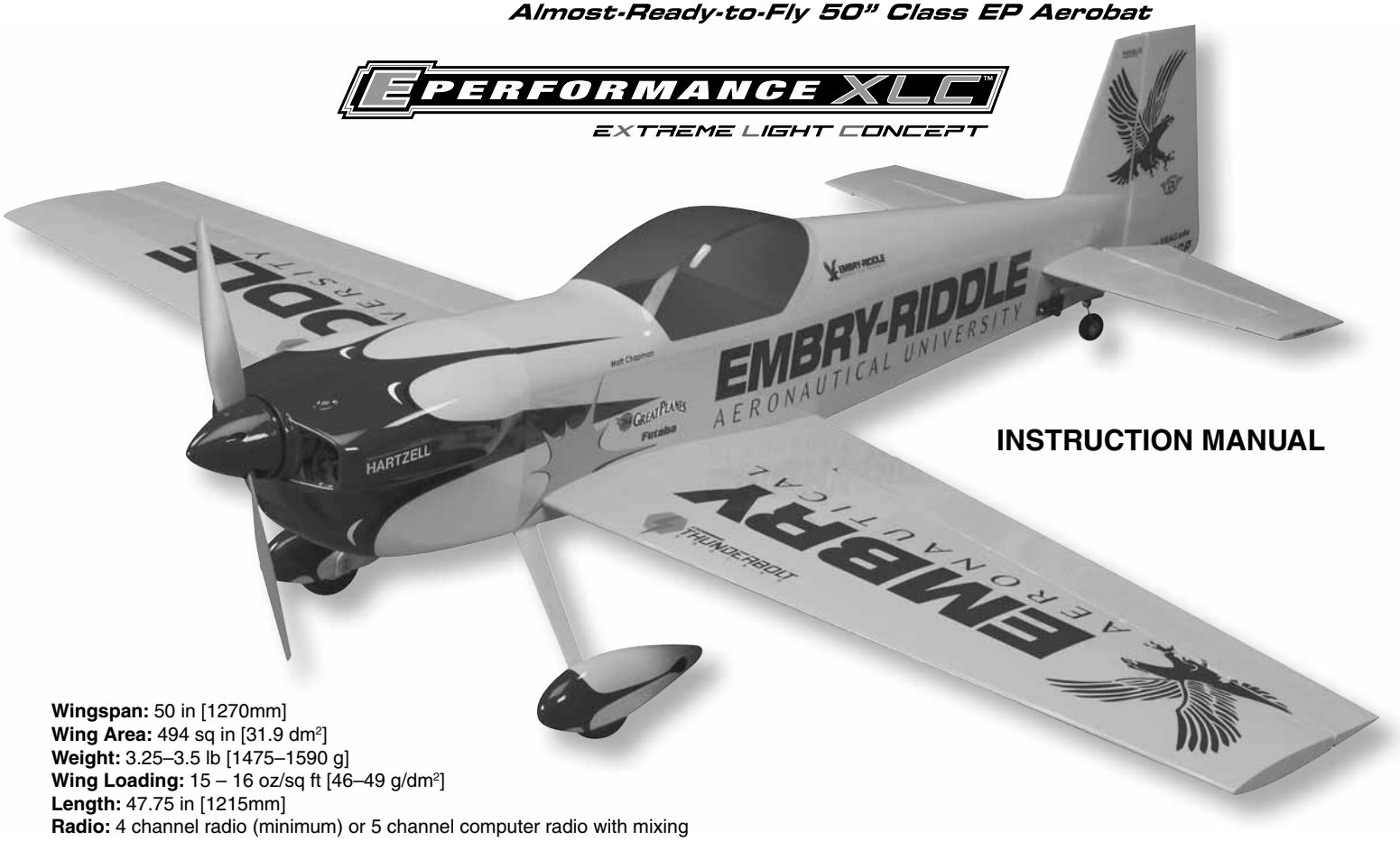
Matt Chapman EAGLE 580

Almost-Ready-to-Fly 50" Class EP Aerobat

EPERFORMANCE XLC™

EXTREME LIGHT CONCEPT



INSTRUCTION MANUAL

Wingspan: 50 in [1270mm]
Wing Area: 494 sq in [31.9 dm²]
Weight: 3.25–3.5 lb [1475–1590 g]
Wing Loading: 15 – 16 oz/sq ft [46–49 g/dm²]
Length: 47.75 in [1215mm]
Radio: 4 channel radio (minimum) or 5 channel computer radio with mixing capabilities (for separate ailerons).
Motor: RimFire™ .32 (42-50-800kV)

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

TABLE OF CONTENTS

INTRODUCTION

The full scale Eagle 580 is the choice of air show performer Mat Chapman. This Mudry Cap has been designated the "Eagle" by Matt because of the 330 HP Lycoming that powers this awesome plane. Great Planes has taken the best qualities of the full scale aircraft and reduced it down to a light weight, 50" electric powered ARF.

For the latest technical updates or manual corrections to the "Eagle 580" visit the Great Planes web site at **www.greatplanes.com**. Open the "Airplanes" link, and then select the "Eagle 580 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

If you are not already a member of the AMA, please join! The AMA is the governing body of model aviation and membership provides liability insurance coverage, protects modelers' rights and interests and is required to fly at most R/C sites.

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Tele: (800) 435-9262
Fax (765) 741-0057
Or via the Internet at:
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 Eagle 580 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 Eagle 580, 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 good condition and a correctly sized motor and components as specified in this instruction manual.

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 ensure 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. **WARNING:** The cowl and wheel pants included in this kit are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part (wheel pant, cowl) 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 "Eagle 580 EP" that may require planning or decision making before starting to build.

Radio Equipment

A 4-channel radio system with four micro servos and micro receiver are required for this plane. The servos and receiver shown in the manual are Futaba® S3150 Slim Digital Servos and the Futaba 607FS FASST™ 2.4 GHz receiver. A lower priced alternative would be the Futaba 3115 Micro Precision Servo.

TRANSMITTER:

❏ 4-channel radio (minimum) *OR*
❏ 5-channel computer radio with mixing capabilities (for flaperons).

RECEIVER:

❏ 4- to 6-channel R146iP PCM receiver, [FUTL0601]; Futaba FM Single Conversion Short Crystal [Low Band (11-35) – FUTL62**, High Band (36-60) – FUTL63**]
❏ 7-channel Futaba 607 FS FASST 2.4 GHz receiver (FUTL7637)

SERVOS:

❏ (4) Futaba S3115 Micro Precision Servos [FUTM0415] [38.9 oz-in (2.8 kg-cm) of torque] *OR*
❏ (4) Futaba S3150 Slim Digital Servos [FUTM0303] [51.4 oz-in (3.7 kg-cm) of torque]
❏ For 3D rudder throws a 2" [50.8mm] double-sided servo arm may be required (GPMA1155)

CONNECTORS:

❏ (1) "Y" harness [FUTM4135]
❏ (1) 24" extensions [HCAM2721]
❏ (2) 12" extensions [HCAM2711]
❏ (1) 6" extension [HCAM2701]

Motor

The Eagle 580 EP ARF comes with a mounting box for the Great Planes RimFire brushless out-runner motor. The RimFire .32 (42-50-800kV) Brushless Out-runner Motor (GPMG4700) motor has been tested with this plane and works well.

Electronic Speed Control (ESC)

A brushless ESC (electronic speed control) is required for the recommended motor set-up. We recommend using the Great Planes Silver Series SS-45A Brushless ESC [GPMM1840].

If you will be using the 4S LiPo set-up for 3D flying, a voltage regulator must be used with this ESC (we recommend the Great Planes 3A BEC, GPMM1920). If a voltage regulator is not used the ESC may be damaged.

Flight Battery

We recommend two different battery and prop set-ups depending on the type of flying you prefer to do. For basic sport flying we recommend the Great Planes Power Series™ LiPo 2100mAh 11.1V, 3200mAh 11.1V battery or Flight Power 2170mAh 11.1V and the 2500mAh 11.1V with an APC 13 x 8E propeller.

For all out 3D type flying we recommend the Great Planes Power Series LiPo 2100mAh 14.8V or Flight Power 2170mAh 14.8V battery with an APC 12 x 6E propeller. A voltage regulator will also be required to power the receiver. Be sure to follow the ESC instructions for using a separate power source (voltage regulator or receiver battery) for the receiver.

When charging the batteries we highly recommend using a Great Planes Equinox™ LiPo Balancer (GPMM3160).

SPORT SET-UP:

❏ Great Planes Power Series LiPo 2100mAh 11.1V 20C discharge w/balance plug [GPMP0617]
❏ Great Planes Power Series LiPo 3200mAh 11.1V 20C discharge w/balance plug [GPMP0623]
❏ Flight Power EVO25 LiPo 2170mAh 11.1V 20C (FPWP0327)
❏ Flight Power EVO25 LiPo 2500mAh 11.1V 25C (FPWP0333)
❏ APC 13 x 8E Propeller (APCQ3080)

3D SET-UP:

❏ Great Planes Power Series LiPo 2100mAh 14.8V 20C discharge w/balance plug [GPMP0618]
❏ Flight Power EVO25 LiPo 2170mAh 14.8V 25C (FPWP0328)
❏ APC 12 x 6E Propeller (APCQ4130)
❏ Electrifly Voltage Regulator (GPMM1920)
❏ Great Planes Parallel ESC Adapter Deans® Ultra® Connector(GPMM3141)

ADDITIONAL ITEMS REQUIRED

Adhesives and Building Supplies

This is the list of adhesives and building supplies required to finish the Eagle 580 EP. 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 (for epoxy clean up)
❏ Drill bits: 1/16" [1.6mm], 3/32" [2.4mm]
❏ #1 Hobby knife (HCAR0105)
❏ #11 blades (5-pack, HCAR0211)
❏ Small T-pins (100, HCAR5100)

Optional Supplies and Tools

Here is a list of optional tools mentioned in the manual that will help you build the Eagle 580 EP:

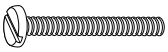
❏ 2 oz. [57g] spray CA activator (GPMR6035)
❏ CA applicator tips (HCAR3780)
❏ CA debonder (GPMR6039)
❏ Epoxy brushes (6, GPMR8060)
❏ Mixing sticks (50, GPMR8055)
❏ Mixing cups (GPMR8056)
❏ Threadlocker thread locking cement (GPMR6060)
❏ AccuThrow™ Deflection Gauge (GPMR2405)
❏ CG Machine™ (GPMR2400)
❏ 21st Century® sealing iron [COCR2700]
❏ 21st Century iron cover [COVR2702]

IMPORTANT BUILDING NOTES

• There are two types of screws used in this kit:

Self-tapping screws are designated by a number and a length. For example, #6 x 3/4" [19mm].

Machine screws are designated by a number, threads per inch, and a length. For example, 4-40 x 3/4" [19mm].



Socket Head Cap Screws (SHCS) are designated by a number, threads per inch, and a length. For example, 4-40 x 3/4" [19mm]

• 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 Eagle 580 EP is factory-covered with Top Flite® MonoKote® film. Should repairs ever be required, MonoKote can be patched with additional MonoKote purchased separately. MonoKote is packaged in six-foot rolls, but some hobby shops also sell it by the foot. If only a small piece of MonoKote is needed for a minor patch, perhaps a fellow modeler would give you some. MonoKote is applied with a model airplane covering iron, but in an emergency a regular iron could be used. A roll of MonoKote includes full instructions for application. Following are the colors used on this model and order numbers for six foot rolls.

Cub Yellow (TOPQ0220)
Insignia Blue (TOPQ0207)
Orange (TOPQ0202)
Black (TOPQ0208)
Missile Red (TOPQ0201)
Jet White (TOPQ0204)

ORDERING REPLACEMENT PARTS

Replacement parts for the Eagle 580 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 Great Planes web site at **www.greatplanes.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 telephone at (217) 398-8970, or by e-mail at **productsupport@greatplanes.com**.

REPLACEMENT PARTS LIST

Order Number	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:

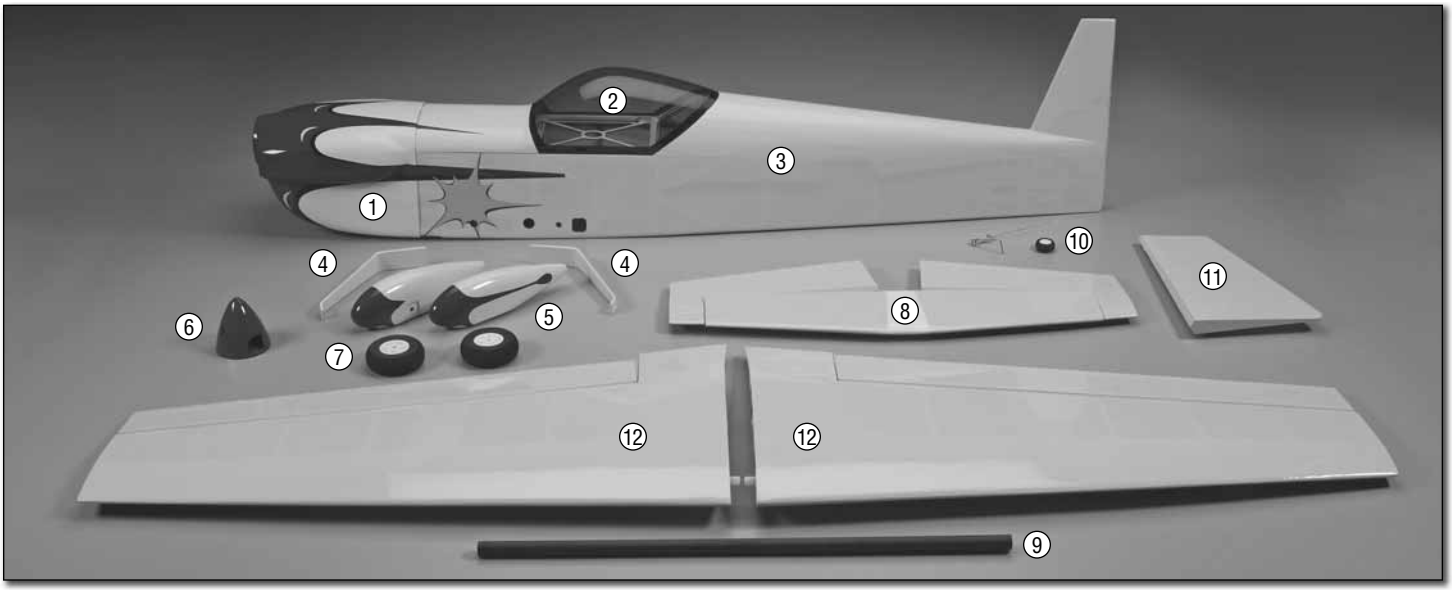
GPMA3323 ..... Wing Set
GPMA3324 ..... Fuselage
GPMA3325 ..... Tail Set
GPMA3326 ..... Landing Gear
GPMA3327 ..... Wheel Pants
GPMA3328 ..... Tailwheel Assembly
GPMA3329 ..... Cowl
GPMA3330 ..... Canopy
GPMA3331 ..... Wing Tube
GPMA3332 ..... Carbon Fiber Landing Gear
GPMA3333 ..... Carbon Fiber Wheel Pants
GPMA3334 ..... Decal Sheet

KIT INSPECTION

Before starting to build, 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



1. Cowl
2. Hatch & Canopy
3. Fuselage
4. Landing Gear
5. Wheel Pants
6. Spinner
7. Main Wheels
8. Stabilizer w/Elevators
9. Wing Tube
10. Tailwheel Assembly
11. Rudder
12. Wings w/Ailerons

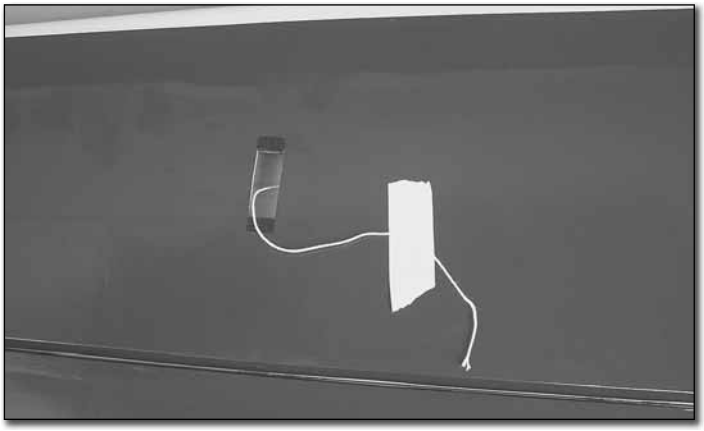
PREPARATIONS

❑ 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 the previous page.

❑ 2. Remove the tape and separate the elevators from the stab. Use a covering iron with a covering sock on medium heat to tighten the covering on the wings, fuselage, etc. if necessary. Apply pressure over sheeted areas to thoroughly bond the covering to the wood. **Caution:** The Eagle 580 was designed to be strong where needed, but lightweight for excellent flight performance. Care must be taken when assembling the plane to avoid damage.

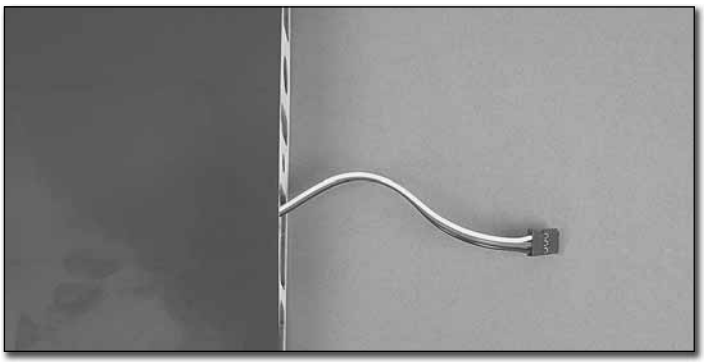
ASSEMBLE THE WINGS

Do the right wing first so your work matches the photos the first time through.

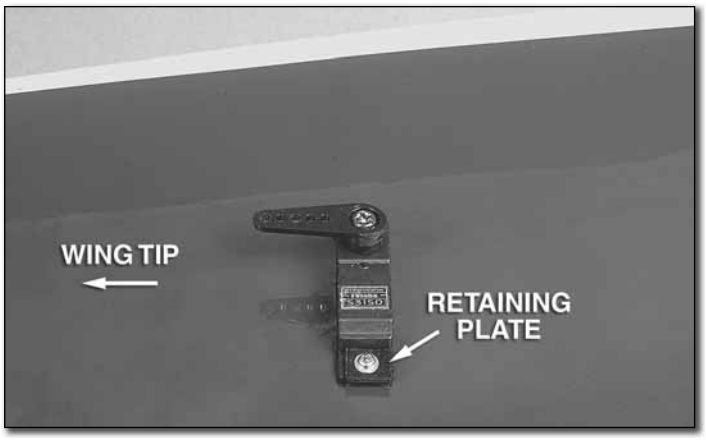


❑❑ 1. Inside the servo bay a string is taped. Carefully remove the string from the servo bay and tape it to the outside of the wing to prevent it from dropping back into the wing.

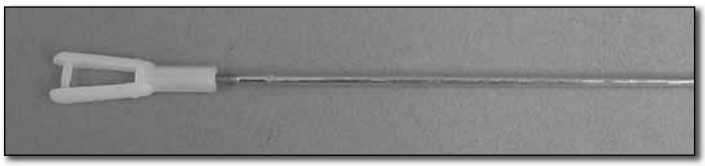
❑ ❑ 2. Install a 12" [305mm] servo extension onto the servo lead. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



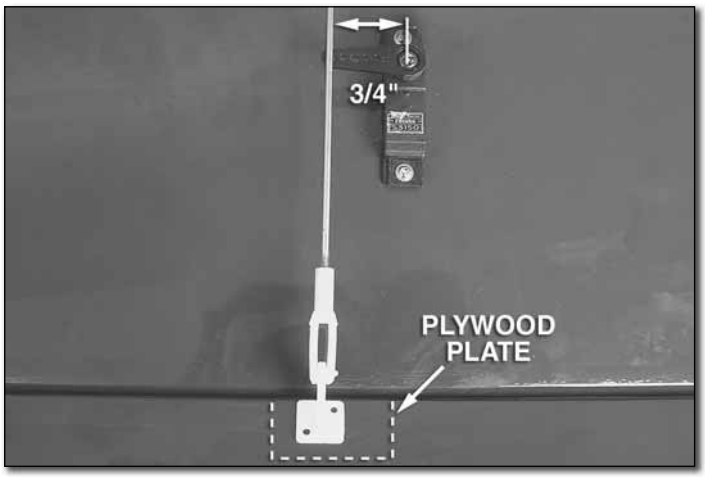
❑❑ 3. Tie the string to the servo extension. Pull the string and the servo lead through the wing. Untie the string from the lead.

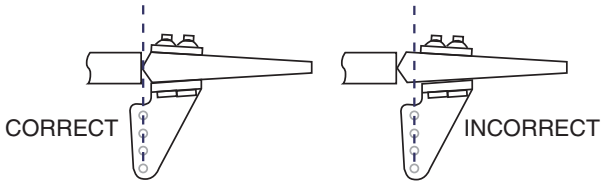


❑ ❑ 4. Install the servo into the servo opening. Install and then remove a servo mounting screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has cured, install the servo into the servo opening. Place a black retaining plate onto each of the servo mounting flanges. Then, screw the servo to the wing using the hardware included with your servo. Center the servo. Then, install a servo arm as shown. The arm should be pointing towards the wingtip.



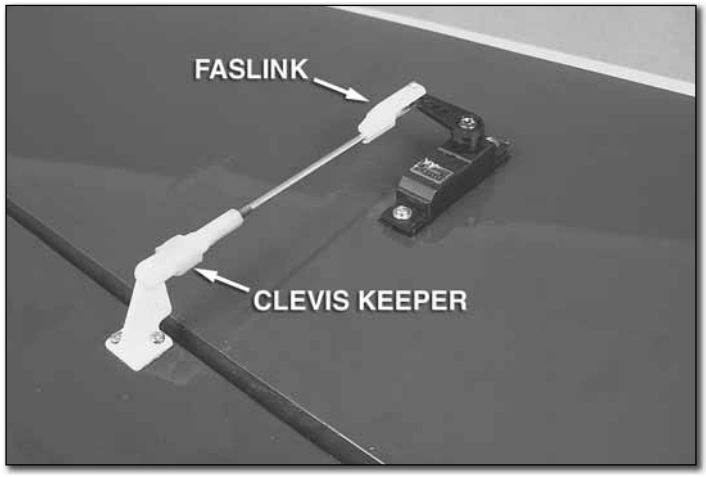
❑ ❑ 5. Thread a nylon clevis, 20 turns, onto a 6" [152mm] wire pushrod.





❑ ❑ 6. Attach the clevis in the outer hole of a nylon control horn. Place the control horn in line with the hole that is 3/4" [19mm] from the center of the servo arm. When positioned properly the control horn will rest on a hardwood plate in the aileron. Mark the location of the mounting holes onto the aileron. Drill a 1/16" [1.6mm] hole on the marks, drilling through the plywood plate but not through the top of the aileron.

❑ ❑ 7. Install and then remove a #2 x 3/8" [9.5mm] screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has cured, secure the control horn to the aileron with the screws.

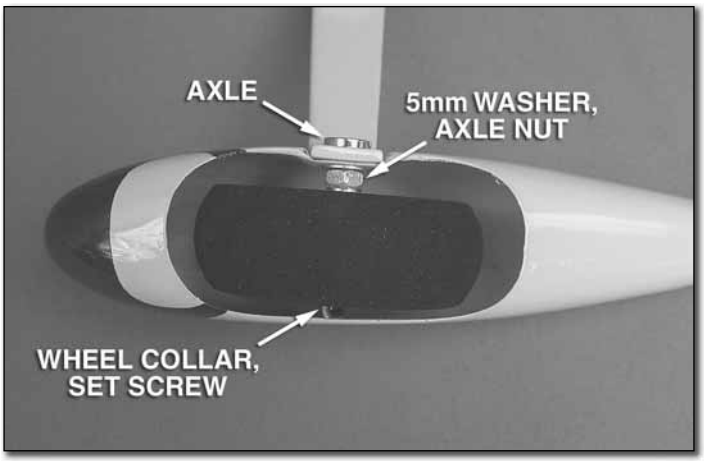


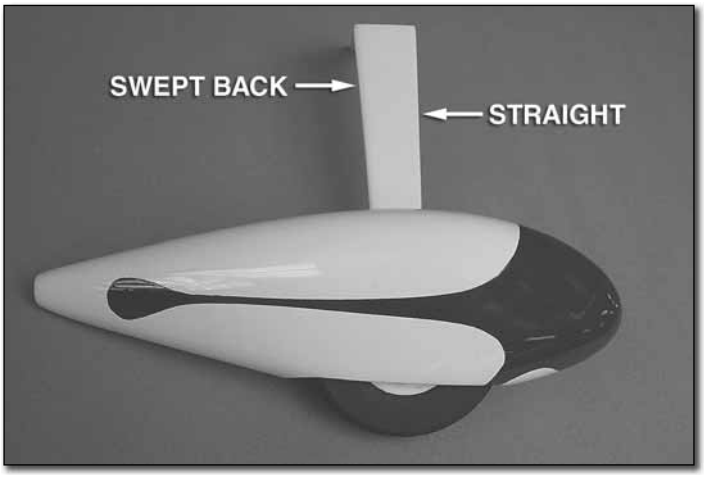
❑ ❑ 8. Slide a silicone clevis retainer over the clevis. With the aileron servo and the aileron centered, mark the aileron pushrod where it crosses the aileron servo arm. Make a 90° bend at the mark. Cut the pushrod 3/8" [9.5mm] past the bend. Attach the pushrod to the aileron servo arm with a nylon Faslink.

❑ 9. Repeat steps 1-8 for the left wing panel.

ASSEMBLE THE FUSELAGE

Install the Main Landing Gear



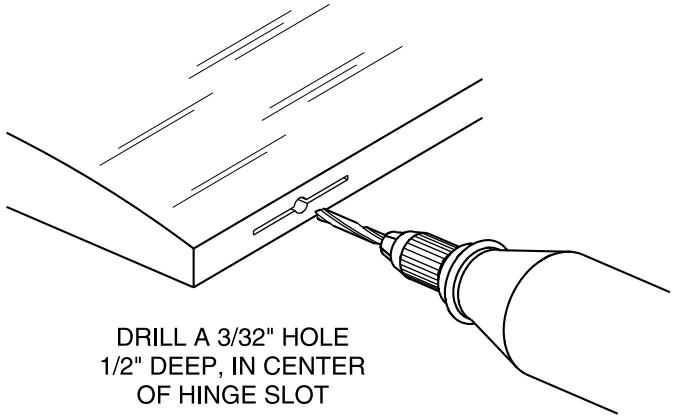


❑ ❑ 1. Insert a 4mm axle through the right main landing gear. Slide a 5mm washer onto the axle followed by the 5mm lock nut and the wheel. (All of these need to be slid into position before securing the assembly to the wheel pant). Tighten the axle nut to secure the pant to the landing gear. Note: the front of the main landing gear is straight, the back of the gear sweeps back. Apply a drop of thread locker to a 6-32 set screw and thread it into a 5/32" [4mm] wheel collar. Slide the wheel collar onto the axle and then tighten the set screw against the axle. Be sure the wheel spins freely after the wheel collar is in place.

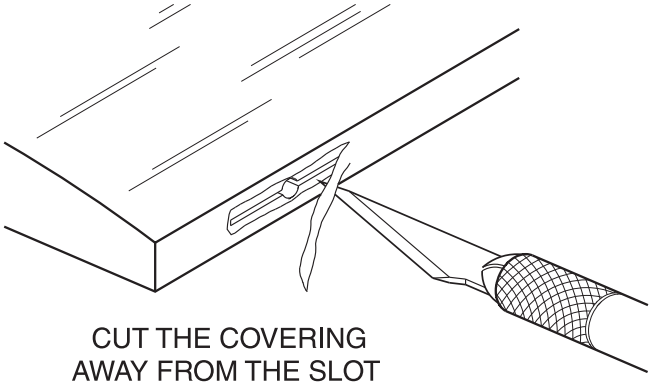
❏ ❏ 2. Attach the main landing gear to the fuselage with two 4-40 x 1/2" [13mm] SHC screws, #4 lock washers and #4 flat washers.

❏ 3. Repeat steps 1&2 for the left main landing gear.

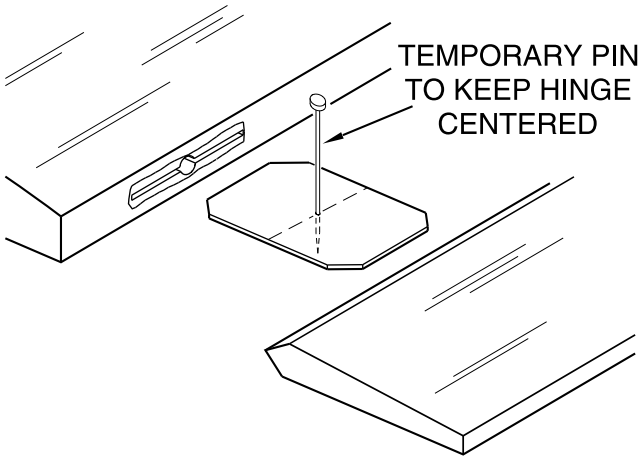
Install the Rudder



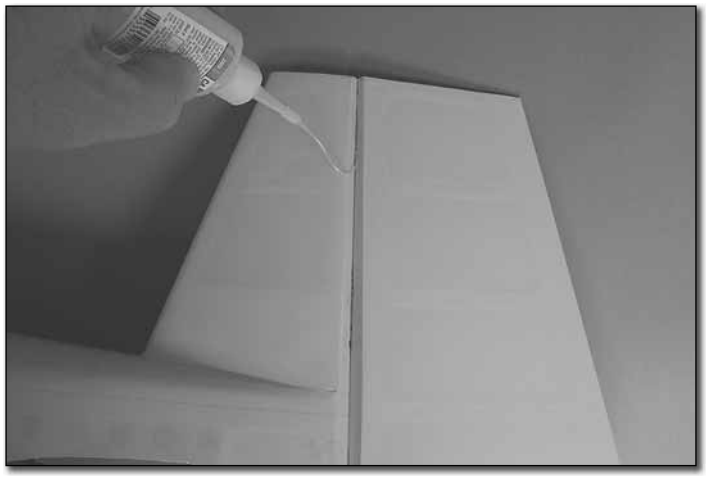
❏ 1. Drill a 3/32" [2.3mm]hole, 1/2" [13mm] deep in the center of each hinge slot to allow the CA to “wick” in. Follow-up with a #11 blade to clean out the slots. **Hint:** If you have one, use a high-speed rotary tool to drill the holes.



❏ 2. Use a sharp #11 blade to cut a strip of covering from the hinge slots in the wing and aileron.

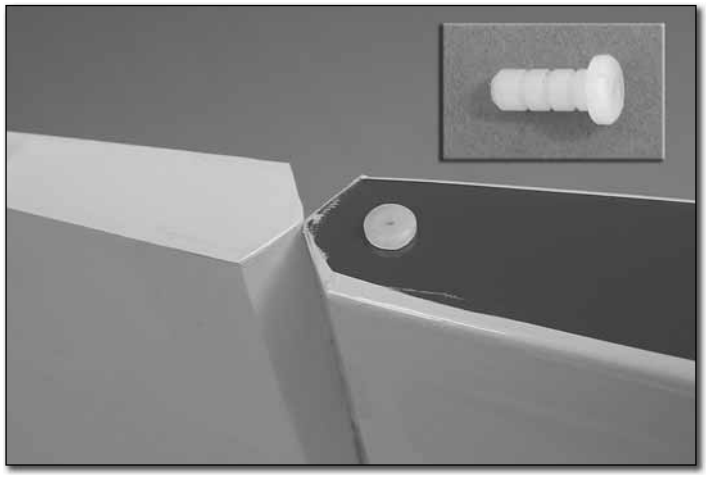


❏ 3. Install three 1/2" x 3/4" [13mm x 19mm] hinges into the rudder. Be sure the hinges remain centered in the rudder. If needed, insert a T-pin into the center of the hinge to keep it centered. Install the rudder to the fin post.

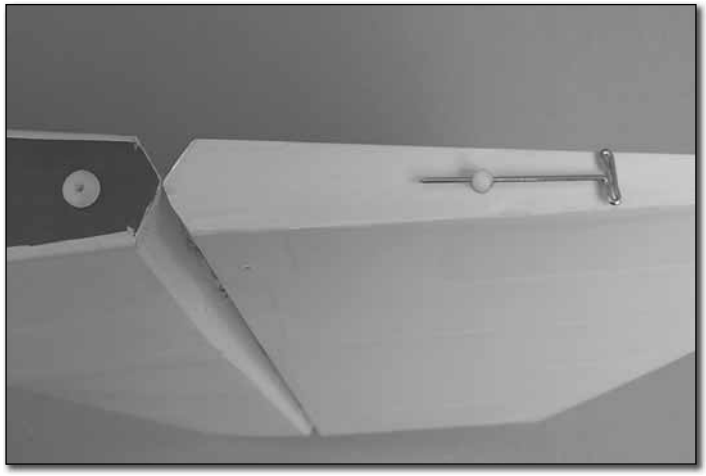


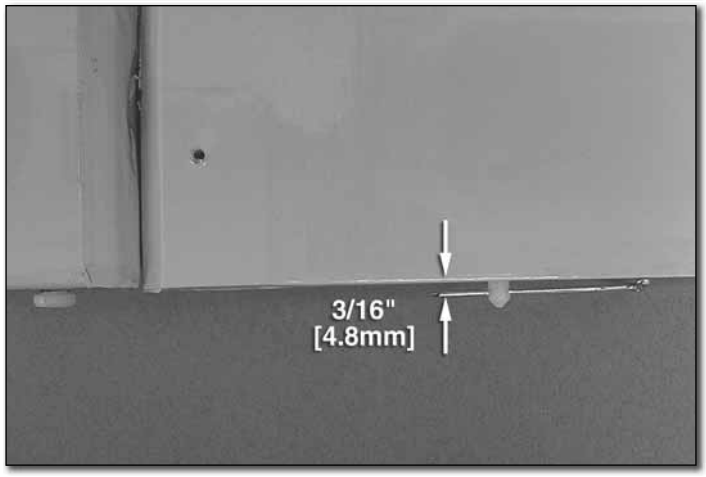
❏ 4. Apply three drops of thin CA to each side of each of the rudder hinges. Allow the glue to harden. Do not apply CA accelerator. This will cause the hinge to get brittle and possibly break.

Install the Tail Gear

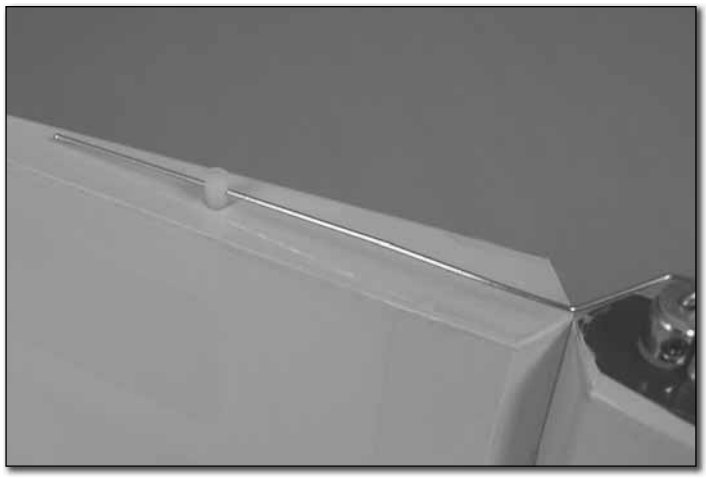


❏ 1. Glue the nylon tail gear bushing in the hole in the aft bottom of the fuse.

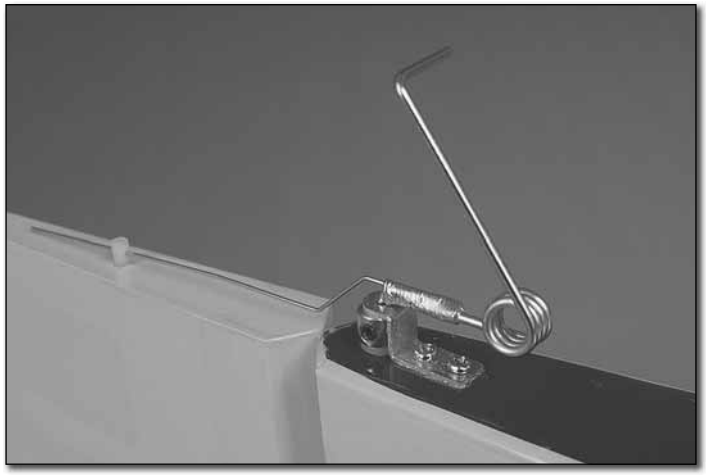




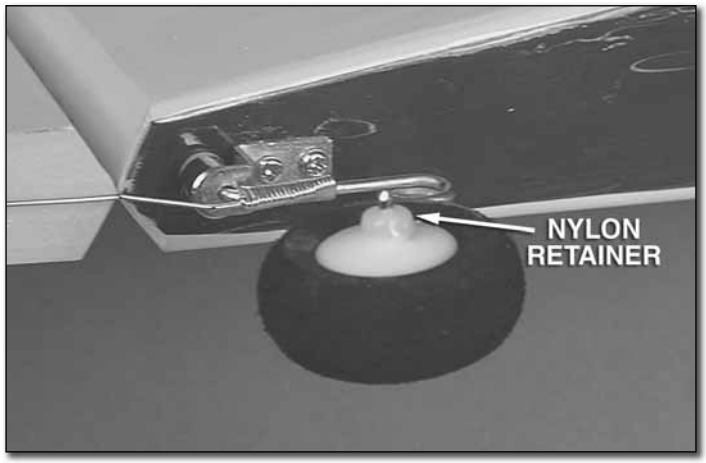
❏ 2. Insert a pin through the hole in the nylon tail wheel stud. Glue the stud into the hole in the bottom of the rudder. The stud should extend from the rudder approximately 3/16" [4.8mm]. When gluing the stud into the rudder, be sure the pin is in line with the center of the fuselage. This will assure proper alignment for the hole. After the stud is glued in place remove the pin.



❏ 3. Insert the wire from the tail gear through the nylon stud in the bottom of the rudder.

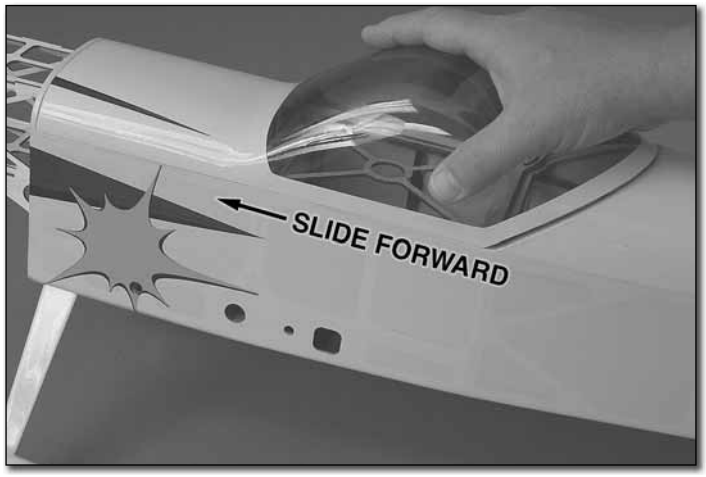


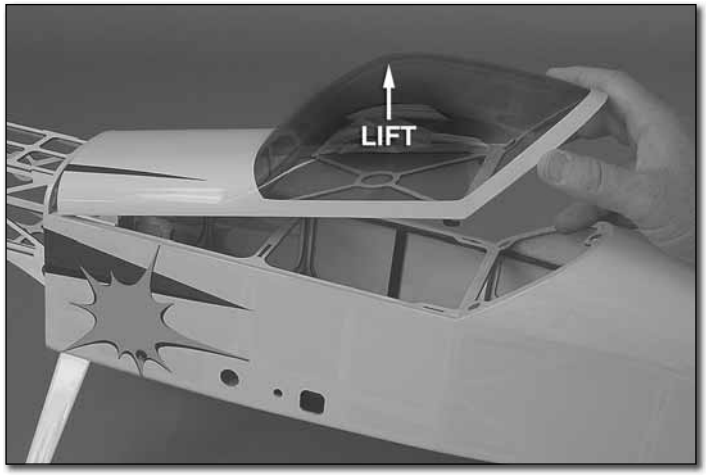
❏ 4. Apply thread locker to the 4-40 set screw and then install it into the 3/32" [2mm] wheel collar. Slide the wheel collar onto the tail gear. Then, insert the tail gear into the nylon bushing you glued into the fuselage. Place the tail gear bracket in place as shown with the tail gear bracket aligned with the bottom of the fuse. Mark and drill a 1/16" [1.6mm] pilot hole at both tail gear bracket mounting hole locations. Secure the tail gear bracket to the fuse with two #2 x 1/2" [13m] sheet metal screws.



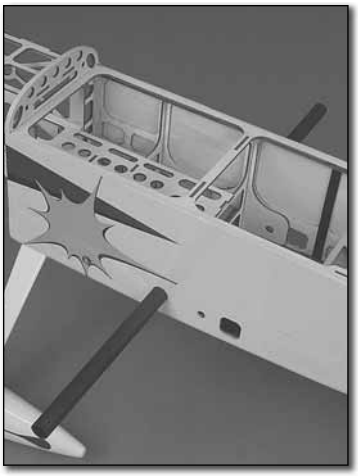
❏ 5. Install the tail wheel on the tail gear wire and press the nylon retainer on the tail gear wire to secure the tail wheel. If necessary, add a small drop of CA to lock it tightly to the wire.

Install the Stabilizer

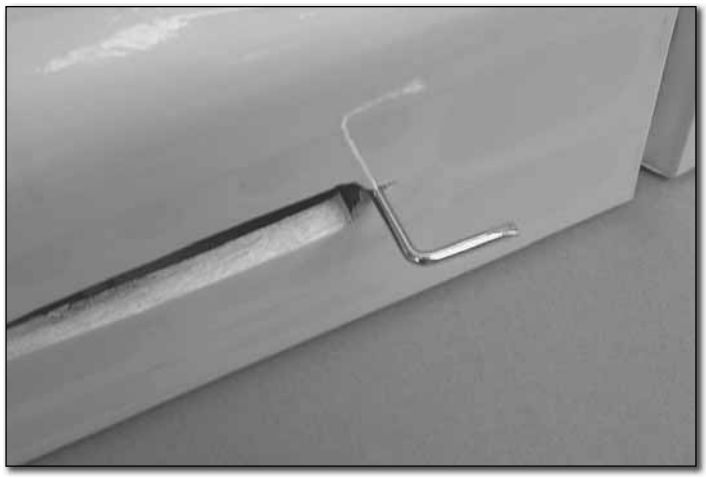




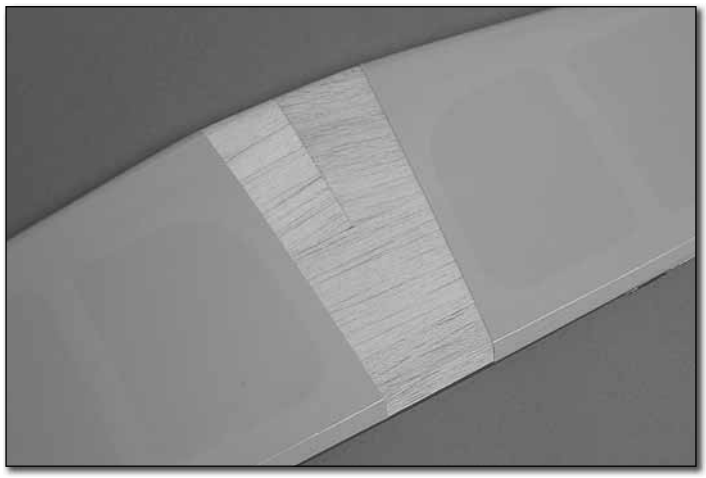
❑ 1. Remove the canopy from the fuselage. Do this by sliding the canopy forward towards the firewall and then lifting the back of the canopy.

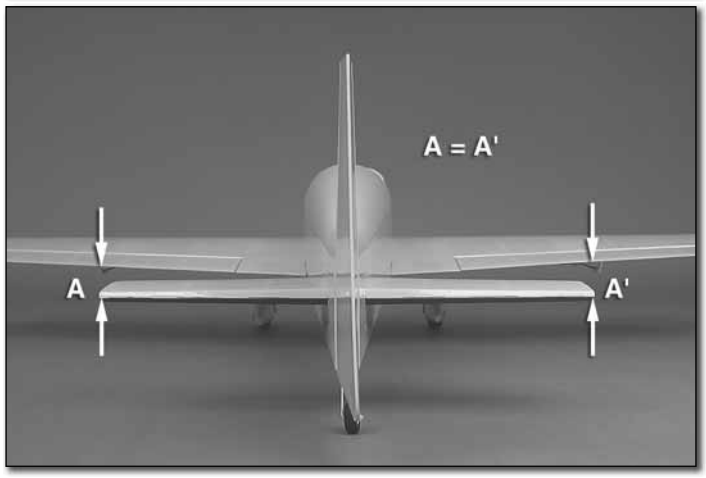


❑ 2. Center the wing tube in the fuselage. Slide the wing halves onto the wing tube and secure the wing halves to the fuselage with the nylon 10-24 thumb screws.

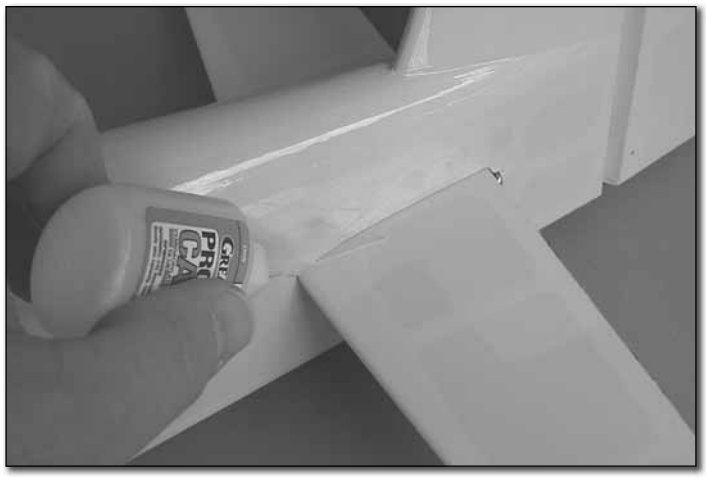


❑ 3. Install the elevator joiner wire into the stab opening in the fuselage.





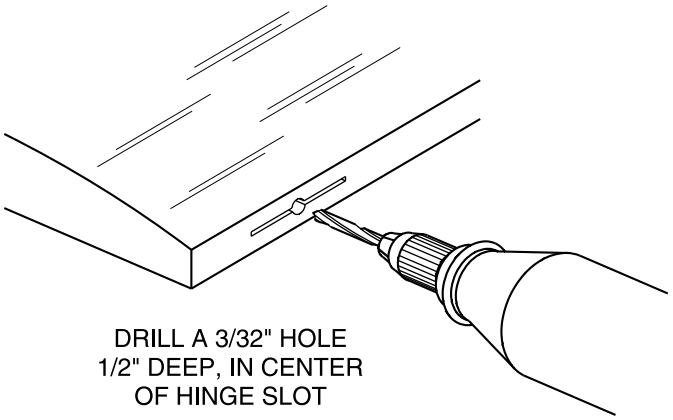
❑ 4. Center the horizontal stabilizer in the slot in the fuselage. The covering has been removed from the center of the stab. Align the stab so that the uncovered center section of the stab is completely inside of the fuselage. Stand back and look at the stab in relation to the wing. The stab should be parallel with the wing. If not, sand the stab saddle until the stab and wings are aligned.



❏ 5. Once you are satisfied with the alignment of the stab, glue the stab in position in the fuselage. Carefully wick small amounts of thin CA into the stab/fuselage to secure the stab.

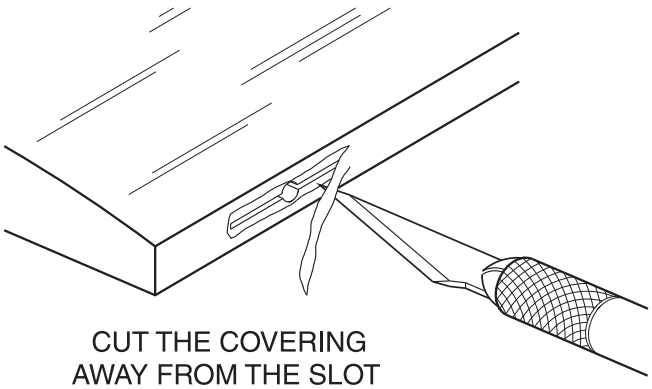
You can now remove the wings and continue with the assembly of the fuselage.

Install the Elevator Hinges



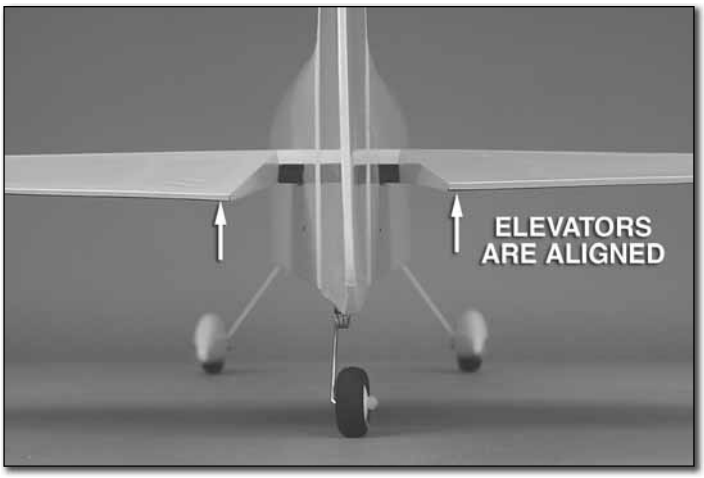
DRILL A 3/32" HOLE
1/2" DEEP, IN CENTER
OF HINGE SLOT

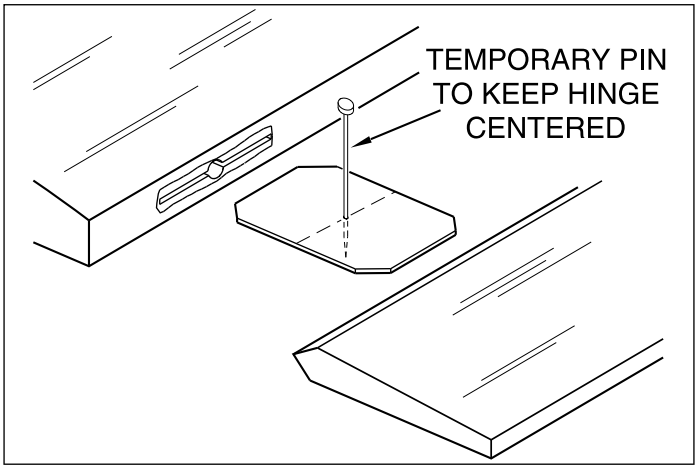
❏ 1. Drill a 3/32" [2.4mm] hole, 1/2" [13mm] deep in the center of each hinge slot to allow the CA to "wick" in. Follow-up with a #11 blade to clean out the slots. **Hint:** If you have one, use a high-speed rotary tool to drill the holes.



CUT THE COVERING
AWAY FROM THE SLOT

❏ 2. Use a sharp #11 blade to cut a strip of covering from the hinge slots in the wing and aileron.



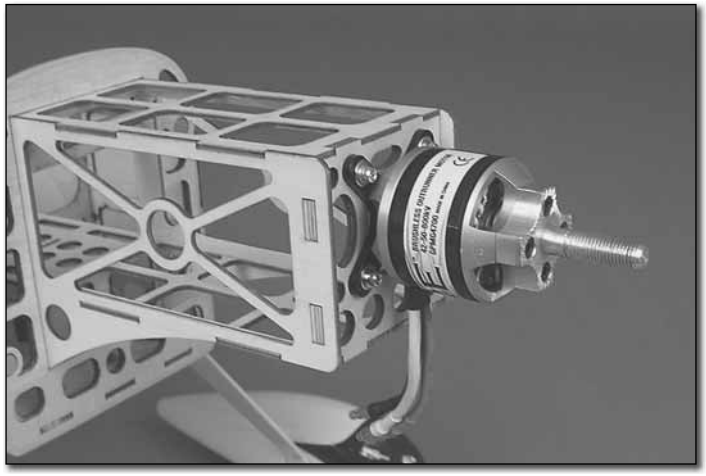


❏ 3. Install three 1/2" x 3/4" [13mm x 19mm] hinges into each elevator half. Install the elevators onto the stab with the elevator joiner wire in each elevator half. Check that both elevator halves are aligned. If not, remove the elevators and while holding one leg of the elevator joiner wire, slightly bend the other. Reinstall the elevator halves and check again.

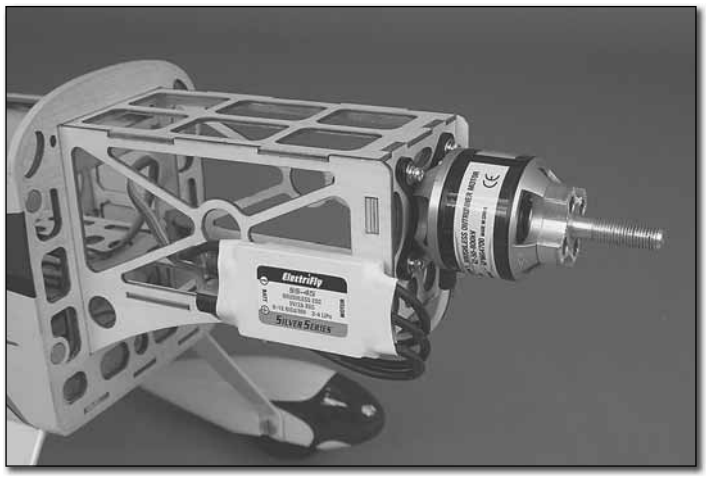
❏ 4. Coat the inside of the two elevator joiner wire holes and the ends of the elevator joiner wire with epoxy. Install the two elevator halves and glue the hinges with thin CA using the same method used on the rudder.

Install the Motor

The Eagle 580 EP has been designed to use the Great Planes RimFire .32 (42-50-800kV) Out-runner Brushless motor. If you will be installing a different motor, you may need to modify the plywood motor box. We recommend that this be done at this time.



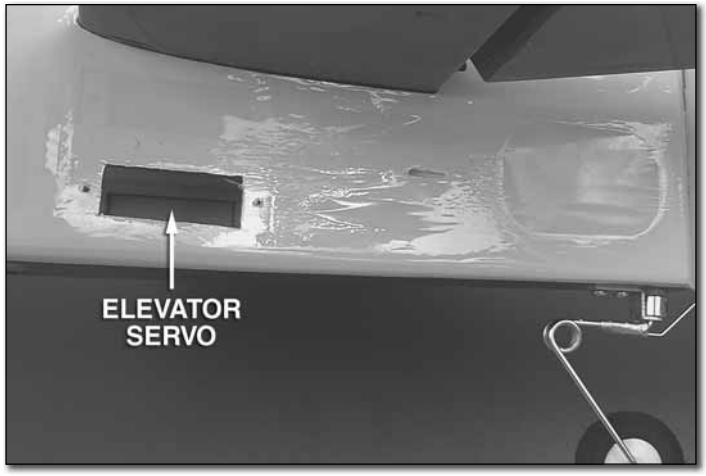
❏ 1. Install the RimFire motor using four 4-40 x 1/2" [13mm] SHC screws, four #4 lock washers and four #4 flat washers. Before installing, apply a drop of threadlocker to the threads of the SHC screws.



❏ 2. Connect the ESC to the motor. The ESC can be attached to the side of the motor box with self adhering hook and loop material.

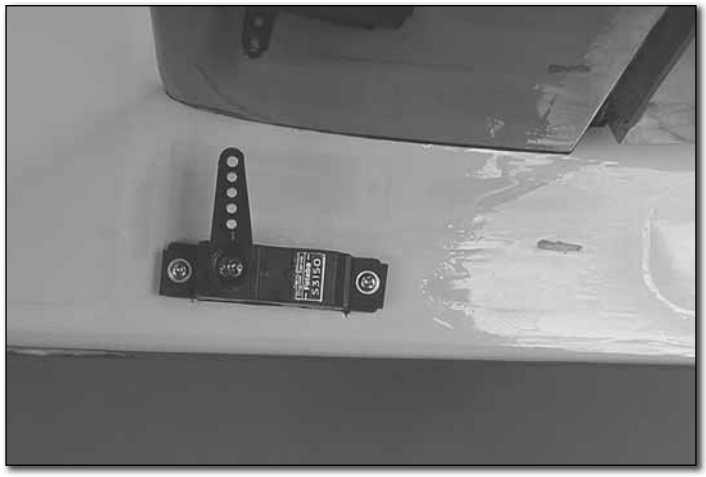
INSTALL THE RADIO SYSTEM

Install the Elevator Servo



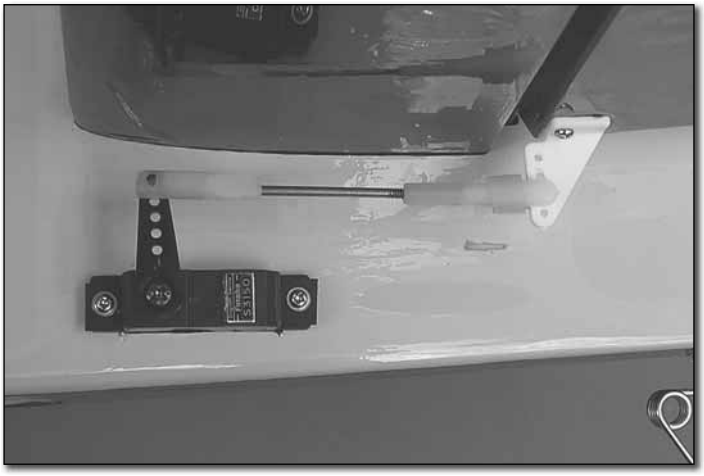
❏ 1. Cut the covering away from the lower opening on the left side, in the rear of the fuselage for the elevator servo.

❏ 2. Install a 24" [610mm] servo extension to the elevator servo. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



❏ 3. Install and then remove a servo mounting screw into each of the holes. Apply a drop of thin CA into the holes to harden the threads. Once the glue has hardened install the servo into the servo opening. Place a black retaining plate onto each of the servo mounting flanges. Then screw the servo to the wing using the hardware included with your servo. Center the servo and then install a servo arm as shown.

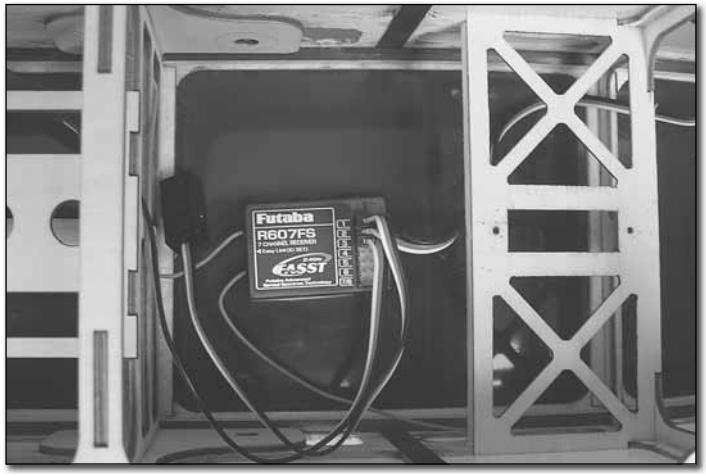
❏ 4. Thread a nylon clevis 20 turns onto a 2-56 x 6" [152mm] wire pushrod. Connect the clevis to the second hole from the base of a nylon control horn. Using the elevator pushrod, position the control horn in line with the servo arm. When positioned properly the control horn will rest on a hardwood plate in the elevator. Mark the location of the mounting holes onto the elevator. Drill a 1/16" [1.6mm] hole on the marks, drilling through the elevator plate only. Do not drill through the top of the elevator. Install and then remove a #2 x 3/8" [10mm] screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has cured, secure the control horn to the elevator with the screws.



❏ 5. Slide a silicone clevis retainer over the clevis. With the elevator servo and the elevator centered, mark the elevator pushrod where it crosses the elevator servo arm. Make a 90° bend at the mark. Cut the pushrod 3/8" [9.5mm] past the bend. Attach the pushrod to the elevator servo arm with a nylon Faslink.

Install the Receiver

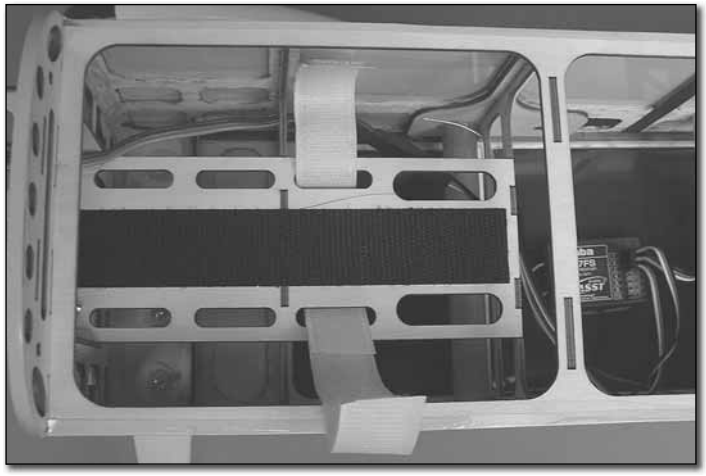
Before installing the rudder servo you need to complete the installation of the receiver and battery. To properly set up the rudder pull-pull system you will need to be able to operate the servos.



❏ 1. Use adhesive-backed hook and loop material to mount the receiver to the bottom of the fuselage. The antenna can be routed out the bottom of the fuse and taped to the covering.

❏ 2. Connect the ESC, voltage regulator, elevator servo and Y-harness for the ailerons to the receiver. (Depending on where you mounted the ESC, you may need to install a 6" [152mm] servo extension to the ESC.)

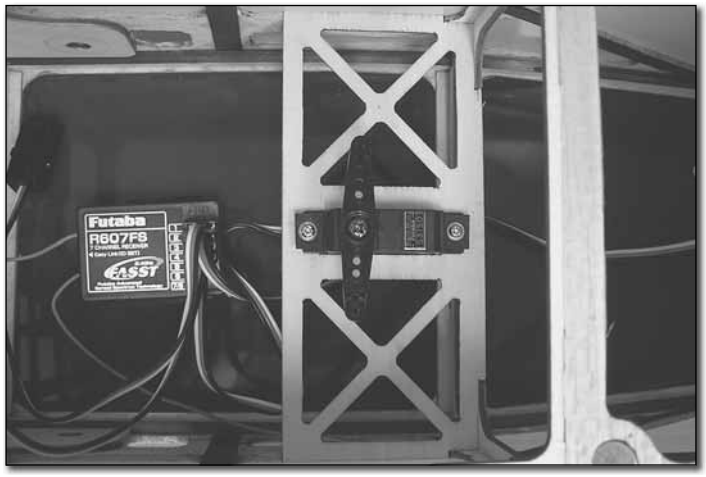
❏ 3. Connect the flight battery to the ESC and check that the servos are operating correctly. Arm the motor (with the prop removed) and slowly start the motor to make sure it is rotating in the correct direction.



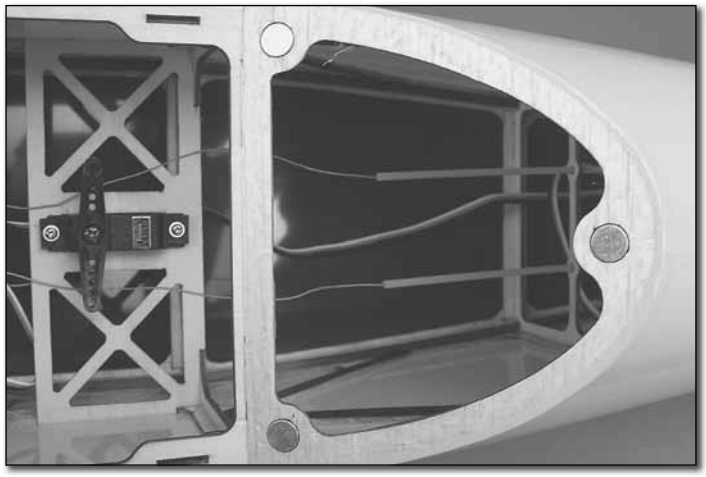
❏ 4. Over lap by 1" [25mm] two strips of nonadhesive-backed hook and loop material. Route the hook and loop material through the slot in the battery tray, under the tray and back through the slot on the other side of the tray. Apply a strip of adhesive backed hook material to the center of the battery tray. The loop material can be applied to the battery.

Install the Rudder Servo

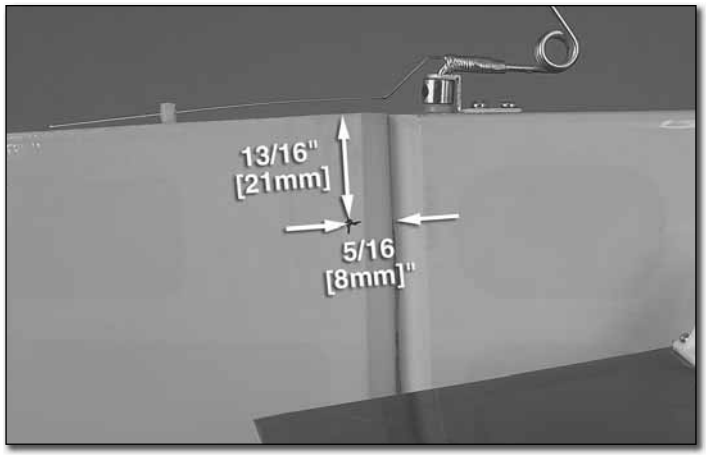
Now is the time you need to decide on which rudder control method you are going to use. Unless you are installing a very heavy motor, we recommend that you use the pull-pull system to keep the weight out of the tail. To help you decide you can install the wing, cowl and canopy. Mark the CG location on the wing (shown on page 17). Then, place the plane on a CG stand and position the flight battery in the middle of the battery tray. If the plane is slightly tail heavy, we recommend that the rudder pull-pull system be installed. If the plane is nose heavy, the rudder servo can be installed in the tail. There are extra servo openings located in the tail for this purpose. We will not go into detail on installing the servo in the tail. Follow the same procedure used for installing the elevator servo.



❏ 1. Install and then remove a servo mounting screw into each of the holes in the rudder servo bay. Apply a drop of thin CA into the holes to harden the threads. Once the glue has hardened, install the servo into the servo opening using the hardware included with your servo and two of the black servo mounting plates. Center the servo. Then install a servo arm as shown.

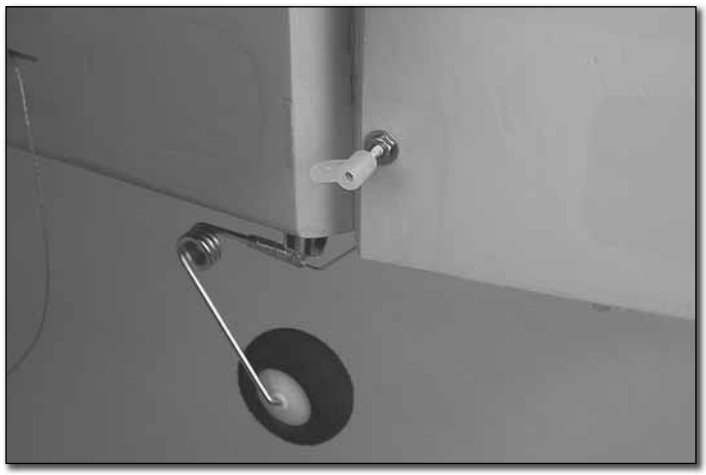


❏ 2. Cut the pull-pull string in half. Put a small drop of thin CA on one end of each piece of string. Allow the CA to cure and trim off any frayed thread. Insert the end into the pull-pull guide tubes in the fuselage. The string may be difficult to guide through the exit. Once the string will not go any further into the tube, the string will not come out of the exit; use the point of a hobby knife to help pull the string through the exit. Tape the string to the side of the fuselage to prevent it from being pulled through while installing the rudder horns.

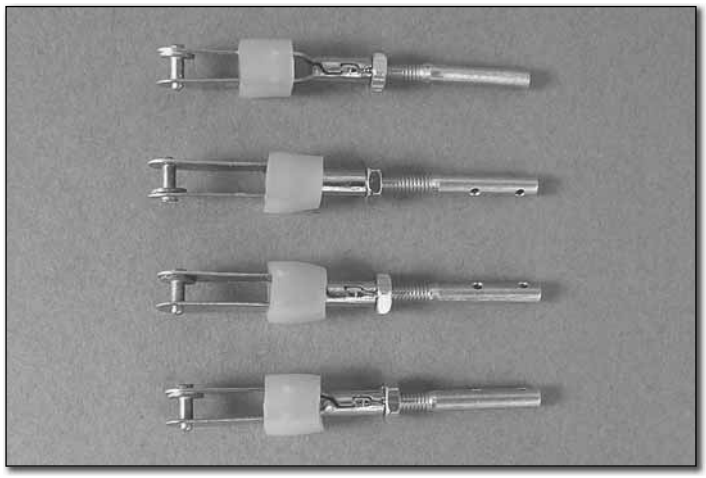


❏ 3. Measure up 13/16" [21mm] from the bottom of the rudder and make a mark. Measure in from the leading edge 5/16" [8mm] and make a mark. Drill a 1/16" [1.6mm] hole through the rudder, perpendicular to the centerline of the rudder.

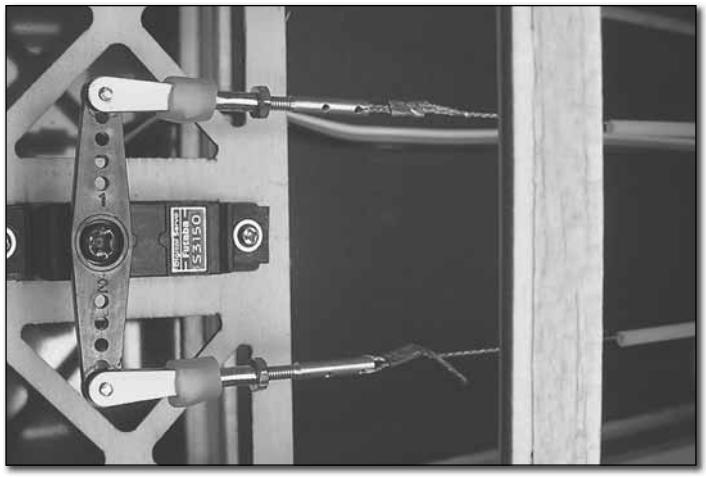
❏ 4. Insert the 2-56 threaded rudder control horn rod. Center the rod in the rudder with two #2 flat washers and 2-56 nuts on each side. A drop of threadlocker on the threads will help prevent the nuts from coming loose.



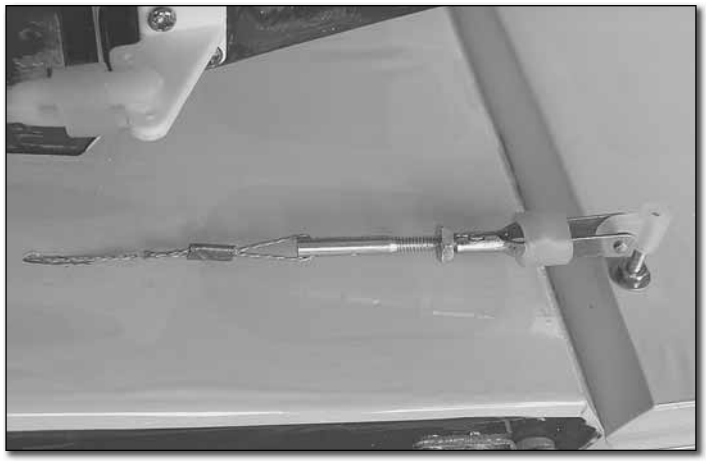
❏ 5. Thread a nylon torque rod horn onto each end of the control horn rod. Adjust the torque rod horn so that they are both equal distance from the rudder.



❏ 6. Thread 2-56 nuts onto four 2-56 rigging couplers. Slide a silicone clevis retainer over both threaded 2-56 metal clevises. Then, thread the clevises 10 turns onto both rigging couplers. Tighten the 2-56 nuts against the metal clevises.



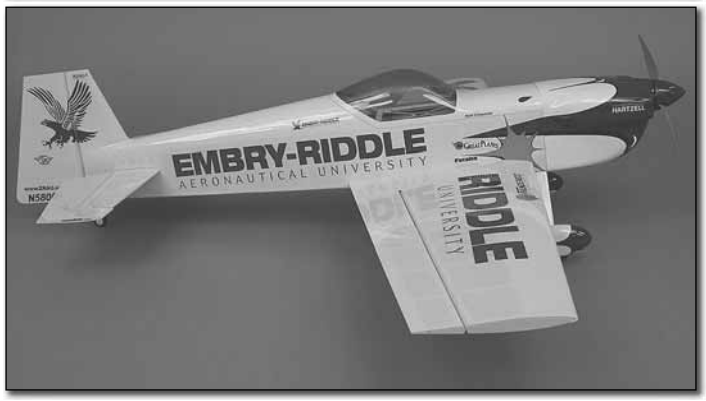
❏ 7. Working from the end of the string inside of the fuselage, pass the string through a crimp, through the rigging coupler and back through the crimp. Squeeze the crimp with a pliers to secure the string in the crimp. Apply a drop of thin CA to the crimp. Attach the clevises to the rudder servo horn in the holes 3/4" [19mm] from the center. Do this for both stings. Temporarily turn on the radio system and center the rudder servo arm.



❏ 8. Pull the pull-pull string out of the fuselage aft end so that the string is tight. Pass the string through a crimp. Attach the clevis to the nylon torque rod horn on the rudder. Repeat on the other side of the fuselage. With the rudder and the rudder servo arm centered, pull the string tight at the rudder and squeeze the crimps to secure the strings. Apply a drop of CA to the string and cut off the excess string.

APPLY THE DECALS

The following photographs and the box photographs show the location of the decals on the airplane. Refer to these for the exact placement of the decals. The following tips may be useful for applying them.



1. 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 & water allows accurate positioning and reduces air bubbles underneath.
2. Position decals on the model. Holding the decal down, use

a paper towel to wipe most of the water away.

3. 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

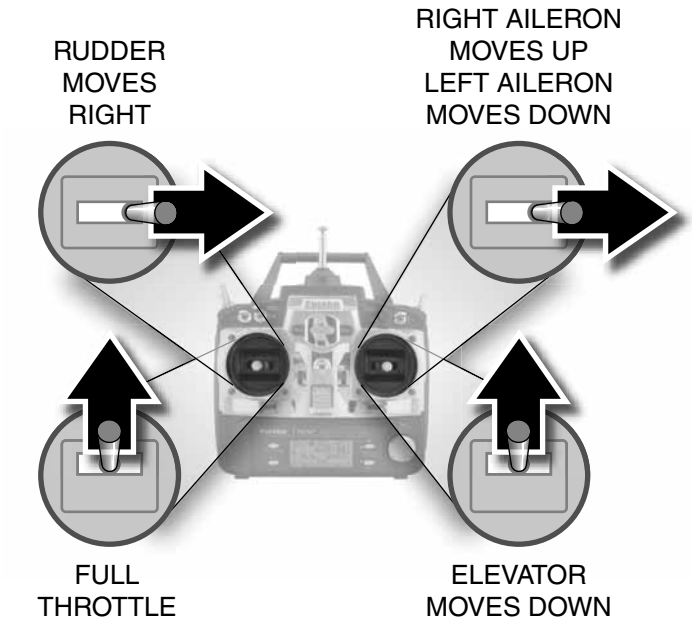
GET THE MODEL READY TO FLY

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.

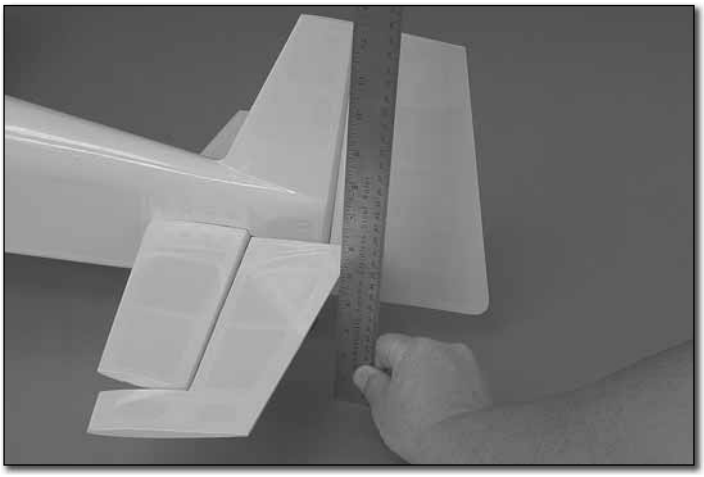
❑ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.

4-CHANNEL RADIO SET-UP (STANDARD MODE 2)



❑ 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.

Set the Control Throws



Use 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 at the low rate setting. **NOTE:** The throws are measured at the widest part of the elevators, rudder and ailerons.

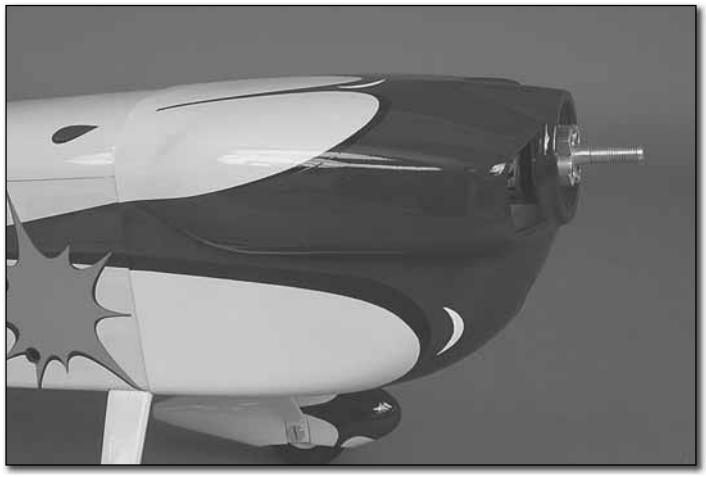
These are the recommended control surface throws:

	3D RATE		HIGH RATE		LOW RATE	
ELEVATOR	**Up**	**Down**	**Up**	**Down**	**Up**	**Down**
	2-3/4" [70mm] 52°	2-3/4" [70mm] 52°	1" [25mm] 17°	1" [25mm] 17°	3/4" [19mm] 12°	3/4" [19mm] 12°
RUDDER	**Right**	**Left**	**Right**	**Left**	**Right**	**Left**
	4" [102mm] 44°	4" [102mm] 44°	1-1/2" [38mm] 15°	1-1/2" [38mm] 15°	1" [25mm] 10°	1" [25mm] 10°
AILERONS	**Up**	**Down**	**Up**	**Down**	**Up**	**Down**
	1-1/2" [38mm] 31°	1-1/2" [38mm] 31°	5/8" [19mm] 13°	5/8" [19mm] 13°	3/8" [10mm] 7°	3/8" [10mm] 7°

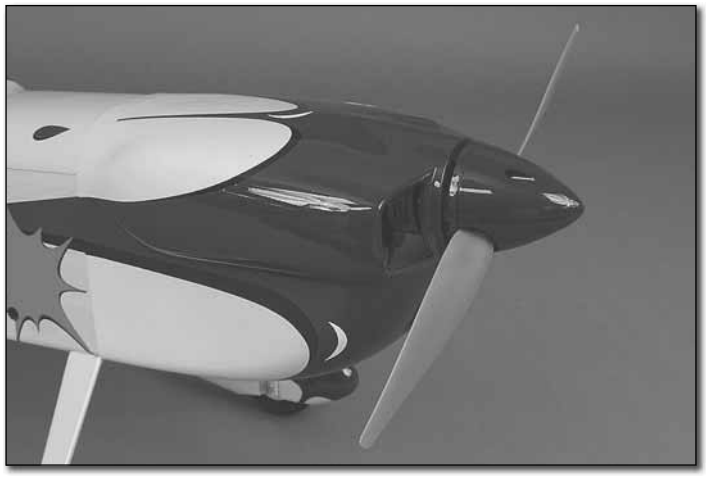
We also put exponential into the High rates and the 3D rates to make the control throws less sensitive around neutral. These can be set up to your own preference and flying style. We put 20% to 30% in the high rate and 50% to 60% in the 3D rates.

IMPORTANT: The Eagle 580 EP 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 Eagle 580 EP 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."

Finish the Model



❏ 1. Slide the cowl in position on the front of the fuselage. The cowl is held to the fuselage with magnets. In our testing we have found the magnets to be very secure but if you will be flying very aggressive aerobatics you may want to consider applying a piece of clear tape to each side of the cowl and fuselage. If you find that the motor is not aligned with the opening in the cowl, remove the cowl, loosen the motor mount bolts and adjust the position of the motor.



❏ 2. Install the spinner back plate, propeller with washer and prop nut and the spinner cone. Secure the spinner cone to the back plate with two 3 x 10mm sheet metal screws.

❏ 3. As you have seen, the canopy slides back and forth to lock in place. The magnets at the rear of the canopy keep it locked in place.

❏ 4. Insert a flight battery in the fuselage and use the hook and loop material to hold the battery in position. Do not connect the battery to the ESC while balancing the model.

❏ 5. Install the canopy.

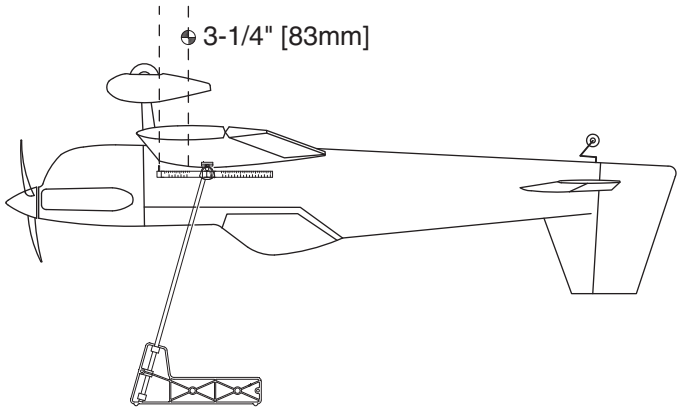
Balance the Model (C.G.)

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 and battery, landing gear, covering and paint, and the radio system.

❏ 1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing at the side of the fuselage. The C.G. is located 3-1/4" [83mm] back from the leading edge of the wing at the side of 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 3/16" [5mm] forward or 3/16" [5mm] 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 the wing attached to the fuselage, all parts of the model installed (ready to fly) and an empty fuel tank, 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 forward or weight must be added to the nose to balance. If the nose drops, the model is “nose heavy” and the battery pack must be shifted aft or weight must be added to the tail to balance. If additional weight is required, use Great Planes (GPMQ4485) “stick on” lead. A good place to add stick-on nose weight is to the motor box (don’t attach weight to the cowl—it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the fuse over the motor box until the model balances. Once you have determined the amount of weight required, it can be permanently attached.

Note: Do not rely upon the adhesive on the back of the lead weight to permanently hold it in place. Over time the adhesive may soften and cause the weight to fall off. Use #2 sheet metal screws, RTV silicone or epoxy to permanently hold the weight in place.

❏ 4. IMPORTANT: If you found it necessary to add any weight, recheck the C.G. after the weight has been installed.

Balance the Model Laterally

❏ 1. With the wing level, have an assistant help you lift the model by the engine propeller shaft and the bottom of the fuse 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

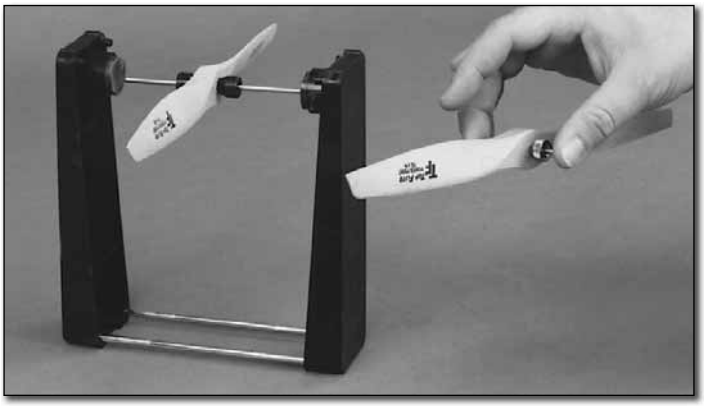
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 23 (or on the decal sheet) and place 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 batteries 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 and receiver 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 [30m] 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, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash. The problem may be the location of the antenna. The antenna should be as far away from the ESC and battery as possible.

ELECTRIC MOTOR SAFETY PRECAUIONS

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.
- Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you run the motor.
- Do not run the motor in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.
- 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.
- When working on your plane, remove the propeller if the motor battery will be connected.
- Always remove the motor battery from the plane when charging.
- Follow the charging instructions included with your charger for charging LiPo batteries. LiPo batteries can cause serious damage if misused.

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 fuse. Simply stuffing them into place with foam rubber is not sufficient.
❏ 3. Extend your receiver antenna and make sure it has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver.
❏ 4. Balance your model laterally as explained in the instructions.
❏ 5. Use threadlocking compound to secure critical fasteners such as the motor screws, wheel collar SHC screws and screw-lock pushrod connectors, etc.
❏ 6. Add a drop of oil to the axles so the wheels will turn freely.
❏ 7. Make sure all hinges are securely glued in place.
❏ 8. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, control horn screws, etc.).
❏ 9. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
❏10. Make sure there are silicone retainers on all the clevises and that all servo arms are secured to the servos with the screws included with your radio.

❏11. Secure connections between servo wires and Y-connectors or servo extensions with vinyl tape, heat shrink tubing or special clips suitable for that purpose.
❏12. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
❏13. Balance your propeller (and spare propellers).
❏14. Tighten the propeller nut and spinner.
❏15. Place your name, address, AMA number and telephone number on or inside your model.
❏16. If you wish to photograph your model, do so before your first flight.
❏17. Range check your radio when you get to the flying field.

FLYING

The Eagle 580 EP is a great-flying model that flies smoothly and predictably. The Eagle 580 EP 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

Before you get ready to takeoff, see how the model handles on the ground by doing a few practice runs at low speeds on the runway. Hold "up" elevator to keep the tail wheel on the ground. If necessary, adjust the tail wheel so the model will roll straight down the runway. If you need to calm your nerves before the maiden flight, bring the model back into the pits, peak the battery and check all fasteners and control linkages for peace of mind.

Remember to takeoff into the wind. When you're ready, point the model straight down the runway, hold a bit of up elevator to keep the tail on the ground to maintain tail wheel steering, and then gradually advance the throttle. As the model gains speed decrease up elevator, allowing the tail to come off the ground. One of the most important things to remember with a tail dragger is to always be ready to apply right rudder to counteract engine torque. Gain as much speed as your runway and flying site will practically allow before gently applying up elevator, lifting the model into the air. At this moment it is likely that you will need to apply more right rudder to counteract motor torque. Be smooth on the elevator stick, allowing the model to establish a gentle climb to a safe altitude before turning into the traffic pattern.

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. The Eagle 580 EP with the recommended power system will only require full throttle in short bursts. Most aerobatic flight can be performed at around 1/2 throttle. If you observe the flight of some of the best aerobatic pilots, they very seldom use full throttle.

Take it easy with the Eagle 580 EP for the first flight, 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, 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 battery power level, but use this first flight to become familiar with your model before landing. With most electric planes it is best to have a timer set on your transmitter or a separate timer with an alarm to alert you when the battery may be getting low. This will require a few flights before determining the maximum flight time you can achieve with the batteries. This will prevent the downwind auto motor cutoff over the end of the flying field. With the plane properly trimmed you will want to get started with some aerobatics. This plane is capable of just about every aerobatic maneuver you can do. Become familiar with the high and low rate settings before using the 3D rates. If you have not flown an airplane with 3D rates you should work your way into these higher 3D rates cautiously. The extreme throws can stall the airplane if you are not careful. Over controlling could also result in unwanted snaps. If you have not flown 3D you might want to consider getting help from an experienced 3D pilot. When executing down line maneuvers it is important to use good throttle management. Full power down lines could result in over stressing of the aircraft.

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. Once the model is on the runway and has lost flying speed, hold up elevator to place the tail on the ground, regaining tail wheel control.

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.

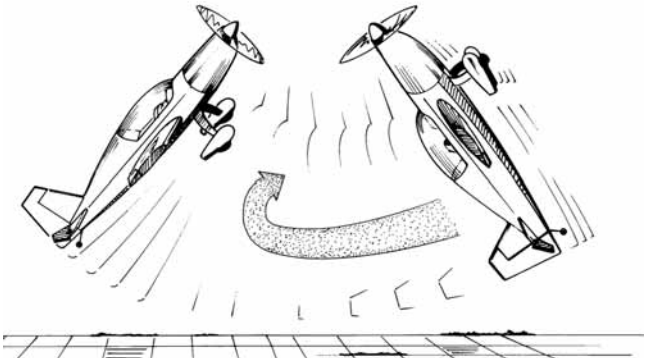
GOOD LUCK AND GREAT FLYING!

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.

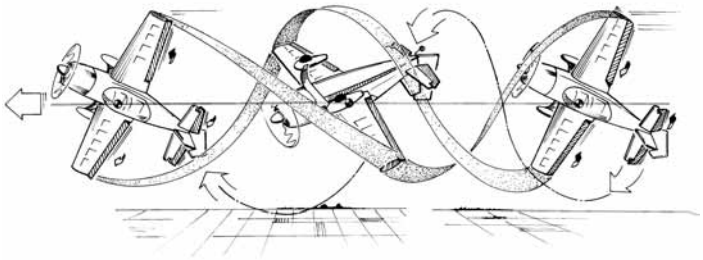
INVERTED FLAT SPINS

This is the same as the up-right 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.

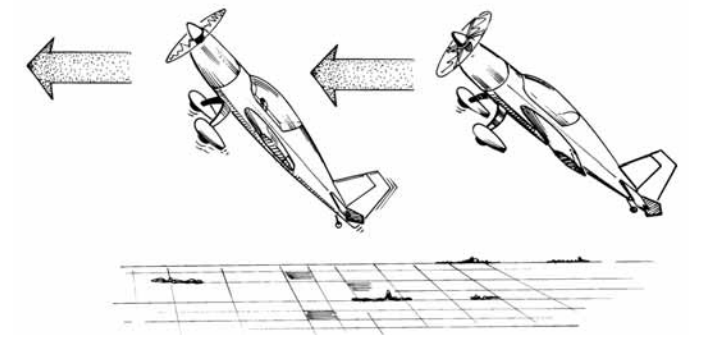
VERTICAL HOVER

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.

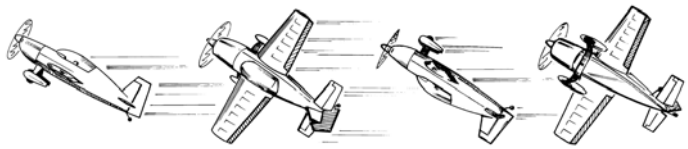
HARRIER



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/set-up, 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 spoileron mixing will be needed.

ROLLING HARRIER



Once you get comfortable with the up-right harrier, it's time to work rolls into the mix. From an up-right 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.

OTHER ITEMS AVAILABLE FROM GREAT PLANES

ElectriFly™ RimFire™ .32 (42-50-800kV) Out-Runner Brushless Motor GPMG4700

Specifications:
kV Rating: 800 rpm/volt
Input Voltage: 11.1-18.5V
Max. Constant Current: 50A
Max. Surge Current: 80A
Max. Constant Watts: 925W
No Load Current: 2.6A
Motor Diameter: 42 mm (1.65 in)
Motor Length: 50 mm (1.97 in)
Shaft Diameter: 5 mm (0.20 in)
Shaft Length: 17 mm (0.67 in)
Weight: 198 g (7.0 oz)
Suggested Prop Sizes: 10x5E – 14x7E

• Two-year quality guarantee.

Powered by rare-earth Neodymium magnets, RimFire™ out-runner motors produce explosive acceleration in planes ranging from park flyers to 1.60-size giants! Their high-torque design eliminates the need for a gearbox, making them the simpler, lighter and less expensive alternative to a brushed motor and gearbox. Plus, their innovative housing optimizes cooling, allowing RimFire motors to produce 50% more performance power than out-runners of similar size. Prop adapter, motor mount and hardware are included. The installed, gold-plated bullet connectors are compatible with all ElectriFly ESCs.

Futaba® S3150 Slim Digital Servo FUTM0303

Speed: .25 sec/60° @ 4.8V
Torque: 51.4 oz-in @ 4.8V
Dimensions: 1.1 x 0.5 x 8.0 in
(28 x 13 x 19.7 mm)
Weight: 0.8 oz (23g)

The compact design of the S3150 servo is perfect for easy installation inside the wing of electric planes such as the Eagle 580. Its digitally enhanced microprocessor speeds response time, while two ball bearings, metal gears, and a dust- and water-resistant case provide a long life of smooth operation. Includes a J-connector and one-year limited warranty protection.

ElectriFly™ Power Series 2100mAh 20C Balanced LiPo Battery GPMP0618

LiPo cells offer three times the voltage of NiCd and NiMH cells, at less than half the weight. Rated at a true 20C continuous discharge (30C burst for 30 seconds), this ElectriFly LiPo pack comes wired for balanced — allowing each cell to be charged to the maximum 4.2V. The result: Maximum power to your motor for maximum performance in the air! The battery features quality Deans® Ultra Plugs® and balancing connector. Recharge using the ElectriFly Equinox™ Cell Balancer for maximum power per cell.

ElectriFly™ Silver Series 45A Brushless ESC GPMM1840

With Silver Series brushless ESCs, the only way their performance would be any easier to enjoy is if they came already installed. As it is, hook-up takes only seconds — and set-up takes no time at all. Silver Series brushless ESCs do it automatically on hook-up, and offer the option to use brake (or not) with a flick of the throttle stick. The Silver Series 45A is NiCd, NiMH and LiPo-compatible, with a 5V/2A BEC capable of handling 3 or 4 standard servos. Includes all connectors.

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


GREAT PLANES®
MODEL MANUFACTURING COMPANY