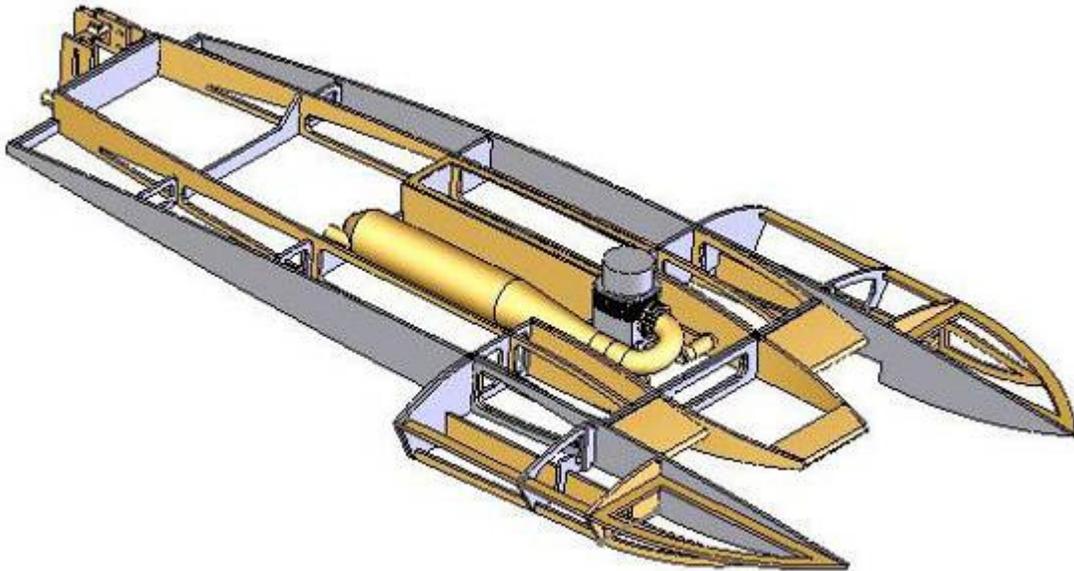


Blazer Marine, Whiplash Sport20

Thank you for choosing to build the Whiplash Sport20. We have been perfecting this design since 1993 and finally, we are making it available to the world. We are excited to release the kits to everyone so you can experience the pride that comes from building your own hydroplane. If you have questions during the building process, feel free to email me and I will get back with you in a timely manner. Take your time, do things to the best of your ability and you will have an outstanding Sport20!

Best Wishes!



Building Supplies:

- Scroll Saw
- Sander / Sand paper
- CA glue with accelerator
- Epoxy, I recommend MAS or West System slow set.
- Several Spring Clamps.
-

STEP #1: Look at the layout to get a good idea what the boat will look like before you glue anything together.

STEP #2: The first thing you need to do is decide how you are going to build your boat. You need to be able to keep everything square and flat.

From the transom to the sponsons, the boat is completely flat. I simply like to use a flat surface as my building jig. The sponsons will overhang the flat surface so that the bottom

of the boat rests flush. The bottom sheet will be a great reference to keep the boat symmetrical.

Step #3: Place a straight-edge on the running surface of frames 4 and 5. You will notice that one side is flat, while the other side has a slight angle. The side with the angle is the left side (as if you are sitting in the boat). Mark it accordingly (LH).

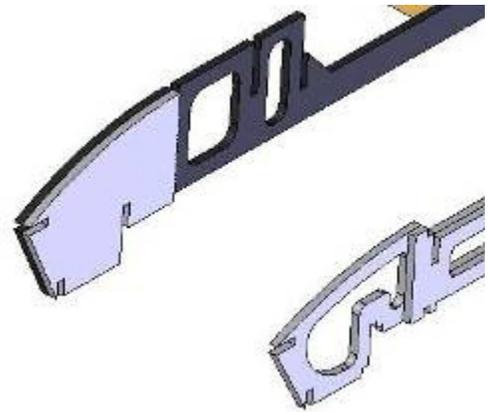


Step #4: Three frames; #1, #4 and #5 have doublers which are glued in place using CA.

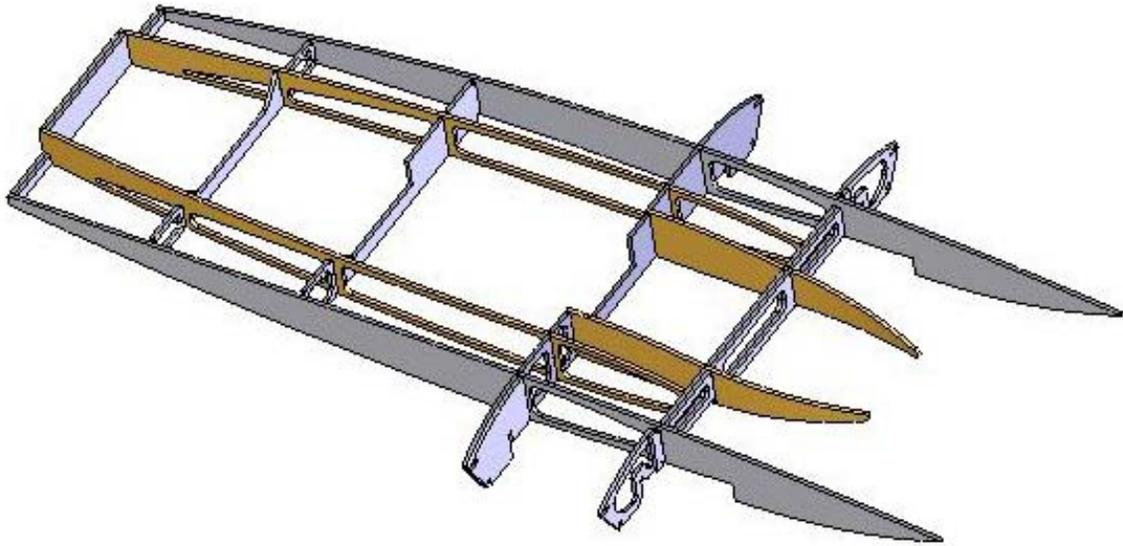
Frame #1: These pieces are exactly the same.

Frame #4 has a smaller doubler. The doubler gets glued to the RH side, toward the front of the boat.

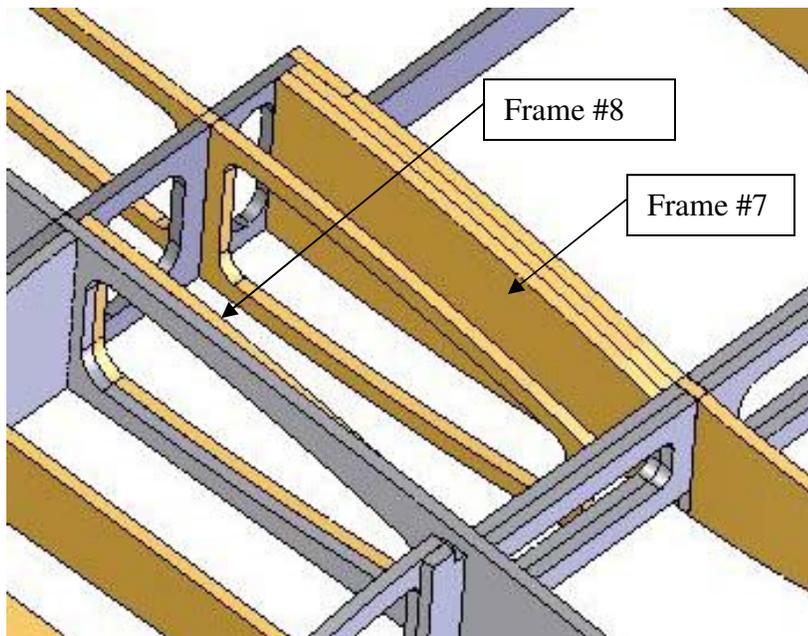
Frame #5 has a doubler that has the exact same profile as the main frame except it doesn't have sponsons. Glue the doubler toward the front of the boat.



Step #5: Find the center of the jig / flat surface and scribe a line at that location. Find the center of the transom (frame #1) and scribe a perpendicular line at that location. Test-fit frames #1, 2, 3, 4, 5, 6, inside sponson, and the former frame, making sure the "LH" frames are on the left side. All of the frames must rest flush on the jig. If a frame doesn't rest perfectly, make adjustments to the frame slots until you are happy with the fit. Determine where the boat sits best on the jig / flat surface, match up the lines you just drew, and draw a line at the transom (frame #1). You will use this line as a reference guide during the building process. With the frames resting flush on the jig / flat surface, measure the distance from each sponson tip to your table. Be sure these dimensions are the same. Once you are sure the boat is square and true, start to tack the frames together using thick CA. Just apply a couple of drops at each joint. Do not glue the entire joint with CA. (we will come back later and use epoxy on all of the joints). You may want to put wax paper on the jig so the frames don't stick to the jig.

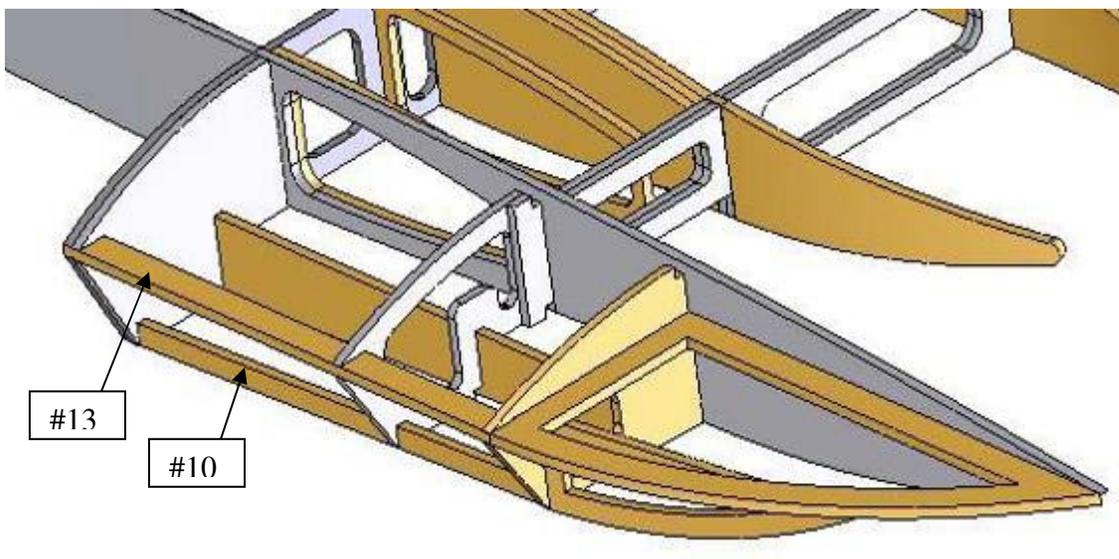
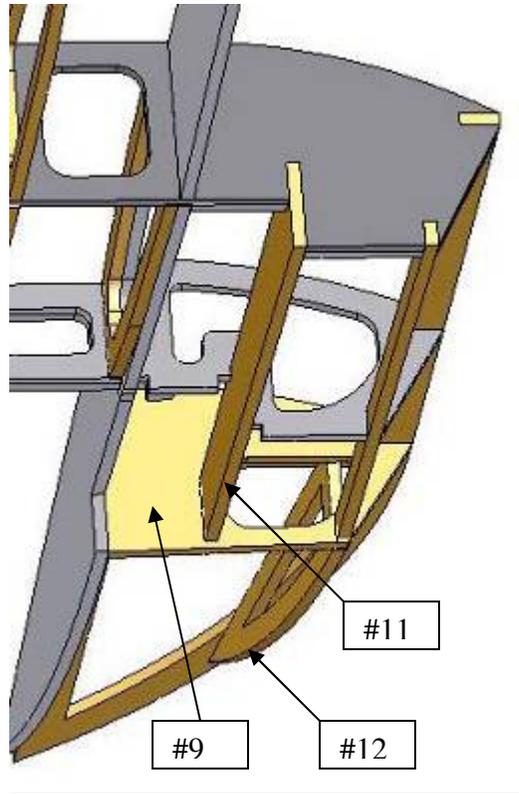


Step #6: Glue the deck frames, #7 and #8 in place. These frames form the contour of the deck and the bottom sheet.

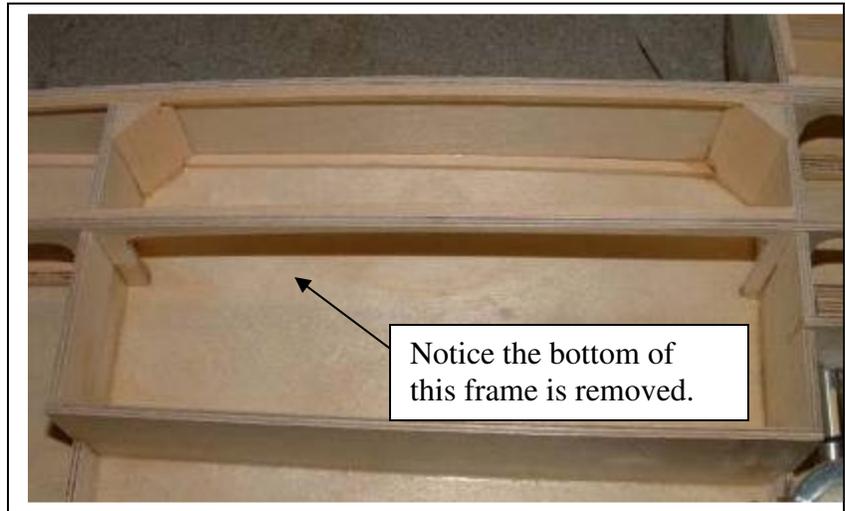


Step #7: Install the framework for the sponsons.

Start with the front recovery pad, frame #9. Make sure this frame is perpendicular to the mating surface (inside sponson). Next, glue frame #13 in place, then the inside sponson, frame #11. When gluing frame #11, make sure this piece is perfectly straight when it butts up to frame #9. Frame #9 should be about 1/16" deeper than frame #11. Glue the outside sponson strip, frame #10 in place, making sure it is parallel with frame #11 in both the length and width. The final frame is frame #12. Align this frame to the outside point of frame #9, then pull the tip until it matches up with the outside of frame #13. This frame should have a slight bow outwards. Place a piece of spruce between the inside sponson and the frame to make the bow.



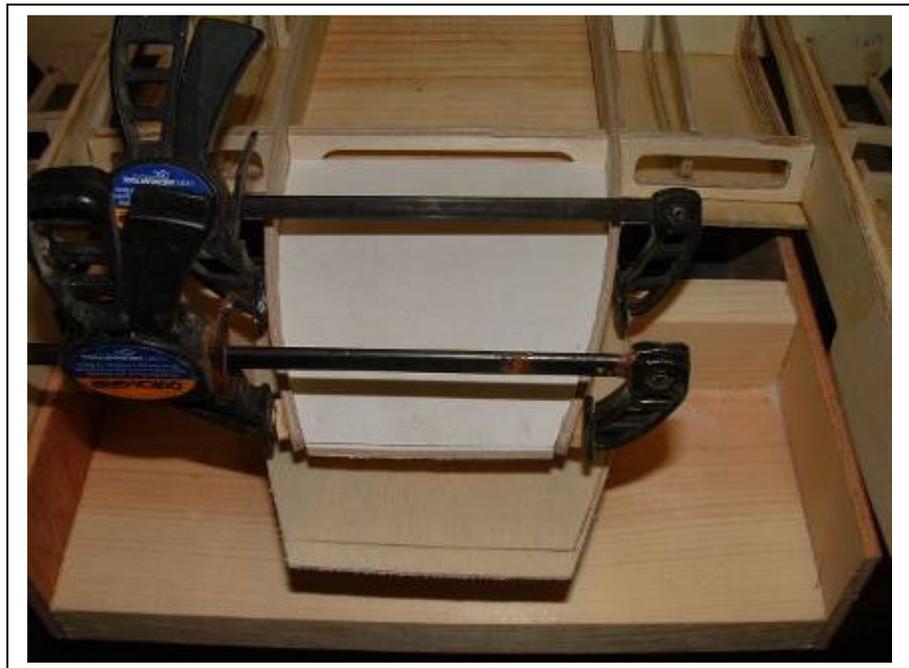
Step #8: The two inside former frames must be modified so the servos and fuel tank can lay flat on the bottom sheet. Locate the third cutout from the transom and remove the part that would get glued to the bottom sheet. Use thick CA to glue frame #14 in place, and put two 1/2"x1/2" triangles in the corners of the radio box for extra support.



Congratulations, you are now done with the framework! Now the sheeting....

Step #9: In order to get a maximum gluing surface without adding too much weight, add 1/8"x1/8" basswood (or spruce) sticks to all of the places where skin will be added. This essentially doubles the gluing surface. Once the spruce is in place, sand the pieces flush with the birch frames. I like to use small clamps to secure the basswood, and then put a few drops of thin CA on each piece. Thin CA soaks into the wood much better than thick CA.

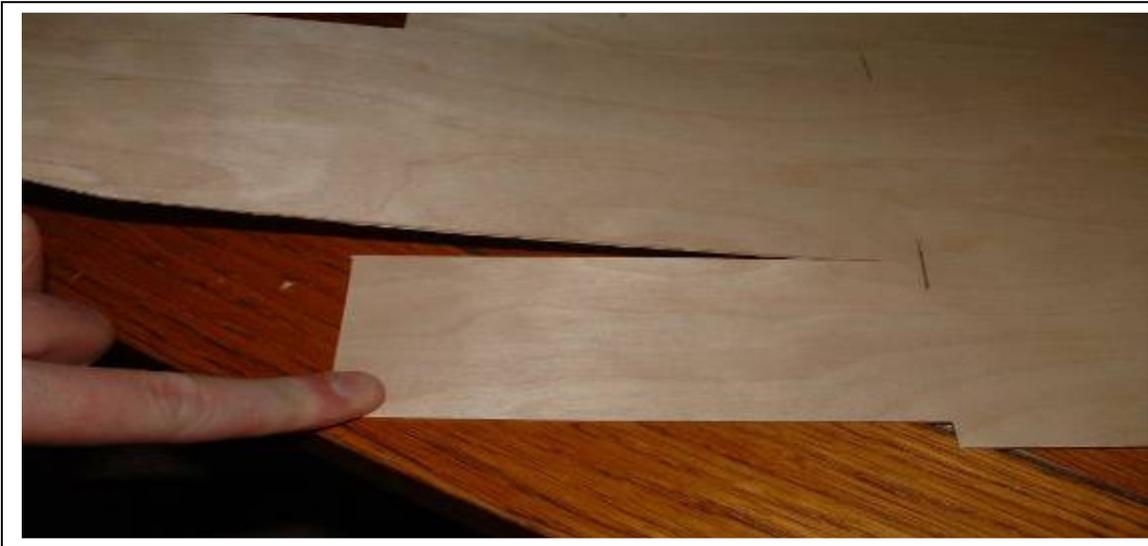
Step #10: The nose of the boat tapers in for aesthetic reasons. The kit contains a piece of 1/16" plywood for you to tack in place to give the nose the proper shape. This will ensure that the nose tapers in at the same angle. Remove the template after the bottom is glued in place.



Step #11: Gluing the bottom of the boat in place is a very critical step. Take the bottom piece and place it on the frames. You will notice the piece is bigger than the frames. This was purposely done so you can sand the edge perfectly with the outside frames. Locate frame #4 and scribe a line on the bottom sheet. Remove the bottom sheet from the frames and lay a straight edge along the front nose (4-1/4" wide).



Use a razor blade and carefully cut a slit all the way to the line you scribed from frame #4. Be sure both cuts are perfectly parallel with the straight nose section.



Step #12: Sand an angle onto frame #5 so that it matches the slope of the bottom sheeting. Pay careful attention that the front of the frame is parallel with the top side of the frame. Leave the top of the frame alone (we will sand this when we are ready to put the deck on).



Step #13: I like to use my table saw as my flat surface for gluing the bottom sheeting on, as well as the top sheeting. Simply put some wax paper on the flat surface and put the boat over the wax paper, hanging the sponsons over the edge of the flat surface. This will ensure everything from the transom to frame #4 is perfectly flat. If you don't have a flat surface you can use, continue to use the jig. Using a flat surface as a jig from here on out is MUCH easier than using the assembled jig, especially when you start gluing the deck as you will see later on.



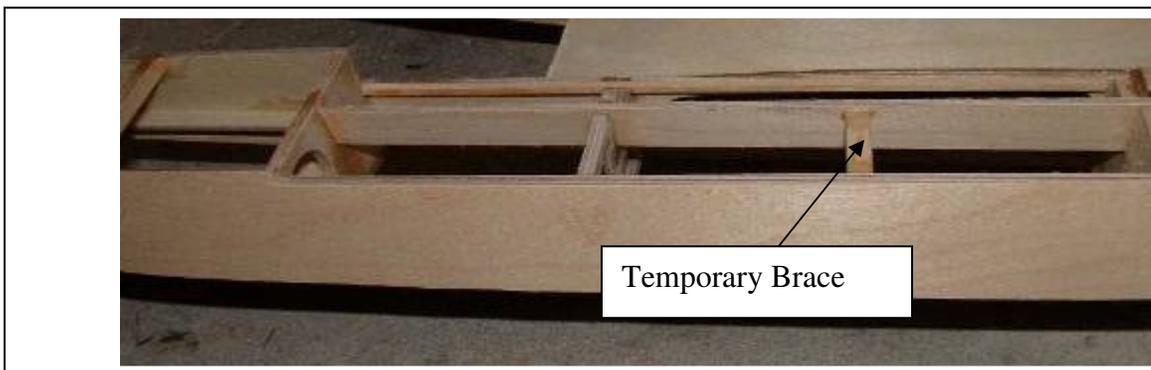
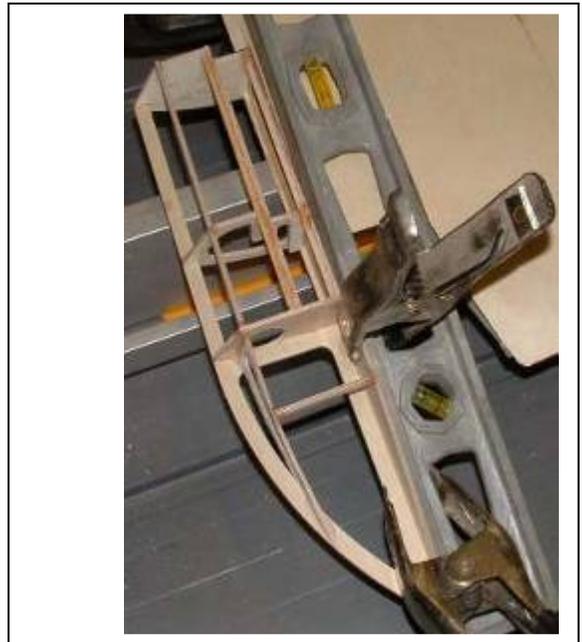
Step #14: As I stated in step #11, gluing the bottom sheeting on is a very critical step. Place some wax paper on your jig (either a flat surface or fabricated jig), lay the bottom sheet on the wax paper and then place the framework over the bottom sheet. As you can see, the bottom sheet fits perfectly inside the front sponsons and then extends out after the #4 frame. Look at the boat from the top and make sure the framework is symmetrical on the bottom sheet. Make sure the front of the bottom sheet will rest flush on frame #5 when the bottom sheet is pulled up to meet the frame. Look at the inside frames #7 and #8 to make sure the bottom sheet is resting flush. Once you are satisfied with the fit, use four (4) spring clamps to secure the bottom sheet to frame #5. Make certain all frames are symmetric with the bottom sheet and start gluing, beginning with frame #1 and work your way forward using thin CA. Thin CA is great for this step because it doesn't leave a fillet of glue in the joint. This is important because later we will come back and use West System or MAS Epoxy to seal the boat and to strengthen all joints.

Step #15: After the bottom is glued in place, the nose of the boat needs to have a hardwood block glued in place. The kit has the block included, but it requires sanding so it will fit perfectly with your boat. Use 5 minute epoxy to glue in place.



Step #16: The sponson skins need to be glued on in sequence:

The first piece of skin to put on is the outermost piece. Before you sand anything, clamp a straight block to the inside of the sponson. You want to make the sponson as rigid as you can. It is very important the sponson is straight as an arrow when you are gluing the sponson sheeting on. Glue temporary bracing on frame #10 and frame #8 so the frames don't flex when you are sanding. With the straight block clamped in place, sand the side of the sponson so that the skin will lay flat on all of the edges. While you are sanding the outside edge, it is important to maintain parallelism between the inside sponson pad edge and the outside edge. The sponson pad will be glued on after the first piece is glued in place. I like to staple a piece of 80grit sand paper to an oak block for sanding sponsons.

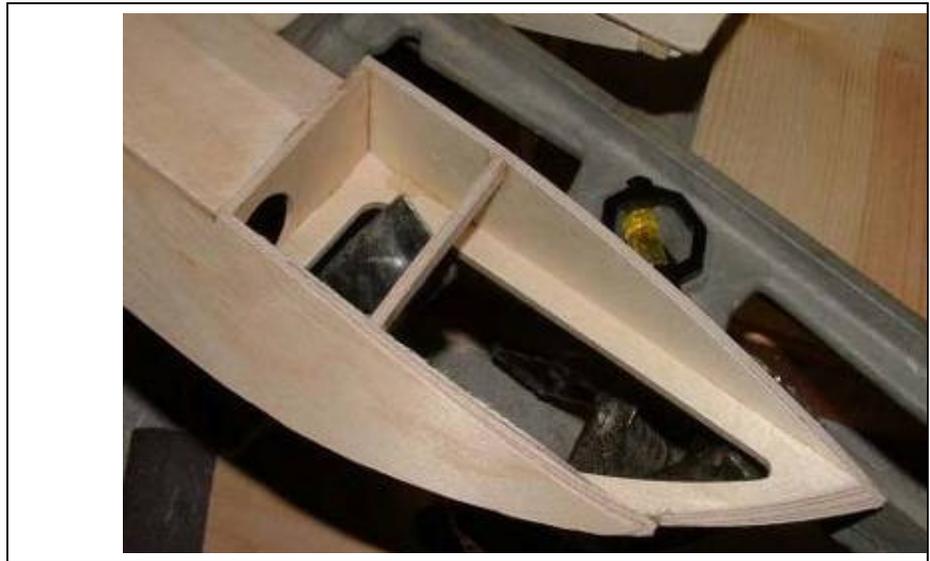


The second piece of skin to put on is the sponson pad. It is very important both frames are parallel and straight. I also like to check the depth of both sponsons by placing a straight edge from sponson to sponson. I then measure from the top of the straight edge to the bottom sheet. The closer these numbers are, the better you will be. Also, while sanding, make sure you don't change the angle of the sponsons. The inside sponson should be flat, and the outside sponson should have a slight dihedral angle. Once you are sure everything is perfect, use CA to glue in place, then sand flush. DO NOT round any edges on the sponsons. You want the edges to be as sharp as possible.



The third piece of skin to put on is the inside air release sheet. No magic to this piece, just sand the area to fit and glue in place. When finished the top of this sheet and the top of the bottom sheet should be on the same plane.

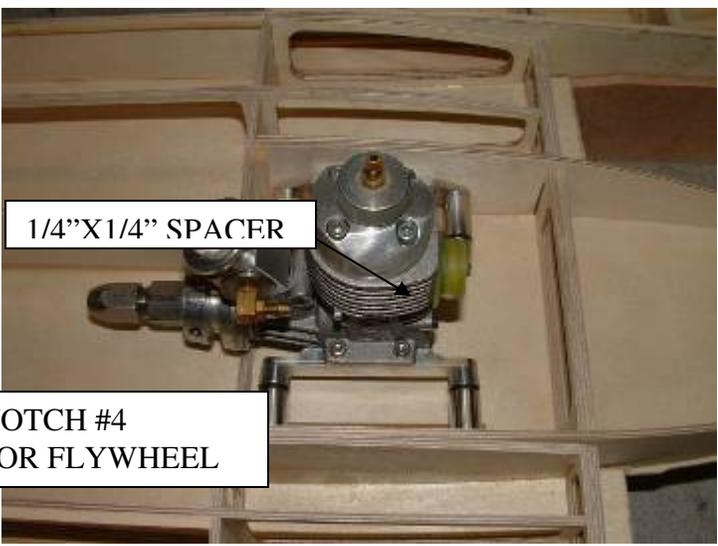
The fourth and final piece of skin to put on is the recovery pad. This piece is a little tricky because you have to bend it to the tip of the sponson. First, sand the frames until you are happy with the fit. You will need to sand a larger chamfer on the front, so when the recovery pad is



glued, it flows nicely from the side sheet (step 1). The best way to do this is to clamp the sheet to frame #9, pull the sheet down and check the fit. Do this until you are happy with the fit. Once you are satisfied, use clamps to secure the piece in place. Use thick CA for this step. Don't be afraid to put a lot of CA on this joint. After the CA dries, it is a good idea to place the boat on its tips, pour some epoxy in the recovery pad so that it dries in the tips. Make sure the back edge of the recovery pad is as sharp as you can get it.

Congratulations, the bottom is now finished!!!

Step #17: Now that the bottom is complete, it is time to mount the engine in place. I highly recommend using the Speedmaster Mini Mount, part # UMM. You want to mount the engine as low in the boat as you can and still be able to slide the starter cable under the flywheel. Before you do anything, you will need to use a Dremel and notch the center of frame #4 so the flywheel will not interfere. Make sure the groove of the flywheel is towards the rear of the frame so you can get your starter cable on. With the Speedmaster UMM mount, cut two pieces of scrap wood to 5/16"x5/16"x3". Place a piece of 1/4" scrap towards the front of frame #4 and place the 5/16"x5/16"x3" pieces under the mount. So the mount should be 1/4" in front of frame #4, and 5/16" above the bottom of the boat. This will mount the engine almost flat so an "S" bend in the shaft can be used. If you don't like using the "S" bend, you can



NOTCH #4
FOR FLYWHEEL



mount the engine anyway you want, just make sure the engine/carburetor clears the cowl. With the mounts clamped in place, drill your holes using a 90 degree Dremel attachment. Once the four holes are drilled, you will have to make the hole bigger so you can install blind nuts on the back side of the engine frames.

Step #18: The turnfin should be mounted vertically as far to the outside you can get it. Place a straight edge from sponson to sponson. From the straight edge, use a framing square to draw a perpendicular line on the outside edge of frame #4. Clamp your angle to this line and drill your holes. Use blind nuts the same way you did in the previous step.



Step #19: Aesthetically, the most important part of the boat is the deck. The most efficient way to put the deck on is to seal the inside of the boat with epoxy the same time you put the deck on. Before you do anything, you must plan out how you are going to hold the deck down while the epoxy dries. I like to use masking tape, spring clamps, weights and “C” clamps.

Cut some pink insulation foam into small pieces (1”x1”x2”) to use as floatation. Cut enough to fill the sponsons. Once you have enough, set the foam aside.

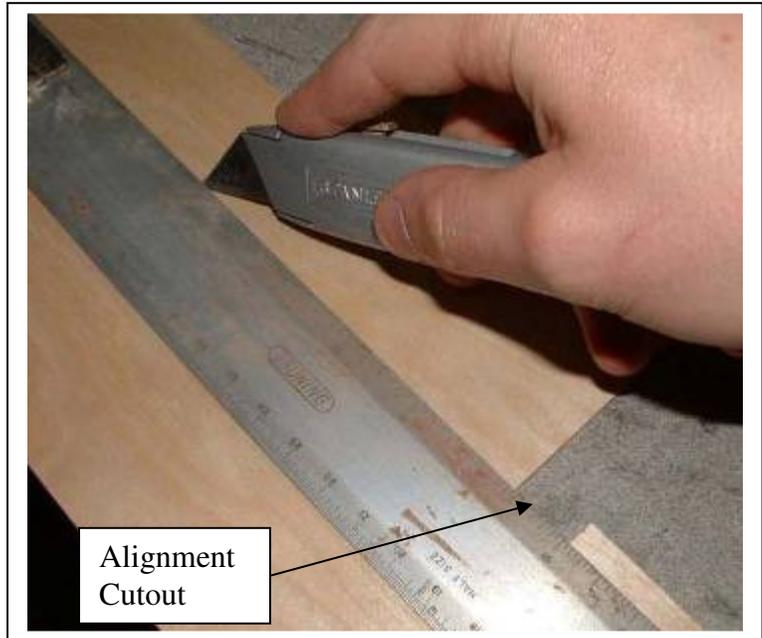
Place the deck on the frames and draw a line where frame #4 is. The deck has a notch where the sponson starts. Place a straight edge on this cutout and use a knife to cut the deck to the line you just drew.

Apply a heavy coat of slow setting epoxy (West System or MAS) to the inside decks (the side that gets glued to the frames) as well as the inside of the boat.

Place your foam blocks in the sponsons.

Place the decks on the frames and hope that you had a good plan. I like to start out placing spring clamps where the deck meets

frame #5, then secure the deck on frame #1. I use masking tape to secure the rear of the decks, as well as the sponsons. Once the deck is securely on the frames, double and triple check that you have all areas of the deck on the frames. You will have plenty of time to work with slow setting epoxy, so take your time and make sure everything is perfect.



Step #20: Once the glue dries (wait at least 24 hours), you can trim the deck to fit.

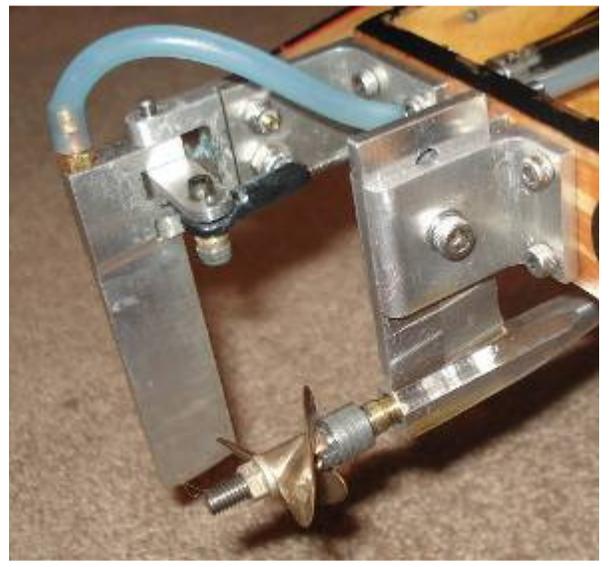
Congratulations, the hull is now complete!!!

Step #21: The radio box has enough room for three servos. Use a high torque for the steering, and either a standard servo for throttle, or two mini servos for throttle and 3rd channel.



Step #22: Mount the strut (Speedmaster VM1F) on the center of the transom, or thru the bottom (depending on what is legal in your organization). Mount the rudder (Speedmaster Mini Hydro) to the left of the strut.

- Cut 3/4" off the bottom of the rudder.
- Set the strut to 2 degrees negative and 1" from the bottom of the boat.



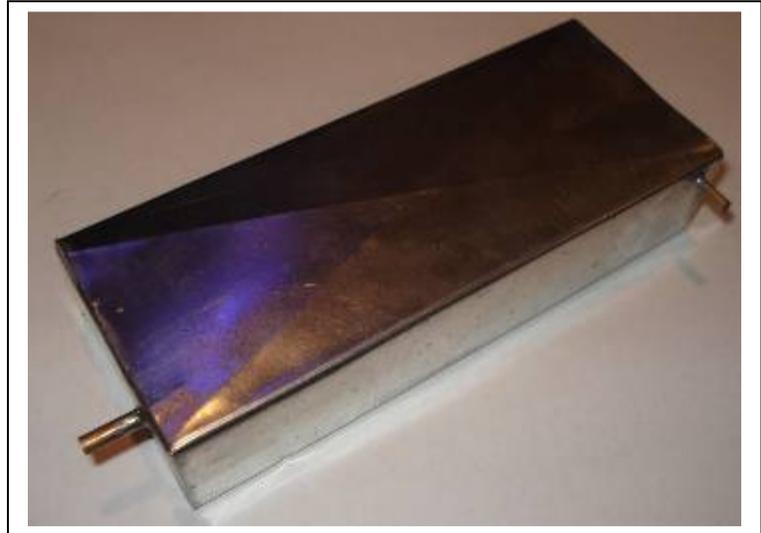
Step #23: The stuffing box should go thru the boat directly in back of frame #3. A piece of 5/16" dia brass tube should be fiber glassed in the boat, and then the stuffing box (1/4" dia. brass tube) goes thru the 5/16" tube. This enables you to replace the stuffing box without cutting it out of the boat. The stuffing box should be straight for about 2" before the culet, then gets bent down thru the hull, then bent back up thru the strut.



Step #24: The fuel tank must be fabricated, or purchased from Walt Barney at tanks2u (239-949-7137, 256-779-6472, kwb@power.net.org). The 8oz main tank sits under the deck, opposite the radio box. The tank measures 6"lg, 2-3/8"wide, and 1-1/4" tall. Use 5/32dia tubing for the pickup, and 1/8"dia tubing for the pressure. The pressure line is located on the top of the tank at the rear. The pickup line should be located on the bottom left side of the tank and exiting on the top left side of the tank. I do not put a sump in the tank so I use an additional 1oz tank in the nose of the boat which remains full during a normal run.



If you choose to run a 3rd channel (I use Bob Violet needles) set it up as shown in the picture. Use medium a fuel line for the pressure, large fuel lines to the 1oz tank, large fuel line to the needle, and medium line to the carburetor.



Step #25: Miscellaneous setup tips:

Heat racing props:

- Octura M440
- ABC 40x53
- ABC 1516/2
- Prather 215
- Prather 220

SAW Prop:

- ABC H4 (a little pitch taken out)
- Octura 1445 (a little pitch taken out)

Turnfin

- Set the fin so the bottom of the blade is parallel with the bottom of the boat. If you push the fin forward, the boat will loosen up. If you pull the fin back, the boat will tighten up.

Water Pickup

- Flow the water line at 40"hg to 5" of water.

Pipe

- OPS 3280 nitro pipe with muffler set at 8-1/4" from the glow plug to the cone.

Center of Balance

- Roughly 14-1/4" from the transom, less fuel.

Turn Fin

- Mount the fin as close to the end of the sponson as you can.

If you have any questions, please give me a call, or visit our webpage.

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