

MINI SPEEDWING[®] - BY ACER

ASSEMBLY INSTRUCTIONS

Thank you for choosing the Mini SpeedWing as your next project. This kit is easy to build and only requires a few hours to complete. Once finished, you will be rewarded with a stable, fun to fly wing that you can take anywhere. It is the perfect "take to work" plane to fly on those lunch breaks or to stop by the park on the way home. Although this kit isn't recommended for beginners because of its high speed and agility, once you master the basics of flying R/C planes you can handle this plane. Well lets get started. Below is a list of supplies and tools needed to complete the Mini SpeedWing.

Supplies:

- ▶ Velcro Tape (for battery attachment)
- ▶ Dubro Micro EZ-Connects (for servo horns)
- ▶ Pen
- ▶ 5 minute epoxy
- ▶ 320 grit sand paper (or equivalent)
- ▶ Xacto knife
- ▶ Dremel Tool (optional)
- ▶ Foam Safe CA (optional)
- ▶ Two sided foam tape (for servo anchor)
- ▶ 3M #600 3/4" tape (for hinges)
- ▶ Covering tape or Low Heat iron on covering
- ▶ 1" strapping tape (has fibers imbeded in it)
- ▶ 3M 77 Spray Adhesive*

* 3M has recently changed the formula of their 77 Spray. Make sure that you use the old formula in the BLACK can. The new formula contains Acetone which will attack EPS foam. The new formula can is orange fading to black. To be sure you use the right one, look on the back of the can. If it says it contains Acetone DO NOT USE.

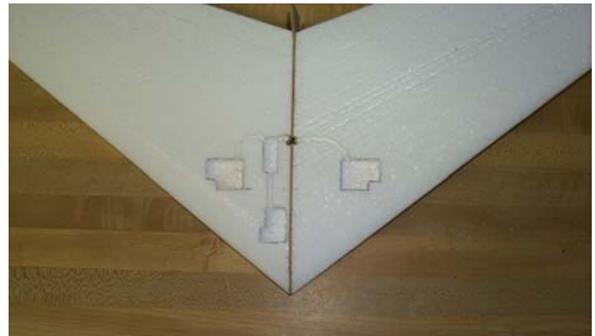
Radio Equipment:

- ▶ Micro receiver (GWS 4P recommended)
- ▶ Micro Servos - 2 (HS-55 recommended)
- ▶ Small Speed Control (GWS 5amp recommended)
- ▶ 7-cell 300mah NiMh Battery or equivalent

Instructions:

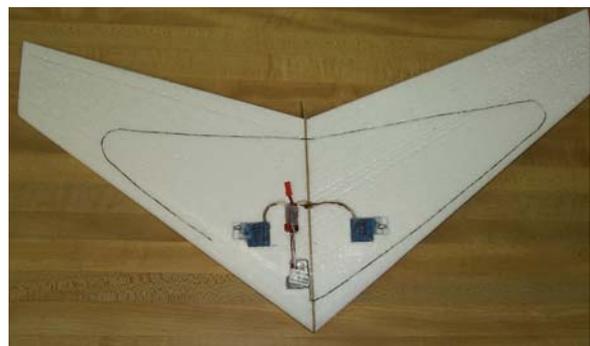
1. Separate cores from their beds. Using a sanding block and 320 grit sand paper, lightly sand the top and bottom of both wing panels.
2. Find the ply motor mount. The laser cutting process leaves the edges darker than the wood, if you want to you can lightly sand the edges.
3. Using 5 minute epoxy, glue the motor mount to one wing core. Make sure that the mount is aligned to the shape of the wing core. Once that is dry, epoxy the other wing core to the mount. Before the epoxy dries, make sure that the wing cores line up. Wait for the epoxy to dry. Lightly sand the leading edge so that it is rounded.
4. Now mark the areas where you will recess your radio gear. You can put the gear where ever you like, but here is the recommended location. The servos are placed 3 inches behind the nose and 1.5 inches to the left and right of the center. The receiver location is the hole closest to the nose. The speed control location is in the center of the wing. Also mark where you will rout the wires .

5. Once everything is marked out, take a sharp Xacto knife and cut around the outlines you just made (only cut as deep as the part you are going to recess). Once that is finished take a Dremel tool or other means to remove just enough foam for your radio gear to sit flush with the surface of the wing. Temporarily mount all radio gear to make sure everything fits snug. Once you are sure of the fit, remove gear. Put a little 5 minute epoxy in the servo holes so that the servo tape sticks.



6. Lightly mist the whole wing with 3M 77 spray. Make sure to read the warning on the previous page regarding the new 3M 77 formula. Let the wing dry for about 20 minutes.

7. Now permanently install the radio gear making sure that your servos are centered and that the servos move in the right direction for elevon operation. Take the Xacto and slice a shallow line in the wing for the antenna (see picture). Bury the antenna in the slice using your nail. Just work slowly as it is a little tedious.



8. Use strapping tape to strengthen the wing. The picture is self explanatory. Make sure you don't introduce warp in the wing while applying the strapping tape. Do this for both the top and bottom of the wing. Now run a piece of strapping tape along the leading edge of the wing having an equal amount of tape on the top and on bottom.

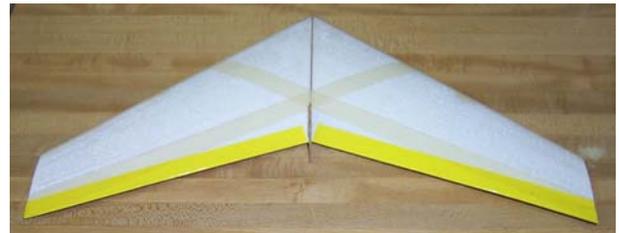


9. Lightly 77 spray just the tape and let dry.

Covering the Wing:

You can cover the wing any way you want. If you are going to use iron on covering, make sure to use **LOW HEAT** covering material. For simplicity, I prefer to use colored packing tape like that used on other wings. I'll give you instructions on how to use the tape for covering.

1. First take the color of tape that will be on the top of the wing. Run a strip of the colored tape along the trailing edge making sure that equal amounts are on the top and bottom of the wing.



2. Now cover the top of the wing first. Only cover half at a time making sure to overlap the center of the wing by about 2 inches. Start from the trailing edge and work your way to the leading edge. Make sure that you have a very sharp Xacto handy while covering. Also make sure that you don't introduce a warp in the wing.
3. Once the top is covered, cover the bottom in the same way, preferably with a contrasting color of tape. Once again working your way from trailing edge to the leading edge. You can take the warp out that you may have introduced with the top covering by stretching the bottom tape before applying.
4. Now use a strip of the bottom covering and overlap the top covering at the leading edge.

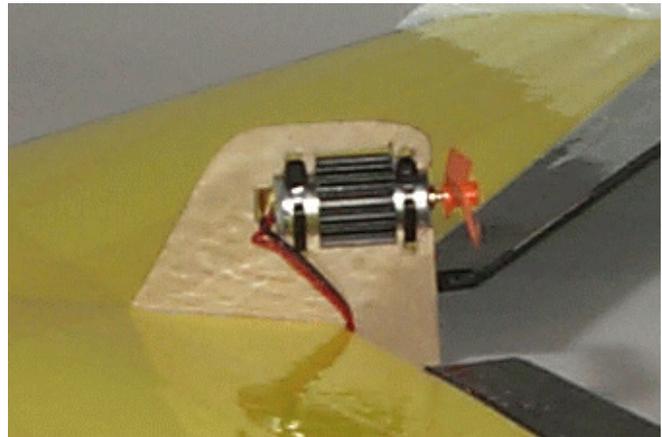


5. Find the elevons in your kit. The elevons are precut, but you have to sand in the bevel on the bottom of the elevon. Also sand an angle at the front of the elevon for clearance. 
6. Lightly spray the elevon with 77 spray and let dry. Cover the elevon with the colored tape you used for the bottom of the wing.
7. Now attach the elevons to the top of the wing using 3M 600 3/4" tape. Bend the elevons to their maximum deflection before taping to the wing. Also put a couple of small strips of tape (2") on the bottom of the elevon making sure to deflect the elevon before taping to the wing. 
8. Attach the tiplets to the wing using foam safe CA or a very small amount of 5 minute epoxy.

Final Setup:

1. Find the micro control horns and install them in the bottom of the elevons. Just push them through making sure that they are lined up with the control horns of the servos. Cut the covering away from where the micro control horns sit. Now permanently attach the horns with some CA or epoxy. Once that is dry, you can cut off the post sticking through the elevon.
2. Make a small "Z" bend in the end of both music wire pushrods. Attach the pushrods to the elevons. Make sure that your servos are centered, then cut the pushrods to the correct length. If you are using the dubro micro EZ-Connects, all you have to do is slide the pushrods through the EZ-Connect and tighten the screw making sure that the elevon has a very slight reflex (up angle) to the wing. If you are not using the EZ-Connects, mark the location of the servo arm on the pushrod and make another z-bend. Then insert the z-bend into the control horn of the servo. I recommend the Dubro EZ-Connects as it makes for a MUCH simpler setup.
3. There are a couple of ways to attach the battery. The most simple solution is to just attach it to the bottom of the wing with a strip of velcro tape. Some people may want to bury the battery. Before burying it make sure that the C.G. is correct. You will have to cut out some of the ply mount to bury the battery. I prefer to just attach the battery to the bottom of the wing as it aids in cooling, it also lessens any damage from high speed crashes as the battery will eject and not harm the wing with the extra weight.

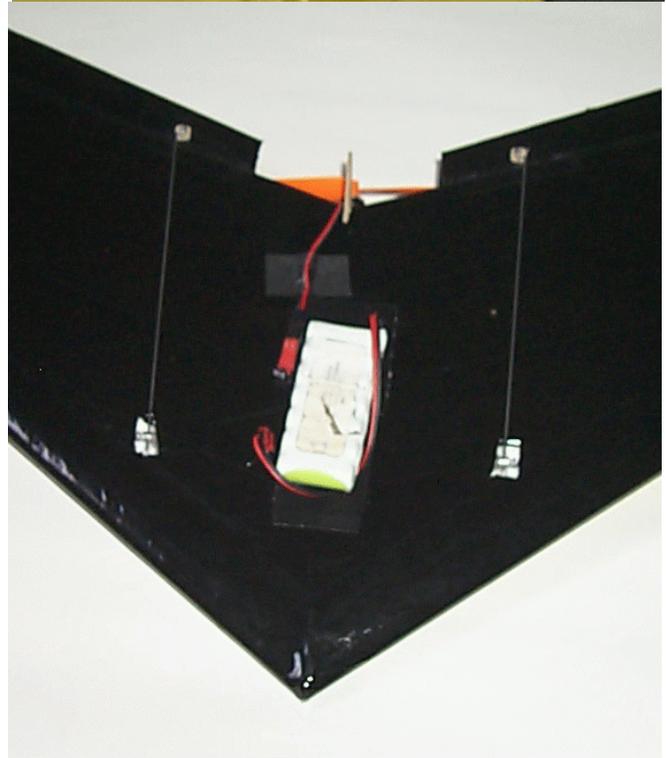
4. Attach the motor to the motor mount using the tie wraps included. Make sure that you tighten the tie wraps fully. Attach the prop to the motor making sure that the letters on the prop are facing forward. Plug the motor in to the speed control the red wire attaches to the red wire on the speed control and the black attaches to the black.



Here is how I routed all the motor and battery wires.

Center of Gravity:

The center of gravity is located 5 3/4" back from the nose. Just move the battery back and forth until you find the right C.G.



Control Throws:

Here are the recommended control throws. If you have a radio with exponential, I recommend at least -50% expo on all surfaces. Start on the mild setting. On the wild setting use -100% expo on ailerons and -50% expo on elevator. When measuring control throws, measure at the tip of the elevon at its widest point.

Mild

Elevator: 3/8" up, 3/8" down

Aileron: 1/4" up, 1/4" down

Wild

Elevator: 1/2" up, 1/2" down

Aileron: 5/8" up, 5/8" down

First Flight:

Make sure that your control surfaces move in the right directions. When you give up both elevons should go up. When you give right, the right elevon goes up and the left elevon goes down. You will need to have a slight amount of UP elevator dialed in. This is called reflex. All wings need a certain amount of reflex to fly. To launch the wing put your palm on the bottom of the wing with your index and middle finger on both sides of the mount at the end of the wing. Then just give it a toss and start the motor after it leaves your hand. There is no need to give it full throttle as it will fly at 1/4 throttle. Trim it for level flight.

Flight Performance:

The Mini SpeedWing has a very wide flight envelope. It can fly as fast as 40 m.p.h. or it can slow down and just cruise around. It is very acrobatic also, able to do consecutive loops and about 3 barrel rolls per second with the “wild” control throws. It can even thermal pretty well. I’ve had many 15 plus minute flights with a mixture of full speed acrobatics and then thermaling. I think you will be very pleased with the amount of fun that the Mini SpeedWing provides.

