Assembly Manual

All EPP Foam  
Precision wire cut  
Light plywood brace  
5 carbon spar matrix  
1800 mAh NiMh battery  
Transverse battery position  
Carbon prop w/machined hub  
Die cut servo and battery bays  
Zagi-20 electronic speed control  
Zagi reverse rotation pusher motor  
Airfoil shaped, constant cord elevons  
Radar clocked at 55 mph in level flight

Airfoil  Zagi 101.4  
Flying Weight  25.5 oz  
Wing span  48"  
Wing area  2.8 sq ft  
Wing loading  8.75 oz sq ft  
Servos  Micro  
Radio  w/mixer  
Stock #  ZS402
Recommendations and Notes. Read the entire manual before beginning construction!

To avoid injury or damage to electronic speed control, do not plug the battery into the speed control or install the prop on the motor until all of the installation steps have been followed.

Do not use the motor to cycle batteries. Do not run the motor over 30 seconds while holding in your hand. The battery, motor and ESC are high performance electronics and require air flow for cooling. The pusher configuration does not provide prop wash for cooling.

The ZAGI XS is not a combat or bungee launch airplane. The design objectives were to make a rugged low cost, fast, light weight, aerobatic electric flying wing. The Zagi XS is recommended for all flyers, experts and beginners.

The new Zagi Pusher Motor is a custom designed dedicated reverse rotation 6-volt motor. The can looks the same but inside there are three important new features. The Pusher is factory timed at optimum top-end performance for direct drive reverse rotation. Like the earlier Zagi-400 motors, the new Zagi Pusher is balanced. The Pusher winding wire gauge was changed to increase torque at top-end. The red (positive) and blue (negative) wires from the electronic speed control should be soldered to the motor tabs. Solder the red (+) wire on the terminal next to the red dot and the blue wire (-) to the other tab. Remember to install the prop for reverse rotation. The 8 cell 1800 mAh NIMH battery pack used with the Zagi XS are made with high rate cells. These high rate cells deliver current up to 25 amps; more than enough to power the Zagi Pusher.

The target weight for the ZAGI XS is 25.5 oz. The airplane is designed to balance at 8” measured back from the nose. In order to achieve these two objectives, the Zagi Pusher motor, micro servos, and an 1800 mAh MIMH 8 cell high rate battery pack must be used. Any modifications, reinforcements or substitutions not described in this manual must be considered carefully to maintain the correct weight and balance. If all the procedures in this manual are followed, the ZAGI XS will never need nose weight.

A separate battery is not required for the receiver and servos. They are powered by the 8 cell (9.6 V) battery through the Electronic Speed Control (ESC) which contains the Battery Elimination Circuit (BEC). When the motor drains the battery to a certain level the low voltage cut-off will turn the motor off leaving sufficient power to control the plane long enough for a landing.

3M Super 77 or 87 Spray Adhesives are the recommended adhesives for assembly. 3M #77 Spray Adhesive will not dissolve EPP foam when it is sprayed with a heavy coat or at close range. If a substitute adhesive is selected, test spray a piece of scrap foam before spraying the cores.

Epoxy, Shoe Goo or Goop adhesives are not recommended for assembly. Although they both work with EPP foam, they are unnecessarily heavy.

An extra roll of poly tape in a contrasting color is recommended for visual orientation in flight. It is best to cover the top with a light color and the bottom dark. Trick R/C did not test nor do we recommend any covering materials such as UltraCote, MonoKote, Solarfilm, or any other iron-on materials. If an alternate covering material is chosen, test a patch on the beds first. The wing geometry can be changed by uneven heating and shrinkage of iron-on heat shrink coverings.

Tools and materials needed:

Optional: a second roll of contrasting color poly tape
Sanding block
150 to 320 grit sandpaper
X-Acto knife or Dermal
3M Super 77 or 87 Spray Adhesive
Longnose pliers
Soldering iron
There are three parts to each wing panel. The top of the wing can be identified by its greater curvature. The right wing is the wing that would be on your right if you were in the cockpit. The right and left panels can be identified by the color mark at the root (the big end of the wing panel): Red on the right.

**DO NOT REMOVE ANY PRE-CUT PARTS AT THIS TIME!**

There are three important pre-cut features on the wing panels. The electronics bay and plywood spar channel are die-cut. These come out as an assembly after joining the wing panels.

The servo bays are also die-cut. They are hard to see. An easy way to find them is to rub the surface just behind the plywood spar channel.

The four carbon fiber spar channels extend the full length of both wing panels on both sides.
Use fiber filament tape to tape the top beds together. Then tape the bottom beds together. Remove the hairs and zigzags from the wing cores and beds by rubbing them with a scrap piece of EPP foam. Lay the bottom right and left wing beds on a flat surface. Set the wing cores on the beds and lightly blocksand the wing panels (cores) with #150 or #320 sandpaper. Blocksand the leading edge (LE) to round the flat spot.

Spray the root (wide end) of the wing panels with 3M Super 77 Adhesive. Hold the spray head 1 inch from the root. Spray a long bead along the root edge. Spread the bead with a small brush, a mixing popsicle stick, or scrap foam. Let the adhesive dry to the touch. Join the wing panels together. Put two pieces of fiber tape on the top to hold the wing panels together while the glue dries.

Glue the carbon fiber spars in the bottom side first. Lay the top beds on a flat surface. Put the wing panels in the top bed bottom side up. Hold the spray head 2 inches from the spar slot. Spray one long puddle of spray adhesive the length of the two spar slots.

Use the popsicle stick as a trowel to direct the adhesive into the spar slot. Repeat this until the entire inside of the groove is wet with adhesive.

Lay two flat carbon spars on a piece of newspaper and spray them with adhesive. Starting at the battery bay, push the spars into the channel. Make sure that the entire spar is below the wing surface.

Lay the top beds on a flat surface and cover them with clear food wrap or waxed paper to prevent the wings from sticking to the beds. Repeat the carbon fiber gluing procedure on the top side.
Weights are very important to maintain alignment and wing geometry. Pictured here are five pound fishing weights wrapped with duct tape. Let the wing assembly dry for a couple of hours and go on to the next step.

Spray the center plywood brace channel with adhesive. Lay the 18 inch plywood brace on a sheet of newspaper and spray both sides with adhesive. Place the wings in the bottom beds on a flat surface, Push the brace into the channel. Make sure that the spar is flush with the top and bottom of the wing. Use weights to hold the panels in place. If necessary, use tape to pull the foam against the plywood brace.

Remove the electronics bay and plywood spar groove plug as a unit. Push the plywood brace into the slot with the carbon spars facing the electronics bay. Center the brace. Make a mark on the brace to match the contour of the wing on the top and bottom of the brace. Cut and sand the brace to the contour of the wing.

Cut the remaining flat carbon spar to the 18 inches; the same length as the plywood brace. Use strong wire cutters.

Make a mark across the center of the plywood brace. Squeeze a generous bead of Zagi-Lock CA Adhesive along the length of both carbon spars. Center the long and short carbon spars in the middle of the plywood brace.

Spray the center plywood brace channel with adhesive. Lay the 18 inch plywood brace on a sheet of newspaper and spray both sides with adhesive. Place the wings in the bottom beds on a flat surface, Push the brace into the channel. Make sure that the spar is flush with the top and bottom of the wing. Use weights to hold the panels in place. If necessary, use tape to pull the foam against the plywood brace.
Starting at the rear corner of the motor tray, cut along the indented cut lines of the motor tray until you reach the opposite corner. Remember, the rear of the motor tray has the cut lines on the overhang.

The final cut should leave an overhang on the back end of the motor tray. Block sand and round the sharp edges.

The motor tray is easier to cut from the molded part if it is done in two stages. Cracking and tearing the finished part can be avoided by removing the skirt before making the final cut. Removing the skirt will allow the styrene to roll away from the scissors. The motor tray is designed with an overhang at the back end. Notice that the indented cut lines transition from the skirt to the top of the molded part. Place the tray right side up. Cut the skirt off the back of the motor tray. Make sure that the first cut is below the final part cut line.

The rest of the skirt is easily removed by cutting the part from the underside.

The final indented cut lines are still visible when the first cut is completed. Remove the skirts from the other styrene parts before making a final cut.
Locate the cut line on the forward end of the motor fairing. Drill the holes large enough for the ESC wires to fit through.

Locate the dimples on the firewall bulkhead at the back end of the motor fairing. Center the blade in the dimple and spin. Drill the holes in the motor mount rails wide enough for the motor tie downs to fit through.

Locate the dimples in the motor mount rails. Drill holes in the motor mount rails by spinning an Xacto blade with light pressure. Center the blade in the dimple and spin. Drill the holes in the motor mount rails wide enough for the motor tie downs to fit through.

The Zagi-20 electronic speed control (ESC) has two wires red (+ positive) and blue (- negative). The red and blue wires are 4" long. Push the wires through the holes in the motor fairing to the other side of the tray.

Set the motor in place to check the alignment of the motor solder terminals on the motor with the holes in the firewall.
Remember the Zagi Pusher is a reverse rotation motor. Solder the red wire to the terminal next to the red dot! Push the wires through the firewall. Facing the back of the motor tray, the red wires should be in the hole on the right side. The thin wires on the motor solder terminal go to the built-in capacitors. Make sure that they get soldered to the terminal along with the ESC wires.

Pull the wires through far enough to solder the ends to the motor solder terminal.

Square the motor mount holes to make them slightly larger than the tie-downs. Slightly larger holes will make it easier to service the motors without removing the motor tray. Thread the motor tie-downs through from the top. Wrap the tie-downs around the motor mount and back out the other side.

Thread the tie-downs and pull them snug with a pliers. Cut the excess tail off the tie-downs.

Do not install the props or hubs at this time!
The Zagi XS servo bay was designed to fit the Hitec HS-81 servo. The HS-81 is a moderately priced readily available servo with more than adequate torque. The servo bay may be expanded or shimmed to fit a different size servo. Since the servos are mounted so close to the center of gravity (CG), different size servos may be used without effecting the balance. Find the straight control arm with two tabs in the parts bag supplied with the servo.

Cut one of the tabs off of the control arm leaving only one tab.

If the servo is supplied with a four tab (X) shaped control arm, remove three of the tabs leaving only one.

Replace the round servo control arm with the modified arm. Avoid stressing the gears by holding the control arm to limit travel when removing and replacing. Do not over tighten the screw; snug is tight enough. To maximize servo life, avoid moving the servo control arm with the radio off.

The servos must be centered with the radio powered up before installation. Do not install the prop or hub yet!

Computer radios have settings for elevon mixing. Check the radio manual for flying wing, elevon or delta mix setting. V-tail settings will not work. Set the transmitter for elevons and determine the appropriate receiver slot for the controls. Check to see that the ESC switch is off. Position the servos the way they will be in the wings. Plug the right and left servos into the receiver. Plug the three wire ribbon connector from the ESC into the throttle slot of the receiver, not the battery slot. The receiver is powered by the ESC. No separate receiver battery is necessary.

The trim levers are located on the transmitter to the left and below the control stick. Some trim controls are electronic and others are mechanical. Trim levers are provided for in-flight adjustments to achieve level flight. It is important to set the trim levers at the zero or center position. Set the motor control to the “Motor off” full down position. Turn the ESC switch off.

Do not install the prop or hub yet!
Always turn the transmitter switch to the on position before plugging in the airplane battery. Check the battery condition indicator on the transmitter to make sure that the battery is charged. Make sure that the throttle is in the full down (off) position.

Make sure that the ESC power switch is in the off position.

**CAUTION!**

*The prop should not be installed at this time. The motor may be tested and run without the prop installed. Remember that the potential energy of this power system will turn the prop at 14,000 rpm and propel this airplane over 55 mph.*

Plug the ESC into a charged battery. The male and female Deans Ultra connectors have a polarity lock. They will only mate in one position: Red to red and black to black.

The Zagi 20 ESC requires an arming procedure. The arming procedure begins with the throttle stick in the full off position. Move the throttle stick to the full on position and then back to full off. The ESC will emit a faint tone to signal that it is armed. The motor will now turn when the throttle stick is moved. Follow this procedure every time the ESC is powered up.

With the radio on, inspect the servos to see that the control arm is at 90 degrees to the servo case in the hands-off neutral stick position. Adjust the control arm by moving and replacing it at 90 degrees to the servo case. Only use the trim lever to make in-flight adjustments. When the elevon control stick is pulled back (the opposite direction to antenna) the servo control arms should both move forward. When the stick is moved to the right, the right servo control arm should move forward and the left servo control arm moves back.
The die cut servo bay is a cookie cut-out in the shape of a servo. The cut-outs are not easy to see. Poking a finger from the bottom while inspecting the top helps. Locate the cutout and push the cookie about halfway through into the bottom of the wing.

The shape of the cut-out indicates the orientation of the servo. Push the servo into the cut-out forcing the cookie to the bottom side of the wing.

Align the servo so that it is flush with the top of the wing.

A sharp kitchen knife works well to make a flush cut. Another method is to mark the perimeter of the cookie with a pencil, remove the cookie and make the cut.

Remove the servo. Push the cookie from top to bottom of the wing about 1/4 inch. Spray a small amount of adhesive on two sides of the cookie and push the cookie back in place.
Lay the wing in the bottom beds. 77 Spray Adhesive will not melt EPP foam. Spray the center portion of the top side of the wing with adhesive. Make sure that the walls of the battery and receiver bays are covered. Let the adhesive dry for 20 minutes before taping.

*The fiber tape will not appear as dark as pictured here. Darker tape was used in these pictures to enhance contrast visibility.*

Apply a piece of fiber filament tape straight across center section of the wing between the carbon spars. Align the tape to the top of the scallops.

Apply two pieces of fiber filament tape across the nose.

Apply a piece of fiber filament tape at an angle from the top of the outboard scallop to the aft corner of the battery bay. For rough duty, wrap a strip of fiber tape around the entire length of the leading edge.

Place the wing in the top beds and repeat the same procedures on the bottom side of the wing.
Spray adhesive on all top surfaces of the wing including the areas covered with fiber tape. Make sure to spray the tips and trailing edges. Spray 2 inches of the bottom of the wing at the trailing edge (TE). Let the adhesive dry for 20 minutes.

Put the wing top side up in the bottom beds. Put a weight on the left panel to hold it steady while taping. Start taping at the TE and work forward.

*Covering the top and bottom of the wing in contrasting colors makes the plane much easier to fly. Use the darker color on the bottom surface. An optional roll of color tape will be required.*

The first strip of tape is wrapped around the TE from top to the bottom, being careful to follow the shape.

Apply strips of tape working forward from the TE. Overlap each strip of tape a quarter of an inch. Extend the tape two inches beyond the center line of the wing. Extend the tape two inches beyond the tips.

Continue overlapping the strips of tape until the entire top right wing panel is covered.

Trim the tape that extends beyond the leading edge (LE).
Cover and trim the top left wing panel. Repeat the same taping procedures as on the right panel.

After the right and left top panels are covered, add some strips of color tape to the walls of the electronics bay.

Cut out the electronics bay floor. Lay the part on a piece of newspaper. Spray the part with adhesive. Center the floor over the electronics bay and press it in place.

Apply strips of fiber tape cordwise (parallel to the center line) to completely cover the electronics bay floor beyond the edges. Spray a mist coat of adhesive to the new tape.

Complete the color tape covering the bottom of the wing working from TE to LE.

When the entire top and bottom are covered, wrap a spanwise strip of color tape around the LE.
Position the elevon with the 90 degree surface down. Hold the elevon against the TE. Make a mark to match the wing tip. Trim the end of the elevon to match the angle of the wing tip.

Sand a 45 degree angle into the front of the elevon. Sand the elevons and smooth all the surfaces. Spray the elevons with any spray enamel. Primer works well. Apply a light coat of paint and immediately wipe it with a cloth before it soaks in and dries. Let the paint dry.

For rough duty, the elevons may be covered with color tape.

Position the elevon on the trailing edge of the wing. Align a straightedge with the wing tip. Leave a 1/16" space between the end of the elevon and the straight edge. Use small pieces of masking tape to hold it in position temporarily. Best to leave a corner of the tape turned up for easy removal.

Peel the short paper backing tab from the 1" x 3 mil vinyl hinge tape. Align the hinge tape at one end. Holding the peeled end of the tape over the seam press the hinge tape in place while peeling the backing. Remove the small pieces of masking tape ahead of the hinge tape. Press the hinge tape down along the length of the elevon with a squeegee. Save one of the short ends of hinge tape for the hatch hinge.

Press the servo in place with the control arms centered at 90 degrees to the servo case. (see page 10)
Make a line from the outboard side of the servo control arm to the elevon. The line should be parallel to the center line.

Align the control horn to the line on the elevon. Use a punch or any pointed tool to mark the position of the holes in the control horn foot. Drill two holes big enough for the 2 x 56 self tapping machine screws. Thread the machine screws through the elevon into the nylon locking pad. Snug the screws to make a slight impression in the balsa wood. Do not over tighten!

Screw the threaded clevis onto the control rod so that equal threads are showing on both sides of the clevis. Hold the elevon in the neutral position and make a mark where the rod matches the holes in the control arm.

*The diameter of the control rod may be reduced with a file or belt sander to fit better into the control arm. The control arm hole may be enlarged with a drill or by spinning an X-Acto blade in the hole.*

Attach control rods to the servo control arms with a Z-bend. (NOTE: Z-bend pliers may be purchased from your local hobby dealer to make this operation easier.) Long nose pliers will also work to make a Z-bend.

Using a straight edge as a guide, make a half inch deep cut for a servo wire channel. The channel goes between the servo wire, where it exits the servo, to the middle of the receiver bay. Push the servo wire into the channel with a flat blade screwdriver. A cleaner installation can be made by drilling or burning a hole between the servo bay and the electronics bay. Burning a hole can be done with a heated wire. Practice on scrap foam.
Cut the bottom out of the electronics bay. Use a razor knife to cut only the bottom square out.

Press the motor tray in place. The left front corner will not seat because of the Velcro cutout. Measure the space and remove enough material so that the motor tray will seat. Cut a piece of hook side Velcro to fit inside the motor tray Velcro cutout.

The motor tray can be taped or glued in place. If glue is chosen, use a small amount around the perimeter of the skirt that fits in the foam cutout and a little on the flange that contacts the top of the wing.

Drill a hole in the wall at the rear corner of the electronics bay at an angle to miss the floor plate. Make the hole big enough for the antenna wire to fit through. Push the wire through leaving a couple of inches of antenna in the electronics bay for positioning. Using a straight edge as a guide, make a quarter inch deep cut in the wing surface for an antenna wire channel. Cut the antenna channel to the end of the carbon spar then circle back about an inch from the first channel. Push the antenna wire into the channel with a flat blade screwdriver. **DO NOT CUT THE ANTENNA WIRE!**
Locate the three inch hook side Velcro strips in the parts bag. Center the strips 3/4 inches apart on the battery bay floor. Center the loop side of the Velcro on the battery. The battery may now be mounted anywhere along the length of the battery bay depending on the desired Center of gravity (CG). Plug the right and left servos into the Receiver. Make sure that the layout is the same as the earlier test on page 10.

Use a 1 x 1 Velcro set to hold the RX in the corner of the bay. Plug the universal RX connector into the slot in the receiver to control motor speed. The three wire ribbon connector will provide power for the receiver and servos. **No other receiver battery is necessary.** The universal connector will work with all radios except the old Airtronics. The red and brown wires must be reversed in the plastic housing to change to the old Airtronics system.

Cutout the vented hatch. Make sure that the vent holes are cutout the full size of the cut lines. The hatch can be hinged on the right side with one of the short ends of the elevon hinge tape. Apply a piece of loop side Velcro on the hatch opposite the hook side on the motor tray. The Velcro hatch latch may not be strong enough for extreme flying. A strip of tape on the front of the hatch will work.

Put a piece of fiber filament tape through the winglet slot to the top of the wing and wrap it around to the bottom of the wing. Add two more pieces of tape to secure the winglet in place. Make sure that the elevon will not bind against the winglet as it moves.

*The winglets are at the very back of the airframe where excess weight is a real balance factor. The tape method of fastening is both light and strong. If a different winglet fastening system is preferred, keep the weight down to the weight of two short strips of tape.*

**Install the prop for balance purposes only. Do not hookup the battery at this time.** Lay the wing bottom-side-up. Tape a 1/4” dowel 8 inches back from the nose. A round pencil or ball-point pen can be used. Place the wing right-side-up on a flat surface. Balance is achieved when the wing balances momentarily on the dowel. Move the battery forward or aft to balance. Do not add nose weight. Cut a piece of foam the size of the space between the battery and the front of the battery bay. Glue or tape the shim in front of the battery or tape it to the battery.
Assemble the prop and hub so that the raised lettering on the prop is facing toward the motor.

Adjust the zero setting of the elevons. Remove the prop. Turn the transmitter on and then the receiver. The trim initial settings should be adjusted holding a straight edge against the bottom of the wing at the TE. The elevon should be flush with the bottom of the wing for the last three inches. Use the threaded clevis to adjust them to the proper position, do not use the trim levers on the transmitter.

Adjust the throw settings of the elevons. Remove the prop. Turn the transmitter on and then the receiver. Set the wing on a couple rolls of tape or anything that will let the elevons move freely. Hold a ruler near the elevon. Pull the elevator stick back to the full up position without any right or left movement. The throw should be 1/2”. The full down throw should be the same. Now push the stick to the full right position. The right elevon should move up and the left move down. The throw should be 1/2”.

If the Zagi XS requires reflex (up elevator) for level flight it is nose heavy. The weight in the nose pushes the nose down. The elevons compensate in the up elevator position creating drag.

The Zagi XS will balance with the elevons in a neutral position. No reflex is necessary for washout or other stability reasons. The suggested starting point for balance is 8 inches back from the nose. The best way to find the balance point is to keep moving the battery back, between flights in 1/8” increments until it is almost unflyable (too elevator sensitive). Remember, the elevator throw can compensate for over sensitivity.
First time motor power-up

The following steps are provided for a safe first time motor power-up. Do not install the prop onto the motor
shaft yet. Test the motor hookup before the prop is installed. Make sure that the battery is charged. The
batteries are not shipped with a charge.

NOTE: Always turn the transmitter (TX) on before connecting the battery and disconnect the battery before
turning off the TX.

1. Remove the prop and make sure that the motor is seated and securely attached to the motor mounts.
2. Make sure that the reverse switch for the motor stick on the transmitter is in the normal position.
   Not reversed!
3. Push the motor control stick on the transmitter to the full off position.
4. Push the motor control stick trim lever to the full down position.
5. Turn the transmitter power on. Check the output meter for battery condition.
6. Secure the charged 8 cell battery in place with the Velcro tabs.
7. Check that the ESC signal lead is in the motor slot of the receiver.
8. Position yourself with the nose of the airplane pointed at you. Plug the battery into the electronic speed
   control (ESC).
9. Turn the ESC switch to the on position.
10. Move the trim lever for the motor control stick slowly upward to the center position. The motor
    should not move.
11. Move the motor control stick to the full on position and back to the full off position. The motor
    should run faster the further up the stick is moved. The motor should turn counter clockwise when
    observed from the front.
12. Unplug the battery from the ESC. Install the prop onto the motor shaft. Rotate the prop to make sure
    that it is clear of any obstructions.
Preflight check and glide test

Do a preflight check before every flight. Always turn the transmitter power on before the motor battery in the airplane is plugged in. Make sure that the throttle control stick is in the full down position. Make sure that the controls are working properly. Check the trim levers on the transmitter. Pull the elevator control stick back and observe that both elevons move upward. Push the control stick to the right and observe the right elevon moves up and the left elevon moves down. Hold the wing securely by the nose. Move the throttle stick to the half throttle position momentarily. The first glide test should be done on flat land in a light breeze. The wing should be held by the nose with your palm up over your head and your thumb wrapped around to the top. Hold the wing over your head with the nose pointed straight ahead. Run slowly into the wind. Give it a gentle push STRAIGHT AHEAD. Do not point the nose upward. Correct the flight path with the radio control stick. The test is successful when the wing flies straight ahead with a slow sink rate to a sliding landing. If the wing turns in either direction after the launch, compensate by adding 2 or 3 clicks of trim in the opposite direction. If the wing pitches up and immediately dives, add 2 or 3 clicks of down trim. Repeat the glide test until the Zagi XS flies straight ahead with a slow sink rate to a sliding landing. Increase the launch speed each time to provide longer control flights.

First flight

Check the frequencies (channel number) of all pilots within visual range before turning on your transmitter. Turning on your transmitter with the same channel number as someone who is flying will certainly cause his plane to crash.

The Zagi XS is capable of high speed. Flights at a high rate of speed can cause considerable damage to someone or something if a collision occurs. Please exercise caution while flying. It is recommended that you join the Academy of Model Aeronautics (AMA) (1-800-435-9262) to provide insurance, awareness of safe flying practices, and knowledge of what’s going on in the modeling field. At some flying sites it is mandatory that you be a member of the AMA.

Do not launch the Zagi XS with the motor running. Hold the wing by the nose with your palm up over your head and your thumb wrapped around to the top. Take a step or two forward and give the wing a good strong throw into the wind. A follow through with a little finger tip will increase the launch speed. Slide the throttle stick to the full forward position when the Zagi XS is a comfortable distance from the ground. Get some altitude and experiment with some throttle settings. Full motor is fun but will use up the battery quickly.

Good luck,

JT
DO NOT RUN THE MOTOR ON THE BENCH WITH THE PROP INSTALLED FOR MORE THAN 30 SECONDS. DO NOT USE THE MOTOR TO DRAIN OR CYCLE BATTERIES. The 1800 mAh 8 cell High Rate NIMH Zagi battery may be charged at a rate as high as 3 amps although slower charge rates will charge better. Battery life is determined by two main factors; charging and discharging. Both of these functions produce heat. Warm is okay, hot isn’t. A hot battery has either been charged or discharged too fast. First, charging. Make sure that the charger is designed to charge the number of cells and type of battery being charged. The best type of charger is the peak detector type. These chargers will charge the battery to peak at a pre-selected rate then drop to a trickle. Older chargers with timers will often over charge batteries causing excessive heat. Manufacturers recommend fast charging batteries at the rated capacity (1C). “C” means designated capacity. So a 1000 mAh battery should be charged for one hour at 1C 1000 mAh (1 amp). There is a big difference between what the manufacturer and the hobbyist call a fast charge. Hobbyists are notorious battery abusers. Batteries that are not designed for rapid charge are routinely over charged by charging and discharging them too fast. All batteries have a finite number of cycles. Abuse will decrease the number of cycles. Electric flight hobbyists are willing to accept the shortened life of the batteries for performance. The Zagi XS, in flight, will draw about 10 amps, (5.5C) which is beyond manufacturers recommended loads. There are ways to cut these losses. Don’t charge at a rate more than twice (2C) the designated capacity of the battery. Don’t charge a hot battery. Get enough batteries to fly one, cool one, and charge one. A way to speed up the cycle is to make a 12 volt field battery cooler. Tape a 12 VDC muffin fan to a 6 inch length of 2 inch PVC pipe. The Muffin fan is available at Radio Shack or find an old computer power supply fan (but make sure it’s designed for 12 VDC and not 110 VAC).

Discharging the battery at the rate of 15 to 30 amps is the other way electric flight hobbyists abuse batteries. These high discharge rates produce heat. Again there are ways to cut your losses. Airflow over the battery during flight will help. Vent holes in the cowling is a good idea. But more important is the throttle settings during the flight. Full bore for the entire flight will definitely produce heat. Try some throttle off time and some half throttle time. This will extend the flight time and battery life.

\[ \text{6” Piece of 2” PVC plumbing pipe} \quad \text{Battery} \quad \text{Muffin fan} \]

\[ \text{Air flow} \]

\[ 12 \text{ VDC} \]
Trick R/C guarantees this kit to be free from defects in both workmanship and material at the date of purchase. This does not cover any components or parts damaged by use, misuse or modification. In no case shall Trick R/C’s liability exceed the original price of the purchased kit.

Since Trick R/C has no control over the final assembly, no liability shall be assumed for any damage resulting from the use by the user of the final user-assembled product. By the act of using the final user-assembled product, the user accepts all resulting liability.