CARL GOLDBERG MODELS™

Tiger 2™ ARF

Wingspan: 60.5 in [1540 mm]
Wing Area: 667 sq in [43.0 dm^2]
Weight: 5.5–6.5 lb [2490–2950 g]
Wing Loading: 19–22 oz/sq ft [58–67 g/dm^2]
Length: 55 in [1395 mm]
Radio: 4-channel minimum with 4–5 servos and standard size receiver
Engine: .40–.55 cu in [6.5–9cc] two-stroke, .70 cu in [11.5cc] four-stroke, RimFire™ .46 (42-60-800) brushless out-runner motor

WARRANTY

Carl Goldberg Products 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 Carl Goldberg's liability exceed the original cost of the purchased kit.** Further, Carl Goldberg reserves the right to change or modify this warranty without notice.

In that Carl Goldberg 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 this address:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA
(217) 398-8970 Ext. 5

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.

TABLE OF CONTENTS

Ideal as a first low-wing trainer and as a terrific everyday sport plane, the Tiger 2 ARF combines docile flight characteristics with the aptitude for super-smooth, exciting aerobatics. This ARF has been designed to keep building time to a minimum. With only final assembly and radio and engine installation required, you will soon be flying a tiger that “growls as you grow”. The better you get, the more fun it gives you!

THINGS TO CONSIDER

This is a partial list of items required to finish the Tiger 2 ARF that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

RADIO EQUIPMENT

The Tiger 2 ARF requires a minimum 4-channel radio system with four 44 oz.-in. [3.2 kg-cm] minimum standard servos. If you are installing a glow engine, an additional standard servo is required for the throttle.

In addition, two 9" [229mm] servo extensions are required for the aileron servos. A Y-harness is also required to connect the aileron servos together into a single radio channel.

A charge jack receptacle is optional, but is useful for recharging the receiver pack without removing the hatch or wing and is shown in the assembly of the plane. Recommended part numbers for the radio components are provided below:

- Futaba® S3003 Servo Standard (FUTM0031)
- Futaba 9" Servo Extension J (FUTM3910)
- Futaba 6" Dual Servo Extension J (FUTM4130)
- Ernst Charge Receptacle Futaba J FM (ERNM3001)

POWER SYSTEM RECOMMENDATIONS

The recommended engine/motor size for the Tiger 2 ARF is a .40-.55 cu in [6.5-9cc] two-stroke engine, .70 cu in [11.5cc] four-stroke engine, or a RimFire .46 (42-60-800) brushless outrunner motor. Engine and motor order numbers are provided below:

- O.S.® .46 AX ABL w/Muffler (OSMG0547)
- Great Planes® RimFire .46 (42-60-800) Out-Runner Brushless (GPMG4725)
- Great Planes Brushless Motor Mount Medium Motors (GPMG1255)

If using the recommended brushless motor, a 60A brushless ESC is required:

- Great Planes Silver Series 60A Brushless ESC High Volt (GPMM1850)

PROPELLER

If you are installing a glow engine, choose a prop based on the engine manufacturer’s recommendation. If you are installing the recommended RimFire brushless motor, we suggest an 11x5.5E APC propeller.

- APC 11x5.5 Electric Propeller (APCQ1055)

BATTERIES AND CHARGER

For a brushless motor installation, a 5S battery configuration can be used as an economy setup for moderate power and extended flight time. A 6S battery configuration can be used for better performance at a cost of flight time. For a 5S battery configuration, one 3200mAh 11.1V Lithium Polymer battery pack and one 3200mAh 7.4V Lithium Polymer battery pack will need to be connected in series. Two 3200mAh 11.1V Lithium Polymer battery packs need to be connected in series to create a 6S configuration. Order numbers for the battery packs and series connector are provided below:

- Great Planes LiPo 7.4V 3200mAh 20C Discharge w/ Balance (GPMP0622)
- Great Planes LiPo 3200mAh 11.1V 20C Discharge w/ Balance (GPMP0623)
- Great Planes Series Deans U 2 to 1 Adapter (GPMM3143)

A cell balancer is required for the LiPo battery packs listed above:

- Great Planes ElectriFly™ Equinox™ LiPo Cell Balancer 1-5 (GPMM3160)

A suitable charger is also required. The Great Planes PolyCharge4™ is designed for LiPo packs only. However, it is able to charge four LiPo packs simultaneously. The Great Planes Triton2™ charger will only charge one pack at a time. However, it is capable of charging NiCd, NiMH, LiPo, and Pb acid batteries. Order numbers for both are provided below:

- Great Planes PolyCharge4 DC Only 4 Output LiPo Charger (GPMM3015)

OR

- Great Planes ElectriFly Triton2 DC Comp Peak Charger (GPMM3153)

ADDITIONAL ITEMS REQUIRED

REQUIRED HARDWARE AND ACCESSORIES

This is the list of hardware and accessories required to finish the Tiger 2 ARF. Order numbers are provided in parentheses:

- R/C foam rubber 1/4" [6mm] (HCAQ1000)
- 3' [900mm] standard silicone fuel tubing (GPMQ4131) (Glow engine installation only)

ADHESIVES AND BUILDING SUPPLIES

This is the list of Adhesives and Building Supplies that are required to finish the Tiger 2 ARF:

- 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
- Pro 30-minute epoxy (GPMR6047)
- Masking tape (TOPR8018)
- Threadlocker thread locking cement (GPMR6060)
- Denatured alcohol (for epoxy clean up)
- Drill bits: 1/16" [1.6mm], 5/64" [2mm], 3/32" [2.4mm], 11/64" [4.4mm]
- Dead Center™ Engine Mount Hole Locator (GPMR8130)
- Small metal file
- #1 Hobby knife (HCAR0105)
- #11 blades (5-pack, HCAR0211)
- Medium T-pins (100, HCAR5150)
- Top Flite® MonoKote® sealing iron (TOPR2100)
- Top Flite Hot Sock™ iron cover (TOPR2175)
- 220 grit sandpaper
- Great Planes Velcro Hook & Loop 1x6" (2) (GPMQ4480) (Brushless installation only)
- Panel Line Pen (TOPQ2510)
- DuraTrax® Servo Tape Wide 1x36" (DTXR1215)
- Heat shrink tubing or electrical tape

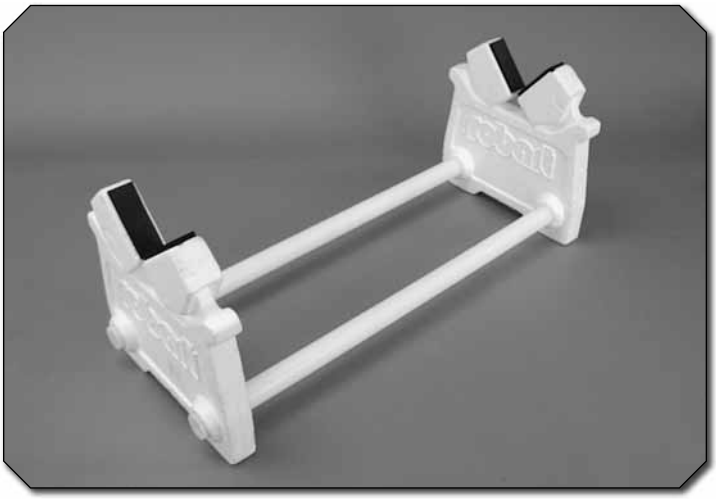
OPTIONAL SUPPLIES AND TOOLS

Here is a list of optional tools that will help you build the Tiger 2 ARF:

- 1/2 oz. [15g] Thick Pro CA- (GPMR6013)
- 2 oz. [57g] spray CA activator (GPMR6035)
- 4 oz. [113g] aerosol CA activator (GPMR6034)
- CA applicator tips (HCAR3780)
- CA debonder (GPMR6039)
- Pro 6-minute epoxy (GPMR6045)
- Epoxy brushes 6, (GPMR8060)
- Mixing sticks (GPMR8055)
- Mixing cups (GPMR8056)
- Diagonal Sprue Cutter 5" (HCAR0630)
- Rotary tool such as Dremel
- Rotary tool reinforced cut-off wheel (GPMR8200)
- Servo horn drill (HCAR0698)
- Hobby Heat™ Micro Torch II (HCAR0755)
- 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)

- Hobbico 7-Piece Ball Tip Hex L Wrench Metric (HCAR0521)
- 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.

PREPARATIONS

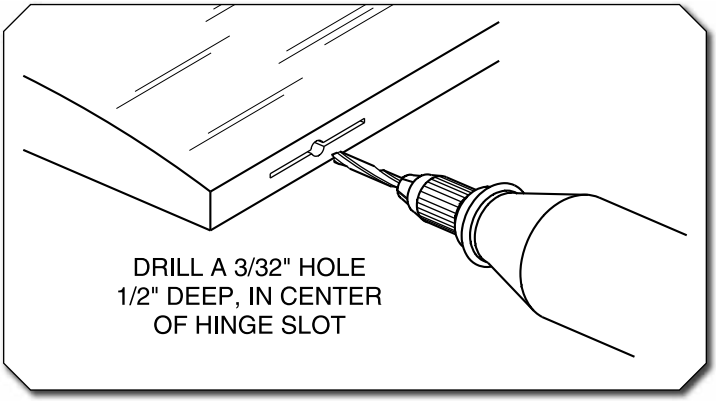
- 1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support.

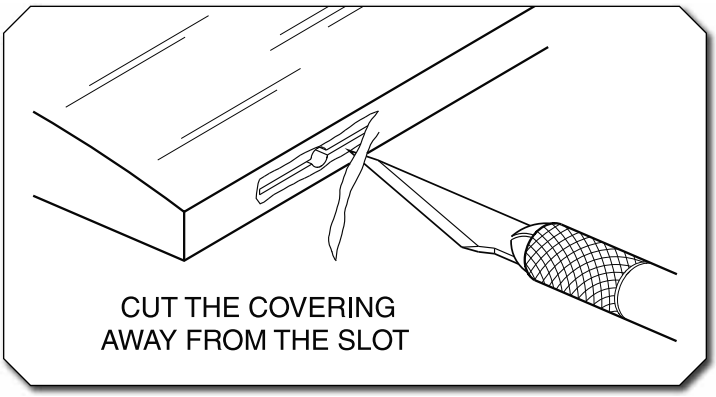
- 2. Remove the tape and separate all the control surfaces. Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

BUILD THE WING PANELS

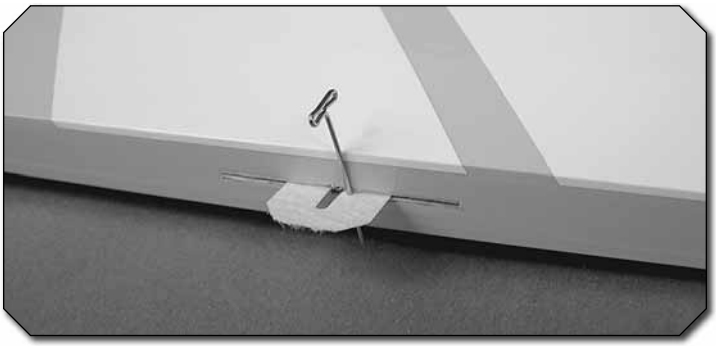
INSTALL THE AILERONS

Do the right wing first so your work matches the photos the first time through. You can do one wing at a time, or work on them together.



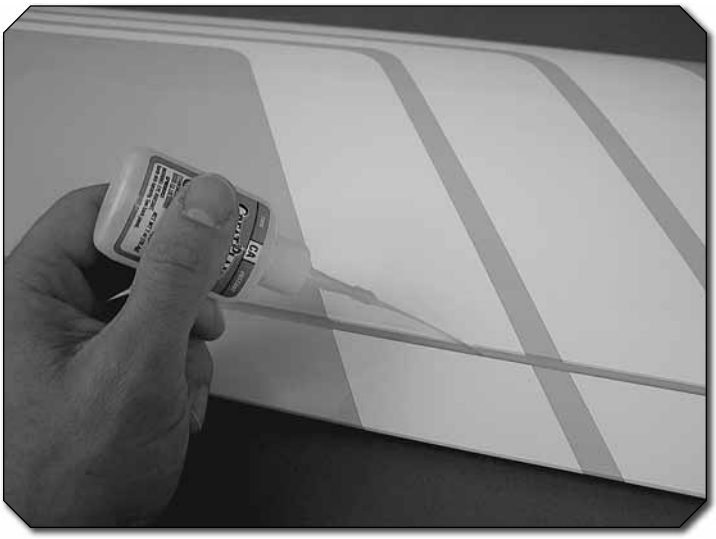


- - 1. Drill a 3/32" [2.4mm] hole 1/2" [13mm] deep into the center of each hinge slot in the **aileron** and **wing panel**. Trim the covering away from each hinge slot to ensure that the hinges will be properly glued in place.



- - 2. Test fit a CA hinge into each of the hinge slots in the wing panel and aileron. If necessary, enlarge the slots with a hobby knife. When satisfied with the fit, insert a CA hinge halfway into each hinge slot in the wing panel. Push a pin through the middle of each hinge to keep them centered.

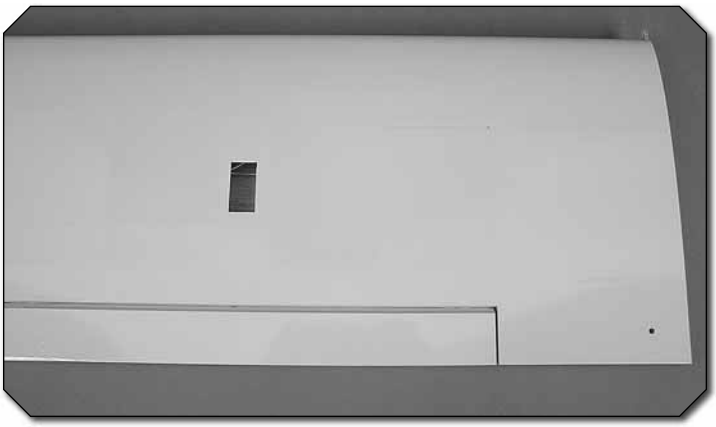
3. Join the aileron to the wing panel and remove the pins from the hinges. Center the aileron on the wing. Remove the pins and adjust the aileron so there is a small gap between the LE of the aileron and the wing. The gap should be small, just enough to see light through the gap or to slip a piece of paper through.



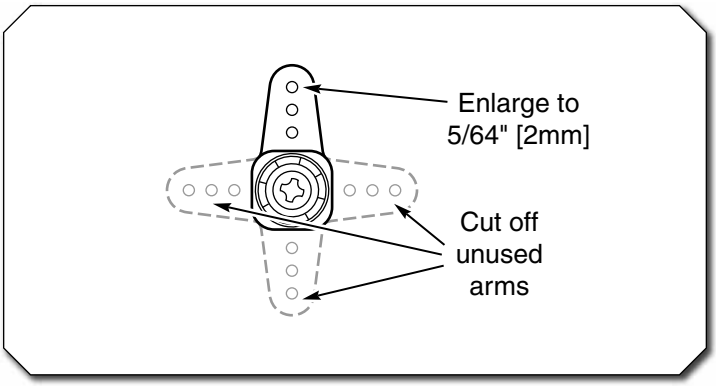
4. Apply six drops of thin CA to the top and bottom of each hinge without using accelerator. After the CA glue has hardened, confirm that the aileron is secure by pulling on it and deflecting it up and down.

5. Repeat steps 1–4 for the other wing panel.

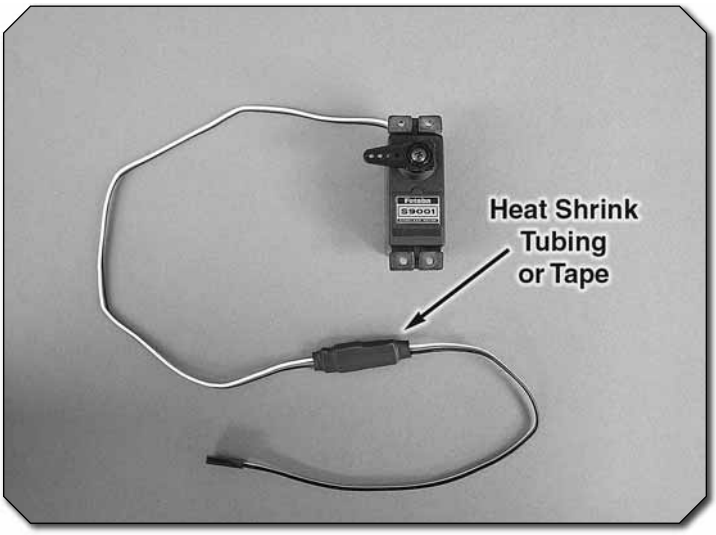
INSTALL THE AILERON SERVOS AND PUSHRODS



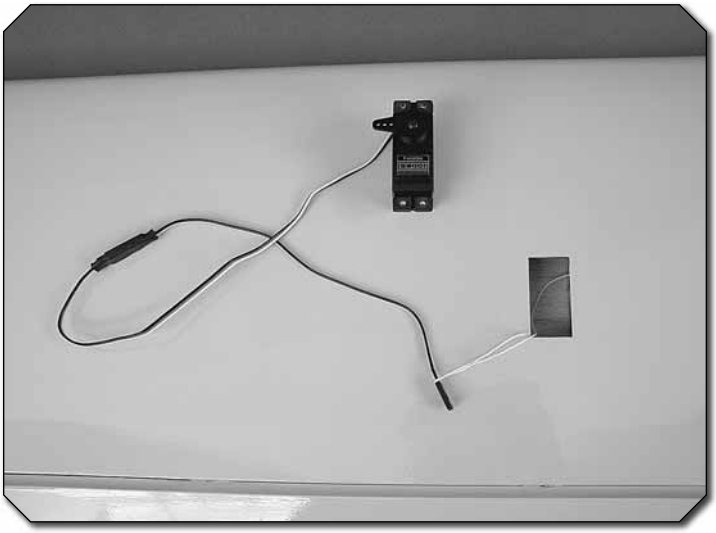
1. Trim the covering from the aileron servo bay on the underside of the wing panel.

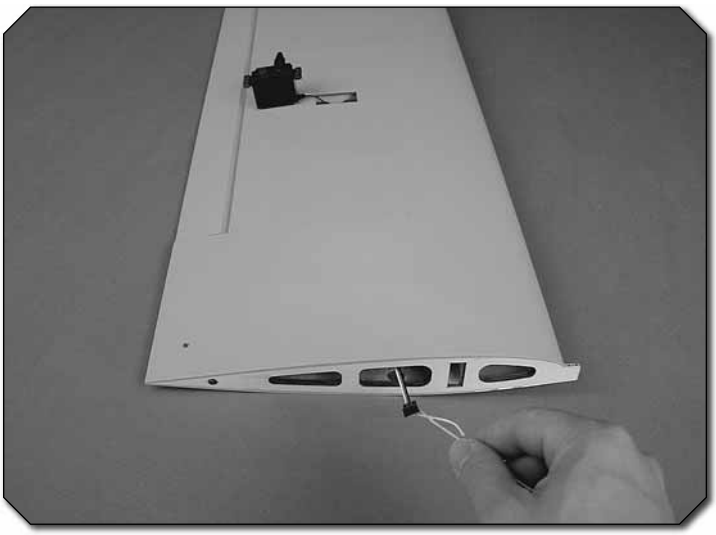


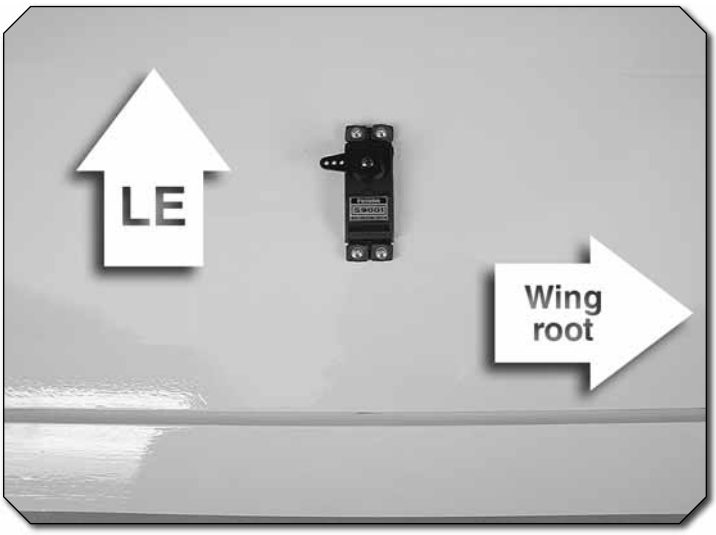
2. Cut three arms from a four-armed servo arm for the aileron servo. Enlarge the outer hole of the remaining arm with a 5/64" [2mm] drill bit.



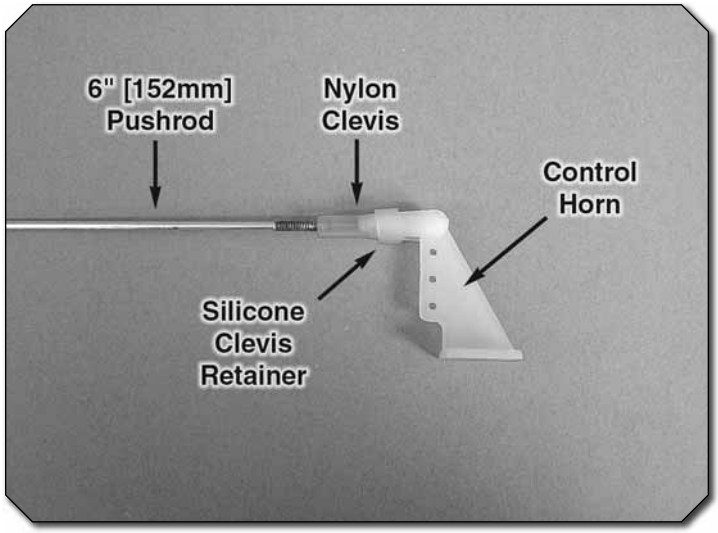
3. Attach a 9" [229mm] servo extension to the aileron servo and secure the connector using tape, heat shrink tubing (not included), or a product designed specifically for securing servo lead connections. Center the servo with your radio system and install the servo arm to the servo perpendicular to the servo case as shown. Be sure to reinstall the servo arm screw into the servo.



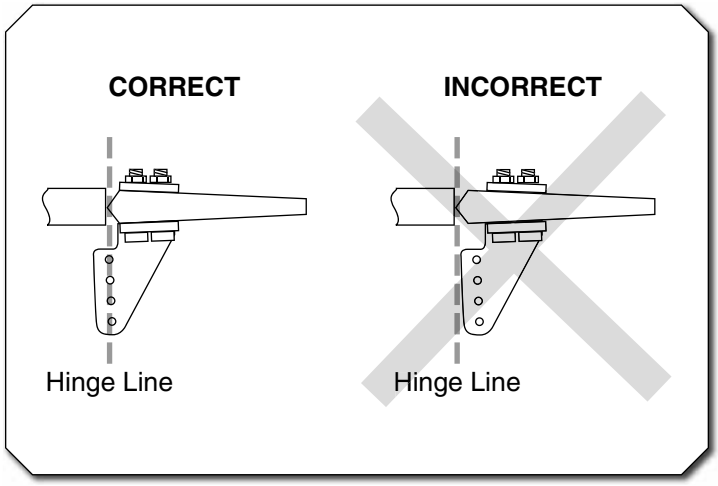


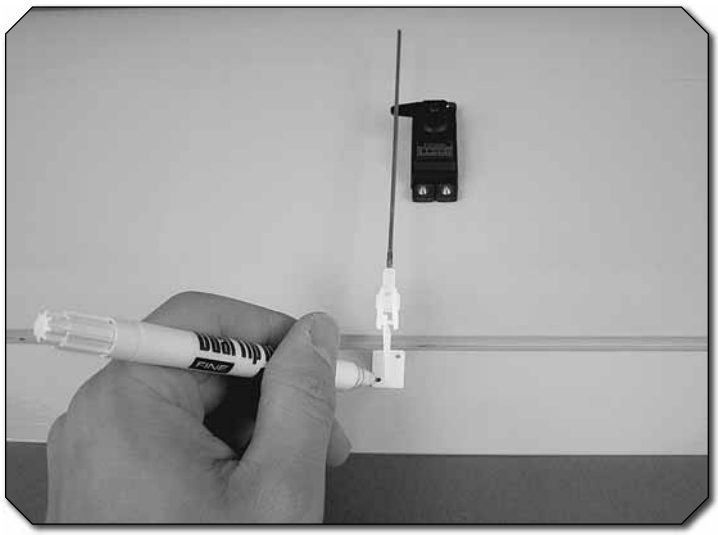


◐ ◐ 4. Use the string taped inside the aileron servo bay to pull the servo lead through the wing ribs. Fit the servo into the servo bay with the spline toward the LE of the wing. Drill 1/16" [1.6mm] holes through the mounting tabs on the servo case into the wing. Thread a servo mounting screw (included with the servo) into each hole and back it out. Apply a drop of thin CA to each hole to harden the wood. When the CA has dried, install the servo using the hardware supplied with the servo.



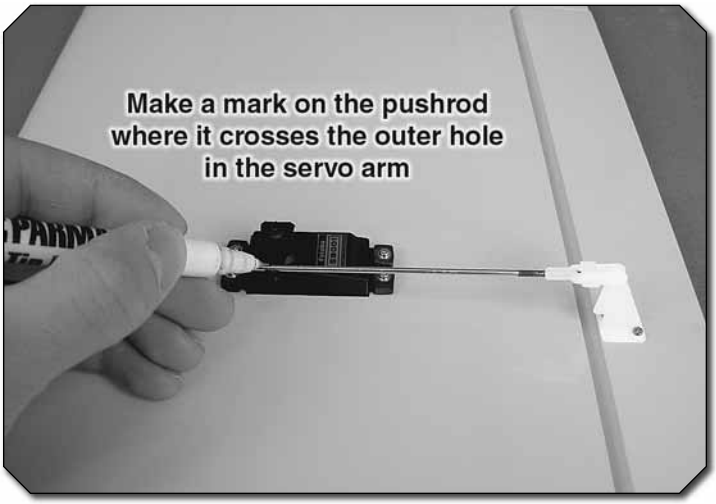
◐ ◐ 5. Thread a nylon clevis 20 complete turns onto a 6" [152mm] pushrod. Slide a silicone clevis retainer onto the clevis and connect the clevis to the outer hole of a control horn.

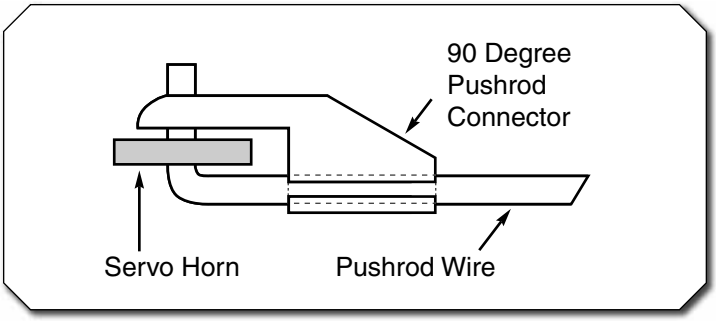


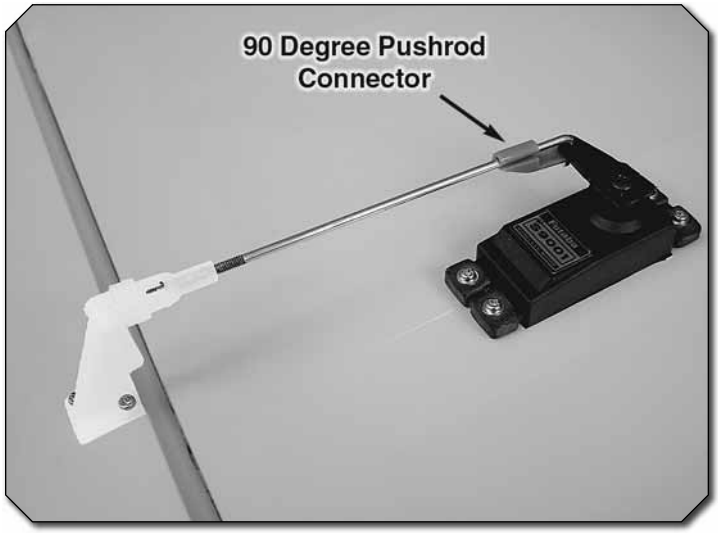


◐ ◐ 6. Position the control horn onto the aileron using the position of the servo arm as a guide. Align the holes in the control horns directly over the aileron hinge line and mark the location of the control horn mounting holes.

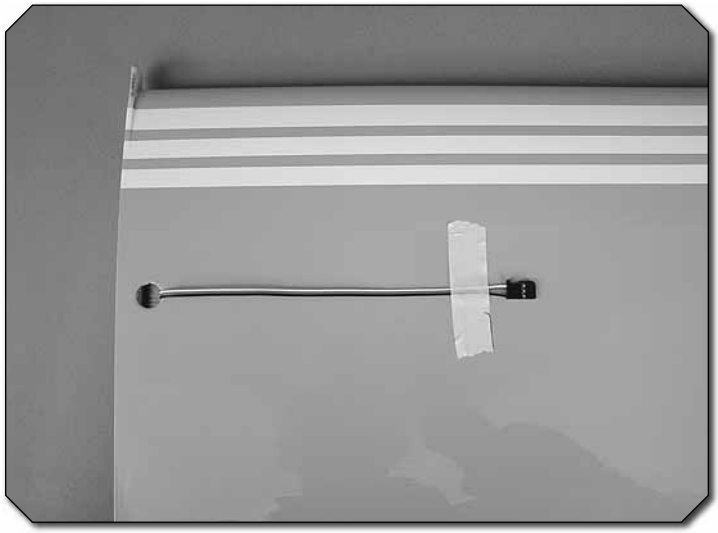
7. Drill 5/64" [2mm] holes at the marks you made through the aileron (drill perpendicular to the aileron chord line). Apply a couple drops of thin CA glue to each hole to harden the surrounding wood. When the glue has dried, install the control horn onto the aileron using two 2 x 20mm machine screws and a control horn backplate. The excess length of screw protruding beyond the backplate can be cut off.







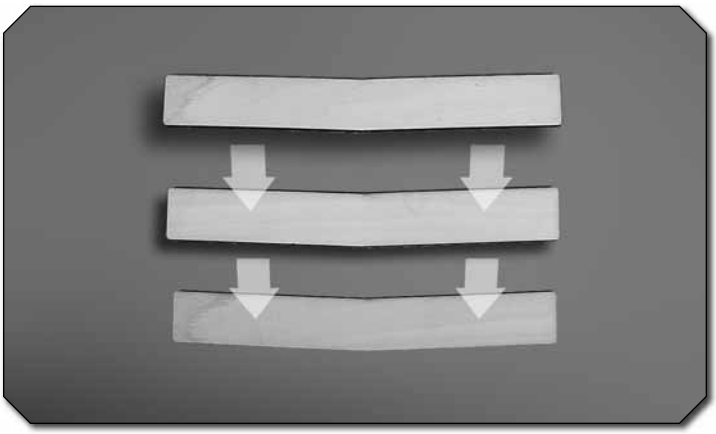
8. Use tape or a small clamp to hold the aileron in the neutral position. Make a mark on the pushrod where it crosses the outer hole in the servo arm. Make a 90 degree bend at the mark on the pushrod and cut off the excess pushrod 1/4" [6mm] beyond the bend. Attach the pushrod to the servo arm using a 90 degree pushrod connector. Thread the clevis up or down on the pushrod as necessary to center the aileron with the servo arm centered. When satisfied, slide the silicone clevis retainer to the end of the clevis to secure it.

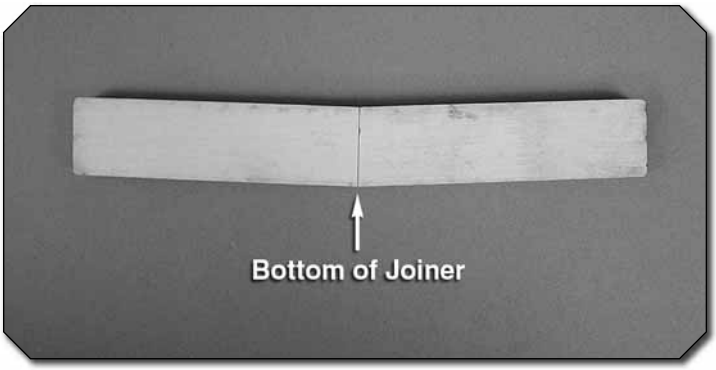


9. Route the servo lead through the hole in the top of the wing panel and tape it back and out of the way.

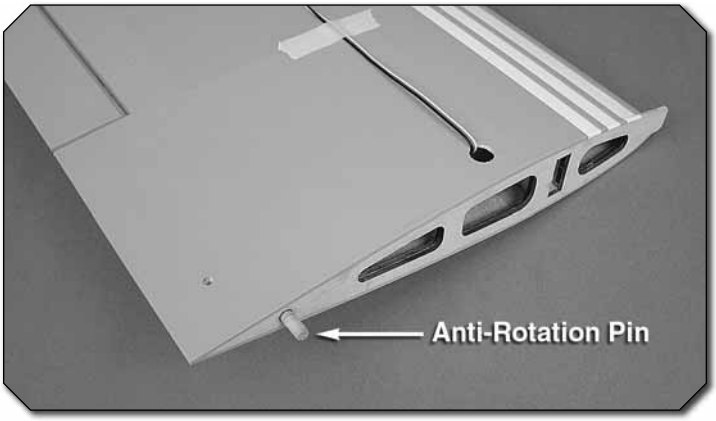
10. Repeat steps 1-9 for the other wing panel.

JOIN THE WING PANELS

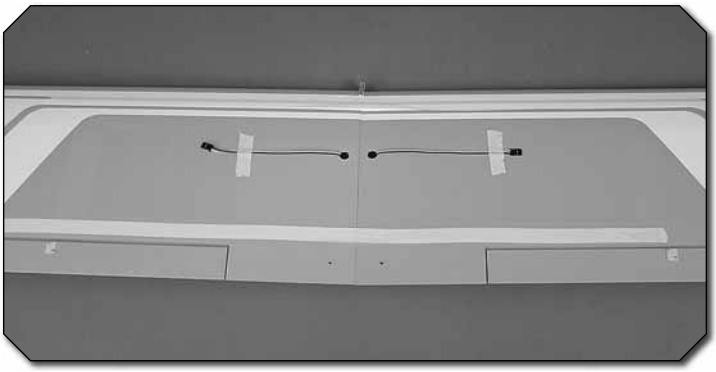




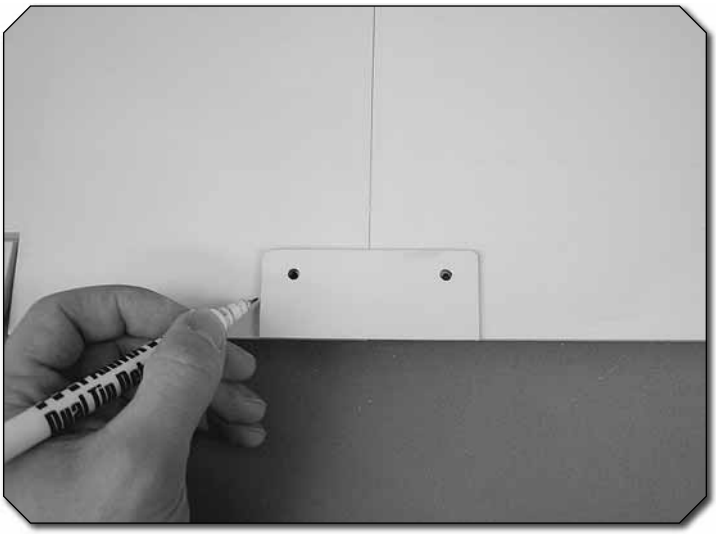
1. Locate the three plywood **wing joiner** pieces. Glue the three pieces together using epoxy. Note that the joiner has a slight "V" shape that will give the wing a small amount of dihedral when assembled. The point of the "V" shape is the **bottom** of the joiner. Wipe away any excess epoxy with a cloth dampened with denatured alcohol and use clamps to hold the pieces together while the epoxy cures. Be sure that the joiner pieces are glued so the edges are flush with each other. Mark a centerline on the assembled wing joiner. The centerline is used to confirm that the wing joiner fits halfway into each wing panel.



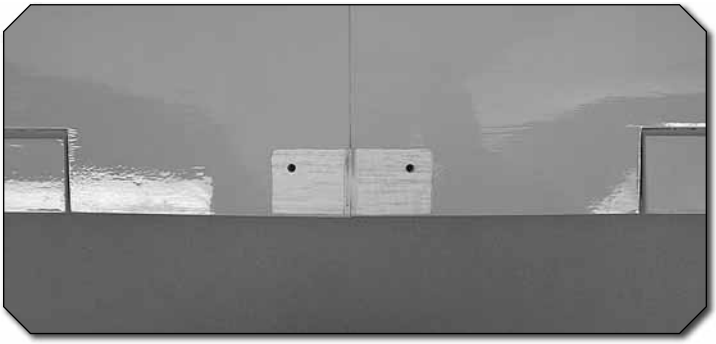
2. Read all of step 3 and dry fit the parts together to ensure a proper fit before gluing. Sand the wing joiner or root ribs if necessary to achieve the correct fit. The root ribs should join together tightly with no gaps. When satisfied, glue the anti-rotation pin halfway into the hole of one of the wing panels as shown.

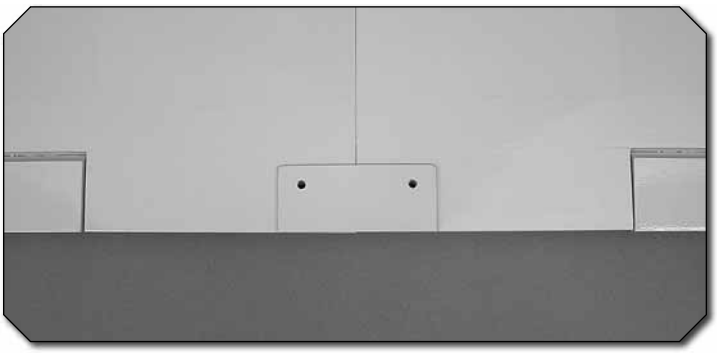


3. Use a mixing stick or something similar to coat the inside of the wing joiner pockets of both wing panels with 30-minute epoxy. Thoroughly coat one half of the wing joiner with 30-minute epoxy and insert it into the joiner pocket of one wing panel with the bottom of the "V" shape pointing to the underside of the wing. Coat the root ribs of both wing panels and the protruding end of the wing joiner with epoxy. Slide the wing panels together and use tape to hold them tight while the epoxy cures. Wipe away any excess epoxy with denatured alcohol.



4. Trim the covering from the holes in the plywood **wing bolt plate** as shown. Position the wing bolt plate over the wing bolt holes on the underside of the wing and use a felt-tip pen to trace around it.



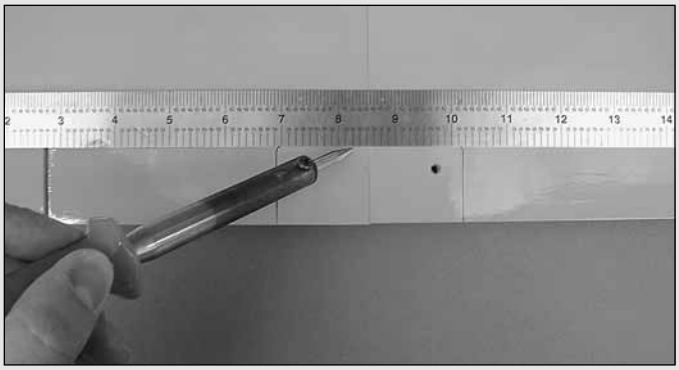


5. Use a sharp #11 hobby knife or use the following **Expert Tip** to cut the covering 1/16" [1.6mm] inside of the lines you marked. Use care to cut **only in the covering** and **not into the wood**. Use alcohol to wipe away the lines. Glue the wing bolt plate in position. If necessary, clean out the wing bolt holes using a 11/64" [4.4mm] drill bit.

EXPERT TIP

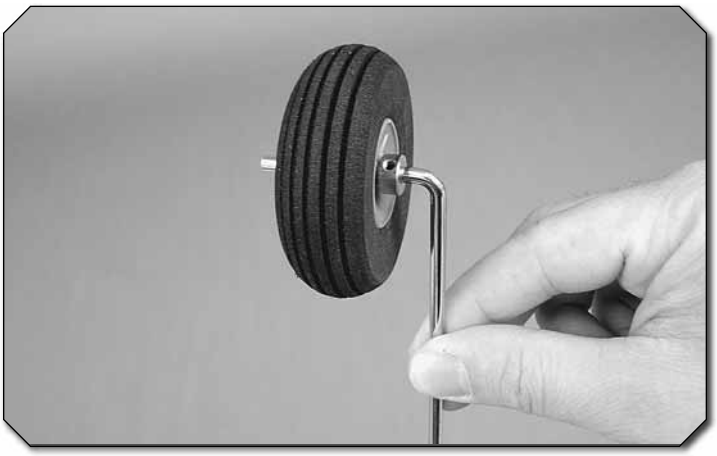
HOW TO CUT COVERING FROM BALSA

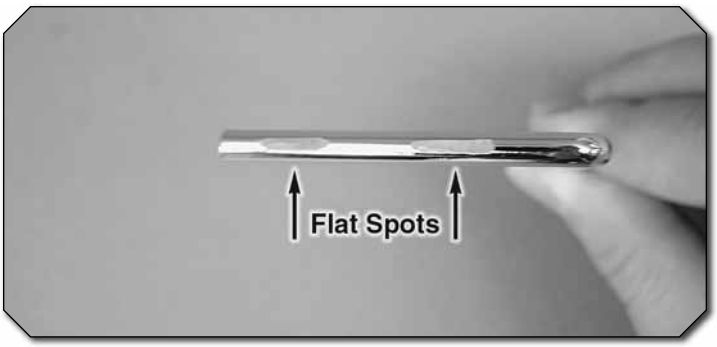
Use a soldering iron to cut the covering from the area beneath the wing bolt plate. The tip of the soldering iron doesn't have to be sharp, but a fine tip does work best. Allow the iron to heat fully.



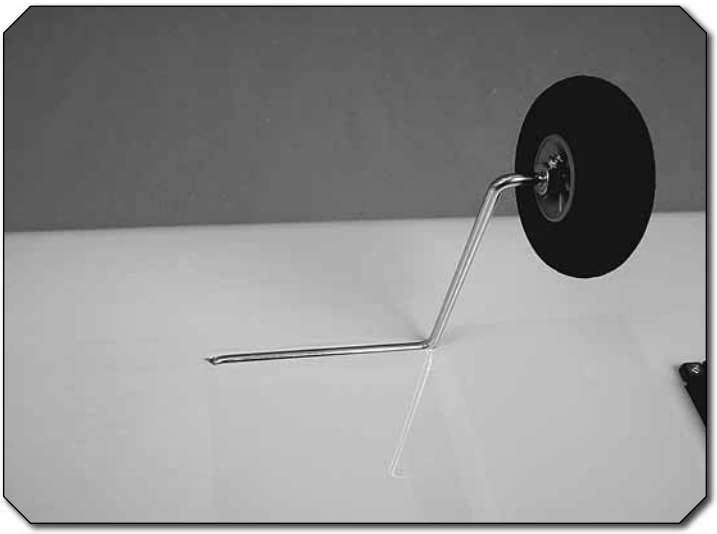
Use a straightedge to guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut. Peel off the covering.

INSTALL THE MAIN LANDING GEAR

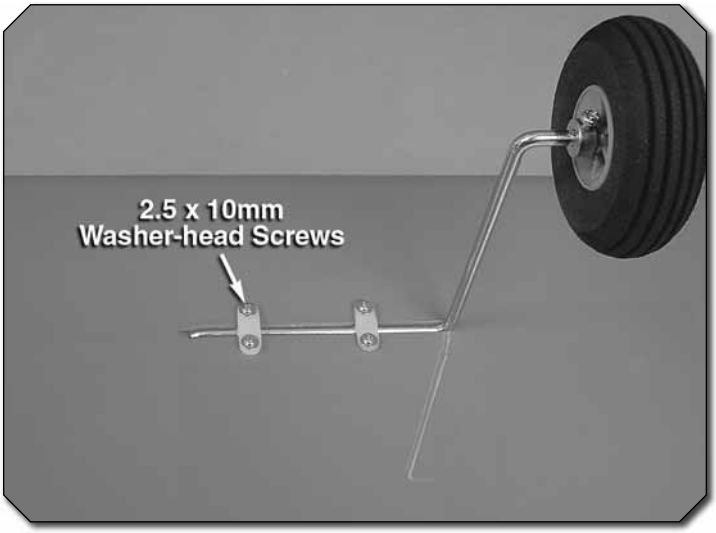




1. Slide a 4mm wheel collar onto each **main landing gear wire** followed by a wheel and another 4mm wheel collar. Center the wheels on the landing gear wires and mark the position of the wheel collars onto the wires. Use a file or rotary tool to grind flat spots at the marks you made. The wheel collar screws will tighten against the flat spots on the wires. Use four 3x5mm machine screws and thread locking compound to tighten the wheel collars onto the landing gear wires. The wheels should rotate freely on the wires. Oil the axles if necessary.



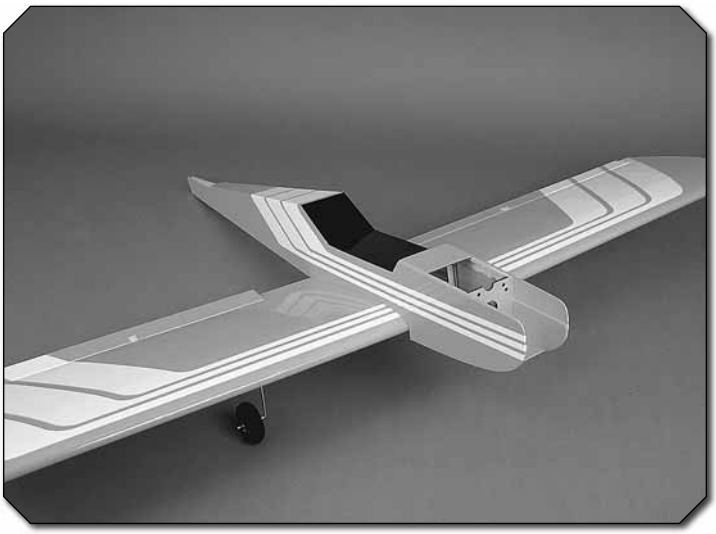
2. Press the landing gear into the slots on the underside of the wing.



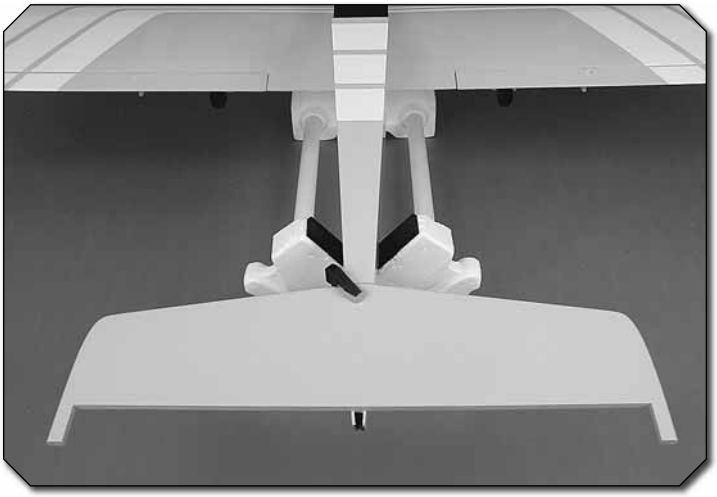
3. Position two landing gear straps evenly spaced apart over each landing gear and mark the location of the strap holes onto the wing. Drill holes at your marks using a 1/16" [1.6mm] bit. Thread a 2.5x10mm self-tapping washer head screw into each hole and back it out. Apply a drop of thin CA to each hole to harden the wood. When the glue has dried, install the straps using eight 2.5x10mm self-tapping washer head screws.

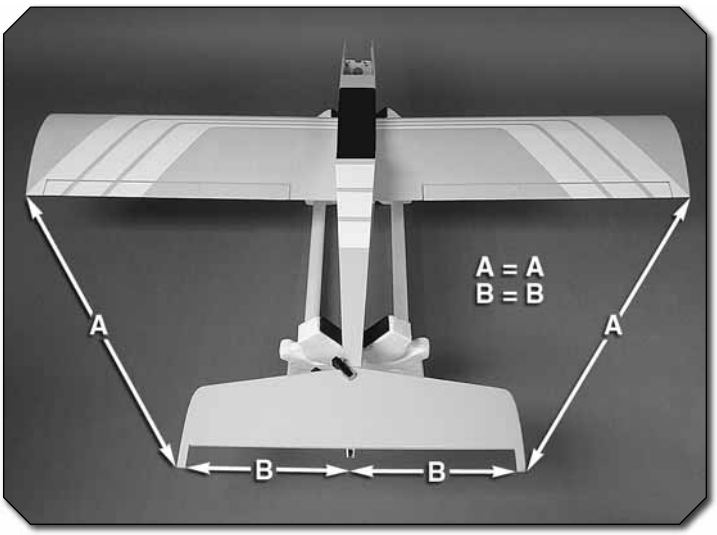
BUILD THE FUSELAGE

INSTALL THE TAIL SURFACES



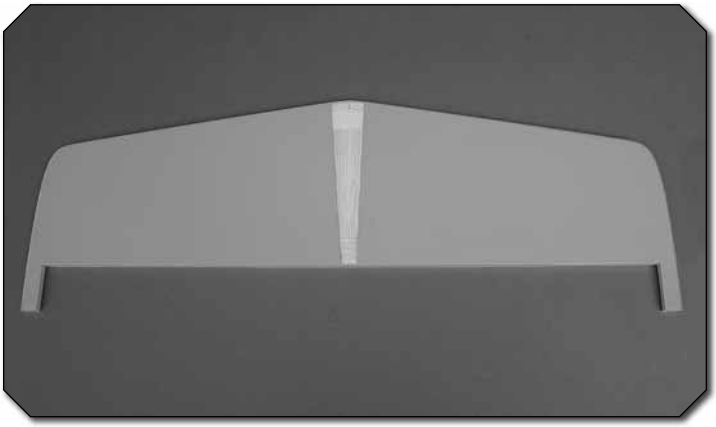
1. Temporarily install the wing onto the **fuselage** using two 4x25mm machine screws and two 4mm flat washers. The wing will be used to properly align the **horizontal stabilizer** onto the fuse.





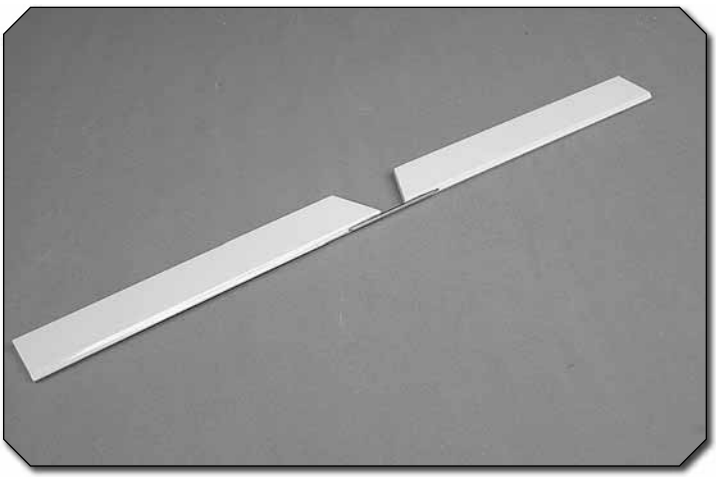
2. Place the horizontal stab onto the stab saddle as shown. Center the stab left and right on the fuse (making a center mark on the stab is helpful) and make the distance between wing and stab tips equal on both sides. When satisfied, use a felt-tip pen to trace around the saddle where it meets the underside of the stab. We used a small clamp to hold the stab in place while we did this.

3. Stand back 5-6 ft [1.5 - 1.8m] and view the model from behind. Confirm that the stab and wing are parallel. If not, sand the fuselage as necessary until they are parallel.

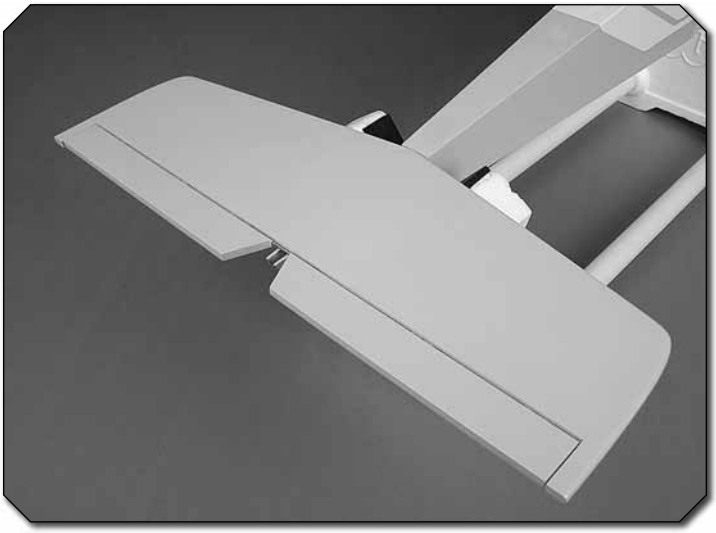


4. Remove the stab from the fuse and trim the covering 1/16" [1.6mm] inside the lines you drew. Be careful not to cut into the wood structure beneath the covering. Use denatured alcohol to wipe away the lines.

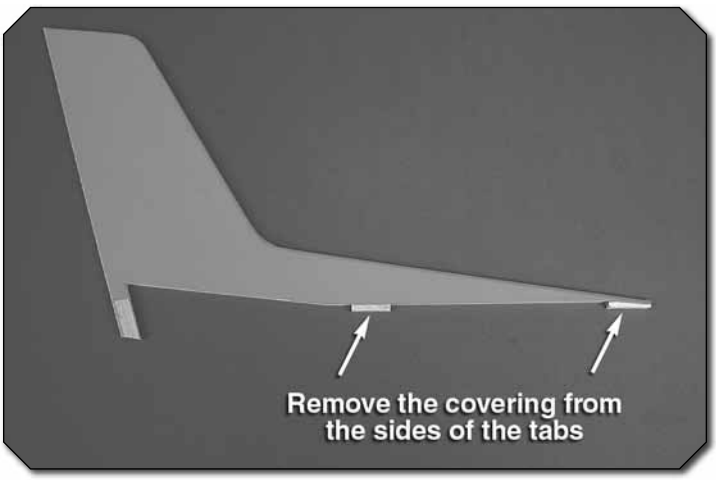
5. Coat the stab saddle and the area where you removed the covering from the stab with 30-minute epoxy. Put the stab back into place on the saddle and re-center its position. Use clamps or weights to hold the stab in place while the epoxy cures. Wipe away any excess epoxy with alcohol.



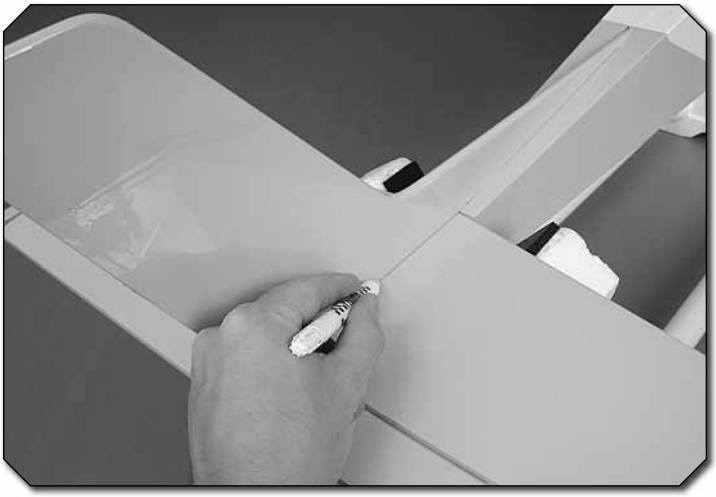
6. Trim the covering away from the **elevator joiner wire** slots at the LE of the **elevator halves**. Confirm that the joiner wire fully seats into the slot. Use a hobby knife to enlarge the slot as necessary. When satisfied, test fit both elevator halves onto the joiner wire and lay them on a flat surface. If both elevator halves do not lay flat, "tweak", or bend the joiner wire until they do. Do not attempt to bend the joiner wire with it inside the elevators.

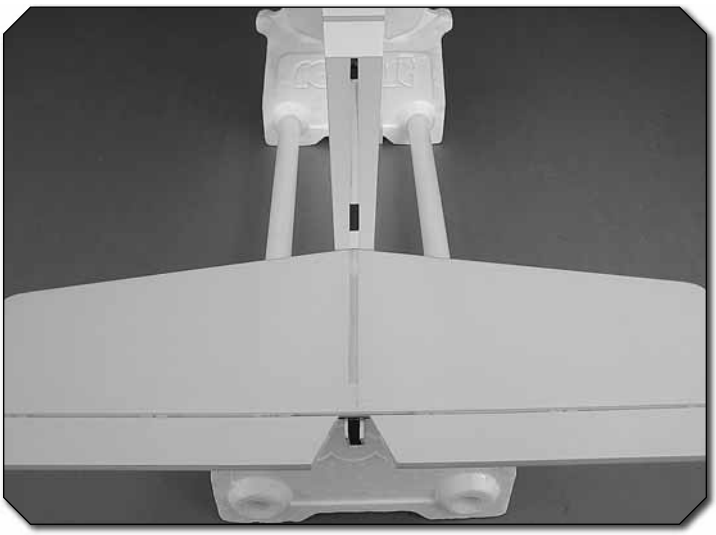


7. Roughen the ends of the joiner wire with 220 grit sandpaper and clean them off with alcohol. As you did with the ailerons, dry fit the elevator halves onto the stabilizer using CA hinges and the elevator joiner wire. When satisfied with the fit, mix up a small batch of epoxy and coat the ends of the joiner wire. Insert the joiner wire into the elevator halves and wipe away any excess epoxy. Fit the elevator halves to the stabilizer with CA hinges and apply 6 drops of thin CA to both sides of every hinge.

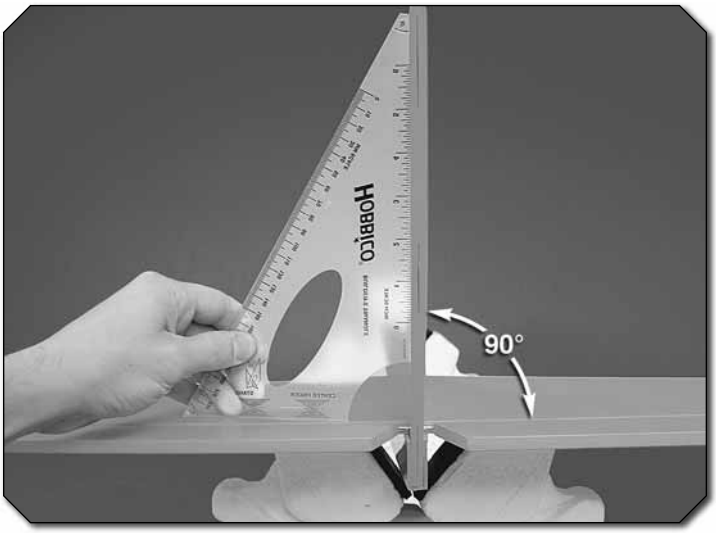


8. Trim the covering from the **vertical fin** slots in the fuselage. If necessary, remove the covering from the sides of the tabs on the vertical fin.

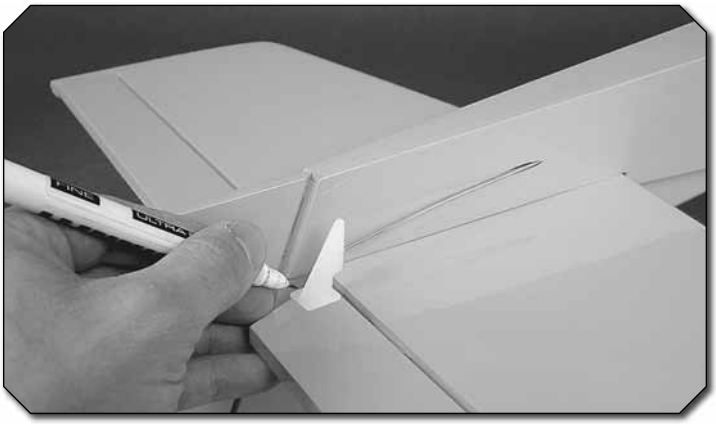




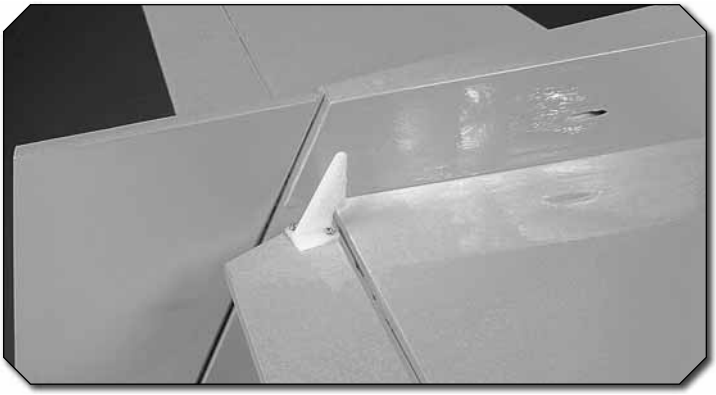
9. Fit the vertical fin onto the fuselage and use a felt-tip pen to trace around it onto the fuselage. Remove the covering 1/16" [1.6mm] inside the lines you drew.



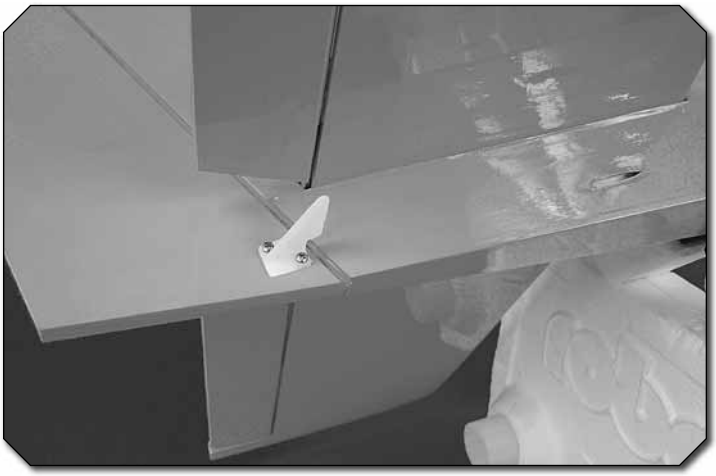
10. Use 30-minute epoxy to glue the fin into place. Be sure to put a coating of epoxy along the entire underside length of the fin as well as the side of the tabs. Wipe away any excess epoxy with denatured alcohol. Use a triangle or measure to confirm that the vertical fin is installed perpendicular to the horizontal stabilizer. If necessary, use tape to hold the fin square while the epoxy cures.



11. Trim the covering from the tail servo pushrod exits on the left and right sides of the fuselage. Temporarily insert a 29-1/2" [749mm] pushrod into the elevator outer pushrod tube that exits the left side of the fuselage. Use the position of the pushrod to mark the location for the elevator control horn onto the underside of the elevator.

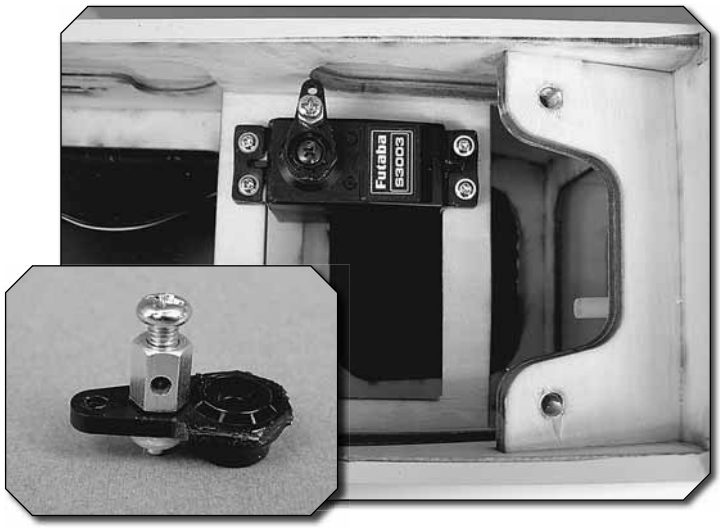


12. Drill 5/64" [2mm] holes at your marks through the elevator. Apply a couple drops of thin CA to each hole to harden the surrounding wood. Install a control horn and backplate onto the underside of the elevator using two 2x20mm machine screws.

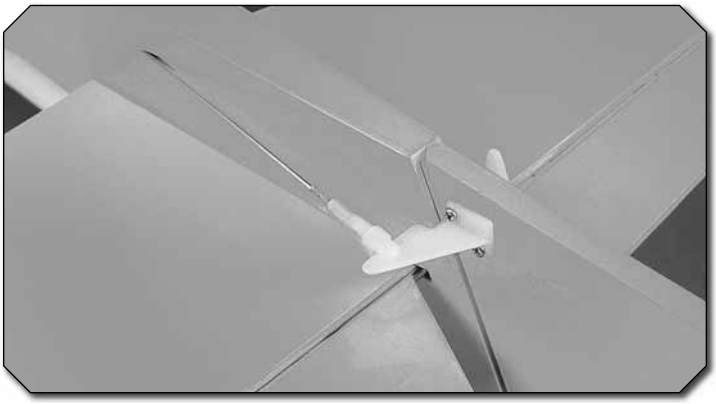


13. Install a control horn onto the right side of the rudder in the same manner.

INSTALL THE TAIL SERVOS AND PUSHRODS

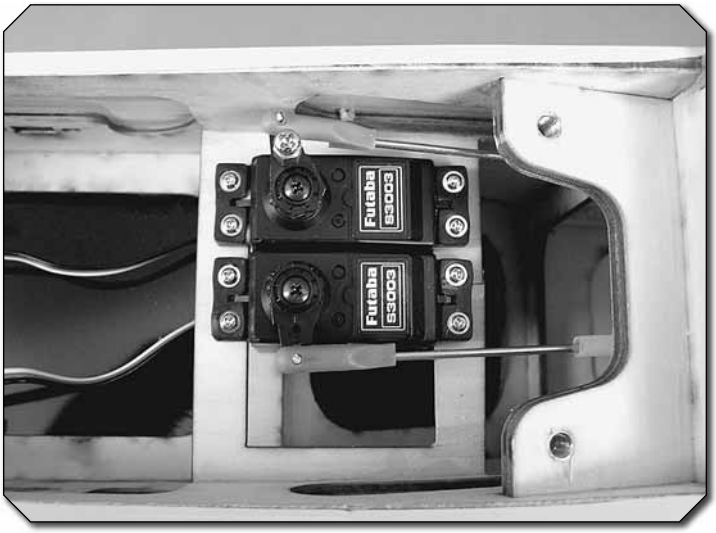


1. Cut five arms from a six-armed servo arm and enlarge the outer hole and inner hole of the remaining arm with a 5/64" [2mm] drill bit. Install a screw-lock pushrod connector into the inner hole of the servo arm. The plastic screw-lock pushrod connector retainer may need to be trimmed down to clear the center of the servo arm. Center the rudder servo with your radio system and install the servo arm perpendicular to the servo case as shown. As you did with the aileron servos, install the rudder servo onto the left side of the servo tray.



2. Thread a nylon clevis 20 complete turns onto a 29-1/2" [749mm] pushrod. Slide a silicone clevis retainer onto the clevis. Then insert the pushrod into the rudder outer pushrod tube and connect the clevis to the third outer hole of the rudder control horn. As you did with the aileron pushrods, use tape or a small clamp to hold the rudder in the neutral position. Make a mark on the pushrod where it crosses the outer hole in the servo arm. Make a 90 degree bend at the mark on the pushrod and cut off the excess pushrod 1/4" [6mm] beyond the bend (removing the pushrod from the fuselage will make this easier). Attach the pushrod to the servo arm using a 90 degree pushrod connector. Thread the clevis up or down on the pushrod as necessary to center the rudder with the servo arm perpendicular to the servo case. When satisfied, slide the silicone clevis retainer to the end of the clevis to secure it.

3. Install the elevator servo next to the rudder servo using the hardware included with the servo. Be sure that the two servos are not touching each other.

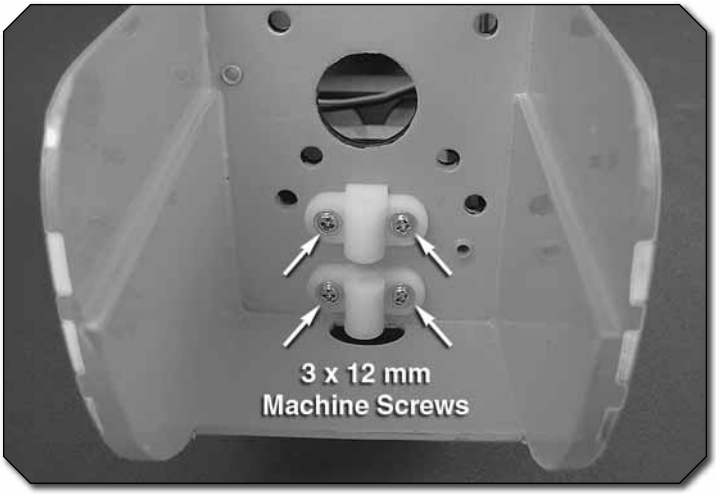


4. Install the elevator pushrod in the same manner as you installed the rudder pushrod.

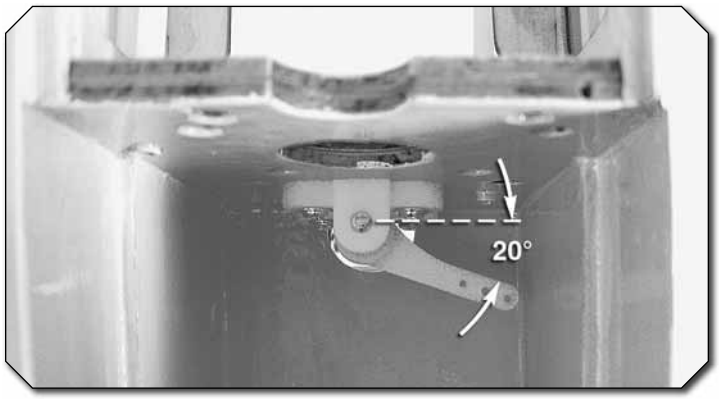
INSTALL THE NOSE GEAR

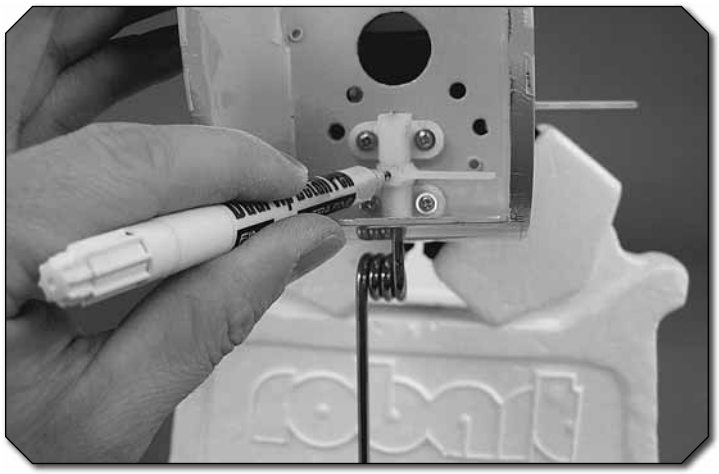
1. Trim the covering from the nose gear exit at the front underside of the fuselage.

2. Push a 3mm blind nut into the back of each nose gear bearing block mounting hole in the firewall. Use a 3x12mm washer head machine screw to draw the blind nuts tight against the firewall.

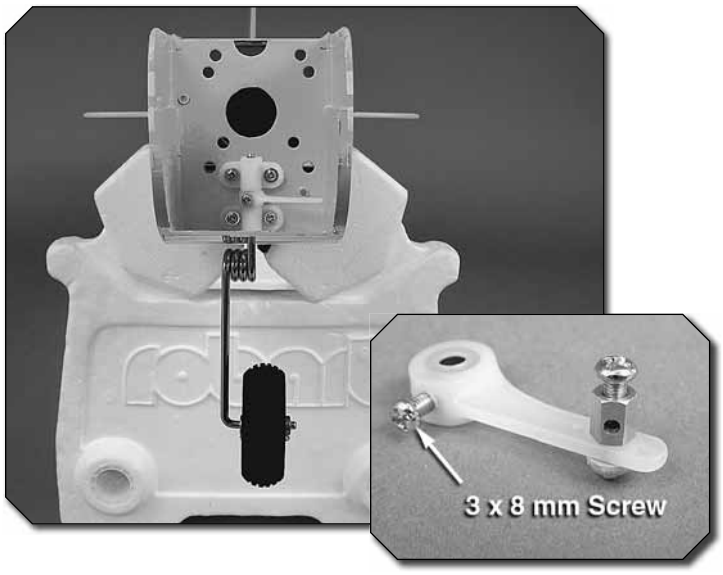


3. Cut apart the nose gear bearing block halves and rotate them around 180 degrees. Install the bearing block halves onto the firewall using four 3x12mm washer head machine screws and thread locking compound.



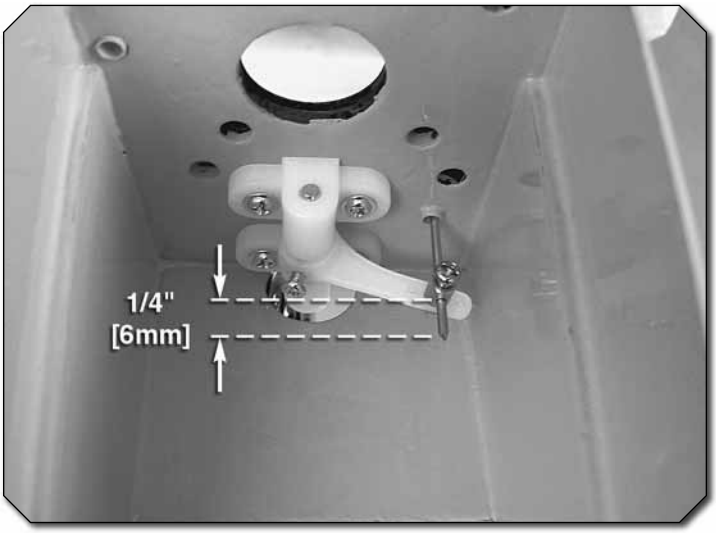


4. Fit the nylon steering arm between the two nose gear bearing block halves. Slide the nose gear wire up through the bearing blocks and the steering arm. Square the axle of the nose gear wire with the length of the fuselage. Rotate the steering arm so it is approximately 20 degrees to the firewall as shown. Mark the location of the threaded hole in the steering arm onto the nose gear wire.



5. Remove the nose gear wire from the bearing blocks. As you did with the main gear, install two 4mm wheel collars and a wheel onto the nose gear wire and mark the positions of the wheel collar screw holes onto the axle. Grind flats spots for the wheel collar screws at your marks as well as for the

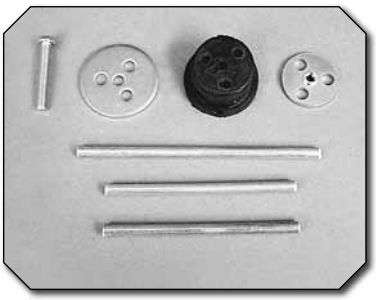
steering arm screw. Install the wheel and wheel collars onto the axle using two 3x5mm machine screws and thread locking compound. Loosely thread a 3x8mm machine screw with thread locking compound into the steering arm. Install a screw-lock pushrod connector into the middle hole in the steering arm. Reinstall the nose gear wire into the nose gear bearing blocks and steering arm. Tighten the screw in the steering arm against the flat spot you made on the nose gear wire.

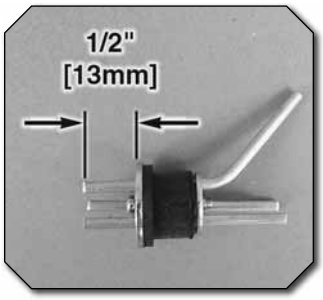


6. Slide the 16-1/4" [413mm] unthreaded pushrod through the screw-lock pushrod connector on the steering arm, through the steering outer pushrod tube, and through the screw-lock pushrod connector on the rudder servo, positioning the end of the pushrod 1/4" [6mm] beyond the screw-lock connector on the servo arm. Center the rudder servo and the nose wheel. Tighten the screws in the screw-lock pushrod connectors and cut off the excess pushrod 1/4" [6mm] beyond the steering arm pushrod connector.

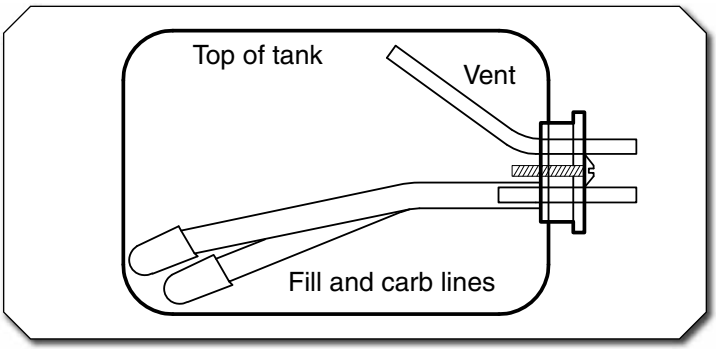
GLOW ENGINE INSTALLATION

The Tiger 2 ARF is designed to be flown with a .40–.55 [6.5–9cc] two-stroke glow engine, .70 [11.5cc] four-stroke glow engine, or a brushless out-runner motor. If you plan to install a brushless motor, skip this section as it only contains information relevant to installing a glow engine.

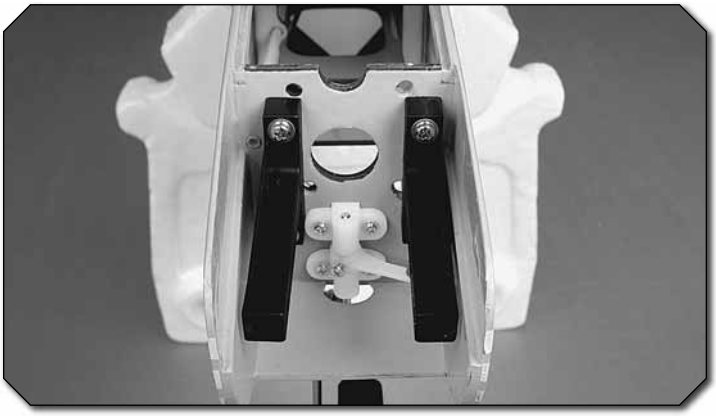




1. The fuel tank can be assembled as a two line system consisting of a vent (pressure) line to the muffler and a carb line. Filling and emptying of the tank would need to be done through the carb line, or an optional fuel fill valve (not included). The tank can also be assembled as a three line system having a vent line, carb line, and fill line. If installing a fill line, puncture the top of the stopper above the sealed off fuel tube hole. The fill and carb lines should extend out 1/2" [13mm] beyond the stopper and the vent line should be bent upwards. With the tubes installed in the stopper, fit the stopper plates loosely in place with the 3 x 20mm phillips screw to hold the assembly together.

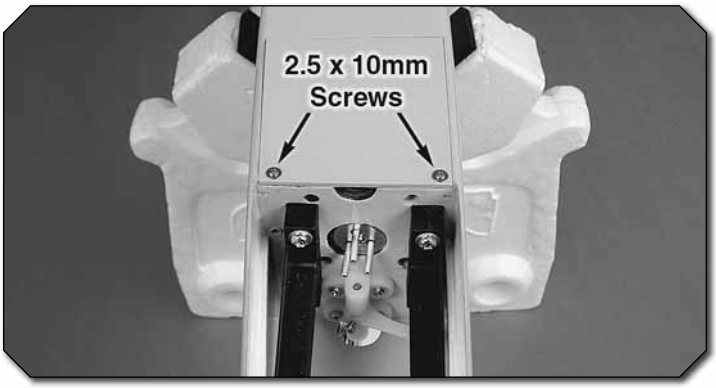


2. Fit the stopper assembly into the tank with the vent line pointing toward the top of the tank, but not touching. The fuel tubing and clunks (fuel pickup) on the carb and fill lines should almost reach the back of the tank but not touch. The clunks must be able to move freely inside the tank when assembled. Adjust the length of the fuel tubing accordingly. When satisfied, remove the stopper from the tank. It will need to be reinstalled after the tank is fit into the fuselage.



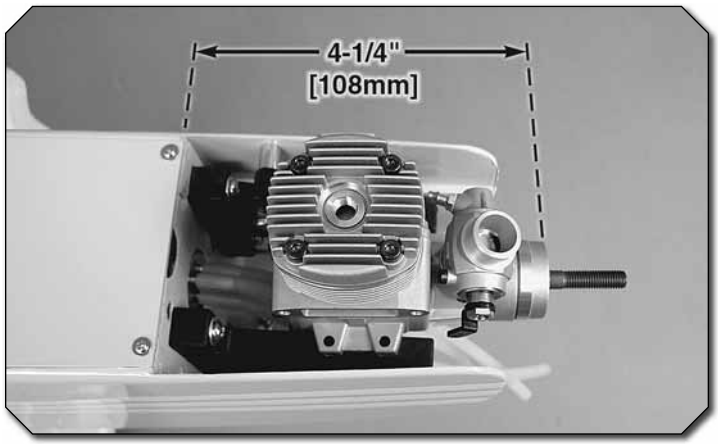
3. Use a 4x20mm machine screw, engine mount half, and a 4mm flat washer to draw the four 4mm blind nuts tight into the engine mounting holes. Confirm that the holes you are using line up with the holes in the engine mount halves (the unused holes are for a brushless motor mount). Install the motor mount halves using four 4x20mm machine screws, four 4mm flat washers, and thread locking compound.

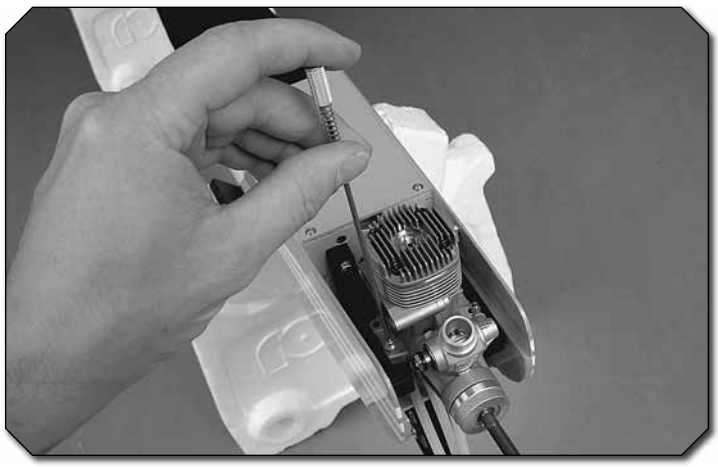
4. Cut a piece of 1/4" [6mm] foam rubber (not included) to fit the fuel tank. Lay the foam rubber inside the fuel tank compartment. Fit the fuel tank into the compartment and pull the fuel tank neck through the hole in the firewall. Install the stopper into the tank (be sure the correct side is facing up). Do not over-tighten the stopper screw.



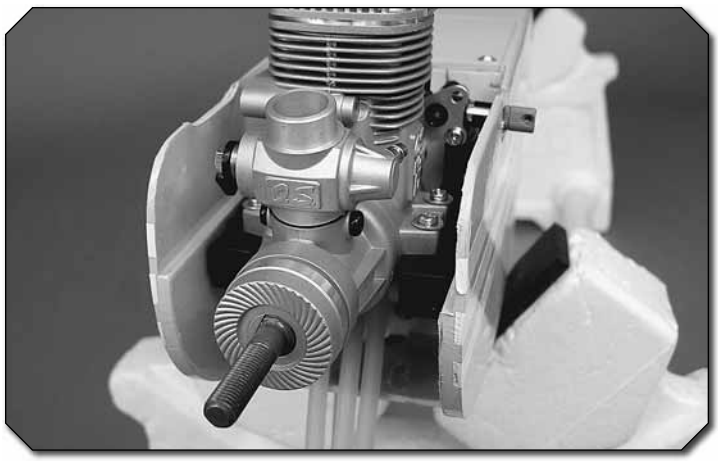
5. Line the top and sides of the tank with additional foam rubber. The tank should be held securely by the foam rubber. Fit the fuel tank hatch cover in place and drill two 1/16" [1.6mm] pilot holes through the forward end of the hatch cover and into the firewall. Thread a 2.5x10mm washer head self-tapping screw into each hole and back it out. Apply a drop of thin CA to each hole to harden the wood. Install the hatch cover using two 2.5x10mm washer head self-tapping screws.

6. Attach a 6" [152mm] piece of fuel tubing to each of the tubes in the fuel tank stopper.



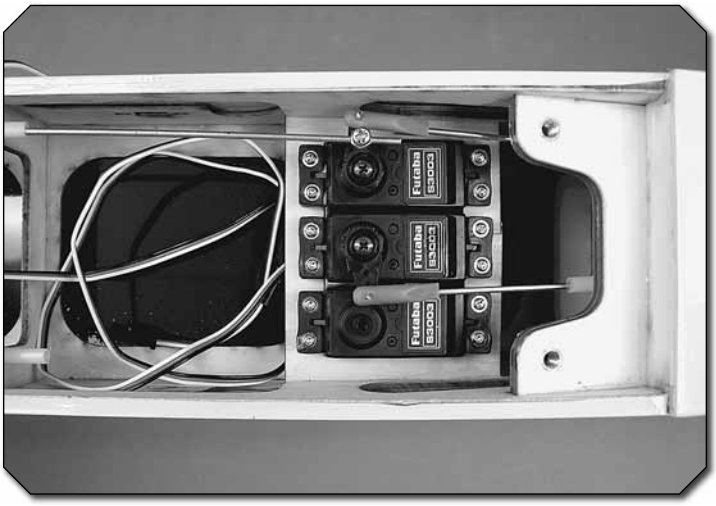


7. Position your engine 4-1/4" [108mm] from the firewall. Use a Great Planes Dead Center Hole Locator to mark the location of the engine mount holes onto the engine mount halves. If necessary, carve away any portion of the fuselage that interferes with the needle valve or exhaust. Drill 1/8" [3.2mm] holes through the marks you made.

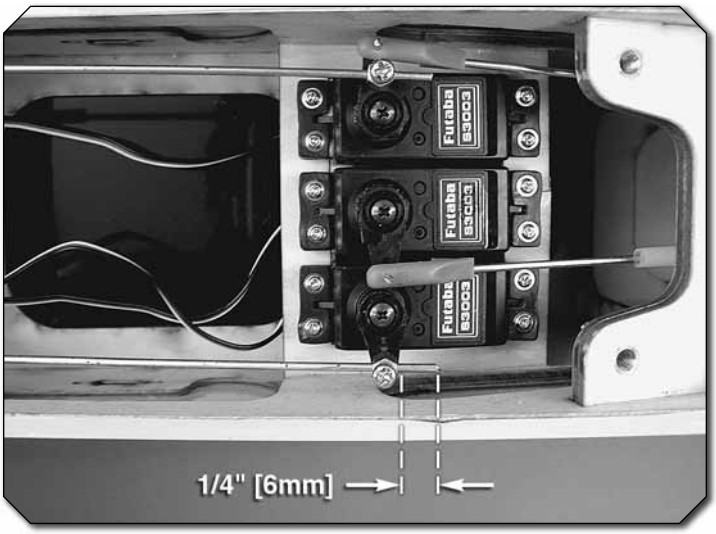


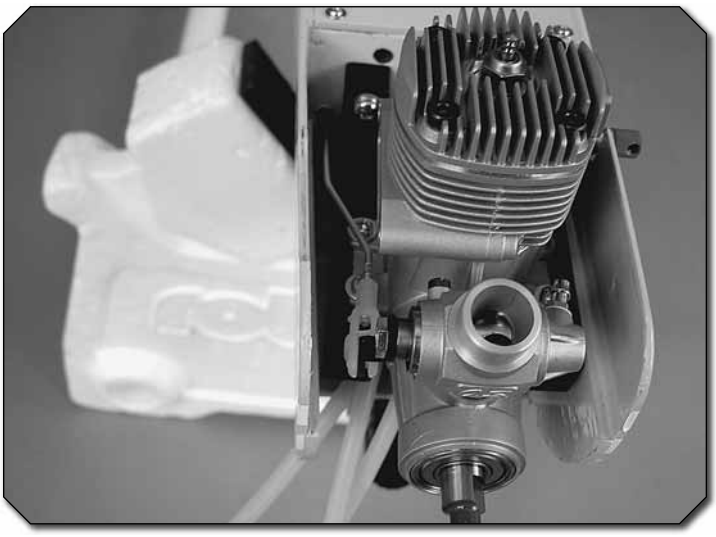
8. Attach the engine to the engine mount halves using four 3x25mm machine screws, eight 3mm flat washers, and four

3mm nylon insert lock nuts. Use a lock nut and washer on the underside of the engine mount halves on each screw.

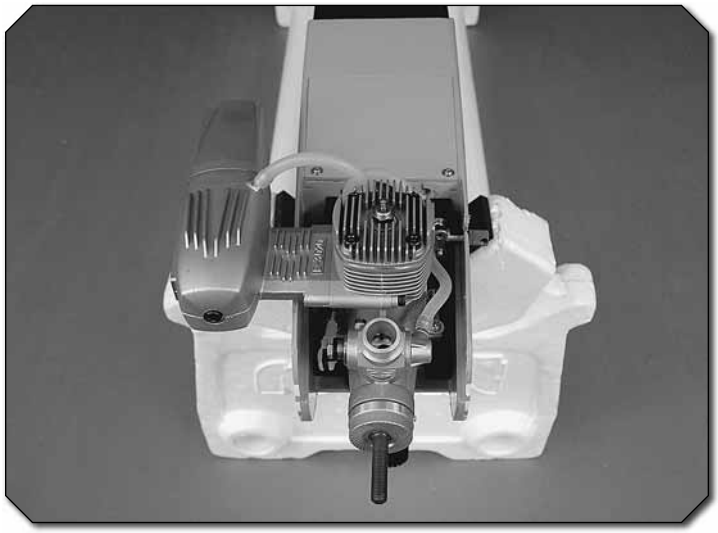


9. Mount the throttle servo onto the servo tray. Make sure that it is not touching the elevator servo. Use your radio system to center the servo.

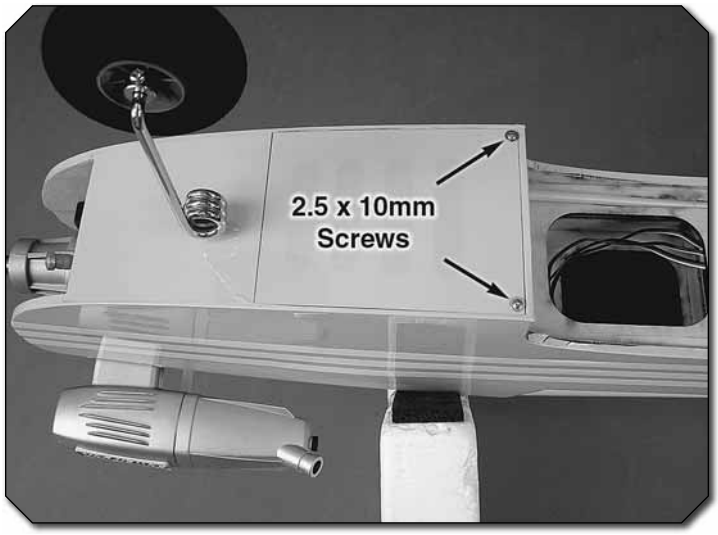




10. Cut five arms from a six-armed servo arm and enlarge the second outer hole of the remaining arm with a 5/64" [2mm] drill bit. Install a screw-lock pushrod connector into the second outer hole of the servo arm. Thread a nylon clevis 20 complete turns onto the remaining 16-1/4" [413mm] pushrod. Slide a silicone clevis retainer onto the base of the clevis. Slide the pushrod through the throttle outer pushrod tube pre-installed in the fuse. Fit the aft end through the screw-lock pushrod connector installed on the throttle servo. Make any necessary bends to the forward end of the pushrod and connect the clevis to the throttle arm on the carburetor. Adjust the pushrod in the screw-lock connector so the servo properly opens and closes the carburetor. When satisfied, tighten the screw-lock connector screw, slide the silicone clevis retainer to the end of the clevis, and cut the excess pushrod 1/4" [6mm] behind the screw-lock connector.



11. Make any final connections to the engine such as the pressure line to the muffler, carb line, etc. If you assembled the fuel tank with a fill line, cut the fill line to length and plug the line with a fuel line plug (not included).

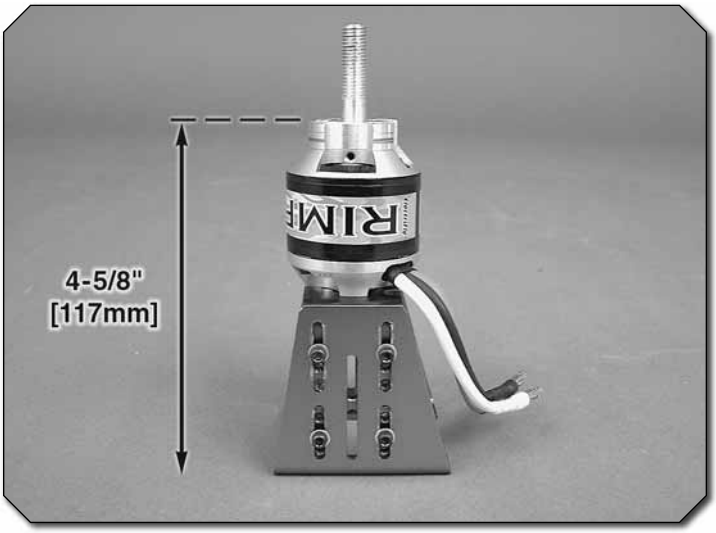


12. Install the bottom hatch cover with two 2.5x10mm washer head self-tapping screws. Be sure to harden the wood surrounding the holes with thin CA.

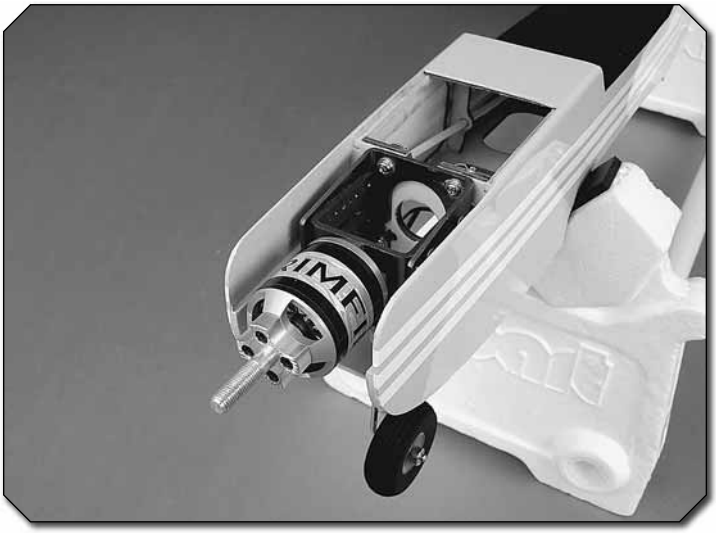
BRUSHLESS MOTOR INSTALLATION

If you have installed a glow engine, skip this section as it only contains information relevant to installing a brushless motor.

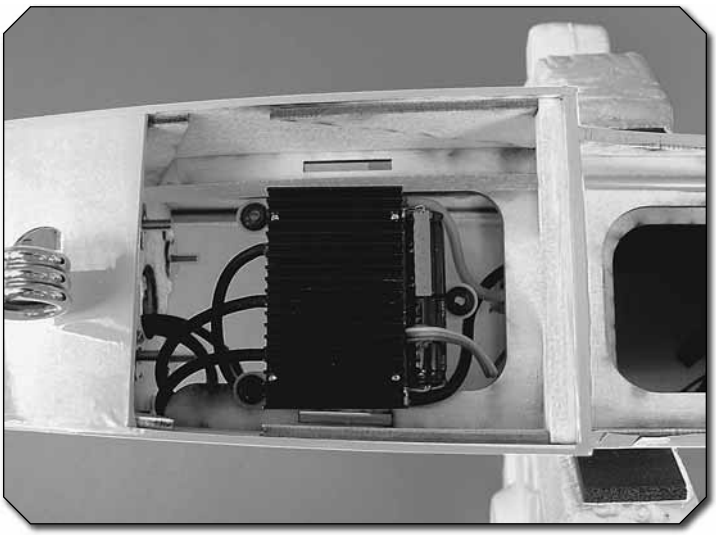
Be sure to read and understand the instructions that come with the ESC and motor before attempting to operate the system.



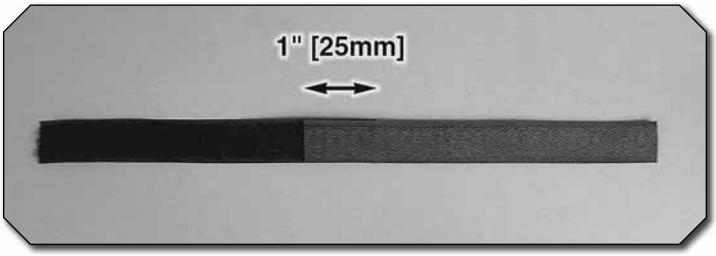
1. Attach the out-runner motor to the brushless motor mount using the included 3 x 8mm machine screws and thread locking compound. If you haven't done so yet, install the prop adapter to the motor case with the hardware included with the motor and thread locking compound. Loosen the screws that hold the two motor mount halves together and set the distance from the back side of the mount to the front of the prop washer to be 4-5/8" [117mm]. Retighten the screws using thread locking compound.

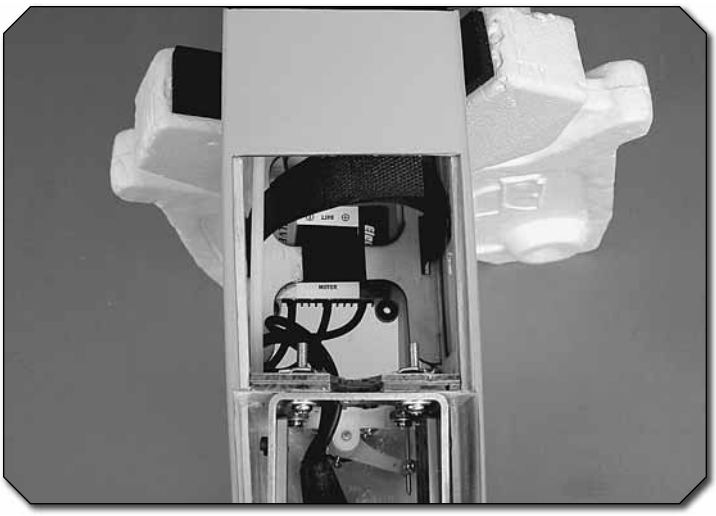


2. Locate the pre-drilled holes in the firewall that match up with the Great Planes medium motor mount. Use a 4x20mm machine screw and a 4mm flat washer to draw four 4mm blind nuts tight into the holes. Attach the motor mount to the firewall using four 4x20mm machine screws, four 4mm flat washers, and thread locking compound.

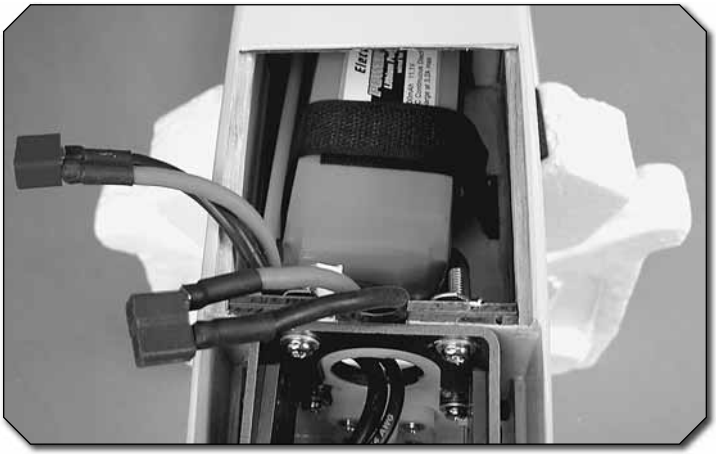


3. Apply a thin coating of epoxy where you plan to mount the ESC. This will improve the adhesion of the double-sided foam mounting tape (not included). Let the epoxy cure undisturbed. Connect the ESC to the motor. This is a good time to confirm the correct rotation of the motor by temporarily connecting the battery and radio system to the ESC and powering the motor (without prop). If the motor rotates the wrong direction, simply disconnect any two of the three motor leads and swap their position. Use double-sided foam mounting tape to secure the ESC in place.

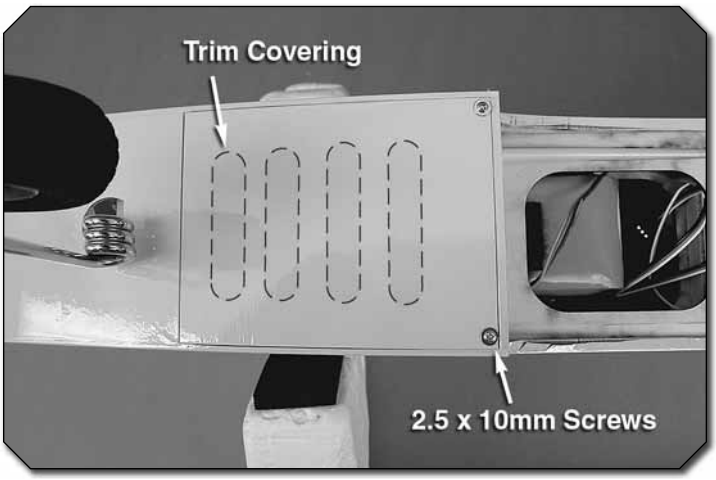




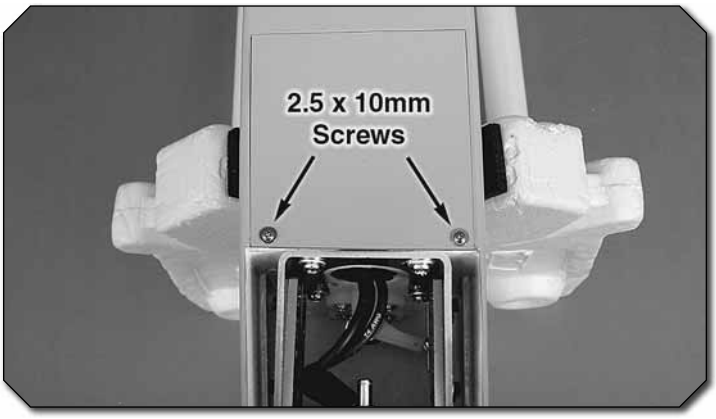
4. Apply a piece of self-adhesive hook and loop material inside the battery compartment (don't forget a coat of epoxy to improve adhesion). Make a strap from the included hook and loop strap material to fit around your battery packs by overlapping the mating ends by approximately 1" [25mm]. Fit the strap ends through the slots in the battery tray. Cut the strap to length as needed.



5. Test fit your battery packs in the battery compartment. They can be secured together with additional self-adhesive hook and loop material, but the packs may need to be inserted into the compartment one at a time.

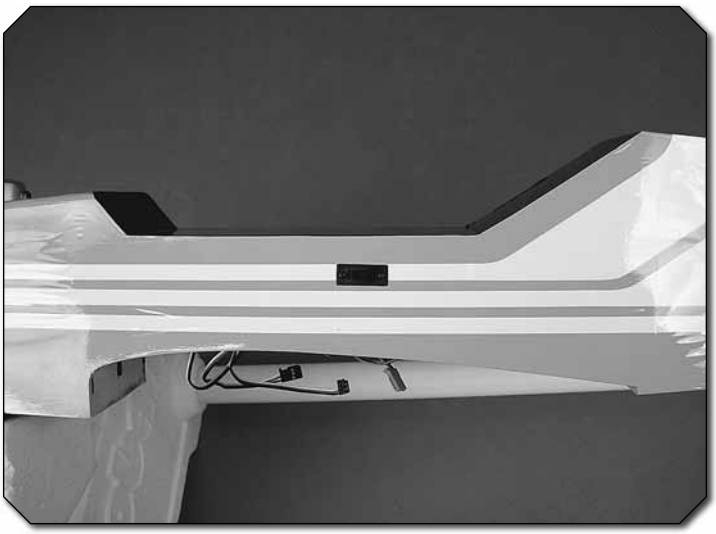


6. Fit the ESC hatch cover in place and drill through the pre-cut mounting holes into the hardwood rail using a 1/16" [1.6mm] drill bit. Thread a 2.5x10mm washer head self-tapping screw into each hole and back it out. Apply a drop of thin CA to each hole to harden the wood. Install the hatch cover using two 2.5x10mm washer head self-tapping screws. Trim the covering from the cool air exit slots in the hatch cover.

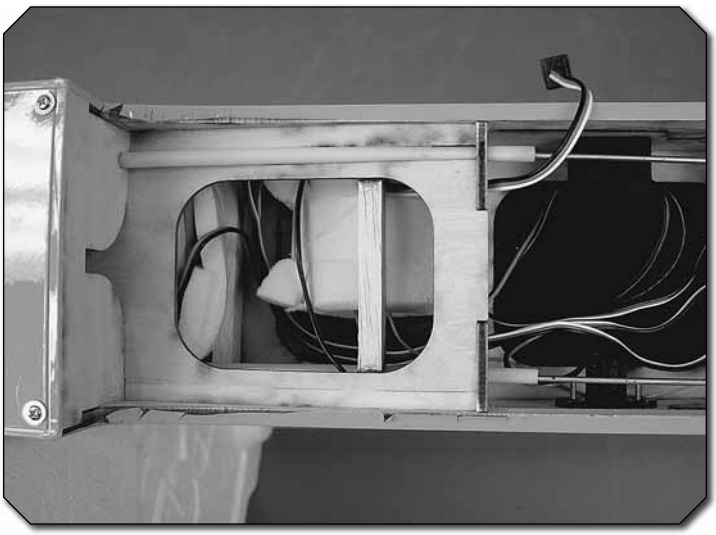


7. Mount the battery hatch cover using two 2.5x10mm washer head self-tapping screws.

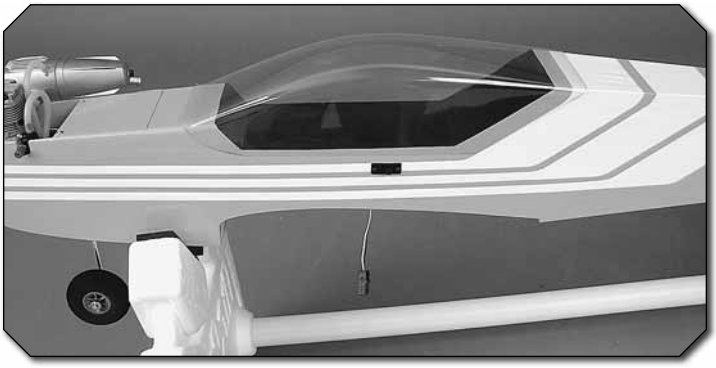
FINISH THE MODEL



1. Pre-cut slots are provided on both sides of the fuselage for an on/off switch. The slots may need to be enlarged depending on what brand switch harness you are using.



2. Wrap your receiver and receiver battery in foam rubber (not included). Connect the battery to the switch and the servos and switch lead to the receiver (be sure to secure the connection between the battery and the switch using tape or heat shrink tubing). Stuff the components into the fuselage and use scrap sticks of wood to hold them securely in place. It is recommended to only tack glue the sticks in place at this time as the components may need to be shifted forward or aft when balancing the plane. When the exact position of the radio components is confirmed, be sure to thoroughly glue the sticks in place.



3. Apply the instrument panel decal (see **Apply the Decals** section). Use canopy glue to glue the canopy in place as shown. Tape the canopy down and allow the glue to dry overnight. The canopy can also be screwed into place (additional screws not included).

4. Install the spinner backplate, propeller, prop washer, prop nut, and spinner cone onto the engine crankshaft. The spinner backplate (and propeller) may need to be drilled or reamed larger to match the crankshaft diameter. Be sure to balance your prop!

5. This completes the assembly of the Tiger 2 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

INSTALL AND OPERATE THE MOTOR BATTERY (BRUSHLESS ONLY)

IMPORTANT: If using multiple battery packs that are connected with an adapter, never charge the batteries together through the adapter. Always charge each battery pack separately. Charge the batteries, then read the following precautions on how to connect multiple packs for flying the model:

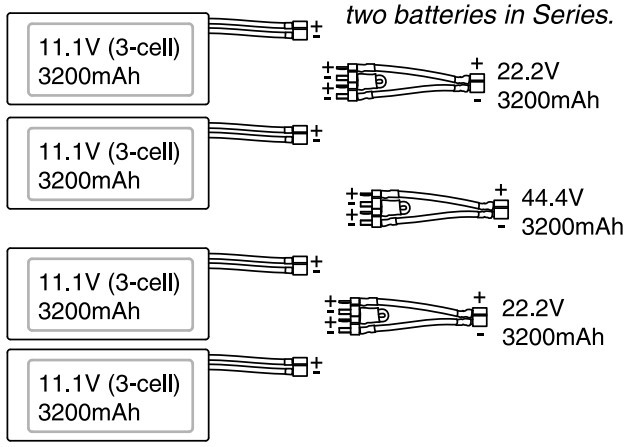
BATTERY PRECAUTIONS:

There are two ways to connect multiple battery packs: In **Series** and in **Parallel**.

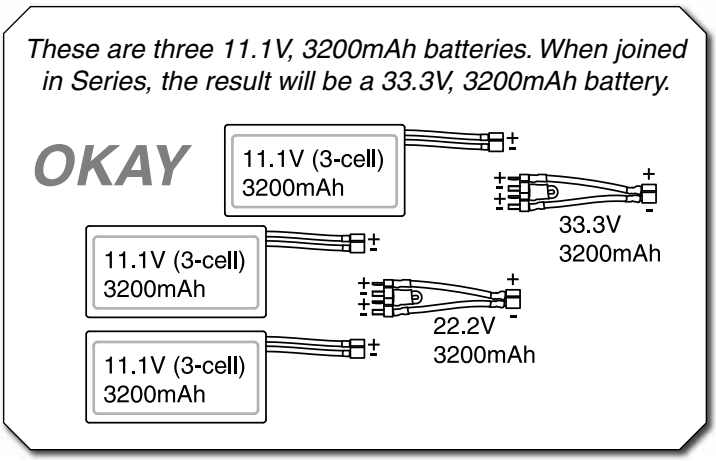
These are four 11.1V, 3200mAh batteries. When joined in Series, the result will be a 44.4V, 3200mAh battery.

OKAY

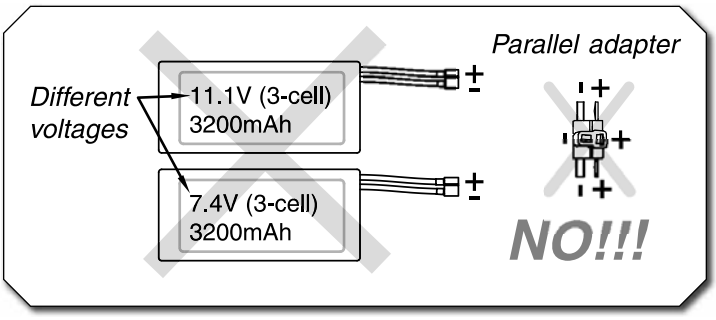
These are Series adapters that connect two batteries in Series.



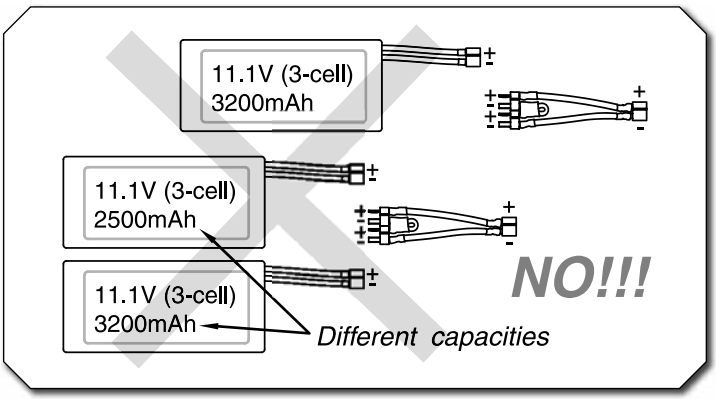
1. Connecting batteries in **"Series"** means to connect the +'s to the –'s and the –'s to the +'s. This combines the batteries' Voltages, but the capacity remains the same.



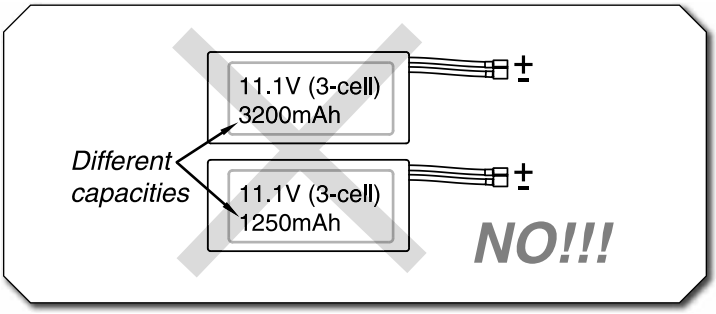
❑ 2. Connecting batteries in **"Parallel"** means to connect the +'s to the +'s and the -'s to the -'s. This combines the batteries' capacities, but the Voltage remains the same.



NEVER connect battery packs with different Voltages in **Parallel**–only combine in **Series**. Otherwise, the batteries will try to "equalize" with the larger one trying to "charge" the smaller one, thus causing heat and likely a fire.



Also **NEVER** connect battery packs with different capacities in Series or in Parallel.



LITHIUM BATTERY HANDLING & USAGE

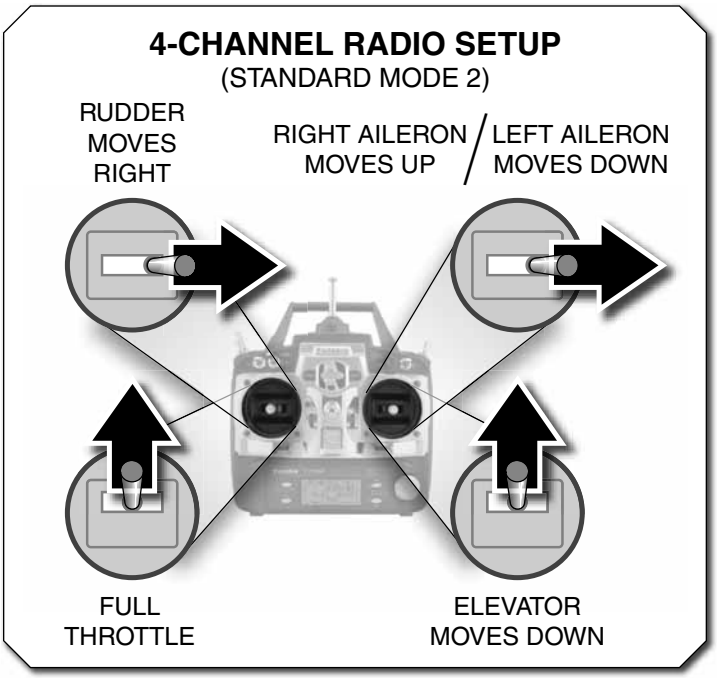
WARNING!! Read the entire instruction sheet included with the battery. Failure to follow all instructions could cause permanent damage to the battery and its surroundings, and cause bodily harm!

- ONLY use a LiPo approved charger.
- NEVER charge in excess of 4.20V per cell.
- ONLY charge through the "charge" lead. NEVER charge through the "discharge" lead.
- NEVER charge at currents greater than 1C.
- ALWAYS set charger's output volts to match battery volts.
- ALWAYS charge in a fireproof location.
- NEVER trickle charge.
- NEVER allow battery temperature to exceed 150° F (65° C).
- NEVER disassemble or modify pack wiring in any way or puncture cells.
- NEVER discharge below 3.0V per cell
- NEVER place on combustible materials or leave unattended during charge or discharge.
- ALWAYS KEEP OUT OF REACH OF CHILDREN.

CHECK THE CONTROL DIRECTIONS

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

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

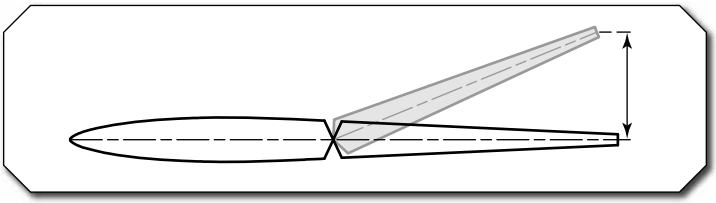


3. Make certain that the control surfaces and the throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use

the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

SET THE CONTROL THROWS

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



NOTE: The throws are measured at the **widest part** of the elevators, rudder and ailerons. If you are using a ruler to set your control surface throws, the deflection distance is measured as the height from the center trailing edge of the control surface when moved from the neutral position as shown in the sketch. Deflection in degrees is also provided for an alternative measuring method.

These are the recommended control surface throws:

	HIGH RATE		LOW RATE	
	Up	Down	Up	Down
ELEVATOR	5/16" [8mm] 11 deg	5/16" [8mm] 11 deg	3/16" [4.8mm] 7 deg	3/16" [4.8mm] 7 deg
	Right	Left	Right	Left
RUDDER	7/8" [22mm] 13 deg	7/8" [22mm] 13 deg	5/8" [16mm] 9 deg	5/8" [16mm] 9 deg
	Up	Down	Up	Down
AILERONS	7/16" [11mm] 14 deg	7/16" [11mm] 14 deg	5/16" [8mm] 10 deg	5/16" [8mm] 10 deg

IMPORTANT: The Tiger 2 ARF has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Tiger 2 flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

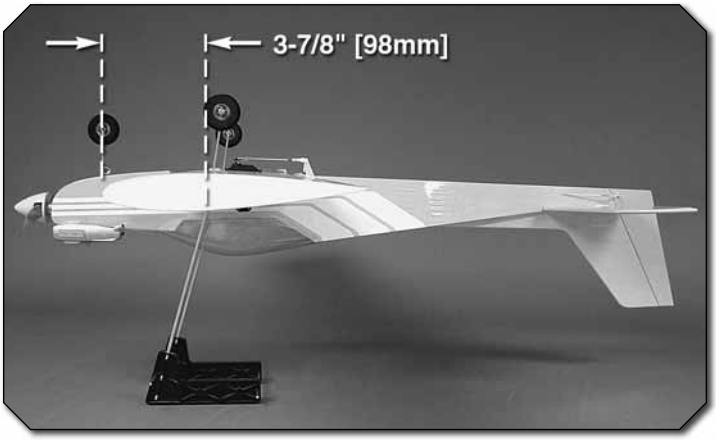
BALANCE THE MODEL (C.G.)

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

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

1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing on both sides of the fuselage. The C.G. is located 3-7/8" [98mm] back from the leading edge of the wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 3/8" [9.5mm] forward or 3/8" [9.5mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



2. With the wing attached to the fuselage, all parts of the model installed (ready to fly) and an empty fuel tank, 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" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using a "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, use Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is to the firewall (don't attach weight to the cowl—it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the bottom of the fuse over the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside.

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

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

BALANCE THE MODEL LATERALLY

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

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

FLYING

The Tiger 2 ARF is a great-flying model that flies smoothly and predictably. The Tiger 2 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.

TAKEOFF

If you have dual rates on your transmitter, set the switches to "high rate" for takeoff, especially when taking off in a crosswind. Although this model has good low-speed characteristics, you should always build up as much speed as your runway will permit before lifting off, as this will give you a safety margin in case of a "flame-out." When you first advance the throttle the plane will usually turn left slightly. Correct by applying sufficient right rudder to hold it straight down the runway. When the plane has sufficient flying speed, lift off by smoothly applying up elevator (don't pull it hard into a steep climb!), and climb out gradually.

FLIGHT

We recommend that you take it easy with your Tiger 2 ARF for the first several flights, gradually "getting acquainted" with this realistic model as your engine gets fully broken-in. Add and practice one maneuver at a time, learning how she behaves in each. For ultra-smooth flying and normal maneuvers, we recommend using the "low rate" settings as listed on page 22. Well before it's time to land, fly your Tiger 2 ARF to a safe altitude. Cut the throttle to an idle and check out the model's low-speed characteristics. Do this several times to become familiar with how the Tiger 2 ARF handles stalls. This also helps you learn what to expect when landing.

LANDING

When it's time to land, fly a normal landing pattern and approach. For your first landings, plan to approach slightly faster than stall speed and flare a few inches off the runway onto the main wheels.

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