side Support 2" x 27"

Front Side Support 2" x 27"

Bulkhead 30"W x 10"H

10"

5"

19"

1-3/4"

Seat Support 30"W x 4-3/4"L

Cutouts

Rear Seat Top
30"L x 13"W

Forward Panel Supports
make from 1 x 6 lumber
(see page 8)

1x6

1x6

B
O
W

1x4
x
30"

Suggested Safety Bolt Holes
see p.25

Seat Center & Side Supports
12-3/4"L x 4-3/4"W
6 pcs.

Forward Side Panel
36"L x 10" W

24" radius

Transom
Support
2" x 27"

Forward Side Panel
36"L x 10" W

3"

Forward Base Panel
39"L x 30-1/2"W
Fit at assembly

Kid Friendly !

Forward
Deck
30-1/2"L
x 9"W

Rear Inside Floor
28-1/2"W x 34" L

fit at assembly

Seat Support 30"W x 4-3/4"L

Front Seat Top
30"L x 13"W
See note for cutouts

General Notes

The redesign of POD 2 was a direct response to a request for a small boat that could be easily constructed by children, with help from an adult. It should be easy to paddle, be stable and be safe. It should also be lightweight, very portable and possibly have a motor or sail option.

To achieve that goal, the following plans use traditional methods of assembly , specifically 'Glue and Screw' construction for simplicity and ease of assembly. This provides a strong, yet lightweight finished product, and building is easily mastered by the beginner and amateur boat builder. As a result, only hand tools, a jig-saw, a power drill and a large carpenters square is all that will be required throughout the assembly process.

Be selective in your choice of materials. Use plywood that is at least exterior rated. To insure proper alignment of the various panels, certain other small tools may be suggested. It is important to note, the final choice of materials is the decision of the builder. We have made specific recommendations, but if the builder has previous experience with different methods and materials, that is their choice, and we respect that decision.

Certainly, minor changes in design are encouraged, to provide a 'custom' boat to satisfy a builders specific needs. We do not make changes to the drawings. This would be up to the individual builder, and their responsibility. Also, it is very important that none of the basic design parameters be drastically modified, as this may adversely affect overall boat safety or performance.

It should also be noted that the hull halves can be glued and screwed together, for those that do not have limitations of storage or transportation.

The hull exterior can also be completely fiberglassed for durability, allowing yet thinner and lighter (4 or 5 mm) plywood hull building material .

Any questions or comments regarding the construction and/or design of this project will be responded to in a timely fashion. Thank you for purchasing these plans, and good luck with your project.

And don't forget to visit our website for new designs and updates.
Happy Boating !
Ken Simpson , Designer

www.PortableBoatPlans.com

POD 2 ASSEMBLY

STEP 1

Start by cutting required panels from the plywood sheet. It is important you cut straight lines, so use a solid straightedge to guide the jigsaw. Place the good side of plywood down while cutting, which reduces splintering on the boats outside edges. Lightly sand all edges afer cutting. Insure that both Bulkheads are identical, as these form the hull shape. Cut only what you need, when you need it.

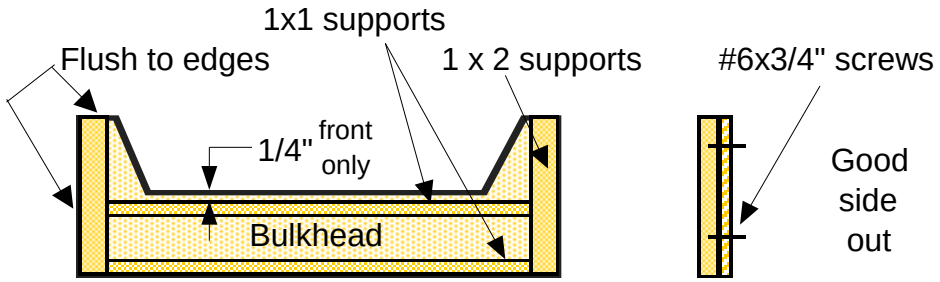
The following process will be the same for all panel assemblies.

AFT Section (<u>after adding 1x2 supports to Bulkhead & Transom</u>:

Apply TB3 (TiteBond III) glue to the edges of the Bulkhead, smooth out with finger. Allow to dry for a couple of minutes. Do the same for the end surface of the Side Panel to be glued. This allows the glue to penetrate the wood and form a bonding joint. Next, apply a thick bead of TB3 glue to the edge of the Bulkhead, press a side panel in place, and hold with Masking Tape. Panel goes on the outside of the bulkhead, and the 'good side' should be out. Insure a square corner. Small #6 x 3/4" SS Screws should be used to hold the panel in position during the curing process. Do the same for the opposite side panel. The Transom can be assembled in the same manner, at the same time. Make sure the corners are square. Allow to cure for at least **<u>6</u>** (six) **hours** at room temperature.

Adding supports to the Bulkheads and Transom

Glue and screw the supports to the Bulkhead and Transom using the same process as described at left.

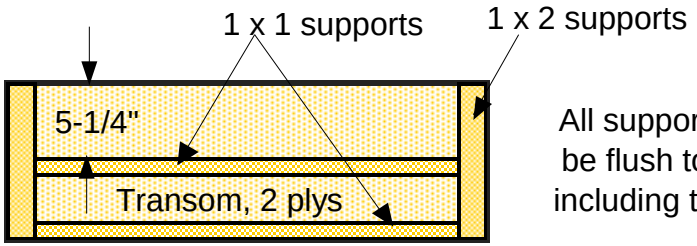


Glue and screw supports to inside surface of each Bulkhead.

Note: Top support sits flush on rear section bulkhead, not 1/4" below.

Side View

Keeping the Bulkhead flat is critical for proper hull alignment.

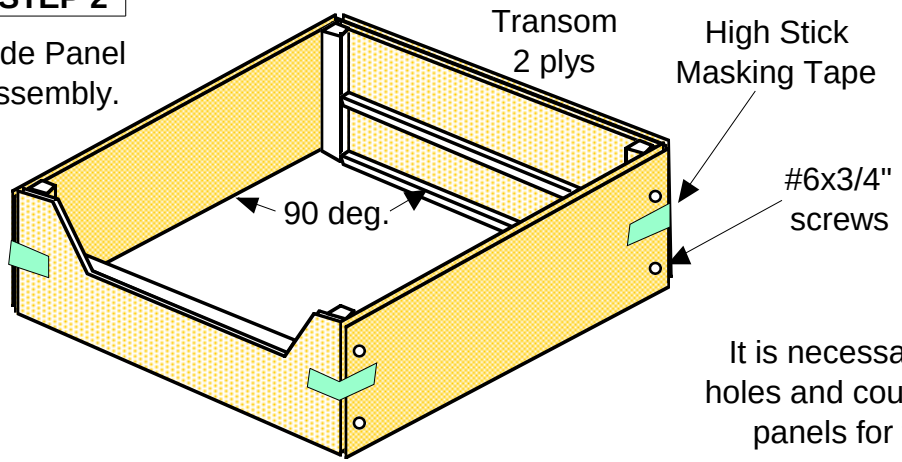


All supports are to be flush to edges, including the ends.

Remember, 1 x 2 stock is actually 3/4" x 1/1/2",and 1 x 1 stock is 3/4" x 3/4" (can be a 1x2 cut in half).

STEP 2

Side Panel assembly.

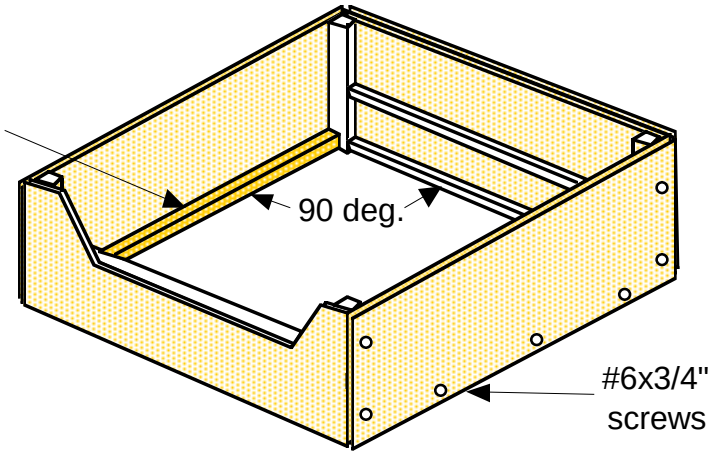


Square corners are essential.

It is necessary to drill pilot holes and countersinks in the panels for the screws .

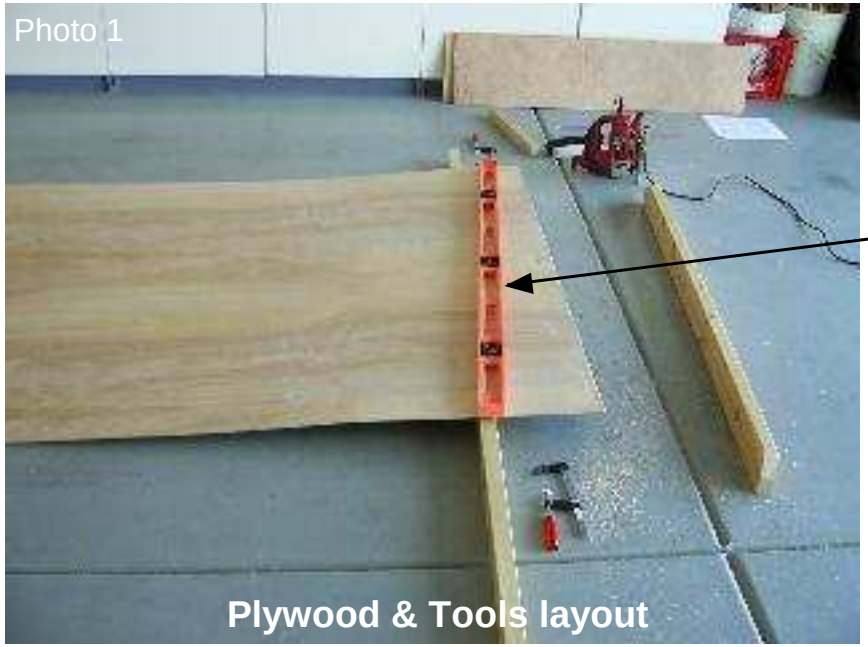
STEP 3

Add 1 x 1 flush to bottom edge, both sides. Glue & Screw in place



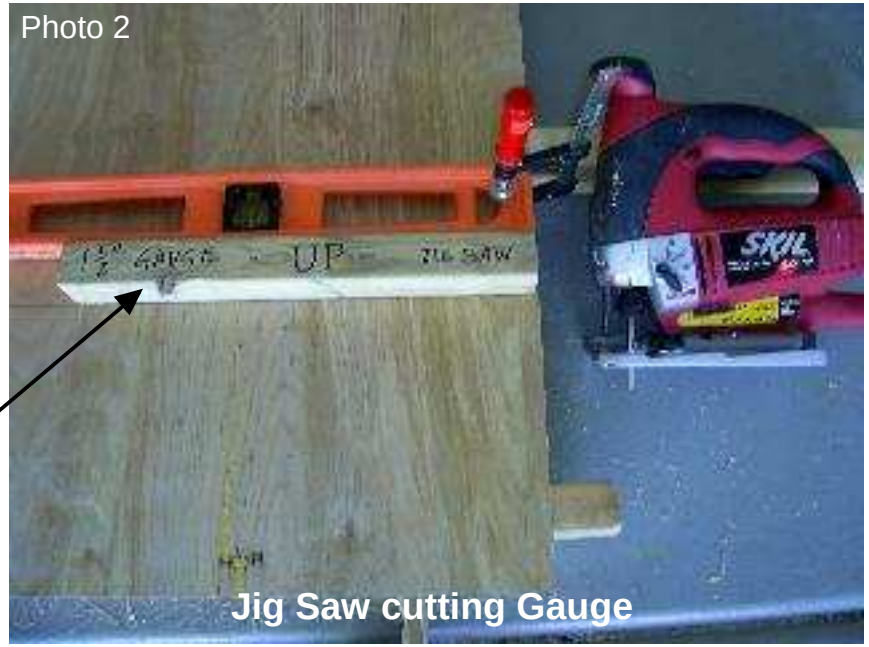
Plywood - Cutting a Straight Line

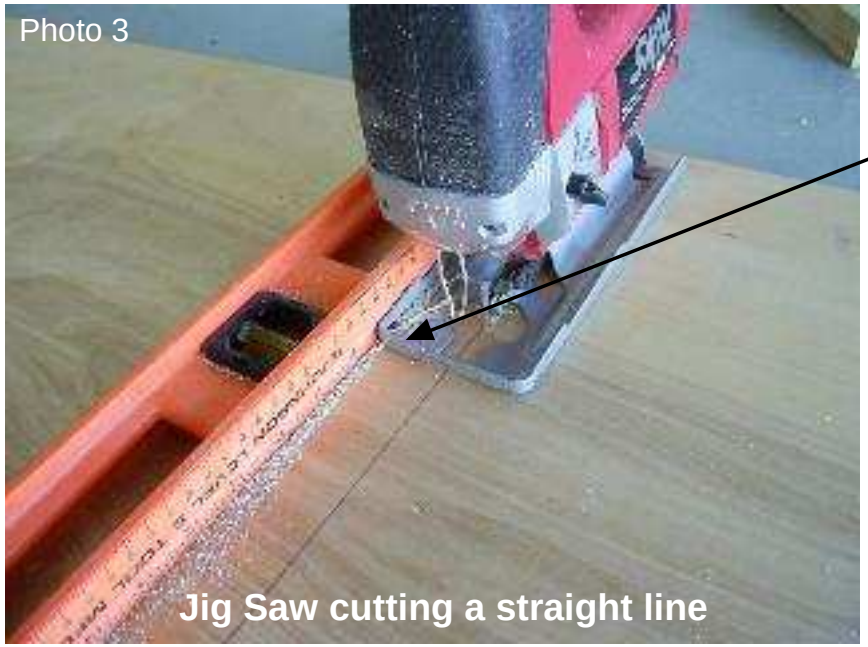
It is important that all hull panels fit together with even edges. A good cutting set-up will insure this. And a good Jig-Saw is the only power tool needed for this project. Pencil mark the plywood with panel layouts, clamp on a straight-edge and cut a straight line.



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

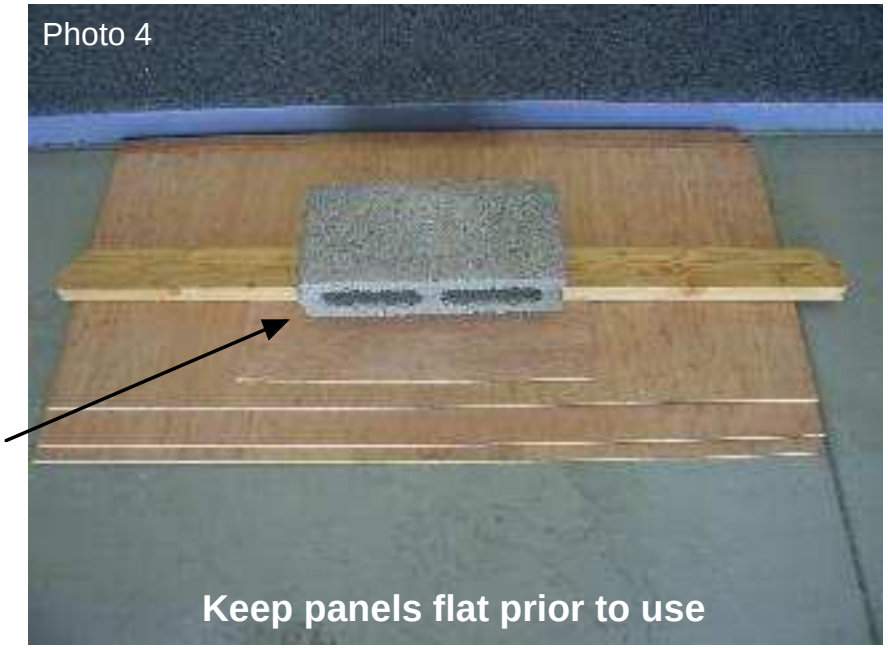
Make gauge to consistently position straightedge from panel marked line.





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

Weigh down panels to prevent warpage prior to use.

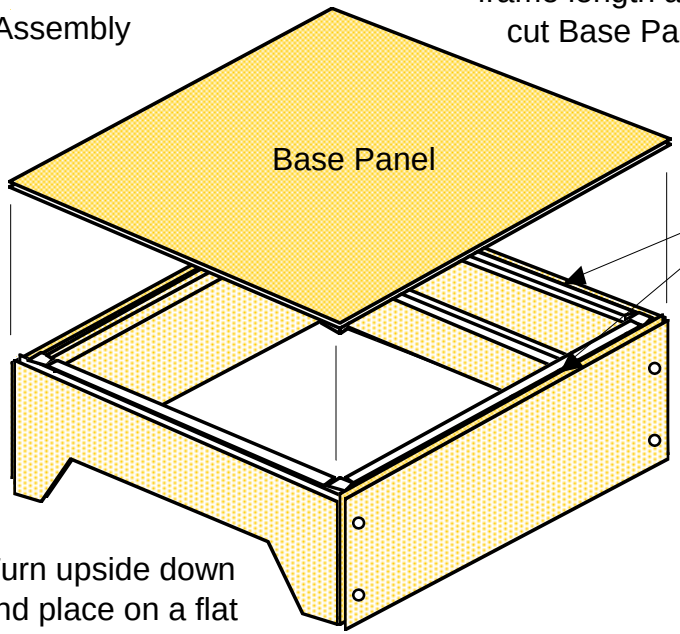


- General note: POD 2 and POD 2-XL are constructed in the same way -

STEP 4

Base Assembly

Measure completed Aft frame length and width, and cut Base Panel to suite.



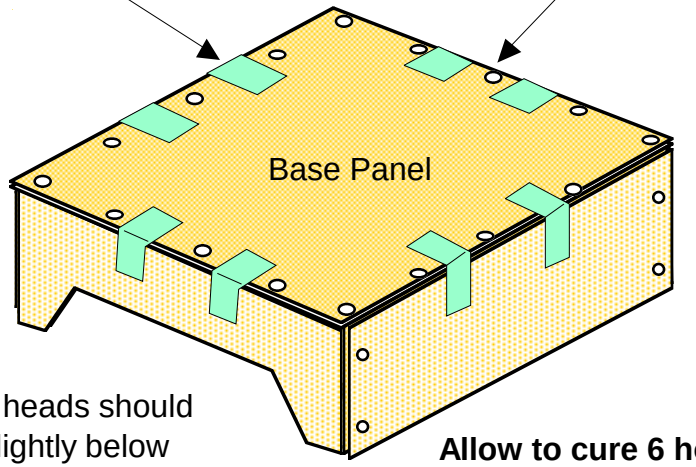
Apply TB3 glue all around edges

Turn upside down and place on a flat surface.

It is necessary to drill pilot holes and countersinks in the base panel for the screws .

Tape down the Base prior to adding screws. Drill and c'sink corner holes first, then screws. Complete the perimeter.

Use #6x3/4" screws, apply every 6" to 8" along all 4 edges.

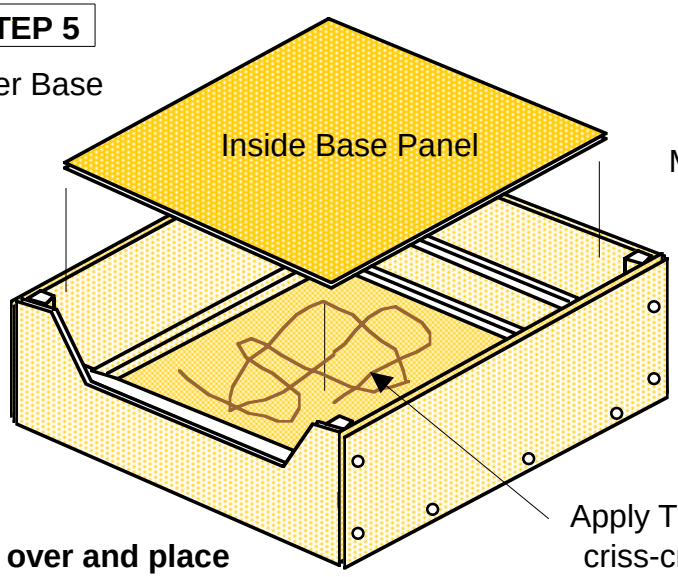


Screw heads should be slightly below flush to the panel.

Allow to cure 6 hours before next step.

STEP 5

Inner Base

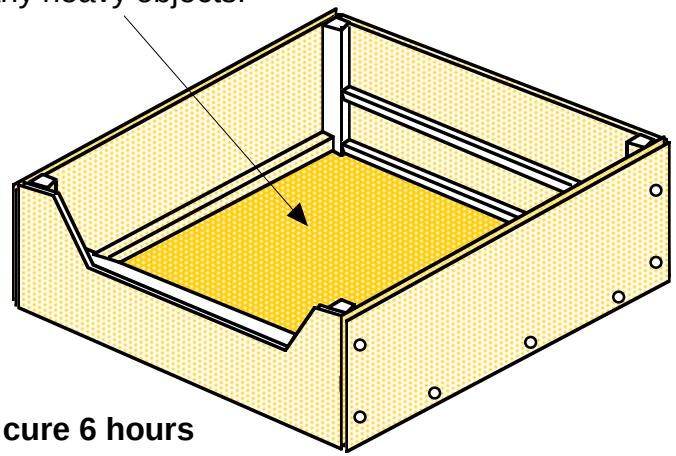


Turn over and place on a flat surface.

Measure the inside base dimensions and cut the Inside Base to fit.

Apply TB3 glue in thick criss-cross beads on entire Base inside.

Weigh down Inside Base with books or cement blocks, or any heavy objects.

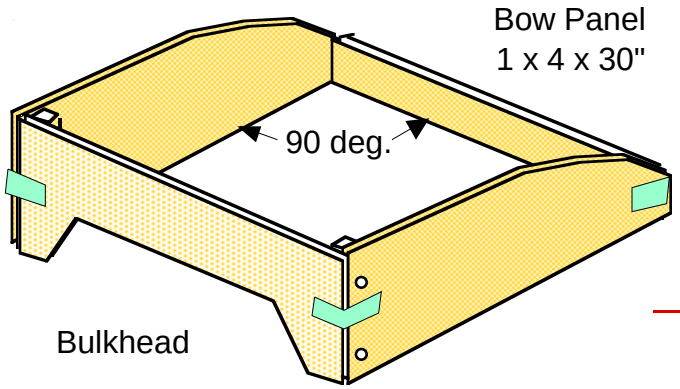


Allow to cure 6 hours before next step.

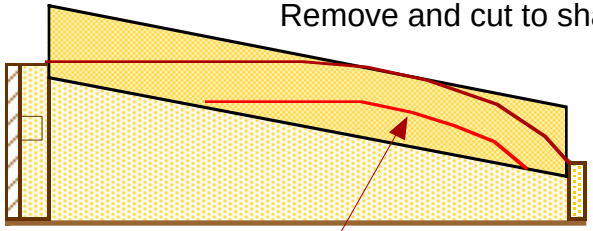
Start Forward Section next page

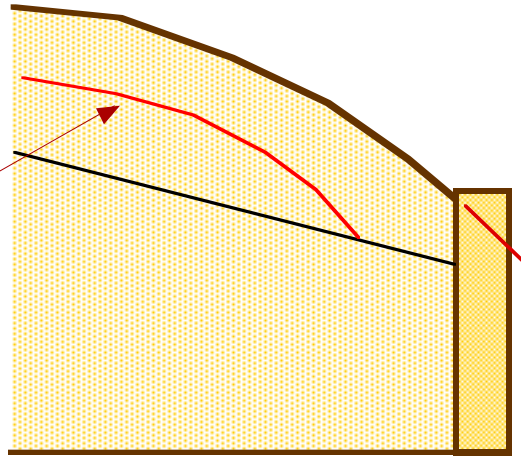
STEP 6 **FORWARD** Section

Glue and screw side panels in place, same as Aft section.
Glue and screw the Bow Panel, flush to ends.



Set Support on side panel
and trace curve.
Remove and cut to shape.



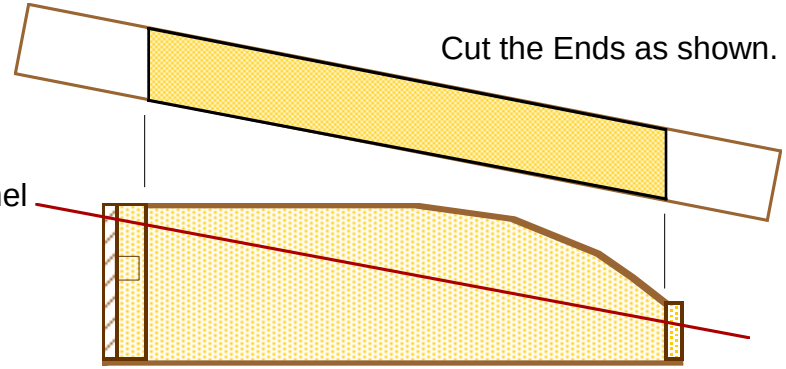


Optional Support
cutaway to reduce
hull weight.

STEP 7

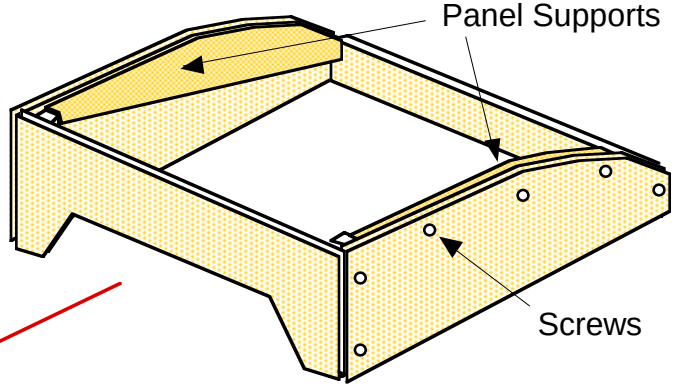
Cut the 2 Panel Supports from the 1x4's as shown.

1 x 6 x 48" lumber



Forward Assembly
cross section

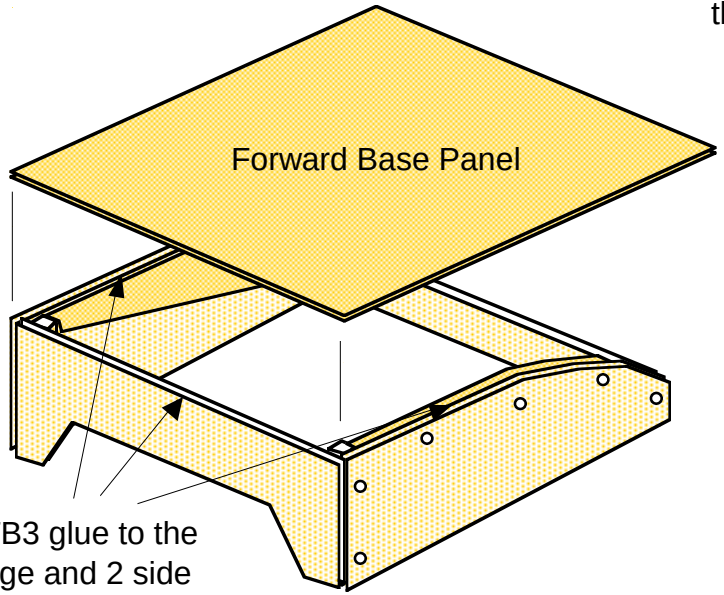
Glue and screw Supports to side panels.

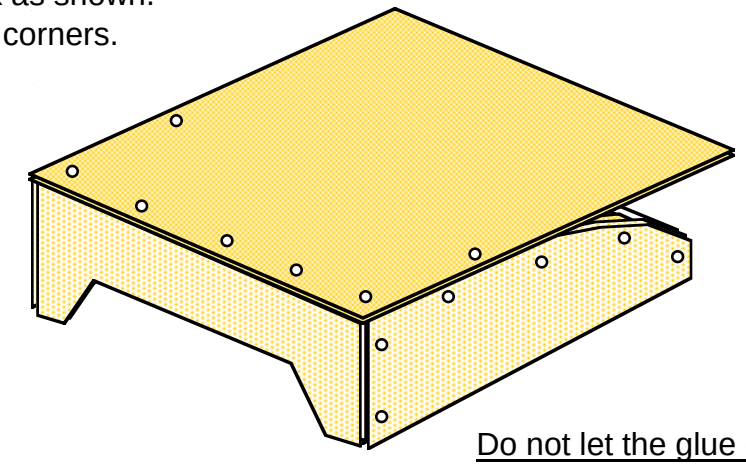


Trim Bow Panel to
conform to side panels.
Approx. 45 deg.

STEP 8 **FORWARD** Section Base

Drill and c'sink the 2 corners first, then each side and back as shown. Insure squareness of corners.



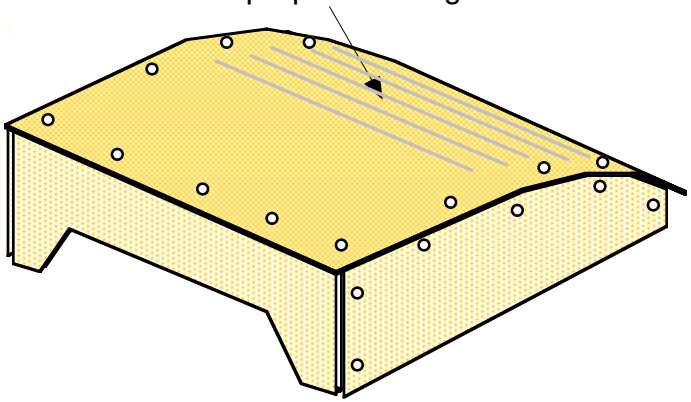


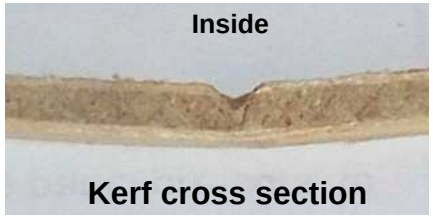
Apply TB3 glue to the back edge and 2 side edges where the Base will sit.

Do not let the glue cure. Move on to the next operation, which is completing the base assembly.

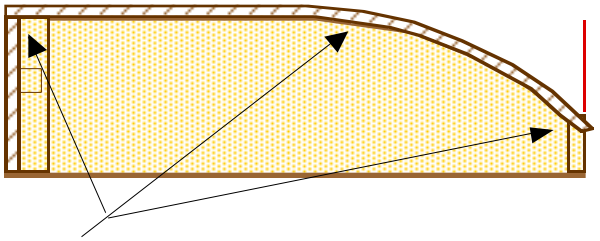
Gently press evenly on the Base Panel to form it to the sides. Drill & c-sink the holes furthest back. Apply glue to edges and screw down. Repeat the process to the Bow Panel. Glue edge and screw the Base to Bow Panel. There may be excess panel hanging over.
Wait for glue to cure before removing.

Depending on plywood selected, it may be necessary to **Kerf** the base internally to facilitate proper bending.





Trim excess material.



This completes the pre-assembly process. To insure good joints, apply a bead of TB3 glue to all inside corners of both hull sections. Also, you must now decide if you are going to add the sail rig, or not. And what custom features you are considering. Plan ahead what to do. The next standard steps are completing the interior and adding rubrails & skids.

Let me make a few custom feature recommendations.

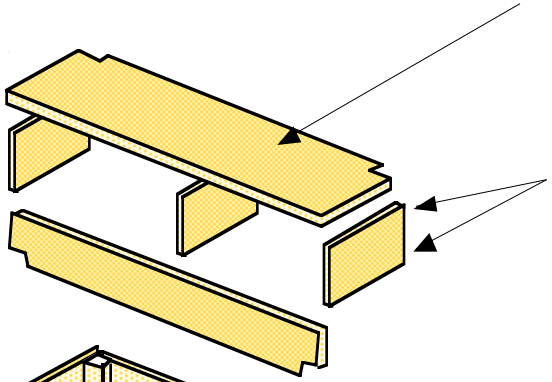
You could enclose the bow area, with a hatch, to provide dry storage.
Addition of side panel hooks could provide fishing rod or oar storage.
Small rubber wheels on the aft bottom for easy transport to the water.
A simple canopy for protection from the suns rays.
Fishing gear storage or water bottle holders.

These are just a few of the ideas you can place into action

STEP 9 SEATING

It is important to note here, before you place the seat top in position, you must waterproof the inside of all the seating surfaces.

(I use Thompsons Waater Seal Wood Preservative.
Follow Manufacturers Instructions.)

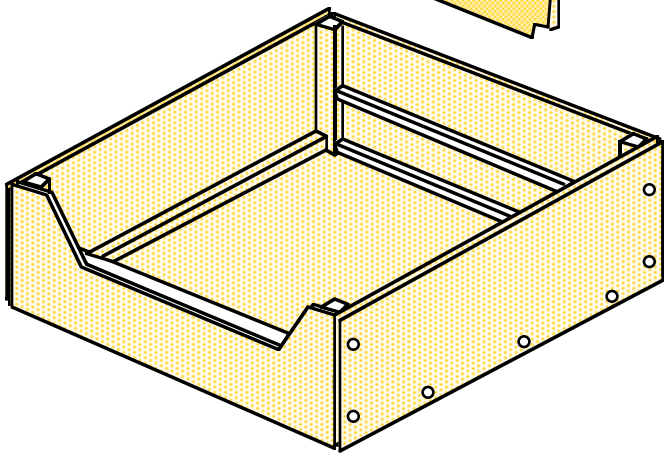


It will be necessary to make cutouts in the seat supports where they intersect the panel supports.

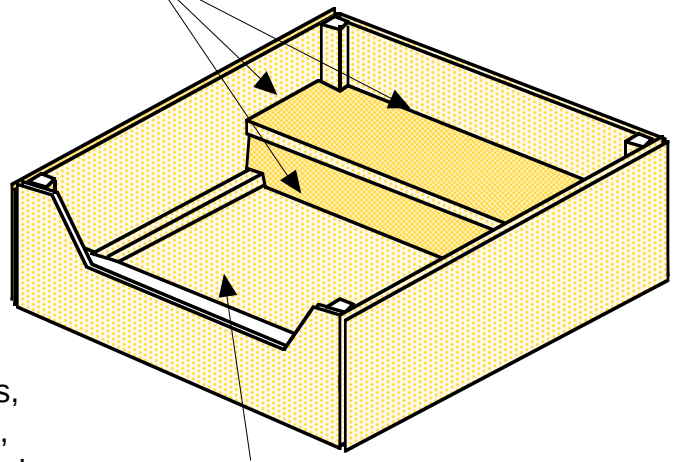
After fitting and installation, apply a generous bead of TB3 glue on all outer seams.

This compartment forms the safety buoyancy.

Do the same for the forward seat assembly.



Rear Hull Assembly



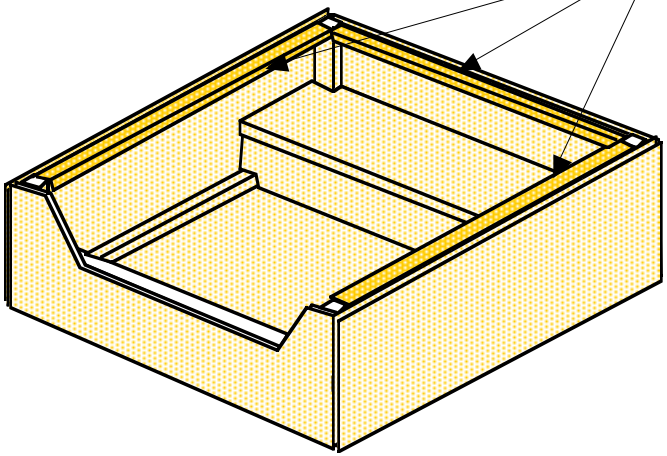
The next step is to install interior 1 x 2 rails, and side supports. Once that is complete, sanding and slightly rounding all corners and edges will commence.

NOTE: The aft seat assembly can be re-located to the forward end of the hull module for those that will do a lot of rowing.

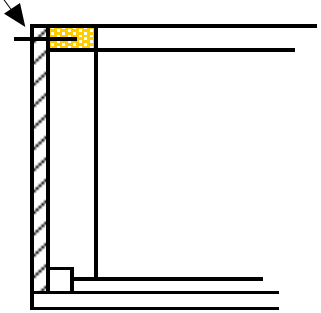
Add thicker plywood seat for larger occupants.

STEP 10 Support Rails

Glue and screw 1 x 2's **on edge**, flush with the 3 sides shown.

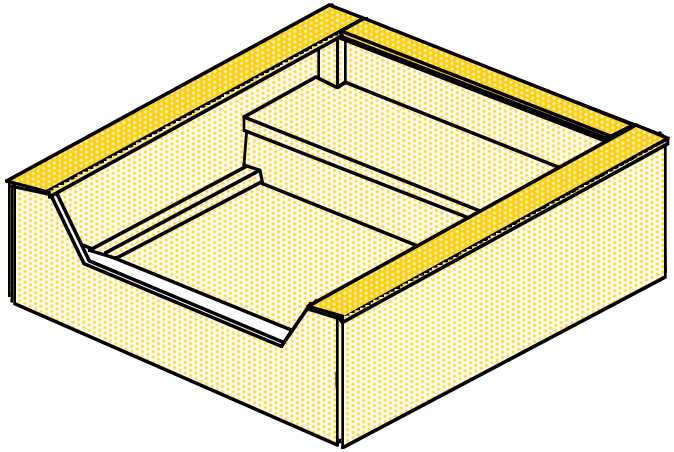


#6 x 3/4" screw



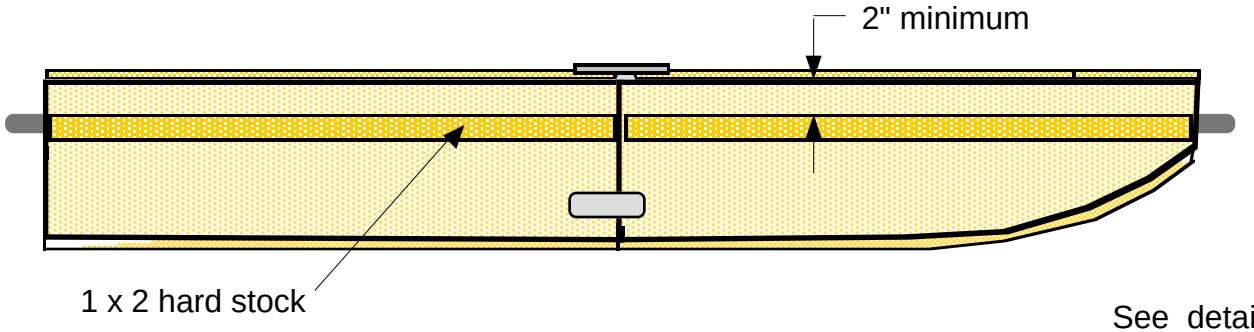
side partial view

STEP 11 Glue and screw the 3 side supports as shown. Trim to insure a good fit. This provides a finished appearance.



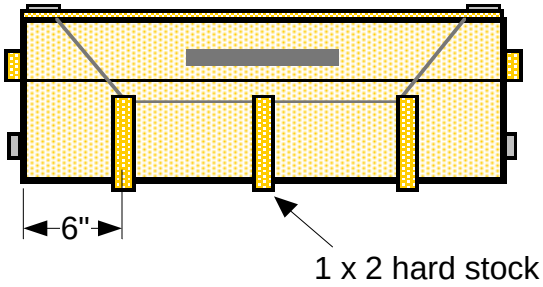
If you decide to '**Tape & Glue**' the exterior seams, now is a good time to do so. Start by sanding all exterior surfaces with at least 120 fine grit sandpaper. All edges and corners should be slightly rounded (1/8" radius).
It is best if you do both the forward and rear sections at the same time.
Proceed with the 'Tape & Glue' process.

Rubrails **Glue & Screw in place.** **Skids**



The Rubrails offer side protection to the hull, and provide additional stiffness and strength. Mark location on outdide, drill screw pilot holes, and fasten from the inside with #6 x 3/4".

See details of hinges and clamps on later pages.

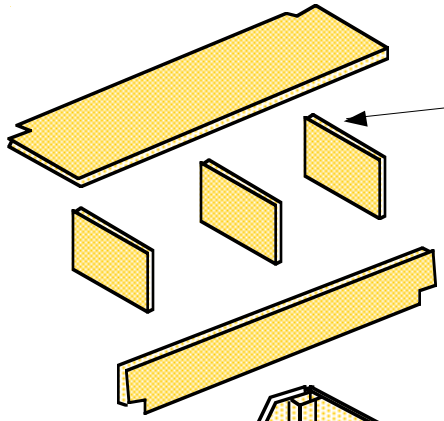


Skids run the full length of each hull section. You may have to **kerf** them in the bow curved area.

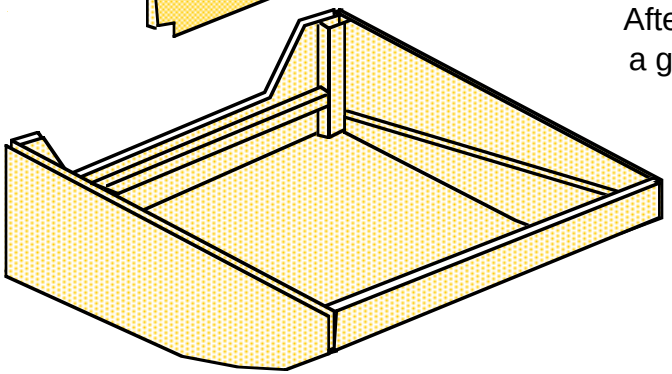
STEP 12 Forward Seat

It is important to note here, before you place the seat top in position, you must waterproof the inside of all the seating surfaces.

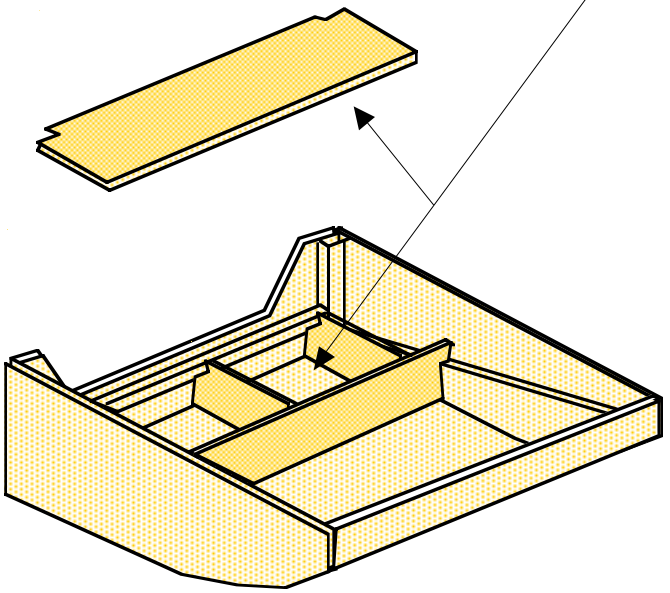
(I have used JASCO Clear Wood Preservative)



It will be necessary to make cutouts in the seat supports where they intersect the panel supports.

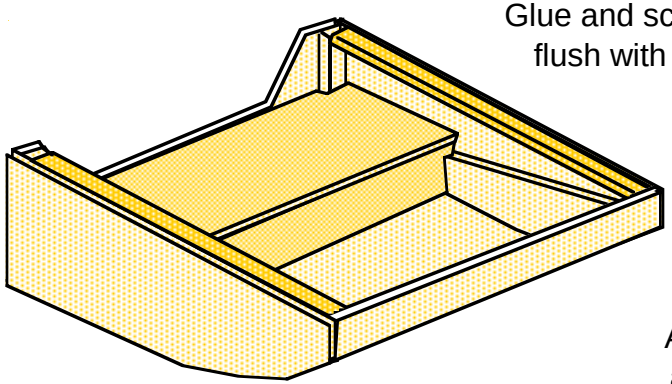


After fitting and installation, apply a generous bead of TB3 glue on all outer seat seams.



STEP 13

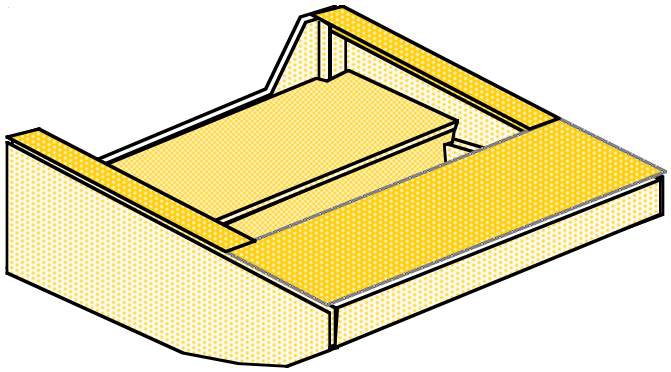
Glue and screw 1 x 2's **on edge**, flush with the 2 sides shown.



After fitting and installation, apply a generous bead of TB3 glue on all seating seams.

STEP 14

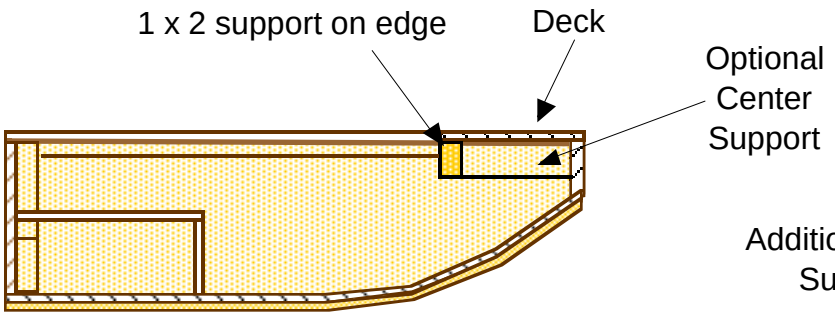
Glue and screw the 3 side supports as shown. Trim to insure a good fit. This provides a finished appearance.



NOTE: If you re-locate the aft seat, you can eliminate the forward seat, and then enclose the bow area for additional buoyancy.

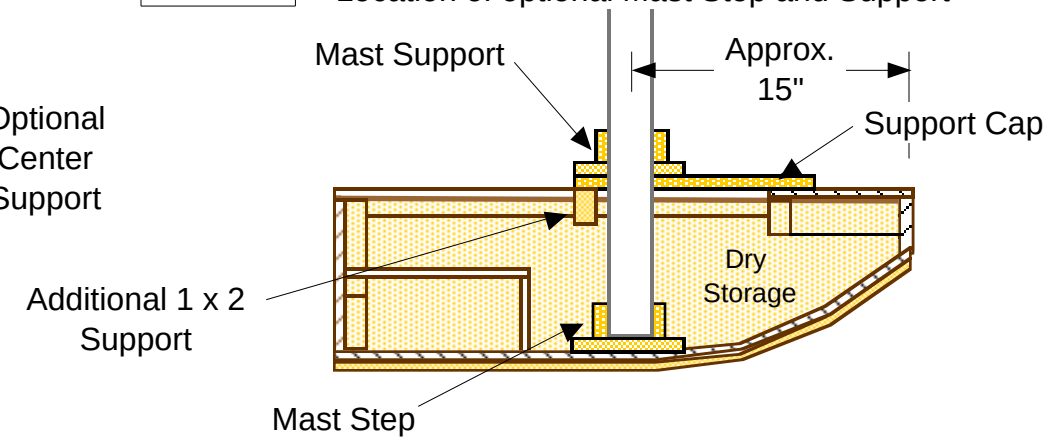
Refer to the 'Tape & Glue note on page 11.

STEP 15 Deck Support



Sail Only

STEP 16 Location of optional Mast Step and Support



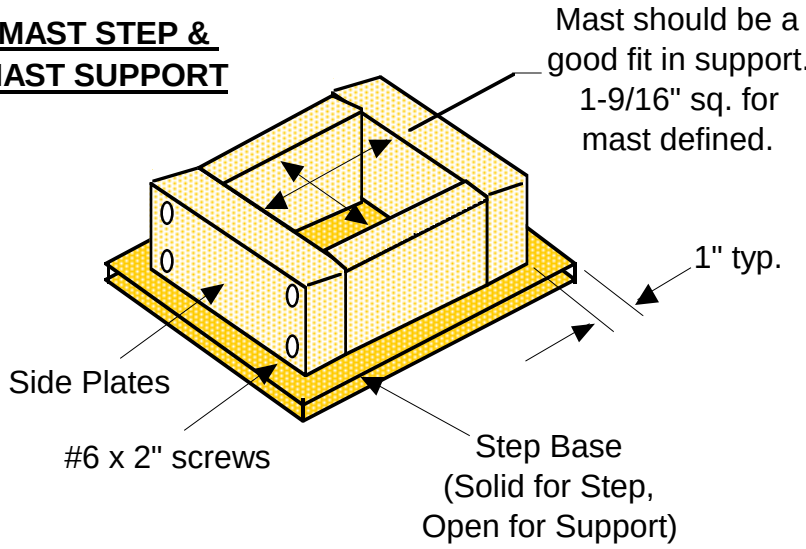
If you are considering the Sail option, you should now fabricate, locate and secure the Mast Step and Mast Support and Cap. The Mast Step is glued & screwed to the hull base & skid. The Mast Support & Cap are glued & screwed to the hull decking.

Sail Only

STEP 17

Make the Mast Step & Support from 1 x 2 hard stock. Glue and Screw together.

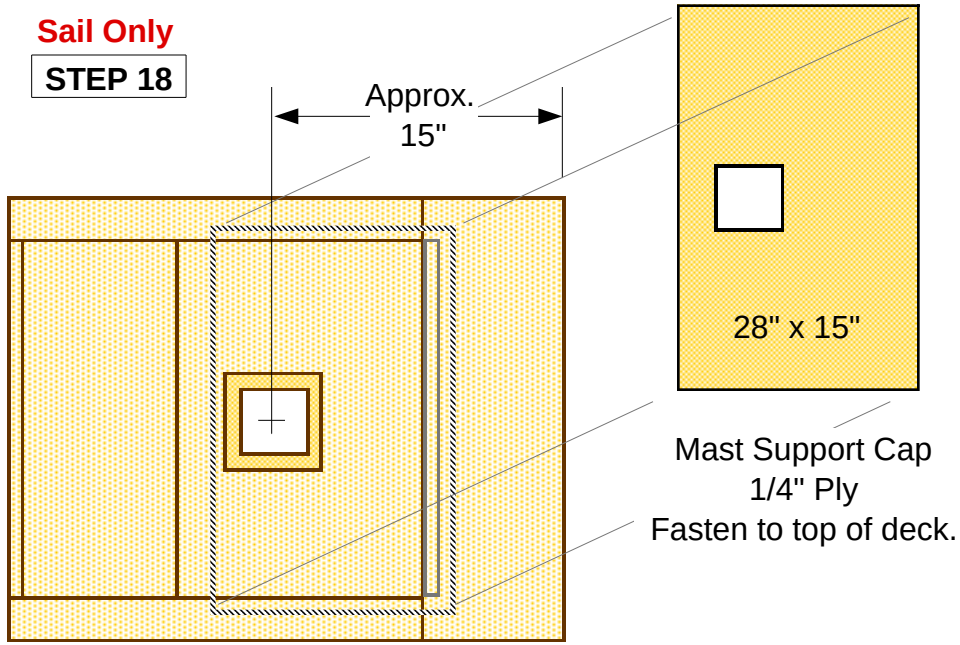
MAST STEP & MAST SUPPORT



The Mast Support & Step will accepts a square or round Mast.

Sail Only

STEP 18



The Suppport and Step must be in aligment.

SAIL PLAN

The sail plan has been defined, and It is small, considering the size of the boat, and the fact that the boat has no keel. This plan is workable, but it is also suggested the builder could choose to make a sail type they have more familiarity or previous experience with.

The advantages of this sail plan are:

A short mast, simple sail geometry, area proportional to boat size, a low center of effort (COE), simple controls (halyard and sheet), easy to raise and lower, and all components fit into the hull for easy transport.

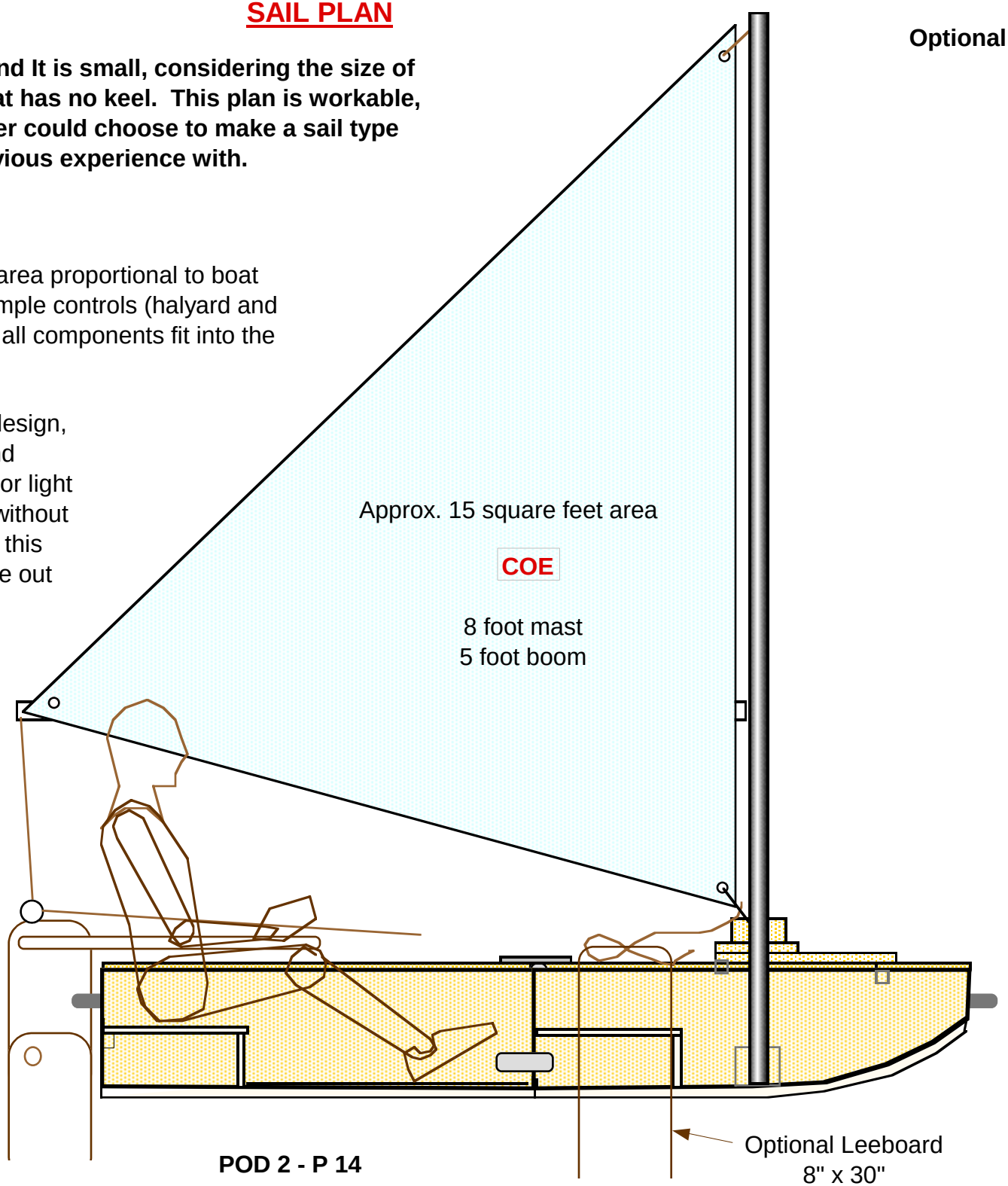
.

There is no keel or leeboard in this design, although a single leeboard could (and probably should) be added easily. For light to moderate winds the boat will sail without concern. It is the designers opinion, this little boat and occupant should not be out in heavy wind conditions.

However, in case of a knockdown, the boat will rest at 90 degrees in the water, with the mast floating horizontal on the surface.

To right the boat, you will have to be in the water. Then it will be necessary to get to the bottom side of the boat, grab the top side at the gunwale, place your feet on the center skid, and lean back with all your weight. Slowly, the boat should rise. You will then need to bail out the remaining water, so always carry a bailing bucket secured inside the boat.

ALWAYS WEAR A LIFE JACKET !



Optional

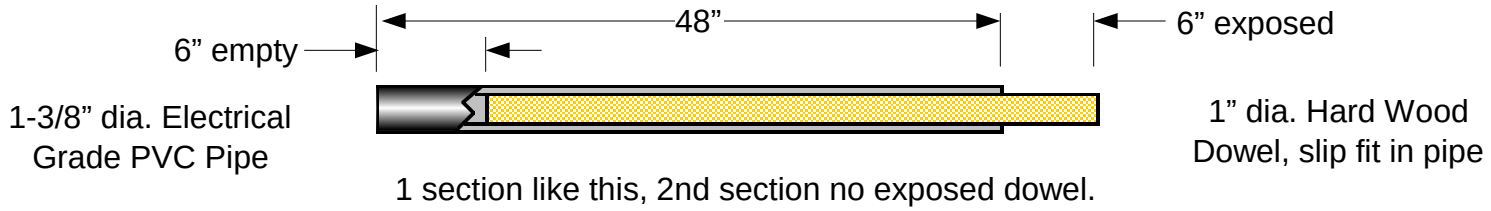
MAST ASSEMBLY

This mast design is just one of many to choose from. Make the mast and boom of materials, and size, that best suites your needs, skills and availability.

The mast design and build is critical to the overall success of a portable boat.
Therefore, a design approach for lightweight and strength, with the necessity to be collapsible, was studied.
Not finding other masts with all the right attributes, the following new mast design was developed.
It is made of heavy duty electrical PVC conduit (10 foot length) and hardwood dowels (4 foot length).
By utilizing a lightweight tubular structure, the take-apart sectional design could be realized.

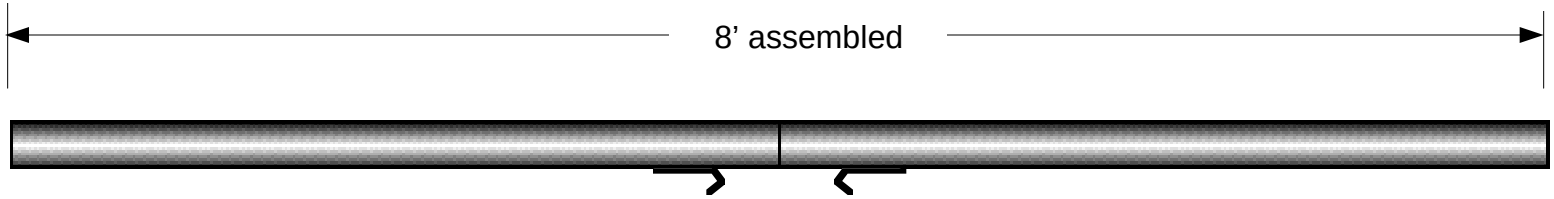
The Dowel is to be glued into the PVC Pipe using a Silicone Adhesive. This will bond the wood to the plastic, but still leave it flexible. The mast is sure to have some bend in it during the sailing process.
Make sure the cuts you make to the parts are square and true, as the butt joint is important to the overall mast rigidity.

TUBULAR MAST DESIGN



1 section like this, 2nd section no exposed dowel.

Dowels are to be cut and glued in pipe to dimensions shown.



Screw small "J" Hooks onto mast as shown. Hold 2 mast sections together using a small bunge cord.

The 5 foot Boom can be built in much the same way, only using smaller diameter Tubing and Dowels.

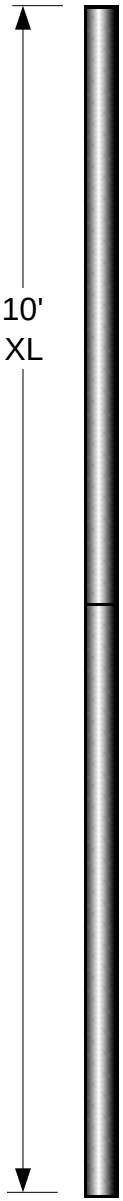
HULL CONNECTORS

Strap Hinge

Hasp Clamp

The mast and sail design are merely suggestions, as mentiond at the right. The collapsing mast as described is for those that require it to be stored in a small space for transport and storage. The use of a sail rig from another boat would be acceptable, as long as it is of similar size and style.

POD-2-XL MAST



1-1/2" Dia. PVC pipe

Optional

Modified mast for POD 2-XL

Make 2 sections each 5 feet long, same fashion as smaller POD, only using larger diameter PVC Tubing.

The Boom would be about 6 feet long.

Sail details are up to the individual builder. There are a variety of sail types that can be incorporated into the POD design. Each has it attributes and shortcomings. My suggestion is to select one that is simple to make and easy to raise and lower.

The rudder assembly is not detailed, and is also up to the builder to define. A rudder from another similar size boat would be acceptable. It should be of the kick-up type, to allow beaching. This designer has provided an example from a previous build.

The use of the new Folding Mast is also recommended.

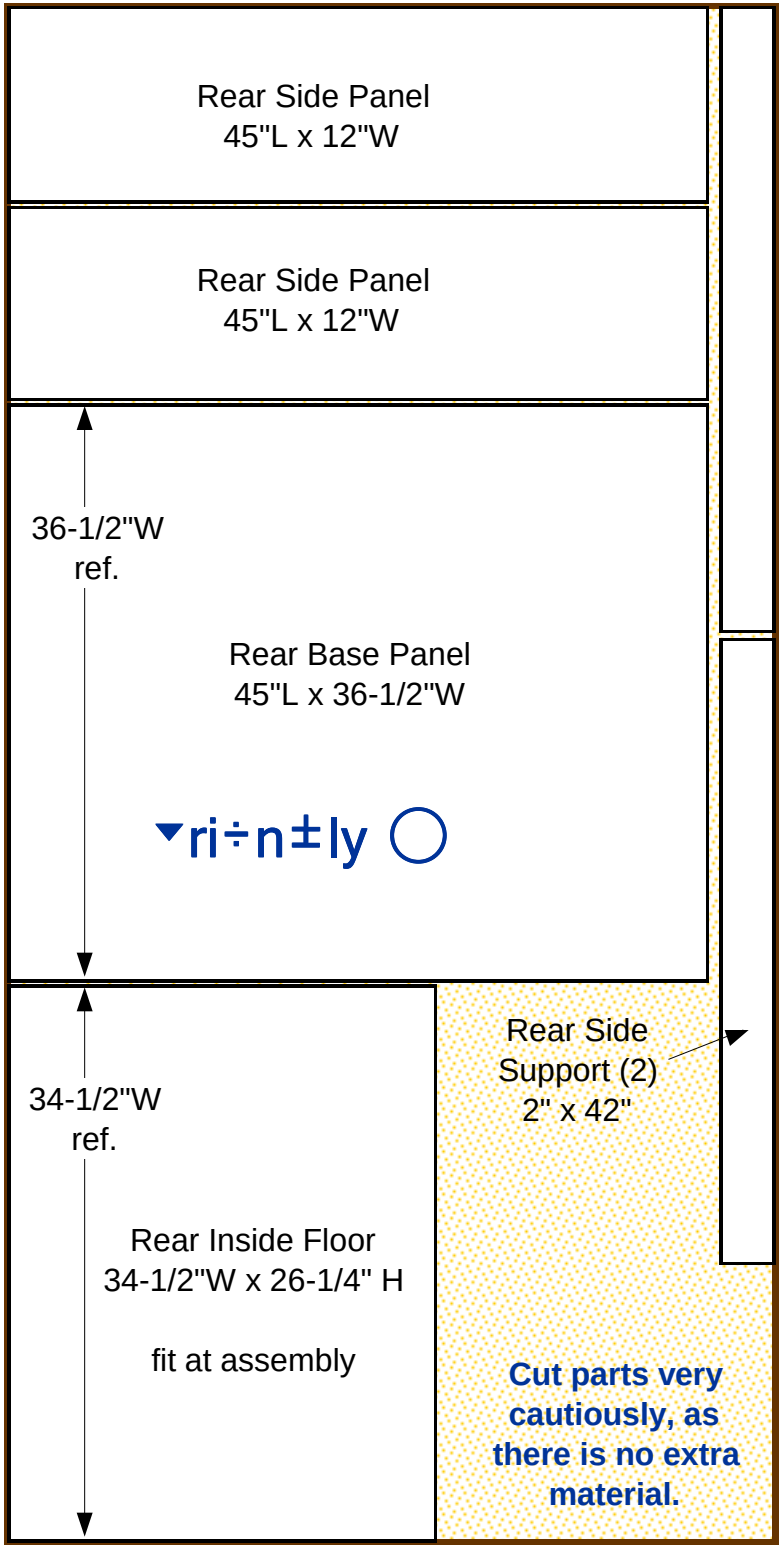
Go to www.PortableBoatPlans,com and download the free plans.

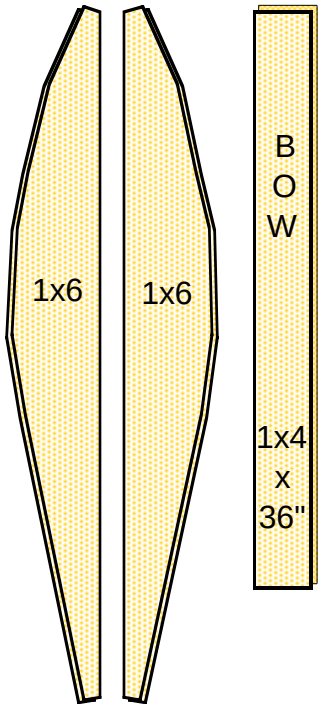
POD 2 XL

Slightly Bigger, for Larger People. Can support up to 300 pounds

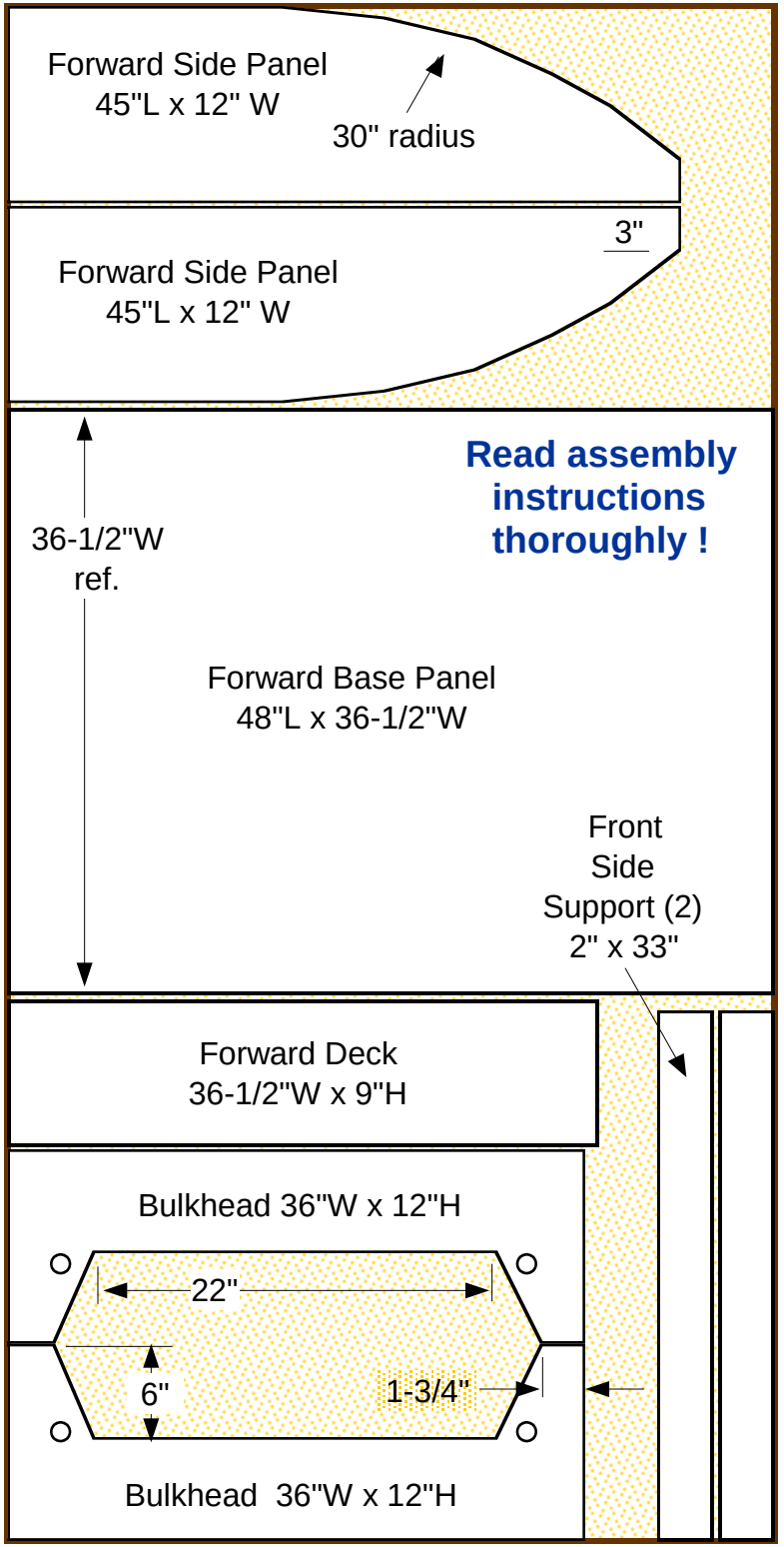
(4 inch draft)

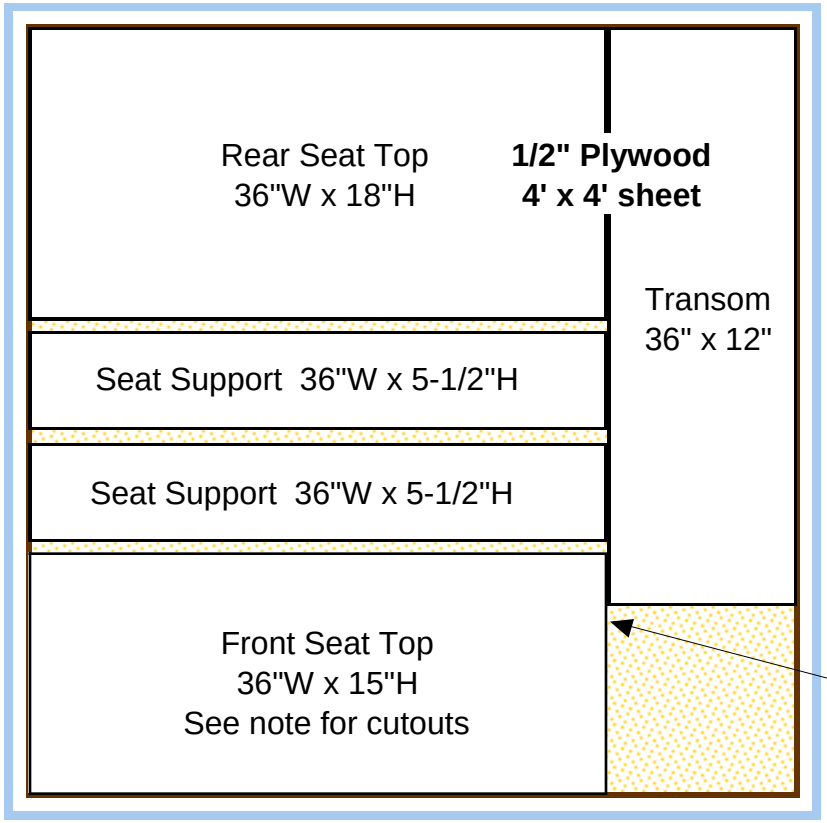
Plywood Layout
2 sheets of 1/4"
4' x 8'
&
1/2 sheet of 1/2" Ply





Forward Panel Supports make from 1 x 6 lumber
(see page 9)



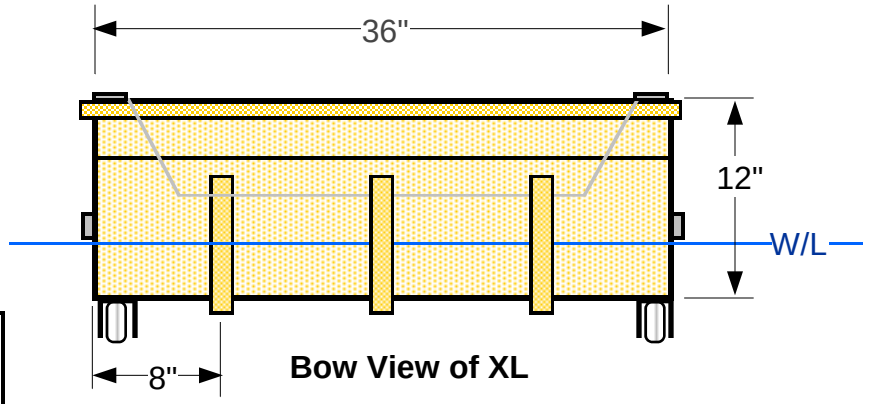


POD 2-XL additional 1/2" plywood 4' x 4' sheet

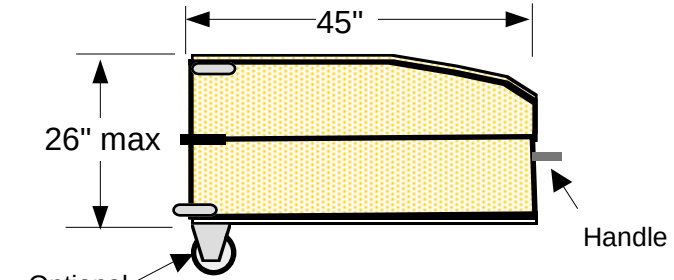
Remember: Measure Twice & Cut Once !

3 feet wide
7-1/4 feet long
12 inches high
Less than 50 pounds

Saw cut will shorten panels slightly.



Bow View of XL



XL Folded for Transport

not to scale

Build the POD-2-XL exactly the same way as it's smaller sister boat. All instructions can be scaled-up and the extra materials are specified.

Caster wheels have been used by the designer on other craft, with no performance reduction. They assist in getting the boat from vehicle to water, and back, by one person.

POD 2 XL would make a great rowboat for two. It is portable, stable and roomy for such a little craft. With reinforcement, a trolling motor can be safely added. Modification to the interior layout is highly recommended, like repositioning the seating, to personalize or make the boat into a specialty craft, for fishing, hunting or just plain fun.

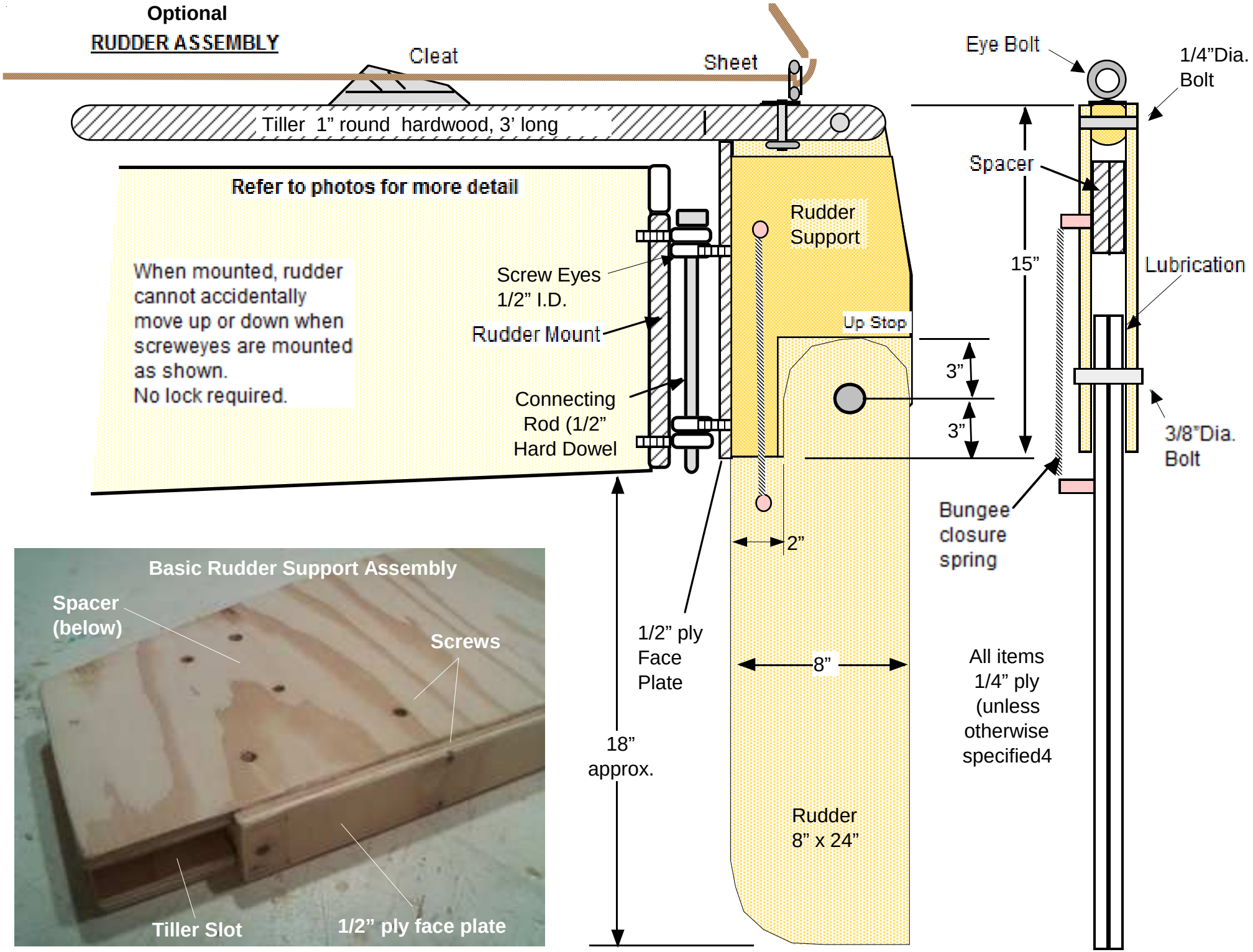
The sail plan can be the same as for the regular POD 2. It will be necessary to lengthen the mast to at least 9 feet, and the boom to 6 feet. The sail area will then be increased to about 24 square feet. As with the POD 2, there is no keel or leeboard, so the builder has the choice of adding one, or just don't sail in high wind conditions. However, a 9" x 36" leeboard would be easy to afix to each side.

A recommended option would be to 'Tape & Glue' all outside seams prior to applying a finish to the hulls. The primary reason is for positive sealing of all outboard joints. Experience has proven that normal glued joints weaken over time, possibly allowing water penetration. This cannot occur with the Taped seams, unless they have been damaged, but they are more easily repaired. If you elect to use this process, just download the file from our website **www.PortableBoatPlans.com** .

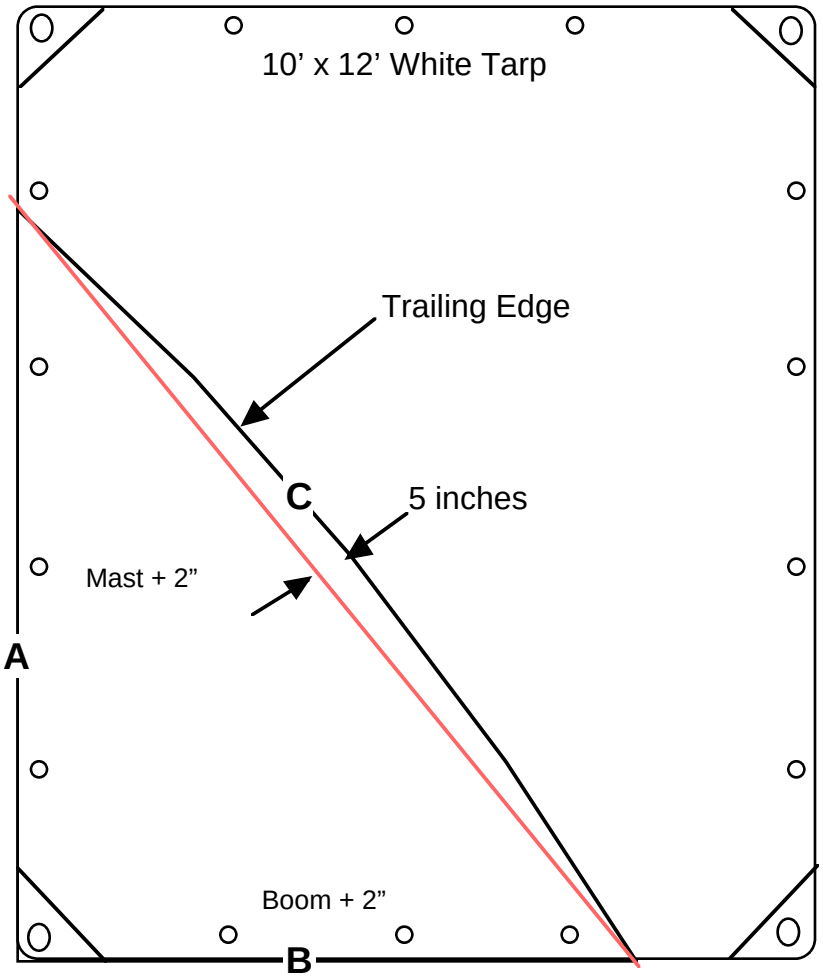
Building Notes

Optional

RUDDER ASSEMBLY



SAIL CUTTING and ASSEMBL'



Sail layout and measurement on driveway

First make Mast and Boom measurements to determine the finished sail size (between attachment points). Then cut side **A** and side **B** two (2) inches larger.

Side C should be cut in an arc, from end A to end B that is 5 inches greater than if it were a straight line.

The remaining tarp material can be used for any of three purposes: Make another sail because a mistake was made on the first one. Make a Jib Sail for added area in light winds, or keep as scrap material for future use.


Orientation of Sail Corner to Mast and Boom

I purchased a 10 x 12 Tarp, as the above photo shows, but a 10 x 10 would do just as well. If you are considering a taller mast or a longer boom, or just different attachment points, you will have to resize the tarp to suite.
Tarps.com can supply a wide variety of sizes, so you might want to design the mast/boom assembly around one of their other offerings.
This might reduce, or even eliminate, grommet placement, as the tarps already come with corner grommets and side grommets that you can use in your sail setup.

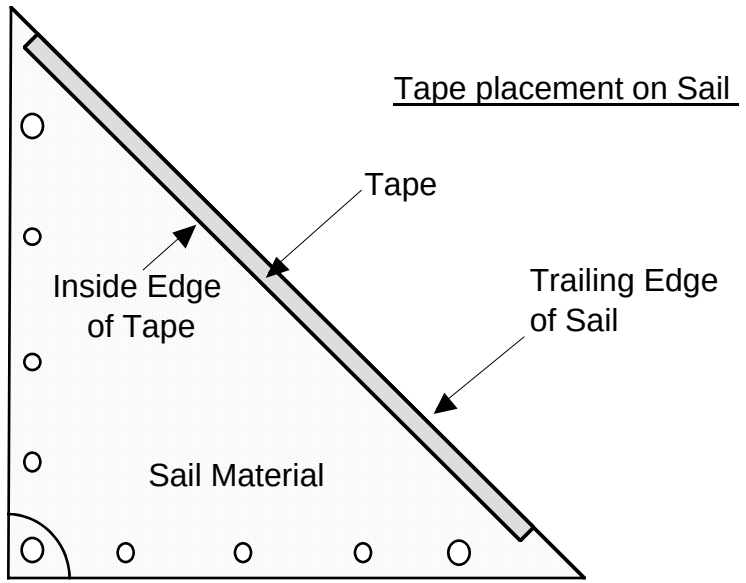
Applying Carpet Tape to Trailing Edge of Sail :

Layout Sail on a flat surface and smooth out. Using 2 inch wide Double Sided Indoor/Outdoor Carpet Tape, peel back about one foot of backing from one side only. Start from one end, and place tape, adhesive side down, onto the Sail material, aligned to the trailing edge (see sketch below). Next remove another foot of backing, and continue taping. Repeat the process to the other end of the sail.

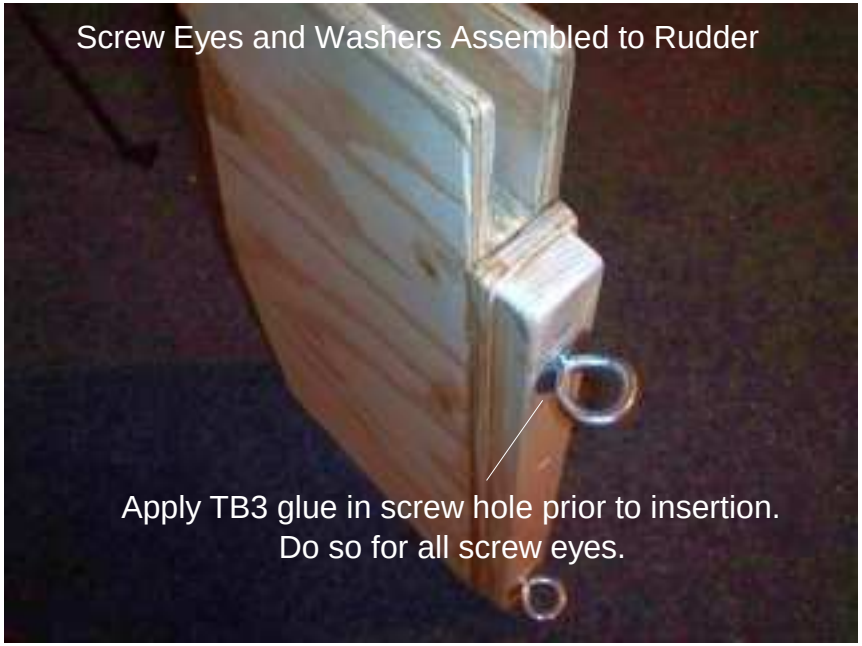
Now, remove about a foot of backing from the top of the tape. Fold the sail material over (with tape), so that the inside edge of the tape becomes the new outside edge of the sail. Repeat this process to the other end of the sail.

Once this is complete, apply tape to any of the corners that need securing, and fold over the sail material to complete the corner. Be careful when removing the backing not to touuch the tape surface, as it will be difficult to remove from fingers.

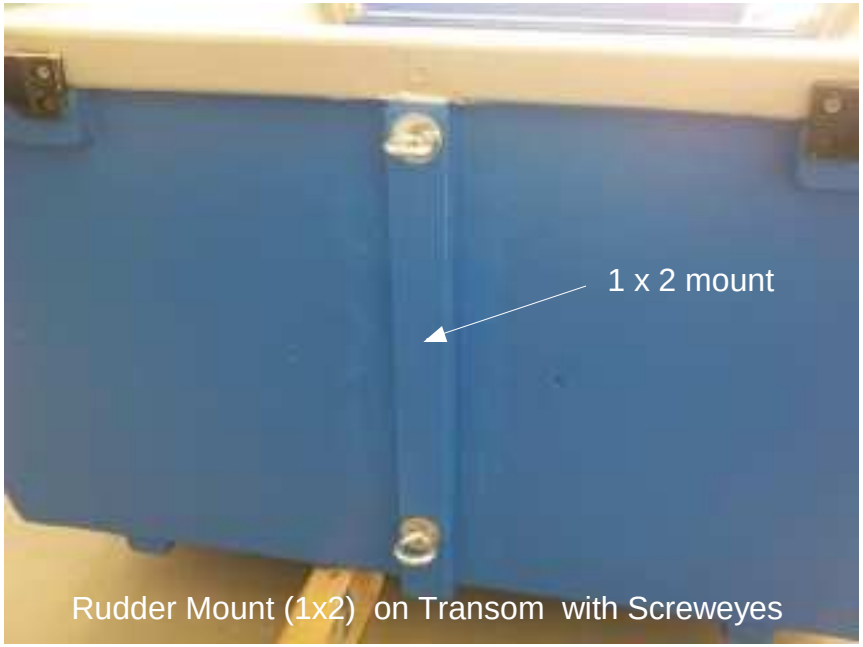
Finally, roll or tamp trailing edge of sail to set the tape and provide a good bond with the sail material.

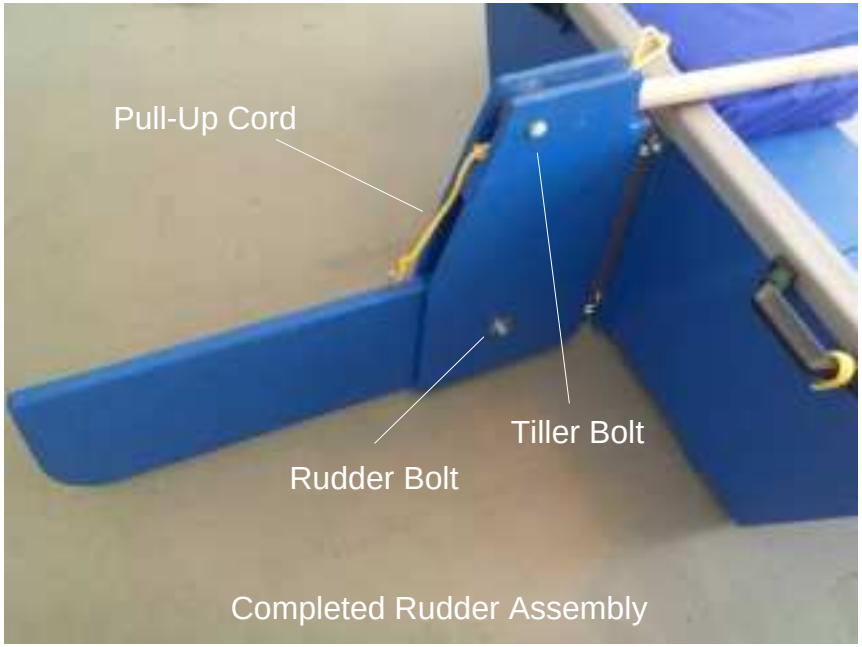


These photos are of a similar boat design. The rudder for the POD could be a little smaller in width and length.



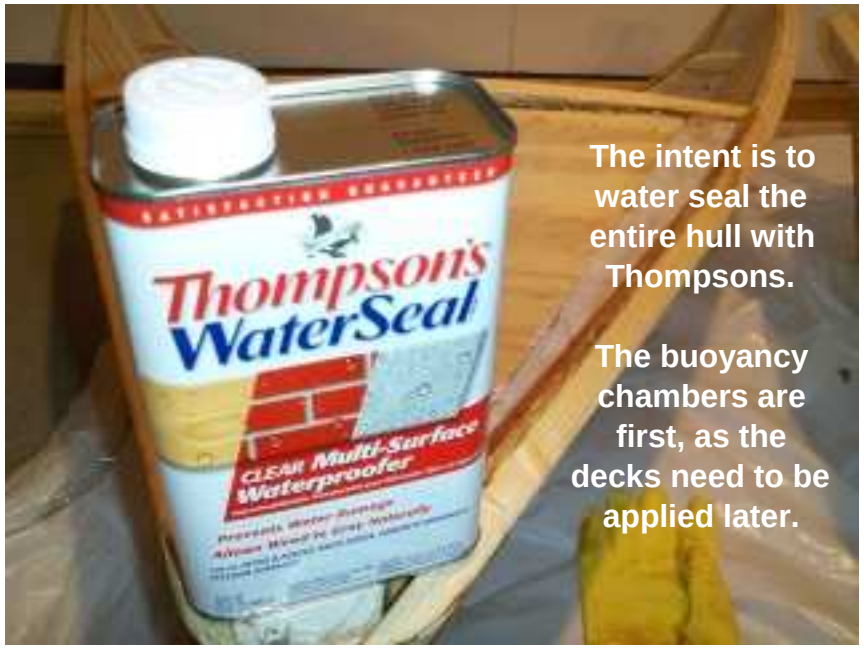
Optional





Remember, these plans are free.

FINISHING



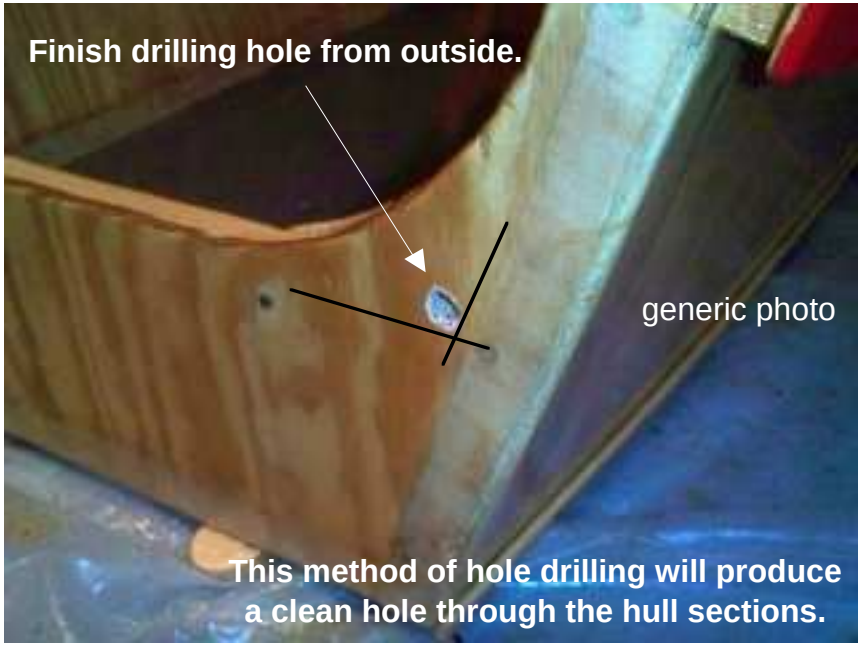
SEALING and FINISHING

Applying **1 x 2 Skids**. Mark their location (9" apart on Center Module, single Skeg on center of Forward & Aft Modules). Apply TB3 glue and screw from the inside. Refer to detail photos for additional information. I try to use a harder grade lumber for the skids, and a softer (easier to bend) grade for any optional rubrails.
Do this prior to sealing with Thompsons.

Now it is time to treat the entire hull, inside and outside, with **Thompsons Water Seal**. This is done to prevent the plywood from absorbing moisture. It is important you follow the Manufacturers Instructions for Application and Drying time. When complete, and after drying, you must lightly sand all treated surfaces of the hull. I usually use 150-180 grit for this operation. Sanding helps the adhesion of the surface finish being applied next.

Finally, apply the finish of choice to the hull surfaces. Select a finish that is at least water resistant (non-porous). Check exterior surfaces after each use for any water penetration, such as surface checking (roughness) or lifting of the finish. Repair as necessary. Constant maintenance will vastly extend the usefulness, and life, of your boat.

Suggestion for Drilling Safety Bolt Holes.



The location of the Safety Bolt Holes is at the intersection of the horizontal and vertical bulkhead supports.