Z II Basic Build Instructions

Kit Contents:

(2) Precision EPOR molded wing panels

(2) Custom balsa pieces (trailing edge)

(6) Fiber glass reinforcement spars

(1) CNC T-6 aluminum motor plate

Corrugated plastic package for utility bays and winglets

Optional items:

CNC laser cut corrugated Go-Pro and flight camera box (with camera protecting rail skids)

Optional clear laminate package for strength and durability

Basic building tools:

3/4 in x 3 in retractable snap blade razor (available at Walmart)

Xacto knife

Zona Balsa Saw

Sharpie marker

Small hobby screwdriver

Scissors

Soldering iron and accessories

Low temperature hot glue gun

Popsicle sticks

Approved Adhesives:

5 Minute Epoxy

Gorilla Glue (Slow cured dark or fast light)

Lock Tight 200 Spray Adhesive (in multiple light coats)

3M 77 spray adhesive (in multiple light coats)

3M packing and storage tape (for Elevon attachment)

Transparent Magic Tape

Foam Safe and Regular CA with activator

3M 90 (Caution: Use with caution as it contains harsh solvents, which may attack the foam. Manufacturer uses this product only to join the wing halves together) See building instructions for details.

Spray Paints:

Low VOC or Foam Safe Spray Paint

Krylon Rust-Oleum Flats and Neons

Any flat color will work well, and all paints should be applied in multiple, light coats. Manufacturer suggests using extreme caution when using dark colors, as it can melt, attack, and/or destroy the foam. When flat colors are laminated, they will become glossy.

Approved Filler:

Patch and Paint Lightweight Spackling

**Caution needs to be used when using solvent-based paints. EPOR is not as forgiving as EPP. If you are using spray adhesives and/or paints, very light coats should be used so solvents are not in concentrated amounts. It is suggested by manufacturer to stay away from covering large areas with dark, solvent-based paints. Dark colors should be used sparingly. Manufacturer also suggests that Goop is used only on installing winglets, if the area to be mated with winglet has a layer of laminate between the foam and the winglet. Regular CA, Foam Safe CA, or low temperature hot glue are all good options for gluing down the corroplast lid edges. Use caution when using hot glue and be sure it low temperature so it does not melt the foam. Thick versions of each of these glues are recommended. Take caution when curing large pools of CA with activator, as this creates a large amount of heat and may melt foam in these areas.

Build Instructions:

A. **Prepare work area**

    1. Area should be large and flat.

B. **Join wing halves**

    1. Follow flat plane and measure down 3/8 inch from top of motor plate shelf. Draw a line and follow the same plane. This will allow you to set the motor plate approximately 1/8 inch above the spar.
    2. Pre-fit motor mount plate using a balsa saw or hack saw blade to fit into desired position. Flush with the trailing edge of motor cut out.
    3. Lightly spray root with multiple light coats of 3M 90. *Take extreme caution to not allow the adhesive to pool, as it may damage the foam.

4. Let tack for 3-4 minutes, place on flat surface, and take caution to align the roots true.
5. Babysit this joint to ensure a solid bond.
6. Use large snap razor (with new blade) to slice off the raised filler buttons produced during manufacturing. Use multiple passes in same direction, following the contour of air foil.
7. Use sanding block with 200 to 250 grit to smooth out surface where filler buttons were trimmed.
8. Place airplane on surface face up.
9. Pre-fit motor mount and check for proper alignment. Make any adjustments necessary at this time.
10. Mix approximately ½ ounce of 5 Minute Epoxy. Using a Popsicle stick or like object, massage epoxy into motor mount slit. Slide in motor mount plate and align. Gorilla mixed with a small amount of water can be used as an alternative to appoxy.
11. Using small pieces of tape around the perimeter of motor mount slip, use tape to pull motor mount slit closed. This applies pressure to ensure proper bond.

C. Install main, dark-colored fiber glass tube spars

1. Place wing facing bottom up.
2. Using dark gorilla glue with no water, place one large bead in the bottom of spar slot.
3. Drop in main spar using blunt tool.
4. Run a bead of thick CA glue on top of the first spar then activate so spar will not float.
5. Put a bead of dark gorilla on top of the first spar and sprits with a little water and use a stick to run back and forth to mix the water , Now drop in the second spar.
6. Put a few large drops of CA on top of second spar, and lock down with CA activator (kicker) this will keep from floating when the gorilla is

expanding, don't be shy with the CA so this ensures the spar will not float.

7. Using a small cup, mix approximately ½ ounces of dark Gorilla glue (PU glue) with a few drops of water using a Popsicle stick. Mix thoroughly.
8. Pour mixture onto second spar using a Popsicle stick, run back and forth to ensure thorough distribution of glue, this will fill the gap and encapsulate the spars making the I beam system complete.
9. Install the bottom rebar spars. The rebar spars are light colored and textured. Install wing spars into small slits that extend to winglets area. To do this, place a thick bead of CA into bottom of channel. Drop in spars and use CA activator (kicker) to lock into place.
10. These spars will overlap the main internals that have been previously installed, creating an I beam spar system.
11. Let Gorilla glue foam and cure to approximately 75%. Do not disturb until at 75%. The outer skin of the PU should be slightly sticky and raised above airplane surface.
12. Use a snap razor to slice off extra glue, following the contour of the plane surface. If the glue is sticky, wait until it gets to the point that it does not stick to the knife. If glue hardens too much, it will be difficult to achieve desired smooth surface.

D. Install top rod I beam wing spars

1. Place wing face up.
2. Install wing I beam spars in same manner as bottom wing spar with CA glue and accelerator (kicker). Manufacture does not suggest using Gorilla glue under any spars, as this may cause the spars to float.

E. Prepping surface and filling spar gaps and slots

1. Using 200 grit sanding block, sand all surfaces over spars.
2. Use light-weight spackle and spreader to fill these areas. This process is optional for a smoother finish.
3. After spackle is dry sand smooth.

F. Install gear

1. The ZII was designed to accommodate multiple types of set-ups, including FPV, UAV, AP sport flying, and night flying.
2. Setting up gear is up to the user.
3. The main battery bay was designed to accommodate up to (2) 4S 3300 mhr lipos. 4S 4000's by selected manufacturers will also fit.
4. The main battery bay can be modified and utilized for FPV and UAV electronics.
5. The ZII servo slots are designed for standard size servos. Manufacturer recommends servos with 70 inch ounce of minimum torque.
6. Prior to installing servos, you will need to clear the area of the foam where the wire will exit the servo. This should be done with a small Xacto knife.
7. After clearing the foam make a slit with a razor from the servo to the electronics area.
8. Servos may be installed with thick CA or low temperature hot glue applied to the servo, allowing glue to cool so that it does not melt the foam. Drop servos in place.
9. Clear small slot or hole on divider between the electronics bay and the battery bay to clear channel for ESC wires to penetrate the battery bay area.

G. Placing battery bay lid and electronics bay lid

1. Lay the lid on the battery bay area, mark ending point, and trim to length with scissors. Do the same for the electronics area.
2. Carefully flip lid over and slice the flute at 50% of the length of the lid, making the top side act as a hinge. This will allow for access to the battery bay to slide in battery and close lid.
3. Repeat the process on the electronics bay and size for proper opening

for electronics.

4. Mount lids with thick CA applied to the underside of the lid.
5. Hold in place and activate the edges of the lid with CA kicker.
6. Shelves have been placed in the rear of each bay for the use of velcro or rare earth magnet for holding the lids closes. Modify as required.

H. Prep for covering airplane with manufacturer suggested laminating film

1. Inspect airplane for areas for touch up.
2. Touch up any desired areas with light weight spackling and sand paper. Once this is done, the plane can be laminated or paint may be added for color.

I. No paint option

1. Spray area that is to be laminated ten minutes prior to lamination with even coat of lock tight 200 covering the entire surface. Manufacturer does not suggest spraying the entire plane, only the side to be laminated.
2. Spray ends of wing where the winglets will be mounted.
3. Cut laminating film to fit each right and left wing half.
4. Apply laminate with hobby iron starting at 225-250 degrees. Test small area moving fast.
5. Adjust temperature as necessary to achieve desired effect.

J. Paint and Film option

1. Paint option requires a smooth, clean surface. It is not necessary to put Lock Tight 200 down before painting process.
2. Manufacturer suggests light, bright and flat colors as these will flash off faster and leave less solvent residual on surface. Dark colors should be used only as accents in multiple light coats. Airbrush paints with low solvent content are recommended.

   All paints should be applied in multiple, light layers to keep accumulation

of solvents to a minimum.

3. Apply desired paint as recommended above.

4. Once paints are dry apply Lock Tight 200 adhesive over entire area to be laminated. Allow to dry for 10-15 minutes.

5. Apply lamination film as directed in the no paint. See section I #3.

6. All areas should be overlapped by one inch.

7. Wing ends should be capped with lamination film. This allows the use of Goop to attach the winglets.

8. Once the plane has been painted and prepped apply laminating film with hobby iron at approximately 225 degrees and increase temperate until desired results occur.

K. Trimming, prepping, and mounting elevons.

1. Hold the control surface against the trailing edge of the airplane. Mark the balsa with light pen or sharp object to ensure the prop cutout area and winglet area follow the same lines. This needs to be done so the movement of the elevon does not interfere with the winglet.

2. After marking use a balsa saw (Zona) or multiple passes with a sharp razor and a straight edge to achieve desired cuts.

3. Manufacturer suggests trimming the inboard side of the trailing edge so the elevon tapers inboard approximately 1/3 of the way to the outboard end. See online build threads for examples.

4. Sand trimmed elevons with 200-250 grit sand paper.

5. If painting elevons is desired best results will be achieved by spraying LockTight 200 over dried, painted surface prior to laminating. The laminating film does not adhere properly to painted surface without the layer of 200.

6. Pre trim laminating film for control surfaces. Leave enough laminating film around the edges to properly wrap and seal.

7. After the elevon has been covered, use small pieces of Scotch tape (Magic Tape) and pre mount elevon to the trailing edge of the plane.

Check for proper alignment.

8. Using 3M storage tape hinge the top of the elevon placing 2/3 of the storage tape on to the wing and 1/3 on to the Balsa control surface.

9. Once both sides of the top have been finished flip the wing over. Flip the elevons on top of the wing exposing the root of the elevon. Use 3M storage tape to place 50% of the storage tape on to the bottom of the wing and 50% on to the elevon. This will create a strong and true hinge. See video online for this process.

L. Mounting Winglets

1. Winglets should be mounted symmetrically with an even amount above the wing and an even amount below the wing.

2. The end of the wing should be capped and laminated.

3. Apply a thin bead of hot glue on the wing end and press winglet into place.

4. After the hot glue has cooled use Goop to run a small bead around the perimeter where the winglet meets the wing. The hot glue is used to hold the winglet in place until the Goop has dried. The Goop is the main strength of attachment. Do not apply Goop directly to bare foam.

M. Attaching control rods

1. Center servos.

2. Attach control rods and mount control horns to elevons.

ZII Specs

1. Wing Area= 770 square inches of wing area
2. CG is located on the bottom 9 3/8'' to 9 1/2'' from the nose back.

Drivetrain

1. Motor and esc should be fully tested for amp draw prior to flight to make sure it's within spec.
2. Esc need to be vented well due to the insulating properties of the foam.
3. If you chose a 4s setup you need to watch the amps to see if you are within spec, and you must disable the esc BEC and use a separate RX power. If you do not do this you mite over heat and short the esc's internal BEC, this sometimes takes out the esc ,servos and receiver.