REACTOR™ BIPE

INSTRUCTION MANUAL

Wingspan: 35 in [890mm]
Wing Area: 600 in^2 [38.7dm^2]
Weight: 34.2 – 38.2 oz [970 – 1085g]
Wing Loading: 8.2 – 9.1 oz/ft^2 [25 – 28g/dm^2]
Length: 43 in [1080mm]
Radio: 4-channel minimum with micro receiver and four micro servos
Motor: 35-36-1200kV RimFire™ out-runner motor with APC 11" x 7" thin-electric prop

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

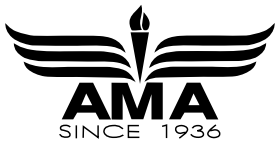
INTRODUCTION

The Reactor Bipe 3D EP is an evolution of our successful Reactor series and was designed with both the 3D pilot and sport flier in mind. Sport pilots will enjoy a stable airplane with no bad tendencies that builds confidence and skill. 3D performance pilots will be surprised to find an airplane capable of performing almost any maneuver with ease and precision. Whatever your abilities are, you will enjoy an accurate and nimble performer armed with a power package that allows unlimited aerobatics. Best of all, it will fit into practically any car and requires no disassembly – just grab it and go!

For the latest technical updates or manual corrections to the Reactor Bipe 3D EP visit the Great Planes web site at **www.greatplanes.com**. Open the "Airplanes" link, then select the Reactor Bipe 3D EP. 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 Reactor Bipe 3D EP 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 Reactor Bipe, 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, wheel pants, and fairings 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 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.

LITHIUM BATTERY HANDLING & USAGE

WARNING!! Read the entire instruction sheet included with the 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 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 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.

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Reactor Bipe 3D EP 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. We ***highly recommend*** that you use Futaba® S3154 Digital Micro High-Torque servos. The S3114 is a suitable alternative to this but because of the nature of this particular airplane, the S3154 will provide a better "on-center" feel.

❏ (4) Futaba S3154 Digital Micro HT Servo (FUTM0654)
– OR –
❏ (4) Futaba S3114 Micro HT Servo (FUTM0414)
– OR –
❏ (4) Minimum 20 oz-in torque micro servos

❏ Futaba R114F FM Micro Receiver (Low Band – FUTL0442, High Band – FUTL0443)
❏ Futaba FM Single Conversion Short Crystal (Low Band – FUTL62**, High Band – FUTL63**)
❏ (2) 12" [300mm] servo extension (HCAM2711 for Futaba)
❏ (1) Y-harness (FUTM4130 or FUTM4135 for digital)

Motor & Propeller Recommendations

The Reactor Bipe EP was tested extensively to find the best "power package" that offers light weight, long flight time, and aggressive thrust. Because of the nature of electric motors, the correct propeller must be chosen to get the most out of the recommended motor without damaging components. The order numbers for these are provided below.

❏ Great Planes RimFire™ 35-36-1200kV Brushless Out-runner Motor (GPMG4620)
❏ APC 11" x 7" TE Thin Electric Propeller (APCQ4128) **recommended** (draws 34 amps max.)
– OR –
❏ APC 10" x 7" TE Thin Electric Propeller (APCQ4123) **sport** (draws 30 amps max.)
– OR –
❏ APC 10" x 5" TE Thin Electric Propeller (APCQ4120) **sport** (draws 25 amps max.)

Note: *Motors from other manufacturers may work with the Reactor Bipe EP. However, the included motor mount adapter is designed to work specifically with the Great Planes motor listed.*

ESC (electronic speed control)

A brushless ESC (electronic speed control) is required for this plane. We recommend using the Great Planes Silver Series 35A Brushless ESC 5V/2A BEC (GPMM1830). Any other ESC should be capable of delivering a minimum of 34A continuous.

Battery Pack & Accessories

The Reactor Bipe EP has been tested with 11.1V LiPo packs ranging from 1200mAh to 2100mAh. Order numbers are provided for packs of this size. The lighter 1200mAh pack is suggested for maximum aerobatic performance, while the larger 2100mAh is suggested for best flight times. If you are planning to use the 25C 1200mAh battery pack, you cannot use the APC 11" x 7" propeller. In this case the 10" x 7" propeller is recommended.

❏ FlightPower EVO25 LiPo 1200mAh 11.1V 25C Discharge w/Balance (FPWP0313)
❏ Great Planes LiPo 1500mAh 11.1V 20C Discharge w/ Balance (GPMP0613)
❏ FlightPower EVO Lite LiPo 2100mAh 11.1V 18C Discharge w/Balance (FPWP0117)
❏ Great Planes LiPo 2100mAh 11.1V 20C Discharge w/Balance (GPMP0617)

Note: *Please be aware of the type of battery pack that you are choosing for this airplane. The battery pack must be able to deliver 30 amps continuously. The ones listed above are capable of doing this when they are in a "new condition" state. Batteries should be checked periodically using an inline "watt meter" for their ability to deliver this current. A battery's maximum continuous current rating can be found by multiplying the capacity (mAh rating) by the "C" rating by 0.001. For example:* ***1200mAh x 25C x 0.001 = 30 amps***

A LiPo-compatible charger is required for these batteries, along with a cell balancer. We recommend:

❏ Great Planes PolyCharge4™ LiPo battery charger (GPMM3015)
– AND –
❏ Great Planes Equinox™ 1-5 cell LiPo cell balancer (GPMM3160)
– OR –
❏ FlightPower V-Balance Complete balancer (FPWM0120)

Required Adhesive & Building Supplies

This is the list of adhesive and building supplies required to finish the Reactor Bipe 3D 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
❏ Drill bits: #38 [2.6mm], 1/16" [1.6mm]
❏ #1 Hobby knife (HCAR0105)
❏ #11 Blades (5-pack, HCAR0211)
❏ Hobbico® Steel T-Pins 1" (100) (HCAR5100)
❏ Great Planes Pro Threadlocker (GPMR6060)
❏ Great Planes Double-Sided Servo Tape 1" x 3' (GPMQ4442)
❏ CA applicator tips (HCAR3780)
❏ 220-grit Sandpaper
❏ Bru Line hemostat – curved 5-1/2" (BRUR1303)

Optional Supplies & Tools

Here is a list of optional tools mentioned in the manual that will help you build the Reactor Bipe 3D EP.

❏ 21st Century® sealing iron (COVR2700)
❏ 21st Century iron cover (COVR2702)
❏ 2 oz. [57g] spray CA activator (GPMR6035)
❏ 4 oz. [113g] Aerosol CA activator (GPMR634)
❏ Masking tape (TOPR8018)
❏ CA debonder (GPMR6039)
❏ Epoxy brushes (6, GPMR8060)
❏ Mixing sticks (50, GPMR8055)

❏ Mixing cups (GPMR8056)
❏ Hobbico Duster™ can of compressed air (HCAR5500)
❏ Panel Line Pen (TOPQ2510)
❏ Rotary tool such as Dremel® with cutoff wheel
❏ Hobbico Flexible 18" Ruler Stainless Steel (HCAR0460)
❏ Builder's Triangle Set (HCAR0480)
❏ AccuThrow™ Deflection Gauge (GPMR2405)
❏ Hobbico 12 Volt DC power supply (HCAP0250)

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**, and 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.

• Should covering repairs be required, use Top Flite® MonoKote®. 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 can 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.

Jet White – TOPQ0204
Metallic Teal – TOPQ0409
Metallic Plum – TOPQ0403
Metallic Platinum – TOPQ0408

• 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 Reactor Bipe 3D EP 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 is 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

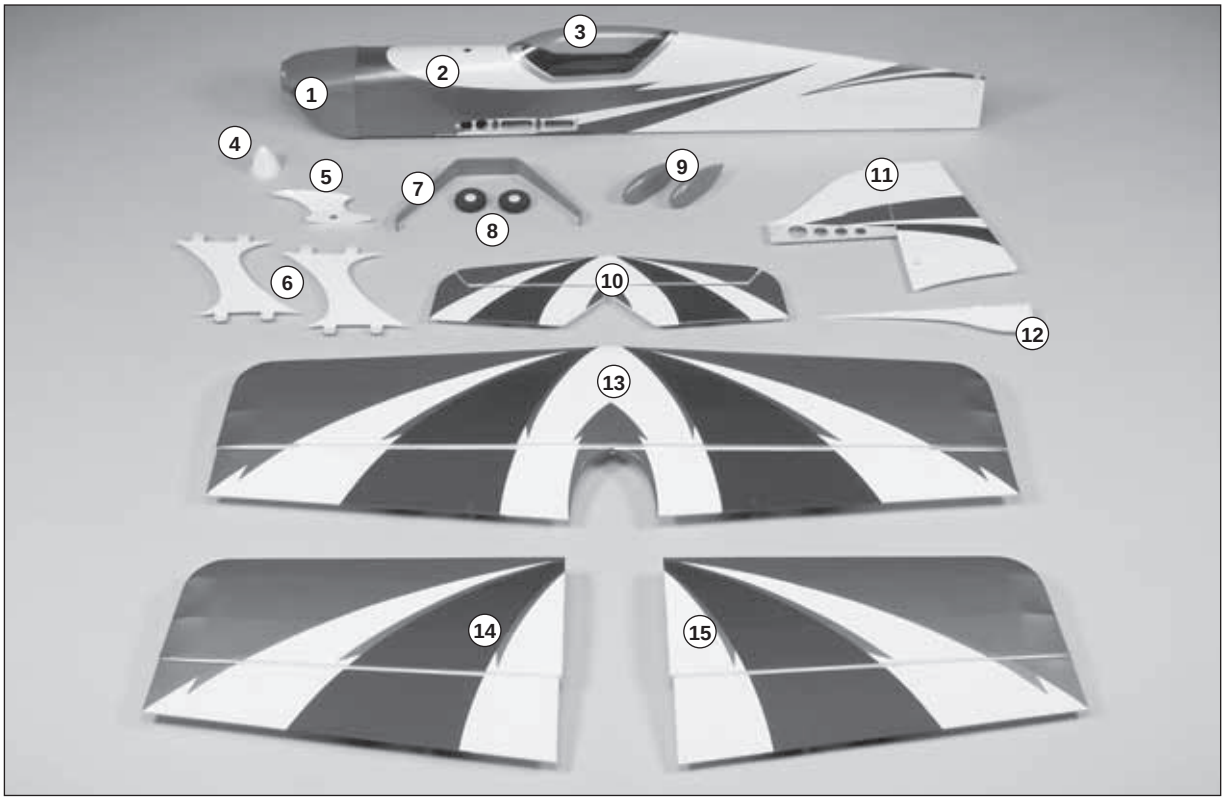
GPMA3137	Fuselage
GPMA3138	Top Wing Set
GPMA3139	Lower Wing Set
GPMA3140	Vertical Fin Set
GPMA3141	Stabilizer/Elevator Set
GPMA3142	Wing Struts
GPMA3143	Landing Gear
GPMA3144	Canopy
GPMA3145	Wheel Pants
GPMA3146	Battery Hatch
GPMA3147	Cowl
GPMA3148	Cabane Pylon
GPMA3149	Motor "X" Mount
GPMA3150	Decal Sheet

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

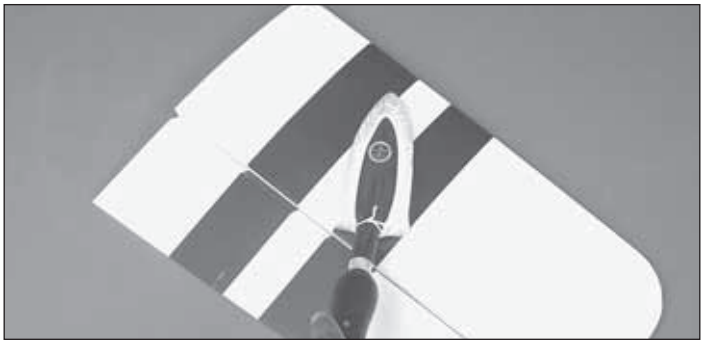
KIT CONTENTS



Kit Contents

1	Cowl
2	Fuselage
3	Canopy
4	Spinner
5	Cabane Strut Fairing
6	Interplane Struts (L&R)
7	Landing Gear
8	Main Wheels (2)
9	Wheel Pants (L&R)
10	Horizontal Stabilizer & Elevator Halves
11	Vertical Fin & Rudder
12	Tail Skid
13	Top Wing Panel w/Ailerons
14	Left Bottom Wing Panel w/Aileron
15	Right Bottom Wing Panel w/Aileron

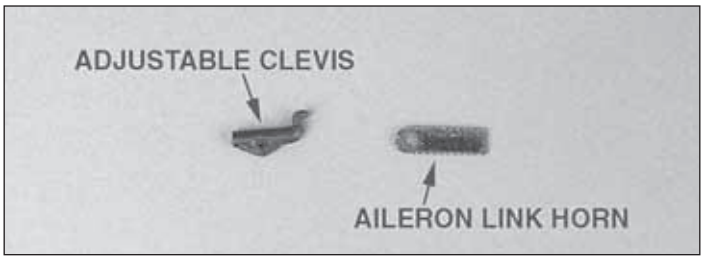
BEFORE YOU BEGIN



Before you begin assembling your model, inspect it for wrinkled covering and areas where the covering may not be tacked down adequately. Areas like the servo bay openings, the radio access hole (bottom of fuselage), and the slots for the horizontal stabilizer should be tacked down **before** trimming them with a knife. The covering should be tacked down to the wood using just enough heat to soften the adhesive backing. **Low heat** should be enough to accomplish this. More heat may be required to begin to tighten the covering.

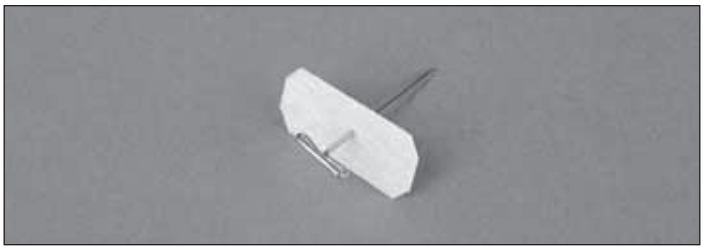
ASSEMBLE THE WINGS

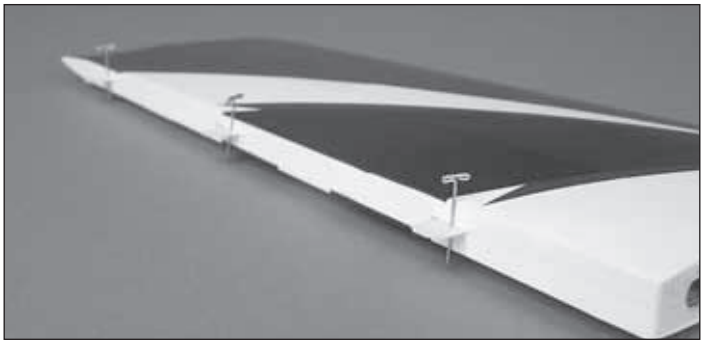
Install the Ailerons



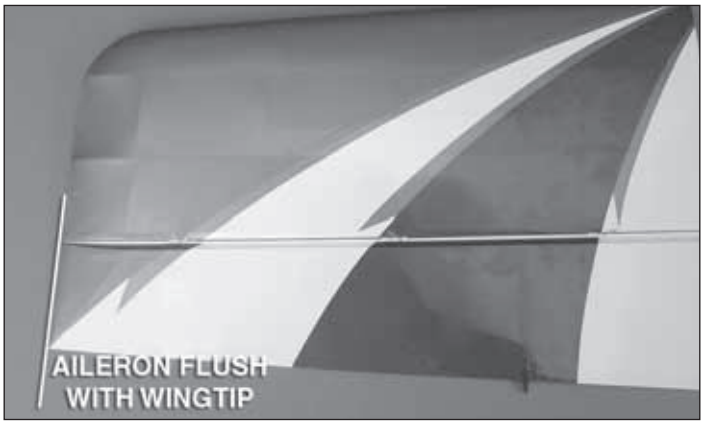
❏ 1. Locate the four flat aileron link horns. Check the size of the hole using one of the adjustable clevises. If the hole is too small, drill it out using a #38 drill bit. If this size bit is not available to you, a hobby knife can be used to carefully ream out the hole. Use 220-grit sandpaper to roughen up both sides of each link horn. This will improve adhesion.

❏ 2. Remove the adjustable clevis from the link horn and slide it into the slot at the TE of each of the four **ailerons**. Position each link horn so that the hole is aligned with the TE of each aileron as shown. Glue each link horn using seven to eight drops of thin CA glue.

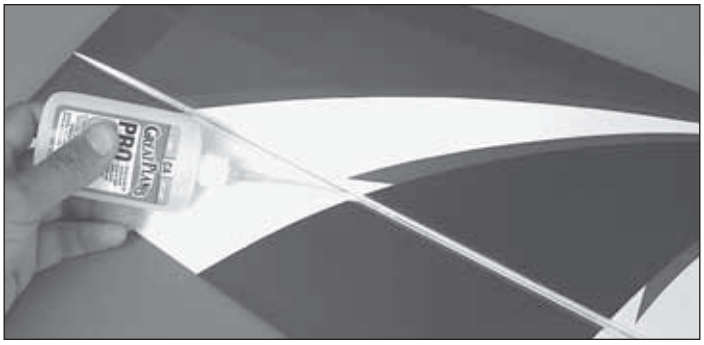




❏ 3. Push a T-pin through the center of twelve CA hinges and test fit each hinge in the hinge slots in the **top and bottom wing panels** and ailerons. If the hinge is difficult to insert or the covering interferes with insertion, use a sharp hobby knife to carefully enlarge the slot or trim the covering. To improve the adhesion of the hinge, we recommend trimming the covering from the area just above and just below the slot so that the hinge does not draw the covering into the slot.

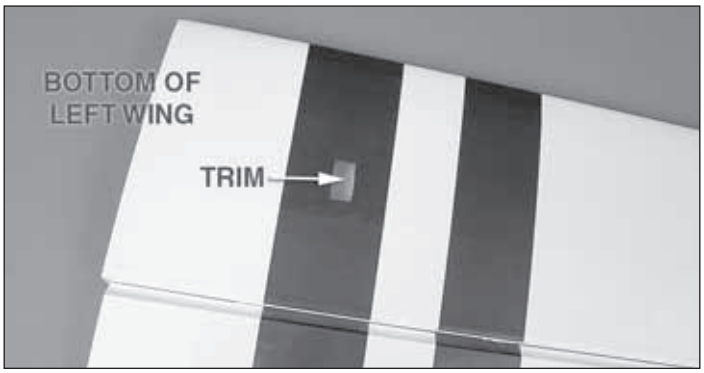


❏ 4. Insert the CA hinges halfway into the slots in the wing panels. Carefully slide each aileron onto the hinges. Align each aileron so that the tip of the aileron is even with the edge of the **wingtip**. Push the ailerons in tightly and then remove the T-pins from the hinges.

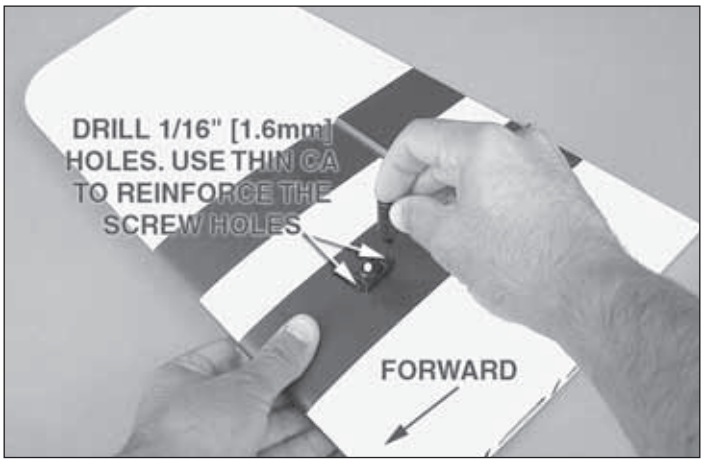


❏ 5. Deflect each aileron up and down until the beveled edge lies flat with the TE of the wing panel. This will ensure that you will achieve full travel of each aileron without opening too much of a gap. When satisfied with the fit of each aileron, apply seven to eight drops of thin CA glue to the top and bottom of each hinge. Allow the CA a few minutes to harden before attempting to move the ailerons. Do not use CA activator.

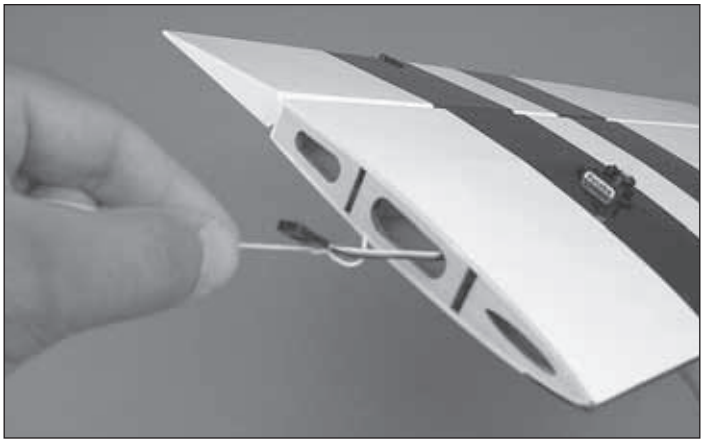
Install the Aileron Servos & Pushrods



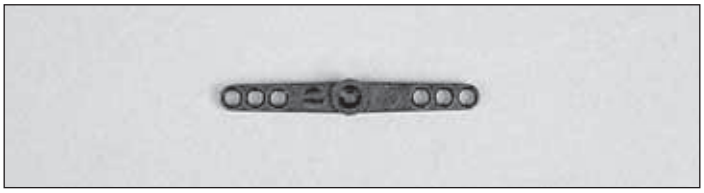
❏ 1. Using a sharp hobby knife, trim open the **aileron servo bay** in each lower wing panel.

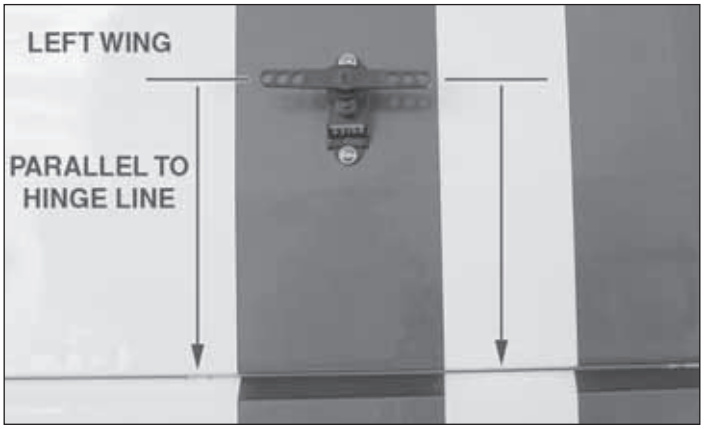


❏ 2. With the splines facing forward, temporarily insert a servo into each servo bay. Using a 1/16" [1.6mm] drill bit, drill holes for the servo mounting screws (provided with your servos). Thread a servo screw into each hole and then remove the screws and pull out the servos. Apply two to three drops of thin CA glue into each of the holes you threaded and allow the CA to dry thoroughly.

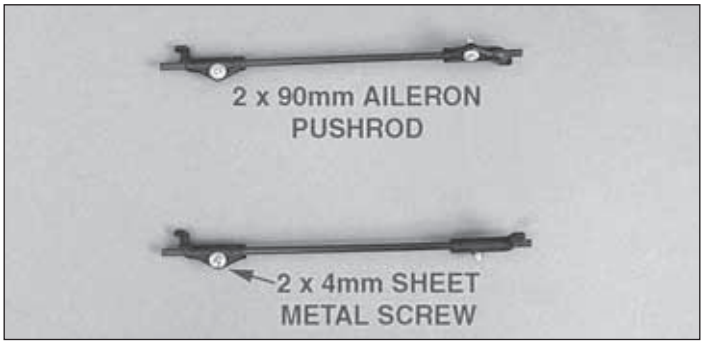


❏ 3. Reinstall the aileron servos and use the installation string to pull the servo lead out through the **wing rib**. Install the servo mounting screws.

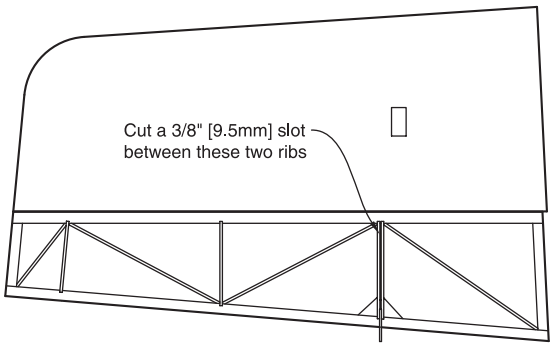


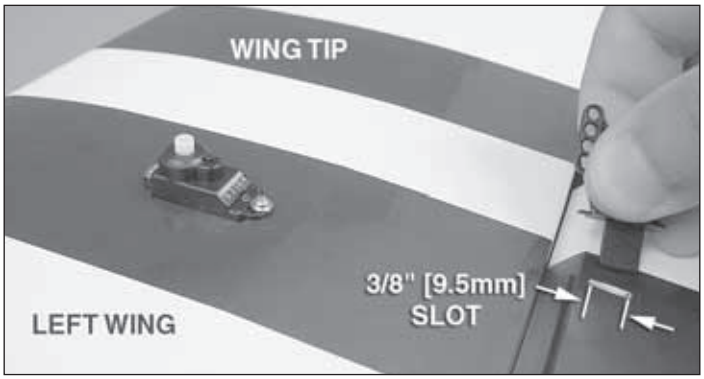


❏ 4. Use your radio to center the servos. Locate the servo arms that fit the splines of your servos. Test fit a double-sided servo arm onto each aileron servo. Fit the arm so that the two arms are aligned parallel to the hinge line. Cut off the **inboard arm**.



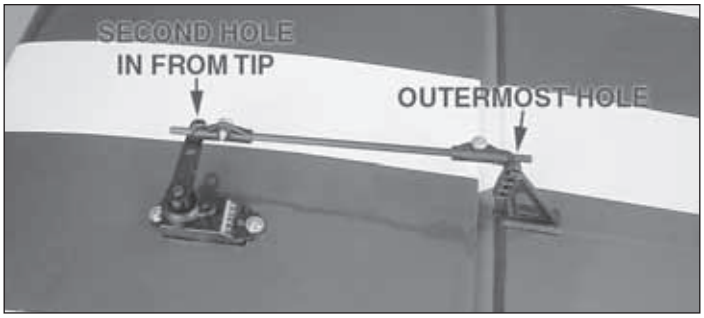
❏ 5. Locate four adjustable clevises, four 2 x 4mm sheet metal screws, and the two 2 x 90mm carbon fiber pushrods. Using 220-grit sandpaper, lightly sand the last 3/4" [19.1mm] of each side of each pushrod. Slide a clevis on each end of the pushrods and loosely thread a 2 x 4mm sheet metal screw into each clevis. Insert the screw on the side of the clevis that has the recessed hole. The other side of the clevis is thicker for the screw threads to engage in.





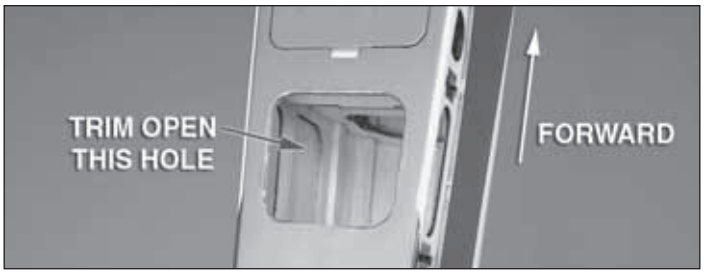
❏ 6. Cut a 3/8" [9.5mm] long slot in the lower wing ailerons just behind the beveled edge of the aileron LE. The slot will be cut between two closely spaced ribs directly ahead of where you installed the aileron link horns.

❏ 7. Clean the studs of the control horns with denatured alcohol and glue the horns in place with epoxy or thick CA.

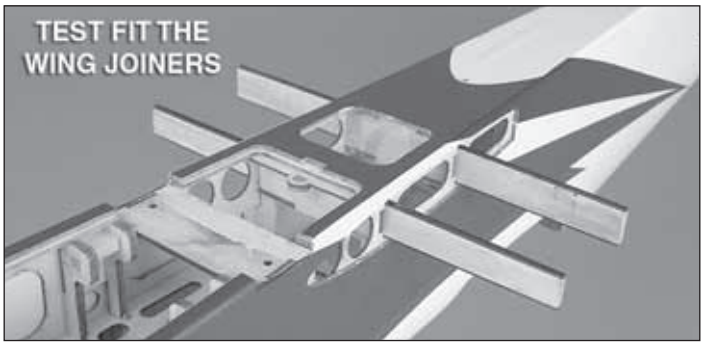


❏ 8. Install each pushrod in the control horn so that the clevis is in the **outermost hole** of the control horn. Install the other side of the pushrod in the servo arm so that the clevis is in the **second outermost hole**. This will require you to temporarily remove and reinstall the servo arm, so remember to reinstall the servo arm screw.

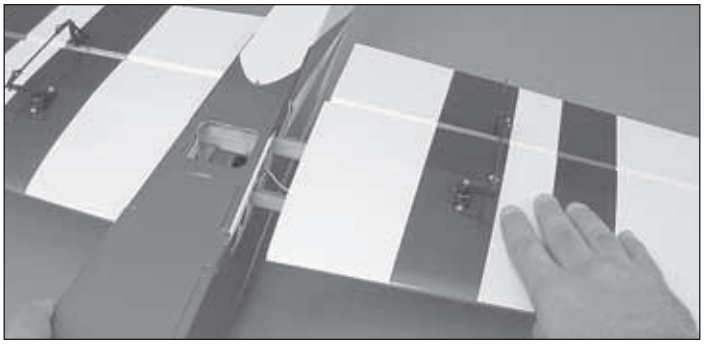
Install the Lower Wings



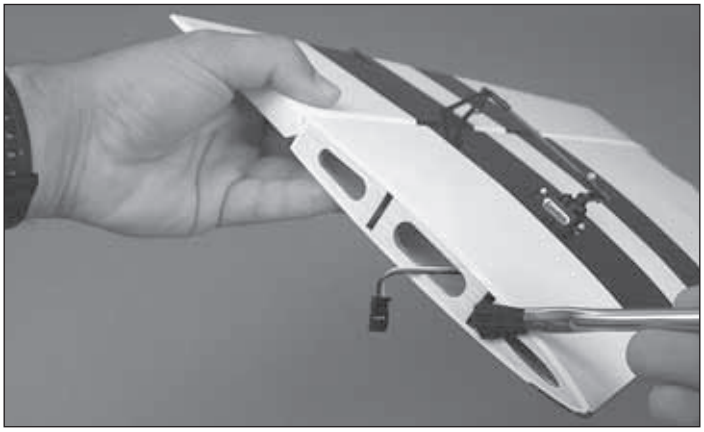
❏ 1. Trim the covering from the opening (and reseal along the edges with a covering iron), just behind the **battery access hatch** on the bottom of the **fuselage**. This is where the receiver will be installed later.



❏ 2. Locate the **front** and **rear wing joiners**. Test fit each one inside of the fuselage. You should not need to force the joiner into position. If a joiner is too tight, you may lightly sand the flat face and the upper or lower carbon edge of the joiner until it will slide into place. Use only 220-grit sandpaper for this.

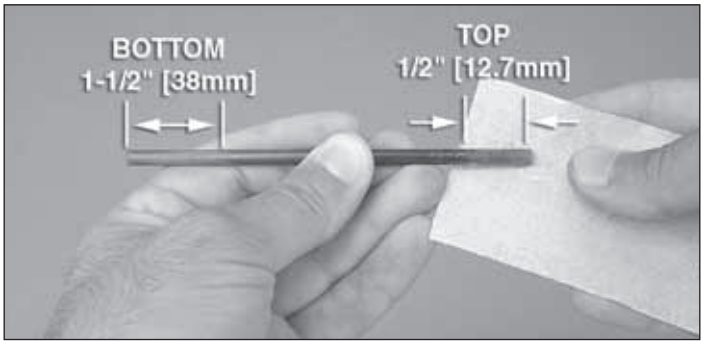


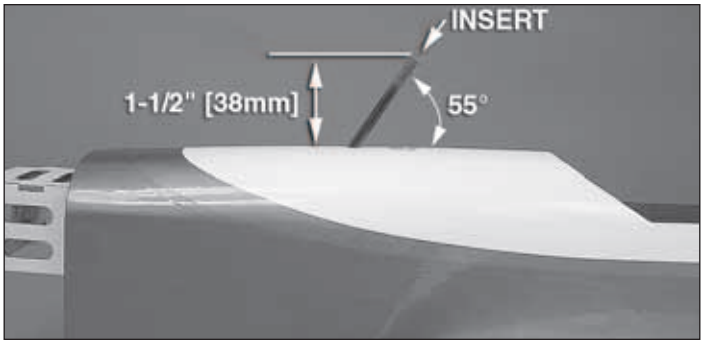
❏ 3. Test fit the two lower wings to the joiners. Check to see that each wing will slide all the way into its respective fuselage pocket.



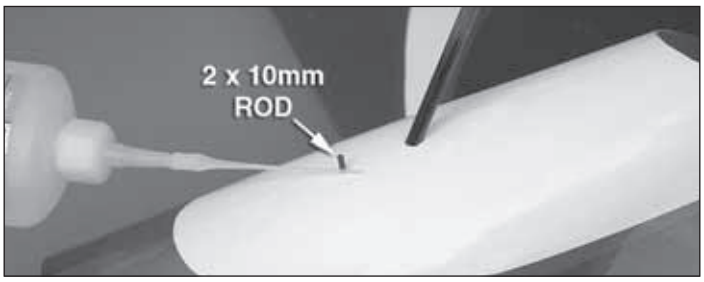
❏ 4. Using 30-minute epoxy, apply a thin film of epoxy to the joiners and to the wing root ribs. Slide the lower wings onto the **wing joiner rods** until the root ribs sit flat against the fuselage sides. Masking tape may be used to hold each wing tightly against the fuselage. Clean up any epoxy residue using denatured alcohol.

Install the Upper Wing

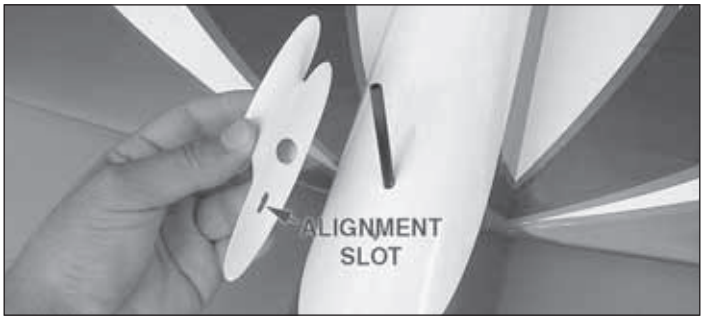




❏ 1. Locate the 5 x 120mm **carbon strut tube**. Use 220-grit sandpaper to roughen up the top 1/2" [12.7mm] and the bottom 1-1/2" [38mm] of the carbon strut tube. **Without applying any glue,** slide the tube through the hole in the top of the fuselage at a 55° angle. (To make it easier to achieve the 55° angle, see the **cabane strut installation template** on page 27). Push the rod in so that the top of the tube is 1-1/2" [38mm] from the top of the fuselage. You will slide this up into the top wing and epoxy it in place later.

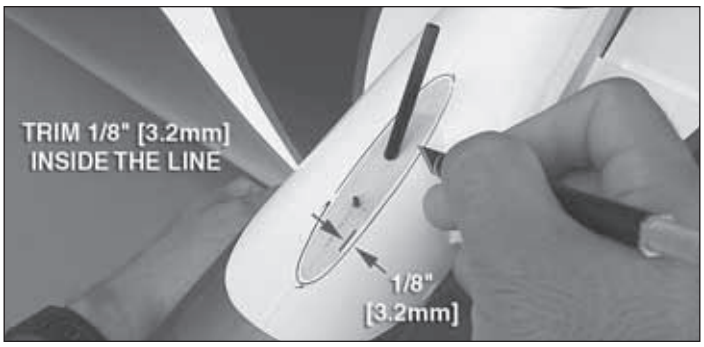


❏ 2. Slide the small 2 x 10mm **carbon rod** through the small hole in the top of the fuselage just ahead of where you fitted the carbon strut tube. Position it so that approximately 3/16" [4.8mm] of the rod is sticking out of the fuselage. Use thin CA to glue this in place.



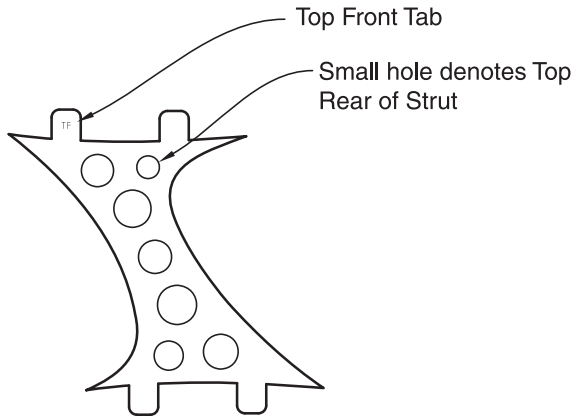
❏ 3. Test fit the **cabane strut fairing** to the fuselage, noting that the bottom of the fairing is identified with an alignment slot. Align the fairing by holding it onto the fuselage and sliding

it fore and aft until the fairing is approximately centered. With a felt-tip pen, trace the outline of the fairing on the fuselage.

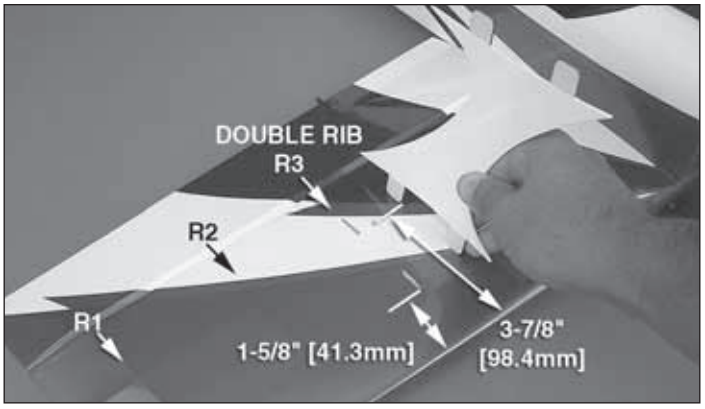


❏ 4. Use a hobby knife to trim the covering so that you are trimming about 1/8" [3.2mm] inside of the line you drew. Re-tack the covering using a sealing iron. Use denatured alcohol to wipe away the lines.

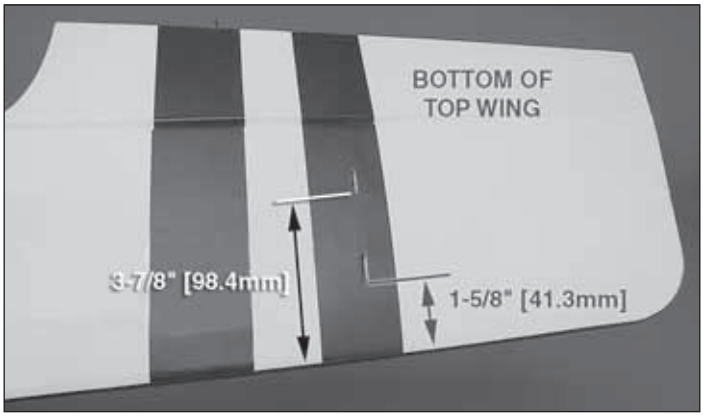
❏ 5. Use 220-grit sandpaper to roughen up the bottom gluing surface of the strut fairing. Using thick CA or epoxy, glue the fairing and press it to the fuselage. Make sure that the carbon strut tube is approximately centered in the hole in the fairing.



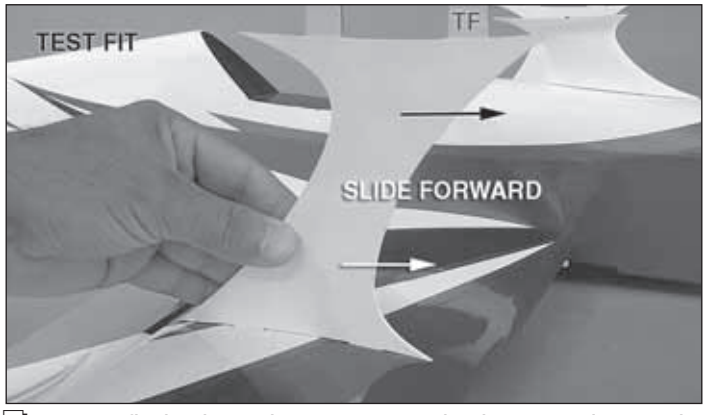
❏ 6. Locate the two **interplane struts** and identify the **top front tab** of each strut. Each strut is marked with the letters **"TF"** to help you. Another way to identify the top of the strut is to look for the small lightening hole behind the covering.



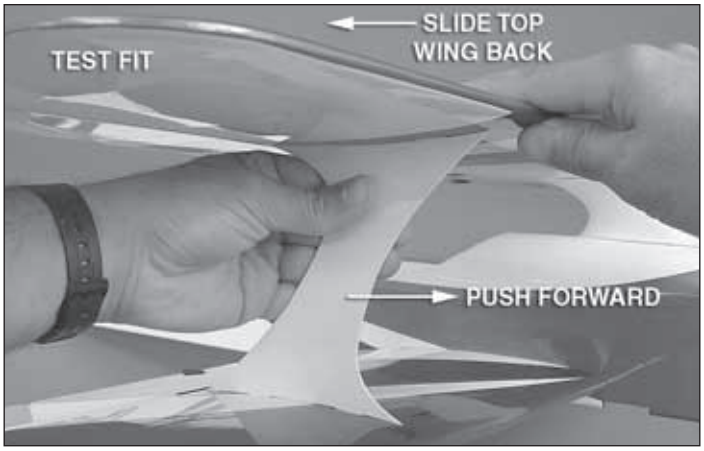
❏ 7. Use an interplane strut to help you locate the slots in the **top of the lower wings** where the strut tabs will install. The slots are located at the **third rib** in from the wingtip OR about half-way in on each wing. You will be cutting **between two closely spaced ribs**. The LE of the forward slot is 1-5/8" [41.3mm] from the LE of the wing. The LE of the rear slot is 3-7/8" [98.4mm] from the LE of the wing. Each slot must be cut 5/8" [15.9mm] long. If you have not already done so, use a covering iron set to low to tack down the covering before you trim. Trim the slots as shown.



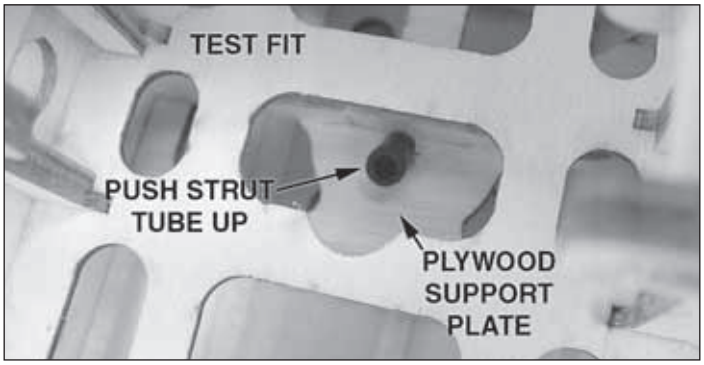
❏ 8. Use an interplane strut to help you locate the slots in the **bottom of the top wing** where the strut tabs will install. These slots are located at the **third rib** in from the wingtip. The LE of the forward slot is 1-5/8" [41.3mm] from the LE of the wing. The LE of the rear slot is 3-7/8" [98.4mm] from the LE of the wing. Each slot must be cut 5/8" [15.9mm] long. Trim the slots as shown.



❏ 9. Test fit the interplane struts to the bottom wing. Make sure that the tab marked **"TF"** is pointing up. Slide each strut forward until it stops.



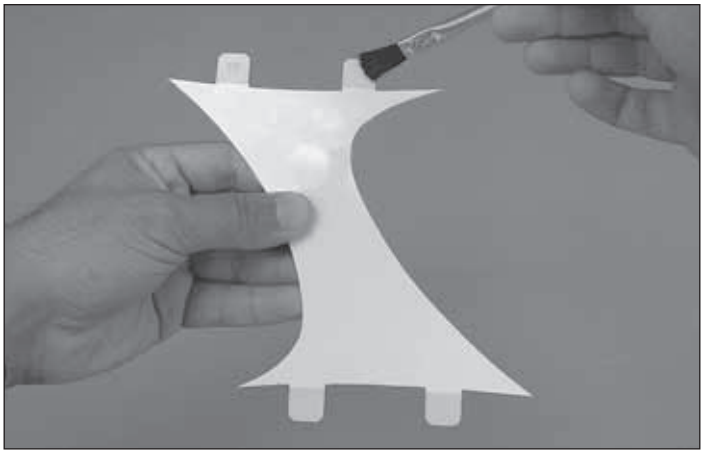
❏ 10. Test fit the top wing by sliding it onto the corresponding strut tabs. Press the wing down and slide it back until it stops. The LE of all the strut tabs must butt up against the back edge of the wing spars.



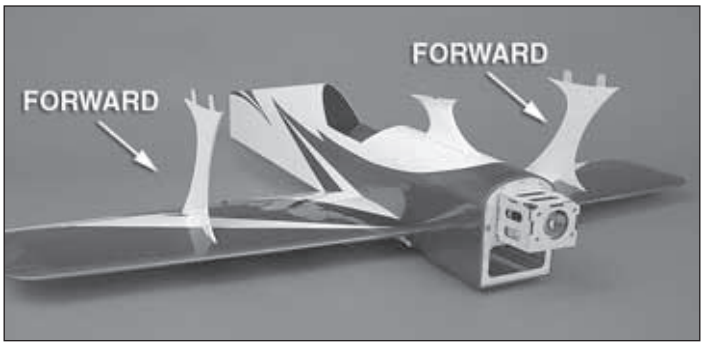
❏ 11. Turn the model over and push the carbon strut tube up into the wing. The strut tube is properly positioned when the bottom of the tube sits no more than 1/8" [3.2mm] above flush from the **plywood support plate**. This is not a critical dimension. It is only a guideline so that you know that the strut tube will be firmly anchored in the wing cavity.

❏ 12. When you are satisfied with the fit of the wing, remove the upper wing and the interplane struts. Slide the carbon rod back into the fuselage until it sits flush with the top of the strut fairing.

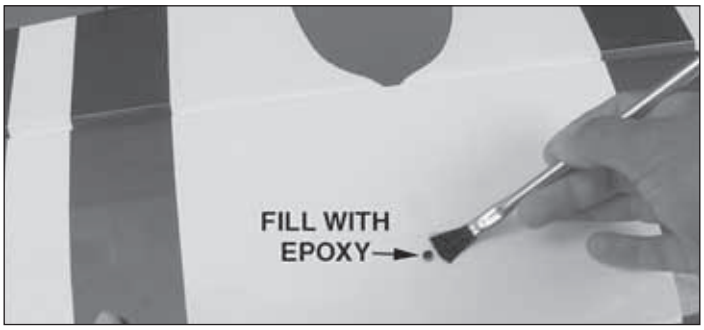
Please Note: You should familiarize yourself with the next few steps before you begin work. You will need to mix up a batch of 30-minute epoxy and steps 13 through 18 must be accomplished before the epoxy cures.



❏ 13. Apply 30-minute epoxy to the interplane strut tabs. A thin film should be applied to both sides of the top and bottom tabs.



❏ 14. Install the interplane struts onto the **lower wings** like you did before.

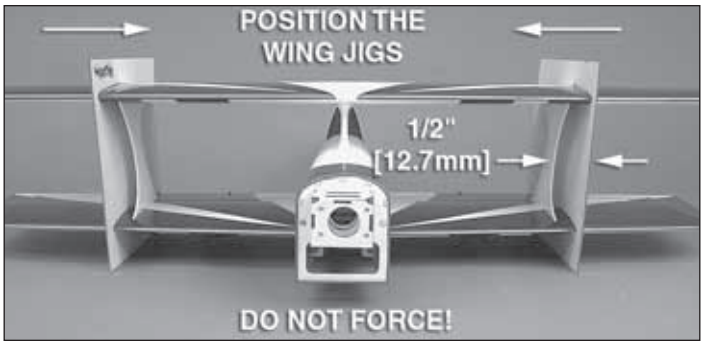


❏ 15. On the upper wing, fill the strut tube cavity with 30-minute epoxy.

❏ 16. Turn the airplane over and install the airplane onto the top wing.

❏ 17. Slide the carbon strut tube up into the top wing, making sure that it sits no more than 1/8" [3.2mm] above flush from

the plywood support plate. Apply a generous bead of epoxy to the carbon tube and plywood support plate.



❏ 18. Slide the two **wing alignment jigs** onto the wings as shown. Do not force the jigs to slide closer than 1/2" [12.7mm] from the interplane struts. Check the alignment of the top wing by viewing from the top down – match the LEs of the top and bottom wings.

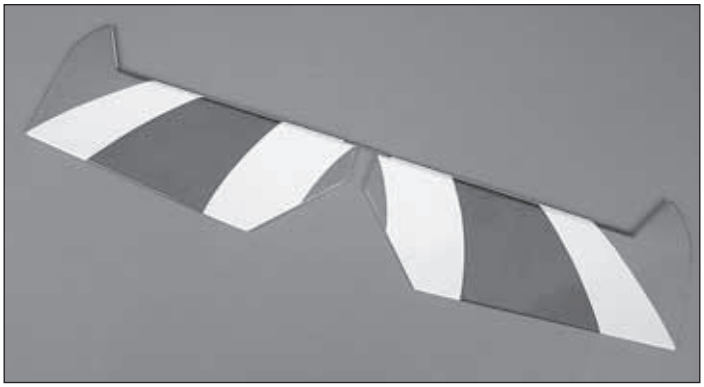
❏ 19. Set the plane aside and allow the epoxy to cure.

BUILD THE FUSELAGE

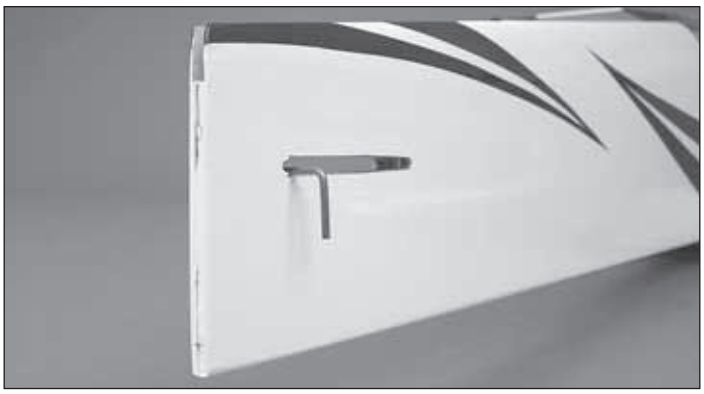
Install the Horizontal & Vertical Tail

❏ 1. Trim the covering from the opening in the fuselage where the **horizontal stabilizer** will install. Re-tack the covering using a sealing iron.

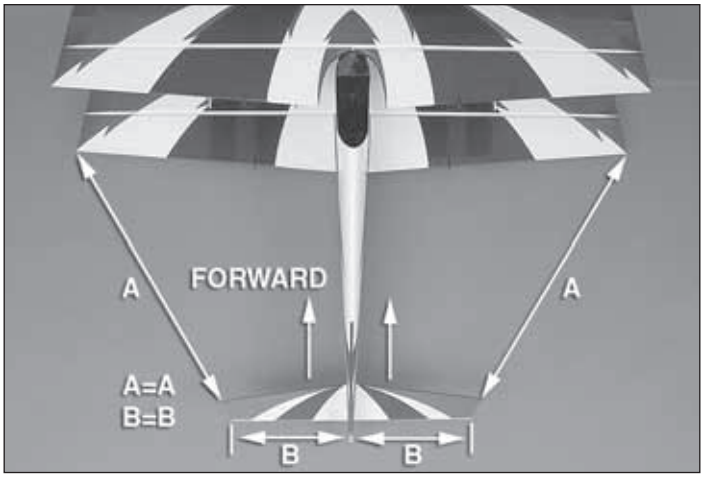
❏ 2. Locate the "U" shaped **elevator joiner wire** and the two **elevator halves**. Using 220-grit sandpaper, roughen up the arms of the joiner wire.



❏ 3. Lay the elevator assembly on a flat work surface and check to see that it lies flat. If not, remove the elevator joiner wire and bend it a small amount. Reinstall the joiner wire and check it again. **Caution:** Do not attempt to bend the joiner wire while it is installed in the elevator halves. This can damage the wood and cause the elevator to come apart in flight.

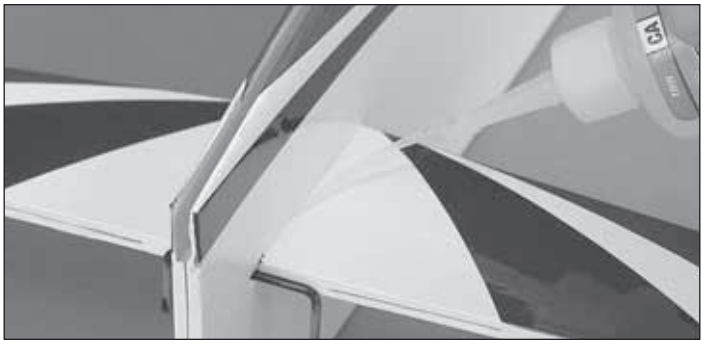


❏ 4. Insert the elevator joiner wire into the **stab slot** and position it at the rear of the slot.



❏ 5. With the airplane on a level surface, test fit the horizontal stab to the fuselage and position it so that it is as far forward

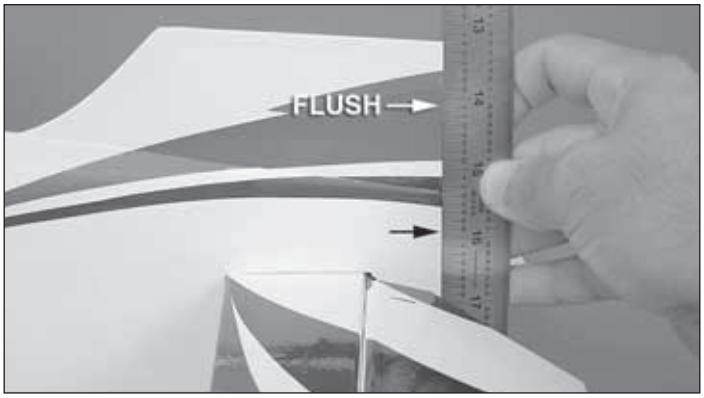
in the slot as it will go. Center the stab from left to right and square it in the fuselage by measuring the distance from each lower wingtip to the tips of the stab. Stand several feet behind the model and check to see if the stab is parallel with the lower wing. If it is not level, use a small weight to level it. Lightly sanding the stab slot in the fuselage is also acceptable, but be careful not to remove too much material. Remove the stab.



❏ 6. Use **thin CA** to glue the horizontal stabilizer to the fuselage. Run two generous beads of thin CA into the left and right stab to fuse joints. Do this on the top and bottom of the stab. Let the glue dry and check the stab for a strong and secure bond. You may use CA debonder applied to a paper towel to clean up any excess CA on the covering.

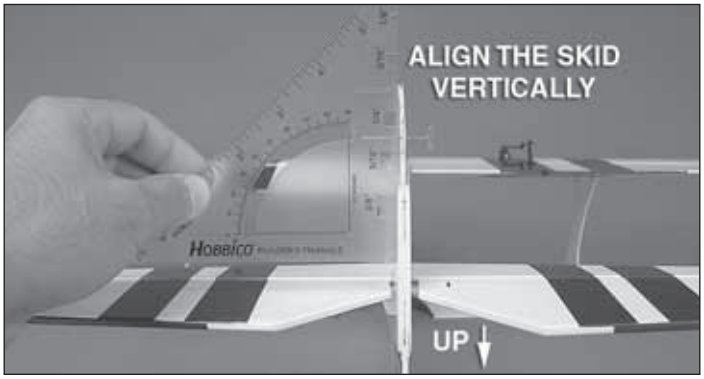
❏ 7. As you did with the ailerons, push a T-pin through the center of 6 hinges and fit them to the horizontal stabilizer. Carefully slide each elevator onto the **stab** and the **elevator joiner wire**. Position the hinges so that they are equally spaced. Bend the elevator up and down several times and check for free travel.

❏ 8. When you are satisfied, use thin CA to glue the hinges and the joiner wire. Be sure to wick at least five to six drops of CA into the joiner wire. Allow this time to harden without CA accelerator.

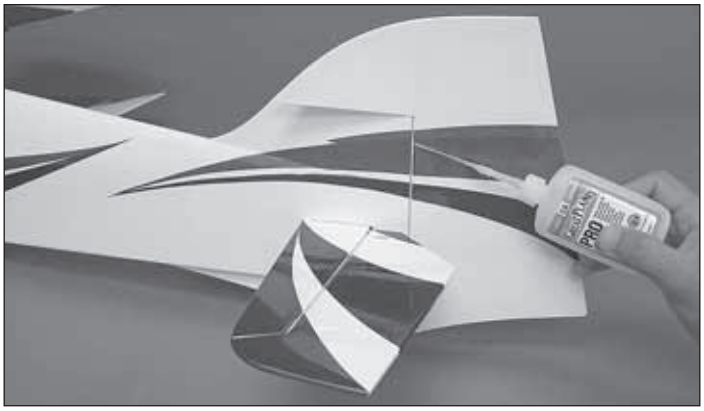


❏ 9. Fit the **vertical fin** into the fuselage. Using a straightedge or the LE of the **rudder**, make sure that the TE of the vertical fin is flush with the TE of the fuselage. When you are satisfied with the fit, glue the fin to the fuselage.

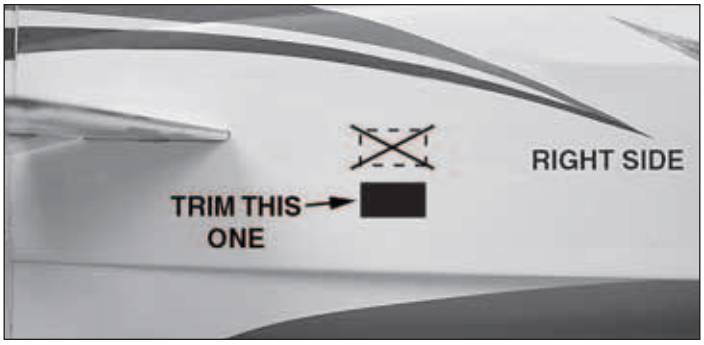
❏ 10. Prepare and insert one hinge into the TE of the **tail skid**. Do not glue the hinge yet. Apply medium CA to the 10mm washer and insert it into the slot at the bottom of the tail skid.



❏ 11. Fit the tail skid to the bottom of the fuselage. Align the skid with the TE of the fuselage as you did with the fin above. Use a straightedge or a builder's triangle to make sure that the skid is vertical, and glue it to the fuselage.



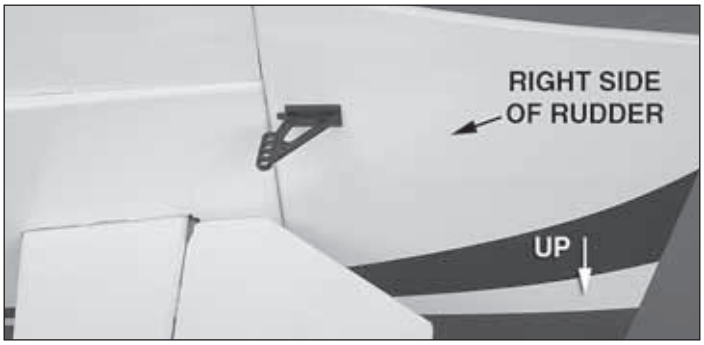
❏ 12. Join the rudder to the fin using four CA hinges.



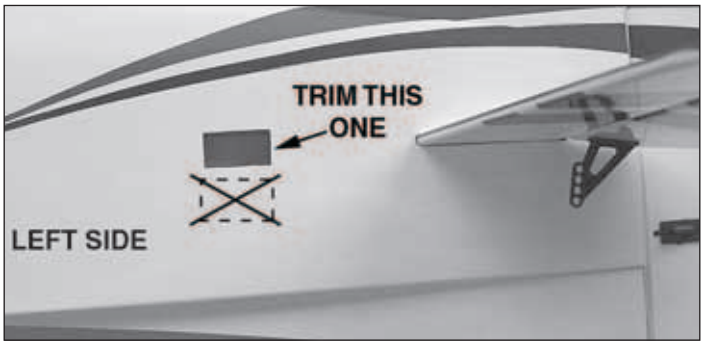
❏ 3. Trim the covering from the **lower servo bay** on the **right side** of the fuselage. This is where the rudder servo will be installed. Re-tack the covering using a sealing iron.

Install the Tail Servos & Pushrods

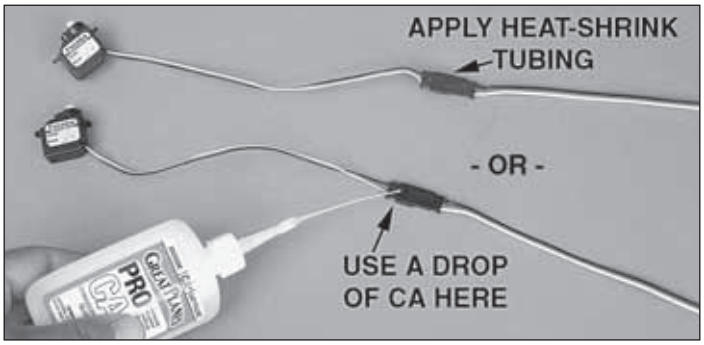
❏ 1. Locate two control horns and two horn retainers. Fit one horn to the **bottom** of the **left elevator.** Turn the model over and install a horn retainer onto the stud of the control horn. Apply one drop of medium CA to each side of the stud. You may trim off the tip of the stud after the glue has cured.



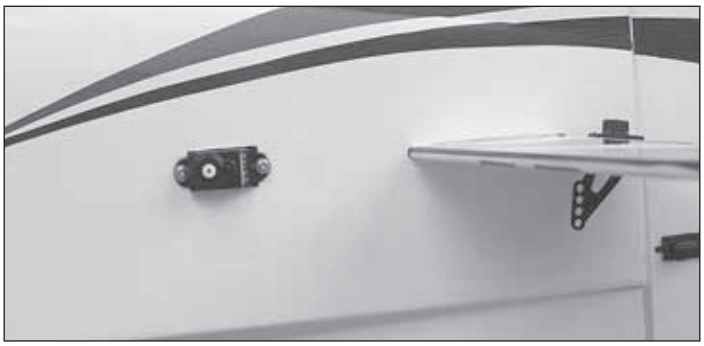
❏ 2. Install the other horn on the **right side** of the rudder.



❏ 4. Trim the covering from the **upper servo bay** on the **left side** of the fuselage for the elevator servo. Re-tack the covering using a sealing iron.

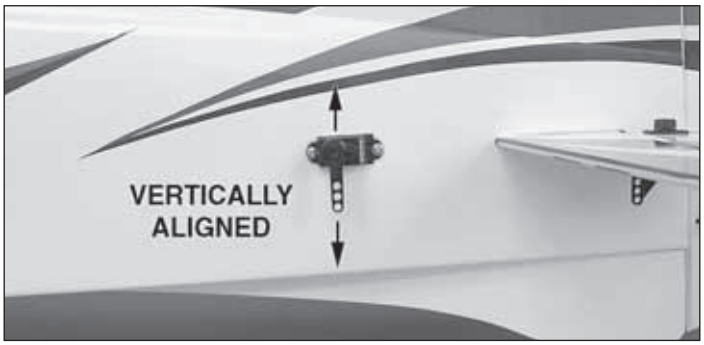


❏ 5. Connect a 12" [305mm] servo extension to each of the tail servos. Use one drop of medium CA or heat-shrink tubing to secure the servo extension to the servo lead.

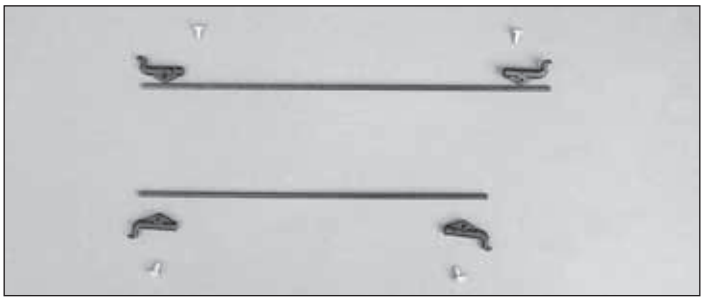


❏ 6. Feed the servo leads through the fuselage and into the radio compartment. Position the servos so that the splines face forward and drill 1/16" [1.6mm] holes using the servo tabs as your guide. Thread a servo screw into each hole and then remove the screws and pull out the servos. Apply two to three drops of thin CA glue into each of the holes you threaded and allow the CA to dry thoroughly.

❏ 7. Reinstall the tail servos and secure them with servo mounting screws.

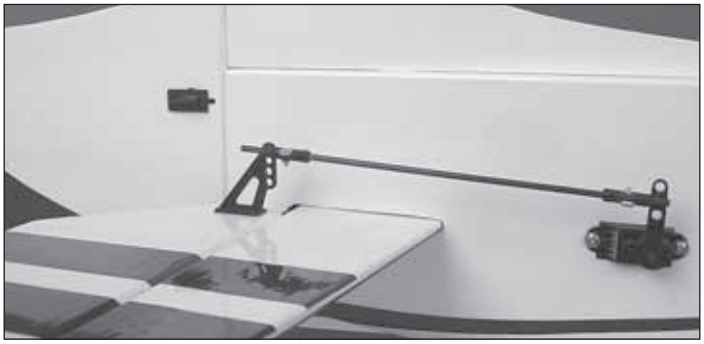


❏ 8. Use your radio to center the servos. Locate the servo arms that fit the splines of your servos. Test fit a servo arm onto each tail servo. Choose the arm that aligns closest to vertical.



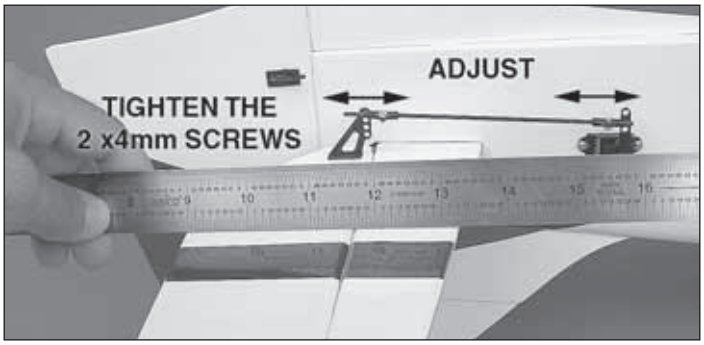
❏ 9. Prepare the 2 x 155mm rudder pushrod and the 2 x 130mm elevator pushrod the same way you prepared the aileron pushrods. Partially thread the 2 x 4mm sheet metal screws into the clevises.

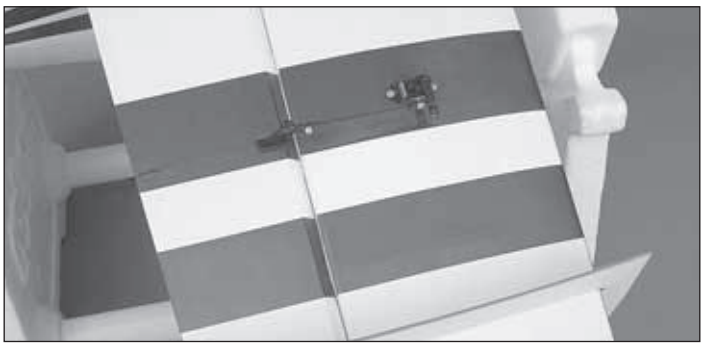
❏ 10. Install the 2 x 155mm rudder pushrod in the **second hole** in from the tip of the **rudder horn**. Install the other clevis in the outermost hole of the servo arm.



❏ 11. Install the 2 x 130mm elevator pushrod in the outermost hole of the elevator horn. Install the other clevis in the **second hole** in from the tip of the **servo arm**.

Adjust the Pushrods & Link the Ailerons

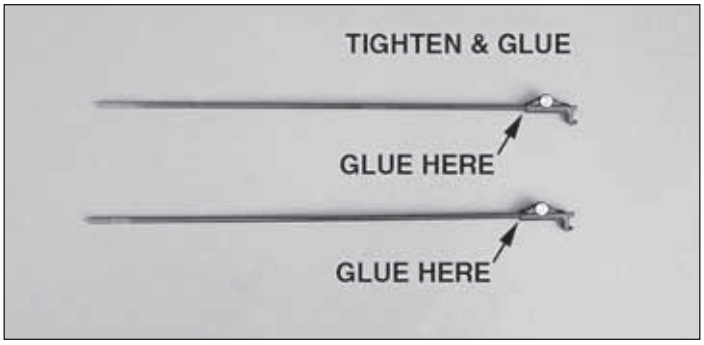




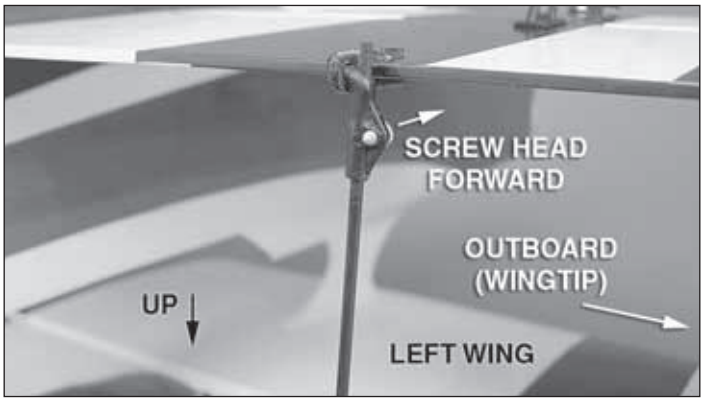
❏ 1. Use your radio to help you adjust the length of each pushrod. You should adjust your **elevator, rudder,** and both **aileron pushrods** at this time. Use a straightedge to help you center each control surface. You may use the wing jigs to check the ailerons after you have made an adjustment.

For example: Turn on the radio, adjust the aileron pushrod, check the position with the wing jig, readjust, and so on.

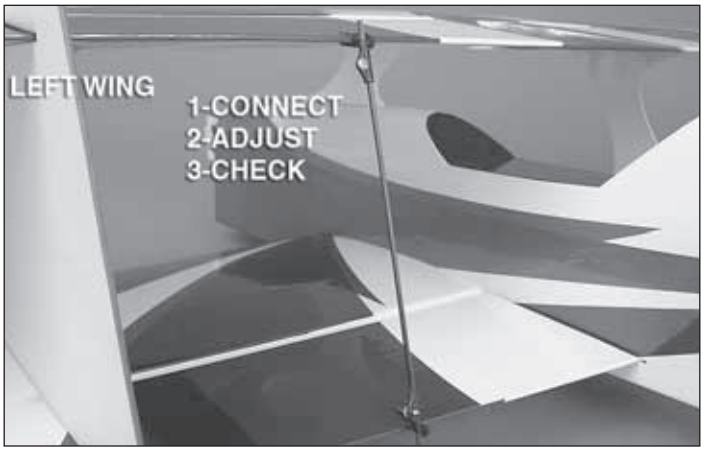
❏ 2. Tighten the 2 x 4mm sheet metal screws when you are satisfied with the pushrod alignments.



❏ 3. Locate the two 2 x 160mm **aileron link rods** and install one adjustable clevis to only **one side of each rod**. Position the clevises as shown and secure them using 2 x 4mm sheet metal screws. Use two drops of thin CA to glue the clevises to the rods.

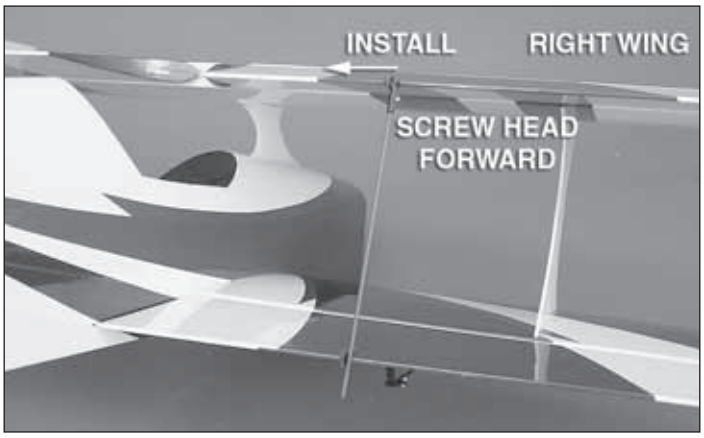


❏ 4. Install one of the aileron link rods to the **lower aileron** of the **left wing**. Install it from the **outboard side** of the wing so that the screw head is facing the front of the airplane. You will make your adjustments to the opposite clevis.

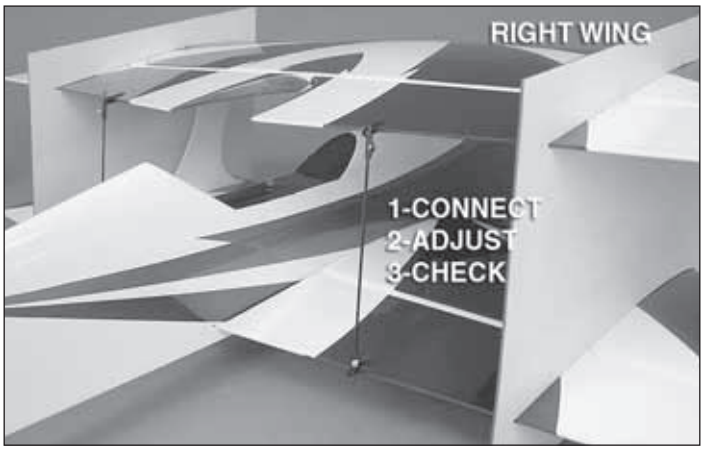


❏ 5. Install an adjustable clevis to the **top left aileron** from the **outboard side**. Insert the aileron link rod into this clevis and adjust the rod length so that both ailerons are at "zero throw" and are parallel to one another. You may use a wing jig to help you check the alignment after the top and bottom ailerons are linked.

❏ 6. When you are satisfied with the upper aileron alignment, secure the clevis on the **top left aileron** with a 2 x 4mm sheet metal screw.



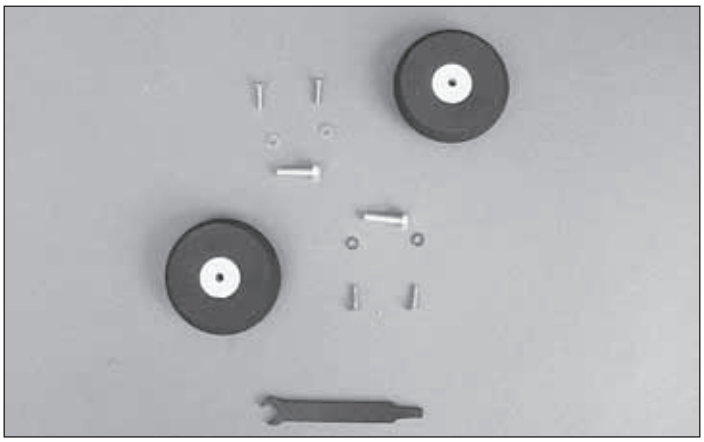
❏ 7. Install the other aileron link rod to the **upper aileron** of the **right wing**. Install it from the outboard side of the wing so that the screw head is facing the front of the airplane.



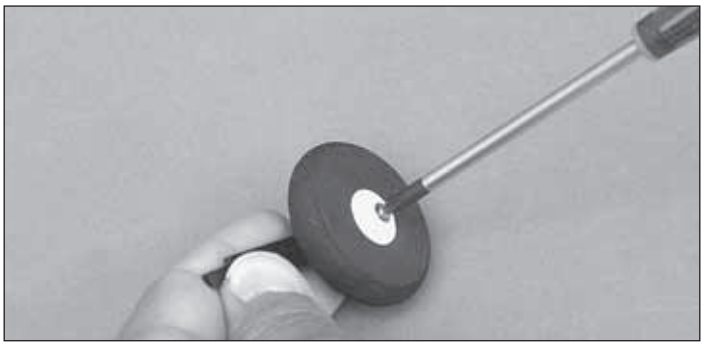
❏ 8. Install an adjustable clevis to the bottom right aileron of the right wing and insert the aileron link rod into the clevis. Make the necessary adjustments and then secure the clevis with a 2 x 4mm sheet metal screw.

FINISH THE MODEL

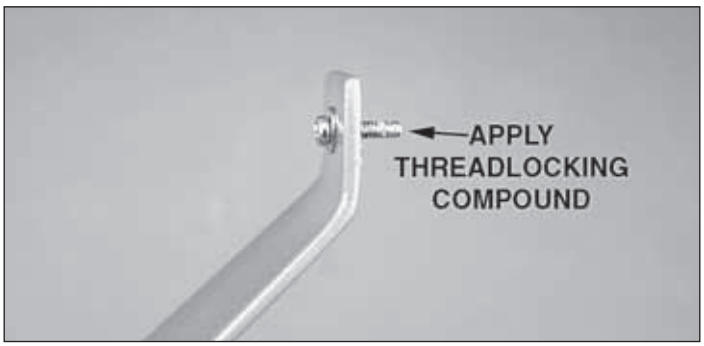
Install the Landing Gear



❏ 1. Locate two axles, two 1.5" [40mm] foam wheels, four 2 x 8mm machine screws, and four 2mm washers. **Note:** Four 2 x 8mm washer head screws may be supplied in place of the machine screws and washers. These will require no washers.

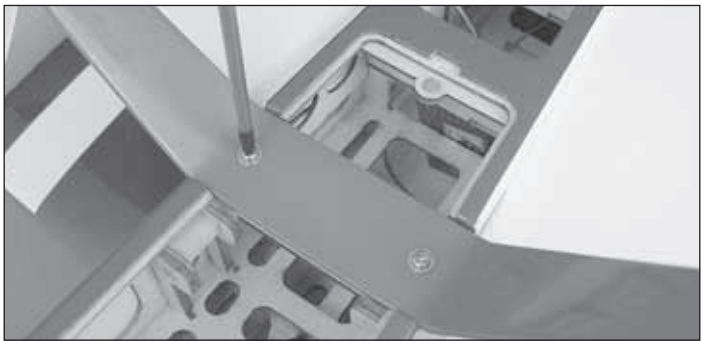


❏ 2. Apply light machine oil to the axle shaft and fit the wheel. Apply threadlocking compound to one 2 x 8mm machine screw. Install the screw with one 2mm washer on the axle as shown.



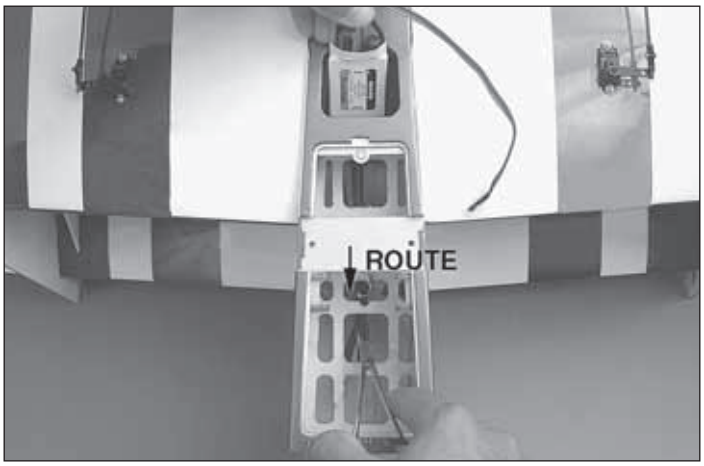
❏ 3. Apply threadlocking compound to one 2 x 8mm machine screw. Install the screw with one 2mm washer through the landing gear leg as shown.

❏ 4. Put the axle and wheel assembly inside one **wheel pant.** Thread it onto the 2 x 8mm axle screw and tighten this down using the included wrench. As you are tightening, position the wheel pant so that it keys into the landing gear leg. Make sure that the wheel pants are installed so that the **swept edge of the landing gear leg is facing aft**.

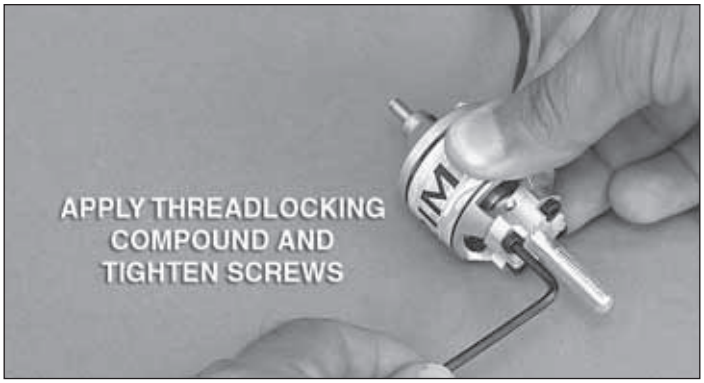


❏ 5. Locate two 3 x 15mm machine screws and two 3mm washers. Apply threadlocking compound to the threads of the screws and install the landing gear leg on the fuselage.

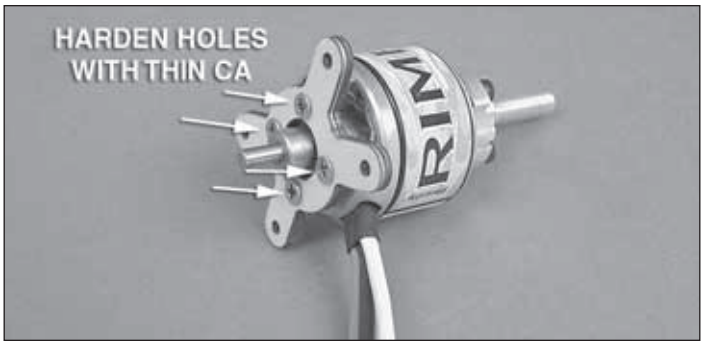
Install the ESC & Motor



❏ 1. Route the ESC through the radio compartment access hole that you cut earlier. Pull the three motor leads through the hole in the firewall using a curved-tip hemostat or long nose pliers. Use one or more twist ties to bundle the motor leads together to make it easier.



❏ 2. Apply threadlocking compound to the prop adapter screws and tighten the prop adapter onto the motor. Remove the "X" mount that was included with the motor and retain the four 3 x 8mm countersunk screws. Tighten all motor screws.



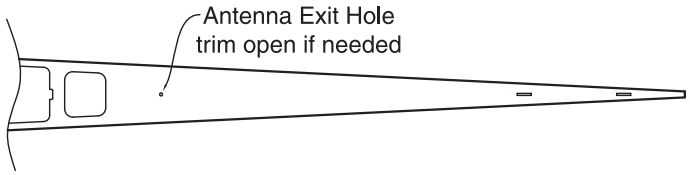
❏ 3. Temporarily install the supplied wooden "X" mount using the countersunk screws. Tighten the screws until the head is 1mm above the surface of the wooden "X" mount. Remove the screws and the motor and harden the holes in the mount with thin CA.

❏ 4. Apply threadlocking compound to the screw threads and reinstall the "X" mount with the screws.

❏ 5. Apply threadlocking compound to four 3 x 10mm machine screws and use four 3mm washers to attach the motor to the motor mounting box.

❏ 6. Connect the motor leads to the ESC. Any motor wire can be connected to any ESC wire at this point.

Install the Radio

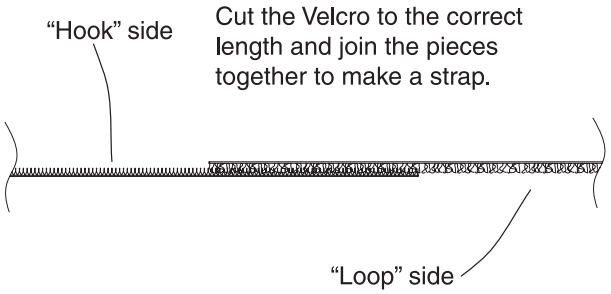


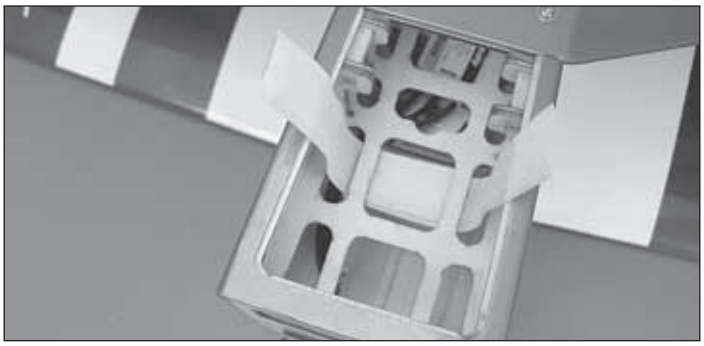
❏ 1. Use the sketch above to help you locate the pre-drilled antenna exit hole. **Trim the covering from the antenna exit hole only!** You may skip this step and the next step if you are using a 2.4GHz spread spectrum receiver.

❏ 2. Route your antenna lead through the hole and out of the fuselage. Tape the end of the antenna to the side of the tail skid.

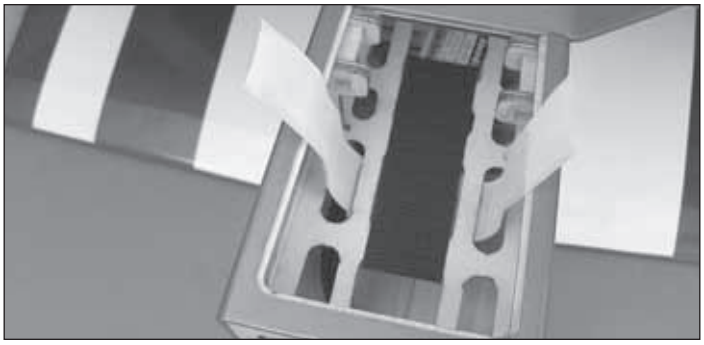
❏ 3. Plug your servo leads into their corresponding channels on the receiver.

❏ 4. Use double-sided servo tape to mount your radio receiver to the back side of the forward wing spar. You may apply 30-minute epoxy to the back side of the front wing spar to help the double-sided tape stick better.





❏ 5. Make a battery strap out of the included 5" [127mm] hook and loop material and route it as shown.

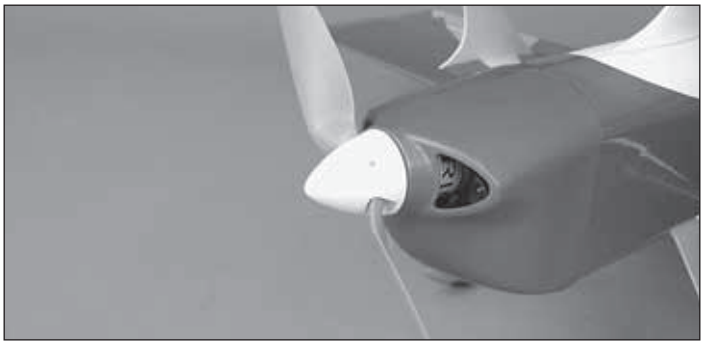


❏ 6. Attach the hook side of the included 3" [76mm] adhesive backed hook and loop material to the **battery tray**.

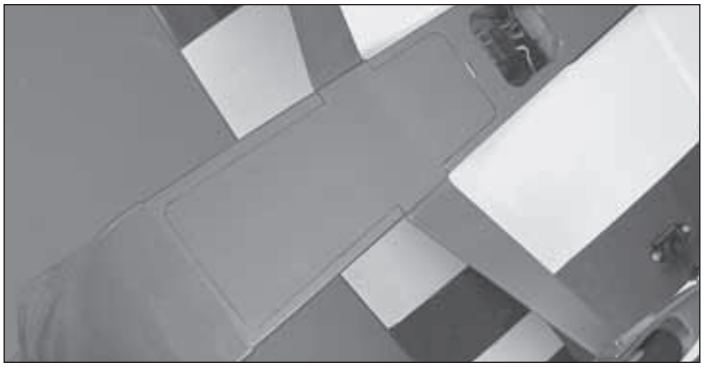
❏ 7. Without the propeller installed and your radio on, plug in your battery and **check to see which direction the motor rotates**. The motor should rotate counterclockwise as viewed from the front. If the motor rotates in the wrong direction, you must unplug two motor leads and swap their position.

FINAL ASSEMBLY

❏ 1. Install the **cowl**.



❏ 2. Install the spinner backplate and then the propeller onto the motor.



❏ 3. Install the **battery hatch cover**.

❏ 4. Use clear tape to attach the **canopy** as shown.

❏ 5. Take time to double check all of the **adjustable clevises** for security and each of your **servo arm screws**. Make sure that all of the screws on the adjustable clevises are tight and that none of the clevises slip on the pushrods when you pull on them. After the initial "test flight" and when the controls are trimmed, we recommend that you remove all of the pushrods (noting their position) and carefully apply one drop of thin CA to each adjustable clevis to permanently bond them to their pushrods. This will rule out the possibility of a pushrod slipping out of position.

❏ - 12 clevises tight
❏ - 4 servo arm screws tight

Apply the Decals

1. Peel the decals from the die-cut decal 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.

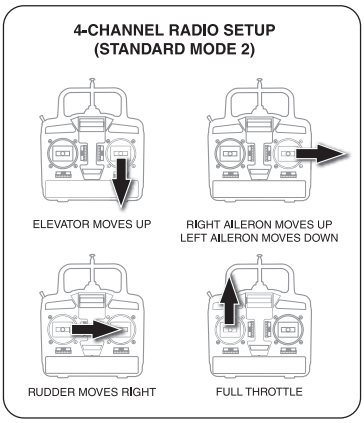
4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

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.

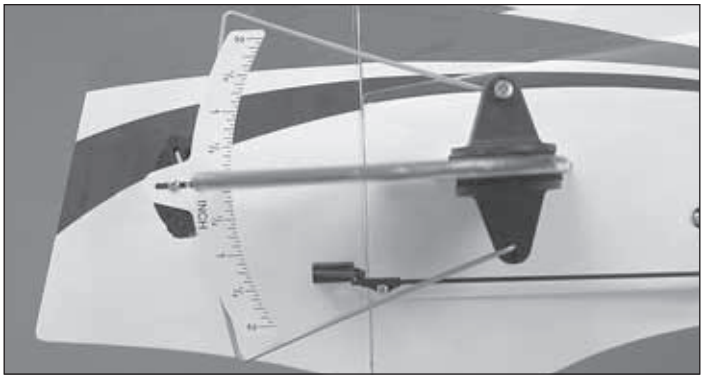
❏ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.



❏ 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.

Set the Control Throws

To ensure a successful first flight, fly your Reactor Bipe set up only according to the C.G. and control surface throws specified in this manual. The throws and C.G. are not arbitrary, but have been determined through extensive testing and accurate record-keeping. This provides you with the best chance for success and enjoyable first flights that should be surprise-free. Additionally, the throws and C.G. shown are true, real data which will allow the model to perform in the manner in which it was intended when flown by a pilot of the skill level for which it was intended. **DO NOT OVERLOOK THESE IMPORTANT PROCEDURES.** A model that is not properly set up may be unstable and possibly unflyable.



❏ 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 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	Low Rate
ELEVATOR:	9/16" [14mm] up 9/16" [14mm] down	5/16" [8mm] up 5/16" [8mm] down
RUDDER:	2-1/4" [57mm] right 2-1/4" [57mm] left	1-3/16" [30mm] right 1-3/16" [30mm] left
AILERONS:	3/4" [20mm] up 3/4" [20mm] down	3/8" [10mm] up 3/8" [10mm] down

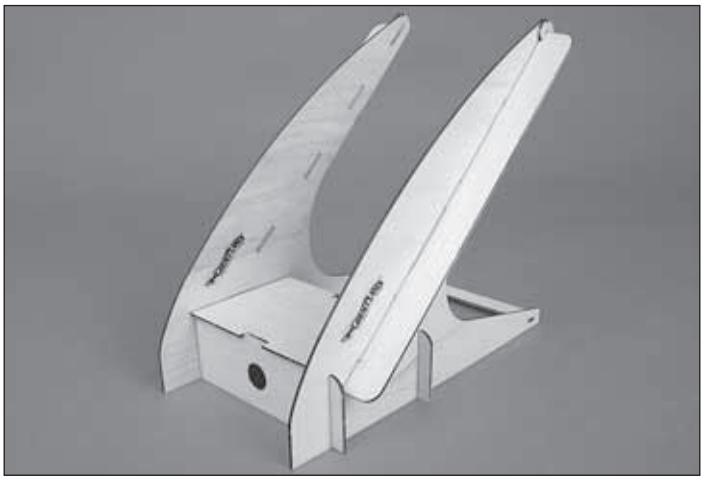
3D RATES

3D ELEVATOR	1-1/4" [30mm] up 1-1/4" [30mm] down
3D RUDDER	3-3/8" [87mm] right 3-3/8" [87mm] left
3D AILERONS	1-1/8" [28mm] up 1-1/8" [28mm] down

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, radio system, **and battery**. Place the battery in the battery compartment but **do not** connect it.



❏ 1. Assemble the balance stand as shown.

❏ 2. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the **bottom of the top wing** on both sides of the fuselage. The C.G. is located 3-7/16" [87.5mm] back from the LE of the wing.

❏ 3. With all parts of the model installed (ready to fly) and a battery pack in place, place the model on the balance stand as shown and align it on the marks.

❏ 4. If the tail drops, the model is "tail heavy" and the battery pack 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 firewall (don't attach weight to the cowl–it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the top of the fuselage over the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuselage and gluing it permanently inside.

❏ 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 wings level, lift the model by the engine 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 wingtip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

PREFLIGHT

Identify Your Model

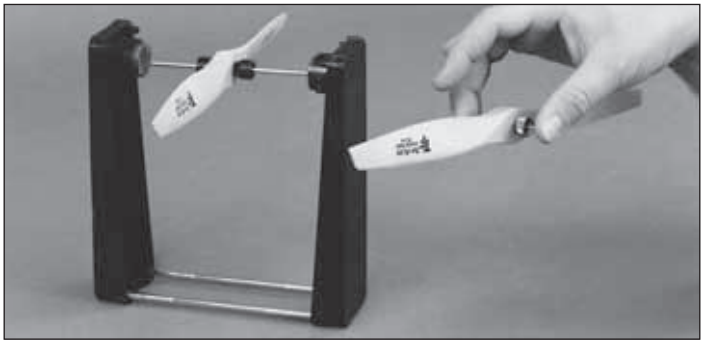
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 26 (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 and receiver 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

Always ground check the operational range of your radio before the first flight of the day following the manufacturer's instructions that came with your radio. This should be done once with the motor off and once with the motor running at various speeds. 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, a bad or failing ESC, a defective battery pack, 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 operating 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, scarves, 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.

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 motor for secure attachment.
❏ 2. Check the cowl for secure attachment and proper alignment.
❏ 3. Balance your propeller (and spare propellers).
❏ 4. Tighten the propeller nut and check to make sure that a prop washer is in place.
❏ 5. Inspect the spinner cone and backplate for cracks and missing attachment screws. Turn the prop to look for excessive “wobble.” If this is the case, attempt to correct this or replace the spinner.
❏ 6. Check the wheels for free rotation, inspect the axles and landing gear for security, and add a drop of light machine oil to the axles.
❏ 7. Check the wheel pants for secure attachment. A loose wheel pant is a sign of a loose axle screw. Remove the screw and use threadlocking compound when reinstalling.
❏ 8. Make sure all hinges are **securely** glued in place.
❏ 9. Check the control horns for secure attachment to the control surfaces.
❏ 10. Pull / push on each of the pushrods and check to see that the adjustable clevises do not slip and that the screws are tight.
❏ 11. Check the servo arms for secure attachment and make sure that the arm screws are in place and are tight.
❏ 12. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, cowl mounting screws, etc.).
❏ 13. Secure the connections between servo wires and Y-connectors or servo extensions with tape, heat-shrink tubing, or special clips suitable for that purpose.
❏ 14. Check that all servo connectors are fully plugged into their respective channels on the receiver.
❏ 15. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
❏ 16. Check the receiver for secure attachment. This must not be “stuffed into place.”
❏ 17. 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.
❏ 18. Balance your model *laterally* as explained in the instructions.
❏ 19. Check the C.G. according to the measurements provided in the manual.
❏ 20. Place your name, address, AMA number and telephone number on or inside your model.
❏ 21. Fully charge your transmitter battery and check the battery voltage after it is charged.
❏ 22. Range check your radio when you get to the flying field.
❏ 23. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
❏ 24. If you wish to photograph your model, do so before your first flight.

FLYING

Although the Reactor Bipe is an easy flying airplane, like most precision aerobatic airplanes it tends to "go where it's pointed." It does not 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 Reactor Bipe onto the runway pointed into the wind. Slowly advance the throttle stick to half throttle, pulling gently up on the elevator. 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 Reactor Bipe, they can be performed quickly, only requiring five to ten feet of runway until the model is airborne.

If you do not have access to a smooth runway, the Reactor Bipe 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 Reactor Bipe hold the plane by the fuselage just behind 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 Reactor Bipe 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, 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 the time on your battery pack, 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. 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!

This model belongs to:

Name

Address

City, State Zip

Phone number

AMA number

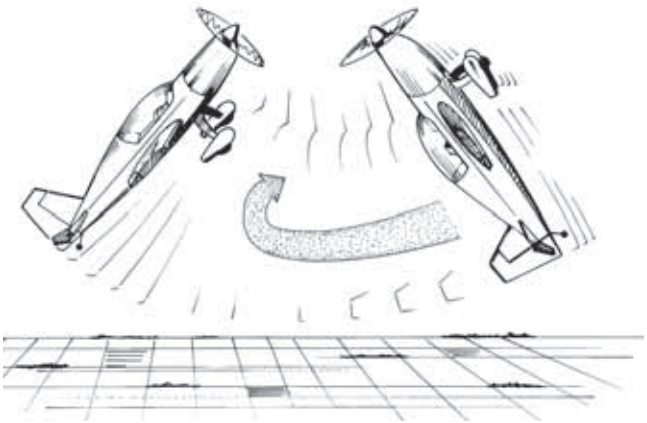
Make a copy of this identification tag and put it on or inside your model.

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.

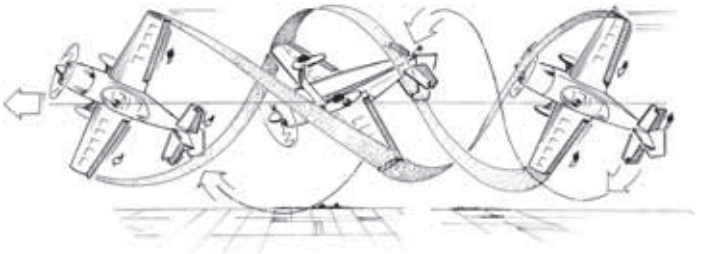
INVERTED FLAT SPINS

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

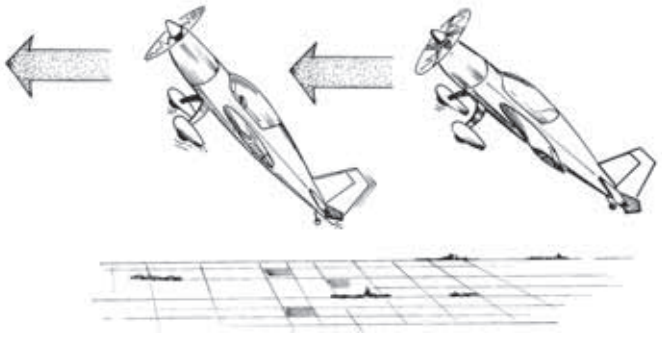
Fly a straight pass across the field at 75ft high and 100ft out and pull the model vertical. Roll the model until the top of it is facing you and slowly begin to reduce power. As the model begins to slow down to 10 mph or so, slowly add a little bit of power back in. You will have to adjust the throttle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

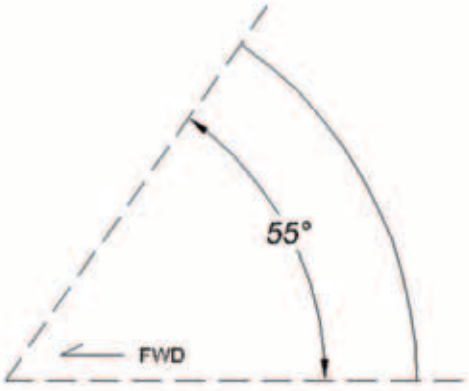
ROLLING HARRIER

Once you get comfortable with the 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.

CABANE STRUT INSTALLATION TEMPLATE



Cabane Strut Installation Template