EDGE 540

Almost-Ready-to-Fly Electric 3D Aerobat

EPERFORMANCE SERIES™

INSTRUCTION MANUAL

Wingspan: 41 in [1040mm]
Wing Area: 353 in^2 [22.8dm^2]
Weight: 29 – 32 oz [820 – 910g]
Wing Loading: 11.8 – 13.1 oz/ft^2 [36 – 40g/dm^2]
Length: 39.5 in [1005mm]
Radio: 4-channel minimum with micro receiver
Motor: RimFire™ 35-30-1250 out-runner

WARRANTY

Great Planes® Model Manufacturing Co. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Great Planes' liability exceed the original cost of the purchased kit.** Further, Great Planes reserves the right to change or modify this warranty without notice.

In that Great Planes has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

GREAT PLANES® MODEL MANUFACTURING COMPANY

Champaign, Illinois
(217) 398-8970, Ext 5
airsupport@greatplanes.com

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INTRODUCTION

Congratulations on your purchase of the Great Planes E-Performance Edge 540 EP ARF! Like the other models in the E-Performance line, the Edge 540 EP ARF will deliver the precision performance that 3D pilots are looking for. It's a great sport plane for the casual flier. As a new feature, the Edge 540 EP ARF is designed with removable wing panels around a carbon fiber wing tube for transporting convenience. The wingspan of the Edge 540 EP ARF will, however, allow the plane to fit into most vehicles without removing the wings.

For the latest technical updates or manual corrections to the Edge 540 EP ARF, visit the Great Planes web site at **www.greatplanes.com**. Open the "Airplanes" link, then select the Edge 540 EP ARF. If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

AMA

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302-9252
Tele. (800) 435-9262
Fax (765) 741-0057
Or via the Internet at:
http://www.modelaircraft.org

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

PROTECT YOUR MODEL, YOURSELF & OTHERS....FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. Your Edge 540 EP ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Edge 540 EP ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.

3. You must take time to build **straight, true** and **strong**.

4. You must use an R/C radio system that is in first-class condition, and a correctly sized motor and components throughout the building process.

5. You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air.

6. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.

7. If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

8. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as racing, or if a motor larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

9. **WARNING**: The cowl included in this kit is made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Edge 540 EP ARF that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Radio Equipment

A 4-channel radio system with four micro servos and a micro receiver are required for this plane. The servos and receiver shown in the manual are Futaba® S3114 micro servos and the Futaba R114F micro receiver. Two 6" [150mm] servo extensions, two 16" [400mm] servo extensions, and a Y-harness are also required. Order numbers for these items are provided below.

- ❏ (4) Futaba S3114 Micro High Torque Servo 7.7g (FUTM0414)
- ❏ Futaba R114F FM Micro Receiver (Low Band – FUTL0442, High Band – FUTL0443)
- ❏ Futaba FM Single Conversion Short Crystal (Low Band – FUTL62**, High Band – FUTL63**)
- ❏ (2) Futaba C-25 Extension Slim Wire 150mm (FUTM4506)
- ❏ (2) Futaba 16" [400mm] Servo Extension Futaba J (FUTM3955)
- ❏ Futaba 6" Dual Servo Extension J (FUTM4130)

Motor Recommendation

The recommended motor for the Edge 540 EP ARF is:

- ❏ Great Planes RimFire™ 35-30-1250kV Brushless Out-runner Motor (GPMG4595)

Note: *Motors from other manufacturers may work with the Edge 540 EP ARF, however the included motor mounting components are designed to work specifically with the Great Planes motor listed.*

Propeller

The recommended propeller for the Edge 540 EP ARF when using the Great Planes RimFire 35-30-1250kV motor is:

- ❏ APC 10" x 7 Thin Electric Propeller (APCQ4123)

Electronic Speed Control

A brushless electronic speed control (ESC) is required for this plane. We recommend using the Great Planes Silver Series 35A Brushless ESC 5V/2A BEC (GPMM1830).

Battery Pack

The Edge 540 EP ARF has been tested with 11.1V LiPo packs ranging from 1250mAh to 2100mAh. Order numbers are provided for packs of this size. The lighter 1250mAh pack is suggested for maximum performance.

- ❏ Great Planes LiPo 1250mAh 11.1V 20C Discharge w/Balance (GPMP0609)
- ❏ Great Planes LiPo 1500mAh 11.1V 20C Discharge w/Balance (GPMP0613)
- ❏ Great Planes LiPo 2100mAh 11.1V 20C Discharge w/Balance (GPMP0617)

Note: *Do not use Great Planes LiPo 1500mAh 11.1V 3S 8C Discharge (GPMP0831). This battery pack is not capable of supporting the current draw of the recommended power systems.*

Required Adhesives & Building Supplies

This is the list of adhesives and building supplies required to finish the Edge 540 EP ARF. Order numbers are provided in parentheses.

❏ 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
❏ 1/2 oz. [15g] Medium Pro CA+ (GPMR6007)
❏ Pro 30-minute epoxy (GPMR6047)
❏ Denatured alcohol
❏ Drill bits: 1/8" [3mm]
❏ #1 Hobby knife (HCAR0105)
❏ #11 Blades (5-pack, HCAR0211)
❏ Hobbico® Steel T-Pins 1" (100) (HCAR5100)
❏ Great Planes Pro Threadlocker (GPMR6060)
❏ CA applicator tips (HCAR3780)
❏ 220-grit Sandpaper

Optional Supplies & Tools

Here is a list of optional tools that will help you build the Edge 540 EP ARF.

❏ 21st Century® sealing iron (COVR2700)
❏ 21st Century iron cover (COVR2702)
❏ 2 oz. [57g] Spray CA activator (GPMR6035)
❏ 4 oz. [113g] Aerosol CA activator (GPMR6034)
❏ CA debonder (GPMR6039)
❏ Epoxy brushes (6, GPMR8060)
❏ Mixing sticks (50, GPMR8055)
❏ Mixing cups (GPMR8056)
❏ Panel line pen (TOPQ2510)
❏ Rotary tool such as Dremel®
❏ Hobbico flexible 18" ruler stainless steel (HCAR0460)

IMPORTANT BUILDING NOTES

- When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.
- Whenever the term ***glue*** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.
- Whenever just ***epoxy*** is specified you may use **either** 30-minute (or 45-minute) epoxy **or** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.
- ***Photos*** and ***sketches*** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.
- The stabilizer and wing incidences and motor thrust angles have been factory-built into this model. However, some technically-minded modelers may wish to check these measurements anyway. To view this information visit the web site at **www.greatplanes.com** and click on "Technical Data." Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Edge 540 EP ARF are available using the order numbers in the **Replacement Parts List** that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company.

To locate a hobby dealer, visit the Hobbico web site at **www.hobbico.com**. Choose "Where to Buy" at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

Parts may also be ordered directly from Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax. If ordering via fax, include a Visa® or MasterCard® number and expiration date for payment.

Mail parts orders and payments by personal check to:

Hobby Services
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822

Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason contact Product Support by e-mail at **productsupport@greatplanes.com**, or by telephone at (217) 398-8970.

Replacement Parts List

Description	**How to Purchase**
Missing pieces	Contact Product Support
Instruction manual	Contact Product Support
Full-size plans	Not available

Contact your hobby supplier for the following parts:

GPMA3155	Wing Set
GPMA3156	Fuselage
GPMA3157	Tail Surface Set
GPMA3158	Landing Gear
GPMA3159	Wheel Pants
GPMA3160	Cowl
GPMA3161	Canopy
GPMA3162	Wing Joiner Tube
GPMA3163	Decal Sheet
GPMA3164	Battery Hatch

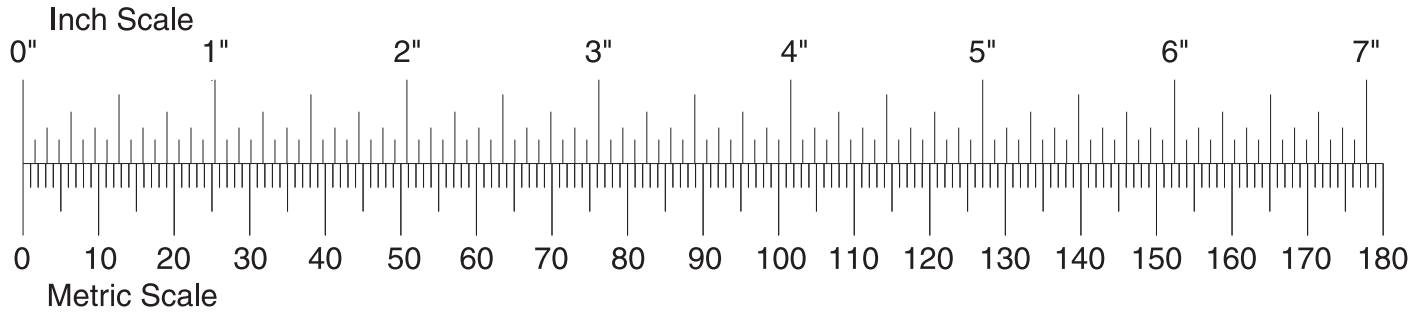
COMMON ABBREVIATIONS

Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
Ply = Plywood
" = Inches
mm = Millimeters
SHCS = Socket Head Cap Screw
ESC = Electronic Speed Control

METRIC CONVERSIONS

1" = 25.4mm (conversion factor)

1/64" = .4mm	3/4" = 19.0mm
1/32" = .8mm	1" = 25.4mm
1/16" = 1.6mm	2" = 50.8mm
3/32" = 2.4mm	3" = 76.2mm
1/8" = 3.2mm	6" = 152.4mm
5/32" = 4.0mm	12" = 304.8mm
3/16" = 4.8mm	18" = 457.2mm
1/4" = 6.4mm	21" = 533.4mm
3/8" = 9.5mm	24" = 609.6mm
1/2" = 12.7mm	30" = 762.0mm
5/8" = 15.9mm	36" = 914.4mm

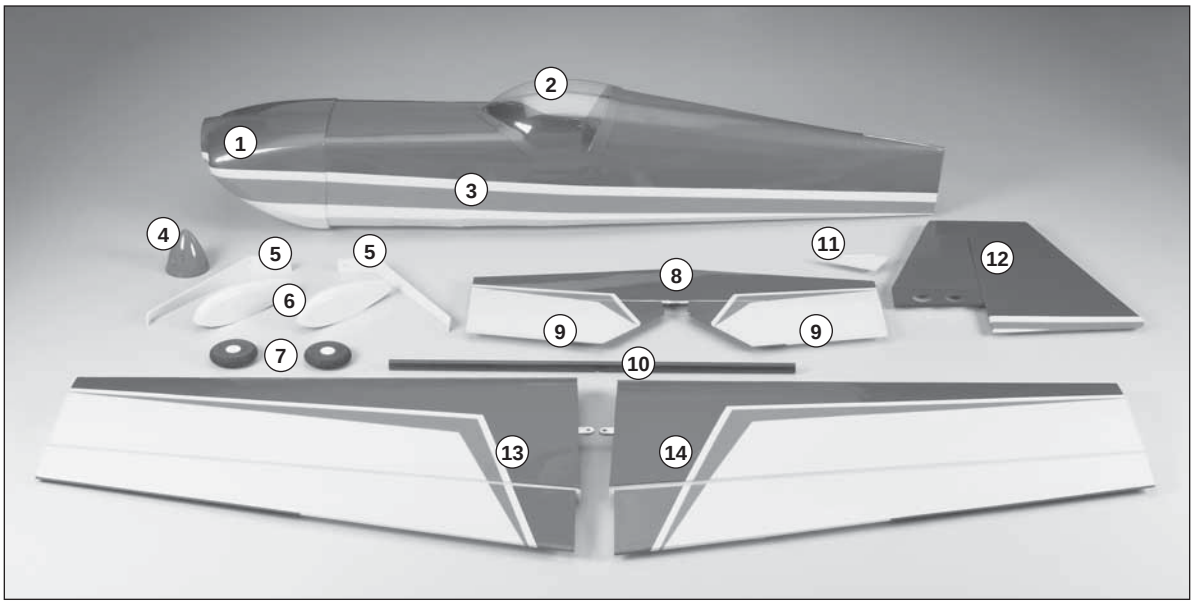


KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list.

Great Planes Product Support:
3002 N Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970, ext. 5
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com

KIT CONTENTS



Kit Contents

1	Cowl
2	Canopy
3	Fuselage
4	Spinner
5	Main Landing Gear (L&R)
6	Wheel Pants (L&R)
7	Main Wheels (2)
8	Horizontal Stabilizer
9	Elevator Halves (L&R)
10	Carbon Fiber Wing Tube
11	Tail Skid
12	Vertical Fin & Rudder
13	Left Wing Panel with Aileron
14	Right Wing Panel with Aileron

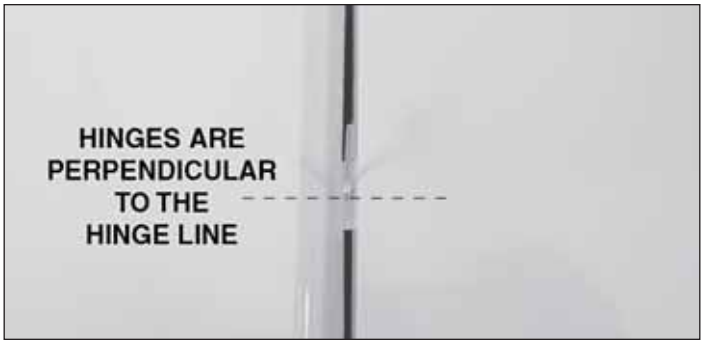
PREPARATIONS

❏ 1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support at the address or telephone number listed in the ***"Kit Inspection"*** section on page 6.

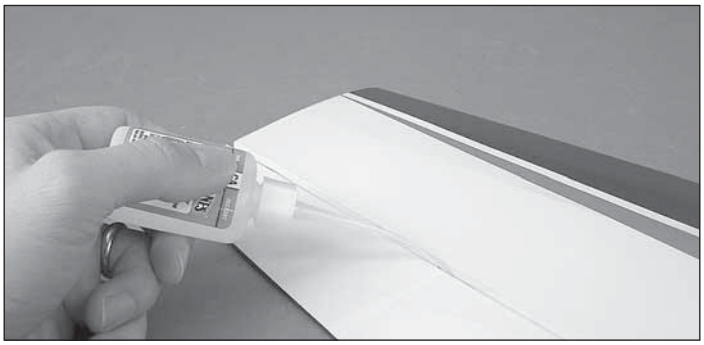
❏ 2. **Carefully** remove the tape and separate all the control surfaces. Use a covering iron with a covering sock on medium heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

ASSEMBLE THE WING PANELS

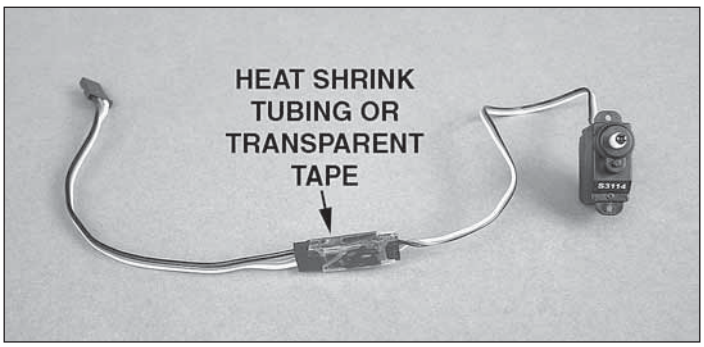
❏ 1. Test fit the pre-cut CA hinges into the slots in the **wing panels** and **ailerons**. If any are difficult to install, enlarge the slots with a hobby knife.



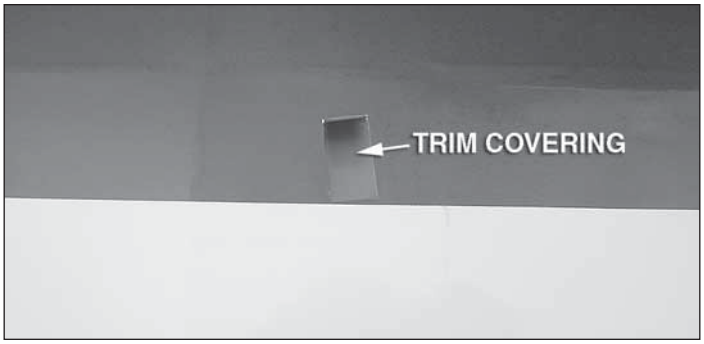
❏ 2. Insert the CA hinges halfway into the slots in the wing panels. Push small T-pins through the middle of the hinges to keep them centered. Insert the ailerons onto the other ends of the hinges. Align the outer tips of the ailerons flush with the wing tips. Pull the ailerons away from the panels far enough to confirm that the hinges remained perpendicular with the hinge line. If not, use a hobby knife or small screwdriver to nudge them straight.



❏ 3. When satisfied, carefully remove the T-pins from the hinges. Adjust the ailerons so there is a small gap between the LE of the aileron and the wing. The gap should be small, just enough to see light through the gap or slip a piece of paper through. Use thin CA glue to secure the ailerons by applying 6 to 7 drops onto both sides of each hinge.

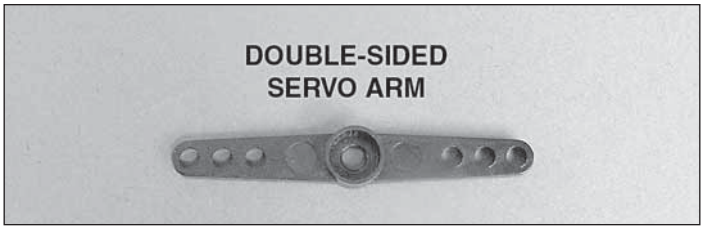


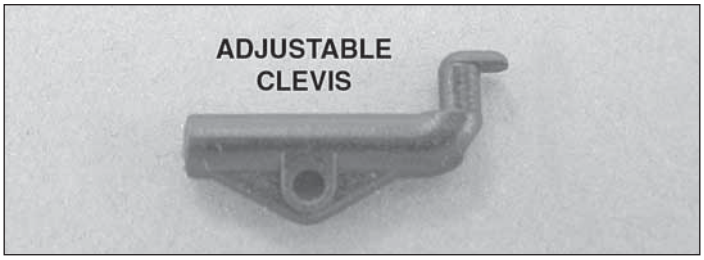
❏ 4. Attach a 6" [152mm] servo extension to each aileron servo and wrap the connection with transparent tape or heat shrink tubing (not included).



❏ 5. Trim the covering from the aileron servo bays on the undersides of the wing panels. Also trim the covering from the control horn slots in the ailerons.

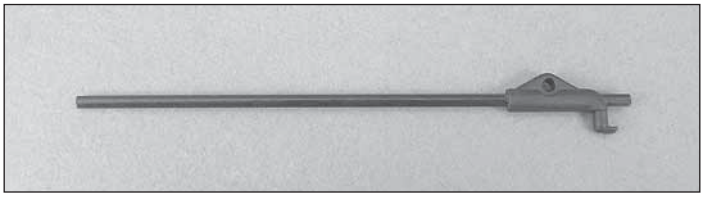
❏ 6. Insert the servo leads into the servo bays and pull them through the wing ribs. The servos can be installed using the hardware included with the servos or they can be glued in place. If installing the servos in place with screws, thread a mounting screw (included with the servo) into each hole you drilled and remove it. Apply a couple drops of thin CA glue to each hole to harden the wood. If gluing the servos in place, slit or puncture the covering just beneath the servo mounting tabs where they will contact the wing. This will ensure that the servo will be glued to the plywood servo bay, not just the covering. Roughing up the underside of each servo mounting tab with sandpaper will also improve glue adhesion. Glue the aileron servos into the servo bays using epoxy or CA glue with the servo splines facing the LE of the wings. After the glue has cured, confirm that the servos are properly secured to the wings and reinforce with extra glue if necessary.

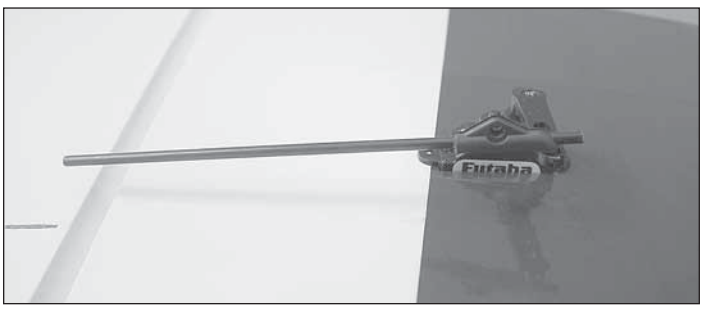




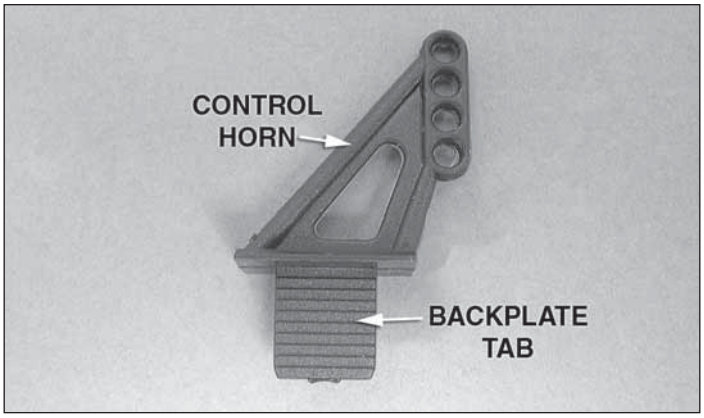
❏ 7. Locate two **double-sided servo arms** that fit the output splines of your aileron servos and four **adjustable clevises**.

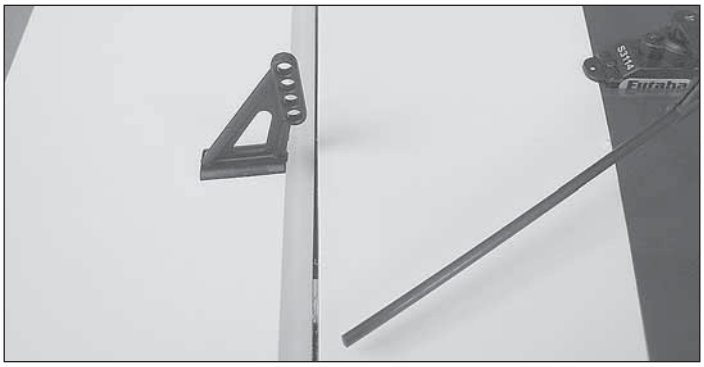
❏ 8. Temporarily connect your aileron servos and battery pack to your radio and center the servos and trim levers on the transmitter. Test fit the double-sided servo arms parallel to the aileron hinge line. If the servo arm does not fit onto the servo spline parallel to the hinge line, remove it from the servo and rotate it 180°. Decide which way fits best (closest to parallel) and cut off the arm that isn't used. The remaining arm should point toward the wing tip. Be sure to make a left and right servo arm.



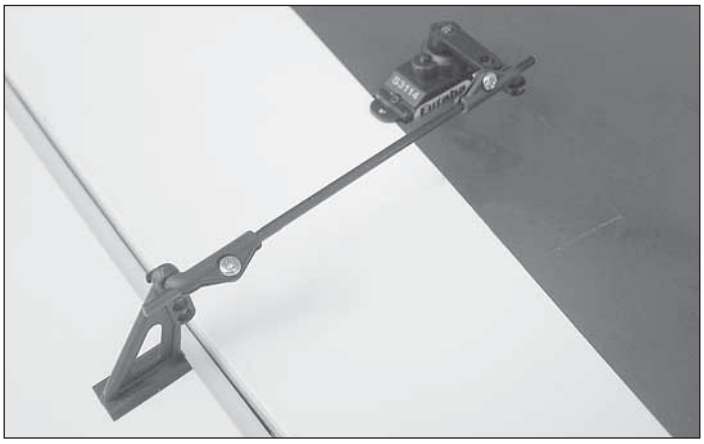


❏ 9. Fit an adjustable clevis onto both 2 x 90mm carbon fiber **aileron pushrods**. Push/rotate the clevis from each pushrod into the outer holes of the servo arms.



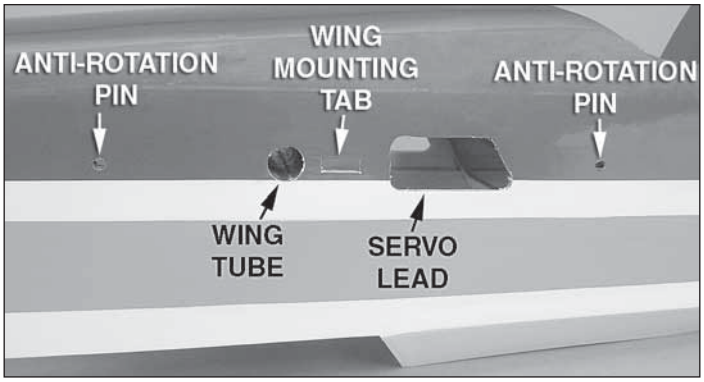


❏ 10. Coat the **control horn backplate tabs** with medium CA and press them into the slots in the ailerons.

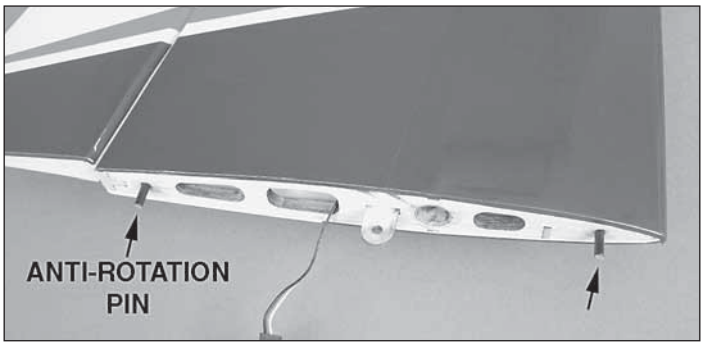


❏ 11. Attach an adjustable clevis to the outer hole in each aileron control horn. Fit the other ends of the pushrods into the clevises on the control horns. With the servo arms perpendicular to the servo cases and the ailerons in the neutral positions, center the length of the pushrods between the two clevises. When satisfied, lock the clevises onto the pushrods by threading a 2 x 4mm screw into each clevis screw hole. The screw head should fit into the recessed hole in the adjustable clevises as shown **(installing the screws in the wrong direction may not properly tighten the clevises onto the pushrods)**.

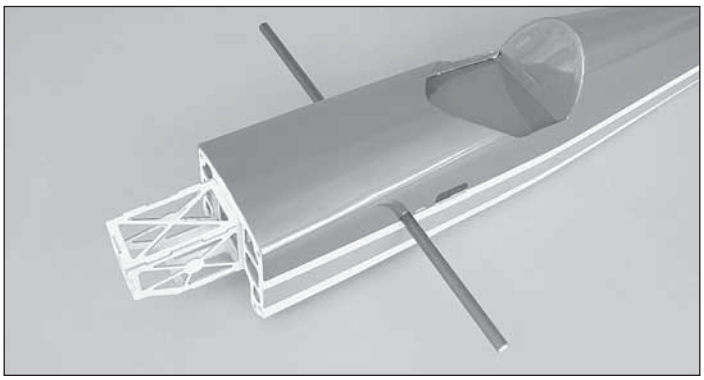
INSTALL THE WING PANELS



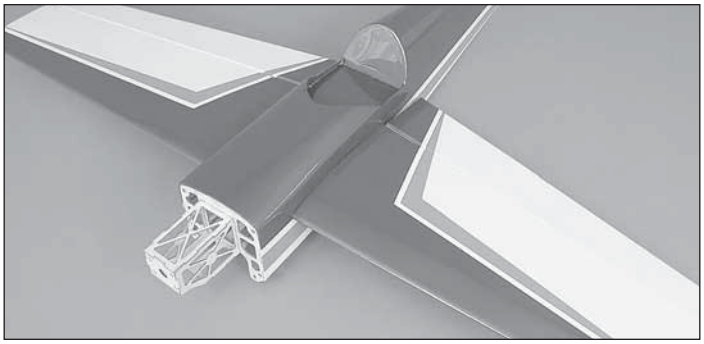
❏ 1. Trim the covering in the **fuselage** for the wing tube, wing mounting tabs, servo lead holes, and anti-rotation pins.

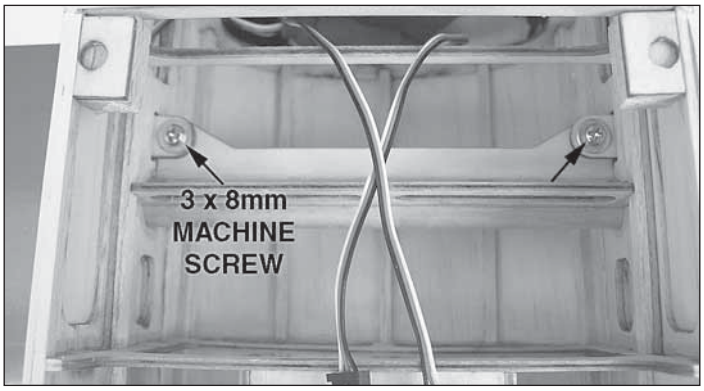


❏ 2. Glue the 3 x 15mm carbon fiber **anti-rotation pins** halfway into the holes in the wing root ribs.



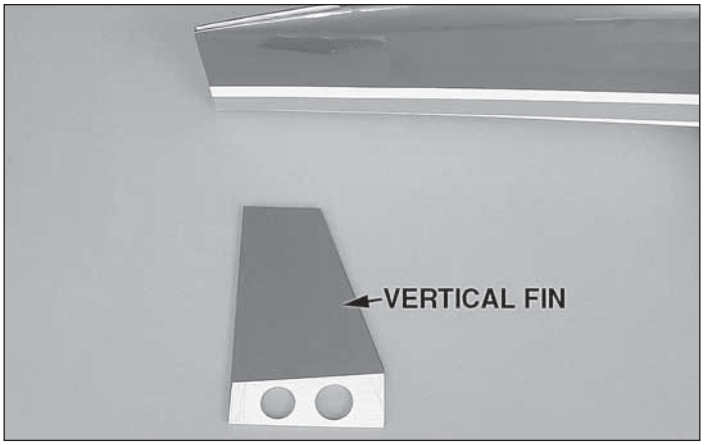
❏ 3. Slide the carbon **wing tube** into the wing tube channel in the fuselage and center its position.

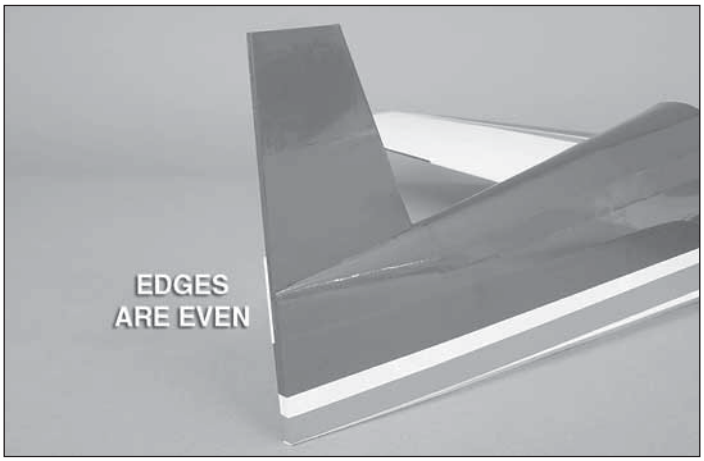




❑ 4. Slide the wing panels onto the wing tube and push them in place against the fuselage sides by fitting the anti-rotation pins into their mating holes. Use two 3 x 8mm machine screws, two 3mm flat washers and threadlocking compound to secure the wing panels to the fuselage.

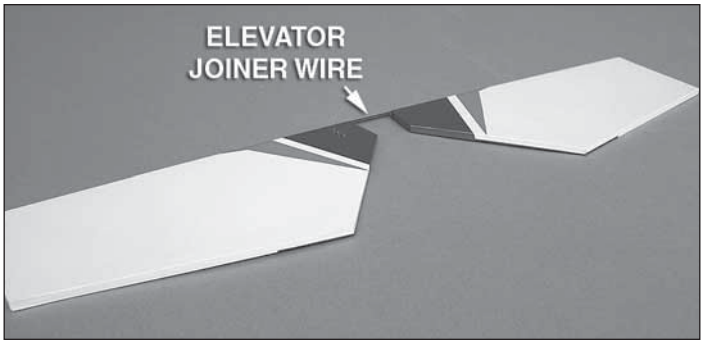
ASSEMBLE THE TAIL SECTION



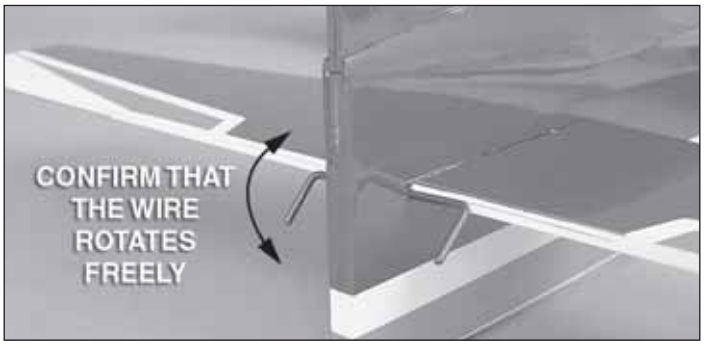


❑ 1. Test fit the **vertical fin** into the slot at the aft end of the fuselage. Confirm that the fin is perpendicular to the wings. If not, carefully sand the slot as necessary until the correct fit is achieved. When satisfied, glue the fin into the slot.

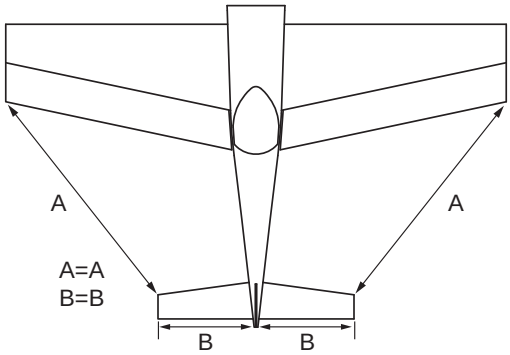
❑ 2. Trim the covering from the **horizontal stabilizer slot** in the fuselage.

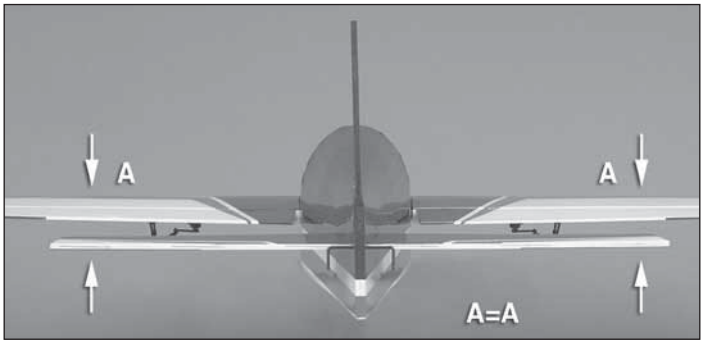


❏ 3. Test fit the **elevator joiner wire** into the **elevator halves**. Lay the elevators on your work surface and confirm that they both lay flat. If not, "tweak", or bend the elevator joiner wire slightly until they do. Do not attempt to bend the joiner wire while it is installed in the elevators. **Do not** glue the joiner wire in place at this time.

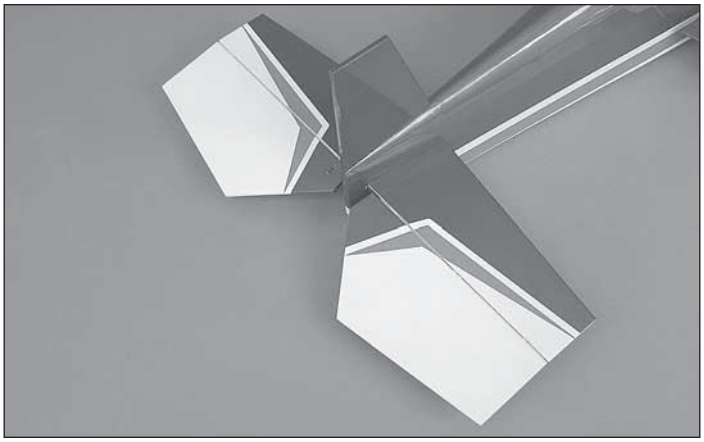


❏ 4. Insert the elevator joiner wire into the aft end of the stab slot. Test fit the horizontal stab into the slot in front of the joiner wire. The joiner wire must be able to swivel freely inside the slot. If it cannot, carefully enlarge the slot as necessary with a hobby knife. Roughen the elevator joiner wire with sandpaper and clean it off with alcohol.

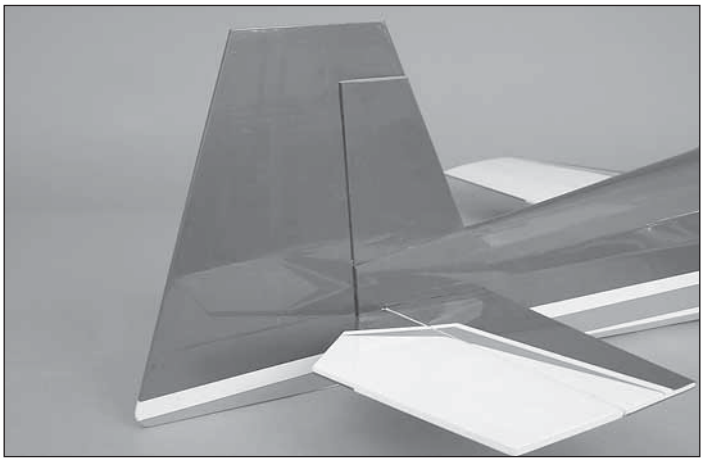




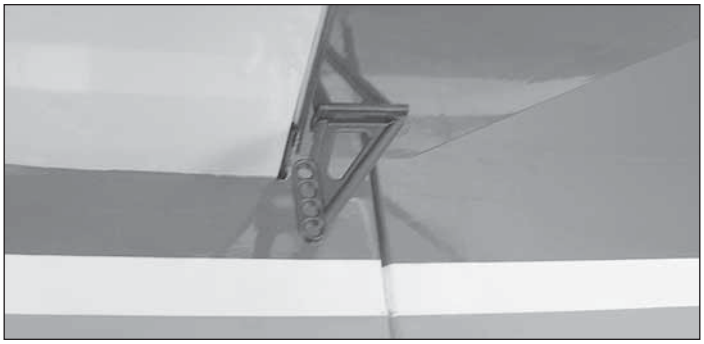
❏ 5. Position the horizontal stabilizer into the stab slot, centering it left and right and making it square to the wings. Stand back several feet behind the model and view it from behind. Confirm that the stabilizer is parallel with the wing panels. If not, use tape or a weight to straighten it. CA glue or epoxy can be used to glue the stabilizer in place. Be sure that the elevator joiner wire is in place before gluing the stab!

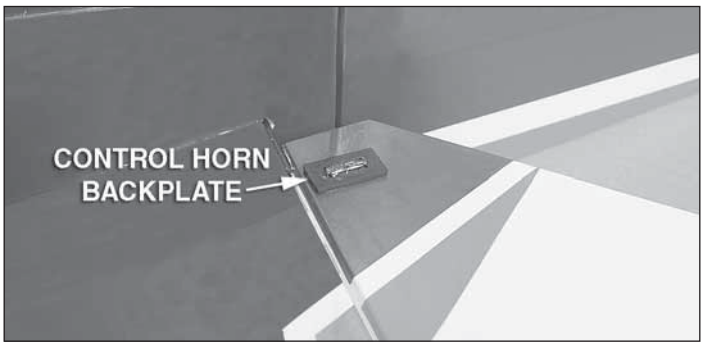


❏ 6. Prepare the elevators by inserting a CA hinge into each hinge slot. Use T-pins to keep the hinges centered. Put a light coating of epoxy onto the ends of the elevator joiner wire. Install the elevators onto the joiner wire while fitting the CA hinges into their mating slots in the horizontal stabilizer. As you did with the ailerons, use thin CA to glue the hinges. Wipe away any excess epoxy with a cloth dampened with denatured alcohol.

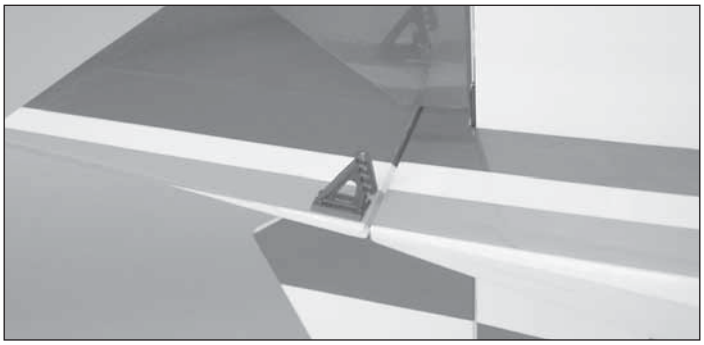


❏ 7. Attach the **rudder** to fuselage using three CA hinges.



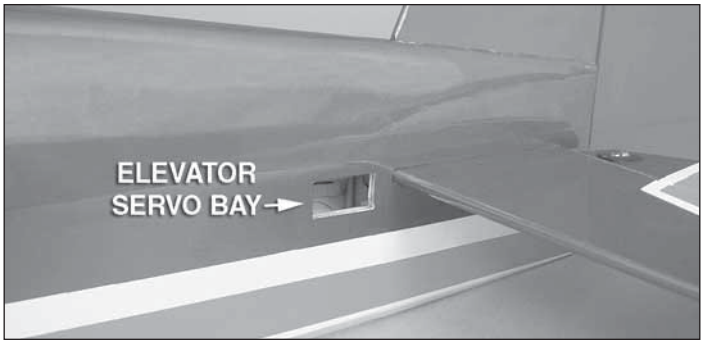


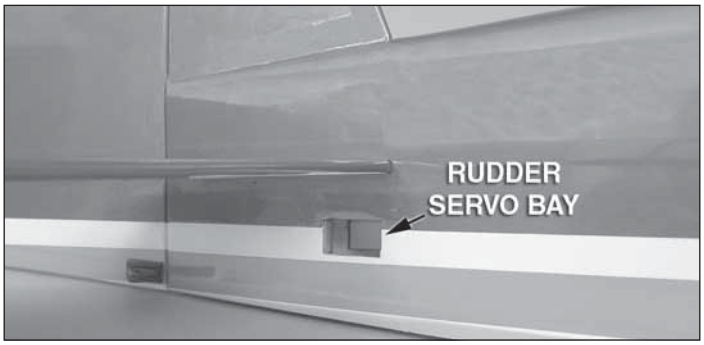
❏ 8. Trim the covering from the control horn slot in the left elevator (both top and bottom) and insert a control horn into the slot on the underside of the elevator. Press a **control horn backplate** onto the control horn tab on top of the elevator. Apply a few drops of medium CA glue to the control horn and backplate to secure them in place. The control horn tab can be trimmed flush with the backplate.



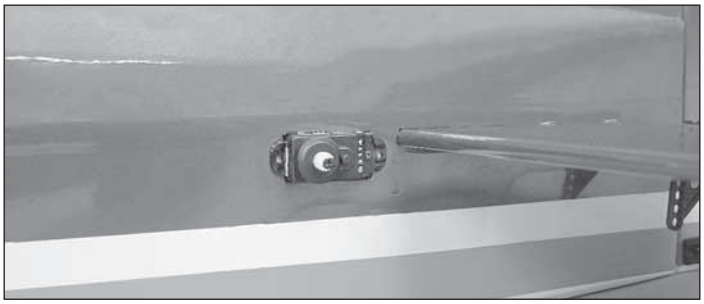
❏ 9. Attach a control horn to the right side of the rudder in the same manner.

INSTALL THE TAIL SERVOS & PUSHRODS

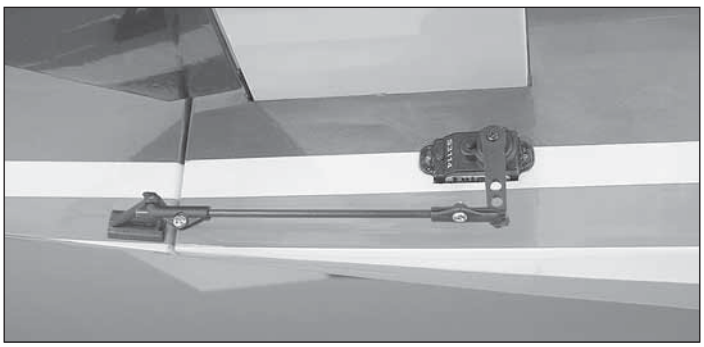




❏ 1. Trim the covering from the elevator and rudder servo bays on both sides of the fuselage as shown.

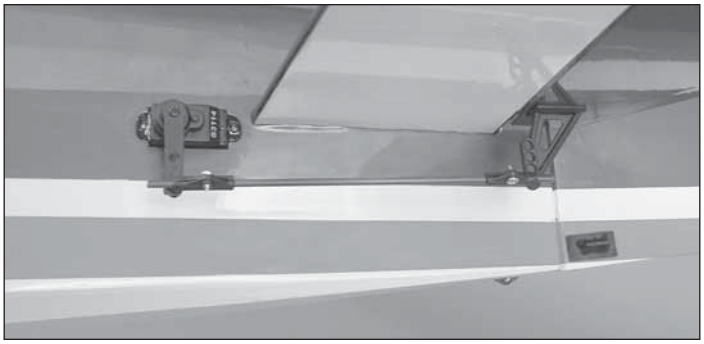


❏ 2. Attach a 16" [400mm] servo extension to the elevator and rudder servos. Use your radio system to center the servos. Before installing the servos, test fit double-sided servo arms perpendicular to the tail servo cases. If the servo arms do not fit onto the servo splines perpendicular to the servo cases, remove them from the servos and rotate 180°. Decide which way fits best (closest to perpendicular) and cut off the arms that aren't used. Secure the servos in the servo bays with the splines facing forward.



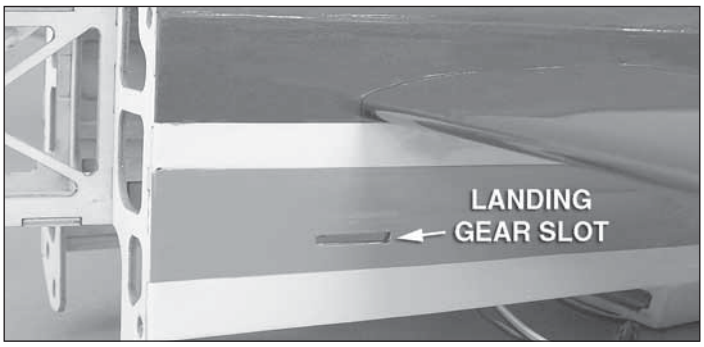
❏ 3. Attach an adjustable clevis to the outer holes of the rudder servo arm and rudder control horn. Attach the arm to

the servo with the servo arm screw. Install a 3-9/16" [90mm] pushrod into the clevises, center the control surface, and use 2 x 4mm self-tapping screws to secure the clevises to the pushrod. The screw head should fit into the recessed hole in the adjustable clevises as shown **(installing the screws in the wrong direction may not properly tighten the clevises onto the pushrods)**.

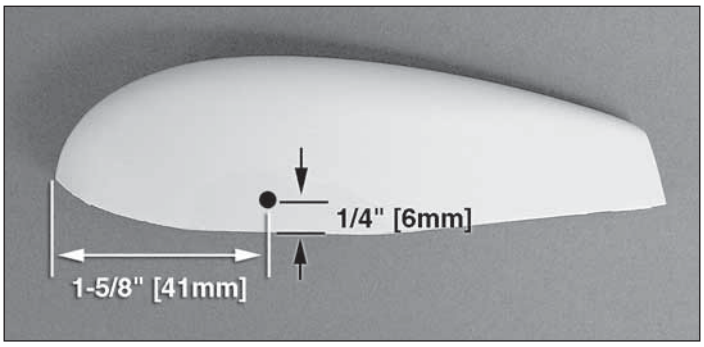


❏ 4. Install the elevator pushrod in the same manner using a 4-3/8" [110mm] pushrod.

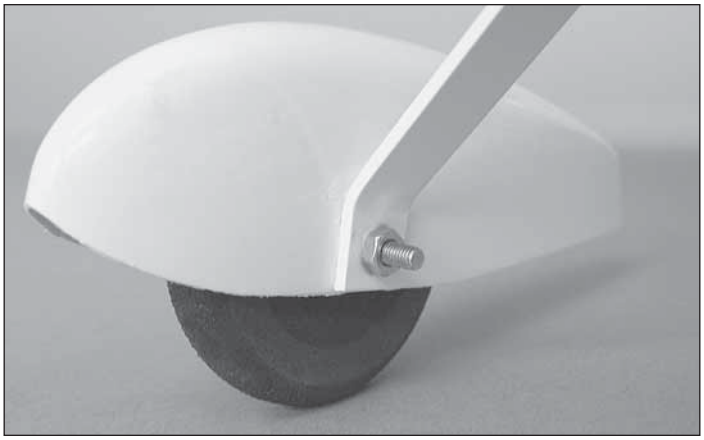
INSTALL THE LANDING GEAR

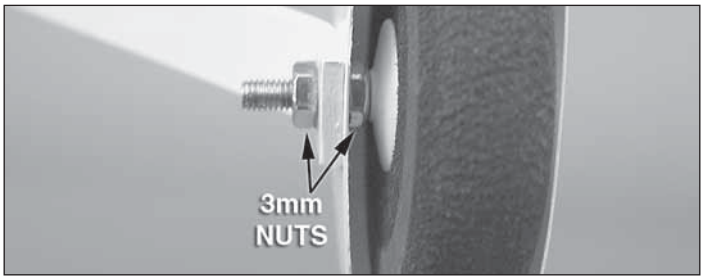


❏ 1. Trim the covering from the **landing gear slots** in the fuselage.

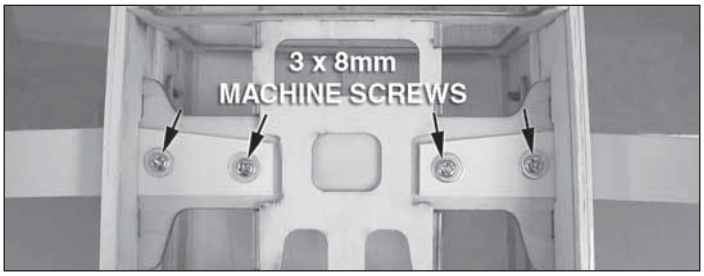


❏ 2. Measure and mark 1-5/8" [41mm] from the front and 1/4" [6mm] from the bottom of the wheel pants. Drill a 1/8" [3mm] hole at your marks (or use a reamer) on the inside of each wheel pant. Accuracy during this step will ensure that your wheels are centered inside the pants. When drilling the holes, make a pilot hole with a smaller bit first, then enlarge the holes to the correct diameter. Be sure to make a left and right wheel pant!



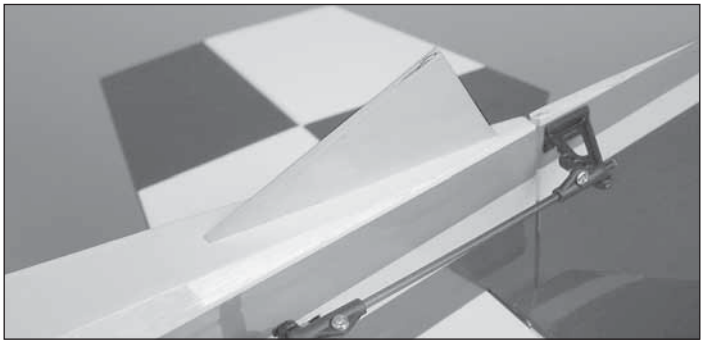


❏ 3. Fit the 3 x 25mm machine screw (axle) through the axle hole in the wheel and secure the wheel to the axle using a 3mm nut and threadlocking compound. Be sure the nut is loose enough to allow the wheel to rotate freely on the axle. Fit the wheel and axle inside the wheel pant with the end of the screw through the landing gear leg (the tapered sides of the landing gear legs face the rear of the plane) and install another 3mm nut with **threadlocking compound** tightly against the landing gear leg, securing the wheel pant in place. The addition of silicone adhesive between the wheel pant and landing gear leg will help prevent the wheel pant from rotating on the axle. Repeat this step for the other wheel.



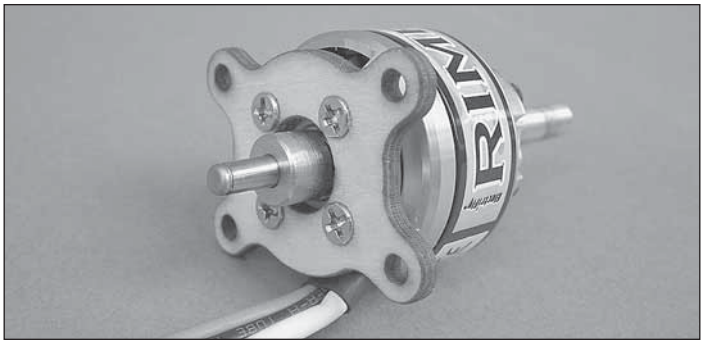
❏ 4. Attach the landing gear to the fuselage using four 3 x 8mm machine screws, four 3mm washers, and threadlocking compound.

❏ 5. Use a hobby knife to cut open the covering over the slot in the bottom tip of the **tail skid**. Glue a 3mm washer into the slot. The washer will prevent the tail skid from being worn down when flying from a paved runway.

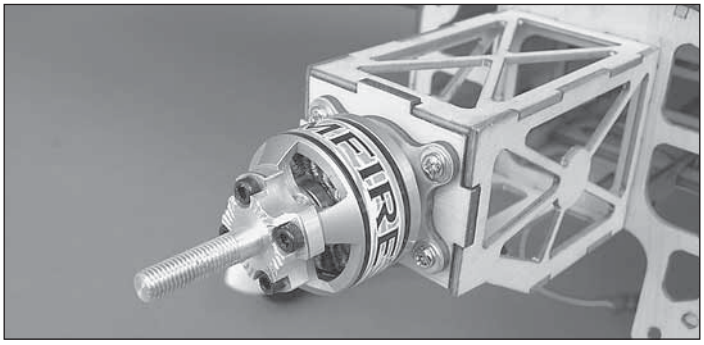


❏ 6. Trim the covering from the tail skid slot at the aft end of the fuselage. Glue the tail skid into the slot using medium CA or epoxy. Be sure to remove the covering from the top of the skid and the fuselage where the skid will be glued before you attach it.

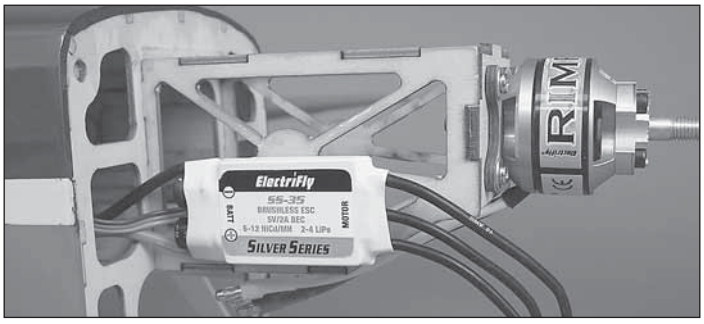
MOUNT THE MOTOR, ESC & RECEIVER



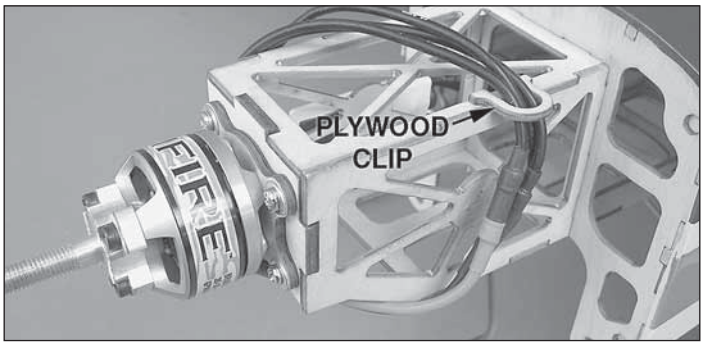
❏ 1. Use the flat head screws included with the motor and **threadlocking compound** to attach the plywood motor adapter to the back of the out-runner motor case.



❏ 2. Attach the motor to the motor mounting box using four 3 x 8mm machine screws, four 3mm flat washers, and **threadlocking compound**.

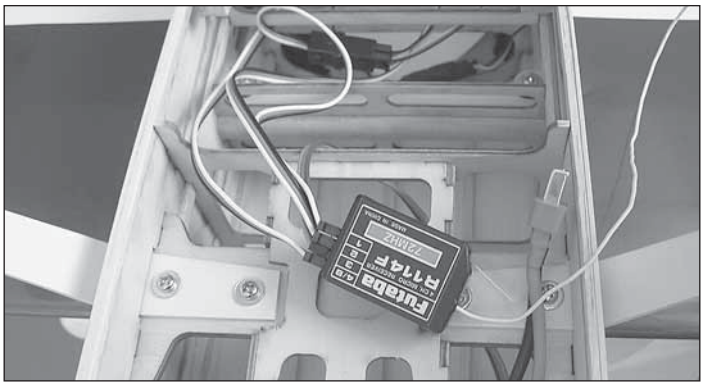


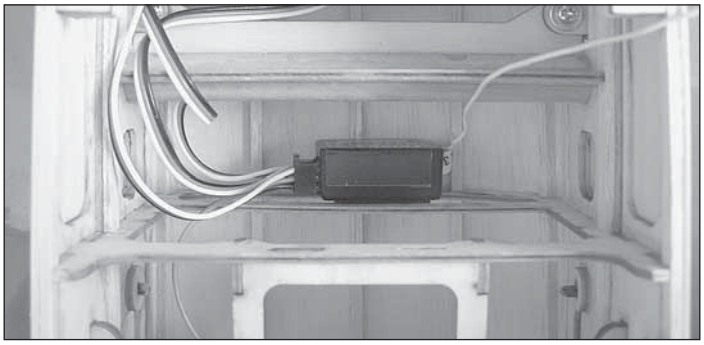
❏ 3. The ESC should be secured to the side of the motor mounting box with double-sided servo tape. For better adhesion of the tape, brush on a light coating of epoxy where the ESC will be installed.



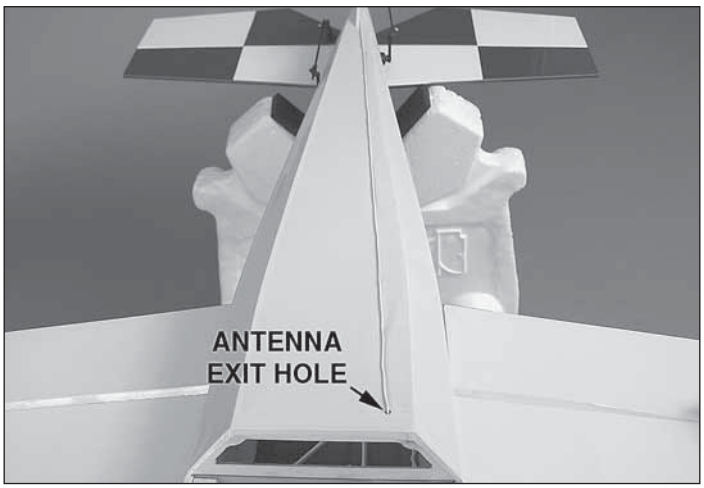
❏ 4. Connect the motor leads on the ESC to the motor. This is a good time to confirm that the motor will rotate the correct

direction (use your radio system to test the motor operation). If the motor is rotating the wrong direction, disconnect any two of the three motor leads and swap their position. Plywood clips are included to hold the motor leads away from the rotating motor. These can be glued anywhere on the motor box where necessary. Be sure to read the ***"Lithium Battery Handling and Usage"*** section on page 20 of this manual!

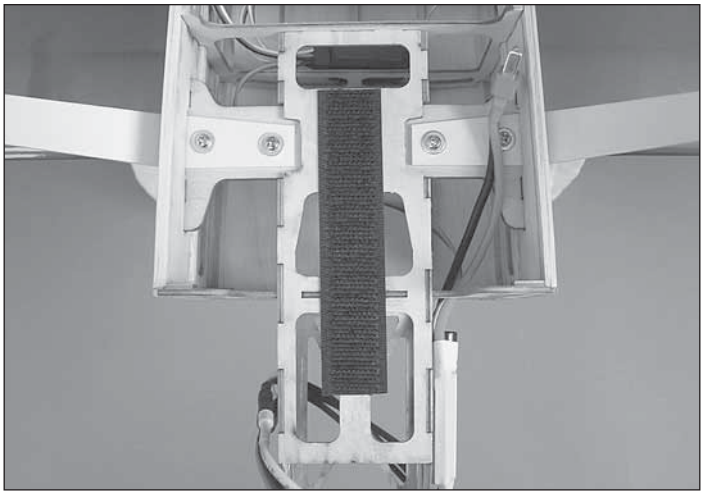




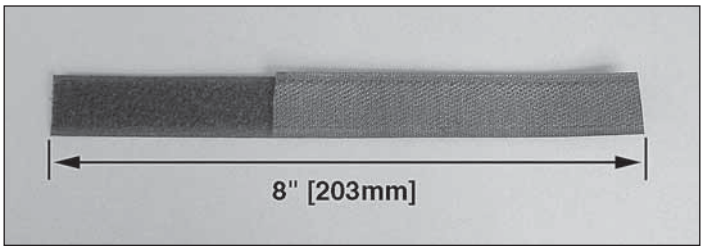
❏ 5. Connect the servo leads and ESC to the receiver. If you are using a 4-channel receiver, you will also need a dual servo extension or Y-harness for the aileron servos. Cut a piece of double-sided servo tape to secure the receiver inside the fuselage. We attached ours to the top of the second former just behind the battery tray.

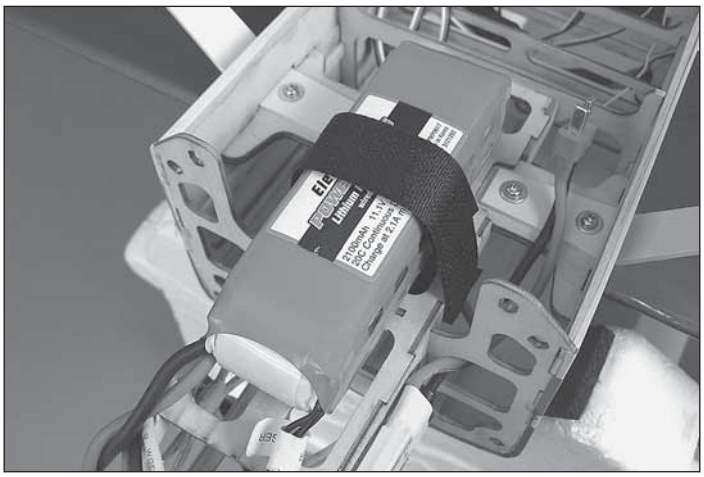


❏ 6. A small hole just aft of the battery hatch opening is provided to route the receiver antenna. Trim the covering from the hole, feed the antenna through it, and tape it to the underside of the fuselage as shown.

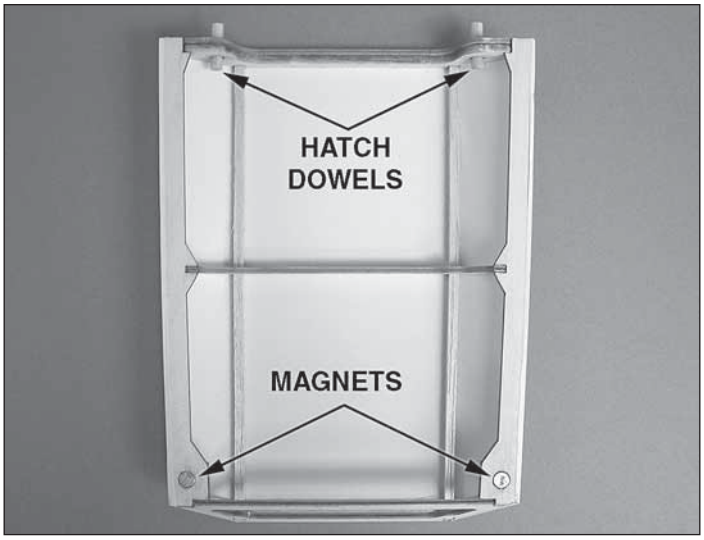


❏ 7. Coat the center of the battery tray with epoxy and let it cure. Apply the "hook" side from the included self-adhesive hook and loop material to the tray.

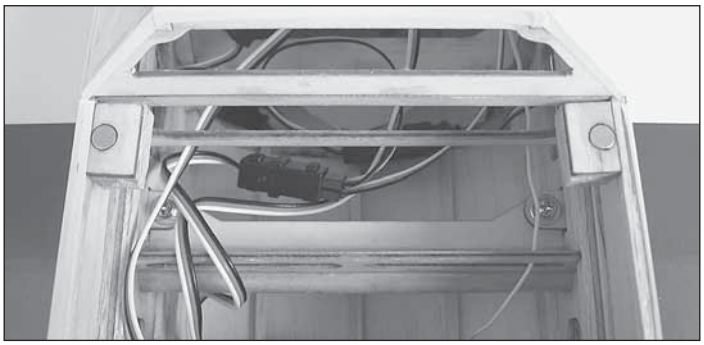




❏ 8. A strap can be made from the included non-adhesive hook and loop material for securing the battery pack to the tray by overlapping the mating ends of the pieces. Apply the "loop" side of the adhesive hook and loop material to the battery pack. The strap should be wrapped around the tray and battery tightly. When you balance the model, the exact position of the battery pack will be determined. When you know where the pack will need to be to balance, mark its position onto the battery tray.



❏ 9. Glue the two hatch dowels halfway into the holes in the front of the **battery hatch**. Glue two magnets into the battery hatch with medium CA as shown. Do not use too much CA because it may prevent the magnets from sitting flush inside the holes. If the magnets do not sit flush with the hatch bottom, use long nose pliers to carefully press them in place. A light skin coating of thin CA over the magnets that overlaps onto the wood frame of the hatch will help secure the magnets in place. Let the CA glue harden without accelerator.

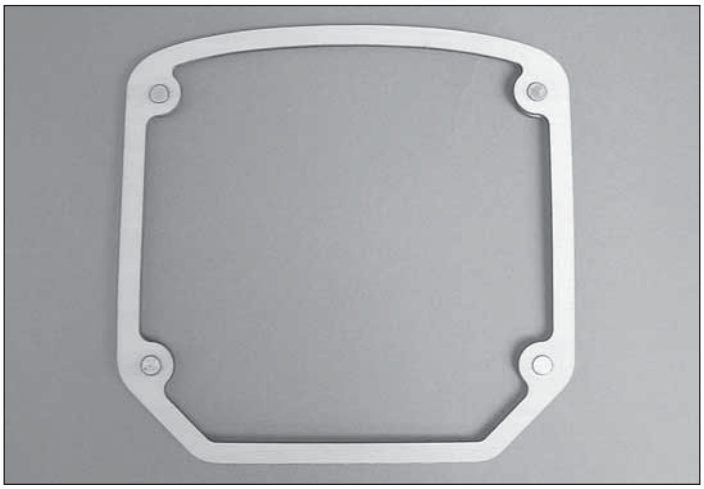


❏ 10. Glue two magnets into the fuselage for the battery hatch. **Be sure that the magnets are glued with the correct polarity facing out!** The magnets in the fuselage must be attracted to the magnets in the battery hatch.

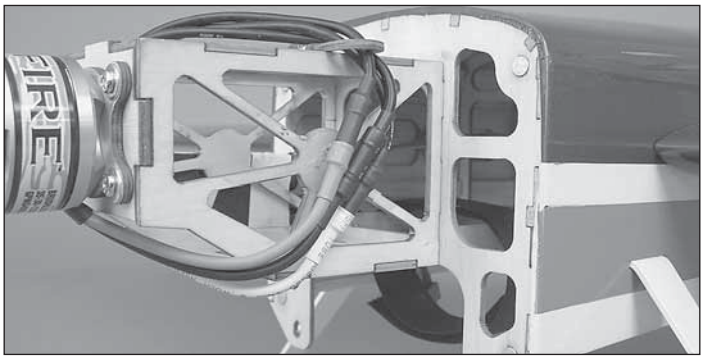
❏ 11. Test fit the battery hatch onto the fuselage.

INSTALL THE COWL, CANOPY & SPINNER

❏ 1. Prepare the inside of the **cowl** by lightly scuffing it with 220-grit sandpaper. When satisfied, clean the inside with alcohol.

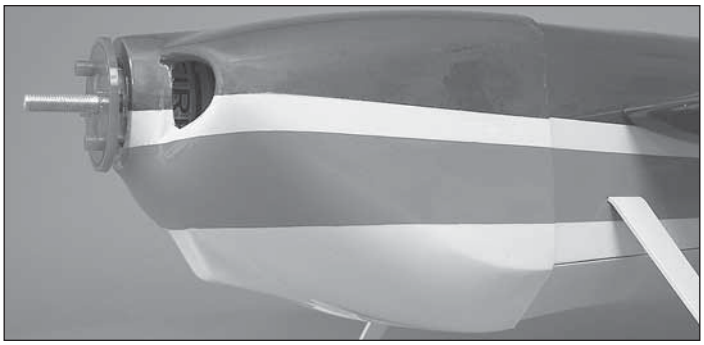


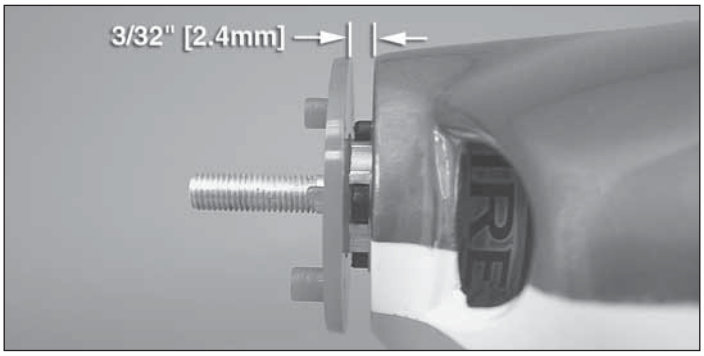
❏ 2. Glue the four plywood magnet back pieces to the **cowl ring**. Glue a magnet into each of the four holes in the cowl ring by coating the insides of the holes with medium CA. A light skin coating of thin CA over the magnets that overlaps onto the cowl ring will help secure the magnets in place. Let the CA glue cure without accelerator.



❏ 3. Glue four magnets into the holes in the fuselage as shown. **Be sure that the magnets are glued with the correct polarity facing out!** The magnets in the fuselage must be attracted to the magnets in the cowl ring. As you did with the cowl ring, apply a light skin coating of thin CA over

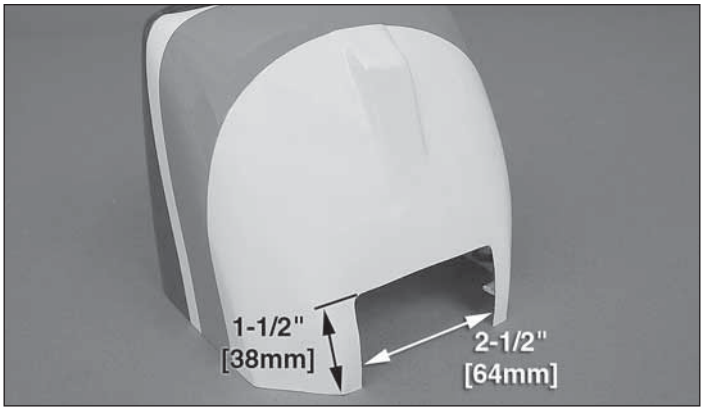
the magnets after they have been glued into the fuselage. Let the CA cure without accelerator.



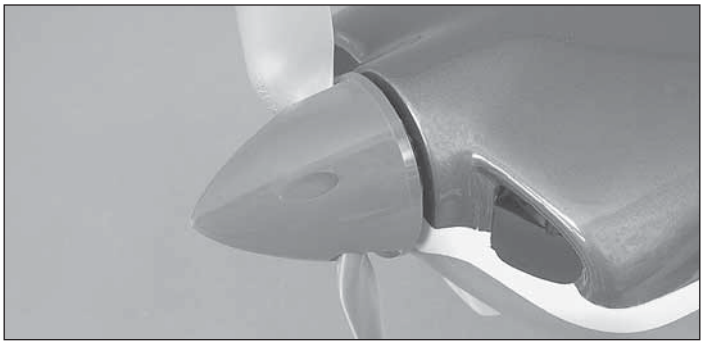


❏ 4. Connect the cowl ring onto the fuselage. Slide the cowl over the cowl ring and onto the fuselage. Confirm that the spinner backplate properly fits your motor shaft. If not, ream or drill it to the correct diameter. Temporarily install the spinner backplate onto the prop shaft. Adjust the position of the cowl on the fuselage so that the colors line up with the covering on the fuselage. The spinner backplate should be centered over the front cowl opening, and the backplate should be approximately 3/32" [2.4mm] beyond the front of the cowl. When satisfied, tack glue (medium or thick CA recommended) the cowl to the cowl ring in three or four spots by reaching through the front opening in the cowl. A CA applicator tip is very useful in this step. If you do not have an applicator tip long enough, use a stick to apply a dot of epoxy to each of the four cowl ring corners. Be careful not to glue the cowl ring to the firewall! As an additional precaution, you can use one of the plastic bags that came in the plane box as a protective liner between the cowl ring and firewall.

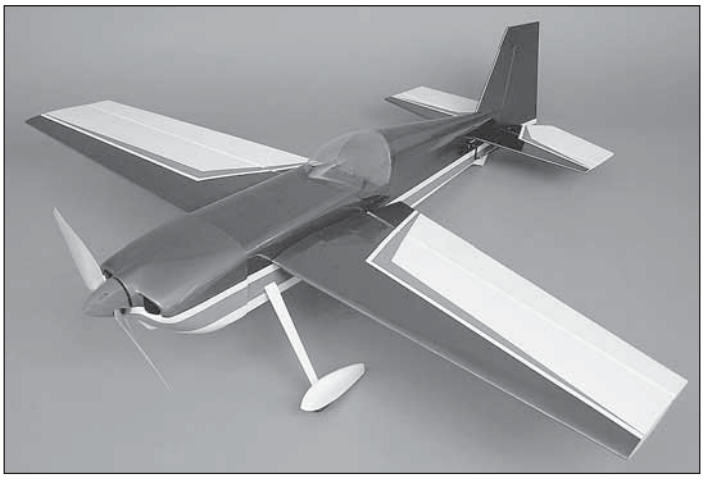
❏ 5. Carefully remove the cowl (and cowl ring) from the fuselage and apply a fillet of medium or thick CA glue along the front of the cowl ring where it touches the cowl.



❏ 6. Cut a cooling hole out of the underside of the cowl as shown approximately 2-1/2" [64mm] wide x 1-1/2" [38mm] long.



❏ 7. Reattach the cowl to the fuselage. Install the propeller, prop washer, and prop nut onto the prop shaft. Install the spinner cone using the included spinner screws. Depending on the size propeller being used, the slots in the spinner cone may need to be enlarged using a hobby knife or rotary tool.



❏ 8. If you plan to install the instrument panel decal, do so now. Finish up the assembly by taping the canopy in position. Clear tape works well for this.

Apply the Decals

1. Use scissors or a sharp hobby knife to cut the decals from the sheet.

2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water–about one teaspoon of soap per gallon of water. Submerse the decal in the soap and water and peel off the paper backing. **Note:** Even though the decals have a "sticky-back" and are not the water transfer type, submersing them in soap and water allows accurate positioning and reduces air bubbles underneath.

3. Position decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.

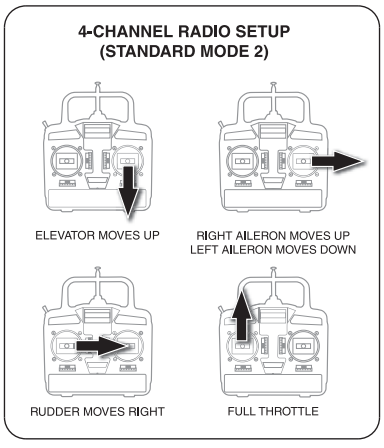
4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

GET THE MODEL READY TO FLY

Check the Control Directions

❏ 1. Turn on the transmitter and receiver and center the trims. If necessary, remove the servo arms from the servos and reposition them so they are centered. Reinstall the screws that hold on the servo arms.

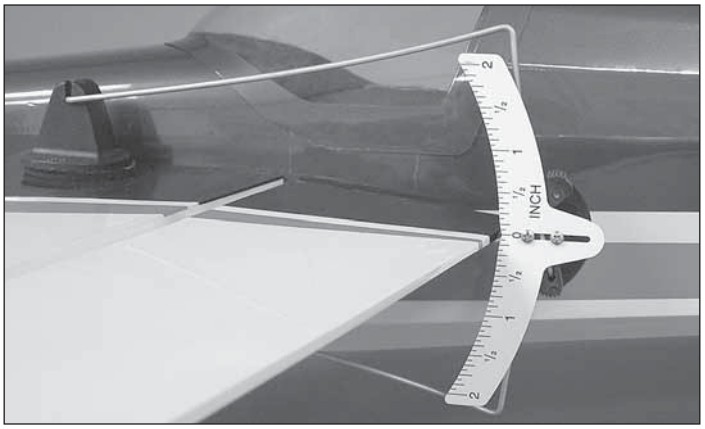
❏ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.



❏ 3. Make certain that the control surfaces and the throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

❏ 4. After checking the control directions and centering the control surfaces, it is recommended to apply a drop of thin CA glue to each carbon pushrod where it meets the adjustable clevis. This will ensure that the pushrods will not change position in the clevises during flight.

Set the Control Throws



Use a Great Planes AccuThrow (or a ruler) to accurately measure and set the control throw of each control surface as indicated in the chart that follows. If your radio does not have dual rates, we recommend setting the throws for your first few flights at the **low rate** setting.

Note: The throws are measured at the **widest part** of the elevators, rudder and ailerons.

These are the recommended control surface throws:

HIGH RATE	
ELEVATOR:	1-1/8" [29mm], 19° up 1-1/8" [29mm], 19° down
RUDDER:	2-3/4" [70mm], 27° left 2-3/4" [70mm], 27° right
AILERONS:	1-1/8" [29mm], 20° up 1-1/8" [29mm], 20° down
LOW RATE	
ELEVATOR:	1/2" [13mm], 8° up 1/2" [13mm], 8° down
RUDDER:	2" [51mm], 19° left 2" [51mm], 19° right
AILERONS:	5/8" [16mm], 11° up 5/8" [16mm], 11° down
3D RATE	
ELEVATOR:	2-1/4" [57mm], 40° up 2-1/4" [57mm], 40° down
RUDDER:	3-3/4" [94mm], 39° left 3-3/4" [94mm], 39° right
AILERONS:	1-3/4" [44mm], 33° up 1-3/4" [44mm], 33° down

IMPORTANT: The Edge 540 EP ARF has been extensively flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Edge 540 EP ARF flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

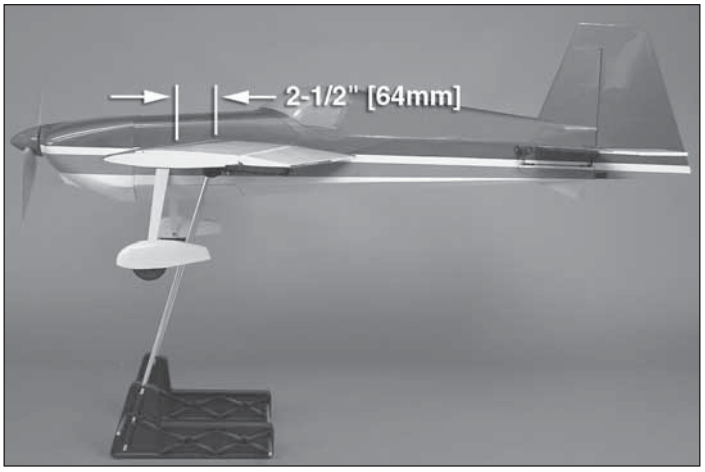
Balance the Model (C.G.)

More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that is not properly balanced will be unstable and possibly unflyable.

At this stage the model should be in ready-to-fly condition with all of the systems in place including the motor, landing gear, battery pack, and the radio system.

❏ 1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the bottom of the wing on both sides of the fuselage. The C.G. is located 2-1/2" [64mm] back from the LE of the wing at the fuselage.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 3/8" [10mm] forward or 9/16" [14mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



❏ 2. With all parts of the model installed (ready to fly) and the battery pack installed, place the model on a Great Planes C.G. Machine, or lift it at the balance point you marked.

❏ 3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft to balance. If possible, move the battery pack and receiver to minimize or eliminate any additional ballast required.

❏ 4. **IMPORTANT:** If you found it necessary to move the battery pack or receiver for the Edge 540 EP ARF to balance, recheck the C.G. after this has been done.

Balance the Model Laterally

❏ 1. With the wing level, have an assistant help you lift the model by the motor propeller shaft and the bottom of the fuselage under the TE of the fin. Do this several times.

❏ 2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

PREFLIGHT

Identify Your Model

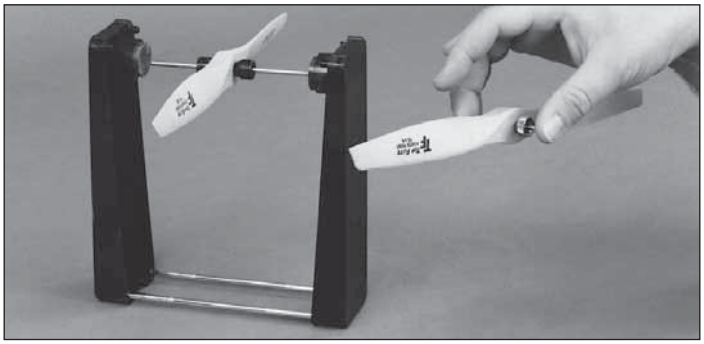
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 23 and secure it on or inside your model.

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries. You should always charge your transmitter battery the night before you go flying, and at other times as recommended by the radio manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter batteries should be done for 15 hours **using the slow-charger that came with the radio system.** This will "condition" the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Balance Propellers



Carefully balance your propeller and spare propellers before you fly. An unbalanced prop can be the single most significant cause of vibration that can damage your model. Not only will motor mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery.

We use a Top Flite Precision Magnetic Prop Balancer (TOPQ5700) in the workshop and keep a Great Planes Fingertip Prop Balancer (GPMQ5000) in our flight box.

Range Check

Ground check the operational range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test **with the motor running** at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, or a damaged receiver crystal from a previous crash.

MOTOR SAFETY PRECAUTIONS

Failure to follow these safety precautions may result in severe injury to yourself and others.

Get help from an experienced pilot when learning to operate electric motors.

Use safety glasses when running electric motors.

Do not operate the motor in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you operate the motor.

Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

The motor gets hot! Do not touch it during or right after operation.

LITHIUM BATTERY HANDLING & USAGE

WARNING!! Read the entire instruction sheet included with your battery. Failure to follow all instructions could cause permanent damage to the battery and its surroundings, and cause bodily harm!

- ONLY use a LiPo approved charger. NEVER use a NiCd/NiMH peak charger!
- NEVER charge in excess of 4.20V per cell.
- ONLY charge through the "charge" lead. NEVER charge through the "discharge" lead.
- NEVER charge at currents greater than 1C.
- ALWAYS set charger's output volts to match battery volts.
- ALWAYS charge in a fireproof location.
- NEVER trickle charge.
- NEVER allow the battery temperature to exceed 150° F [65° C].
- NEVER disassemble or modify pack wiring in any way or puncture cells.
- NEVER discharge below 2.5V per cell.
- NEVER place on combustible materials or leave unattended during charge or discharge.
- ALWAYS KEEP OUT OF REACH OF CHILDREN.

AMA SAFETY CODE (excerpts)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to *Model Aviation* magazine, the AMA web site or the Code that came with your AMA license.

General

1) I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.

2) I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. **Note:** This does not apply to models while being flown indoors.

7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

Radio Control

1) I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.

2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.

4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.

5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** (in the complete AMA Safety Code).

9) Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing**.

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a check list is provided to make sure these important areas are not overlooked. Many are covered in the instruction manual, so where appropriate, refer to the manual for complete instructions. Be sure to check the items off as they are completed.

- ❏ 1. Check the C.G. according to the measurements provided in the manual.
- ❏ 2. Be certain the battery and receiver are securely mounted in the fuselage. Simply stuffing them into place with foam rubber is not sufficient.
- ❏ 3. Extend your receiver antenna.
- ❏ 4. Balance your model laterally as explained in the instructions.
- ❏ 5. Add a drop of oil to the axles so the wheels will turn freely.
- ❏ 6. Make sure all hinges are securely glued in place.
- ❏ 7. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ❏ 8. Make sure that all servo arms are secured to the servos with the screws included with your radio.
- ❏ 9. Secure connections between servo wires and Y-connectors or servo extensions with vinyl tape, heat shrink tubing or special clips suitable for that purpose.
- ❏ 10. Balance your propeller (and spare propellers).
- ❏ 11. Tighten the propeller nut and spinner.
- ❏ 12. Place your name, address, AMA number and telephone number on or inside your model.
- ❏ 13. If you wish to photograph your model, do so before your first flight.
- ❏ 14. Range check your radio when you get to the flying field.

FLYING

The Edge 540 EP ARF is a great-flying model that flies smoothly and predictably. The Edge 540 EP ARF does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice an alarming or unusual sound such as a low-pitched "buzz," this may indicate control surface *flutter*. Flutter occurs when a control surface (such as an aileron or elevator) or a flying surface (such as a wing or stab) rapidly vibrates up and down (thus causing the noise). In extreme cases, if not detected immediately, flutter can actually cause the control surface to detach or the flying surface to fail, thus causing loss of control followed by an impending crash. The best thing to do when flutter is detected is to slow the model **immediately** by reducing power, then land as soon as safely possible. Identify which surface fluttered (so the problem may be resolved) by checking all the servo grommets for deterioration or signs of vibration. Make certain all pushrod linkages are secure and free of play. If it fluttered once, under similar circumstances it will probably flutter again unless the problem is fixed. Some things which can cause flutter are; Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of wire pushrods caused by large bends; Excessive free play in servo gears; Insecure servo mounting; and one of the most prevalent causes of flutter; Flying an over-powered model at excessive speeds.

Takeoff

If you have access to a smooth, paved runway, we suggest using it to takeoff, especially for the first few flights. Position the Edge 540 EP ARF onto the runway pointed into the wind. Slowly advance the throttle stick to half throttle, leaving the elevator in the neutral position. As the tail rises off the ground, slowly increase throttle and apply a bit of up elevator to lift the model into the air. As you become accustomed to the takeoff characteristics of the Edge 540 EP ARF, they can be performed quickly, only requiring a short distance until the model is airborne.

If you do not have access to a smooth runway, the Edge 540 EP ARF can be hand launched. For the first flight, it is a good idea to have someone launch the airplane for you. This allows you to keep your hands on the radio sticks and correct any trim problems that are present.

Have the person launching the Edge 540 EP ARF hold the plane by the fuselage just below the canopy. Throttle up to full power, and have your helper give the plane a gentle underhanded toss at about 30° angle upward into the wind. The high thrust to weight ratio will allow the plane to accelerate to flying speed almost instantly. Climb to a comfortable altitude and throttle back to a lower power setting.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff, most models fly more smoothly at reduced speeds.

Take it easy with the Edge 540 EP ARF for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of battery charge, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the runway (into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is a foot or so off the deck, smoothly increase up elevator until it gently touches down.

One final note about flying your model. Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills *(though it is never a bad idea!)*, but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you

are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

Have a ball!
But always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!

This model belongs to:
Name
Address
City, State Zip
Phone number
AMA number

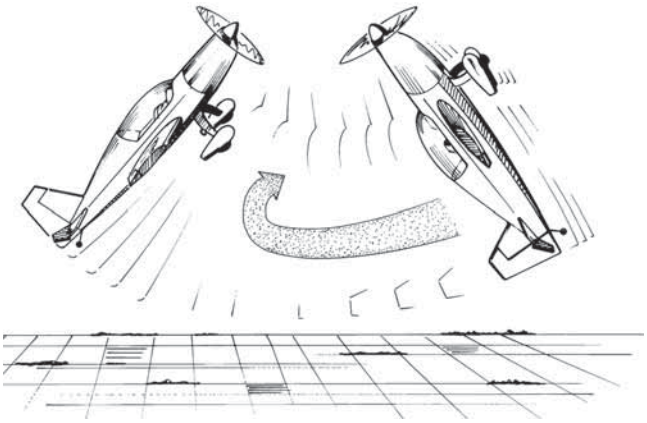
Make a copy of this identification tag and put it on or inside your model.

3D FLYING

Because of the power-to-weight ratio on 3D planes, straight-and-level flight should be at a reduced throttle and full power should be used only when the airplane is “loaded” during a maneuver. Learn to manage the throttle and experiment while in the maneuver. The power needed will depend on the maneuver being performed. C.G. also plays a large role in the 3D capability of models as well. Experiment, but keep in mind that being tail heavy is not always the best way to go.

Another thing to remember is that maximum control throw is not necessary for all 3D maneuvers. Occasionally, too much throw can place the model too far into a stall, causing it to become uncontrollable. Practice your maneuvers at a higher altitude while you become accustomed to your particular plane’s stall characteristics.

WATERFALLS



With the model pointing vertically (almost in a hover), push full down elevator and full throttle. As the model rotates and begins to point downwards, reduce the throttle (to keep the model from being pulled downwards). As the model flattens out, add power to pull the model around. Many models will require some rudder correction (usually right rudder) during this maneuver. Some planes will require aileron correction to keep the wings level.

UPRIGHT FLAT SPINS

Pull the nose up slightly and slowly decrease power. As the model slows to a few mph, slowly apply full left rudder and power. Next, start adding up elevator as needed to keep the model flat in the spin. Most airplanes will require some aileron as well to keep the wings level. This is one of the maneuvers to experiment on; try different C.G. positions and different amounts of throw and power to see how flat the spin will go. It is possible to maintain altitude in the flat spin and in some cases it is also possible to climb during the spin.

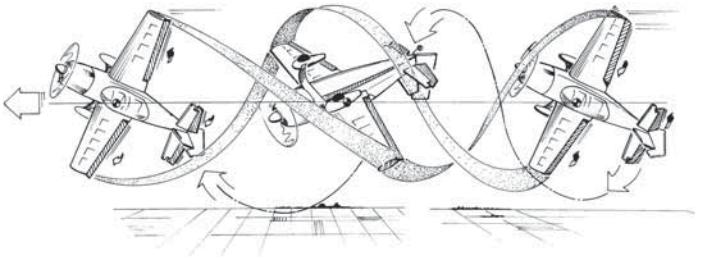
INVERTED FLAT SPINS

This is the same as the upright flat spin except most planes like to spin in the opposite direction, for example: right rudder and down elevator.

THE WALL

Fly straight across the field at a moderate speed and simply pull full up until vertical. Adjust the power as necessary to maintain a hover.

KNIFE EDGE TUMBLE



This is an impressive looking maneuver that really isn’t as difficult as it looks. (Before learning this maneuver you must be able to confidently Snap and Tumble your plane and stop the aircraft exactly, without over rotating.) Fly the model Knife Edge from the right at a moderate airspeed, using just enough rudder to maintain Knife Edge, not climbing or diving. Perform one full right negative Tumble by maintaining your rudder setting while applying full throttle, full down elevator, and full right aileron, releasing in time to end again flying Knife Edge to the right. Note that you may need to use some positive elevator and/or left aileron to stop the Tumble at exactly Knife Edge. This maneuver is easier to the right because torque helps stop the Tumble and it can be done at varied airspeeds with proper throttle and rudder modulation.

VERTICAL HOVER

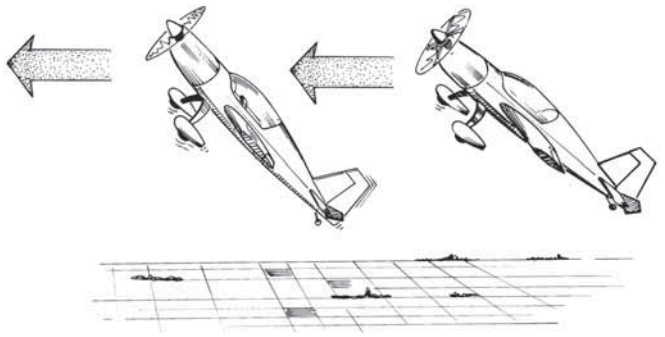
Fly a straight pass across the field at 75ft high and 100ft out and pull the model vertical. Roll the model until the top of it is facing you and slowly begin to reduce power. As the model begins to slow down to 10 mph or so, slowly add a little bit of power back in. You will have to adjust the throttle as needed, but make your adjustments smooth. Some right aileron may

be needed to keep the model from torque rolling. Use the rudder and elevator to keep the nose pointing straight up. Be patient as this maneuver will take a while to learn.

TORQUE ROLL

This is the same as the vertical hover but without the use of right aileron to keep the model from rolling. If needed, you can use a little left aileron to speed the roll up. As the model rotates around, the controls will appear to be reversed to you but only the orientation of the model has changed.

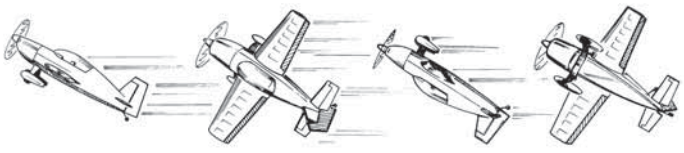
HARRIER



The harrier is nothing more than a high angle of attack flying stall. Check the stall characteristics of your plane before proceeding with this maneuver. Bring your plane across the field at 75ft high and 100ft out away from yourself. Slowly pull back on the elevator while reducing throttle. The nose of the plane should come up. Depending on the plane/setup, you may have to make constant aileron (wing walking) and rudder corrections for this maneuver. As the nose of the plane comes up, start adding in a little bit of power to help maintain airspeed. The rudder is now used to turn the model. This maneuver will take some practice as there are a lot of small corrections made to keep most planes in the maneuver.

This is one maneuver where less control is needed. Too much elevator and the model goes into an uncontrollable stall. The C.G. of the plane will have a large effect on the stability of the model during this maneuver. Some planes perform better with more elevator deflection and a farther forward C.G. while other planes prefer a further aft C.G. and less elevator deflection. Elevator to flap mixing can be used on airplanes with marginal wing area, and some planes won't stall so elevator to spolieron mixing will be needed.

ROLLING HARRIER



Once you get comfortable with the upright harrier, it's time to work rolls into the mix. From an upright harrier, add in left aileron and change from up elevator to down elevator when inverted. If you are comfortable with four point rolls and slow rolls, inputting rudder on the knife edges can improve the maneuver considerably. To turn the model, simply input the elevator or rudder a little sooner or later in the rotation. It's all a matter of timing.

PINWHEEL

Climb vertically and bring the model to a vertical hover, but do not stop long enough to let the torque pull the model around (climbing or sliding slightly will not be noticeable to spectators but will keep air flowing over the ailerons and provide you roll authority to stop the torque). When the model is hanging, rock the plane left with rudder, then apply full throttle and full right rudder and hold both, completing 3/4 of a VERY tight Knife Edge Loop and flying out Knife Edge. When done correctly, the plane pivots around the wingtip in a very small area. This maneuver can be done either direction.