BUZZARD MODELS

Specializing in mini, micro, and indoor model airplane kits and components.

MADE IN U. S. A.

MARK 8

A pint sized F3P style fully aerobatic 3D aircraft. Small enough to fly in the smallest of backyards, and even your living room! This rehashing of an old design from the “new depron”, giving it the weight advantage of the “old depron” with much greater durability and damage resistance. Our advanced engineering gives you a high performing airframe with very easy assembly.

Wing span : 16"
Length : 16.5”

Battery: 1S 130-1600mah
Weight RTF w/battery: 30 - 35 grams

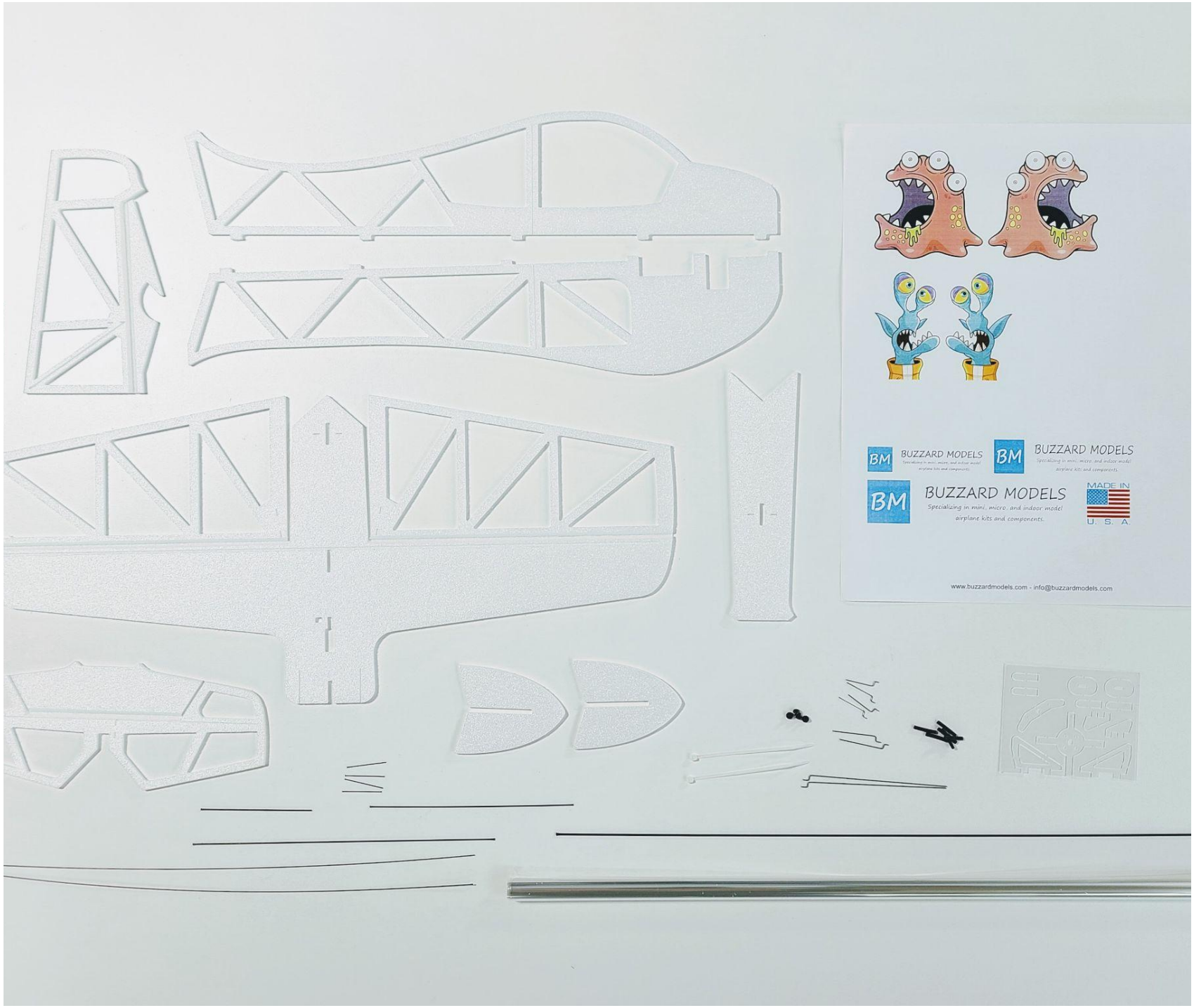
Please read and understand all steps to these instructions before beginning assembly. This plane is not a toy and is potentially dangerous to operate. Children should not operate this aircraft without adult supervision. To start assembly, gather the required electronic hardware and building supplies. You will need some foam-safe glues, and optional paint. Look for the recommended electronic hardware at the end of these instructions and painting tips in that section.



Supplies and tools - We recommend Foam-Cure from Bob Smith Industries for gluing most of the foam joints, and will work just fine to glue everything with. It remains flexible when cured which helps the durability of the completed airframe. There are certainly other brands of foam glue such as Foam-tac, or UHU por. Regular super glue will attack the depron foam, use only “foam safe” CA glues. We like to use the BSI Super Gold Plus which is a medium viscosity foam safe CA glue. It also works well on foam to foam and foam to carbon joints and can be accelerated. To install the covering you will need to buy a small can of 3M super 77 spray adhesive, don’t try other brands, I have not found anything else that is suitable.



Kit contents-



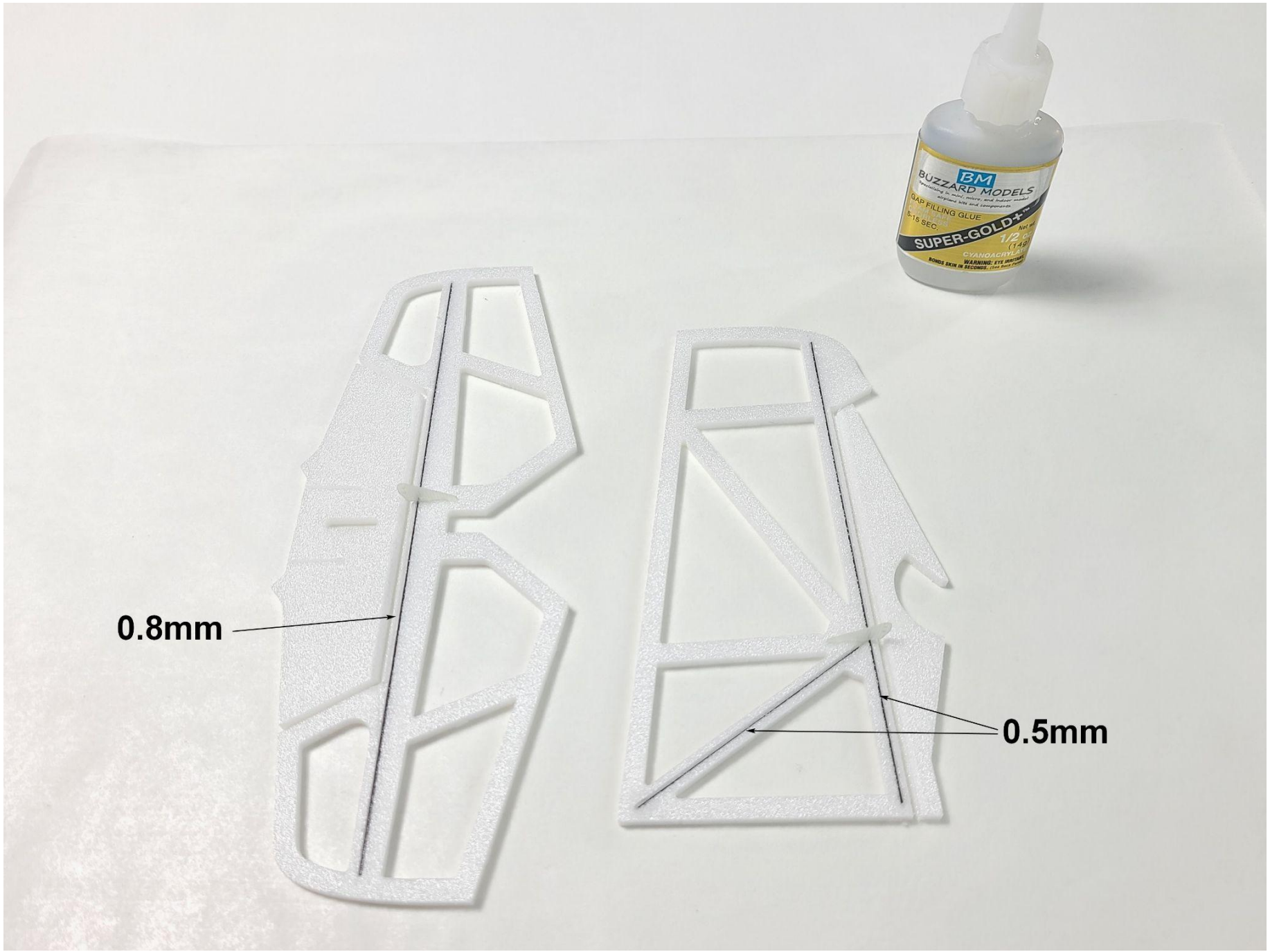
Hinge beveling - Start by beveling all of the hinges. Use a sharp edge of a table or board to support the foam while doing this. Fold the hinges open, and place over the corner of the table with the hinge side down. Using 120grit paper, bevel the corners of the foam just enough to allow the hinges to flex closed at least 45 degrees. Be careful that you do not sand though the hinge.



Picture of hinge flexed closed to 45 degrees - Flex the control surfaces up and down and verify free movement. Sand more if necessary to allow easy and free movement. Do the rudder, elevator, and aileron hinges the same way.



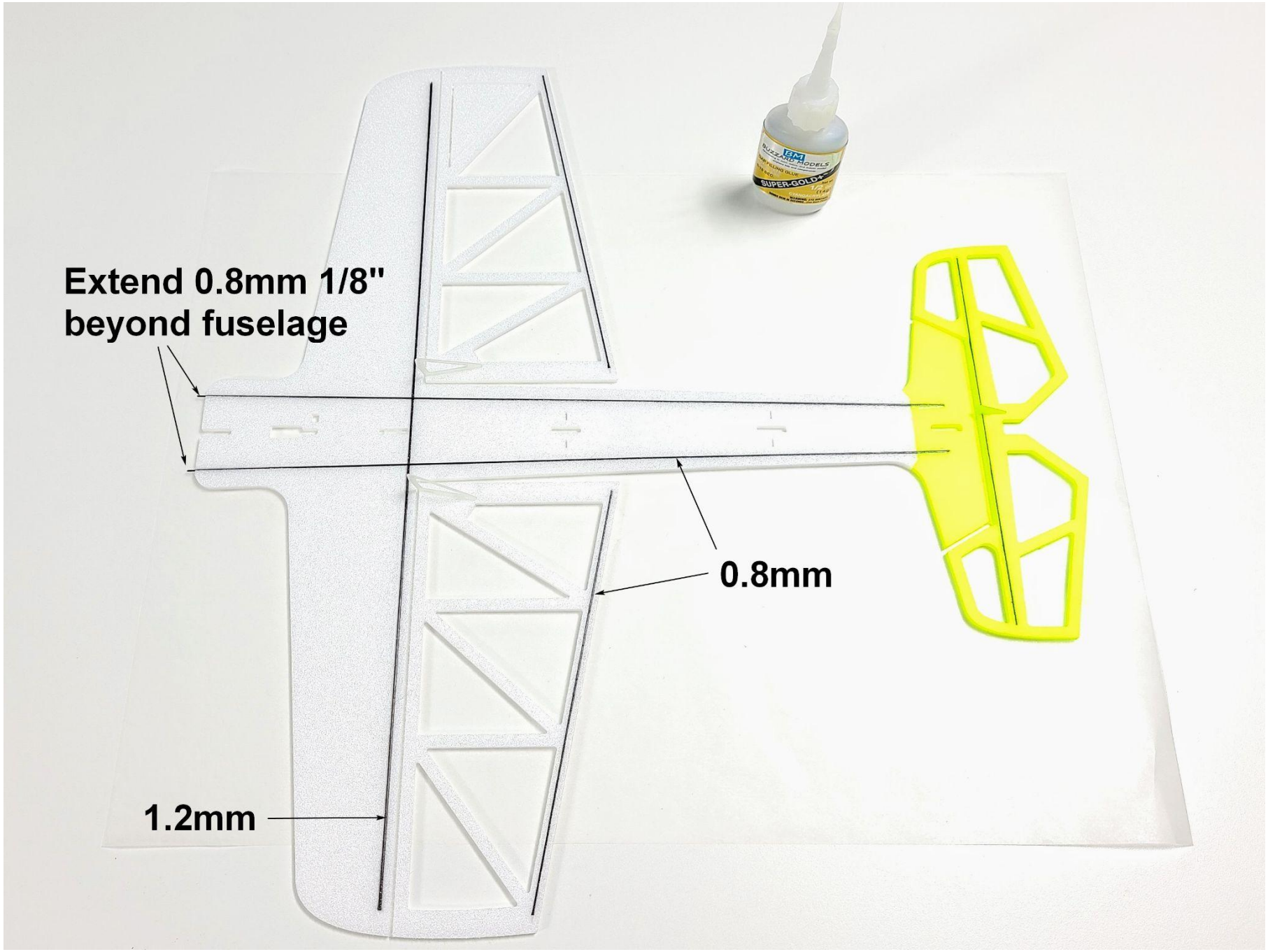
Empennage assembly - With the elevator and rudder hinges beveled and freely flexing, dry fit the carbon fiber reinforcements in place, and then liberally apply a foam safe CA glue with an extender tip. Dabb the excess glue off with a paper towel before it dries. Do the same with the rudder and elevator control horns. Working on wax paper prevents the parts from sticking to the table.



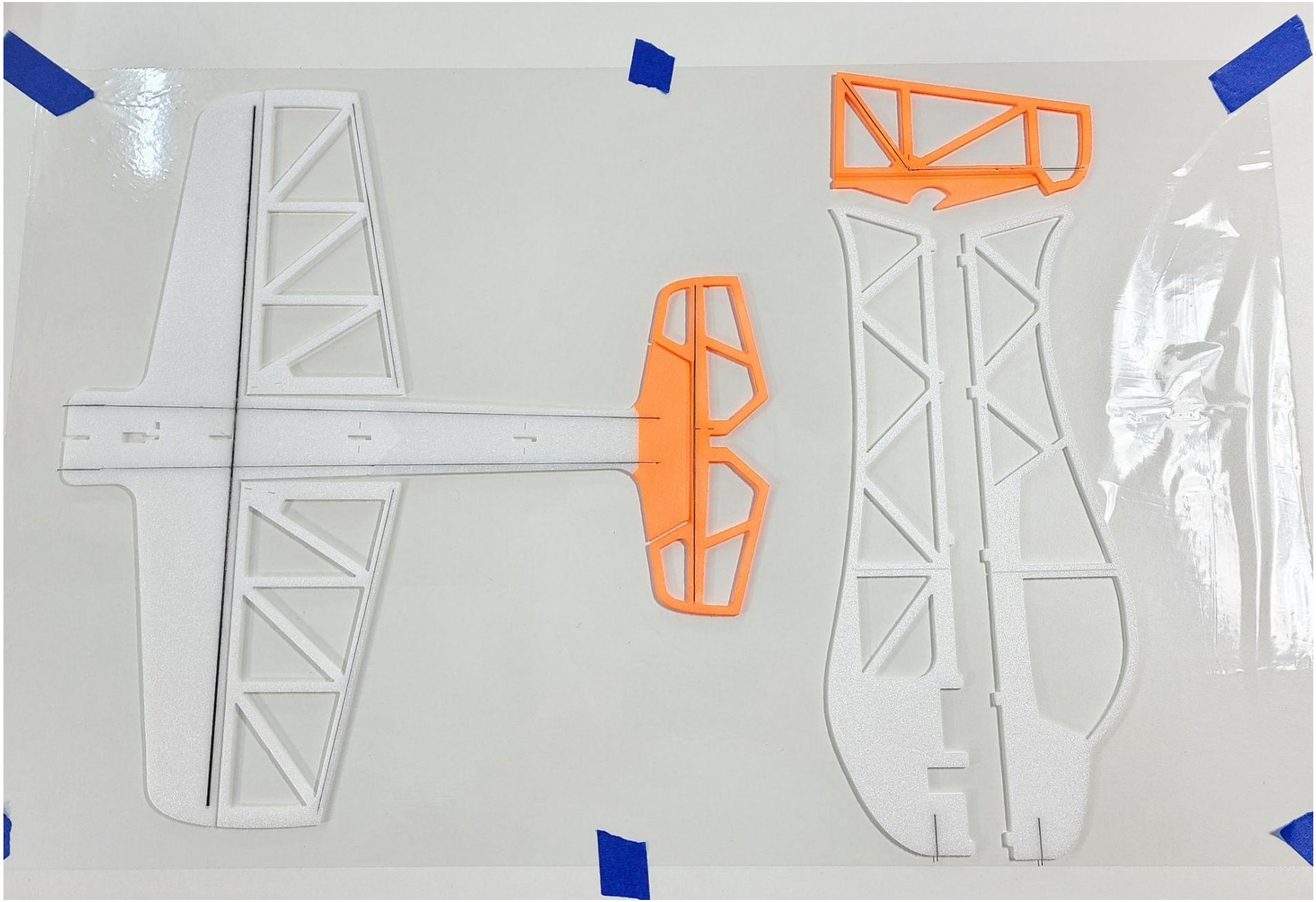
Painting- You can optionally paint now, or after the covering is in place. It is easier to do it now. Basic craft acrylic paint works well if thinned and brushed on conservatively. Makeup brushes work for bigger areas. Alternatively, airbrushing is the best way to paint, alcohol or india inks are ideal, the same basic acrylic paint thinned one-to-one with windshield washer fluid works great through an airbrush. Paint can add a lot of weight, so be careful. Good markers also work well. Make sure to test any paint for compatibility.



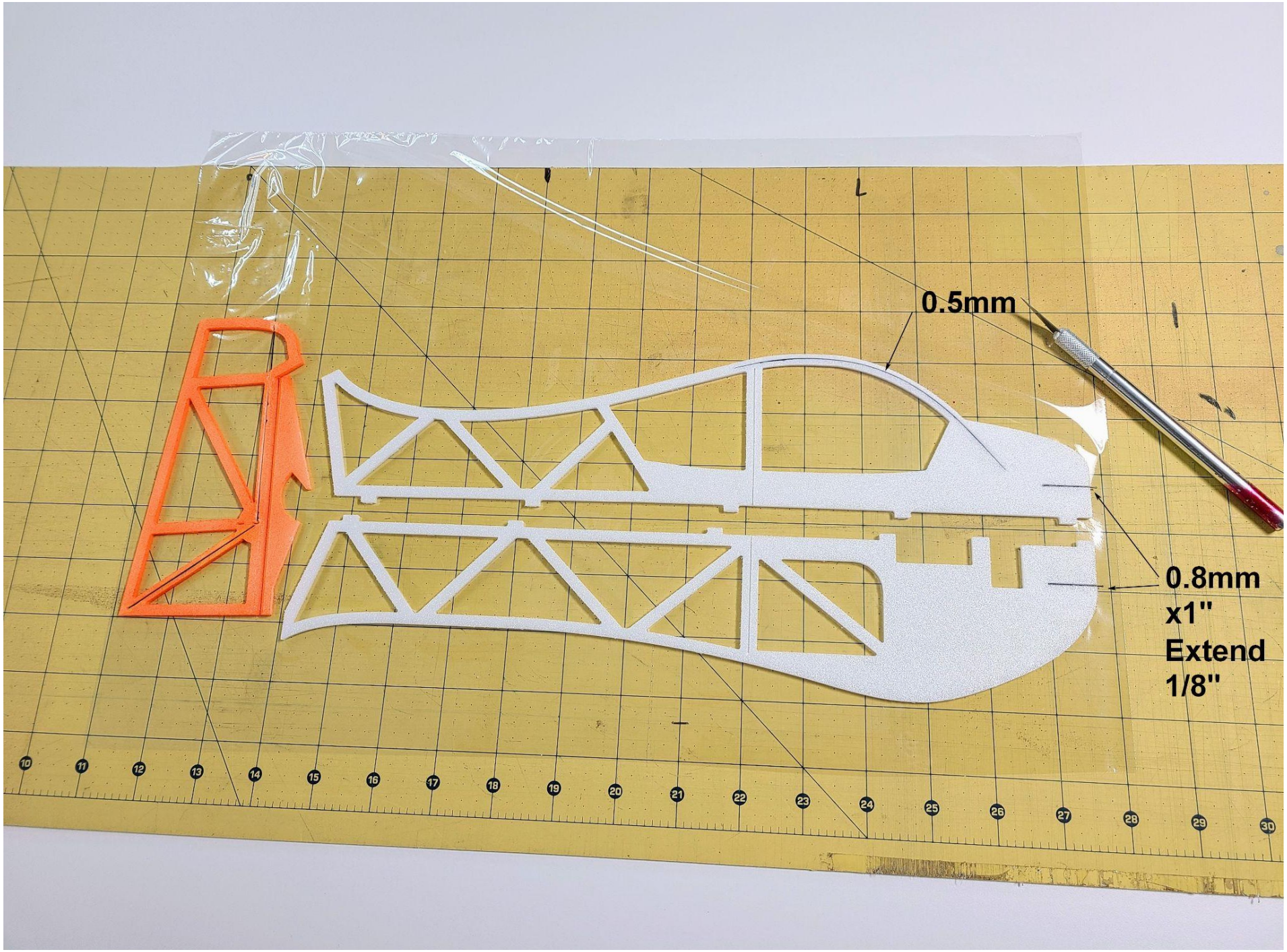
Assembly - Working on some wax paper, glue the wing to the mid-fuselage and the horizontal stabilizer. Add the 1.2mm carbon mainspar first, the 0.8mm fuselage reinforcements go over the top. Add the 0.8mm aileron reinforcements and aileron horns. Again, dry fit the parts and then add medium foam safe CA. Make sure everything is flat as it dries. CA accelerant can be used.



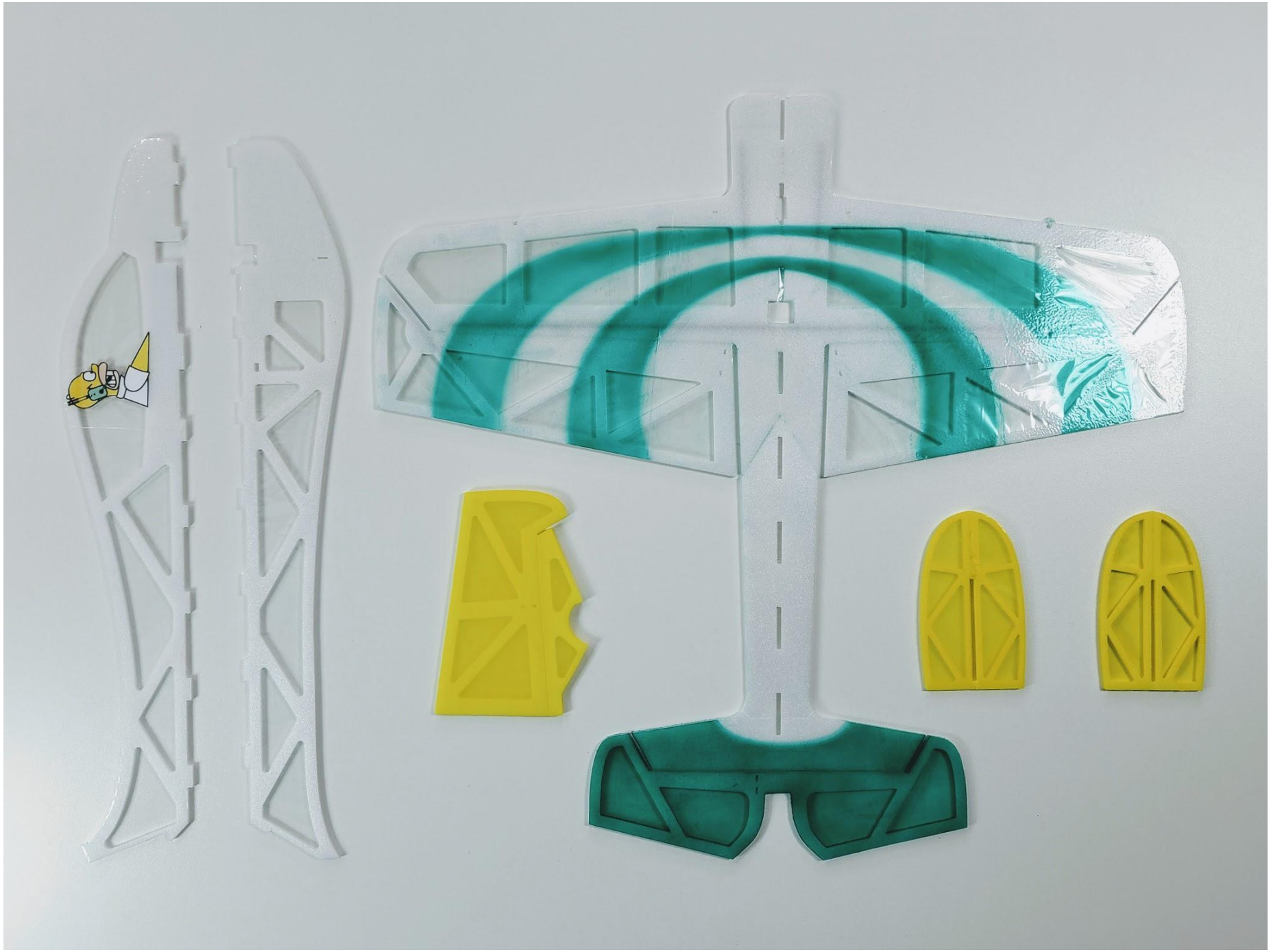
Covering - Now is the time to cover the parts. Layout the mylar covering on a flat work surface, tape the edges down pulling it just taught enough to remove any wrinkles. Layout where your parts will fit before applying glue, make sure the hinge sides are down. One part at a time, remove each from the covering film, and very lightly mist one side with 3M 77 spray adhesive. Stick the part back down on the covering where it came from. Repeat that process until all of the parts are glued down. I highly recommend finding a large cardboard box to place each part in while spraying the 3M 77 adhesive.



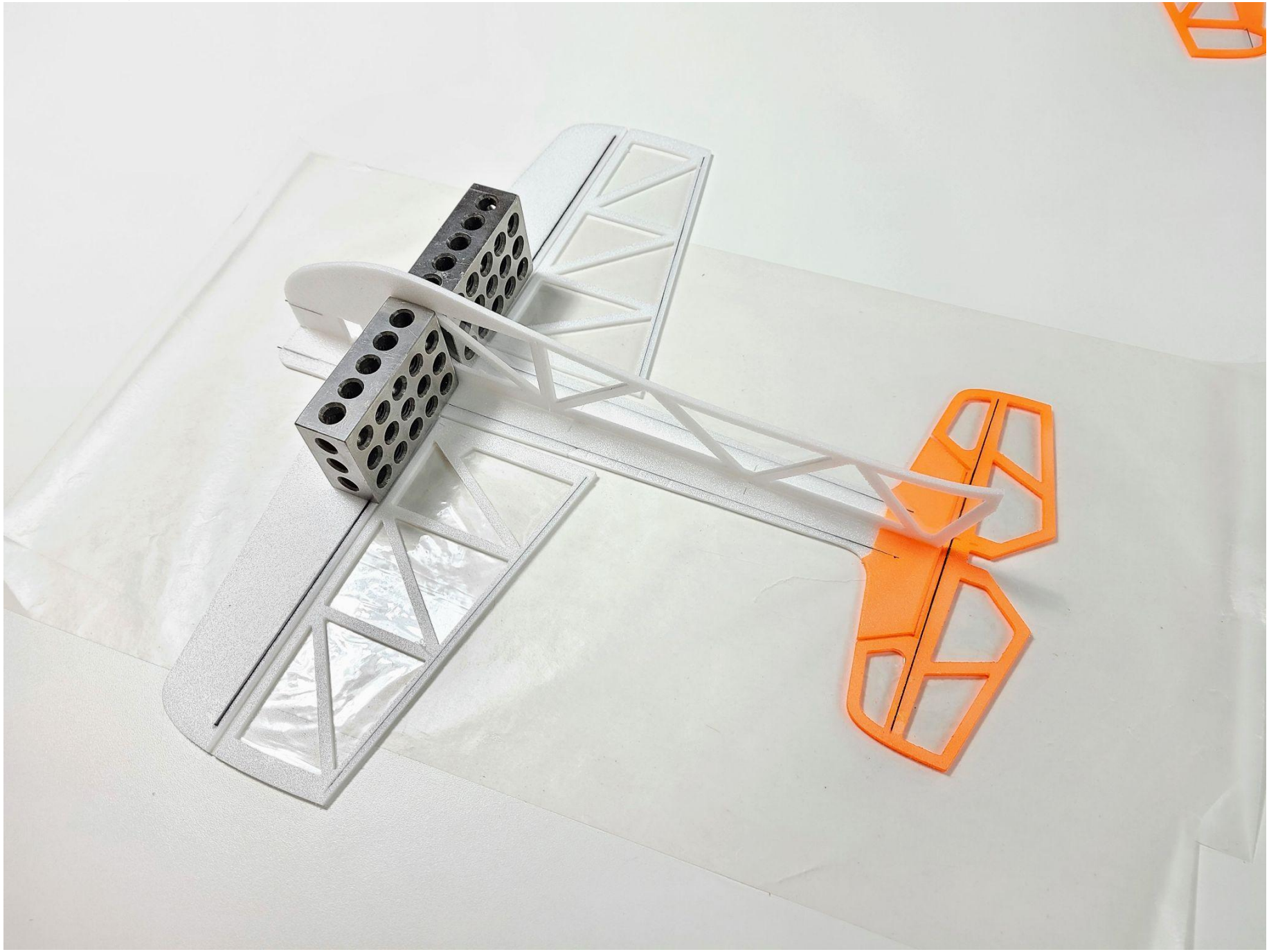
Trim the covering - With the parts still upside down, trim around their perimeters with a new sharp hobby knife blade over a cutting mat.



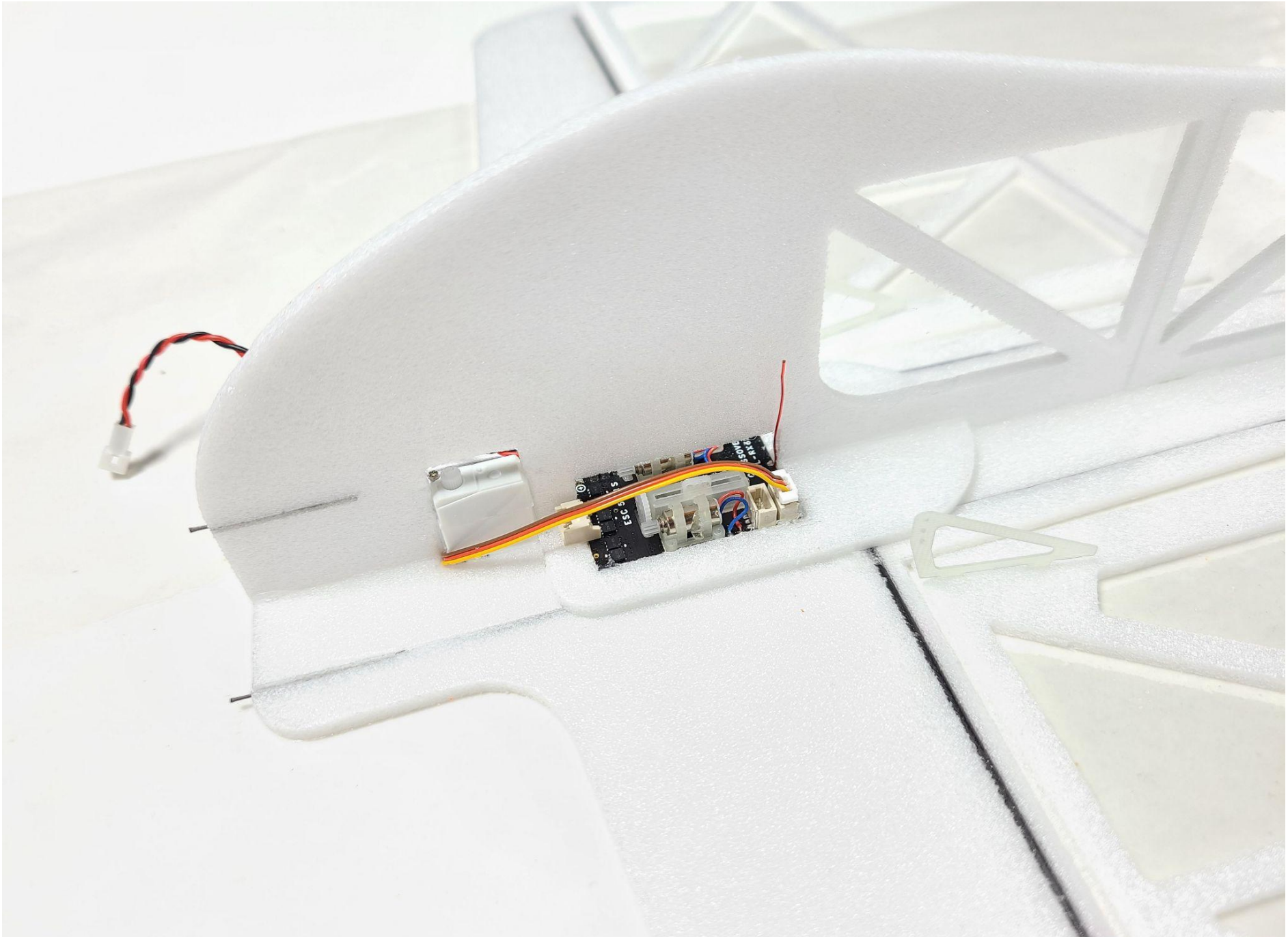
Painting - Here is an example of a similar plane that was painted after covering.



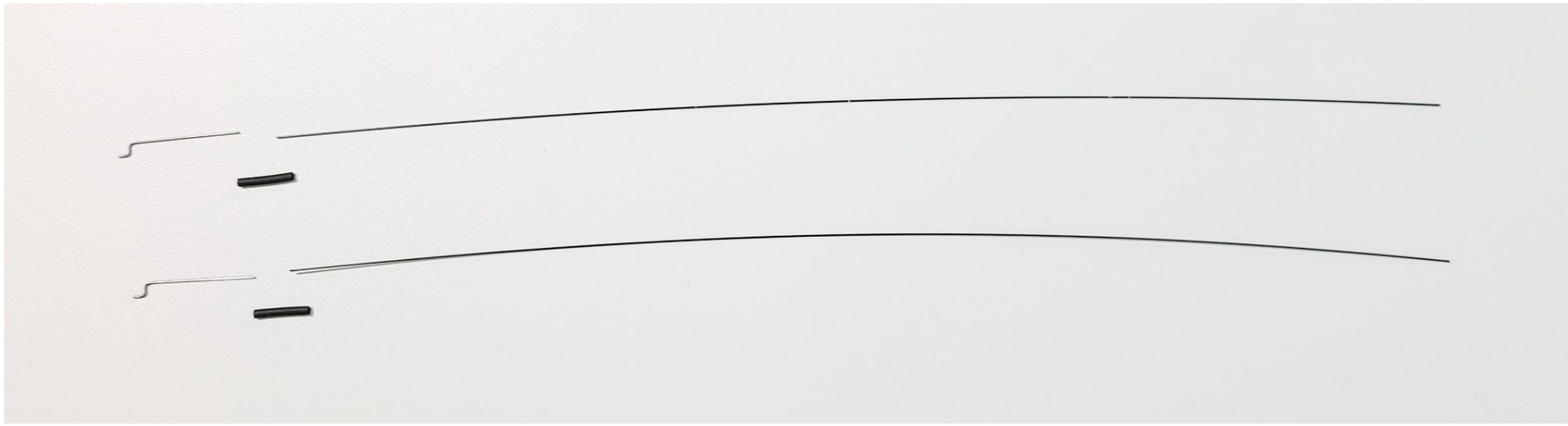
Glue it all together - Glue lower fuselage in place.

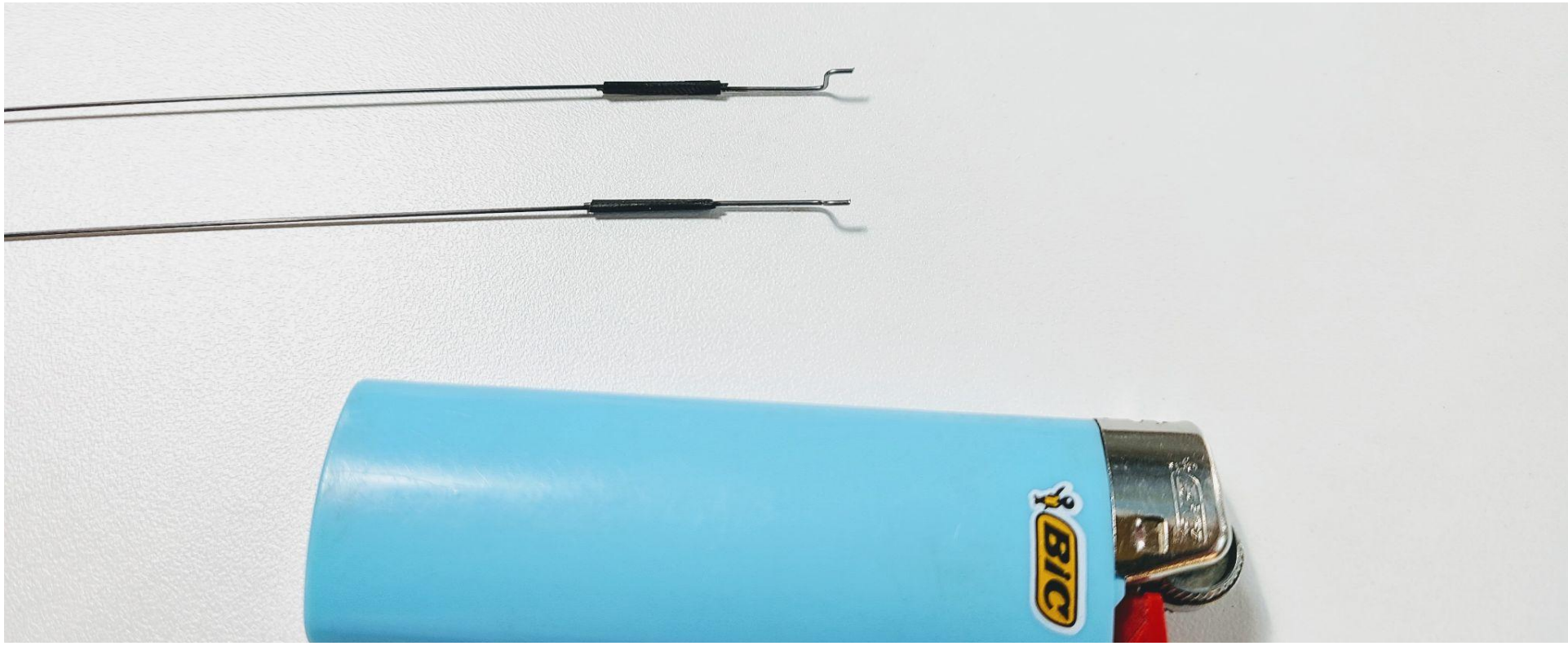


Receiver and servo install - Carefully glue the 3mm foam receiver doublers in place if using the PRO-BRICK MXL-RX62E. Trim the attachment ears off of the 1.7g BM5320S aileron servo and install it in the direction shown, securing it with glue. The MXL-RX62E can be installed, secure it with small dabs of foam glue in the corners, wait to stuff the power wire up through the fuselage until later.

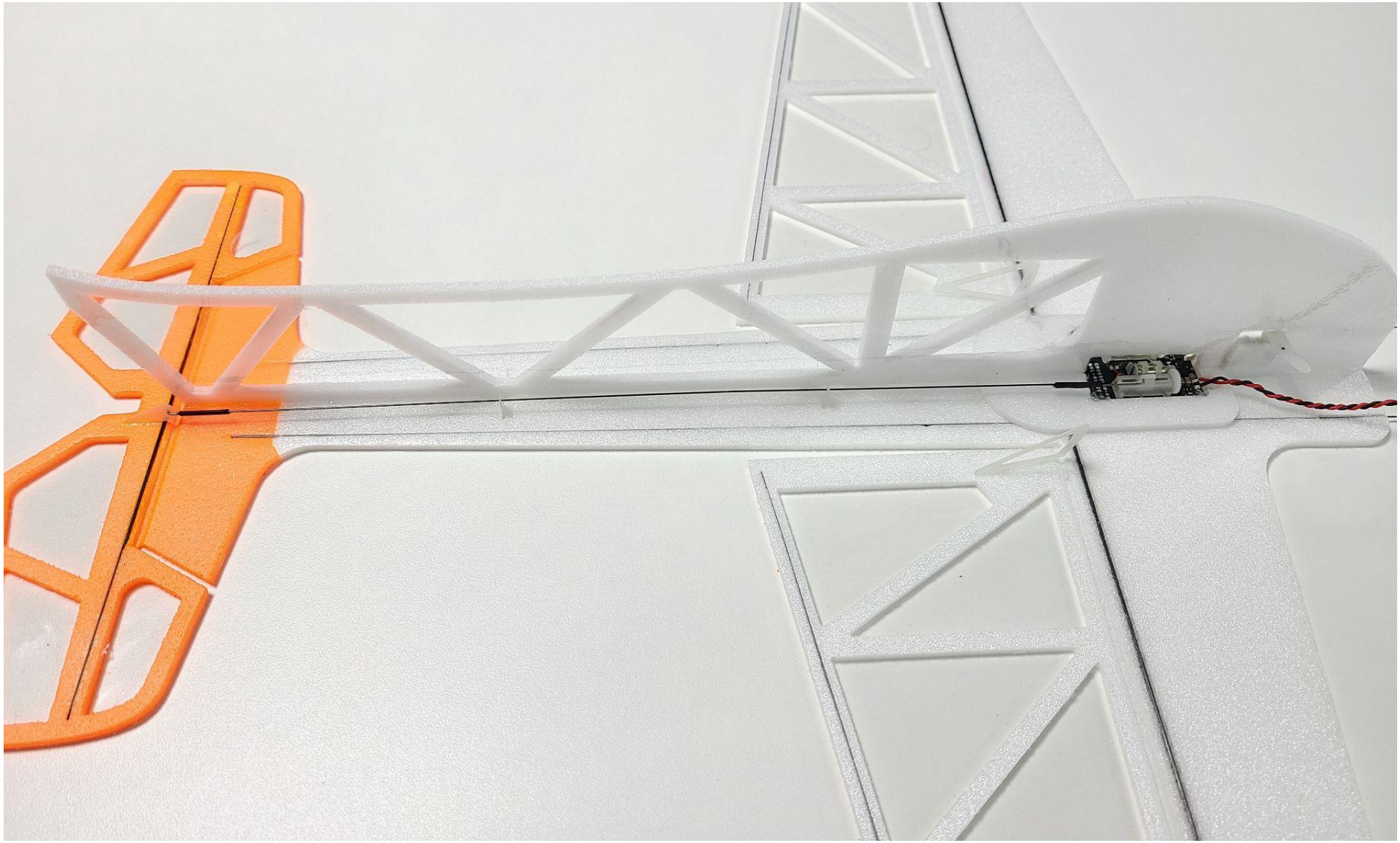


Pushrod assembly - Overlap the two 1” long zee-bends onto the 11” 0.5mm carbon pushrods as shown, shrink the tubing.





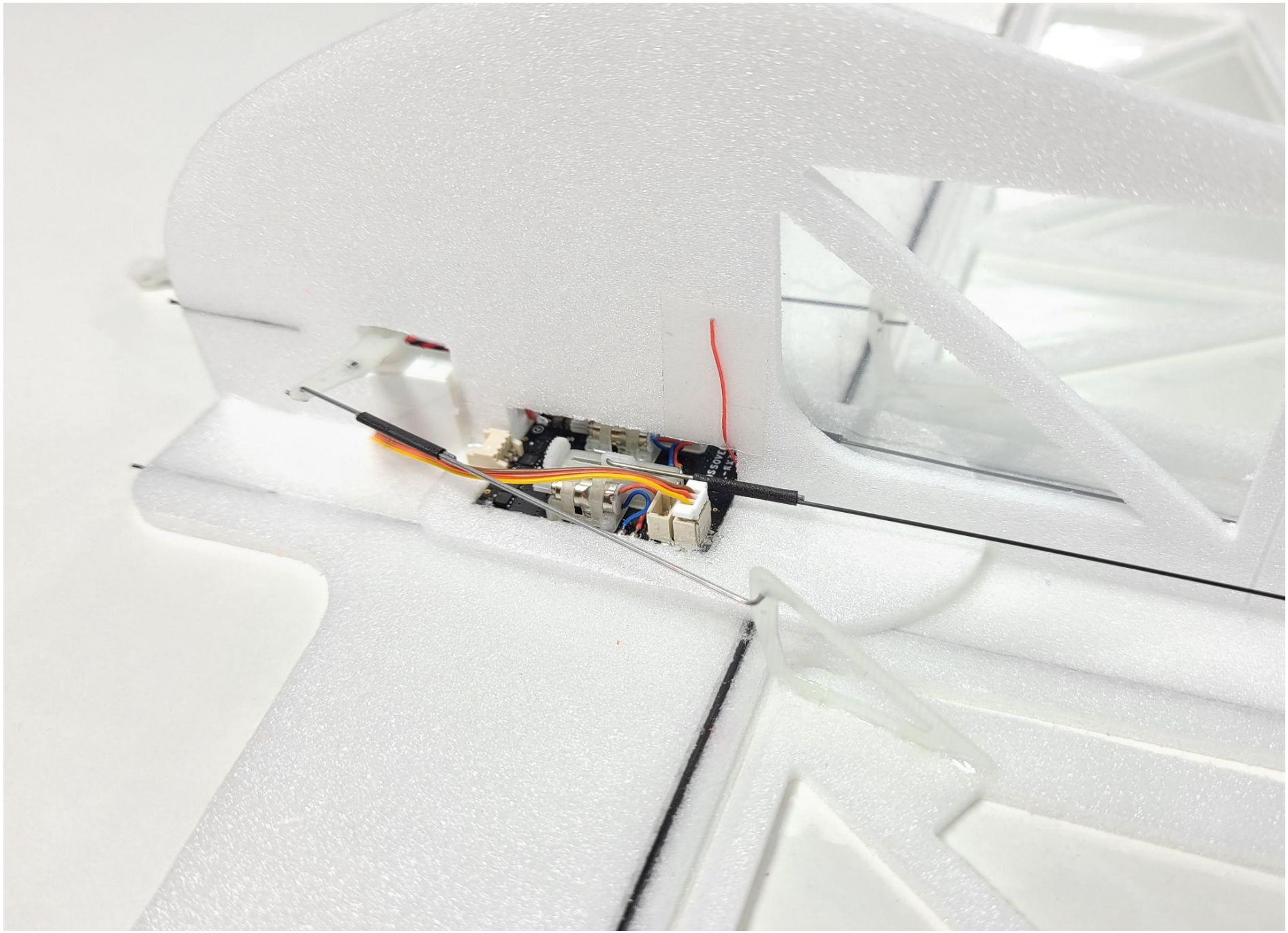
Elevator pushrod install - Slide two of the composite pushrod supports over the pushrod, insert the end with the 1” zee-bend into the smallest hole of the linear servo, be careful the servos are fragile. Install a 5/8" zee-bend into the inner-most hole in the elevator horn. Slip a piece of heat shrink over the pushrod and then the zee-bend, but do not shrink yet. Push the pushrod supports into the pre-cut slots and trim them to make the pushrod travel straight, glue them in place. The next step is very important, power up the receiver and bind it to your transmitter following the MXL-RX62E instructions, set your transmitter trims to zero. Now with everything flat on your work surface and the servo centered, shrink the connection to the elevator horn. A soldering iron or even a butter knife tip heated with a lighter works good for shrinking the heat shrink close to the fuselage. Later, once assembly is complete, and we are happy that the control surfaces are centered with the radio on, we will lock these in place with thin CA.



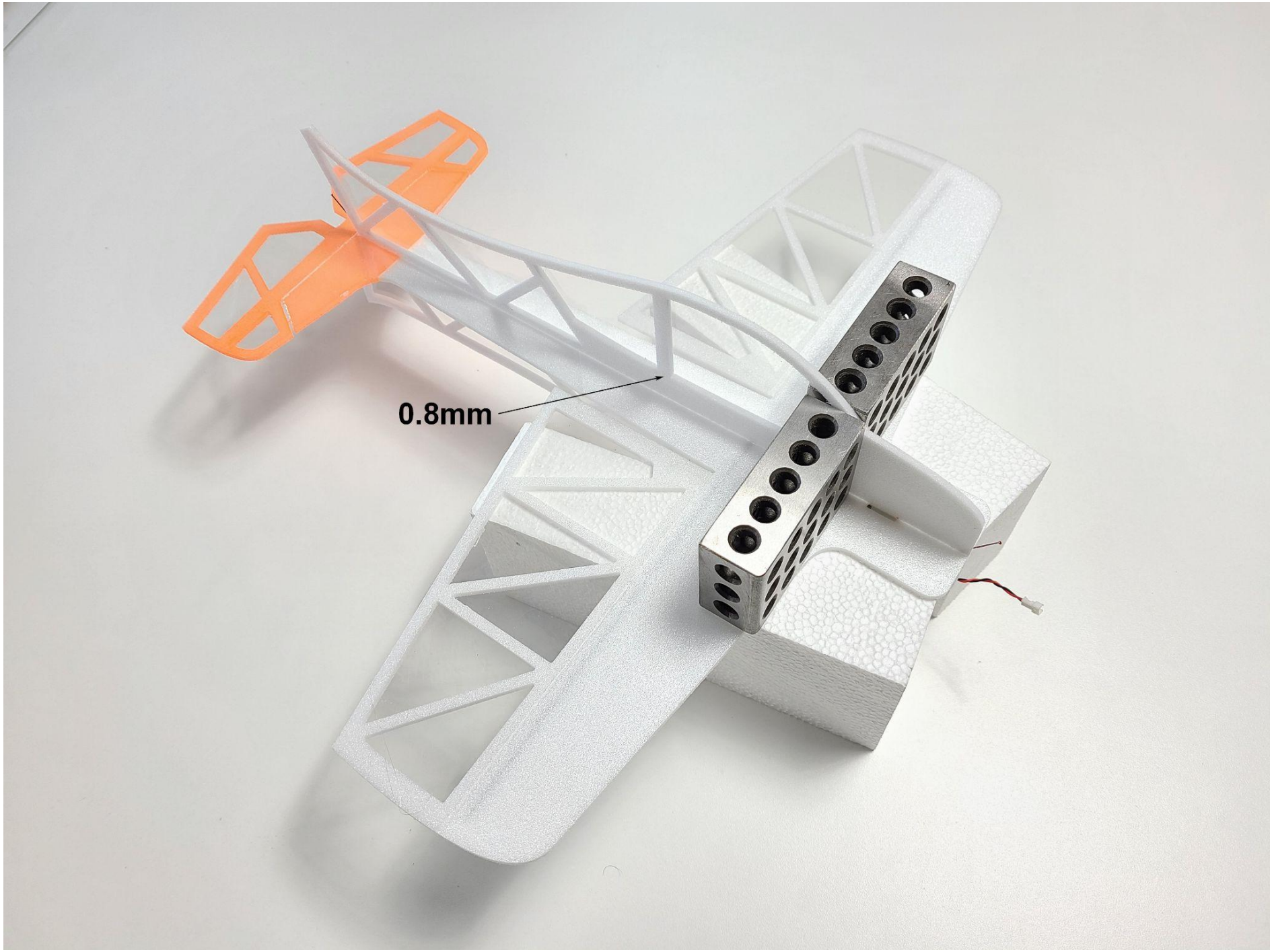
Assemble aileron servo arm - Locate the composite aileron servo arm and the nylon straight servo arm from the BM5320S 1.7g servo hardware. Sand both mating surfaces flat with 120 grit sandpaper and clean with alcohol. There are two holes in the composite arm that correspond with holes in the nylon arm, pin with two of the 7/8" 0.8mm carbon pins from the hardware kit through a piece of wax paper into a block of foam or otherwise pinnable substrate. Glue with a plastic compatible glue. When cured, trim and sand the pins flush. Install the arm onto the servo, verify the aileron is centered by powering up the radio again.



Aileron pushrod install - With everything still flat on the table, install the 2-1/8" pushrods by lapping them over two of the 5/8" zee-bends with heat shrink. Use the outer hole on the aileron servo arm, and the middle holes on the aileron horns. Again, verify that the aileron servo is centered, and shrink the tubing. The receiver antenna can be taped to the fuselage, I like blenderm tape.



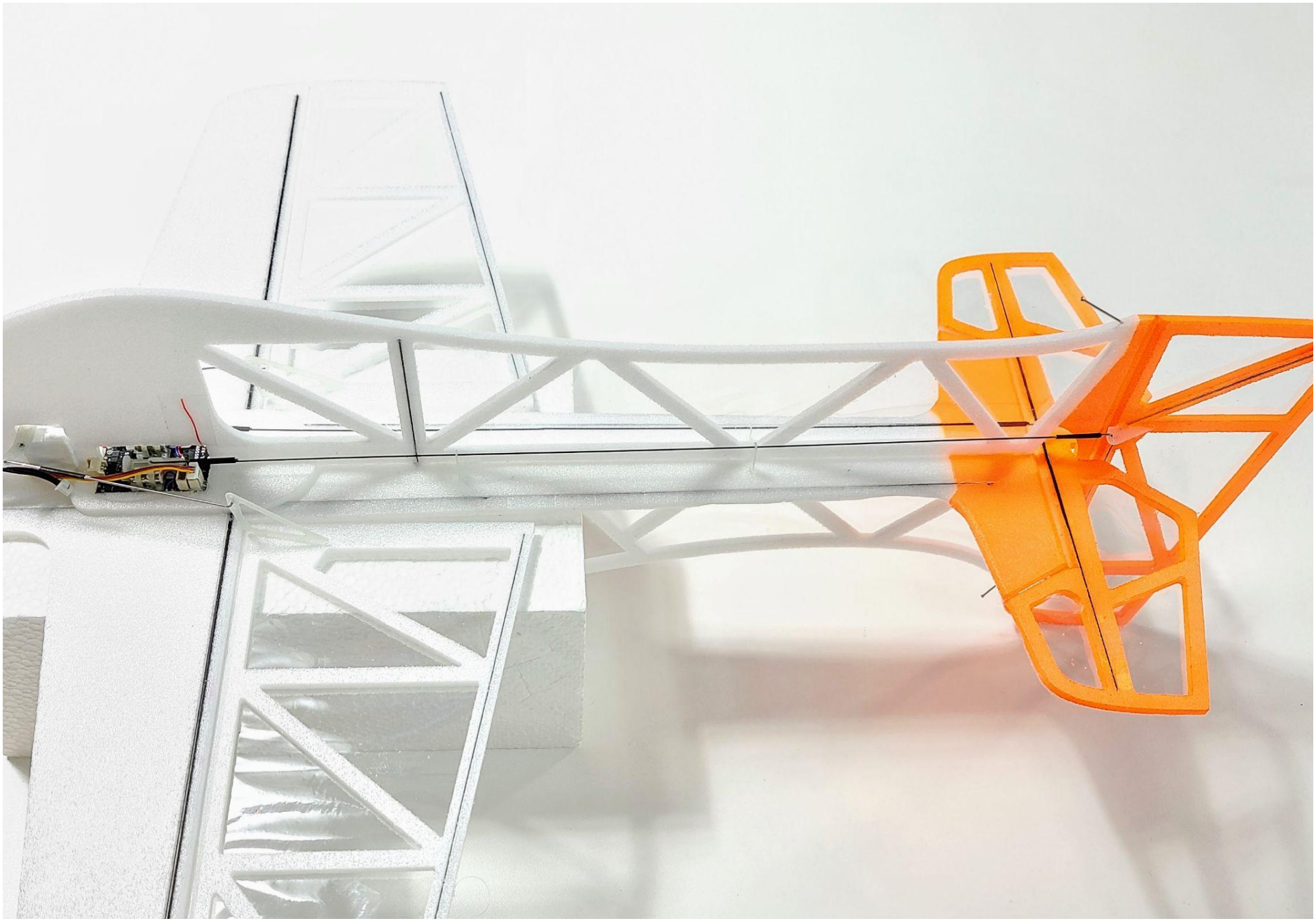
Upper fuselage - Find a secure way to support the fuselage, these two foam blocks work great. Glue the upper fuselage in place. Glue in the 0.8mm dia. carbon fiber upper to lower fuselage reinforcement.



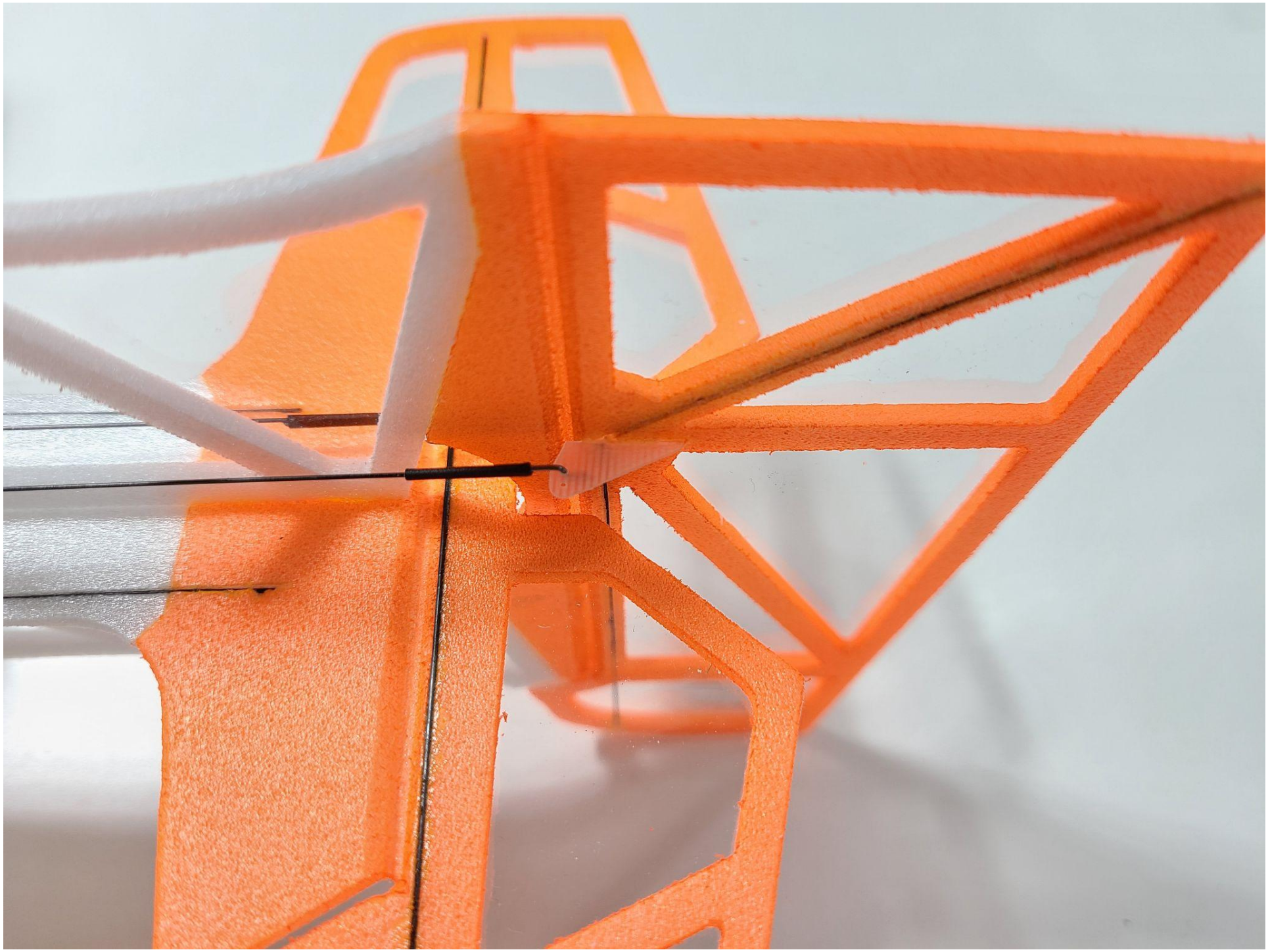
Vertical Stabilizer- The vertical stabilizer can be glued in place, pins can help hold the part in alignment.



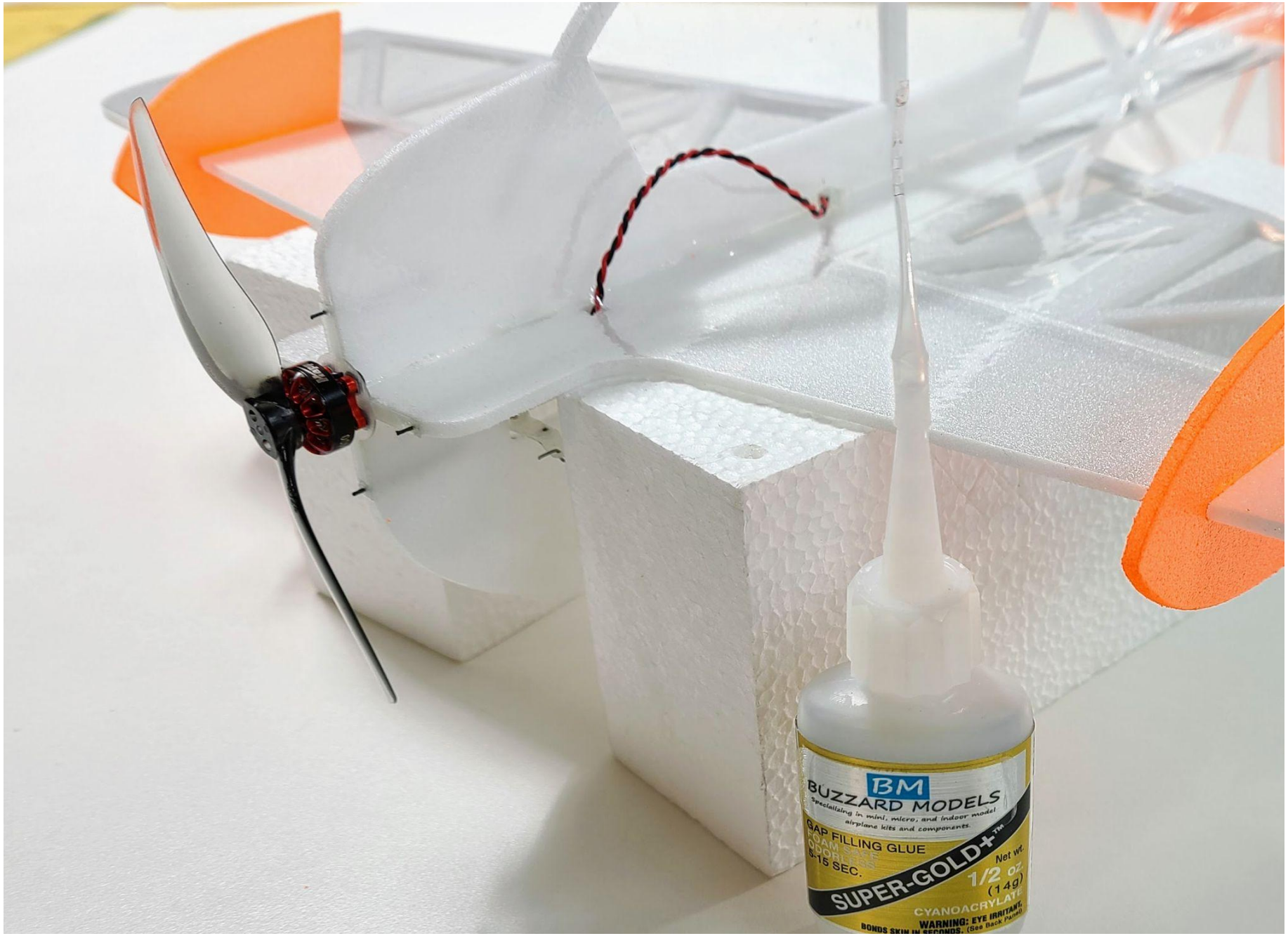
Rudder Pushrod - You can now install the rudder pushrod just like you did the elevator pushrod. Trim the two composite supports so that the pushrod runs straight, then glue in place. The 1" zee-bend goes into the smallest hole of the linear servo, the 5/8" zee-bend goes in the innermost hole of the rudder horn. Make sure the servo and rudder are centered, and shrink the connection.



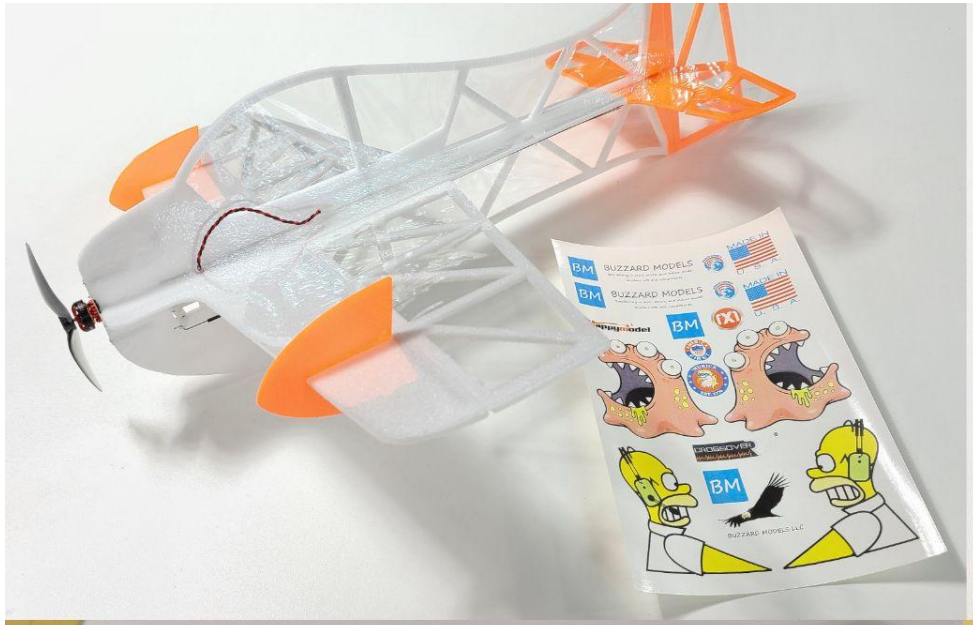
Rudder Pushrod - 5/8" zee-bend goes in the innermost hole of the rudder horn.



Motor Install - Dry fit the motor mount over the four protruding motor mount pins. When satisfied, glue the mount to the fuselage, and add a drop of glue to the protruding pins. When dry, trim the pins leaving a small glue blob on the front side of the mount to make sure it is secured to the pins, the pins provide the majority of the strength. Install your propellor, and pull the battery wire up. The wing fences can now be glued in place, use foam glue wherever gluing depron over the covering.

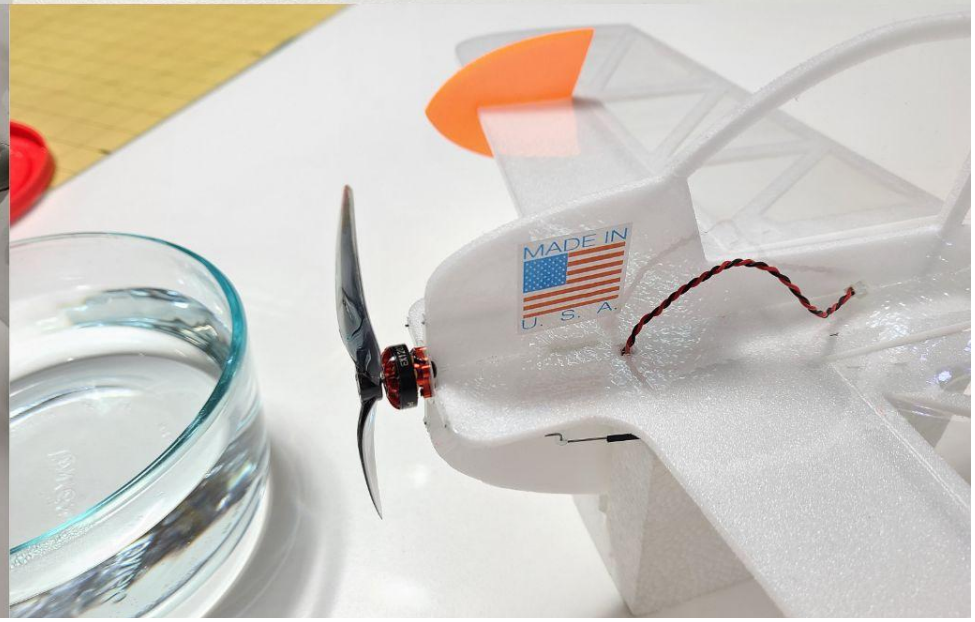


Decal Installation - Now is the time to add decals, paint, landing gear, or anything else that will affect the center of gravity. Your kit includes a sheet of water-slide decals. These are used because they are much lighter than vinyl type stickers. Cut the decals out with a sharp hobby knife. Soak each decal separately in room temperature water for approximately 30 seconds or until the decal starts to slide on the carrier paper. Place the entire decal still on the carrier paper where you desire it to be located, slide the decal off of the paper just enough to be able to apply pressure to the decal holding it in place, and then pull the paper out from under it. Gently rub out any excess water from under the decal.









Center of Gravity - The CG will be set using the battery location. Build a CG test stand, use the tips of your fingers, or even the eraser end of two equal length pencils shoved in some styrofoam. A good place to start is having the CG located at the main wing spar, more advanced pilots will like it a little further back. Adjust the fore and aft position of the battery on top of the fuselage to attain the desired CG. It is important to use the propeller and battery that you will be flying with.



Battery Mount - With the battery location determined, use the supplied micro zipties to mount the battery. Cut or drill holes on either side of the battery. Route the ziptie around the battery, with the ratchet part of the ziptie on the bottom of the fuselage. Leave the ziptie loose enough so that the battery slides in and out with a desired amount of friction. Check for sharp edges on the batteries that may dig into the foam. If you have enough wire length, it is nice to have the battery slide forward into the mount, which prevents it from sliding forward in an abrupt stop, otherwise it is okay to have it slide to the rear. When you are happy with the setup, put some glue on the entire part of the ziptie on the bottom of the fuselage to lock it in place. Velcro may also be used.



Final checklist:

- A good starting point for the center of gravity is at the main spar location. It is vital that the center of gravity is checked before any flying is attempted. More advanced flyers will probably like the CG further back.
- Suggested full travel settings 140% aileron, 140% elevator and 140% rudder.
- Suggested exponential 25% aileron, 35% elevator, 40% rudder.
- When you are happy that all of the control surfaces are in a neutral position with the radio on on, wick some thin CA glue into the heatshrink at each end of each of the pushrods to lock them in place. If adjustment is needed, you can usually slide the pushrods in the heatshrink before they are glued, but not after. If you need further adjustments, simply trim the heatshrink off and reapply.

Flying Tips - The Mark 8 has very low wing loading and does not like much wind. For your first flight, I would recommend flying either in a large indoor area such as a gymnasium, or wait for a dead calm day outside. Once you get comfortable with the flying characteristics you will be able to fly in much smaller areas, and outdoors in more wind. For your first flight I would recommend hand launching it at partial throttle. This aircraft likes to fly slow, the power is only good for climbing and aerobatics.

Recommended Hardware -

- Buzzard Models 4gram 1S PRO-BRICK Power Combo with one (1) BM5320S 1.7g digital servo
- Lectron Pro 3.7V 160mAh 25C LiPo Battery 2-Pack w/Molex Picoblade 1.25mm Ultra Micro Connector

Alternate components:

- 1 ea. 1.7g servo
- MXL-RX62E or equivalent brick receiver ~4.3g
- Happymodel EX1103-6000kv or equivalent brushless motor ~3.8g
- 5x3 prop and prop-saver or shaft adapter
- 130-160mah 1S 35C Lipo ~4.1g