PROUD BIRD™

INSTRUCTION MANUAL

SPECIFICATIONS

Wingspan: 51-15/16 in [1319 mm]
Wing Area: 388 in^2 [25 dm^2]
Wing Loading: 18–21 oz/ft^2 [55–64 g/dm^2]
Weight: 3–3.5 lb [1360–1590 g]
Length: 40 in [1015 mm]
Radio: 4+ channels
Electric Power: 1200 kV Outrunner Brushless Motor

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
E-mail: airsupport@greatplanes.com

TABLE OF CONTENTS

INTRODUCTION

Congratulations on your purchase of the Great Planes Proud Bird ARF! The Proud Bird was specifically designed to be a fast, precision airframe while maintaining the requirements of the NMPRA Electric Formula One (EF1) racing rules (the rules can be found at nmpra.org). Accommodations are provided to install different brushless motors that are allowable per the race rules. You will find that the Proud Bird is a pleasure to build as it assembles quickly.

Although the Proud Bird was made for racing, it makes a great sport flier as well. The Proud Bird can be flown with a .15 size brushless motor and a 3S battery which will give you longer flight times and a more casual flight envelope.

For the latest technical updates or manual corrections to the Proud Bird visit the Great Planes web site at www.greatplanes.com. Open the “Airplanes” link, then select the Proud Bird 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 (Academy of Model Aeronautics), 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 47302-9252

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.

SAFETY PRECAUTIONS

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

1. Your Proud Bird ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Proud Bird, 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, a correctly sized motor, and other components as specified in this instruction manual. All components must be correctly installed so that the model operates correctly on the ground and in the air. You must check the operation of the model and all components before **every** flight.

5. 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.

6. **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 Proud Bird that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Battery Recommendations

The recommended battery for the Proud Bird that meets EF1 rules for maximum voltage and weight is:

- ❍ FlightPower LiPo Pro50 4S 14.8V 2550mAh 50C (FPWP5041)

In addition to a battery, a LiPo battery charger is also required and there are several that will work (depending on your budget and requirements). A safe, economical charger is the Great Planes ElectriFly Triton Jr DC Computer Charger. TheTriton Jr will require a DC power source as well as a Great Planes Equinox™ LiPo Cell Balancer in order to safely charge LiPo batteries. If wall charging is a priority, an AC 12-Volt power source must also be purchased separately. A suitable power supply for the PolyCharge4 is the Great Planes 12V 12A DC power supply. Some pilots prefer to have several batteries and charge them faster so they can fly more. For charging up to four batteries faster at the same time, the Great Planes PolyCharge4™ DC-powered LiPo charger is recommended. Like the Triton Jr, the PolyCharge4 does not have an internal LiPo cell balancer which is a critical component in making sure your LiPo batteries charge efficiently and evenly. So, for each LiPo battery you wish to charge simultaneously, one Great Planes Equinox™ LiPo Cell Balancer will also be required. Finally, the PolyCharge4 does not have AC capability, so if wall charging is a priority, a separate AC 12-Volt power source must also be purchased separately. A suitable power supply for the PolyCharge4 is the Great Planes 12V 12A DC power supply. Part numbers for the products mentioned here are:

- ❍ Great Planes ElectriFly Triton Jr DC Computer Charger (GPMM3152)
- ❍ Great Planes PolyCharge4 DC 4 Output LiPo Charger (GPMM3015)
- ❍ Great Planes ElectriFly Equinox LiPo Cell Balancer (GPMM3160)
- ❍ Great Planes 12V 12A Switching DC Power Supply (GPMP0901)

Radio Equipment

Three micro servos are required for the Proud Bird. Futaba S3115 micro servos are shown in the manual. S3102 micro servos can also be used.

- ❍ Futaba S3115 Micro Precision Servo (FUTM0415)
- ❍ Futaba S3102 Aircraft Micro Metal Gears Servo (FUTM0034)

Motor Recommendations

The O.S. .25 brushless motor is shown in the assembly instructions of this manual. Also recommended is the RimFire 35-45-1200 motor. A 60A minimum ESC is also required. We recommend the Castle Creations Ice Lite 75A ESC. If using the recommended ESC, you will also need to purchase a male Deans Ultra connector. Part numbers for these recommended components are provided below.

- ❍ O.S. .25 Brushless Motor (OSMG9525)
- ❍ RimFire EF1 35-45-1200 Motor (GPMG4630)
- ❍ Castle Creations Phoenix Ice Lite 75 25V ESC (CSEM7000)
- ❍ W.S. Deans® Male Ultra Plug® (2) (WSDM1302)

The Proud Bird is not just for racing. It is a very capable sport plane and flies well using a more conservative power system. Part numbers for the recommended sports setup are provided below:

- ❍ Great Planes RimFire .15 35-36-1200 Outrunner Brushless (GPMG4620)
- ❍ Great Planes Silver Series 45A Brushless ESC 5V/2A BEC (GPMM1840)
- ❍ Great Planes Bullet Adapter 4mm Male/3.5mm Female (3) (GPMM3123)
- ❍ FlightPower LiPo Pro50 3S 11.1V 2550mAh 50C (FPWP5040)

ADDITIONAL ITEMS REQUIRED

Propeller

The EF1 racing rules state that the APC 8x8E propeller is the only allowable prop. If you plan to fly our recommended

sport setup then we recommend the APC 9x9E prop. Part numbers for both are provided below:

- ❍ APC 8x8 Thin Electric Propeller (APCQ4116)
- ❍ APC 9x9 Thin Electric Propeller (APCQ4149)

Adhesives and Building Supplies

This is the list of Adhesives and Building Supplies that are required to finish the Proud Bird:

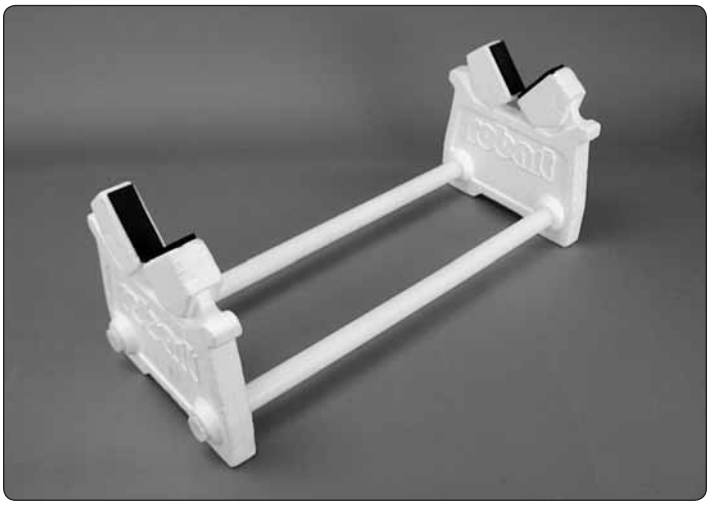
- ❍ 1/2 oz. [15g] Thin Pro CA (GPMR6001)
- ❍ Great Planes Pro CA- Glue Thick 1/2 oz (GPMR6013)
- ❍ Pro 30-minute epoxy (GPMR6047)
- ❍ Threadlocker thread locking cement (GPMR6060)
- ❍ Denatured alcohol (for epoxy clean up)
- ❍ Drill bits: 1/16" [1.6mm], 5/64" [2mm], 3/32" [2.4mm], 9/64" [3.6mm], 5/32" [4mm]
- ❍ Revell Premium Soft Handle Knife w/Blades (5) (RMXR6900)
- ❍ Top Flite MonoKote sealing iron (TOPR2100)
- ❍ Top Flite Hot Sock iron cover (TOPR2175)
- ❍ Panel Line Pen (TOPQ2510)
- ❍ Hobbico Steel T-Pins 1" (100) (HCAR5100)
- ❍ Hobbico Curved Tip Canopy Scissors 5-1/2" (HCAR0667)
- ❍ Small clamps
- ❍ Zap Adhesives Ric 560 Canopy Glue (PAAR3300)
- ❍ Masking tape
- ❍ Household oil
- ❍ 220 grit sand paper

Optional Supplies and Tools

Here is a list of optional tools that will help you build the Proud Bird:

- ❍ 1/2 oz. [15g] Medium Pro CA+ (GPMR6007)
- ❍ 2 oz. [57g] spray CA activator (GPMR6035)
- ❍ 4 oz. [113g] aerosol CA activator (GPMR6034)
- ❍ CA applicator tips (HCAR3780)
- ❍ CA debonder (GPMR6039)
- ❍ Great Planes Pro Epoxy 6-Minute Formula 4 oz (GPMR6042)
- ❍ Epoxy brushes 6, (GPMR8060)
- ❍ Mixing sticks (GPMR8055)
- ❍ Mixing cups (GPMR8056)
- ❍ Pliers with wire cutter (HCAR0630)
- ❍ T.A. Emerald Performance Duster Compressed Air (TAEC1060)
- ❍ Servo horn drill (HCAR0698)
- ❍ DuraTrax Body Reamer (DTXR1158)
- ❍ Precision Magnetic Prop Balancer (TOPQ5700)
- ❍ AccuThrow Deflection Gauge (GPMR2405)
- ❍ CG Machine™ (GPMR2400)
- ❍ Hobbico Flexible 18" Ruler Stainless Steel (HCAR0460)
- ❍ Top Flite MonoKote trim seal iron (TOPR2200)
- ❍ Top Flite MonoKote heat gun (TOPR2000)
- ❍ Hobbico Pin Vise 1/16 Collet w/6 Bits (HCAR0696)
- ❍ Great Planes Clevis Installation Tool (GPMR8030)

Building Stand



A building stand or cradle comes in handy during the build. We use the Robart Super Stand II (ROBP1402) for all our projects in R&D, and it can be seen in pictures throughout this manual.

IMPORTANT BUILDING NOTES

- When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.
- Whenever the term ***glue*** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.
- Whenever just ***epoxy*** is specified you may use ***either*** 30-minute (or 45-minute) epoxy ***or*** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.
- **Photos** and **sketches** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.
- The Proud Bird 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.

Top Flite MonoKote Jet White 6' (TOPQ0204)

- The stabilizer and wing incidences and engine 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.

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 Ph: (217) 398-8970 ext. 5
3002 N Apollo Drive Suite 1 Fax: (217) 398-7721
Champaign, IL 61822

E-mail: airsupport@greatplanes.com

ORDERING REPLACEMENT PARTS

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

To locate a hobby dealer, visit the Great Planes web site at www.greatplanes.com. Select "Where to Buy" in the menu across the top of the page and follow the instructions provided to locate a U.S., Canadian or International dealer.

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

Mail parts orders and payments by personal check to:
Hobby Services
3002 N Apollo Drive, Suite 1
Champaign IL 61822

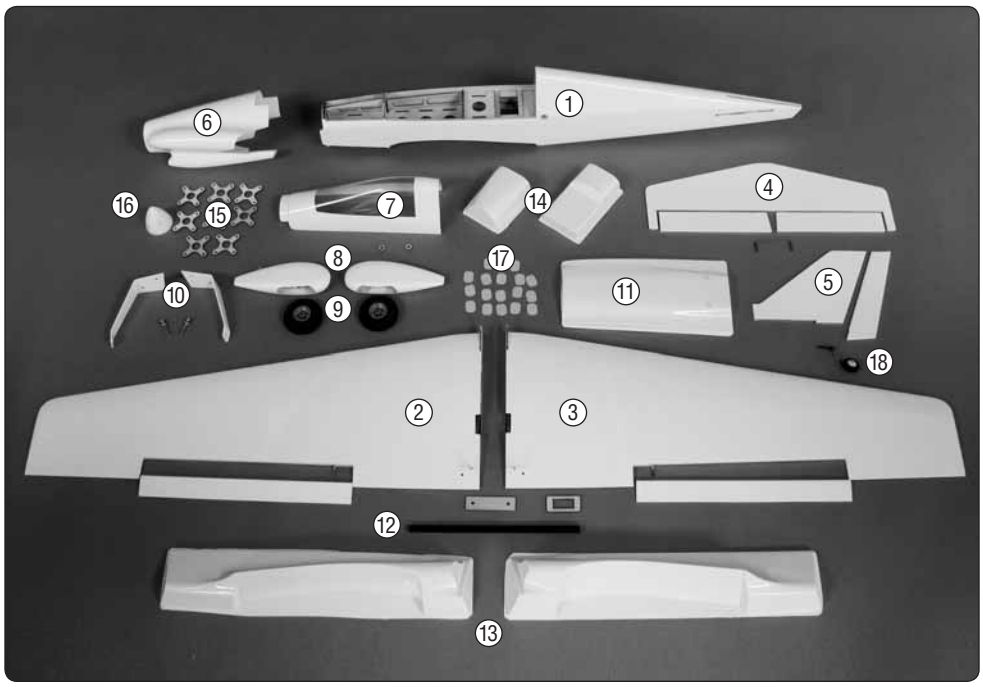
Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

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

REPLACEMENT PARTS LIST

Order No.	Description
GPMA4300	Fuselage Set
GPMA4301	Wing Set
GPMA4302	Tail Surface Set
GPMA4303	Cowl
GPMA4304	Landing Gear Set
GPMA4305	Wheelpants
GPMA4306	Canopy
GPMA4307	Spinner
GPMA4308	Decals
GPMA4309	Plastic Parts Set

KIT CONTENTS

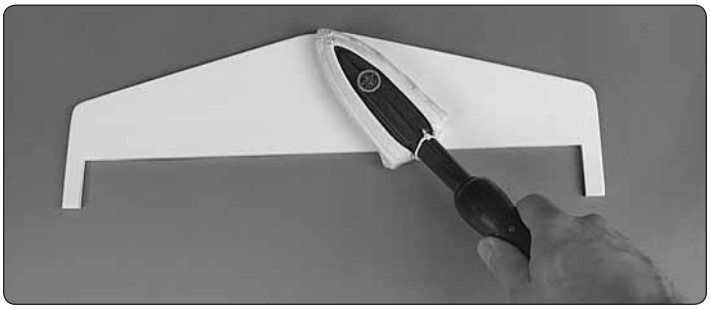


Kit Contents

1. Fuselage
2. Left Wing & Aileron
3. Right Wing & Aileron
4. Horiz. Stabilizer & Elevators
5. Vertical Fin & Rudder
6. Cowl
7. Canopy
8. Wheel Pants
9. Main Wheels
10. Main Landing Gear
11. Belly Pan
12. Wing Tube
13. Wing Fairings
14. Cockpit Floor
15. Motor Spacers
16. Spinner
17. CA Hinges
18. Tail Wheel Assembly

PREPARATIONS

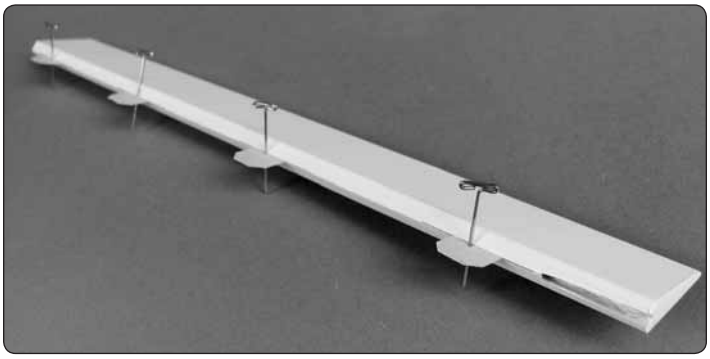
❏ 1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support at the address or telephone number listed in the "Kit Inspection" section on page 5.



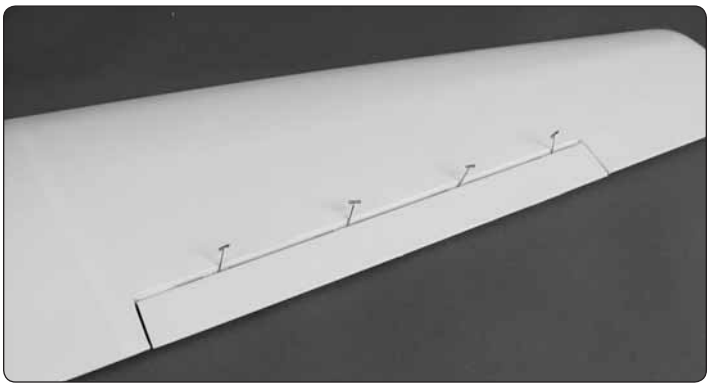
❏ 2. Remove the tape and separate all the control surfaces. Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

ASSEMBLE THE MODEL

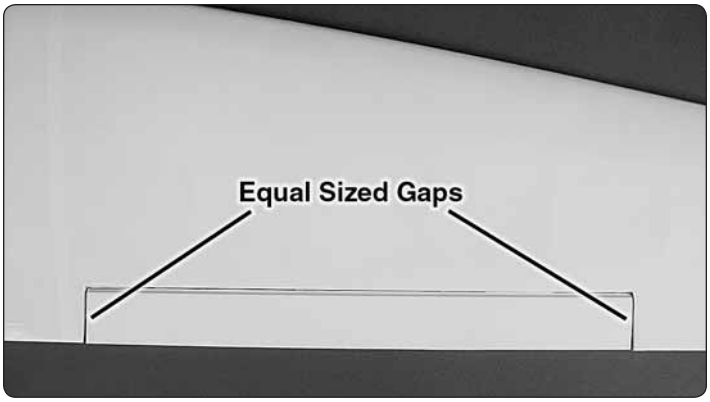
Build the Wing

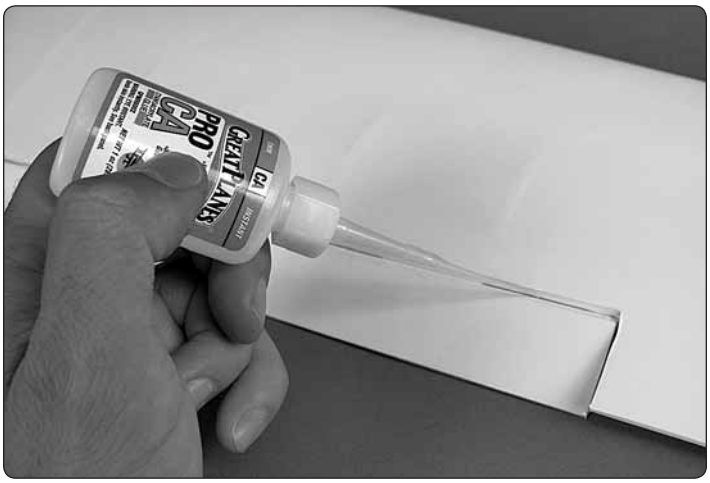


❏ 1. Each aileron requires four CA hinges. Use T-pins or something similar and push one through the center of each CA hinge. The pins will keep the hinges centered between the wing panels and ailerons. Insert the hinges into the pre-cut slots in the ailerons as shown. If any hinges are difficult to install, use a hobby knife to enlarge the slot as necessary.

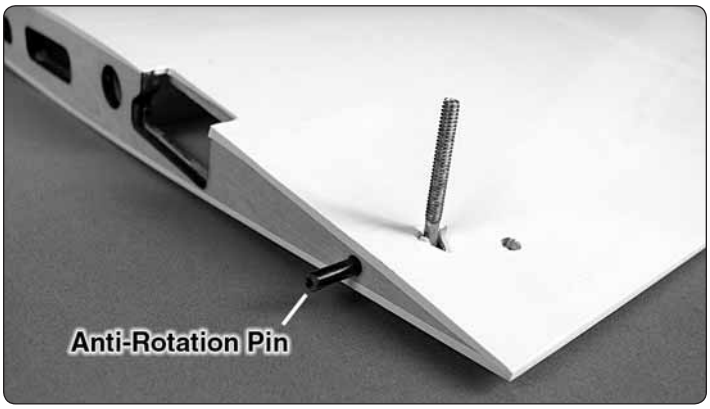


❏ 2. Test fit the ailerons onto the wing panels. The metal torque rods will fit into the holes pre-drilled in the ailerons.

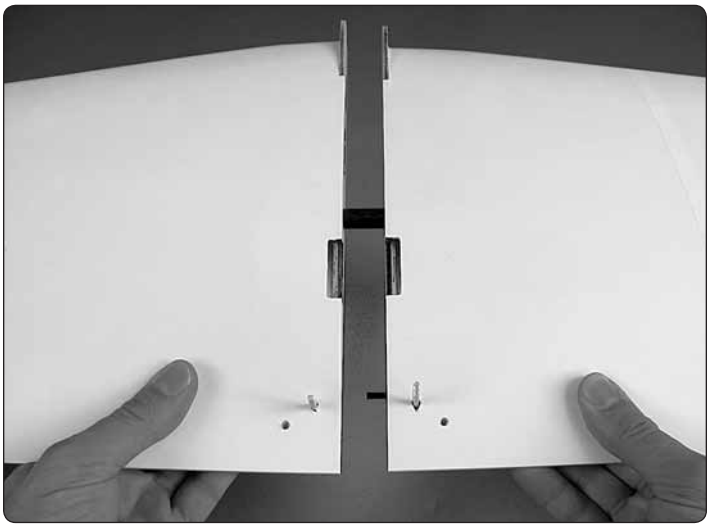




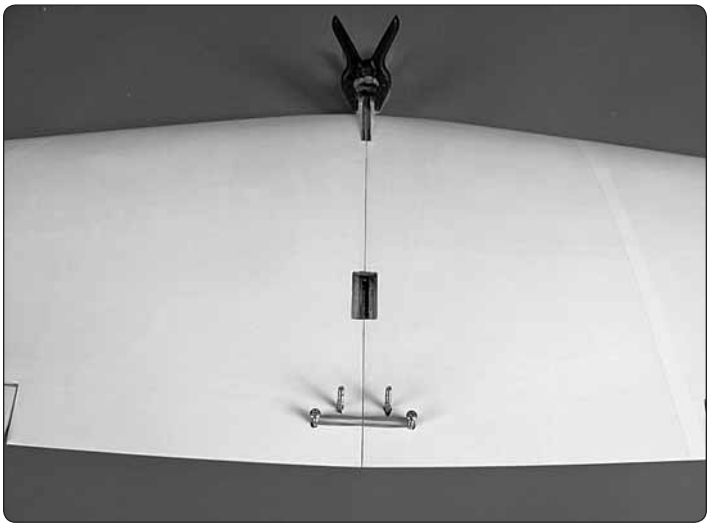
❏ 3. When satisfied with the fit, remove the ailerons from the wings. Clean the ends of the torque rods with a paper towel dampened with denatured alcohol. Mix up a small amount of epoxy (6 minute is fine but work quickly to glue both aileron torque rods before the epoxy hardens) and apply a light coating to the ends of the torque rods. Reinstall the ailerons onto the wings. Wipe away any excess epoxy that squeezes out of the torque rod holes. Remove the pins from the hinges and center the ailerons on the wings, making the gap at each end an equal length. Push the ailerons up against the trailing edge of the wing snugging them up. Deflect the ailerons down and apply 6 drops of thin CA to the center of each hinge allowing it to wick into the hinge material. Flip the wings over and apply 6 more drops of CA to the other side of the hinges. When the CA has hardened, ***pull on each aileron to confirm they are securely glued in place.***



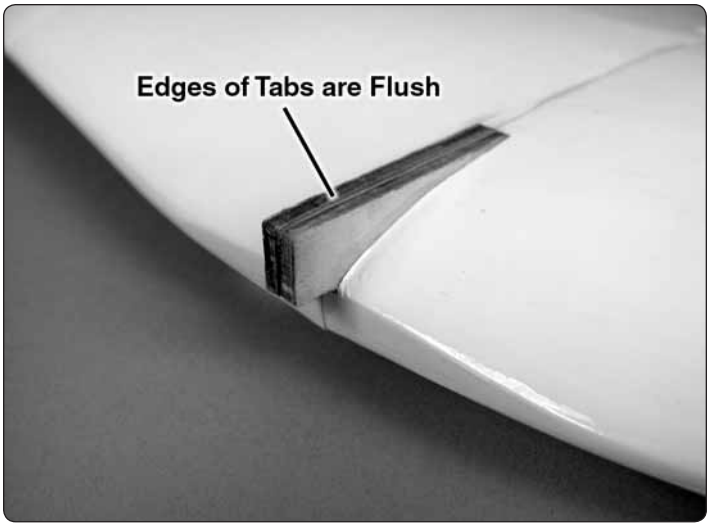
❏ 4. Glue the carbon anti-rotation pin halfway into one of the wing panels.



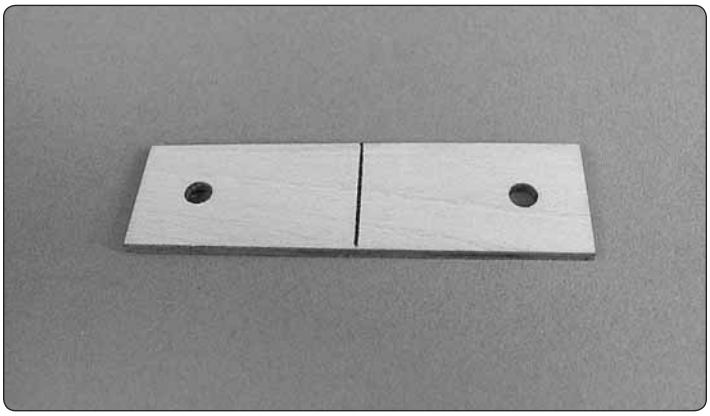
❑ 5. Test fit the wing panels together with the wing tube. The root ribs of the wing panels should fit flat against each other. If not, lightly sand them as necessary until they do.

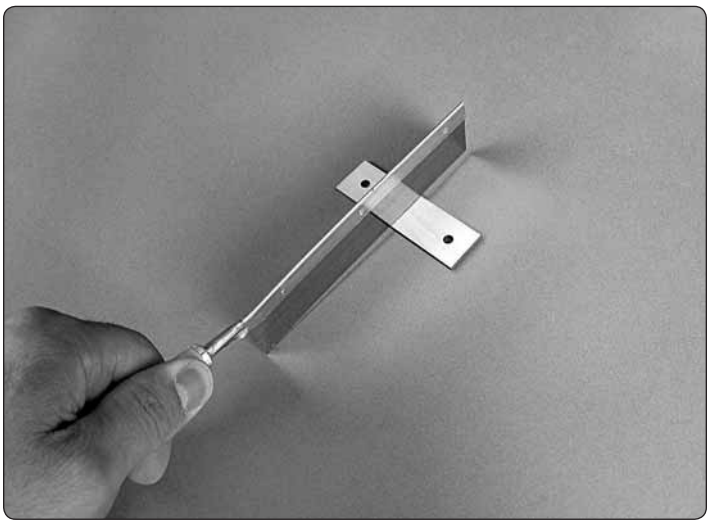


❑ 6. When satisfied with the fit, mix up 1/4 oz [7cc] of 30-minute epoxy. Coat one half of the wing joiner tube and insert it into one of the panels. Coat the root rib of both panels and the exposed halves of the joiner tube and anti-rotation pin. Slide the wing panels together and wipe away any excess epoxy.

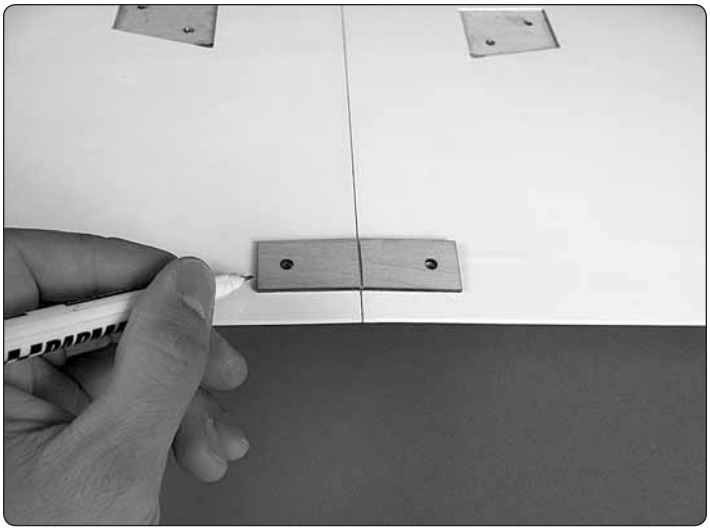


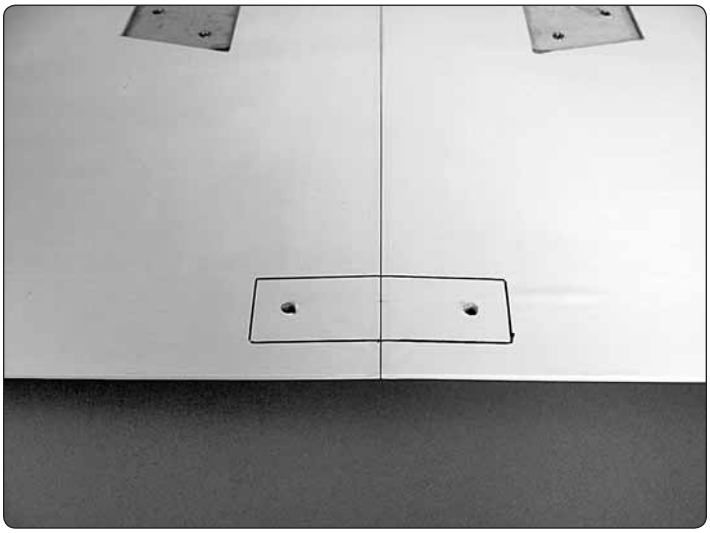
You can tape the wing panels together while the epoxy hardens. The panels can also be held together with spring clamps at the root tab. Slide the 4x30mm wing bolts through the wing bolt holes and wrap rubber bands around them to draw the aft end of the panels together. Ensure that the edges of the tabs at the leading edge of the panels are flush with each other. Allow the epoxy to cure undisturbed.



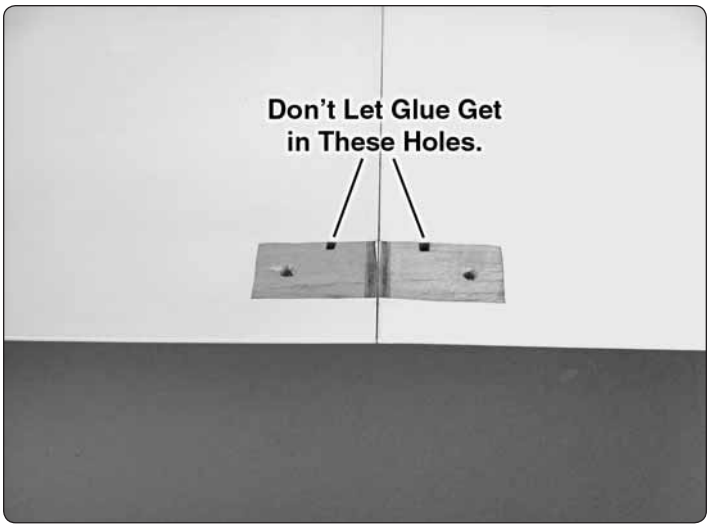


❑ 7. Draw a center line onto the plywood wing bolt plate. Use a razor saw or hobby knife to make a shallow cut along the center line. This will allow the plate to bend over the dihedral angle of the wing.





❑ 8. Align the holes in the wing bolt plate with the wing bolt holes in the wing and use a felt-tip pen to trace around the plate onto the wing.

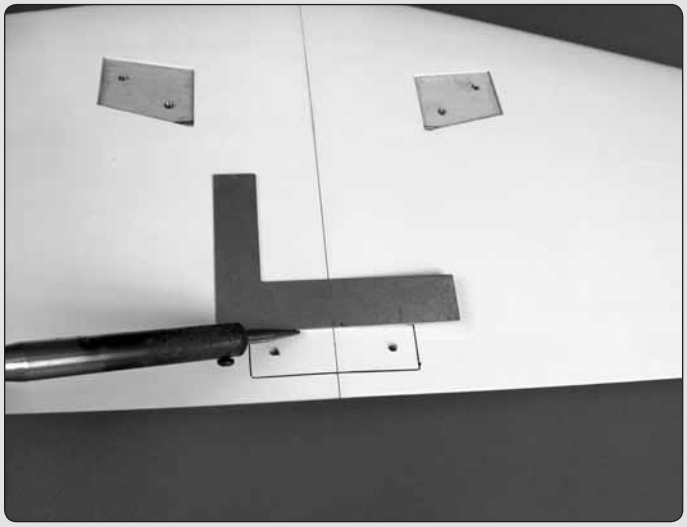


❑ 9. Use a sharp hobby knife or follow the expert tip below, to remove the covering 1/16" [1.6mm] inside the lines you drew. Use denatured alcohol to wipe away the lines. Avoid getting any glue into the exposed holes beneath the covering.

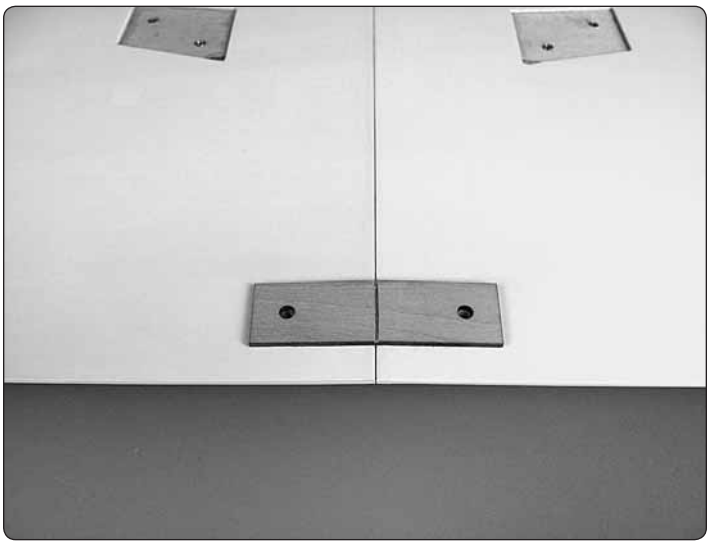
EXPERT TIP

HOW TO CUT COVERING FROM BALSA

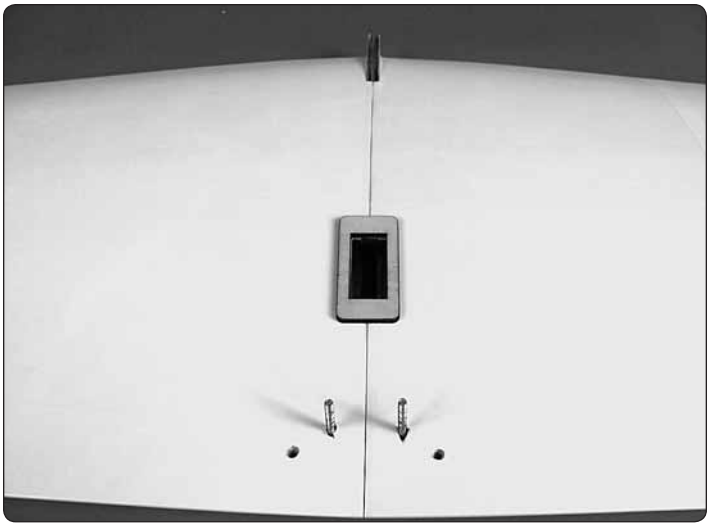
Use a soldering iron to cut the covering from the area beneath the wing bolt plate. The tip of the soldering iron doesn't have to be sharp, but a fine tip does work best. Allow the iron to heat fully.



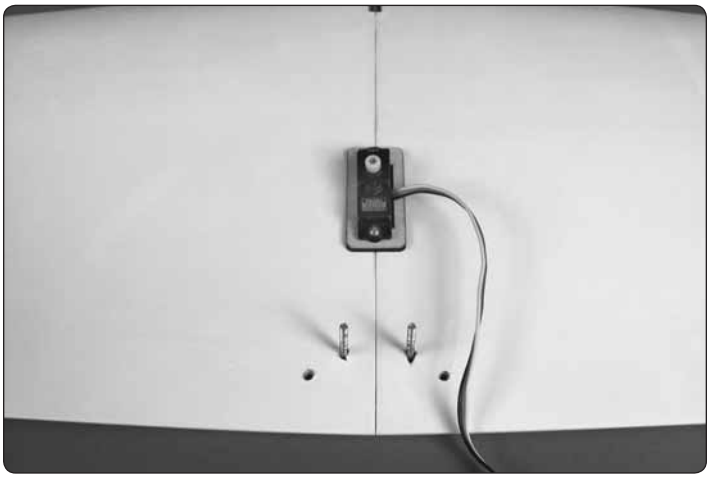
Use a straightedge to guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut. Peel off the covering.



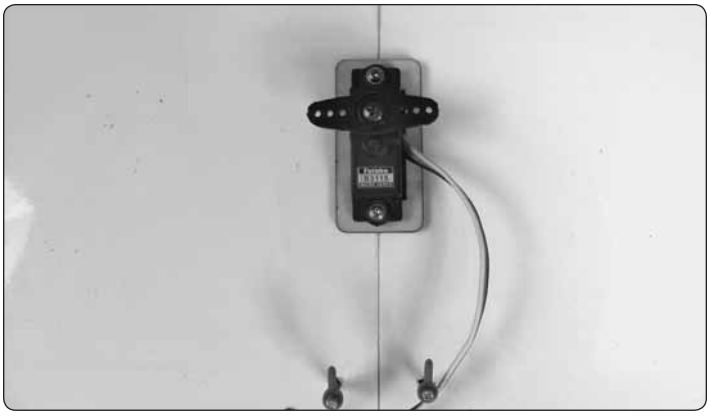
❑ 10. Glue the wing bolt plate to the wing being sure that the holes in the plate are aligned with the holes in the wing.



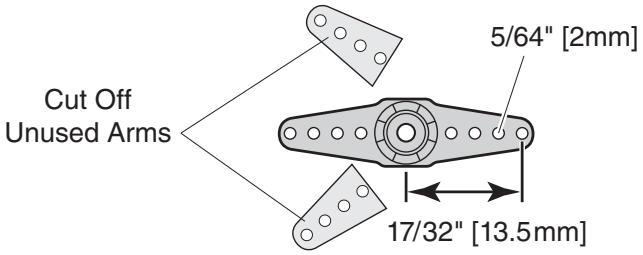
❏ 11. As you did with the wing bolt plate, remove the covering and glue the aileron servo tray over the servo bay in the wing.



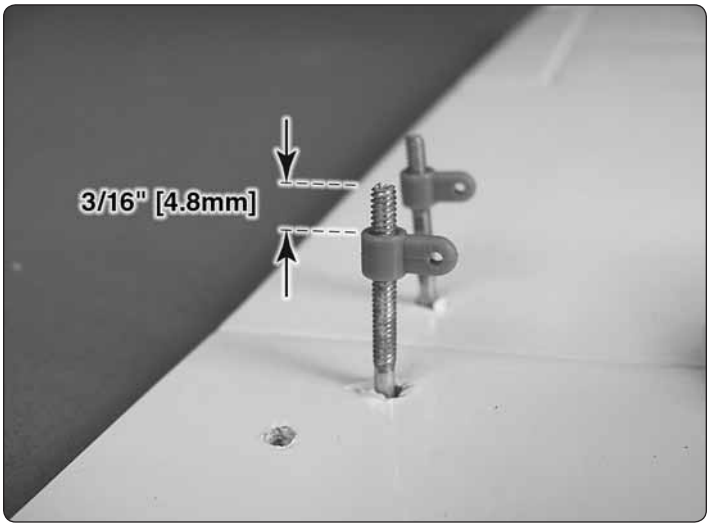
❏ 12. Install the rubber grommets and eyelets included with your servo hardware. Mount the servo as shown. Drill 1/16" [1.6mm] holes through the servo tray to mount the aileron servo. Remove the servo and thread a servo mounting screw into each hole and then remove it. Apply a drop or two of thin CA glue to each hole to harden the surrounding wood. When the CA has hardened, install the servo with the servo mounting screws included with the servo.



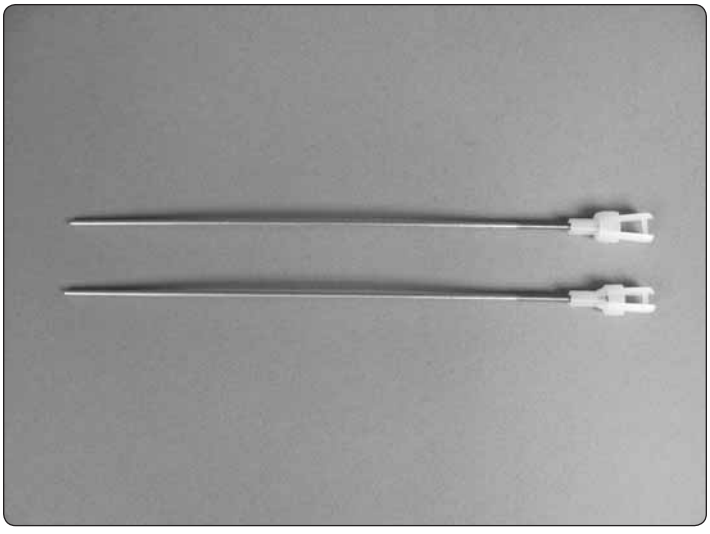
❏ 13. Electronically center the aileron servo using your radio system. Mount a four-armed servo arm onto the aileron servo. If the servo arm does not fit "square" to the servo case, remove it and rotate it 90 degrees and re-install it. Repeat this until you find which way the servo arm fits best onto the servo.



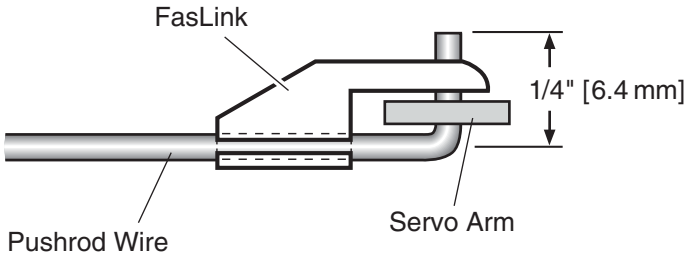
Make note of its orientation, remove it, and cut off the two unused arms as shown in the picture. Because the aileron pushrods will connect to the holes 17/32" [13.5mm] from the center of the servo arm, cut off the excess arm length beyond these holes. Enlarge those holes with a 5/64" [2mm] drill bit. Install the arm on the servo and secure it with the servo arm screw.

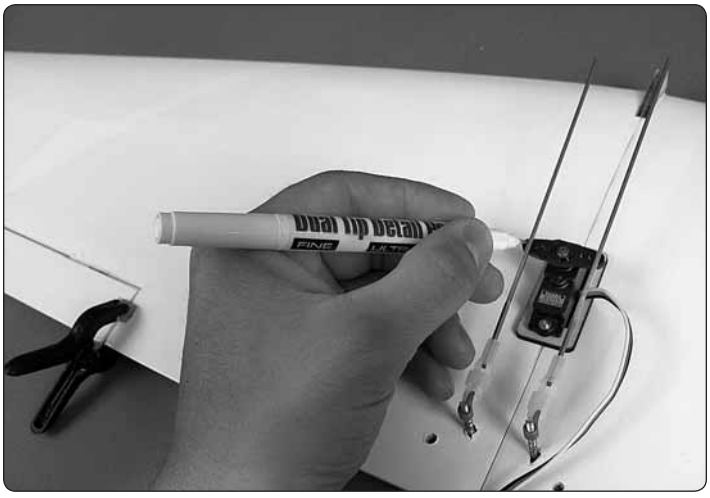


❏ 14. Thread a nylon torque rod horn onto each torque rod. The horns should be positioned 3/16" [4.8mm] from the ends of the rods.

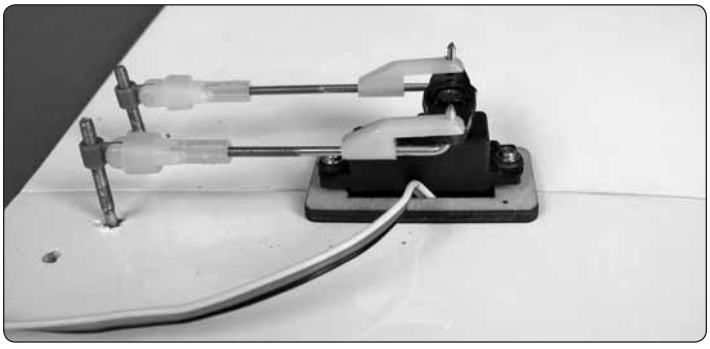


❏ 15. Thread a nylon clevis onto each 2x90mm pushrod wire 20 complete turns. Slide a silicone clevis onto the base of each clevis.





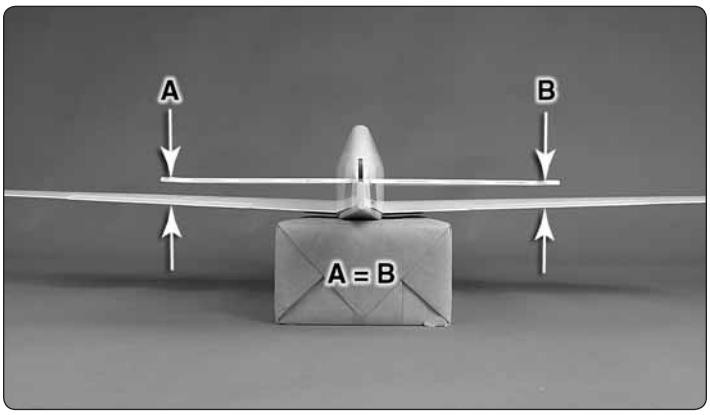
❏ 16. Use tape or small spring clamps to hold the ailerons in the neutral position. Connect the clevises on the pushrods to the torque rod horns. Mark the pushrods where they cross the outer holes of the aileron servo arm. Make a 90 degree bend at the marks on the pushrods and cut off the excess pushrod 1/4" [6.4mm] beyond the bend. Attach the pushrods to the servo arm using two FasLinks.

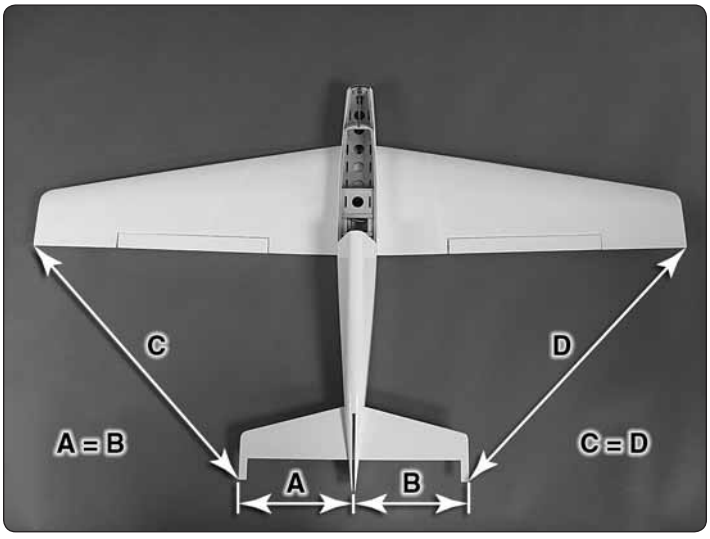


Thread the clevis up or down on the pushrod as necessary to center the ailerons with the servo arm centered.

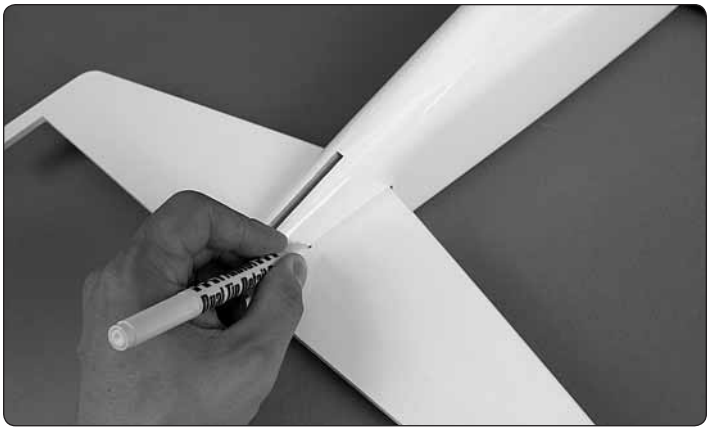
Assemble the Tail Section

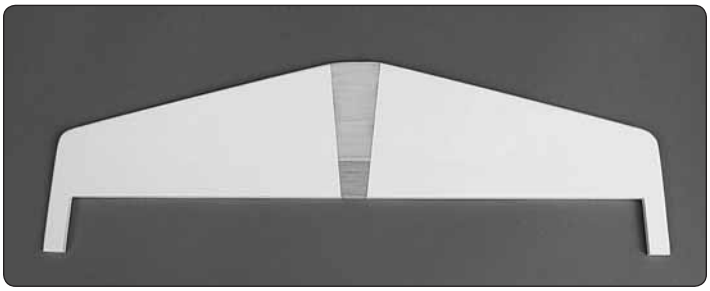
❏ 1. Temporarily mount the wing onto the fuselage using two 4x30mm screws and two 4mm flat washers.





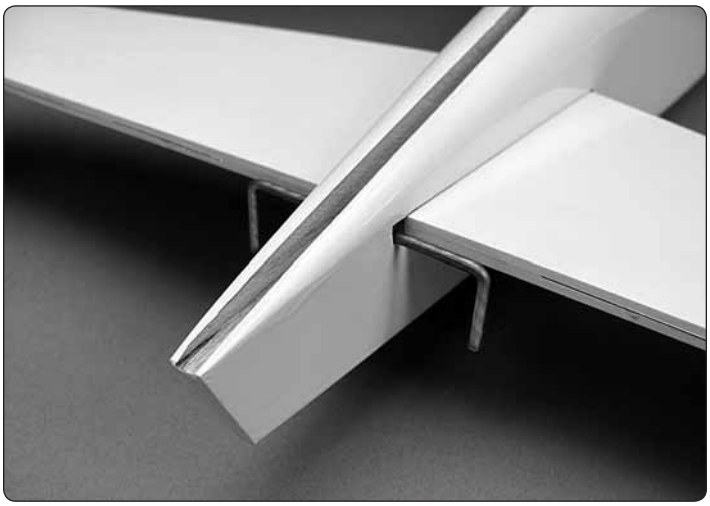
❏ 2. Slide the horizontal stabilizer into the stab slot and center it left and right. Stand back approximately 10' [3m] and view the model from behind. Confirm that the wing and stab are parallel. If not, remove the stab and lightly sand the slot until the two align symmetrically. Measure the distance between the wing tips and stab tips and make any adjustments to make the measurements equal.



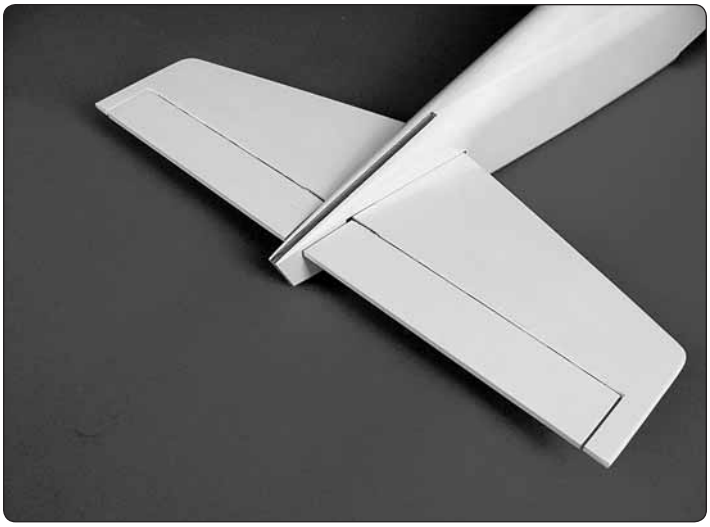


❏ 3. When satisfied with its position, use a felt-tip pen to trace around the fuselage onto the stab. Remove the stab and cut away the covering 1/16" [1.6mm] inside the lines you drew. Wipe away the lines with a paper towel dampened with denatured alcohol.

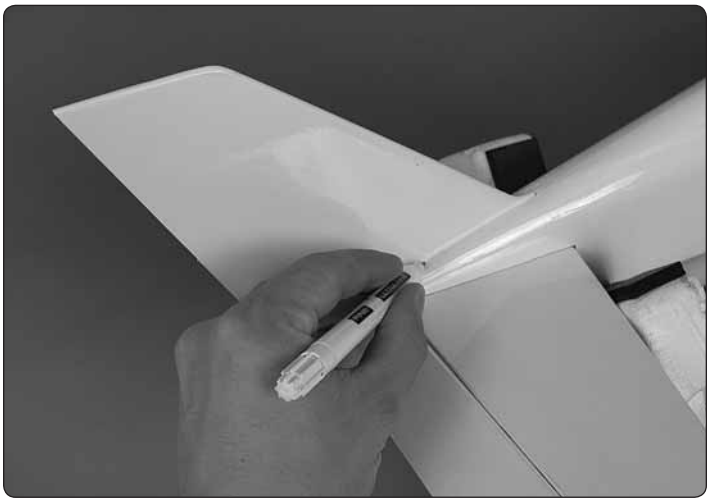
❏ 4. Check the fit of the elevator joiner wire into the elevator halves. Lay them on a flat surface. If the two elevator halves do not lay flat, make adjustments to the wire until they do.

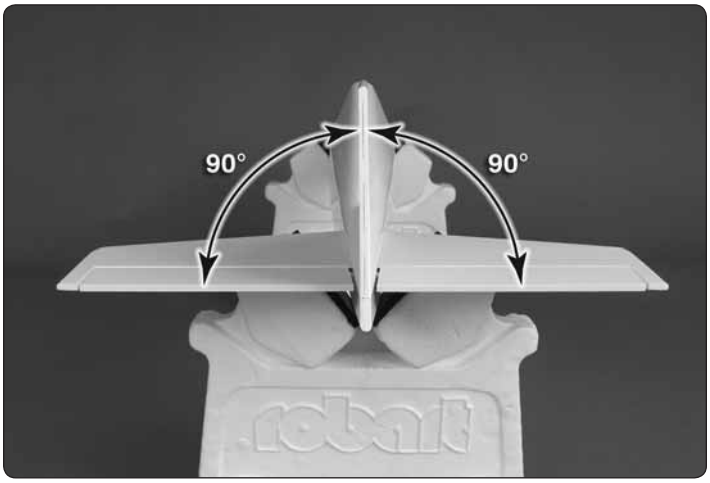


❏ 5. Clean the ends of the elevator joiner wire with denatured alcohol. Insert the joiner wire into the aft end of the stab slot. Mix up a batch of epoxy (30-minute is recommended to allow you the added working time) and coat the exposed wood (top and bottom) of the stab. While holding the joiner wire back and out of the way, slide the stab back into the slot aligning it with the wing and centering it left and right. Clean up any excess epoxy with denatured alcohol. If necessary, add weight to the high side of the stab while the epoxy is curing to ensure that the wing and stab remain parallel. On the center stab, check the alignment and use medium CA.

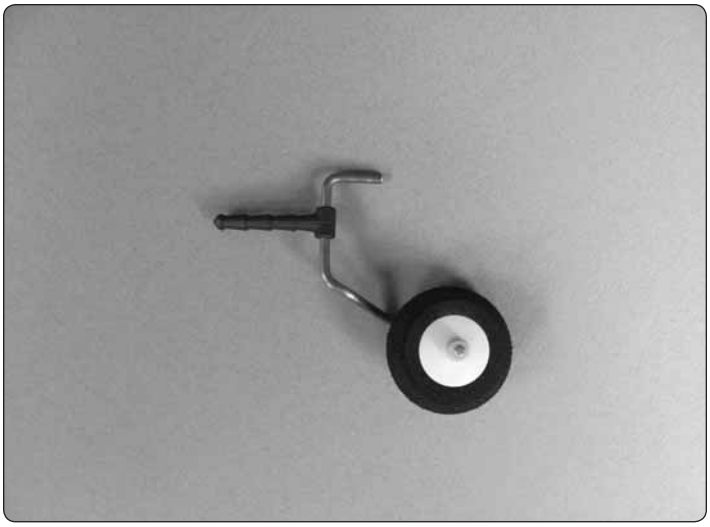


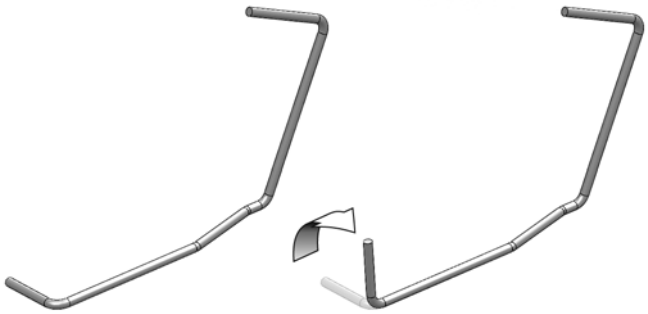
❏ 5. Hinge the elevator halves onto the stabilizer just as you did with the ailerons. Ensure that the elevators are equally spaced between the stab ends. The elevators should both be centered. **Pull on elevators to be sure they are securely attached.**



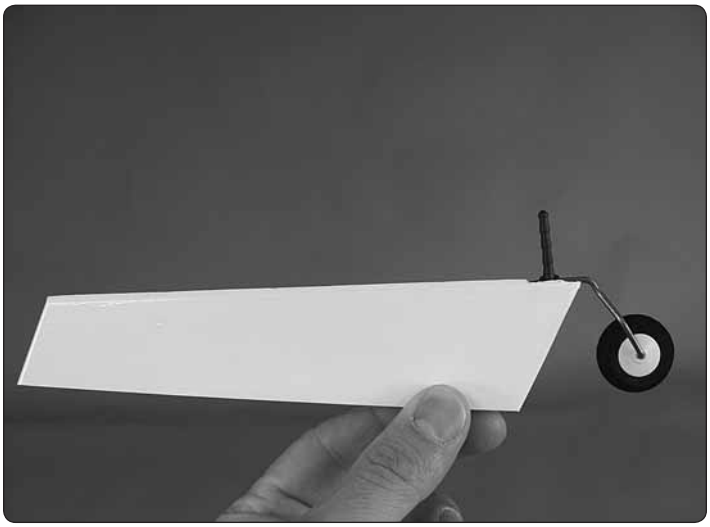


❏ 6. Insert the vertical fin into the slot in the fuselage. Trace around the fuselage onto the fin. Remove the covering 1/16" [1.6mm] below your lines. Wipe away the lines with alcohol and epoxy the fin into the slot. View the plane from behind and confirm that the fin is square with the stab. If not, use some masking tape to pull it square while the epoxy is curing.

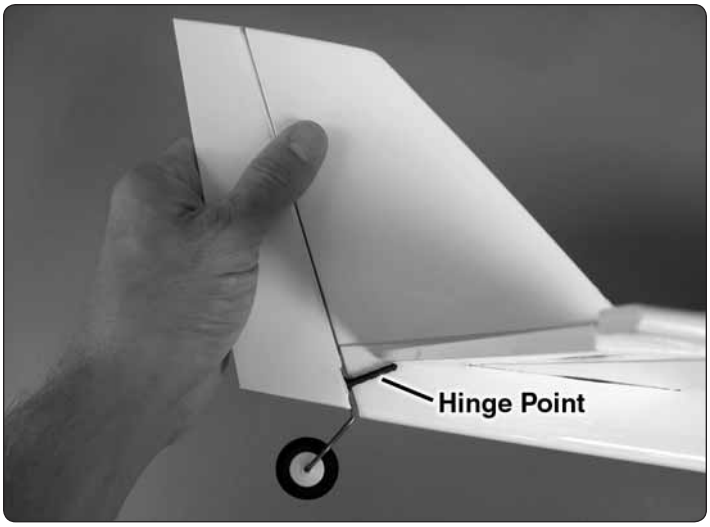


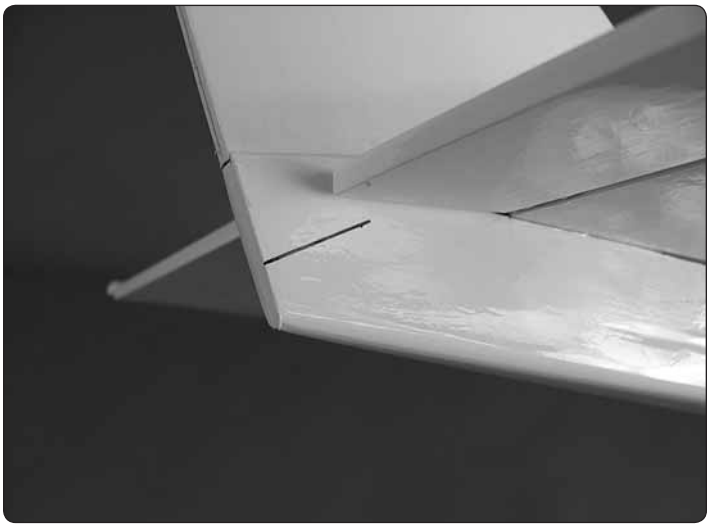


❏ 7. The tail wheel is provided to you pre-assembled from the factory. If you choose to remove the wheel to reduce drag the axle can be bent vertically to act as a tail skid.



❏ 8. Temporarily insert the tail wheel wire into the hole in the leading edge of the rudder.

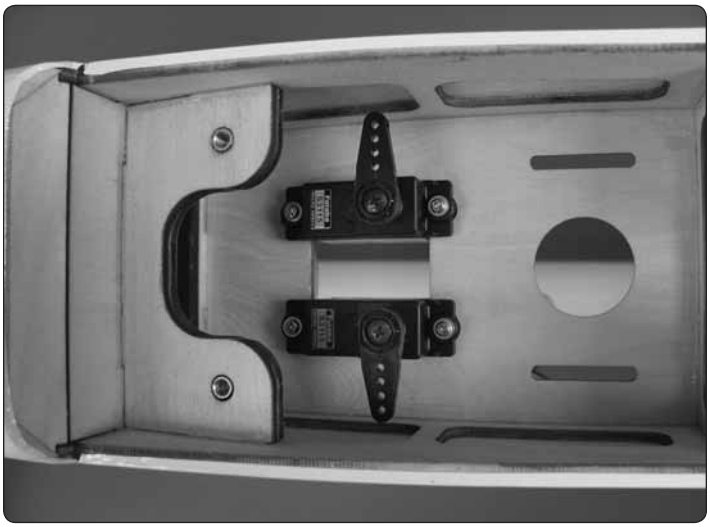




❏ 9. Hold the rudder up against the rudder hinge line on the fuselage. Draw a line onto the fuselage that matches the angle of the nylon tail wheel hinge point.

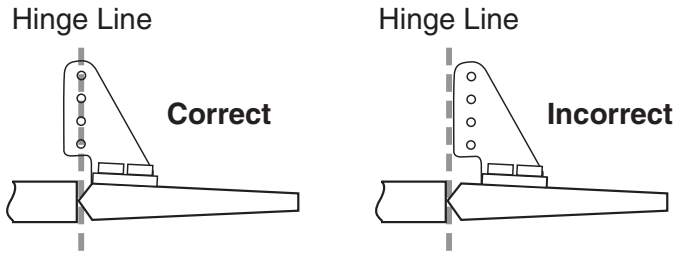
❏ 10. Drill a 9/64" [3.6mm] hole for the tail wheel hinge point. Be sure that the hole you are drilling is centered in the hinge line and matches the angle of the hinge point. A smaller pilot hole is recommended.

❏ 11. Prepare three CA hinges with T-pins and insert them into the rudder (we recommend test fitting the rudder and tail wheel wire onto the fuselage without glue before completing this step). Clean the section of the tail wheel wire that fits into the rudder with denatured alcohol. Apply a drop or two of household oil to the tail wheel hinge point bearing. Mix up a small batch of epoxy and use a toothpick to coat the inside of the hole in the rudder as well as the hole you drilled in the previous step. Apply a very light coating of epoxy onto the tail wheel hinge point. Insert the tail wheel wire into the rudder and the hinges and hinge point into the fuselage. Wipe away any excess epoxy with alcohol. Remove the T-pins from the hinges and apply 6 to 7 drops of thin CA to both sides of each hinge. Tug on the rudder to ensure that it is securely hinged.

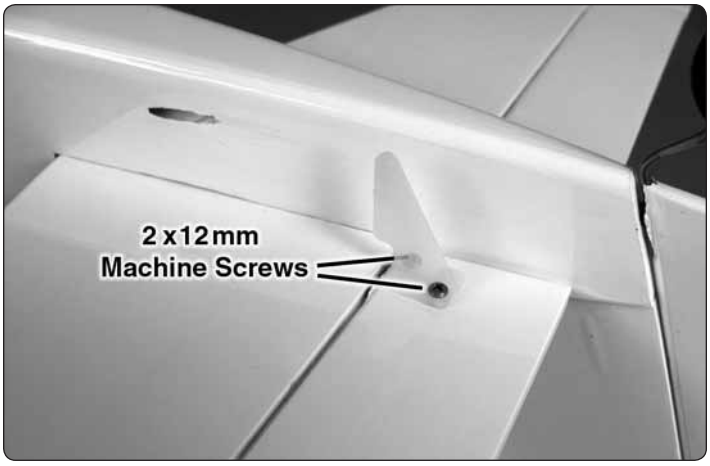


❏ 12. Mount the tail surface servos in the orientation shown. Electronically center the servos using your radio system. Determine the best fit of your servo horns and cut away the unused arms.

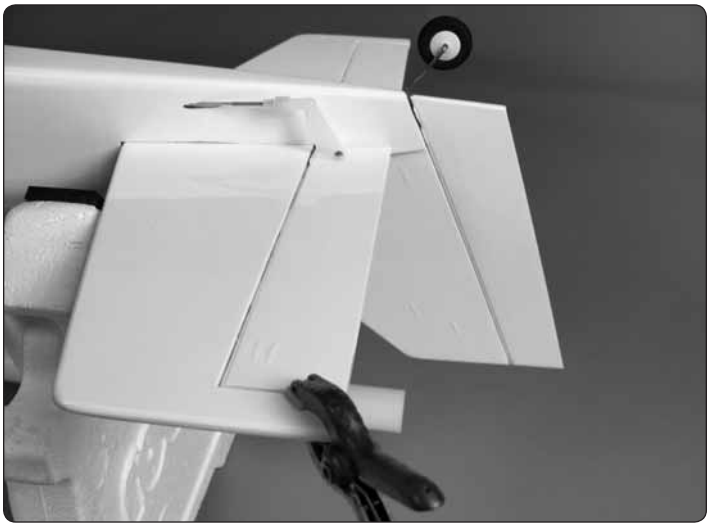
❏ 13. Insert a 21-5/8" [550mm] long pushrod into each of the tail pushrod tubes. Gently push them against the covering that is over the exit slots. This will show you exactly where you need to trim away the covering from the exit slots. Trim the covering.



❏ 14. Thread a clevis onto a pushrod. Connect the clevis to the outer hole of a control horn and insert the pushrod into the elevator pushrod tube. Align the holes in the control horn over the elevator hinge line and mark the location for the mounting holes.

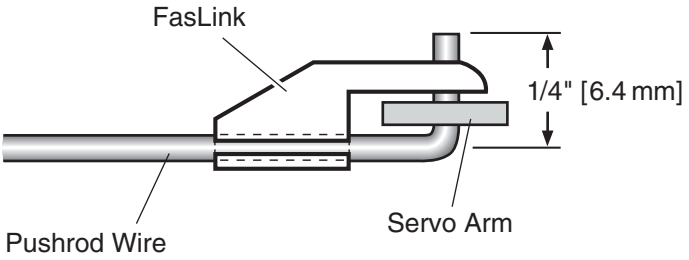


❏ 15. Drill 5/64" [2mm] holes at the marks you made. Install the control horn using two 2x12mm machine screws and a control horn backplate.

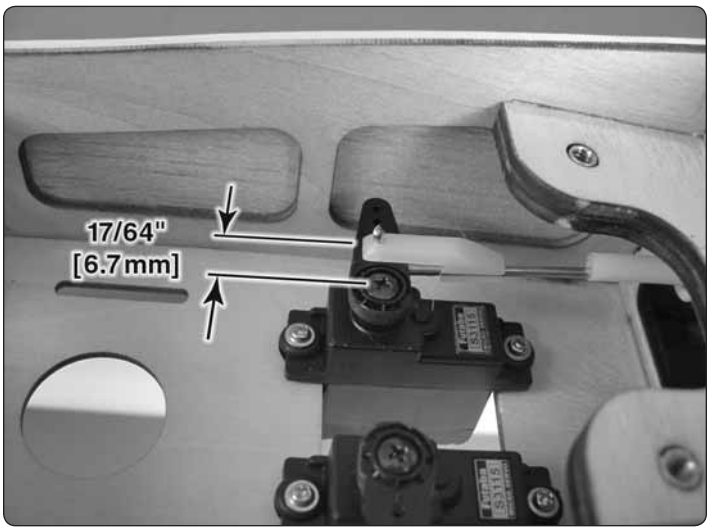


❏ 16. Use a small spring clamp or tape to hold the elevators in the neutral position.

❏ 17. Mark the pushrod where it crosses the innermost hole in the elevator servo arm.

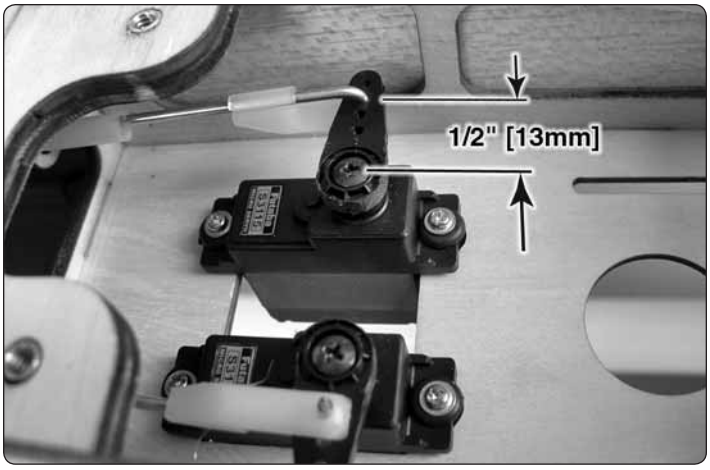


Remove the pushrod from the plane. Bend the pushrod 90 degrees at your mark and cut off the excess pushrod 1/4" [6.4mm] beyond the bend. Enlarge the inner hole of the pushrod to 5/64" [2mm]. Remove the clevis from the pushrod and insert the pushrod back into the pushrod tube. Reinstall the clevis onto the pushrod. Connect the bend in the pushrod into the inner hole of the servo arm and secure it using a FasLink.



Connect the clevis to the outer hole of the elevator control horn. Remove the spring clamp and check the elevator servo one more time with your radio system. Make any adjustments to the clevis position on the pushrod to ensure the elevators are centered with the servo centered. When satisfied, slide the clevis retainer toward the aft end of the clevis.

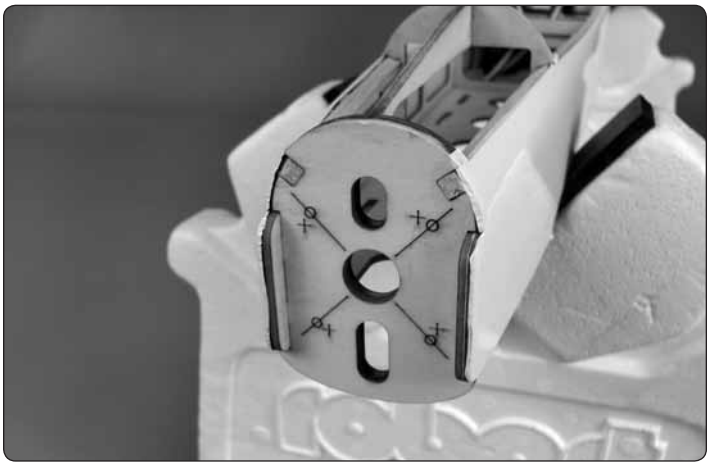
❏ 18. The rudder pushrod is installed in the same way as the elevator pushrod.



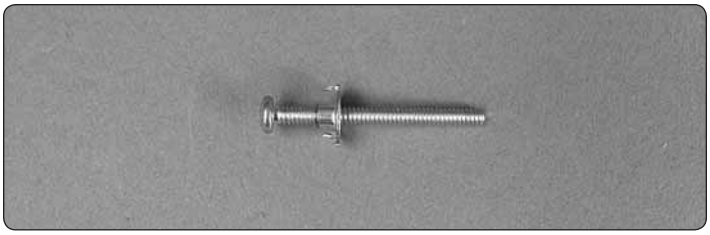
However, the clevis should connect to the second hole from the base of the control horn and the 90 degree bend should connect to the hole that is 1/2" [13mm] from the center of the servo arm. A slight bend in the pushrod at the aft end will prevent the pushrod from binding in the pushrod tube.

Install the Power System

❏ 1. The Proud Bird includes eight plywood motor spacers to accommodate different length motors. The recommended O.S. .25 motor (OMA-3820-1200) requires the use of three of these spacers to set the face of the prop adapter at the correct length of 2-3/4" [70mm] from the firewall. The E-Flite Power 25 1250kV motor does not need any spacers. Use the spacers to properly space different model motors to the correct distance from the firewall.

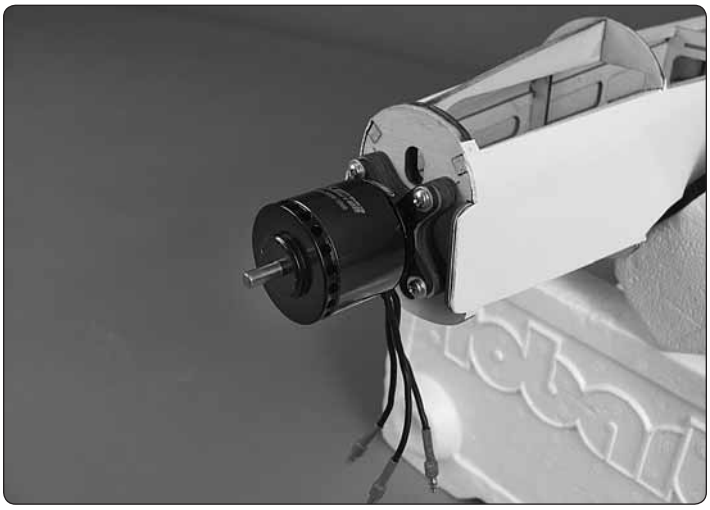


❏ 2. The firewall has mounting hole locations for the recommended O.S. .25 motor ("O" marks) and the E-Flite Power 25 1250kV motor ("+" marks). Other motors may not align with these marks and will require you to use the centering lines on the firewall to mark the mounting hole locations for your motor.

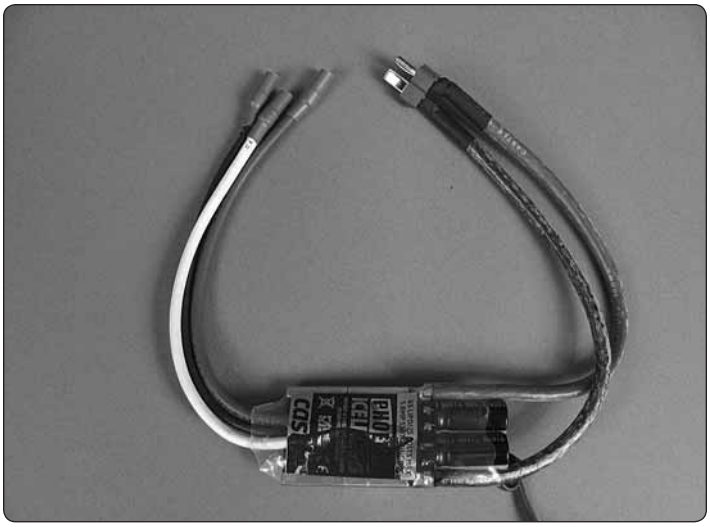


❏ 3. 3x35mm screws are included for accommodating motors requiring all eight motor spacers. If you are using less than eight spacers, the screws can be cut shorter but this may not be a necessary step. If you need to cut the screws, thread a blind nut onto each screw before cutting them. Removing the blind nut after the cut is made will straighten any damaged threads.

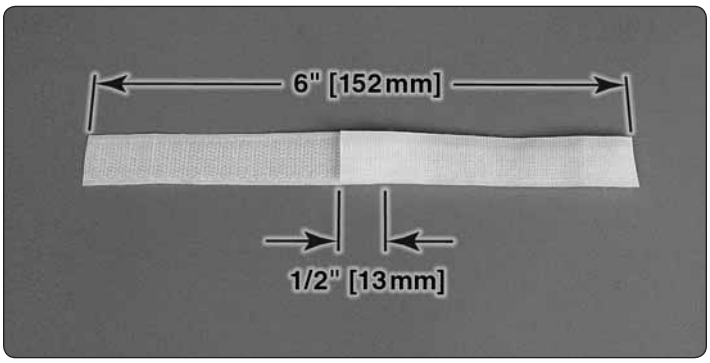
❏ 4. Drill 5/32" [4mm] at the marks that match the motor mounting hole pattern of your motor. We suggest starting with small pilot holes to ensure accuracy. Use a motor mounting screw and flat washer to draw 3mm blind nuts tightly into the holes you drilled. Apply a drop of glue to the back of each blind nut to secure them in place.



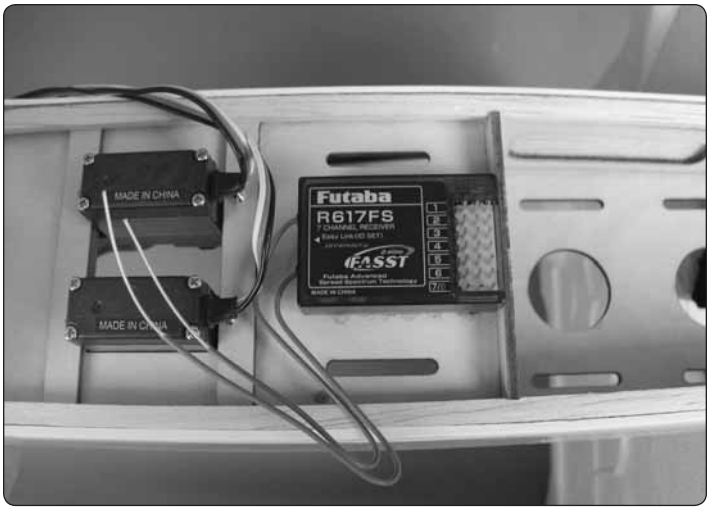
❏ 5. Mount your motor using the four 3x35mm motor mount screws, four 3mm flat washers and thread locking compound.



❏ 6. The recommended O.S. motor includes 3mm female bullet connectors which must be soldered onto the recommended Castle Ice 75A ESC. This speed control will also require you to solder a battery connector to the battery leads. If you are using the recommended battery, you will need W.S. Deans Male Ultra Plug (WSDM1302).

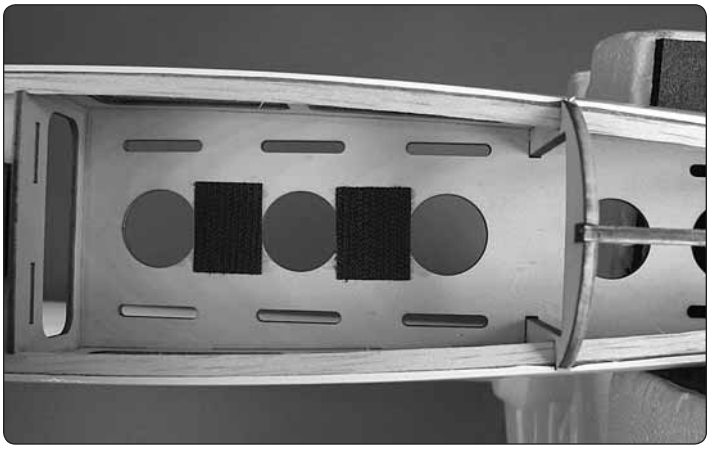


❏ 7. Make a 6" [152mm] long strap to hold the ESC in place from the included hook and loop material by cutting a length and overlapping the mating ends by 1/2" [13mm]. Connect the ESC to the motor and route the receiver lead through the hole in the fuselage former. A 6" [152mm] servo lead extension is required. Be sure to use tape, heat shrink tubing or a special clip made for securing servo lead extension connectors together.



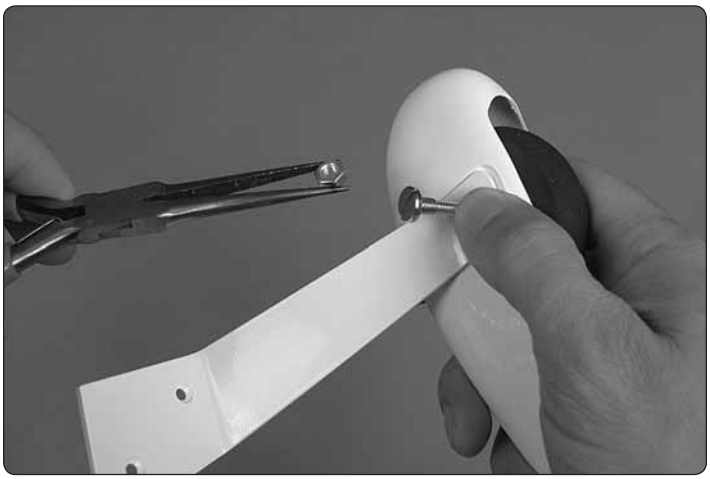
❏ 8. Use a piece of self-adhesive hook and loop material or make a strap from non-adhesive hook and loop material to secure the receiver in the location shown.

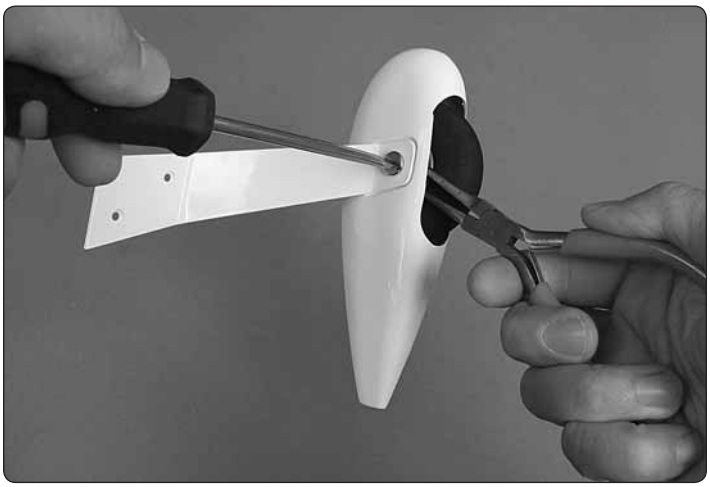
❏ 9. Cut the included 2" [51mm] piece of plastic tubing into two equal pieces. Glue the pieces to hold the 2.4GHz receiver antennas in the orientation described in your radio manual.



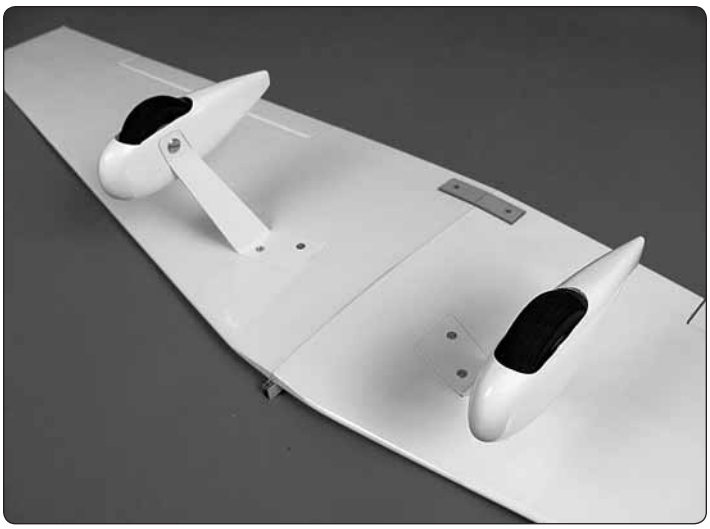
❏ 10. Coat the center of the battery tray with a thin coating of epoxy to improve the adhesion of the self-adhesive hook and loop material. Medium or thick CA glue will also work. Allow the glue to harden completely before attaching pieces of the hook side from self-adhesive hook and loop material.

Assemble & Install the Landing Gear



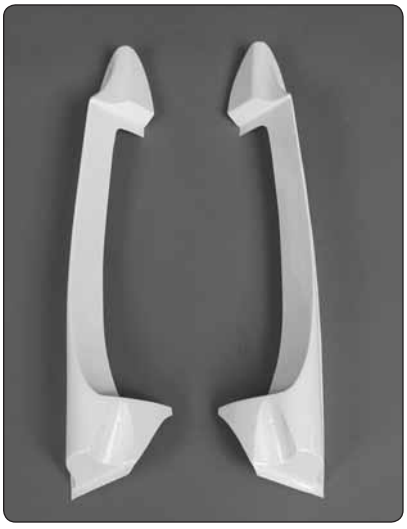


❏ 1. Apply a drop or two of household oil to the main wheel axles and thread locking compound to each axle nut. Fit an axle through a landing gear leg and partially into the wheel pant that fits onto that gear leg. Use a slender pair of needle-nose pliers to hold the axle nut. Put a main wheel into the wheel pant, fit the axle nut between the wheel and the pant aligned with the axle hole and slide the axle through the nut and through the wheel hub into the plywood disk glued to the other side of the pant. Holding the axle nut with pliers, tighten the axle. Repeat this step for the other landing gear leg. Use threadlocker.

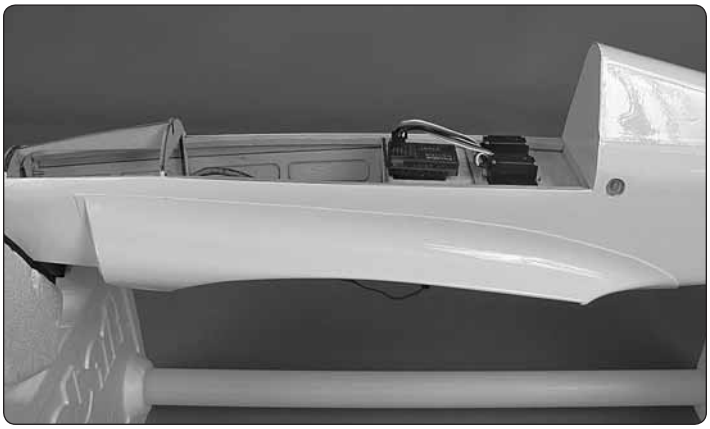


❏ 2. Mount the landing gear onto the wings using four 4x12mm flat head machine screws and thread locking compound.

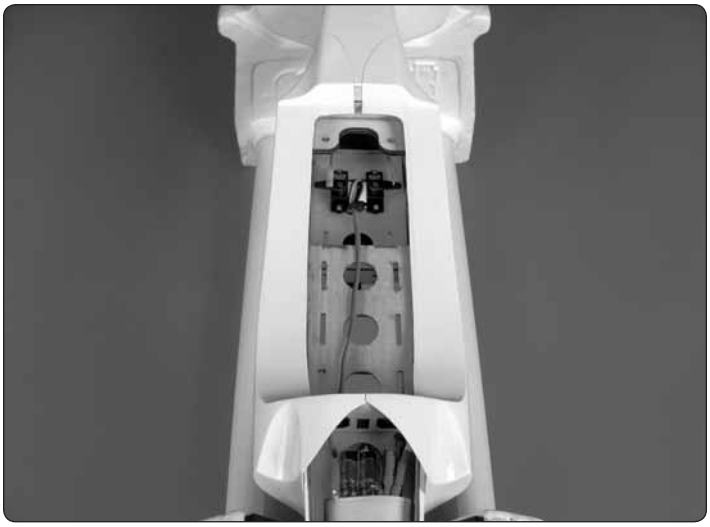
Install the Wing Fairings, Belly Pan & Cockpit Floor



❏ 1. Cut out the wing fairings along the cut lines. Curved canopy scissors work well for this task (HCAR0667).

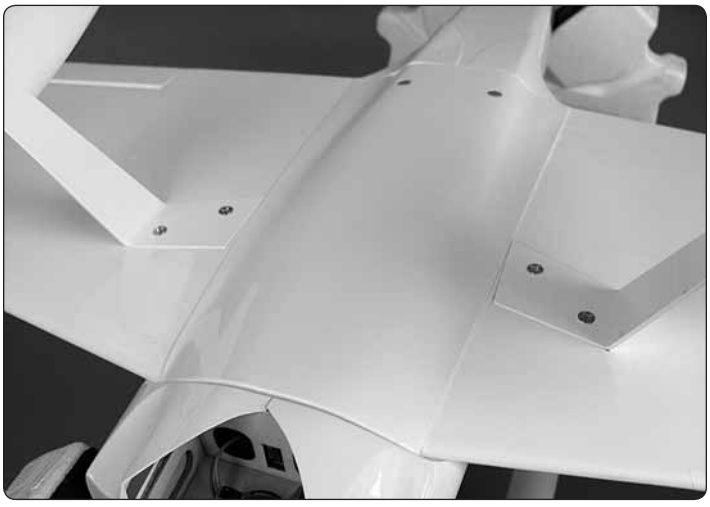


❏ 2. The fairings are molded to fit on the sides of the wing saddle and on the formers at the fore and aft ends of the saddle. Attach the wing. Test fit the fairings in place and make any adjustments necessary until you are satisfied with the fit.

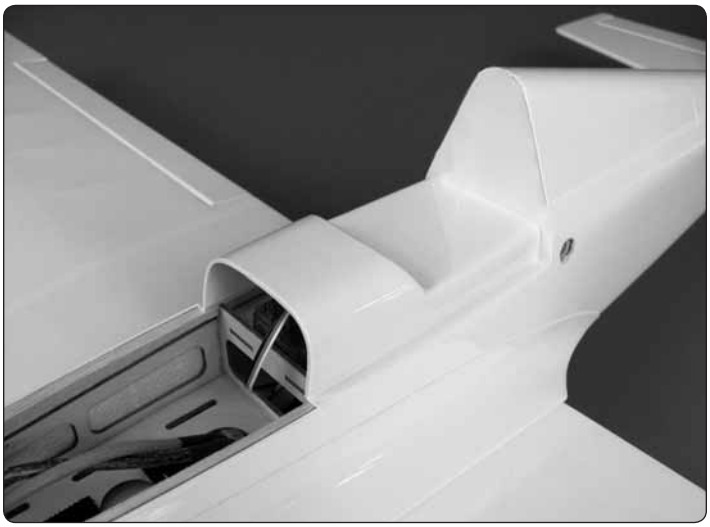


Use 220 grit sandpaper to smooth out the edges. The fairings can be glued on with canopy glue or CA glue. We recommend CA glue to avoid the drying time and masking tape required for canopy glue. To glue the fairings on with CA, apply a drop of medium or thick CA approximately every inch along the inside of the fairings where they fit onto the wing saddle edges and fore and aft formers. Press and hold them into place until the CA glue tacks up. Flip the plane over and use a small flathead screwdriver to carefully pry the fairings away from the fuse sides and apply additional drops of CA until the fairings are thoroughly glued in place.

❏ 3. Trim the belly pan along the cut lines. Make holes for the wing screws. Their location is marked with indentations. A body reamer works well for this task as it will make perfectly circular shaped holes without tearing the material (DTXR1158).



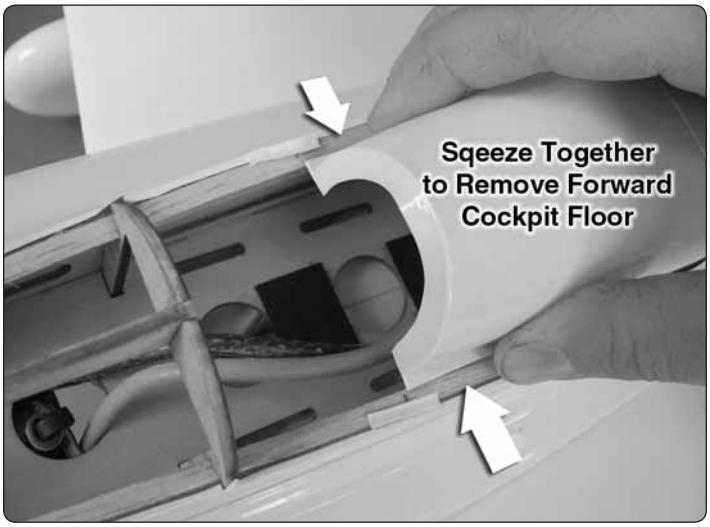
❏ 4. Test fit the belly pan in place and make any additional trimming and sanding necessary until you are satisfied with its fit. Don't allow the belly pan to cover any part of the landing gear bases. That may make them difficult to remove in the event they need to be repaired or replaced. Glue the belly pan to the wing. Take care not to glue the wing to the fuselage!



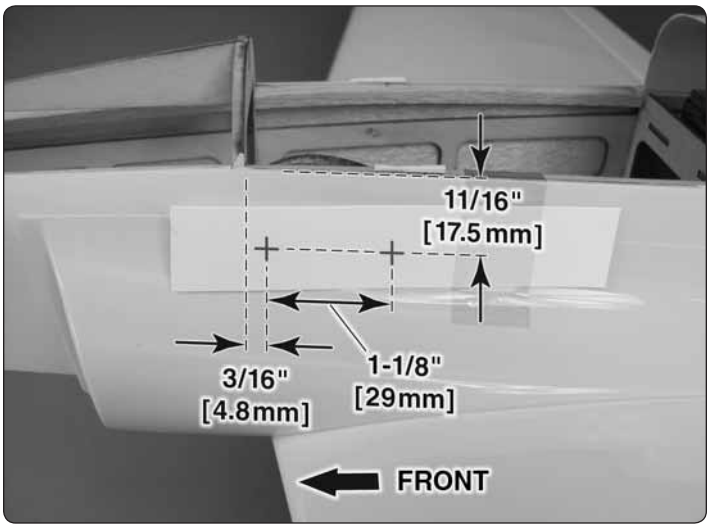
❏ 5. Trim the aft cockpit floor along the cut lines and test fit it in place. Before gluing this piece in place, confirm that your receiver antennas are properly placed, your receiver is bound to your transmitter, your tail servos and ESC are connected and you have a 6" [152mm] servo extension plugged into your aileron channel. Gluing the aft cockpit floor in place will provide only limited access to your receiver. We suggest using canopy glue sparingly or taping the floor in place in case you need to remove the floor in the future.

❏ 6. Trim the forward cockpit floor along the cut lines.

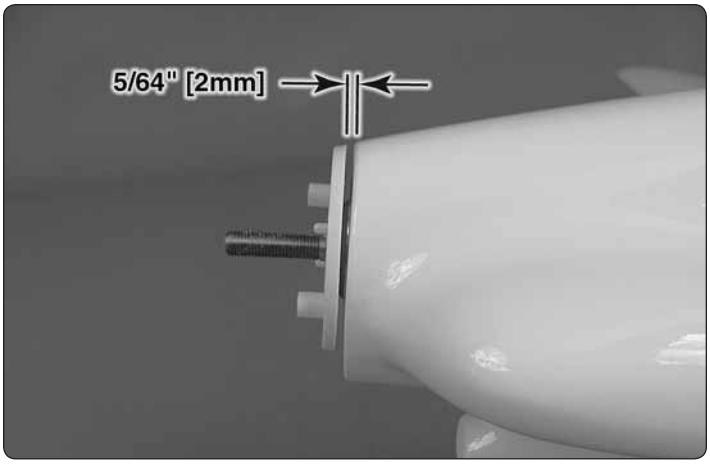
❏ 7. Test fit the forward cockpit floor in place. The back end of the forward floor fits underneath the aft cockpit floor. The forward cockpit floor is meant to be removable to provide you access to the battery. How you set it up to be removable is up to you. We used some scrap material from trimming the parts. To do this, choose a length of material that has a 90 degree bend and cut two strips approximately 1/2" [13mm] long and 1/8" [3.2mm] wide with the 90 degree bend going down the lengths of the strips. The crease in the strips will help keep them rigid. With the forward cockpit floor in place, glue the strips to the cockpit sides as shown, overlapping the front edges of the floor piece. To remove the forward cockpit floor, simply squeeze together the two front sides to unhook the piece from the strips.



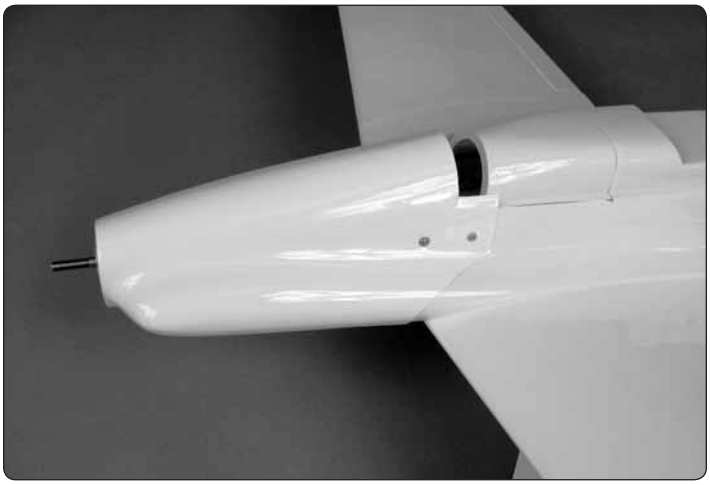
Finish the Model



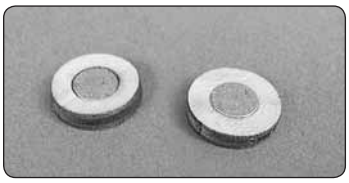
❏ 1. Cut strips of card stock or something similar approximately 4" [102mm] long and tape the aft ends of the strips to the fuselage in the location shown (one on each side of the fuselage). Use the measurements shown in the picture and mark the pieces of card stock for the cowl mounting screws. Use a T-pin to make small holes at your marks in the card stock.



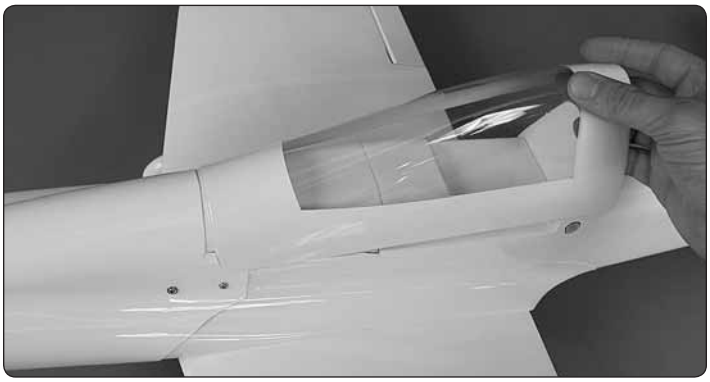
❏ 2. Slide the cowl onto the fuselage. Fit the spinner backplate onto the prop adapter (if you are using the recommended O.S. motor you will need to enlarge the hole in the backplate to 5.0mm). Position the cowl so that the front of the cowl is centered behind the backplate and there is a 5/64" [2mm] gap between the cowl and backplate. Use a felt-tip pen to make marks through the holes in the card stock onto the cowl.



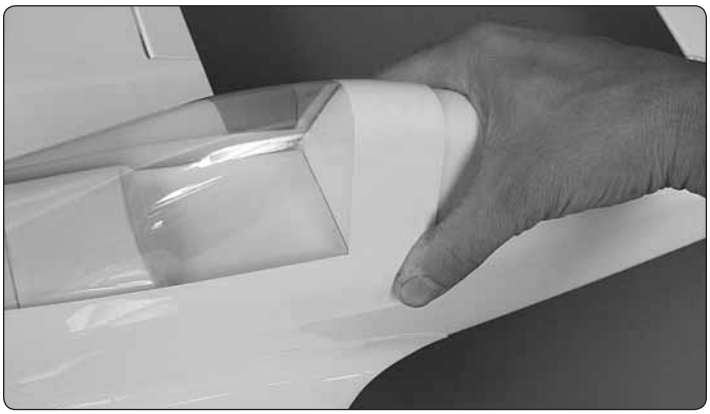
❏ 3. Drill 1/16" [1.6mm] holes at your marks through the cowl, through the wing fairings and through the fuselage sides. Remove the cowl from the fuselage. Thread a 2.3 x 10mm washer head screw into each hole in the fuselage and back it out. Apply a drop of thin CA to each hole and let the glue harden. Enlarge the holes in the cowl to 3/32" [2.4mm]. Install the cowl using four 2.3 x 10mm washer head screws.



❏ 4. Use CA to glue a magnet into each plywood disk. Allow the glue to harden completely before continuing to the next step.

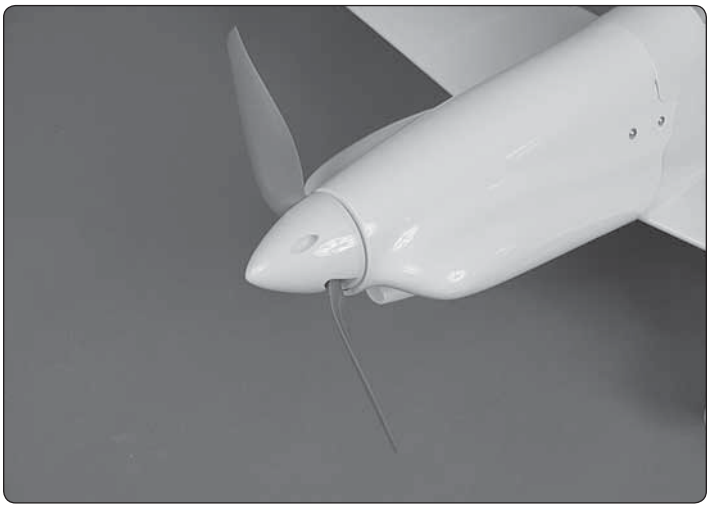


❏ 5. Magnetically attach the disks from the previous step to the magnets in the fuselage. Without glue, test fit the canopy onto the fuselage by fitting the forward end underneath the cowl.

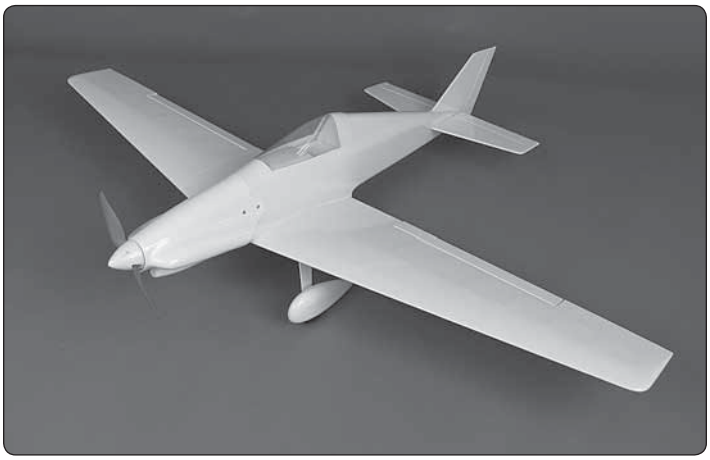


❏ 6. Apply a thin film of medium or thick CA glue onto the center of each magnet that is inside the plywood disks. **Apply the glue**

sparingly as you do not want it to run and inadvertently glue the disks to the fuselage. We recommend taping some non-stick material around the magnets such as wax paper to prevent gluing the canopy to the fuselage. Put the canopy in place and press the canopy against the magnets. Hold it there for a minute or two allowing time for the glue to tack. When the glue has completely hardened, test the operation of the canopy by pulling the magnets (which are now glued to the canopy) outward to release the canopy from the fuselage.



❏ 7. Install the spinner backplate followed by the prop, prop washer, prop nut, and spinner cone.



❏ 8. You have now completed the assembly of the Proud Bird ARF!

Apply the Decals

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

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

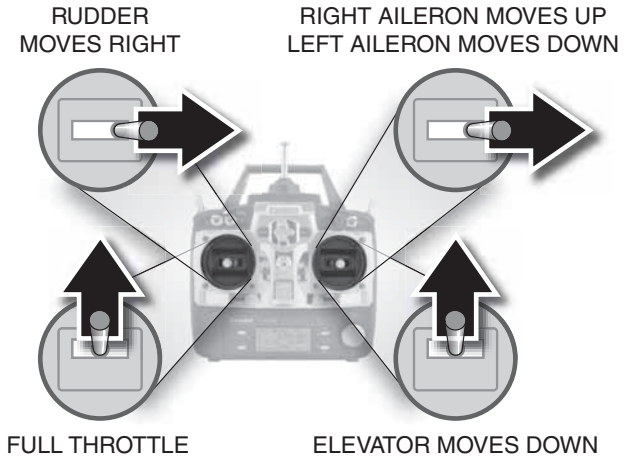
GET THE MODEL READY TO FLY

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.

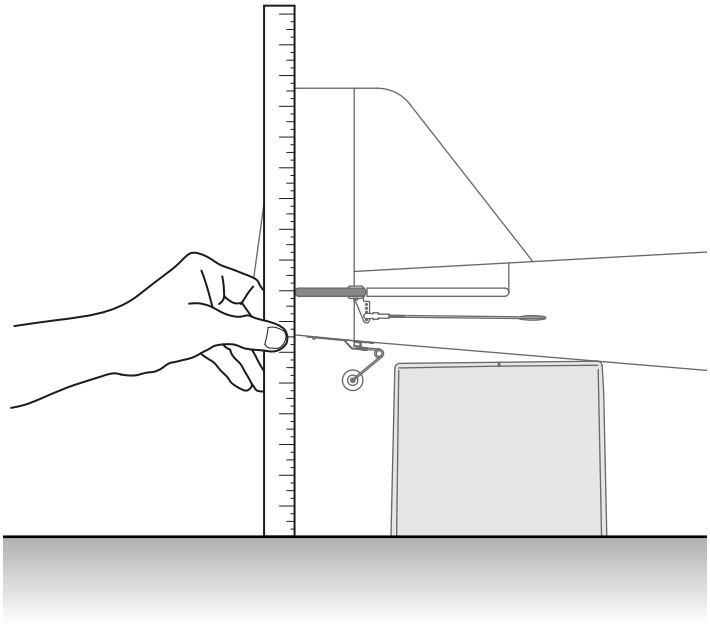
4-Channel Radio Set Up (Standard Mode 2)



❏ 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

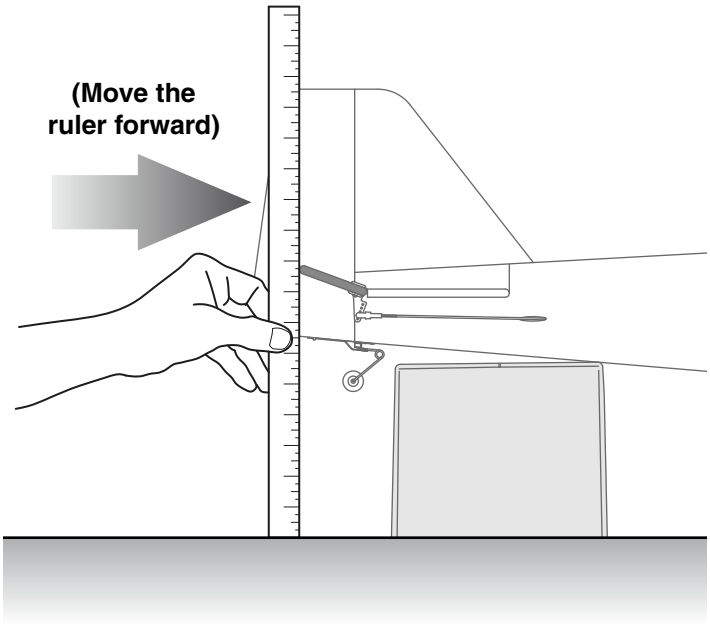
To ensure a successful first flight, set up your Proud Bird according to the control throws specified in this manual. The throws have been determined through actual flight testing and accurate record-keeping allowing the model to perform in the manner in which it was intended. If, after you have become accustomed to the way the Proud Bird flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model too responsive and difficult to control, so remember, "more is not always better."



❏ 1. Use a box or something similar to prop up the bottom of the fuselage so the horizontal stabilizer and wing will be level.

*Measure the **high rate** elevator throw first…*

❏ 2. Hold a ruler vertically on your workbench against the widest part (front to back) of the trailing edge of the elevator. Note the measurement on the ruler.



❏ 3. Move the elevator up with your transmitter and move the ruler forward so it will remain contacting the trailing edge. The distance the elevator moves up from center is the "up" elevator throw. Measure the down elevator throw the same way.

❏ 4. Measure and set the **low rate** elevator throws and the high and low rate throws for the rest of the control surfaces the same way.

If your radio does not have dual rates, we recommend setting the throws at the low rate settings for at least your first couple of flights.

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

These are the recommended control surface throws:		
	LOW RATE	HIGH RATE
ELEVATOR	Up & Down 1/8" [3mm] 5°	Up & Down 3/16" [5mm] 7°
RUDDER	Right & Left 1/2" [13mm] 18°	Right & Left 3/4" [19mm] 27°
AILERONS	Up & Down 1/4" [6mm] 11°	Up & Down 3/8" [10mm] 17°

ESC Setup

If you have installed the recommended ESC and brushless motor, then we suggest setting your motor timing to HIGH (10). Also, we recommend setting the cutoff voltage to AUTO-LIPO and 3.0 VOLTS/CELL.

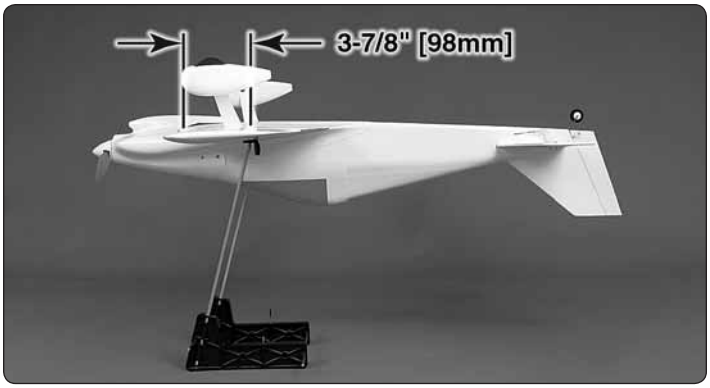
Balance the Model (C.G.)

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

At this stage the model should be in ready-to-fly condition with **all** of the components in place including the complete radio system, battery, propeller, spinner and pilot (not included). If you haven't already done so, apply the loop side of self-adhesive hook and loop material and apply it to the battery. Fit the battery on the center of the tray.

❏ 1. If using a Great Planes C.G. Machine, set the rulers to 3-7/8" [98mm]. If not using a C.G. Machine, use a fine-point felt tip pen to mark lines on the top of wing on both sides of the fuselage 3-7/8" [98mm] back from the leading edge. Apply narrow (1/16" [2mm]) strips of tape over the lines so you will be able to feel them when lifting the model with your fingers.

This is where your model should balance for the first flights. Later, you may experiment by shifting the C.G. 1/8" [3.2mm] forward or 1/8" [3.2mm] back to change the flying characteristics. Moving the C.G. forward will improve the smoothness and stability, but the model will then be less aerobatic (which may be fine for less-experienced pilots). Moving the C.G. aft makes the model more maneuverable and aerobatic for experienced pilots. 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, place the model upside-down on a Great Planes CG Machine, or lift it upside-down at the balance point you marked.

❏ 3. If the tail drops, the model is "tail heavy." Move the battery pack forward to get the model to balance. If the nose drops, the model is "nose heavy." Move the battery pack aft. If the battery cannot be moved far enough to bring the model to balance, or if additional weight is still required, nose weight may be easily added by using Great Planes "stick-on" lead (GPMQ4485). To find out how much weight is required, place incrementally increasing amounts of weight on the bottom of the fuselage over the location where it would be mounted inside until the model balances. A good place to add stick-on nose weight is to the firewall. Do not attach weight to the cowl—this will cause the mounting screws to open up the holes in the cowl. 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 fuse and gluing it permanently inside.

Note: Over time, the adhesive on the stick-on lead weight may fail and cause the weight to fall off. Do not rely on the adhesive alone to secure the weight. Instead, permanently attach the weight with glue or screws.

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

❏ 5. Once you have determined the optimum position of the battery on the battery tray, make a strap from the remaining hook and loop material and fit it through the slots in the battery tray that best match the location of the battery. Mark the location of the battery. Use the marks to position the battery on the tray for future flights.

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

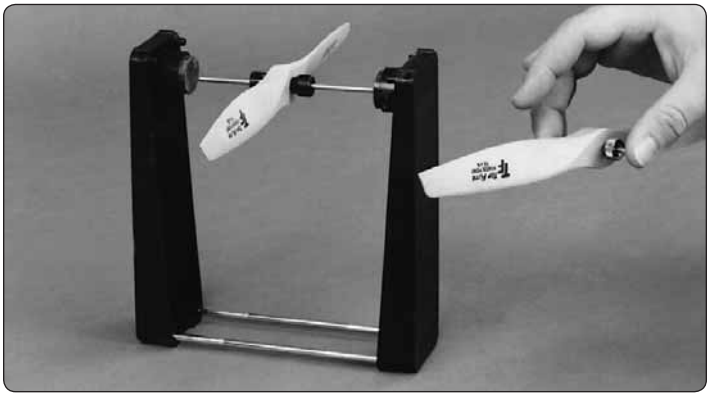
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on the back cover 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 battery the night before you go flying, and at other times as recommended by the radio manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter 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 engine 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.

Ground Check & Range Check

Run the motor on the ground and confirm that it transitions smoothly to full power and there is not excessive vibration (which would indicate a prop that requires balancing). Afterward, inspect the model closely, making sure all fasteners, pushrods and connections have remained tight and the hinges are secure. 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, or possibly a problem with the transmitter or receiver.

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 motors.
- Use safety glasses when starting or running motors.
- 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 your face and body as well as all spectators away from the plane of rotation of the propeller as you run the motor.
- Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.
- The motor gets hot! Do not touch it during or right after operation.

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 (that's why it's called a *check list!*).

❏ 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 (if applicable) 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, 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, cowl mounting 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, and the connection between your battery pack and the on/off switch 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 Proud Bird is a great-flying model that flies smoothly and predictably. The Proud Bird 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 take off, 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. Top off the charge in your pack, then check all fasteners and control linkages for peace of mind.

Remember to take off 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, 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 engine 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. While full throttle is usually desirable for takeoff, most models fly more smoothly at reduced speeds.

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

TRIMMING THE PROUD BIRD FOR RACING

"The NMPRA developed the Electric Formula 1 class to fill a need for a fun racing class that would be a great way for RC pilots interested in trying racing to give Pylon a try and for experts to have some laid back fun with cool looking planes that are reasonably priced, easy to operate and also fun to sport fly. The rules are also specifically written to keep the planes relatively equal with specific approved motors and tightly controlled model designs and batteries. Those goals have been met and exceeded.

You can find out more about this type of racing and the organization at the NMPRA web site: www.nmpra.org

The full set of rules is available on the site at: http://www.nmpra.org/rules.htm

Racing your Proud Bird in NMPRA EF-1 class can be a great time but, it can be even better when the plane is properly setup and trimmed to make it as easy as possible to get around the course quickly and consistently. It all comes down to doing the little things that improve your lap times. The easier it is to fly those fast lap times consistently, the better your heat times will be. We're going to walk you through the process of trimming your Proud Bird to allow you to make the most of the great flying qualities of this plane.

Let's start by carefully setting an initial center of gravity fore and aft to be within the range specified earlier in this manual. Play with battery location in the compartment as much as possible to get the CG to the desired location without adding weight, if at all possible. If you have the battery as far back as possible in the battery compartment and you're still nose heavy, use stick on weights under the horizontal stab, as far back as possible. You'll want to establish the position where your battery pack needs to be to get the CG in the desired position and mark it so you can repeat the position each time you install the battery. If you have battery packs that weigh different amounts, they'll need to be placed in different locations in the compartment to achieve the same CG. You may end up fine tuning the CG forward or aft to adjust the way the plane flies on the course but we'll get to that shortly.

Now, check the lateral balance of the plane, side to side, by picking up the plane by the prop shaft and the top of the vertical fin or lifting under the tail end of the fuselage (not on the movable rudder) to see if the plane is heavier on one side or the other. If it is, add weight to the light tip to get it as close as possible. Taping coins to the lower wing surface works well or you can use lead tape, available at golf stores or online. Again, this may end up being adjusted more based on the way the plane flies later.

Next, you need to set up your control throws. The control deflections that you use for sport flying will usually be more than is needed or wanted for racing. Every time you move a control surface you increase the drag of the airplane slightly and it slows down. The more you move those control surfaces, the more you slow down. Minimizing how much you move the controls while maintaining a tight course will always result in faster lap times. Learning to fly those faster laps consistently will result in faster heat times. Set your throws with low rates as recommended in this manual. That will be a good place to start. You can use the higher rates for sport flying or for landing in windy or bumpy conditions.

You should now be ready to get the plane in the air and see how it flies. Go fly the plane and get it trimmed well for straight and level flight. Throughout the trimming process, you will always want to do this first and after each change you make. Always re-trim for level flight. This is very important. Make long, level passes starting with the nose and wings level and get it trimmed very well before you think about flying it on the course.

Whether you are racing a 2-pole course while standing alongside the runway or the 3-pole course standing in the middle near pylons 2 and 3, you still need to make your turns as efficient as possible. Pulling on the elevator too hard will cause too much increase in drag and result in the loss of

too much speed by the time you complete the turn. You will cover less distance but you reduce your airspeed entering the following straightaway dramatically. Making a turn too soft and wide will take too much time to complete by covering too much distance. Your turn exit speed will be higher but may not be enough to offset the distance you covered making the turn. The optimum turn is somewhere in the middle. Many of the fastest racers set their elevator throws so that they pull full elevator deflection in each turn. If you have your rate set right on the 3-pole course, you should be able to bank into pylon 2 and smoothly pull elevator to full deflection and end up just clearing pylon 3.

The next step is to dial in the way the plane turns. What we're after is a plane that, when banked into a 90 degree bank for a turn, it comes out of that turn still at a 90 degree bank and it didn't climb or descend. What we want is to make sure that the plane flies "like" the weight is equal on both sides of the plane. If you have one side of the plane that is heavier than the other, the plane will roll some toward the heavy side when you pull elevator and not stay at the bank angle you started the turn with. I know we already talked about statically balancing the plane and that will usually get you very close but, sometimes, this roll is not simply caused by a weight difference but, you can help correct it by adding weight to the side that is "acting" like it's lighter. To check for this condition you'll want to fly the plane away from yourself so you can bank 90 degrees and pull elevator to do a 180 degree turn back toward yourself. If it does roll left or right, it will also climb or dive as it rolls. If it rolls out of the turn and climbs, add weight to the lower wing. If it descends and rolls into the turn, add weight to the top wing. This will dramatically help with consistency of your laps and your ability to control the altitude as you navigate the course.

Now, let's trim the rudder. Of course, like aileron and elevator, you want to trim for level flight with the plane not yawing left or right. Now trim the rudder so that the plane is easy to hold a constant altitude through the turns and is comfortable holding that partial bank angle in the straights. Don't add too much and cause it to fly tail low. You want just enough to get the plane comfortable and not wanting to descend or climb as you fly the course.

Next we'll dial in the way the plane flies in the straightaways. This is going to depend on what course you'll be flying, 2 or 3-pole and what length. In dedicated NMPRA EF-1 racing we mostly use the 375 ft 3-pole course and 400 ft 2-pole course. At some events where EF-1 is being flown along with AMA 424 or 426 Q500 events the 475ft 3-pole course is used. On the longer courses you will obviously spend more time in the straights, making it more worthwhile to roll the wings closer to level. On the shorter 375 ft 3-pole course, you'll find that the faster way around the course will be to not roll all the way out to wings level in the straights. Ideally, you would roll out to a bank angle of approximately 45 to 80 degrees. When viewed from above, your path around the three pole course will look a lot like the shape of an egg with the course in the straightaway's being a gentle curve connecting the tighter turns on each end. If you do it right, this will reduce the time that you spend in each turn at a high elevator deflection with the additional drag that comes with it.

To understand adjusting the way the plane flies the straights, you need to understand that a nose heavy plane will need more up trim in the elevator to fly level than a plane that has the center of gravity further aft. We're not talking about very much difference, just a little. Maybe a few clicks of trim. So, with a plane that is on the nose heavy side of the CG range, the required up elevator trim will have an effect on the course the plane will fly when you bank the plane to say, a 45 degree angle. That up elevator trim will then cause the plane to make a gradual turn in the direction it is banked. The more forward you have the CG, the more up elevator trim you need to fly level. The further aft the CG is, the less up elevator trim you need to fly level. So, when you bank a plane that has a further aft CG, it will carry less elevator trim and consequently, it will make a more gradual turn when simply banked to a given angle than a plane that has a further forward CG carrying more up trim.

With this in mind, go fly your Proud Bird on the race course. When you exit a turn, roll to a 45 to 60 degree bank angle as you enter the straight and ease off the elevator. If the plane tends to drift too much toward pylon one before you want it to, move the CG aft a little bit and go re-trim for level flight. It will now drift toward the pylon less than it did before. If it goes too straight for your flying style, move the CG forward and re-trim for level flight. It will now drift slightly more in the straights. The thing you have to keep in mind is, you may want the CG in a different position for a longer course that has longer straightaways. Usually, you will want the CG a little further aft for a longer course to not curve the straights quite as much.

You need to keep in mind that, while you're working through these steps, you may find that one adjustment has a small effect on the other. That's OK, just work with the different adjustments we've discussed to find a balance where all of these factors work well together. Once you've completed these steps, you'll have a Proud Bird that will be easier to fly faster and more consistently than one where you have to work harder to fly well. These techniques apply to any pylon racing plane and much of it to any plane you fly.

You can continue to learn more by seeking out races and racers in your area and get to know them. The NMPRA is a great organization with a lot of members who enjoy helping the new guy develop their skills and helping them enjoy the thrill of pylon racing. As mentioned earlier, you can find out more at: www.nmpra.org.

Have fun and GOOD RACING!!!"

This model belongs to:

Name

Address

City, State, Zip

Phone Number

AMA Number