Alien Technologies

MICRO Sinbad

A simple 2 channel micro glider designed for ParkZone radio systems.

Specs:
2 channel (Rudder & Elevator)
34” wing Span
108 Sq. In.
1.5-2 oz. Flying Weight
2.3 oz./ Ft. wing loading

Thank you for buying your **Micro Sinbad** kit **from Alien Technologies.** It is designed to be an easy building, fun to fly anywhere 2 channel micro glider. Sinbad the Sailor designed by Henry Struck is the inspiration for this kit. It is perfect size to toss around the school yard, local slope or keep in the back seat of your car for a quick lunchtime thermal session. I hope you enjoy it as much as I do.

Although it is easy to build, it does require a nice flat surface that will accept pins to ensure the wing is built straight & warp free. A balsa building board is idea, but an acoustic ceiling tile or nice flat piece of cardboard will suffice.

Care should be taken in the covering that you choose. Lightweight film or tissue must be used. Traditional covering like Monokote and Ultracote will warp and crush the structure, do not use them! The prototype was covered in Parklite film. You must make sure not to over tighten the covering and induce warps in the lightweight structure.

All part markings should face inward and right side up unless otherwise noted. Parts should be left in their sheets until needed to prevent damage. When removing, cut the tab holding them in place carefully with an X-acto knife and sand any remnants of the tab away with 220G sandpaper for a nice tight fit.

This kit was designed in CAD and laser cut in my garage. If you have any questions, comments or concerns, please do not hesitate to contact me.

Thanks

Red

RedtheAlien@gmail.com

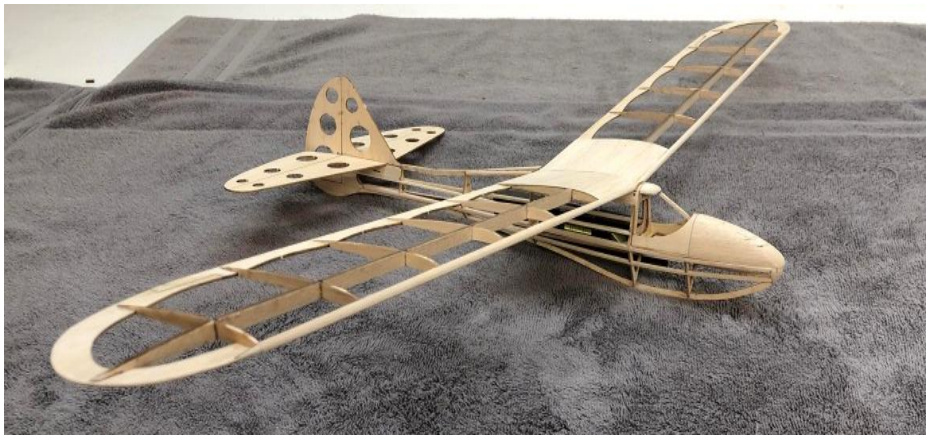
Equipment needed:

- ParkZone brick radio system
- Covering (Coverite MicroLite, CoverLite, UltaCote Lite etc.)

Tools needed to Complete:

- Masking tape
- Waxed paper
- Straight or T pins
- Straightedge
- Sandpaper 150, 220 & 400 grit
- X-Acto knife
- 90 deg. triangle
- Covering iron
- Thin & Med CA, Hot glue, ShooGoo or silicone equivalent
- Small piece of Velcro

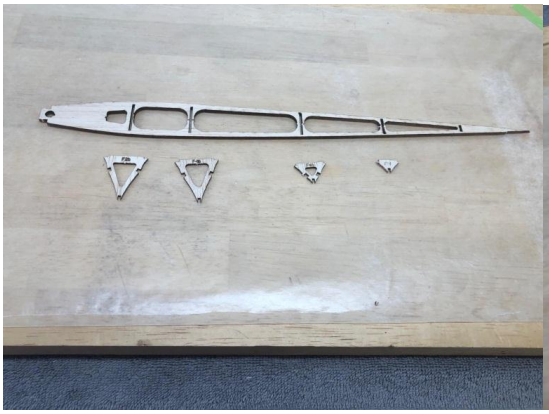
I like to use a pipette for precise CA joints, especially with the thin stuff. The parts are small and it can run everywhere right out of the bottle if you aren't careful. They are available from a few different sources, I get mine from CSTsales.com Give them a try, I won't build without them now. Most of the construction uses thin CA, except in a few instances where med CA is called for.



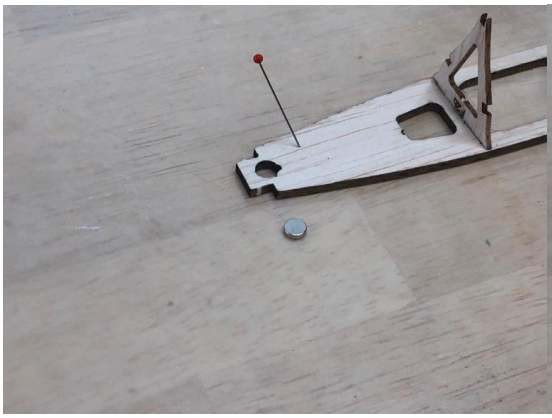
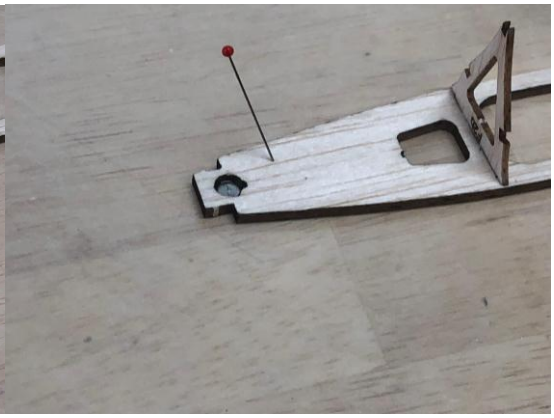
Fuselage Construction

Use thin CA unless otherwise noted

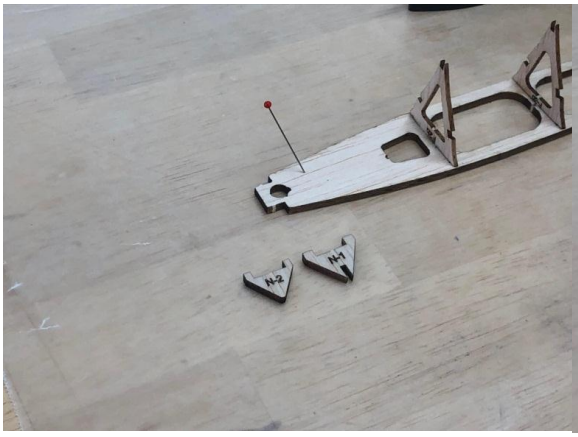
1. It is not necessary to build the fuselage over the plans. Locate the main fuselage crutch along with formers F-2b, F-3b, F-4b & F-5b. The "b" stands for bottom, please make sure you use the correct ones, refer to the plans. Pin the crutch upside down flat to your building surface. **(NOTE: the Alien logo will be face down)** Glue formers in place using a small square to keep them 90 degrees to the crutch.

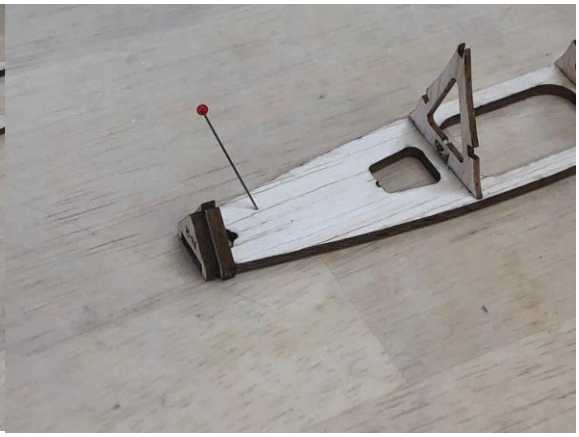



2. Locate one of the magnets. Press it fully into the hole until it is flush against the board and glue in place with medium CA.

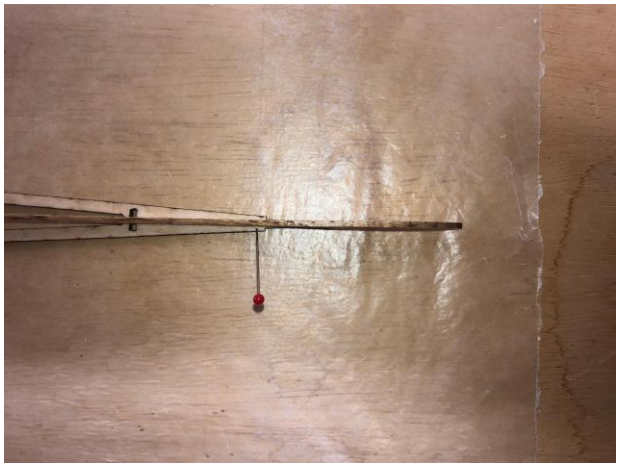
3. Locate the N-1 & N-2 nose blocks. Glue N-1 in place first followed by N-2. Try to keep glue away from the edges, this will make sanding later much easier.



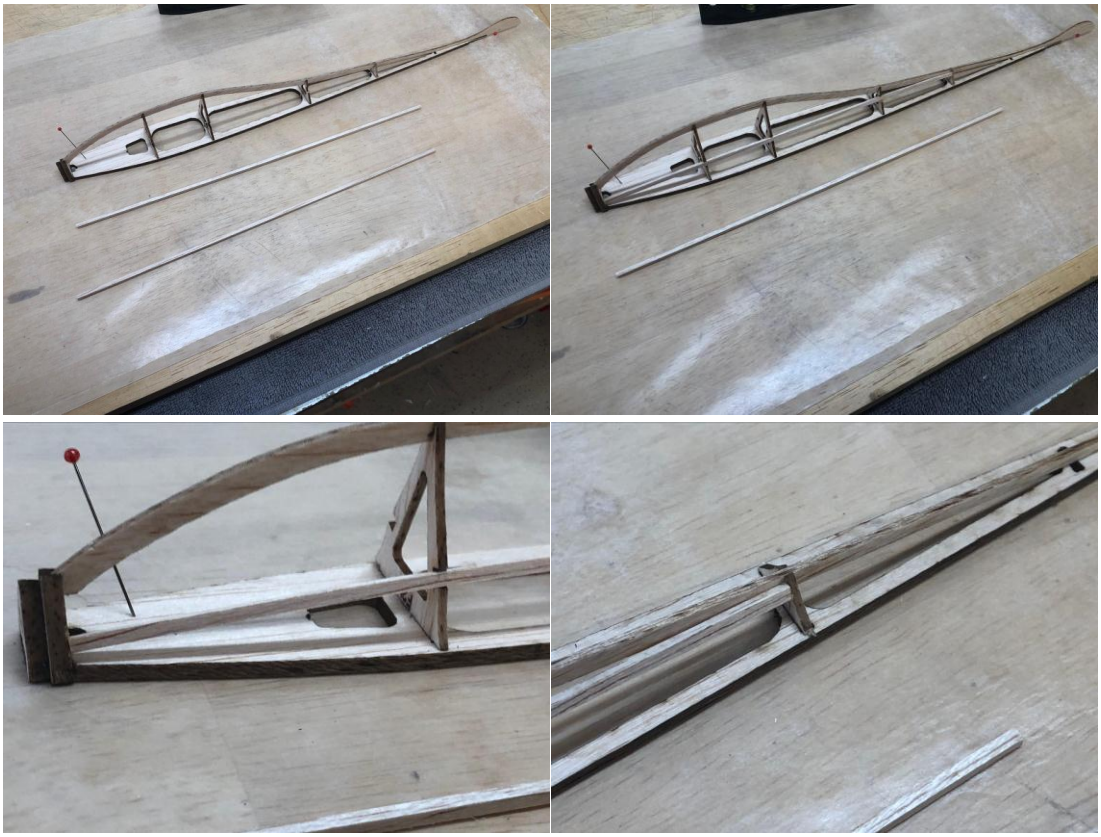


4. Locate the bottom spine and dry fit it into place. Do not glue this until it is fitting flush will all of the formers. It fits nicely so don't force it. Pay special attention at the rear of the fuselage to keep it straight and vertical. This forms the bottom of the fin/rudder assembly and also functions as the tail skid, any misalignment will be visible while flying.



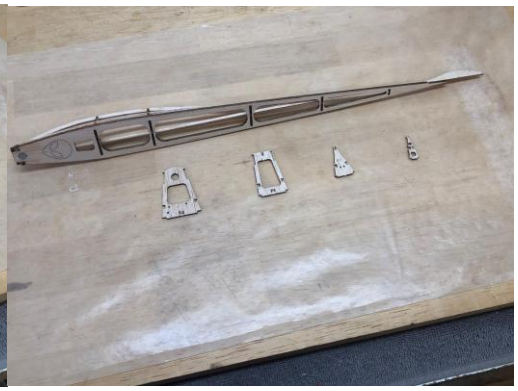
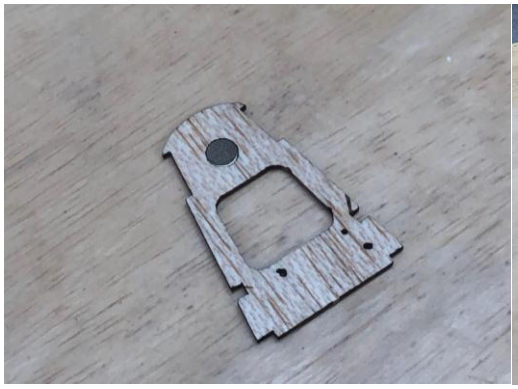


5. Locate 2 of the 3/32” stringers. These are taped to the inside of your kit box along with the pushrods. These will need to be trimmed to the proper length before being glued in place. Note that the front bends to meet the rear of N-1, and also sits a bit proud at the rear where it joins F-5b. This will be sanded flush later.

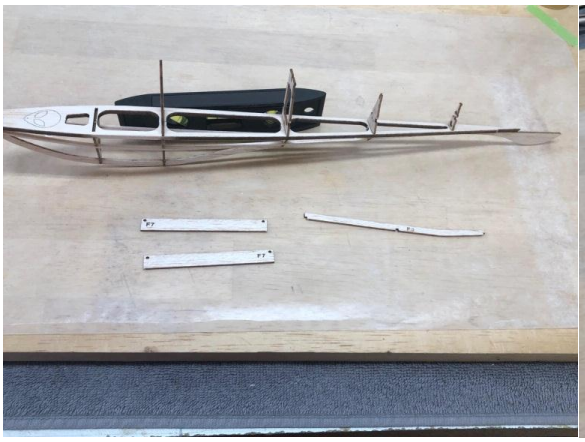
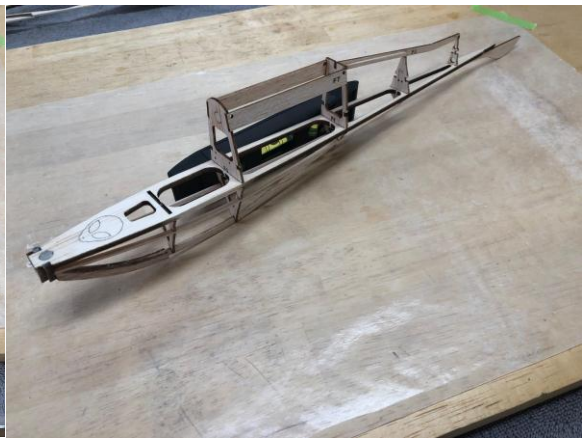


6. Locate and glue the 2 nose doublers in place flush to the rear of N-1

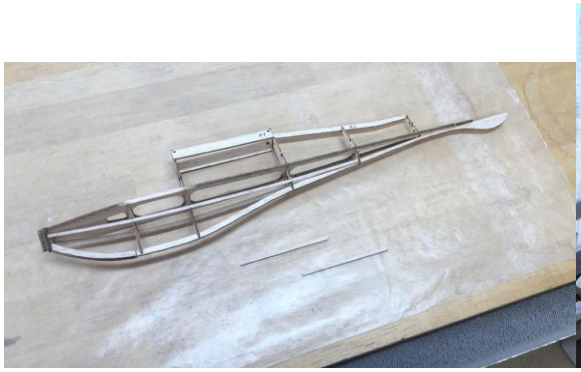
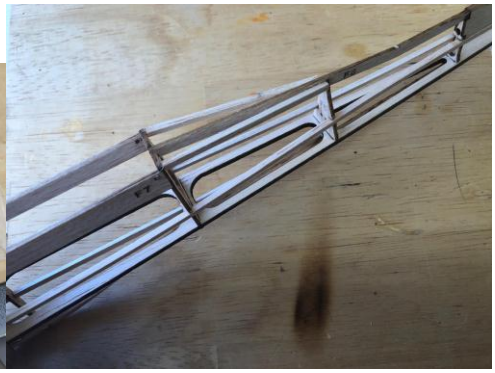
7. You can now un-pin the fuselage from your table and locate formers F-3, F-4, F-5 and F-6. F-6 is not marked due to its size. Install the remaining magnet flush with the front of F-3 using Med CA. Glue formers in place again being sure to keep them 90 degrees to the crutch.


8. Locate the 2 F-7 wing saddles and F-8 upper spine. Glue the saddles in place taking care to get them as even as possible with each other. Care must be taken to not distort F-3 or F-4 from vertical or the hatch will not fit correctly.

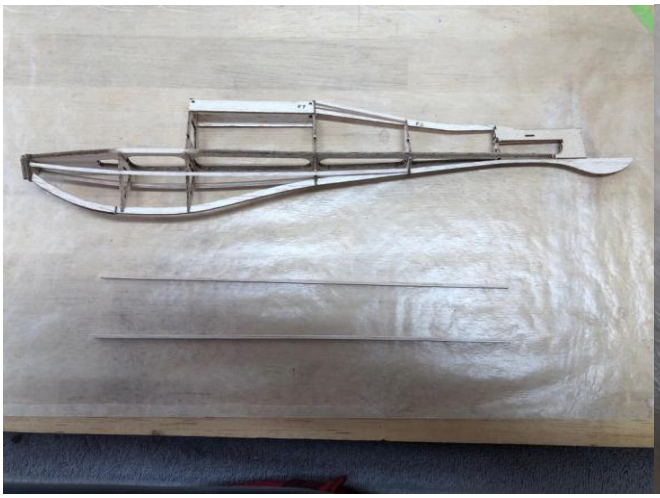
9. Locate the two shorter 3/32 stringer pieces. These will fill in the area behind the wing saddles back the spine and F-5. These will also be trimmed to fit, glue in place.

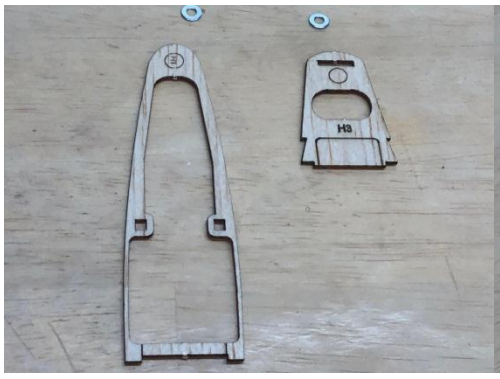
10. Locate the 1/32" tail saddle pieces. Glue these one at a time to the crutch and F-6. Again make sure that these are square and vertical. A small gap remains at the top front area for the fin to slide between.




11. Fit the remaining two 3/32” stringers from the tail saddle all the way forward to F-3. When fit correctly, the stringers will be slightly proud of the tail saddles, these will be sanded flush later. Trim them flush with the front of F-3.



12. Locate H-1 (hatch base), H-3 former and two washers out of the hardware bag. Remove the area inside the etched circle with the tip of an X-acto blade until the washers sit flush with the surface. When satisfied glue in place with Med CA.

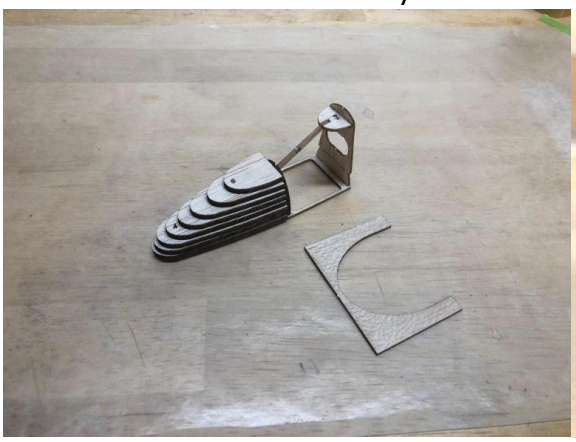


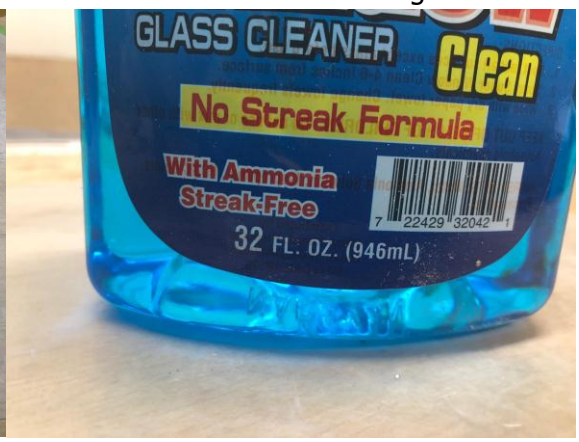
13. Glue H-3 (facing aft) to H-1 keeping it square. Fit H-2 in place (1/8”) and glue. Glue H-5 into the slot in H-3, again keeping it square.

14. Place the hatch temporarily in place on the fuselage. Dry fit H-4 (window post) in place. Once everything is square, bond permanently.

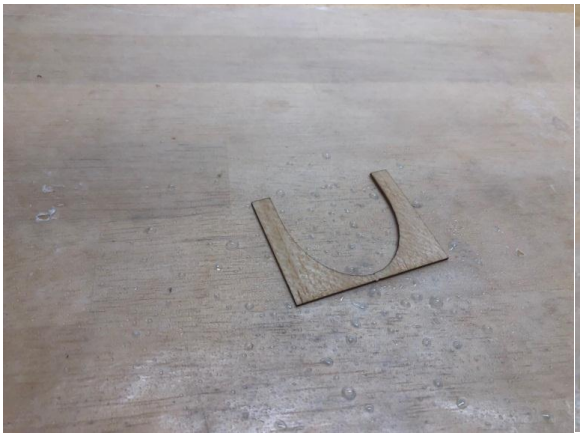
15. Carefully remove the hatch from the fuselage and locate the 1/8” hatch nose blocks numbered 1-8. Glue them to H-1 and H-2 in order starting with #1. Try to only glue around the inside edge of the wood, this will make sanding later much easier.

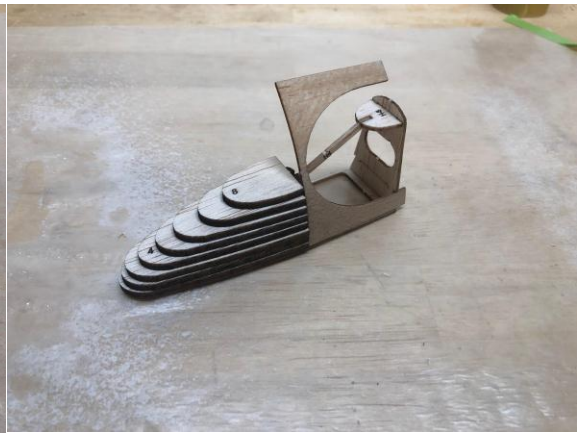
16. Locate the 1/32” nose sheeting. Lay it on the bench and give it a few squirts of glass cleaner. Make sure it contains ammonia; this is what softens the fibers in the wood which will allow it to bend easily. Leave it sit for 2-3 minutes before handling.





17. Place the nose sheeting on the hatch *wet side out.* Starting from one side, glue it to H-1, H-3 and partway around H-2.





18. Bend it the rest of the way around and glue it to the other side. Trim the ends of the sheeting flush with the back of H-3. Glue H-5 on top of H-5.

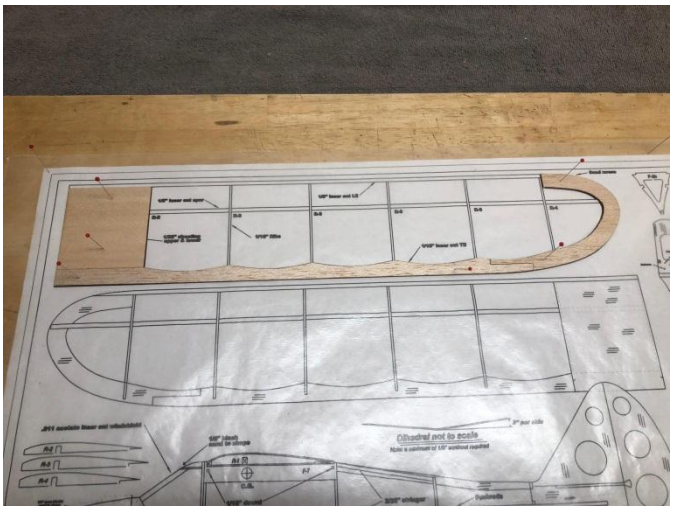
19. Fuselage construction is now complete. You can now sand the nose to shape, and all stringers flush.

Wing Construction

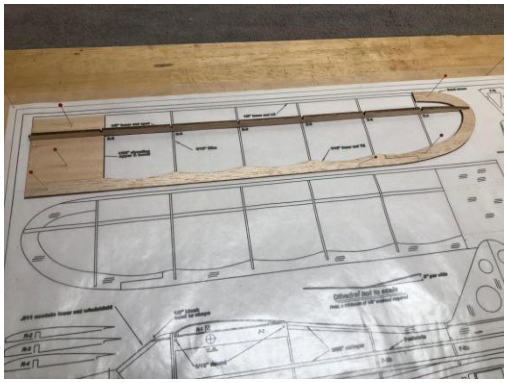
Although the wings are built directly over the plans, humidity (*or lack thereof)* can cause the plans to shrink or stretch. This can make the parts appear not to fit exactly. Not to worry, the parts are self-jigging and will end up in the right place. Use the plans as a reference to keep the ribs straight etc., but don't fret if the parts don't match the plans exactly.

The wing is built in only left and right halves. The spar is cut with the dihedral angle precut. Begin with the right wing.

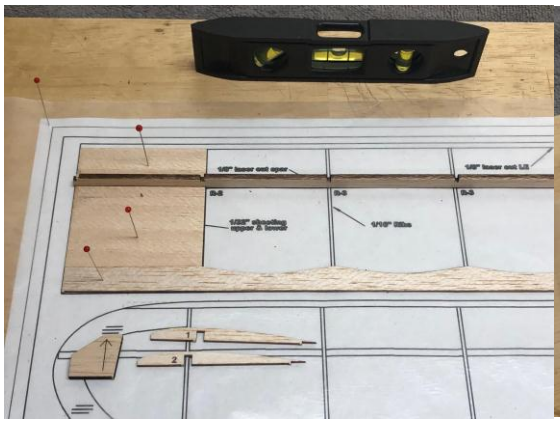
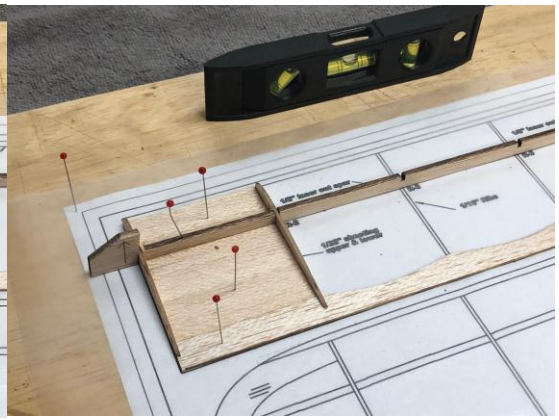
1. Locate the 1/16" trailing edge, tip bow and 1/32" center sheeting (shorter one without the etch mark) and pin in place over the plan, but do not glue.



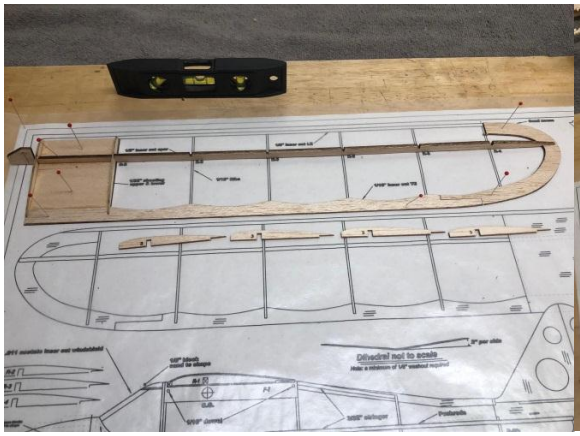
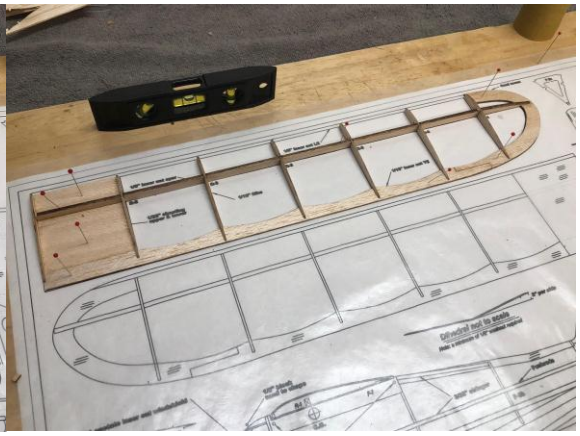
2. Locate the 1/8 spar and position it in place over the plan, but do not pin.



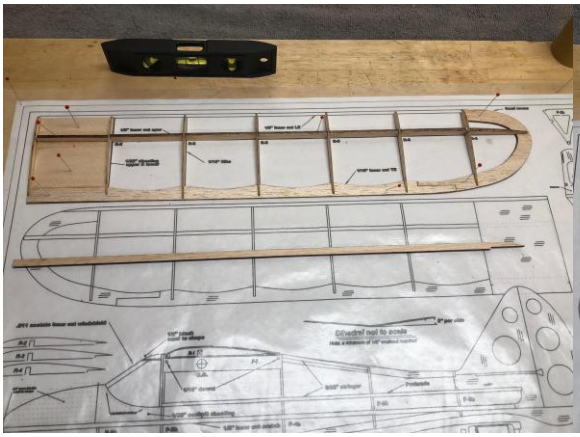
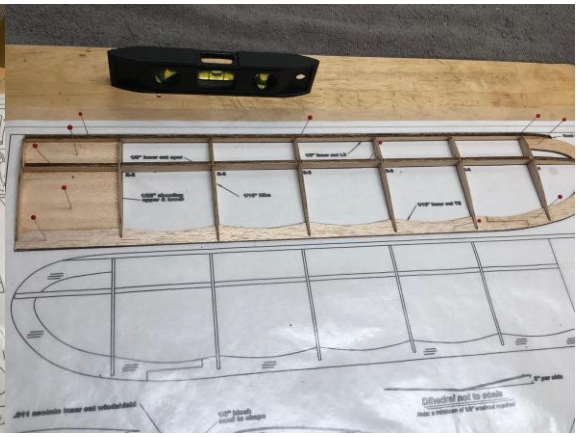
3. Locate the dihedral gauge, R-1 and R-2. Using the gauge, place R-1 at the proper angle on the spar with the notch tight at the trailing edge. Add R-2 the same way, but vertical. Glue both ribs in place along with the spar to the bottom sheeting, trailing edge and tip bow.

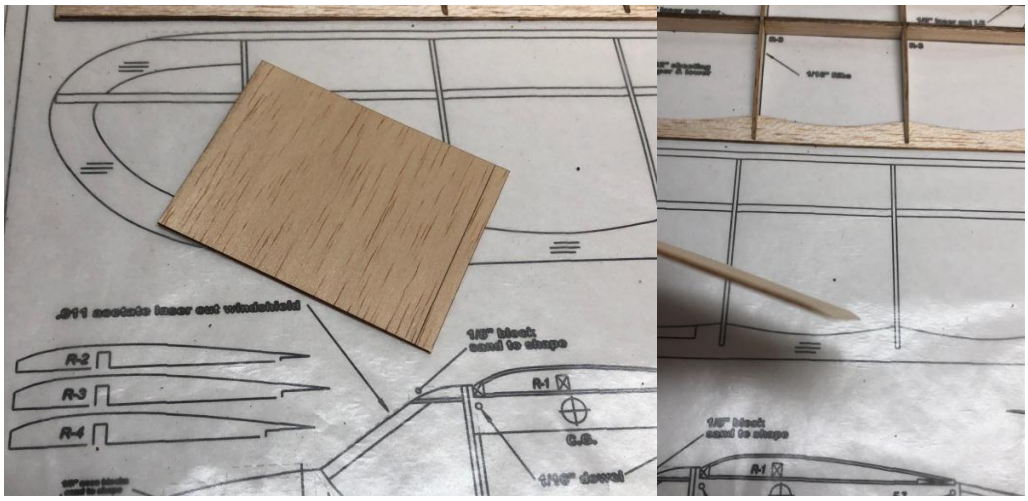
4. Add the 4 R-3's and 1 R-4 ribs and glue in place.

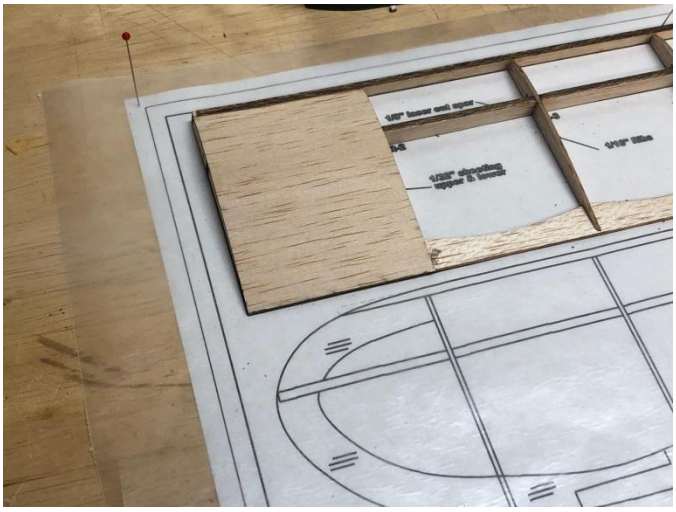
5. Place the 1/8" leading edge up against the ribs and pin in place. The notch in the tip will extend over the tip bow a little and will be sanded flush later.

6. Find the 1/32” top sheeting with the etch mark. Taper the sheeting to a point from the etch mark to the edge.

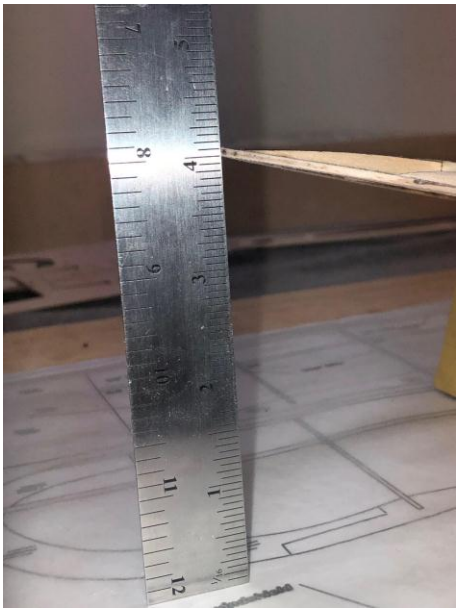


7. Trim the forward edge of the sheeting until the tapered part is even with the trailing edge and glue in place.



8. Repeat the above steps for the left wing.
9. Sand both wings to final shape in preparation for joining them. Sand the leading edge nice and round and flush with the tops of the ribs and faired into the tip. Round the tip bows and soften all the edges.
10. Sand the sheeting flush with the root rib R-1 and adjust the angle if necessary to get 2” of dihedral per side.

11. Lay one wing panel flat on the bench (on waxed paper) and block the other tip up to get a total of 4" of dihedral. When satisfied glue both panels together with Med CA. No need for epoxy or even fiberglass.



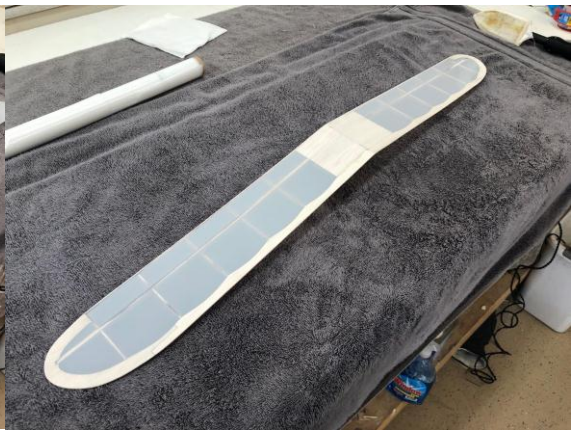
Tail Construction

There is no tail construction other than sanding, covering and hinging. The sequence below describes my method for using covering as a hinge. Although it takes a bit more time this makes for a very durable hinge and I think a nicer looking model. If you plan to use another hinging method, please read though below and deviate where appropriate to suit your meeds.

1. Locate all of the tail pieces. Dry fit the fin to the fuselage between the 1/32" sheeting. Tape the rudder in place and sand to fit if necessary to achieve a tight, straight gap with the tail skid.
2. Round all of the leading edges and trailing edges, but do not sand the hinge lines.
3. Next sand a 45 degree angle into the bottom LE of the elevator. Pay attention the slot for the control horn will be on the ***right side***.
4. Sand a 45 degree angle into the LE of the Rudder. Notice the bevel is in the ***right side*** of the Rudder.
5. Sand all of the tail pieces in preparation for covering. Be sure to round all of the edges except for the TE of the Stabilizer and Rudder, leave these squared off.

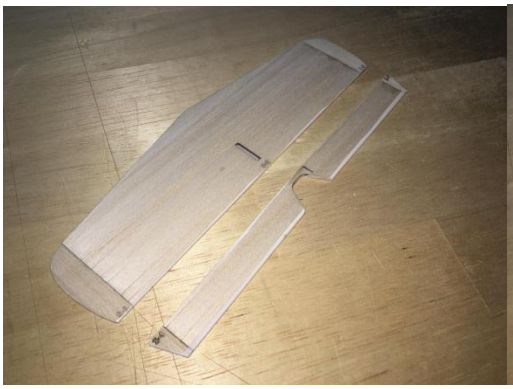
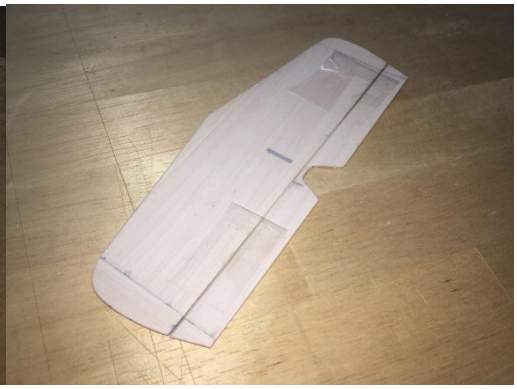
Covering

Once again go over the entire airframe, this is your last chance to check for blemishes. I'm going to assume that you know how to cover, so I will not go over it step by step. However I will offer a few tips.

- Cover the bottom of the wings first. This helps to hide the seams and makes for a nicer job. I was able to cover the bottom in of both wings in one piece. Move to the top next. This I had to do in 2 pieces, 1 each left and right.
-  

I didn't get pictures when I covered the tail, so the ones below are from a different but similar airplane.

- Cover the bottom of the Stabilizer and elevator first. Once done tape the Stabilizer and Elevator together (over the covering), flip it over and cover the top in one piece. This will yield a nice tight gap free hinge.

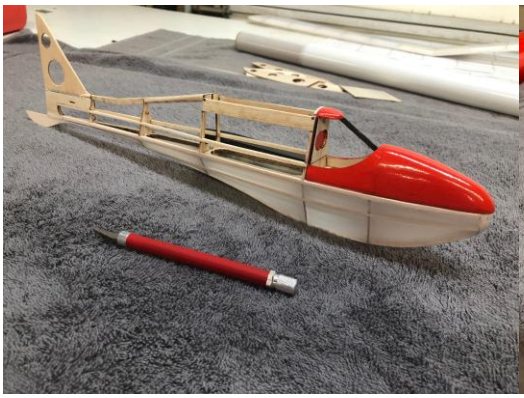
 

- If the elevator hinge is too tight, you can head it it up with your iron and flex it further if necessary.

- Use the same process for the rudder.
- Cover the hatch and remove the laser marked portion to clear the pushrods.


- I covered the fuselage in 4 pieces, splitting it in upper and lower as well as left and right sections. I started with the lower left and covered up to the crutch, then right up to the crutch.

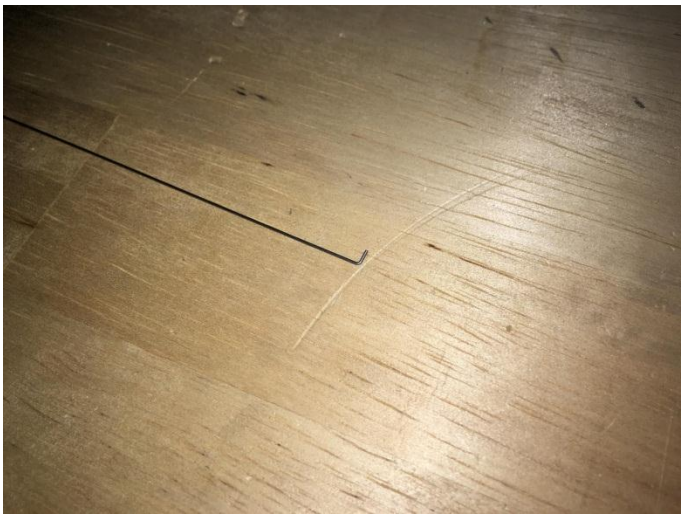
- I covered the upper right all the way up to the spine wrapping it over the spine a bit to secure it. ***Leave the left side uncovered, you will need access to run the pushrods!***




Final Assembly

Locate the two .020 music wire pushrods (they are taped inside the shipping box). Both ends will use a modified "Z" bend for control hook up. While not difficult, care must be takes as once they are bent, there is no adjustment. It is best to use two small pair of needle nose pliers to make these bends. This type of bend allows removal by "rolling" the pushrod out of the servo arm or horn. You can fudge the length a little when you glue the control horn in place however.

1. Start the process by making a 90 degree bend 1/8" from one end.



2. Make the second bend 90 degrees from the first.

3. Repeat for other pushrod.
4. Install the pushrods into the fuselage with the Z bends at F-3 rearward. They will corss over each other and pass through the upper hole in F-6, cross over and finally out the exit slots. This can be a bit tedious, so some patience is required here.
   Note: The pushrod on the right side of the brick drives the rudder and will exit in the *left side* of the fuselage. The pushrod on the left side of the brick drives the elevator and will exit on the *right side* of the fuselage.
5. Using a couple dabs of hot glue, secure the brick in place up against F-3. Note the extra hole for the antenna wire to pass through.
6. Measure pushrod length at the servos and make Install both pushrods into the tabs on the brick servos.
7. Cover the upper left side of the fuselage. You will need to cut a slit in the covering, slide it over the pushrod and iron it down to the fuselage.
8. Turn on your radio system and make sure the servos are centered. If you are using a 4 channel brick instead of the recommended 3 channel, your rudder control will be on the left stick (mode 2). If this is the case you can simply move it to the right stick by mixing aileron to rudder at 100%
9. Glue the stabilizer to the fuselage with thin CA making sure it is square. There is no need to remove any covering, it will stick just fine.
10. Test fit the rudder, once satisfied with the fit, glue in place with thin CA, agaon making sure it is all square.
11. Starting with the Elevator, locate the 1/64th ply control horn. Uncover the horn slot in the elevator with an X-acto knife.
12. Place the horn in the slot (**Do not glue!)** and mark the pushrod where it needs to be bent.

13. Bend the pushrod 90 degrees outward.
14. Move your pliers over about 1/16th and make the final bend straight up towards you. Trim off excess to about 1/8" length.
15. Test fit the horn over the wire; you may have to enlarge the hole in the horn with the tip of the X-acto knife.

16. Tape the elevator straight. Making sure the servo is still centered, and then fit the horn in the slot in the Elevator. Adjust the horn till it is vertical and keeps the elevator centered. Glue in place with thin CA.
17. Repeat for Rudder. Note the slot in the rudder may not be cut. Mark the location and slice with an X-acto knife.

18. Cut out the covering over the holes for the wing hold down dowels. Slide the dowels though and center them in the fuselage. Glue them in place with thin CA.
19. Add a piece of Velcro in the fuselage ahead of the brick to hold the battery in place.
20. Sand the edges of the windshield smooth and glue in place with RC-56 or other canopy glue.
21. Rubber band the wing in place. I use (4) bands, (2) front to back, and (2) crisscrossed.
22. The CG is located on the spar. Add nose weight to achieve proper balance. It should hang slightly nose low. BB's and epoxy as well as lead shot work well for this. I added shot inside the hatch cavity.

Congrats! Your Micro Sinbad is now complete!

Preflight

- Double check CG. You can always move it to suit your taste later.
- Check for proper direction of Rudder & Elevator. *Caution:* do not set your servo travel beyond 100% as this will cause the servos to bind up and lock.
- I use about 20% expo but it's not necessary at all.

Flying

Start with a few gentle hand tosses to get the hang of it check CG, then wind up and let it rip. It will withstand the hardest javelin style launches you can muster. It is also very at home on the slope. There is no provision for a tow hook, however I have had good luck bending one out of pushrod wire and taping it in place near the CG. Experiment with placement for best position.

Of course it is most at home just tooling around at minimum sink looking for the next thermal bump, but simple 2 channel aerobatics including loops, wingovers, spins etc. are all in its bag of tricks.

Options

- A simple strip of 3M packing tape on the bottom of the fuselage will help protect the covering on rough flying fields.
- You can make a simple bungee from ¼" (or larger)free flight rubber and a length of lightweight monofilament line. The lengths are up to you and should suit your flying area. A general rule of thumb is about 1/4 rubber to 3/4ths line. Attach a brightly colored ribbon near the loop so you can easily find it after you land.
- An aerotow hook can also be made from the same .020 wire. I simply glued it to the right side of the nose block straight out to the side about ½". You can bend this slightly back to hold onto the towline, and when it's time to release you can simply turn sharply left and the towline will slide off.

Enjoy!

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