

The Witch Wilga

Kit# FT3011

A Sport Scale
Flying Witch



Made In The USA!



About This Construction Manual

This booklet divides the construction into sub-assemblies; wing, fuselage, etc. Please read each section carefully before starting on that particular sub-assembly. There is a complete description of all parts under "Kit Contents" Please check to make sure your kit is complete. We are human, and occasionally miss something! If you have trouble identifying a part, or are missing something, please contact us and we can help.

During the construction process the steps will outline what part to use. We have used actual pictures instead of unclear or often inaccurate illustrations to assist in the building process. This manual was intended for English users, and all measurements are made in standard units. (Inch, foot, etc.)

Customer Service

Should you experience a problem building or flying this kit, we recommend you see your dealer first. If you are unable to solve the problem, feel free to call or write:

Flying Thingz
P.O. Box 19183
Spokane, WA 99219

support@flyingthingz.com or online at www.flyingthingz.com

This product is sold with exclusion of all warrantee, expressed or implied, statutory or otherwise. Pilot assumes all risk.

Pilot assumes all risk in building and operating this model. Refer to and abide by AMA rules at www.modelaviation.com for regulations on Radio Control Models.



Kit Contents

| Part No. | QTY. | Dimensions | Description |
|----------|------------|------------------------|------------------------|
| 1101 | 1 (2parts) | Laser Cut Coroplast | Body Parts |
| 1102 | 1 (2parts) | Laser Cut Coroplast | Tail Parts |
| 1103 | 1 | Laser Cut Coroplast | Dress Sides |
| 1105 | 2 | 3" Round Fuselage Tube | 2 Piece Fuselage |
| 1106 | 1 | Laser Cut Plywood | Construction Set |
| 1107 | 1 | Laser Cut Plywood | Gear Brace (G-1) |
| 1117 | 1 | Rip Stop Nylon Sail | Sail |
| 1120 | 3 | Carbon Tubes | Sail Frame |
| 1121 | 25 | Zip Ties | Mounting hardware |
| 1123 | 1 | String Reel | 100# test sail support |
| 1126 | 1 | 1/8" Wire | Elevator joiner |
| 1127 | 1 | 5/32" Wire | Landing Gear |
| 1128 | 1 | 1/4" Wood Dowel | 1" Hatch Peg Hold |
| 1129 | 1 | Paper | Instruction Manual |

Additional items you will need to build a flyable R/C Witch


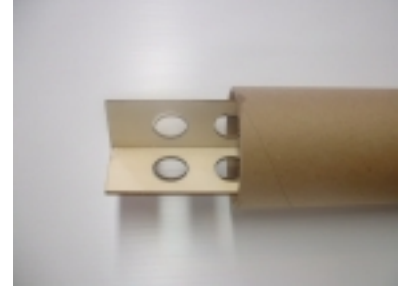

This is a list of parts used on the Witch Wilga prototype. Consult your hobby shop or our website at www.flyingthingz.com for these additional items.




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| <input type="checkbox"/> 2- 2 ½" wheels | <input type="checkbox"/> Engine- .40-.65 2c or .45-.72 4c | <input type="checkbox"/> 2" spinner |
| <input type="checkbox"/> Motor Mount | <input type="checkbox"/> 6- 5/32" wheel collars | <input type="checkbox"/> 2-3 Ch Radio System |
| <input type="checkbox"/> 2' medium fuel tubing | <input type="checkbox"/> foam rubber | <input type="checkbox"/> 2 large nylon control horns |
| <input type="checkbox"/> Prop- Suitable for engine | <input type="checkbox"/> 3- Pushrods (Nyrods work) | |
| <input type="checkbox"/> 1-1" Tail Wheel | <input type="checkbox"/> 8 oz round fuel tank | |


Tools and materials you will need



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| <input type="checkbox"/> Instant CA (superglue). | <input type="checkbox"/> #80; #120; #400 sand paper | <input type="checkbox"/> Steel straight edge |
| <input type="checkbox"/> Slow CA (superglue) | <input type="checkbox"/> Hobby Knife and extra blades | <input type="checkbox"/> Small building square |
| Note: CA's come in many grades, and some are not compatible with foam, balsa and ply woods. | <input type="checkbox"/> Pencil and Pen | <input type="checkbox"/> Wire cutters and needle nose pliers |
| <input type="checkbox"/> Epoxy and resin glue | <input type="checkbox"/> Assorted screwdrivers | <input type="checkbox"/> Paper towels |
| <input type="checkbox"/> CA Accelerator | <input type="checkbox"/> Building pins | <input type="checkbox"/> Scissors |
| | <input type="checkbox"/> Razor saw | |




Construction



| Fuselage Construction | |
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|  | <input type="checkbox"/> Begin by Gluing the 2 fuselage joiners (J1,J2) together to form an “X” Use Thin or medium CA. |
|  | <input type="checkbox"/> Insert the assembly halfway into one of the fuselage tubes and glue with thin or medium CA. |
|  | <input type="checkbox"/> Apply Med CA to exposed wood on the joiner as well as the face of where the fuselage pieces will meet. (Use epoxy if you are not real fast) |


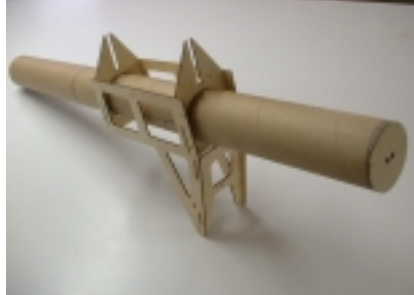



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|  | <input type="checkbox"/> Slide together quickly and let the glue set before continuing. Run a bead of thin CA around the joint to make sure you get a good bond. |
|  | <input type="checkbox"/> Locate F-1 and F-1A. Align the 3 holes and then glue them together to form a ¼” thick F-1. It is a good idea to drill and glue your engine mount blind nuts to the Fire wall now, as access to the back of F1 will be limited later. Make sure the throttle pushrod is on the correct side to fit your engine. |
|  | <input type="checkbox"/> Before gluing in F-1, you may want to permanently install your fuel tank while it is easy to access. The second option is to make a tank hatch in the top of the fuselage, but this does |



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| | <p>weaken the fuse. Test fit F1 into the fuselage, sand the inside of the tube if necessary to get a good fit. Coat the inside $\frac{1}{4}$" of the end of the fuselage tube as well as the rear edges of F-1 (Firewall) with 5 Min Epoxy. Insert into one end of the joined fuselage tubes. Use a scrap to remove excess epoxy.</p> |
| | <p><input type="checkbox"/> While you are using epoxy, mix some up and coat the front of F-1 to fuel proof it.</p> |
|  | <p><input type="checkbox"/> Align the fuselage so that the fire wall top is facing up and measure 10" back from the firewall and make a pen mark. Again measure back from the firewall 18" and make a second pen mark.</p> |

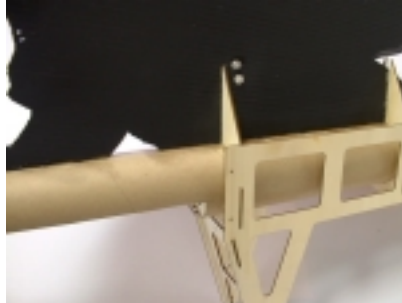

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|  | <p><input type="checkbox"/> Use one of the formers to help determine exactly where the half way point (1.5") is in the tube. Draw a line down each side, connecting the hatch marks you made previously.</p> |
|  | <p><input type="checkbox"/> Use a square or straight edge to make nice cuts for the hatch using a razor saw or sharp X-acto blade. The cuts should make a $1\frac{1}{2}$" deep cut into the fuselage at both of your hatch marks. The cut should be nice and straight as this will be your hatch cover later. (Make sure that the tube does not rotate when cutting the second cut.) Also make sure you are cutting on the bottom side or opposite from the top of the firewall.</p> |

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|  | <p><input type="checkbox"/> Use thin CA to glue F-2 (the one with the cross section for the bolt plate) into position in the front of the hatch opening.” Make sure there is adequate room to insert the fuel tank later. If not, sand F-2 to allow for fuel tank, or permanently install the fuel tank prior.</p> |
|  | <p><input type="checkbox"/> Glue F-3 to the inside of the fuselage at the rear of the hatch opening.</p> |
|  | <p><input type="checkbox"/> Glue the hatch bolt plate into F-2.</p> |

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|  | <p><input type="checkbox"/> Glue the servo tray directly in front of F-2. Glue two of the 4 long ply wood hatch supports on top of the servo tray, along the edges of the tube. (Alternatively you can skip to gluing just the rails in place then secure the servo tray to the rails with screws. This allows access to the fore and aft areas for battery and receivers)</p> |
|  | <p><input type="checkbox"/> Glue H-1 (the one with the 1/4" hole in it) to the front of your hatch. Glue the 1" x 1/4" dia. Dowel into the hatch side. Leave 1/2" protruding to insert into F3.</p> |

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|  | <p><input type="checkbox"/> Now glue the rear hatch support (H-2) to the hatch. It should be 1/2" away from the edge to allow clearance for the bolt plate on the front of F-3.</p> |  | <p><input type="checkbox"/> Test fit the entire assembly onto the fuselage. Do Not Glue. Sand if necessary to achieve a snug fit around the fuselage.</p> |
|  | <p><input type="checkbox"/> Glue the remaining 2 hatch braces to the sides of the hatch. Use med CA to get a good bond.</p> | | <p><input type="checkbox"/> Remove the cradle from the fuselage.</p> <p><input type="checkbox"/> NOTE: You may wish to skip ahead to the painting and finishing section before assembling the body sections.</p> |
|  | <p><input type="checkbox"/> Find the two outer fuselage sides (FS-1), the gear support (G-1), and the wing mounting plates (F-4). Glue as shown to the Left. (Isn't laser cut stuff fun?) Make sure you get plenty of glue on the gear legs.</p> |  | <p><input type="checkbox"/> Using a sharp razor blade, finish cutting the back side of the Coroplast parts out. Slide the head in place between the two bodies and align the pre cut holes. The sails nose will fit in the pre cut groove.</p> |

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|  | <p><input type="checkbox"/> Use a zip tie on the lowest set of holes to mount the head in between the two main bodies.</p> |
|  | <p><input type="checkbox"/> Set the sail on top of the bodies as shown to the left and mark on the Coroplast where the main body mount holes are located. (The sail mount should be pulled tight against the top of the bodies when marking these holes)</p> |
| | <p><input type="checkbox"/> Use a hot soldering iron to drill/melt through BOTH of the Coroplast bodies at the two marked holes.</p> |

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|  | <p><input type="checkbox"/> Slide a zip tie through the bottom of the first body, through the sail mounting holes, then through the second body, around and back through the sail and lock the zip tie tight. You have now joined the 2 bodies with the sail in between them.</p> |
|  | <p><input type="checkbox"/> There are 2 head braces that hold the sails nose inside the head. Align the holes on the braces (one on each side) and zip tie through the head. (You may also use Thin CA for added strength.</p> |
| | <p><input type="checkbox"/> Now zip tie the rest of the holes on the main body.</p> |



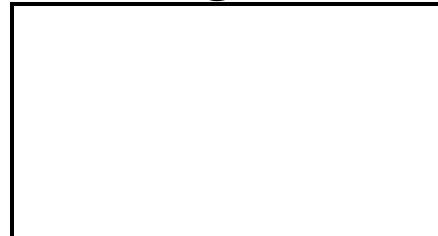
Apply thin CA to the bottom of the witch bodies where they will meet the fuselage, and also the rear “cape” portion. Make sure not to get any glue on the sail, as it is designed to be replaceable by cutting off the zip ties. This concludes the main portion of construction.

A Few Sides Notes...



You may need to sit back and think a little now...as the next few steps can be done in various order. You can paint now, and then do the final gluing, or skip ahead to the assembly and paint later. Either will work, it is up to you.

Painting



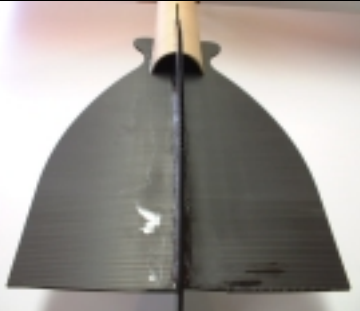

Since there are no “open” structures that require covering, the easiest way to finish your Witch Wilga is with paint.




Use either Epoxy paint or a Polyurethane paint as both of these are suitable for the Coroplast as well as the wood and are hot fuel proof.

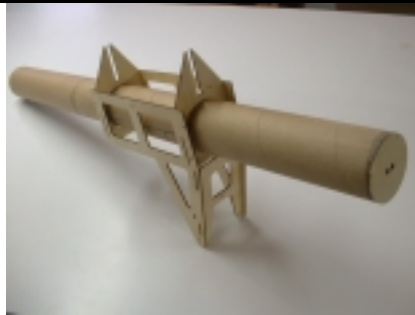


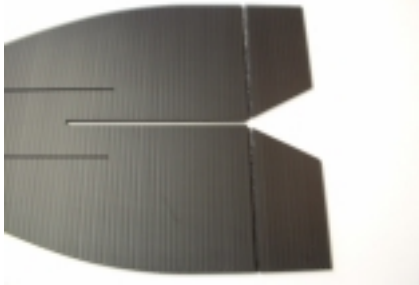


Use your imagination to give the head, feet and face character. If you are not airbrushing, use masking tape to create the facial features and paint it in layers, lightest colors first. A Black Sharpie permanent marker and

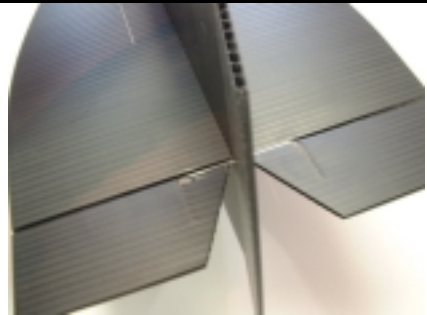
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| | <p>a Testers paint marker were used for the black face features.</p> |
|  | <p><input type="checkbox"/> Slide the tail feathers into the rear of the fuselage temporarily to paint the broom tail feathers. (Don't Glue)</p> |
|  | <p><input type="checkbox"/> Slide the outer cradle onto the "Broom" fuselage temporarily. Paint it however you like, but make sure you get at least 3 layers to completely seal out moisture and fuel. A good clear coat will improve looks and life span.</p> |

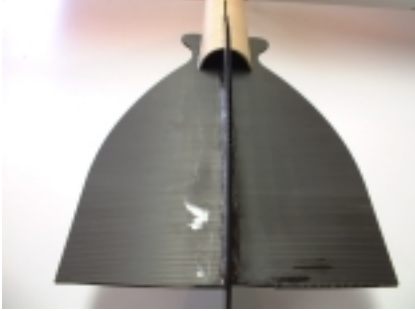
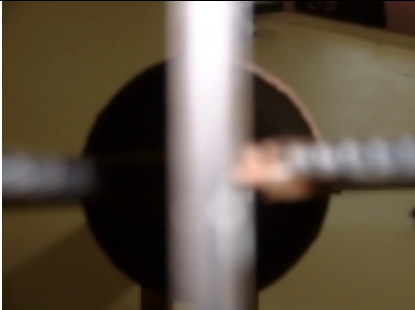
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|  | <p><input type="checkbox"/> You can add "broom" detail to the tail feathers using a few shades of brown and a paint brush.</p> |
| | <p><input type="checkbox"/> You should now see a very good looking woman! We found some "rattling" eyes and some doll hair for her face at the local craft store...</p> |

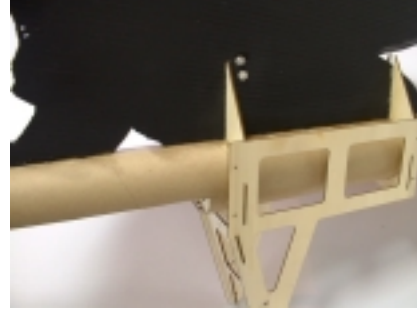
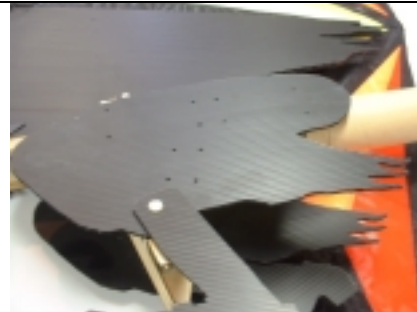
Final Assembly



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|  | <p><input type="checkbox"/> Slide the main cradle onto the broom fuselage. The rear former of the cradle should be flush with the back of the hatch, with the hatch on the bottom of the cradle. Use Thick CA to glue the cradle to the tubes. (You may need to rough up the</p> |
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| | <p>paint to get a good bond.)</p> |
|  | <p><input type="checkbox"/> Make the elevator cut in the Horizontal broom (the one with the “V” notch) to make the cut; remove only one side of the “flute” that is in line with the top of the notch. This will create a natural hinge.</p> |
|  | <p><input type="checkbox"/> Now use a razor blade to cut ONE SIDE of a “flute” on the Coroplast to create a hinge for the rudder. The hinge should go through the center of the precut circle of the joiner wire</p> |
|  | <p><input type="checkbox"/> Next mark and drill the holes for the joiner wire. The wire should slide very tightly into the holes. DO NOT GLUE YET!!!</p> |

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|  | <p><input type="checkbox"/> Slide the rudder broom into the elevator to form an “X”. Insert the wire joiner through the round hole and into the hole you previously drilled for the joiner wire. Drop some thin CA around the wire after inserted into the 2 holes.</p> |
| | <p><input type="checkbox"/> Use Thick CA and accelerator to glue the Elevator and Rudder brooms together. Use a square to keep them straight.</p> |
| | <p><input type="checkbox"/> We added a bead of silicone glue to the joints to give them some strength.</p> |
| <p>Thinking Time...</p> | <p><input type="checkbox"/> Decide what engine you will be using...If you will be using a .53 or smaller, then cut off the rear 10” of the fuselage. If using a .60 or larger then leave it as is. This will help you</p> |

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| | <p>balance with out adding nose or tail weight.</p> |
|  | <p><input type="checkbox"/> After they dry completely, test fit them into the rear of the fuselage. They should slide in freely with out deforming or crushing the Coroplast. If necessary, remove a small amount of Coroplast to achieve a good fit.</p> |
|  | <p><input type="checkbox"/> Align the brooms so that the Elevators (the broom with a 2 separate rear sections) are horizontal, and the rudder is vertical. Glue the Coroplast broom feathers into the rear of the fuselage. They should be vertical and horizontal when compared the ply wood cradle. Sight down the rear to properly align them. Thick CA them in place when aligned.</p> |
| | <p><input type="checkbox"/> Use a scrap piece of</p> |

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| | <p>Coroplast to make a skid to protect the bottom of the rudder. (A tail wheel may be added for added maneuverability, but the air rudder works fine)</p> |
|  | <p><input type="checkbox"/> Mount the Coroplast body to the uprights on the fuselage cradle. Use epoxy or thick CA to bond the body to the cradle, and also glue the body to the tube. (You may need to rough up the paint to get a good bond.)</p> |
|  | <p><input type="checkbox"/> Place the Coroplast dress sections against the fuselage sides so that all the holes line up. Use zip ties and thin CA to attach the dress. Use the set of 1/4-20 nylon bolt to attach the legs to the dress and the gear leg. The legs should move freely.</p> |

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|  | <input type="checkbox"/> Find the 2 plywood axle reinforcement disks and glue them to the outside of the gear legs where the 5/32" gear goes. |
|  | <input type="checkbox"/> Use 2 5/32 wheel collars on the OUTSIDE of the cradle to attach the gear. Mount your main wheels to the outside of the axle using 1 wheel collar on each side of the wheel. |

the servo tray, depending on your balance point. Wrap in a few layers of foam rubber and then slide them tightly down the tube. (With a .46, ours were mounted inside the rear tube on top of the tube joiner.)

Install the 3 servos for the controls and route your elevator and rudder pushrods out the rear. Use a cable or music wire pushrod for the throttle.

Cut a small hole on the top of the fuselage tube for your radio on/off switch and mount it.

The last step in your radio set up is to mount control horns. Use large nylon horns for rudder and elevator. For added durability, push some scrap 1/8" ply wood into the flutes under the control horns and then bolt the horns in place.

Engine Radio Installation

Install your engine on a matching mount and bolt it to the front of F-1. There are fuel line and throttle holes cut for you already.

Assemble your fuel tank and slide it into place in the forward area behind F-1. Feed the brass tubes through the two holes in F-1. Use scraps of Coroplast to hold it in place.

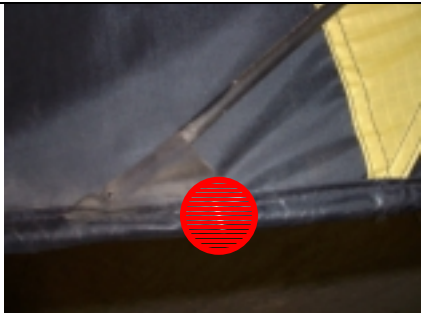
Your battery and receiver will go in front or behind

Sail Rigging

The sails main support is the center zip tie mount, but two riggings on either side will keep it centered over the body in flight.



- Use a soldering iron or hot piece of wire to melt a hole through the sail on the underside of the main spar pocket. This is to slide the removable cross spar under, to keep it from bowing upwards in flight. **DO NOT OMIT THIS!** Also slide the leading edge spars all the way to the REAR of the sail pockets. This allows the sail to create a camber in flight.



- Melt a small hole in the heavy nylon area by the cross spar and then using the supplied 100# test nylon string, wrap around the spar and tie it off and then go to the top zip tie on the dress section and tie it off. Make sure you check that the top of the sails spar is level from side to side. The strings should be under slight

tension while setting on the ground.

Balancing and Flight Set Up

- Verify that all your radio is functioning. And the controls are moving in the correct directions. Left stick is left rudder, back stick is up elevator...
- Set the travel as follows:
Rudder...2" Left & Right
Elevator... 2" Up & Down
- The Balance point should be set so that when held 2" behind the main sail cross spar, she sits level. This is the starting point, so after test flights, feel free to adjust the balance point to your style of flying. Aft CG makes her glide better, but climb more under power. Forward CG makes her faster but worse glide.
- That wraps it up! Lets Fly!

Flight

- Do a range check with the engine running. You should have control for at least 100'-200' with the antenna down.
- The landing gear is mostly for landings. For take off, grab her under the dress, power up to full power and give her a gentle upward toss. She will fly away just fine.

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| <p style="text-align: center;"><u>TIPS</u></p> <p>1. In hot weather the Coroplast head can get slightly flexible. If the head is bent while in flight it will act as another rudder! To help this, slide a 16" wood or carbon dowel through a flute in her nose to keep the head flying straight.</p> | <p><input type="checkbox"/> Fly her around for a while to get the feel. The rudder is very effective! The elevator is not. All altitude changes are made with throttle. At low speeds the elevator will do nothing, so on landings come in with power and use the elevator to hold the nose up. Add power for a flair.</p> |
| <p>2. Add a zip tie to the rear of her "hat", through the sail's spine to further help directional control on windy days. We have flown her in 20 MPH winds fine...</p> | <p><input type="checkbox"/> Power will be required to climb and should be reduced to descend. Almost all altitude changes are made with throttle. The elevator is primarily for added control in aerobatics and to flair for a nice touch down.</p> |

www.flyingThingz.com

Remember to send your pictures!!

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