Quik-V6

INSTRUCTION MANUAL

SPECIFICATIONS

Wingspan:	52 in [1320 mm]	**Weight:**	3.6 – 3.75 lbs [1630 – 1700 g]	**Radio:**	4 – Channel with V-Tail Mixing
Length:	40.5 in [1030 mm]	**Wing Loading:**	16.5 – 17.2 oz/ft^2 [50 – 52.5 g/dm^2]	**Engine:**	.40 – .55 cu in [6.5 – 9.0 cc] 2-stroke glow
Wing Area:	503 in^2 [32.4 dm^2]				

WARRANTY

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

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

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

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

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

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

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

GREAT PLANES® MODEL MANUFACTURING COMPANY

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

TABLE OF CONTENTS

INTRODUCTION

Congratulations and thank you for purchasing the Great Planes ***Quik-V6*** Quickie 500 pylon racer. If you're on a quest for speed the Quik-V6 is the answer, but the Quik-V6s primary objective is to be a competitive weapon in AMA 424 or 426 (Sport Quickie or Super Sport Quickie) pylon racing. If you spend any time reviewing race results on the internet or if you attend any of the major pylon races you'll know that **Jim Allen** is one of the premier pilots. Jim is the designer of the Quik-V6 (as well as the Great Planes *Proud Bird EF1* pylon racer). You can read all about Jim's interesting and insightful development history of the Quik-V6 (and the origin of the name) on the back cover. Also make it a point to read Jim's regimen on flight trimming for pylon racing on page 34.

For the latest technical updates or manual corrections to the Quik-V6 ARF visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the Quik-V6. 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.

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

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

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

SAFETY PRECAUTIONS

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

1. Your Quik-V6 should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Quik-V6, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
3. You must take time to **build straight**, **true and strong**.
4. You must use an R/C radio system that is in good condition, a correctly sized engine, and other components as specified in this instruction manual. All components must be correctly installed so that the model operates correctly on the ground and in the air. You must check the operation of the model and all components before **every** flight.
5. If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for

your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

6. While this ARF 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.

We, as the ARF manufacturer, provide you with a top quality, thoroughly tested ARF and instructions, but ultimately the quality and flyability of your finished model depends on how you assemble it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

REMEMBER: Take your time and follow the instructions to end up with a well-built model that is straight and true.

ADDITIONAL ITEMS REQUIRED

NOTE: Some of the items specified are in accordance with current AMA/NMPRA rules. If you plan on racing your Quik-V6, be certain to consult the rules for the ***latest*** specified equipment to make sure your plane is in compliance.

Most of the specialty pylon racing items for AMA 426 (Super Sport Quickie), including the ***Jett*** brand engine and muffler, Jett back plate engine mount, Jett remote universal needle valve, Tettra fuel tanks, Super Tanker fueler, etc., are available on the internet from **Jett Engineering Inc.** and/or **Darrol Cady Racing**.

Engine and Engine Accessories

For sport flying:

- ❍ O.S. 46AXII ABL w/Muffler (OSMG0548) **OR** O.S. .55AX ABL 2 w/muffler (OSMG0557)

For AMA 424 (Sport Quickie):

- ❍ ThunderTiger Pro .40 w/muffler
- ❍ APC 9 x 6 Sport propeller (APCQ9725)

For AMA 426 (Super Sport Quickie):

- ❍ Jett Engineering Inc. QJ-1 .40 engine and muffler
- ❍ Jett back plate mount
- ❍ Jett remote universal needle valve
- ❍ Darrol Cady or Sullivan thin-wall fuel tubing (SULQ1205)
- ❍ Spare glow plugs (Merlin 1125A Red most common)
- ❍ Jett *Super Tanker* syringe-type fueler
- ❍ Suitable propellers (APC 8.8 x 8.75 most popular – APCQ8975)
- ❍ Bubbless, bladder-type fuel tank (Tettra 6 oz. or Tettra 5.25 oz.)
- ❍ Pylon racing-type glow igniter system
- ❍ Silver solder (STAR2000)

Radio and Servos

	S.Bus	Non-S.Bus
TRANSMITTER	Futaba 4-channel on 2.4 GHz w/V-tail mixing	
RUDDERVATOR, AILERON SERVOS	(3) Futaba 9670SV (FUTM0725)	(3) Futaba 9650 (FUTM0260)
THROTTLE/ FUEL-CUT SERVO	(1) Futaba 3172SV (FUTM0125)	(1) Futaba 3102 (FUTM0034)
RECEIVER	R6303SB Micro 3-18ch (FUTL7661)	Futaba R617FS *FASST* (FUTL7627)
SERVO EXTENSIONS	(1) 6" dual servo extension (FUTM4135)	(3) 6" (TACM2090)
RECEIVER BATTERY	2S 1300mAh LiFe receiver battery (HCAM6411)	
ON-OFF SWITCH	FUTM4350	
SBC-1 CHANNEL SETTING TOOL*	FUTM4190	

Not required if using a Futaba transmitter with *Serial Interface

Adhesives, Hardware & Accessories

Other than **common hobby tools** here is a list of the rest of the items required:

- ❍ Z-bend pliers (HCAR2000)
- ❍ 30-minute epoxy (GPMR6043)
- ❍ Dave Brown carbon fiber tape (DAVR2000)
- ❍ Thin CA (GPMR6001)
- ❍ Medium CA (GPMR6007)
- ❍ CA applicator tips (HCAR3780)
- ❍ CA activator (GPMR6035)
- ❍ Threadlocker (GPMR6060)
- ❍ 1/4" RC foam rubber (HCAQ1000)
- ❍ 10-24 drill and tap set (or #25 or 5/32" drill and 10-24 tap)
- ❍ Spare 10-24 x 1/2" nylon flat-head screws (for main landing gear)
- ❍ Covering iron (COVR2700)
- ❍ Cover Sock (COVR2702)
- ❍ Trim Sealing Iron (COVR2750)
- ❍ After-run engine oil (GPMP3001)

For optional carbon fiber ruddervator pushrods:

- ❍ (2) 4mm [5/32"] Midwest carbon fiber pushrod tubes (MIDR5721)
- ❍ (1) K&S 3/16" aluminum tube (K+SR8104)

On page 7 you'll see the common practice of reinforcing all the critical, high-stress joints with fillets made from 30-minute epoxy and chopped carbon fiber or fiberglass. Dave Brown carbon fiber tape is recommended for this (DAVR2000).

A covering iron is also required for applying the included MonoKote covering over the wood tail covers after they have been glued into place, as well as tightening the covering over the entire model in general. The 21st Century Sealing Iron (COVR2700) and Cover Sock (COVR2702) are recommended. A Trim Sealing Iron is also helpful (COVR2750).

Glow Plug Igniter

If you're a little serious about racing, a racing-type glow plug igniter system is preferred over the one-piece, integrated glow-driver/battery unit commonly used for sport flying. Racing-type glow igniters developed for the flight line feature a high-capacity battery and a lighted display that can alert you of the condition of your glow plug and automatically discontinue power after a prescribed time. For security and safety, and to relieve stress from the glow plug, the lightweight clip is connected to the battery/controller unit via an electrical cord. Pylon racing glow igniter systems are available from the aforementioned pylon racing specialty sources.

NOTE: The stabilizer and wing incidences and engine thrust angles have been factory-built into this model. However, some technically-minded modelers may wish to check these measurements anyway. To view this information visit the web site at www.greatplanes.com and click on "Technical Data." Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

KIT INSPECTION

Before starting to build, inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support.** When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list.

Great Planes Product Support
3002 N Apollo Drive, Suite 1
Champaign, IL 61822

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

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

ORDERING REPLACEMENT PARTS

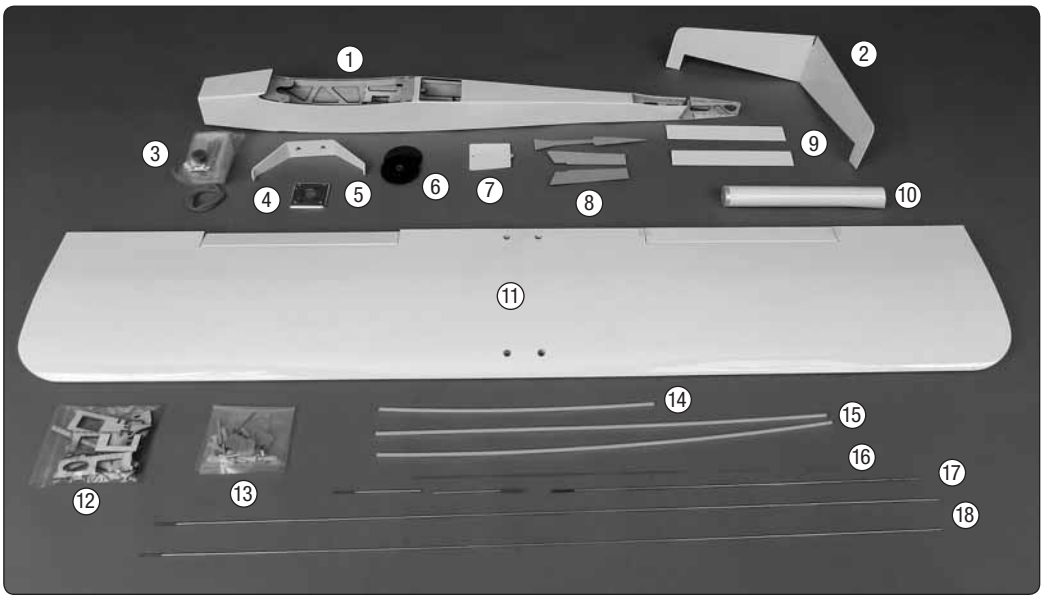
Replacement parts for the Great Planes Quik-V6 ARF are available using the order numbers in the **Replacement Parts List** that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company.

To locate a hobby dealer, visit the Great Planes web site at **www.greatplanes.com**. Choose "Where to Buy". Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

GPMA2550.....Backplate Engine Mount
GPMA2552.....Fuel Tank
GPMA4575.....Fuselage Set
GPMA4576.....Wing
GPMA4577.....Tail Surface Set
GPMA4578.....Landing Gear
GPMA4579.....Servo Hatch
GPMA4580.....Wheel Set

KIT CONTENTS

1. Fuselage
2. V-Tail
3. Fuel Tank & Hardware
4. Engine Mount
5. Main Landing Gear
6. Main Wheels
7. Hatch Cover
8. Tail Covers
9. Ruddervators
10. MonoKote
11. Wing/Ailerons
12. Wood Parts
13. Hardware
14. Throttle Guide Tube
15. Ruddervator Guide Tubes
16. Fuel Cut Wire
17. Aileron/Throttle Pushrods
18. Ruddervator Pushrods

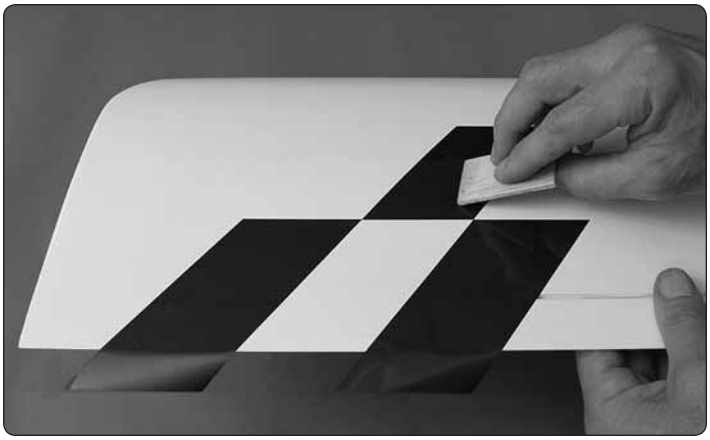


ASSEMBLE THE MODEL

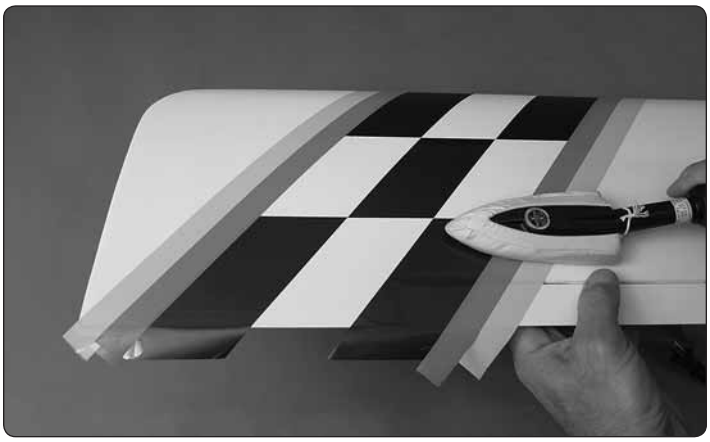
Preparation

❏ 1. Examine the covering over all the parts of the model to find wrinkles or areas that are not bonded to the wood underneath. Where necessary, use a covering iron with a cover sock to tighten the covering, pushing down on the iron to bond the covering to the wood. Be thorough—this procedure can take anywhere from a few minutes to an hour or so. The optimum temperature for shrinking/bonding MonoKote is around 320°F – 360°F (which requires a dial setting of about 350°F – 375°F on the 21st Century Sealing Iron with a Cover Sock). If the covering bubbles or blisters, this may indicate too much heat. Allow the area to cool and don't hold the iron in one spot for too long. Press down harder and/or use less heat. A sharp hobby blade may be used to puncture the bubble in a few areas, but be careful; if using solution to apply vinyl graphics or trim cut from MonoKote later, it will wick through the perforations and cause the wood to swell, causing a minor blemish in that area. You could always puncture these trouble spots later after you have applied your graphics.

❏ 2. When ready to apply graphics, trim colors may be cut from MonoKote. Applying MonoKote over MonoKote is best done by spraying the back of the trim piece with window cleaner. **NOTE:** If any of your trim graphics cross the aileron hinge gaps it may be better to apply the graphics after the hinges have been joined and the hinge gaps have been sealed as illustrated on page 25.

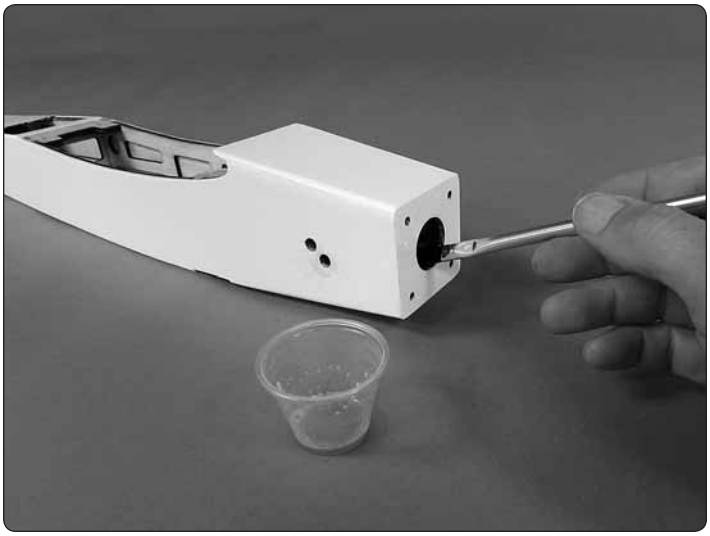


❏ 3. Then, laying the piece into position, gently *squeegee* out the solution with a piece of soft balsa. This procedure removes air bubbles that would otherwise form between the layers.

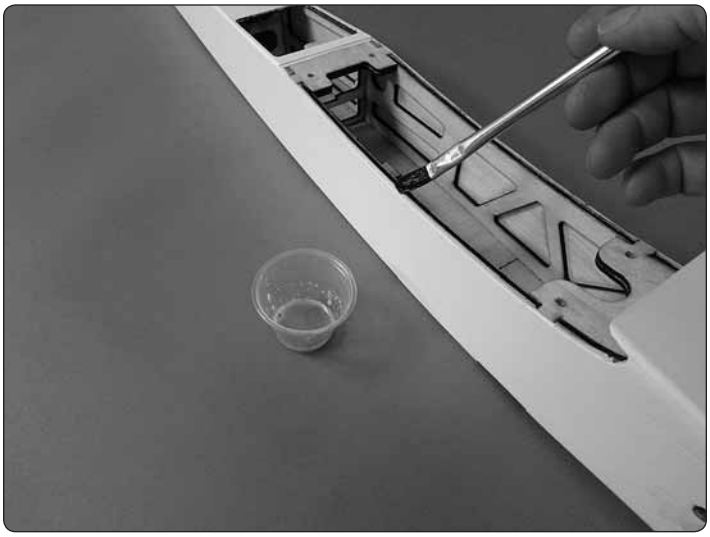


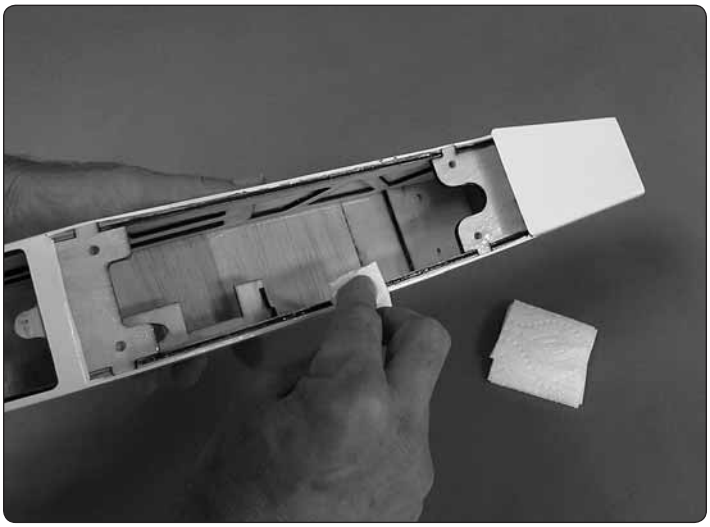
❏ 4. Allow to dry **at least** over night before permanently ironing the trim down—the longer you wait before ironing the better.

❏ 5. There are several instances during assembly where epoxy cleanup with denatured alcohol will be necessary. To conserve whole paper towels and to make cleanup easier, stack a few paper towels on top of each other and cut them into small squares as shown. This may seem ridiculous now, but you'll thank us later and continue to keep a supply of paper towel squares on your workbench from now on!

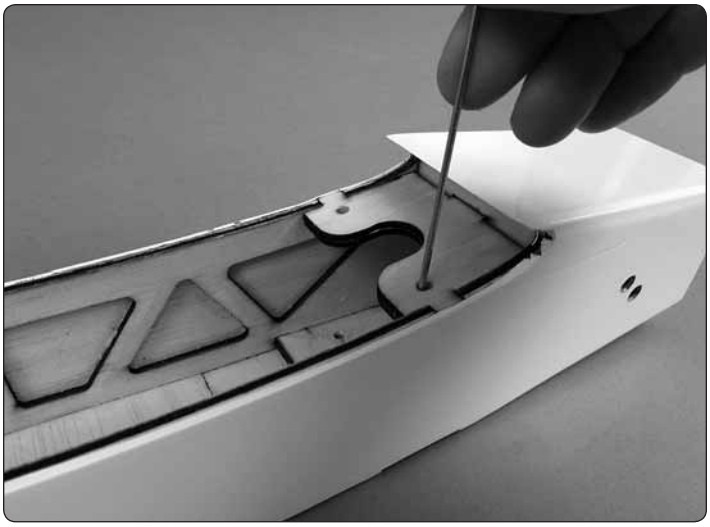


❏ 6. Use 30-minute epoxy to fuelproof areas that may be exposed to exhaust, fuel or cleaning solution (see next page).

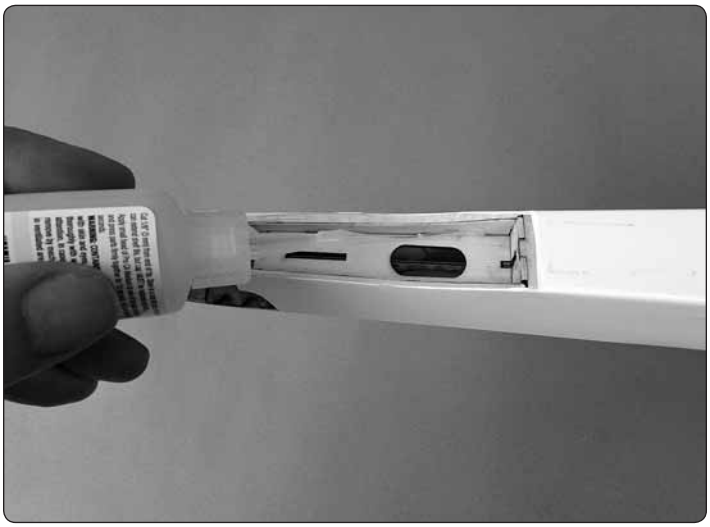




❏ 7. Don't forget to coat the outside of the landing gear plate on the bottom of the fuselage. Apply liberally, allow to soak in, and then remove excess epoxy before it hardens.

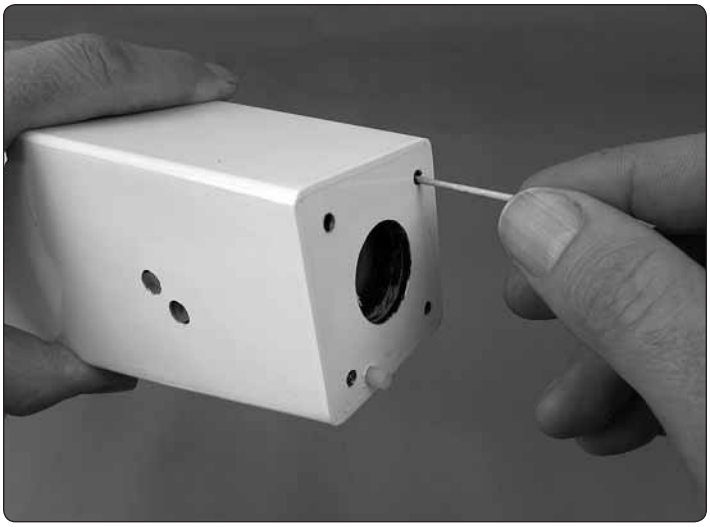


❏ 8. Also lightly coat the holes in the wing bolt plates and the holes in the landing gear plate with 30-minute epoxy. Allow to fully harden before re cutting the holes with a 10-24 tap later.

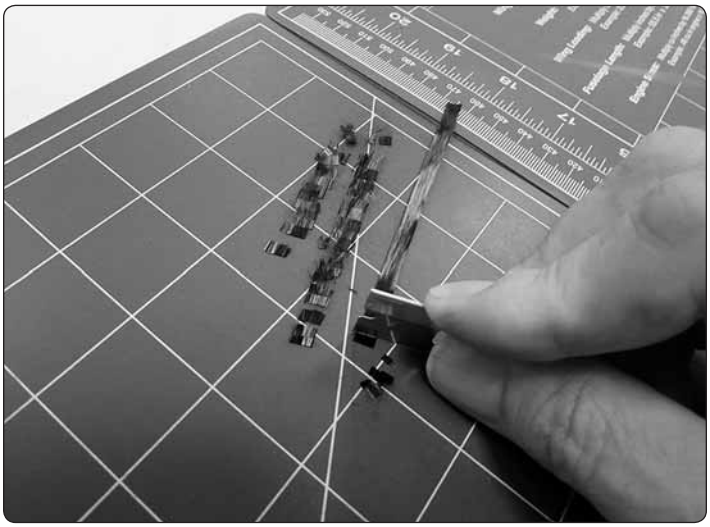


❏ 9. Inspect all visible glue joints looking for areas in the cabin or tail that could use reinforcement. Where necessary, use a CA applicator to apply thin or medium CA to any glue joints that don't look strong.

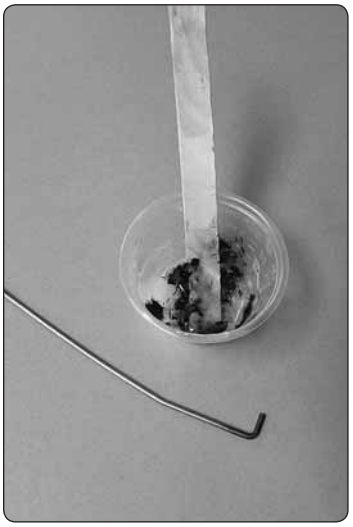
Next, epoxy/carbon fiber epoxy fillets will be added to key structural areas in the fuselage. First, we'll mix up a batch and apply to the landing gear plate and wing bolt plates. Then, we'll repeat the process for the firewall with a new batch of resin. Separating the job into two procedures insures plenty of working time before the epoxy begins to harden.



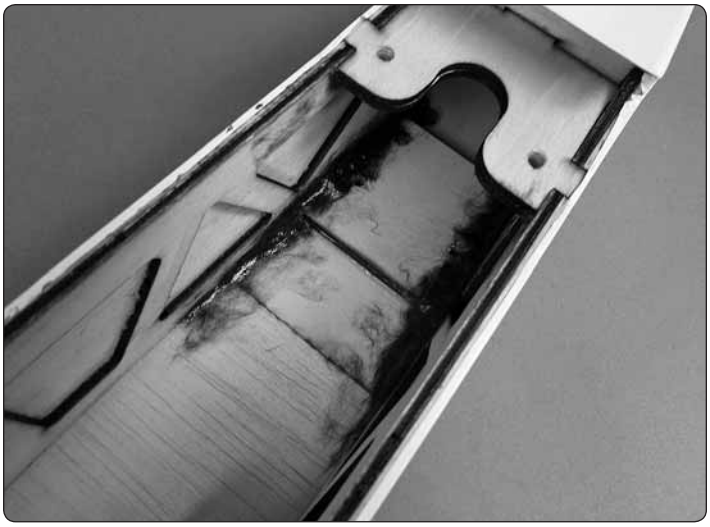
❏ 10. Use a toothpick to apply a little petroleum jelly to the threads in the blind nuts inside the firewall to prevent excess epoxy from clogging up the threads. (Any material that remains can also be removed with a 6-32 tap later.)



❏ 11. Chop 3" – 4" [80 – 100mm] of Dave Brown carbon fiber tape into 1/8" [3mm] segments.

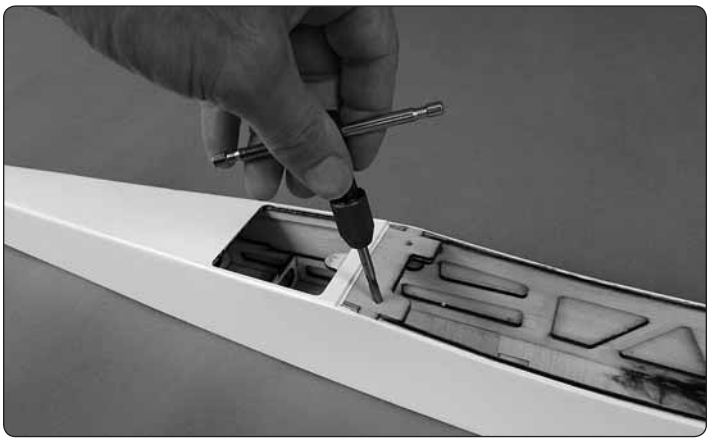


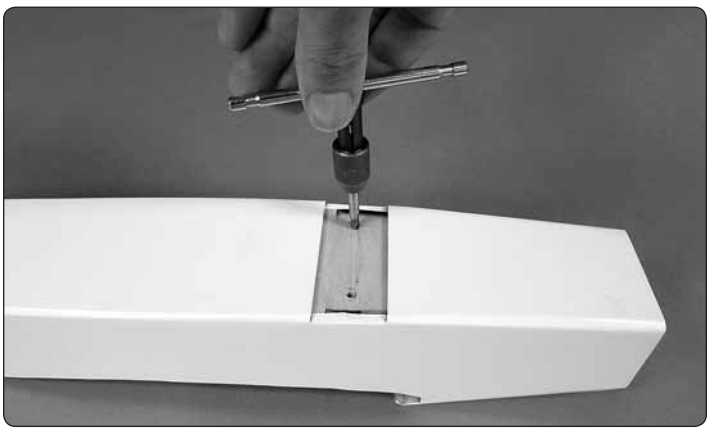
❏ 12. Mix approximately 1 oz. [30cc] of 30-minute epoxy, then mix in the chopped carbon fiber.



❏ 13. Apply the epoxy/carbon fiber fillets to the joints between the fuselage sides and the bottom of the wing bolt plates and to the landing gear area as shown. You can dip your finger in denatured alcohol to smooth and form the fillets as you go.

❏ 14. Mix up another batch of epoxy/carbon fiber. Using the hole in the firewall for access, apply fillets all the way around the joint of the back of the firewall and the fuselage sides and top and bottom—don't worry too much about getting excess epoxy into the blind nuts in the back of the firewall—if necessary, a drill and 6-32 tap can be run through the blind nuts to clean them out later.



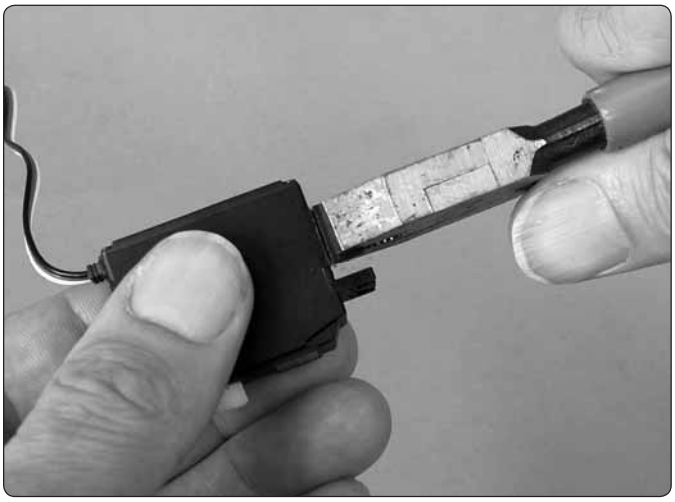


❏ 15. After all the epoxy has hardened, clean out the wing bolt holes and the landing gear bolt holes with 10-24 tap.

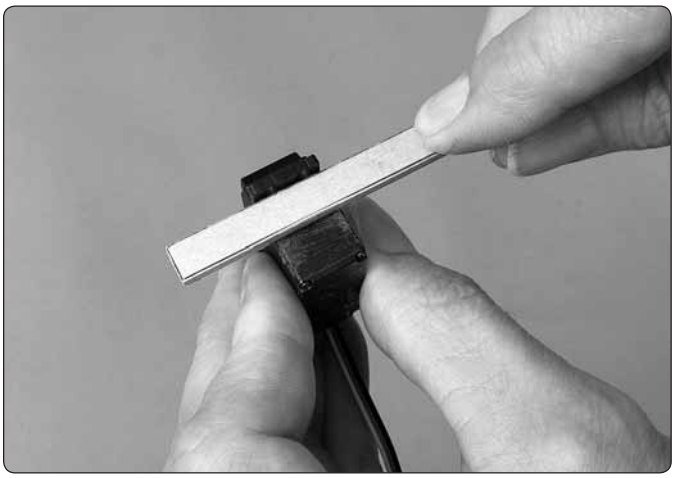
Install the Ruddervator Servos

❑ 1. If using the recommended servos that come with side tabs, carefully remove the tabs as follows:

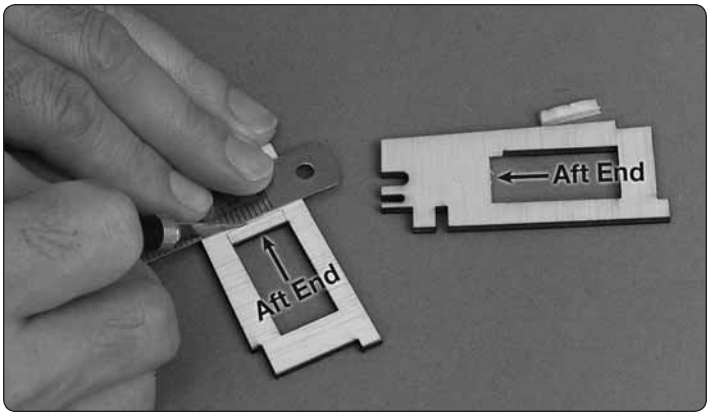
❑ A. First, use a razor saw to score or cut most of the way through the tabs—of course, use extreme care not to cut into the servo wires where they exit the case!



❑ B. Then, break off the tabs with pliers.

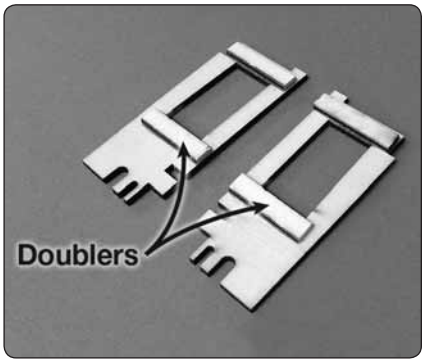


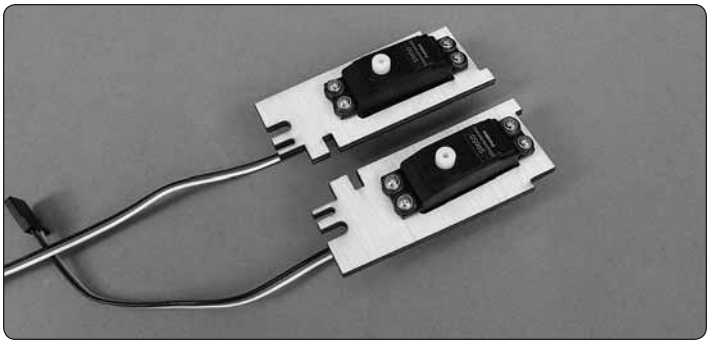
❑ C. Use a stick with sandpaper to remove any remaining tab material and smooth the edges.



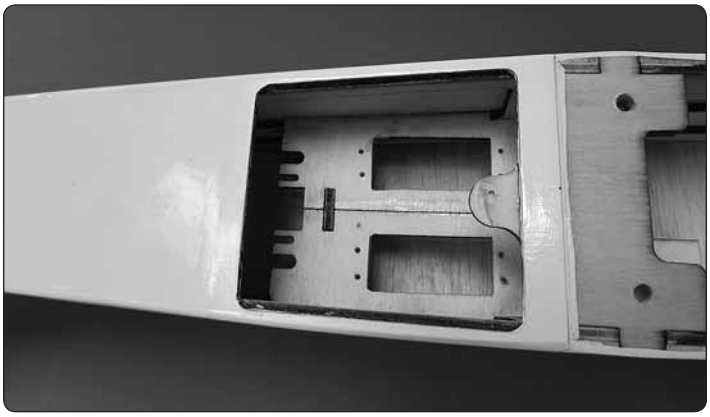
❑ 2. If necessary, enlarge the openings in the servo trays to fit your servos, then test-fit the servos—if the cutouts do require cutting, remove material from the ***aft*** end of the openings.

❑ 3. Cut the included 3mm lite-ply strip into segments and glue them to the bottom of the servo trays for screw doublers.

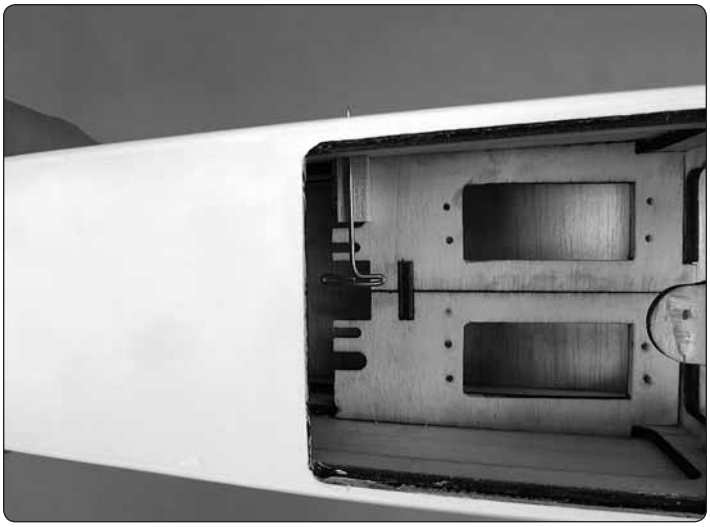


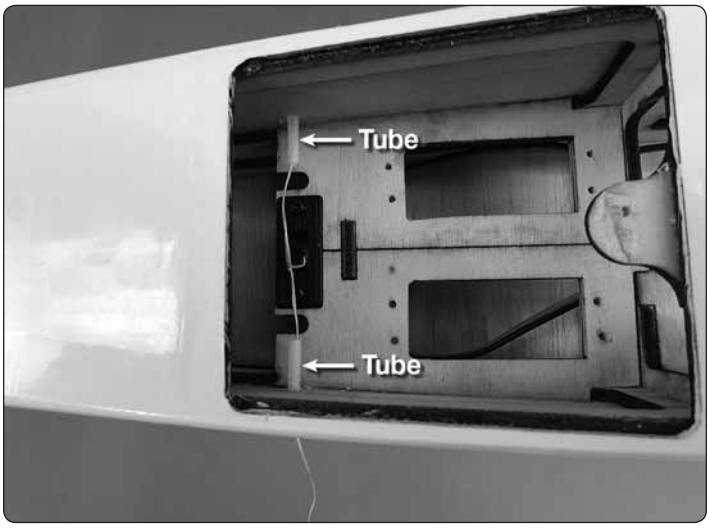


❑ 4. Drill 1/16" [1.6mm] holes for the servo mounting screws, temporarily mount the servos, remove the screws, and add a few drops of thin CA to the screw holes. We'll remount the servos into the tray later.

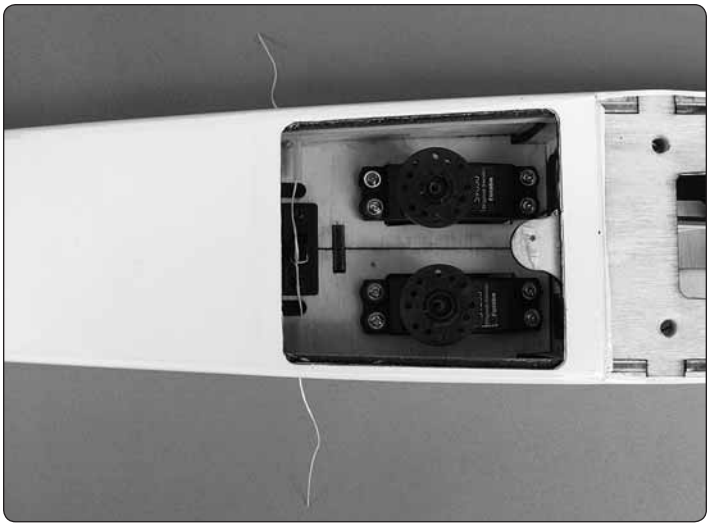


❑ 5. Test-fit, then securely glue the servo trays into the fuselage.

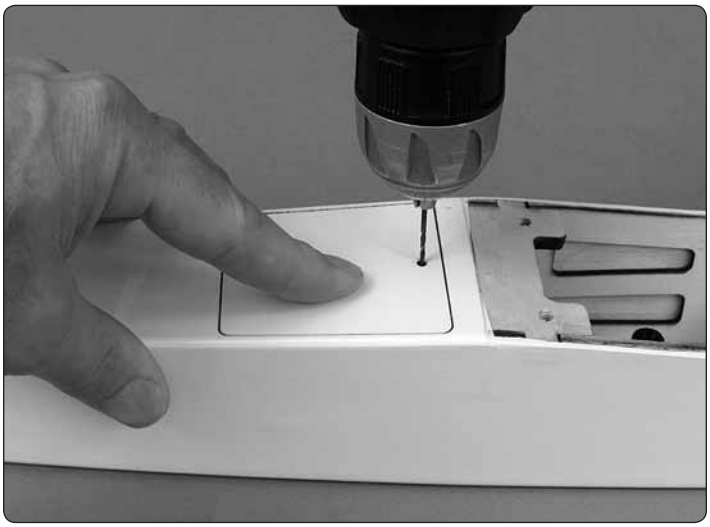




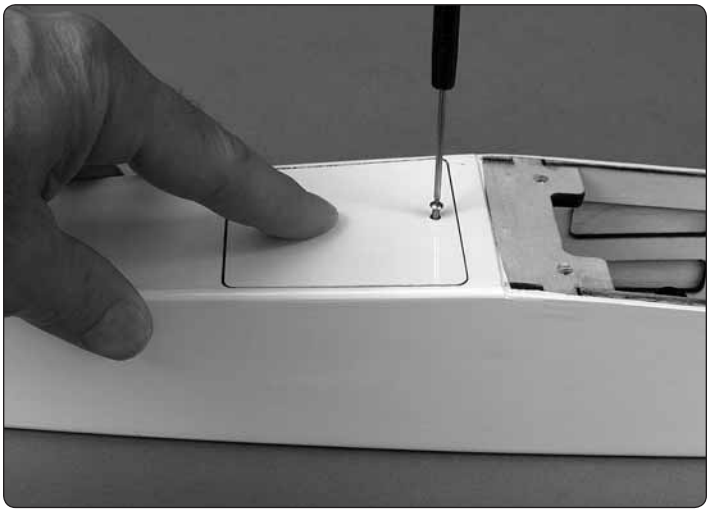
❏ 6. Determine how you are going to actuate the switch from outside the fuselage. One popular way is the "string technique" to pull the switch ***on*** from one side and ***off*** from the other. Test-fit the switch and use a pin to locate the holes for the string. Use a sharpened brass tube or a drill to make holes in the fuselage for small plastic tubes (cut from any kind of spray applicator) glued into position as a bearing for the holes. Drill a hole in the switch for the string, then mount the switch with threadlocker on the threads and connect the string.



❏ 7. Mount the servos. If using the included pushrod wires (whether as supplied, or with the carbon fiber pushrod tube option), enlarge the holes in the servo wheels with a .074" drill.



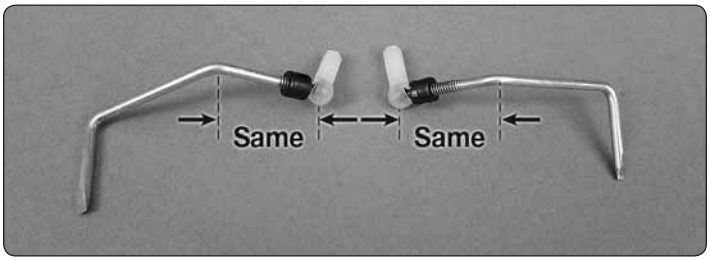
❏ 8. Drill the hole for the servo hatch cover screw with a 1/16" [1.6mm] drill.



❏ 9. Fit the hatch cover with a #2 x 3/8" button-head screw. Remove the screw and hatch, add a few drops of thin CA to harden the hole and allow to harden.

Test Fit the V-Tail

Do not use any glue until instructed to do so—we're going to go as far as possible fitting up the V-tail and hooking up the pushrods before permanently gluing anything in.



❑ 1. **Temporarily** thread the ball link balls onto the ruddervator torque rods. Examine the ball link balls to make sure there is no burr or a sharp point on the tip. If necessary, use a metal file to grind off the protrusion, then snap the ball links onto the balls. Also make sure the ball link balls are the same length. If necessary, shorten the longer torque rod to match the short one.

❑ 2. Make sure the ball links can move freely and are not too tight. If they are too tight, chuck the base of the ball in a hand drill (or, try another ball link if you have a supply of your own). Polish the ball with metal polish and a cloth or other mildly abrasive product until the ball links swivel on the balls smoothly. Temporarily reassemble and set aside.

❑ 3. Temporarily fit the V-tail to the fuselage (being certain to key the tab at the front of the V-tail center rib into the notch in the former and the tab on the bottom into the slot in the base). Without glue, test-fit the ruddervators with the hinges, torque rods and ball links. Make sure the ruddervators move smoothly and the ball links don't interfere with anything. Make any adjustments necessary.

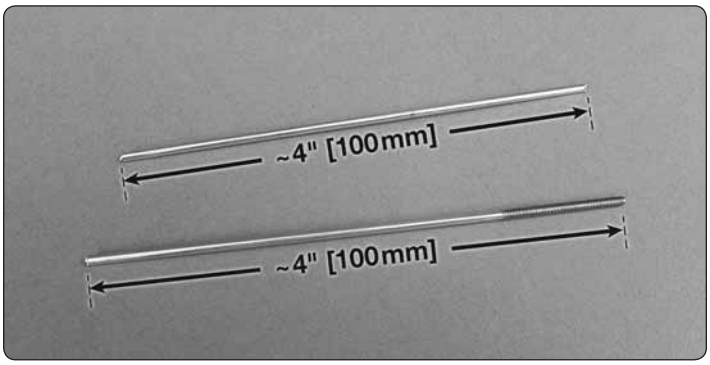
❑ 4. If you haven't yet done so, program your radio for **V-tail** mixing.

Now it's time to decide what kind of pushrods you are going to use—either the included rod-and-tube setup, or an optional 5/32" [4mm] carbon fiber pushrods (not included). Most pilots use the standard wire pushrods, but some pylon racers prefer carbon fiber pushrods for ultimate precision.

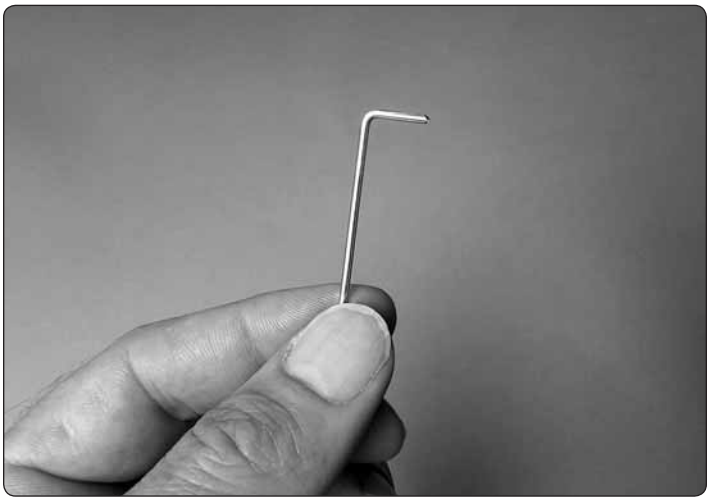
If using the pushrods included, skip to **Make the Wire Pushrods** on page 13. If using carbon fiber pushrods, follow these instructions, or use your preferred method to make the pushrods:

Make the Carbon Fiber Pushrods

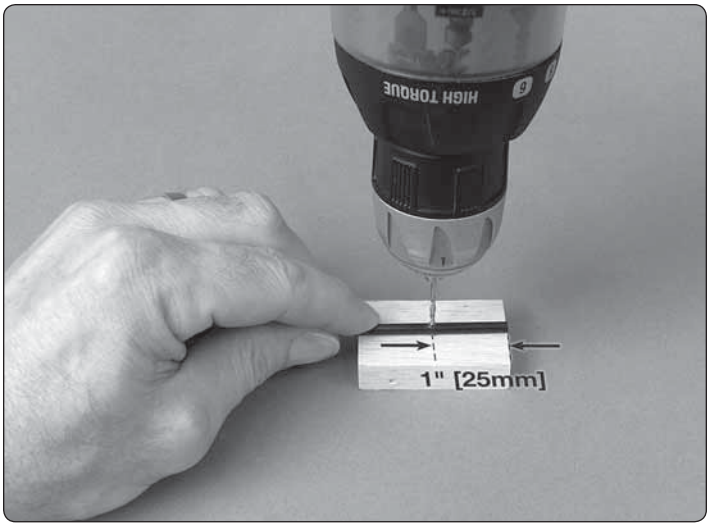
The instructions illustrate making one pushrod at a time, but you could make them simultaneously.



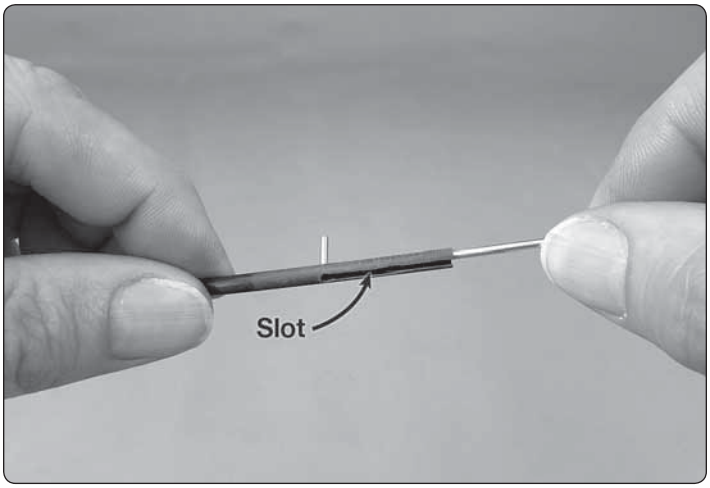
❑ 1. Cut two, approximately 4" [100mm] segments from the threaded end of one of the long pushrod wires so you have a threaded piece and a non-threaded piece. Clean the wires with denatured alcohol, then roughen with medium-grit sandpaper so glue will adhere.



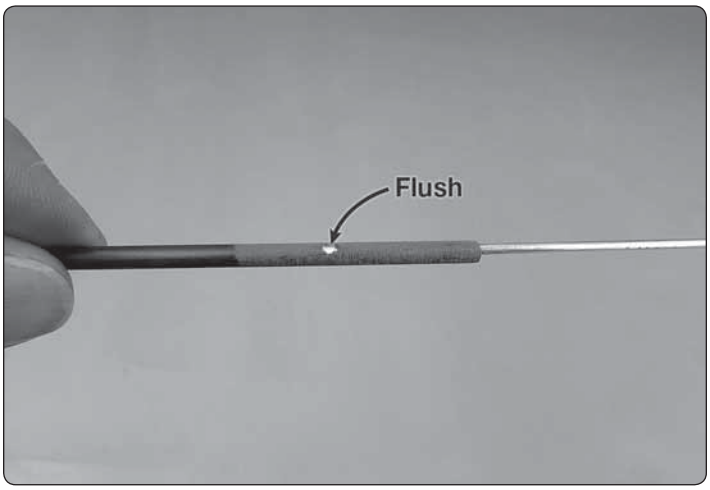
❑ 2. Make a 90° "L-bend" as **sharp** as you can on one of the non-threaded wires.



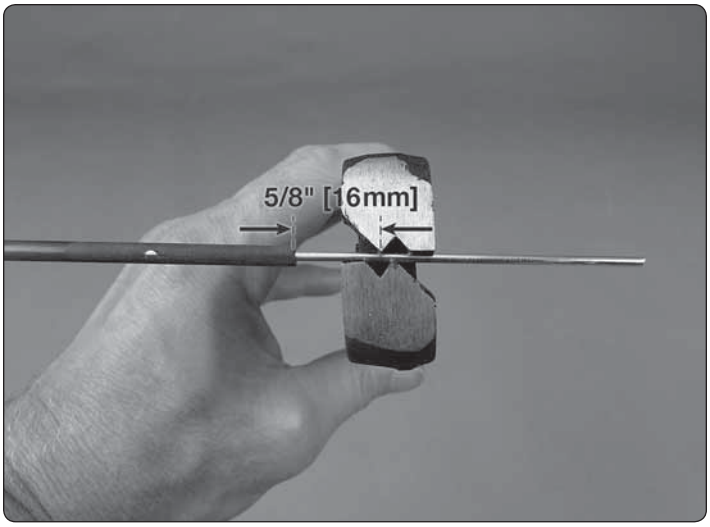
❏ 3. Drill a .074" or 5/64" [2.0mm] hole all the way through a 5/32" [4mm] carbon fiber pushrod tube 1" [25mm] from the end.

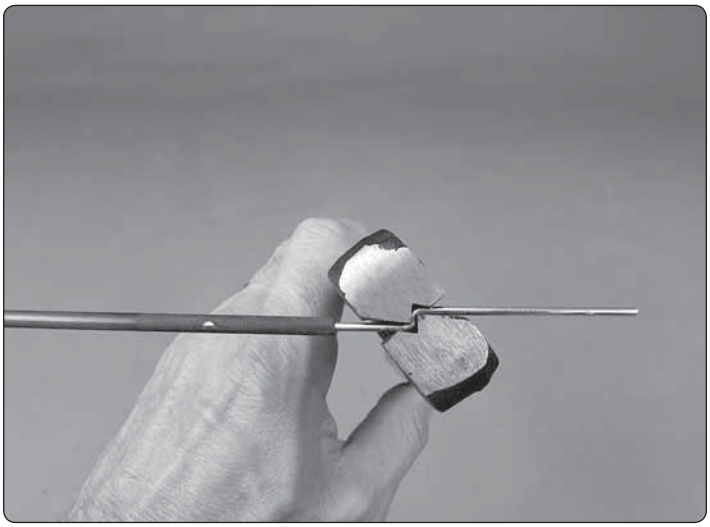


❏ 4. Wearing respiratory and eye protection, use a razor saw or a reinforced cutoff wheel to cut a slot from one of the holes up to the end of the tube, then install the pushrod wire.

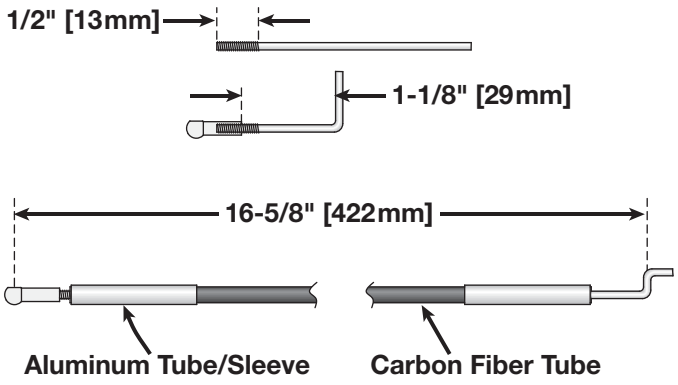


❏ 5. Tack-glue the pushrod into place with a few drops of thin CA. Cut the "L" of the pushrod even with the tube, then use a file to make the wire completely flush with the tube so an aluminum sleeve can be fit over the assembly later.

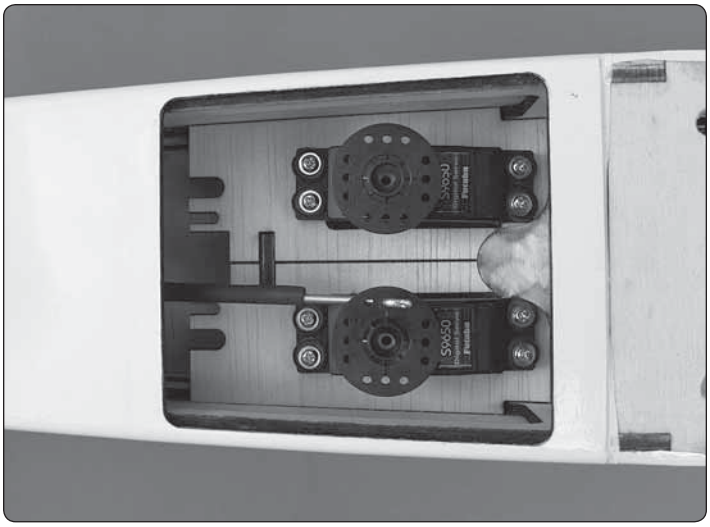




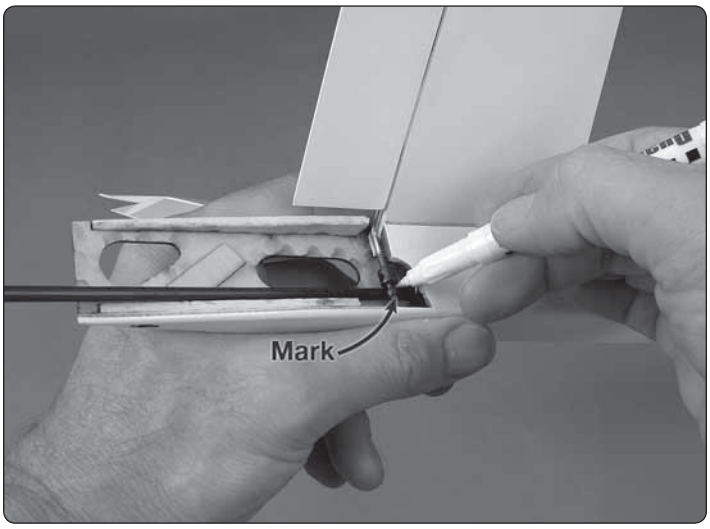
❏ 6. Make a Z-bend in the wire 5/8" [16mm] from the end of the tube. Cut the excess wire off the end of the Z-bend and use a file or a reinforced cutoff wheel to deburr the end of the wire.



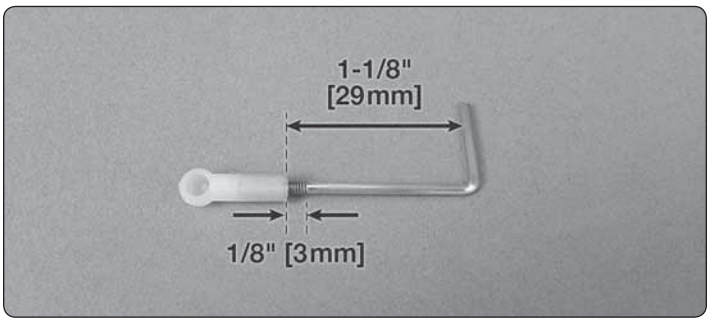
❏ 7. If installing the Futaba servos recommended, you can skip steps 8 through 12 and simply finish making the pushrod to the dimensions shown above. If using other servos, it would be better to custom-fit the pushrods in case the output shaft of your servos is different requiring different pushrod lengths.



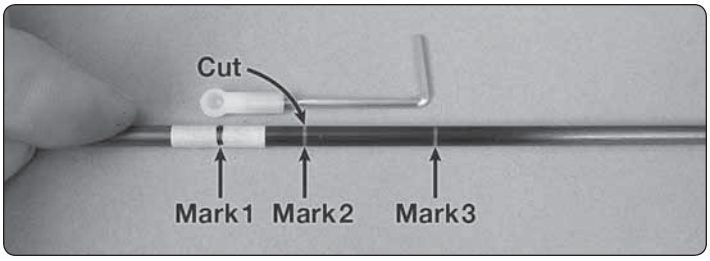
❑ 8. Guide the pushrod up through the back of the fuselage and temporarily connect it to the servo.



❑ 9. With the V-tail and torque rods temporarily held in place and the ruddervator and elevator servo wheel **centered**, mark the pushrod tube at the ball. This is where the socket on the ball link must end up after the back of the pushrod is done. Remove the pushrod.



❑ 10. Cut the threaded end of the 4" [100mm] pushrod wire so approximately 1/2" [13mm] of thread remains. Thread a ball link most of the way onto the threads so approximately 1/8" [3mm] of the thread is exposed, but the ball link could be threaded on an additional 1/8" [3mm] as well—this will leave room for adjustment later. Bend an "L" bend in the wire 1-1/2" [29mm] from the ball link and cut off the excess wire.

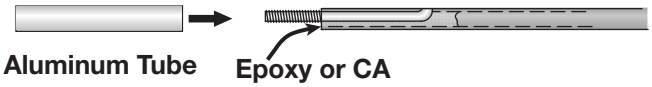


❑ 11. Lay the pushrod wire alongside the pushrod tube with the socket in the ball link aligned with the mark you made on the pushrod. (The pushrod was wrapped with masking tape for clarity in the photo.) Mark the pushrod 1/8" [3mm] from the ball link and a third mark 1" [25mm] from the second.

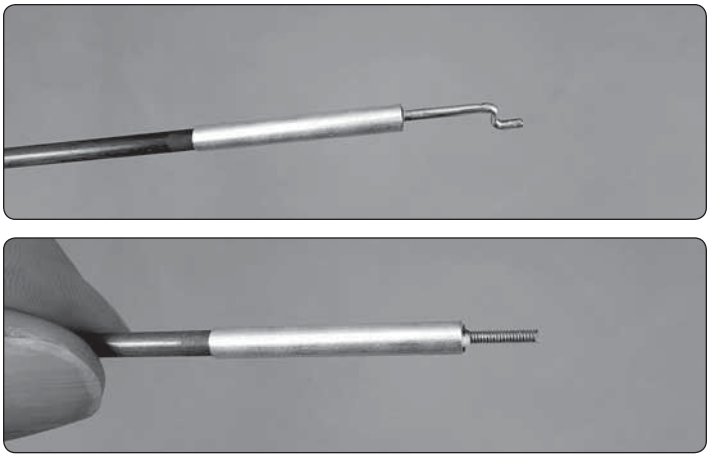
❑ 12. Cut the pushrod at the second mark made in the previous step. Then, drill the holes through the pushrod at the second mark. Cut another slot same as was done on the front of the pushrod.

❑ 13. Unthread the ball link from the pushrod wire and use thin CA to tack-glue the pushrod into the tube and trim the excess wire so it is flush with the outside of the tube.

❑ 14. Cut two 1-1/2" [40mm] pieces from a 3/16" K&S aluminum tube. Clean the inside of the tubes with a small paper towel square and denatured alcohol.



❑ 15. Thoroughly pack the slots in both ends of the pushrods with 30-minute epoxy mixed with microballoons or milled glass fiber and coat the ends of the pushrod tubes.

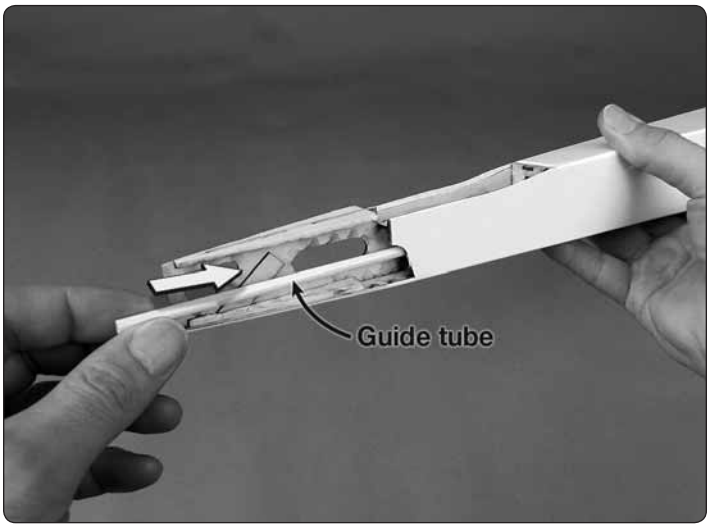


❑ 16. Apply epoxy inside the aluminum tubes, then slip the tubes over the ends of the pushrods (the aluminum tube that goes over the pushrod with the Z-bend will have to go on from the other end because it won't fit over the

Z-bend). Be certain to remove any epoxy from the threads on the pushrod wire. Allow the epoxy to harden.

❏ 17. If you haven't yet done so, make and test-fit the other pushrod the same way. After the epoxy has hardened, thread the ball links onto the threaded end of the pushrods. Set the pushrods aside until it's time to hinge the ruddervators. Skip to "Attach the V-tail" on page 14.

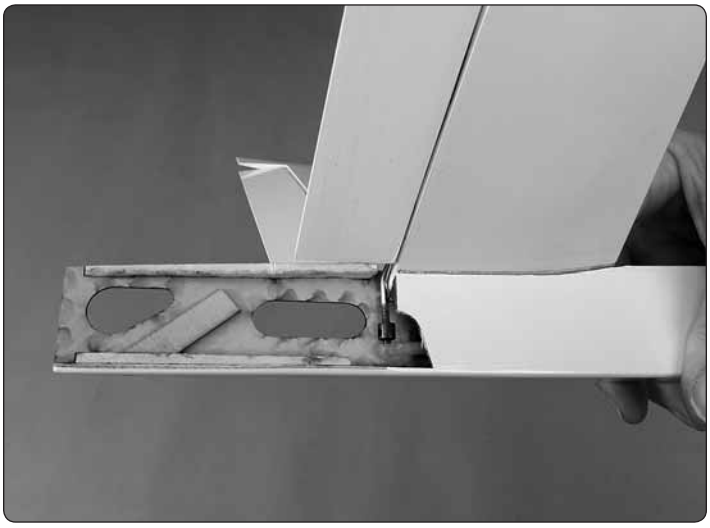
Make the Wire Pushrods



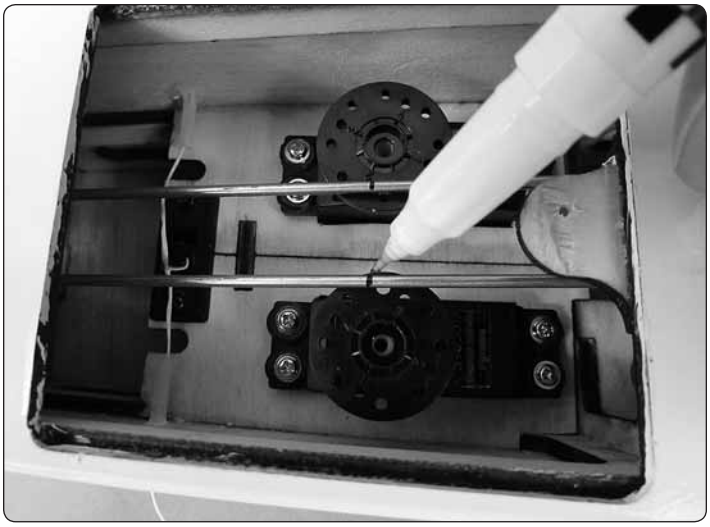
❏ 1. Cut the included pushrod guide tubes to a length of 14-1/2" [370mm] and the included pushrod wires to a length of 17-1/2" [445mm]. Use medium-grit sandpaper to roughen the outside of the guide tubes so glue will adhere, then install the tubes up through the formers in the fuselage.

❏ 2. Thread a ball link ball about 3/8" [10mm] onto each of the pushrod wires.

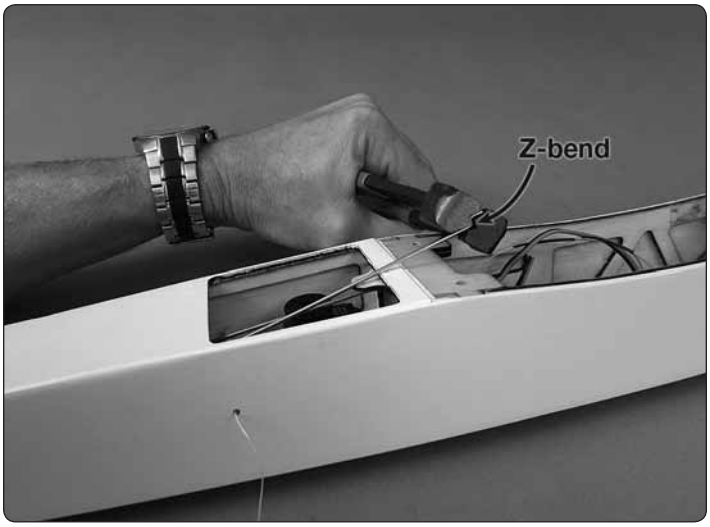
❏ 3. Thoroughly clean the pushrod wires with a paper towel square and denatured alcohol. Lightly coat the wires with any light oil.



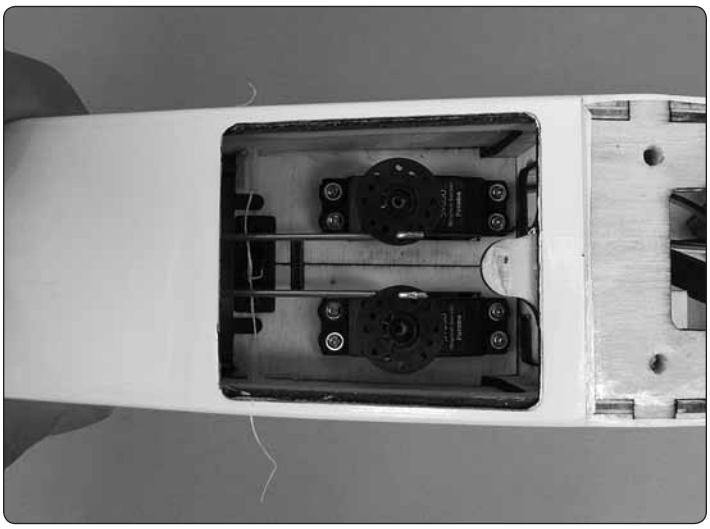
❏ 4. Install the pushrods up through the guide tubes. Place the V-tail with the torque rods and ball link balls into position and snap the ball links onto the balls.



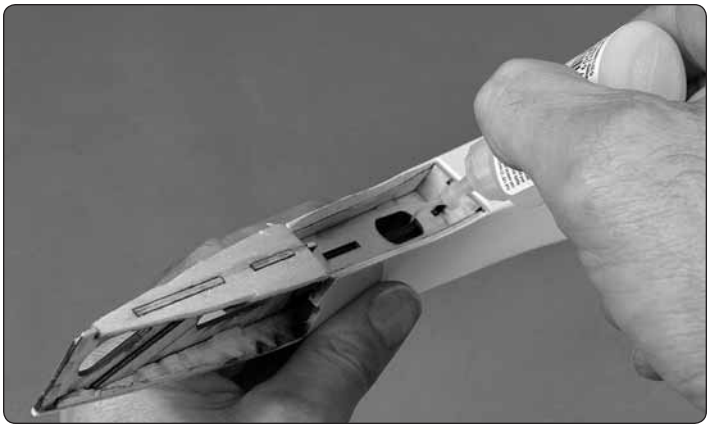
❏ 5. With the V-tail held in position and the ruddervators and servo wheels **centered**, mark the pushrods where they cross the holes in the servo wheels.



❏ 6. Disconnect the ball links from the metal balls. Cut the pushrods 5/16" [8mm] past the marks, chamfer ends of the wires to remove any burrs, and then make a Z-bend in each pushrod wire at the marks.



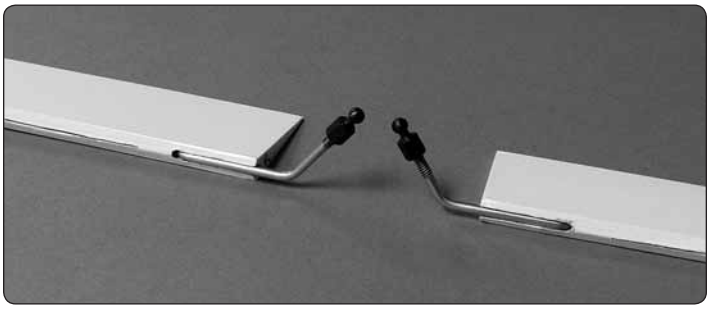
❏ 7. Connect the pushrods to the servos.



❑ 8. Glue the guide tubes into the two formers in the fuselage with medium CA and a CA applicator tip.

Attach the V-Tail

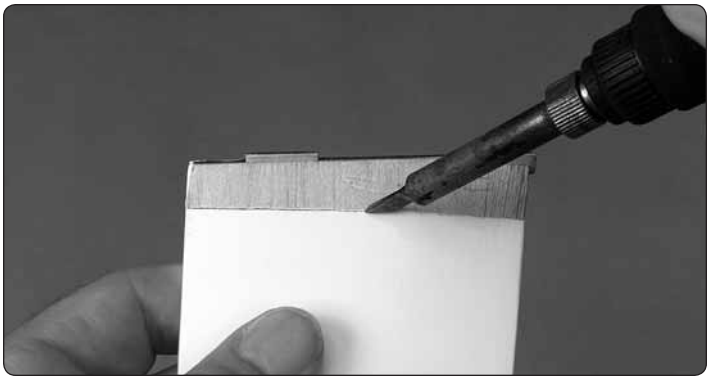
❑ 1. If you haven't yet done so, **permanently** attach the thread-on ball link balls to the ruddervator torque rods with threadlocker, epoxy, JB Weld or even silver solder if you prefer.



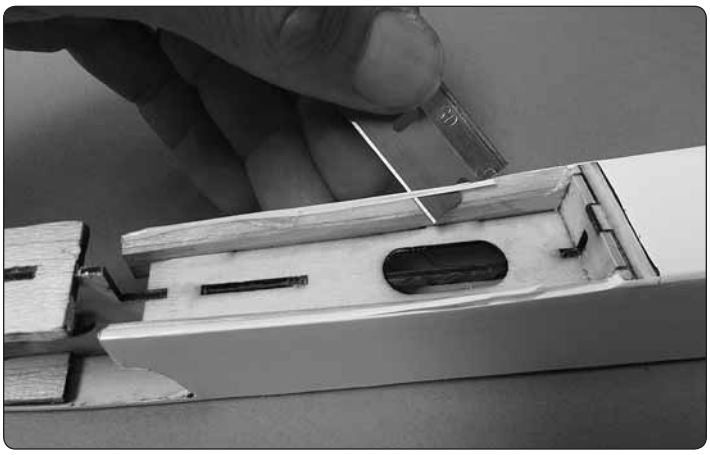
❑ 2. Use medium-grit sandpaper to roughen the *torque arm* portion of the torque rods that go into the ruddervators so glue will adhere.

❑ 3. Securely glue the torque rods into the ruddervators with 30-minute epoxy. Set aside and allow the epoxy to harden.

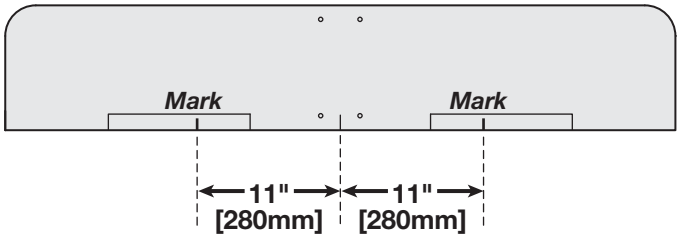
❑ 4. Hold the V-tail into position on the fuselage and view the joint from the bottom. Make sure the covering has been trimmed so there will be a full, wood-to-wood glue joint between the bottom of the V-tail and the fuselage. If necessary, use a fine-point felt-tip pen to mark where the fuselage sides meet the bottom of the V-tail halves.

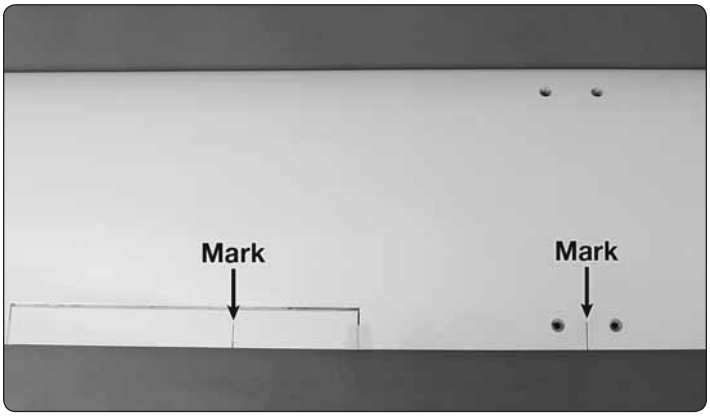


❑ 5. If any covering does require trimming, use the tip of a soldering iron set to about 400°F to melt through the covering where necessary.

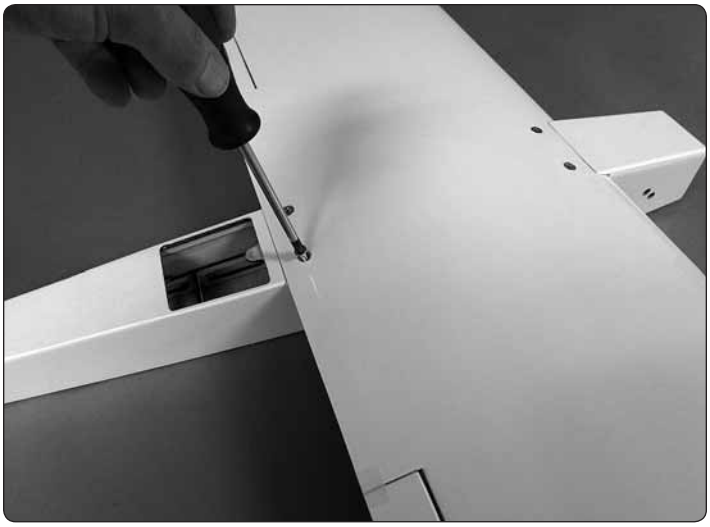


❑ 6. Also trim off any MonoKote that may have been wrapped around the stab saddle.



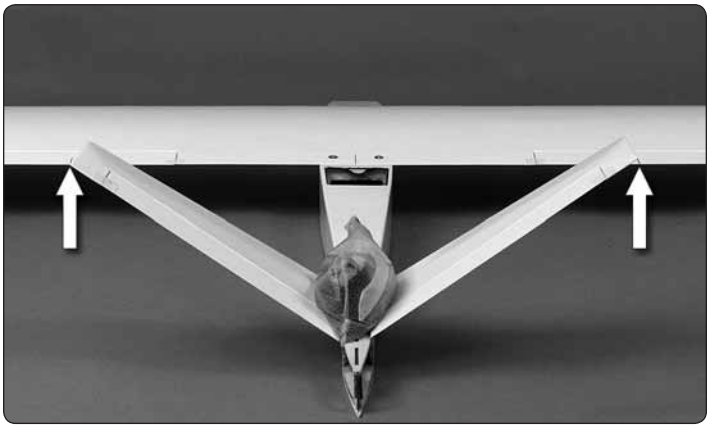


❑ 7. Without using any glue, fit the ailerons to the wing with the hinges and tape the ailerons to the wing so they will be centered. Use a fine-point felt-tip pen to mark centerline of wing between aft wing bolts. Also mark lines on each aileron 11" [280mm] out from centerline.

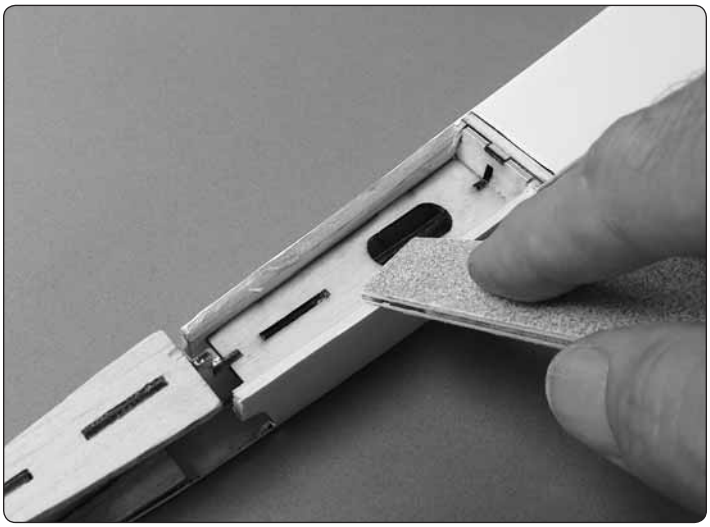


❑ 8. Mount the wing to the fuselage with the included 10-24 wing bolts.

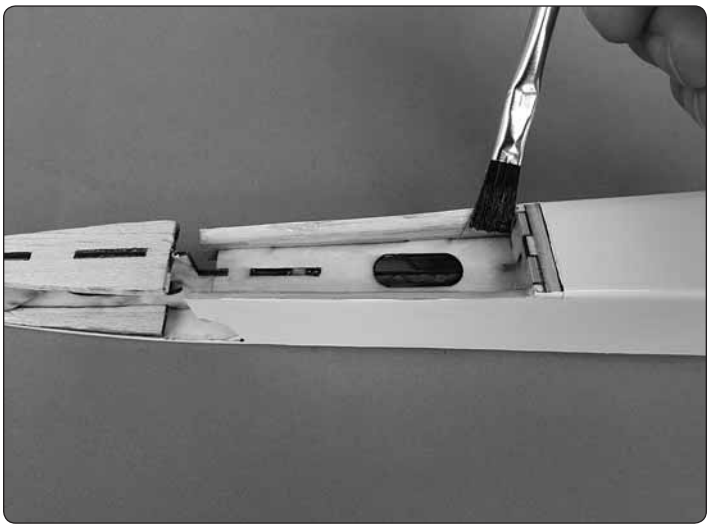
NOTE: ***In following images you will see the ruddervators connected to the V-tail, but yours should not yet be installed (or at least not yet permanently attached with the hinges).***

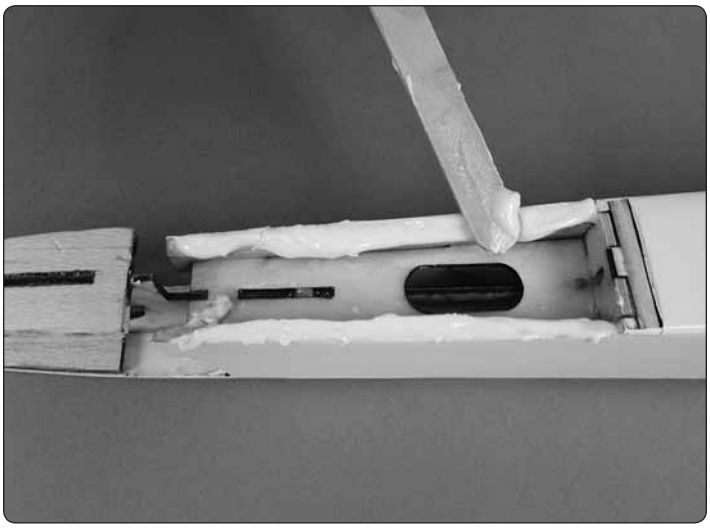


❑ 9. Fit the V-tail to the fuselage. Place a weight on the V-tail to hold it down. View the assembly from 4' – 6' [1 – 2m] behind the plane.



❑ 10. When viewing the model from behind, the tips of the V-tail should align with the marks precisely at the trailing edge of the ailerons. If the tips do not align, **carefully** sand the high-side of the stab saddle until you can get the V-tail to align—use care—sanding a small amount of material can have a drastic effect. (The stab in the image needs to be rotated clockwise to bring the left tip up and the right tip down, requiring material to be trimmed from the right fuselage side at the stab saddle.)

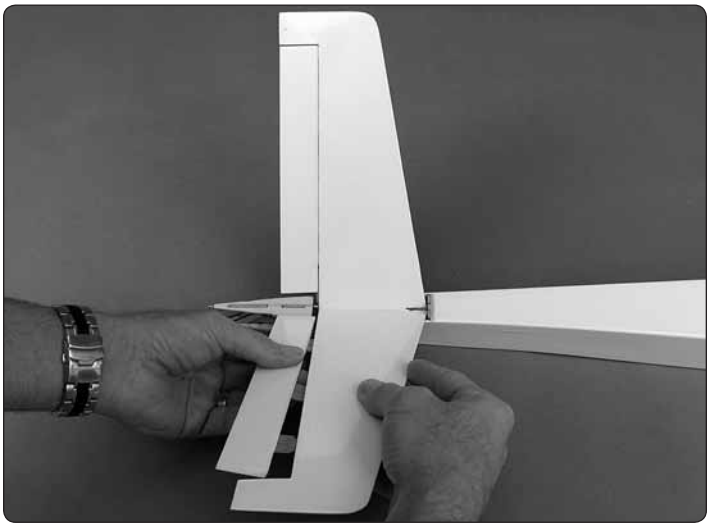




❑ 11. Once alignment has been achieved, prepare to permanently glue on the V-tail. Mix about 1/4 oz. [10cc] of 30-minute epoxy. First apply a film of epoxy to all joining surfaces, then add microballoons to what remains in the cup and repeat the process coating all joining surfaces with the epoxy/microballoons mixture.

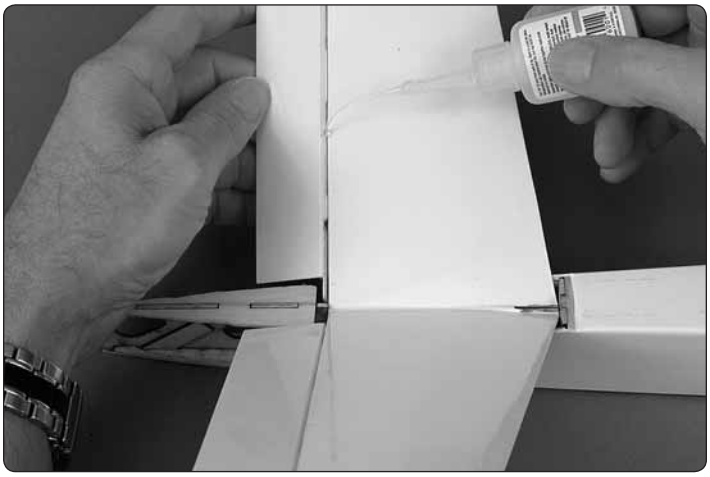
❑ 12. Fit the V-tail into position, place weight over the V-tail to hold it down and double-check the alignment. Wipe away excess epoxy and do not disturb the assembly until the epoxy has hardened.

Hinge the Ruddervators



❏ 1. Install the ruddervator pushrods if they aren't already installed. Connect the balls on the ruddervator torque rods to the ball links on the pushrods, then fit the ruddervators to the V-tail with the hinges—be certain the hinges remain centered as they go in.

❏ 2. Connect the ruddervator servos to your receiver and a battery so you can operate the servos and ruddervators with your transmitter. Make sure everything moves smoothly and operates correctly and that the pushrods are the correct length so the ruddervators will be centered when the servos are centered. Make any adjustments necessary.



❏ 3. Permanently join the ruddervators with the torque rods to the V-tail by securely gluing in the hinges with 6 – 8 drops of thin CA on both sides of each hinge. Allow time between drops so the CA soaks into the hinge slots instead of running down the hinge gap.

❏ 4. Any excess CA or CA "fog" can be removed with a small paper towel square and debonder.

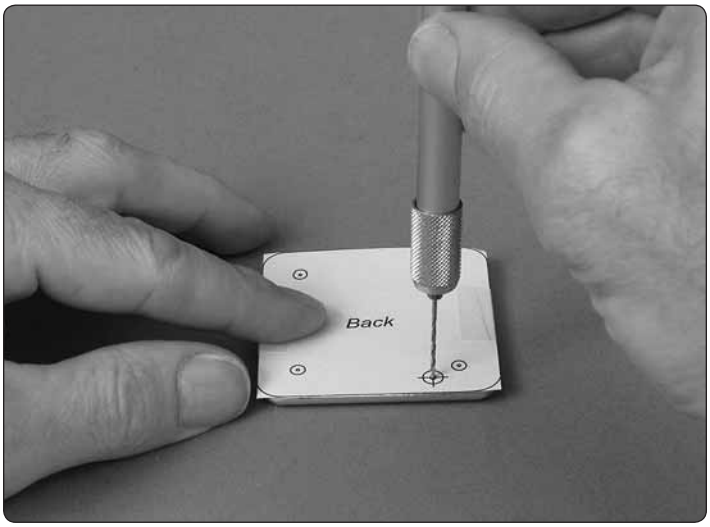
❏ 5. Pull hard on each ruddervator to make sure the hinges are secure.

The wood tail covers will be added after it has been determined whether or not any ballast is required in the tail to achieve the correct C.G.

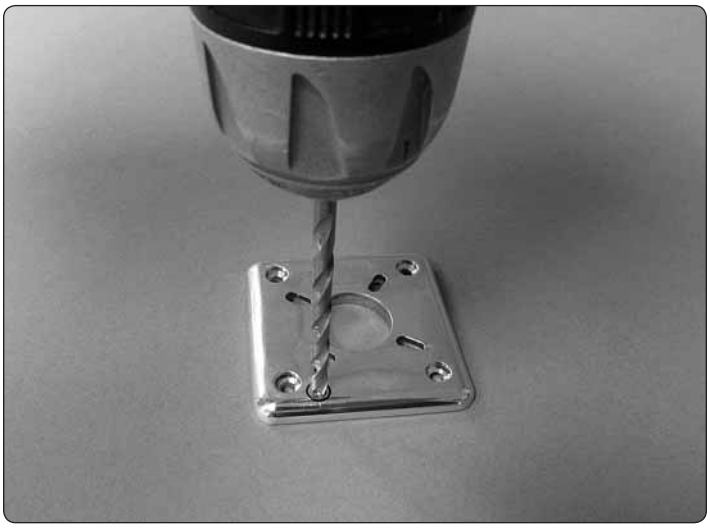
Mount the Engine

Installation of both a sport setup with an O.S. Max .55AX with the included back plate mount and the Jett QJ-1 engine for AMA 426 with the Jett back plate mount are illustrated. Follow the instructions for the setup you will be using.

SPORT ENGINE WITH INCLUDED BACKPLATE MOUNT:



❏ 1. If using the O.S. .46 or .55AX (or most other engines that will have the carburetor arm on the bottom with the engine mounted on its side), cut the back plate template labeled "***Back***" from the back of the manual. Tape the template to the **back** of the back plate mount, then mark the throttle pushrod hole using a small drill. (This hole also aligns with the hole for the throttle cut wire in the Jett Engineering back plate mount.)



❏ 2. Drill a 1/16" [1.6mm] hole at the mark, then enlarge the hole with a 3/16" [4.8mm] drill.

❏ 3. Run a 6-32 tap down through the blind nuts in the firewall to clean up any epoxy leftover from the fillet inside. If the tap won't go through, drill out the obstruction with a #36 (or 7/64" [2.8mm]) drill, then run the tap.

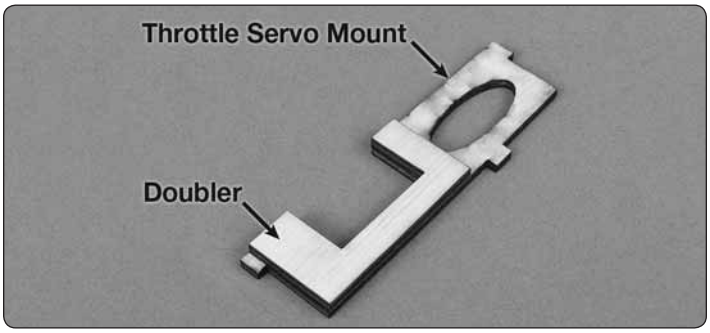
❏ 4. Temporarily fasten the back plate mount to the firewall as shown with four 6-32 x 5/8" [16mm] SCHS (socket-head cap screws). Use the hole in the mount as a guide to drill an 11/64" [4.4mm] (or 3/16" [4.8mm]) hole through the firewall. Remove the mount.

❏ 5. M3 x 10 SHCS and M2.5 x 10 SHCS are included for mounting your engine to the included back plate mount. These screws should be slightly longer than the screws that are in your engine. Remove the back plate from your engine and fasten the back plate mount with whichever screws are suitable and a drop of threadlocker on the screws.

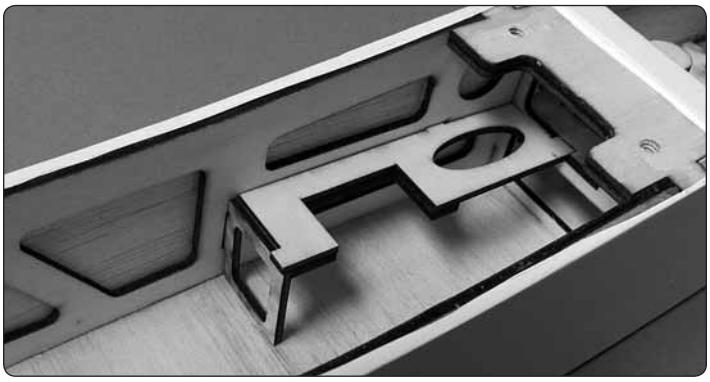
❏ 6. Mount the back plate mount to the firewall with four 6-32 x 5/8" [16mm] SCHS and threadlocker.

Mount the landing gear as illustrated on pages 22 & 23.

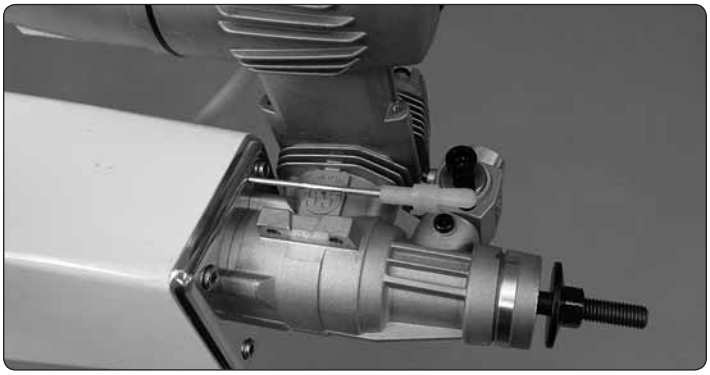
Hook Up the Throttle



❏ 1. Glue the laser-cut 1/8" [3.2mm] plywood **doubler** to the bottom of the laser-cut 1/8" [3.2mm] plywood **throttle servo mount**. Test-fit your servos and make any adjustments if necessary.

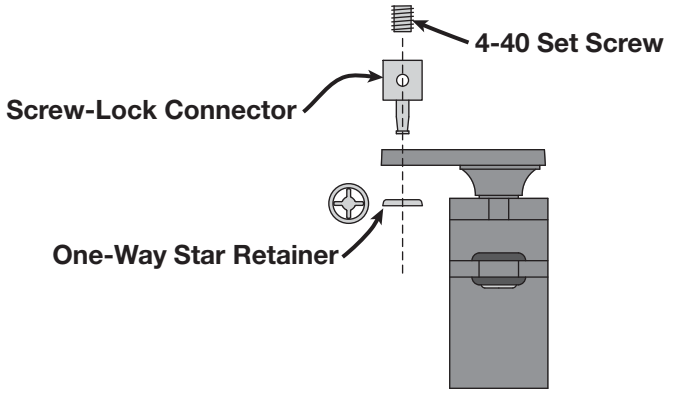


❏ 2. Glue the throttle servo mount and the laser-cut 1/8" [3.2mm] plywood **support** for the front of the mount into the fuselage.



Refer to these images to hook up the throttle as described in the following steps.

❏ 3. Cut the 3/16" [4.8mm] throttle guide tube approximately one inch longer than required (for trimming later). Roughen the tube with medium-grit sandpaper so glue will adhere, then install the tube through the back plate mount and the firewall. Glue the front of the guide tube into the back of the firewall.



❏ 4. Mount the throttle servo to the servo tray. Cut the guide tube to the correct length, then install the throttle pushrod using a clevis and a silicone retainer on the carburetor arm and a screw-lock connector with a metal one-way ***star*** retainer on the servo arm. Glue the guide tube to the side of the fuselage and glue the laser-cut 1/8" [3.2mm] **guide tube holder** into position.

❏ 5. Use the radio to set up your throttle linkage and lock the pushrod to the screw-lock connector with the 4-40 set screw and threadlocker.

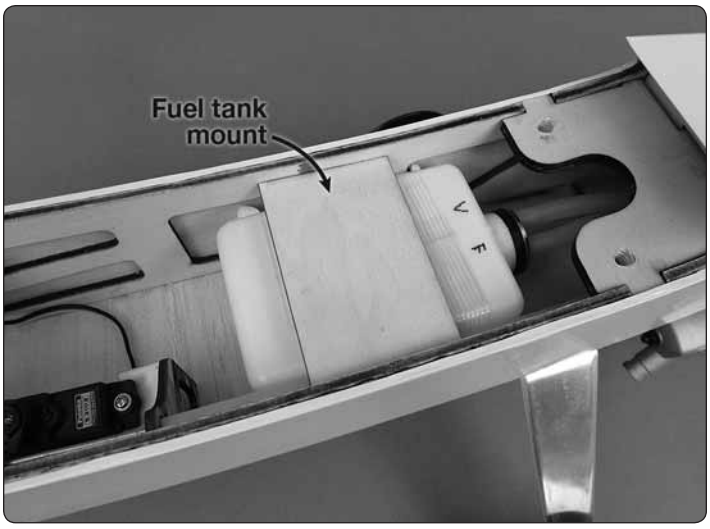
❏ 6. Mount the muffler to the engine.

Install the Fuel Tank

❏ 1. Prepare the fuel tank as shown—it would be a good idea to mark the location of the fueling line ("F") and the vent/pressure line ("V") on the outside of the tank so you don't forget when connecting the fuel tubing later.

❏ 2. Insert the stopper into the tank and tighten the screw to expand the stopper sealing the tank.

❏ 3. Use tape to wrap the sides and bottom of the tank in a sheet of 2-1/2" x 5" [60 x 130mm] 1/4" [6.5mm] RC foam.



❏ 4. Install the fuel tank and hold it into position with the 1/8" [3.2mm] lite-ply **fuel tank plate** and another piece of 1/4" [6.5mm] RC foam.

❏ 5. Guide the pressure/vent line and the pickup fuel lines through the holes in the side of the fuselage and connect them to the fuel tank. Connect the pickup tube to the carburetor and the pressure/vent line to the muffler.

Skip to *Hook up the Ailerons* on page 25.

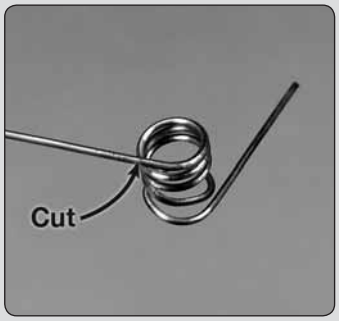
JETT QJ-1 ENGINE

The fuel line included with this kit is suitable for the fuel lines from the fuel tank to the needle valve and from the fuel tank to the muffler, but thin-wall fuel tubing from Darrol Cady or Sullivan is preferred for the line from the needle valve to the engine because it will be easier for the fuel cut wire to pinch for stopping the engine.

❏ 1. Form the fuel cut wire before mounting the engine:

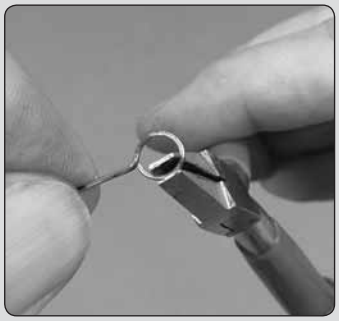
NOTE: Forming the loop on the fuel cut wire is somewhat of an art that takes a little practice—if your first attempt at making the loop is unsuccessful using the wire that comes with this kit, make a new wire from K&S .031" music wire. The method illustrated below uses a 3/16" [4.8mm] brass tube for making the loop, but round-nose pliers could also be used to make the loop.

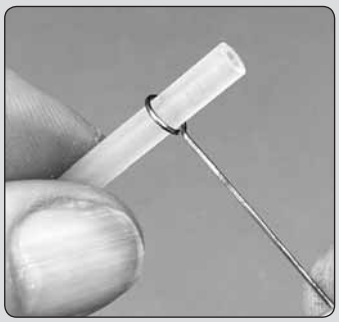
❏ A. Use 400-grit sandpaper to scuff 2" – 3" [50 – 75mm] of one end of the wire and clean off any residue or oxidation.



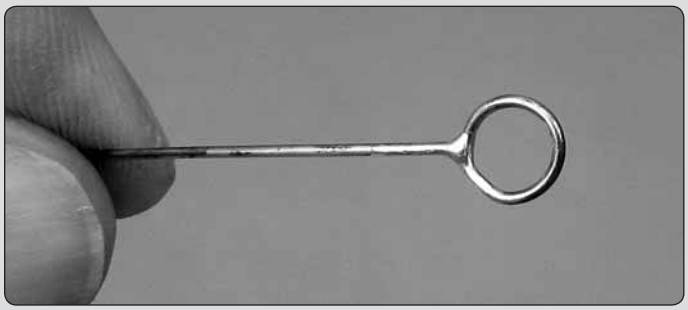
❏ B. Wrap the cleaned end of the wire four or five times around a 3/16" [4.8mm] tube or rod—the coils will get tighter with each wrap until the I.D. of the last coil is about the same as the tube.

❏ C. Cut off the extra coils so only the last, tightest coil remains.





❏ D. Use pliers to bend and manipulate the coil until it will slip through the hole in the back plate mount and your fuel tubing will pass through.



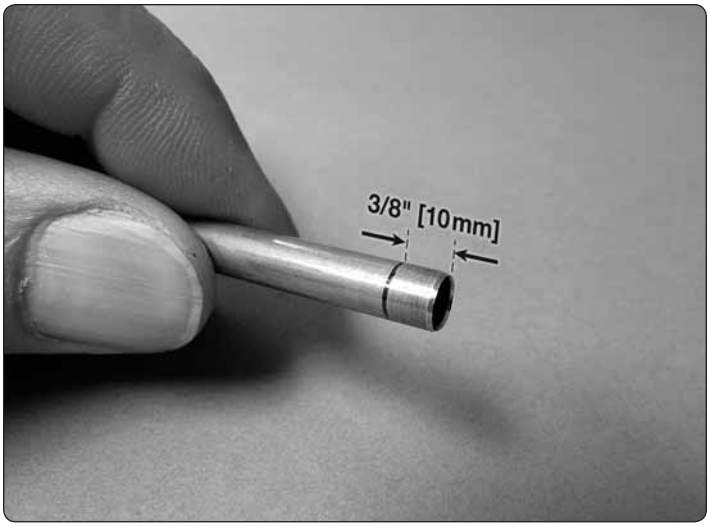
❏ E. Use silver solder to permanently close the loop. Use steel wool to thoroughly clean any residual soldering flux from the wire, then apply a fine coat of oil so the wire won't rust. Set the fuel cut wire aside.

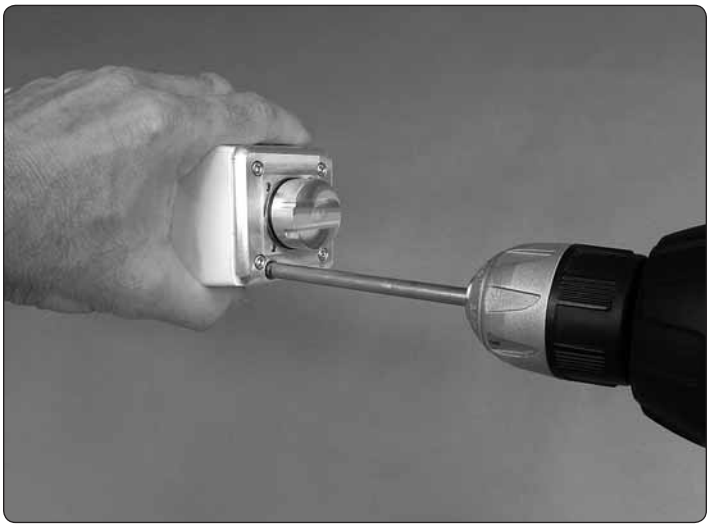
❏ 2. Run a 6-32 tap down through the blind nuts in the firewall to clean up any epoxy leftover from the fillet inside. If the tap won't go through, drill out the obstruction with a #36 (or 7/64" [2.8mm]) drill, then run the tap.

❏ 3. Temporarily fasten the back plate mount to the firewall as shown with four 6-32 x 5/8" [16mm] SHCS.

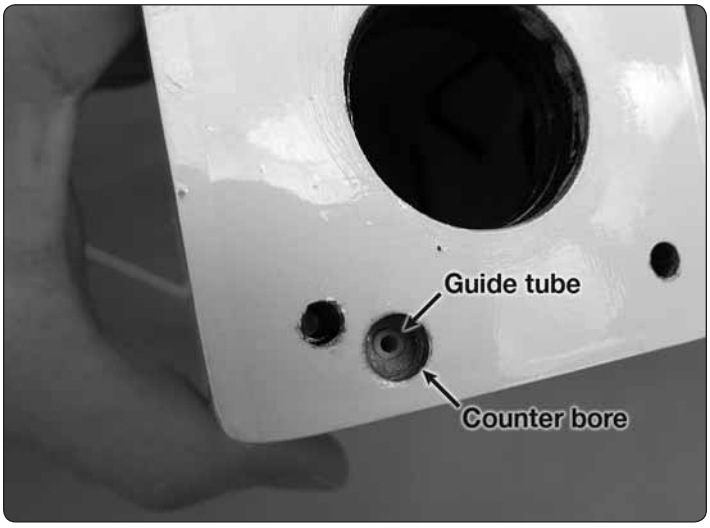
Hook Up the Fuel Cut Wire

❏ 1. Mark the center of the hole in the back plate mount onto the firewall for the guide tube for the fuel cut wire. Drill a 1/16" [1.6mm] pilot hole through the firewall at the mark, then enlarge the hole with a 1/8" [3.2mm] drill.





❏ 2. The hole in the firewall for fuel cut wire must be *counter-bored* so the loop can travel far enough to pinch the fuel line without overdriving the servo. The easiest way to cut a precise counter-bore is with a 1/4" K&S brass tube sharpened on the end. Mark a line on the tube 3/8" [10mm] from the end and use a drill to turn the tube into the firewall up to the line. This will provide a counter bore that's approximately 3/16" [5mm] deep.



Refer to this photo for the following three steps.

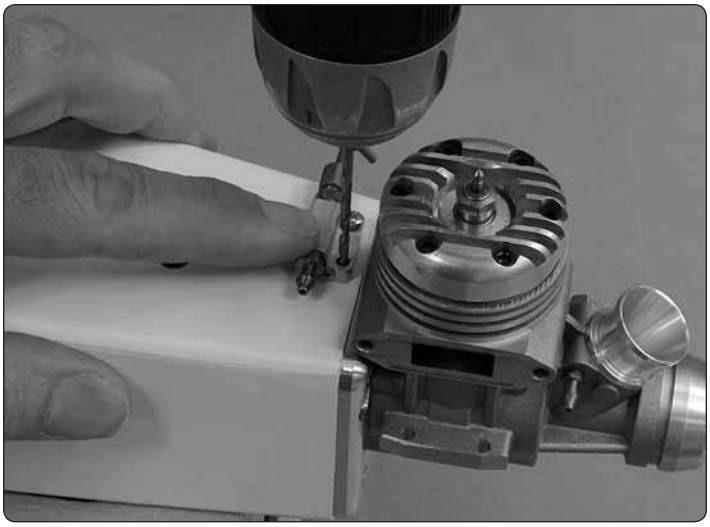
❏ 3. Remove the engine mount from the firewall. Use a hobby knife and/or a small, flat-blade screwdriver to pick the material out of the counter bore. Use your covering iron to make sure the covering is thoroughly sealed to the firewall around the hole.

❏ 4. Cut the 1/8" [3.2mm] guide tube for the fuel cut wire to a length of 11" [280mm]. Roughen the tube so glue will adhere, then insert the tube into the firewall so the end of the tube aligns with the bottom of the counter bore hole. Use thin CA to glue the tube into the hole from the back-side of the firewall.

❏ 5. Using care not to get any glue inside the tube, fuelproof the bare wood inside the hole with CA or epoxy.

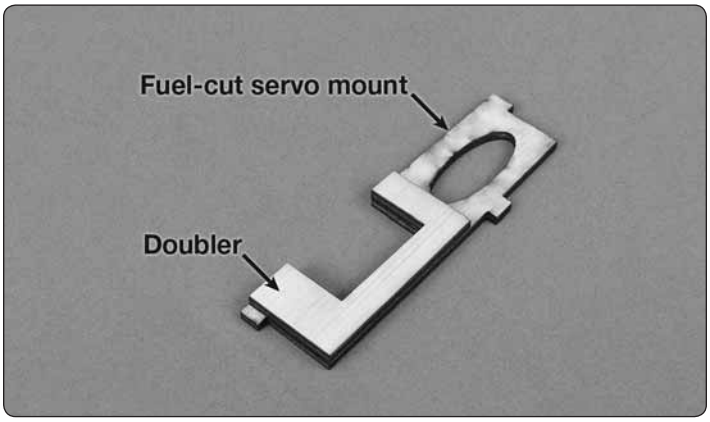
❏ 6. Install one of the 6-32 x 5/8" [16mm] SHCS into the hole in the back plate mount near the engine exhaust, then mount the back plate mount to your engine.

❏ 7. Mount the engine to the firewall with four 6-32 x 5/8" [16mm] SHCS and threadlocker.

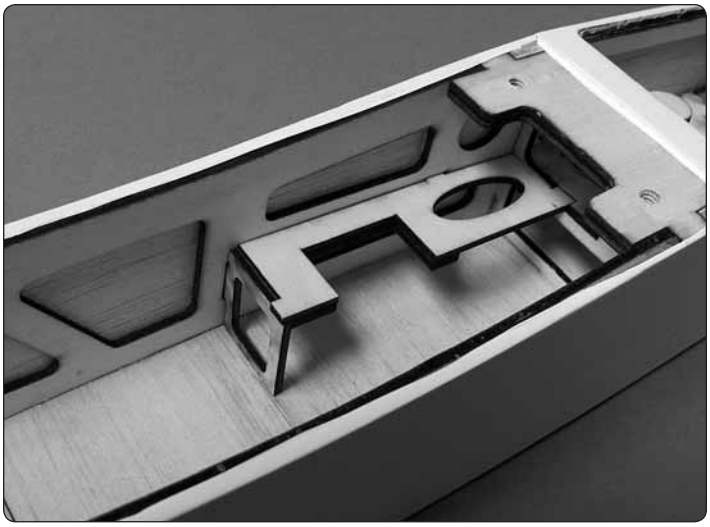


❑ 8. Position the remote needle valve mount where desired so that the mounting screws will thread into the side of the firewall (also making sure they will not interfere with the engine mount screws already in place). Drill 3/32" [2.4mm] holes for one of the screws and temporarily mount the needle valve with two #4 x 1/2" [13mm] screws.

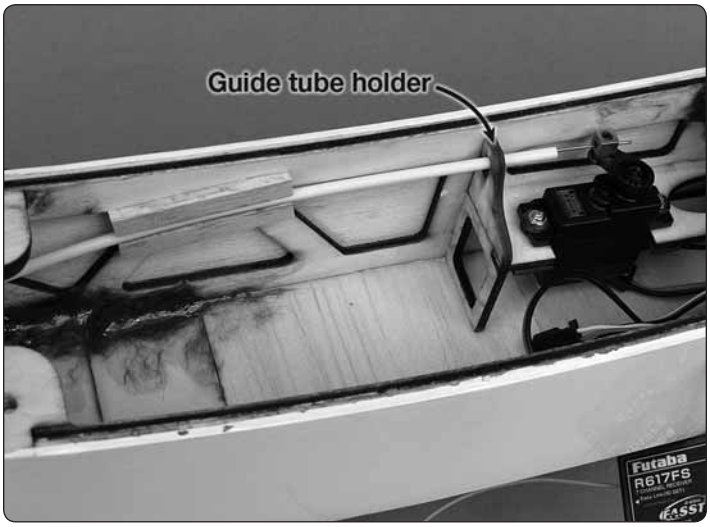
❑ 9. Remove the screws, harden the holes with thin CA, allow to harden, then mount the needle valve.



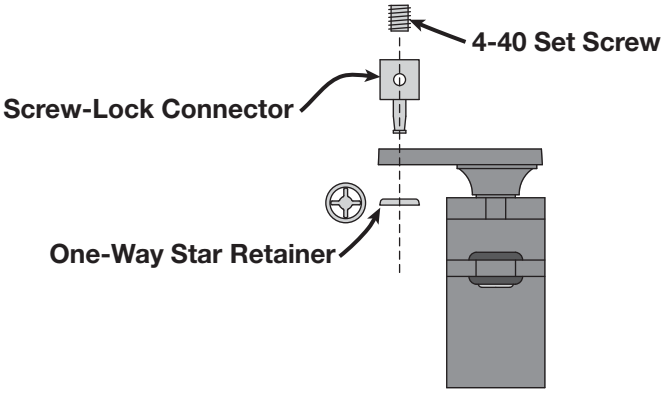
❑ 10. Glue the laser-cut 1/8" [3.2mm] plywood **doubler** to the bottom of the laser-cut 1/8" [3.2mm] plywood fuel-cut **servo mount**. Test-fit your throttle servo and make any necessary adjustments.



❑ 11. Glue the fuel-cut servo mount and the laser-cut 1/8" [3.2mm] plywood **support** for the front of the mount into the fuselage.



Refer to these images to hook up the fuel-cut wire as described in the following steps.



❏ 12. Mount the fuel-cut servo to the servo tray with a servo arm cut down to the correct length. Cut the guide tube so it won't interfere with the throttle servo arm when the arm rotates all the way forward, then install the fuel cut wire with a screw-lock connector with a metal one-way ***star*** retainer on the servo arm.

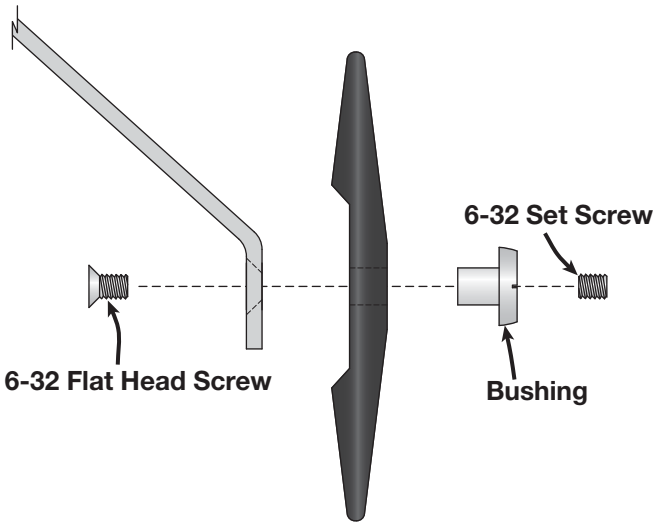
❏ 13. Glue the guide tube to the side of the fuselage and glue the laser-cut 1/8" [3.2mm] **guide tube holder** into position. Balsa scraps (not included) can be used to help secure the guide tube to the side of the fuselage so it won't become dislodged or interfere with the fuel tank.

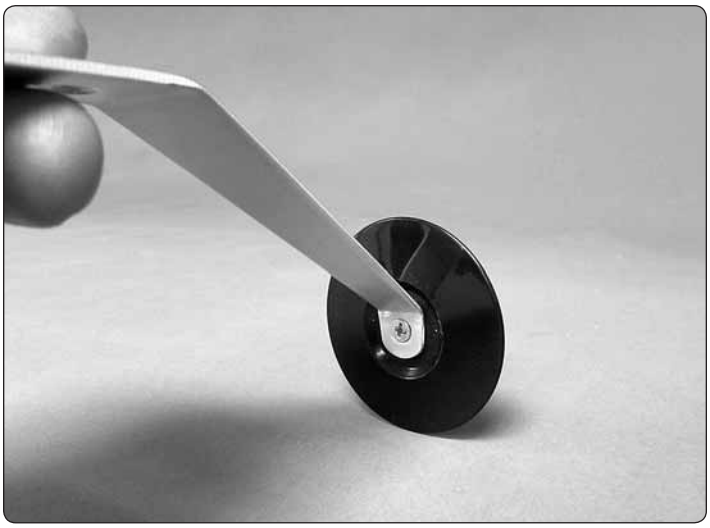
❏ 14. Route the fuel line from the engine to the needle valve through the loop in the fuel cut wire and use the radio to set the servo travel and finalize your fuel cut linkage—Darrol Cady or Sullivan 3/32" fuel line is preferred for this segment of the fuel system. Lock the fuel-cut wire to the screw-lock connector with a 4-40 set screw and threadlocker.

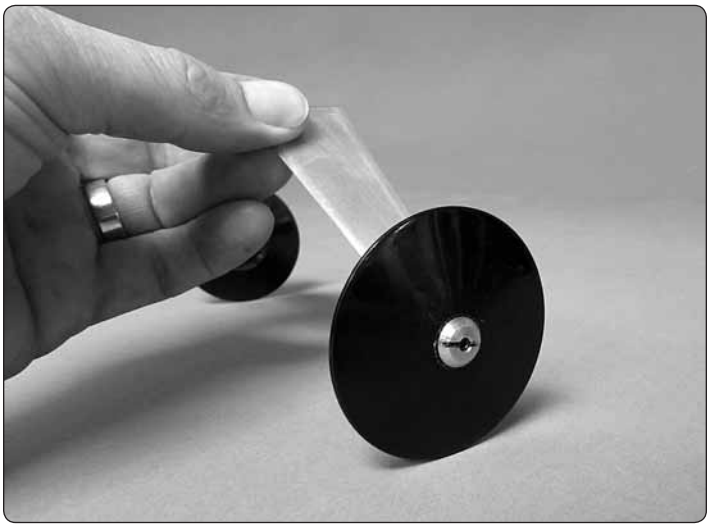
Mount the Landing Gear

The main landing gear is fastened to the fuselage with the supplied 10-24 x 1/2" [13mm] **nylon flat-head screws.** This is a "break-away" system where the bolts will break allowing the gear to separate from the plane to prevent structural damage in the event of an unusually hard landing. It is a good idea to purchase spare screws from your local hardware or home improvement store and store them in your field box when you go to the races.

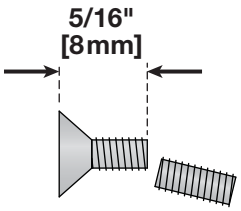
❏ 1. The landing gear may be used as-is, but most pilots prefer to chamfer the front and back edges of the gear first. This takes a lot of elbow grease, but that's the way it's done! Use whatever means available to grind the edges such as a belt sander, a grinding wheel or a metal file. Finish with increasingly finer grades of wet-dry sandpaper until the gear is polished to suit your taste. Steel wool and dish soap (or a Brillo pad) really make it shine!





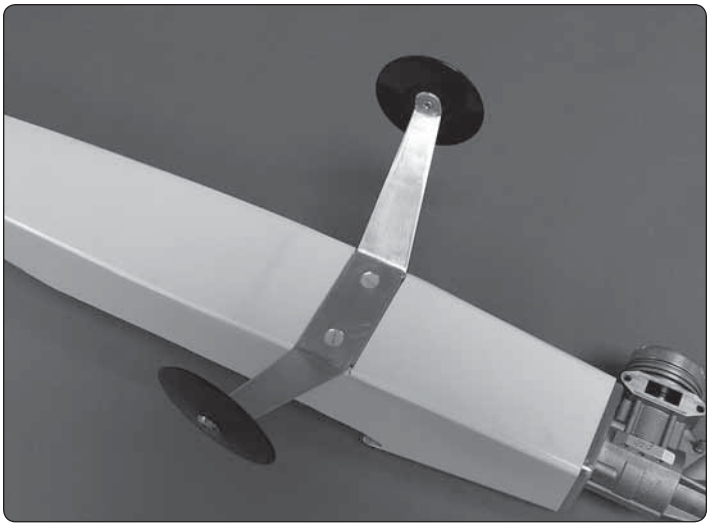


❏ 2. Mount the wheels to the landing gear as shown—be certain to lightly wet the threads of the screws with threadlocker.



10-24 x 5/8" Nylon Landing Gear Screw

❏ 3. Cut the included 10-24 x 5/8" [16mm] nylon landing gear screws to a length of 5/16" [8mm].

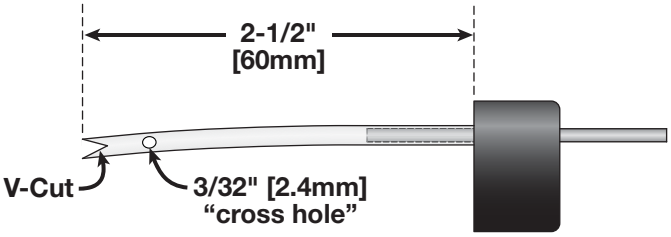


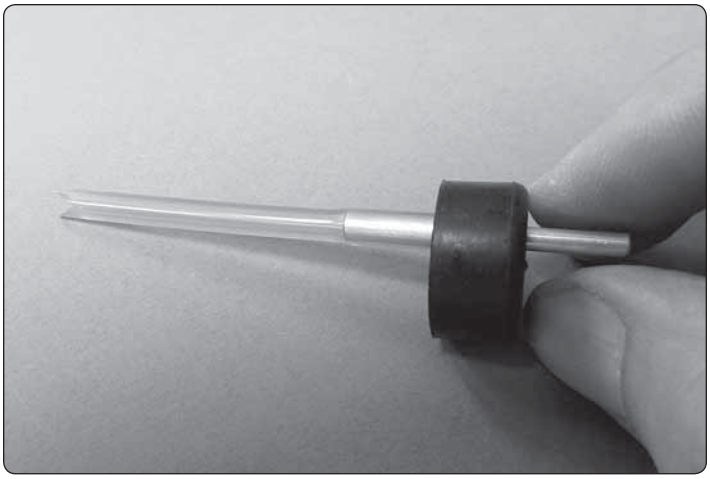
❏ 4. Mount the landing gear to the fuselage with the screws—note that the gear may be swept ***forward*** for landing and taking off from grass or swept ***back*** for hard surfaces.

❏ 5. Check the screws inside the fuselage—make sure you've cut them so they are not protruding from the landing gear plate too far to interfere with the fuel tank. Trim farther if needed.

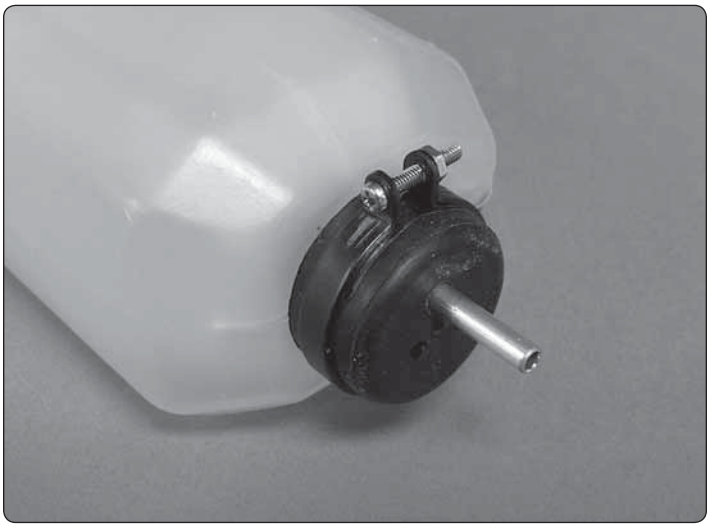
Install the Fuel Tank

A Tettra 6 oz. bubbles fuel tank is illustrated. There is more than one way to prepare the tank, but the method illustrated is popular. Because the tank features a collapsing bladder (pressurized between itself and the plastic container) only a single pickup line is used inside the tank. A *Bubble Jett Fuel Tanker* syringe-type fueler (or similar) is required for filling the tank properly without introducing air into the tank.

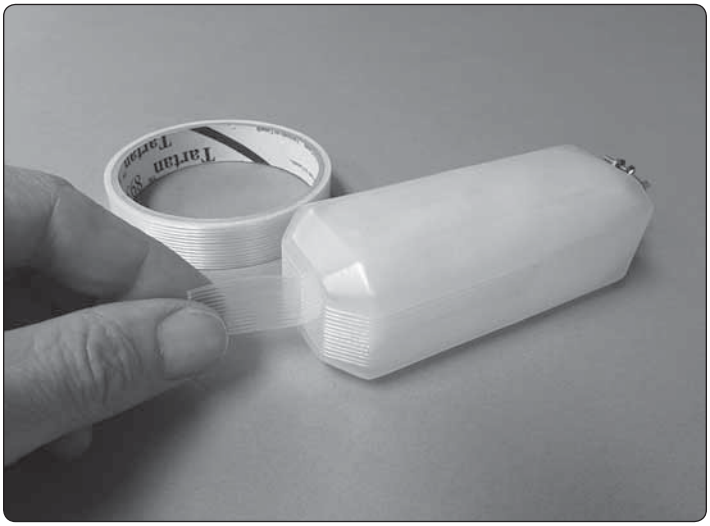




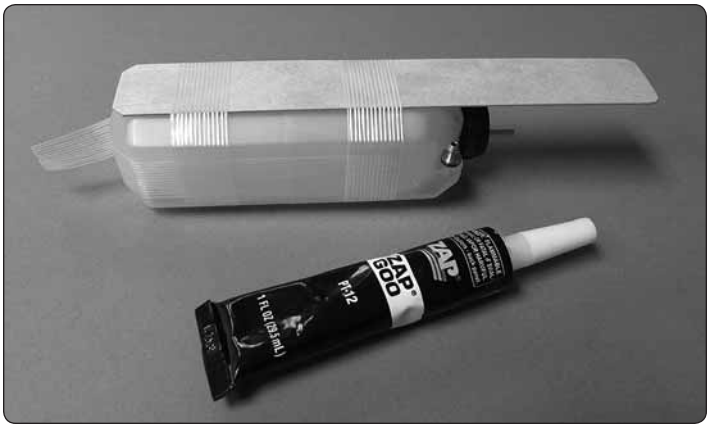
❏ 1. Prepare and fit the aluminum fuel tube and silicone pickup line as illustrated.After making the "V" cut, also use a 3/32" sharpened brass tube to cut a "cross hole" throught both sides of the tubing.

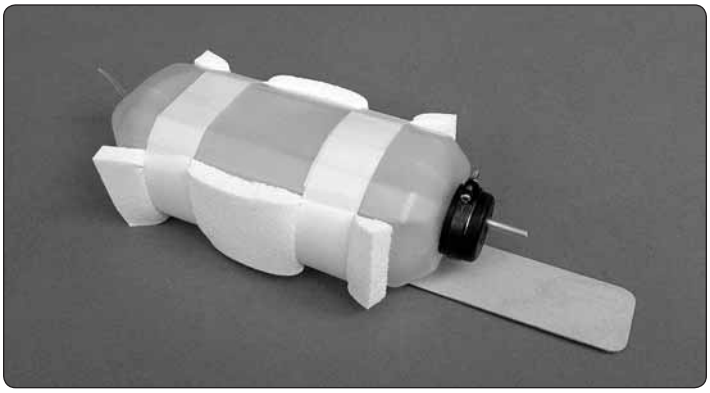


❏ 2. Secure the stopper in the tank with the hardware included with the tank – don't forget the thin, metal plate shown in the instructions that came with the Tettra tank.

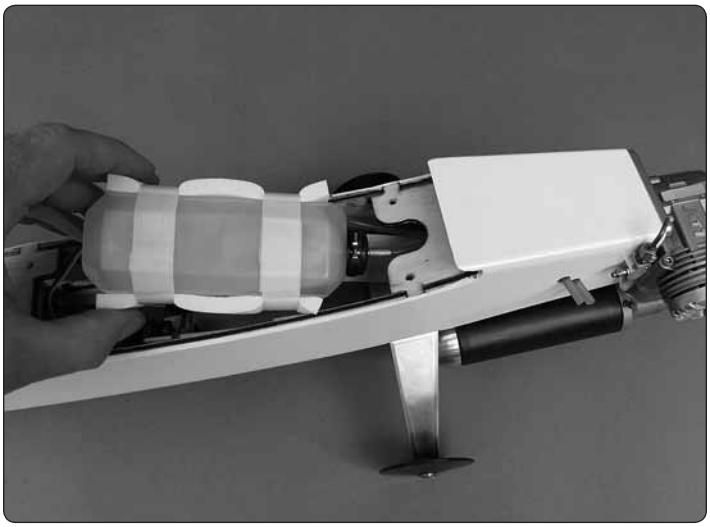


❏ 3. If the fuel tank ever requires removal in the future, it will be helpful to have a strap made from tape as shown to facilitate pulling the tank out.

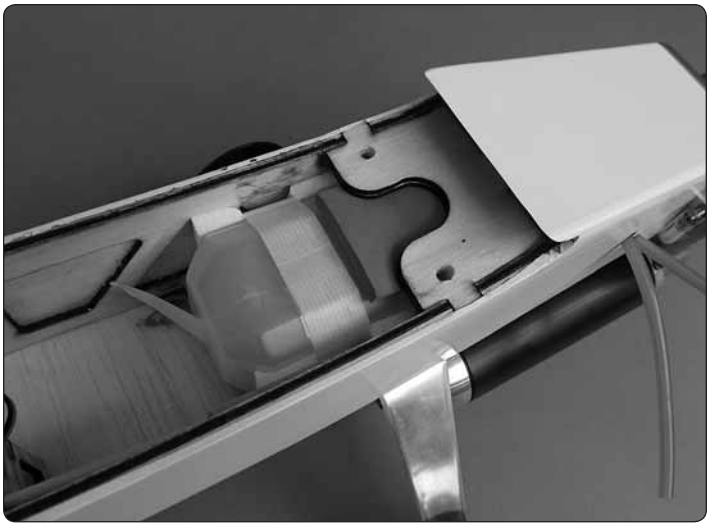




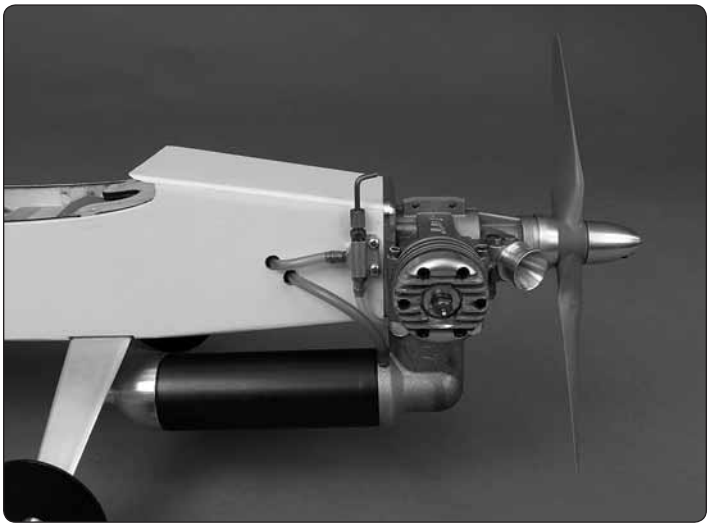
❏ 4. The fuel tank must be stabilized so it cannot shift forward or aft, but because the tank is bubble-less, ***completely*** isolating the tank in RC foam is not necessary. But some foam will be helpful for holding the tank into place and preventing vibration from eventually wearing the tank. A popular method for keeping the tank from moving forward is a popsicle stick or similar wood plate fastened to the tank with Zap Goo and/or tape. Sheets of 1/4" [6.5mm] RC foam were also held to the sides of the tank with tape.



❏ 5. Guide the fuel lines through the holes in the side of the fuselage and connect them to the fuel tank. Install the tank as you guide the lines through – be certain the fuel lines are not kinked or pinched inside the fuselage. If you have any concerns about the fuel lines being kinked inside the fuselage, you could always pull the engine and view the lines through the hole in the firewall.



❏ 6. Use additional pieces of foam padding on top of the tank and under the tank as needed. As shown, the tank was secure and will not shift forward or aft, but if a little more security is desired a balsa stick could be glued across the fuselage sides at the back of the tank.

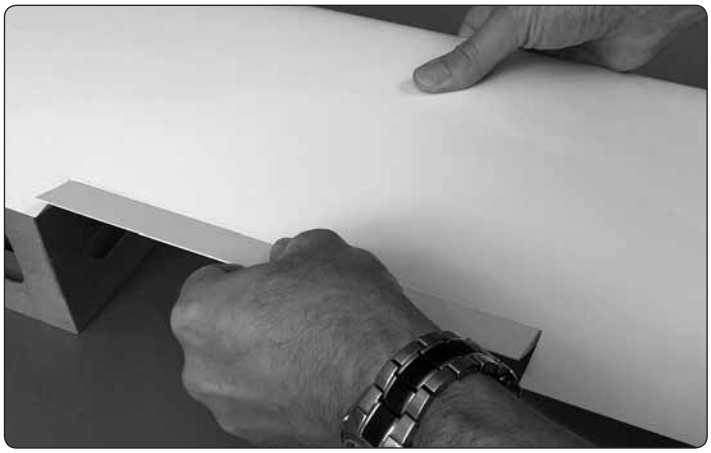


❏ 7. Mount the muffler and connect the fuel lines. Might as well install the propeller too—be certain to lock the propeller down so that it will be horizontal when the piston is at the top of the compression stroke to prevent damaging the tips when landing.

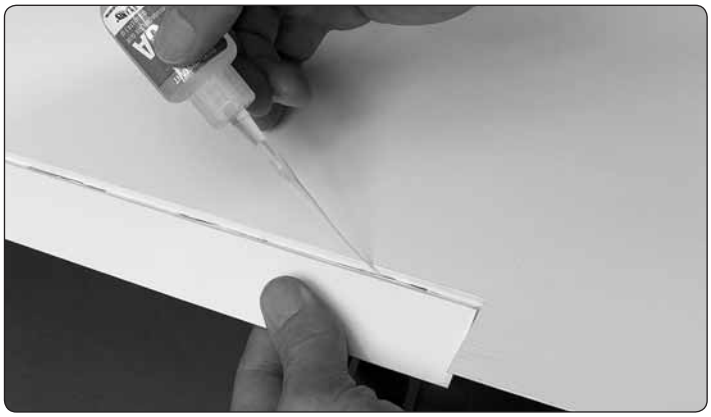
NOTE: ***If you ever replace the wing bolts with different bolts, be certain they do not contact the top of the fuel tank.***

Hook Up the Ailerons

Note: The aileron servo is shown with the output shaft toward the ***back*** of the wing. This orientation may be necessary to clear the included fuel tank for the sport setup, but if using a Tettra fuel tank the servo may be positioned with the output shaft closer to the **front** of the wing. In any case, test-fit the wing with your servo to make sure it clears your fuel tank before deciding which way to mount the servo.



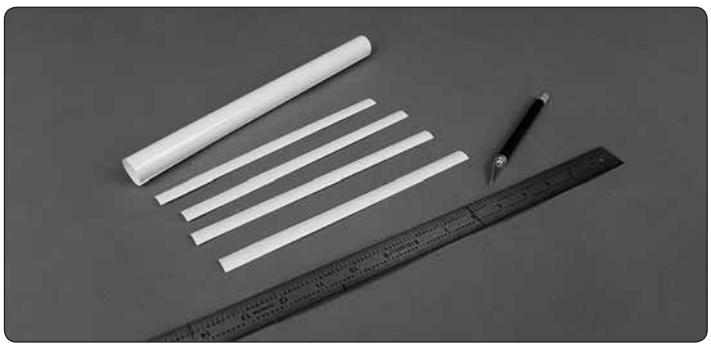
❑ 1. The ailerons should already be test-fitted to the wings from the V-tail alignment procedure. If you haven't yet done so, make sure the ailerons fit properly to the wing and torque rods and make sure the ailerons move up and down freely. Make any adjustments necessary.



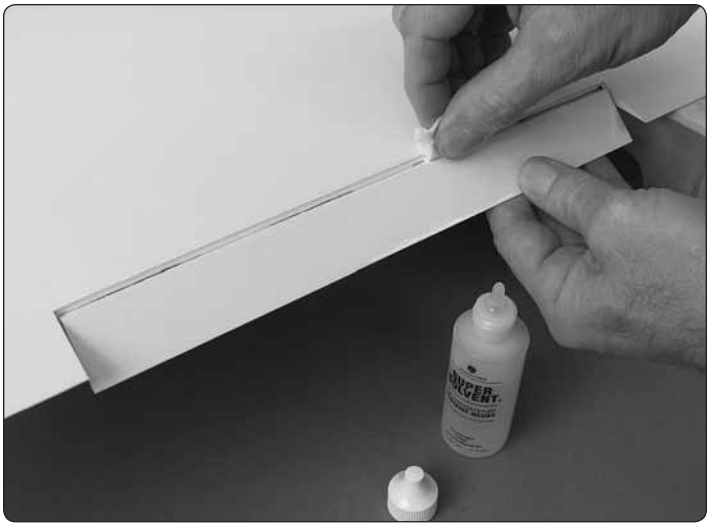
❑ 2. Remove the ailerons. Apply 30-minute epoxy to the joiner wires where they go into the ailerons and in the joiner pockets in the ailerons. Join the ailerons to the wing with the hinges and remove excess epoxy that comes out of the ailerons. Apply 6 – 8 drops of thin CA to both sides of all the hinges.

❑ 3. After the CA on the hinges has hardened, pull hard on each aileron to make sure the hinges are secure.

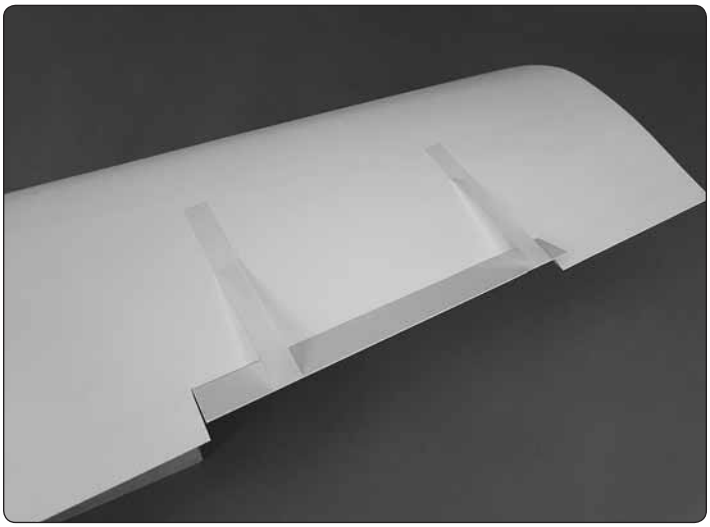
In the following steps the aileron hinge gaps will be sealed from the ends of the torque rods out to the tips. This is an important procedure to prevent flutter and increase the effectiveness of the ailerons.



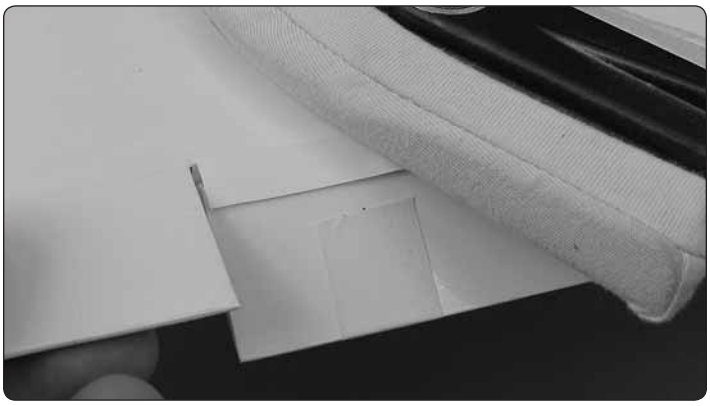
❑ 4. Cut four 1/2" x 8-3/4" [10mm x 220mm] strips from the included white MonoKote sheet.



❑ 5. Examine the hinge gaps on the top and bottom of both ailerons. Larger blobs of CA can be picked away with a hobby knife while smaller smears can be removed with a small paper towel square dampened with CA debonder.

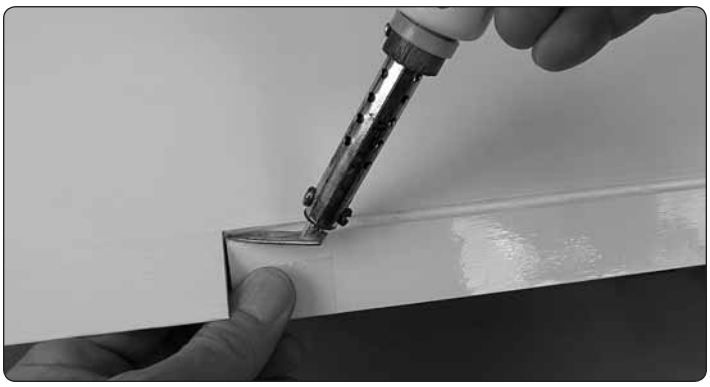


❑ 6. Use a couple strips of tape to hold one of the ailerons as up as far as it will go.



❏ 7. Lay one of the strips of MonoKote on the bottom of the wing with the edge extending forward of the hinge gap by approximately 1/8" [3mm]. Use a regular covering iron to iron the piece of covering to the wing only.

❏ 8. Use a trim iron to seal the covering tightly all the way down the trailing edge of the wing only.



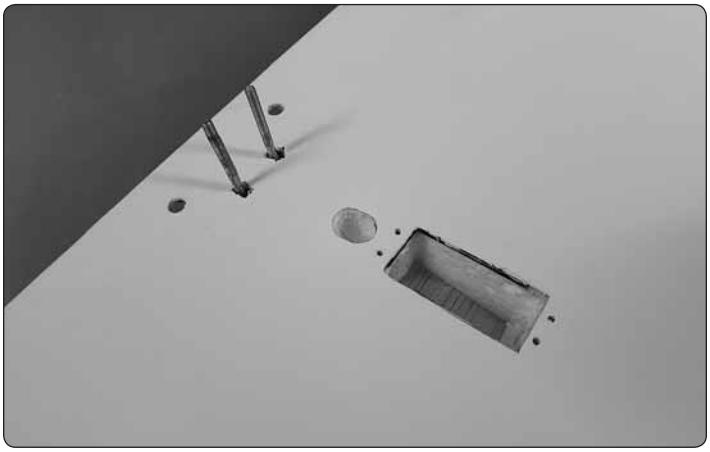
❏ 9. Now seal the strip down the leading edge of the aileron.

❏ 10. Trim any excess covering as necessary, or simply iron it down to the bottom of the aileron.

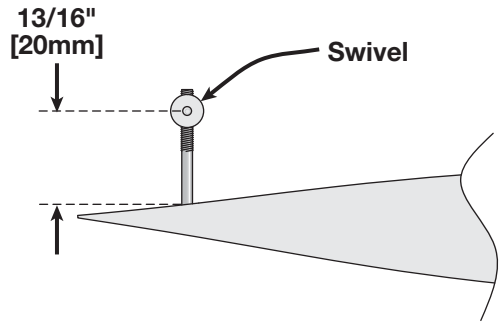
❏ 11. Remove the tape that was holding the aileron down, then move the aileron up and down a few times to make sure it moves reasonably smoothly. Make any adjustments necessary.

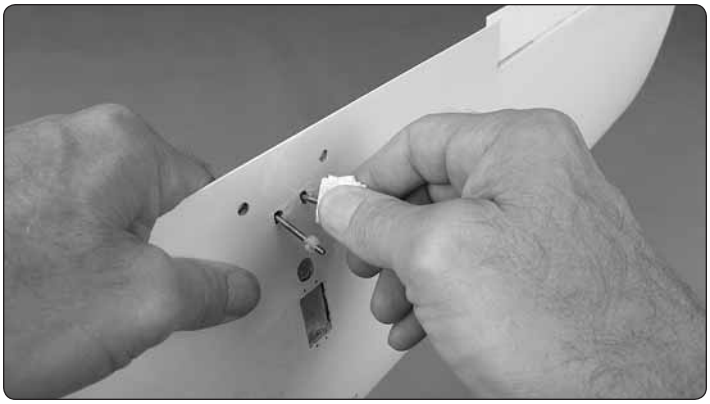
❏ 12. Seal the top of the aileron and the top and bottom of the other aileron the same way.

❏ 13. Any glue or residual MonoKote adhesive that may have been deposited on the strips may be cleaned with a small paper towel square and CA debonder.

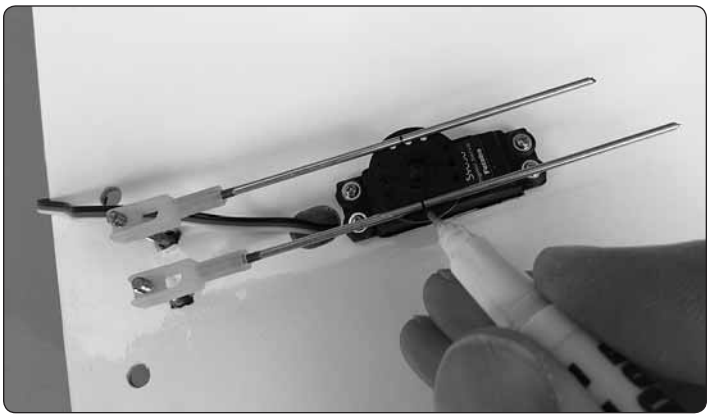


❏ 14. Use a 3/8" [9.5mm] brass tube sharpened on the end or a hobby knife to cut a hole in the wing sheeting and through the foam to pass the aileron servo wire. Install the aileron servo. Drill 1/16" [1.6mm] holes for the servo mounting screws and mount the servo with the screws. Remove the screws, add a few drops of thin CA to the screw holes and allow the CA to harden.

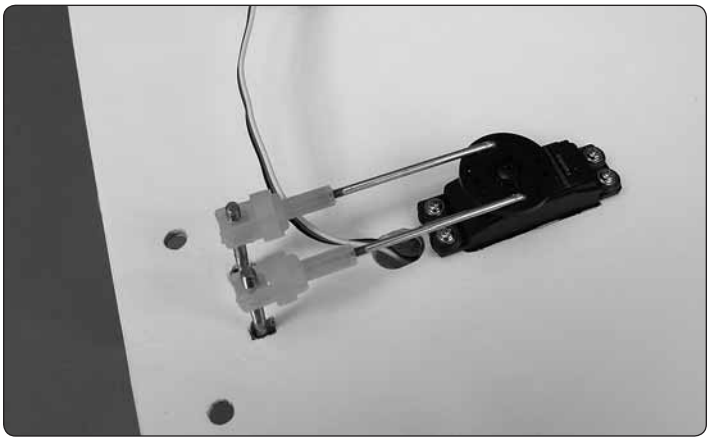




❏ 15. Thread a **nylon swivel** onto each torque rod until it is 13/16" [20mm] from the bottom of the wing—grasping the swivels with a paper towel square or a tissue makes them easier to turn.



❏ 16. Mount the aileron servo in the wing. Make the aileron pushrods as shown and attach them to the swivels. With the servos and the ailerons centered, mark the pushrods where they cross the servo wheels. **Note:** High-wing Quickie 500 planes do not require aileron differential, but the pushrod hardware and torque rod configuration on some quickies require offsetting the pushrods ***forward*** of the pivot point in the servo wheel to remove the "backward" differential (more down than up) that results. But since the swivel clevises used on the Quik-V6 align the pivot point of the clevis with the torque rod, the pushrods should be installed in the servo wheel ***in-line*** with the pivot point as shown so there should be no differential.



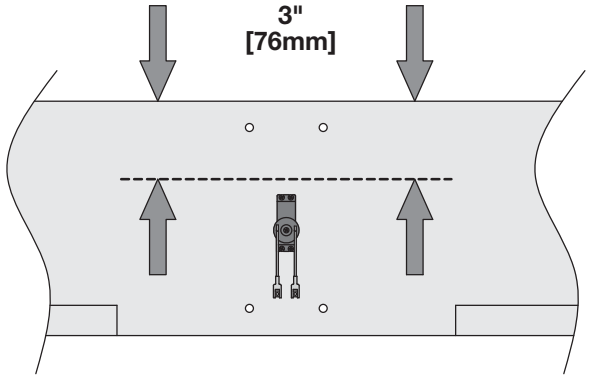
❏ 17. Use Z-bend pliers to make the Z-bends in the pushrods, cut off the excess wire, and file any burrs from the ends of the wires. Enlarge the holes in the servo wheels with a .074" [1.9mm] drill, then connect the pushrods.

❏ 18. Use your radio to center the servo and the ailerons adjusting the length of the pushrods as necessary. Install silicone retainers on the clevises and the servo screw in the servo wheel.

FINAL ASSEMBLY

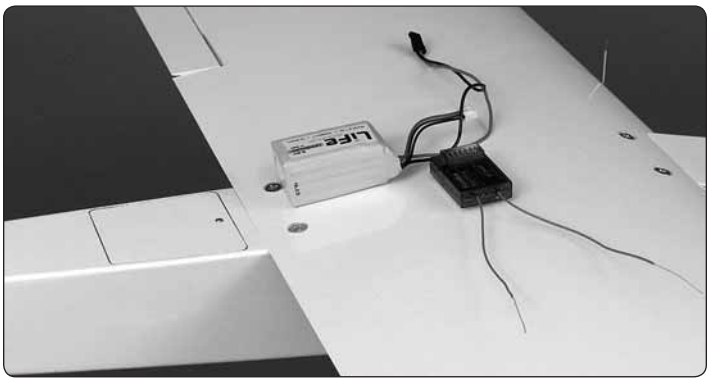
Check the C.G.

This is an ***initial*** C.G. check. The beginning C.G. for initial flights will be set after the model has been completed, but now is a good time to do a simulated check while you have the opportunity to conceal weight inside the tail (should tail weight be needed) and determine the location of the receiver and battery. Refer to ***Final C.G. Check*** on page 31 for full C.G. information.

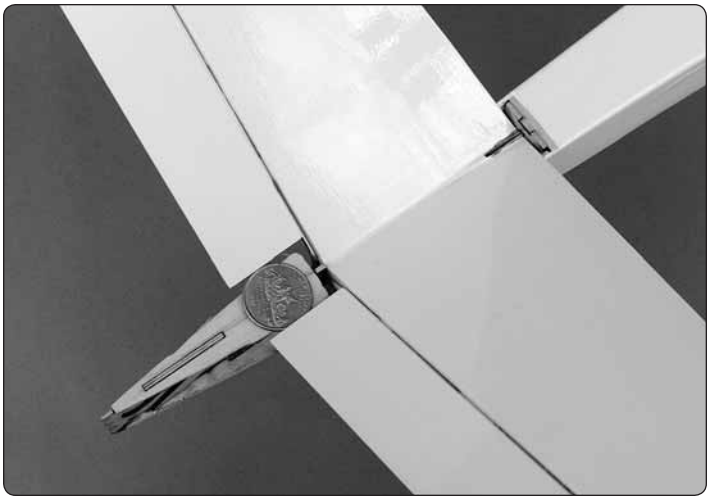


❏ 1. Set your Great Planes *C.G. Machine* to the starting, recommended C.G. which is 3" [76mm], or mark a line on the bottom of the wing noting the starting C.G. 3" [76mm] back from the leading edge.

❏ 2. Mount the wing to the fuselage and make sure everything else is in place including the propeller and prop nut, fuel tank, landing gear, servos and servo hatch cover. Also have your receiver battery and receiver nearby and the thin, plywood tail covers, the tail skid wire and some MonoKote approximately equal to the amount of MonoKote that will be used to cover the tail. Alternately, you could substitute a quarter, which approximately simulates the weight of the tail covers, skid wire and covering (about 5.5g).

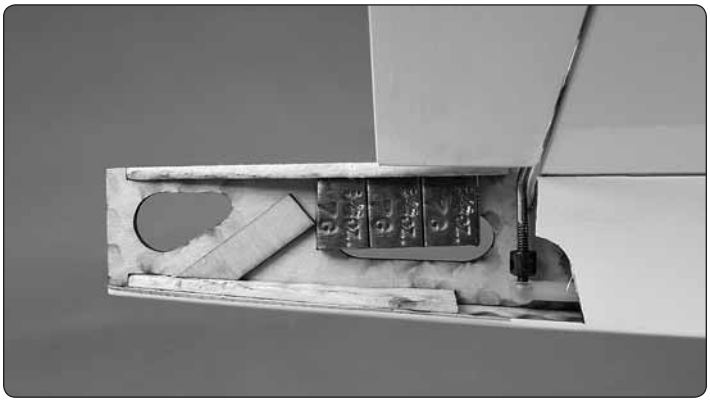


❏ 3. Place the receiver and battery on top of the wing in the approximate location they will be inside the fuselage.



❏ 4. Lay the tail covers and MonoKote (or a quarter) on the tail. Place the model on your C.G. machine or lift it at the balance point to see where it balances. Quik-V6s with the 426 Jett setup will tend to not require any ballast (depending upon the location of the battery and receiver) and sport setups with different engines (that are probably slightly heavier than the Jett engine) may require tail ballast.

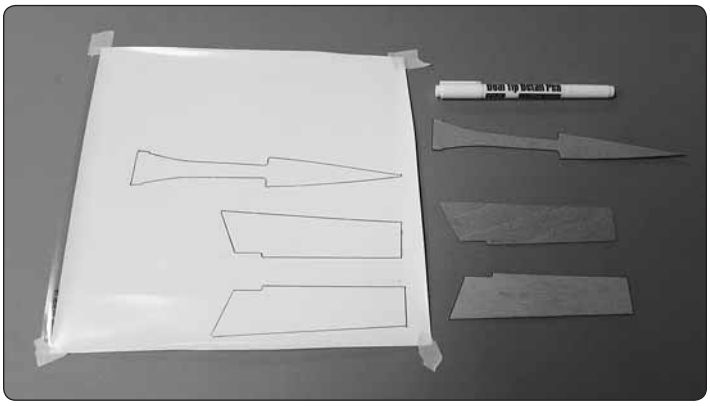
❏ 5. If the Quik-V6 doesn't balance, first try to arrange the receiver battery and receiver to get the model to balance, then place lead ballast over the nose or on the tail. With the sport setup the Quik-V6 may require 1 – 1.5 oz. [30 – 40g] of ballast on the tail.



❏ 5. Arrange the battery and receiver to get the model to balance, or add ballast where necessary. Tail ballast can be added as shown, but be certain it is **securely** glued into place—30-minute epoxy is recommended and doesn't interfere with the V-tail linkages.

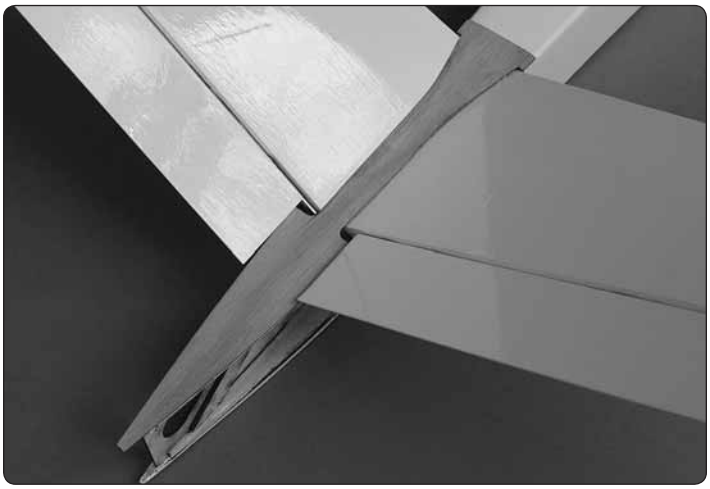
Attach the Tail Covers

❏ 1. Perform a final check to make sure the servos operate the elevators smoothly and the linkages and ruddervator torque rods are secure.



❏ 2. Use a fine-point felt-tip pen or ballpoint pen to mark the outlines of the top tail cover and both side covers onto the clear backing on the bottom of the included white MonoKote sheet. **NOTE:** The grain direction on the side covers was changed after the images were taken.

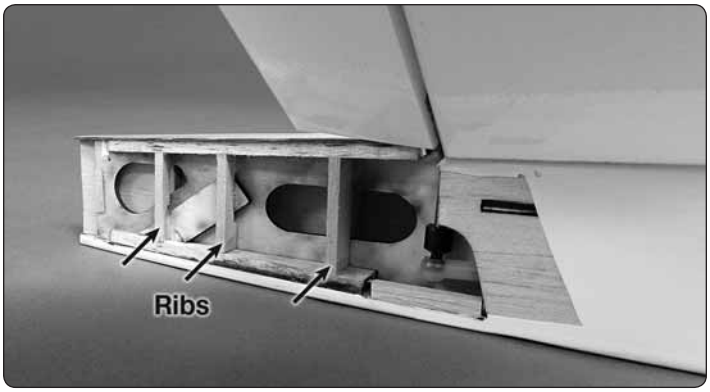
❏ 3. Sand a bevel to the bottom of the top tail cover to match the angle of the V-tail.



❏ 4. Test-fit the top cover and side covers (the ***bottom*** of the side covers will likely require trimming). Note that the front edge of each side cover fits ***over*** the fuselage

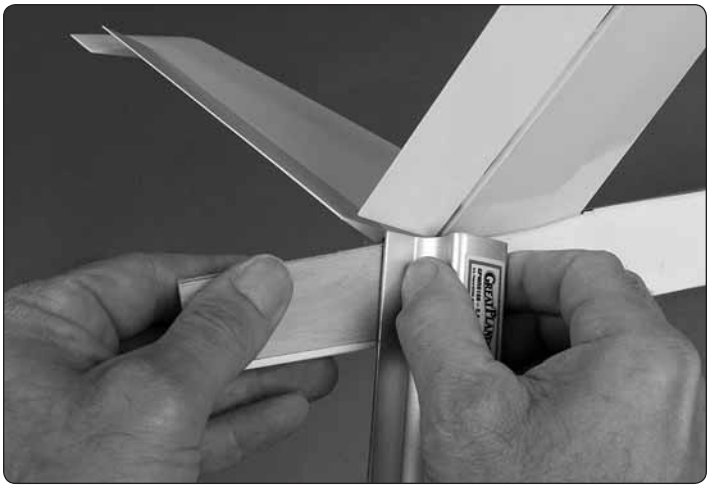
sides, but the bottom edge of each side cover transitions to rest on top of the fuselage bottom. If the resulting forward-facing edge of the side covers is objectionable (though this area will be out of view because it will be concealed by the V-tail), you could cut the fuselage sides to accommodate the front of the side covers, or sand the front of the side covers to a fine point that will smoothly blend down to the fuselage sides.

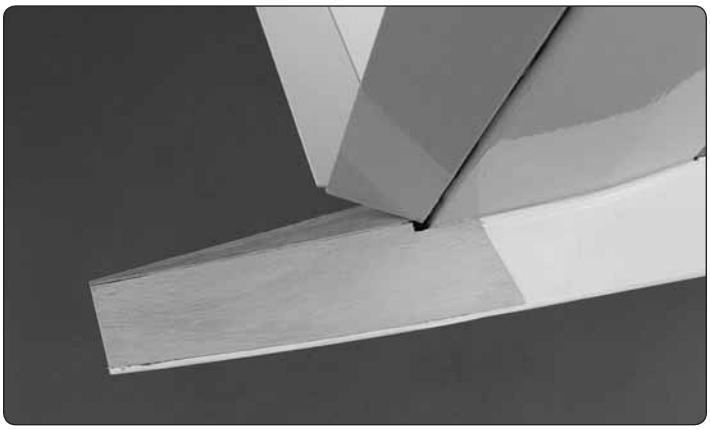
❏ 5. Glue the top cover into position.



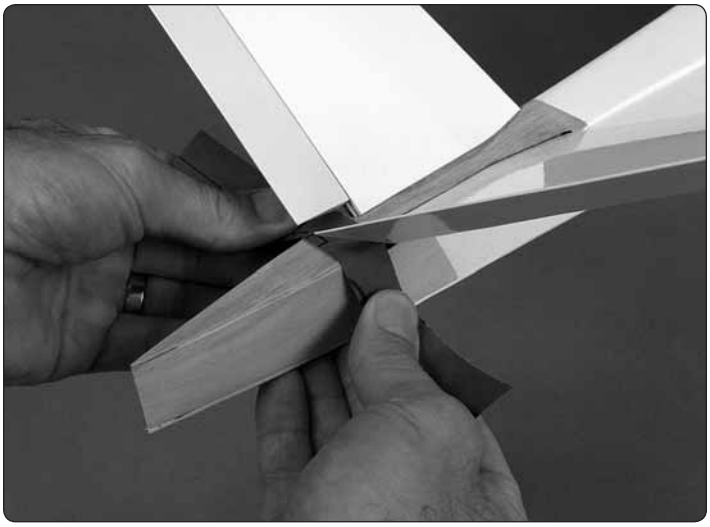
❏ 6. Cut and remove the covering from the fuselage sides where the side covers will fit. If your technique is to pinch the plane by the tail for launching for a pylon race, you may lightly reinforce the side covers by adding small "ribs" made from scrap balsa (not included).

❏ 7. Glue one, then the other side cover into position.

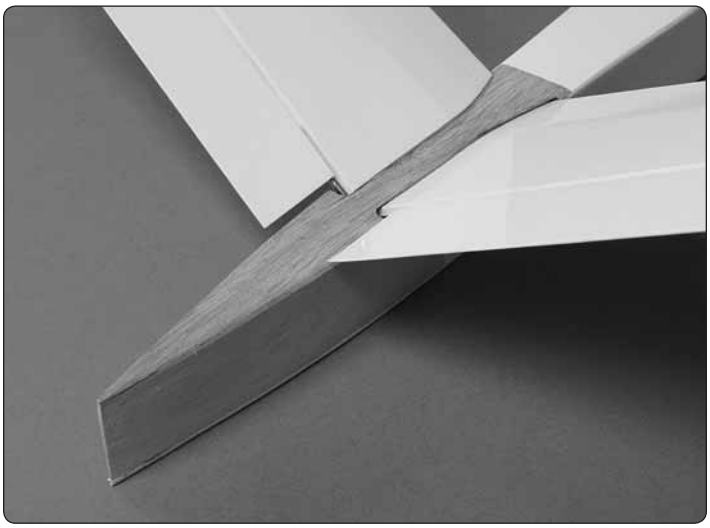


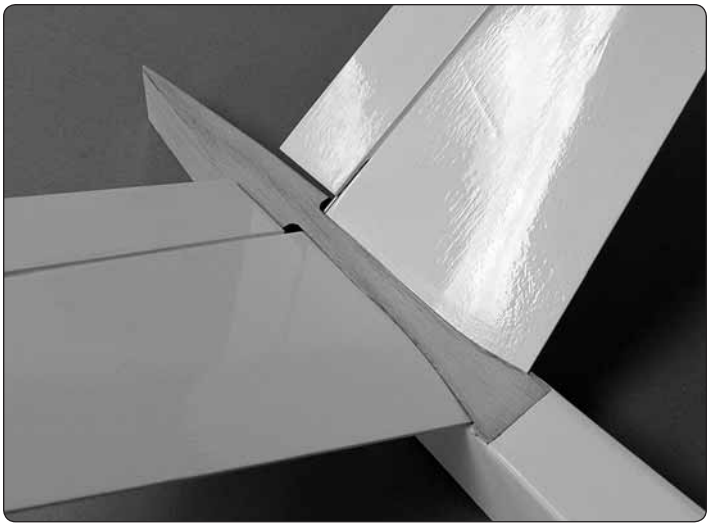


❏ 8. Sand the side covers even with the top cover.

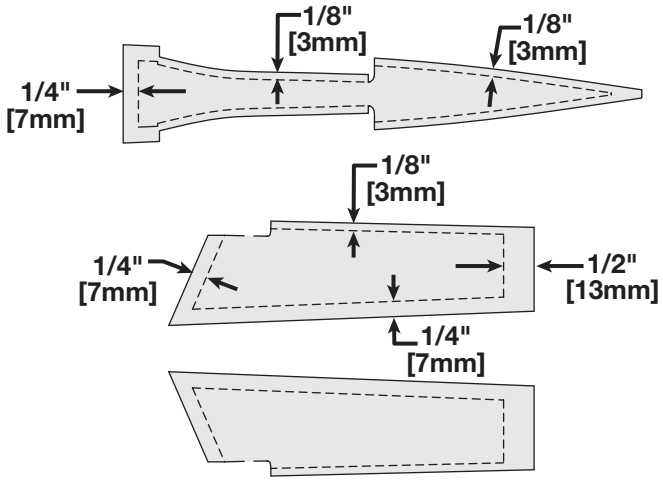


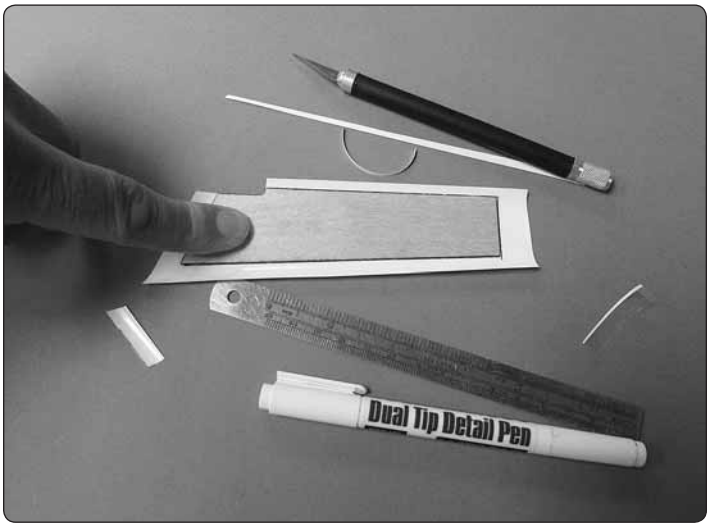
❏ 9. Continue sanding the side covers for a finished appearance—you can move the servos to hold the ruddervators in the extreme up and down positions for access with your sander. You can also have an assistant hold the fuselage while you use a strip of sandpaper to sand the corners of the covers at the root ends of the elevators where a sander won't fit.



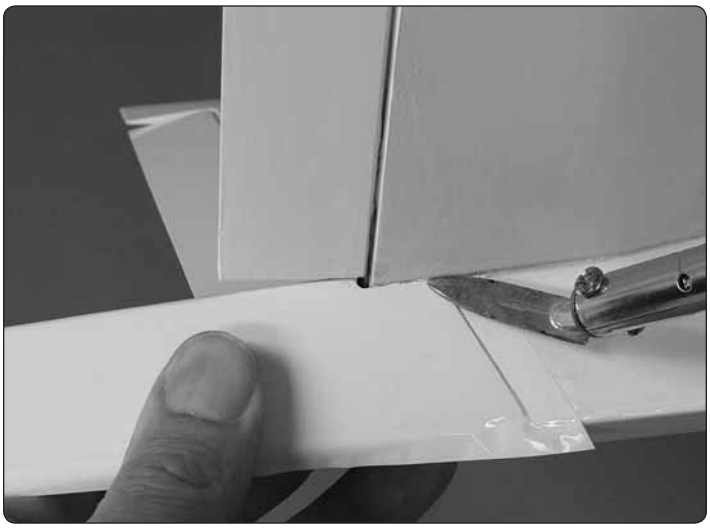


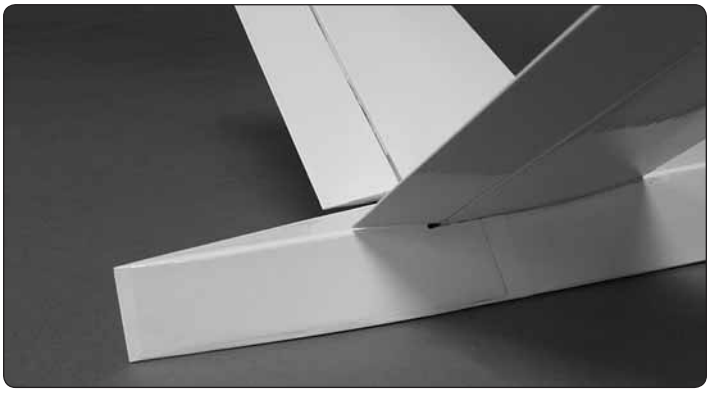
Here are a couple more images of the finished side covers ready for covering with MonoKote.



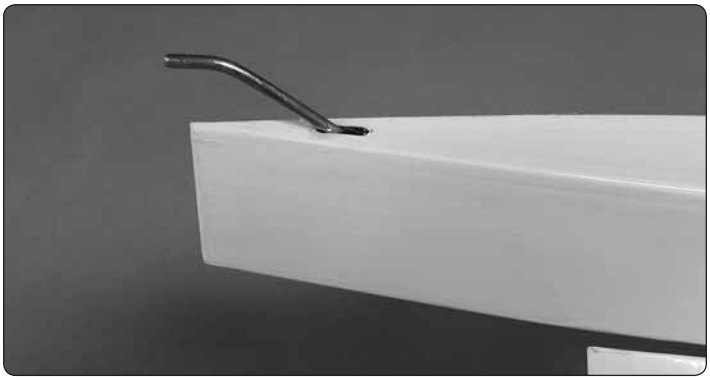


❏ 10. Using the approximate dimensions in the sketch, use a hobby knife and a straightedge to cut the pieces of MonoKote around the outlines you drew.





❏ 11. Use a covering iron to iron the MonoKote top, then the side pieces into place—a trim iron is also useful here.

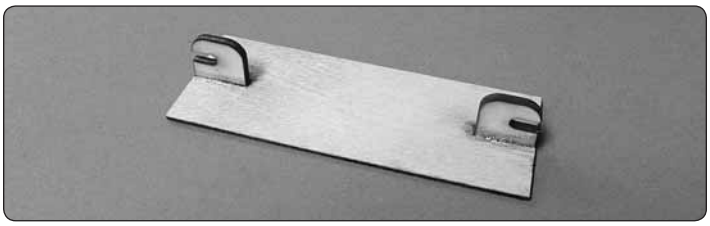


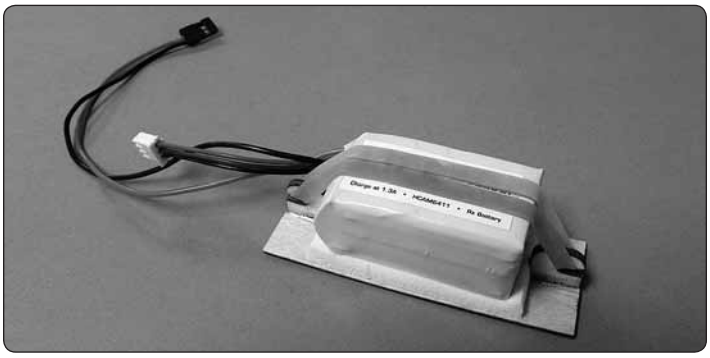
❏ 12. Glue the tail skid wire into place—non-permanent glue such as Zap Goo is recommended in case the skid ever wears down and requires replacement.

PREPARE THE MODEL FOR FLIGHT

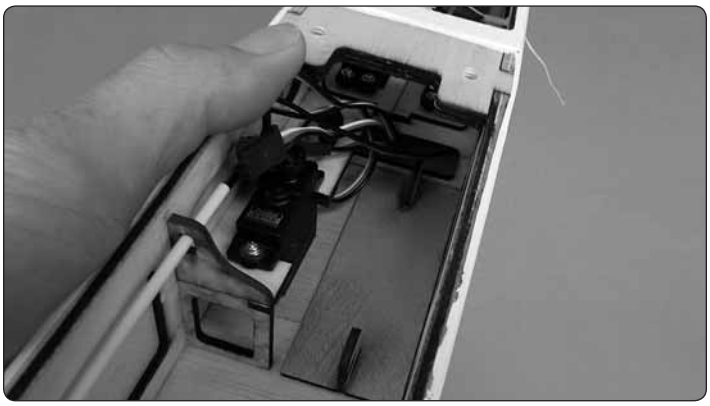
Install the Battery and Receiver

❏ 1. Now that the tail covers have been completed, you could do another C.G. check before determining where the receiver battery and receiver will be mounted.

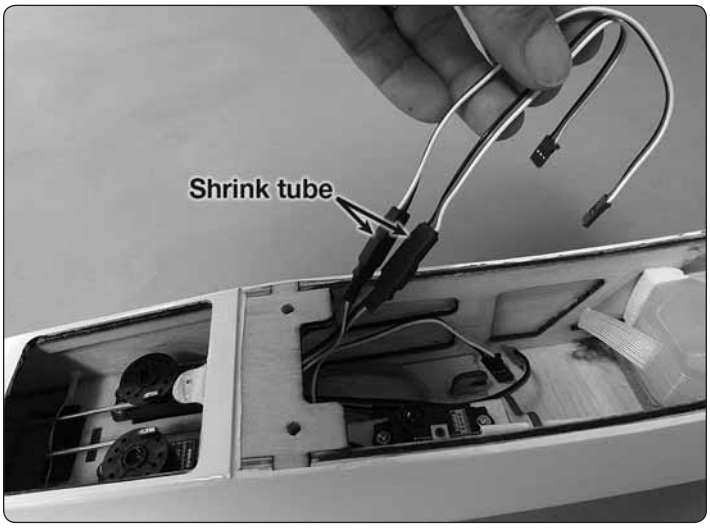




❏ 2. If you wish to use the included battery mount, assemble the mount and fit your battery. Or, use your own method to secure the battery.



❏ 3. Securely glue the battery mount into the fuselage, then mount your receiver and battery. 1/8" [3mm] double-sided adhesive foam tape was used to mount the receiver as shown, but first the fuselage bottom was coated with medium CA for better adhesion of the foam tape.



❏ 4. Depending on the length of the ruddervator servo wires and the location of your receiver, servo extensions may be required. If using servo extensions, secure the connection with pieces of 1/2" [13mm] shrink tubing.

❏ 5. If you prefer not to connect and disconnect the aileron servo wire directly into the receiver every time you install and remove the wing, you may also connect a servo extension to the aileron channel in your receiver.

Final C.G. Check

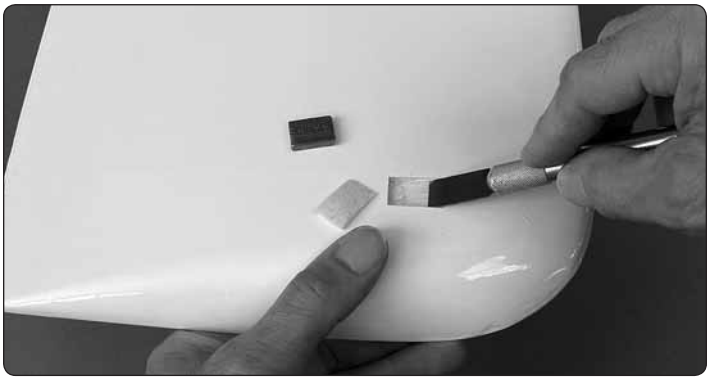
NOTE: Additional information regarding C.G., lateral balance and control throws is in the ***Trimming Notes*** section on page 34, but start by balancing your Quik-V6 as described below:

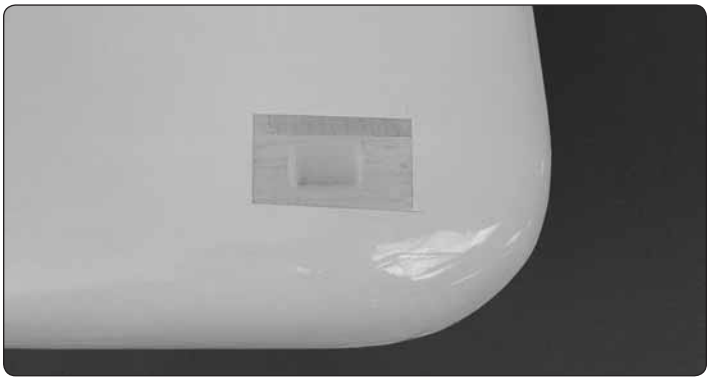
As stated earlier, a safe, beginning C.G. location is with the Quik-V6 balanced 3" [76mm] aft of the wing leading edge. The full C.G range is from 2-5/8" [67mm] to 3-1/4" [83mm]. The Quik-V6 will fly balanced beyond these measurements, but for pylon racing you'll probably find that you'll settle right on 3" [76mm] or possibly 1/8" [3mm] ahead of that (2-7/8" [73mm]) depending on your personal taste and preferences.

With the Quik-V6 in a completely ready-to-fly state (fuel tank empty) with all components installed including the propeller and propeller nut, use your C.G. Machine or balance lines marked on the bottom of the wing to do your final C.G. check. Make any adjustments needed to set the C.G. where desired.

Balance the Model Laterally

❏ 1. With the crankshaft at the bottom of its stroke (so the piston is not under compression and the crank shaft can move freely), lift the model by the spinner nut with the tail on the workbench so the model can rotate about the crankshaft. The weight and position of the engine will undoubtedly cause the Quik-V6 to rotate to the right requiring ballast in the left tip.





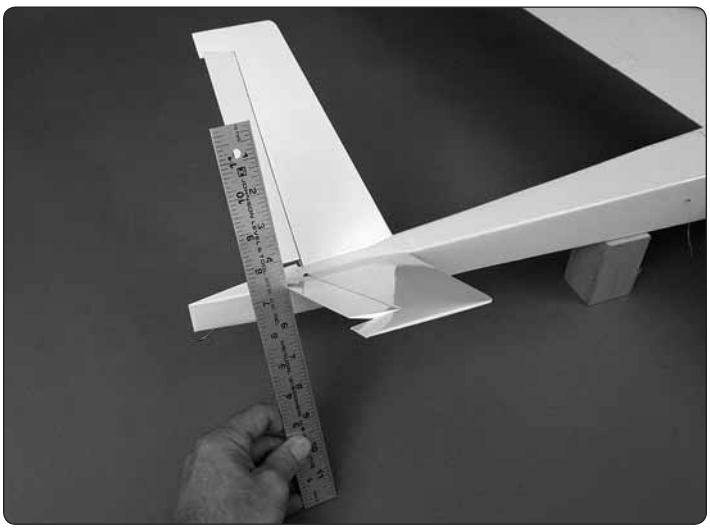
❏ 2. There are several ways to add tip weight, but one way is to cut a pocket into the tip, glue in the lead required, and then seal with MonoKote.

Set the Control Throws

Like many aspects of model setup for pylon racing, the control throws are a matter of personal taste. But the throws specified below will be a great starting point and should allow you to be comfortable enough to get the plane low and on the course immediately after the initial trim passes:

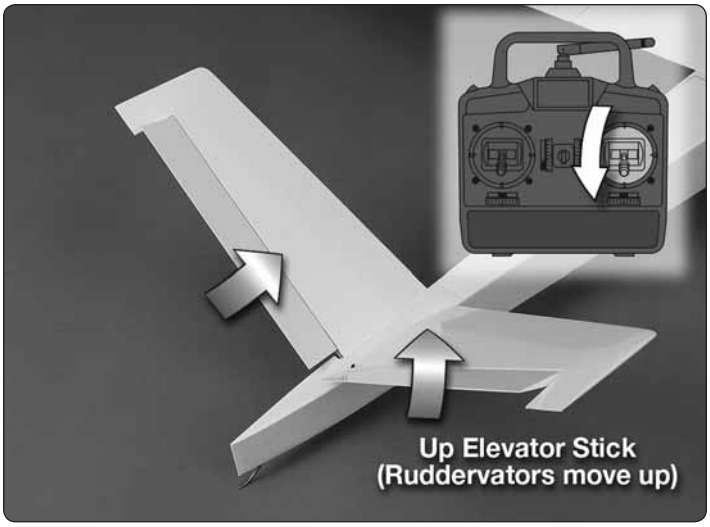
These are the recommended control surface throws:				
	HIGH RATE		**LOW RATE**	
ELEVATOR	**Up and Down**	7/32" [6mm] 10.2°	**Up and Down**	5/32" [4mm] 7.3°
RUDDER	**Right & Left**	7/32" [6mm] 10.2°	**Right & Left**	1/8" [3mm] 5.8°
AILERONS	**Up and Down**	7/32" [6mm] 10.1°	**Up and Down**	5/32" [4mm] 7.2°

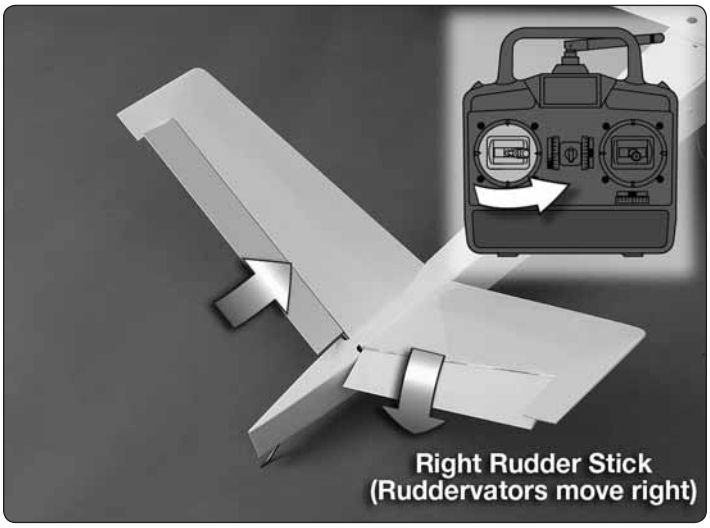
NOTE: The throw values provided in 1/32" increments may be rounded up to the nearest 1/16" if it's easier for you to measure.



❏ 1. Support the fuselage so the model will be level, then measure and set the throws. The ruddervators are measured with the ruler perpendicular to them.

❏ 2. While programming the radio, don't forget to set your ***Failsafe*** so when you turn off the transmitter (simulating loss of signal) the throttle/fuel cut servo causes the engine to stop.





❑ 3. Finally, make one last check to be sure all the controls are responding in the correct direction—same as a conventional tail, the ruddervators should move up with up elevator stick input and move right with right rudder stick input.

Basic Checklist

Perform these basic checks before heading out to the field:

❑ Receiver battery charged
❑ Servo mounting screws present and tight
❑ Servo wheel/arm retainer screws present and tight
❑ Fuel tank secure
❑ Engine and muffler bolts tight
❑ C.G. check
❑ Throws check
❑ Control response direction
❑ Failsafe set
❑ Spare parts:
  ❑ Glow plugs
  ❑ 10-24 nylon landing gear screws
  ❑ Propellers

CAUTION: ***Monitor the threads in the wing bolt plates each time you mount the wing to the fuselage to make sure they are strong. If there are ever signs of the threads breaking down, reinforce them with epoxy or CA and re-tap the threads.***

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.

Range Check

Don't forget to perform a ground range check as written in the instruction manual that came with your radio system to be certain it is operating correctly.

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.**

QUIK-V6 TRIMMING NOTES

By Jim Allen

Quickie 500 racing has seen its share of development since its inception in the early 70's, but the premise has remained the same; to develop the skills necessary for AMA 3-pole racing with simple, .40-size planes that fly well. The Quik-V6 is an example of the latest design in the series with a shoulder-wing and V-tail that originated with the original Quik-V in 1987.

Racing your Quik-V6 is fun, but it can be even better with a plane that is properly setup and trimmed making it as easy as possible to get around the course quickly and consistently—it all comes down to doing the *little things* that improve your lap times. The easier it is to fly those fast lap times consistently, the better your heat times will be. This guide will walk you through the process of trimming your Quik-V6 to allow you to make the most of its great flying qualities.

C.G.: If you haven't yet done so, accurately set the initial C.G. according to the specifications in this manual. Eventually, you may end up fine tuning the C.G. to adjust the way the plane flies on the course, but you need a good starting point and we'll cover adjusting the C.G. with flight trimming later.

LATERAL BALANCE: Now check the lateral balance also as described in this manual. Taping coins to the bottom of the wing works well, or you can use lead tape available at golf stores or on e-bay. Same as the C.G., lateral balance may also end up changing based on the way the plane flies.

THROWS: Over-controlling or over-flying a pylon racer results in lower lap times and consequently lower heat times. Every time you move a control surface you increase drag slowing the plane. The more you move the surfaces the more the plane slows. Minimizing control movement while maintaining a tight course will always result in faster lap times. Learning to fly those faster laps consistently will result in faster heat times and more heat wins. Set your throws as recommended in this manual. This will be a good place to start. Low rates are intended for racing and high rates are fine for sport flying or for landing in windy or bumpy conditions. When measuring throws, use a ruler with fine increments such as a machinist's 6-inch rule.

AILERON DIFFERENTIAL: Note that the rotation pin on the included swivel clevises on the aileron torque rods should provide close to equal up and down throw for the ailerons. This is important – you do not want more than a 1/32" [.8mm] difference in up vs. down. If there is a difference, more up throw than down throw is preferred. If necessary, the degree of up or down aileron throw can be altered by changing where the aileron pushrods connect to the aileron servo wheel—moving the pushrod holes in the servo wheel forward (toward the leading edge of the wing) will provide more up throw; the opposite will increase down throw. If you have to resort to this, a blank servo wheel will be required so you can drill your own offset holes. Try to work to make sure both ailerons are the same—the Quik-V6 does not require differential.

ELEVATOR SYNCHRONIZATION: For the Ruddervators, make sure the **elevator** movement is the same on both sides. Remember, the elevator is relying on separate servos and separate linkages potentially contributing to small differences in throw. If necessary, use the End Point adjustment in your radio to equalize elevator throw. Later, after flying, we may come back to this while trimming for the course, but begin by getting the throws as close as you can on the bench. Again, measure carefully with a fine-increment ruler.

FLIGHT TRIMMING: The plane is now ready to fly. The first order of business is always to get the plane trimmed for straight-and-level flight. Make extended passes at that are not too close and not too high so you can really get a good read on how it's trimmed. As the trimming process continues, always re-trim for level flight before you do anything else. And don't even think about putting your Quik-V6 down on the course until you've trimmed it! This is important.

TURN RADIUS: Whether racing around a 2-pole course (standing outside the course) or around the 3-pole course (standing within the course near pylons 2 and 3), your turns

always must be as efficient as possible. Pulling too hard on the elevator causes too much drag resulting in the loss of too much speed by the time you complete the turn. You may cover less distance, but you'll dramatically reduce your airspeed entering the following straight. Conversely, making too soft and wide a turn will take too much time by covering too much distance. Exit speed will be higher, but not enough to offset the distance flown. The optimum turn is somewhere between the two. Many of the fastest racers set their elevator throws so that they pull full elevator deflection around P1 (pylon 1) and around P2-P3. If you have your rate set correctly for the 3-pole course, you should be able to bank into pylon 2 and smoothly pull elevator to full deflection and end up just clearing pylon 3.

ROLL STABILITY IN TURNS: The next step is to dial in the *way* the plane turns. What we're after is a plane that, when banked 90°, it exits the turn still at a 90° bank without climbing or descending. We want the plane to fly as though the weight is equal on both wing tips. If one side is heavier than the other, the plane will roll toward the heavy side when you pull elevator. Even though the plane was laterally balanced on the workbench, sometimes other factors contribute to this unwanted roll, but you can still correct it by weighting the tip that reacts as though it is lighter. To check for this condition, fly the plane away from yourself so you can bank it 90°. Execute a full elevator 180° turn toward yourself simulating a pylon 1 turn. If the Quik-V6 rolls left or right, it will also climb or dive. If it rolls *out* of the turn and climbs, add weight to the lower wing. If the plane descends and rolls *into* the turn, add weight to the high wing. This will dramatically help with consistency of your laps and your ability to control the altitude as you navigate the course.

YAW STABILITY IN TURNS: Next is the rudder. Of course, same as with aileron and elevator, the plane must be trimmed for level flight without yawing left or right. Now, trim the rudder so that the plane is easy to hold a constant altitude through the turns and is comfortable holding a partial bank angle in the straights. Don't add too much rudder and cause it to fly tail low when banked. You want just enough to get the plane comfortable without descending or ascending as you fly the course.

If, when pulling elevator in a turn you do not observe the plane rolling, yet it still changes altitude exiting the turn higher or lower than the entrance, one ruddervator may be travelling farther than the other. For example, if the *left* ruddervator deflects slightly more than the right, this effectively adds *right* rudder as you pull. Of course, the opposite is true if the *right* ruddervator deflects more. This can be subtle to recognize, but can really make a difference in the way the plane flies. Use your End Point adjustments to add or remove a few percent of throw from the side you think is travelling farther. 3% to 5% can make a noticeable difference. When this adjustment is needed, it is most noticeable at the turn exit. Do not confuse this with the tip weight adjustments—they are correcting different problems.

TRACK TOWARD PYLON 1 (C.G.): Next, we'll dial in how the plane flies in the straightaways. This depends on what course you'll be flying (2-or 3-pole) and the distance. In AMA Class 424 and Class 426 we mostly use the 475' 3-pole course, but sometimes these classes are flown at the same event as Quarter Midget Class 422 on the longer 608ft course. The two-pole course distances used by some clubs also varies. On the longer courses, you'll obviously spend more time in the straights, making it more worthwhile to roll the wings closer to level. On the shorter, 475' 3-pole course, you'll find that the faster way around will be to *not* roll the wings closer to level in the straights. Then, you would roll out to a bank angle of approximately 45 to 80° in the straight. When viewed from above, your path around the three pole course will resemble the shape of an egg with the course in the straightaways being a gentle curve connecting the tighter turns on each end. If done correctly, this will reduce the time that you spend in each turn at high elevator deflection and the additional drag that comes with it.

To understand the adjustment required, you have to understand the effect of elevator trim on the trajectory the plane takes while banked. First, a plane with a farther forward C.G. will require more up elevator trim to fly straight-and-level than a plane with a farther aft C.G. And maybe not even much—just a couple of clicks. When banked to say, a 45° angle, the slightly nose-heavy situation with the up elevator trim will cause the plane to pitch toward the top of the fuselage, or drift slightly toward the pylon. Conversely, a plane with a farther aft C.G. (requiring less up trim) will cause the plane to make a less gradual turn toward the direction it is banked.

With this in mind, fly your Quik-V6 on the course. When you exit a turn, roll out to a 45 to 60° bank angle as you enter the straight and ease off the elevator. If the plane drifts toward pylon one before you want it to, move the C.G. aft a little, re-trim for level flight, then put it back on the course. It should now drift toward the pylon less than before. If it goes *too* straight for your preference, move the C.G. forward. Re-trim the Quik-V6, then put it back out on the course. It will now drift slightly more in the straights. The thing to remember is you may want the C.G. in a different location for a longer course with longer straightaways. Usually, you will want the C.G. slightly aft for a longer course to curve less in the straights.

Keep in mind that, while you're working through these steps, you may find one adjustment has a small effect on the other. That's okay. Just work with the different adjustments discussed to find a balance where all of these factors work well together. Once completed, you'll have a Quik-V6 that will be easier to fly faster and more consistently than one where you have to work so hard. These techniques apply to any pylon racing plane and much of it to any plane you fly.

You can continue to learn more by seeking out races and racers in your area and get to know them. The NMPRA is a great organization filled with members who enjoy helping the new guy develop their skills and helping them enjoy the thrill of pylon racing.

You can learn more about pylon racing and the NMPRA (National Miniature Pylon Racing Association) at **www.nmpra.org.** The complete rulebook is available at **www.modelaircraft.org**.

QUIK-V SERIES HISTORY

By Jim Allen

The original Quik-V made its debut back in 1987. It was the first shoulder-wing/V-tail combination for Quickie 500 racing. Back then, shoulder-wings were prevalent, but only with conventional tails or T-tails. Doug Whitaker from Tennessee was the first person I saw with a V-tail, but his plane had a low wing.

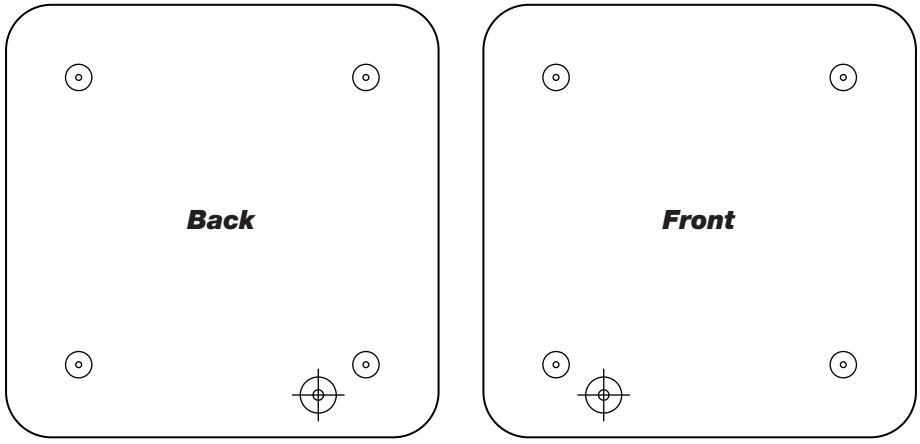
When I set out to make my own design, I not only wanted to be different, but I felt a V-tail could fly better by having most of the tail in undisturbed air and one less drag-inducing intersection between the tail and fuse. I also preferred the high wing for less drag and improved stability—air travels faster over the *top* of the wing than the bottom. Having the draggy wing/fuse joint on the *bottom* of the wing places it in the slower air for less drag. The shoulder wing also doesn't require dihedral, so it can be made one-piece for increased strength for a given weight.

My first Quik-V featured external pushrods and tip fences to control airflow. It sure was stable!

The Quik-V2 debuted just before the 1990 Nats with a new airfoil, a smaller V-tail and slimmed fuselage. In 1993, the Quik-V3 debuted, again just before the 1993 Nats in Lawrenceville, IL. V3 was one of the first quickies to maximize the aspect ratio by using a full, 52-inch span and the narrowest cord possible to meet the just-over-500 square-inch requirement. It also incorporated the upward-curved wing tips still used on the Quik-V6! V3 also used another new airfoil by Harry Riblet, who also described the tip shape to me. With V3 we were beginning to see a consistent speed advantage over the other quickies of the day—especially when most races switched to the 608' course in 1994.

In the winter of '94-'95 I started working on the Quik-V4—the first version with concealed ruddervator linkages. Mike Delponte did this a few years earlier on his *Revolution* and I finally got around to doing it on the Quik-V. We also positioned the V-tail so that it exited the fuselage from the corners—same as the Quik-V6 is today. V4 showed how good the V3 wing really was. We had at least a 2-second advantage on everybody! Gary Schmidt and I went to the '95 Nats and were blowing everyone away. I ended up getting a zero for a reason I've forgotten, but Gary went on to win easily and I got fast time. We won a *LOT* with these planes over the next few years! The following year at the '96 Nats, Gary and I tied for 1st and I won in a fly-off against him. Late in '96, I acquired access to an airfoil analysis program and went to work. The airfoil I came up with went into the Quik-V5 that had all the attributes of V4 and an even further slimmed fuselage. Only three V5s were built—one by me and two by Gary. Gary eventually lost both of his, but I still have mine. We basically dominated the 1999 *Winterfest* race here in Phoenix, AZ. Last fall at the Whittier 2014 October race, I pulled out that V5 and raced it just for giggles. I won 426 both days! Other designs have caught up with the Quik-V5, but have not passed it in performance—even with composite wings. It took a couple more years for other airplanes to evolve and begin to close the gap.

Beginning in 2002, I was wanting to focus more on QM. I worked out a deal with Terence Palaschuk from Canada to fly his *Neme-Q* composite quickies and help him develop his new version. Terence stopped making planes and I've been gradually using up the ones I had. In addition, our sport needed a new wood-and-foam quickie that is competitive with the current crop of composite wing and all-composite quickies. Most thought it was not possible to win without a composite wing. So the Quik-V6 was born and has clearly disproven that theory. The Quik-V6 incorporates everything I learned developing the previous Quik-Vs and other race planes since. The structure was designed with laser-cutting and ARF construction in mind and uses my latest airfoil developed specifically for the Quickies. It uses all the key features from the previous versions with moments and tail areas for today's engines and equipment. The design has proven to be dead-competitive and flies as good as or better than any quickies today—even with MonoKote finish! Winning the 2014 Quickie Nats really sent that message home.



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