Mountain Models
quality r/c kits

MiniHeff™

Mini Old Timer Model

MiniHeff Specifications

Wingspan: 36.0 in.
Length: 19.4 in.
Wing Area: 164 sq. in.
Weight (Ready to Fly): 4.2 to 4.5 oz.
Wing Loading: 3.7 – 4.0 oz. / sq. ft.

WARRANTY

Mountain Models guarantees this kit to be free from any defects in both material and workmanship at the time of purchase. This warranty does not cover ANY components or parts damaged by use or modification. In no case shall Mountain Model's liability exceed the original cost of the purchased kit. Mountain Models reserves the right to modify or change this warranty without notice.

LIABILITY RELEASE

In that Mountain Models has no control over the final assembly or material used for final assembly, no liability shall be assumed or accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return the kit immediately in new and unused condition.

THIS PRODUCT IS NOT INTENDED FOR CHILDREN 12 YEARS OF AGE OR YOUNGER.

WARNING: This product may contain chemicals known to the State of California to cause cancer and or birth defects or other reproductive harm.

PRODUCT SUPPORT

This product has been designed to function properly and perform as advertised with the SUGGESTED power system, speed control, and servos, as described in advertisements and in this manual. We do NOT support, nor can Mountain Models assist in determining the suitability or use with any other electronics or hardware not recommended by Mountain Models.

For the proper electronics to complete this model, replacement parts, and product assembly questions, please contact Mountain Models online at www.MountainModels.com

Thank you for purchasing the Mountain Models MiniHeff™. The MiniHeff™ old timer is a small model designed to bring back that nostalgic feeling of yesteryear, in a small field electric package. Taking inspiration from many different free flight planes of the past, we developed the 36 inch MiniHeff™, which resulted in a super lightweight, nostalgic, and relaxingly smooth flying plane.

The MiniHeff™ was designed using a state of the art 3D CAD package, to allow for exceptional interlocking parts design and fit. 3D design also allows us to provide clearer assembly images, without having to use photos.

The MiniHeff™ is built from self-jigging interlocking laser cut balsa and plywood parts. It's like a 3D jigsaw puzzle with instructions. Although not needed for building, full size plans are included for reference. If the instructions are read before hand and followed during the build, the MiniHeff™ can be built up and ready to fly in only a few evenings.

We think you'll like the MiniHeff™ and look forward to any feedback you might have.

Thank you,

Brian Eberwein

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Phone: 719.630.3186

Before You Begin

Check to make sure that all of your parts are there and in good shape.

Parts List

Number in Kit	Description of Part
Bundled Parts	
1	Laser Cut Parts (See wood inventory sheet)
1	Plan Sheet (24” x 36”)
1	These instructions of course!
Metal (on the back of the wood bundle)	
2	0.025” x 18” Wire
2	1/16” Pre-bent landing gear wire
Bagged Parts	
1	3/32” Basswood elevator joiner
4	#2 Motor mount screws
2	DuBro black wheel keepers and set screws
1	Velcro, sticky backed, 3”
2	Wheels
1	CF Rod, 0.060” x 1-5/8”
2	DuBro Micro Servo Connectors
1	1/8” x 2-1/2” Dowel
2	Magnets, 1/8” diameter, 1/16” thick
2	DuBro control horn
1	Aluminum tube, 3/32” diameter x 3/4”

Building Materials You Will Need

- Smooth and FLAT work surface
- Wax paper or clear plastic wrap to protect the work surface
- Thin Cyanoacrylate (CA) glue
- 5 Minute Epoxy
- Hobby knife with #11 blades
- Needle nose pliers
- Wire bender or pliers for bending pushrod wires
- Wire cutters
- Screwdrivers
- Sanding block, 320 to 400 grit sandpaper

Finishing Materials You Will Need

- Covering material (SoLite, 1 roll)
- Sealing iron for applying and shrinking the covering

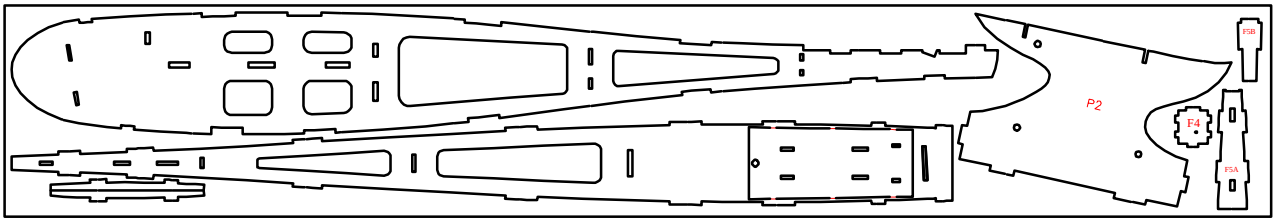
Electronics You Will Need

- 3 channel radio minimum
- 4 channel mini receiver (Berg 4L or Spektrum 6110e)
- 2 ea. 3.7 gram servos (Power HD 1370A or Mountain Models 3.7)
- D1811-2000 10 gram Outrunner
- GWS 6030 HD Prop
- Feigao or Mountain Models 6Amp, 6 gram ESC
- Rhino or PolyQuest 2S-360 LiPo

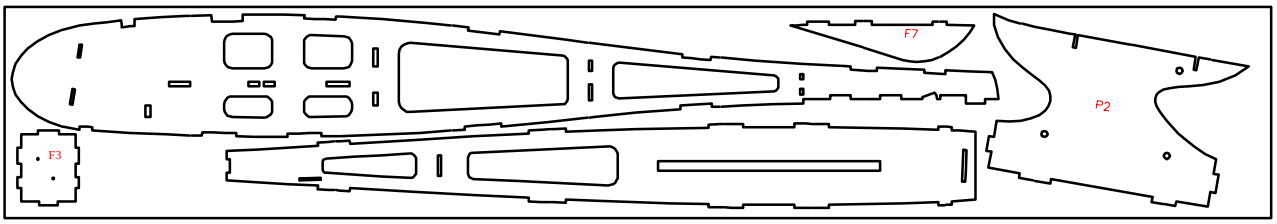
General Building Tips

- READ THE INSTRUCTIONS all the way through and study the plans BEFORE starting any work on the model.
- Tape the plans to your nice clean work surface and cover it with wax paper or plastic wrap. You want to keep your work surface clean and not glue the parts to the plans, right?
- Balsa is a lightweight and fragile wood, so you do need to be careful with it; however, you will also need to use a little bit of force to make everything fit properly, so don't be too timid.
- Do not remove any pieces from the balsa sheets until they're ready to be used. That way, parts won't get mixed up or disappear.
- Do NOT glue anything until told to do so.
- Join all of your pieces using thin CA (Cyanoacrylate) glue, unless we tell you otherwise. In general, only a small amount of CA is necessary to glue parts together.
- Don't over force your pieces together. If they aren't fitting together properly, make sure you have the right pieces and that they are oriented correctly. If needed, you can lightly sand the part to fit after making sure it is the correct part and oriented correctly. On balsa "tabs", you can "pinch" the wood with your fingers to get them to fit in slots. (The tabs might be tighter some times, due to tolerances in wood thickness)
- If you want to remove the charred edges caused by the laser cutting process, lightly dampen a cloth with bleach and gently rub the affected areas. Removing the char will not increase the strength but will make it look better. It also keeps that dark edge from showing under the lightweight coverings.

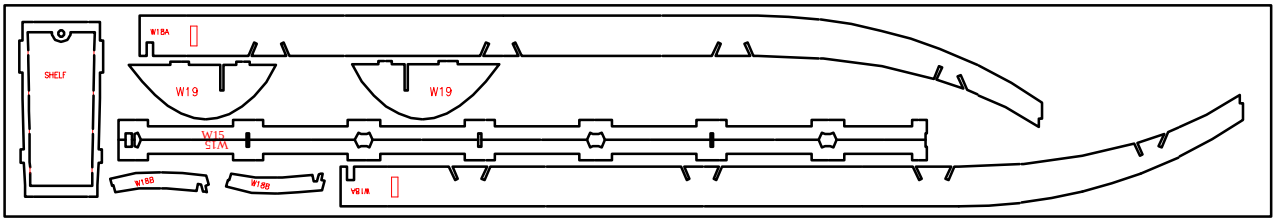
WOOD INVENTORY SHEET



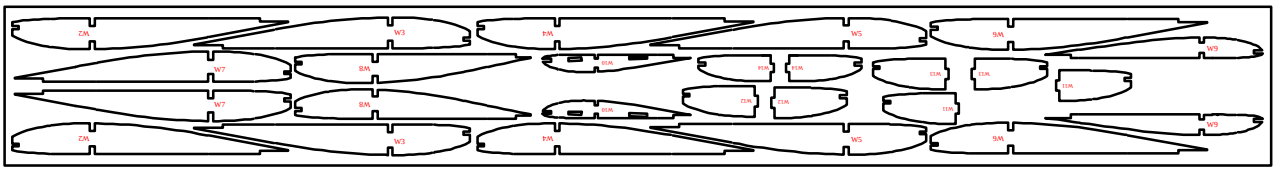
1/16" BALSA



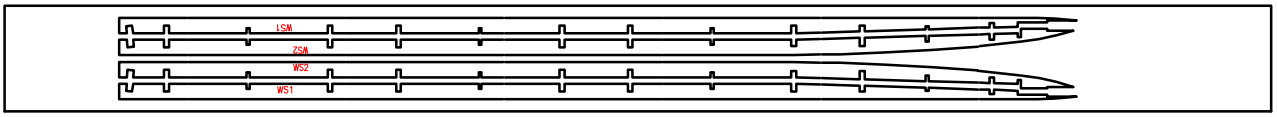
1/16" BALSA



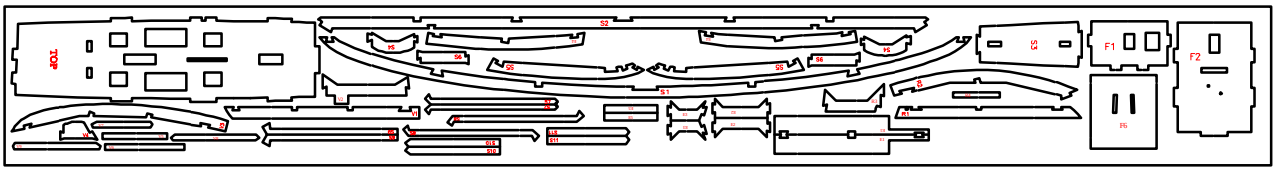
1/16" BALSA



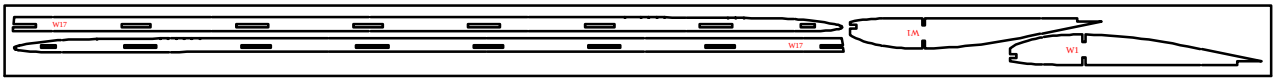
1/16" BALSA



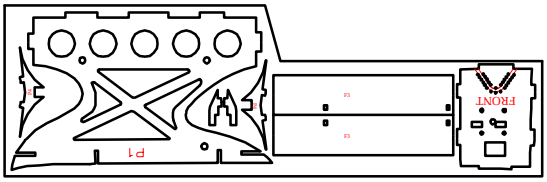
1/16" BALSA



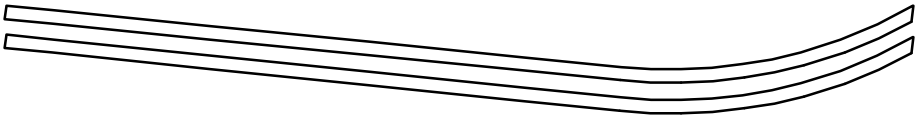
3/32" BALSA



1/8" BALSA



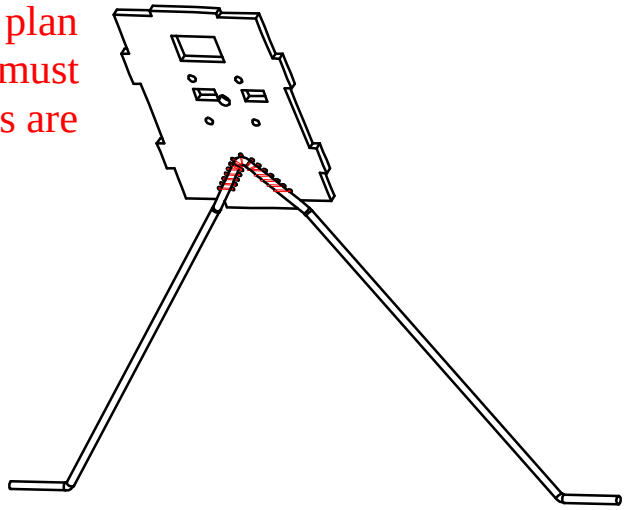
1/16" PLYWOOD



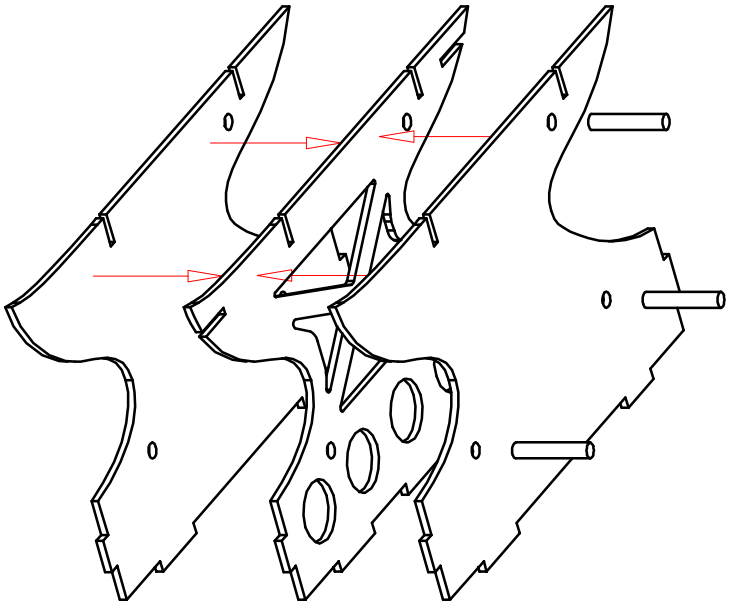
1/64" PLYWOOD

3/32" BASSWOOD

STEP 1: Bend the landing gear, as shown on the plan sheet. It has already been bent to shape, but you must still add the second bend, so the landing gear legs are bent forward.

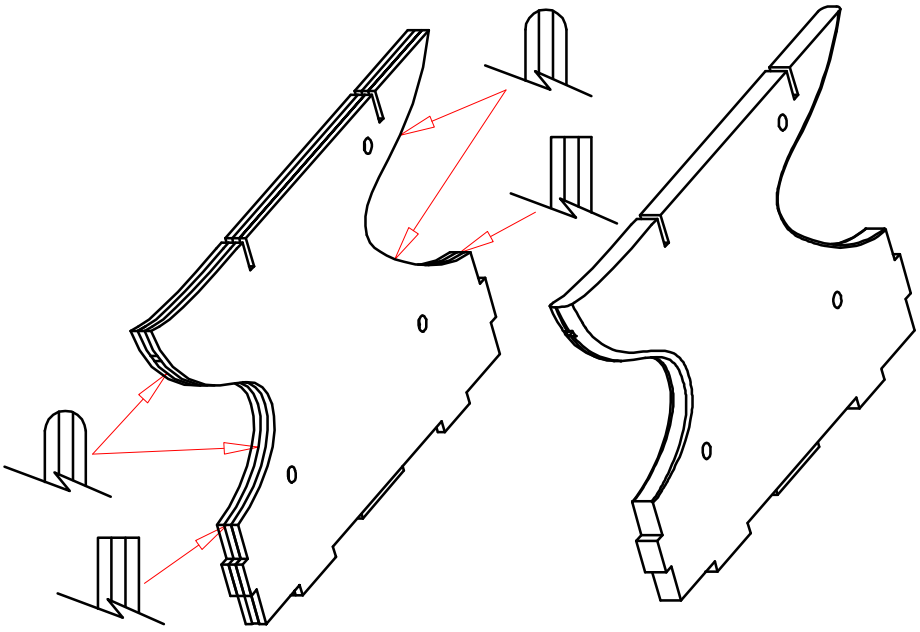


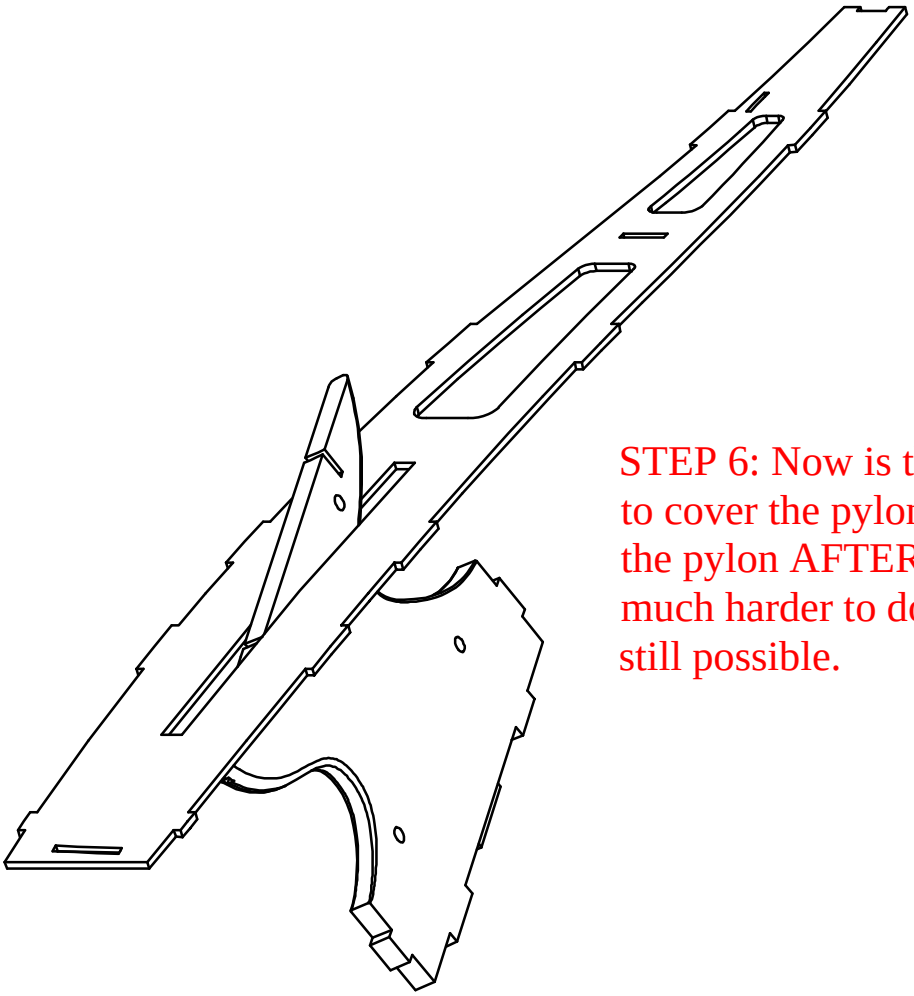
STEP 2: Fasten the landing gear to the 1/16" plywood firewall. MAKE SURE that the engraved text of the firewall is facing FORWARD. Thread a needle with the included Spider Wire and "sew" the landing gear onto the firewall. Start at the bottom of one side and continue to the other. Then, go back to the starting point, so there is a "double wrap". Secure the thread with thin CA.



STEP 3: Glue the 1/16" plywood and 1/16" balsa pylon parts together. Use the 1/8" dowels (cut the 1/8" dowel into 3/4" lengths) through the holes to make sure that the parts are properly aligned BEFORE the glue sets. You can use thick CA if you are careful. Or, you can use a 5-minute epoxy or white glue to give you more working time.

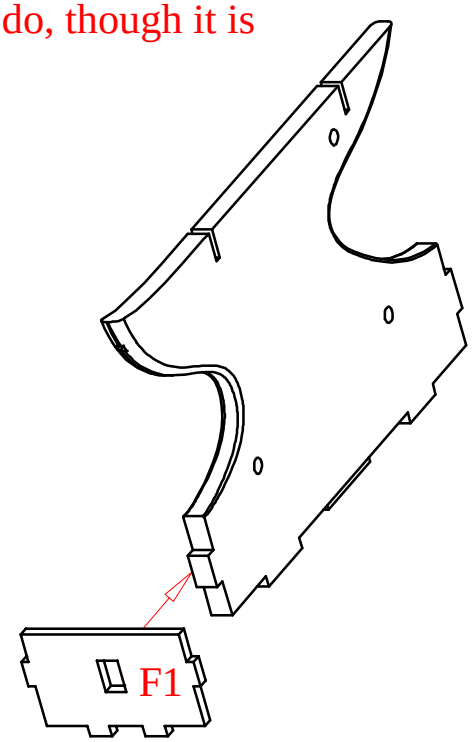
STEP 4: Sand the pylon, as shown in the image to the right. Do not round the bottom edges of the pylon, as these should be left "sharp" to line up with the top fuselage sheet when it is later applied.

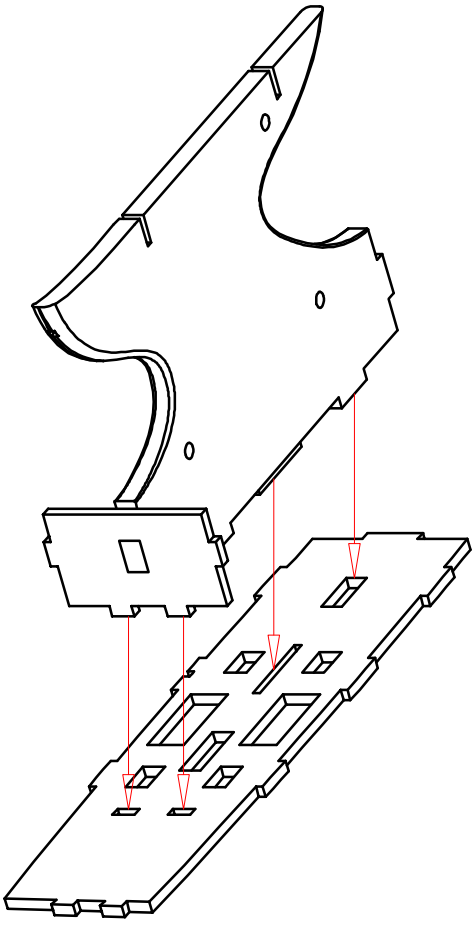




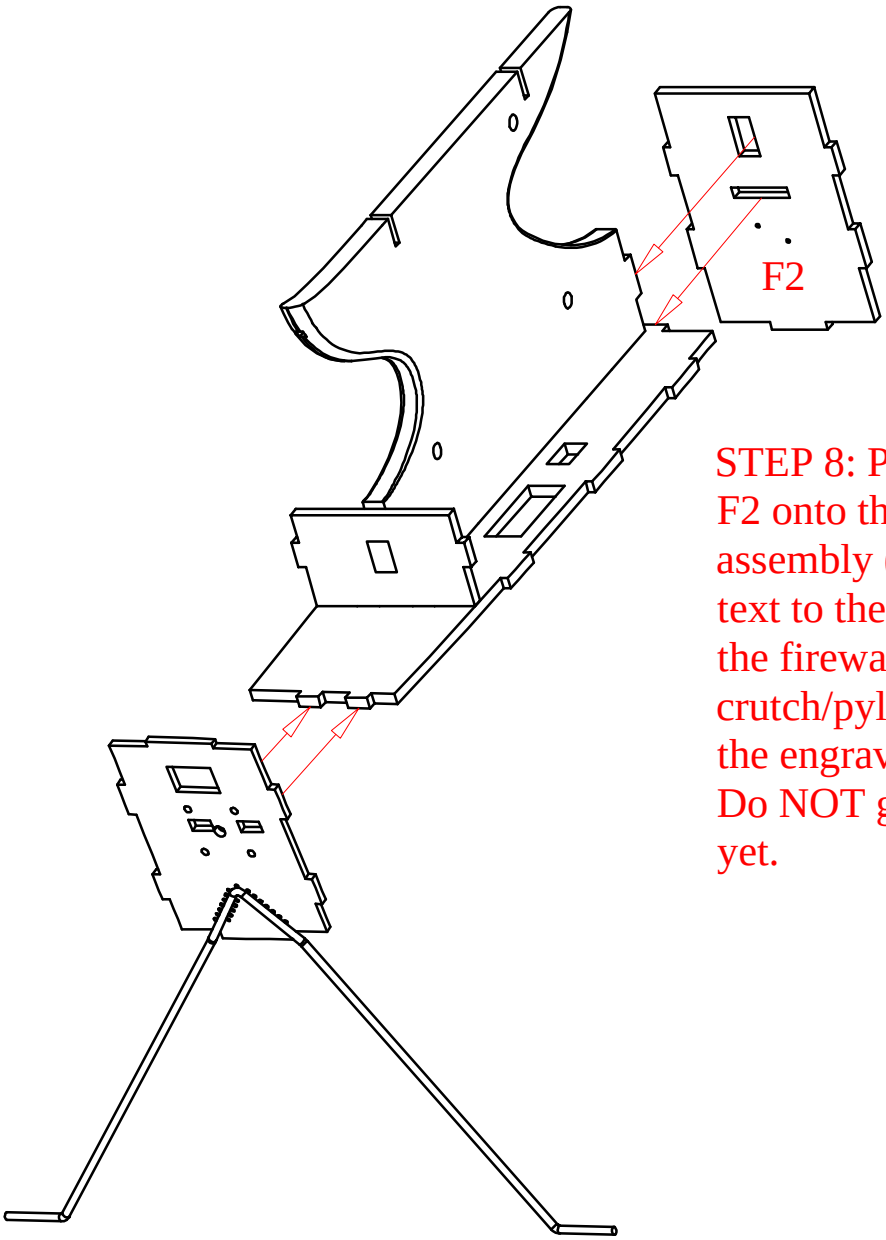
STEP 5: Test fit the pylon into the fuselage top sheet. Sand the sides of the pylon, if necessary, so it fits through the slot smoothly.

STEP 6: Now is the best time to cover the pylon. Covering the pylon AFTER assembly is much harder to do, though it is still possible.

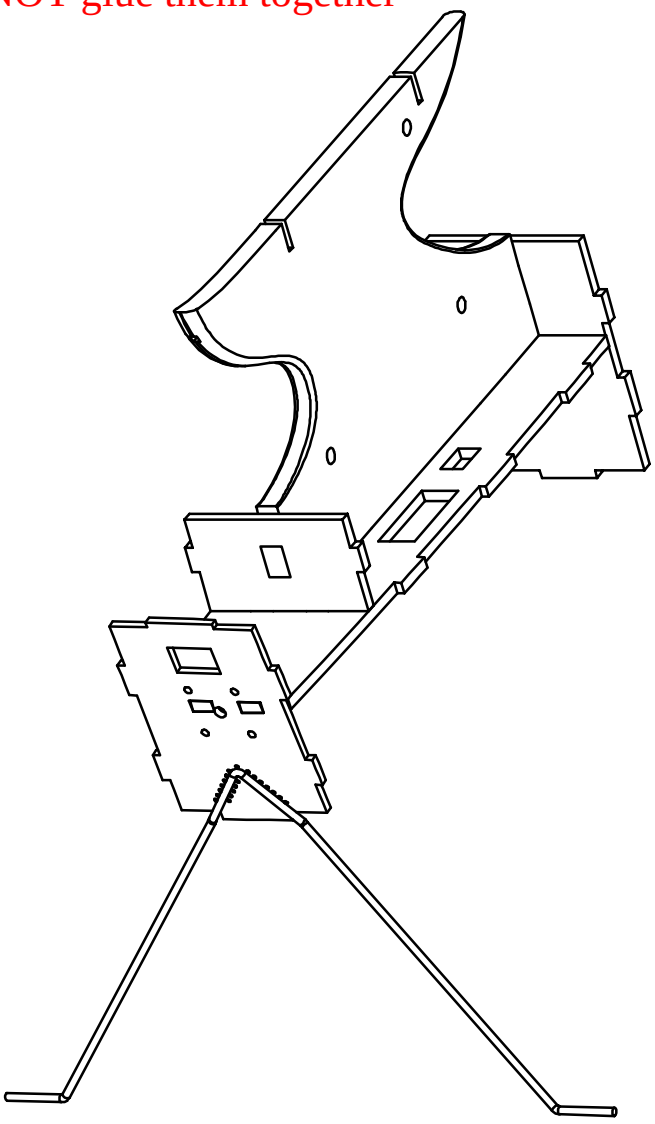


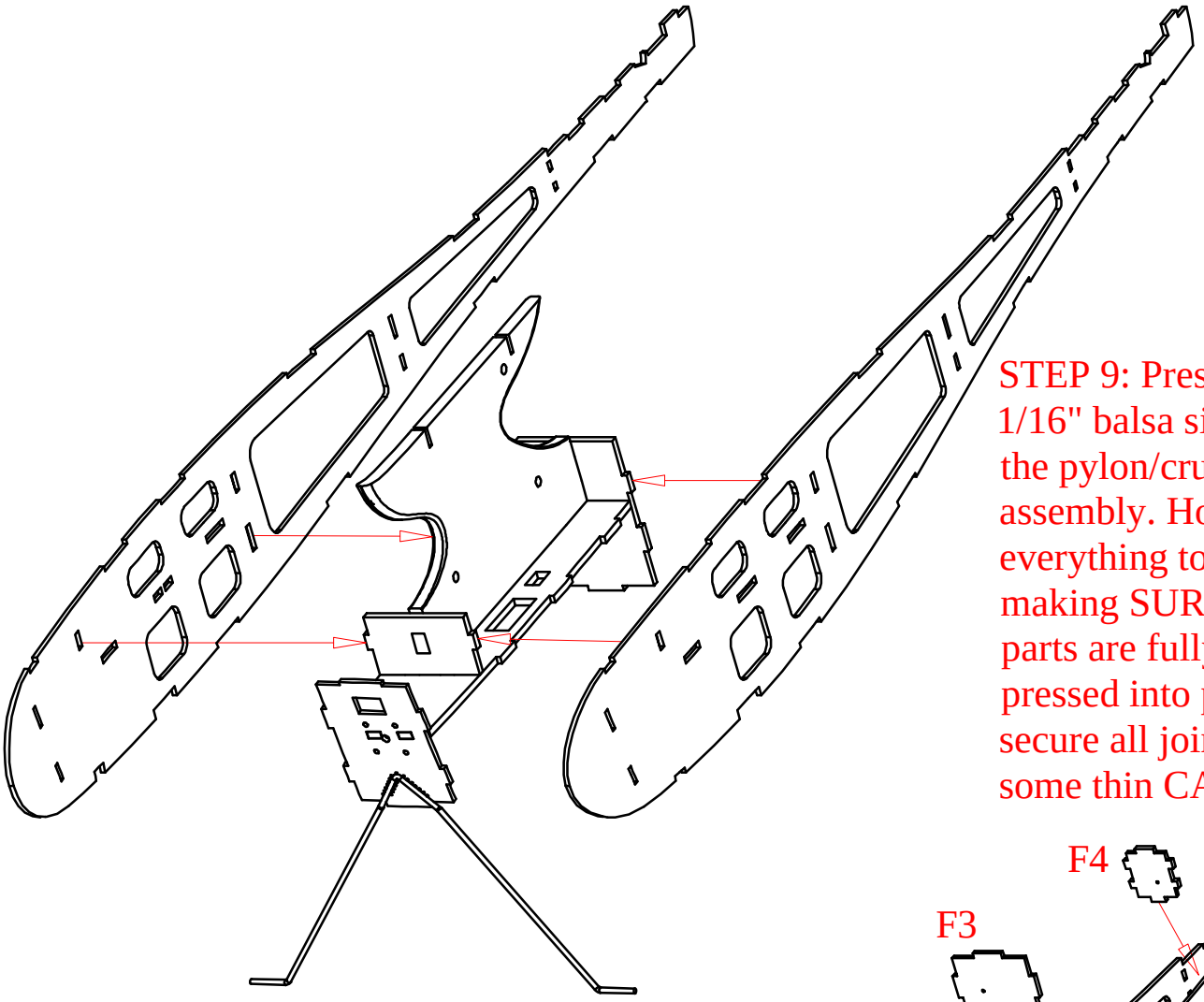


STEP 7: Press the 3/32" balsa F1 part onto the pylon (with the ebgraved text to the FRONT) and then press the pylon assembly onto the crutch. The engraved "TOP" on the crutch should, of course, be on the top. Do NOT glue them together yet.

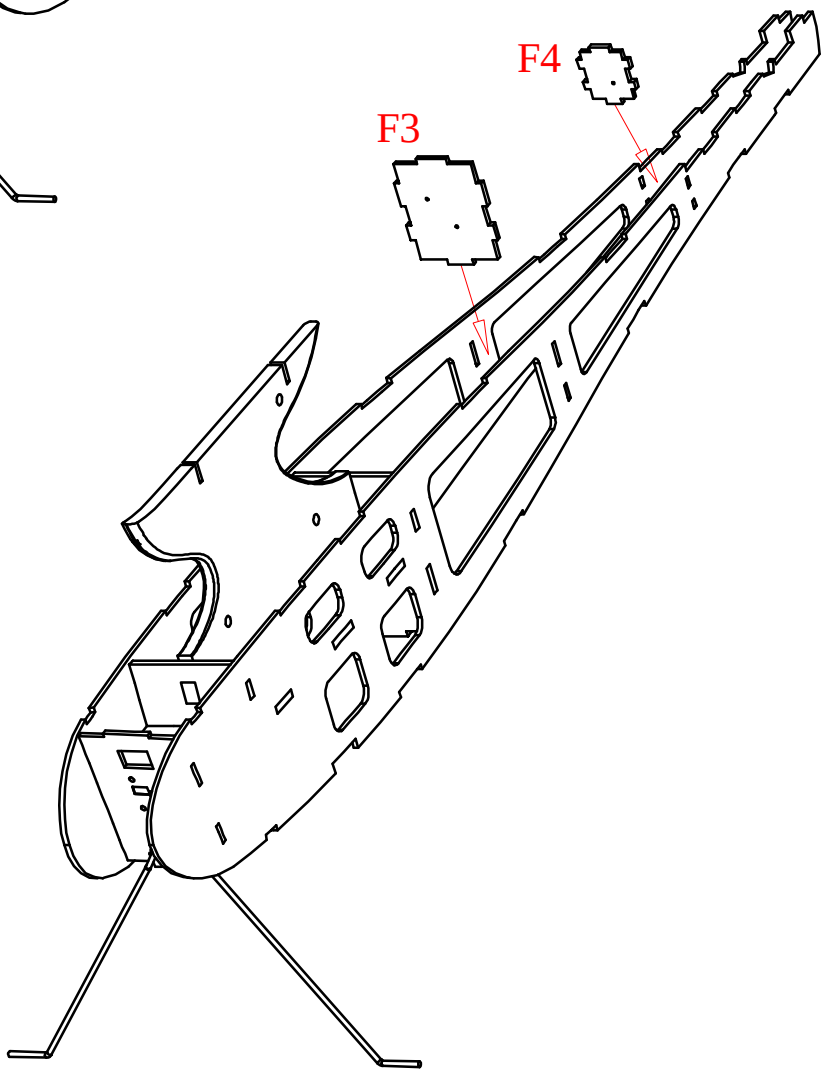


STEP 8: Press the 3/32" balsa F2 onto the crutch/pylon assembly (with the engraved text to the FRONT) and press the firewall onto the crutch/pylon assembly. (with the engraved text to the front) Do NOT glue them together yet.

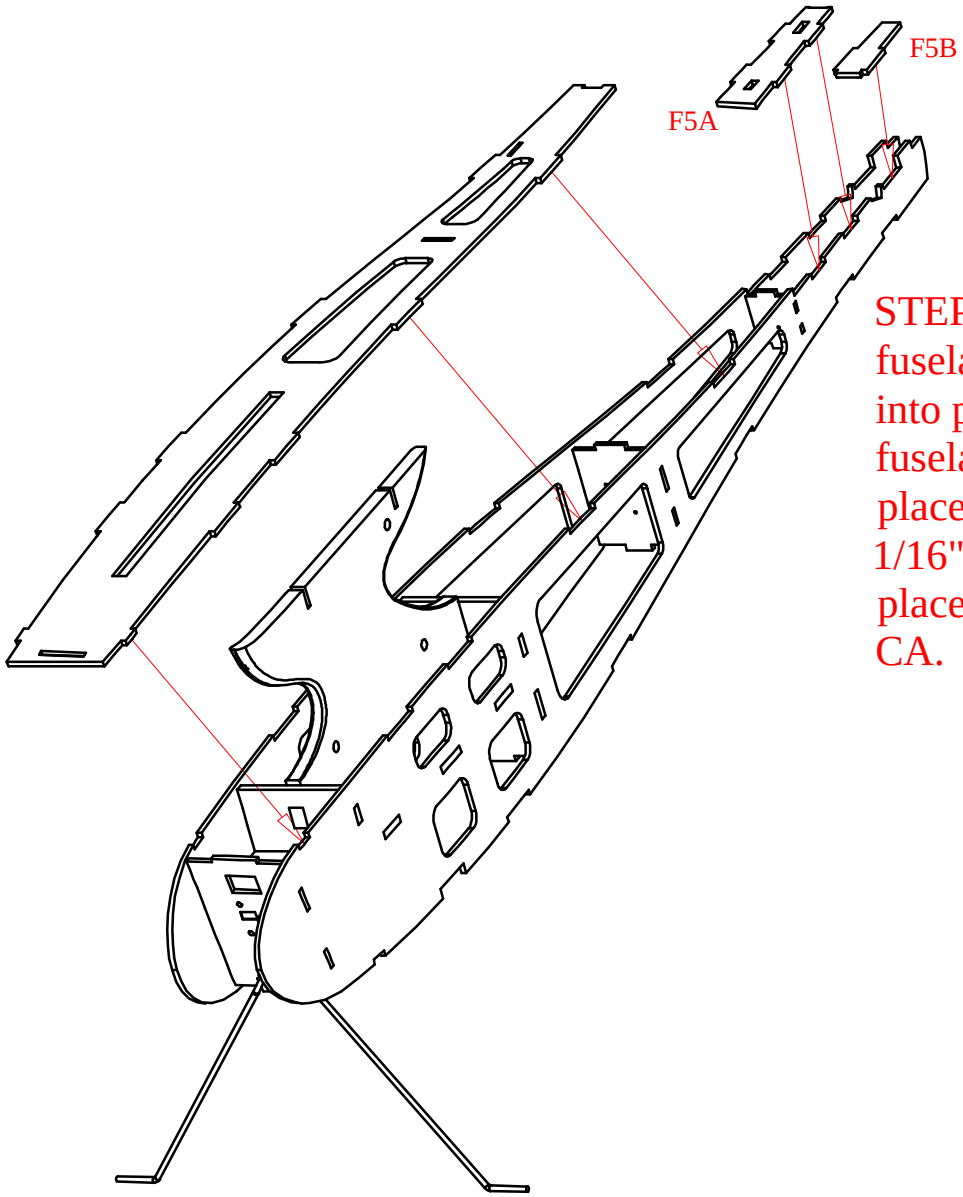




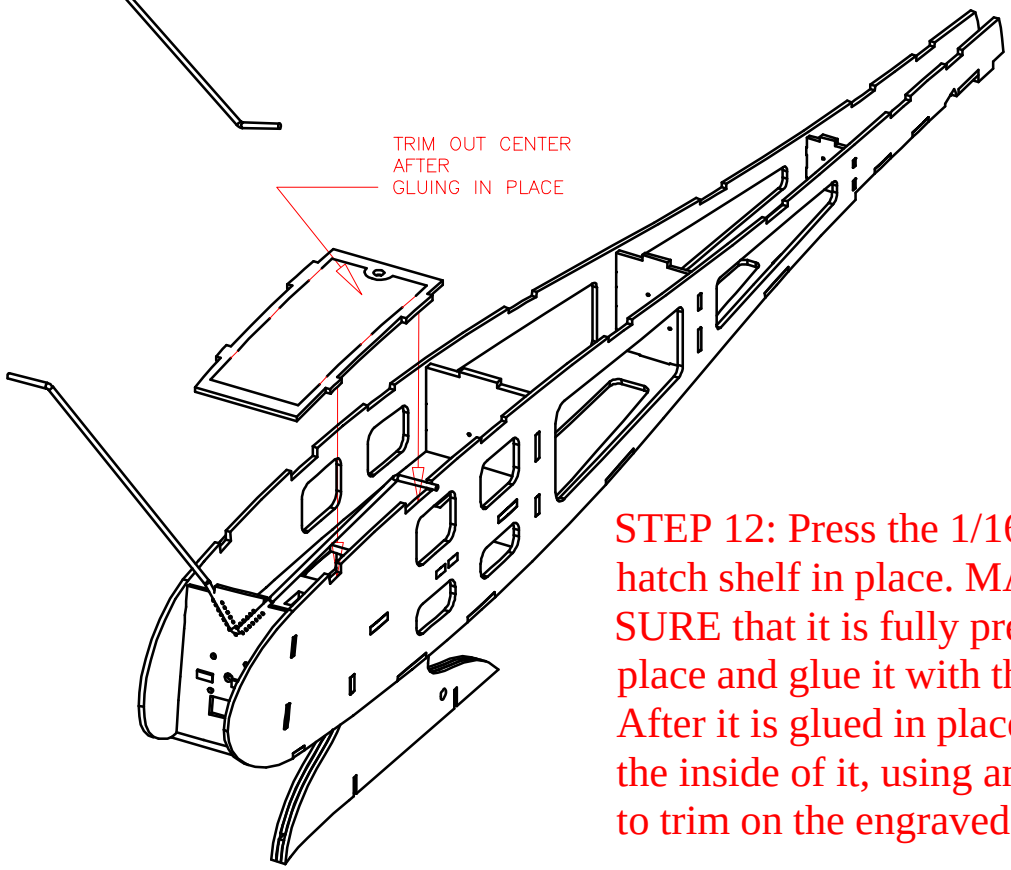
STEP 9: Press the 1/16" balsa sides onto the pylon/crutch assembly. Holding everything together, making SURE that all parts are fully pressed into place, secure all joints with some thin CA.



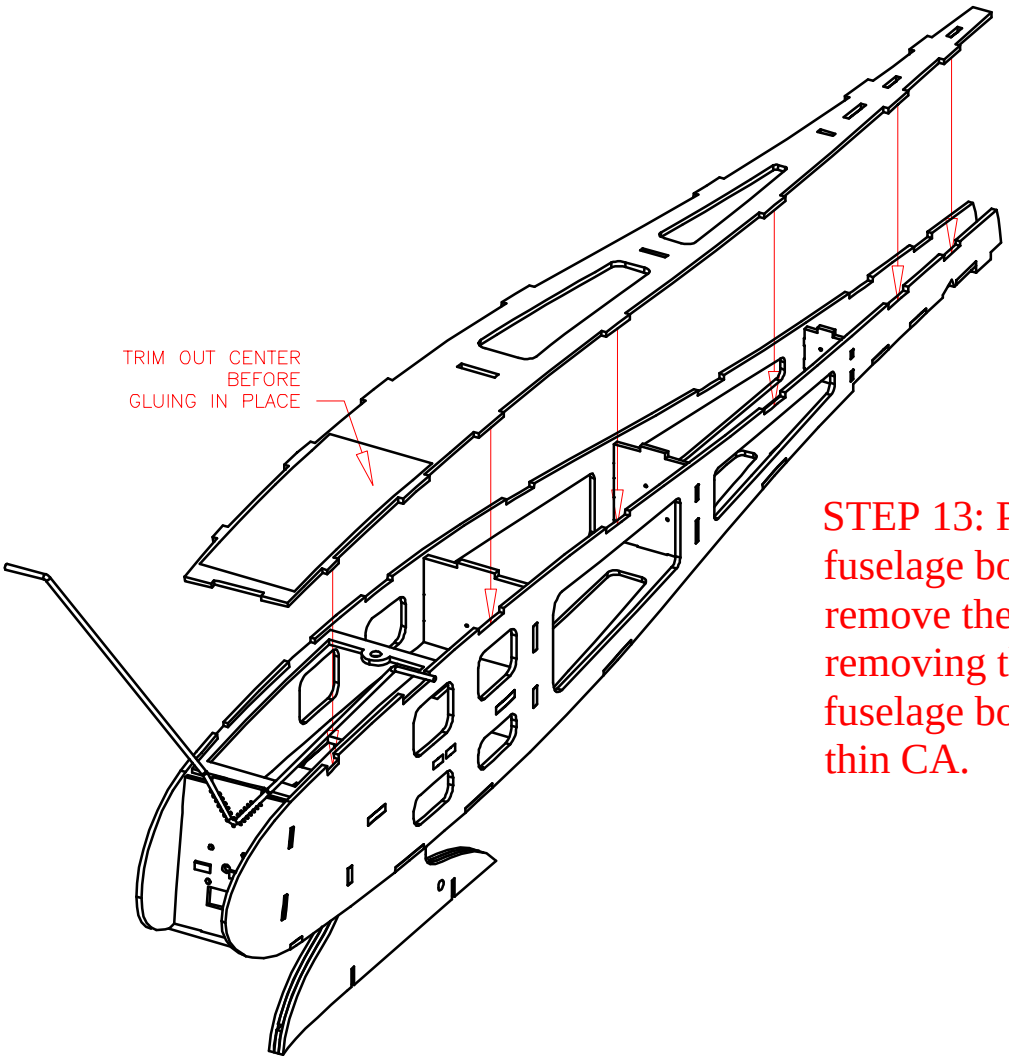
STEP 10: Press the 1/16" balsa F3 and F4 formers into the fuselage sides with the engraved TEXT FACING FORWARD. Be sure that the formers are fully inserted into the fuselage sides and secure with thin CA.



STEP 11: Slide the 1/16" balsa fuselage top over the crutch and into place on all the formers and fuselage sides. Glue the top in place using thin CA. Press the 1/16" balsa F5A and F5B parts in place and secure them with thin CA.

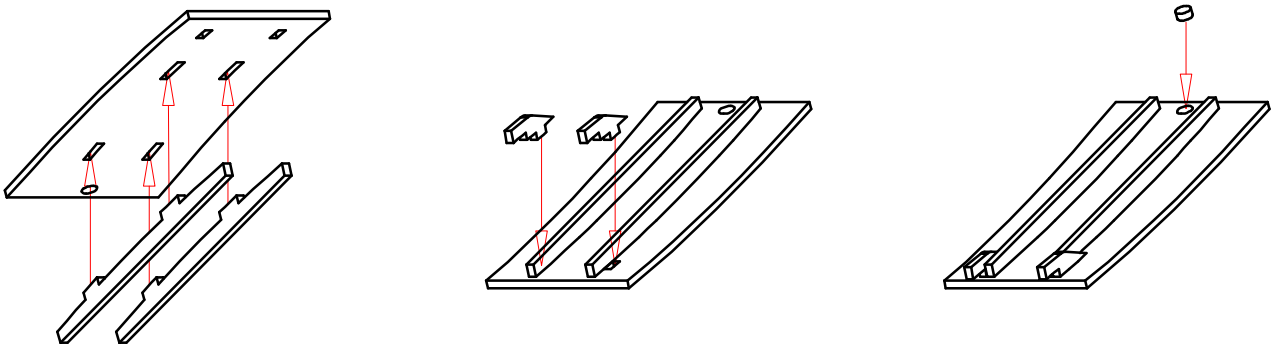


STEP 12: Press the 1/16" balsa hatch shelf in place. MAKE SURE that it is fully pressed into place and glue it with thin CA. After it is glued in place, remove the inside of it, using an X-Acto to trim on the engraved lines.

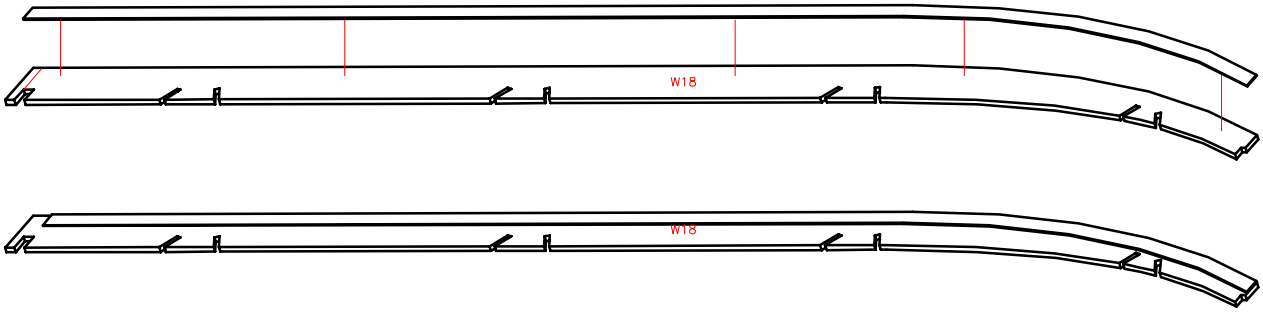


STEP 13: Press the 1/16" balsa fuselage bottom in place and then remove the front hatch. AFTER removing the hatch, glue the fuselage bottom in place using thin CA.

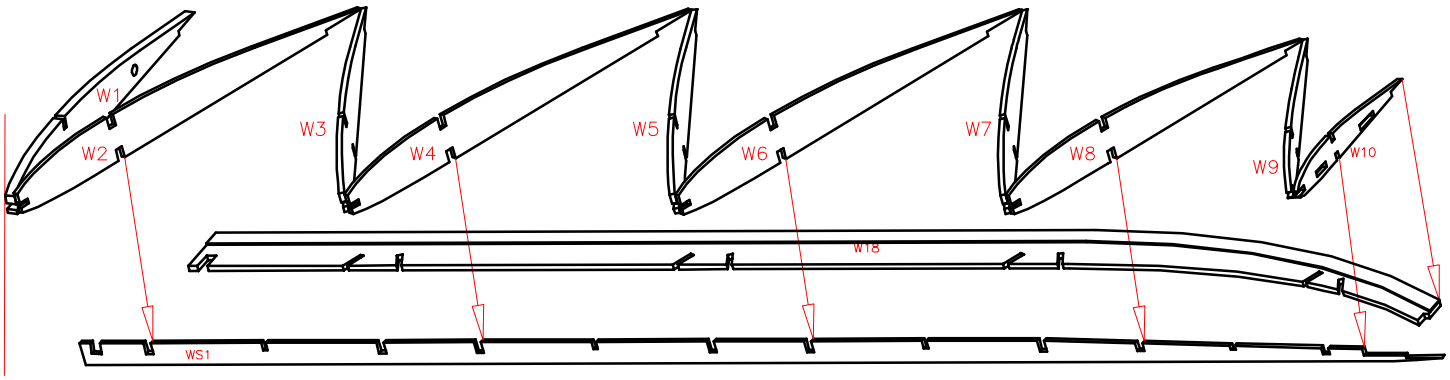
STEP 14: Glue the 1/16" balsa hatch onto the 1/16" balsa hatch braces, as shown. Use thick CA or a slower setting glue. Use a weight to hold the bend in the hatch while the glue dries. Glue in the 1/16" plywood hatch latches in place, as shown. Glue 1 magnet in place, as shown, flush with the bottom of the hatch.



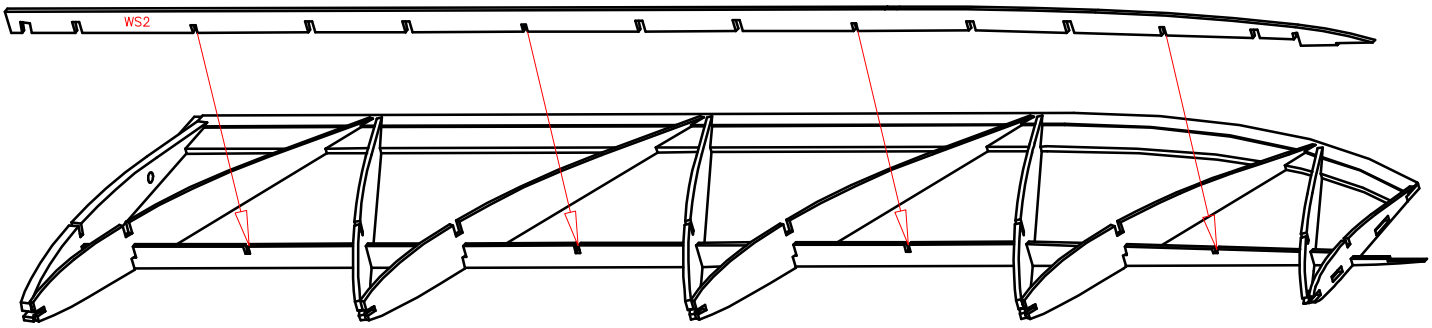
STEP 15: Laminate the 1/64" plywood trailing edge reinforcement part onto the 1/16" balsa W18A trailing edge part. It should be aligned with the trailing edge and the engraved line at the root area. Use a slower setting glue, such as thinned 5 minute epoxy or white glue, weigh the parts down to MAKE SURE that it is flat when the glue dries. Repeat for the other wing.



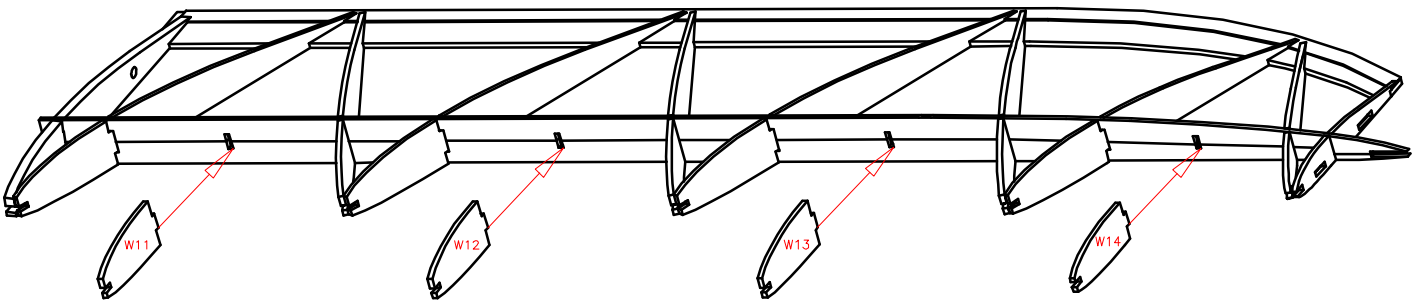
STEP 16: Slide the 1/8" balsa W1 and 1/16" balsa W2, W3, W4, W5, W6, W7, W8, W9, and W10 onto the 1/16" balsa wing spar bottom, WS1 and the trailing edge. Make sure that the ribs are FULLY seated in the trailing edge. Do NOT glue the parts together yet.



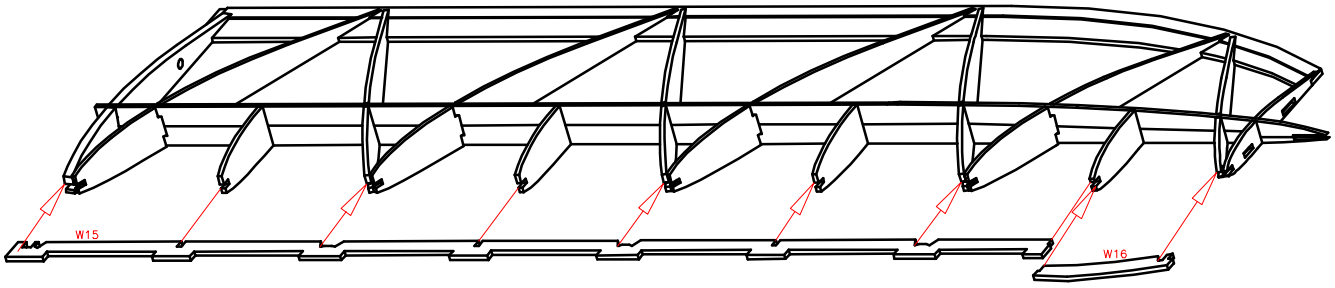
STEP 17: Slide the 1/16" balsa spar top, WS2 in place, as shown. The engraving on WS2 should be facing the opposite way of the engraving on WS1. Do NOT glue the parts together yet. Why? Because the laser actually cuts a very very slight angle in the parts and this makes sure that there is complete contact between the parts for a stronger bond.



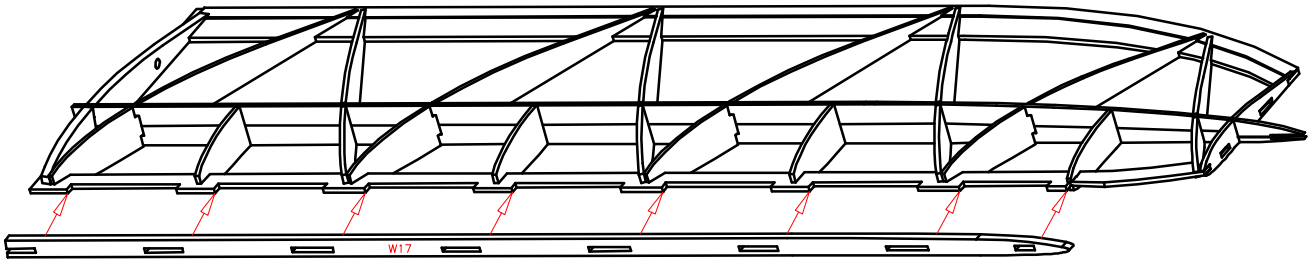
STEP 18: Press the 1/16" balsa half-ribs, W11 to W14, in place. Do NOT glue yet.



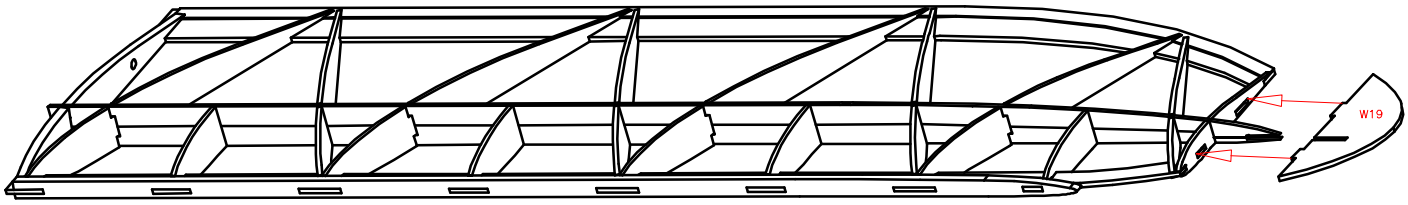
STEP 19: Slide the 1/16" balsa leading edge support parts, W15 and W16 in place in the ribs, as shown. Do NOT glue anything yet.



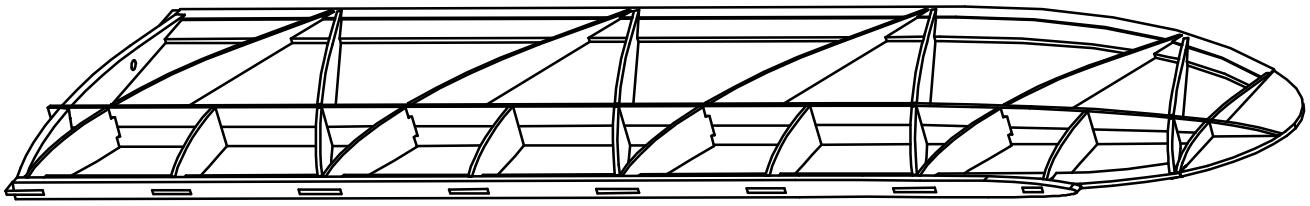
STEP 20: Slide the 1/8" balsa leading edge in place over the leading edge support, as shown. OK, you've been reaching for the CA bottle every step and being told to put it down. Now, you can pick it up! Use thin CA and secure all joints. MAKE SURE that all of the parts are fully pressed together before gluing though.

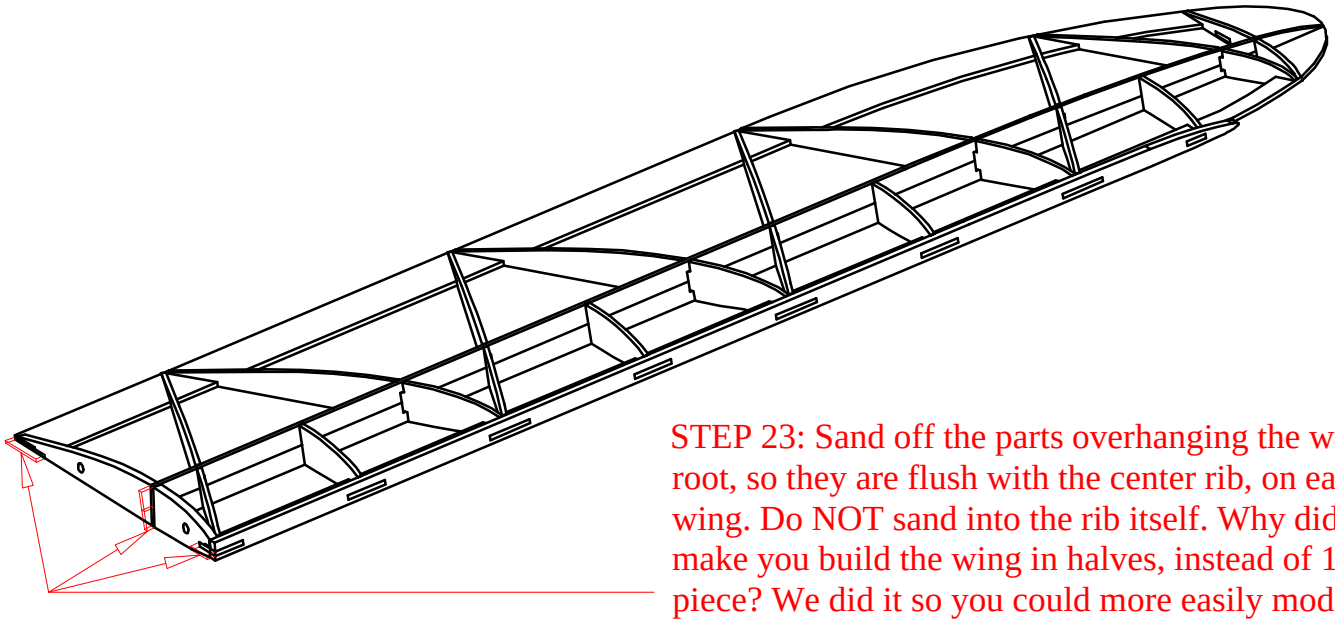


STEP 21: Slide the 1/16" balsa wing tip, W19 in place and secure with thin CA.

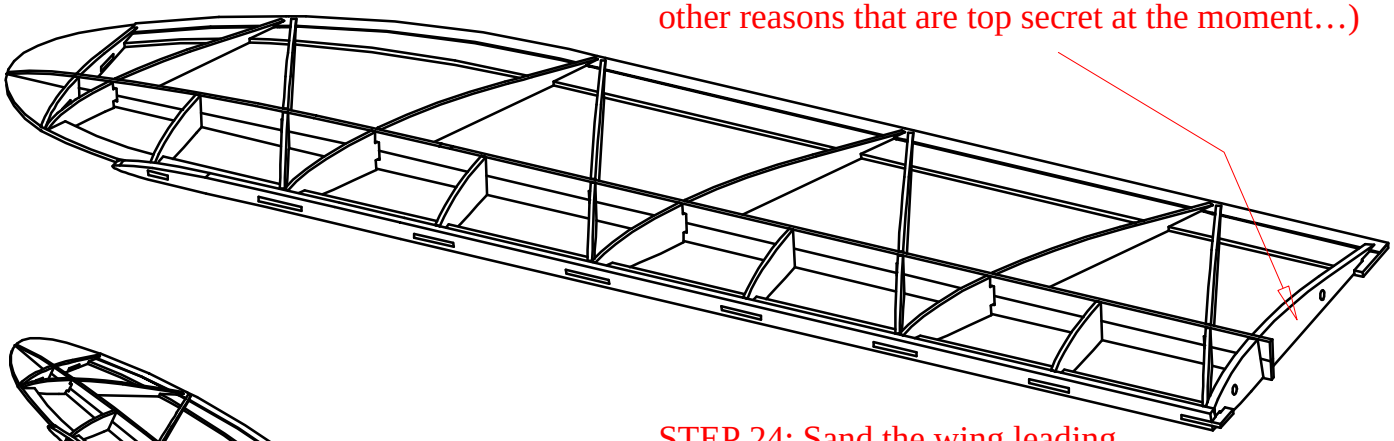


STEP 22: Repeat steps 16 through 21 to build the other wing half.

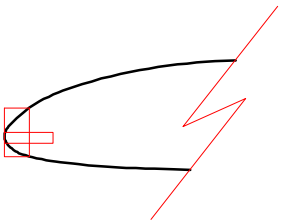




STEP 23: Sand off the parts overhanging the wing root, so they are flush with the center rib, on each wing. Do NOT sand into the rib itself. Why did we make you build the wing in halves, instead of 1 piece? We did it so you could more easily modify it for a 2-piece wing if you desired to do so. (And other reasons that are top secret at the moment…)

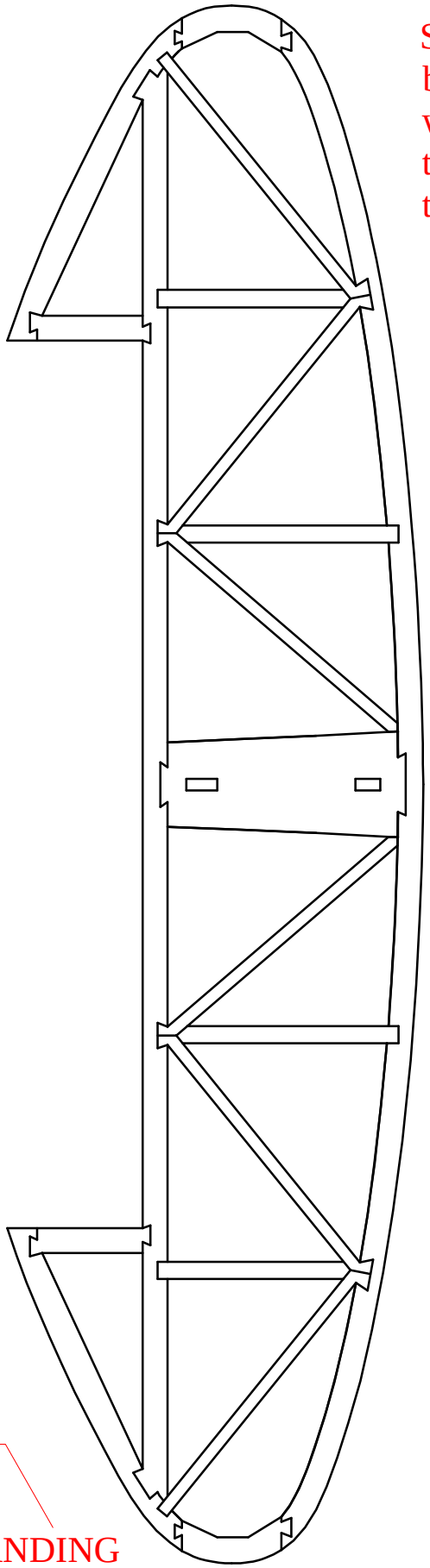


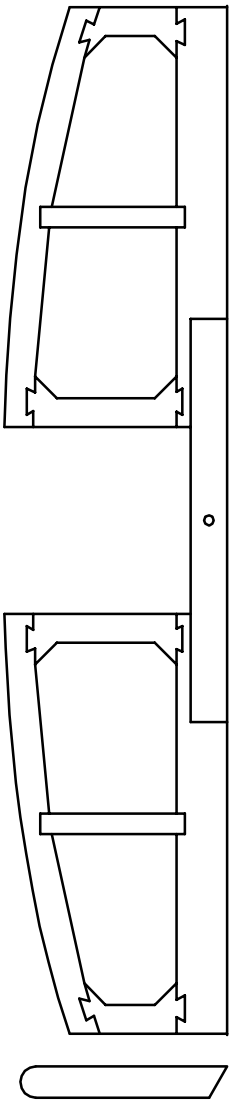
STEP 24: Sand the wing leading edge to the profile shown. To prevent the sandpaper from digging into the ribs and breaking them, put some blue painters tape across the ribs to protect them. Finish sand the rest of the wing with 320 or 400 grit sandpaper.



STEP 25: Cut the included 1/8" dowel in half. Join the wings, using a THIN layer of 5-minute epoxy. The dowels are used for aligning the wings. MAKE SURE that the wing panels are lined up before the glue dries. You can use some small clamps to hold the center ribs together.

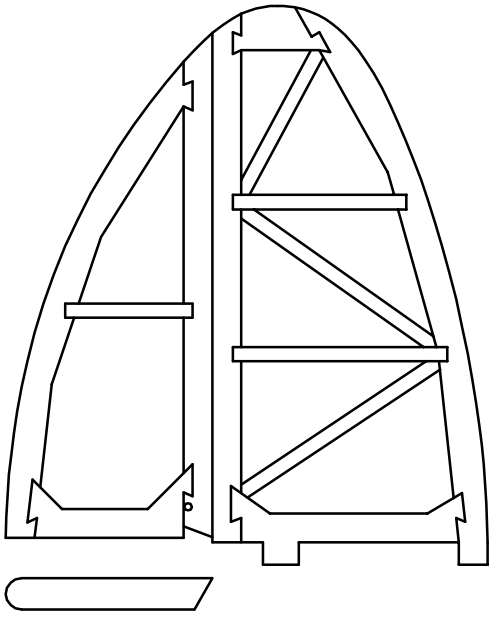
STEP 26: Protect the plans by laying down clear plastic wrap over them. Build the tails over the plans, using thin CA on all the joints.

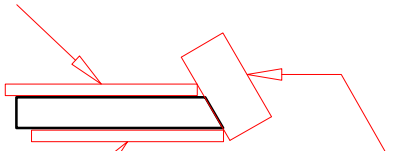




STEP 27: Lightly sand the tail parts. You can round the OUTSIDE edges of the parts if you'd like, for a nicer looking finished model.

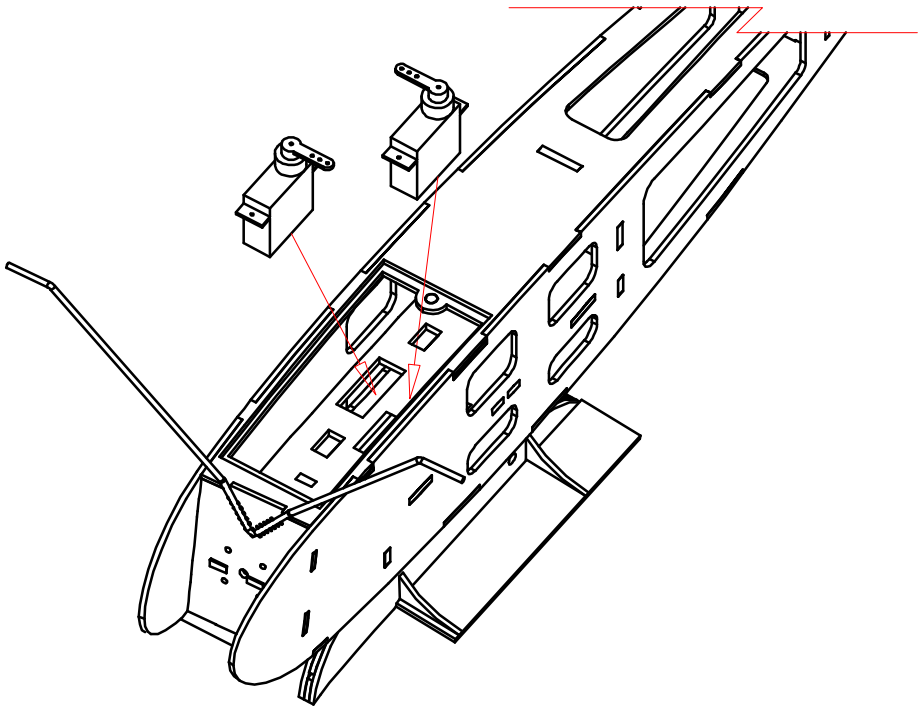
STEP 28: Sand a bevel in the elevator and rudder, as shown. The easiest way to do this is by placing a metal straight edge below the part, and one on top of the part. That way, you don't end up with a wavy hinge line.



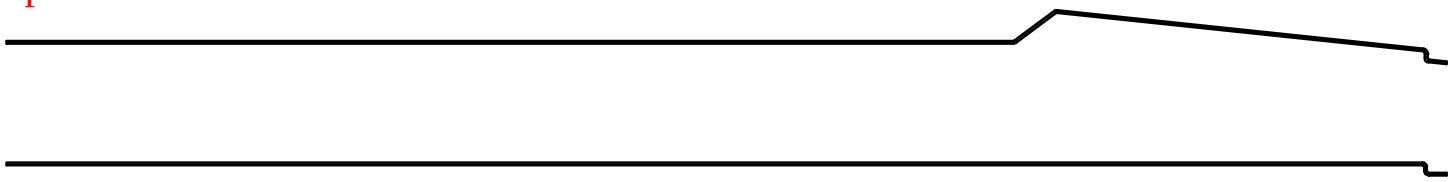


STEP 29: Lightly finish sand all of the fuselage parts with 320 or 400 grit sandpaper. Rounding off the corners makes ot look better when it's covered. Also remove the 1/16" plywood pylon parts and the 3/32" F6 part that are still in the parts sheets and sand them as well.

STEP 30: Install the servos, ESC, and Receiver BEFORE covering the fuselage. It's easier to do that now than after it's covered. Reference the plans for the proper location of the components and where the wires are routed.



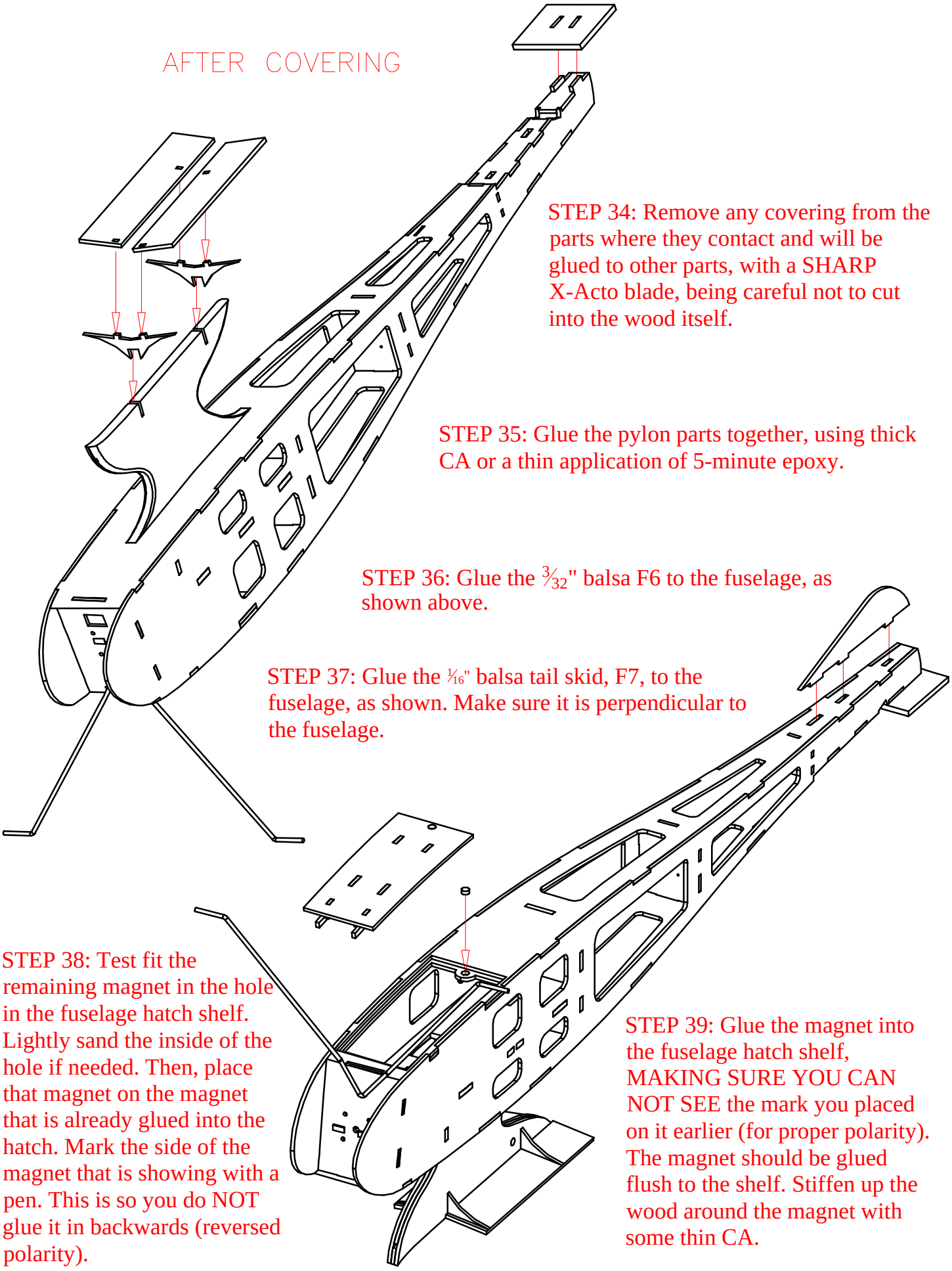
STEP 31: Bend the control rods, as shown on the plans. The ones shown here are NOT TO SCALE.



STEP 32: Insert the pushrods through the back end, as shown on the plans, with the Z-bends end at the back of the fuselage. Tape the pushrods to the inside of the fuselage to keep them from coming loose until they are needed.

STEP 33: Cover all the parts with a lightweight covering film, such as So-Lite. Do NOT use heavier films such as MonoKote, UltraCote SolarCote, etc., as the shrinkage of these films can damage the lightweight structure of this model. They also add a lot more weight, which you absolutely do not want. If you have not covered a model before, please read the instructions that come with your covering. You'll need to poke a hole in the covering for the fuselage top, for the rudder pushrod to go through.

If you have covered with it before, tissue also looks GREAT on this model.



STEP 34: Remove any covering from the parts where they contact and will be glued to other parts, with a SHARP X-Acto blade, being careful not to cut into the wood itself.

STEP 35: Glue the pylon parts together, using thick CA or a thin application of 5-minute epoxy.

STEP 36: Glue the $\frac{3}{32}$" balsa F6 to the fuselage, as shown above.

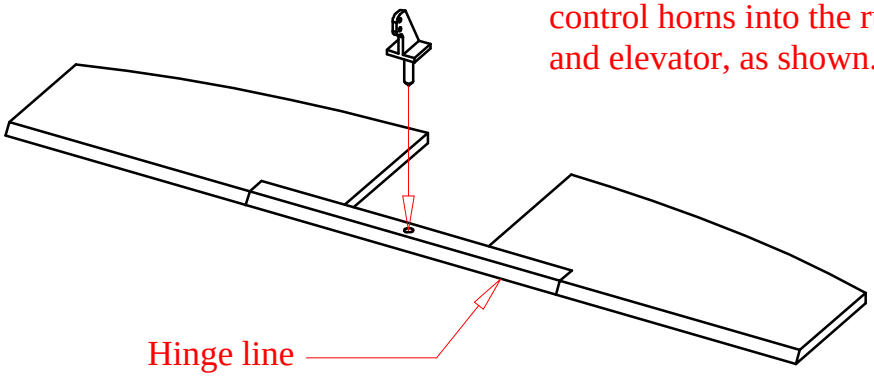
STEP 37: Glue the $\frac{1}{16}$" balsa tail skid, F7, to the fuselage, as shown. Make sure it is perpendicular to the fuselage.

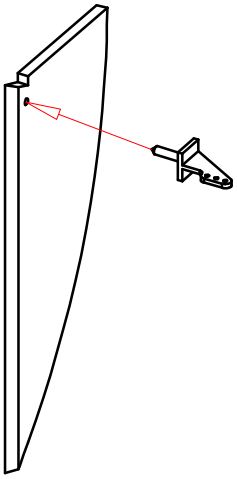
STEP 38: Test fit the remaining magnet in the hole in the fuselage hatch shelf. Lightly sand the inside of the hole if needed. Then, place that magnet on the magnet that is already glued into the hatch. Mark the side of the magnet that is showing with a pen. This is so you do NOT glue it in backwards (reversed polarity).

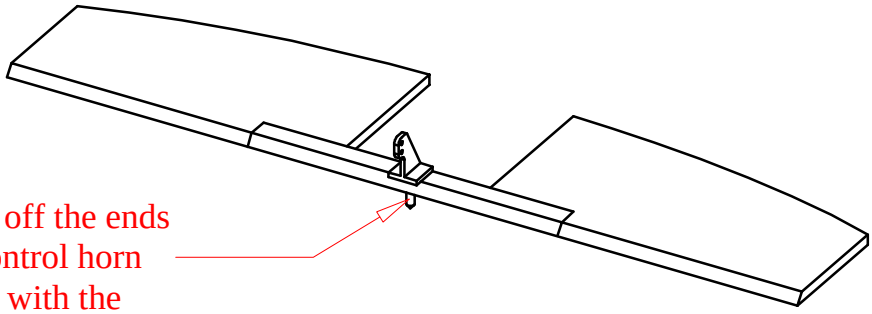
STEP 39: Glue the magnet into the fuselage hatch shelf, MAKING SURE YOU CAN NOT SEE the mark you placed on it earlier (for proper polarity). The magnet should be glued flush to the shelf. Stiffen up the wood around the magnet with some thin CA.

STEP 40: Trim ONE of the plastic control horns as shown. This is for the elevator, so it clears the fuselage bottom.

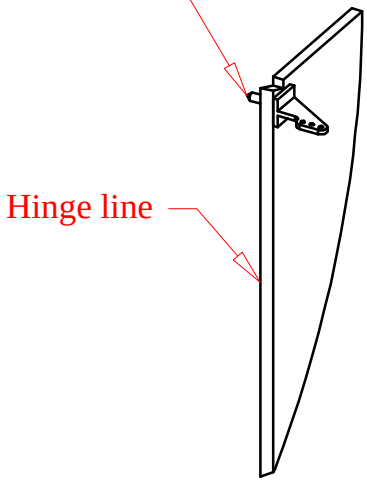
STEP 41: Glue the plastic control horns into the rudder and elevator, as shown.

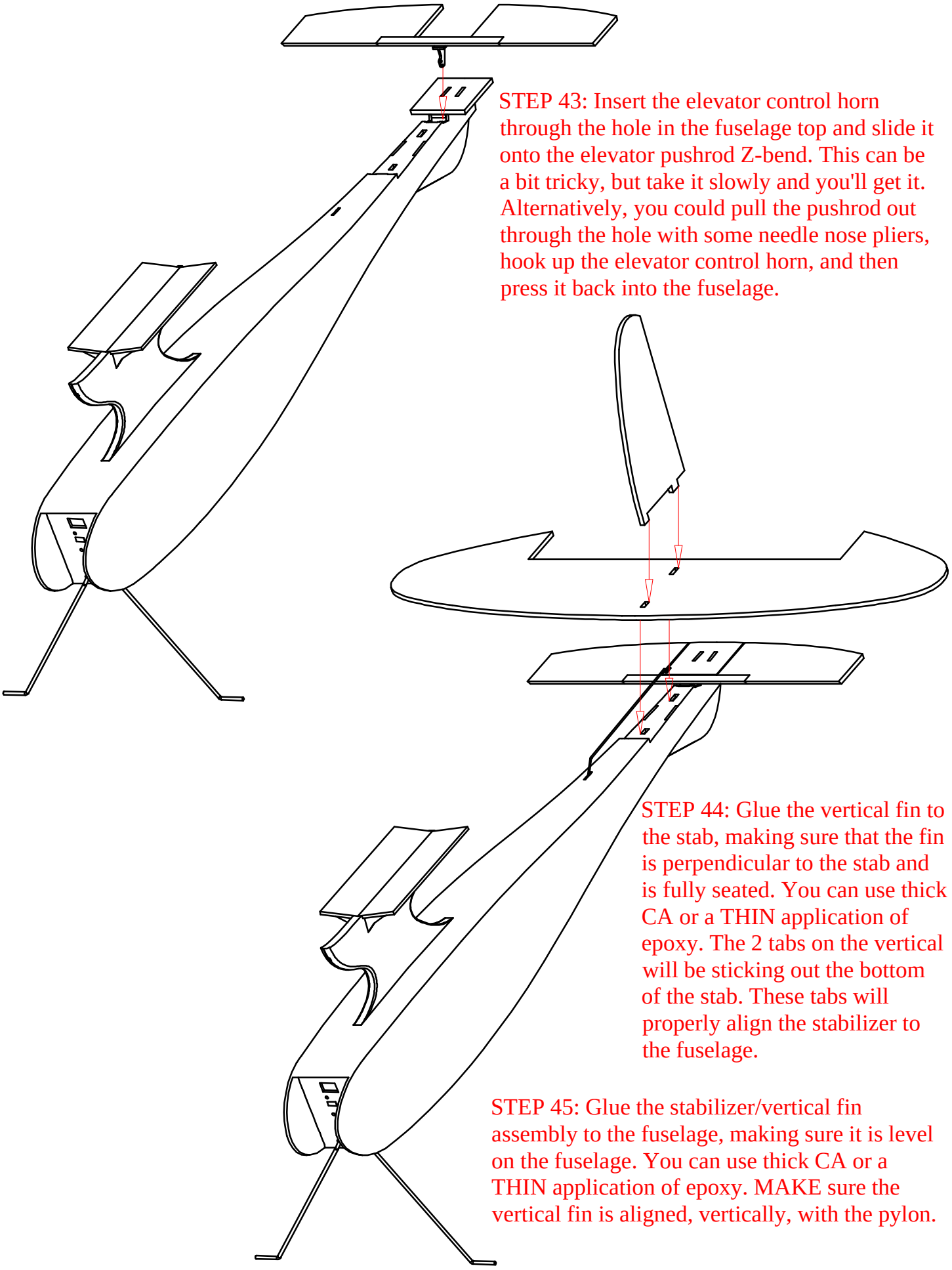






STEP 42: Trim off the ends of the ribbed control horn post to be flush with the control surface.

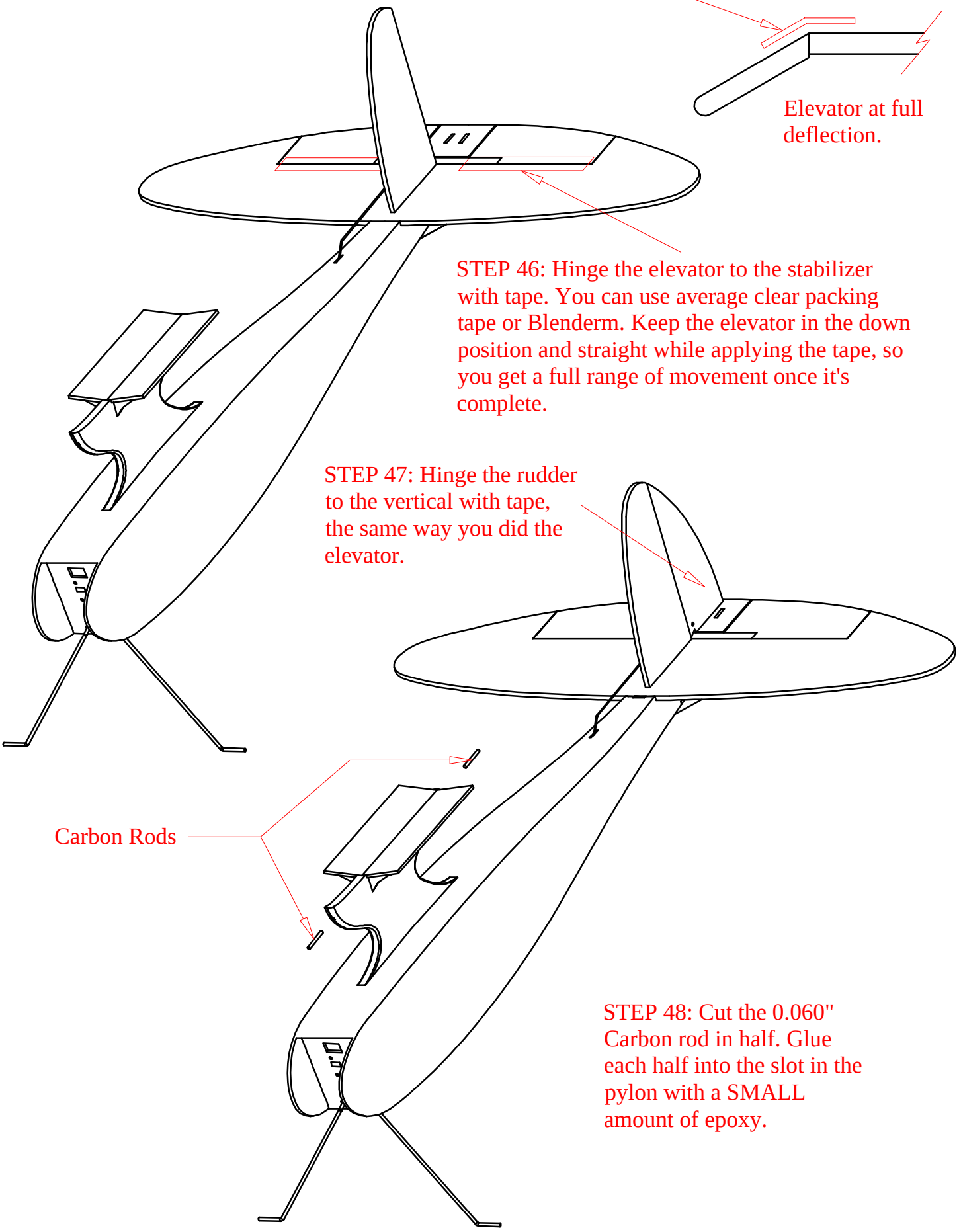




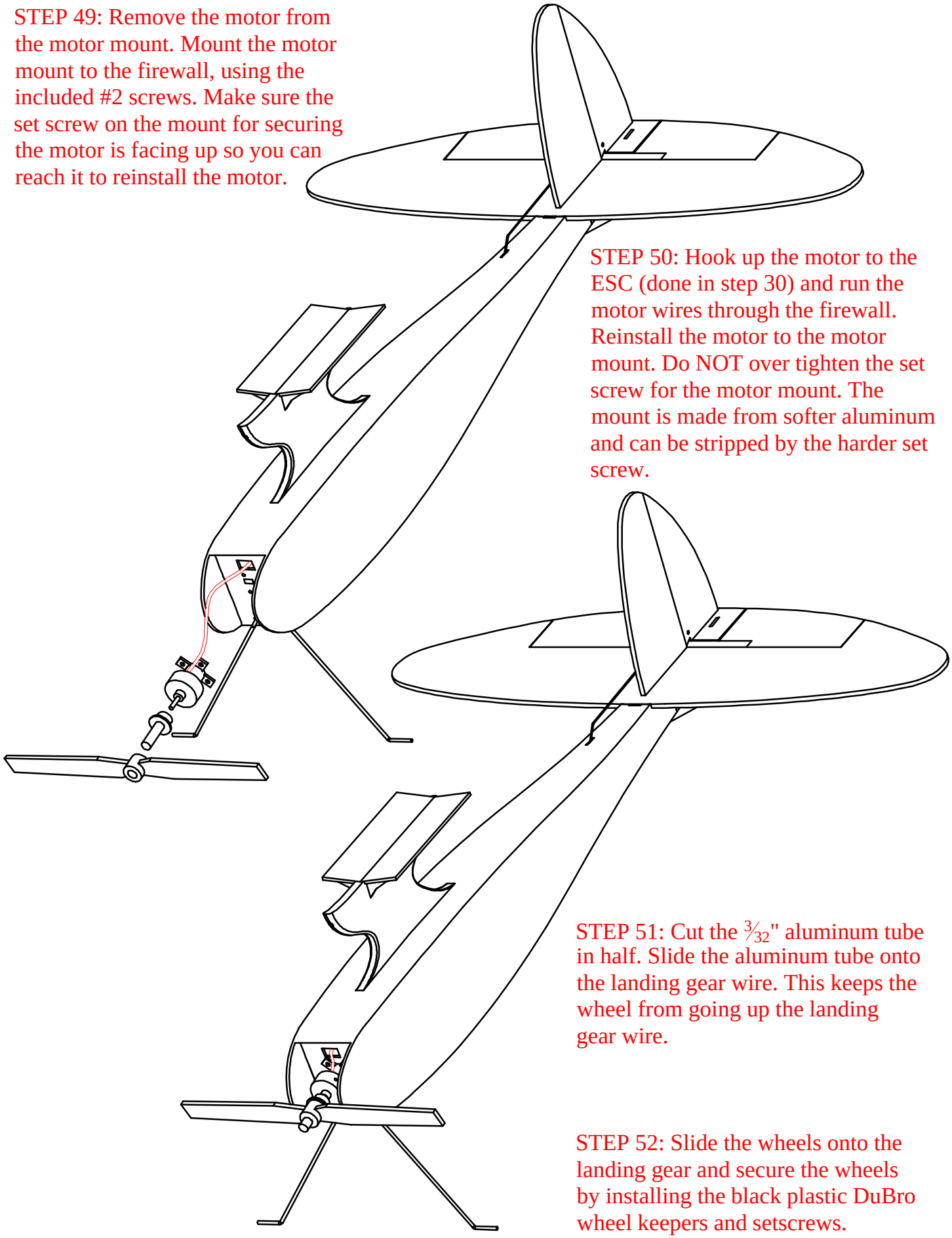
STEP 43: Insert the elevator control horn through the hole in the fuselage top and slide it onto the elevator pushrod Z-bend. This can be a bit tricky, but take it slowly and you'll get it. Alternatively, you could pull the pushrod out through the hole with some needle nose pliers, hook up the elevator control horn, and then press it back into the fuselage.

STEP 44: Glue the vertical fin to the stab, making sure that the fin is perpendicular to the stab and is fully seated. You can use thick CA or a THIN application of epoxy. The 2 tabs on the vertical will be sticking out the bottom of the stab. These tabs will properly align the stabilizer to the fuselage.

STEP 45: Glue the stabilizer/vertical fin assembly to the fuselage, making sure it is level on the fuselage. You can use thick CA or a THIN application of epoxy. MAKE sure the vertical fin is aligned, vertically, with the pylon.


TAPE
Elevator at full deflection.
STEP 46: Hinge the elevator to the stabilizer with tape. You can use average clear packing tape or Blenderm. Keep the elevator in the down position and straight while applying the tape, so you get a full range of movement once it's complete.
STEP 47: Hinge the rudder to the vertical with tape, the same way you did the elevator.
Carbon Rods
STEP 48: Cut the 0.060" Carbon rod in half. Glue each half into the slot in the pylon with a SMALL amount of epoxy.

STEP 49: Remove the motor from the motor mount. Mount the motor mount to the firewall, using the included #2 screws. Make sure the set screw on the mount for securing the motor is facing up so you can reach it to reinstall the motor.



STEP 50: Hook up the motor to the ESC (done in step 30) and run the motor wires through the firewall. Reinstall the motor to the motor mount. Do NOT over tighten the set screw for the motor mount. The mount is made from softer aluminum and can be stripped by the harder set screw.

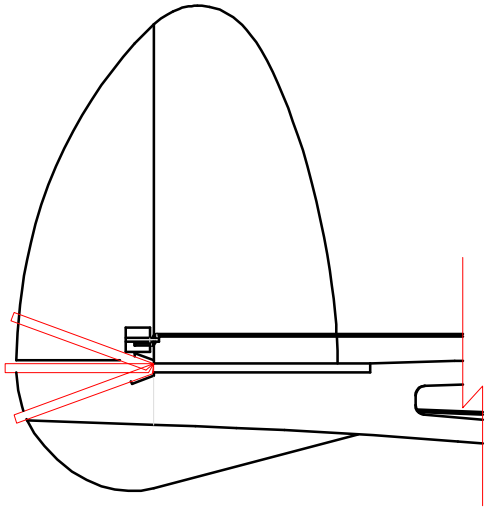
STEP 51: Cut the $\frac{3}{32}$" aluminum tube in half. Slide the aluminum tube onto the landing gear wire. This keeps the wheel from going up the landing gear wire.

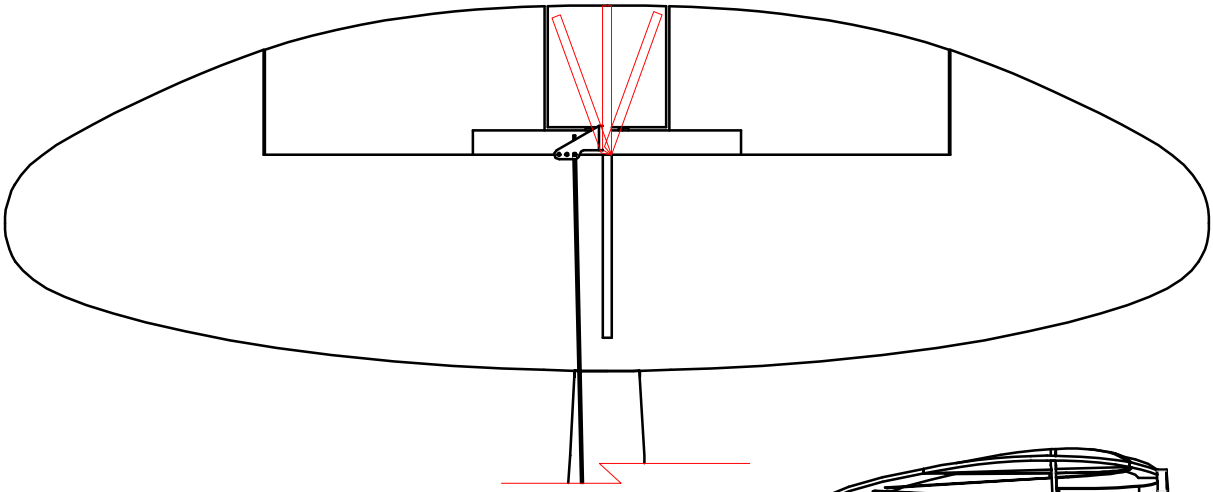
STEP 52: Slide the wheels onto the landing gear and secure the wheels by installing the black plastic DuBro wheel keepers and setscrews.

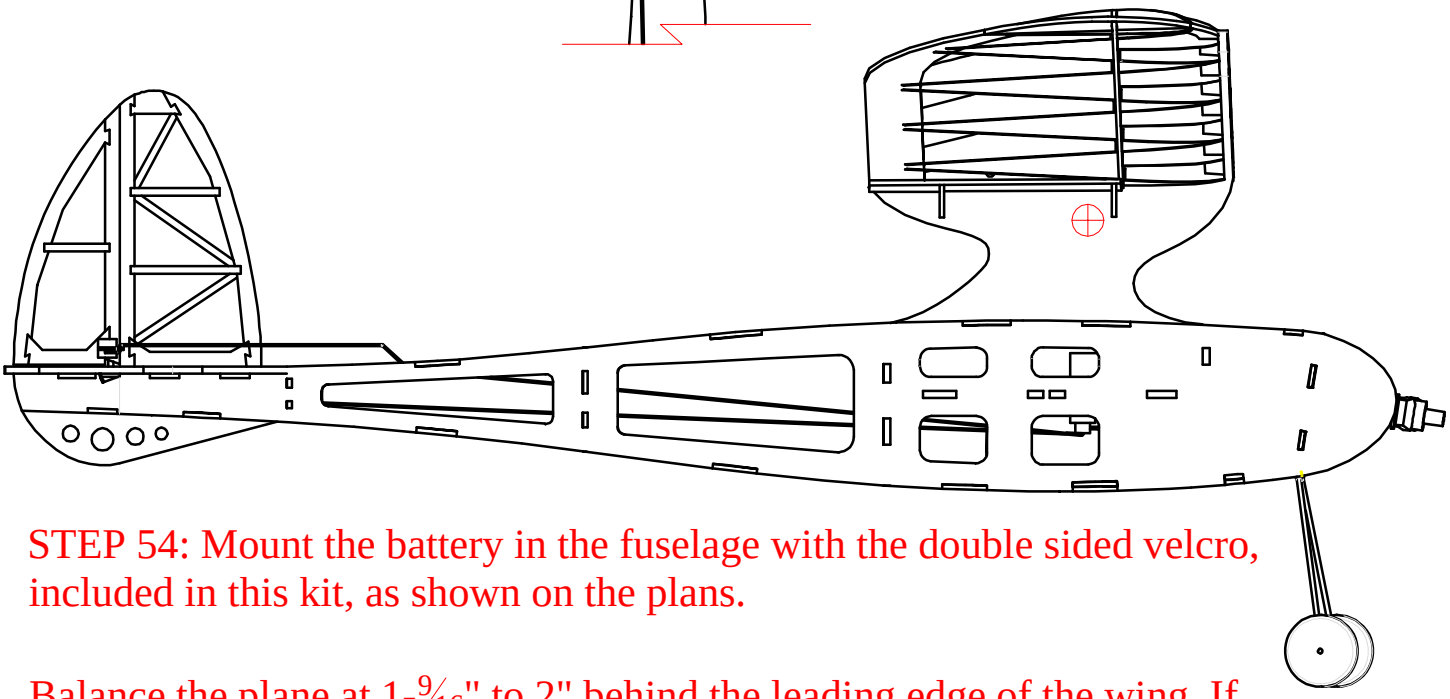
STEP 53: Set the control throws as follows:

LOW RATES:
Rudder: 3/8" (9.5 mm) left and right
Elevator: 3/8" (9.5 mm) up and down

HIGH RATES:
Rudder: 1/2" (12.7 mm) left and right
Elevator: 1/2" (12.7 mm) up and down







STEP 54: Mount the battery in the fuselage with the double sided velcro, included in this kit, as shown on the plans.

Balance the plane at 1-$\frac{9}{16}$" to 2" behind the leading edge of the wing. If you can not move the battery enough to reach this balance point, you can also try bending the landing gear forward or aft to help out a bit.

As long as you use the reccomended components, the CG should be easy to get right.