

# CYCLONE



## Kit Includes

- EPP Foam Wings (2)
- Carbon Fiber Spar (1)
- Coroplast Wing Tips (2)
- Pre-Cut Balsa Elevons (2)
- Du-Bro<sup>®</sup> Control Horns (2)
- Stainless Steel Screws (4)
- Metal Clevises (2)
- Control Rods 4-40 (2)

## Additional Items Required

- 3/4" Strapping Tape (about 20 feet)
- 2" Strapping Tape (about 10 feet)
- Sandpaper 100-150 grit and sanding block
- Hot Glue or Shoe Goo (or similar)
- 3M<sup>®</sup> 77 Spray Adhesive
- Razor Blades or Xacto<sup>®</sup> Knives (Sharp)
- Covering Material (Ultracote<sup>®</sup> or Colored Tape)
- Hinge Tape (optional)

## Radio Requirement

- Radio System w/ mixing (Focus III<sup>®</sup> or similar)
- NiCd receiver battery (700mah flat pack)
- Standard Servos and Receiver – Recommended

## Warning!!!

- **Do Not** use epoxy any where on this wing. It is too brittle and will crack the foam on impact. You need to use shoe goo, household goop, hot glue, or 3M 77 spray glue.

## 3M 77 Notice

- The new 3M 77 spray glue is **okay** to use on our EPP (Expanded Poly Propylene) foam. Yes, you can use it to glue the wings together, if you can't find shoe glue. The new 3M 77 spray glue will melt EPS (Expanded Poly Styrene) foam, which many other brands of wings are made of.

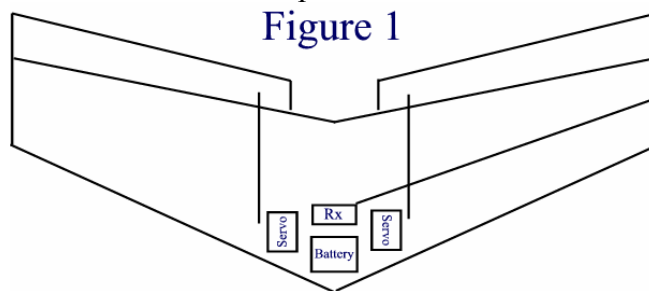
**Need Help???** Visit our website, post your questions on the message board and get help from other combat wing users. Also, download flying instructions, launching techniques, and much more all on [www.combatwings.com](http://www.combatwings.com)

## Wing Assembly

1. Remove the foam cores from their beds. Use the sandpaper or a scrap piece of foam to clean off any melted foam debris. Save the foam beds to use while building. There is a top set and a bottom set.
2. There are two ways to install the carbon spar. One you can use the pre-drilled hole and glue the wings together. Two (if the spar hole doesn't line up well enough for you), glue the wings together without the spar. Then after the glue is dry, trace the spar on the bottom of the wing about where the hole was. Once traced, cut the foam out with a razor blade deep enough to fit the spar in. Glue the spar in the cut out groove with hot glue or Shoe Goo. Not Epoxy!!!
3. The wings are now CNC cut so you do not have to round the leading edge.

## Radio Installation

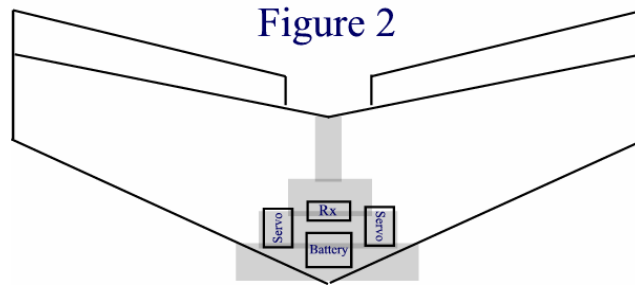
1. Trace your radio gear on the foam with a pen or marker (See Figure1). The marks on the foam are for **standard gear**. If you decide to use mini gear, you can move everything forward about 1/2" to compensate for the reduction in nose weight.



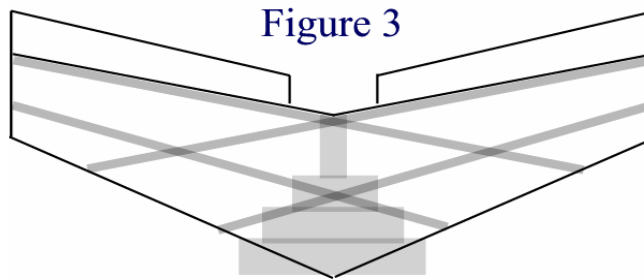
2. Use the Xacto knife to cut out the foam for the servos. Cut them deep enough so that the horn sticks out the top and top of the servo is flush with the airfoil.
3. For the battery, you want to have foam on top and bottom. So cut the hole about 1/8" deeper than the battery itself, and use scrap foam fill in the area above the battery and make the airfoil smooth.
4. Cut the receiver hole deep enough so when the servos are plugged in, the wires don't stick out above the surface.
5. Make a cut about 1/4" deep in the foam for the antenna from the receiver to the end of the wing and push the antenna into the cut. Make cuts in the foam about 1/4" deep to run servo and battery wires to the receiver.
6. Glue all gear in place with Hot Blue or Shoe Goo. Let dry.
7. Before you continue, check your radio and make sure everything is working properly.

## Taping the Wing

1. You will need to spray a light cote of 3M 77 on the areas where the tape is to go. You should wait about 5 minutes after spraying before you apply the tape.
2. Use the 2" strapping tape to strengthen the nose area on top. Basically, what you want to do is tape over the gear helping to hold it in place (See Figure 2).



3. Use the 2" tape on the bottom and use about 4 pieces that run perpendicular to the center of the wing (See Figure 3).



4. Use the  $\frac{3}{4}$ " strapping tape to tape the T.E. (trailing edge) from the tip all the way to the L.E. For combat or beginners, it is recommended that you add another piece of strapping tape that runs down the center of the wing.
5. Now turn the wing over and repeat step 4 on the top, with the  $\frac{3}{4}$ " strapping tape (See Figure 3).
6. After the top and bottom have been taped, put a piece of  $\frac{3}{4}$ " strapping tape along each L.E.

## Covering w/Ultracote

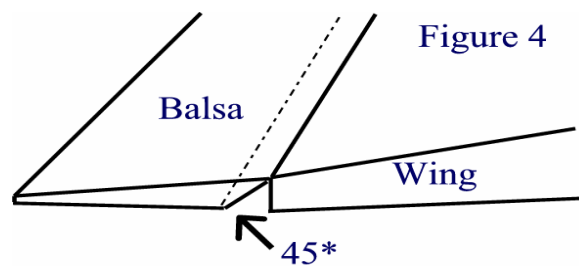
1. Covering could be considered the most difficult part. A good covering job will make you wing look professional. Remember all wrinkles in the tape will show in the covering. Your iron should be at about 350 degrees. Don't go any higher than this. You will melt the foam very quickly. You can still melt the foam at 350, so I recommend setting it at 325 till you get the hang of it (or  $\frac{1}{2}$  of maximum heat). Follow the instructions on the Ultracote packaging.
2. In order for the covering to stick to the foam, you need to spray the foam with 3M 77 glue. Let the glue dry for about 5 minutes before ironing the covering. Do the top first. After the top is covered, spray and cover the bottom.
3. Cover the top first. Let about a  $\frac{1}{2}$ " to  $\frac{3}{4}$ " of covering hang over the L.E. and T.E. and iron it to the bottom. This will help prevent the covering from pulling up. When ironing the covering, start in the center and work your way towards the edges.
4. Once the top is covered, you can cover the bottom using the same techniques as the top.

## Covering w/Tape

1. If you don't want to use Ultracote covering, then you can use colored packaging tape. To apply the colored tape, spray the foam with 3M 77, then lay down your tape avoiding wrinkles. Once tape is covering the whole wing, then use the iron on about 300\* and shrink the tape down a little. Not too much heat or the tape will melt.
2. Tape the top first, then flip it over and tape the bottom. You must use the spray glue, or the tape will not stick very well.

## Elevons

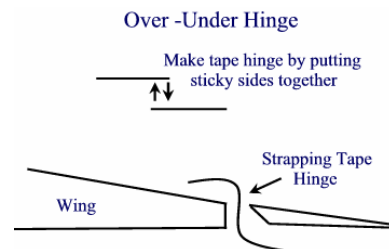
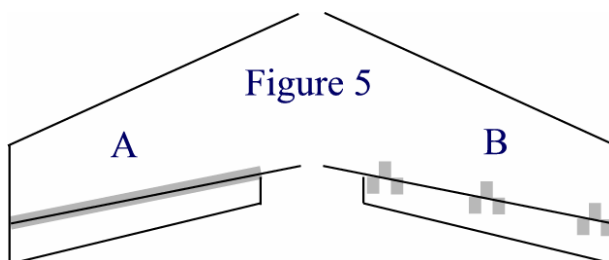
1. You will first need to bevel a 45-degree angle on the bottom of each elevon (See Figure 4).



2. Once beveled, you need to cover them with Ultracote. Top first, leaving about a ¼" to fold and iron over the front of the elevon. This will help prevent the covering from peeling up.
3. Cover the bottoms and trim the edges with a blade. Be careful not to slip and cut the balsa wood.

## Hinging the Elevons

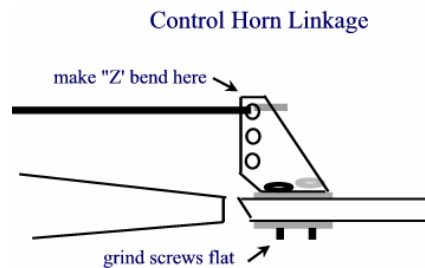
1. There are several different hinging methods, some harder than others. The easy way is using some clear hinge tape (available on our website). You simply tape the elevon to the T.L. and leaving enough room so it doesn't bind. You can add some strapping tape reinforcements at each end of the elevon, to help prevent tearing of the tape (See Figure 5a).
2. The hard way would be the "over-under hinge." You have to make each hinge with strapping tape and there are about 18 hinges. These hinges are very tuff but time consuming (See Figure 5b).



3. Check to make sure the elevons don't bind.

## Hooking Up the Horns

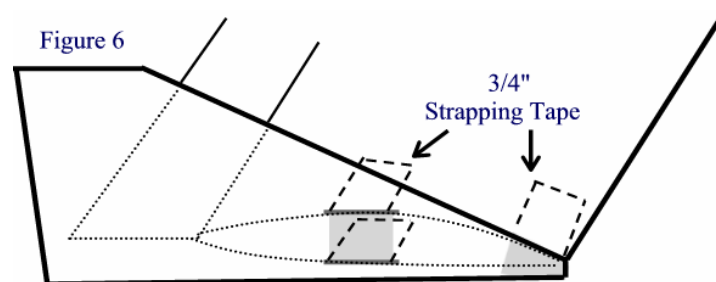
1. Hook up the control rods and clevises to the servos horns and hold them parallel to the center of the wing. Make a mark on the elevons where the control horns should go.
2. Screw the horns in place. Make sure the holes on the control horn are directly over the hinge line.
3. Make a "Z" bend in the control rod and attach the rods to the control horns.



4. Use the top hole on the control horn for beginners or less sensitive controls. As you feel the need for more throw, lower the rods one hole on the control horn. You may need to ream out the hole to make the control fit.
5. Control throws should be about  $\frac{1}{4}$ " up and  $\frac{1}{4}$ " down. If you need more, you can add it later. Use that a starting point.

## Attaching the Wing Tips

1. Make two cuts in the plastic wing tips to feed  $\frac{3}{4}$ " strapping tape in the slit. Use another piece of strapping tape on the front of the wing tip and attach them to the wing (See Figure 6).



## Balance Check

1. The completed Cyclone should balance at 9" to 9  $\frac{1}{4}$ " from the nose. 9" would be the recommended balance for a beginner or combat. It will make it easier to learn. 9  $\frac{1}{4}$ " is more of a thermal or floating balance point.
2. To balance the plane, add lead weight in the nose. Some times you don't have to add any and sometimes you may have to add up to an ounce. This will depend on you gear placement and tape usage. If you don't have any lead, you can use coins as temporary weight. Just tape them on the nose.