

The Slow Stick Flying Boat modification courtesy of JimSP of RC Groups fame.



The SS Flying Boat is easy and inexpensive to build and looks great. This coupled with how nicely the SS Flying Boat flies off water make it something you SS owners really ought to try. I'll try to make it clear how to build the SS boat but as I go through this building post please feel to ask questions as others may have the same question.

Sturdyboard

My SS Flying Boat was build primarily from Sturdyboard foam which is essentially 3/16" Depron. You can make the boat from a single sheet of 20" X 30" Sturdyboard which will cost you \$1.97 at WalMart. Occasionally you can find it on sale for even less. The only problem with it is removing the paper covering. Everyone has their favorite method for removing it..

Mine is as follows;

With a sanding block I round the corners to prevent it from tearing the plastic bag I'm going to put it in. I take it outside and soak it down with the hose, put the sheets in a lawn and leaf bag, add some water, seal the bag and lay it on a flat surface (I use our picnic table) to soak for several days.

After soaking I let the sheets dry and then peel off the paper. This is less messy than doing it wet and it generally comes off in large pieces down to the bare foam. For the stuff I can't peel off I use the garden hose with the nozzle set on the fan setting to spray off the rest of the paper.

Plans

You can find the plans [here](#). They are in a TIFF format and any graphics program should be able to print them out. For the longer parts just print them out with overlapping tiled pages and tape them together. I added the vertical lines to help with alignment. The size should be right but I added a scale on each page so you can double check and adjust if needed.

Cutting the Parts

To attach the patterns for cutting lightly spray the back of the pattern with a spray adhesive. I used Duro all-purpose spray adhesive but other spray adhesives should also work. Let the adhesive dry for a minute or so and then smooth the plans onto the Sturdyboard foam. The adhesive will hold the pattern on for cutting but will come off cleanly and easily after cutting. Use a straight edge and X-acto knife for cutting. You will find that the foam is very easy to cut. For a straight edge I use a steel ruler with a cork backing that prevents the ruler from slipping.

Glues

There are all sorts of glues that you can use for building with Studyboard foam. You can search the Foamies group for the merits of each type. Among them are epoxy, polyurethane, hot glue, perfect glue #1, foam safe CA, Titebond II, and Weldbond. Because exposure time is brief glue rated as weather resistant should be sufficient. For laminating parts I used either epoxy, foam safe CA or Perfect glue #1. For most the joints I used Weldbond or Perfect glue #1. Both dry clear and flexible. I avoid the harder glues as much as possible as it is difficult to sand the hard glue with the very soft foam.

Making the Hull

Cut out the top, sides and bulkheads for the hull. You can remove the plans from the all the parts except for the top. To position the bulkheads you need to glue $\frac{1}{4}$ " wide strips of foam ahead of them. Starting from the front lift the plan from the top until you get just past F2. Put a scrap piece of foam under the plan and cut it in front of F2. Put the plan back down on the foam and use it to position and glue a $\frac{1}{4}$ " wide strip of foam slightly narrower than the top of F2. Do this for the remaining bulkheads. Glue F4 and F5 together. Starting with F1 glue the bulkheads to the top making sure they are square to the top. Any of the glues will work but I like using Perfect glue #1 for this because grips the parts very well. After the glue is cured you can glue on the sides. I used Weldbond for this because it's cheap and has a long working time. Starting at the step align the side with F4,F5 and pin it in place rechecking that the bulkhead are square. Repeat this with the other bulkheads using lots of pins to keep things in place. Repeat with the other side.

Let things dry overnight and then using a sanding block flatten the bottom edges of the sides so that when you glue on the bottom pieces they will make good contact with the sides. Don't glue on the bottom pieces yet.



Floats

You need the floats to help determine where to put the spreader bars through the fuselage so it is helpful to make the floats now. Design of the floats was based on the following;

1. With my heaviest battery pack that I plan to use mounted on the SS I wanted to be able to push the wing tip to the surface of the water and have it tip back up and not rest with the wing tip on the water. My first floats were too small and it took a few testing iterations to get it right.
2. Because the SS has no ailerons to keep the wings level I used slanted floats to help keep them level.
3. I mounted the floats so the rear bottoms of the floats were in line with the top of the step. I reasoned that when the boat was at rest the floats would be in the water. When it comes up on the step they will be out of the water. I can't tell if this actually happens but the boat does work well.

The final floats came out to be 2" wide so I just cut them out of ordinary 2" thick white Styrofoam. This is the insulation stuff or the foam people often use for packing for shipping. The blue and pink foam although slightly heavier should also work fine.

To make the floats cut out the float pattern and trace around it on a small block of foam. Using a scroll saw or small band saw cut out the float. I drilled the holes for the spreader bars just short of going all the way through the float. I show the approximate location of the holes but wait until the spreader bars are mounted in the hull to locate these holes.

Spreader Bars

I ended up with the spreader bars being 18" long. I used .157" dia graphite tubes. The .157" or .125" graphite rods would probably work as well. If you don't have any graphite available a 3/16" dowel should work.

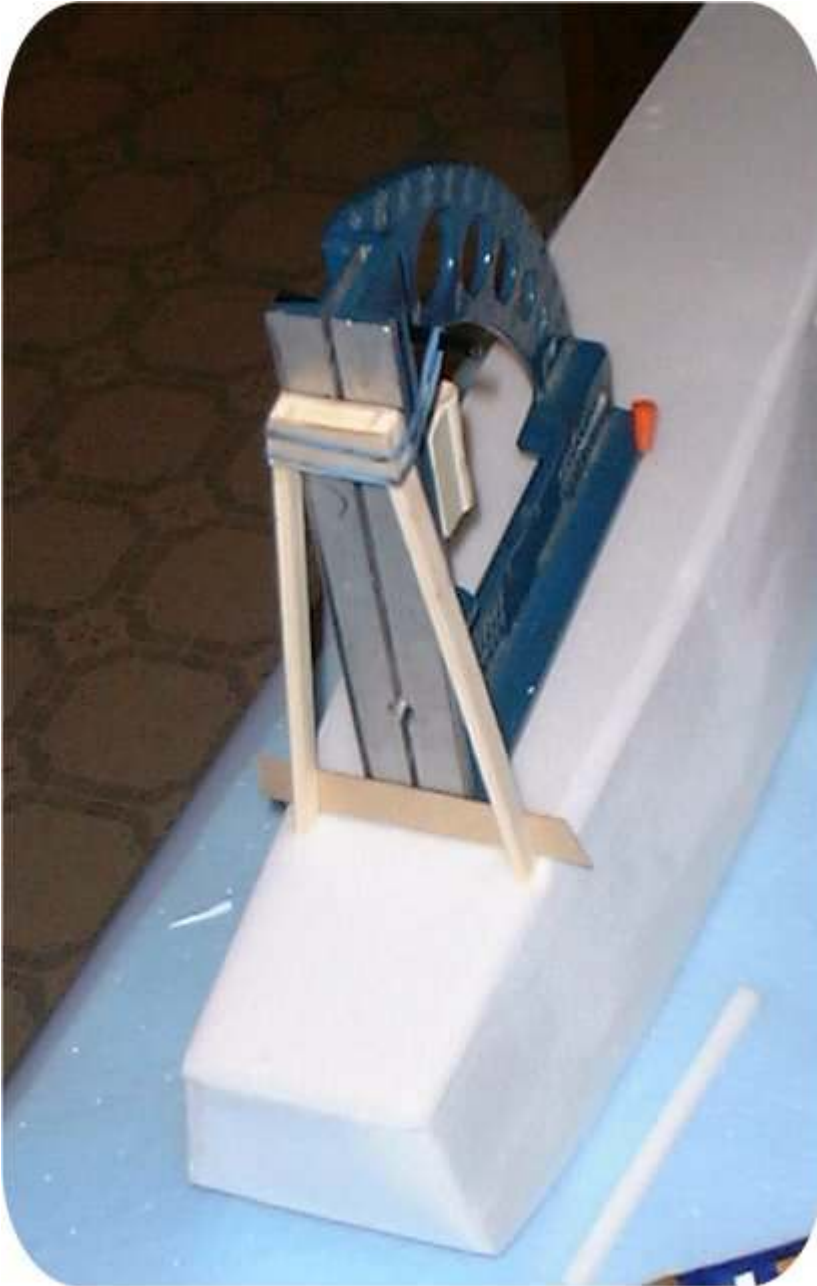
Mounting The Spreader Bars.

Because I knew it was likely that I would be changing the floats and spreader bar length I mounted the bars using tubes in the hull. Also this made covering the hull easier. These tubes were old push rod tubes which turned out to be a perfect fit for the .157" graphite tubes. Since you know the float size and spreader bar length should be right you could mount the spreader bars directly to the hull. My forward bar was mounted just ahead of F3 and about 1 1/8" down from the top. The rear bar was about a .1" ahead of F4 and about 1 7/8" down from the top. Because it wasn't touching the bulkhead I glued a strip of foam between it and the bulkhead.

Struts

Build the struts over the plans using epoxy for glue. Remove them and add the 1/32" ply caps. I mounted the struts in back of F2 and in front of F7. After doing some flying I think it would be better if the forward strut was about an inch back. This would give you more flexibility in positioning the boat relative to the fuselage. Rather than adding another bulkhead I would laminate some foam strips and glue them to the sides to give a place to attach the struts. Cut holes in the top so you can insert the struts and epoxy them in place. The tops of the struts should be about 5 1/4" from the top of the hull. This will give you clearance for an 11" prop. To make sure the strut was square, centered and at the right height I used a square as shown in the photo to hold the strut in place while the epoxy cured. After the initial epoxy setup I added some more epoxy to somewhat fill the gap between the struts and hull sides.





Bottom and Nose

Now you can glue on the bottom. I didn't include the bottom parts in the plan because it is easy using the hull to mark out slightly over size foam pieces for the bottom. Once dry sand the hull to even things up. The only corner I rounded was between the top and sides. To protect the step I glued a piece of 1/32" ply to the back of the step. I also smeared epoxy over it to protect it from the water.

The nose is cut from a piece of Styrofoam. Trace the front and side patterns of a block of Styrofoam. Cut the trapezoid shape and then hold the parts together and cut the side profile. Glue the nose to the hull and sand it to conform to the shape of the hull.

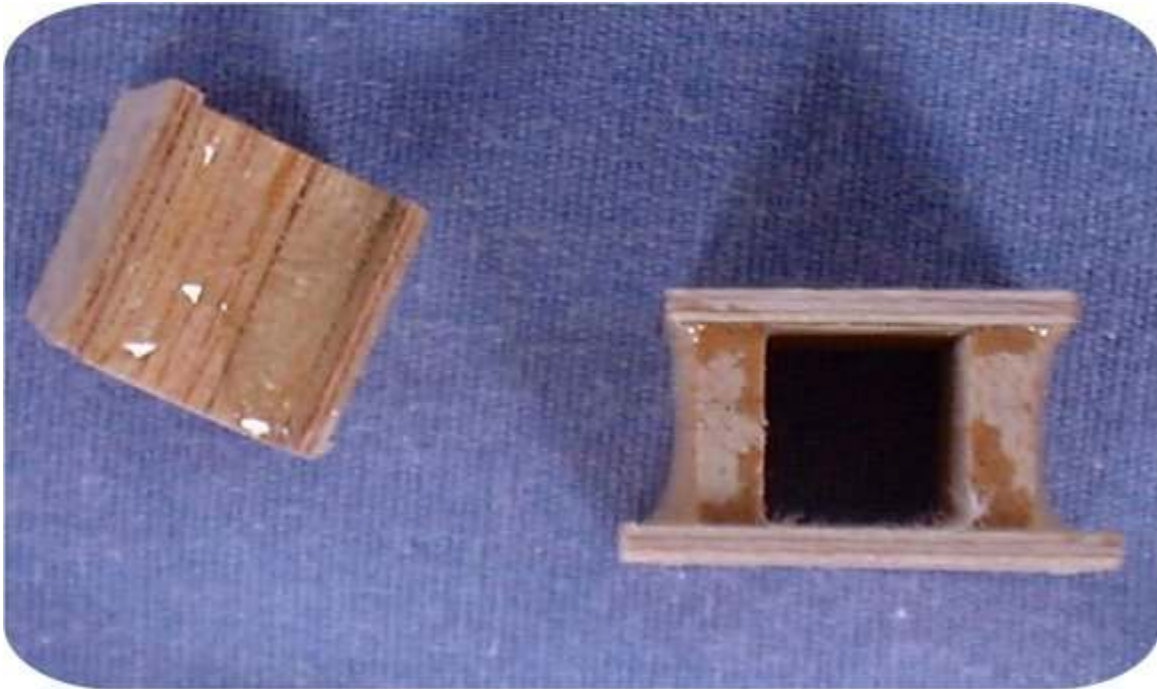
Mounts

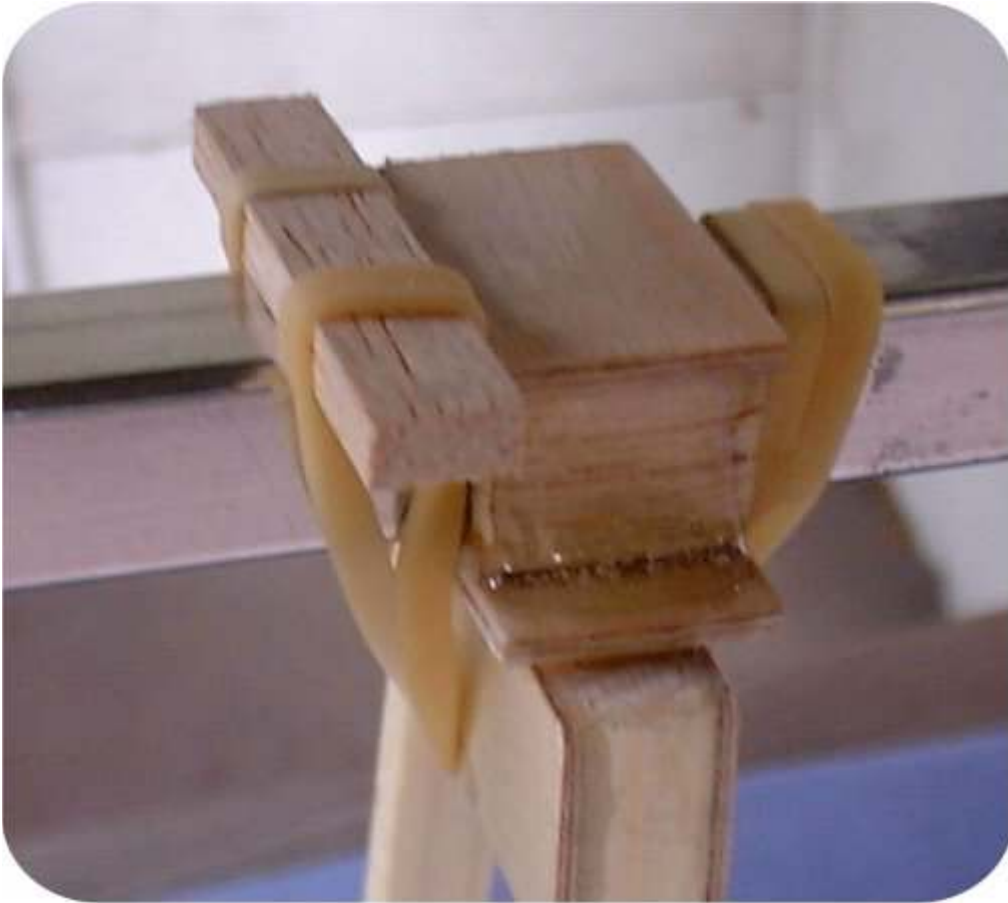
The mounts for attaching the hull to the fuselage are made from 1/16" ply and .394"(10mm) x

1/8" spruce. To make the 10mm size I used thin CA to join 2 pieces of 1/4" x 1/8" spruce to form a 1/2" wide piece and then cut and sanded it to .394". The mount is formed around the SS fuselage protected with wax paper. Using thin CA glue 2 1/2" long spruce pieces to the 3/4" long piece of ply then turn it over and glue on the 1" long piece of ply. Remove the mount and put epoxy on both sides to strengthen the mount.

Gluing the Mounts to the struts.

Slide a mount unto the fuselage, followed by the wing supports and the other mount. Set the hull on a flat surface, put the wings on the SS, and set the SS on the struts. Make sure it is centered over the hull and that the wing is level with the hull. Use epoxy to glue the mounts to the struts. The photo shows how I held the mount in place while the epoxy cured.





Finishing and Covering

Fill any cracks, holes and mismatches with lightweight spackling and sand smooth. Paint or coat the struts to protect them from water.

The only thing that absolutely must be covered is the bottom of the hull. You can use packaging tape, colored wing covering tape, low temperature iron on coverings or 3/4oz fiberglass applied with Minwax Polycrylic. I used red tape for the bottom of the hull and covered the rest of the hull and floats with Black Econokote. You must keep the temperature low to prevent melting or expanding the foam. Because you are covering basically flat shapes you don't need to use high temperatures for shrinking. Once everything was covered I glued the floats onto the spreader bars.

I couldn't resist adding the graphics although the \$10 I spent for them represented about half the cost of the project.(Of course I have lots of stripes, letters and numbers left over for other projects)

Cockpit

This is cut from foam and glued to a piece 1/16" balsa. After painting I just glued it to the covered hull. Pilot is a profile glued to foam. I'm looking for a better pilot but this one will have to do for now.

Attaching

To attach the hull just slide it onto the fuselage and secure it with a screw through the top of the

mounts.

The hull didn't change by CG but make sure to check yours. Waterproof your receiver and ESC and **GO FLYING!**

Flying The SS Flying Boat

I got several more flights in with the SS Flying Boat and it truly is a great flying boat! You SS owners owe it to yourself to give it a try. It's simple to build, very inexpensive and you don't need to modify your SS.

I found that at about half throttle it comes up on the step with the floats out of the water and it shoots across the water like a speedboat. Just give it a bump on the elevator to become airborne. I really like this feature which gives you good control of where and at what speed you become airborne. I think it is the position of the motor that keeps the nose down slightly that allows the SS to move quickly across the water without taking off prematurely.

In the air the only trim adjustment I had to make was a little up to compensate for the drag of the boat. It seems to tolerate about any landing style including power off landings that sort of just plop in to hot get it down fast landings that skip a few times to a stop. Most fun are the level landings with a little power trying to land with little or no splash or short touch and goes with the boat staying on the step. Also as long as it's not too windy you really don't need a water rudder as you can do fairly tight turns. I was doing donuts that I think were less than 10' in diameter that created a cool spiral ripple pattern in the water.

Because of the floats it is very unlikely for you to tip the SS flying boat over sideways. I did however demonstrate how to tip the boat over in the forward direction. Flying in 5-10mph winds that were changing in direction (not good float flying conditions) I tipped it over forward when starting to taxi with the wind. The tendency of the motor to push the nose down and coupled with the wind hitting from behind tipped it over. My suggestion is that when starting to taxi downwind make sure to hold on the elevator. Fortunately when it tips over it turns turtle and the only electrical equipment in the water is the motor. I just run it a little to dry it out and fly again.