

## Building your first Gremlin – Step by Step

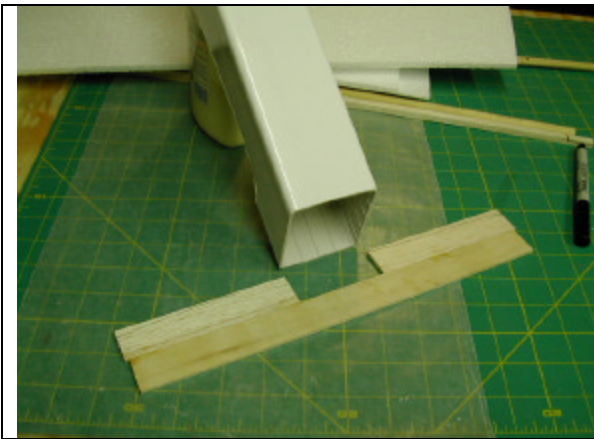
By David Beach

Flying a Gremlin in one-on-one combat is about as much fun as you can have with an R/C airplane. But unless you've seen someone build one (or turn it back into a kit), the first attempt at construction using only the supplied directions can be intimidating.

I'm not a believer in the idea that there is a right way and a wrong way. I'm more of the opinion that there are several right ways. These directions are the result of what I find easiest, but you may want to take another approach.

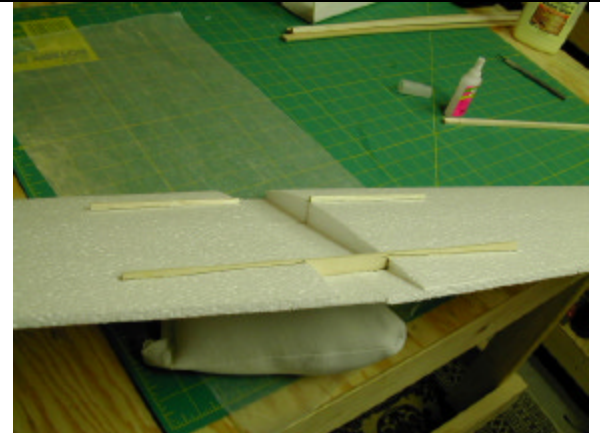
These photos were taken preparing a new Gremlin from the R.A. Cores kit in preparation for Halloween combat. Once you've got the process down, a Gremlin can go from kit to ready-to-fly in four sessions of about five hours each.

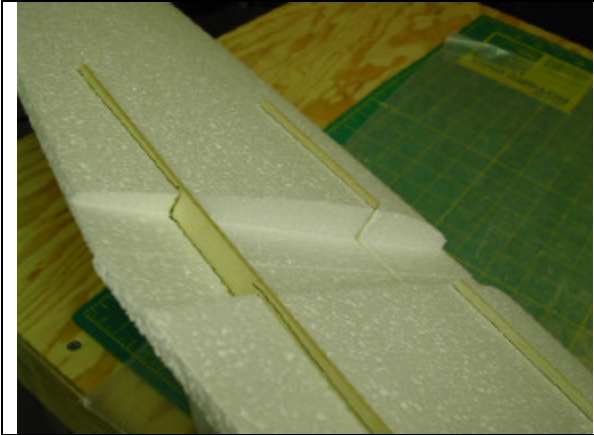
Good luck, and let's get going.



I use thin CA to join the balsa extensions to the main spar. Be sure to make the opening wide enough to fit the fuselage (or you will be sanding later). The foam wings will handle the uneven ends easily enough, no need for sandpaper here.

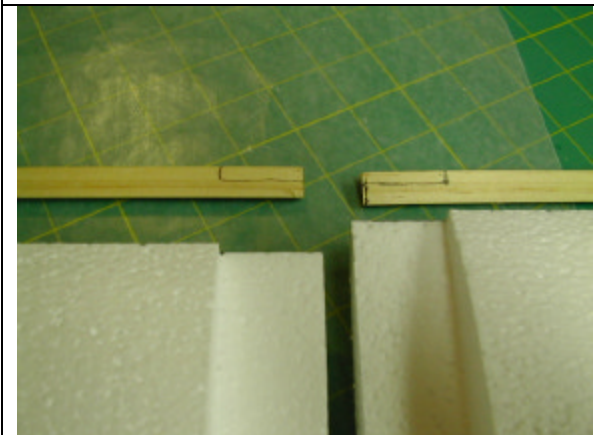
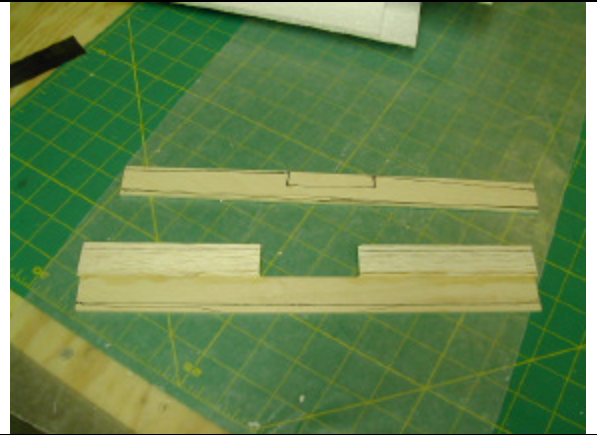
Dry fit the spars into the wing halves.





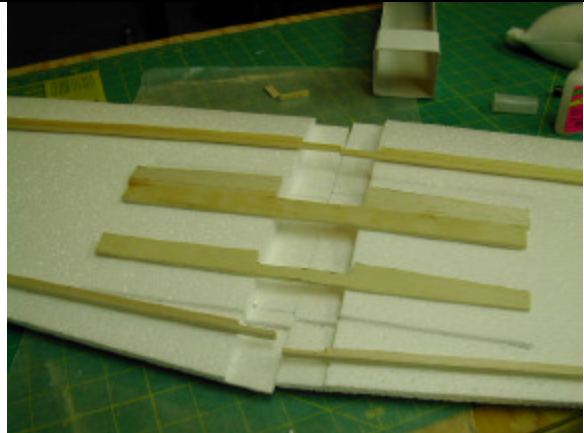
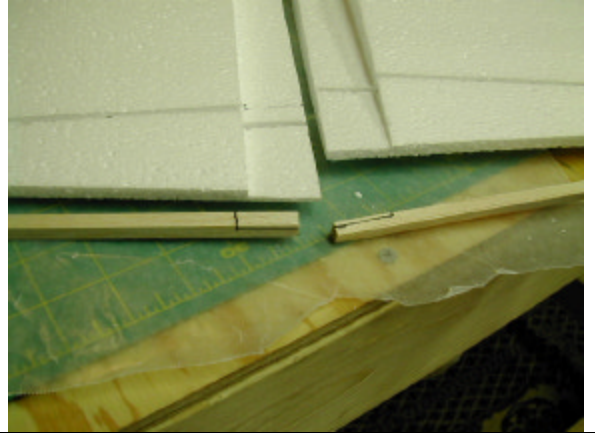
When you are satisfied with the fit, outline the areas to trim off of the front and rear spars. This view is the top of the wing showing my black pen markings. I've also outlined the bottom side.

Here are the spars showing the trim lines. A jigsaw does the job on the plywood, a knife blade will handle the balsa extensions on the main spar.



Here are the center section leading edges showing areas to cut out. If you don't do it now with a jigsaw (or razor saw), it will be a lot more trouble later.

Likewise with the trailing edges. Mark them and cutout the unneeded bits now.



With all the wood properly trimmed, things will be much easier fitting the fuselage after the wing halves are joined. Make sure the fuselage opening in the spars is not too snug, leave room for a layer of fiberglass and epoxy.

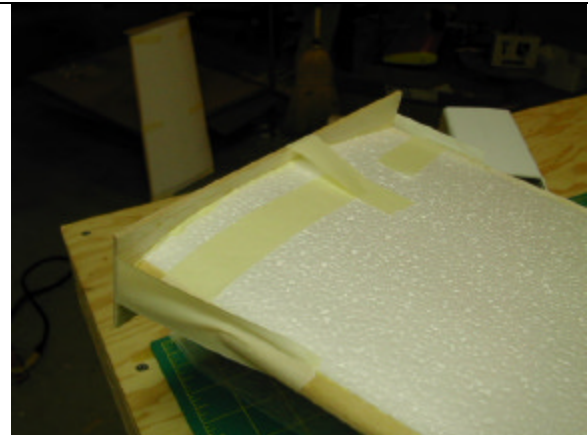
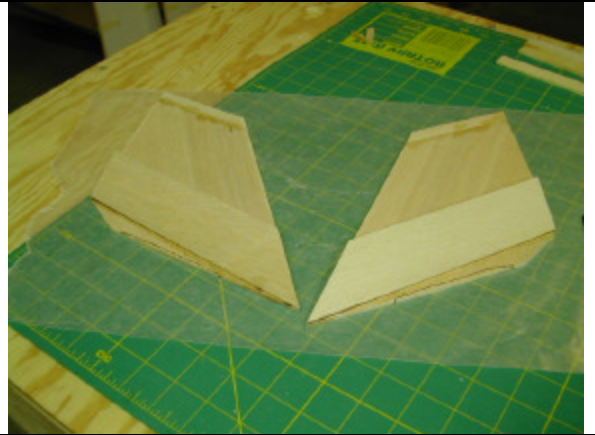
Ready to glue? I use Elmer's for leading and trailing edge. Keep them flush with the wing tips (the trailing edge is intentionally a bit shorter than the wing). Secure the leading and trailing edges with masking tape. Wipe up excess glue with a damp cloth or paper towel.





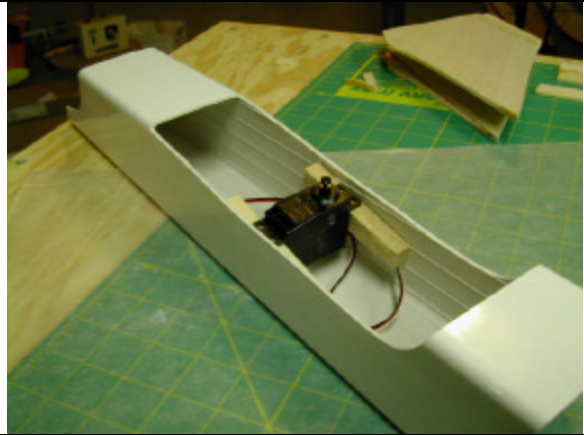
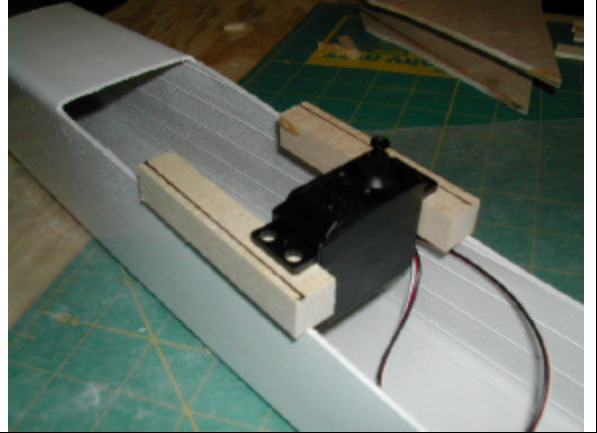
I use thin CA for the tail cap strips, medium CA for the aileron stock used as a stand-off to the fuselage. If you look closely you will notice the stand-off is further up the tail fin than called for in the plans, it's not intentional – it's a mistake (I stopped looking at the plans a few Gremlins ago).

The CA is set, I use a razor saw to trim the edges.



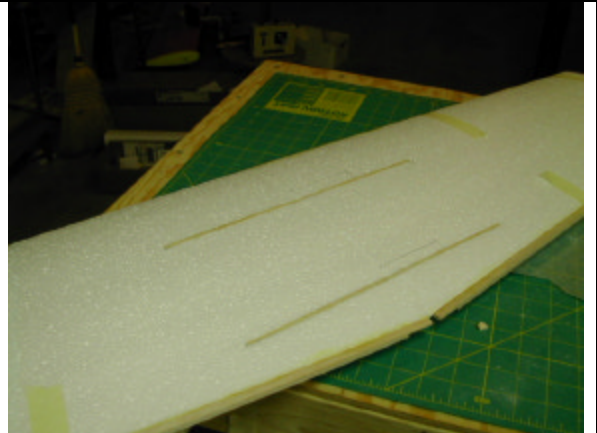
Back to the wing now and add the end caps. Again, Elmer's glue and masking tape is all it takes.

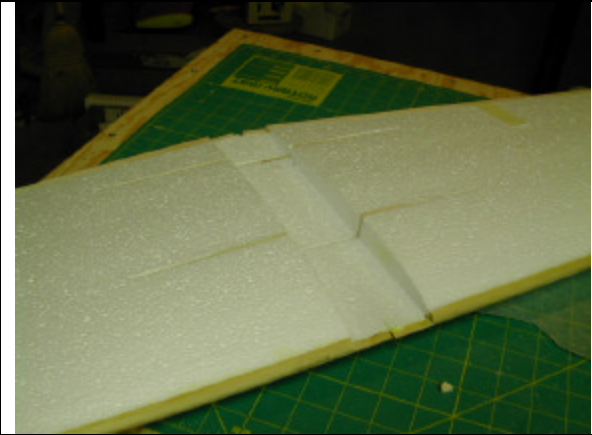
My preference for servo rails is to trim them so the servos sit cross-wise in the fuselage. A band saw is probably the right tool, I use a vise and a jigsaw.



Looking good, but locating the servos in the fuselage is about the last step. The lighter the engine, the further forward they will need to be.

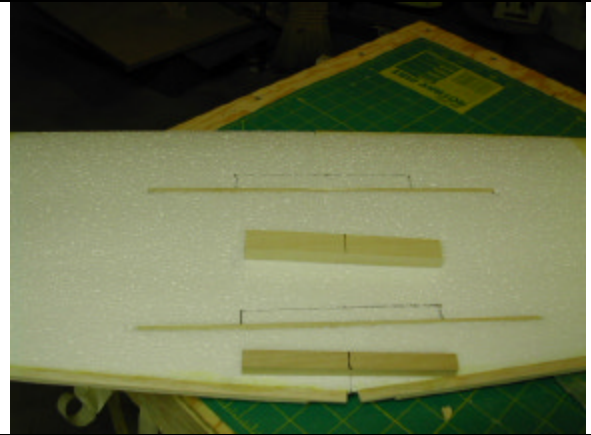
Once the leading and trailing edges have dried, it's time for another dry fit of the wing. This is the last chance to trim away excess wood before it's connected to foam. Get everything aligned with the wing upside down. The top of the wing is flat, but the bottom has built-in washout.





Still dry fit, it looks good to go.

My preference is to cutout the areas for the wing hold down blocks now. I mark the outline for the blocks on the bottom.



Separate the wing halves and outline the depth of the wing hold down blocks. A nice long Xacto blade works well, or you might try a razor saw or Dremel tool. A close inspection of the plans might show the front hold down block against the fuselage, I find it easiest to make it just deep enough to go flush against the bottom of the wing.

I've heard it can be done with 5 minute epoxy if you are really quick, but I use the 30 minute variety. I brush epoxy on half of the spars and insert them in one wing half. Then lather up the wing butt joint and remaining exposed spar pieces with epoxy. Slide everything together bottom side up and get it aligned. Brush epoxy on the hold down blocks and in the cutout where they go. Clean up any excess with alcohol dampened paper towels.



Bottom side up, nice and flat. Leading edges and trailing edges aligned. Secure it with tape, sandbags, or what have you. It will need to sit overnight.

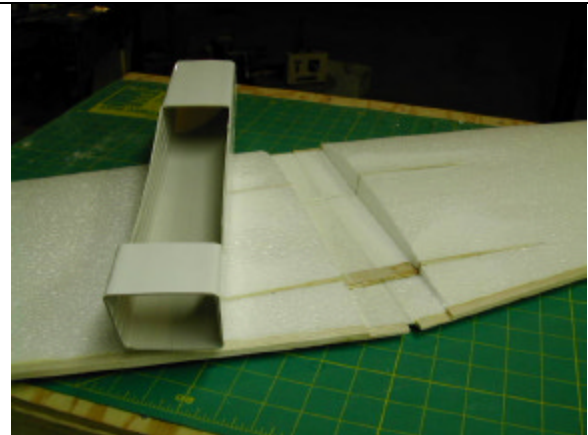
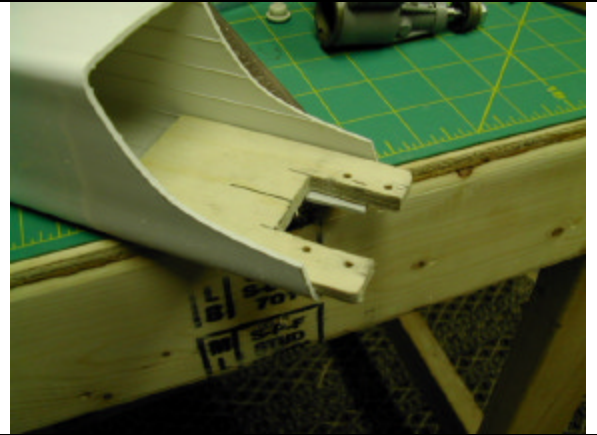
My first Gremlin was .40 powered and had some high speed flutter. Since then I've always tapered the elevons and had no problems.





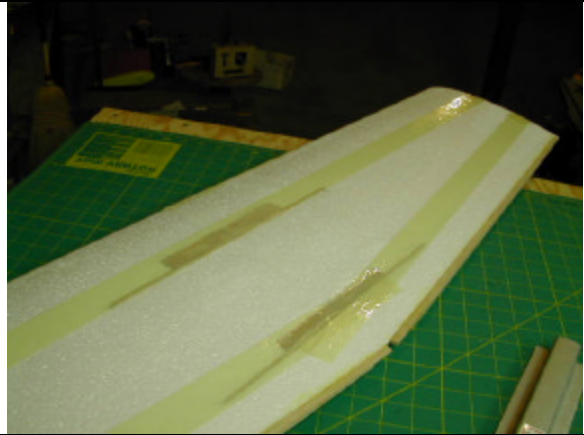
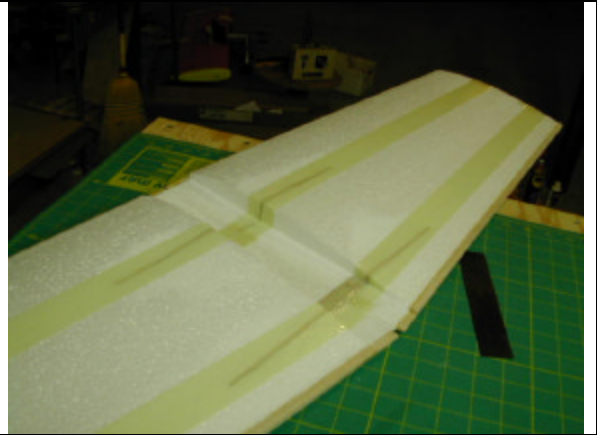
The engine mount block is straightforward. I mark the centerline and go from there.

The front engine bolts only hold the engine to the mount block. The rear bolts will go through the fuselage as well.



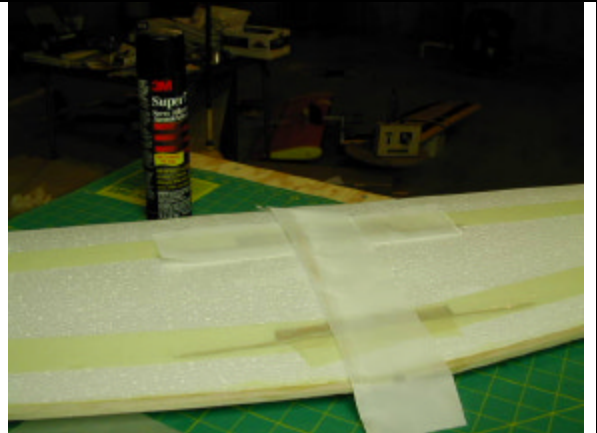
Is your wing dry now? Does the fuselage fit? Most times I resort to some sanding here, but it should be nothing but foam.

Vacuum off the foam dust and go for the strapping tape. I use 1 ½ inch wide tape over both spars. Two pieces on the tops (front and rear), two pieces on the bottom rear, and a single strip all the way across the bottom front. Stretch the tape to get it tight, but don't deform the wing.



Here is the bottom of the wing showing the tape strips.

I use medium weight fiberglass over the center section. Just cut the pieces to size and spray them down with adhesive, then tack them into place.





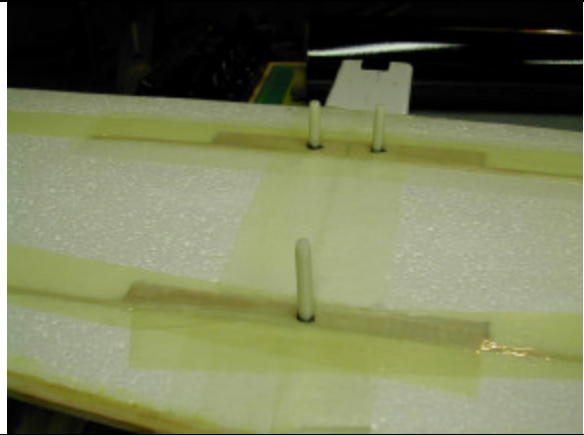
Mix up another big batch of 30 minute epoxy and cut it with a little alcohol. I use a brush to work the epoxy through the cloth and onto the foam. I do top and bottom in one pass, and hang it up to dry.

As far as I know you must resort to sandpaper to shape the front of the elevons. Once that's done they are ready for cutting hinge slots.



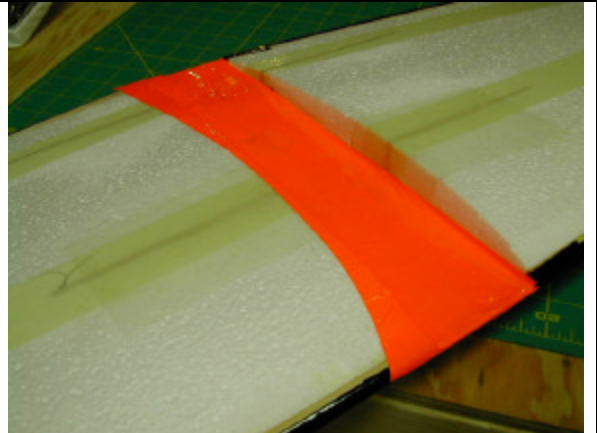
I did this Gremlin in Ultracote and was pleased with the results. I use a  $\frac{3}{4}$  inch wide strip of covering at the top of the stand off. The remainder can be covered in three flat pieces (two inside and one on the outside).

Elevons get covered in two pieces each (bottom, then top). I like the Klett hinges with pins, they can be glued in now.



At this point I've tapped the hold down blocks. Here I'm marking the length of the wing bolts, which I cut with a Dremel cutting disk.

I cover the top center of the wing in three pieces, bottom part first. The other two strips cover the sides of the cut out with a 1/2 inch or so overlap on the top of the wing.





Finish covering the wing, and mount the elevons. I like hinge glue, if you use CA it must be the odorless variety (preferably fresh) to avoid eating the foam.

I've skipped a few steps here, but the rest is pretty straightforward. My Gremlins all have the wing trailing edge flush with the end of the fuselage and use the radio gear for balance. I use 4-40 bolts with aircraft nuts for engine mounting and fin mounting. I use servo screws through the fuselage to hold the servo rails. The black ovals shown here are stick-on non-slip stairway material from the local hardware store, great for easing the launch process.

