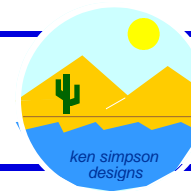


CPB-1 Lightweight Folding Pram

Single
Occupant



September 15, 2012
14 pages
Rev. A

Print in Landscape

An ultra-lightweight folding pram, only 15 pounds. Ideal for the lone fisherman or paddling enthusiast. Easy to make and fits in any vehicle when folded !

See the hull and load specifications on layout page number 3.

Build, and get to the water, for less than 60 US dollars.

Truly a Unique, Unsinkable, Go Anywhere Boat !

a ken simpson design



Sep 19, 2012

Hull with covered bow & stern, seat, paddle & PFD.

IMAGINE



Sep 12, 2012

From a Blank Sheet
to a
Folded Hull



Sep 11, 2012

In Only One Day of Construction !

General Notes

The design of **CPB-1** is in response to a request for a lightweight Folding Portable Boat. It includes a generous beam, good freeboard, small storage size, seating for one, and safety buoyancy. It is reasonably sturdy, easy to build, very portable and utilizes a standard kayak paddle for propulsion.

To have strength and yet be lightweight, the plans use some non-traditional methods of assembly, specifically the "CoroPlast" material, and the tape construction process developed by the designer.

This provides a durable, yet truly portable, finished boat, and the building process is easily mastered by the home handyman and amateur boat builder.

As a result, only hand tools, such as a utility knife, a drill, a hand saw, a steel straight edge and a tape measure are all that will be required throughout the assembly process.

The COROPLAST material is thin, and can be penetrated by hard, sharp objects such as small rocks. For this reason it is advisable not to step on the bare sheet material.

Use only materials as specified, as they have been tested for this design.

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.

Seating choice is also up to the builder. I have folding seat plans available for free on the website.

Any questions or comments regarding the construction and/or design of this project will be responded to in a timely fashion.

Thank you for your interest, and for purchasing these plans, and good luck with your project.

And don't forget to visit www.PortableBoatPlans.Com for new designs and updates.

Happy Boating !

www.PortableBoatPlans.com

Ken Simpson , Designer

This is an experimental design drawn up by an untrained amateur. The Designer accepts no liability for any loss or damage sustained during construction or use. Builders may use these plans to construct small numbers of boats freely for their own use. Commercial manufacturers must ask the designer to negotiate permission.



SIMPLE ONE SHEET FOLD-UP PRAM - CoroPlast Material

August 2012

UNSINKABLE !

CPB-1

Folds for transport to 2' x 4' x 6" thick !

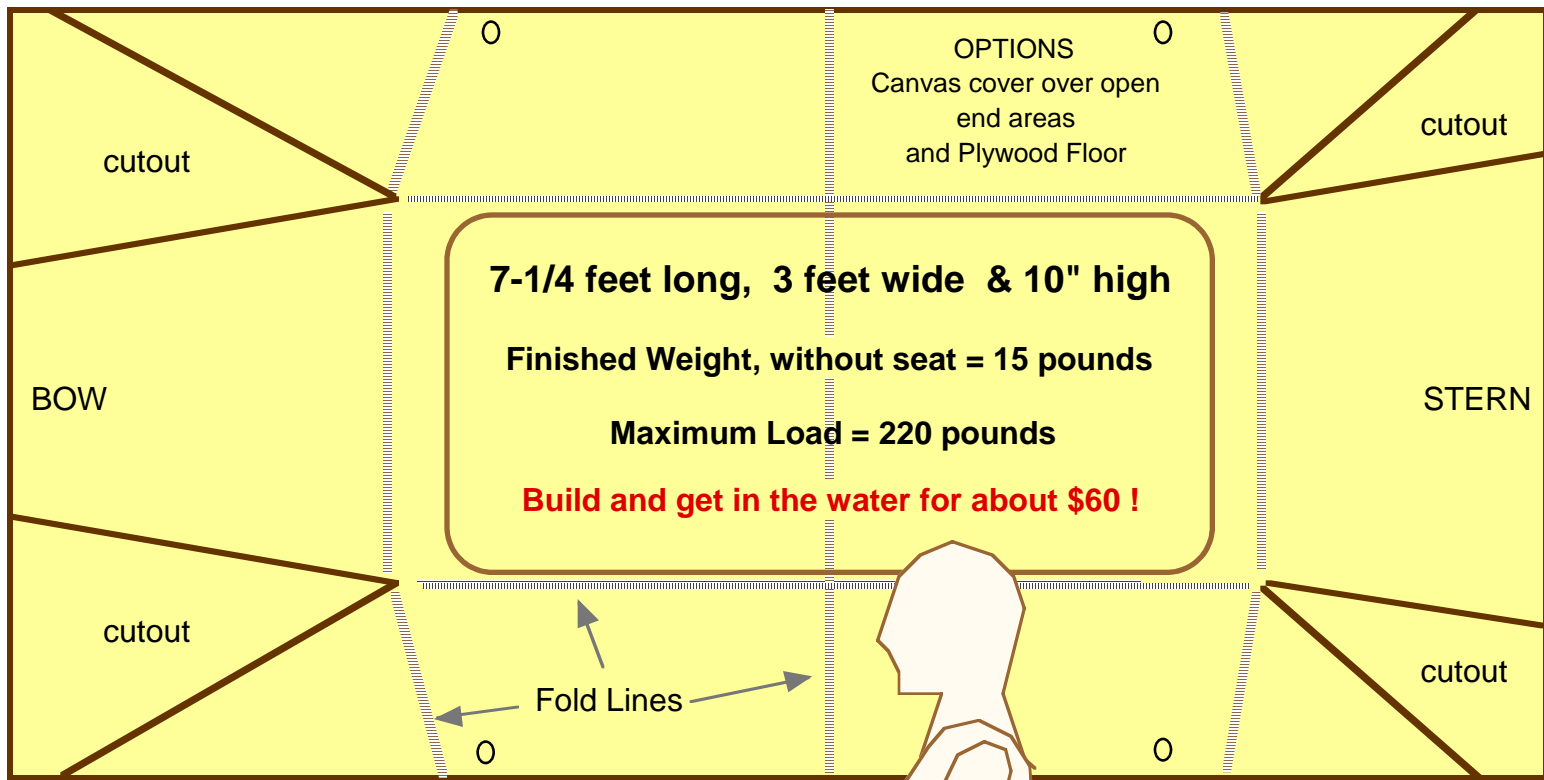
Great Paddle Boat, and Great for Kids of All Ages !

WON'T Sink Rot or Fade

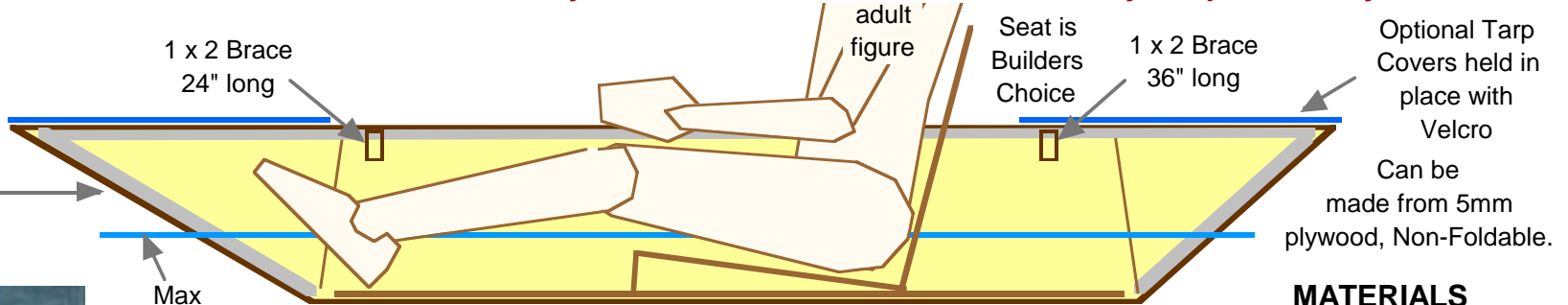
TOUGH TAPE Corner Seams (double tape all exterior seams and edges)



www.PortableBoatPlans.com

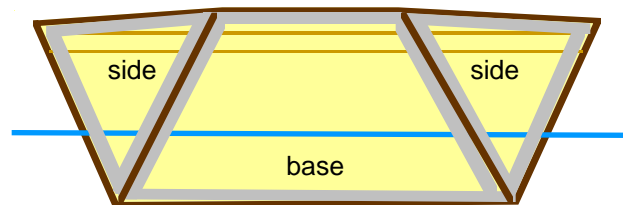


CoroPlast is available in a variety of colors. Select one that reflects your personality !



Material available in a variety of colors: White, Blue, Yellow, Red, Black

Great care must be taken not to bend the panels incorrectly !



Front View

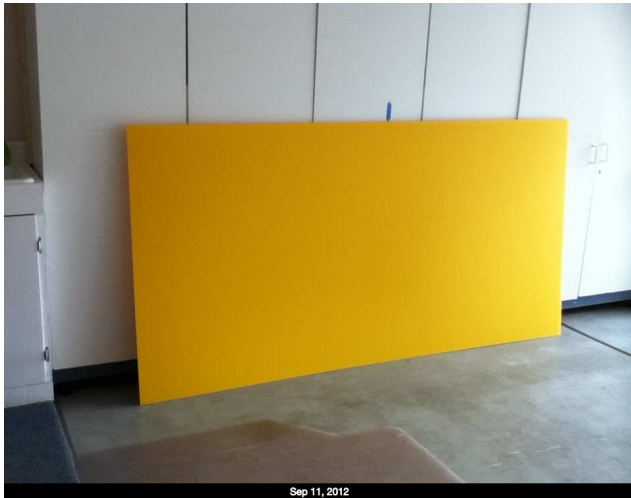
a ken simpson design

MATERIALS

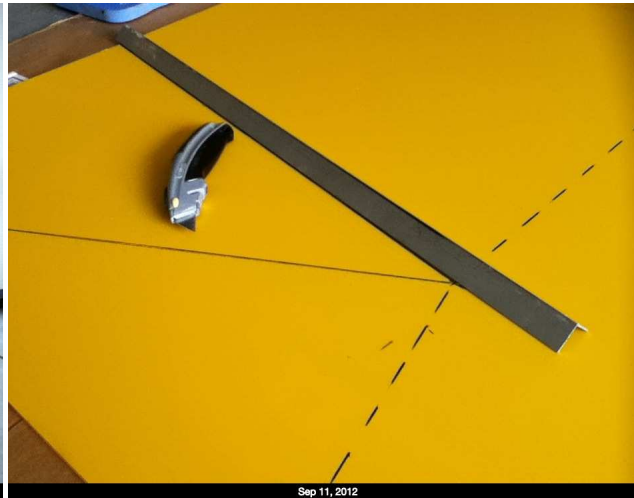
- 1 - 4 x 8 x 4mm CoroPlast - \$19
- 1 - 2' x 4' x 1/4" Ply (floor) - \$10
- 1 - 1" dia. x 8' PVC Pipe - \$2
- 2 - Rolls Tough Tape - \$20
- 1 - 1 x 2 x 8' Lumber - \$2
- 1 - 1/4" x 3/4" x 8' - \$2
- 4 - T-Nuts & Bolts - \$5
- Total Build = \$60**

QUICK SEQUENCE OF ASSEMBLY, ALL IN ONE 24 HOUR PERIOD !

Reference: "CoroPlast" is a plastic corrugated sheet material, available at most Sign Shops, in most Cities, for about \$20.



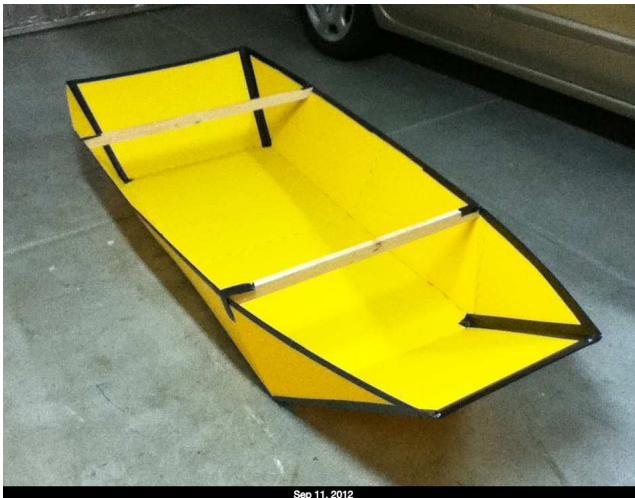
Basic 4' x 8' x 4mm Sheet of CoroPlast.



Marked lines for cutting and folding.



Cut panels, bending and taping.



Initial assembly, unfolded.



Hull folded to transport size, 2' x 4' x 6"



Hull with seat and support bars.

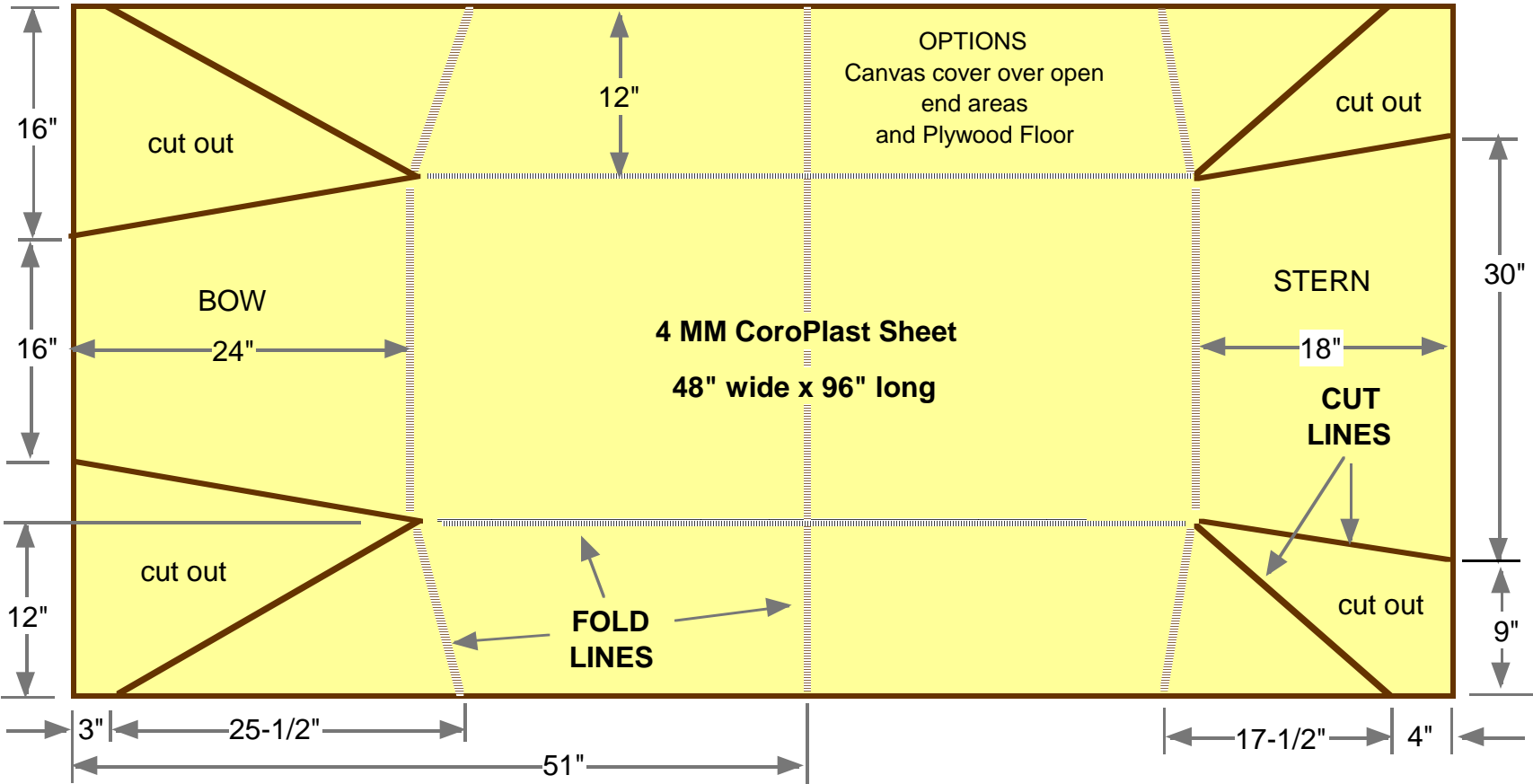
It must be stated now that you cannot step, or kneel, on the bare CoroPlast material, as it will deform and weaken in that spot. That is what the Plywood Floor is for in the finished Hull. Do not violate this rule !

Needless to say, there is more to the plans than this. Detail of the cutting, folding and taping follows, as does the assembly of the support bars and removable plywood floor. Because the boat is made of a flimsy material (not weak), certain precautions should be taken during construction, and after. Follow the plans to a successful build, and enjoy the ride !

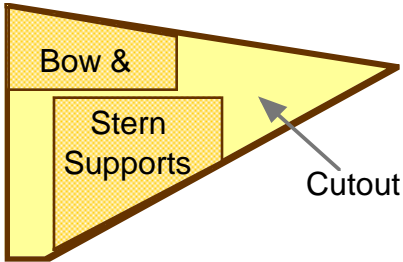
ASSEMBLY PROCESSES.

STEP # 1 Lay the CoroPlast material on a clean flat floor. Gather the following tools: A good, sharp #2 pencil, a 4' steel straight edge, and a sharp utility knife. Also a 2' x 4' piece of heavy cardboard, to use as a cutting surface.

With the pencil, mark all the Cut Lines (8), as shown. Then, mark the fold lines (9), making dotted lines, as shown.



Dimensions are critical for an accurate folding design.

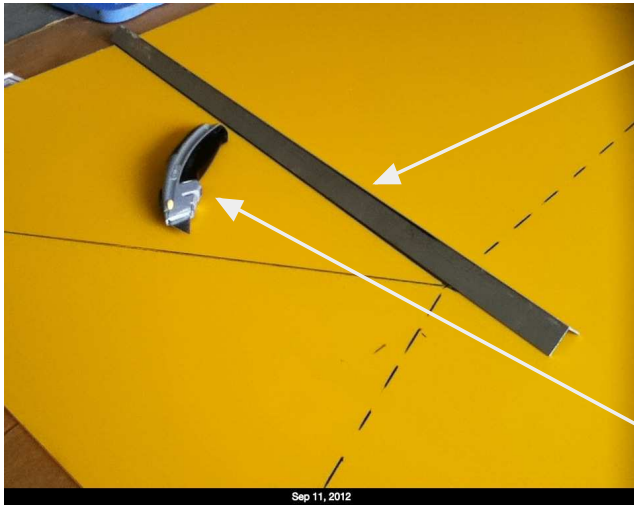


Later, Side Supports will be cut from the 2 large cutouts as shown in this sketch.

Double check all markings for accuracy.

STEP # 2 CUTTING & FOLDING

I used a steel straight edge as a guide in cutting, as the knife might cut into a wooden one. Lay the cardboard beneath the CoroPlast in the area to be cut. This allows the knife to cut through without becoming dull on a hard surface.



Initial Cuts

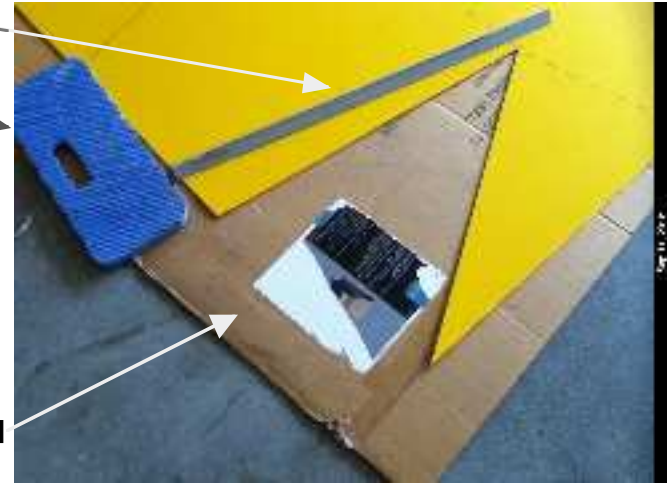
Steel Straight Edge

Kneeling Pad

Make sure you have a sharp blade, and double check dimensions.

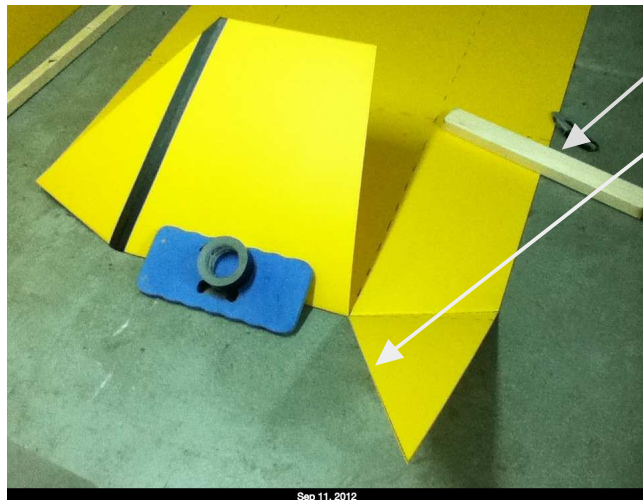
Utility Knife

Cardboard



Finished Cutout

Once all the cuts are made, it is time to start the first bends. First, SCORE the CoroPlast bend lines with the tip of a phillips head screwdriver, against the steel straight edge guide. Do not break through the surface of the CoroPlast. Then, using a length of 2x3 (or something similar), place the 2x3 about 1/16 inch away from the scored bend line. Hold down with your foot (see photo below), and slowly and carefully pull up on the Panel evenly, ntl you feel it bend. Remove the 2x3, and continue to fold the panel over onto itself. If the bends are done correctly, when folded over, the two bent panel edges should line up and contact each other. CAUTION, the panel may slip or slide beneath the 2x3, and the bend will be in the wrong place. NOT GOOD



Bending and Taping Flaps

2 x 3 Clamp

Seam

Center Fold

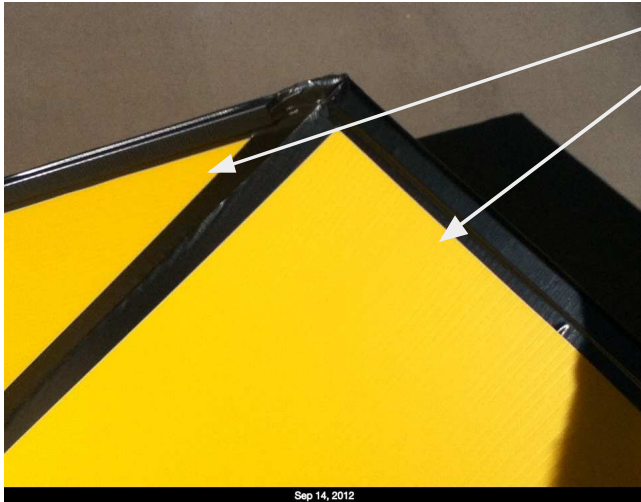
Bending the Center Fold requires 2 people, one on each side. Each must hold the 2x3 down by foot, and slowly lift the panel until you feel it bend. Remove the 2x3 and fold the panel completely over.



Bending Center Fold

STEP # 3 APPLYING TAPE to SEAMS and EDGES

The Tape used is SCOTCH TOUGH TAPE, and it is sticky. It is a good idea to first wipe with Alcohol all the areas to be taped, to remove any contaminates. Then apply the Tape to join the outside panels to the inside panels. Use the utility knife to cut the tape, a scissors will not work, as the tape will stick to it.



Outside Panel
Inside Panel

Fold over and hold the edges of both panels together, and apply Tape to the outside seam. Repeat the process for the remaining 3 seams. Turn the assembly over, and Tape all inside seams. Next Tape all exposed edges, as shown in photos.

Taped Panel Seams



Support Bars and Taped Edges

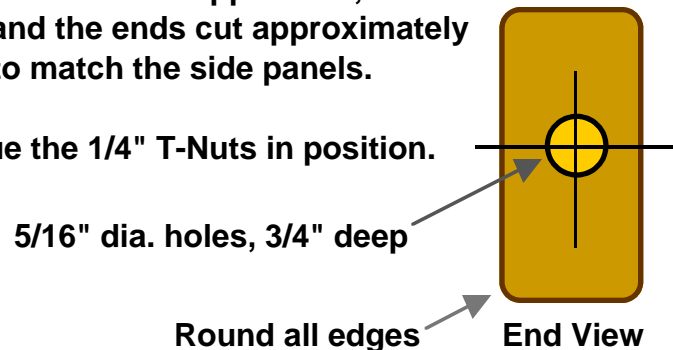
Note: A Seam is the joining of two panel edges, as shown . A Fold is the bending of a panel to achieve the hull shape.

STEP # 4 SIDE PANEL SUPPORT BARS

Two Support Bars are required to hold the shape of the hull. Both are cut to length from 1 x 2 lumber. Cut the forward one 24" long. Drill a 5/16" diameter hole about 3/4" deep in the center ends of the bar, at a right angle to the end cut, both ends.

Repeat this process for the Rear Support Bar, but make it 36" long, and the ends cut approximately at a 30 degree angle, to match the side panels.

The next step is to glue the 1/4" T-Nuts in position.



Scotch TOUGH TAPE
No Residue
About \$10 a roll

STEP # 5 T-NUT & KNOB ASSEMBLY

The T-NUTS are what really hold the boat together in the water, so make sure you glue them in position well.

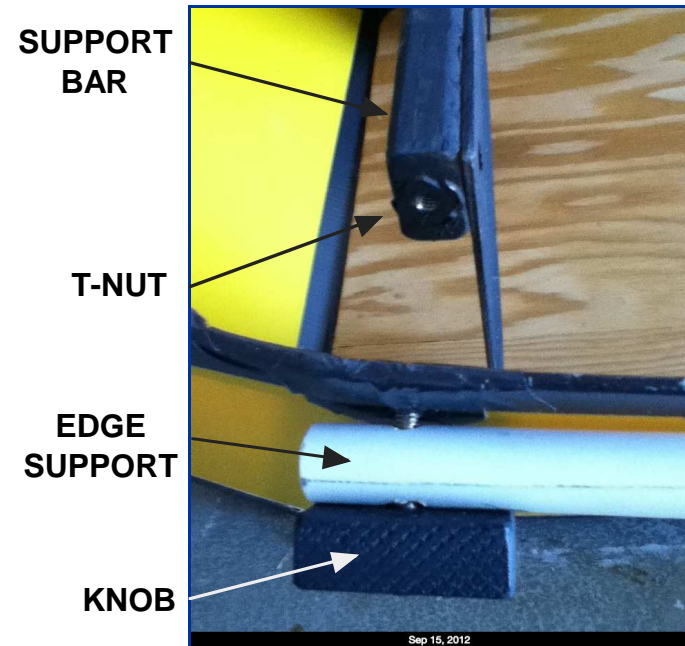
I suggest using Quick Set Epoxy for this task, small tubes available at your local home store. Apply Epoxy to the edge of the support bar hole and to the end surface around the hole. Place the T-Nut into the hole, and seat with a small hammer. Spread Epoxy over the surface of the T-Nut, smoothing out over the end of the Support Bar, being careful not to get Epoxy in the hole of the T-Nut. Do the same for all remaining T-Nuts. Allow to cure.



KNOB ASSEMBLY



Make the 4 Knobs by drilling a 1/4" hole in the center of a 1x2x2. Epoxy a 1-1/2" long 1/4-20 Bolt into the block. Allow to cure, then paint them. Color is your choice.

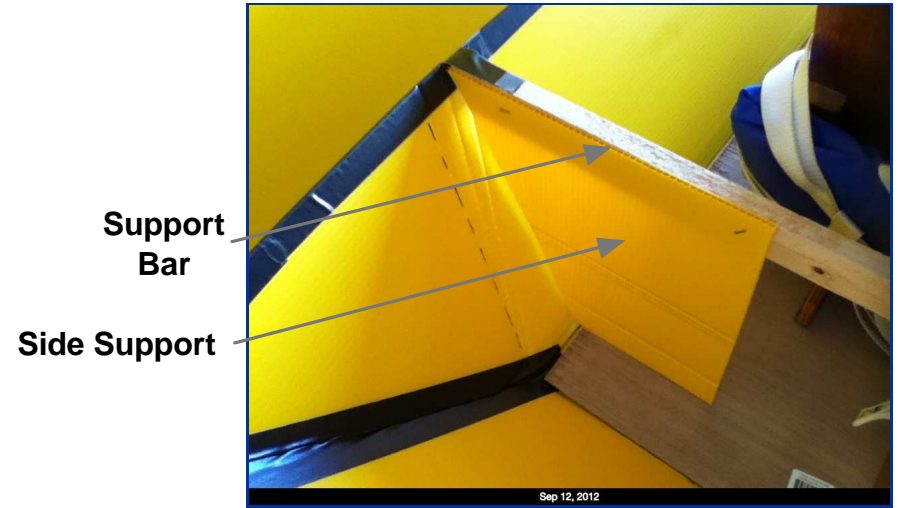
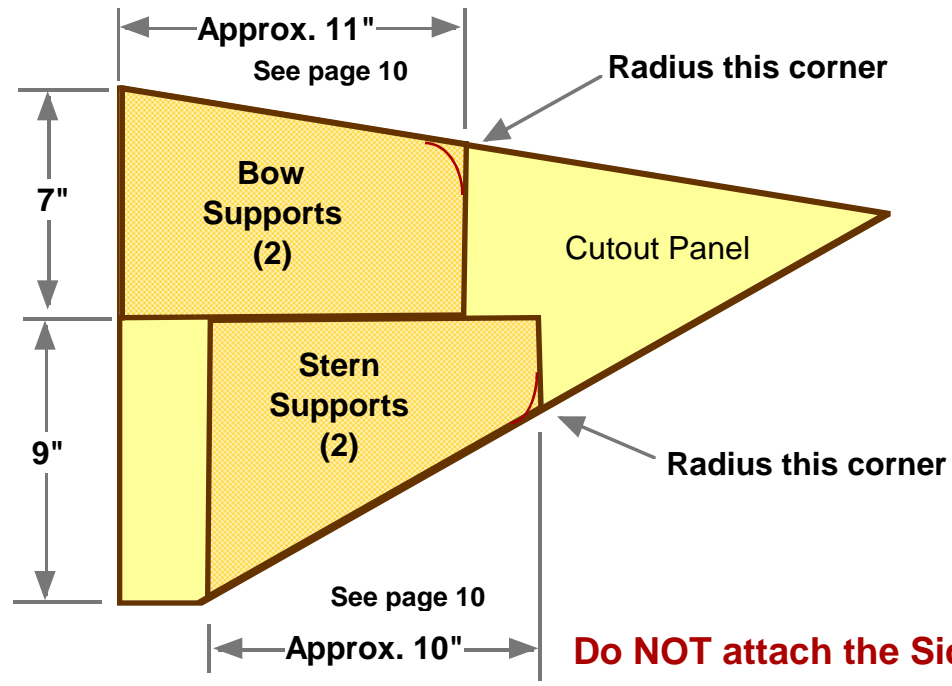


Panel Support Attachment

As you can see, I painted all the support parts a flat black color. It seemed to go well with the yellow hull color I chose. As mentioned earlier, the CoroPlast material is available in a variety of colors, so select a paint color to compliment the color of your hull choice.

STEP # 6 SIDE SUPPORTS to SUPPORT BARS

To reduce possible twist in the hull, Side Supports are added to the Support Bars, as shown. Cut the Side Supports from the large leftover cutouts, per the sketch below.



Stern Side Support Panel Location

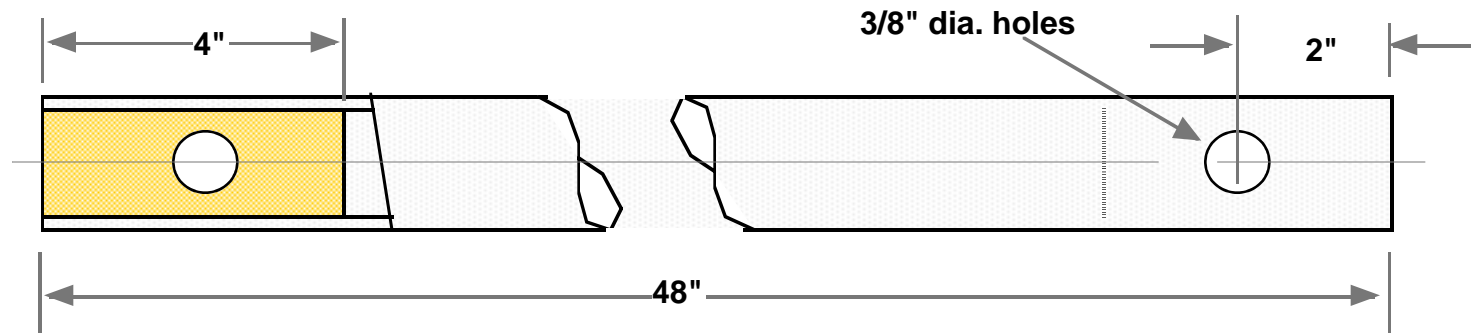
Do NOT attach the Side Support Panels to the Support Bars at this time.
See Page 10, Step 8

STEP # 7 EDGE SUPPORTS (2 required)

The Edge Supports are made of 1" Dia. PVC Pipe, with a 4" length of 3/4" Dia. Wood Dowel epoxied into each end.

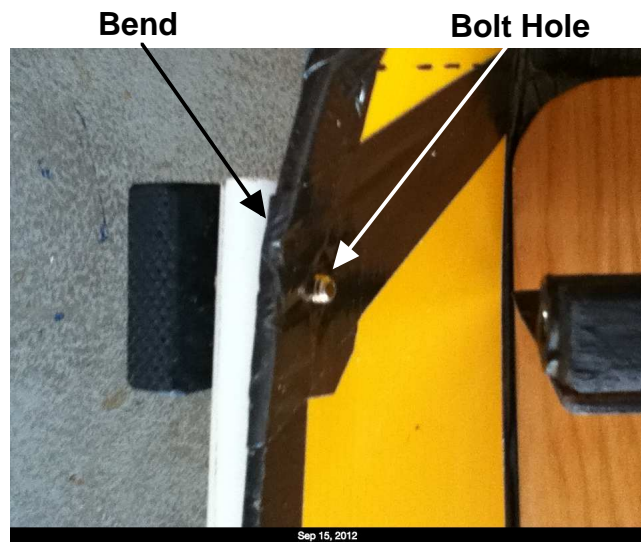
Make sure the holes are in line with each other.

See photos on next page.

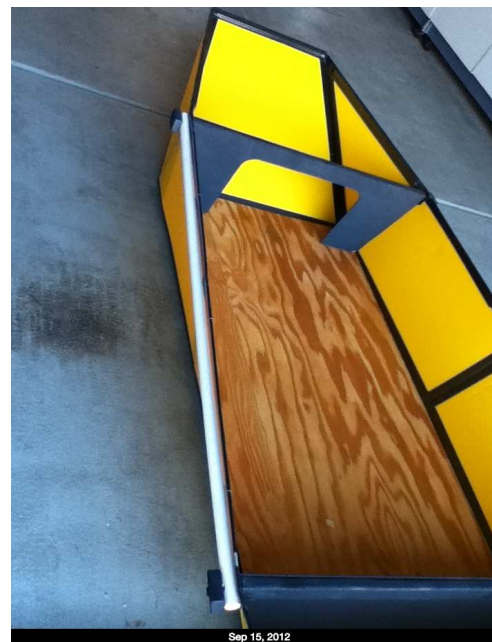


The purpose for the Edge Supports is to minimize side panel warpage, and to maximize hull longitudinal stiffness.

The location of the 2 holes in each Edge Support will dictate where you must drill holes in the Hull Side Panels, to secure the assembly. Unfold the hull and hold one Edge Support to one side, flush to the top edge of the side panel. Next, move it back and forth so that the 2 holes do not interfere with the bends in the side panels. Pencil mark the location of the holes on the side panels. Next, measure down from the panel edge, and place a pencil mark 1" below the top edge for each hole. Drill a 5/16" Dia. hole at each marked location, through the side panels. Finally, wrap a 4" length of Tape evenly over the edge, covering the just drilled hole, inside and outside. Puncture the tape with the utility knife to open the hole. Place the pointed end of a pencil in the hole to spread the tape, and allow bolt entry.



Bolt Hole Location



Edge Support & Side Support



Completed Support Assembly

STEP # 8 SIDE SUPPORT DETAIL

Once you get both Edge Supports located and assembled to the hull, you can determine the height of the Side Support Panels. For the Stern Panels, measure from the top of the Support Bar to the floor of the hull. Cut the Stern Supports to this dimension (approx. 10").

Do the same for the Bow Support Panels, but subtract 3/8" from the dimension (approx. 11") to clear the plywood floor.

Epoxy Glue and staple the Side Supports to their respective Support Bars. Position them so that the edge of the Support is in contact with the hull Side Panel. Allow to cure, and paint the assembly the color of choice.

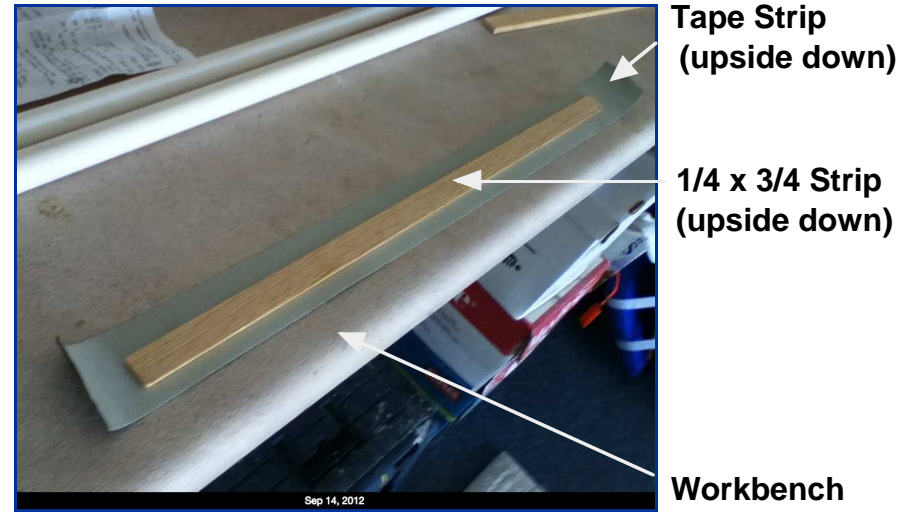
STEP # 9 ADDITIONAL PANEL SUPPORTS

The bow and stern panels are wide and flexible. To minimize possible accidental bending of these panels, a stiffener will be added, as shown below. Cut lengths of the 1/4 x 3/4 lumber so that they are 2 inches shorter than the edges where they are to be placed, which is : Bow and forward panel top sides, and the Stern top.

The Bow is first. I cut a piece of Tape the exact length of the top edge, and placed it upside down on the workbench. I then placed the stiffener upside down, centered on the tape (photo at right). Then carefully place this so that the stiffener is centered and flush to the top edge of the Bow panel. Smooth out the tape at the top first, followed by the lower part beneath the stiffener, photo below.

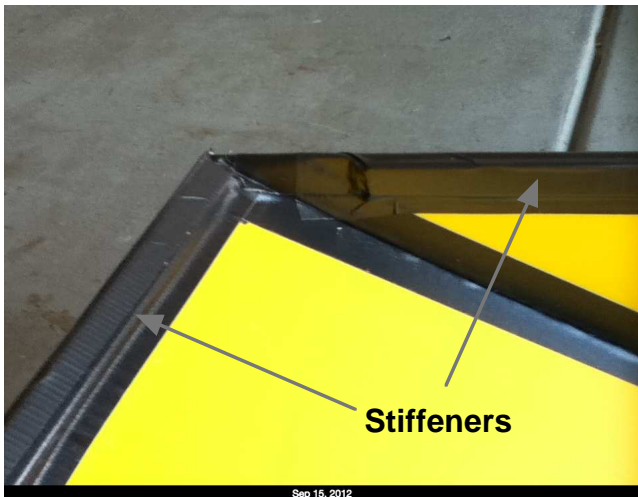
Do each forward side panel next, using the same process, photo below.

Finally, using the same process, apply a stiffener to the top edge of the Stern Panel.



Bow & Stern Edge Supports

BOW Area



At this time it is a good idea to check all the taped seams to insure good bonding.

A second layer of tape, especially on the outside and bottom is suggested, to provide better abrasion resistance. Your choice.

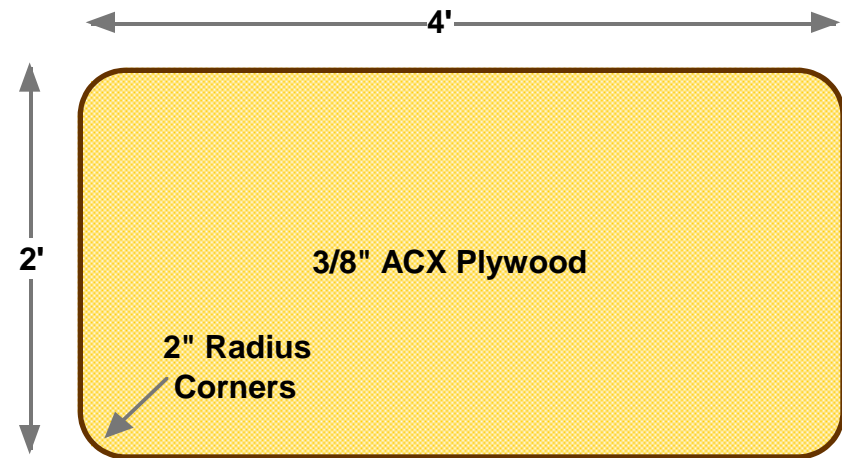
Hull Assembly



STEP # 10 3/8" PLYWOOD FLOOR

I bought a 2' x 4' sheet of ACX ply at my ACE store for \$10. All I had to do was radius the corners, and there was no scrap I had to deal with. I then applied a couple of coats of Marine Spar Varnish, to seal the wood. You can paint it with a good exterior paint if you wish.

The 3/8" plywood is necessary to support the load of the occupant, and to prevent the hull from twisting in the water.



When installing the floor, after the hull is assembled, move it all the way forward to the front bend line. This should provide enough area to rest your feet while paddling.

FINAL NOTES:

Frankly, I did not know what to expect when I first tried the boat at the lake. Was it going to be stable, and safe, always my first concern. Next, was it going to leak ? And, finally, was it going to be easy to paddle and be comfortable. Well, it is not the fastest boat to paddle, as the broad bow does push water, but it handles well, doesn't leak, and is comfortable. I like the fact that for not a lot of money, with the ability to transport it in just about any vehicle, and it's unsinkable nature, make it a very desirable boat. Also, it is all recyclable. Now, after a few outings, I am liking it more. It's easy to set up and get in the water. It literally sits on the water until you get in. And, if you do scrape the tape off an edge, it's easy to remove and replace. I recommend this boat to those who want to enjoy the boating experience for very little money, and are willing to adjust to it's non-rigid structure. It is safe, but a PFD is always required for your personal well being. Good luck with your project !

IF YOU ARE GOING TO LAUNCH THE BOAT FROM A ROCKY AREA, DO NOT GET IN UNTIL THE BOAT IS IN THE WATER, OTHERWISE A ROCK COULD PUNCTURE THE BOTTOM OF THE HULL. THIS IS THE ONLY REAL NEGATIVE ASPECT OF BUILDING A BOAT OUT OF THE COROPLAST MATERIAL.

HAPPY BOATING !

At the Lake Photos.



In the truck crew cab.



Outside ready to unfold



Unfolded and ready for the water



On the water, enjoying the ride.



Plenty of legroom.



Beached for a moment.



Complete with end covers, showing seat and Personal Flotation Device.