VIPER™ 500 ARF

INSTRUCTION MANUAL

Wingspan: 52 in [1320mm]
Wing Area: 504 sq in [33dm²]
Weight: 3.5 lbs - 4 lbs [1360 - 1530g]
Wing Loading: 14 - 15 oz/sq ft [42 - 47 g/dm²]
Length: 41-1/4 in [1048mm]
Engine: .25 - .46 cu in [4.0 - 7.5cc] two-stroke

IMPORTANT NOTE: This model is designed for sport flying and AMA Quickie 500 racing. We will not quote all of the AMA regulations for Quickie 500 racing in this manual. Any information provided here regarding racing is provided for informational purposes only and is NOT guaranteed to be accurate. Only the printed version of the AMA regulations should be used in case of protests or other disputes involving events covered by the regulations.

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.

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

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INTRODUCTION

Once they've mastered a trainer and some sport models, many modelers find "the need for speed." Whether you're ready for your first Quickie 500 race, you've been racing for years, or never plan to race anyone but yourself, the Viper 500 ARF is a great choice for you. This aircraft is fast and responsive, yet predictable – an overall real pleasure to fly. Of course, a Quickie 500 is not recommended as a second aircraft, but if you can comfortably fly most sport models, then the Viper 500 ARF should pose no surprises other than the thrill of speed! Remember, if the model's speed overwhelms you, just throttle back and enjoy the Viper's ability to settle back into "sport mode." Then you can fly at reasonable speeds until your confidence and skill are up to their full-speed adrenaline rush!

COMPETITION

The Viper 500 ARF is designed for sport flying and AMA Quickie 500 pylon racing competition according to the regulations as written at the time of this printing. Great Planes does not guarantee that the model will be legal for future competitive events, nor qualification of this model in any such competitions. All liability for any events incidental to the use of this model in any manner is the sole responsibility of the pilot and the pilot's insurance, not Great Planes.

If interested in Quickie 500 competition, we recommend you contact the AMA and receive a copy of the full competition regulations. You can download a reference version at www.modelaircraft.org, but please note that the AMA does not recognize the digital copy for protests.

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

1. Your Viper 500 ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Viper 500 ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.

3. You must take time to **build straight, true** and **strong**.

4. You must use an R/C radio system that is in first-class condition, and a correctly sized engine and components (fuel tank, wheels, etc.) throughout the building process.

5. You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air.

6. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.

7. If you are not already an experienced R/C pilot, you should fly the model only with the help of a competent, experienced R/C pilot.

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

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

If you 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.

In addition to joining an R/C club, we strongly recommend you join the AMA (Academy of Model Aeronautics). AMA membership is required to fly at AMA sanctioned clubs. There are over 2,500 AMA chartered clubs across the country. Among other benefits, the AMA provides insurance to its members who fly at sanctioned sites and events. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. Contact the AMA at the address or toll-free phone number below:

AMA
SINCE 1936

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Tele: (800) 435-9262
Fax (765) 741-0057
Or via the Internet at:
http://www.modelaircraft.org

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Viper 500 ARF that may require planning or decision-making before starting to build. Order numbers are provided in parentheses.

Radio Equipment

❏ Receiver: standard size, minimum 4-channel.
Note: Due to the unusually high speeds and stresses placed upon racing models such as the Viper 500 ARF, lightweight components such as "micro" or "feather" receivers normally intended for lightweight airplanes (such as Park Flyers) should not be used. The Futaba® R148DF or R148DP receivers are suitable. Additionally, due to the space constraints of the radio compartment, make certain the components fit before purchasing new gear.

❏ 250mAh Lightweight receiver pack: (FUTM1210)
❏ Servo extensions: (2) 9" extensions to allow easy connection of throttle and aileron servos (FUTM3910)
❏ Switch: Standard, with heatshrink to secure to battery
❏ Servos: (4), 3 requiring 35 oz-in of torque
❏ Servo recommendations: The Viper 500 ARF is designed to fit a wide variety of servos. All servos may be mid-size or standard-size servos, so long as they provide at least 35 ounces-inch of torque. The throttle servo may be micro through standard, so long as it provides sufficient torque to operate your carburetor.

Engine Recommendations

The recommended engine size range for the Viper 500 ARF is .25 to .46 cu in [4.0 – 7.5cc] two-stroke. This model is not designed for a four-stroke. As of the time of this writing, the maximum power plant allowed for Quickie 500 racing is a .40 [6.5cc] two-stroke, and only front-intake, side-exhaust, commercially available, unmodified engines with stock carburetors, utilizing approved propellers and fuels, are permitted.

REMEMBER: We will not quote all of the AMA regulations for Quickie 500 racing in this manual. Any information regarding racing is provided for informational purposes only and is NOT guaranteed to be accurate. Only the printed version of the AMA regulations should be used in case of protests or other disputes involving events contained in the regulations.

ADDITIONAL ITEMS REQUIRED

Adhesives & Building Supplies

In addition to common household tools and hobby tools, this is the "short list" of the most important items required to build the Viper 500 ARF. ***Great Planes Pro™*** *CA and Epoxy glue are recommended.*

❏ 1/2 oz Thin CA (GPMR6001)
❏ Drill bits: 1/16" [1.6mm], 3/16" [4.8mm], 1/4" [6.4mm]
❏ R/C foam rubber 1/4" [6mm] - (HCAQ1000)
❏ R/C foam rubber 1/2" [13mm] - (HCAQ1050)
❏ Fiberglass cloth to secure the throttle pushrod

Optional Supplies & Tools

Here is a list of optional tools mentioned in the manual that will help you build the Viper 500 ARF.

- ❏ Hobbico® Heavy-Duty Scissors 8-1/2" (HCAR0670)
- ❏ 2-56 and 6-32 Taps
- ❏ AccuThrow™ Control Surface Deflection Meter (GPMR2405)
- ❏ CG Machine™ (GPMR2400)
- ❏ 4-in-1 Clevis Installation Tool (GPMR8035)

Covering Tools

- ❏ Top Flite® MonoKote® sealing iron (TOPR2100)
- ❏ Top Flite Hot Sock iron cover (TOPR2175)
- ❏ Top Flite MonoKote trim seal iron (TOPR2200)
- ❏ Top Flite MonoKote heat gun (TOPR2000)

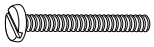
IMPORTANT BUILDING NOTES

- There are two types of screws used in this kit:

Sheet metal screws are designated by a number and a length. For example #6 x 3/4".

This is a number six screw that is 3/4" long.

Machine screws are designated by a number, **threads per inch**, and a length. **SHCS** is just an abbreviation for "socket head cap screw" and that is a machine screw with a socket head. For example 4-40 x 3/4".



This is a number four screw that is 3/4" long with forty threads per inch.

- When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.

- Whenever the term ***glue*** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.

- Whenever just ***epoxy*** is specified you may use ***either*** 30-minute (or 45-minute) epoxy ***or*** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.

- **Photos** and **sketches** are placed ***before*** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

- The Viper 500 ARF is factory-covered with Top Flite MonoKote film. Should repairs ever be required, MonoKote can be patched with additional MonoKote purchased separately. MonoKote is packaged in six-foot rolls, but some hobby shops also sell it by the foot. If only a small piece of MonoKote is needed for a minor patch, perhaps a fellow modeler would give you some. MonoKote is applied with a model airplane covering iron, but in an emergency a regular iron could be used. A roll of MonoKote includes full instructions for application. Following are the colors used on this model and order numbers for six foot rolls.

Red–TOPQ0201
White–TOPQ0204

COMMON ABBREVIATIONS

Fuse = Fuselage
Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
Ply = Plywood
" = Inches
mm = millimeters
SHCS = Socket Head Cap Screw

MANUAL UPDATES

For the latest technical updates or manual corrections to the Viper 500 ARF, visit the Great Planes web site at *www.greatplanes.com*. Open the "Airplanes" link, then select the Viper 500 ARF. If there is new technical information or changes to this model, a "tech notice" box will appear in the upper left corner of the page.

Do not discard the kit box! With minimal disassembly, the Viper 500 ARF can be reinserted into its box for transport and even shipment to contests!

ORDERING REPLACEMENT PARTS

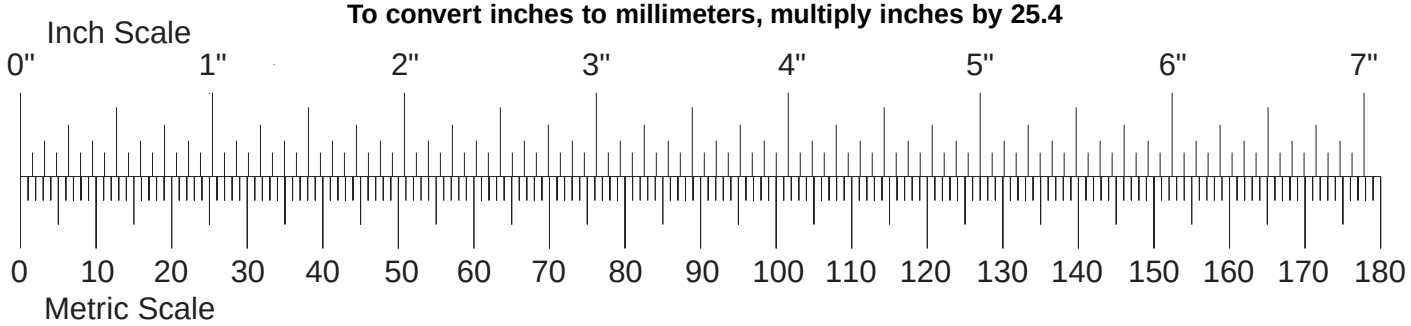
To order replacement parts for the Great Planes Viper 500 ARF, use the order numbers in the **Replacement Parts List** that follows. Replacement parts are available only as listed. Not all parts are available separately (an aileron cannot be purchased separately, but is only available with the wing kit). Replacement parts are not available from Product Support, but can be purchased from hobby shops or mail order/Internet order firms. Hardware items (screws, nuts, bolts) are also available from these outlets. If you need assistance locating a dealer to purchase parts, visit **www.greatplanes.com** and click on "Where to Buy." If this kit is missing parts, contact **Great Planes Product Support**.

Replacement Parts List

Order Number		Description	How to Purchase
		Missing pieces	Contact Product Support
		Instruction manual	Contact Product Support
White Version (GPMA1265)	**Red Version (GPMA1266)**	Full-size plans	Not available
GPMA2500	GPMA2505	Wing Kit	Contact Your Hobby Supplier to Purchase These Items
GPMA2501	GPMA2506	Fuse Kit	
GPMA2502	GPMA2507	Tail Set	
GPMA2503	GPMA2508	Landing Gear	
GPMA2550		Backplate Mount	
GPMA2551		Racing Wheel Set (w/hardware)	
GPMA2552		Fuel Tank	
GPMA2553		Decal	

*Motor mount available separately

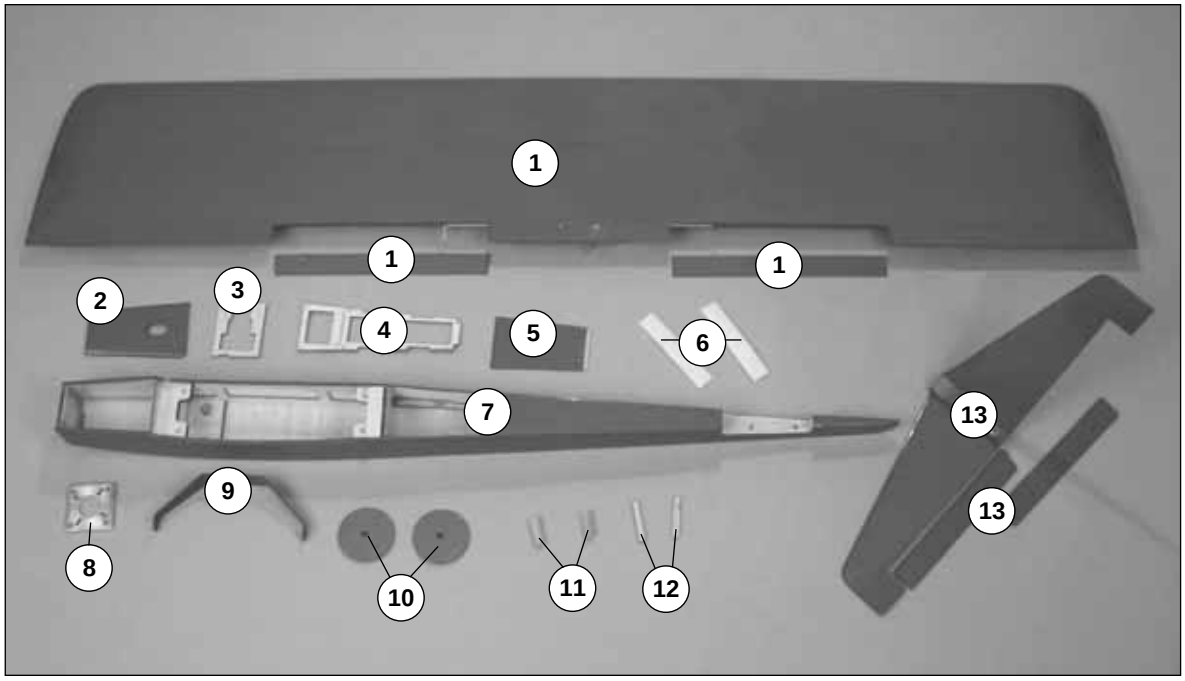
To convert inches to millimeters, multiply inches by 25.4



KIT CONTENTS

Before starting to build, use the **Kit Contents** list to take an inventory of this kit to make sure it is complete, and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Great Planes Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list on this page.

Great Planes Product Support:
Telephone: (217) 398-8970
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com



Kit Contents (Photographed)

1 Wing and Ailerons
2 Tank Hatch
3 Throttle Servo Tray
4 V-tail Servo Tray
5 Servo Hatch
6 Hook and Loop Material
7 Fuselage
8 Engine Mount
9 Landing Gear
10 Wheels
11 Aileron Servo Rails
12 V-tail Servo Supports
13 V-tail with Ruddervators

Kit Contents (Not Photographed)

(2) Aileron Torque Rod Horns
(5) Nylon Clevises
(2) 6" [150mm] Pushrods
(1) 11-3/4" Outer Pushrod Tube
(3) 17-1/2" [445mm] Pushrods
(5) Clevis Retainers
(4) Nylon Faslinks (GPMQ3820)
(1) Screw-Lock Connector (for throttle, GPMQ3870)
(2) Control Horns w/Backplates
(4) 2-56 x 3/8" Control Horn Screws (GPMQ3900)
(4) 6-32 x 1/2" [13mm] Socket Head Cap Screws (to mount engine, GPMQ3028)
(4) 8-32 x 1-1/2" [38mm] Flat-Head Screws (to mount tail, wing, GPMQ3052)
(2) 8-32 x 3/4" [38mm] Flat-Head Screws (to mount wing, GPMQ3046)
(4) 6-32 x 1/4" Bolts (for main landing gear, GPMQ3024)
(5) #2 x 3/8" Screws (to mount servo tray and hatch, GPMQ3820)
(1) #2 Washers (to mount servo tray and hatch, GPMR3400)
(1) 2" x 9" CA Hinge Strip (GPMQ3960)
(1) Tail Skid (GPMQ4445)
(2) Axles

BUILDING INSTRUCTIONS

Preparations

❏ 1. If you have not yet done so already, remove the parts of the kit from the box and inspect them for damage. If any parts are damaged or missing, contact product support at the address or telephone number on page 6. **Note:** With minor disassembly, the plane will fit back into the box. This makes a great way to transport your plane to races.

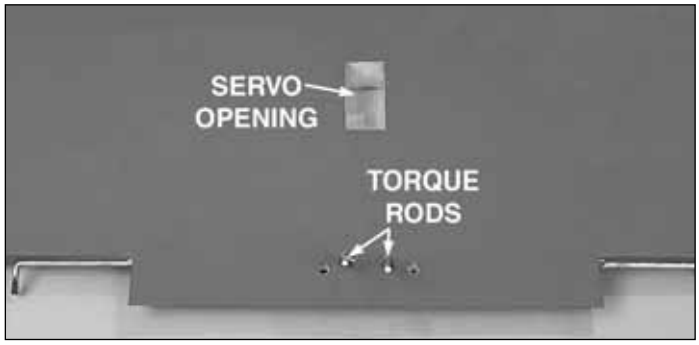
❏ 2. Remove the masking tape and separate the ailerons from the wing and the ruddervators from the V-tail. Where necessary, use a covering iron with a covering sock to tighten the covering that may have loosened during storage or from removing the masking tape. Apply pressure over sheeted areas and the servo openings to **thoroughly** bond the covering to the wood.

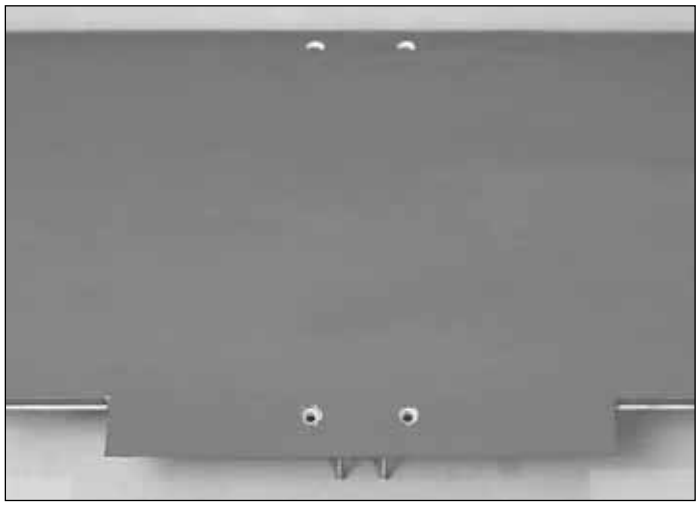
EXPERT TIP

All iron-on coverings sag due to extreme temperature and humidity changes, often encountered during shipment and warehouse storage. In nearly every case of an ARF having sagged covering, this is the cause, and a quick touch-up will solve the problem. To be sure, simply touch up your model's covering, then let it sit overnight. The covering should remain taut and will be fine from here on. If the covering has re-sagged significantly on any portion of the model, please contact Product Support regarding replacement.

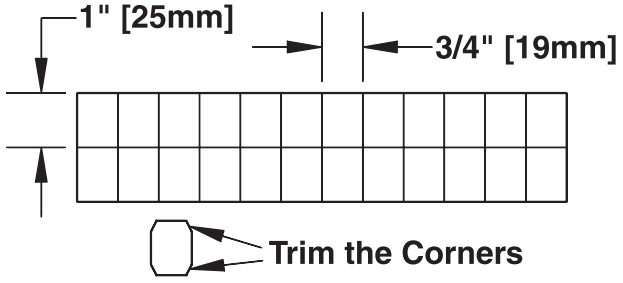
BUILD THE WING & TAIL

Mount the Ailerons

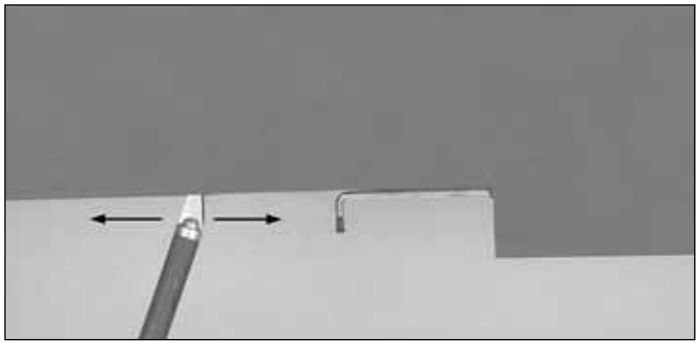




❏ 1. Looking at the bottom of the wing as shown in the top photo (the aileron torque rods protrude from the bottom of the wing), cut the covering from the servo opening and the bottom of the four wing bolt holes. Turn the wing over and cut the covering from the top of the 4 bolt holes.

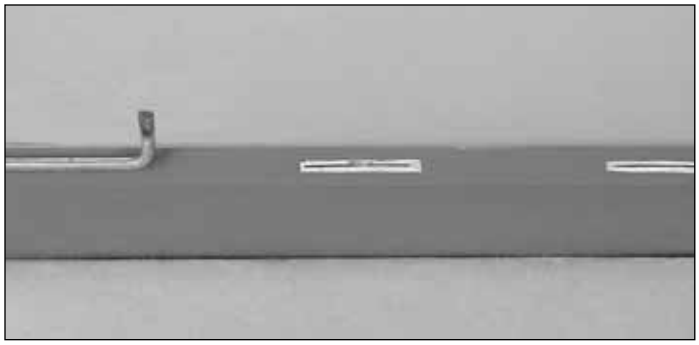


❏ 2. Cut six 3/4" x 1" [19 x 25mm] hinges from the 2" x 9" [50 x 230mm] CA hinge strip. Snip the corners off so they go in the hinge slots more easily.

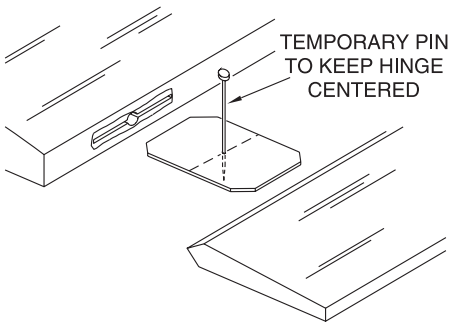


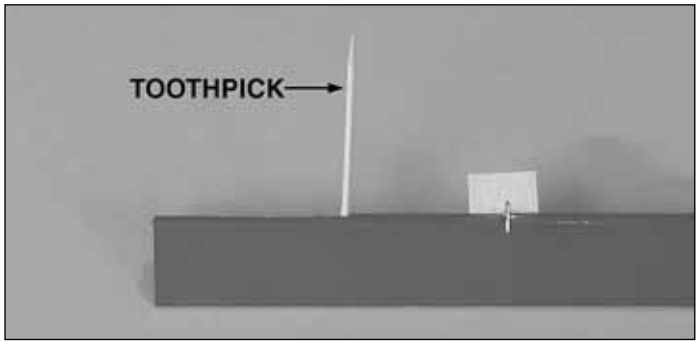
❏ 3. Test fit, but do not glue the aileron to the wing with the hinges. If you have difficulty inserting the hinges, insert a #11 blade into the slot and **carefully** move it back and forth to slightly widen the slot.

❏ 4. Separate the ailerons from the wing and take out all the hinges.



❏ 5. Cut a small strip of covering from both sides of each hinge slot. If not done the covering may interfere with the penetration of the CA into the slot and the free movement of the aileron.

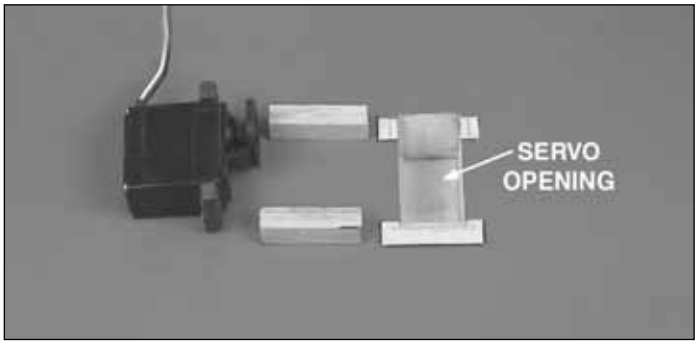




❏ 6. Stick a pin through the center of each hinge. Fit the hinges into the ailerons. Use a toothpick to push epoxy into the torque rod hole in the aileron. Fit the ailerons to the wing with the hinges. The pin will keep the hinge centered. Remove the pins from the hinges. Adjust the ailerons so there is a small gap–just enough to see light through or to slip a piece of paper through.

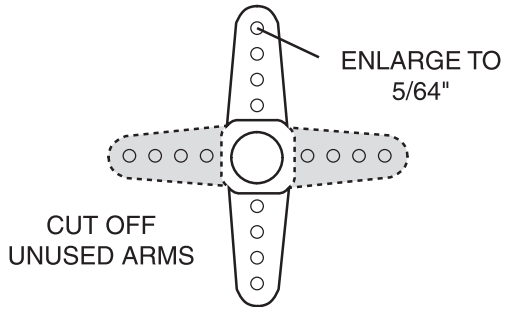
❏ 7. Apply six drops of **thin** CA to the top and bottom of each hinge. **Do not** use CA accelerator. Gently work the aileron up and down while the glue hardens. After the CA has fully hardened, test the hinges by pulling on the ailerons.

Install the Aileron Servo & Pushrods



❏ 1. Test fit the aileron servo and the 3/8" x 3/8" x 1-1/4" [9.5 x 9.5 x 32mm] basswood aileron servo rails in the wing. Mark the covering around the rails. Remove the covering from the contact area between the rails and the wing. Epoxy the rails to the wing.

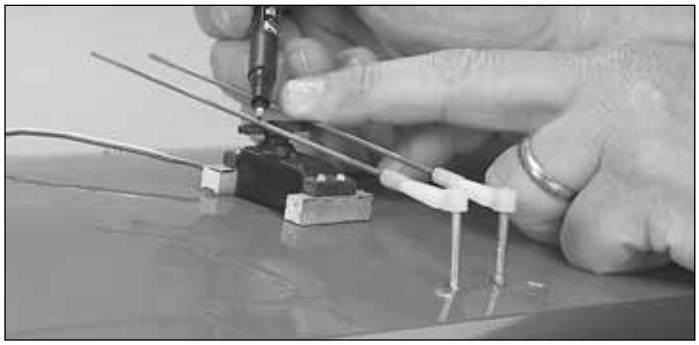
❏ 2. Mark and drill 1/16" [1.6mm] holes through the servo rails for the servo screws. Add a few drops of thin CA to the holes and allow to fully harden. Mount the aileron servo using the hardware that came with the servo.



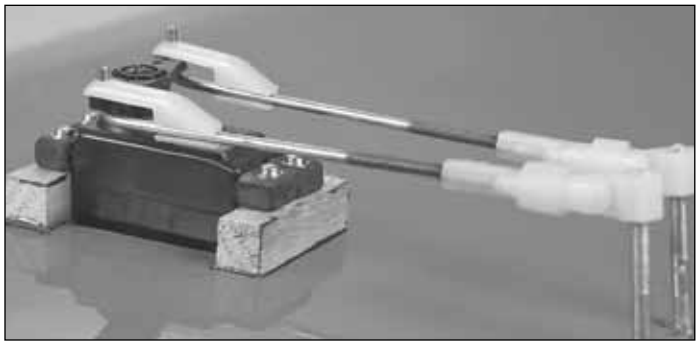
❏ 3. Make a two-sided servo arm. Enlarge the holes in the arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit) so the aileron pushrods will fit.

❏ 4. Thread both nylon torque rod horns onto the aileron torque rods until the edge of the horn aligns with the edge of the rods. **Note:** Turning a 6-32 tap through the horns will make them turn onto the torque rods easier.

❑ 5. Thread a clevis 20 full turns onto each of the 6" [150mm] pushrods.



❑ 6. Attach the clevises to the torque rod horns. With the servo centered, the servo arm parallel to the LE of the wings and the ailerons centered, use a fine-point felt-tip pen to mark the spot that the pushrods cross the outermost holes in the servo arm.



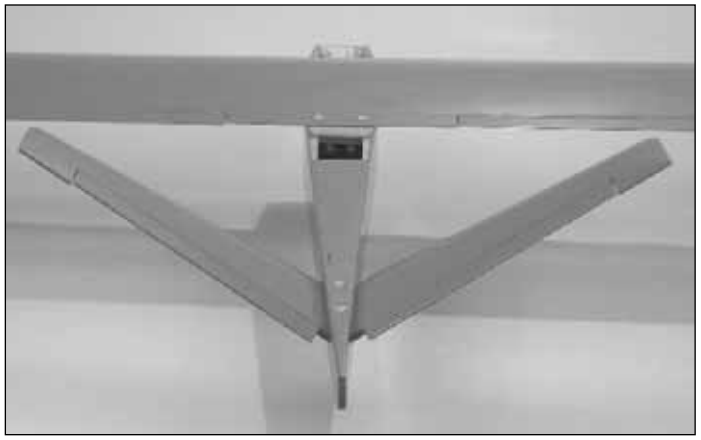
❑ 7. Slide the silicone retainers over the pushrods and onto the clevises. Bend the pushrod upward 90 degrees on the mark you made. Attach the pushrods to the servo arm with two Faslinks. Cut off the excess pushrod. Be certain to leave 1/16" [2mm] of wire protruding from the Faslink as shown.

Assemble & Mount the V-tail

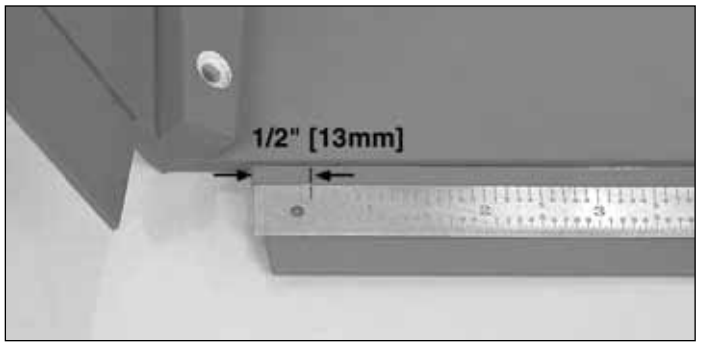
❑ 1. Cut the covering from the top and bottom of the V-tail that covers both bolt holes. Cut the covering around the hinge slots on the V-tail and the ruddervators the same as you did with the wing. Permanently attach the ruddervators to the V-tail the using the same hinging technique used with the ailerons.

❑ 2. Bolt the V-tail to the fuse with two 8-32 x 1-1/2" [38mm] flat-head screws.

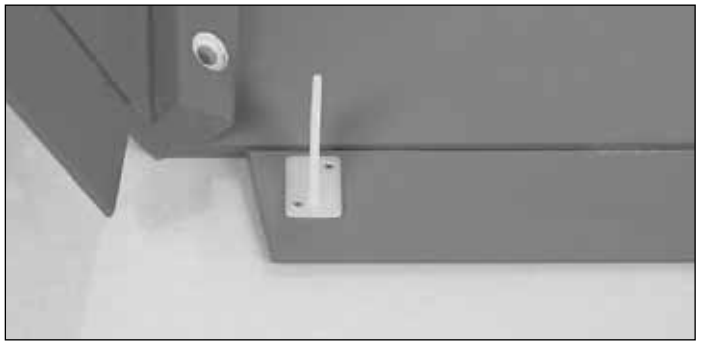
❑ 3. Bolt the wing to the fuse with two 8-32 x 1-1/2" [38mm] flat-head screws for the LE and two 8-32 x 3/4" [19mm] flat-head screws for the TE.

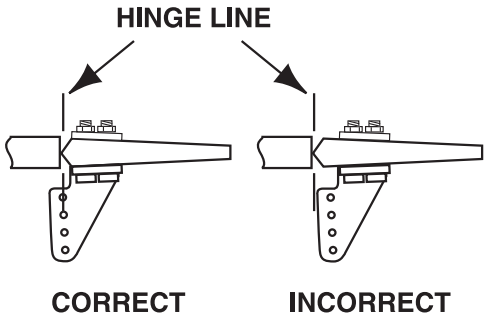


❑ 4. Stand two to three yards or meters behind the plane and sight straight down the center of the fuse. Without moving side to side, approach the plane until you can see if the LE of the V-tail aligns with the TE of the wing. If they do not align, sand the high side of the wing saddle a small amount at a time until the wing and V-tail align with each other.



❑ 5. Mark the top LE of both ruddervators 1/2" [13mm] from the inboard edge.



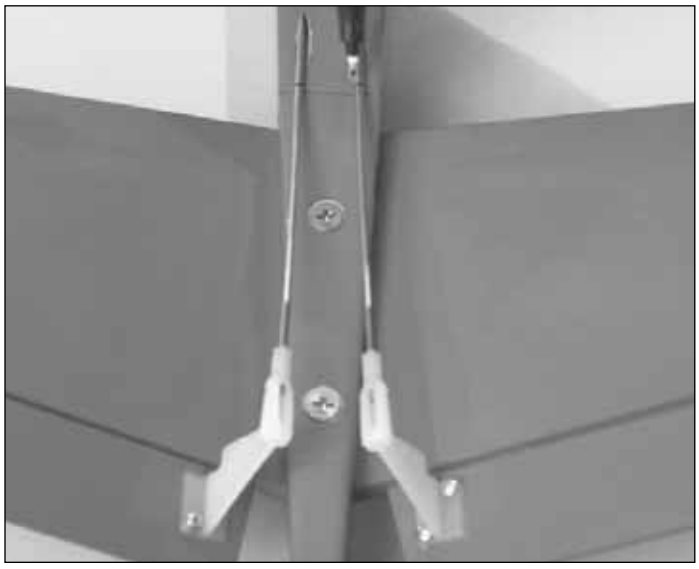


❑ 6. Position the control horn centered over the mark. Mark the hole locations on the ruddervators. Drill 1/16" [1.6mm] holes through the ruddervators for mounting the control

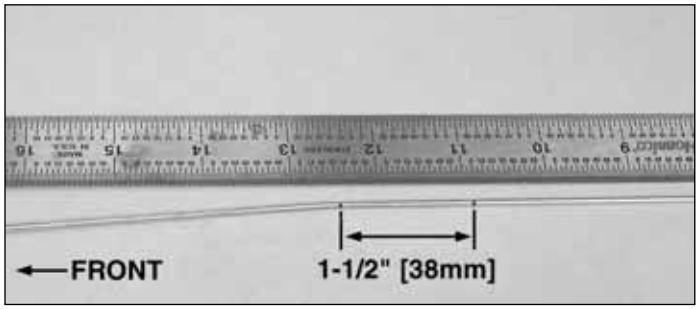
horns. Mount the control horn using 2-56 x 3/8" [9.5mm] machine screws and the nylon backing plate on the bottoms of the ruddervators. **Note:** Turning a 2-56 tap through the back plate holes makes it easier to get the screws to thread into the back plate.

❑ 7. If you removed the V-tail from the fuse, reinstall it. Thread a clevis 15 full turns onto two of the 17-1/2" [445mm] pushrods.

❑ 8. Trim the covering from the pushrod tube exits that are in front of the V-tail on top of the fuse.



❑ 9. Slide the 17-1/2" [445mm] pushrods into the guide tubes in the fuse. Connect the clevises to the outer hole on the control horns. With the elevators centered, mark the pushrods where they cross the V-tail joint.



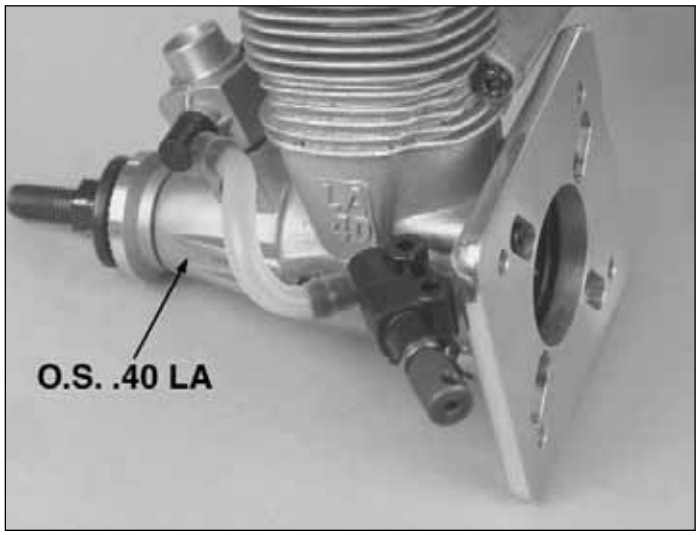
❑ 10. Remove the pushrods. Make another mark 1-1/2" [38mm] in front of the first. At the forward mark make a slight bend. Reinstall the pushrods and attach the clevises. **Note:** This bend is to make the pushrod move as freely as possible in the pushrod tube. It may take several small adjustments to get friction-free movement. It is worth the effort, so take your time until there is no friction.

FINAL ASSEMBLY

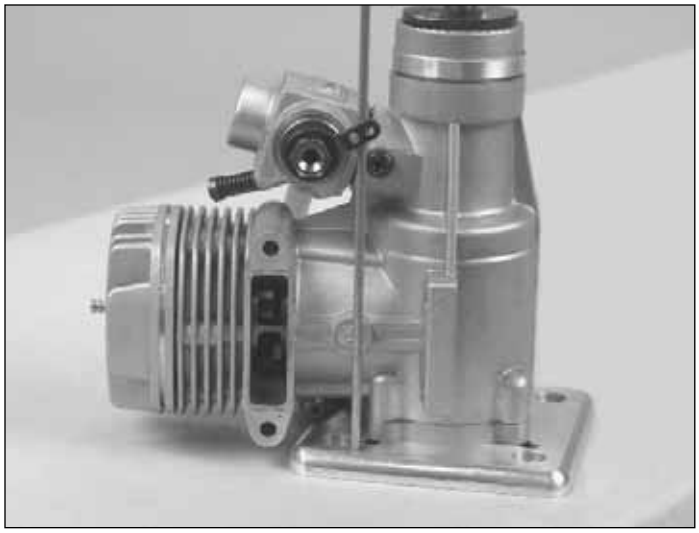
Mount the Engine

The engine mounting holes in the firewall fit both the included **universal aluminum engine mount** and the engine mount that comes with the Nelson .40 Quickee 500 engine.

The included engine mount will fit most .25 – .46 size engines. The bolt pattern of the mount is that of the Nelson .40. This is to make it easy to upgrade to the Nelson, or experiment from engine to engine.

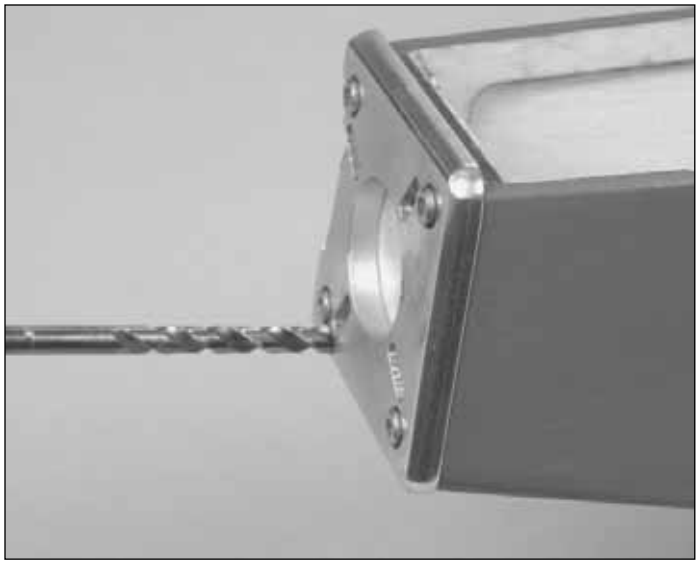


❑ 1. Remove the bolts from the engine backplate. Test fit the mount to the engine. If necessary, file the mount to accommodate the needle valve (required if using the O.S.® .46 FX), or relocate the remote needle to the engine mounting lug (required for the O.S. .40 LA), as shown in the photographs.

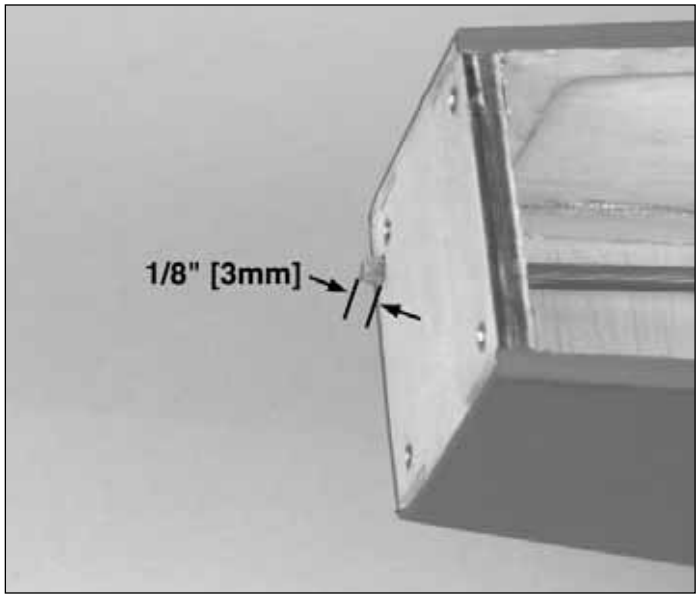


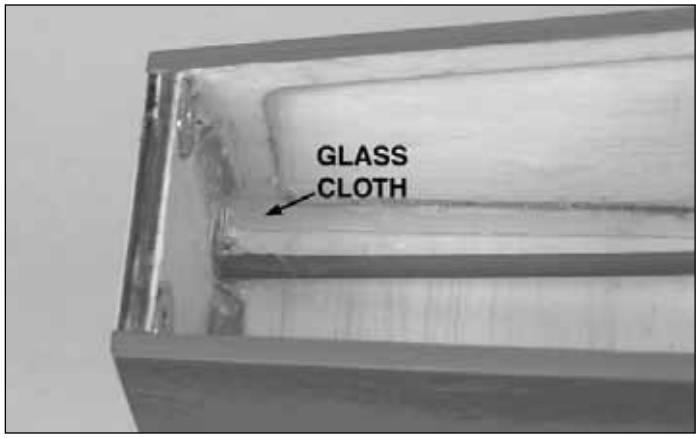
❏ 2. Temporarily mount the engine to the backplate engine mount. Use a pushrod aligned with the carburetor arm to determine the location for drilling the hole through the engine mount. Mark the mount where the pushrod enters.

❏ 3. Remove the engine, and then drill a 3/16" [4.8mm] hole through the mount at the mark. Position the mount on the firewall with the hole you drilled nearest the bottom of the fuselage. Bolt the engine mount to the firewall with four 6-32 x 1/2" [13mm] SHCS.



❏ 4. Use the hole in the mount as a guide to drill a 3/16" [4.8mm] hole through the firewall. **Note:** It is okay if you drill through a portion of the factory-installed blind nut on the back of the firewall. Remove the mount.



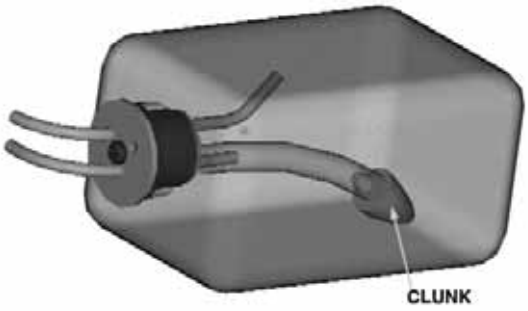


❏ 5. Cut a 6" [150mm] piece off the 11-3/4" [300mm] outer pushrod tube. Roughen one end of the 6" [152mm] pushrod tube with coarse grit sandpaper. Glue the roughened end of the pushrod tube to the firewall with 1/8" [3mm] protruding from the front of the firewall.

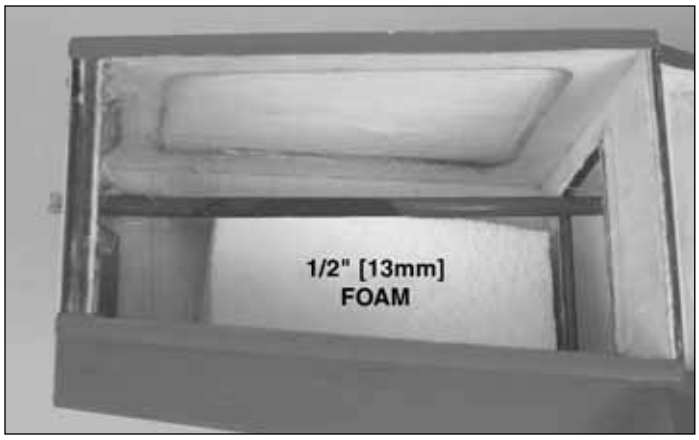
❏ 6. Glue a 1" [25mm] square piece of light glass cloth to the tube and the firewall.

❏ 7. Remove the engine mount from the firewall and the engine from the engine mount.

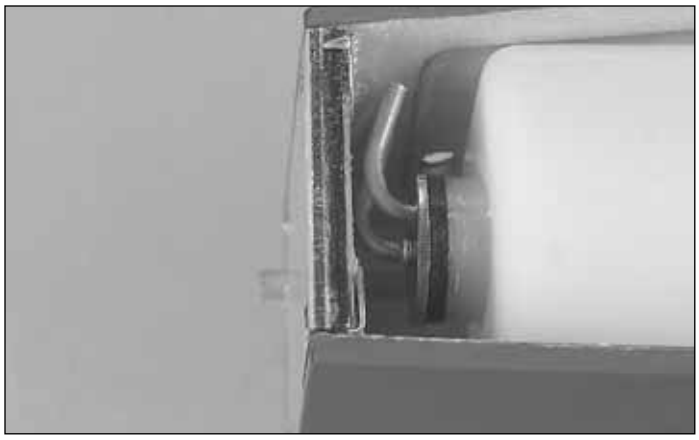
❏ 8. Bend the tubes as shown, taking special care not to kink them.



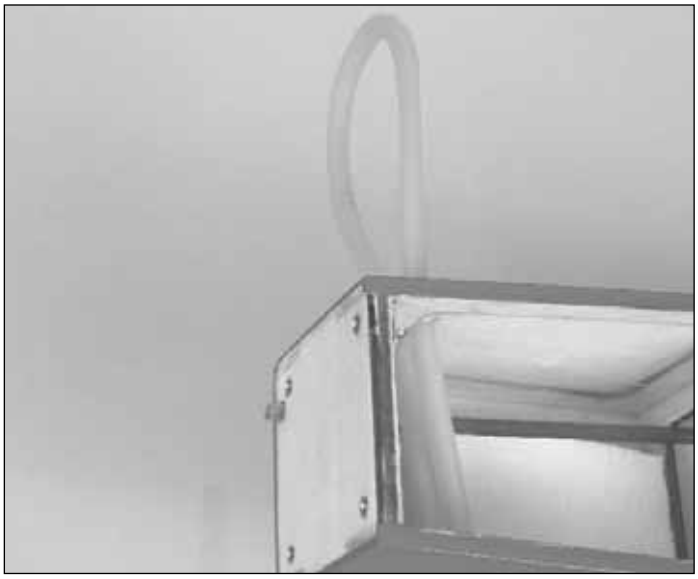
❏ 9. Arrange the stopper and tubes as shown and insert them into the tank. Tighten the screw to expand the stopper, thus sealing the tank. Be certain the fuel line weight (clunk) at the end of the fuel line inside the tank does not contact the rear of the tank. Otherwise, the line may become stuck above the fuel level and discontinue fuel flow.

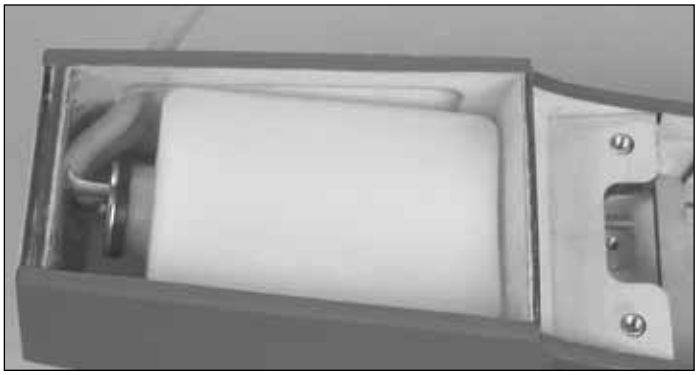


❏ 10. Place a piece of 1/2" [13mm] foam in the bottom of the tank compartment, but not over the outer throttle pushrod.



❏ 11. Fit the tank into the fuselage. Mark the outside of the fuselage in the approximate location of the fuel lines from the tank. Remove the tank. Drill 1/4" [6mm] holes for the fuel lines. Harden the wood around the holes you just drilled with thin CA.



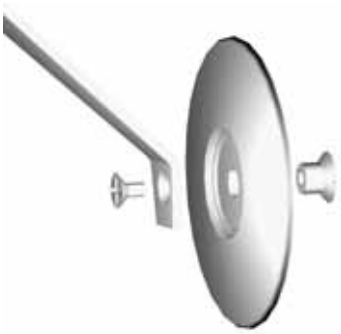


❏ 12. Guide a 12" [300mm] piece of fuel line through the holes from the outside. Attach the lines to the tank and fit the tank in place.

❏ 13. Mount your engine to the firewall with the 6-32 x 1/2" [13mm] SHCS.

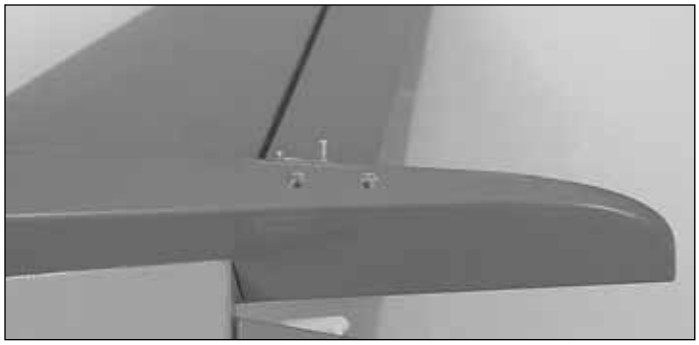
Note: The tank hatch will be glued in place later; wait to do this until after you balance the model, just in case any weight is needed.

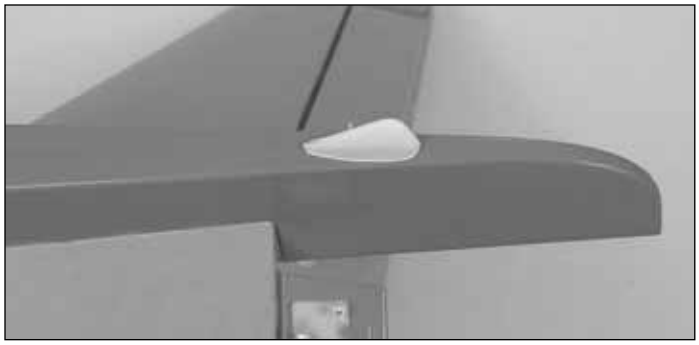
Mount the Landing Gear



❏ 1. Mount the wheels to the landing gear with the 6-32 x 1/4" [6mm] bolts and axle as shown in the sketch.

❏ 2. Mount the landing gear to the fuse with two 6-32 x 1/4" [6mm] bolts.

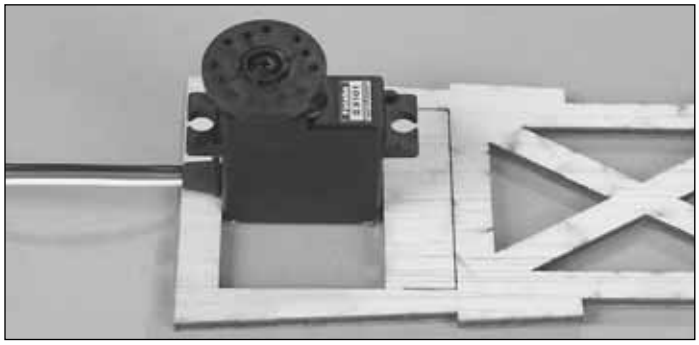


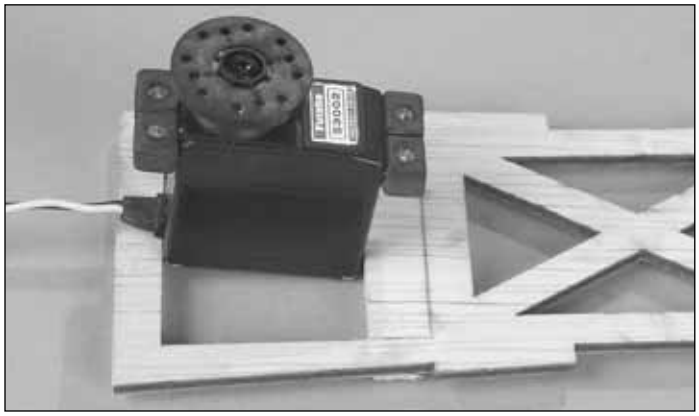


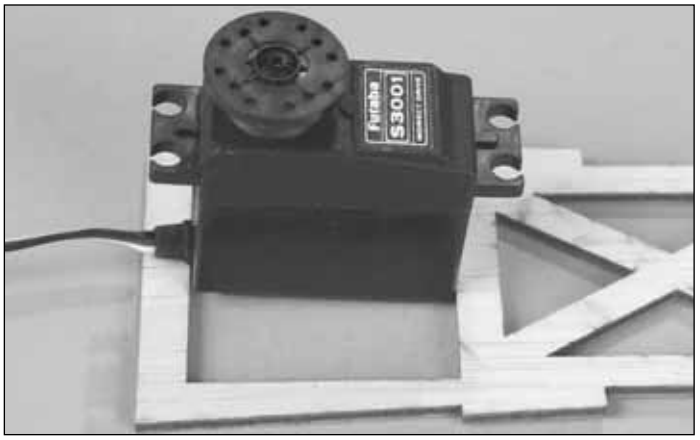
❑ 3. Remove the covering from the two tail-skid mounting holes on the bottom of the fuse. Enlarge the tail-skid mounting holes with a 1/8" [3mm] drill. Glue the nylon tail-skid in place with medium CA.

Install the Radio

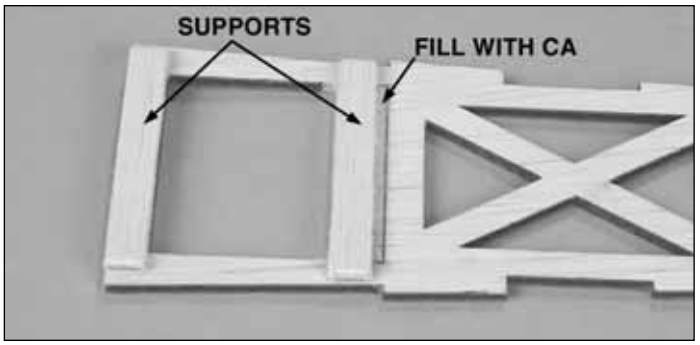
Note: An alternate servo setup can be used if your radio does not offer V-tail mixing and you want to have an active rudder. See ***"Optional Rudder Modifications,"*** on page 16.



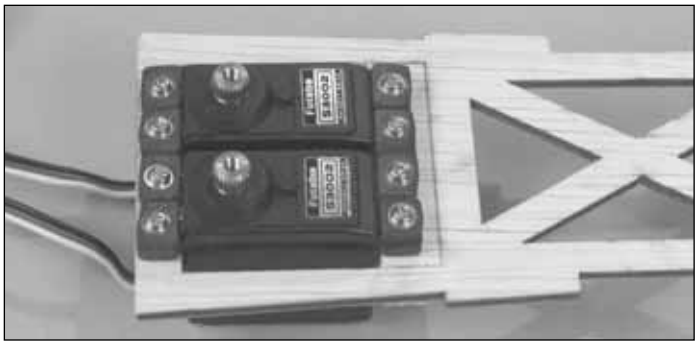




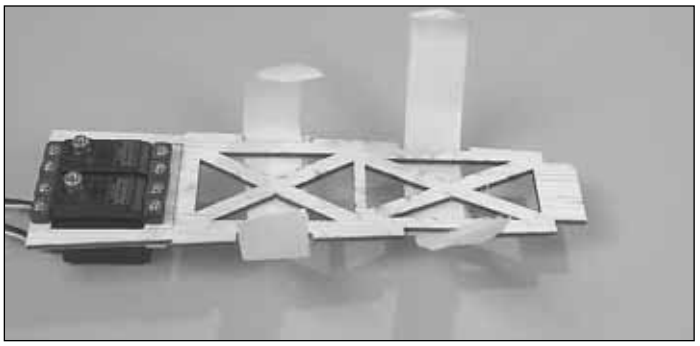
❑ 1. Trim the servo tray to fit your servos.



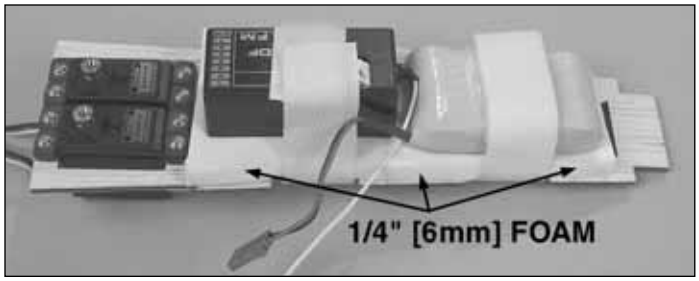
❑ 2. Glue the V-tail servo supports to the servo tray. The side you glued the supports onto is now the bottom. **Note:** If you used servos smaller than standard, fill the cut lines with medium CA.



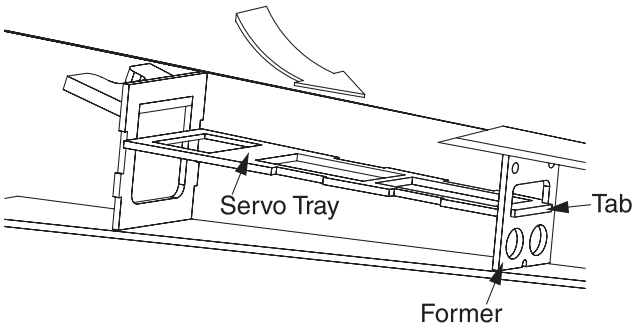
❑ 3. Fit the tail servos into the servo tray. Drill 1/16" [1.6mm] holes for the servo screws and apply thin CA to the holes. Mount the servos to the tray with the screws provided with the radio gear.



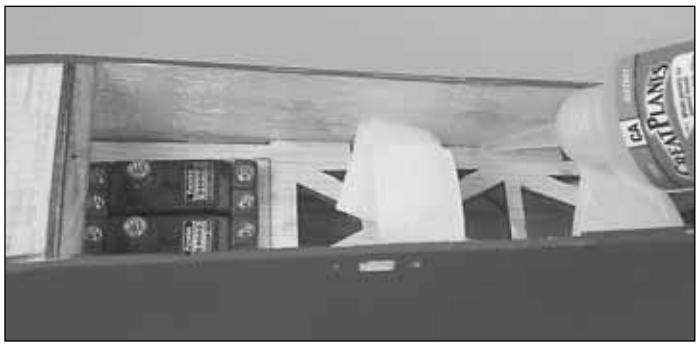
❑ 4. Glue the hook and loop material to the bottom of the servo tray.



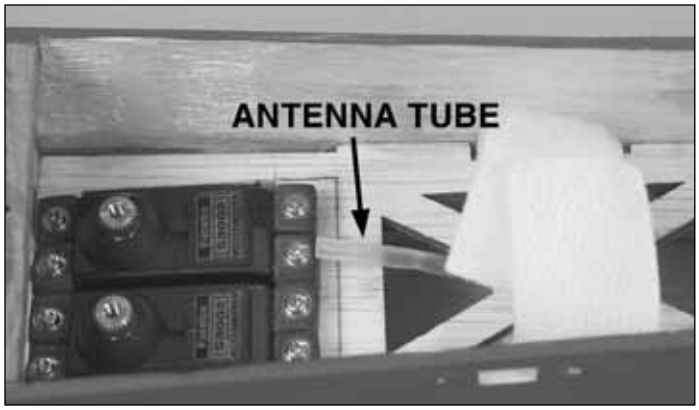
❏ 5. Attach your receiver and receiver battery to the top of the servo tray. Use 1/4" [6mm] foam to isolate vibration, and the included hook-and-loop material to hold them in place. Remove the receiver and receiver battery.



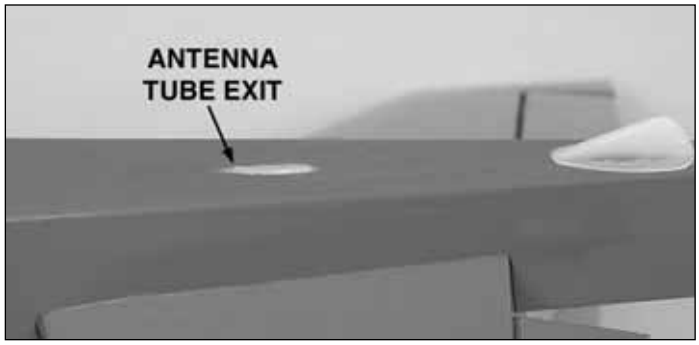
❏ 6. Taking your time, slide the servo tray into the fuse. The back of the servo tray fits into a notch in the former. Because of this, the back of the servo tray needs to be lifted as much as possible while sliding the tray in place to get it positioned properly.



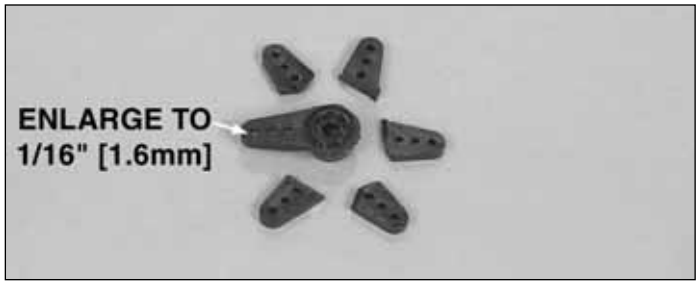
❏ 7. Glue the servo tray to the fuse with thin CA, then with thick CA.

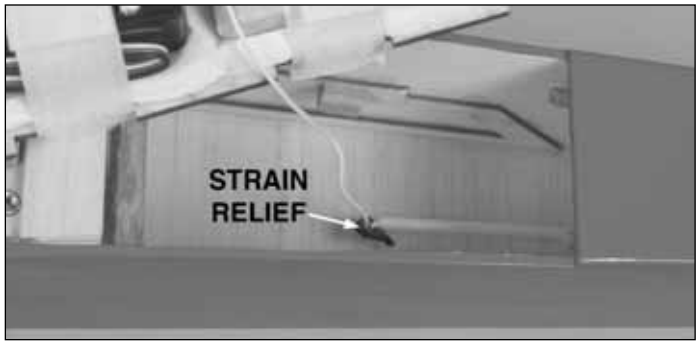


❏ 8. Lift the plastic antenna tube up through the servo tray. Reinstall the receiver and receiver battery.



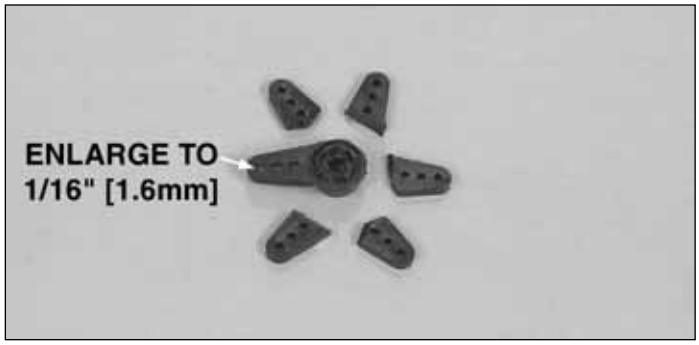
❏ 9. Remove the covering from the antenna tube exit at the rear of the fuse.



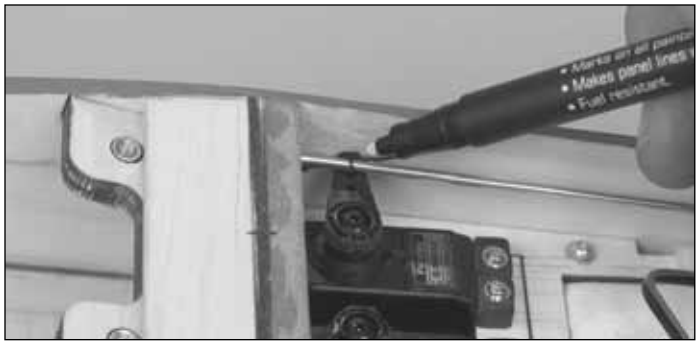


❏ 10. Using an arm cut off the aileron servo, put a strain relief on the antenna and feed the antenna through the antenna tube. The excess antenna hangs out of the bottom of the airplane. **DO NOT CUT THE ANTENNA.**

❏ 11.Attach your receiver and battery to the servo tray. Use 1/4" foam to isolate the receiver and battery from vibration.

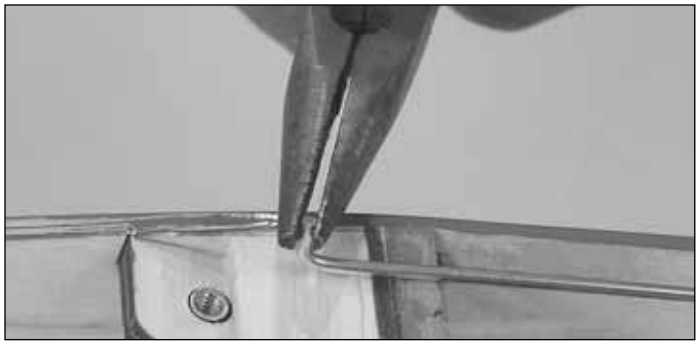


❏ 12. Make three single-sided servo arms from three of the six-sided arms provided with the servos. Enlarge the outer two holes with a 1/16" [1.6mm] drill bit. **Note:** Even though some of the photos show servo wheels, servo arms are recommended.



❏ 13. Slide the ruddervator pushrods into the pushrod tubes and connect the clevises to the control horns. Keeping the ruddervator centered, mark the pushrod where it crosses the center of the servo arm.

❏ 14. Detach the clevises from the ruddervators and slide the pushrods forward, lifting the front of the pushrods out of the servo opening.



❏ 15. Bend the pushrods 90 degrees at the marks.

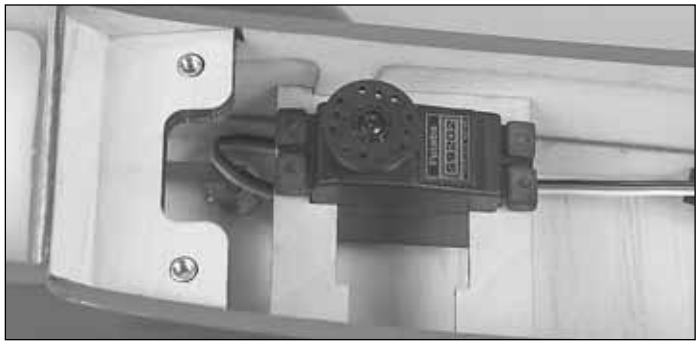
❏ 16. Using two Faslinks, connect the pushrods to the outer hole of the servo arms we made in step 12.

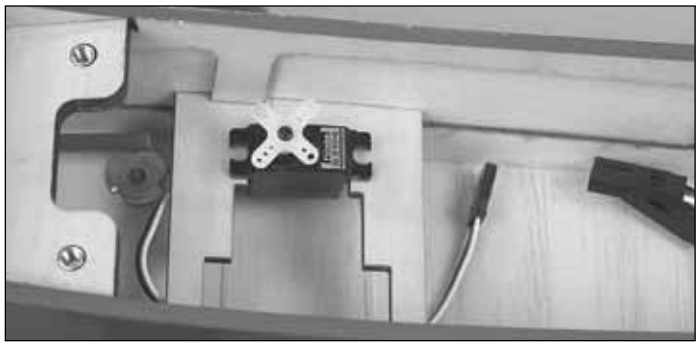
❏ 17. Turn on the radio and center the trims. Attach the servo arms to the servos. Check that the ruddervators are centered with the V-tail. Adjust the pushrods as required.

❏ 18. Mount the switch to the hatch in a location so it does not interfere with anything when the hatch is in place or place the switch in your preferred position.

❏ 19. Drill a 1/16" [1.6mm] hole through the front of the hatch centered on the basswood rail at the front of the servo opening. Use thin CA to harden the hole.

❏ 20. Secure the front of the hatch with a #2 x 3/8" [9.5mm] screw and #2 washer.





❏ 21. Determine the size of the throttle servo you are going to use. Using the photos as a reference, mount the throttle servo in the tray so that it aligns with the throttle pushrod. Fit the tray in the airplane, being sure to leave at least a 1/16" [1.6mm] gap between the servo and the landing gear rail. Glue the servo tray securely to the fuse sides.

❏ 22. Thread a clevis 15 full turns onto the last 17-1/2" [445mm] pushrod. **Note:** The Nelson .40 requires a ball link hookup. (The ball link is not included with this model.)

❏ 23. Slide the pushrod into the tube and attach the clevis to the throttle arm.

❏ 24. Bend the pushrod straight up 1-1/2" [38mm] behind the throttle arm. Do another 90° bend so that the pushrod comes forward over the servo arm.

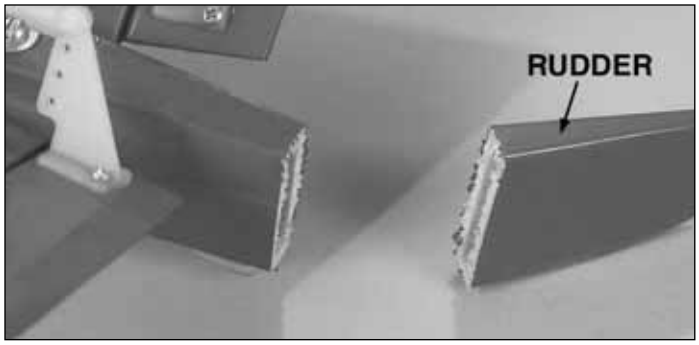
❏ 25 Connect the brass screw-lock connector to the servo arm with the nylon retainer. Thread the 4-40 set screw a couple of turns into the connector. Slide the connector onto the throttle pushrod.

❏ 26. Turn on the radio and receiver. Plug the throttle servo into the throttle servo extension. Center the throttle stick and install the servo arm 90 degrees to the servo.

❏ 27. Center the carburetor barrel by moving the pushrod. With the throttle servo and barrel centered, tighten the 4-40 set screw. Adjust the servo throw so at high throttle the carburetor barrel is completely open. Adjust the transmitter so at low throttle the carburetor barrel is closed or slightly open.

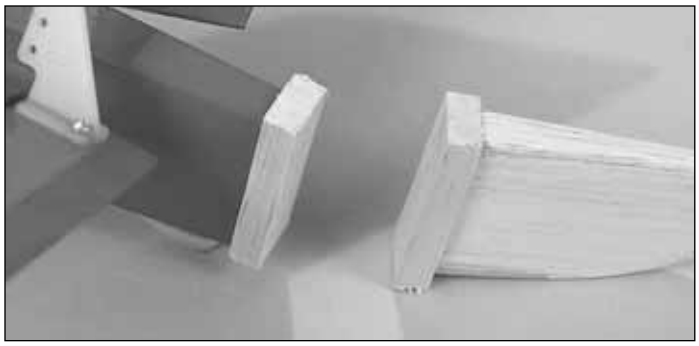
Optional Rudder Modifications

Materials used for the following modifications are not included with this ARF. **These modifications are recommended only if your radio does not have V-tail mixing.**



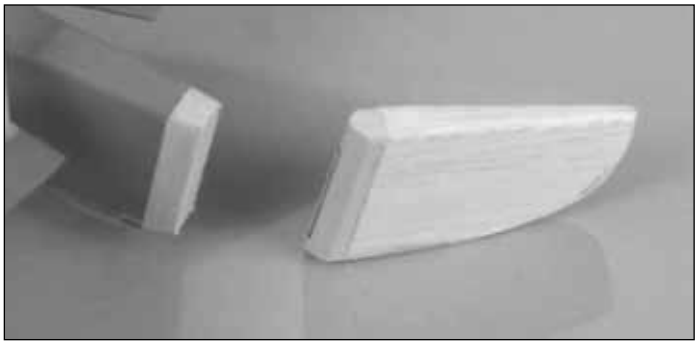
❏ 1. Cut the tail of the fuse off 1/4" [6mm] behind the tail skid.

❏ 2. Remove covering from the rudder.



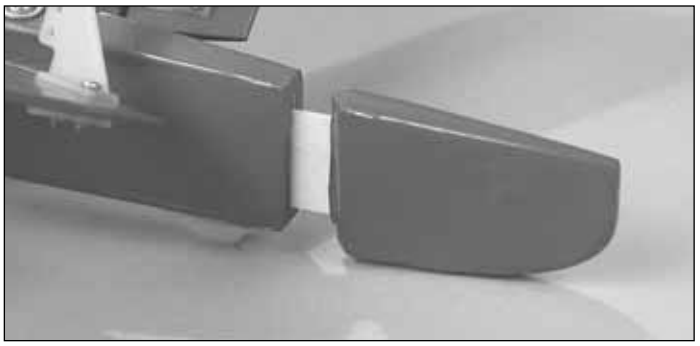
❏ 3. Glue 1/4" x 1/2" x 1-1/2" [6 x 13 x 38mm] balsa to the TE of the fuse and LE of the rudder

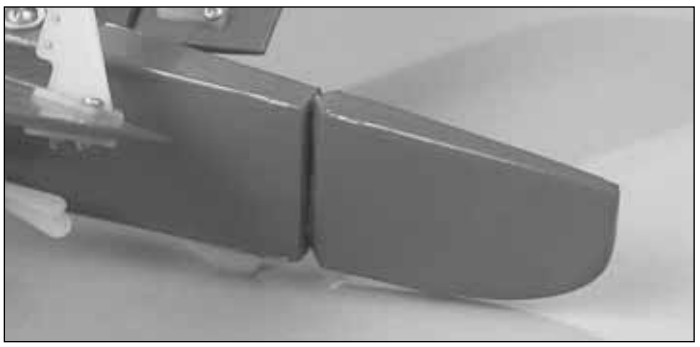
❏ 4. Shape the balsa on the fuse to match the shape of the fuse.



❏ 5. Shape the balsa on the front of the rudder to match the shape of the rudder.

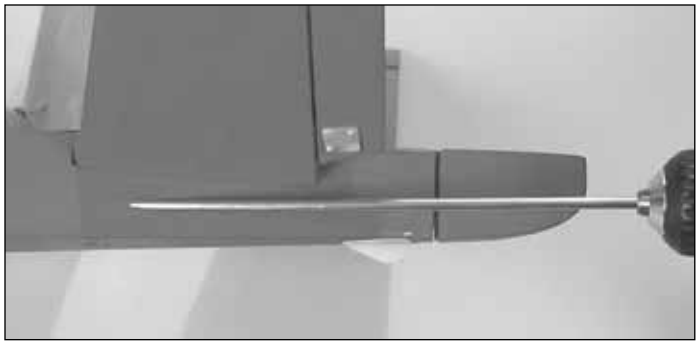
❏ 6. Cover the rudder and the rear of the fuse.

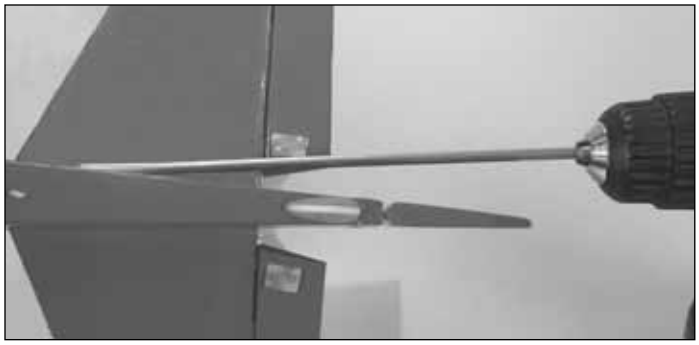




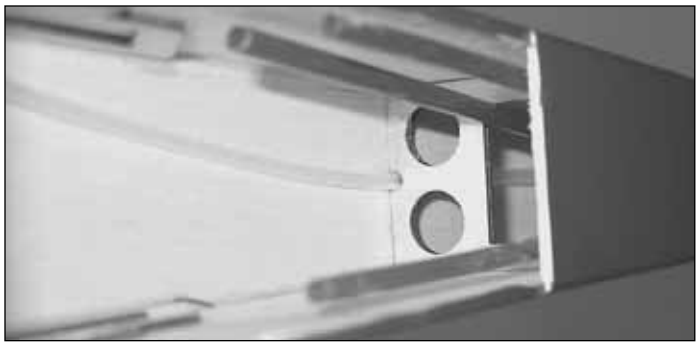
❏ 7. Cut the hinge slots and mount the rudder with one long hinge.

❏ 8. Sharpen the end of a 3/16" [5mm] brass tube.

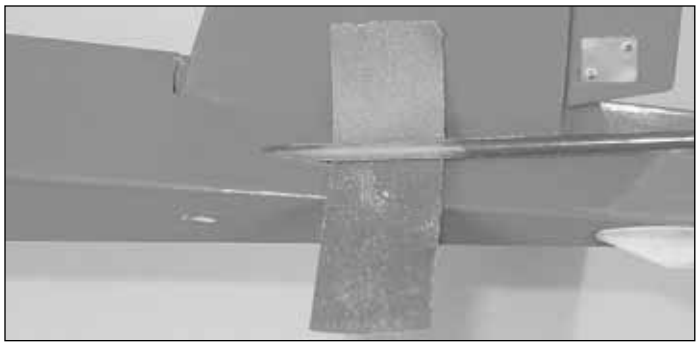




❏ 9. Use the brass tube to drill a hole through the fuse in the approximate location and angles shown in the photo.



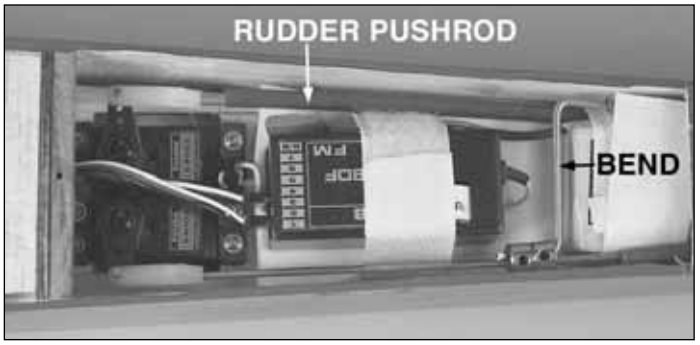
❏ 10. Slide a 3/16" [5mm] plastic pushrod outer tube (not included) into the fuse from the rear, going through the large opening in the former and aligning the front of it with the rear of the servo mounts. **Note:** The servo tray is removed for clarity.



❏ 11. Mark the pushrod tube where is exits the fuse. Use course sandpaper to roughen the pushrod tube from the mark to 1-1/2" [38mm] forward of the mark.

❏ 12. Glue the tube to the fuse with thin CA. Allow the CA to cure and then cut off the excess tube.

❏ 13. Attach a small control horn (not included) to the rudder the same as was done with the ruddervators. Align the holes in the horn with the hinge line.



❏ 14. Attach the pushrods to the ruddervators. Bend the right ruddervator pushrod as shown. Connect the two ruddervator pushrods together with two 5/32" [4mm] wheel collars.

❏ 15. Attach the rudder pushrod to the right hand servo with the Faslink as done with the other servo.

Apply the Decals

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

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

3. Position the decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.

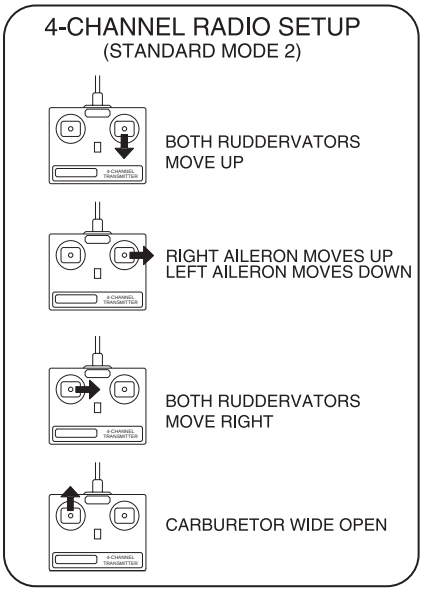
4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

GET THE MODEL READY TO FLY

Check the Control Directions

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

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



❑ 3. Make certain that the control surfaces and the carburetor respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

Set the Control Throws

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

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

These are the recommended control surface throws:

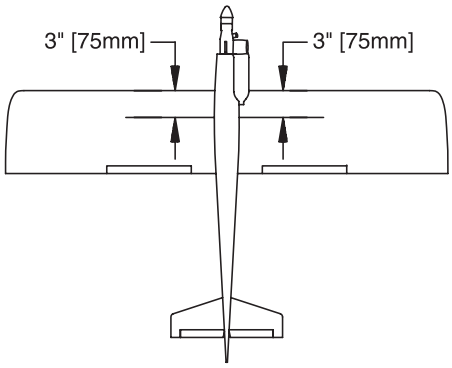
	High Rate	Low Rate
ELEVATOR:	1/4" [6mm] up	1/8" [3mm] up
	1/4" [6mm] down	1/8" [3mm] down
RUDDER:	1/4" [6mm] right	
	1/4" [6mm] left	
AILERONS:	3/8" [9.5mm] up	1/8" [3mm] up
	3/8" [9.5mm] down	1/8" [3mm] down

IMPORTANT: The Viper 500 ARF has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Viper 500 ARF flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

Balance the Model (C.G.)

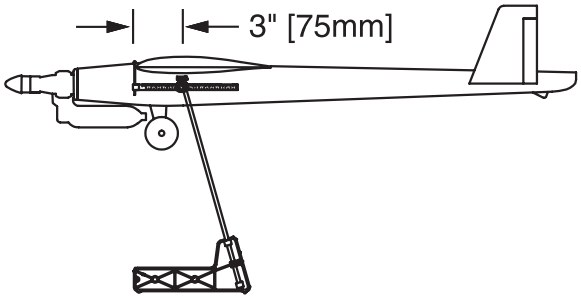
More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that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

At this stage the model should be in ready-to-fly condition with all of the systems in place including the engine, landing gear, covering and paint, and the radio system.



❏ 1. Use a felt-tip pen or 1/8" [2mm] wide tape to accurately mark the C.G. on the bottom of the wing on both sides of the fuselage. The C.G. is located 3" [75mm] back from the leading edge of the wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 2-5/8" [67mm] forward or 3-3/8" [86mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



❏ 2. With the wing attached to the fuselage, all parts of the model installed including the fuel tank hatch (ready-to-fly) and an empty fuel tank, place the model as shown above on a Great Planes CG Machine, or lift it at the balance point you marked.

❏ 3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using a "spinner weight" (GPMQ4645 for the 1 oz. weight, or GPMQ4646 for the 2 oz. weight). If spinner weight is not practical or is not enough, use Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is in the fuel tank compartment. If there is not sufficient space, then the firewall is an excellent mounting location. Begin by placing incrementally increasing amounts of weight on the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside. Glue the fuel tank hatch in place if nose weight is needed.

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

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

❏ **5. REMEMBER: Now that the model is balanced, glue the tank hatch in place.**

Balance the Model Laterally

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

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

PREFLIGHT

Identify Your Model

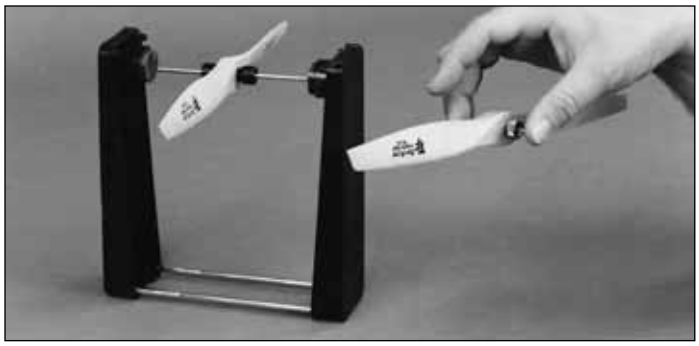
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 23 and place it on or inside your model.

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries. You should always charge your transmitter and receiver batteries the night before you go flying, and at other times as recommended by the radio manufacturer.

Note: Checking the condition of your receiver battery pack is **highly recommended**. All battery packs, whether it's a trusty pack you've just taken out of another model, or a new battery pack you just purchased, should be cycled, noting the discharge capacity. Oftentimes, a weak battery pack can be identified (and a valuable model saved!) by comparing its actual capacity to its rated capacity. Refer to the instructions and recommendations that come with your cycler. If you don't own a battery cycler, perhaps you can have a friend cycle your pack and note the capacity for you.

Balance the Propellers



Carefully balance your propeller and spare propellers before you fly. An unbalanced prop can be the single most significant cause of vibration that can damage your model. Not only will engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause your fuel to foam, which will, in turn, cause your engine to run hot or quit.

We use a Top Flite Precision Magnetic Prop Balancer™ (TOPQ5700) in the workshop and keep a Great Planes Fingertip Prop Balancer (GPMQ5000) in our flight box.

Ground Check

If the engine is new, follow the engine manufacturer's instructions to break-in the engine. After break-in, confirm that the engine idles reliably, transitions smoothly and rapidly to full power and maintains full power–indefinitely. After you run the engine on the model, inspect the model closely to make sure all screws remained tight, the hinges are secure, the prop is secure and all pushrods and connectors are secure.

Range Check

Ground check the operational range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, most radio systems indicate you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test **with the engine running** at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash.

ENGINE SAFETY PRECAUTIONS

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

Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel; and remember that engine exhaust gives off a great deal of deadly carbon monoxide. Therefore, **do not run the engine in a closed room or garage.**

Get help from an experienced pilot when learning to operate engines.

Use safety glasses when starting or running engines.

Do not run the engine in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the engine.

Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

Use a "chicken stick" or electric starter to start the engine. Do not use your fingers to flip the propeller. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.

Make all engine adjustments from behind the rotating propeller.

The engine gets hot! Do not touch it during or right after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine, causing a fire.

To stop a glow engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer's recommendations. Do not use hands, fingers or any other body part to try to stop the engine. To stop a gasoline powered engine, an on/off switch should be connected to the engine coil. Do not throw anything into the propeller of a running engine.

AMA SAFETY CODE (excerpt)

Read and abide by the following Academy of Model Aeronautics Official Safety Code:

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 to, and avoid flying in the proximity of full-scale aircraft. Where necessary an observer shall be used 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.

7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model.

9. 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. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.

4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a check list is provided to make sure these important areas are not overlooked. Many are covered in the instruction manual, so where appropriate, refer to the manual for complete instructions. Be sure to check the items off as they are completed (that's why it's called a *check list!*).

- ❏ 1. Fuelproof all areas exposed to fuel or exhaust residue such as the tank compartment and underside of hatch, wing saddle area, etc.
- ❏ 2. Check the C.G. according to the measurements provided in the manual.
- ❏ 3. Be certain the battery and receiver are securely mounted in the fuse. Simply stuffing them into place with foam rubber is not sufficient.
- ❏ 4. Extend your receiver antenna and make sure it has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver and hasn't been cut, shortened or otherwise damaged.
- ❏ 5. Balance your model *laterally* as explained in the instructions.
- ❏ 6. Use thread-locking compound to secure critical fasteners such as the set screws that hold the wheel axles, screws that hold the carburetor arm (if applicable), screw-lock pushrod connectors, etc.
- ❏ 7. Add a drop of oil to the axles so the wheels will turn freely.
- ❏ 8. Make sure all hinges are **securely** glued in place.
- ❏ 9. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, cowl mounting screws, etc.).
- ❏ 10. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ❏ 11. Make sure there are silicone retainers on all the clevises and that all servo arms are secured to the servos with the screws included with your radio.
- ❏ 12. Secure connections between servo wires and Y-connectors or servo extensions, and the connection between your battery pack and the on/off switch with vinyl tape, heat shrink tubing or special clips suitable for that purpose.
- ❏ 13. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
- ❏ 14. Secure the pressure tap (if used) to the muffler with high temp RTV silicone, thread-locking compound or J.B. Weld.
- ❏ 15. Make sure the fuel lines are connected and are not kinked.
- ❏ 16. Balance your propeller (and spare propellers).
- ❏ 17. Tighten the propeller nut and spinner.
- ❏ 18. Place your name, address, AMA number and telephone number on or inside your model.
- ❏ 19. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- ❏ 20. If you wish to photograph your model, do so before your first flight.
- ❏ 21. Range check your radio when you get to the flying field.

FLYING

CAUTION SPECIFICALLY FOR QUICKIE 500 AND OTHER RACE-STYLE AIRCRAFT: These models are designed to fly **VERY** quickly. Their top speed is twice that of the typical sport model, or more. As such, there are several rules which are **CRITICAL** to safely flying these aircraft. Many of the rules for flying a model of this sort – such as using high rates for take-off and not for normal flying – are likely different from most models you are used to, so please take these cautions seriously.

1. Take-off is very short. Use **HIGH RATES** for takeoff or you will not have sufficient elevator to properly handle the aircraft. As soon as it starts to come up to speed you **MUST** go to low rates.
2. For your first flights, be sure the engine is tuned slightly rich and plan to fly around at half throttle or less, getting used to the model's feel, trims, etc.
3. Trim is absolutely critical. If the aircraft cannot cover the length of your field hands off without banking, climbing or diving, it is unlikely the model will complete the flight safely.
4. These models are **VERY, VERY** aerodynamic. As such, their glide paths are far longer than that of similar sized sport models – typically 2 or even 3 times the length, requiring **HIGH RATE** elevator to flair.
5. Because of the speed at which the Viper travels when wide open, minimal control throws are needed to effect change. As such, the model must be flown on low rates for those conditions. However, any time the model's speed is decreased, high rates are **REQUIRED** to provide enough control to fly safely.
6. Landings, and especially flaring, **MUST** be done on high rates. The model will not flair on low rates, and will not flair from a slow speed nose-down attitude even on high rates. Be sure to practice low speed flight several times at a good altitude until you are used to the model's handling.

The Viper 500 is a great-flying sport and racing model that flies smoothly and predictably, but incredibly fast. The Viper 500 does not, however, possess any of the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

Fuel Mixture Adjustments

For longevity of your engine, especially if it is new, the fuel mixture should be richened so the engine runs at about 400 RPM below peak speed. By running the engine slightly rich, you will help prevent dead-stick landings caused by overheating.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice any unusual sounds, such as a low-pitched "buzz," this may indicate control surface *flutter*. Because flutter can quickly destroy components of your airplane, any time you detect flutter you must **immediately** cut the throttle and land the airplane! Check all servo grommets for deterioration (this may indicate which surface fluttered), and make sure all pushrod linkages are secure and free of play. If the control surface fluttered once, it probably will flutter again under similar circumstances unless you can eliminate the free-play or flexing in the linkages. Here are some things which can cause flutter: Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of pushrod in guide tube caused by tight bends; Poor fit of Z-bend in servo arm; Insufficient glue used when gluing in the elevator joiner wire; Excessive *play* or *backlash* in servo gears; and Insecure servo mounting.

Takeoff

Remember to takeoff into the wind. When you're ready, point the model straight down the runway, ***GO TO HIGH RATES***, then gradually advance the throttle. One of the most important things to remember with a tail dragger is to always be ready to apply right rudder to counteract engine torque. Gain as much speed as your runway and flying site will practically allow before gently applying up elevator, lifting the model into the air. At this moment it is likely that you will need to apply more right rudder to counteract engine torque. Be smooth on the elevator stick, allowing the model to establish a gentle climb to a safe altitude before turning into the traffic pattern. Go to low rates as soon as the model has picked up speed.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff on sport models, it is NOT required for the Viper 500, and the model will fly far more smoothly and allow you more time to react and learn the aircraft at reduced speeds.

Take it easy with the Viper 500 for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of fuel, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how the Viper 500 climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies

the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing. REMEMBER to use high rates when practicing slow speed flight for sufficient control.

Landing

To initiate a landing approach, lower or "cut" the throttle while on the downwind leg. **GO TO HIGH RATE ELEVATOR.** Allow the nose of the model to pitch only very slightly downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down only slightly as you turn onto the crosswind leg. Make your final turn toward the runway (into the wind) keeping the nose ***only slightly*** down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is inches off the deck, smoothly increase up elevator until it gently touches down. Once the model is on the runway and has lost flying speed, hold up elevator to place the tail on the ground, regaining tail wheel control.

One final note about flying your model. Have a goal or flight plan in mind for every flight. This can be flying the model more quickly, working on tighter pylon turns, or practicing mock landing approaches at altitude. ***Always remember to be aware of the relationship between a race model's airspeed and the responsiveness of its flight controls.*** A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. Remember to think.

Have a ball! But always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!

This model belongs to:

Name

Address

City, State Zip

Phone number

AMA number

OTHER ITEMS AVAILABLE FROM GREAT PLANES

O. S.® .46 FX Engine
Engineered for superior, long-lasting power in sport aircraft, the .46 FX has dual ball bearings for durability and smooth operation, plus a low crankcase design that allows for a taller head to improve cooling. For added safety, the needle valve is remotely mounted and the crankshaft has a longer threaded portion to allow secure engagement of the prop, nut and spinner. The engine also uses O. S. Engines' ABN construction – an aluminum piston with Advanced Bi-Metallic Liner of nickel and brass. ABN construction increases durability and provides more consistent plating, resulting in better compression due to the precise fit between the piston and sleeve. Includes muffler and 2-year warranty. **OSMG0546**

Futaba® 9CAP 9-Channel Radio Systems
Want to experiment with *triple* rates? Find, open, set and close functions with amazing ease? Be able to look at an LCD and see how far each servo will travel in operation – and reset the limits of any servo you choose? You can do it all and more, with the 9CAP. Easy Dial N' Key programming, eight-character naming, and a "full functionality" trainer system are just a few of its extraordinary features. Learn more on the Futaba website at *www.futaba-rc.com*. Includes R149DP receiver, four S3001 servos, 600mAh Tx and Rx NiCds. **FUTJ87****

BUILDING NOTES

Kit Purchased Date: _____

Where Purchased:_____

Date Construction Started: _____

Date Construction Finished: _____

Finished Weight: _____

Date of First Flight: _____

FLIGHT LOG