Acer's **SpeedWing** ©
Real Fun - Real Fast ©

SpeedWing 400 Mk II ©
Assembly Instructions

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SpeedWing 400 MKII Instructions

Thank you for choosing the SpeedWing 400 MKII 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, FAST, 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. It Flies FAST or slow on a regular Speed 400 motor. 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 SpeedWing 400 MKII.

Supplies:

- Industrial Strength Velcro Tape (for battery attachment)
- Pen
- 5 minute epoxy
- Thin CA (Superglue)
- Medium CA
- CA Accelerator
- 150 Grit Sand Paper (or equivalent)
- Xacto knife
- Dremel Tool (optional)
- Two sided foam tape (for servo anchor)
- 3M #600 3/4" Scotch Tape, or Clear Packing Tape (for hinges)
- Covering tape or Low Heat iron on covering (I use Solarfilm)
- 1" strapping tape (has fibers imbedded in it)
- 3M 77 Spray Adhesive

Radio Equipment:

- 4 channel receiver (Berg MicroStamp 4L Recommended)
- Micro Servos - 2 (GWS Micro 2BB MG Recommended)
- Small Speed Control (20 amp capacity)
- 7 or 8 cell 2/3A size batteries (IB1400's), or 2-cell 2100 LiPolys
- Speed 400 6V motor and prop (APC 4.75 x 4.75 recommended) Or E-flite Six Series Brushless

1. Find the three parts of the motor mount. You can smooth the edges of the motor mount doublers if you'd like.
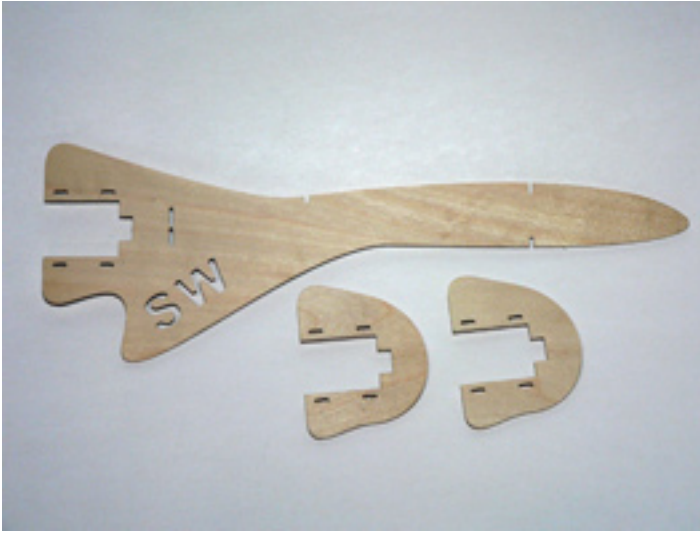
2. Use 5-minute epoxy to glue the ply doublers to the motor mount. Make sure that you align the doublers correctly and hold them in place until the epoxy dries.

3. Now place the mount along one wing core and mark where the ply doublers come in contact with the foam. This foam will have to be cut from the cores so that the motor mount can be glued flush to the cores.


4. Now use a sharp X-acto blade and cut the foam along the marks you have made.

5. Glue the mount to one wing core with 5-minute epoxy. Use just enough epoxy to cover the root of the wing. To help hold the wing in place, use a couple of strips of masking tape.

6. Glue the remaining wing to the motor mount using epoxy. Again, use masking tape to help hold the wing to the motor mount while the glue dries. Make sure the wing cores are in perfect alignment with the motor mount.
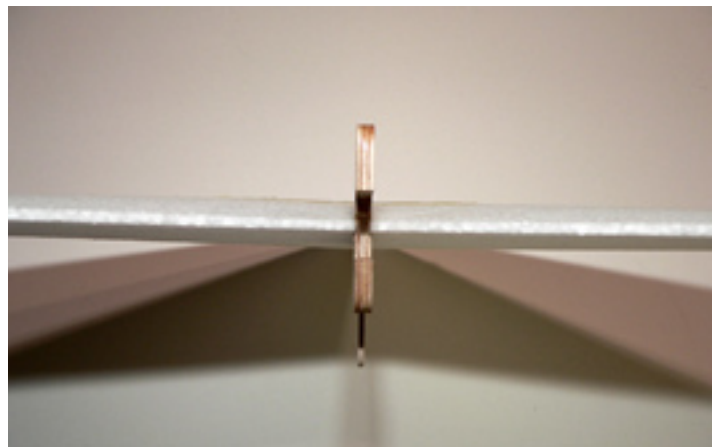
7. Insert the motor into the motor mount. You will need to mark where the motor fits into the mount and cut a small amount of foam out of the wing so that the motor can slide all the way forward.

Installing the Carbon Fiber Flats

IMPORTANT: Be very careful during the next few steps when handling the Carbon Fiber Flats. DO NOT run your fingers or hand along the CF Flats as you will get carbon splinters. When cutting or sanding any Carbon Fiber be sure to wear a dust mask or respirator. BE CAREFUL.

1. Place the wing in the bottom wing beds and place on a flat surface. (Note: you will have to place the wing beds on top of something (like a couple of short 2x4's) so that it can sit level on the table).

2. Tape two CF flats to the top of the wing. There is a slit in the front of the mount and one in the back of the mount that the CF Flats go through.

3. Use a pen to mark where you will be burying the CF Flats. Remove the CF Flats.

4. Using a sharp X-acto knife or single edge blade, make a single cut along the lines that you have marked. Only cut as deep as the CF Flat is wide. I find it helpful to use a little bit of masking tape on the blade so that I don't cut too deep.
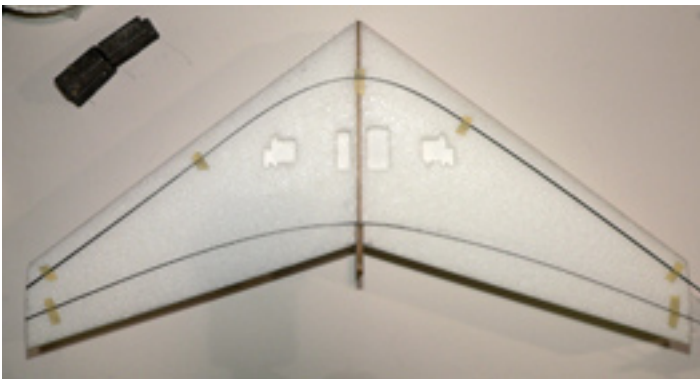

5. Now place weights on the wing so that the wing remains flat for the next steps.

6. Press the CF Flats into the wing until the CF Flat is flush with the top surface of the wing. Now, use Thin CA (superglue) to glue the CF to the foam. You only need to run the Thin CA directly on top of the CF Flat as the glue will absorb into the CF Flat and foam. Leave the wing weighted down in the beds until the glue dries (you can use a small amount of CA Kicker to make the glue dry quicker).

7. Now flip the wing over and lay the wing in the top beds. Repeat previous steps 2-6. Be sure to weigh down the wing so that it remains flat when gluing in CF Flats.
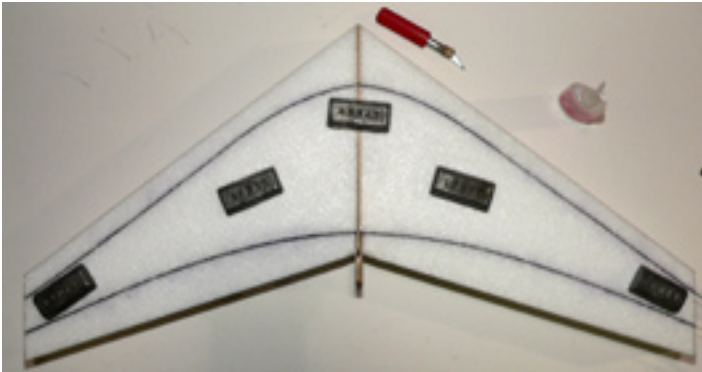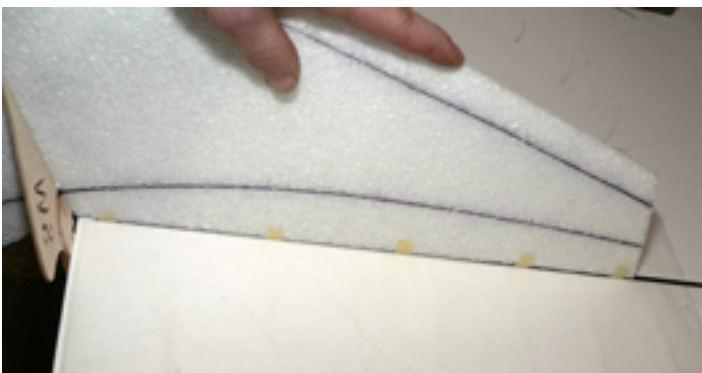

8. Cut the excess CF Flats from the wing tip using a small saw or dremel tool with appropriate attachment. IMPORTANT! Be sure to wear a dust mask or respirator when cutting CF!

9. Tape the remaining CF Flat to the trailing edge of the wing. Be sure to position the CF Flat so that it doesn't hang above or below the trailing edge.

10. Now put a piece of wax paper on your flat work surface. Place the trailing edge of the wing flat against the work surface and glue the CF Flat to the trailing edge with Thin CA. You can use a small amount of CA Accelerator to speed up the drying process.
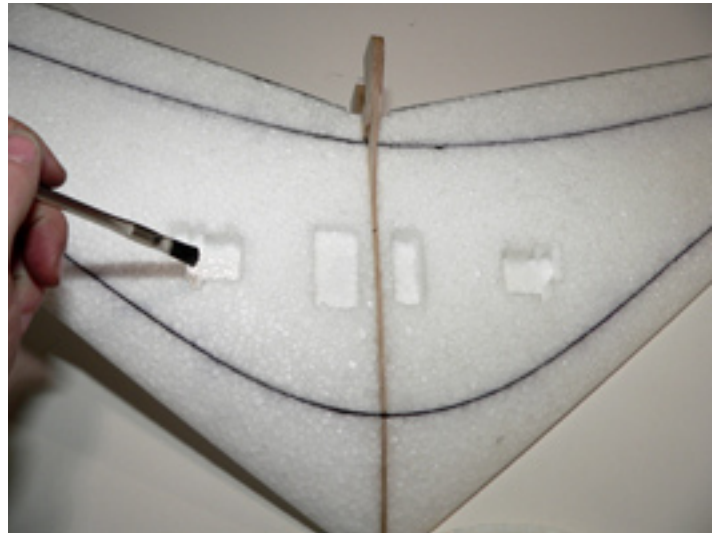

11. Repeat Steps 9 and 10 for the other trailing edge. Remember to use a dust mask or respirator when cutting the excess CF Flat from the wing.
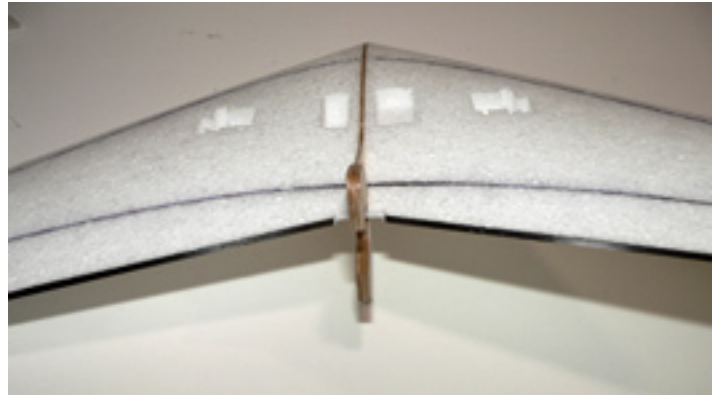
Radio Installation:

1. Mix up a small amount of 5-minute epoxy and paint the bottom of each servo pocket. This is to done so that the servo tape has something to stick to.
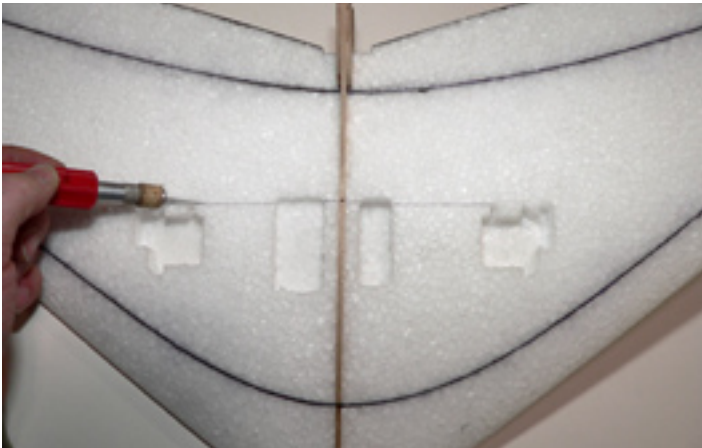

2. Connect all of your radio components and test your servos for proper movement. Looking from the back of the wing, when giving up elevator, you will want the both servo arms to move forward. When giving down elevator, you will both servo arms to move backwards. When giving right aileron, the right servo arm should move forward and the left servo arm should move backwards. When giving left aileron, the left servo arm should move forward and the right servo arm should move backwards.
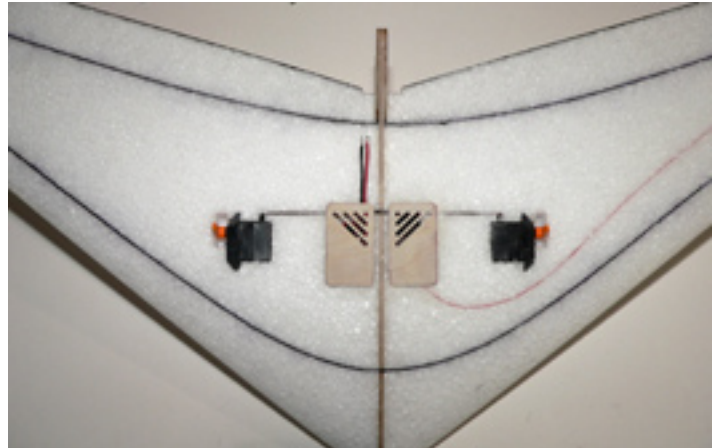
3. Make a shallow slice in the foam between the radio bays. You will later bury the servo and speed control wires in these slices.


4. Place some servo tape on the bottom of the servos and place the servos in their precut pockets. Also, make a small hole in the speed control pocket for the battery connector to fit through.

5. Install the rest of your radio gear. Make a shallow slit in the wing going the one wing tip and press the receiver antenna in the slit with your thumb nail. Leave the excess antenna dangle from the tip at this point.

6. Find the two radio bay covers and glue them over the speed control and receiver bays. I use a small amount of Medium CA and CA Kicker.
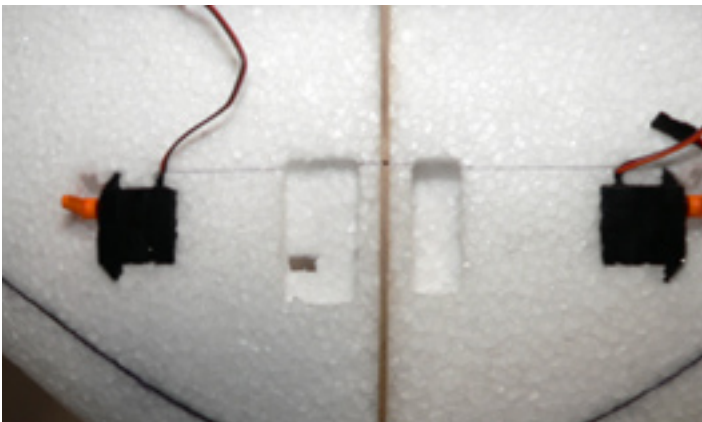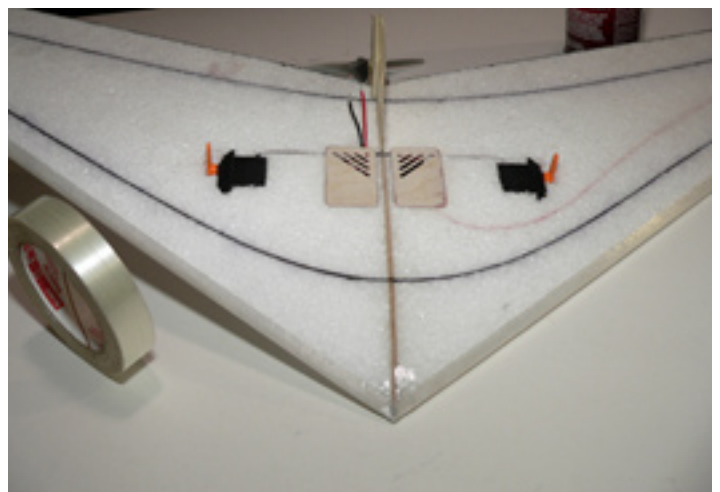

7. Now use some masking tape to cover the motor mount. Spray a light coat of 3M77 spray on the top and bottom of the wing.
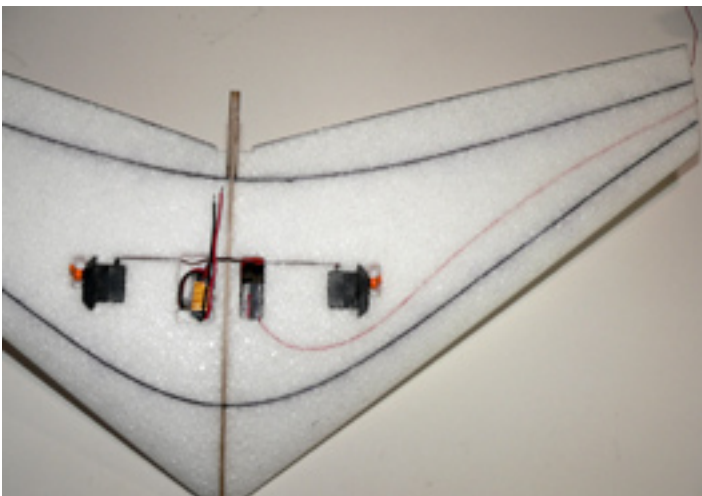
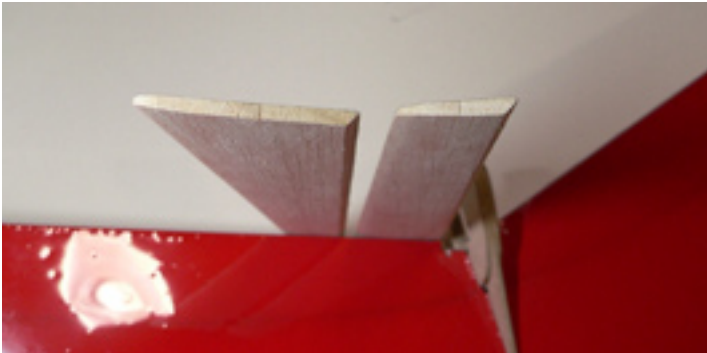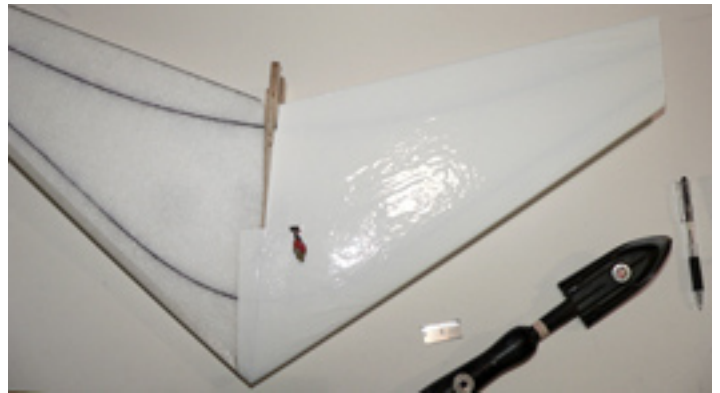8. Place a strip of strapping tape along the leading edge of the wing. The strapping tape helps prevent the leading edge from becoming damaged when hitting sharp objects.

9. Find the two elevons. Sand a 45 degree angle on the leading edge of each elevon. Make sure you make a right and a left elevon. Also, lightly bevel the underside of each elevon. This will make the wing faster as you will need less reflex to fly (up elevator).

Covering Instructions

You can cover the model either with colored covering tape or iron on film.   I like to use either Solarfilm or Econokote to cover with. Both are low-temp coverings and are easy to work with.   If you don't have experience or the tools to cover with iron on films, colored covering tape works well and is easy to use. I like to use two contrasting colors so that it is easy to keep orientation while flying.

1. Start by covering one side of the bottom of the wing. Lay the part of the wing you want to cover over the covering film and mark out where to cut the covering. Leave at least 1.5" excess around the wing.
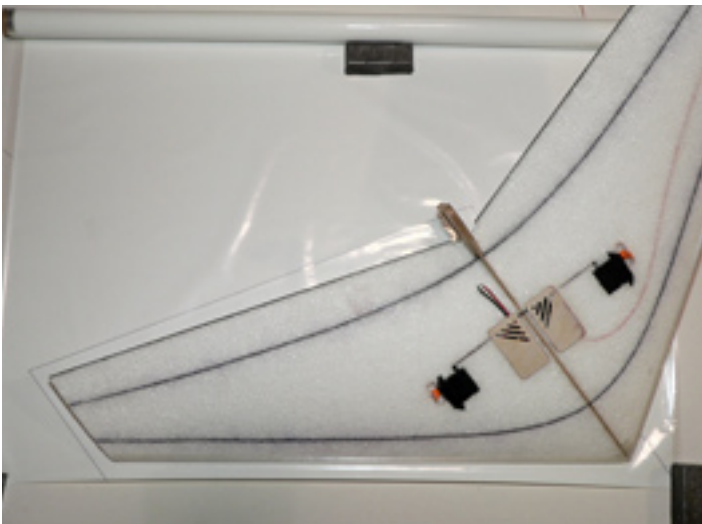

2. Use low heat settings on your iron and iron the covering to the center of the wing. Then stretch the covering and iron it to the tip of the wing. Now, stretch the covering and iron it to the leading and trailing edges. You will shrink the center of the covering after you cover the whole wing. Trim excess covering.
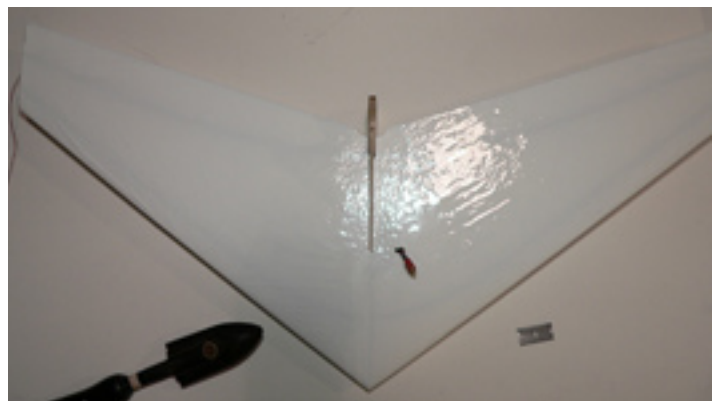

3. Now cover the other side of the bottom wing using the same covering technique. Make sure to overlap the center of the wing by at least 1/2". Trim Excess.

4. Now cover one side of the top wing. Using the same technique as before, iron the edges down, making sure to overlap the bottom covering by 1/2". Trim excess.

5. Cover the other side of the top wing.

6. Now begin shrinking the covering over the whole wing. Shrink one side of the wing at a time (ie. right side then left). Alternate shrinking between the top and bottom of the wing so that the covering shrinks evenly.

7. Cover the elevons starting on the bottom side of the elevons. I like to use the same colors as the wing and later add stripes to the whole assembly.

8. Now cover the top of the elevons making sure to overlap the bottom covering. Check for warps in the elevons and use your iron to shrink one side of the covering or other to take the warp out.

9. Now temporarily tape the elevons to the wing using a couple of strips of masking tape. I do this so that any stripes/details I put on top of the base covering can be ironed to the elevons as well.

10. Iron on any design you'd like. I use racing stripes on most of my wings as they show up very easily when the wing is at high speeds and at a distance.

Installing the Vinyl Decals

1. There are vinyl graphics included in the kit. To install them, tape the decal to the wing using a strip of masking tape about 3 1/8" from the tip of the wing.

2. Peel back the top of the graphic.

3. Cut the transfer backing off.

4. Using a plastic squeegee or a credit card, press the graphic down working your way from the center of the graphic out and towards the front.

5. Be sure to press the graphic down along the leading edge.
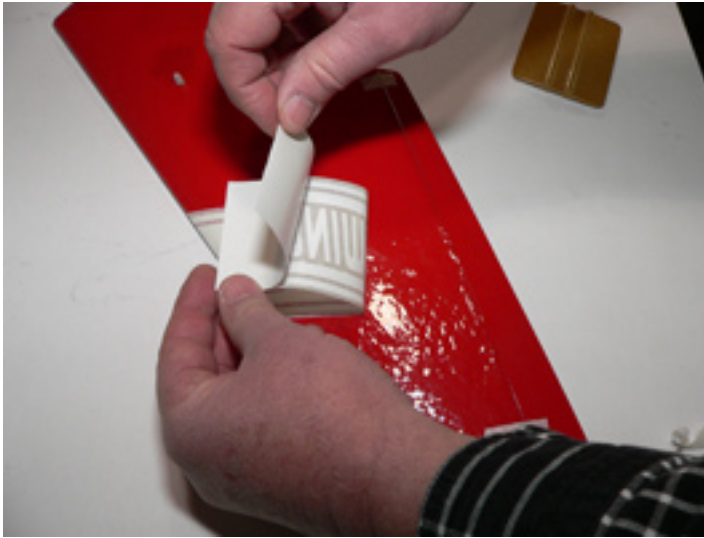
6. Peel the masking tape off.

7. Now peel the rest of the transfer backing off of the graphic.

8. Press the rest of the graphic down working your way from the center of the graphic towards the back of the wing. Be sure to hold the elevon straight when applying the graphic.

9. Bend the elevon up and cut the graphic along the hinge line using a sharp X-acto or single edge blade.

10. Carefully peel the backing off of the top of the graphic. Be sure to pull at an angle and horizontal to the graphic.

11. Carefully go over the top of the graphic again to make sure all the edges are stuck to the covering.

12. Repeat steps 1 - 11 for the other graphic.

22. Apply any other covering scheme you'd like to the rest of the wing.

23. Remove the elevons.

Final Assembly

1. Start by installing the elevons on the wing. You can use clear packing tape or dubro hinge tape. Lay the tape upside down on the building surface, then lay an elevon upside down over the tape. Trim the tape to the ends of the elevon.

2. Tape the elevon to the wing while giving the elevon full deflection.

3. Tape the underside of the elevon to the wing while the elevon is flipped up.
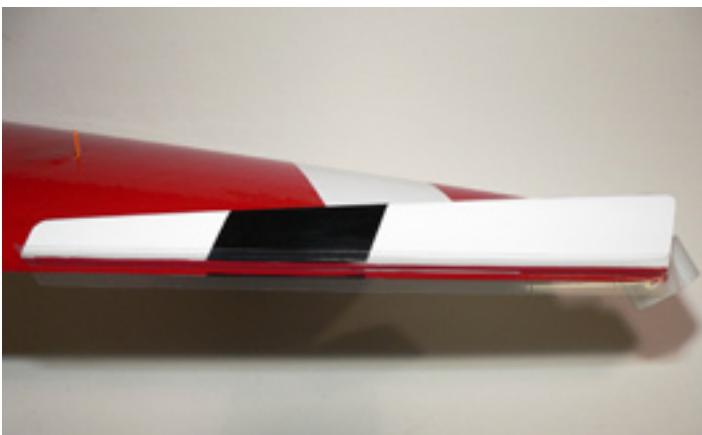
4. Find the coroplast tiplets. Now make a mark from the tip of the tiplet to the back. You will glue the tiplet to the wing with this line on the centerline of the air-foil. Sand the tiplet where it will be glued to the wing.

5. Glue the Right tiplet to the elevon using medium CA and CA accelerator. Use the marks on the tiplets as a guide to align them properly.

6. Make a small hole on the inside of the left tiplet and pull the antenna through the hole into one of the corrugated flutes. Now glue the left tiplet on with med. CA. Run the antenna back and forth through the tiplet flutes leaving a few inches hanging out of the back of the tiplet.
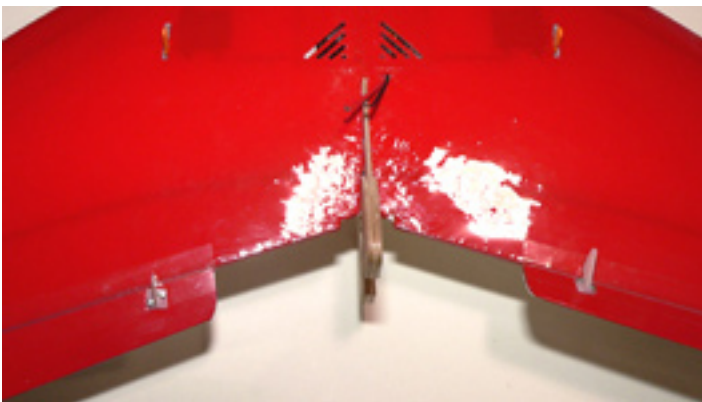
7. Using a straight edge, mark the location of the 1/2A control horns on the elevons.

8. Mount the control horns making sure that the push-rod holes are directly above the hinge line. You will need to use a drill bit to make holes in the elevon for the control horn screws.

9. Connect a pushrod to the control horn and hold the elevon level. Mark the pushrod where it goes over the servo control horn. (Note: I use the second hole from the top on the elevon control horn and the second hole from the bottom on the servo horn).

10. Make a Z-Bend in the pushrods where you marked them using a Z-Bender or a small pair of pliers. Cut off the excess pushrod and attach to your servos.

11. Attach the motor using the tie wraps included in your kit.

12. Cut the covering off of the cooling holes in the speed control cover. You can cut them off of the receiver cover as well, but it isn't necessary.

13. Use industrial strength Velcro to attach the battery. It is a good idea to cut the covering out from under the Velcro and attach the Velcro directly to the foam with some medium CA. Also, glue the 1/32" ply connector plate to the wing and the battery connector to the connector plate using medium CA.

Center Of Gravity

The center of gravity is located at 7 1/2" from the nose. Make a mark 7 1/2" from the nose of the wing and attach the battery so that it balances on this mark.

Control Throws

Measure the control throws at the widest part of the elevon.

Mild

Aileron: 1/4" Up, 1/4" Down
Elevator: 3/8" Up, 3/8" Down

Wild

Aileron: 5/8" Up, 5/8" Down
Elevator: 5/8" Up, 5/8" Down

Reflex

You will need to have a slight amount of UP elevator dialed in to the elevons. This is called reflex. All wings need a certain amount of reflex to fly. Start with about 1/8" up, measuring from the widest part of the elevon.