



**Zippkits**

# ***ULS Bonanza***

***Ultra Low Speed aircraft  
for indoor RC flying.***

**Specifications:**

Span- 29 inches  
Wing Area- 150 Sq/In  
Wing Loading- 3.0 ounces/ft  
Weight- 3.5 ounces RTF  
Build time- 1-2 Hours  
Radio- 3 Channels

**Required to complete:**

Motor- 25-40 watt brushless  
Esc- 6 Amp  
Battery- 2S 250-300mah  
Servos- 2x 3.7 gram HD  
Hot glue  
Foam safe CA glue

Note that we show different models to best illustrate a step. The Bonanza is blue.

**Nosewheel gear:** Bend a circle about 1/4 inch as shown. It does not have to be round. Make a mark two inches away and start to form a triangle or square at the mark. The gear should measure 2 inches from the bottom to the beginning of the square.

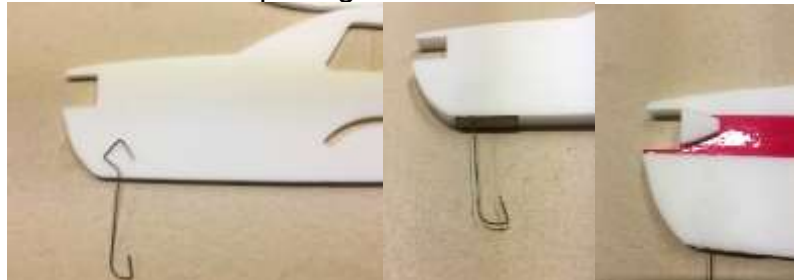


**Main gear:** Make a circle as you did before. Measure 2-1/2 inches and make a 90 degree bend about 1/4 inch long. Make an opposite gear by bending the top 90 the other way. The beginning of the circle should face forward. These wires serve as the landing gear and wheels.

The bent wire will skid easily on a smooth floor. Be sure to make a right and left main. The wheel pants will simulate tires.

Laminate the two fuselage sides together with foam safe CA. Also glue in the nose gear with hot glue as shown, about 1 inch behind front of fuselage.

Be sure that the opening in the “wheel” wire faces aft. Use hot glue from here on.



Different model shown on left. Process is the same, except the nose gear is glued 1 inch back.

Slide the 1/32 ply nose gear brace onto the wire, and glue to fuse bottom with hot glue.

Now is the time to lightly paint or trim the fuselage with colored packing tape.. Add the two foam motor mount doublers.

Sand a little right thrust into the foam and glue the 1/32 ply motor mount in place with hot glue.

Separate each ruddervator from it's stabilizer. Use the included jig (60) to sand a bevel on each stabilizer base as shown. We want to have a nice flush joint at the stabs. Use

the other side of the jig (120) to align the stabs while gluing at 120 degrees.



Sand or cut a bevel on the leading edge of the ruddervators.

Using ½ inch wide Blendederm hinge tape, join the ruddervators to the stabilizers, leaving a tiny gap between the parts. Be sure that you make a right and left (hinge bevel on bottom)

Flip the stabilizers over and hot glue the 1/32 ply control horn so that the hole is over the hinge line. This is the bottom.



Using a tube or any round object (1-2 inches in diameter by at least 15 inches long), roll each wing into an airfoil shape. Roll the wing 90 degrees to the wing root, not parallel to the leading edge. Be sure to do a right and left (look at the wing tips). The front 1/3 has more curl than the rear 2/3.



Block up the wing tip 2-3/4 inches and sand the inboard end at 90 degrees to the bench. Use a square sanding block. Put a rib under the wing, close to the end you are sanding to help hold the shape.

Sand the other wing panel the same way. Bend the 2 inch center section to match the wings.

Paint or trim the wing and tail at this time.

Practice this next step several times before doing it:

Hot glue one wing panel to the 2 inch center section with the wing tip blocked up 2-3/4 inches.. Be sure that the center section is flat on the bench, and the airfoil shape is maintained. Set a rib near the joint to help with the shape (don't glue the rib in place).

When cured, carefully slide the wing into the slot in the fuse, until the center section is half way through.



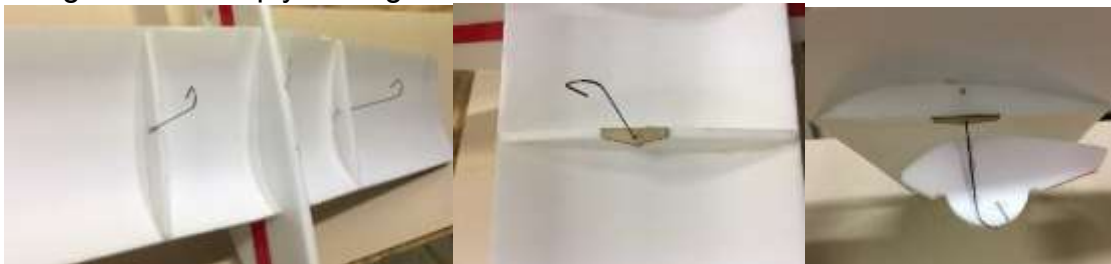
Use books or lumber to elevate the fuse, and hold it in place with the wing center section flat. You will have to allow the nose gear to hang over the table. Block up both wing tips and hot glue this panel exactly as before.

Glue each rib to the bottom of each panel about 3-1/2 inches from the fuselage. Use hot glue and hold firmly until cured. Try to get them vertical or parallel with the fuselage. Otherwise, the landing gear will be angled outward due to dihedral.



Hot glue the tail assembly on the center of the fuse in the notch provided. Be sure it is level by sighting from the rear. Hot glue main landing gear in place. The main gear goes into the tiny holes in each rib, just past half way back. These go on the outside of the rib. Be sure the gear is straight up to the fuselage (the wing has a positive angle). Repeat for the other side.

Hot glue the 1/32 ply main gear brace to each of the foam ribs as shown.



Hot glue the wheel pants in place. The mains simply glue to the outside of the wire "wheel". Be sure to leave a tiny bit of wire "wheel" wire below the pant, as this will be contacting the floor, not the foam pant.

We used an Exacto knife to make a slot through the center of the nose wheel pant. We then simply poked the wire all the way through so that the wire was hidden inside.

We painted our pants black where the simulated tires are.  
Different model shown here



Hot glue your 3.7 gram servos into the cutout with the wires facing forward. Both servo arms should be straight down with the radio on and trims centered.

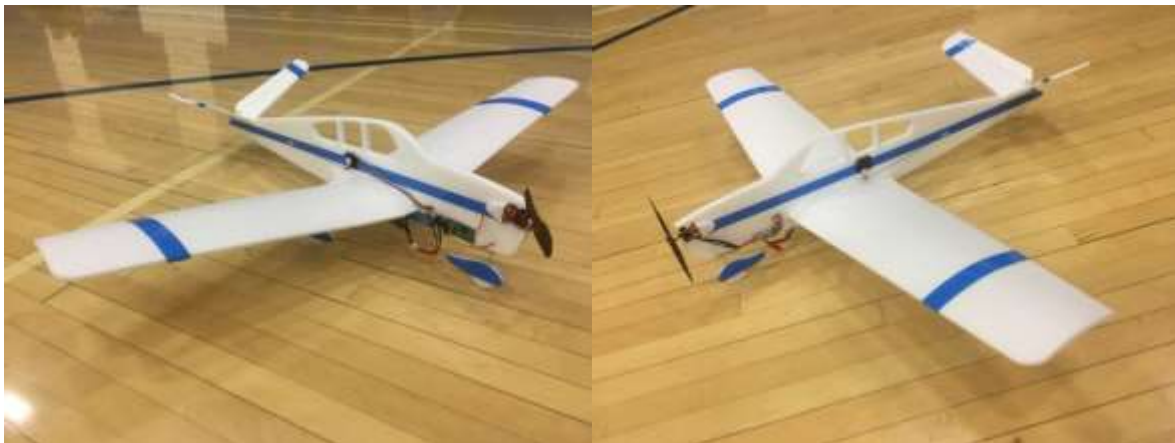
We like (optional) Micro EZ connectors for the pushrod connection at the servo.

Put the Z bend into the plywood control horn and slide a small plastic guide tube onto the pushrod. Attach the pushrod to the servo. Hot glue the plastic guide about half way down the pushrod and allow to cure. Repeat on the other servo.

Attach the motor with 2 screws.

Hot glue the ESC to the left side of the fuse, down low.

Cut a small (1/2x1/8 inch) hole in the fuse, just behind the ESC. This is for wires. Attach all servo wires first, then hot glue receiver to the right side of the fuse. Remove the case to save weight.



Set your battery on top of the wing, and move it around until the plane balances about 1-3/4 to 2 inches from the leading edge of the wing.

Note the position of the battery, and put a strip of Velcro UNDER the wing (on the fuse right side) at this position. We use a strip of Velcro about 1/2 inch wide and 3 inches long. Center this at your battery location so that you can adjust the balance point to your taste.



Setup and flying:

Fully charge your 260-300mah 2 cell LiPo battery. Attach it to the fuse so that the plane balances at 1-3/4 inches from the leading edge.

Set control throws to  $\frac{3}{4}$  inch either way for high rates. Set dual rates for 60% on low.

Use a 5x3 prop (you can use sizes near this, but the 5x3 works pretty good).

This plane is overpowered with the recommended power system, so you don't need more than half throttle unless you want a quick takeoff.

Trim for level flight and minimum flight speed. If you find that you are holding a lot of up trim, move the battery back a little and reset trim.

This aircraft was designed for protected, indoor slow speed flight. It was not designed to hit anything.

If you do **any** of the following, the airframe may fail:

Fly in wind

Fly fast

Dive steeply

Pull up sharply

Hit something

Just fly slowly, enjoy yourself and have fun!

