

# CC Edge 540



**Design and Plans courtesy of Chris**

For more, visit Chris' web site [here](#).

### Material List

1/4" Square Poplar Dowels

Lowe's

1/4x3" Poplar sheet  
Home Depot or Lowe's

2 mil Coroplast:  
2) 10x37 (Fuse sides)

1) 48x30 (wing panel)

4 mil coroplast

1) 9x24 (Ailerons)

1) 9x20 (Hor. Stab)

1) 11x10 (Rudder)

[www.harborsales.net](http://www.harborsales.net)

Regal Plastics - 1-800-444-1420

[Elmers Probond Polyurethane](#)

Home Depot, Lowe's, or Wal Mart

[Goop \(marine or shoo goo\)](#) or [Welder adhesive](#)

Home Depot, Lowe's, or Wal Mart

[12" Bamboo Skewers](#)

Grocery Store

[Zap a Gap.ca](#)

[www.Towerhobbies.com](http://www.Towerhobbies.com)

local hobby shop

[Robart \(or similar\) Hinge Point Hinges](#)

[www.Towerhobbies.com](http://www.Towerhobbies.com)

Local Hobby Shop

[1/8" Music Wire](#)

[5/32" Music Wire](#)

[www.Towerhobbies.com](http://www.Towerhobbies.com)

Local Hobby shop

### NOTICE AND DISCLAIMER

Please note:

This was the second of two of these planes that i built. Both are still in flyable condition. I still own one, and have given the other away. The one in the plans is my regular funfly. AYW is about 4 lb 11 oz, with mini servos (gws 89 oz/6v mighty micros, 5 cell 1850 nimh pack, OS 46 FX). Your weight may vary. Also understand that by changing the plans, you will change the performance of the plane. Every ounce counts in a funfly, and this one pushes the weight limit as it is. So, if you overbuild it, it won't fly as well. If you don't want to purchase 2 mil coroplast, please move on and build another plane. I'd rather someone not see one made of 4 mil trying to fly and give Spads the "thats a brick" reputation that we've all worked so hard to shed.

If you've never built with coroplast before, go here:

[WWW.SPADTOTHEBONE.COM](http://WWW.SPADTOTHEBONE.COM)

and build at least 3 or 4 spad originals.

The Edge is a super plane but, the instructions are geared for someone who knows how to work with coroplast, and knows the ins and outs of SPADding. Not for the newbie. If you don't understand what i am referring to, you need

to be at [WWW.SPADTOTHEBONE.COM](http://WWW.SPADTOTHEBONE.COM)

Let me state it one more time. Go to [www.spadtothebone.com](http://www.spadtothebone.com) and build from the originals first, to learn how to build with coro. Save me and you both a bunch of headaches.

[On to the instructions](#)

[DXF file here](#)

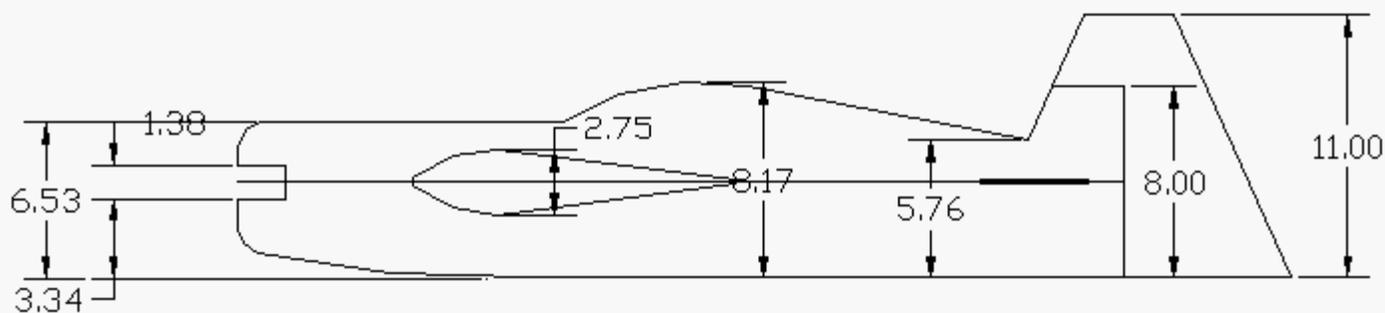
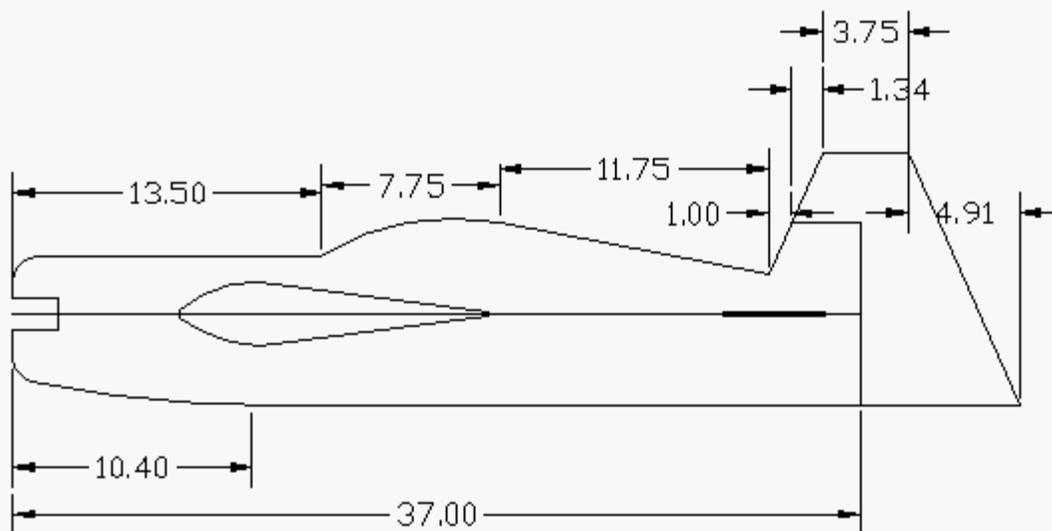
(right click and save as)

Note on the dxf file:

it was created with autocad lt98, and is zipped to save space, as well as ease of transfer.

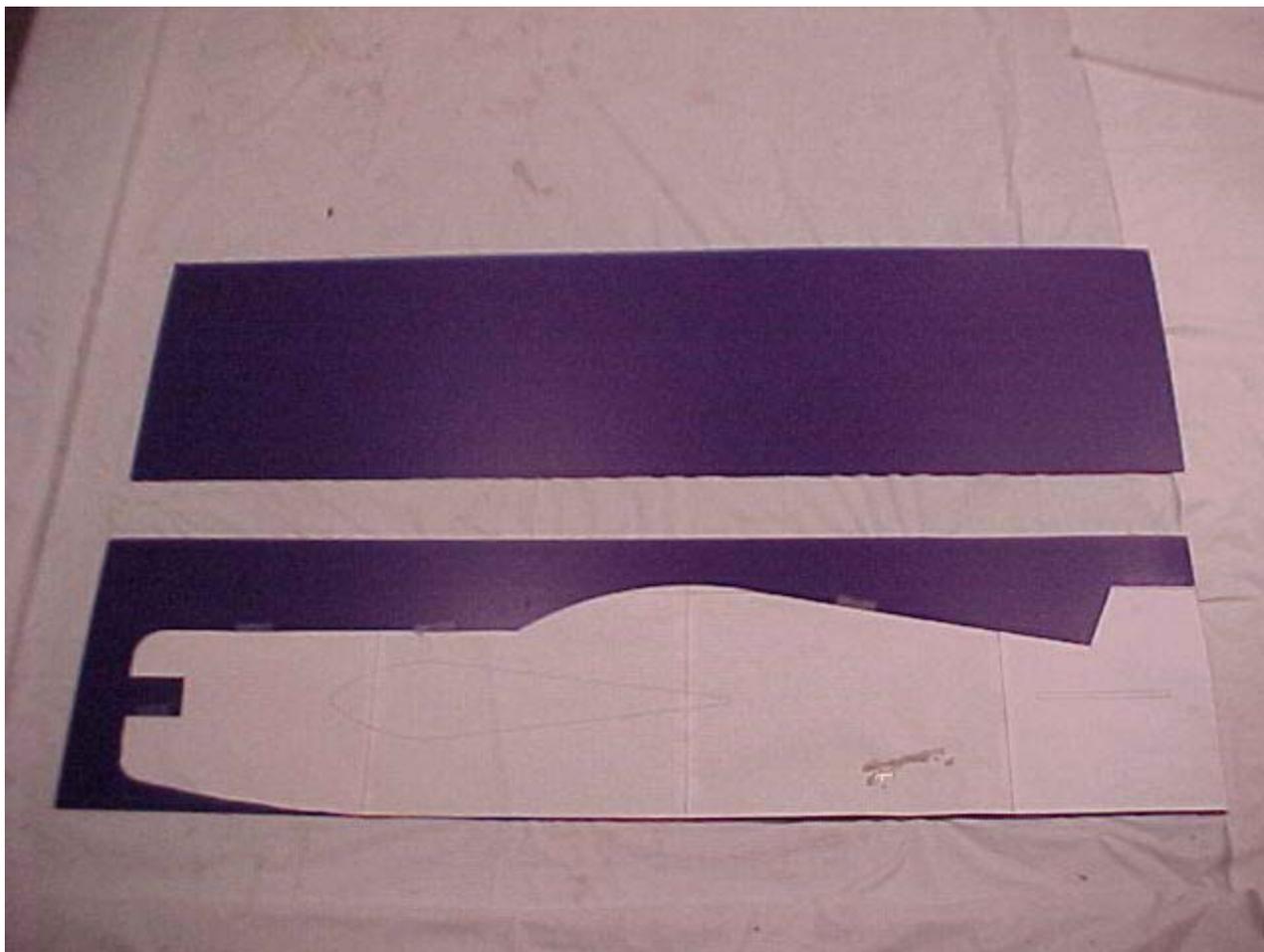
The exact pictures of the dxf file, with dimensions are in the instructions, so if you don't have cad, don't worry about it.

First, you need to cut out a fuselage template. If you have a cad program, the dxf file includes a fuselage print, with it sectioned out into 8 x10 sheets. So, you print each sheet individually, and then cut and tape them together. This is how i do my templates. Short of that, a piece of posterboard, and alot of patience, and you can draw the template onto the posterboard, and cut it out, or draw it straight onto the coro.



Once you have the fuse template cut out, cut 2 pieces of 2 mil coroplast 10x39, with the flutes running in the 39" direction.

The fuse pieces only need to be 37" long in actuality. If you only have a 36" wide piece, thats ok, tape a 1" wide section to the front of the fuse pieces with scotch tape, and proceed as it was one piece.



Tape the template to the coroplast, and mark the fuselage outline on the coroplast then cut it out.

Lay the cut out over the other 10x39" peice, and trace it onto it.



Now cut the second piece out.

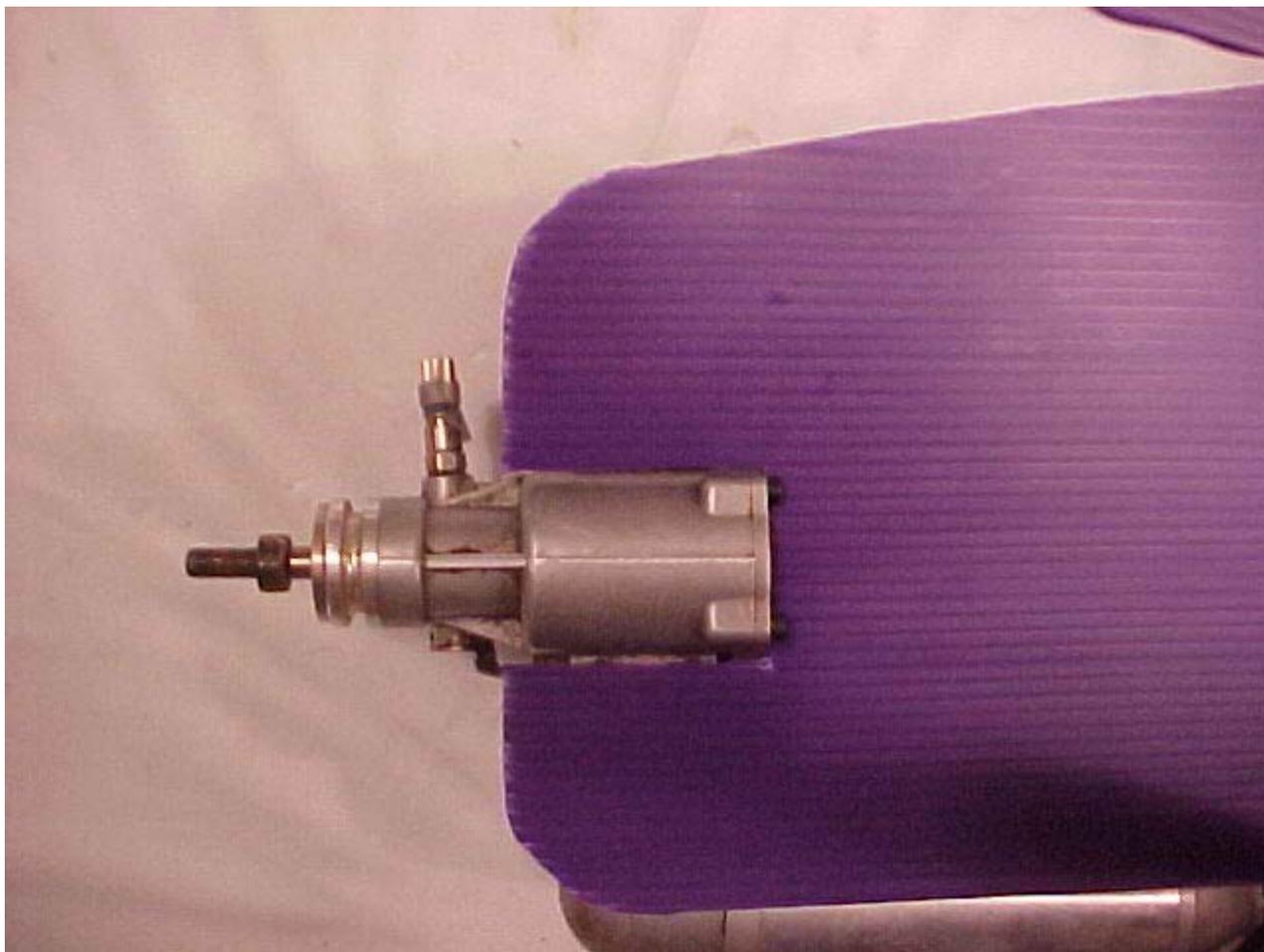
A note on cutting coroplast. For round cuts, i use the poultry shears in the bottom of the picture, but, a good pair of scissors will work as well on 2 mil coro. For straight cuts, i use a good metal straightedge, and a utility knife. Always cut so the flutes pull the knife into the straightedge, not away from it.

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Once you have both sides of the fuselage cut out, prep the inside of both fuse panels. I use mineral spirits and scotchbrite. Wet the coro with mineral spirits, and thoroughly scrub with the scotchbrite, then wipe dry with a cotton cloth.



Double check that your engine will fit the coroplast cutout.



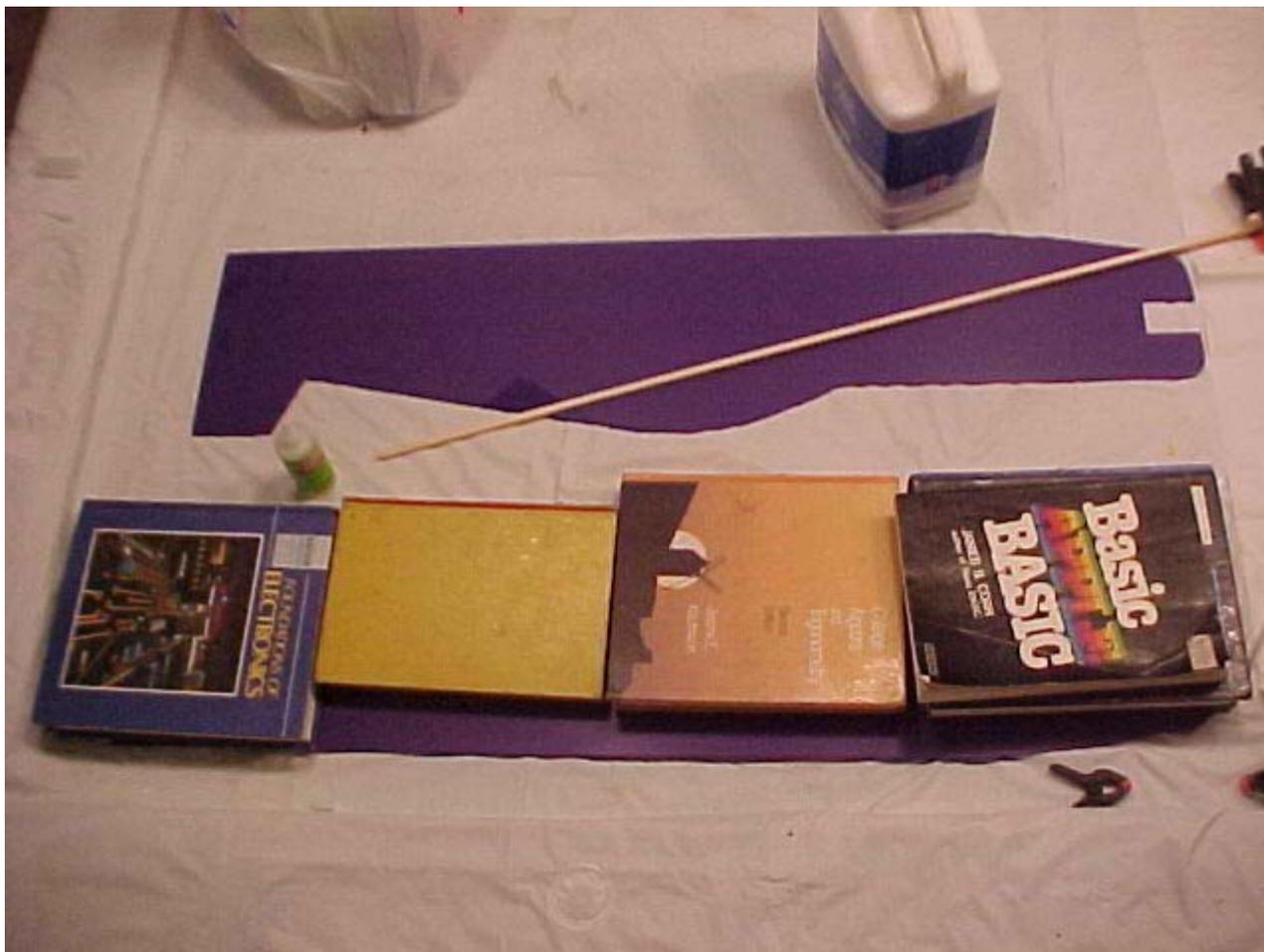
mine ended up a bit small, then i opened it up a bit too much. No big deal, just mark the centerline of the engine, from front to rear, using the flute as a guide. This line will become the wing centerline, and the hor. stab centerline.

Next, from the 1/4x3" piece of poplar, cut out 2 pieces 3 1/2" x 3/4" for engine bearers. Then cut a piece of 1/4" square poplar dowel to fit the rear vertical portion of the fuselage, and glue in place.

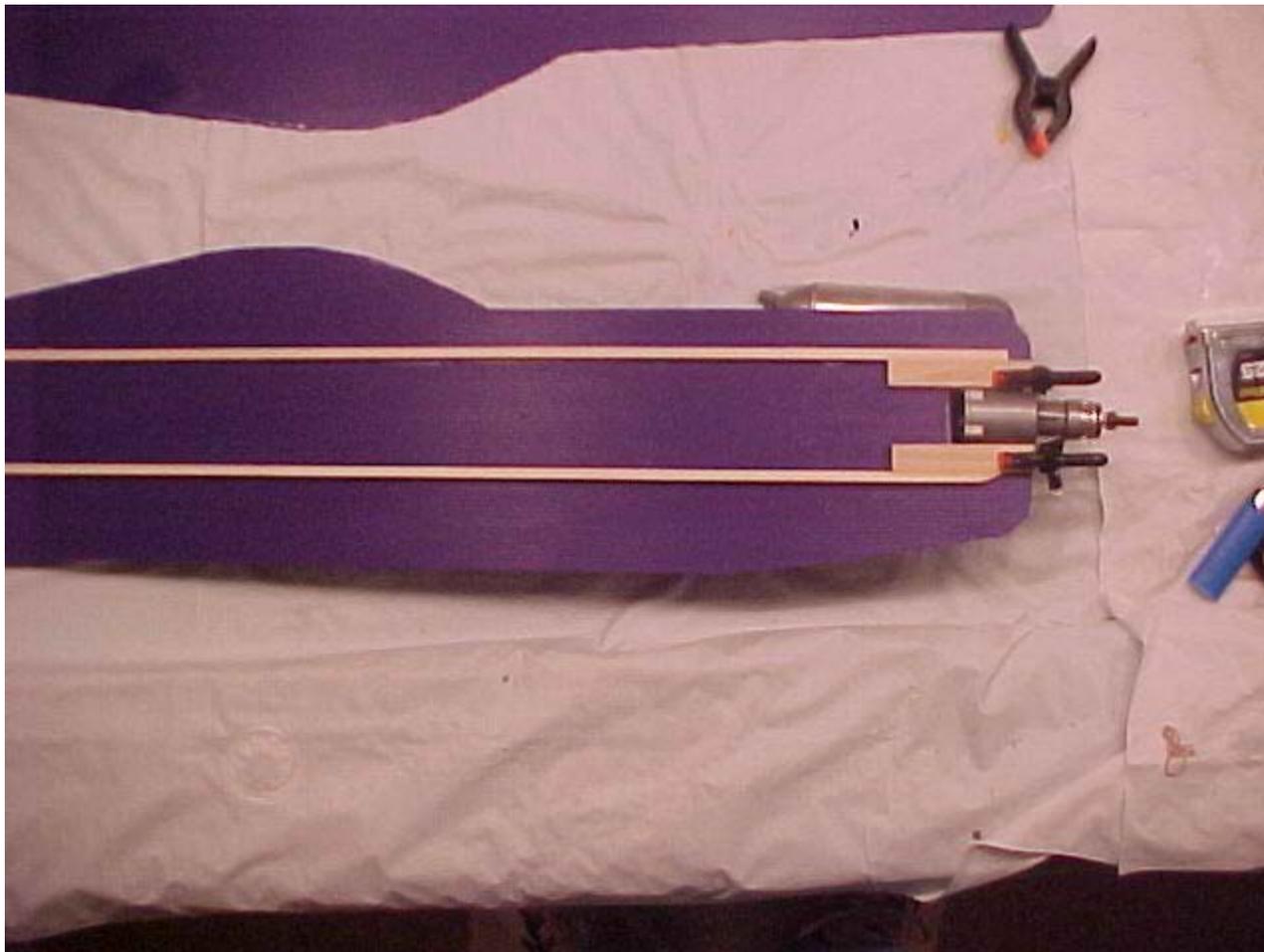
Line the top engine bearer in place, then lay a dowel above it. Mark this flute from front to rear, to use as a glue line.



also mark the place where the dowel stops on the engine bearer. Glue the dowel to the bearer, and also do the same for the bottom rail and dowel. Then glue the top rail in place, and place some books on it to keep it nice and flat until the ca cures.



Once the glue dries, clamp the motor to the top beam, and then push the bottom bearer rail assembly up nice and tight against it. Line it up with a flute from front to rear, then mark its position.



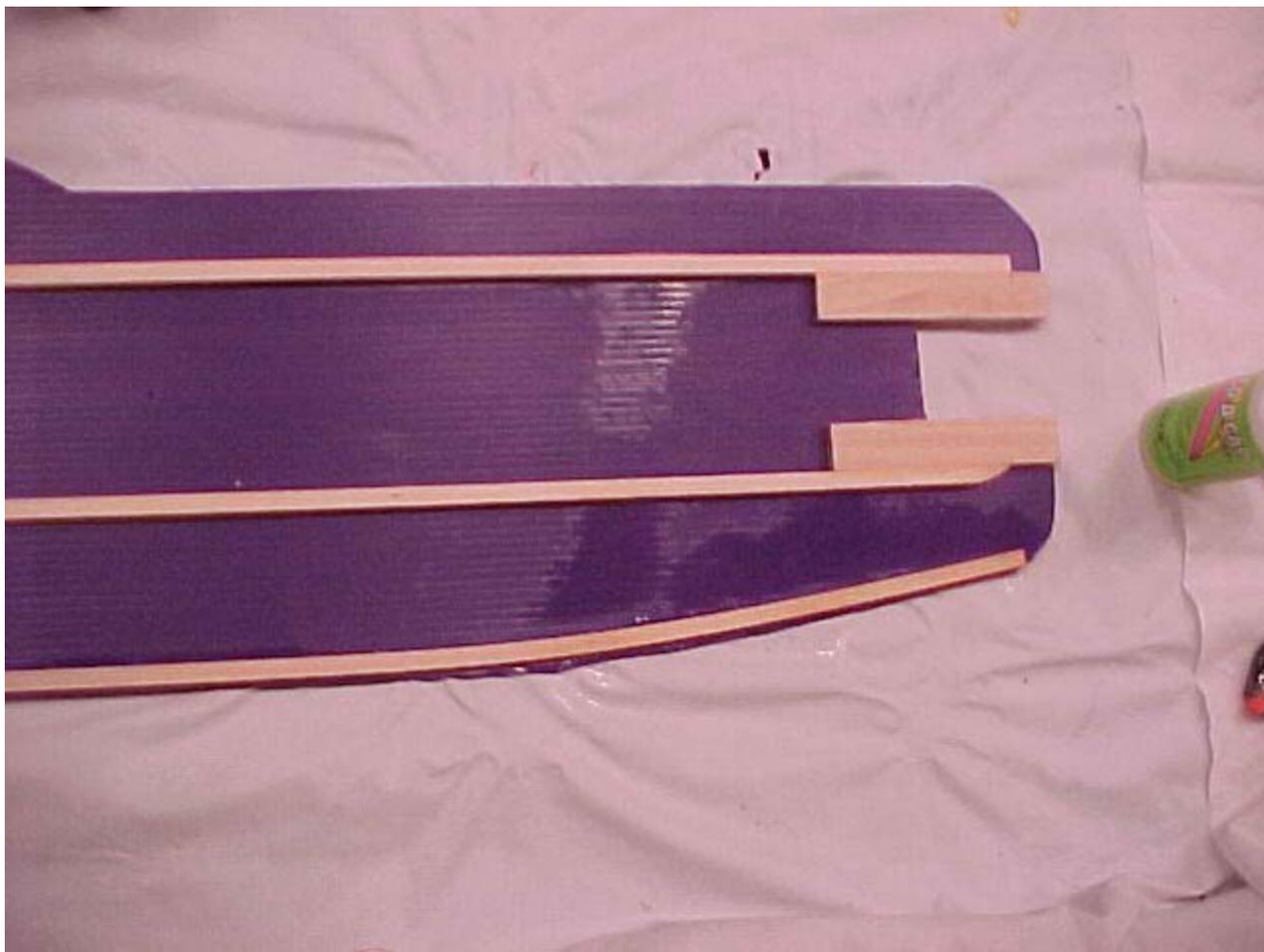
Once you've got it marked, remove it, and glue it in position. Put some books back on top until the glue dries.

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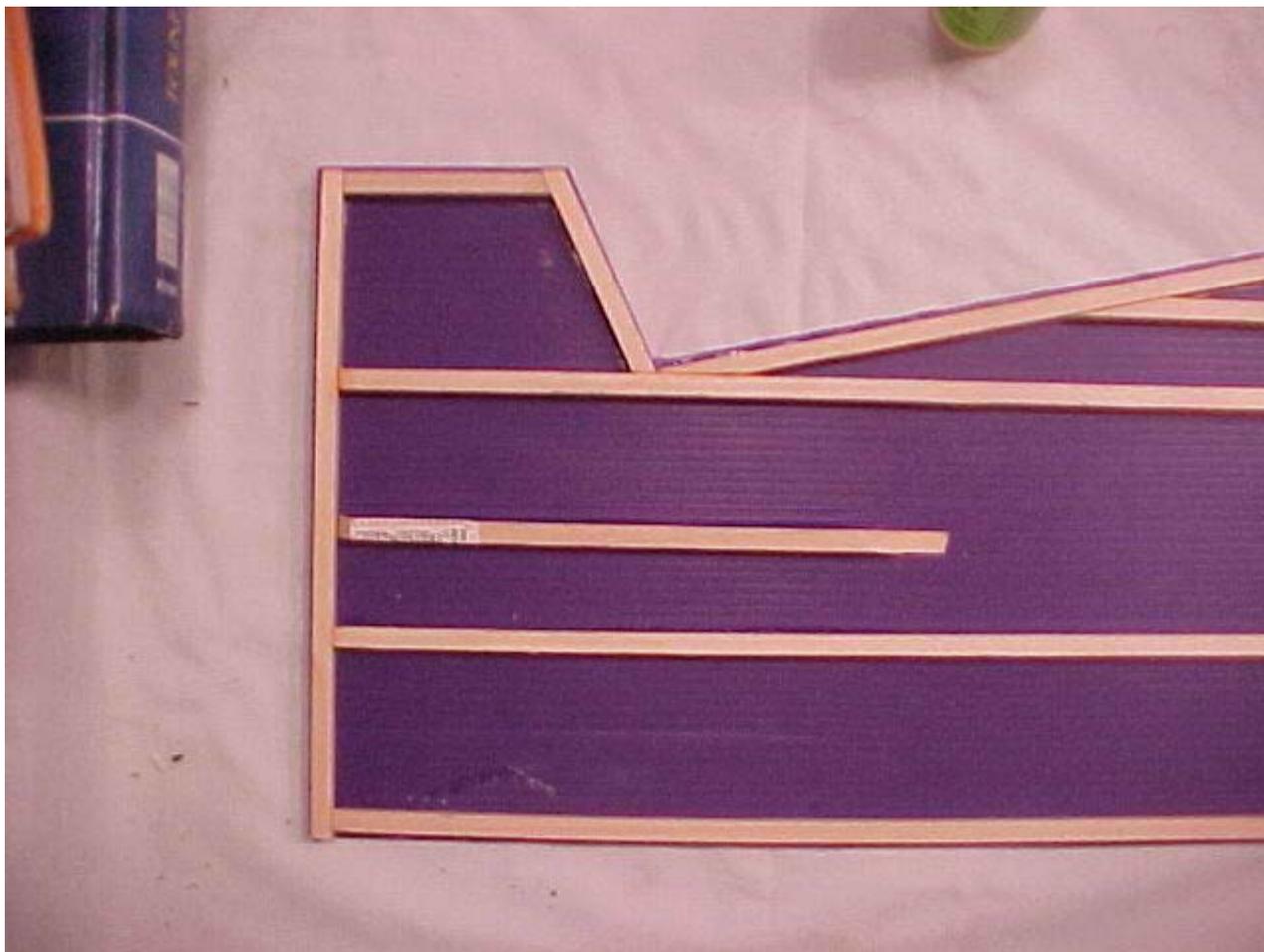
Once you've got the center rails glued. Glue a whole piece to the straight portion of the bottom of the fuselage.



Let that portion dry. You can hit it with kicker if you'd like to speed up the process. Once dry, apply glue to the fuselage, and bend the stick up into position. Use plenty of ca, and then hit it with kicker to hold it in place. Then put some weight on it to be sure.



Make a line from the center of the motor mount all the way to the rear of the fuselage, if you haven't already. Now make another mark below it 2 mm at the rear of the fuse. This will be used to align the tail attach stick.



Don't sweat it, this pic is kinda out of order. The next pics will depict the exact order that the remaining sticks were attached in.

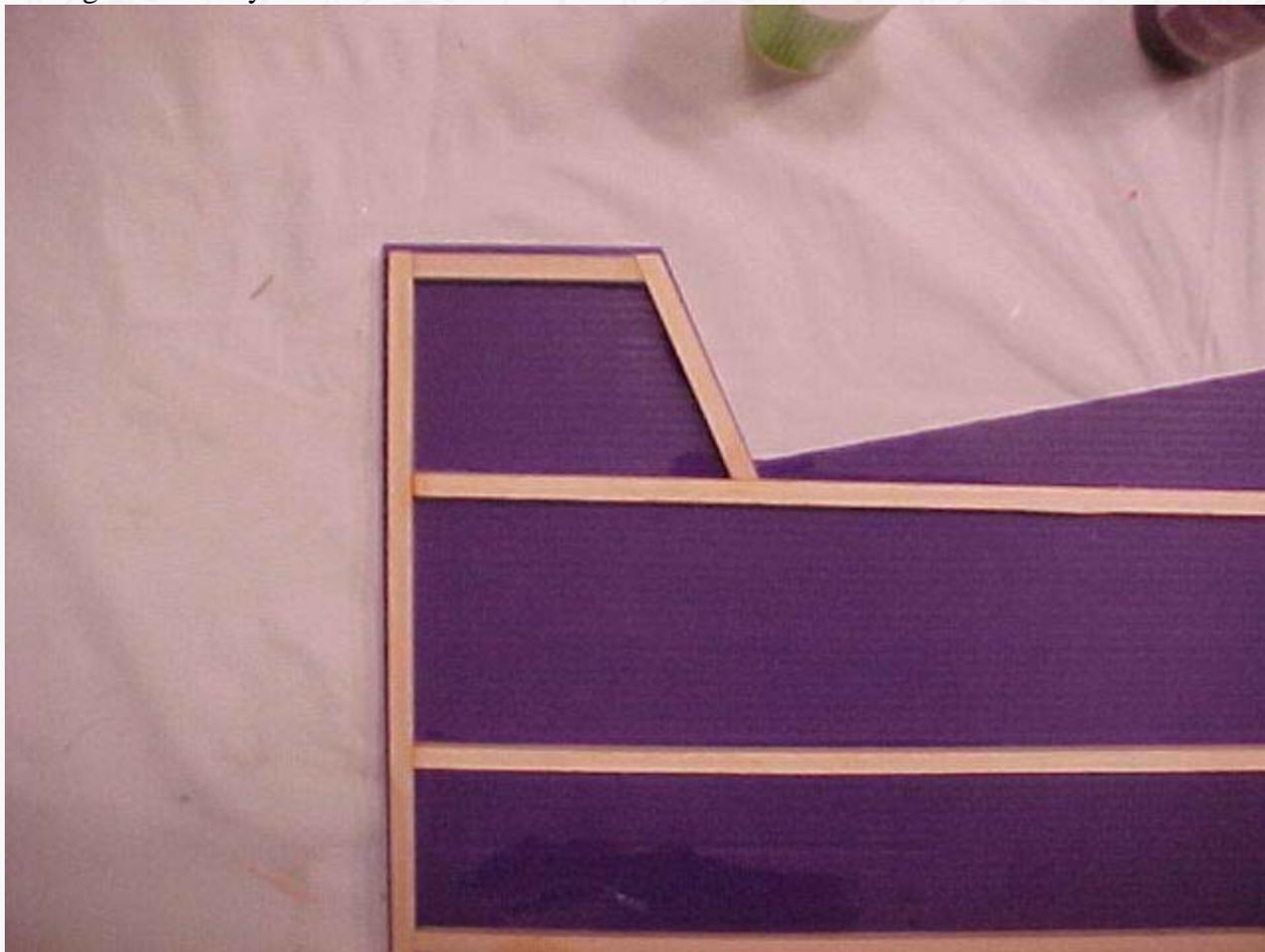
Now, you need to attach the landing gear support, and engine support. Cut a piece of 1/4x3/4" poplar to fit in place as shown. The front of the piece is 6 1/4" behind the leading edge.

Cut a piece of 1/4" dowel to fit behind the engine bearers.



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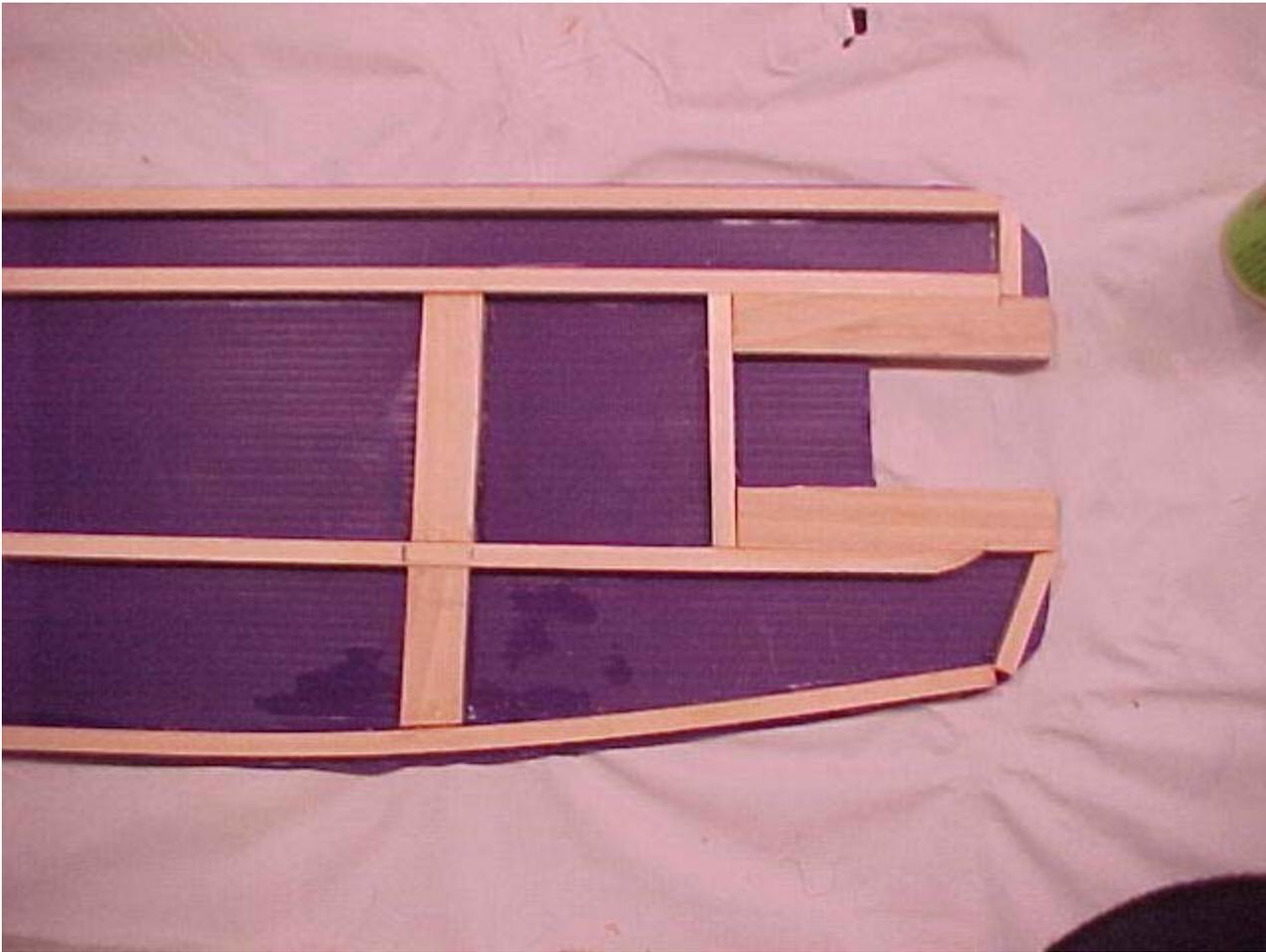
Here are the remaining stick installation. I spaced all mine about 1/16" from the edge of the coro, to allow for any misalignment of my 2 halves.











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You are now ready to glue the other half of the fuselage to the half with the sticks. I run a bead around the outside, then a bead on all the sticks on the inside. If it touches the other piece of coro it gets glued. Use plenty of ca, especially on the engine bearers and center sticks.

Here is a pic of the fuselage just before gluing.



Put some books on top of the fuselage to hold it nice and flat until the glue dries. Preferably for a half hour or so. Here is the completed fuselage.



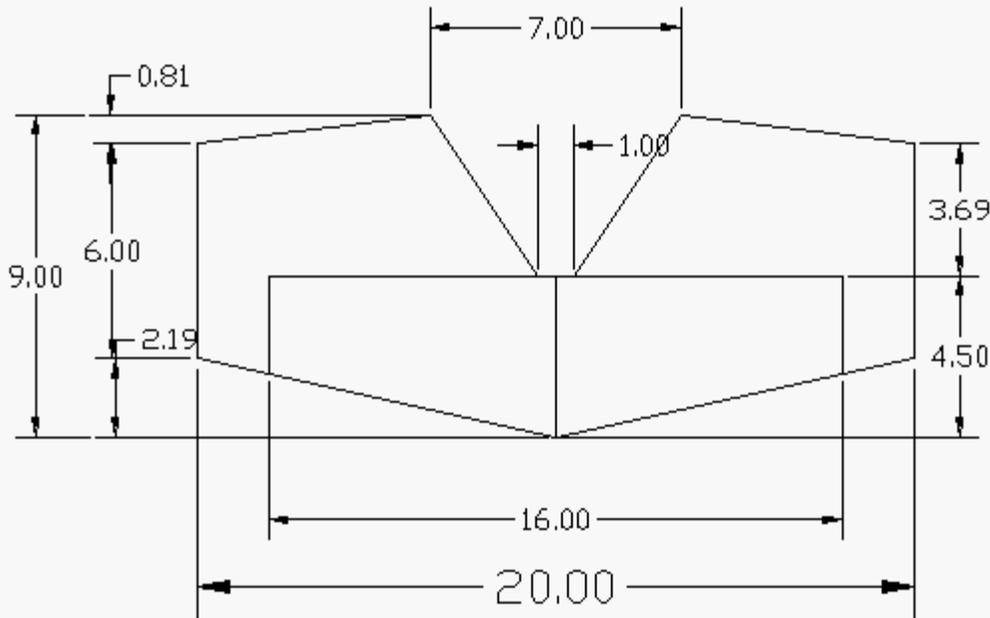
and here it is on the scale. Finished weight: 9.8 oz.



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Next, its time to install the tailfeathers.

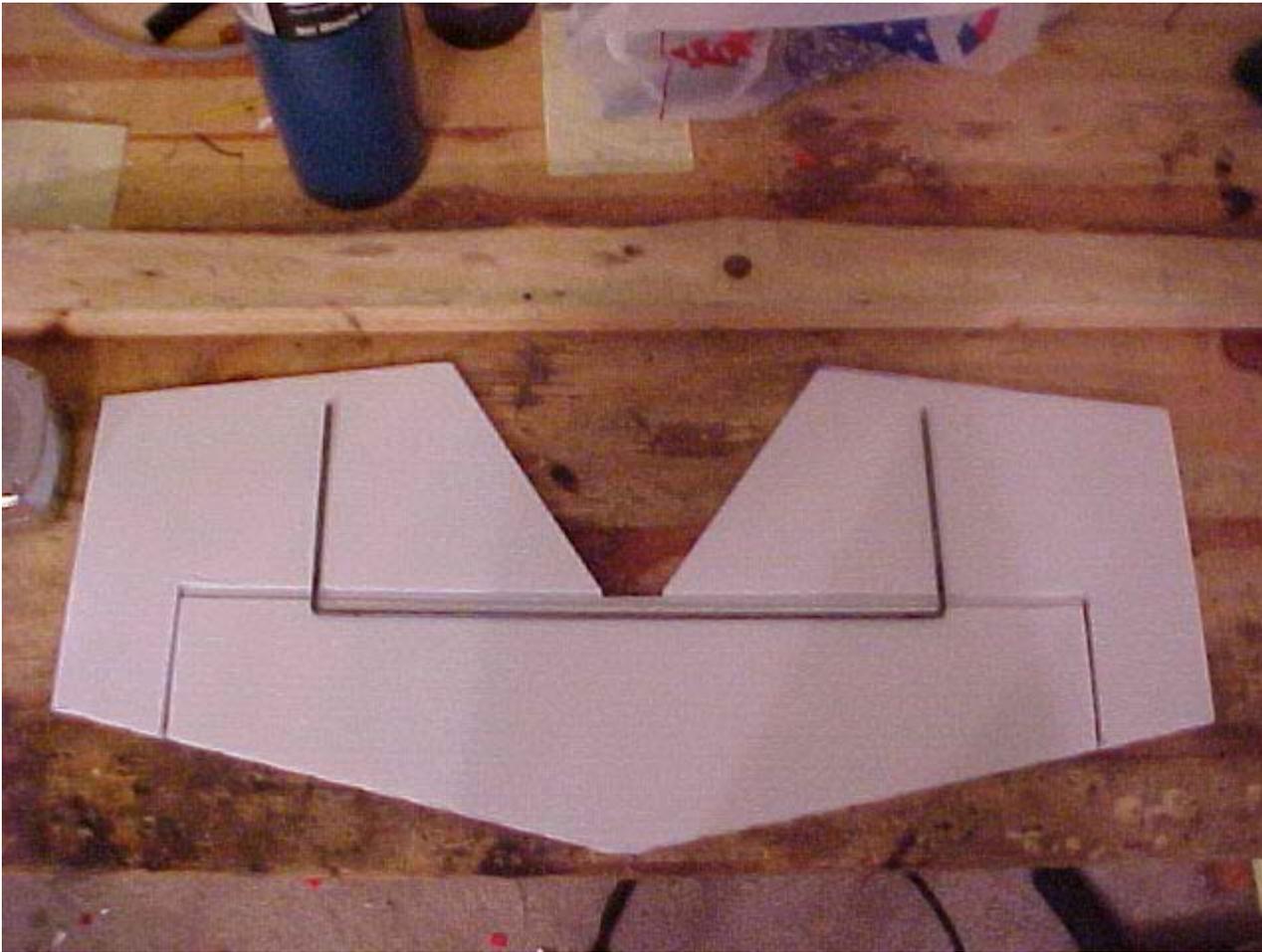
First cutout the elevator and hor. stab as dimensioned here: Cut the external dimensions first.



Once you have the external shape cut. Draw the two balance tabs, and the hinge line. Do not cut the hinge past the balance tabs. The hinge line stops at the balance tabs. Next, cut the balance tabs out, make 2 cuts for each tab as close to each other as you can get. Then cut the hinge line between the two balance tabs.

Once you get the elevator halves hinged, you'll need to install a torque rod between the two halves. Due to coro being quite flexible, i use a piece of 1/8" music wire to make my torque rod out of.

Cut out a second flute for the hinge line, one will be covered by the torque rod, the other will be the hinge.



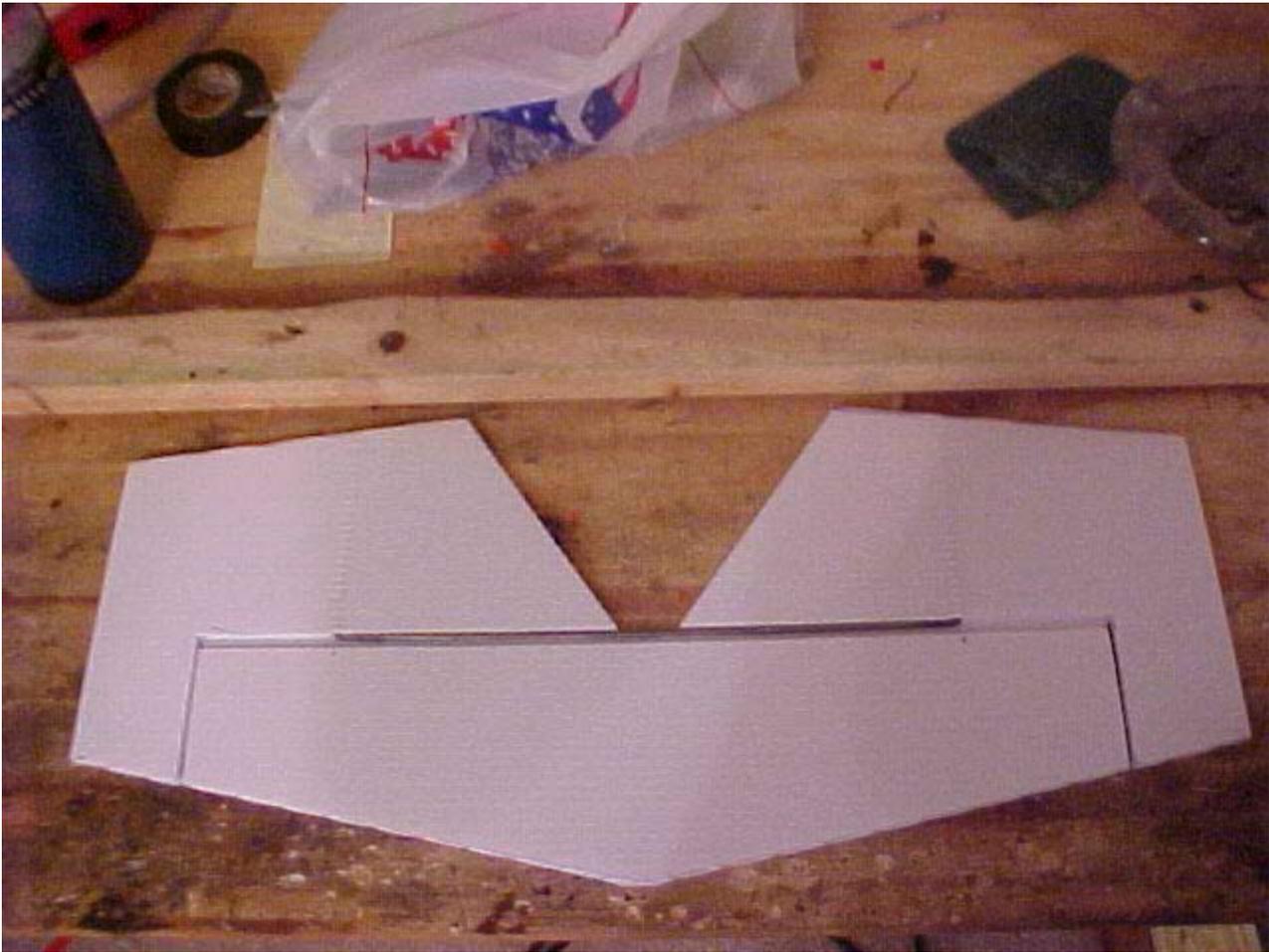
Here is the torque rod i made. As you can see, its quite large, it helps to stiffen up the large elevator surfaces as well as connect them, so don't skimp on it.

Once you bend it into shape, center it on the hinge line, and mark the spots for it to poke into the flutes.

Sharpening both ends of the wire up really makes this easier. After its marked, i push one side in, and twist the wire side to side, kind of like its a drill bit, until i get it all the way seated. Then i remove it, and do the same for the other side.

Then i remove it again, and install both sides at the same time.

Here's the torque rod installed.

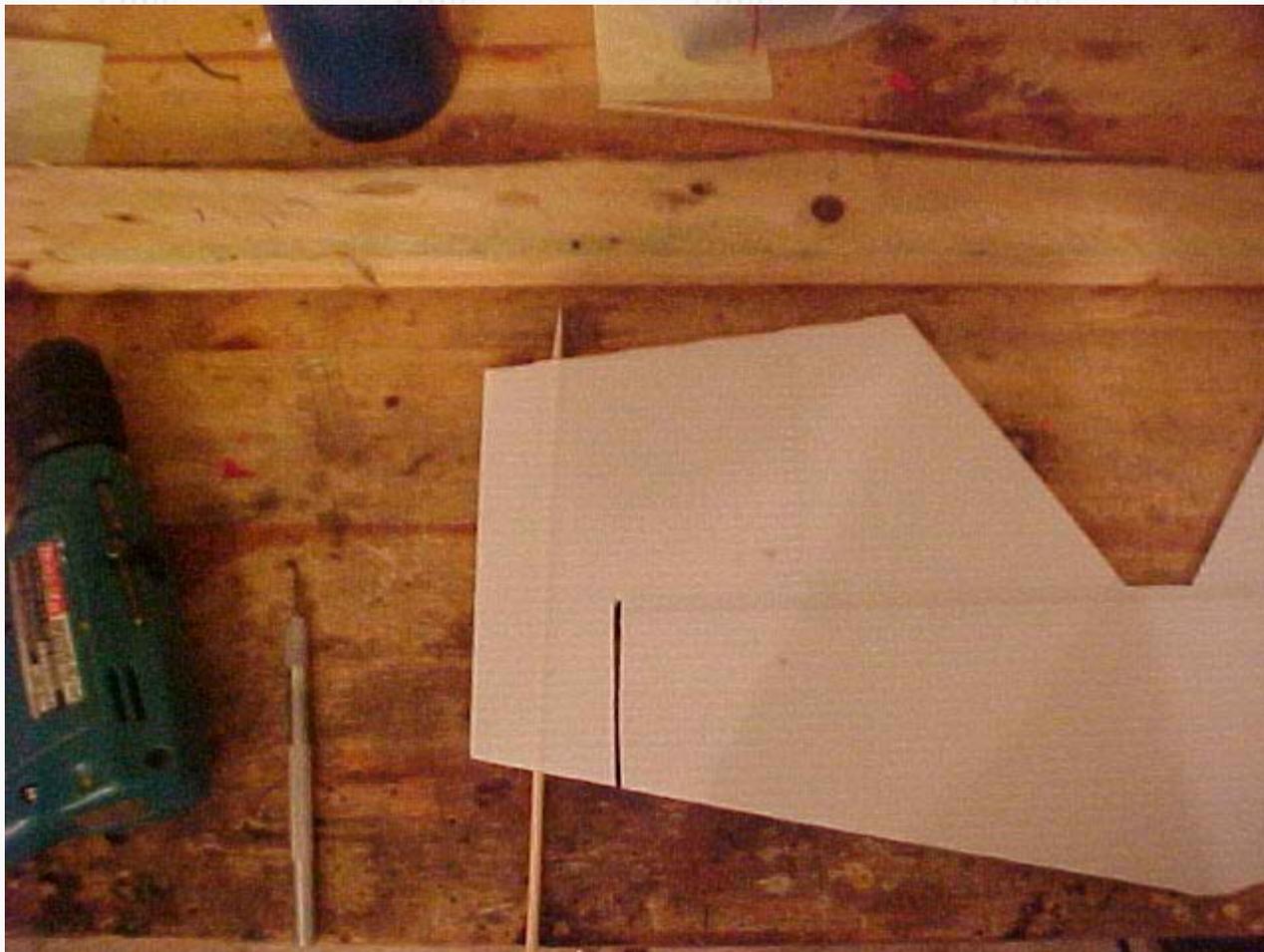


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Your hor. stab is almost finished, but not quite. Something has to be done to stiffen up those floppy balance tabs hanging off the front of the hor. stab.

I use bamboo skewers, you can also use a couple of pieces of 1/16" music wire in each flute. Installation is the same, only the material is different.

Find a good sharp bamboo skewer, and chuck up the dull end in your drill. Now, very carefully, starting at the trailing edge, drill the skewer all the way through to the leading edge. Like so:



Cut off the excess, and repeat for the other half. The hor. stab is done.

Next cut out the rudder, with the flutes running from front to back, to allow you to install giant hinge points into the flutes, like so.

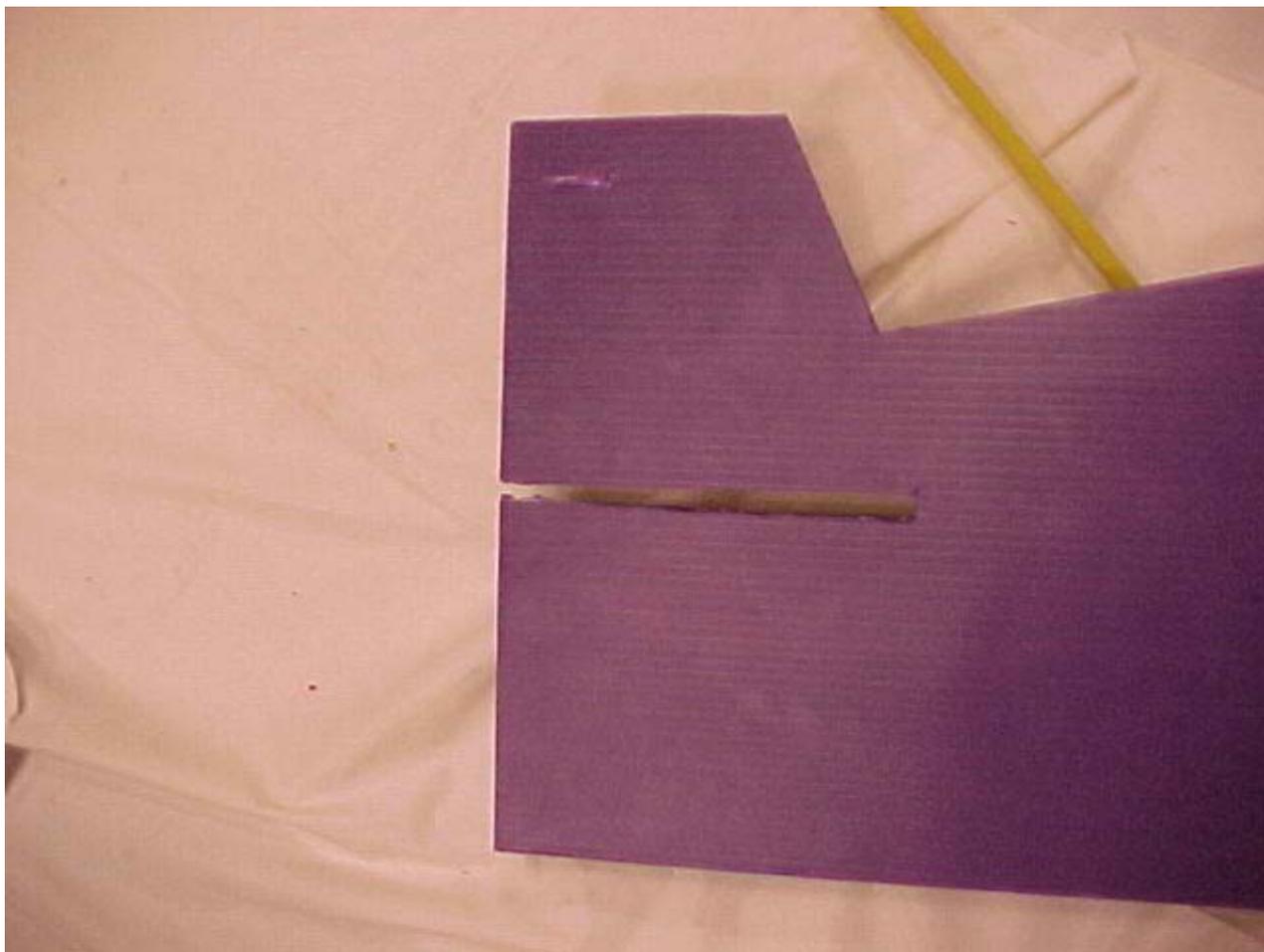
Be sure not to install the center hinge in such a position that it interferes with the hor. stab doubler, or the hor. stab.

I moved mine up a couple of flutes to avoid this.

I use goop to hold the giant scale robarts hinge points into the flute.



Locate the hor. stab dowel in the fuselage, and cut a slot out, from the trailing edge, forward 6" just above the dowel inside the fuse, and just wide enough for the hor. stab to slide in place.

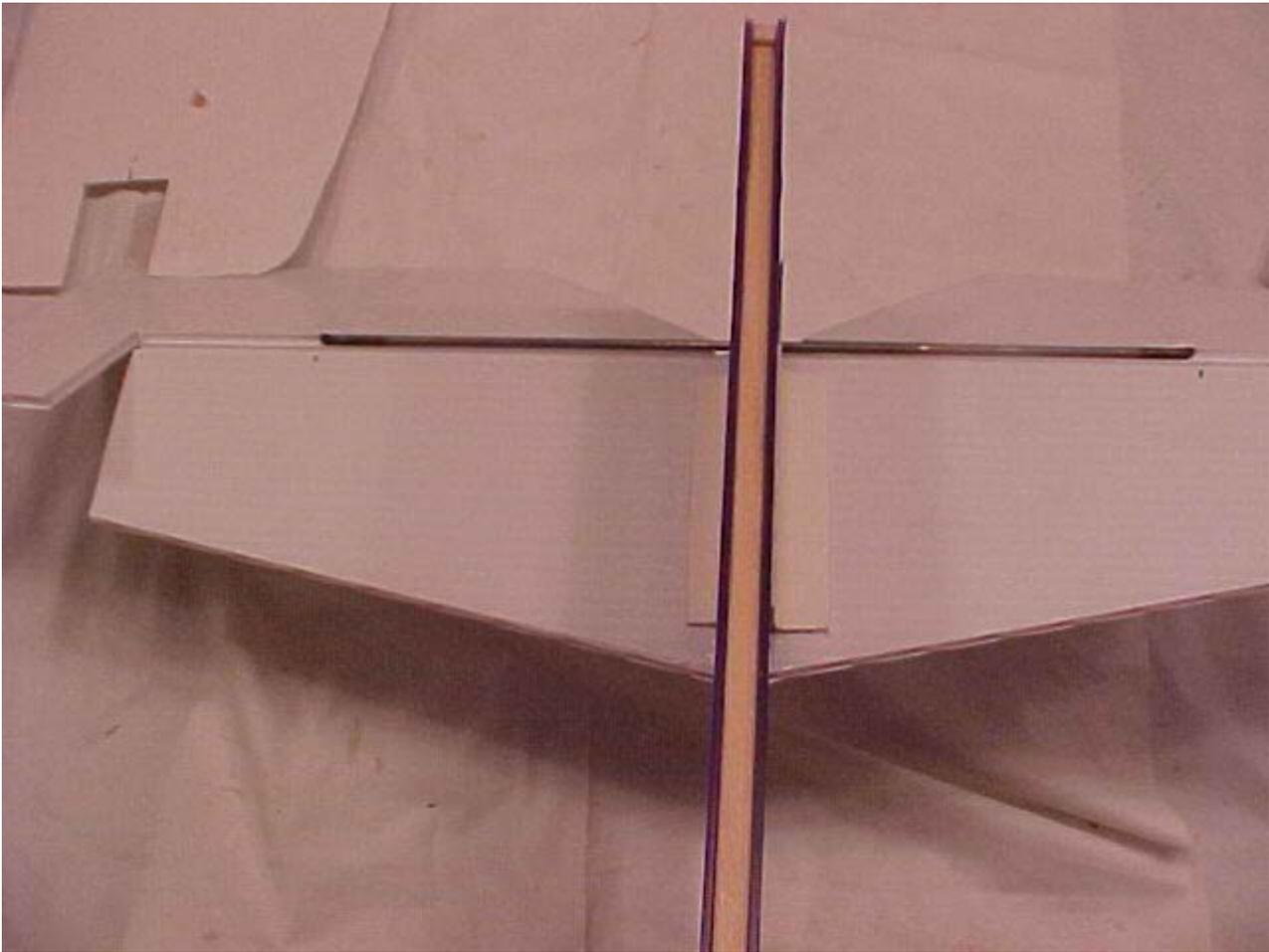


Now, i made a mistake here, but its not a bad one. I should have just temporarily attached the rear dowel, so it could be removed to install the hor. stab. I didn't, you can. Just put a couple of drops of ca on that piece of dowel, then remove it when its time to attach the hor. stab.

Now, slide the hor. stab in to the front of the slot, get it all lined up. It helps to prep the coro around the center of the hor. stab so it'll take ca better. Temporarily glue it in place with a few drops of ca, and use kicker to freeze it in place.

Next, cut a couple of piece of pvc L brackets to fit the hor. stab. Prep the fuse below the hor. stab, and then glue the L brackets in place, as shown, making sure to get the hor. stab perpendicular to the fuse, like this.

The pvc brackets are glued to the bottom half of the elevator, this helps hide them from view, they can also be screwed through the doubler, into each other, if you so desire. I've done several this way, with no problems.



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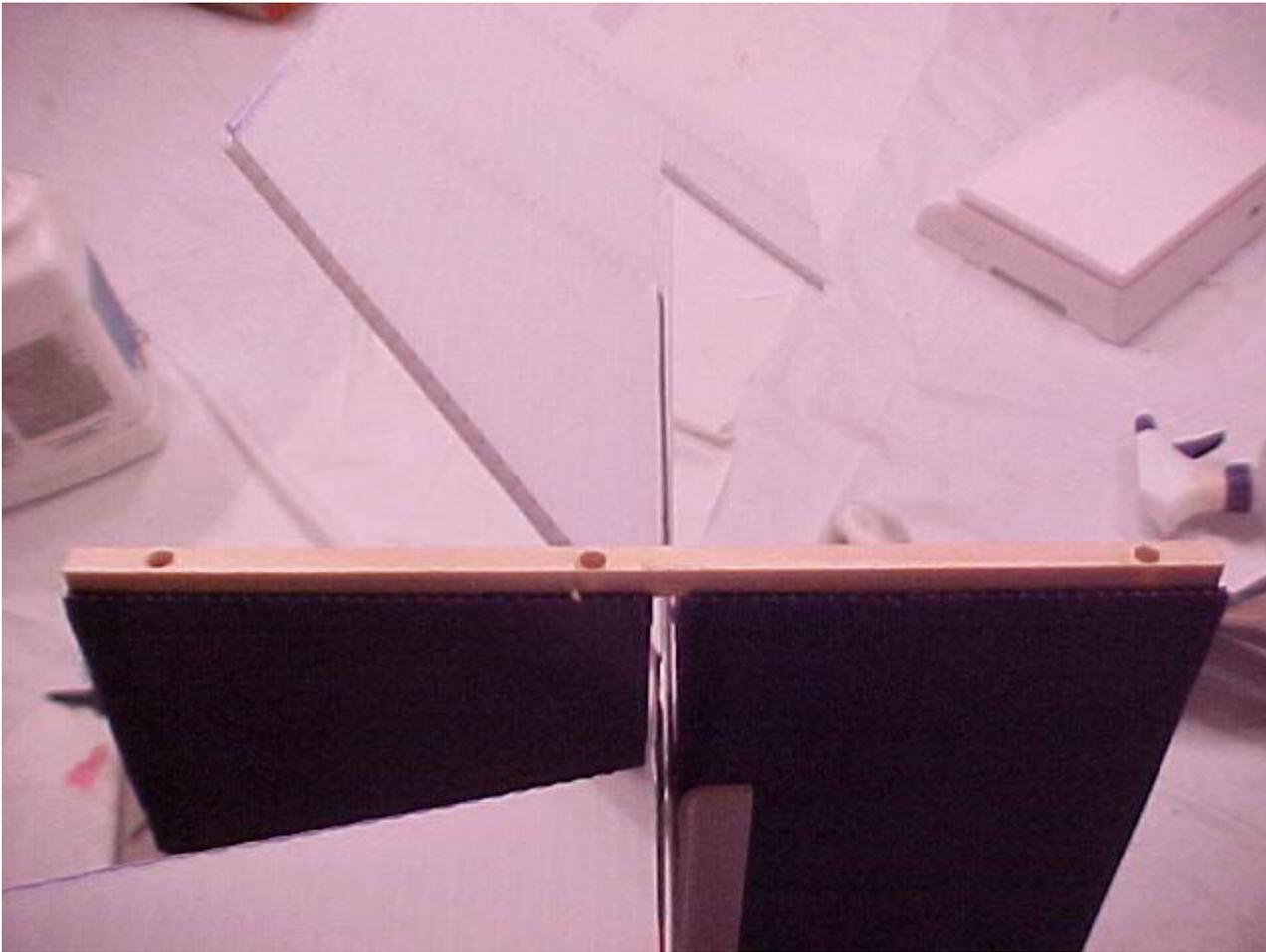
Since i screwed up the vert. stab attatchement, i just glued another one on the back side of it. If you temporally attached the first one, now is the time to glue it in permanently, if not, just glue one behind it, like i did.



Next, align the rudder with the fuselage, and drill the dowel for the hinges.



Mark the hinge locations, then drill them.



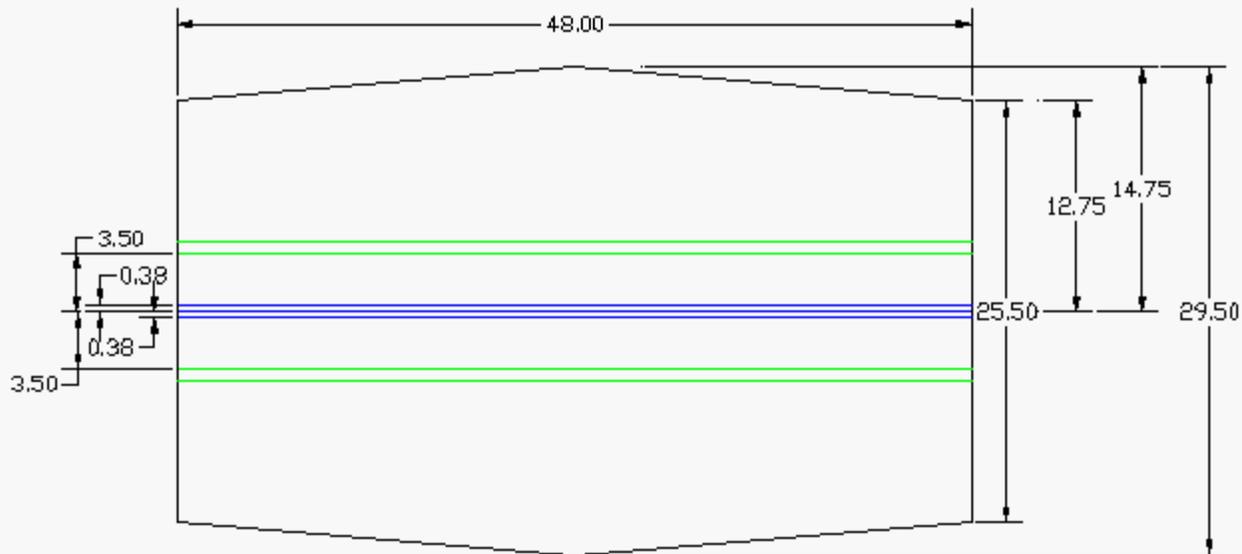
Put a little polyglue, goop, or ca in the holes, and attach the rudder.



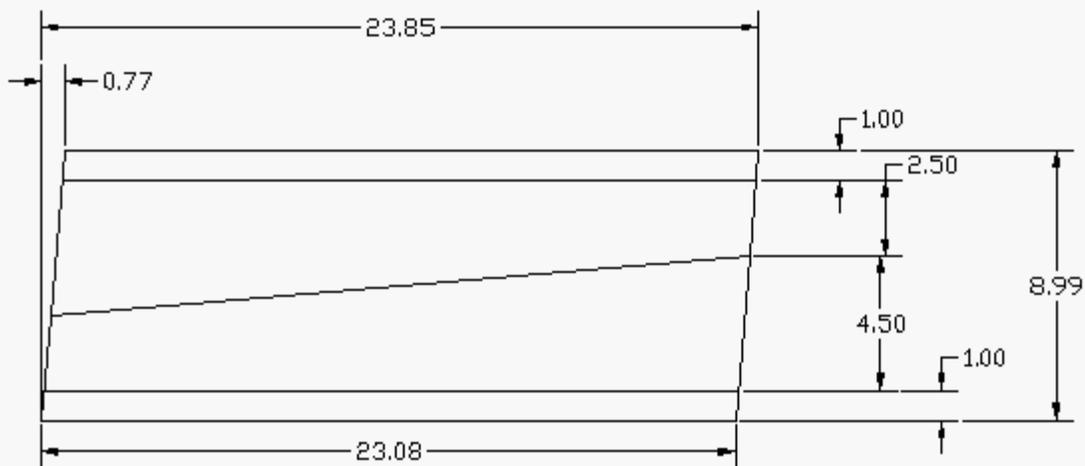
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## Wing build

First cut out the wing skin, with the flutes running up and down (chordwise) as shown in the drawing:



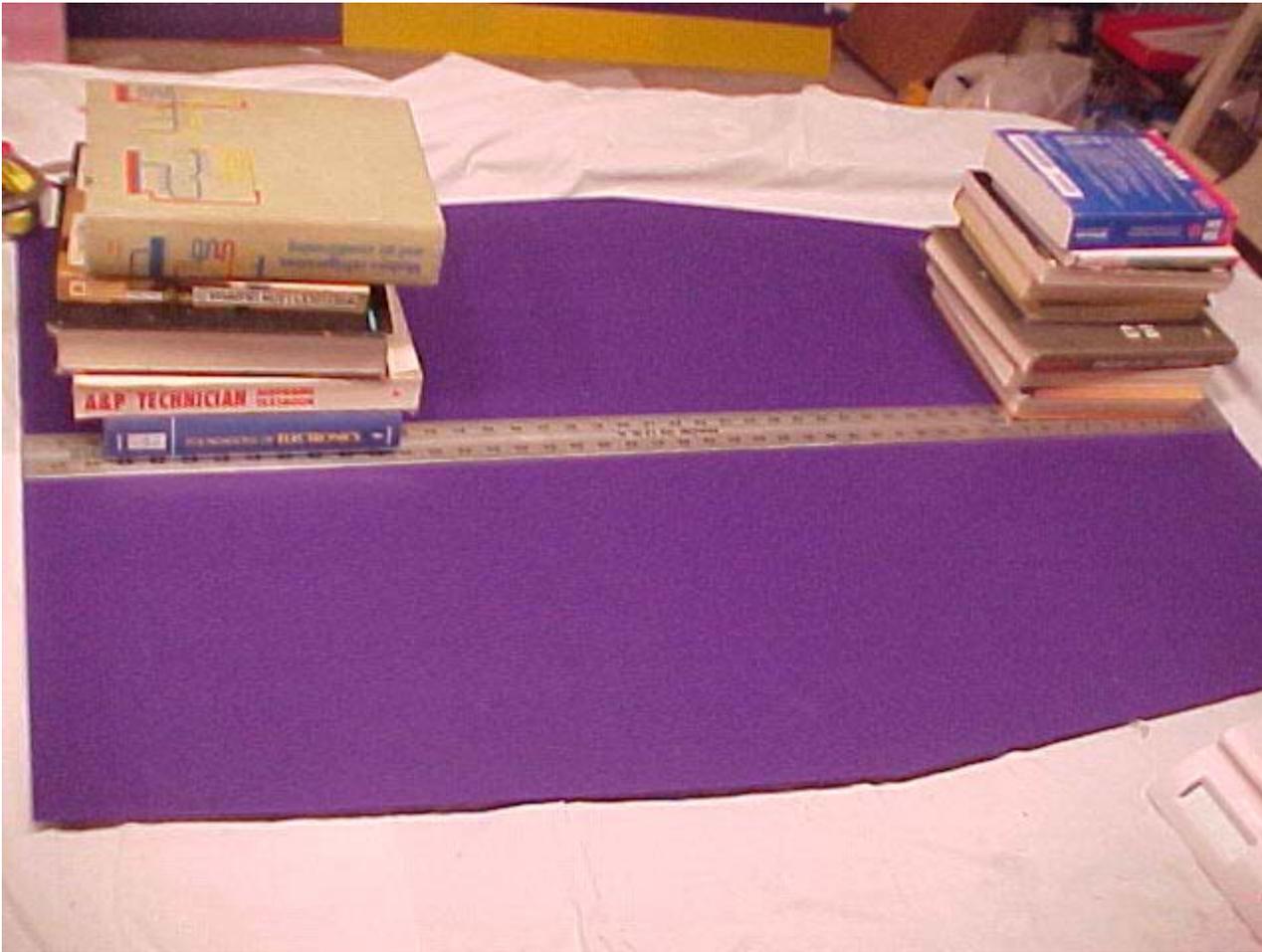
Then cut out the ailerons as pictured in the drawing:



Mark the hinge line on one aileron. Lay the other aileron against it, as it will go on the wing, and mark the other hinge. This will make sure you get the flute cut on the right side.



Now, mark the center of the wing. This is the center fold line. Mark a line  $\frac{3}{8}$ " on each side of the fold line. Score all 3 folds.



This is how i hold the straightedge while i score my wings. I use a dremel engraving tool to score with, it makes scoring very easy. A good #1 Phillips screwdriver works well, also. Make sure to get the scores nice and straight.

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Using 2 4 foot long straightedges, one on the fold line, and one on the back side, very carefully fold the wing over. If you usually use a table to bend the wing, thats fine. Whatever works for you. Since it is so long, and in one piece, it is important to use a straightedge across the wing while you bend it.

Here are my score lines, close up.

Once you get the wing bent over, you need to check and make sure all the edges line up. If they don't, cut off the excess, so they all line up.



Here's a pic of the wing after scoring:



Now you need to prep the coroplast. Prep the entire inside of the wing, and the portion of the ailerons that will glue inside the wing using the mineral spirits and scotchbrite method described earlier, or whatever works for you.

Mark the spar lines, 3 1/2" behind the middle score, on both sides. The spar will be slid in after the wing is glued together.

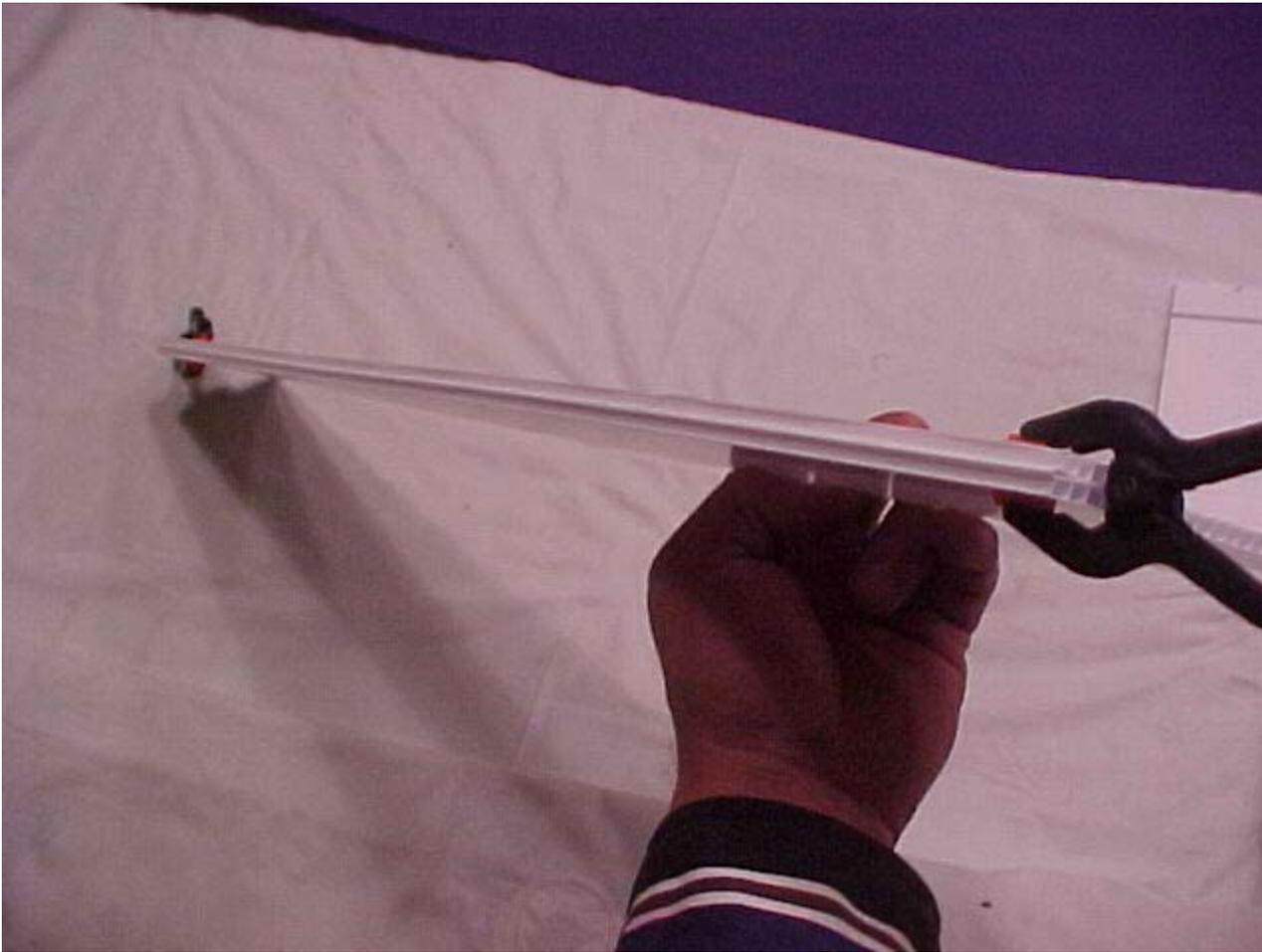
Mark a line 3/4" behind the spar lines, this is so you know where to woodpecker.

The spar is held in place with polyglue, and for polyglue to grip properly, it needs little holes for the glue to expand into.

If you don't have a woodpecker tool, use an exacto knife, and poke holes on the spar area (the area between the spar line and the line 3/4" behind it) through the inside of the coroplast, approximately 1/4" on center. This is very important for getting a well stuck spar.

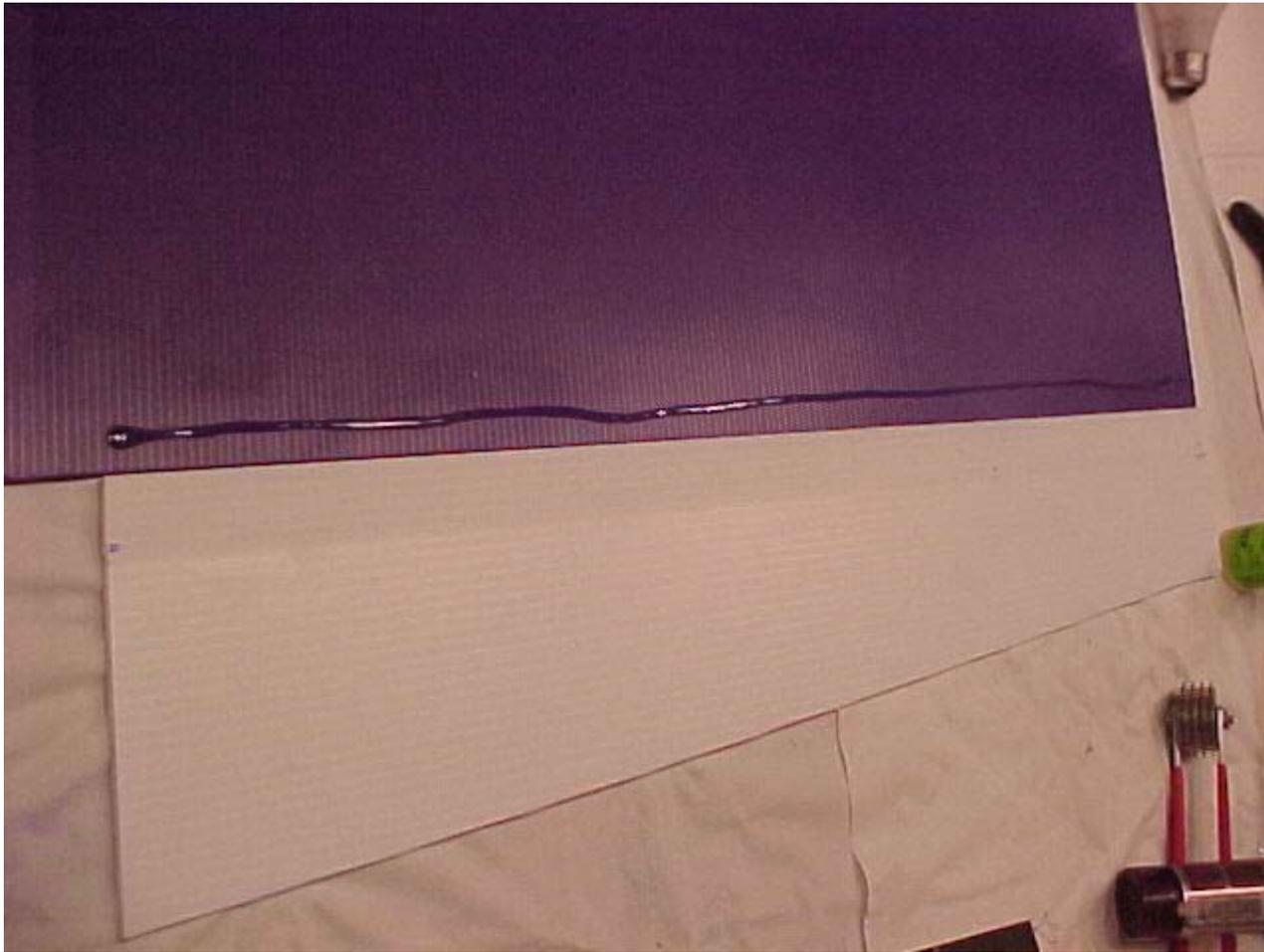
A note on coroplast- it varies widely between soft and stiff. White seems to be the stiffest, and that's why I use it for my control surfaces. If it seems too flimsy, it probably is. If it is, you'll need to polyglue bamboo skewers into the flutes to stiffen it up some.

Here's how I free up my hinges:



Bend it back as shown, and **LIGHTLY**, and i mean **VERY LIGHTLY** sand the exposed portion of the hinge. 2 or 3 swipes is all it takes. If in doubt, check and see. They get real loose real fast.

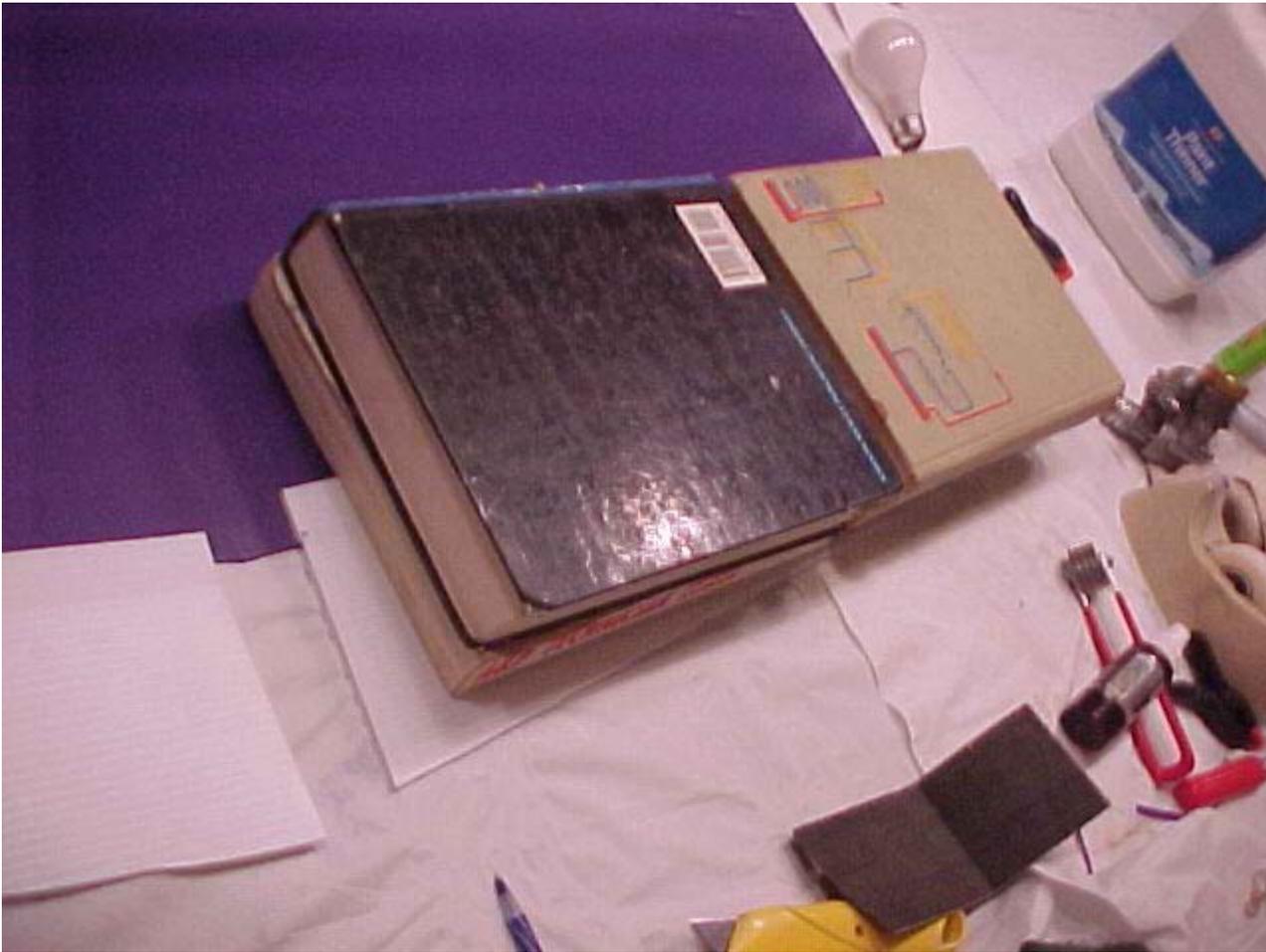
Now, lay the hinges in line with the bottom of the wing skin, as they are to be glued in place.



this is what i mean. I took this pic to show exactly how much ca i use when gluing.

The ailerons are ready to be glued to the lower wing skin now. Here's how i do mine:

Align the outer edge of the aileron, with the outer edge of the wing skin, and the inner portion of the removed flute with the wing skin, and press it in place. Then move the other end of the aileron, and line the inner portion of the removed flute with the wing skin, and press it in place. Now press the rest in place, and weight it down, like this:

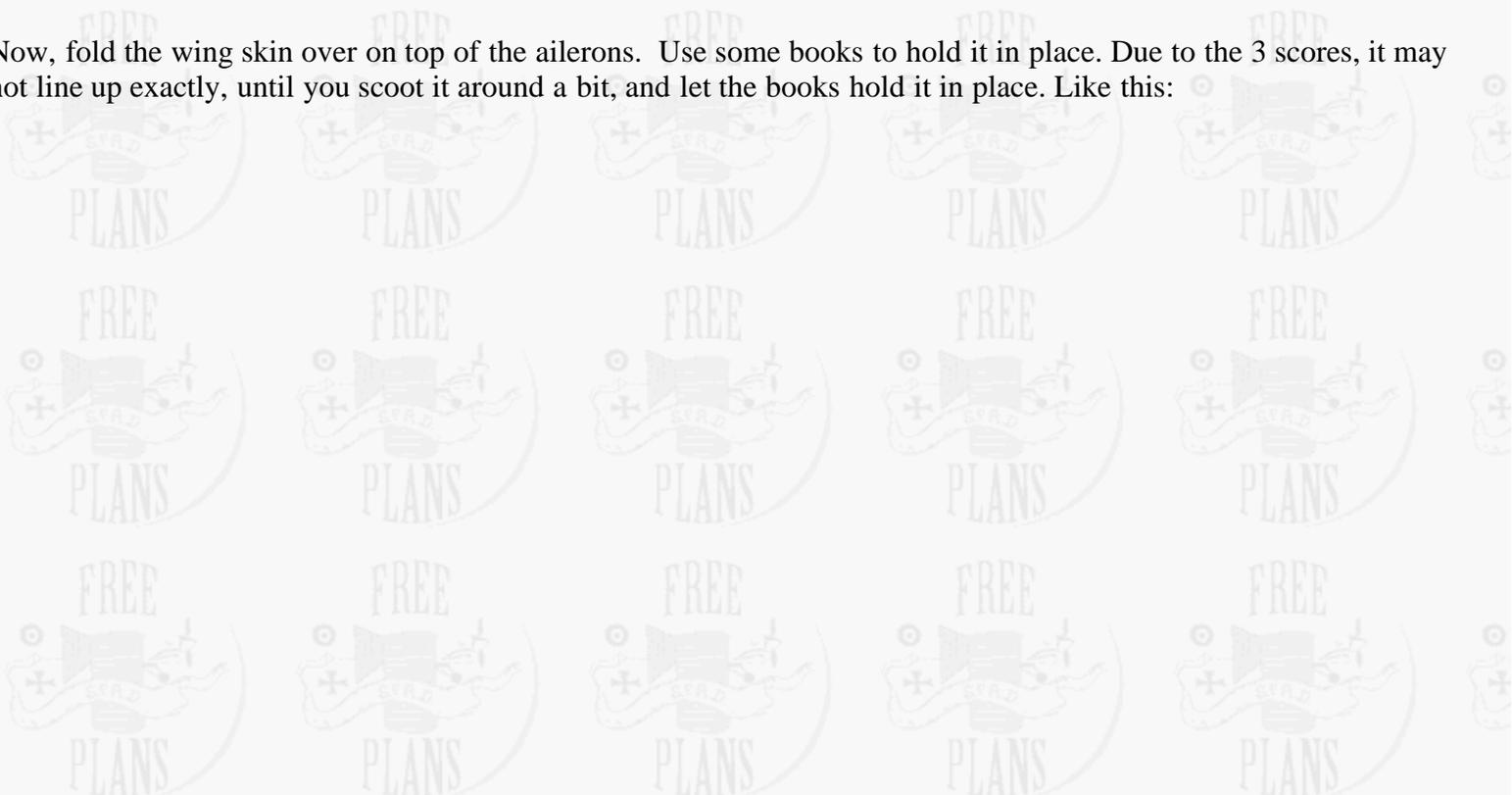


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Once you've glued the ailerons in. There will be a small gap in the center of the wings between the ailerons. Glue a scrap piece of coroplast in. Like this:



Now, fold the wing skin over on top of the ailerons. Use some books to hold it in place. Due to the 3 scores, it may not line up exactly, until you scoot it around a bit, and let the books hold it in place. Like this:





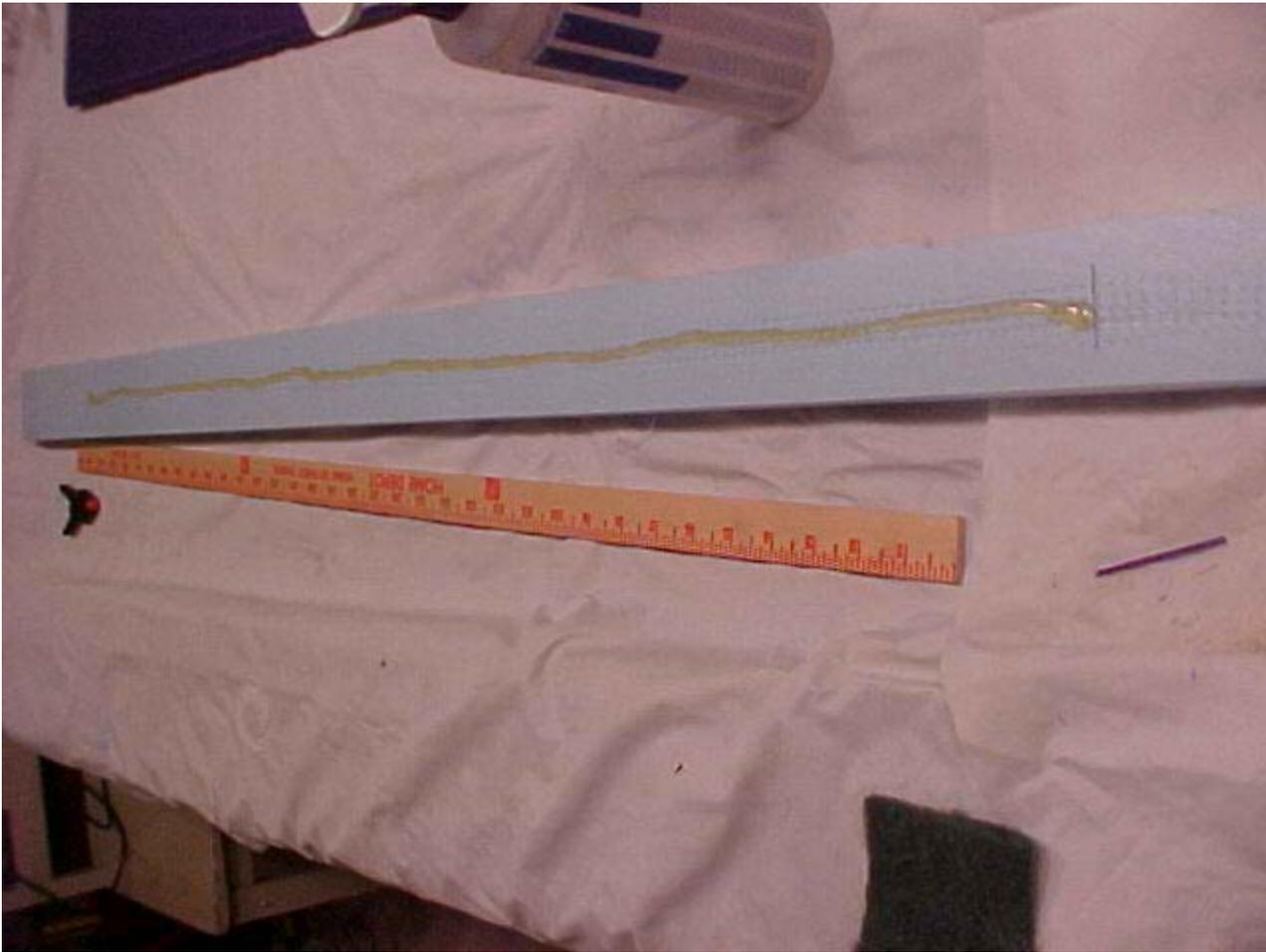
Once you get the wing skin aligned, and weighted as shown. Insert the tip of a ca bottle between the top wing skin, and the aileron (the portion inside the wing), and run a bead of ca down the aileron, to glue it in place. Very carefully pull the books up, one stack at a time, so they are weighting the top skin/aileron glue joint down. Being careful not to move the top wing panel.

Now onto the spar.

The spar is very simple. A yardstick, some zip ties, and a piece of 3/4" pink or blue foam, 2 1/2"x48". Woodpecker the top and bottom of the spar, and one side where the yardstick will be glued to it. If you look cloely, you can see the woodpeckered foam.

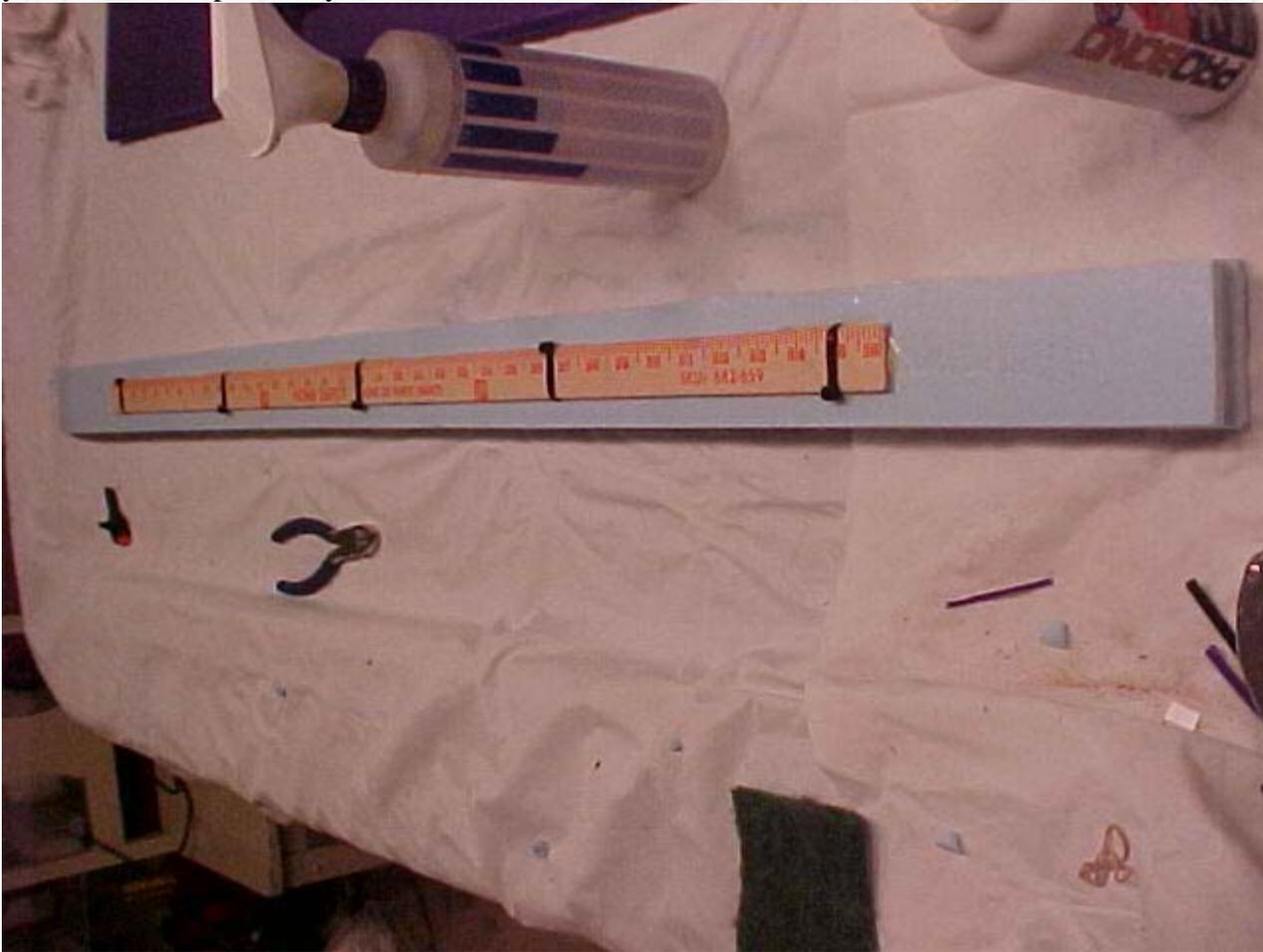


Next, wet the yardstick with water mist, and put a bead of polyglue down the center of the spar.



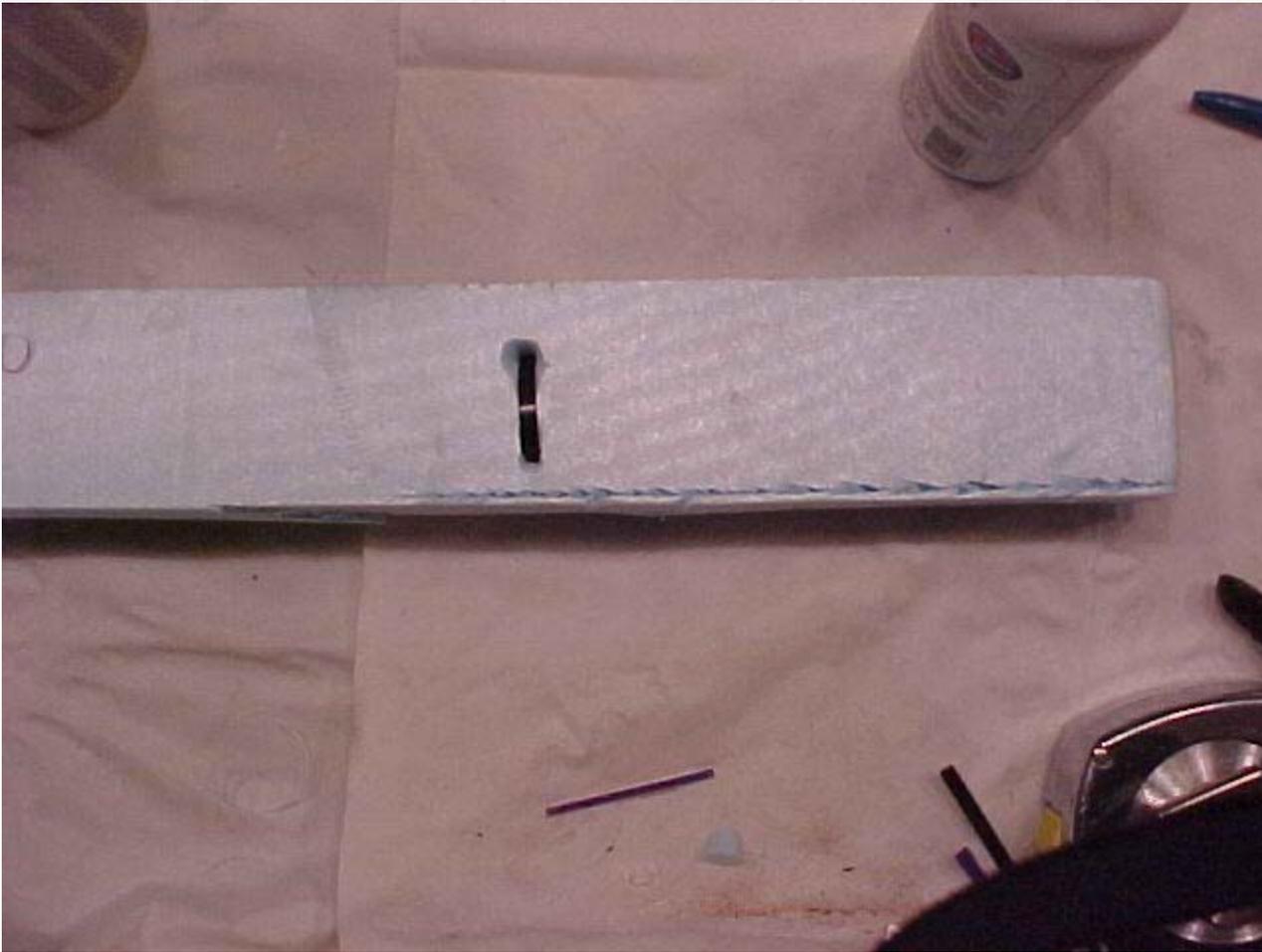
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Center the yardstick on the spar, and press it in place. Then, push a ziptie through the foam, at each edge of the yardstick, and zip tie the yardstick to the foam.



Here's what it looks like from the back side:





Now if your wing has dried, you are ready to install the spar.

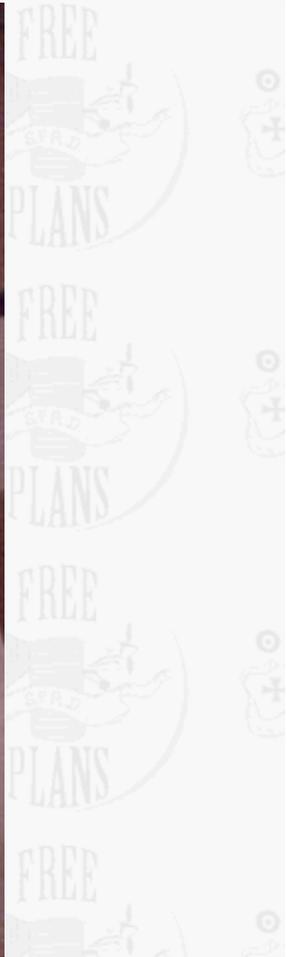
First put a dummy spar into the wing, slide it in, and flip it up. Scoot it behind the real spar location. I use my straightedge for this task



Wet the sides of the foam that polyglue to the coro with a water mist, and wipe off the excess. Then apply a generous bead of polyglue to the spar, both top and bottom.

Slide the spar in, and flip it up into position. Make sure you get it between the spar lines. Place it aside and let the polyglue dry. The wing is finished.

Here's an end pic of the wing, with the spar installed, and the glue cured.





You can't see it in the picture, but that's the wing and fuselage on the scale, before the tail feathers. The weight before tail feathers is 1 lb 15.5 oz. after tail feathers is 2 lb, 4 oz.

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I've ordered a flight pack with the GWS mighty micro servos, i just got conformation that it shipped today, so, i hope to have it Friday. Since i don't want to continue the build until i get the flight pack, i'll post this link to a funfly i built some time ago, with very thorough instructions.

The rest of the build is almost identical.

Here's the jist of how i do it:

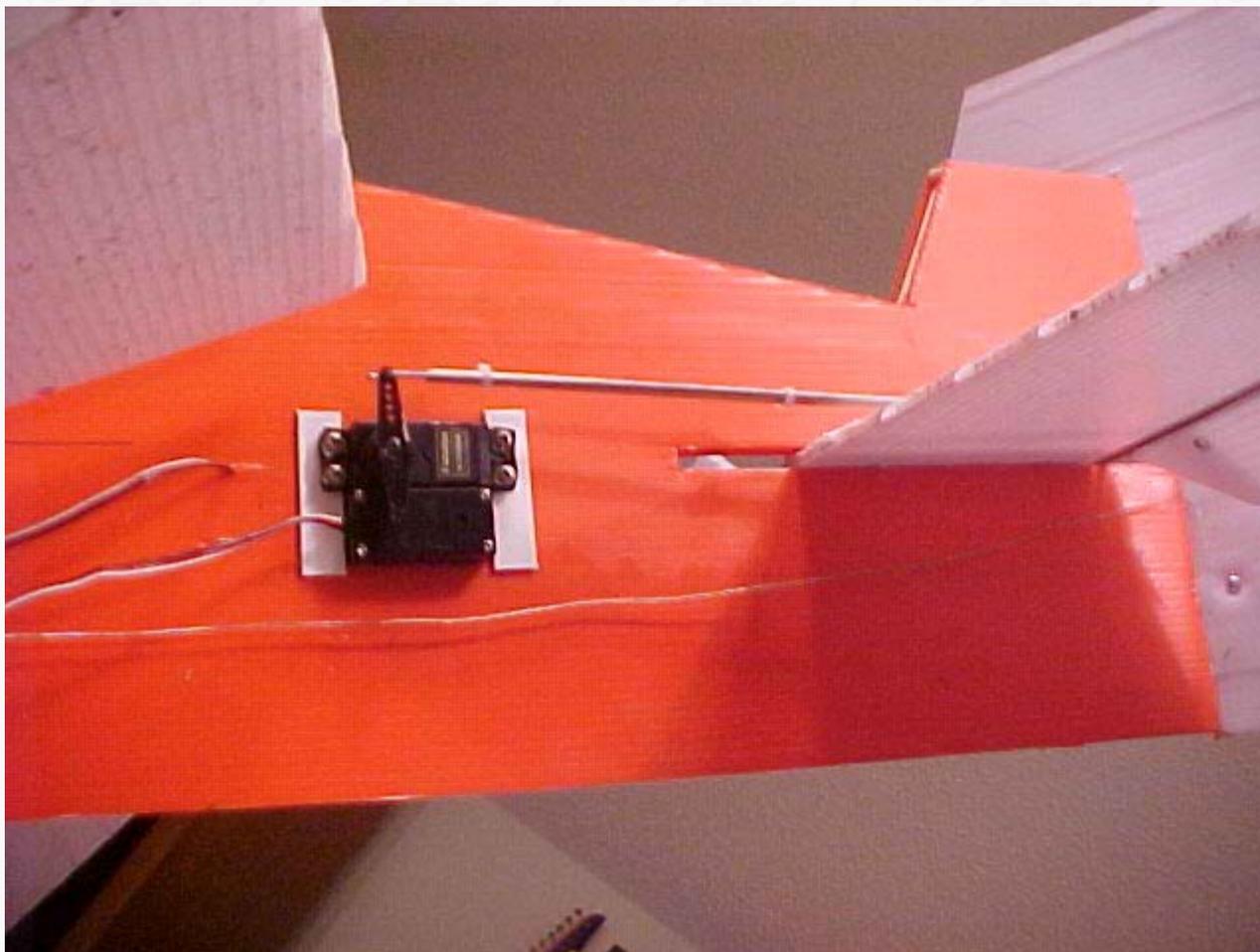
I install the radio gear into the wing, and fuselage, and install the landing gear. tape the battery as far forward as possible, then tape the wing to the fuse, until i find a fairly conservative cg. (usually 25% mac). Thats how i determine where to cut my wing in.

Then i make a template of the wing root, and trace it onto the fuselage, and cut it out. Remove one aileron servo, and slide the wing through the fuselage, with the aileron flipped up over the top of the wing. (see the brickknife build link below). Then, i can move the battery back after i test fly it to find the correct cg.

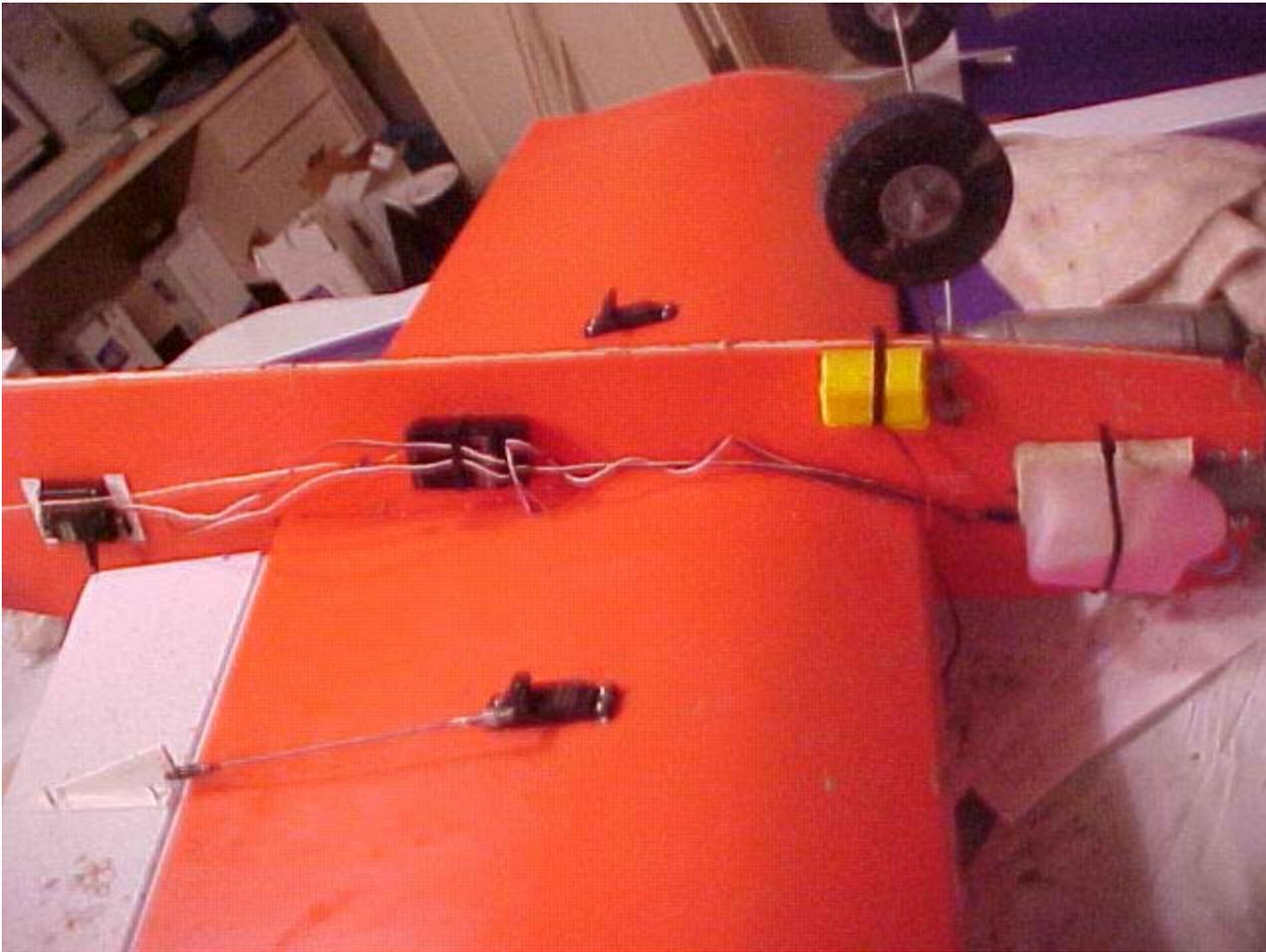
Here's the link to the Brickknife build:

[http://www.rccombat.com/forum\\_2000/topic.asp?TOPIC\\_ID=6345&whichpage=2](http://www.rccombat.com/forum_2000/topic.asp?TOPIC_ID=6345&whichpage=2)

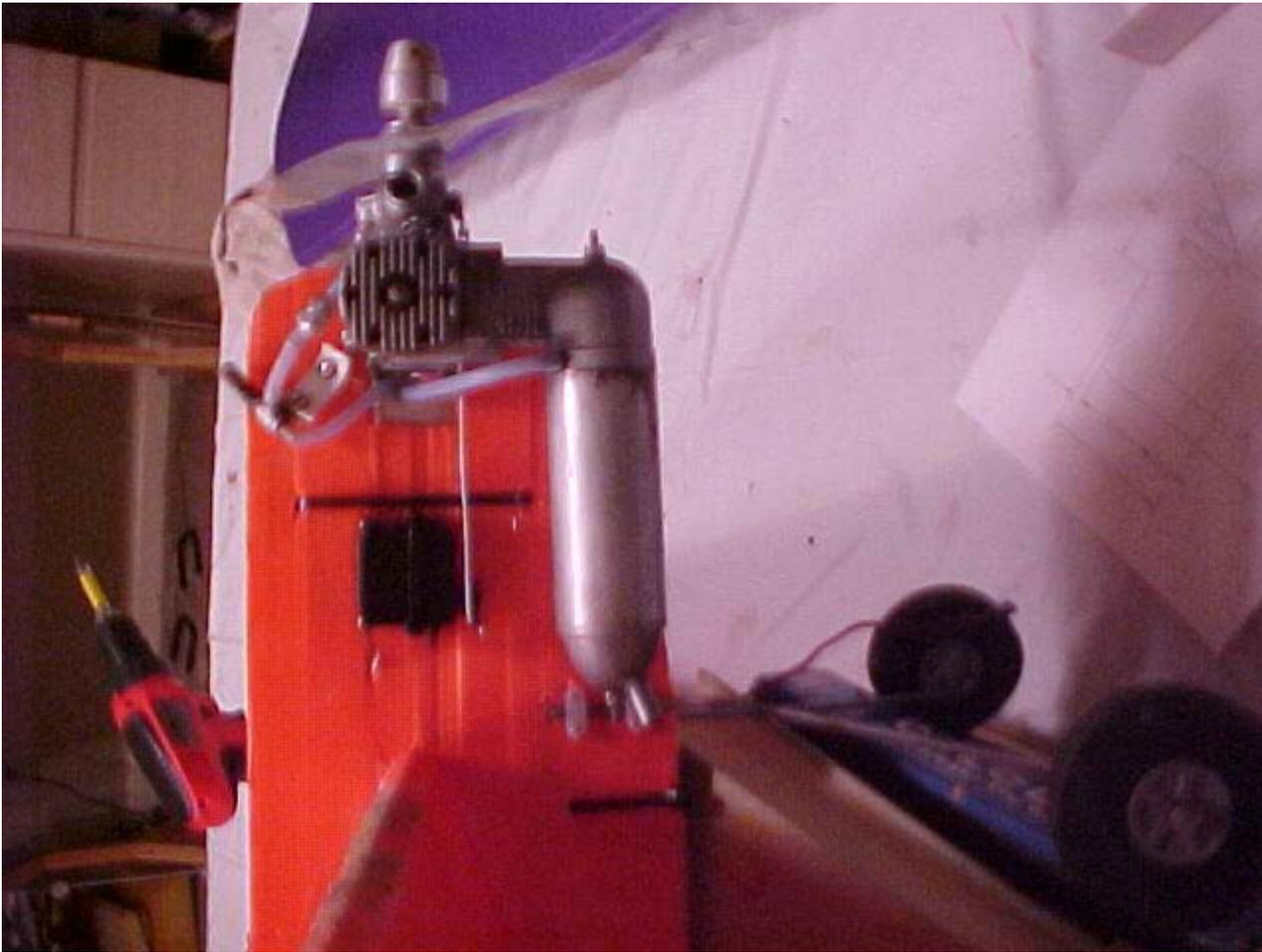
here's a shot of the servo install on the fuselage, for the rudder and elevator:



Here you can see the landing gear, engine mounting, rx and battery mounting. I use double sided tape, and zip ties to hold everything on, the same for the fuel tank.



and one of the throttle servo install, as well.



I'll finish up the plans for the final version, as soon as i get the rest of the parts in. In the meantime, the info above should get you going.

Cg ends up just behind the spar, but, start with it on the middle of the spar, just to be safe, then move the battery back. On mine, the leading edge of the wing was cut in 7 1/4" behind the front of the fuselage.