P-51 MUSTANG ARF

INSTRUCTION MANUAL

SPECIFICATIONS

Wingspan:	52 in [1320mm]	**Weight:**	5– 5.75 lb [2270– 2610 g]	**Radio:**	Minimum four channel
Length:	42.5 in [1080mm]			**Engine:**	.46-.55 cu in (7-9 cc) 2-stroke or .70 (11.5 cc) 4-stroke
Wing Area:	550 in^2 [35.5 dm^2]	**Wing Loading:**	21– 24 oz/ft^2 [64– 73 g/dm^2]	**Electric:**	RimFire 32, 45 amp ESC

WARRANTY

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

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

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

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

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

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

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

GREAT PLANES® MODEL MANUFACTURING COMPANY

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

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INTRODUCTION

The Sport Fighter Mustang is a great flying sport model. For the latest technical updates or manual corrections visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the Sport Fighter Mustang 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

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

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302-9252

Tele. (800) 435-9262
Fax (765) 741-0057

AMA
SINCE 1936

Or via the Internet at: http://www.modelaircraft.org

SAFETY PRECAUTIONS

Protect Your Model, Yourself & Others…
Follow These Important Safety Precautions

1. Your Sport Fighter Mustang should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. If not assembled and operated correctly, it 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
3. You must use an R/C radio system that is in good condition, a correctly sized engine, and other components as specified in this instruction manual.
4. 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.
5. While this kit has been flight tested to exceed normal use, if an engine 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.
6. **WARNING:** The cowl included in this kit is made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part to remove fiberglass dust, as the dust will blow back into your eyes.

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.

DECISIONS YOU MUST MAKE

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

Motor Battery Recommendations

The Sport Fighter P-51 ARF comes with a mounting box for the Great Planes RimFire brushless outrunner motor. This motor has been tested with this plane and works well.

- ❍ Great Planes RimFire .32 (42-50-800) Brushless Outrunner Motor [GPMG4700]

ESC (electronic speed control)

A brushless ESC (electronic speed control) is required for the recommended motor set-up. We recommend using the:

- ❍ Great Planes Silver Series SS-45A Brushless ESC [GPMM1840]

Flight Battery

We recommend the FlightPower FP 30 LiPo 4S 3800mAh 14.8V 30C with an APC 13" x 8E propeller.

- ❍ Great Planes ElectriFly LiPo 4S 2200mAh 14.8V 30C [GPMP0862]
- ❍ FlightPower FP 30 LiPo 4S 3800mAh 14.8V 30C (FPWP3384)
- ❍ APC 13" x 8E Propeller (APCQ3080)

Radio Equipment

The Sport Fighter Mustang requires a minimum of four channels. The airplane requires the use of five servos for the glow engine installation, or four servos and an ESC for the electric motor installation.

A servo with a minimum 54oz-in of torque is required on all of the control surfaces. A lower torque servo is acceptable as the throttle servo. We used the Futaba 9001 (FUTM0075) throughout our testing. Additionally, three 6" [150mm] servo extensions (TACM2090 for Futaba) are required for the aileron servos and one 6" Y-harness (FUTM4135 for Futaba).

Engine Recommendations

The recommended engine size range for the Sport Fighter Mustang is 2-stroke .46-.55 cu in (7-9 cc) OR 4-stroke .70 (11.5 cc). If an engine in the upper end of the size range is used, remember that this is a semi-scale model that is intended to fly at scale-like speeds, so throttle management should be practiced.

Optional Pilot

- ❍ Great Planes 1/5 scale pilot (GPMQ9115)

ADDITIONAL ITEMS REQUIRED

Required Hardware and Accessories

This is the list of hardware and accessories required to finish the Sport Fighter Mustang. Order numbers are provided in parentheses.

- ❍ Three 6" [150mm] servo extensions (TACM2090 for Futaba)
- ❍ 6" Y-harness (FUTM4135)
- ❍ R/C foam rubber (1/4" [6mm] - HCAQ1000
- ❍ 1/2 oz. [15g] Thin Pro CA (GPMR6001)
- ❍ 1/2 oz. [15g] Medium Pro CA+ (GPMR6007)
- ❍ Pro 30-minute epoxy (GPMR6047)
- ❍ Drill bits: 1/16" [1.6mm], 5/64" [2mm], 1/8" [3mm], 7/64" [2.8mm].
- ❍ 6-32 tap and drill set (GPMR8102)
- ❍ Tap handle (GPMR8120
- ❍ #1 Hobby knife (HCAR0105)
- ❍ #11 blades (5-pack, HCAR0211)
- ❍ Threadlocker thread locking cement (GPMR6060)
- ❍ Masking tape
- ❍ Fine line marker

Optional Supplies and Tools

Here is a list of optional tools mentioned in the manual that will help you build the Sport Fighter Mustang.

- ❍ 2 oz. [57g] spray CA activator (GPMR6035)
- ❍ Epoxy brushes (6, GPMR8060)
- ❍ Mixing sticks (50, GPMR8055)
- ❍ Mixing cups (GPMR8056)
- ❍ Rotary tool such as Dremel
- ❍ Denatured alcohol (for epoxy clean up)

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 Ph: (217) 398-8970, ext. 5
Champaign, IL 61822 Fax: (217) 398-7721

E-mail: **airsupport@greatplanes.com**

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Sport Fighter Mustang 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

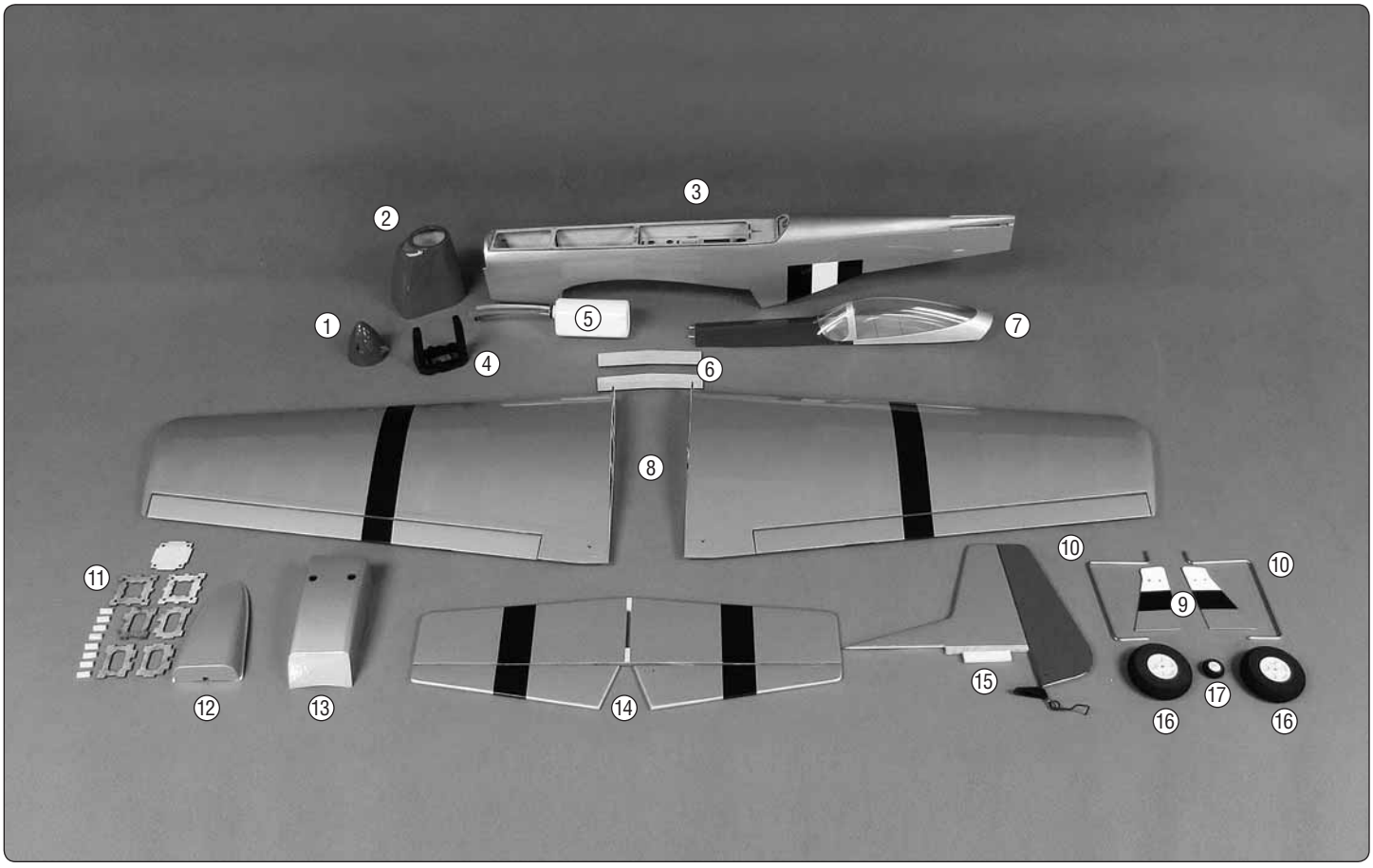
Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

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
GPMA5365	Wing
GPMA5366	Fuse
GPMA5367	Tail Surface Set
GPMA5368	Cowl
GPMA5369	Spinner
GPMA5370	Landing Gear Set
GPMA5371	Gear Covers
GPMA5372	Canopy/Hatch
GPMA5373	Decals
GPMA5374	EP Motor Mount

KIT CONTENTS



Kit Contents

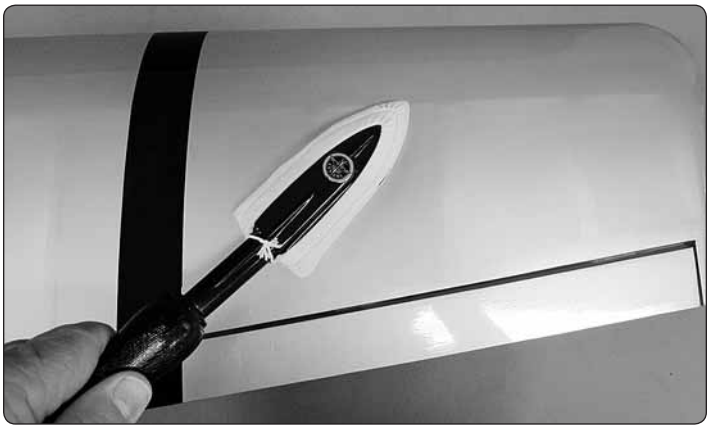
1. Spinner
2. Cowl
3. Fuselage
4. Motor Mount
5. Fuel Tank
6. Wing Joiner
7. Canopy
8. Wing
9. Landing Gear Doors
10. Landing Gear Wires
11. Electric Motor Box
12. Forward Fairing
13. Air Scoop
14. Stab & Elevators
15. Fin, Rudder, & Tail Wheel Assembly
16. Main Wheels
17. Tail Wheel

IMPORTANT BUILDING NOTES

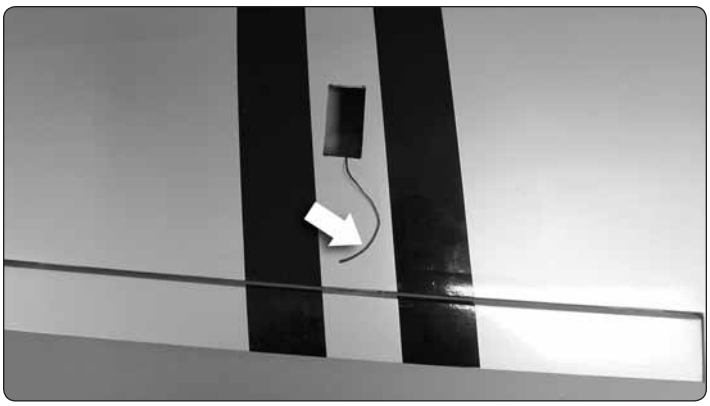
- *Throughout the manual you will be told to drill holes into the wood and insert the screws. In all cases you should insert the screw and then remove the screw. Apply a drop of thin CA glue to harden the threads. After the glue hardens re-install the screws.*
- *When installing nuts on screws and bolts be sure to apply a drop of thread locker to each one.*
- *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.*

- *The canopy/hatch is pre-installed on the fuselage. To remove it, slide the canopy forward and lift it from the rear.*

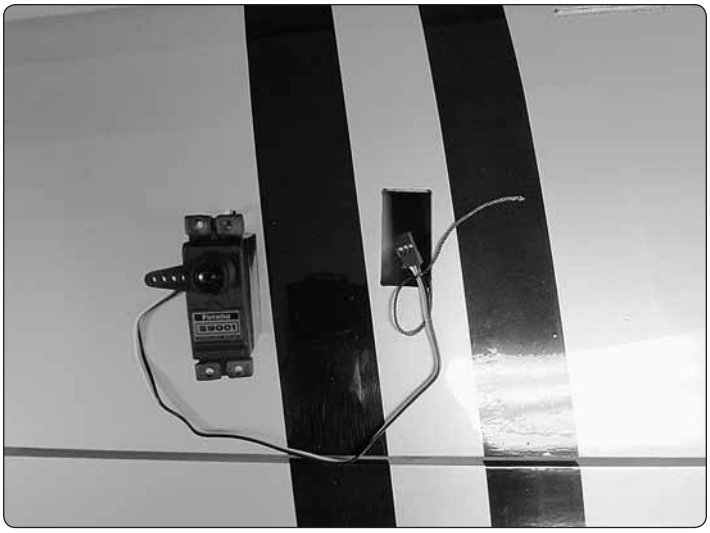
ASSEMBLE THE WING



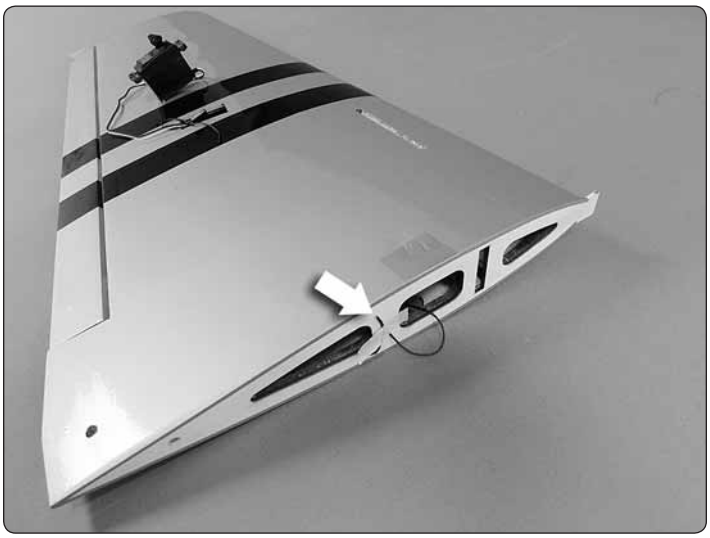
❏ 1. Tighten the covering.



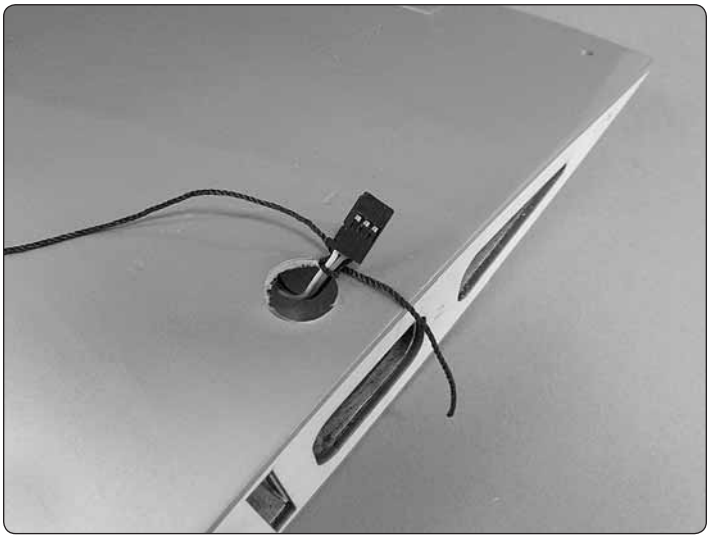
❏ ❏ 2. Remove the end of the string from the wing. ***Do not pull the string completely out of the wing.***



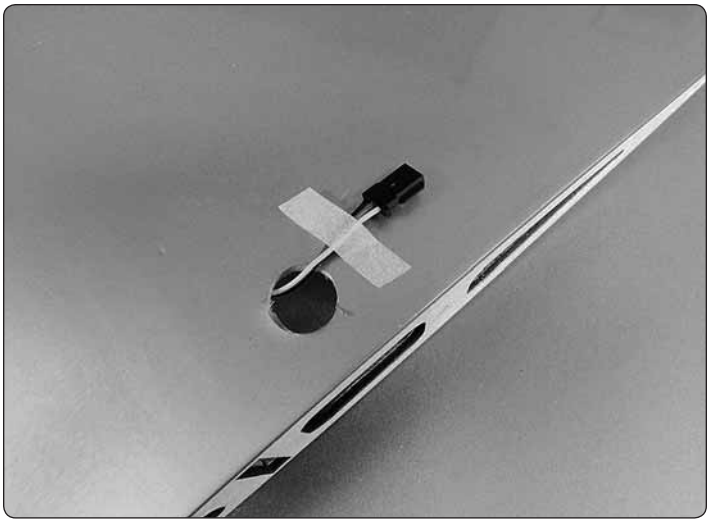
❏ ❏ 3. Install servo arm and hardware. Tie string to the servo lead.



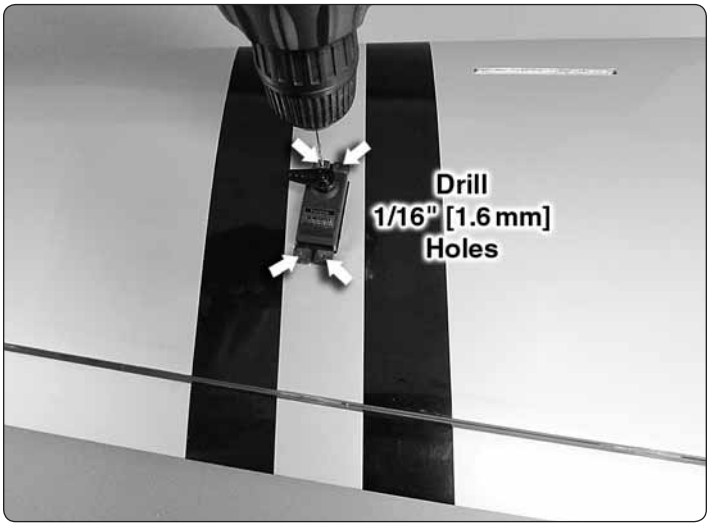
❏ ❏ 4. The end of the string is taped to the root rib of the wing. Pull servo lead through the wing.



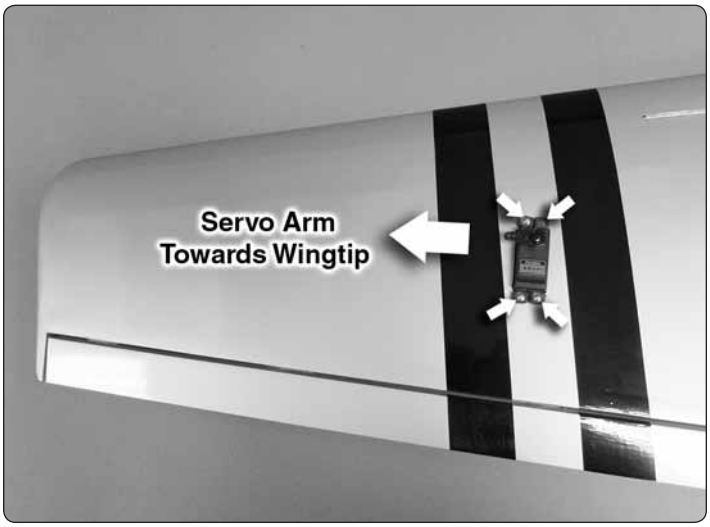
❏ ❏ 5. Pull the servo lead through the hole in the wing.



❏ ❏ 6. Remove the string and then tape the lead to the wing.

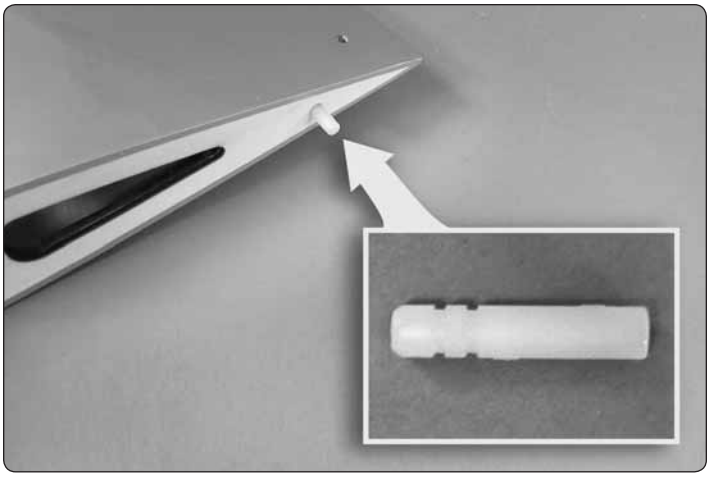


❏ ❏ 7. Drill four 1/16" [1.6mm] holes through the servo mounting holes, into the plywood plate.

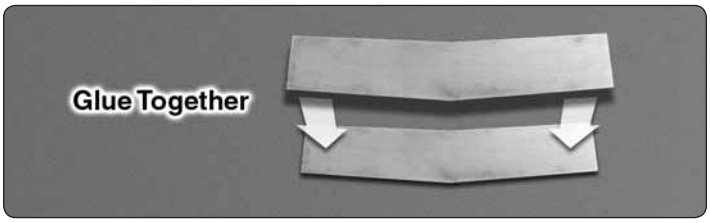


❏ ❏ 8. Mount the servo with four servo screws. Install the servo arm so it points toward wingtip.

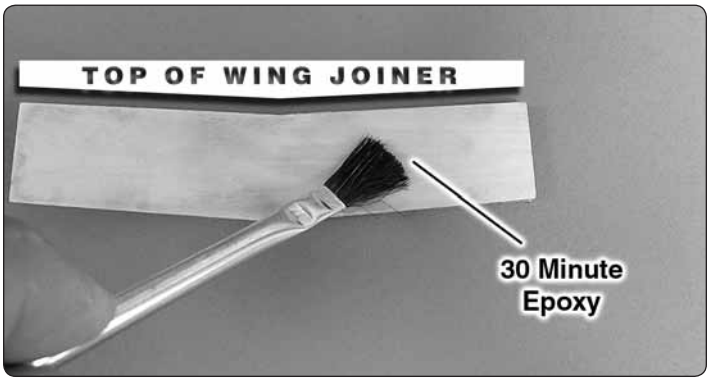
❏ 9. Repeat steps 2 - 7 for the other wing.



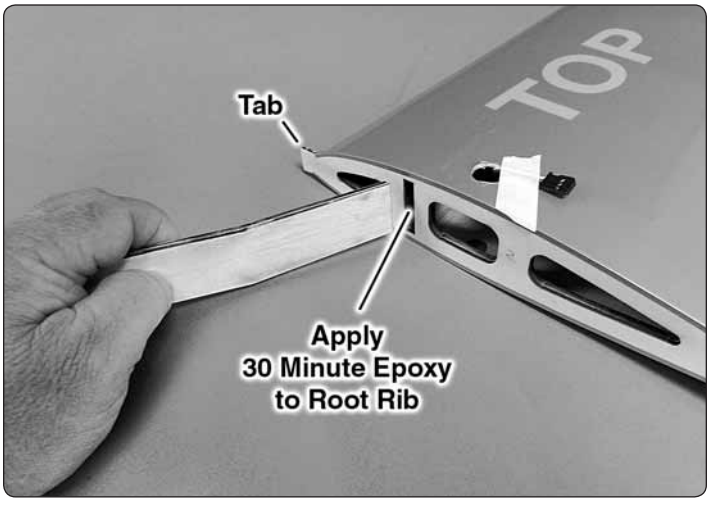
❏ 10. Glue pin into the right wing root rib.



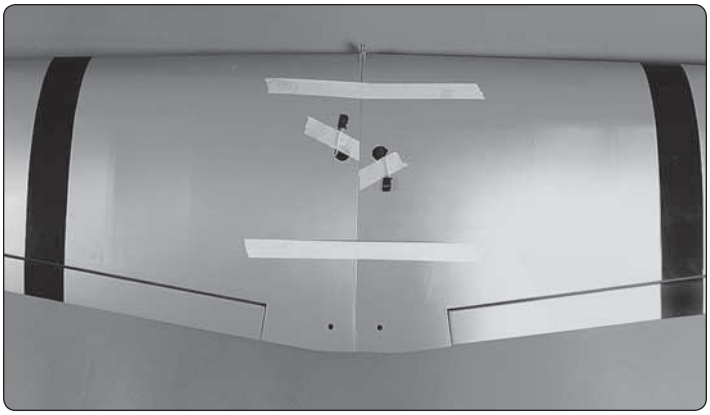
❏ 11. Using 30 minute epoxy, glue two wing joiners together. Allow it to harden.



❏ 12. Apply 30 minute epoxy to both sides of the wing joiner.

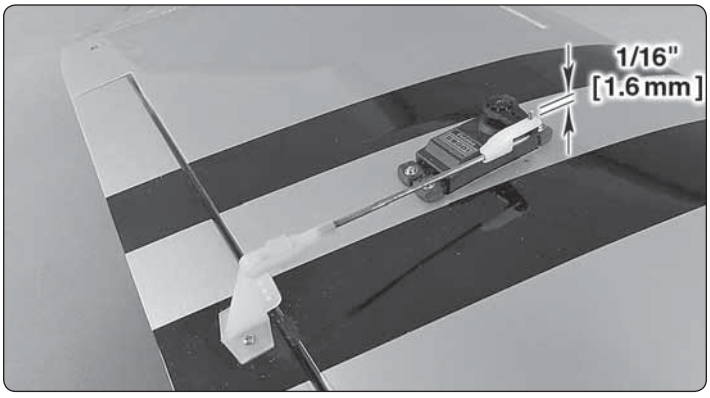


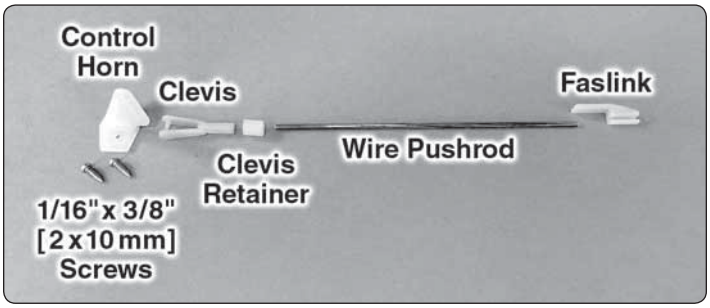
❏ 13. Apply epoxy inside the joiner pocket and all along the root rib (including the tab) of both wings. Insert the joiner and assemble the wings.



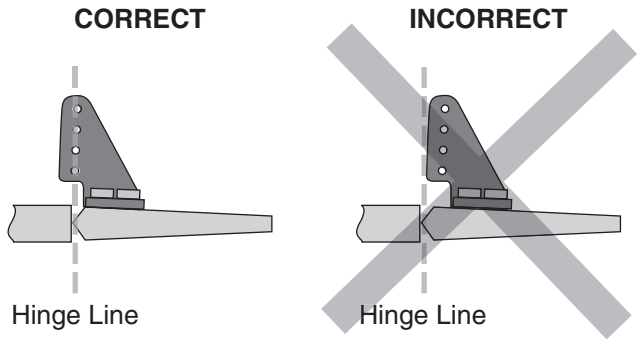
❏ 14. Tape the wings together and allow the glue to harden.

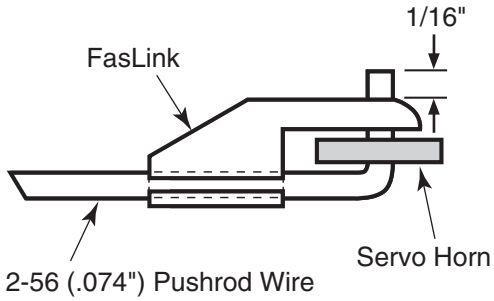
❏ 15. Install a Y-harness to the two aileron servo leads. Secure the leads with shrink tube or tape.

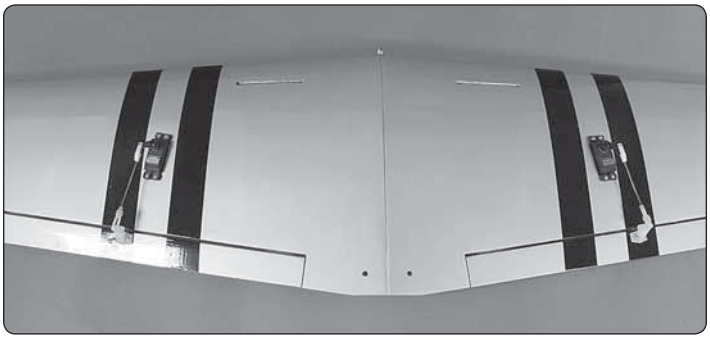




❏ 16. Assemble the pushrod components as shown. Place the control horn on the aileron in line with the servo arm. Drill a 1/16" [1.6mm] hole though the surface of the aileron. ***DO NOT DRILL THROUGH THE TOP OF THE AILERON!*** Secure the control horn with two 1/16" x 3/8" [2x10mm] screws. Drill a 5/64 [2mm] hole in the outer hole of the servo arm. Install the clevis to the outer hole of the control horn. Center the aileron and the servo. Make a mark on the wire where it aligns with the servo arm outer hole. Bend the wire on the mark. Secure the wire to the servo arm with a Faslink and then cut off the excess length of wire.

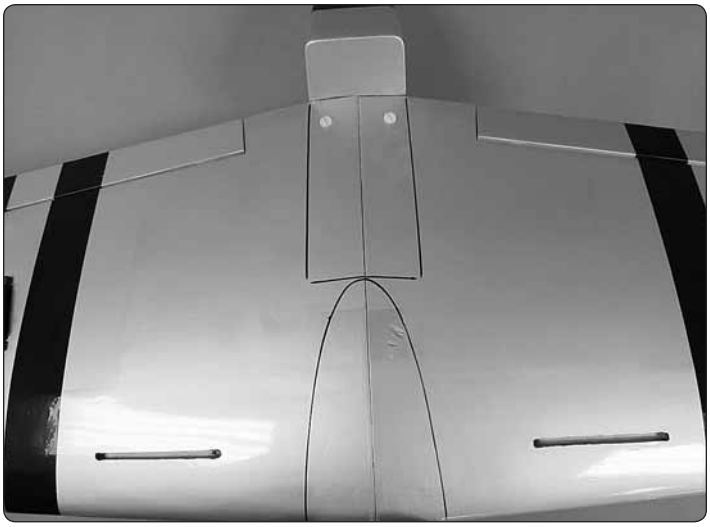


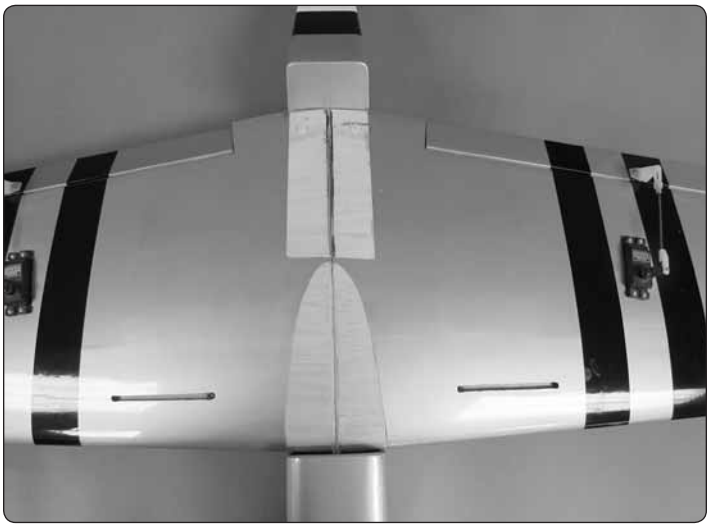


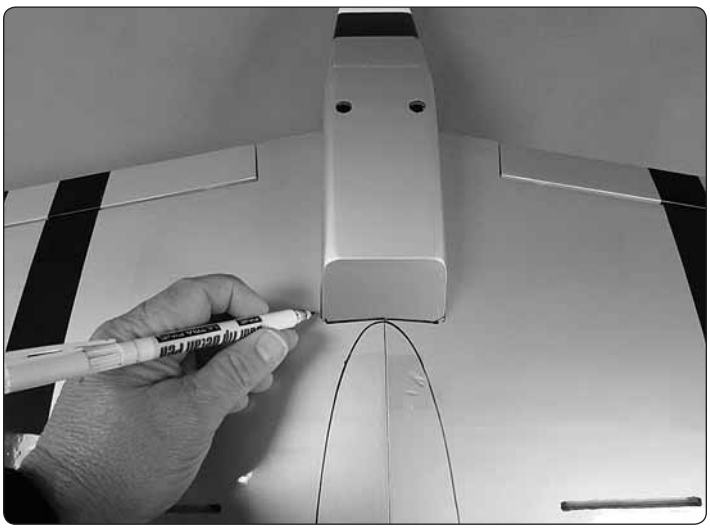


❏ 17. Repeat this for the other aileron servo.

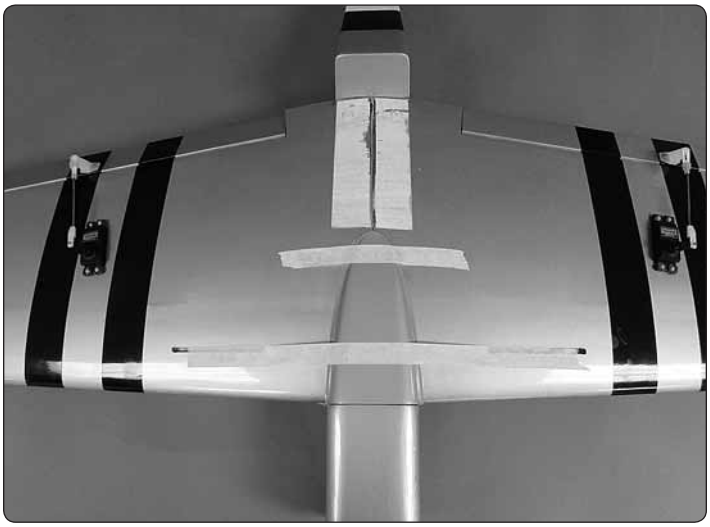
❏ 18. Temporarily mount the wing to the fuselage with two 10-24 x 2" [51mm] nylon bolts.



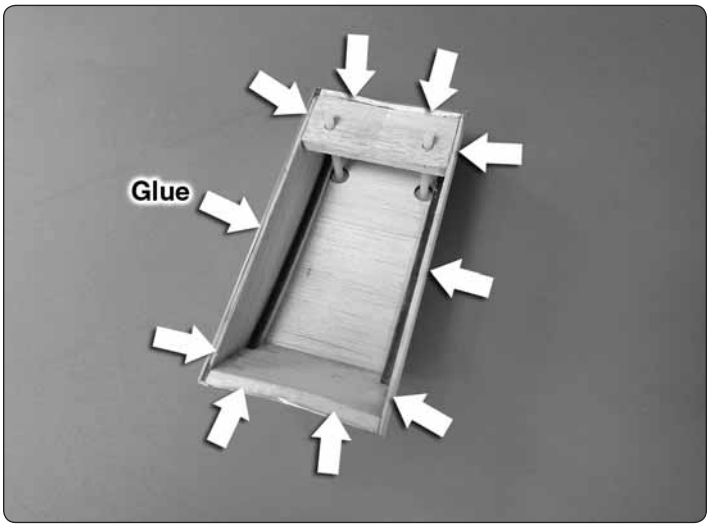




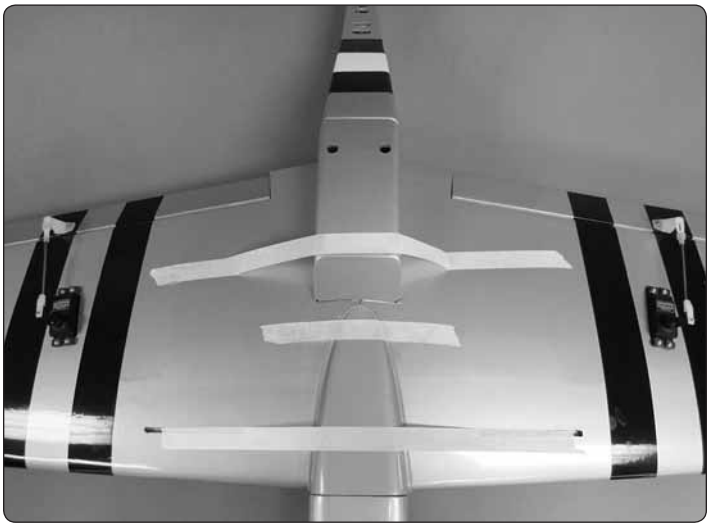
❏ 19. Place the forward fairing onto the wing and trace the location onto the wing with a felt tip marker. Do the same with the air scoop. Using a “Sharp” hobby knife cut the covering 1/16" [1.6 mm] inside of the lines you have drawn. ***DO NOT CUT THROUGH THE BALSA WING SKIN!***



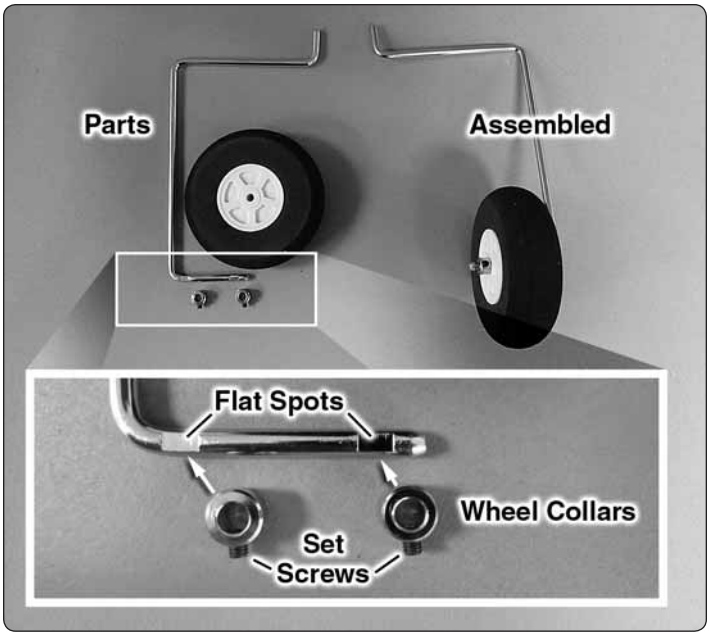
❏ 20. Apply glue to the edges of the fairing. Tape it in place on the wing.



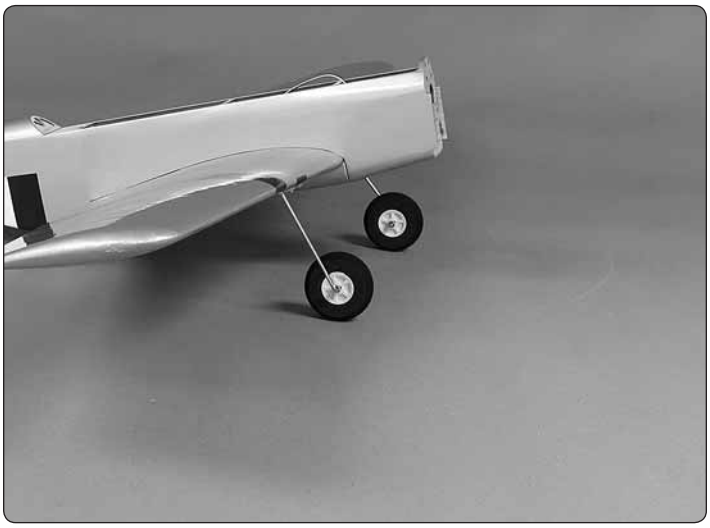
❏ 21. Remove the wing bolts from the wing. Insert them into the holes in the air scoop. Apply glue to the edges of the air scoop.



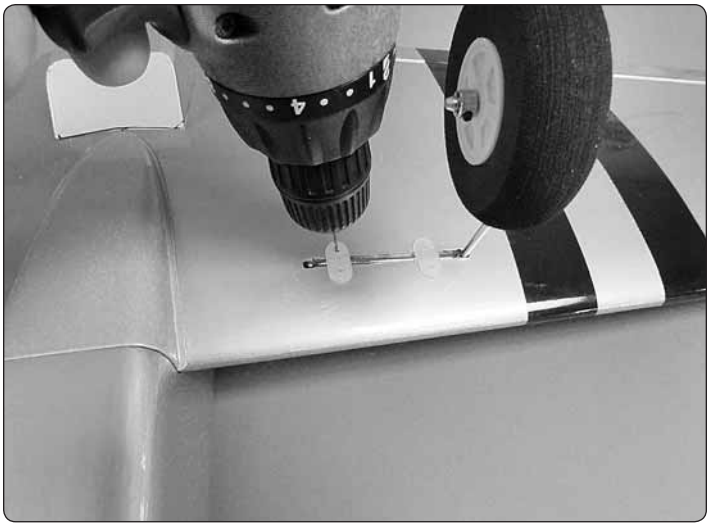
❏ 22. Place the air scoop onto the wing, tighten the bolts to the fuselage and tape the front of the air scoop in place. Allow the glue to dry.

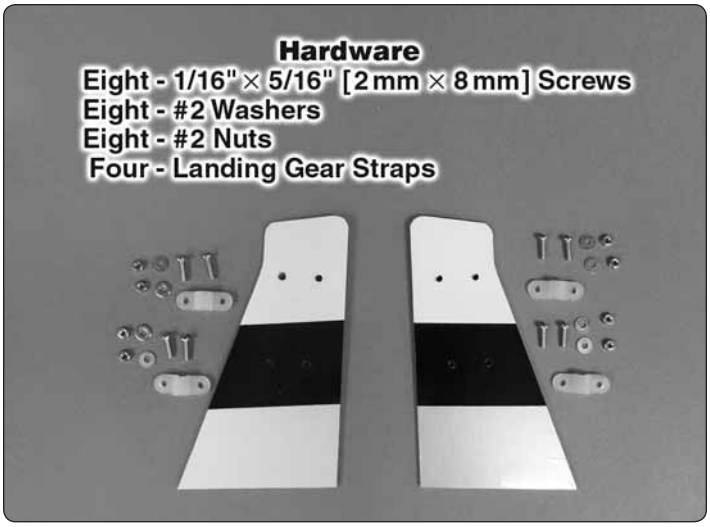


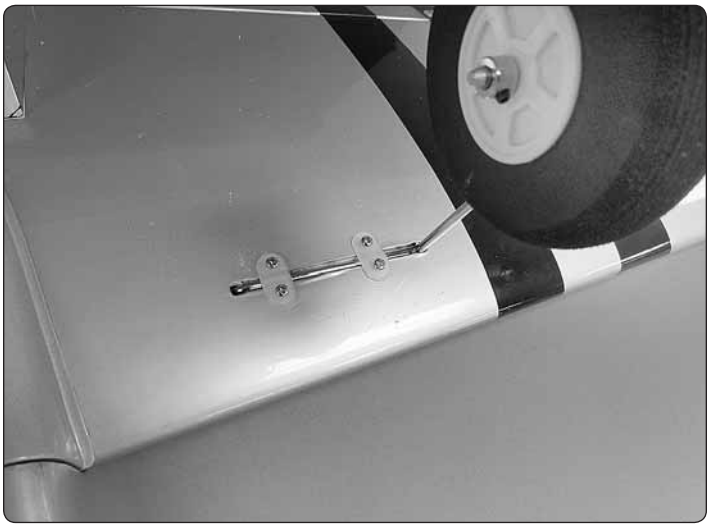
❏ 23. Assemble the landing gear as shown.

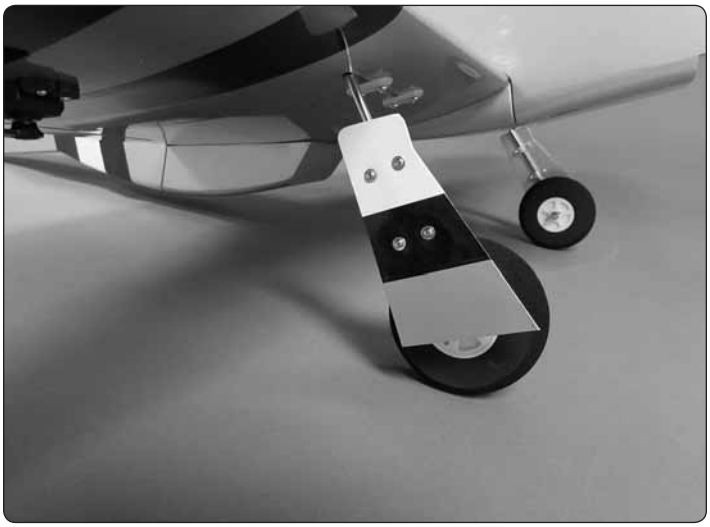


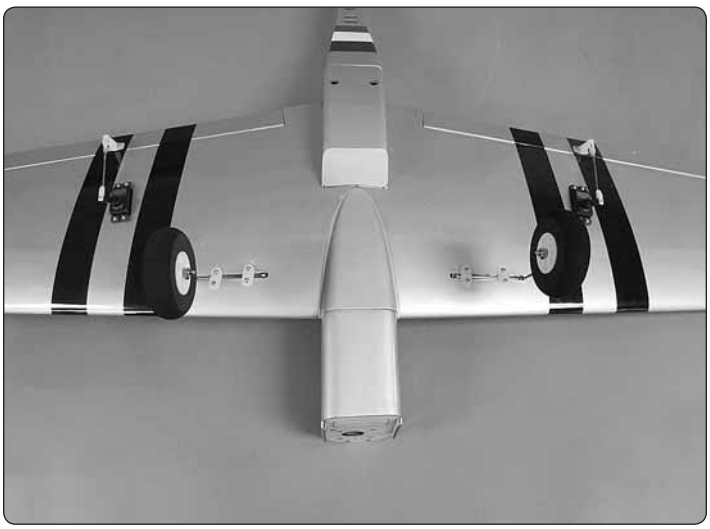
❏ 24. Install the landing gear into the slots in the bottom of the wing. The landing gear should be angled forward.







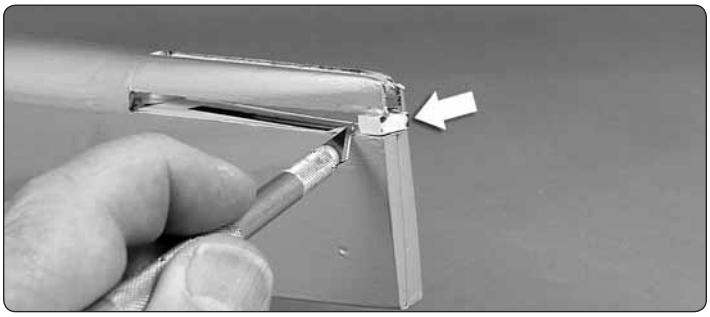




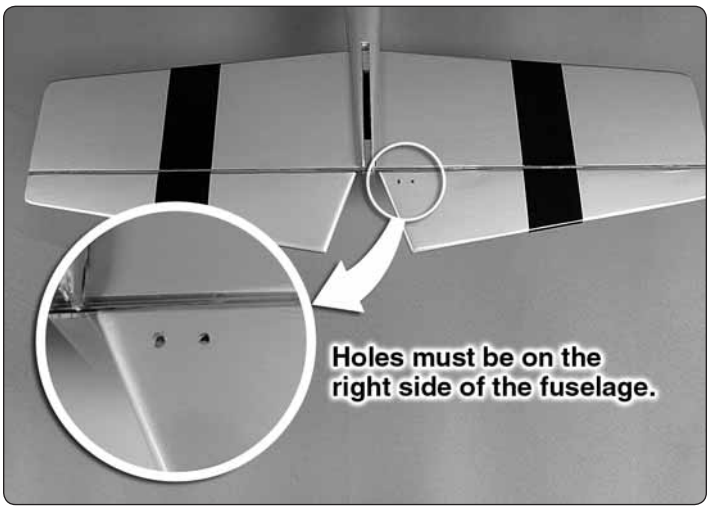
❏ 25. Lay two plastic landing gear straps over each landing gear wire. Drill four 5/64" [2 mm] holes in each wing half. Secure the landing gear straps to each wing half with four 1/8" x 3/8" [3 mm x 10 mm] screws.

❏ 26. Install the landing gear fairings.

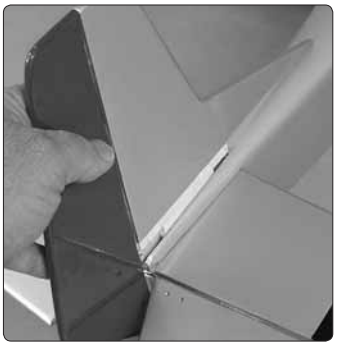
ASSEMBLE THE FUSELAGE



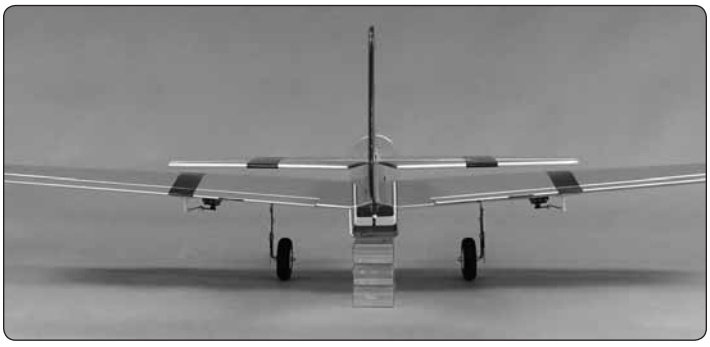
❏ 1. Cut away the block at the rear of the fuselage.



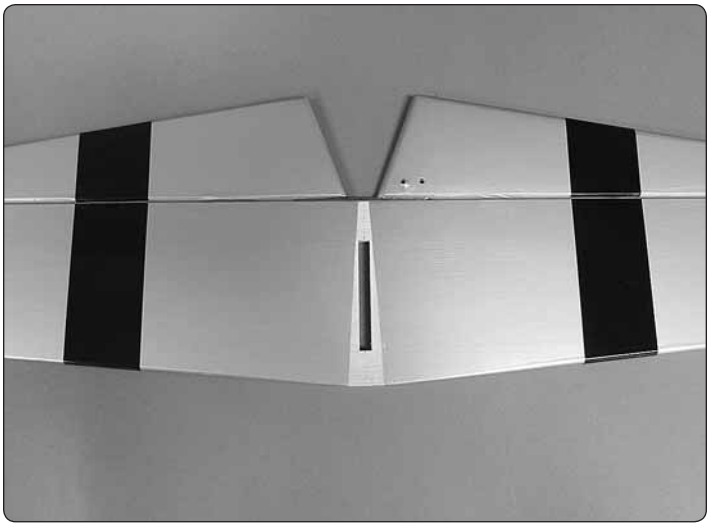
❏ 2. Test fit (do not glue) the stabilizer into the slot in the rear of the fuselage.

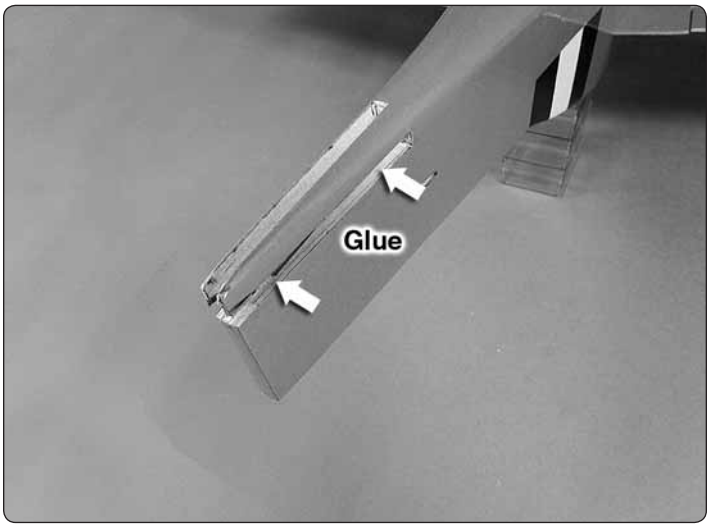


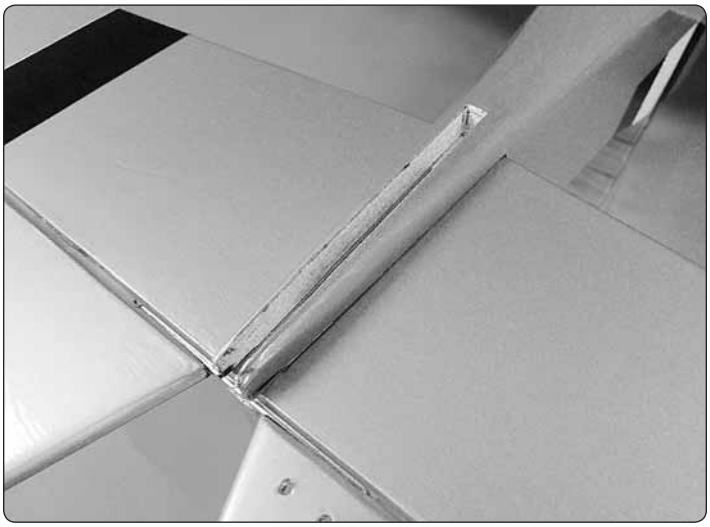
❏ 3. Test fit (do not glue) the fin into the slot in the fuselage and stabilizer.



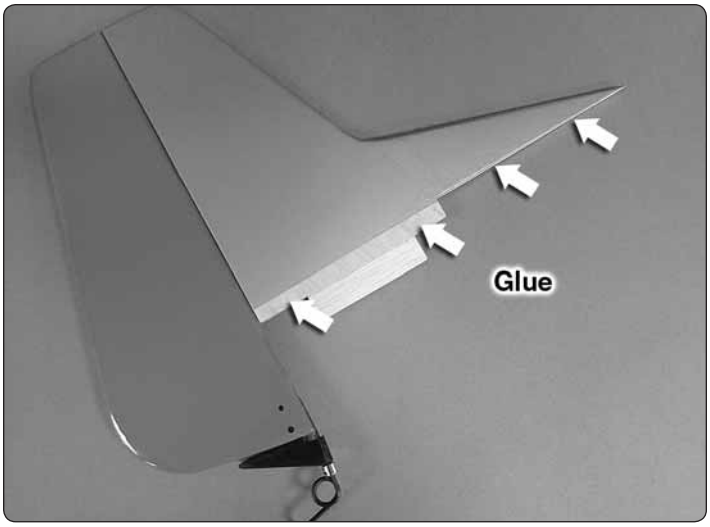
❏ 4. Look at the stab. It should be aligned with the wing. Sand the stab saddle as needed to make the stab align with the wing.

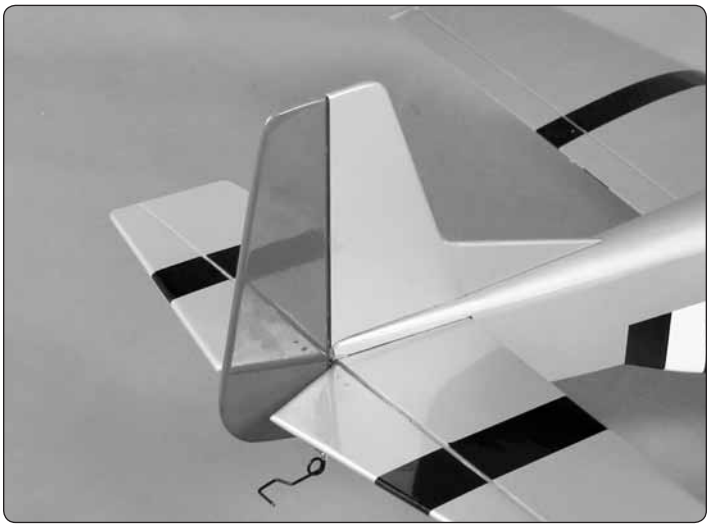


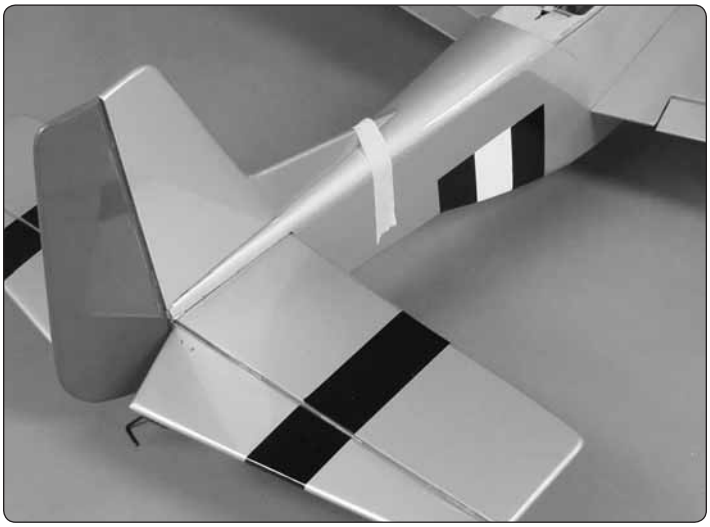




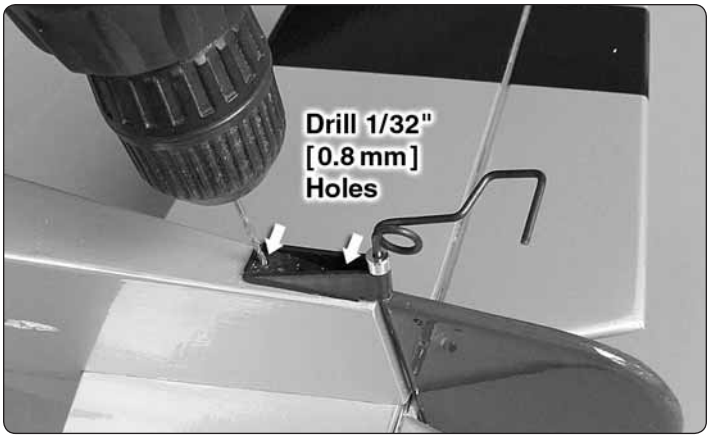
❏ 5. Apply glue to the top, center of the stab and the stab opening in the fuselage. Insert the stab into the opening in the fuselage. Wipe away excess glue.



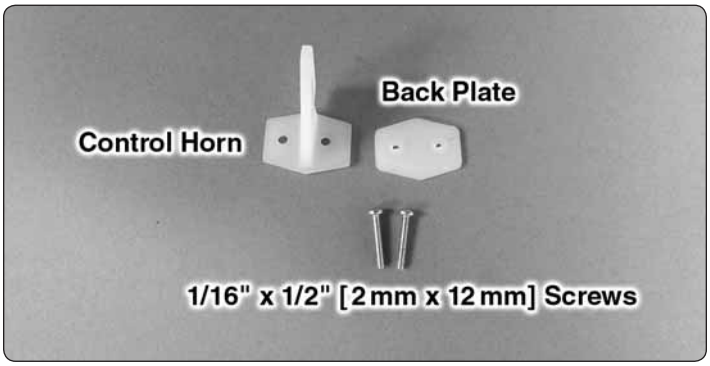


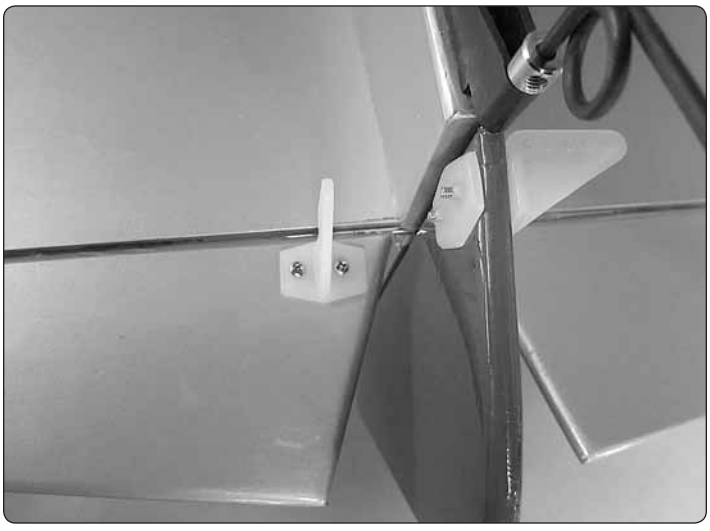


❏ 6. Apply glue to the sides and the bottom of the fin. Install it into the fuselage and stab opening. Tape the fin in place while the glue dries.

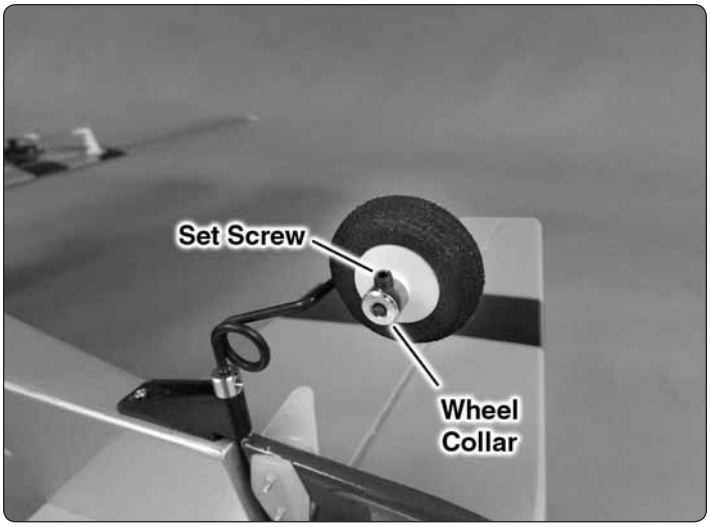


❏ 7. Secure the tail wheel bracket with two 1/16" x 3/8" [2mm x 10mm] screws.

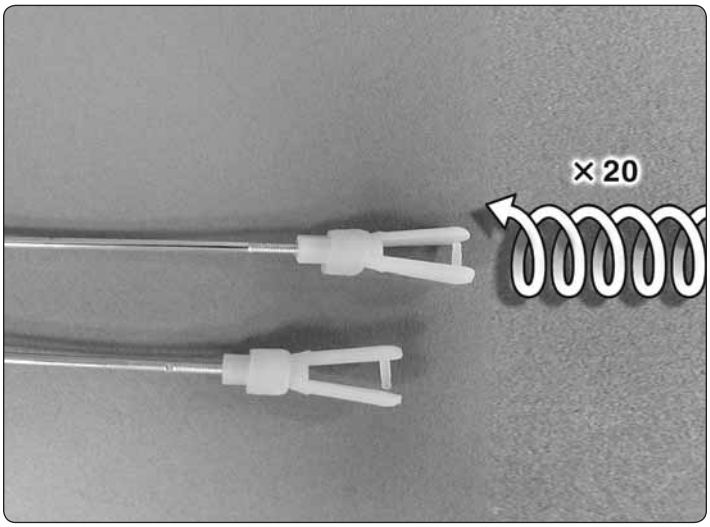




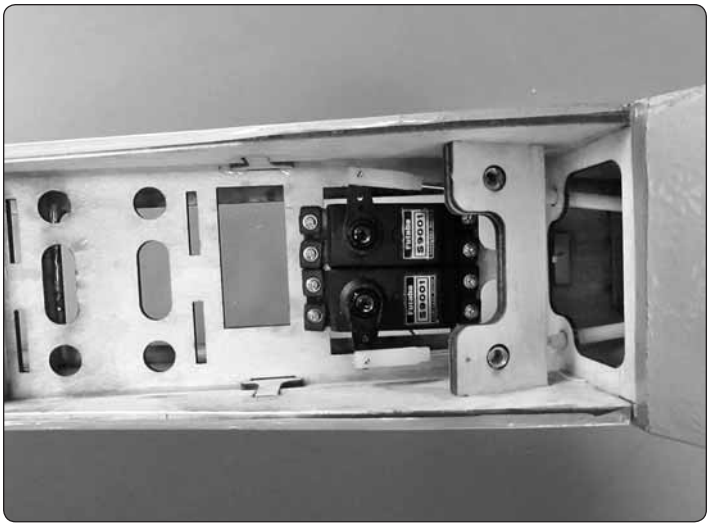
❏ 8. Install the control horns on the rudder and elevator.



❏ 9. Install the tail wheel, securing it with the wheel collar and set screw.



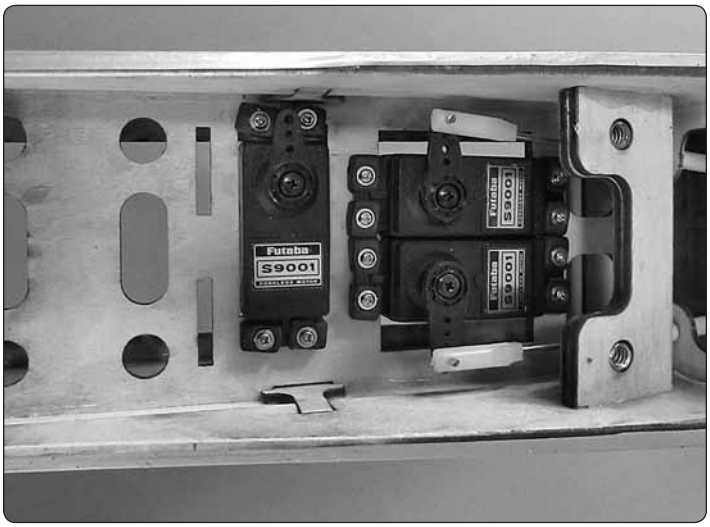
❏ 10. Install a clevis and clevis keeper onto two 20" [508mm] pushrod wires. Insert the wires into the holes in each side of the fuselage. Attach the clevis to the outer hole of each control horn. Slide the clevis keeper over the clevis.



❏ 11. As you did with the ailerons, drill 1/16" [1.6mm] holes for mounting each servo. Secure each servo with four servo screws. Drill a 5/64" [2mm] hole in the outer hole of the servo arm. Center servos, rudder, and elevator, then make a mark on the wire where it aligns with the servo arm outer hole. Bend the wire on the mark. Secure the wire to the servo arm with a Faslink and then cut off the excess length of wire.

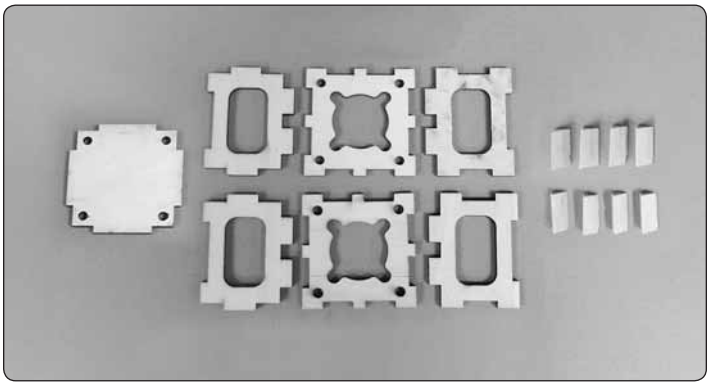
Note: *If you are installing a glow engine continue with step 12. If you will be using electric power skip ahead to page 14.*

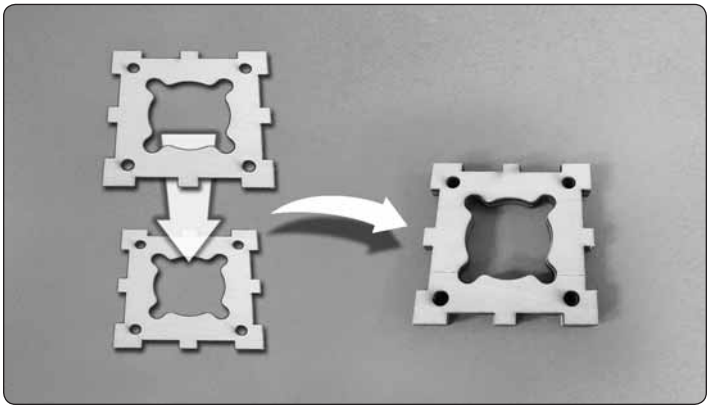
❏ 12. If you are installing a glow engine, install the throttle servo the same as you did the elevator and rudder servos.



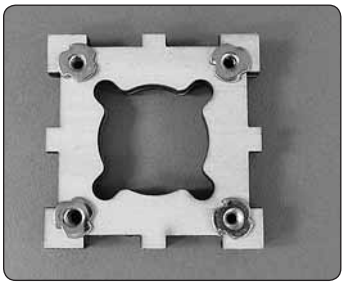
❏ 13. As you did with the other servos, drill 1/16" [1.6mm] holes for mounting each servo. Secure the servos with four servo screws. Drill a 5/64" [2mm] hole in the outer hole of the servo arm. You will complete the throttle servo installation during the engine installation. *Skip ahead to the ENGINE INSTALLATION on page 16.*

ELECTRIC MOTOR INSTALLATION

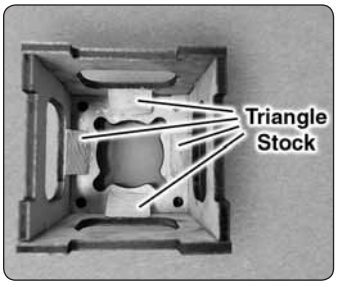


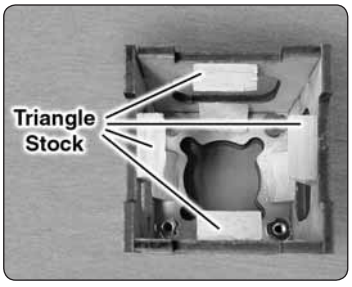


❑ 1. Locate the motor box components. Glue the two parts shown together.

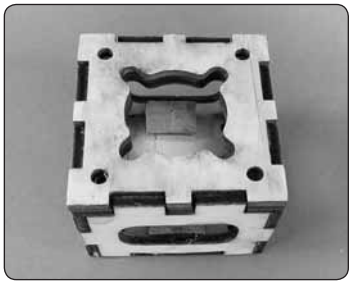


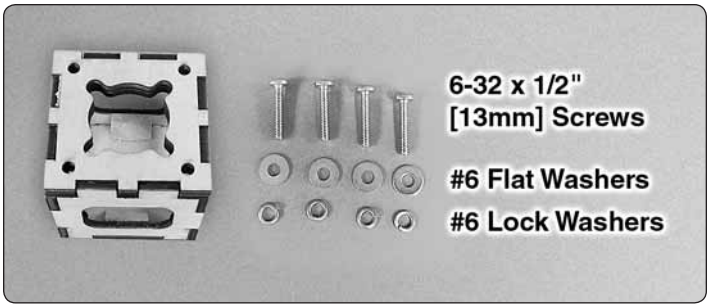
❑ 2. Tap the 6-32 blind nuts into the holes in each corner of the firewall.



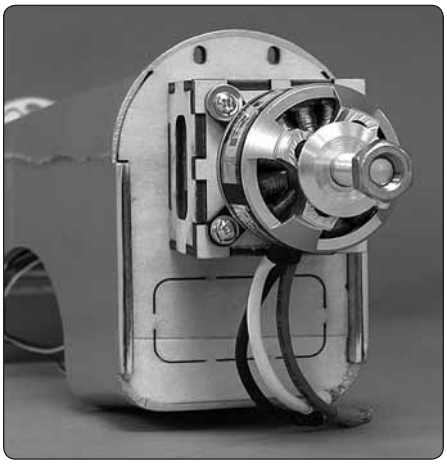


❑ 3. Glue the motor box together. Glue triangle stock into each joint before gluing the bottom of the motor box in place.

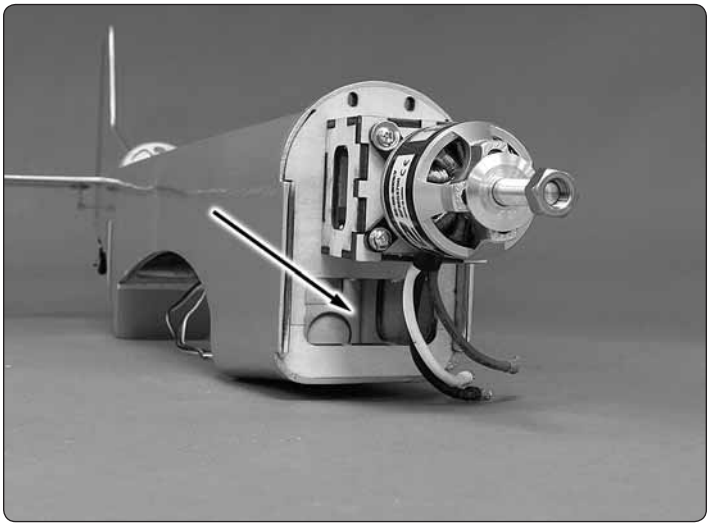




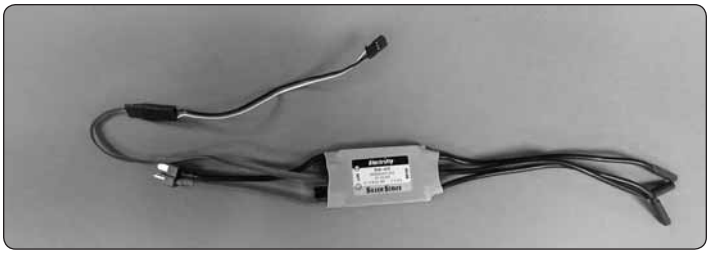
❑ 4. Mount the motor box to the front of the fuselage.



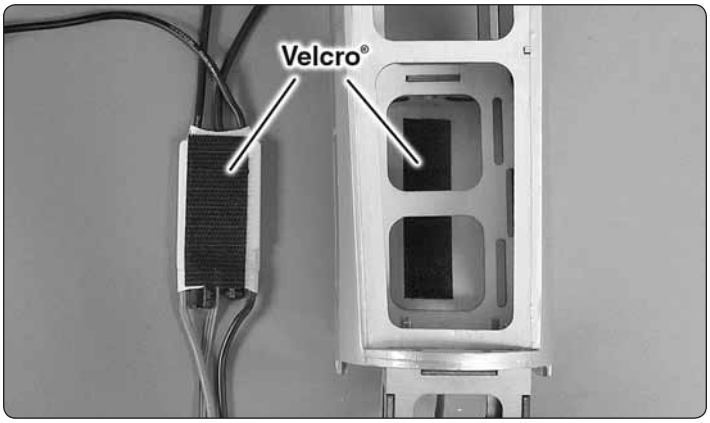
❑ 5. Mount the motor to the motor box with the remaining 6-32 hardware.



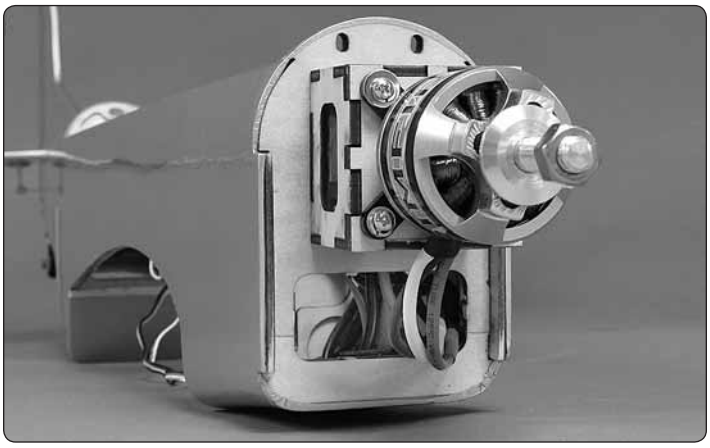
❑ 6. Remove the opening in the firewall.



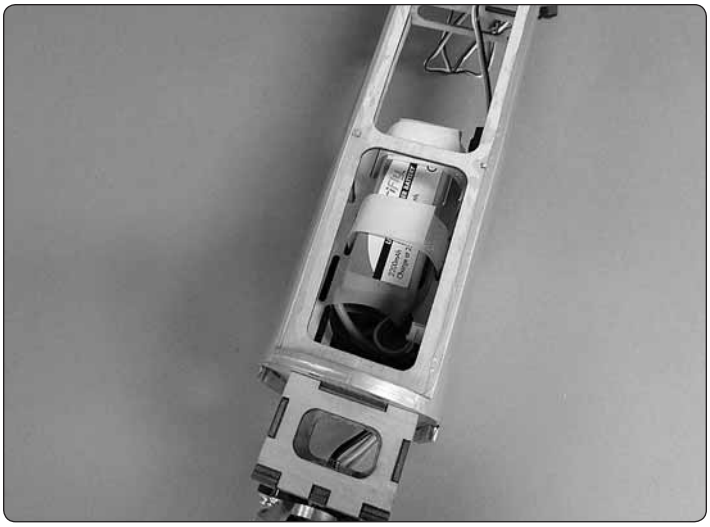
❏ 7. Install a 6" [152mm] servo extension on the ESC speed control. Secure the connection with tape or heat shrink tubing.



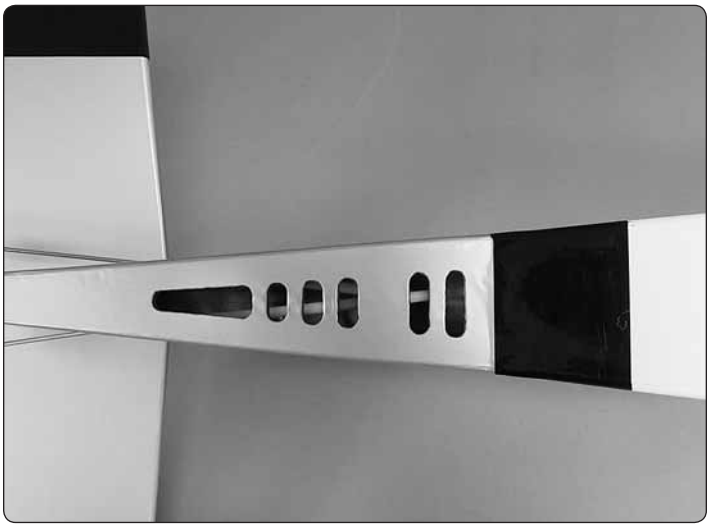
❏ 8. Install one half of the provided Velcro® to the back of the ESC and the other inside the fuselage. Cut the Velcro as needed to fit properly.



❏ 9. Install the ESC inside of the fuselage. Plug the motor wires into the ESC and the servo lead into the receiver following the instructions with the ESC.



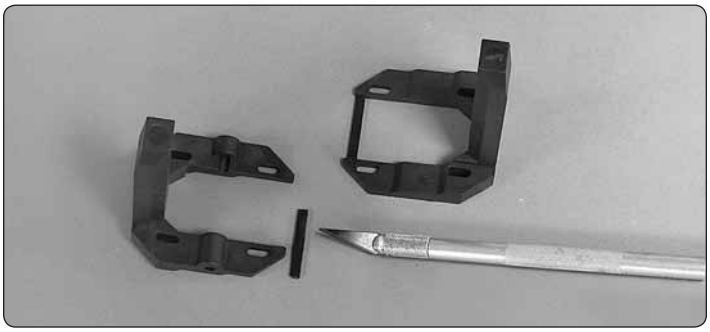
❏ 10. Install your battery, securing it with the included Velcro strap. Cut the Velcro to fit your battery.

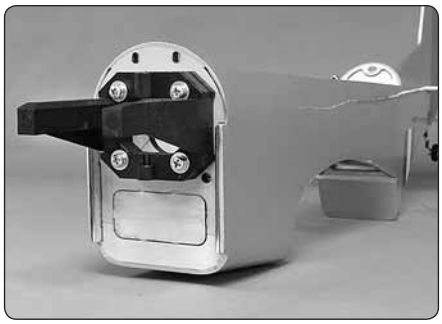


❏ 11. For proper cooling, with a sharp hobby knife remove the covering from the pre-cut holes in the rear of the fuselage.

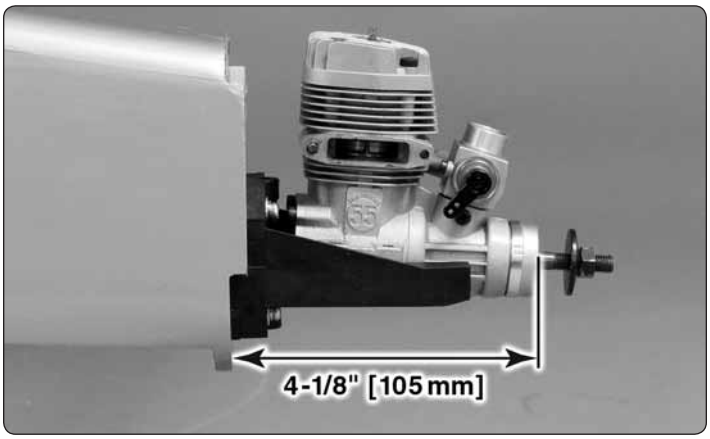
Note: *This completes the motor installation. Move ahead to page 18 to complete the assembly of the airplane.*

ENGINE INSTALLATION



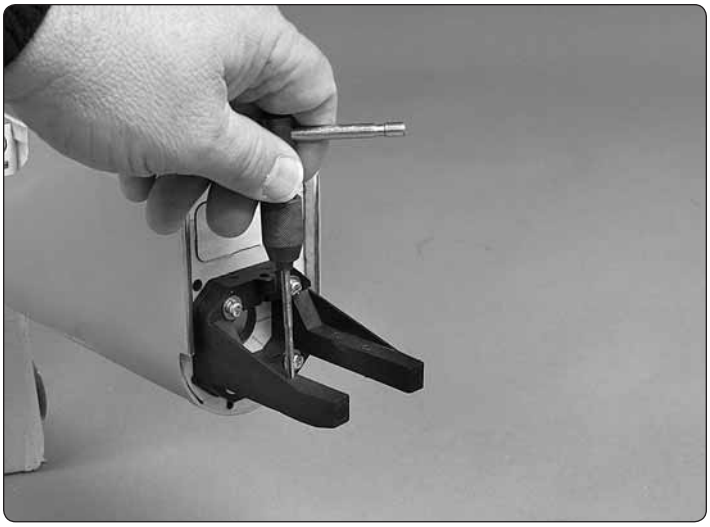


❏ 1. Cut the tabs from the motor mount. Slide the motor mount together. Locate the four 6-32 x 1" [25mm], #6 flat washers and #6 lock washers. Install the mount to the firewall as shown. The engine will be mounted inverted.

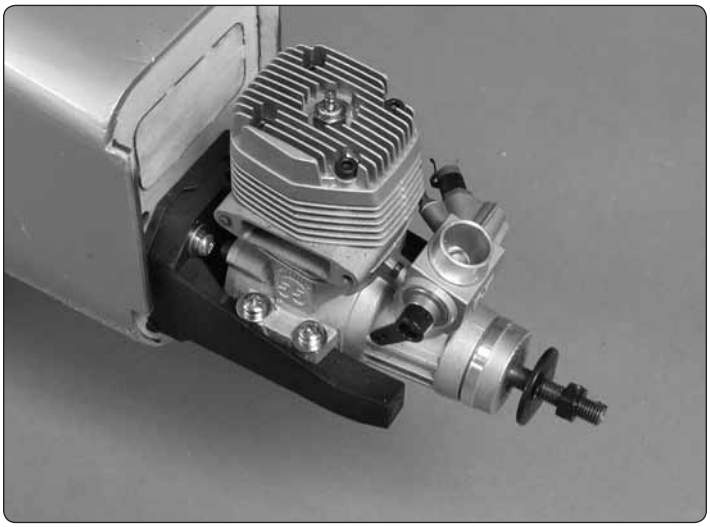


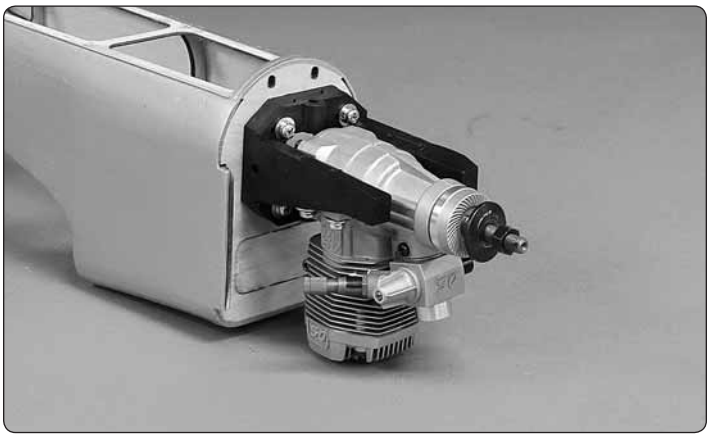
❏ 2. Place the engine onto the engine mount, spacing it 4-1/8" [105mm] from the firewall. Mark the location of mounting holes for the engine onto the motor mount.

❏ 3. Drill four 7/64" [2.8mm] holes on each of the marks, drilling through the engine mount.

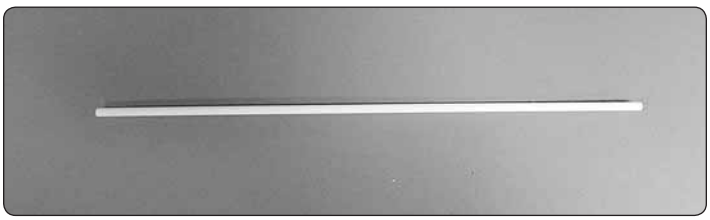


❏ 4. Tap each of the four holes with a 6-32 tap.

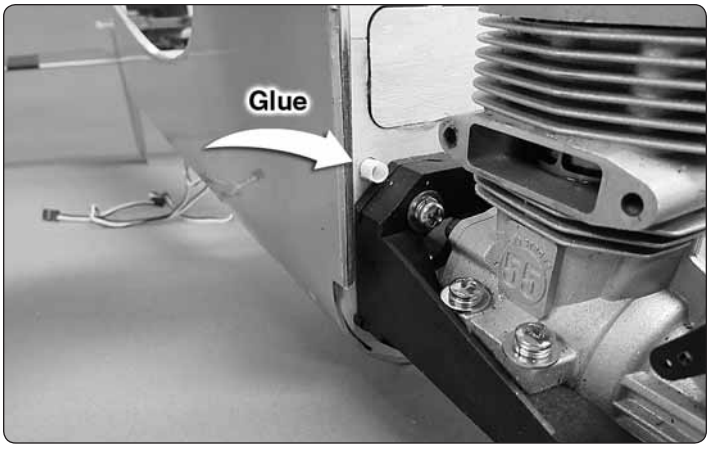


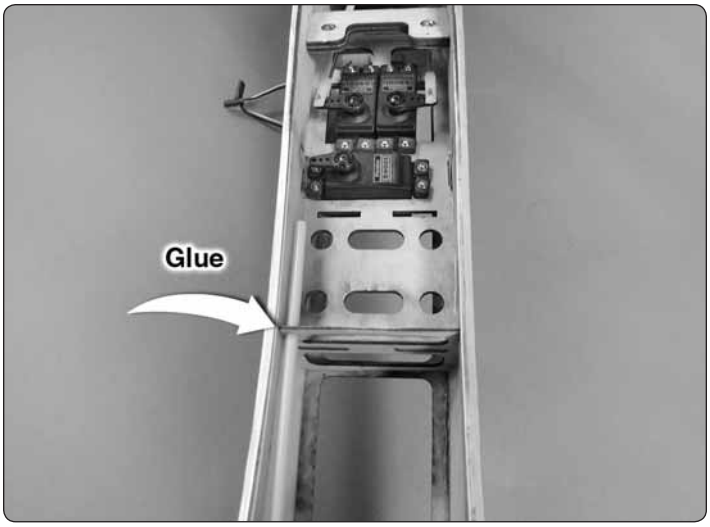


❏ 5. Mount the engine with four 6-32 x 3/4" [19mm] screws, #6 flat washer and #6 lock washers.

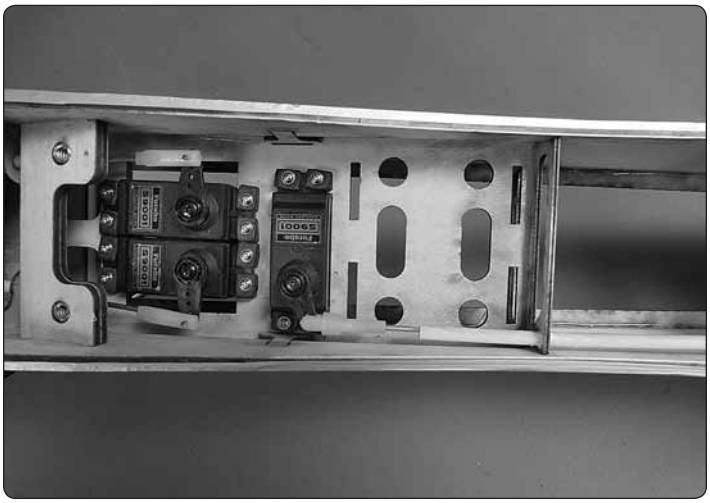


❏ 6. Locate the 11-1/2" plastic pushrod tube.

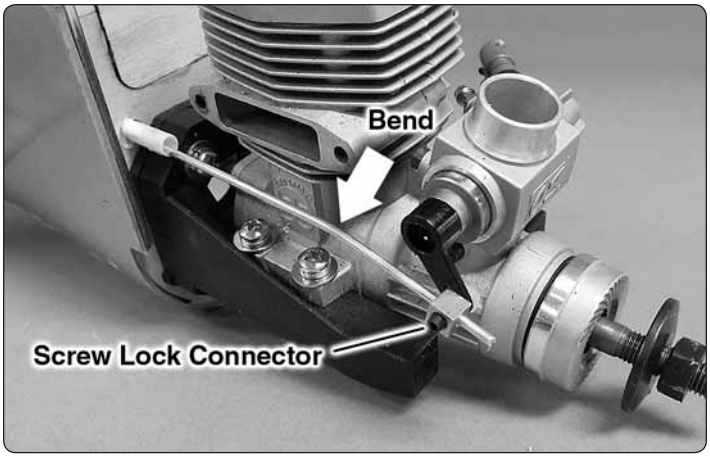




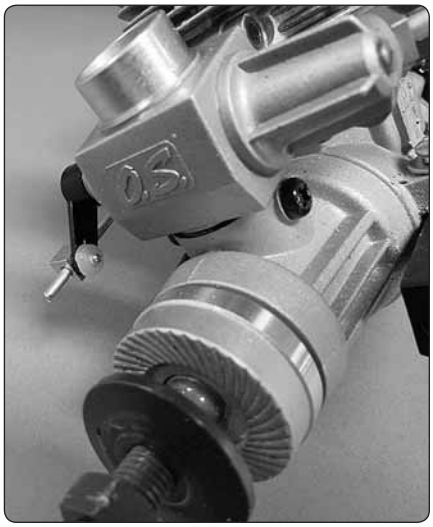
❑ 7. Insert it in the hole in the fire wall *(You may need to cut away a small portion of the triangle stock on the back side of the firewall to allow the tube to pass through the firewall)* and through the hole in the former. Apply a drop of glue to the tube where it passes through the firewall and the former in the fuselage.



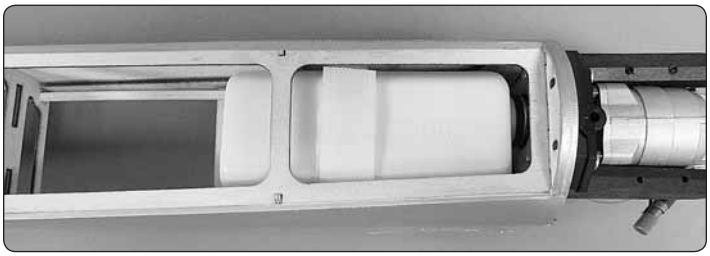
❑ 8. Install a nylon clevis and clevis keeper onto the threaded end of the 2-56 x 19-1/2" [500mm] wire. Insert the end of the wire into the tube, sliding it forward towards the engine. Install the clevis into the outer hole of the servo arm. Slide the clevis keeper over the clevis. Rotate the servo arm toward the front of the fuselage.



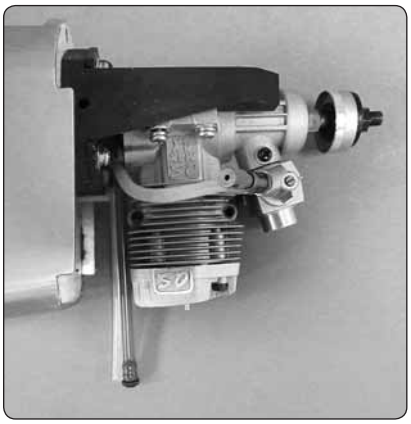
❑ 9. Slide the brass screw lock connector over the end of the wire. Insert the brass pin into the lower hole of the carburetor arm, securing it with a nylon retainer. Rotate the throttle arm forward, and then insert and tighten the set screw against the pushrod wire. Make a slight bend in the wire so the wire moves freely. Cut off the excess wire.



❑ 10. Install a Velcro strip through the slots along the side of the front of the fuselage where the fuel tank mounts.

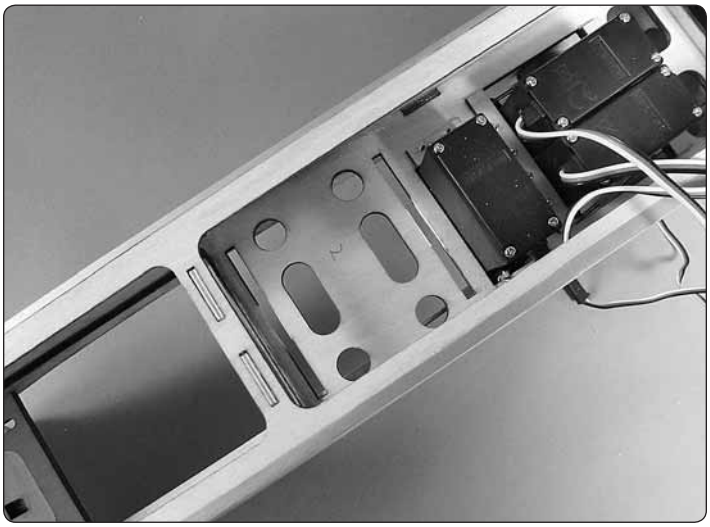


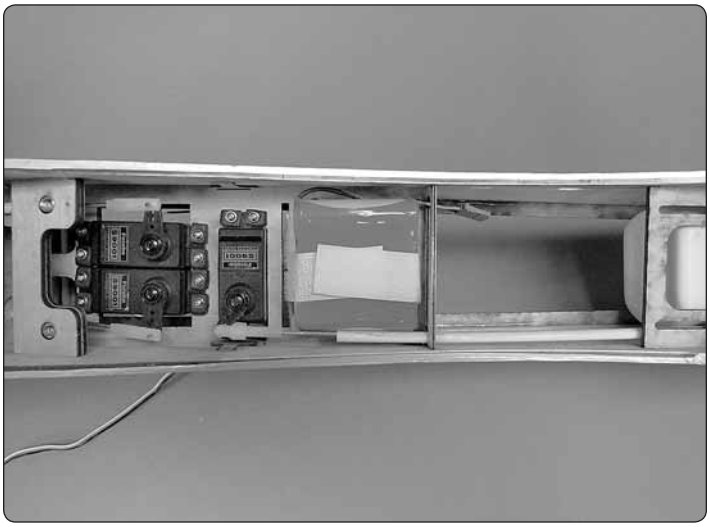
❑ 11. From the bottom of the fuselage insert the pre-assembled fuel tank, turning it on its side, into the front of the fuselage. The neck of the tank will align with the hole in the firewall.

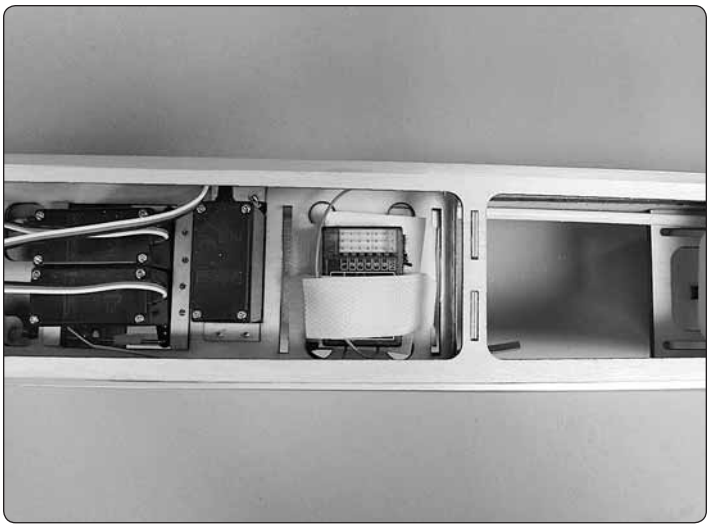


❑ 12. Pull the fuel lines from the tank through the hole. The blue line attaches to the carburetor, the clear line will attach to the muffler and the green line with the fuel plug is the fill line. Secure the tank with the Velcro.

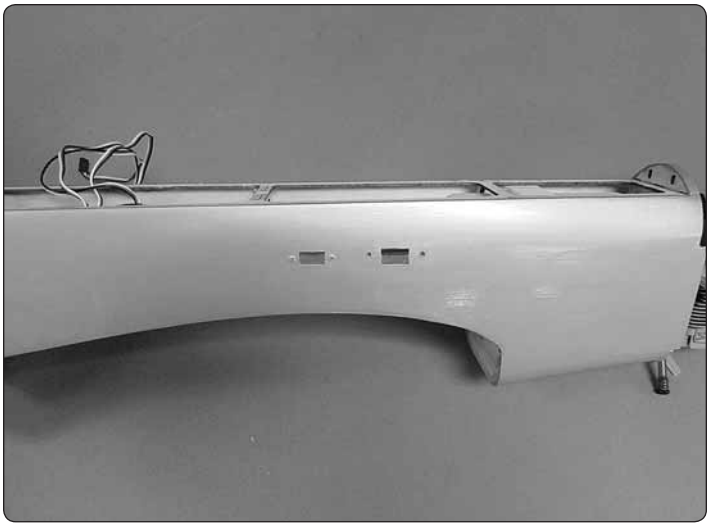
COMPLETE THE RADIO INSTALLATION



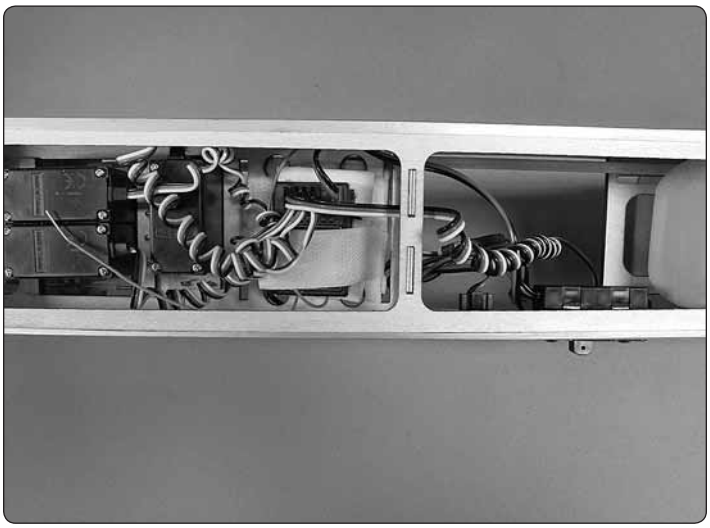




❏ 1. Insert Velcro strips into the slots to secure the battery from the bottom of the tray and the receiver on the top of the tray.

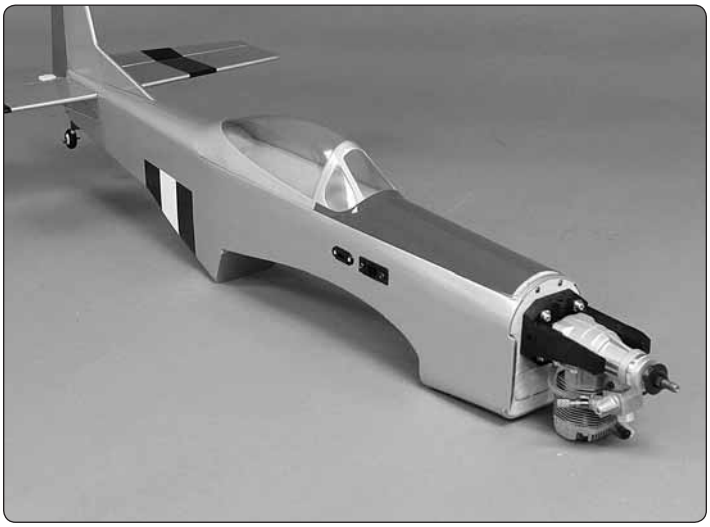


❏ 2. Cut holes in the fuselage for the switch and charge jack.



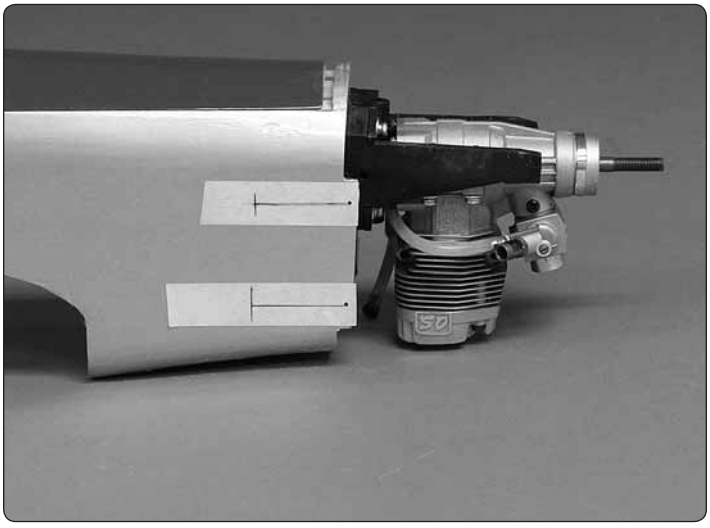
❏ 3. Following the instructions with your radio, plug the servos into the receiver and install a 6" [152mm] servo extension in the receiver for the aileron servo.

INSTALL THE COWL

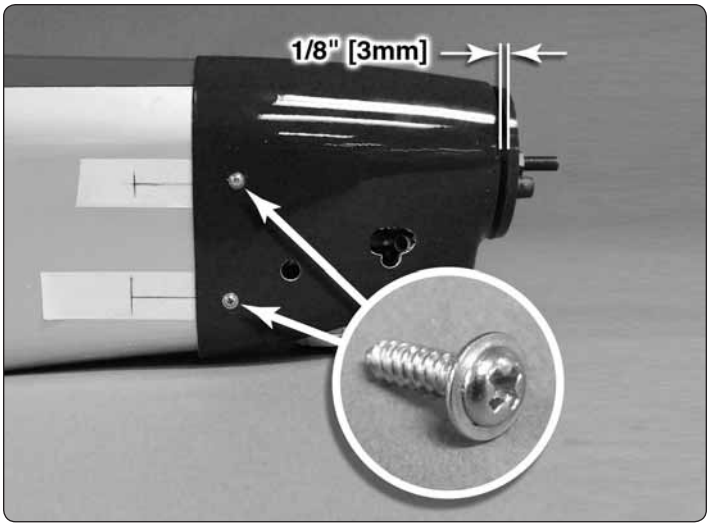


❏ 1. Install the canopy top onto the fuselage.

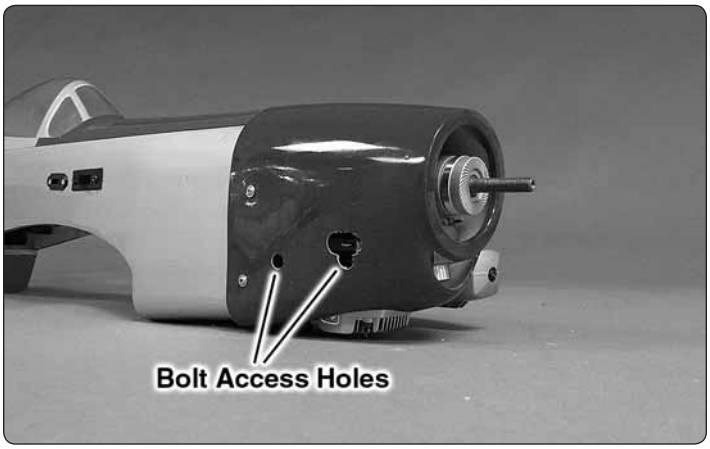
❏ 2. Slide the cowl over the engine, making marks where you need to cut clearances for the cowl. Cut clearance in the cowl for the muffler, needle valve, muffler bolt access, etc. as needed for your engine.

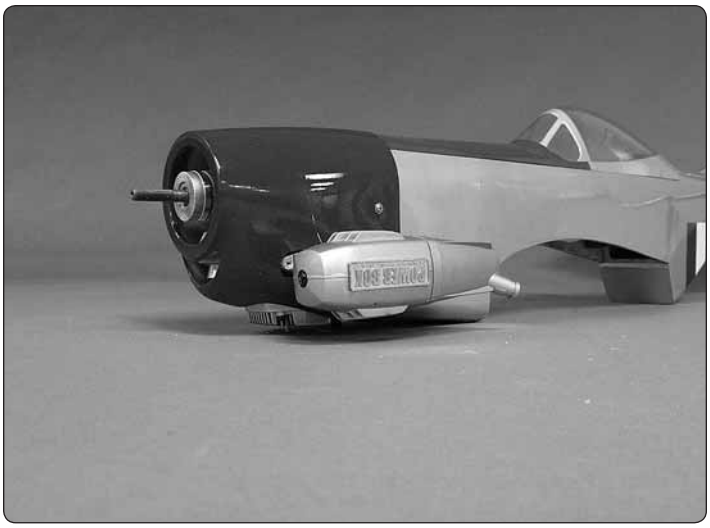


❏ 3. With the cowl cut outs completed, place 2-1/2" [64mm] pieces of tape to the plywood mounting tabs extending back towards the fuselage. Mark the location for the mounting hole, centered on the “tab” and then draw a line back from the mark 1-1/2" [38mm]. Do this for all four pieces of tape.

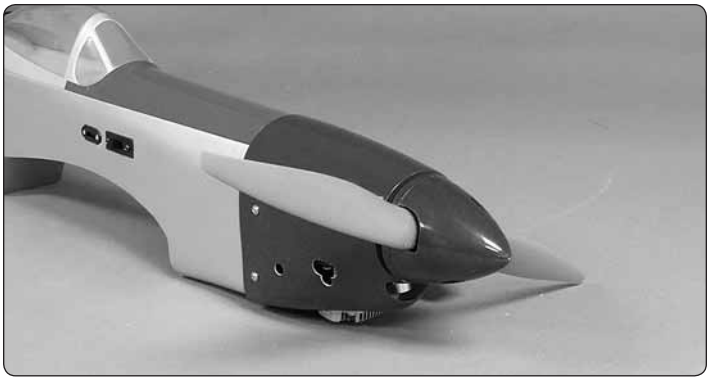


❏ 4. Position the cowl on the fuselage so that the drive washer extends in front of the cowl approximately 1/8" [3mm]. From the marks on the tape measure forward 1-1/2" [38mm]. Drill a 1/16" [1.6mm] hole through the cowl and the plywood mounting tab. Secure the cowl with a 3/32" x 3/8" [2.5 x 10mm] washer head screw. Double check the position of the cowl and do the same for another of the mounting holes. Do this for all four mounting holes.





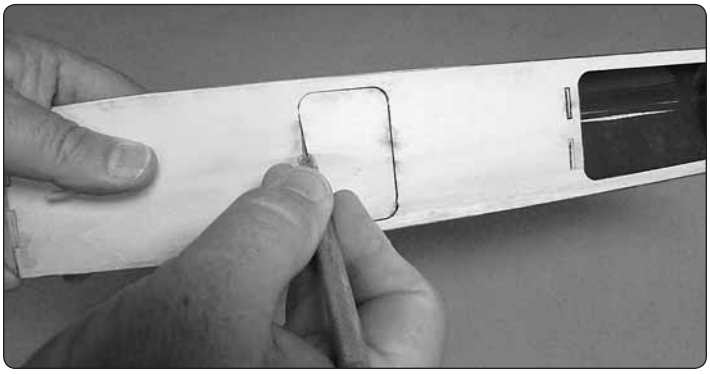
❏ 5. Install the muffler onto the engine. Access holes for the bolts need to be provided on the left side of the cowl to mount the muffler.

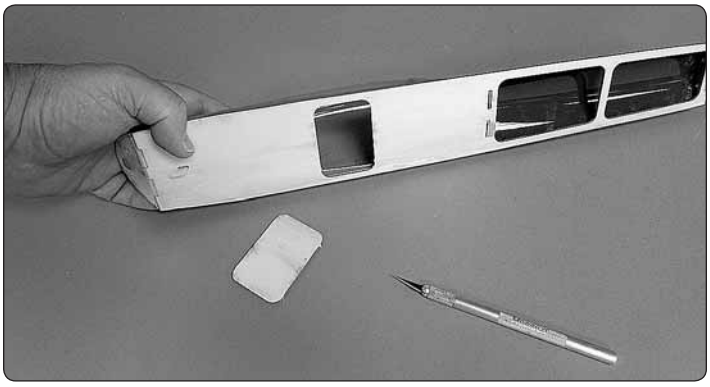


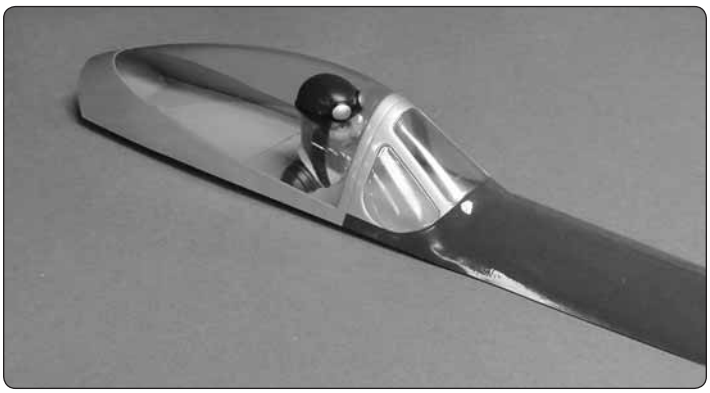
❏ 6. Install the spinner and propeller onto the engine.

FINISH THE MODEL

Install a Pilot

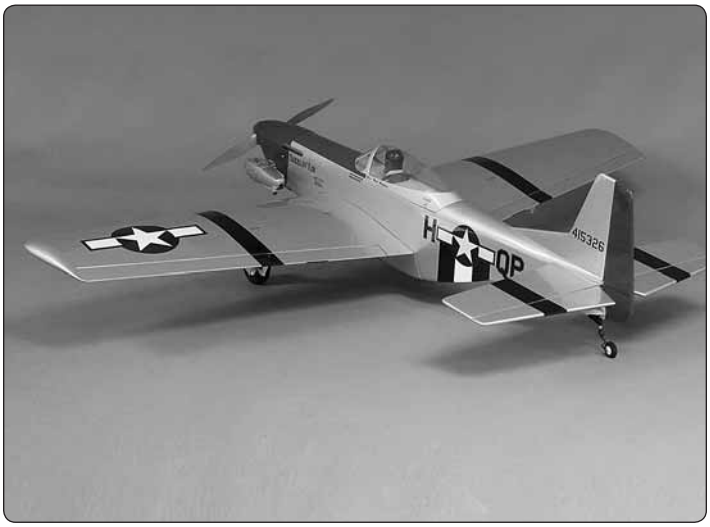


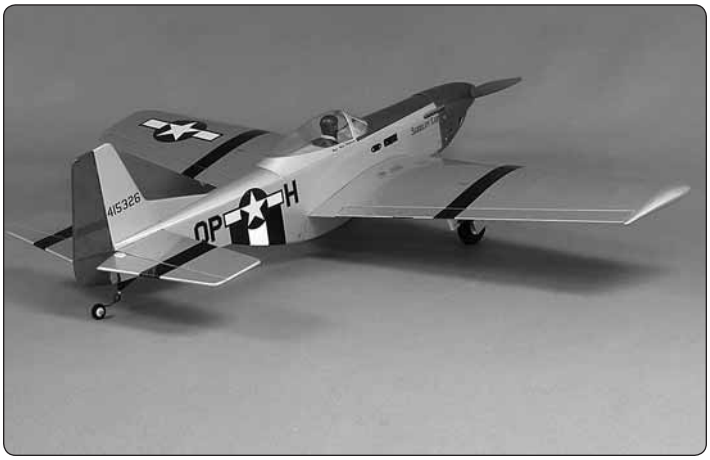




❏ 1. If you wish to install a pilot, cut away the bottom of the canopy and install a pilot of your choice. Replace the portion you cut from the bottom of the canopy using glue. We installed the Great Planes 1/5 scale pilot (GPMQ9115).

Apply The Decals





❏ 1. Apply the decals using these photos and the box photos to determine the proper location.

GET THE MODEL READY TO FLY

EP VERSION

Install and Connect the Motor Battery

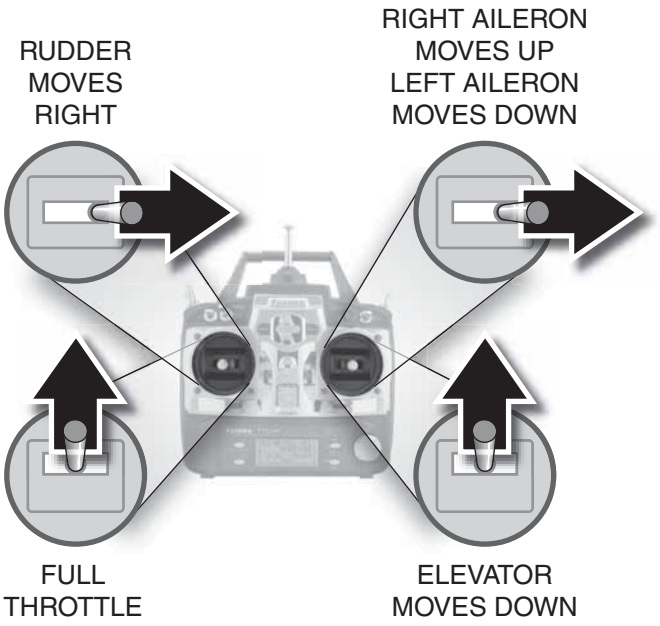
Before you can power the radio system and set up the controls, the motor battery will need to be charged. Charge the battery following the instructions with your battery and charger.

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.

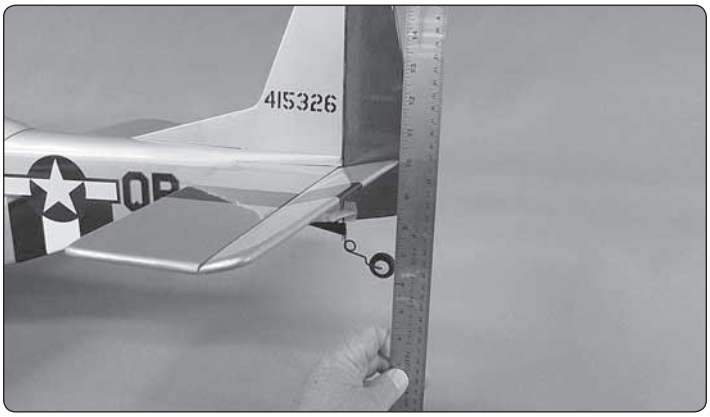
Set the Control Throws

To ensure a successful first flight, set up your Sport Fighter Mustang 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 Sport Fighter Mustang 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.

These are the recommended control surface throws:

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

These are the recommended control surface throws:				
	LOW		HIGH	
	Up	Down	Up	Down
ELEVATOR	1/2" [13mm] 13°	1/2" [13mm] 13°	3/4" [19mm] 19°	3/4" [19mm] 19°
	Up	Down	Up	Down
AILERON	3/16" [5mm] 9°	3/16" [5mm] 9°	5/16" [8mm] 14°	5/16" [8mm] 14°
	Right	Left	Right	Left
RUDDER	3/4" [19mm] 14°	3/4" [19mm] 14°	1" [25mm] 19°	1" [25mm] 19°

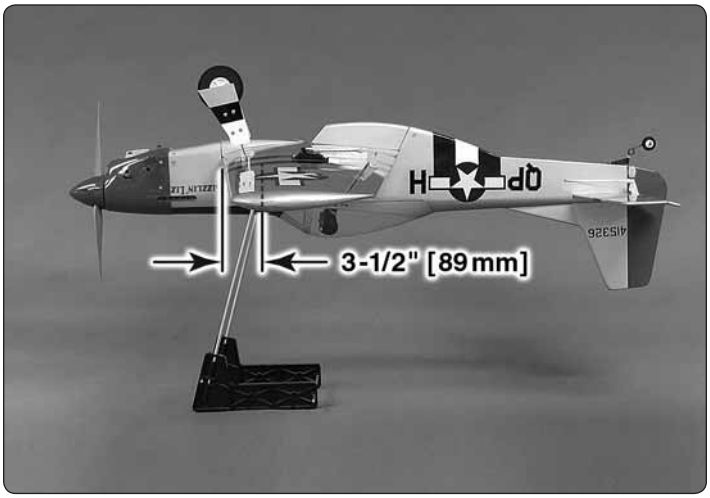
Balance the Model (C.G.)

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, engine, muffler, propeller, spinner and pilot. If you've built the electric version, install the motor battery. If you've built the glow version the fuel tank should be empty.

❏ 1. If using a Great Planes C.G. Machine, set the rulers to 3-1/2" [89mm]. 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 3-1/2" [89mm] 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. 1/4" [6mm] forward or 1/4" [6mm] 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, or LiPo batteries in place, 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." If possible, move the battery pack and/or receiver forward to get the model to balance. If the nose drops, the model is "nose heavy." If possible, move the battery pack and/or receiver aft. If the receiver and/or battery cannot be moved, or if additional weight is still required, nose weight may be easily added by using "spinner weight" (GPMQ4645 for the 1 oz. [28g] weight, or GPMQ4646 for the 2 oz. [57g] weight). If spinner weight is not practical or is not enough, or if tail weight is required, use 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: If mounting weight where it may be exposed to fuel or exhaust, do not rely upon the adhesive on the back to permanently hold it in place. Over time, fuel and exhaust residue may soften the adhesive and cause the weight to fall off. 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.

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

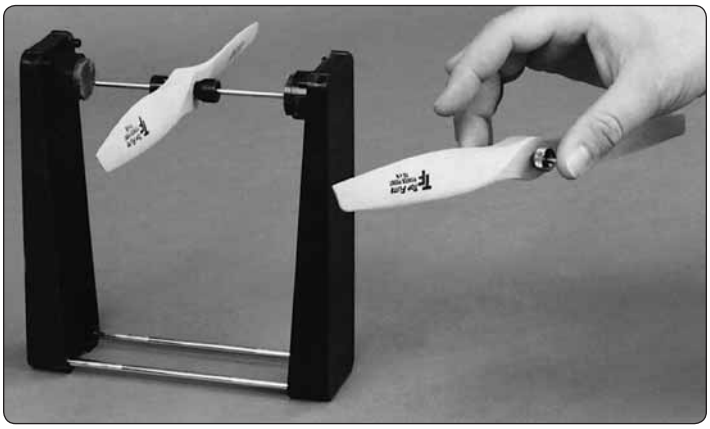
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on the 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 engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause your fuel to foam, which will, in turn, cause your engine to run hot or quit.

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 and Range Check

Run the engine for a few minutes to make sure it idles reliably, transitions smoothly and maintains full power indefinitely. Afterward, shut the engine off and 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 engine off and once with the engine 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, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash.

ENGINE SAFETY PRECAUTIONS

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

- Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel; and remember that engine exhaust gives off a great deal of deadly carbon monoxide. Therefore **do not run the engine in a closed room or garage**.
- Get help from an experienced pilot when learning to operate engines.
- Use safety glasses when starting or running engines.
- Do not run the engine 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 start and run the engine.
- 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.
- Use a "chicken stick" or electric starter to start the engine. Do not use your fingers to flip the propeller. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.
- Make all engine adjustments from behind the rotating propeller.
- The engine gets hot! Do not touch it during or right after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine, causing a fire.
- To stop a glow engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer's recommendations. Do not use hands, fingers or any other body part to try to stop the engine. To stop a gasoline powered engine an on/off switch should be connected to the engine coil. Do not throw anything into the propeller of a running engine.

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.**

CHECKLIST

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. Fuelproof all areas exposed to fuel or exhaust residue such as the cowl mounting blocks, wing saddle area, etc.

❏ 2. Check the C.G. according to the measurements provided in the manual.

❏ 3. Be certain the battery and receiver are securely mounted in the fuse. Simply stuffing them into place with foam rubber is not sufficient.

❏ 4. Balance your model *laterally* as explained in the instructions.

❏ 5. Use threadlocking compound to secure critical fasteners such as the set screws that hold the wheel axles to the struts, screws that hold the carburetor arm (if applicable), 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. Secure the pressure tap (if used) to the muffler with high temp RTV silicone, thread locking compound or J.B. Weld.

❏ 14. Make sure the fuel lines are connected and are not kinked.

❏ 15. Balance your propeller (and spare propellers).

❏ 16. Tighten the propeller nut and spinner.

❏ 17. Place your name, address, AMA number and telephone number on or inside your model.

❏ 18. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.

❏ 19. If you wish to photograph your model, do so before your first flight.

❏ 20. Range check your radio when you get to the flying field.

FLYING

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

Fuel Mixture Adjustments

A fully cowled engine may run at a higher temperature than an un-cowled engine. For this reason, the fuel mixture should be richened so the engine runs at about 200 rpm below peak speed. By running the engine slightly rich, you will help prevent dead-stick landings caused by overheating.

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

Takeoff

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

Remember to takeoff into the wind. When you're ready, point the model straight down the runway, hold a bit of up elevator to keep the tail on the ground to maintain tail wheel steering, 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 Sport Fighter Mustang 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 fuel, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the runway (into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to

overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is a foot or so off the deck, smoothly increase up elevator until it gently touches down. 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!