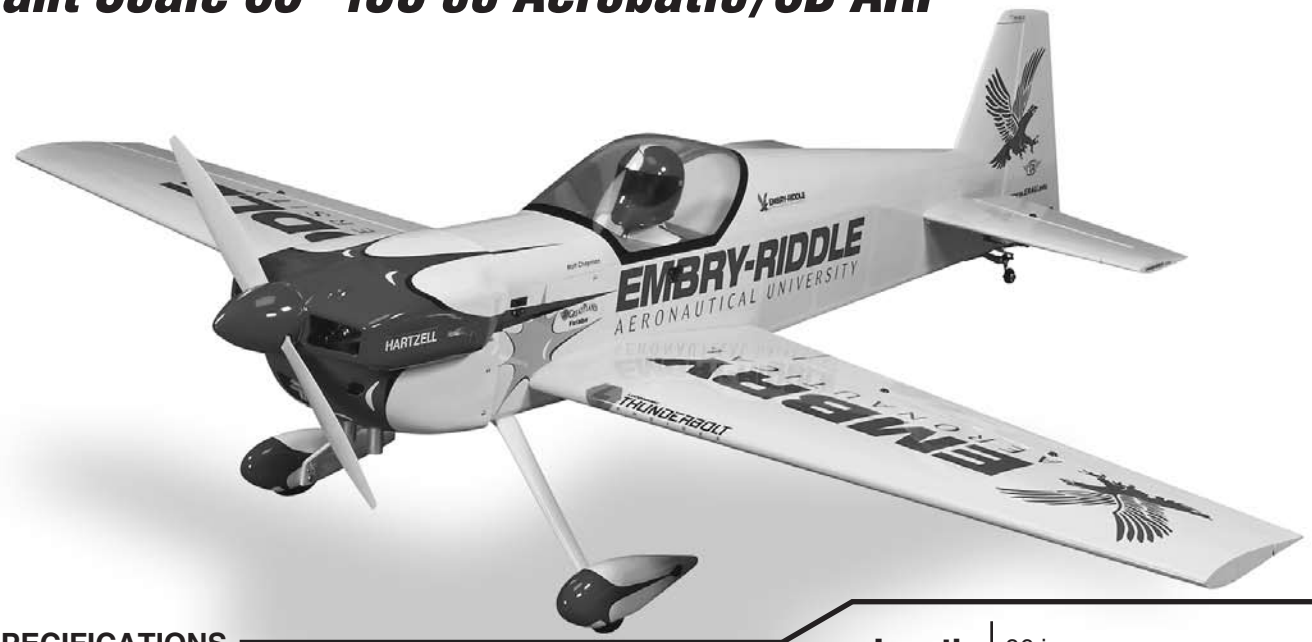
Matt Chapman

EAGLE 580

Giant Scale 85–100 cc Aerobatic/3D ARF



SPECIFICATIONS

Wingspan:	100 in [2540mm]	**Weight:**	24 – 28 lb [10880-12700 g]	**Length:**	96 in [2440mm]
Wing Area:	1892 sq in [122 dm^2]	**Wing Loading:**	29– 34 oz/ft^2 [88– 104 g/dm^2]	**Radio:**	4-5 channel with 9 standard size servos
				Engine:	85 – 100cc gasoline

WARRANTY

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

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

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

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

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

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

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

GREAT PLANES® MODEL MANUFACTURING COMPANY

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

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INTRODUCTION

For the latest technical updates or manual corrections to the Great Planes Giant Matt Chapman Eagle 580 ARF visit the Great Planes web site at www.greatplanes.com. Open the “Airplanes” link, then select the Great Planes Giant Matt Chapman Eagle 580 ARF. If there is new technical information or changes to this model a “tech notice” box will appear in the upper left corner of the page.

AMA – Academy of Model Aeronautics

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

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

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

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.

IMAA

The Great Planes Eagle 580 ARF is an excellent sport-scale model and is eligible to fly in IMAA events. The IMAA (International Miniature Aircraft Association) is an organization that promotes non-competitive flying of giant-scale models. If you plan to attend an IMAA event, obtain a copy of the **IMAA Safety Code** by contacting the IMAA at the address or telephone number below.

IMAA
205 S. Hilldale Road
Salina, KS 67401

(913) 823-5569

Or via the Internet at:
http://www.fly-imaa.org/imaa/sanction.html

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

1. Your Great Planes Giant Matt Chapman Eagle 580 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 Great Planes Giant Matt Chapman Eagle 580 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 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. Inspect for signs of wear in the flight controls and engine controls. You should also cycle your radio batteries regularly and check to see that they fulfill their current and capacity ratings.

5. If you are not an experienced pilot or have not flown this size and 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 kit has been flight tested to exceed normal use, it is important that the modeler understand that aerobatic designs are not race planes, and should not be flown like them. In addition, "more is better" is the WRONG philosophy when powering an aerobatic plane. This model has been professionally designed and tested, and the engine range carefully selected for great performance. We strongly recommend NOT exceeding the recommended engine range. This is unsafe and will void the warranty of this model.

7. **WARNING:** The cowl and wheel pants included in this kit are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part (wheel pant, cowl) to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

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

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

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Great Planes Giant Matt Chapman Eagle 580 ARF that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Radio Equipment

❏ ***4–5 channel radio*** with:

- 1–2 ***Standard size servos*** (throttle and optional choke servo)
- 8 - ***Standard size high torque metal geared (150 oz/in) servos*** (2 for elevator, 4 for ailerons, 2 for rudder)
- 2 - ***36" heavy duty servo extensions*** (HCAM2726 for Futaba®) (outer aileron servos)
- 2 - ***24" heavy duty servo extensions*** (HCAM2721 for Futaba) (inner aileron servos)
- 2 - ***40" heavy duty servo extensions*** (FUTM4148 for Futaba) (elevator servos)
- 3 - ***Y-harnesses*** (HCAM2751 for Futaba) (aileron servos and rudder servos)
- 2 - ***12" [300mm] servo extensions*** (HCAM2711 for Futaba) (receiver to each wing)
- 1 - ***24" [610mm] servo extension*** (HCAM2721 for Futaba) (rudder servos)
- 1 - ***36" [914mm] servo extension*** (HCAM2726 for Futaba) (elevator servos)
- 1 - ***Receiver battery, 4200mAh 4.8V NiMH*** (HCAM6335)
- 1 - ***Ignition battery, 2000mAh NiMH*** (HCAM6321)
- 2 - ***Heavy duty switch harnesses*** (FUTM4385) (Rx and ignition)
- 2 - ***Charge jacks*** (ERNM3001 for Futaba)

If you're not using a computer radio with mixing functions or one with less than 6 channels, please consider purchasing the following items:

- 1 - ***Servo reverser lead***
  (FUTM4150 to reverse one elevator servo)
- 1 - ***Servo synchronizer***
  (FUTM4155 to synchronize inboard and outboard aileron servos) (Note: If you're using this, you won't need to order 2 of the Y-harnesses above)

Engine Recommendations

The recommended engine size range for the Great Planes Giant Matt Chapman Eagle 580 ARF is 85 – 100cc. This manual will detail the installation of the DA-100 engine with twin canister style exhaust. A mounting template and special wooden standoff shims are provided for you if you choose to install the DA-85 engine.

The following items should be ordered from Desert Aircraft or your favorite hobby supplier if you choose the ***DA-100***:

- DA-100 engine
- Standard DA-100 muffler set

OR

- MTW canister exhaust (short version) (DA model number TD 75K)
- MTW headers

The following items should be ordered from Desert Aircraft or your favorite hobby supplier if you choose the ***DA-85***:

- DA-85 engine
- Slimline Pitts muffler for DA-85

OR

- JTEC large wrap around Pitts muffler for DA-85 (JTCG7985) (standard option)

OR

- JTEC X-large wrap around Pitts muffler for DA-85 (JTCG2085) (quiet option)

ADDITIONAL ITEMS REQUIRED

Required Hardware and Accessories

In addition to the items listed in the "Decisions You Must Make" section, the following is a list of hardware and accessories required to finish the Great Planes Giant Matt Chapman Eagle 580 ARF. Order numbers are provided in parentheses.

- Propeller (per the engine manufacturer's suggestion)
- R/C foam rubber 1/4" [6.4mm] – (HCAQ1000)
- Two packs of 3' [914mm] Tygon® gasoline fuel tubing (DUBQ0427)

Adhesives and 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 Great Planes Giant Matt Chapman Eagle 580 ARF. Great Planes Pro™ CA and Epoxy glue are recommended.

- 1 oz. [30g] Thin Pro CA (GPMR6002)
- 1 oz. [30g] Medium Pro CA+ (GPMR6008)
- Pro 30-minute epoxy (GPMR6047)
- Pro 6-minute epoxy (GPMR6045)
- Threadlocker thread locking cement (threadlocker) (GPMR6060)
- R/C-56 glue 4oz (JOZR5007)
- Drill bits: 1/16" [1.6mm], 5/16" [7.9mm], 1/8" [3.2mm], 3/16" [4.8mm]
- X-long (jobber length) drill bit: 3/16" [4.8mm]
- 10-piece standard tap and drill set (GPMR8108)
- Tap handle (GPMR8120)
- Small metal file
- Velcro® hook & loop (1" x 6" [25 x 150mm], (GPMQ4480)
- 3/8" Heat shrink tubing (GPMM1060)
- Stick-on segmented lead weights (GPMQ4485)
- #1 Hobby knife (HCAR0105)
- #11 blades (5-pack, HCAR0211)
- Single-edge razor blades (10-pack, HCAR0212)
- Medium T-pins (100, HCAR5150)
- Sandpaper assortment
- Petroleum jelly
- Hobby torch (HCAR0765)
- Silver solder kit (STAR2000)

Optional Supplies and Tools

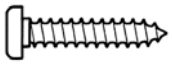
Here is a list of optional tools mentioned in the manual that will help you build the Great Planes Giant Matt Chapman Eagle 580 ARF.

- 4 oz. [113g] aerosol CA activator (GPMR634)
- CA applicator tips (HCAR3780)
- CA debonder (GPMR6039)
- Epoxy brushes (6, GPMR8060)
- Mixing sticks (50, GPMR8055)
- Mixing cups (GPMR8056)
- Pliers with wire cutter (HCAR0630)
- Robart Super Stand II (ROBP1402)
- Masking tape (TOPR8018)
- Denatured alcohol (for epoxy clean up)
- Rotary tool such as Dremel®
- Rotary tool reinforced cut-off wheel (GPMR8200)
- Quick drill set (HCAR0699)
- 3M ScotchBrite® green abrasive pad
- Top Flite® MonoKote® sealing iron (TOPR2100)
- Top Flite MonoKote trim seal iron (TOPR2200)
- Top Flite MonoKote heat gun (TOPR2000)

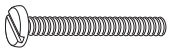
IMPORTANT BUILDING NOTES

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

  Self-tapping or sheet metal screws are designated by a number and a length. For example, #6 x 3/4" [19mm].

  Machine screws are designated by a number, threads per inch, and a length. For example, 4-40 x 3/4" [19mm].

  Socket Head Cap Screws (SHCS) are designated by a number, threads per inch, and a length. For example, 4-40 x 3/4" [19mm]

- 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 Great Planes Giant Matt Chapman Eagle 580 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.

Cub Yellow	TOPQ0220
Sapphire Blue	TOPQ0227
Missile Red	TOPQ0201
Orange	TOPQ0202
Black	TOPQ0208

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

KIT INSPECTION

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

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

E-mail: airsupport@greatplanes.com

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Giant Matt Chapman Eagle 580 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" from the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

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

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

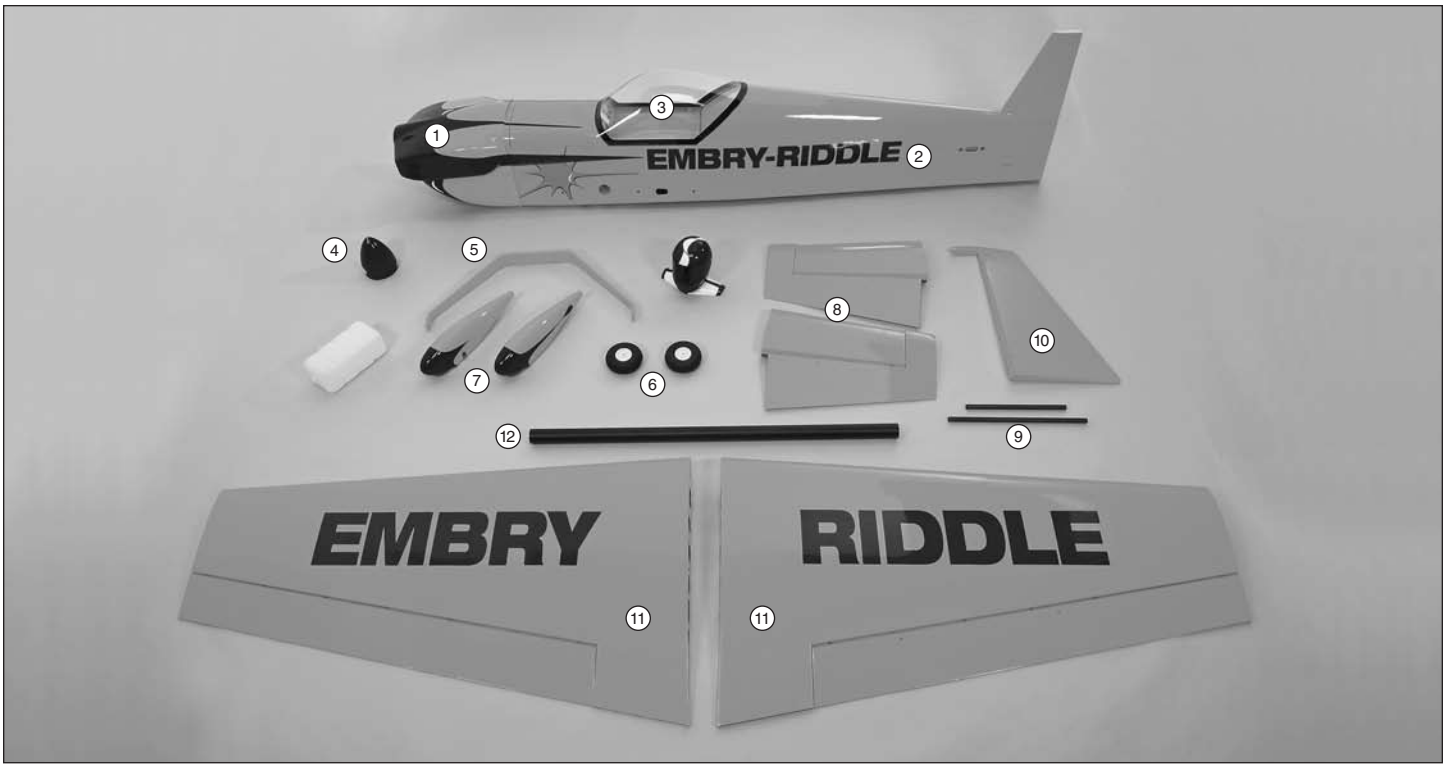
Be certain to specify the order number exactly as listed in the Replacement Parts List. Payment by credit card or personal check only; no C.O.D.

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

Giant Eagle 580 ARF Replacement Parts List

GPMA3355	Fuselage	GPMA3362	Decals
GPMA3356	Wing Set	GPMA3363	Wing Tube
GPMA3357	Hor. Stab. Set	GPMA3364	Stabilizer Tubes
GPMA3358	Rudder	GPMA3365	Hatch/Canopy
GPMA3359	Cowl	GPMA3367	Pilot
GPMA3360	Landing Gear	GPMA3368	Fuel Tank
GPMA3361	Wheelpants		

KIT CONTENTS

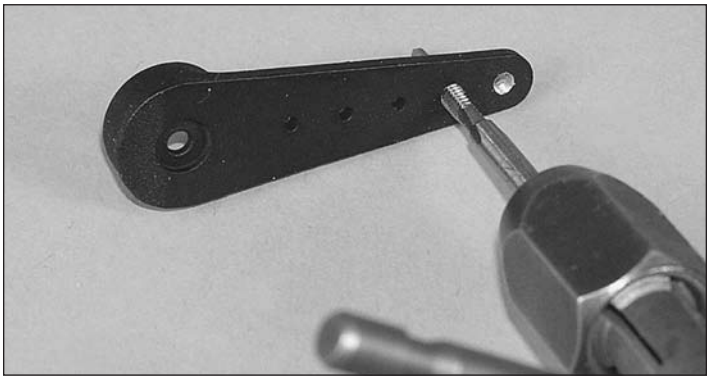


1. Cowl
2. Fuselage
3. Canopy/Hatch
4. Aluminum Spinner
5. Main Gear
6. Wheels
7. Wheel Pants
8. Stab and Elevators
9. Stab Tubes
10. Rudder
11. Wings and Ailerons
12. Wing Tube

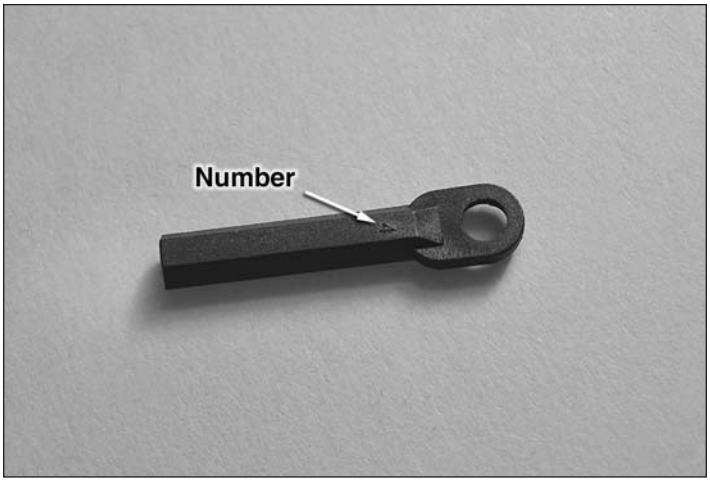
ASSEMBLE THE STAB

Prepare the Servo Arms

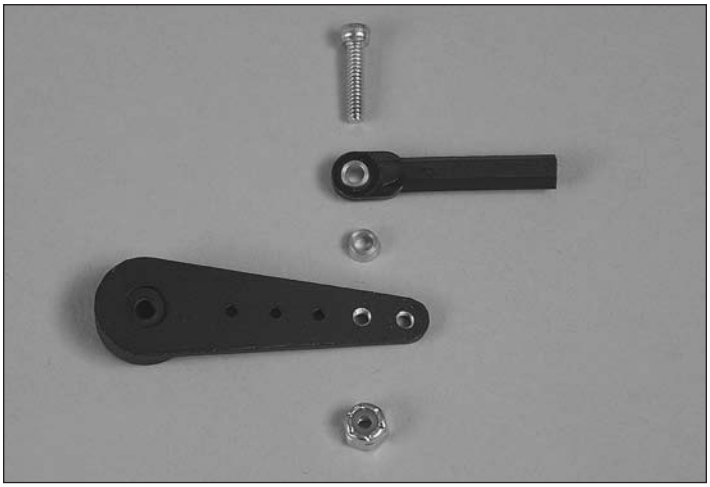
Note: The included aluminum servo arms are designed with plastic inserts, allowing the arms to work with all current Futaba, Hitec, Airtronics and JR servos. The inserts are also designed so that the centering of the arm can be adjusted by rotating the insert and then re-attaching the arm.

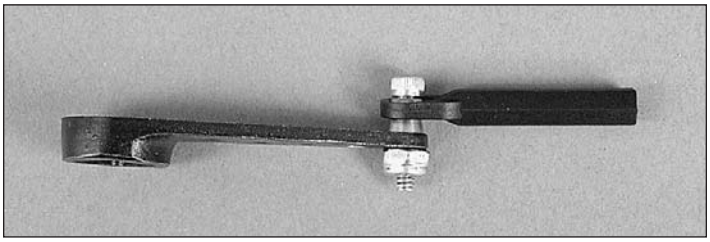


❏ 1. Drill and tap 4-40 threads in the two outermost holes of each of the six single-sided servo arms.



❏ 2. The nylon ball links have a number on one side of them. With the number facing up, press the brass ball into each of the nylon balls link from the bottom, opposite the number.

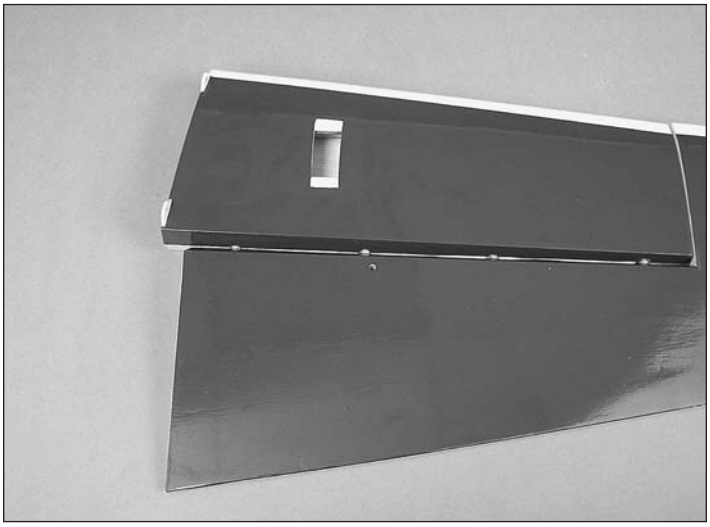




❏ 3. Attach the ball link to the outer tapped hole of one of the one-sided servo arms with 4-40 x 1/2" [13mm] Socket Head Cap Screw [SHCS] brass stand off and 4-40 lock nut. **Note: The number goes down toward the servo arm.**

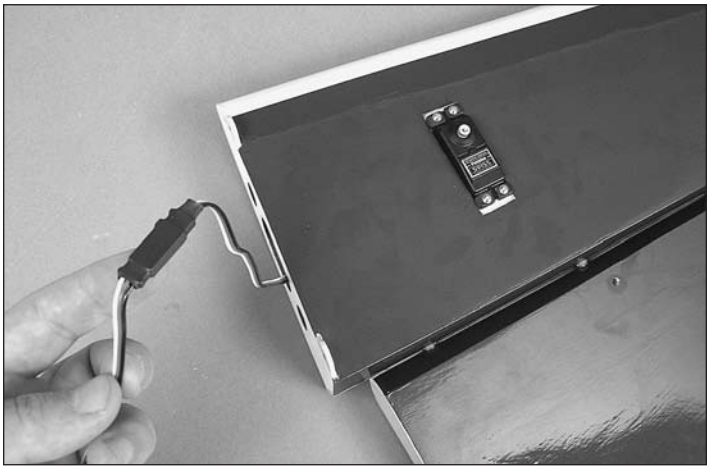
❏ 4. Attach the ball links to one other single-sided servo arm.

Mount the Elevator Servos

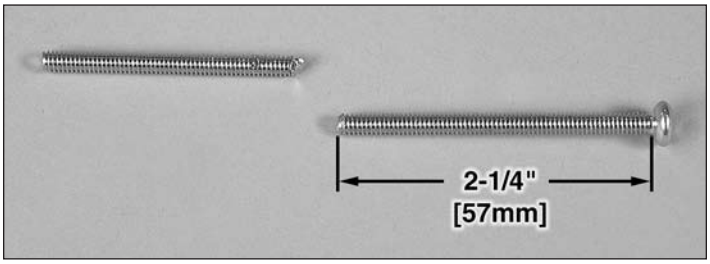


❏ ❏ 1. Trim the covering from the servo bay in the stab.

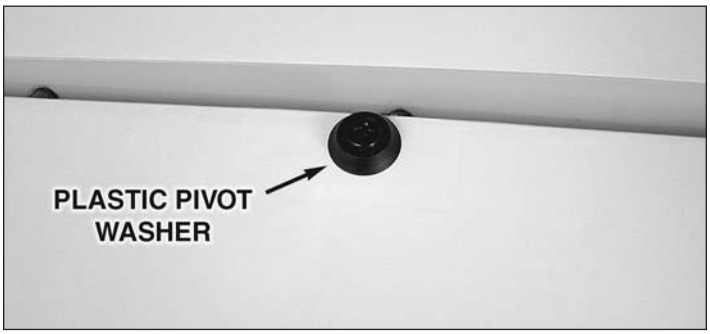
❏ ❏ 2. Use a 1/16" [1.6mm] drill bit to make the holes and install the elevator servo to a stab half using the hardware provided with your servo. Remove the screws and harden the screw holes you created in the wood with thin CA. You should do this each time you thread into wood.



❏ ❏ 3. Attach a 40" [1016mm] heavy duty servo lead extension and secure it using 3/8" [9.5mm] diameter heat shrink tubing.

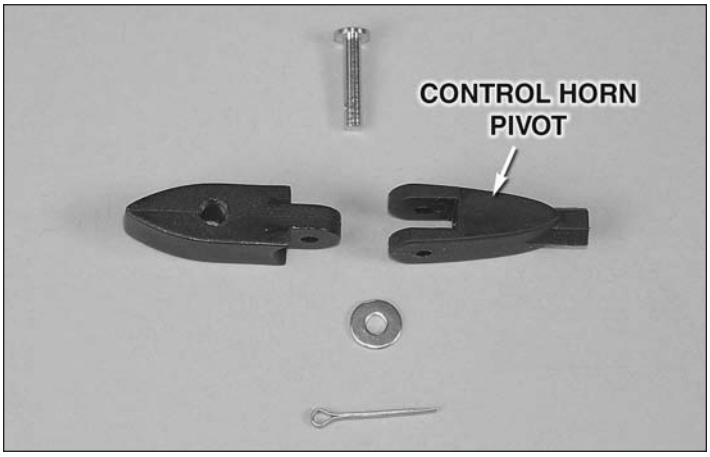


❏ ❏ 4. Cut the 4" [102mm] control horn bolt to a length of 2-1/4" [57mm].

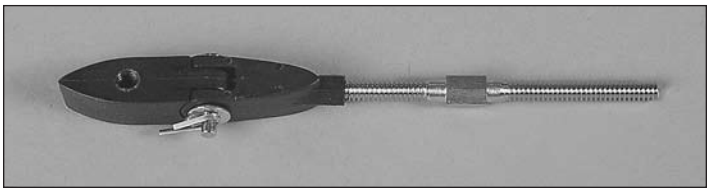


❏ ❏ 5. Place a pivot washer on the control horn bolt. Install the control horn bolt through the top of the elevator.

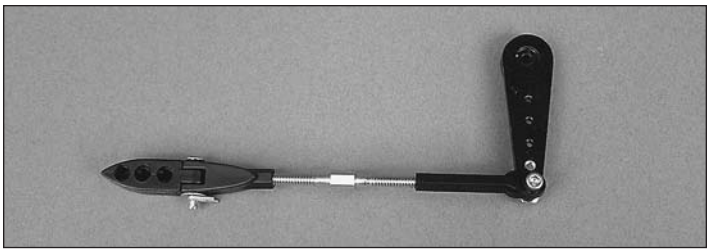
❏ ❏ 6. Install a pivot washer to the other side and screw the nylon nut onto the control horn bolt.



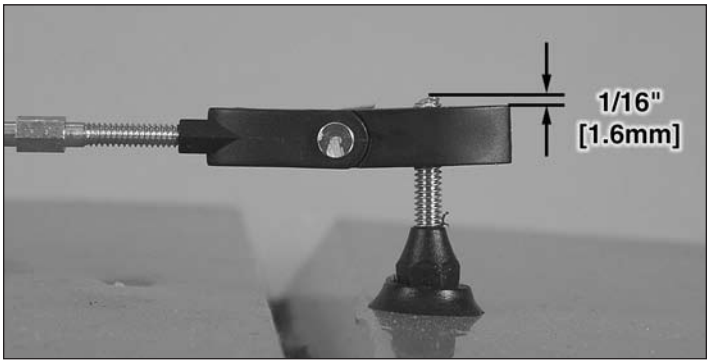
❏ ❏ 7. Assemble the control horn parts as shown. Note: Eight total control horn pivots are supplied. **Two are standard thread and six are reverse thread**. Identify the two standard thread pivots and set them aside for use on the rudder system. Do not assemble those now.



❏ ❏ 8. Screw the reverse threaded end of the 2-1/2" [64mm] pushrod 15 full turns into the control horn. (To tighten, turn counterclockwise.)



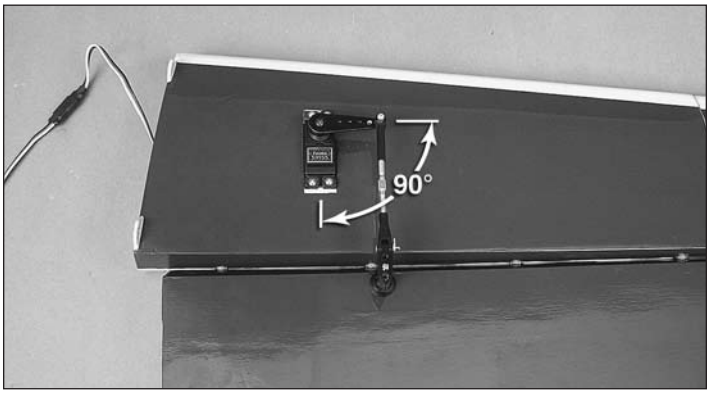
❏ ❏ 9. Screw the “normal” threaded end of the pushrod 15 turns into the ball link that is connected to one of the single-sided servo arms.



❏ ❏ 10. Screw the control horn onto the control horn bolt, leaving 1/16" [1.6mm] extending from the top of the control horn.

❏ ❏ 11. Plug the servo into the receiver and turn the radio on.

❏ ❏ 12. Place the appropriate servo arm adapter on the servo. The inserts have letters stamped on the bottom of them (A=Airtronics/JR, F=Futaba, H=Hitec).



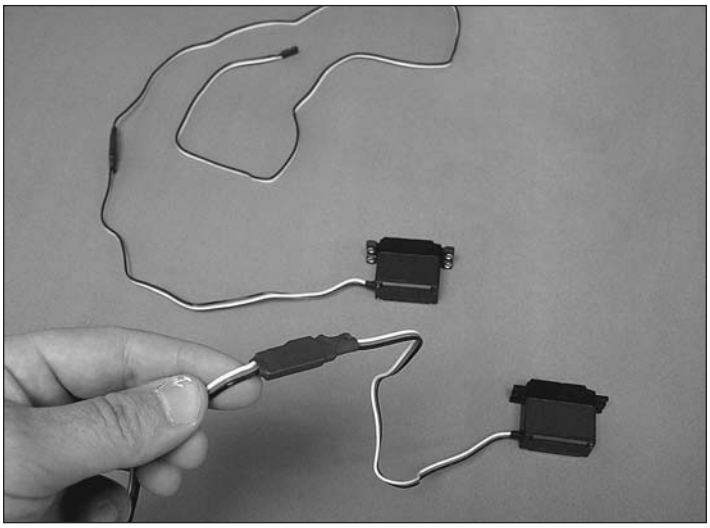
❏ ❏ 13. Attach the aluminum servo arm to the servo so that it is 90 degrees to the long side of the servo case. If it is not, remove the servo arm, rotate the insert 90 degrees and attach the servo arm again. Use the insert position that makes the servo arm fit closest to 90 degrees. Be sure to secure the servo arm with the screw.

❏ ❏ 14. Adjust the pushrod by turning it until the elevator is centered on the stab.

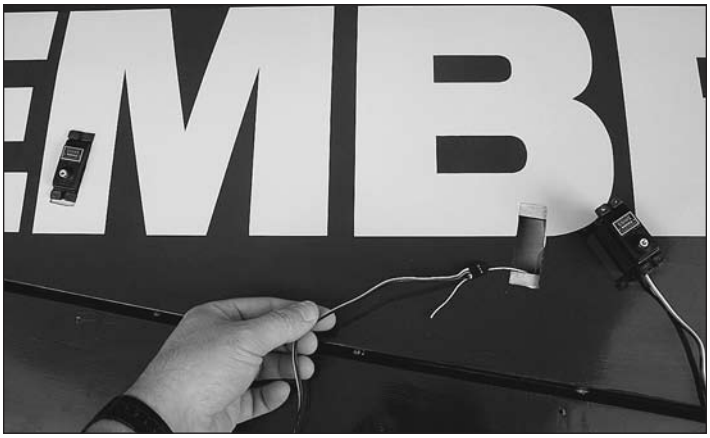
❏ 15. Repeat steps 1-14 for the other stab half.

ASSEMBLE THE WING

❏ ❏ 1. Remove the covering from the two servo openings in the bottom of the wing.

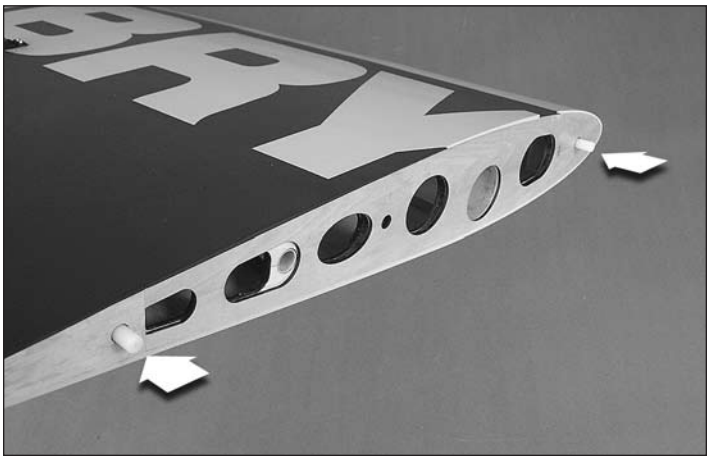


❏ ❏ 2. Connect a 24" [610mm] heavy duty servo lead extension to the inboard aileron servo and a 36" [914mm] extension to the outboard aileron servo. Secure the connections with heat shrink tubing.



❑ ❑ 3. Use the string in the wing to route each servo lead through the wing. Mount the servos, noting that the servo arms go toward the trailing edge of the wing.

❑ ❑ 4. Mount the control horns and servo arms following the same steps used with the stab. Mount the ball link to the inner tapped hole on the aileron servo arms. Cut the 4" [102mm] control horn bolts down to a length of 2-1/4" [57mm].

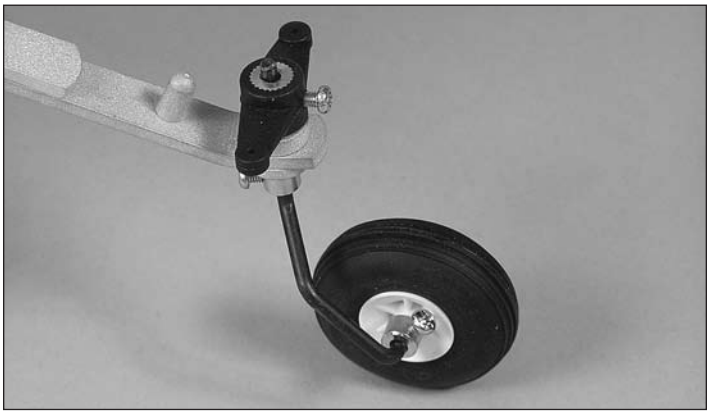


❑ ❑ 5. Glue the white nylon anti-rotation dowels in the wing with epoxy.

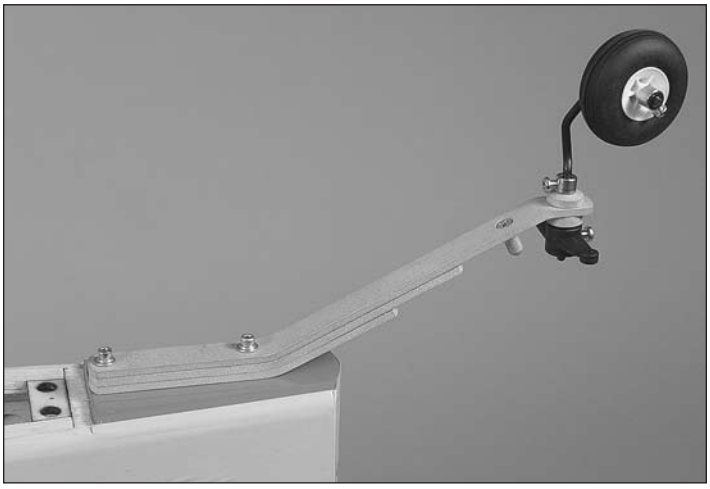
❑ ❑ 6. Repeat steps 1-5 for the other wing.

ASSEMBLE THE FUSE

Install the Tail Gear



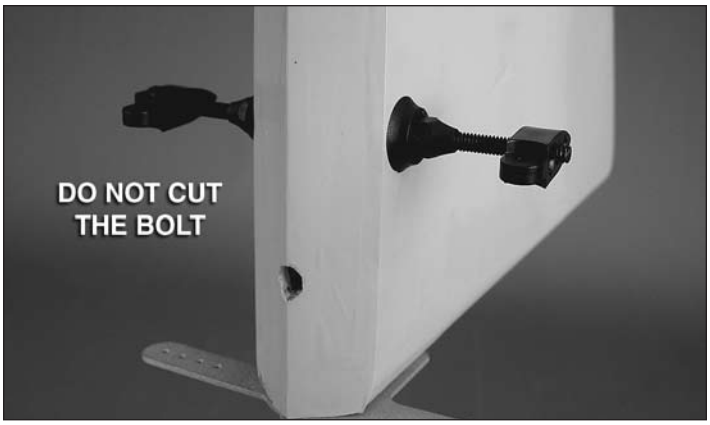
❑ 1. Grind flat spots on the tail gear wire for the set screws. Assemble the tail gear as shown in the photo with threadlocker. Use three 3mm wheel collars, three 3mm x 5mm phillips head screws and one 3mm x 8mm phillips head screw to assemble it.



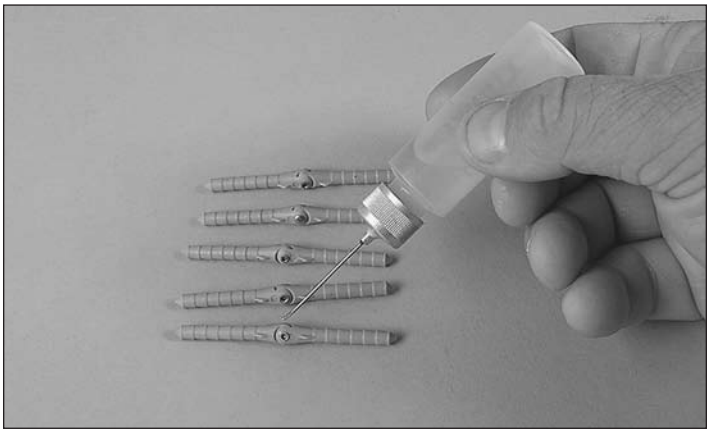
❑ 2. Remove the covering for the tail gear mounting bolts. Attach the tail gear with threadlocker, two 4-40 x 3/4" [19mm] phillips head screws, two #4 flat washers, and two #4 lock washers.

❑ 3. Attach the tail gear steering arm to the bottom of the rudder with three #4 x 5/8" [15.9mm] sheetmetal screws.

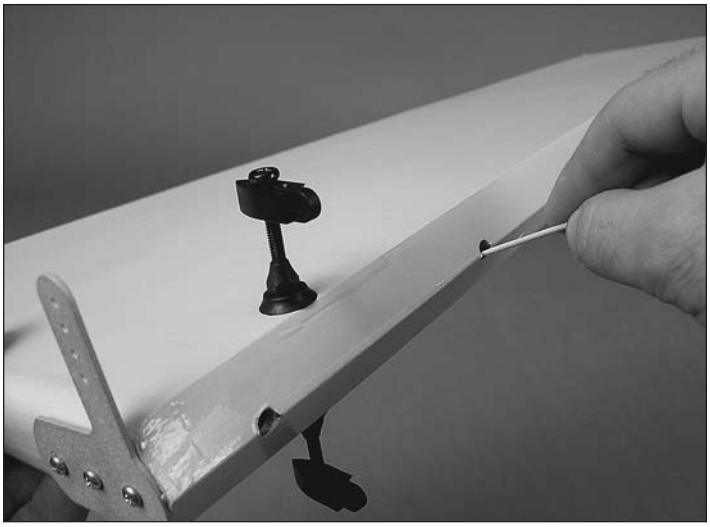
Attach the Rudder



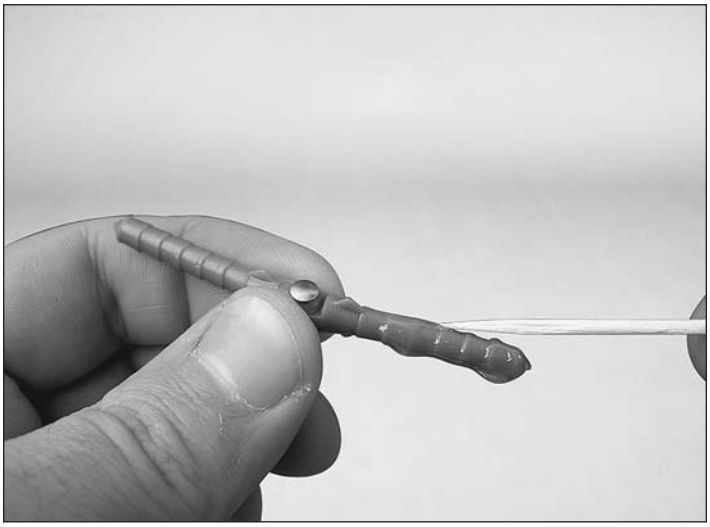
❏ 1. Mount the rudder control horns as shown, using the remaining uncut 4" [102mm] bolt.



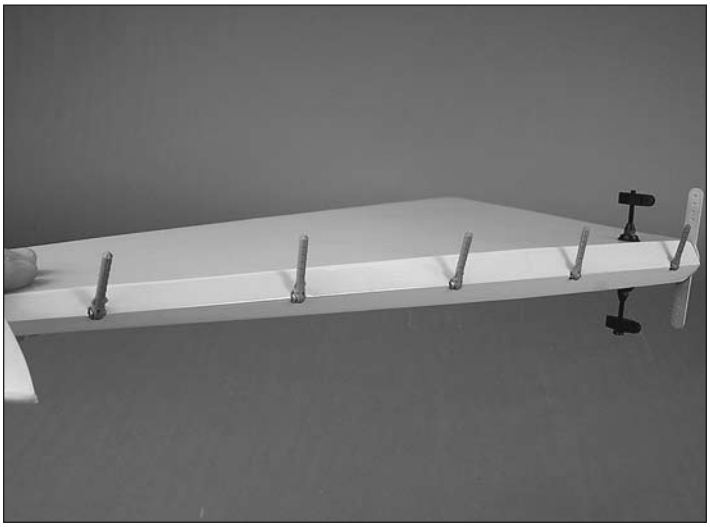
❏ 2. Prepare the five hinges by cleaning the barbs with denatured alcohol and applying household oil or petroleum jelly to the hinge pins.



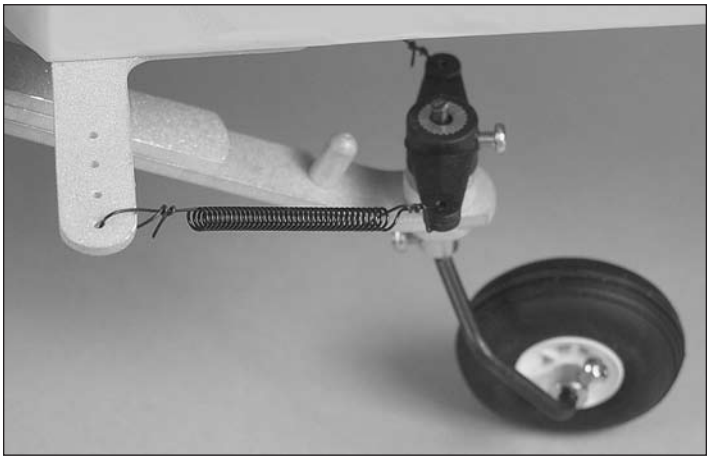
❏ 3. Mix up a batch of 30-minute epoxy (or your preferred hinge glue) and use a toothpick to fill the pre-drilled hinge pockets with glue. Fill the rudder and the fin pockets with glue.



❏ 4. Coat the hinge barbs with glue.



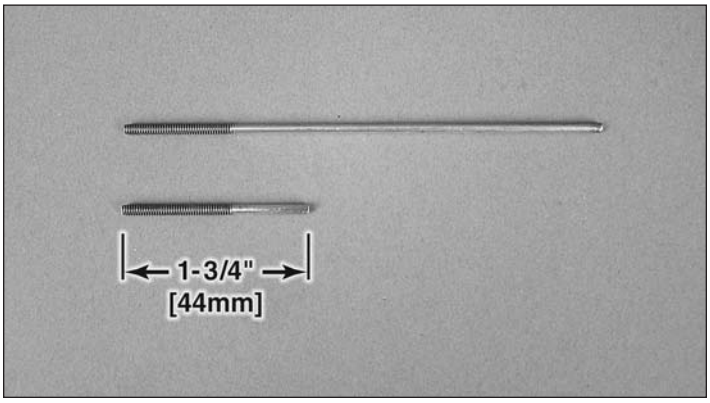
❏ 5. Install the hinges and the rudder with the hinge pins aligned vertically. Rotating the hinges 90° when you fit them to the rudder will help you do this. Deflect the rudder left and right several times as you slide the rudder onto the hinges.



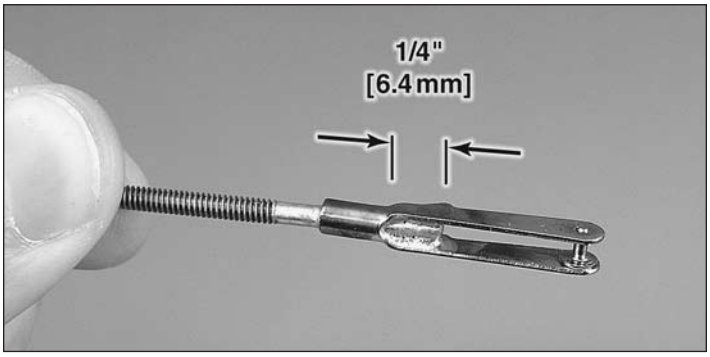
❏ 6. When the rudder hinges are fully cured, attach the tail gear arm to the tail gear with the two springs.

Install the Rudder Servos

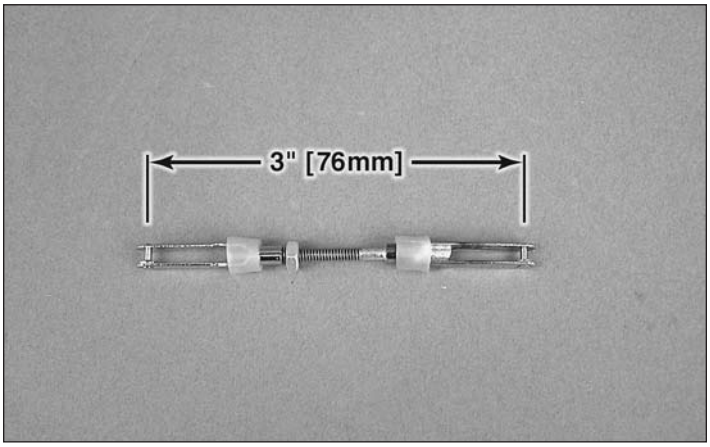
❏ 1. Install two servos in the rudder tray so that the servo output shafts are positioned aft.



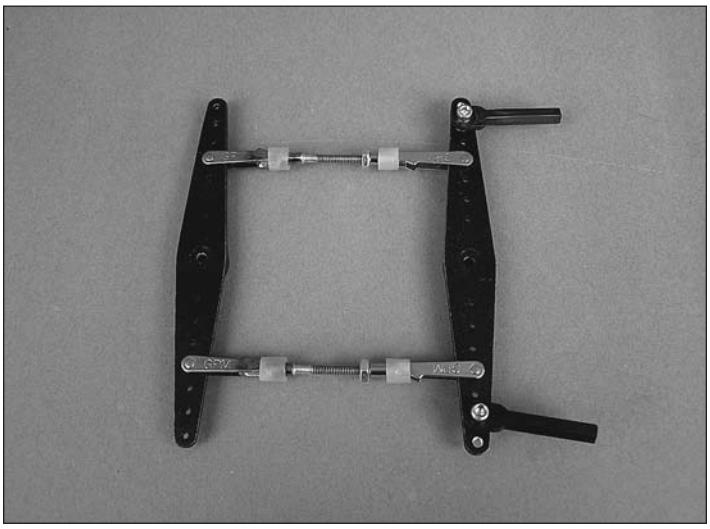
❏ 2. Cut the two 4-40 x 4-1/2" [114mm] one-end threaded rods down so that they each measure 1-3/4" [44mm]. Roughen the end of the rod with a green ScotchBrite pad or sandpaper. Clean the rod with denatured alcohol and a clean cloth.



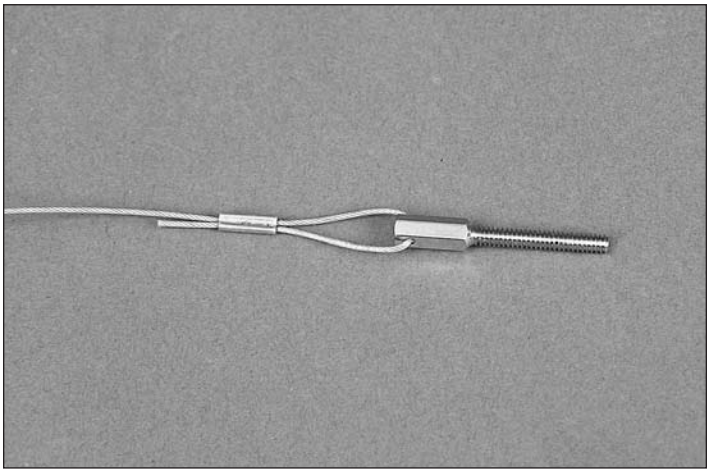
❏ 3. Using silver solder, flux and your hobby torch, solder an unthreaded steel clevis onto the unthreaded end of each pushrod so that 1/4" [6.4mm] of rod protrudes past the barrel of the clevis. Wipe away the remaining flux with a damp cloth while the joint is still warm to prevent corrosion. Apply a thin film of household oil to the surface of the joint.



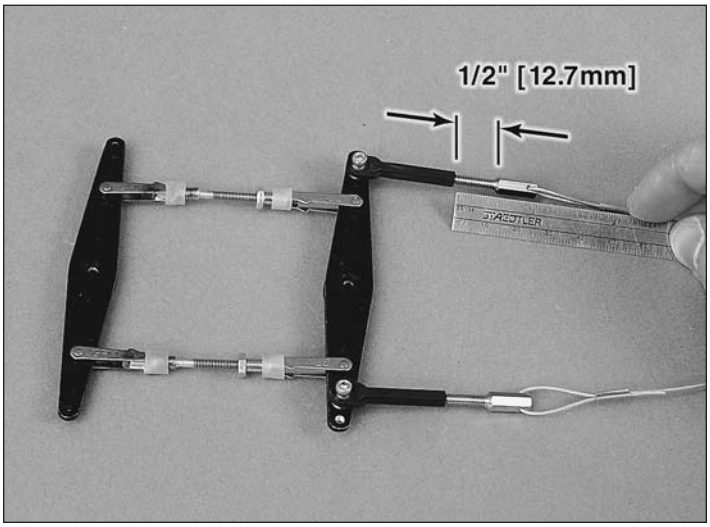
❏ 4. Fit a 4-40 hex nut, two silicone retainers and a 4-40 ***threaded*** clevis onto the threaded end of each rod. Adjust the length of the rods so that they measure 3" [76mm] from pin to pin.



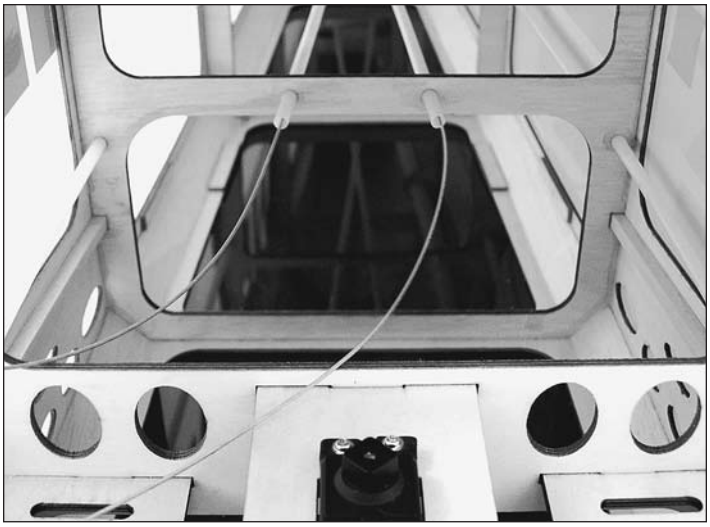
❏ 5. Drill and tap one of the two 4" [102mm] servo arms and install two nylon ball links as shown. Link the two servo arms together by installing the pushrods in the fourth holes out from the center of each arm.



❏ 6. Cut the supplied steel pull-pull cable in half. Swage a threaded coupler to one side of each of the two cables. Note: The swage must be crimped tightly! Inspect each swage for cracks and to assure tightness.

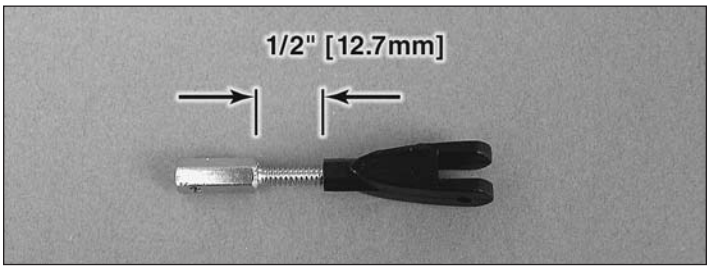


❏ 7. Thread the couplers into the nylon clevises so that at least 1/2" [12.7mm] of thread is still showing.

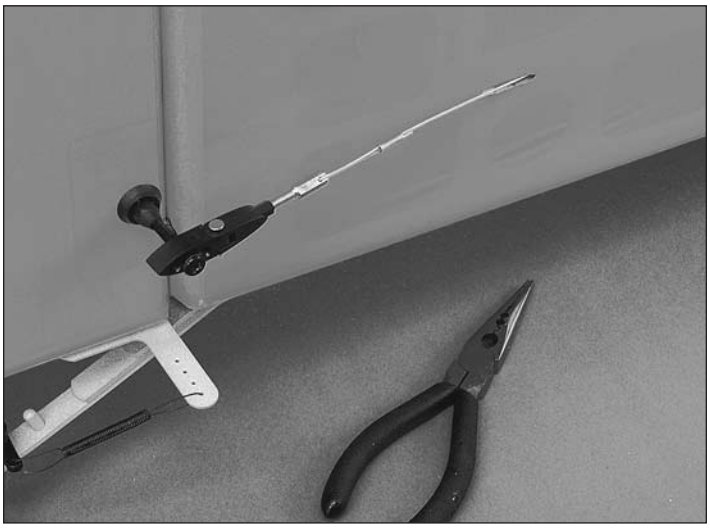


❏ 8. Route the cables through the guide tubes.

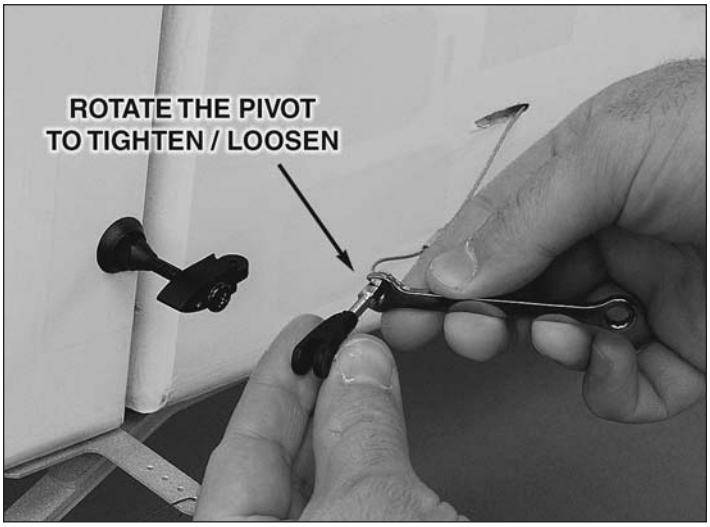
❏ 9. Turn on your radio and fit the servo arms to the rudder servos. Make adjustments using your radio or a servo synchronizer to balance the two servos. Make sure that you have not twisted the cables and that they slide freely through the tubes. Install the servo arm screws using threadlocker.



❏ 10. Install a threaded coupler onto each **standard thread** control horn pivot. Screw them in so that at least 1/2" [12.7mm] of thread is still showing.

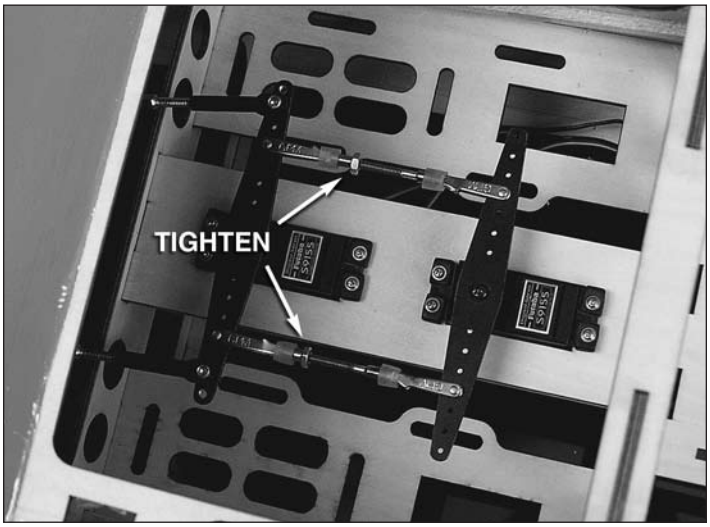


❏ 11. Temporarily fit the control horn pivots to the control horns. ***Do not install the cotter pin*** until after you have adjusted and tensioned both cables. With your radio still on and your rudder servos centered, fit both cables to the couplers and center the rudder. When you're satisfied, swage the cables to the couplers. Trim the excess cable.



❏ 12. Tension and adjust the cables at the couplers by removing the control horn pivot pin and tightening or loosening the pivot on the coupler. Note: It is necessary to adjust the cable tension in this manner to prevent the cable from becoming twisted.

❏ 13. Reinstall the control horn pivots. Make sure that at least 3/16" [4.8mm] of thread is showing at each of the four cable couplers. Install the washers and cotter pins to the left and right rudder control horn pivot pins.

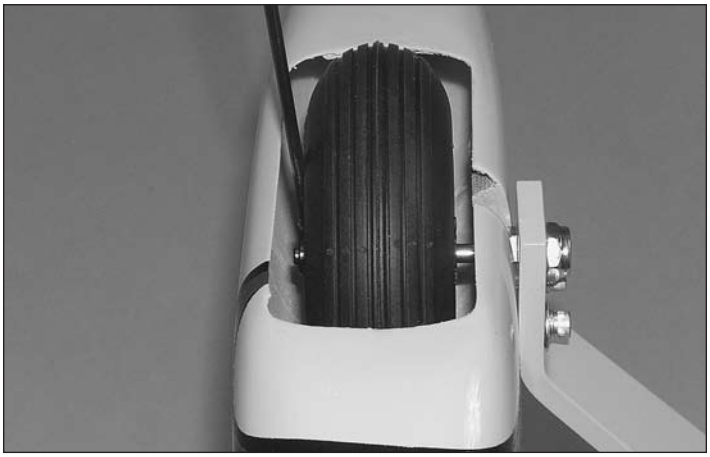


❏ 14. Tighten the 4-40 nuts against the threaded clevises to secure the pushrods, using threadlocker.

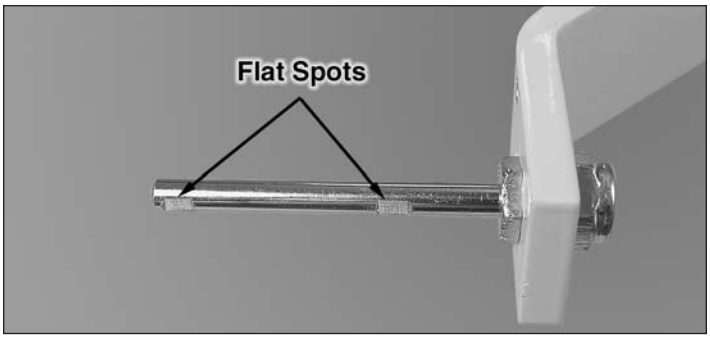
Install the Main Landing Gear

❏ ❏ 1. Attach the axle to the main gear with the nylon lock nut.

❏ ❏ 2. Fit the wheel to the axle using two wheel collars with two 6-32 x 1/4" [6.4mm] SHCS locking screws.



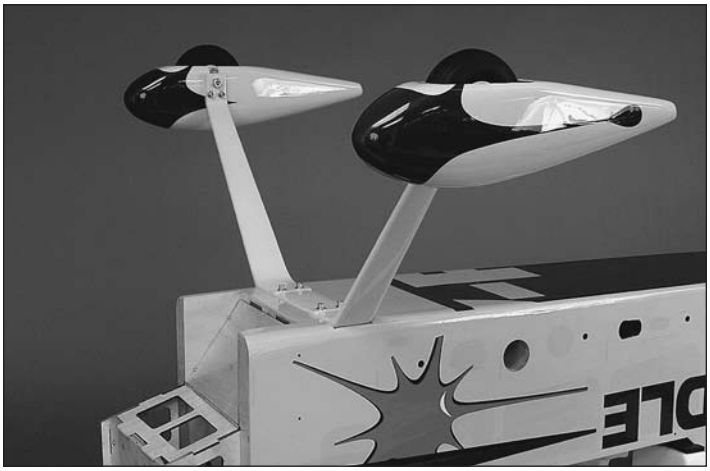
❏ ❏ 3. Mount the wheel pant with two 8-32 x 3/4" [19mm] SHCS. Center the wheel in the wheel pant and tighten the wheel collars.



❏ ❏ 4. Remove the wheel pant. Mark the location of the wheel collars. File flat spots on the axles for the wheel collars.

❏ ❏ 5. Apply threadlocker to the wheel collar locking screws and refit the wheel to the axle. Mount the wheel pant using threadlocker, two 8-32 x 3/4" [19.1mm] SHCS, two #8 flat washers and two #8 lock washers.

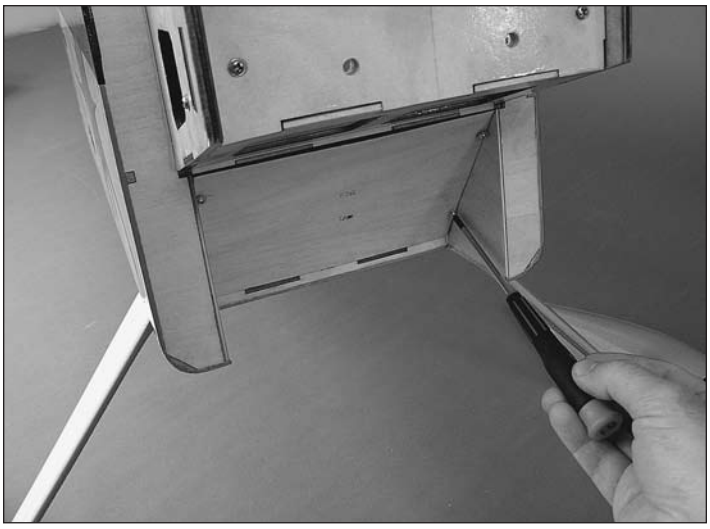
❏ 6. Repeat steps 1 through 5 for the other axle and wheel pant.



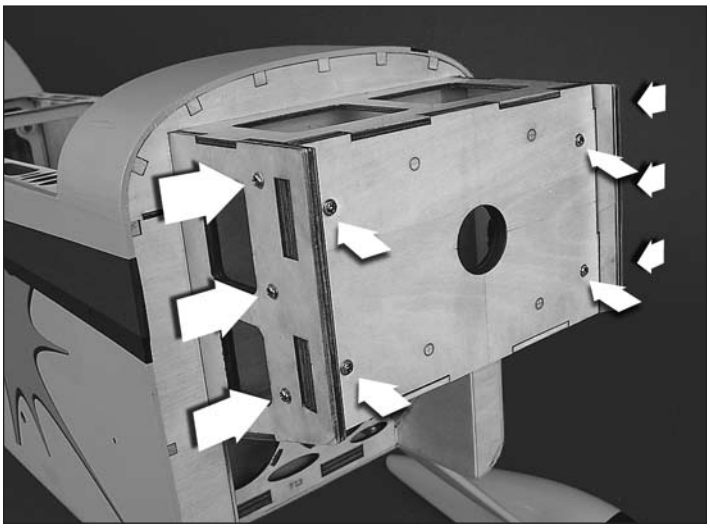
❏ 7. Mount the landing gear to the fuse with threadlocker, four 8-32 x 1" [25.4mm] SHCS, four #8 flat washers and four #8 lock washers.

Mount the Engine

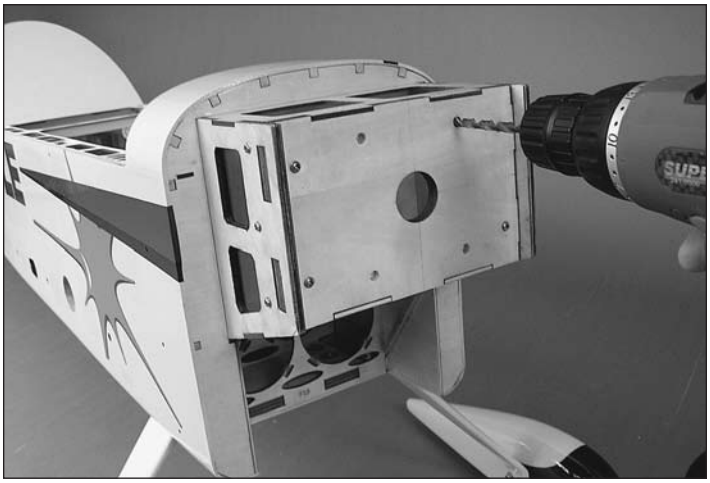
We have made provisions to mount either the DA-85 or the DA-100 gas engine from Desert Aircraft. This section of the manual will guide you in installing the DA-100 along with the optional short canister-style exhaust. Laser-etched marks have been made on the firewall that match the mounting pattern of the DA-100. If you will be using a DA-85 engine, please use the mounting template we have provided for you in the back of this manual and refer to steps 6 through 9. Note: The DA-85 must be used with the standard Pitts style muffler. Canister or tuned pipe exhaust cannot be used on this model with the DA-85.



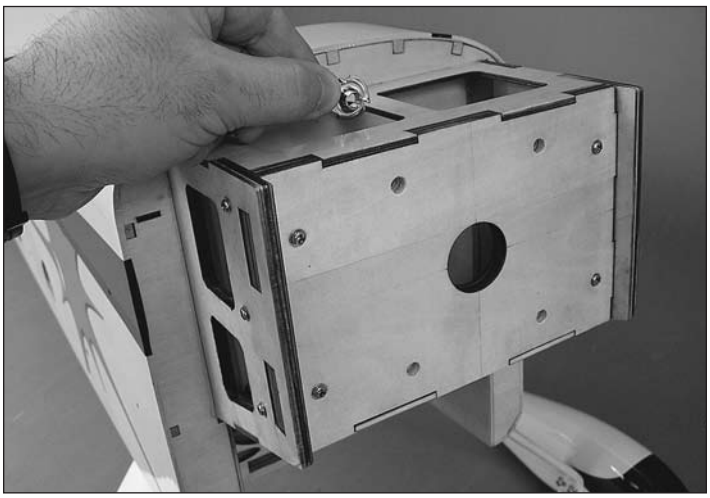
❏ 1. If you're using the DA-100 and will be using canister exhaust, remove the cover for the exhaust tunnel. If not, you may glue the cover in place.



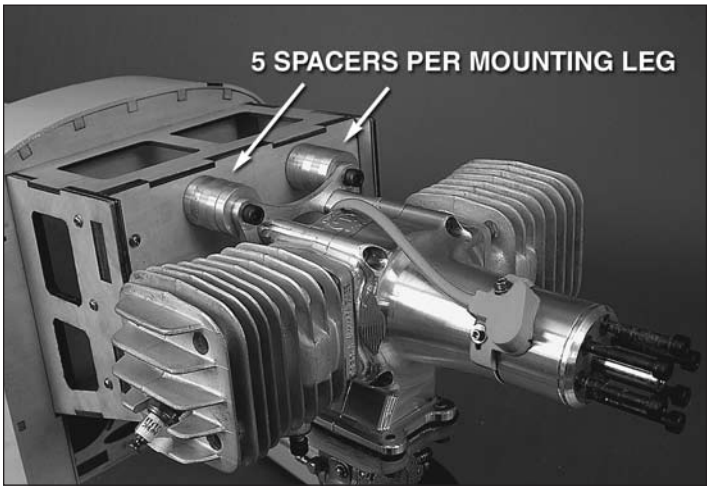
❏ 2. Tighten the ten bracing screws on the firewall. You should periodically check these from time to time to make sure that they stay tight. If you prefer, epoxy them in place.



❏ 3. For the DA-100 engine, drill four 5/16" [7.9mm] diameter holes using the laser-etched marks provided on the firewall. To get the straightest holes, you can drill 1/8" [3.2mm] pilot holes first.



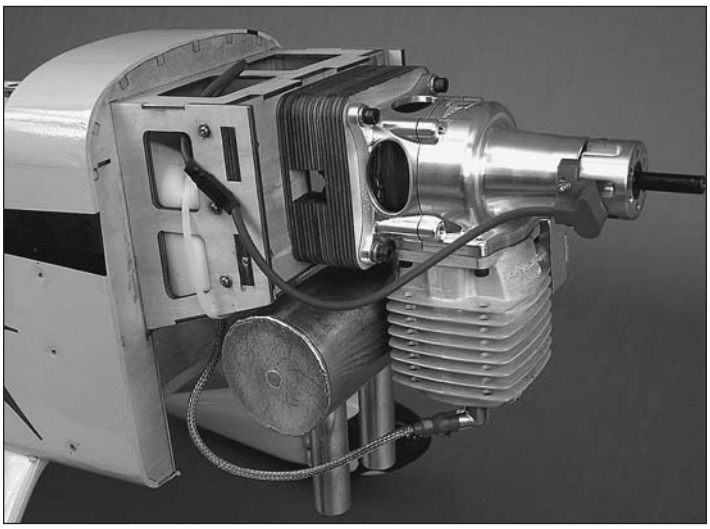
❏ 4. Install four 1/4-20 blind nuts on the back side of the firewall.

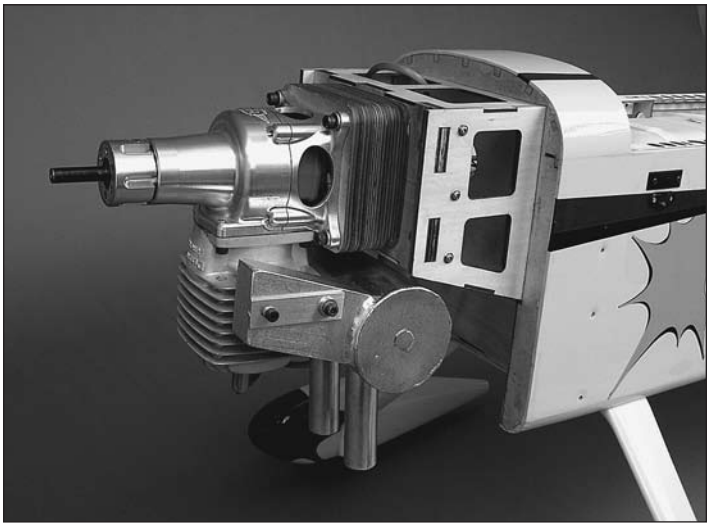


❏ 5. Mount the engine to the firewall using ***threadlocker***, twenty 6mm thick aluminum spacers (five per mounting leg), four 1/4-20 x 2-3/4" [70mm] SHCS bolts, and four 1/4"

[6.4mm] lock washers. You'll want to inspect these screws after the first few flights and then periodically after that to make sure that they're still tight.

Use the next four steps to mount a DA-85 engine.

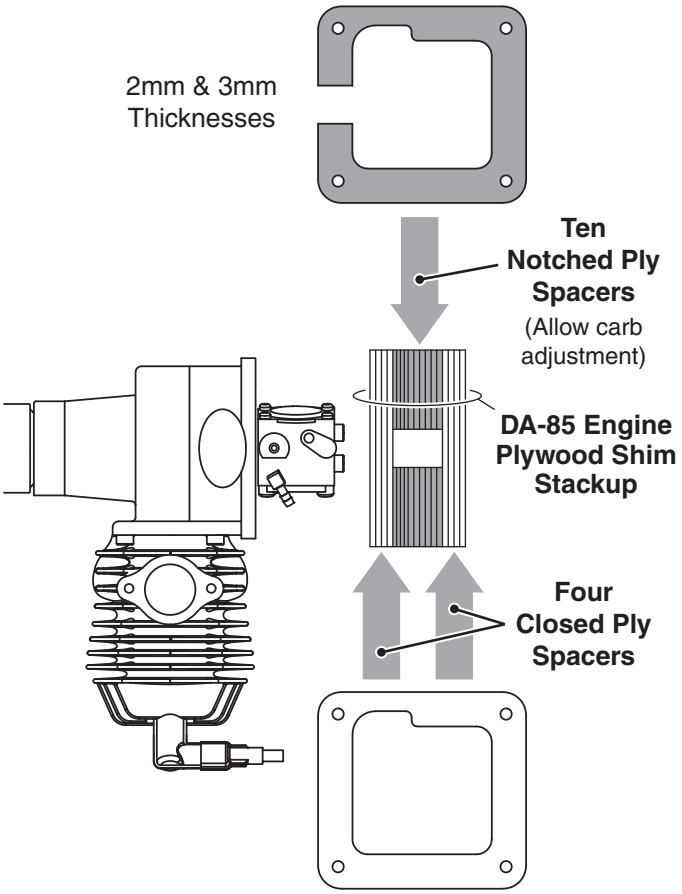




Mounting and rigging the DA-85 engine is similar to the DA-100 with the exception of the required engine mount standoffs. Desert Aircraft does not allow the use of aluminum standoffs for this particular engine. We have supplied you with eighteen wooden standoffs to accommodate your DA-85.

❏ 6. Cut out the DA-85 mounting template we have provided in the back of this manual. Tape (or use spray adhesive) the template in position with the arrow pointed up, the text toward you, and the crosshairs aligned with their corresponding marks on the firewall.

❏ 7. Drill four 5/16" [7.9mm] diameter holes for the engine mounting bolts. Install four 1/4-20 blind nuts on the back side of the firewall.



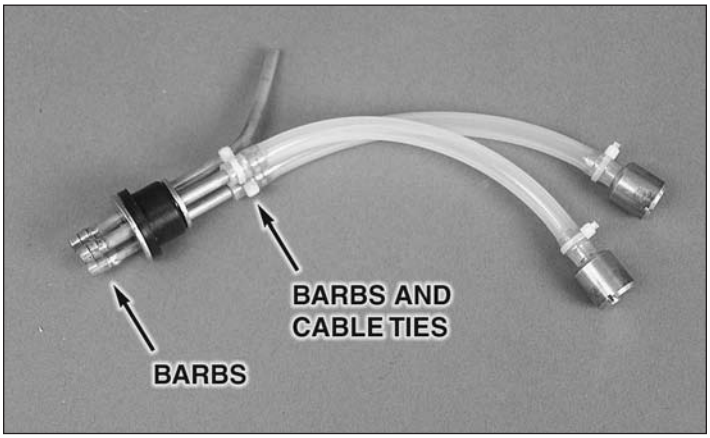
❏ 8. Use the sketch above to help you stack the ply standoffs in the correct order. Four closed standoffs go on either side of the ten notched standoffs. Coat the threads and the shank of the four 1/4-20 x 2-3/4" [70mm] SHCS bolts with petroleum jelly and fit a 1/4" lock washer to each. Apply a thin layer of 30-minute epoxy between each layer and bolt your DA-85 to the firewall.

❏ 9. After the epoxy has cured, remove the engine and clean off the bolt threads. Fuel proof the plywood standoffs with finishing resin or thinned epoxy. Reinstall the engine applying threadlocker to the engine mounting bolt threads.

Assemble and Install the Fuel Tank

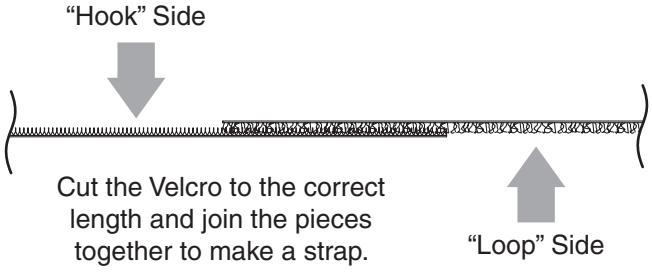
❏ 1. Assemble the stopper, brass tubes and steel stopper end plates as shown.

❏ 2. Solder the brass barbs to the ends of the brass tubes. Note: Get the tubes just hot enough for the solder to flow. If you get the tubes too hot it will damage the tank stopper.

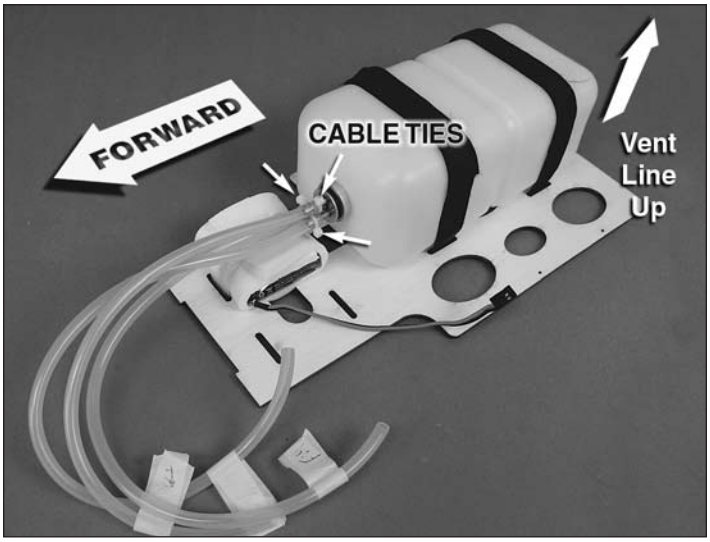


❏ 3. Attach the clunks to the short brass tubes with 5" [127mm] pieces of fuel line. Secure the fuel lines to the barbs with four small plastic cable ties.

❏ 4. Install the aluminum neck ring. Install the stopper assembly in the tank with the vent line toward one of the longer sides of the tank. Mark that side of the tank as top. Tighten the stopper screw.



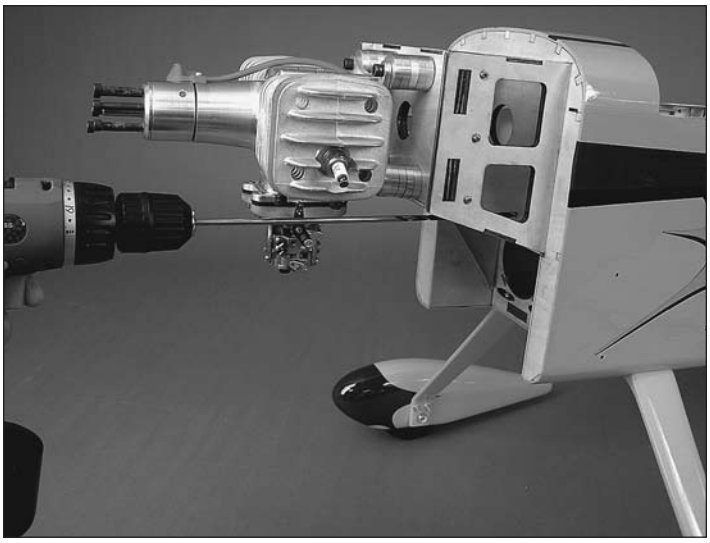
❏ 5. Wrap your ignition battery in 1/4" [6.4mm] latex foam rubber. Cut a section of hook and loop material and make a battery strap as shown in the sketch. Securely install your ignition battery on the fuel tank tray using the strap you made.



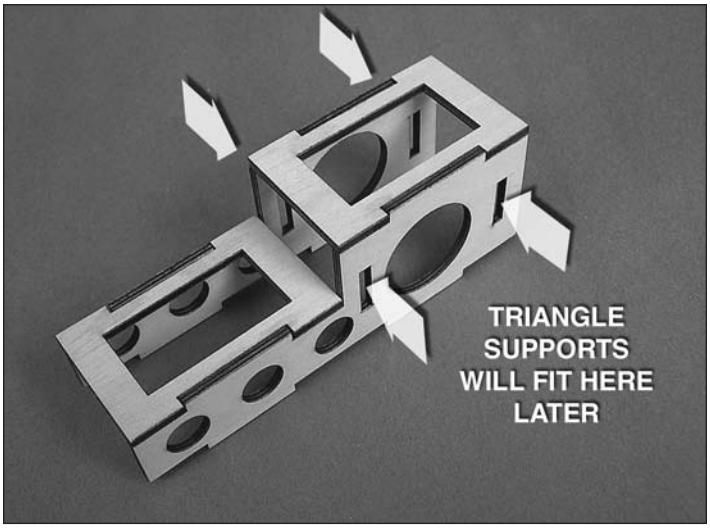
❏ 6. Make two more straps and attach your fuel tank to the tray. Be sure the vent line faces up. Attach three fuel lines using small cable ties to secure them to the lines. The vent and fill lines should be at least 16" [406mm] and the catb line should be at least 14" [356mm]. Label each fuel line to make it easy to identify. The tabs of the tray fit into the slots of the former in the fuse. Note: The tray can be flipped over to offset the tank to the side that will clear the throttle linkage. Install the fuel tank tray using six #2 x 3/8" [9.5mm] Phillips head sheet metal screws and six #2 washers.

Install the Throttle & Choke Servos

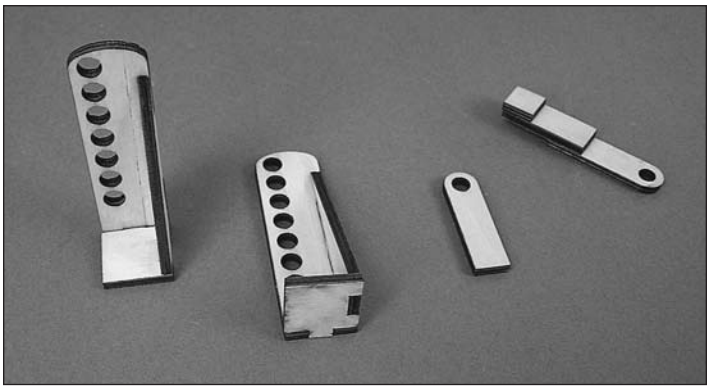
❏ ❏ 1. Fit a steel ball link to your throttle arm using threadlocker and a 2-56 hex nut.



❏ ❏ 2. Drill a 3/16" [4.8mm] hole through the former aligned with the throttle arm on the engine.

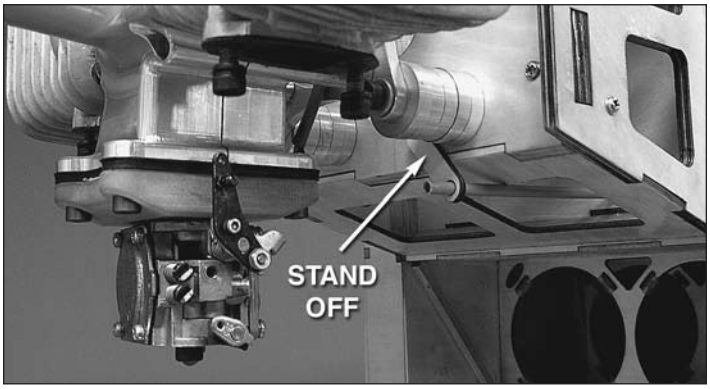


❏ ❏ 3. Assemble the throttle and choke servo tray as shown. Note: Two triangle support pieces are supplied to support the tray. Please glue these in later after you have installed the tray in the fuse.

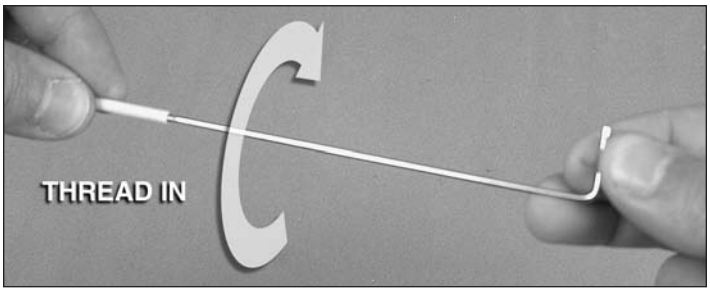


❏ ❏ 4. Assemble the two pushrod standoffs as shown. Four other standoffs are provided for you as well as spacers so you can support the throttle and choke pushrod tubes as needed.

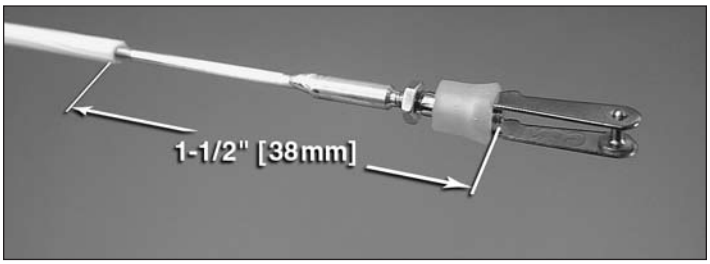
❏ ❏ 5. Install the servo tray and your throttle servo. Note: The servo tray can be offset to the right or left to suit your installation. Install the **two** triangle supports accordingly.



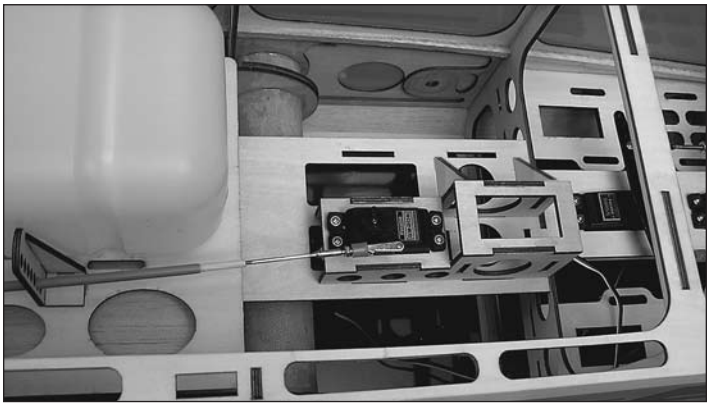
❏ ❏ 6. Lightly sand the outside of the 36" [914mm] throttle outer pushrod tube. Route the tube and fit the standoffs. Cut the tube to length.



❏ ❏ 7. Screw a 2-56 x 6" [152mm] one-end threaded rod into a 36" [914mm] flexible inner pushrod tube. Make a 90° bend in the unthreaded end of the rod to help you screw the rod in. Screw it in so that most of the threads are engaged.



❏ ❏ 8. Cut the steel rod down so that it measures 1-1/2" [38mm] from the end of the plastic tube. Solder a brass threaded coupler onto the end of the pushrod. Thread on a 2-56 hex nut, a silicone retainer, and a steel clevis. Note: A soldering iron should not be used as this is too slow to heat the joint and will cause the pushrod tube to melt. Use a hobby torch with only enough heat to get the solder to flow.



❏ ❏ 9. Install the throttle rod and attach the clevis to your servo arm. Install the servo arm locking screw.

❏ ❏ 10. With your radio on and your throttle servo and throttle set to full open, cut the pushrod to length. Thread a 1" [25.4mm] threaded rod and a nylon ball link socket onto the engine side of the pushrod. Attach the ball link.

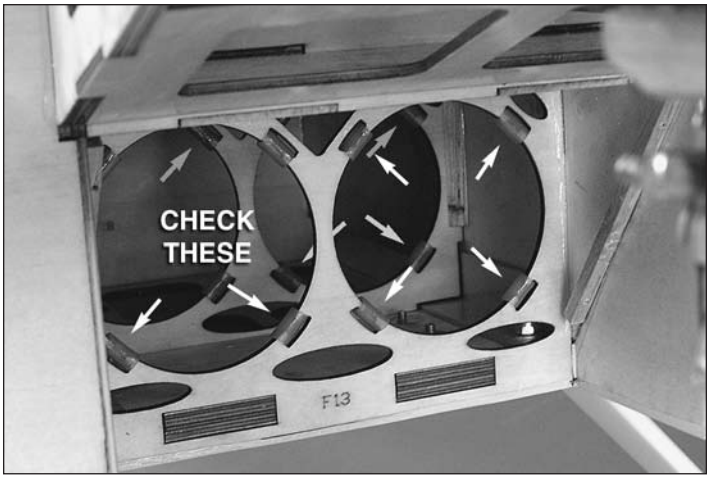
❏ ❏ 11. Test the operation of your throttle and adjust as necessary. Tighten the 4-40 locking nut on the servo arm side of the throttle pushrod.

❏ ❏ 12. Repeat steps 1 through 11 to install your choke servo and linkage. When you're satisfied with the operation of your throttle and choke setup, permanently glue all pushrod standoffs in place and use the provided #2 x 3/8" [9.5mm] sheetmetal screws and #2 washers to screw the two large throttle rod standoffs to the tank tray.

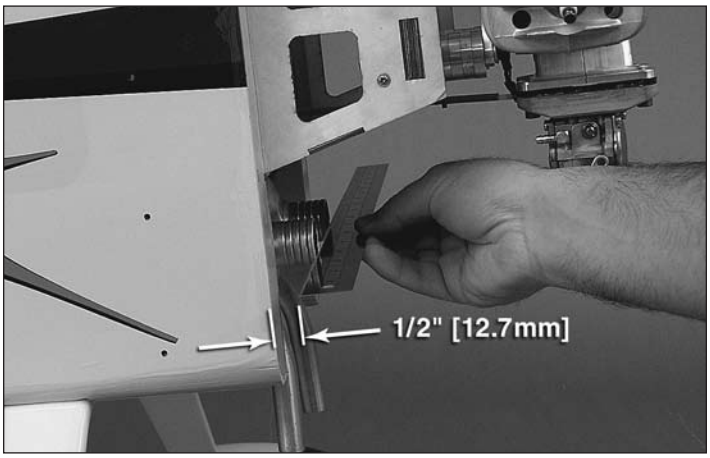
Install the Canister Mufflers (DA-100 only)

This section covers the installation of the optional MTW short canister exhaust system for the DA-100. This airplane was designed around this particular system, but other short canisters may fit. As is, the model will accommodate twin 70mm diameter cans whose can lengths are no longer than 250mm.

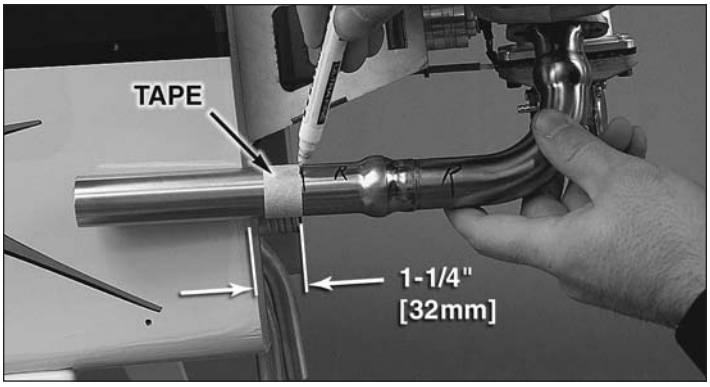
As a word of caution, canister style exhaust must not be considered maintenance free. Periodic inspection is required (especially after the first few runs and flights). The sixteen silicone supports must be replaced when heat has deteriorated them. Also, the cans should be removed from time to time to check the surrounding wood support and box structure for damage, failed glue joints, and dry or charred wood. For a more maintenance free system, please use the standard mufflers for your DA-100.



❏ 1. Inspect the silicone supports and replace any that appear damaged, loose, or are otherwise unusable. These can be replaced by using any standard silicone glow fuel line.

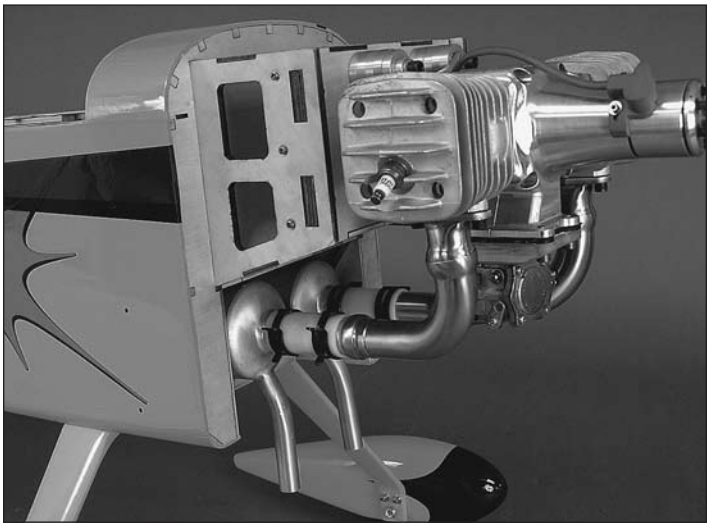


❏ 2. Fit the canister into one of the fuse supports. Slide it all the way back until it stops, and then slide it forward about 1-1/2" [38mm] so that the end of the front pipe is 1/2" [12.7mm] forward of the firewall face. Do the same for the other canister.



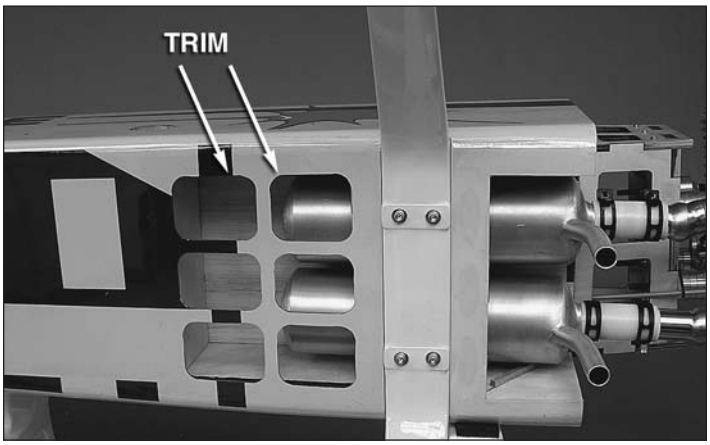
❏ ❏ 3. Position the exhaust header over the right cylinder's exhaust port and mark the pipe about 1-1/4" [32mm] forward of the firewall face. Use a felt tip pen to label this as the right hand pipe.

❏ ❏ 4. Cut the pipe to length.



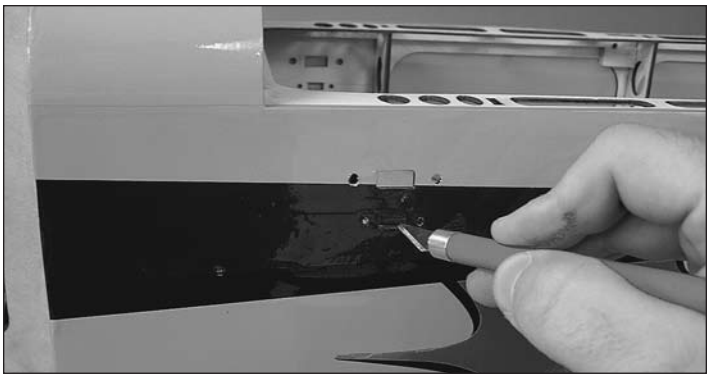
❏ ❏ 5. Fit the header to the canister using a coupler and two spring clamps. Bolt the header to the cylinder using the hardware and any gasket that came with your engine.

❏ ❏ 6. Repeat steps 3 through 5 for the other cylinder.

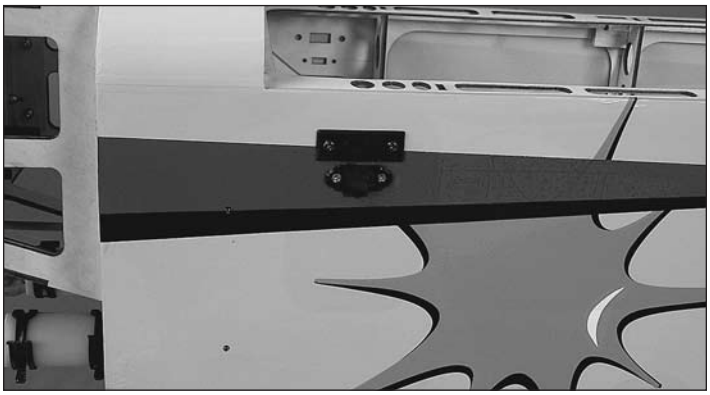


❏ 7. Trim the covering over the six cooling ports. Note: This is not an optional step. Muffler canisters require a generous amount of cooling air flowing over them to prevent damage to the surrounding structure.

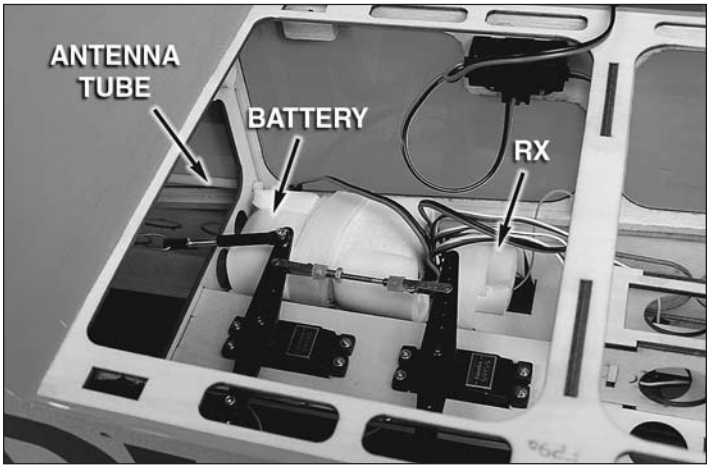
Install the Radio & Ignition Equipment



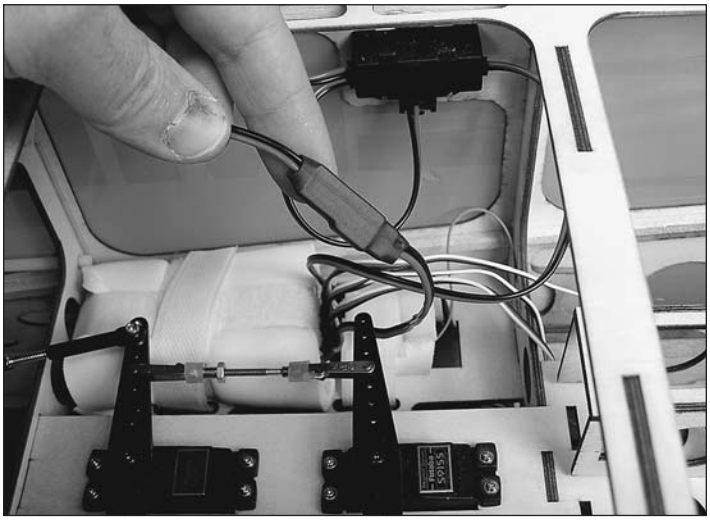
❏ 1. Four total positions are provided for you to mount your radio and ignition switches. Please trim the covering from the switch plates that suit your application. Note: To minimize the potential for radio interference, all engine ignition equipment (battery and switch included) must be kept at least 10" [254mm] from all radio equipment and servos.



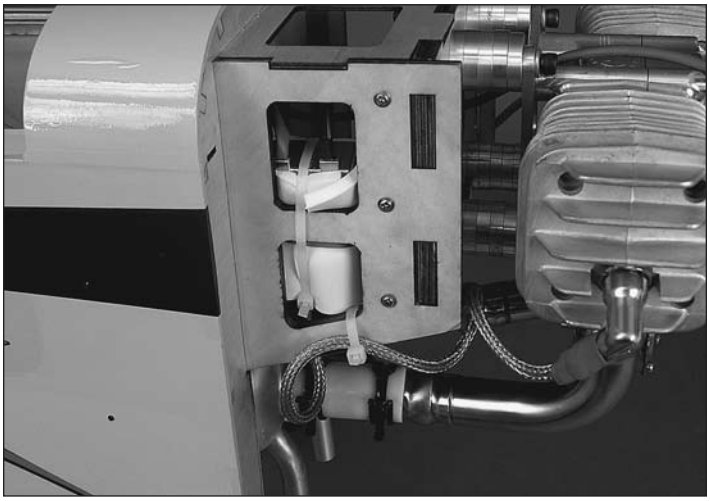
❏ 2. Install the switches and charge jacks. Depending on the switch and charge jack you choose, you may have to enlarge the openings in the fuse.



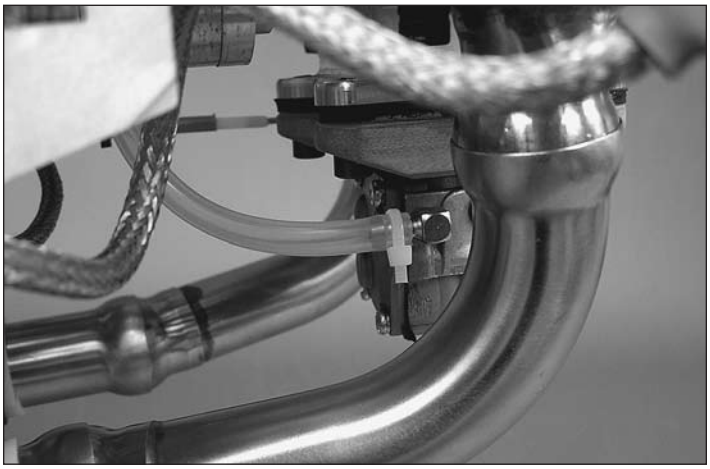
❏ 3. Wrap your radio battery in 1/4" [6.4mm] latex foam rubber and install it to the radio equipment tray. Install your radio equipment, hookup your servos, and install any other radio devices (servo synchronizer, servo reverser, etc.). Route your receiver antenna through the tube provided.



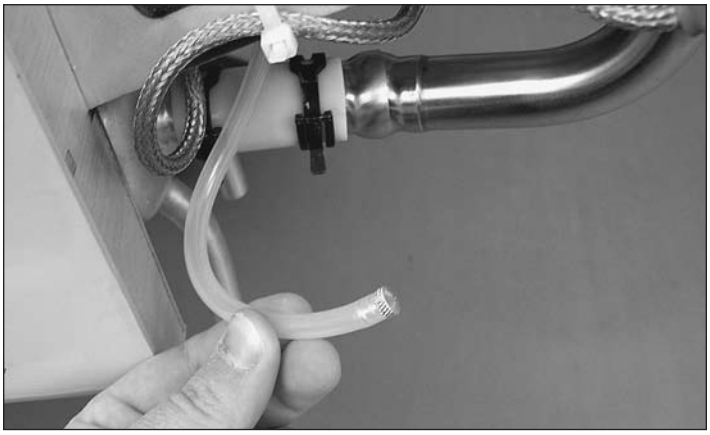
❑ 4. Secure your battery leads with 3/8" [9.5mm] heat shrink tubing.



❑ 5. Install your ignition module away from any radio equipment. Secure the electrical connections with heat shrink tubing. Make sure that the spark plug leads will not chafe by supporting them with plastic cable ties.

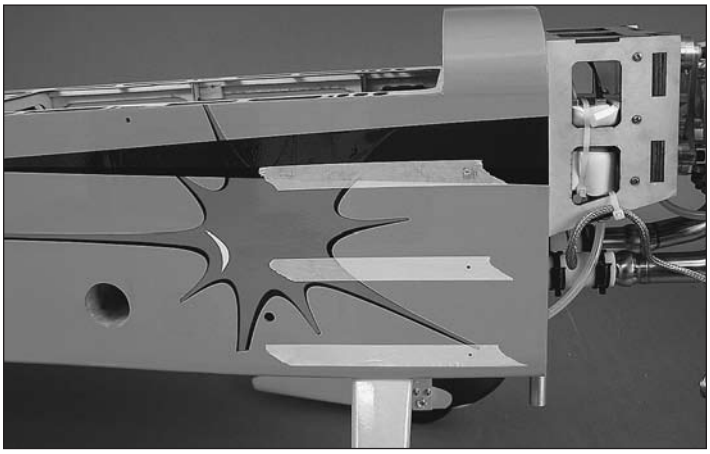


❑ 6. Route your vent and fill lines out the bottom of the fuse. Connect the feed line to the carburetor and secure it with a small cable tie.

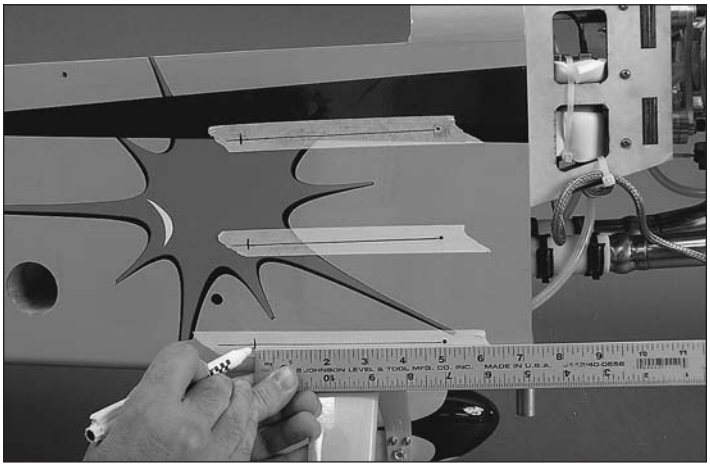


❑ 7. Install the fill line plug.

Mount the Cowl



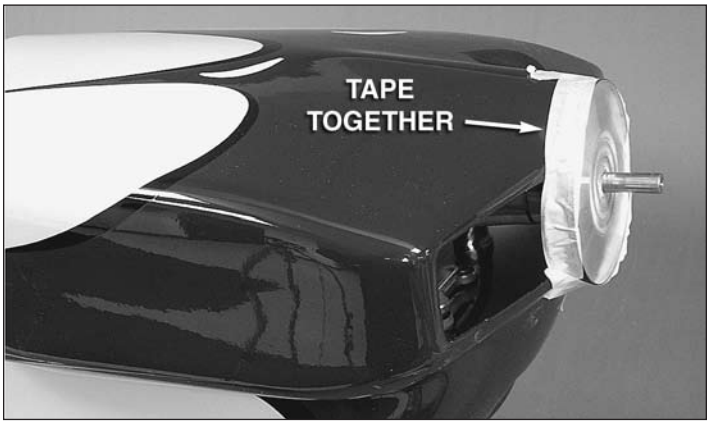
❑ 1. Apply a 6" [152mm] piece of masking tape over each of the six pre-installed blind nuts for the cowl. Each piece of tape should extend straight back and be parallel with the top edge of the fuse. Use cardstock or a manila envelope to make templates for your mufflers or cylinder head if necessary. Tape the templates in place on the fuse.



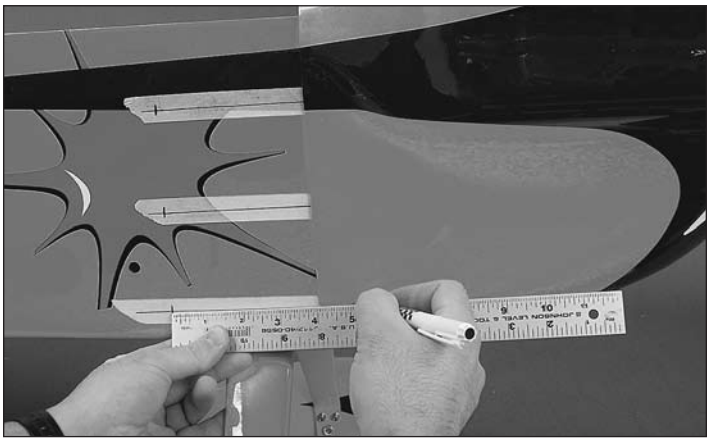
❑ 2. Draw a straight line from the center of the blind nut hole back about 5" [127mm]. Make a mark at the hole and 5" [127mm] back.

❏ 3. Slide the cowl over the engine onto the fuselage. On the DA-100 you need to remove one of the two spark plug boots to get the cowl on.

❏ 4. Cut a cooling slot at the bottom of the cowl that matches the air exit slot in the fuse.



❏ 5. Fit the spinner backplate and position the cowl 1/8" [3.2mm] behind the spinner backplate. Center the cowl with the backplate and tape it in position.



❏ 6. Align a ruler with the lines you made and measure 5" [127mm] forward to the cowl. Mark the cowl for each blind nut. Remove the cowl.

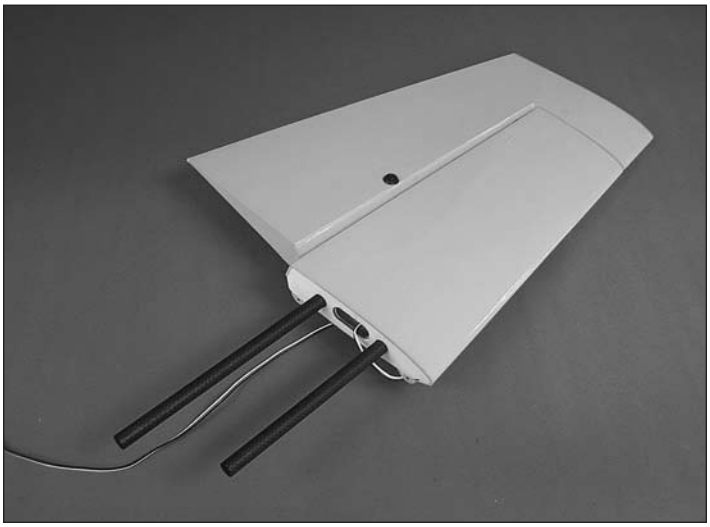
❏ 7. Drill a 1/8" [3.2mm] hole at each mark and reinstall the cowl using six 4-40 x 1/2" [12.7mm] SHCS, six #4 lockwashers, and six flat washers. Don't forget to use threadlocker.

❏ 8. Install the spinner and a balanced prop.

FINAL ASSEMBLY

Mount the Stabilizers

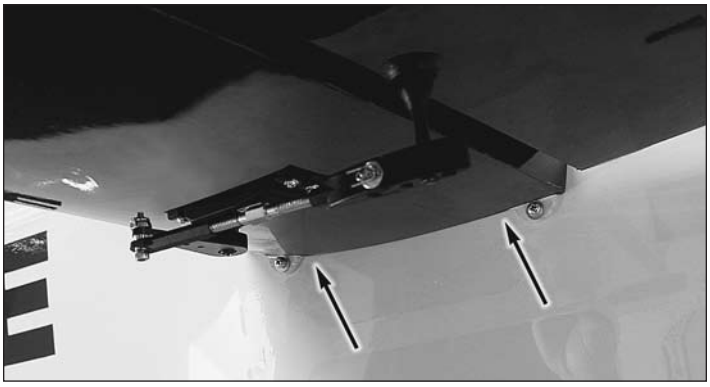
The removable tail needs to be checked often for wear. If the tail develops excessive movement, thin CA sparingly applied to the inside of the stab tubes and root ribs will cure it. If you are able to transport the Eagle with the stabs installed, we recommend permanently attaching the stab to the fuse with epoxy. If you permanently install the stab, please be sure to also use threadlocker on the mounting screws and check to see that these are still in place before each flight.



❏ 1. Fit the carbon stab tubes to one stab half. The shorter tube goes in the front. Rotate the tube as you're inserting it and push each tube in until it stops.

❏ 2. Fit the stab half to the fuse. Route the servo lead through the plastic guide tube inside the fuse.

❏ 3. Fit the other stab half and route its lead. Pull both leads through as you insert the stabs.

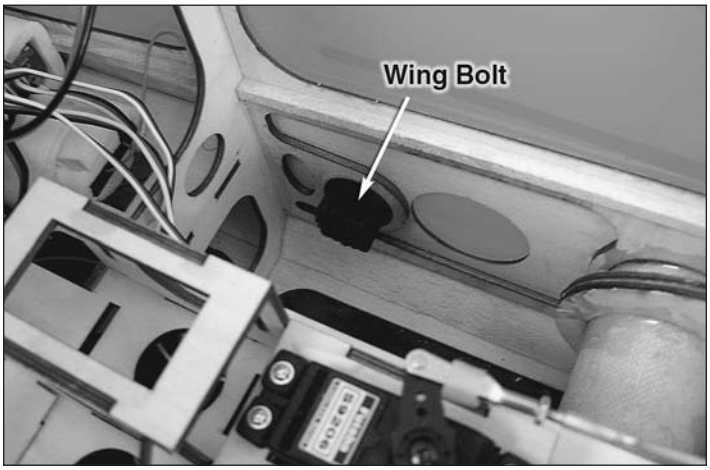


❏ 4. Install the stab halves using ***threadlocker***, four 4-40 x 3/4" [19mm] phillips head screws, four #4 lock washers, and four #4 washers. Make sure that the root rib of the stab sits flat against the fuse side. If it doesn't, remove the stabs and try installing the tubes into the opposite stab half first.

Mount the Wing

❏ 1. Fit the wing tube to one wing. Slide the wing and tube into the fuse. Guide your aileron servo leads into the fuse.

❏ 2. Fit the other wing. Make sure both wings sit flush against the fuse sides.



❏ 3. Secure each wing using one 1/4-20 nylon wing bolt.

Attach the Canopy

❏ 1. Attach the pilot to the canopy frame using two 4-40 x 1/2" [12.7mm] SHCS, #4 flat washers and #4 lock washers. Use threadlocker on the screws.

❏ 2. Mount the canopy to the fuselage with four 4-40 x 3/4" [19.1mm] SHCS, #4 flat washers and #4 lock washers. Periodically coat the screw threads with threadlocker.

Apply the Decals

❏ 1. Remove the decals from the sheet.

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

❏ 3. Position decal on the model where desired, using the picture on the box as a guide. Hold the decal down and 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.

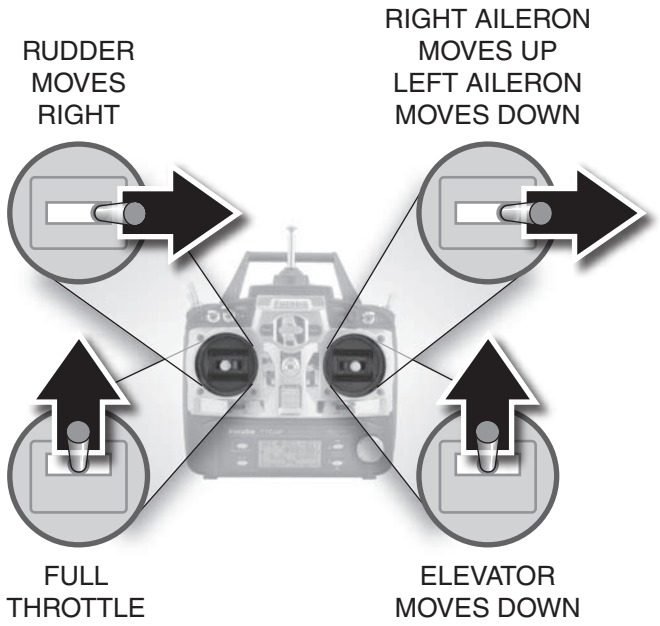
GET THE MODEL READY TO FLY

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 or the cables to center the control surfaces.

4-CHANNEL RADIO SETUP
(STANDARD MODE 2)



❏ 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.

❏ 4. Set the control throw per the next section. When you're all done with that, be sure to double check all of your servo arm screws (use threadlocker), silicone clevis retainers, jam nuts, and control horn cotter pins.

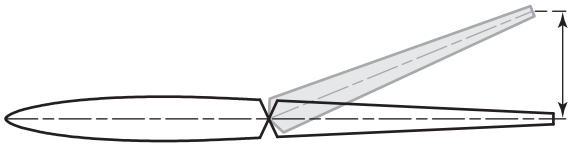
Set the Control Throws

To ensure a successful first flight, set up your Great Planes Giant Matt Chapman Eagle 580 ARF according to the control throws specified in this manual. The throws have been determined through actual flight testing and accurate record-keeping, allowing the model to perform in the manner in which it was intended. If, after you have become accustomed to the way the Great Planes Giant Matt Chapman Eagle 580 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 too responsive and difficult to control, so remember, "more is not always better."

❏ 1. Please read and understand the **Proper Pushrod Hookup** illustrations and guidelines on page 25.

❏ 2. Measure and set the control throws according to the chart below.

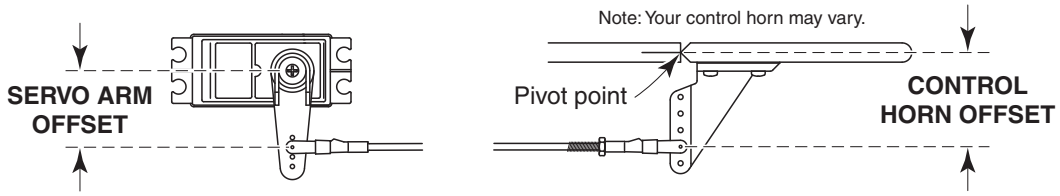
NOTE: The throws are measured at the **widest part** of the elevators, rudder and ailerons.



These are the recommended control surface throws:						
	LOW RATE		**HIGH RATE**		**3D RATE**	
ELEVATOR	**Up**	**Down**	**Up**	**Down**	**Up**	**Down**
	7/8" [22mm] 7°	7/8" [22mm] 7°	1-1/8" [29mm] 10°	1-1/8" [29mm] 10°	4-1/4" [108mm] 38°	4-1/4" [108mm] 38°
RUDDER	**Right**	**Left**	**Right**	**Left**	**Right**	**Left**
	2" [51mm] 10°	2" [51mm] 10°	3" [76mm] 15°	3" [76mm] 15°	8" [203mm] 44°	8" [203mm] 44°
AILERONS	**Up**	**Down**	**Up**	**Down**	**Up**	**Down**
	1-3/8" [35mm] 17°	1-3/8" [35mm] 17°	1-3/4" [44mm] 22°	1-3/4" [44mm] 22°	2" [51mm] 26°	2" [51mm] 26°

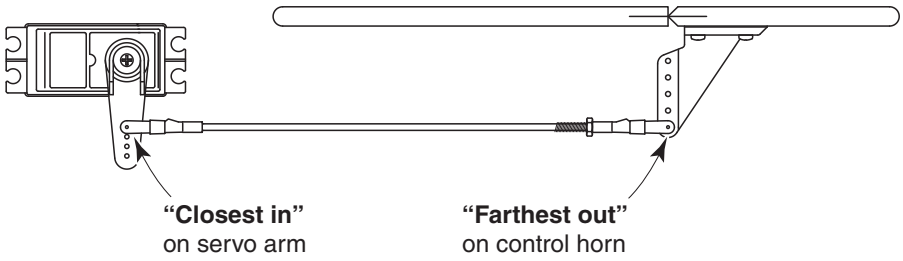
Proper Pushrod Hookup

Avoiding Flutter, Maximizing Servo Output Torque



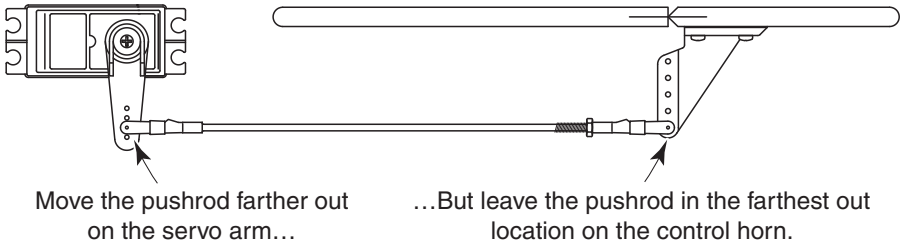
When connecting pushrods and setting up your control throws, it is **critically important** to use proper pushrod geometry — that is the distance from the pushrod on the servo arm to the center of the output shaft (**servo arm offset**) compared to the distance from the pushrod on the control horn to the pivot point (**control horn offset**).

PREFERRED
PUSHROD HOOKUP



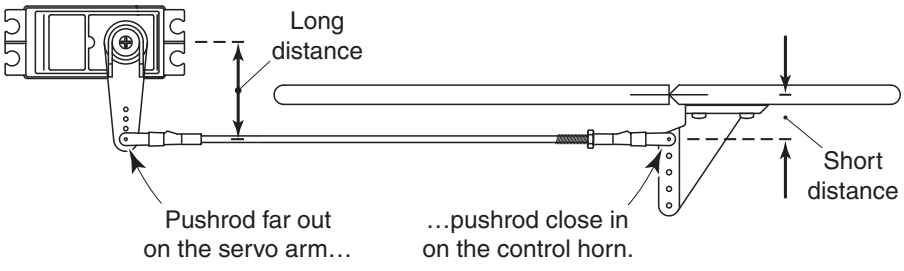
Here is an optimum pushrod setup—the pushrod is "close in" on the servo arm and "far out" on the control horn. This situation gives the greatest mechanical advantage of the servo over the control surface which will increase the servo's centering capabilities and output torque, minimize any free play in the system and allow high ATV settings for optimum servo resolution and positive control "feel." **Note:** When the pushrod is "close in" on the servo arm, make certain the servo arm can travel through its full range of movement without the pushrod (or clevis or other type of connector) interfering with the servo arm, output shaft or servo case.

ACCEPTABLE
PUSHROD HOOKUP



If the optimum situation doesn't provide enough control throw, the pushrod may be moved inward on the control horn, but it's better to go **farther out** on the servo arm because this will introduce less free play than the alternative. Only after moving the pushrod all the way out on the servo arm, if you still can't get the throw required, you'll have to resort to moving the pushrod closer in on the control horn. **Note:** If you have a computer radio, it is always desirable to set your ATVs to 100% (or as near 100% as possible to achieve the control throw required). If setting up a model that requires extraordinary control surface throw (for 3D flying for example), start by "maxing-out" your ATVs (typically 130% – 140%). Then, the dual rates in your "normal" flight mode will still be acceptably high (70% – 80%) for good servo resolution.

POTENTIALLY DANGEROUS
PUSHROD HOOKUP



One particularly dangerous situation arises when the pushrod on the servo arm is too "far out" and the pushrod on the control horn is too "close in." This setup is usually chosen by pilots who are trying to achieve maximum, "monster" control throws for 3D flight. But with your pushrods set up this way, any free play (slop) in the linkages or servo will be greatly magnified, possibly causing destructive control surface flutter. Additionally, if you have to turn your ATVs way down for "normal" throw, the result will be poor resolution and poor servo holding/centering capabilities. More importantly, too much force may be transmitted back to the servo, possibly causing control surface *blowback*, stripped servo gears or stripped servo arms—the latter two likely causing a crash.

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. **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 propeller, spinner, canopy, and radio and ignition batteries.

NOTE: For a model this large, checking the CG requires two people.

❏ 1. Using a felt-tip pen or 1/8" [3mm]-wide tape, accurately mark the C.G. on the tips of both wing panels. **The C.G. is located 3-1/2" [89mm] back from the leading edge of the wing AT THE WINGTIP, NOT THE FUSELAGE!**

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/2" [12.7mm] forward or 1/2" [12.7mm] 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 of the specified range.

❏ 2. With the wing attached to the fuselage, all parts of the model installed (ready to fly) and an empty fuel tank, lift the model from the marked CG location with your assistant.

❏ 3. If the tail drops, the model is "tail heavy" and the battery pack 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 must be shifted aft or weight must be added to the tail to balance.

❏ 4. If possible, relocate the battery to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is to the firewall or the engine box itself (don't attach weight to the cowl—it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the engine box behind the engine 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 covering and affixing lead inside the aft fuselage.

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.

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

Balance the Model Laterally

NOTE: Lateral balance is far more important to a precision aerobatic model than to the typical trainer, sport, or scale aircraft. As such, checking lateral balance is handled far more precisely for this type of aircraft. This process requires the assistance of 2 or ideally 3 people.

❏ 1. With the wings level, have an assistant help you lift the model by the engine propeller shaft and the bottom of the fuse via the tail gear.

❏ 2. Have your second assistant measure the distance each tip is above the floor.

❏ 3. Repeat the lift 3 or 4 times, checking the distance each time, and averaging the distances.

❏ 4. If one wing is more than 1/4" [6.4mm] lower than the other on average, that side is heavy. Balance the airplane by adding weight to the other wing tip until it balances to within 1/4" [6.4mm].

PREFLIGHT

Just as a full-scale airplane needs a "pre-flight inspection" and the pilot a "pilot's briefing", so does a model airplane and its pilot. Good pilots follow a simple routine to quickly inspect their aircraft. After you've learned the routine, you can accomplish it in less time than it takes to gas-up. The following few checks and pointers will guide you for a safe and successful first flight.

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.

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. Get in the habit of also checking your receiver and ignition battery voltage before each flight before you gas up your plane. Sometimes battery packs may "false peak" before they take a full charge. A battery you think is topped off and ready for a whole day's worth of flying may only last 1 flight. Don't risk your valuable airplane for a few simple checks.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge **on new transmitter and receiver batteries** should be done for 15 hours **using the slow-charger that came with the radio system**. This will "condition" the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Balance Propellers

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

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, you should be able to walk at least 100 [30m] feet away from the model and still have control. If you are using a 2.4GHz radio system, follow the manufacturer's recommendations for range checking your model (a low-power transmitting mode may have to be entered). 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 (usually thumbs up or thumbs down for pass or fail). 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, sweater strings, ties, scarves, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

Make all engine adjustments from behind the rotating prop. 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.

GASOLINE ENGINES CAN START BY A SIMPLE FLIP OF THE PROP, REGARDLESS IF THE MODEL'S RECEIVER SWITCH IS ON! ALWAYS UTILIZE AN IGNITION SWITCH SEPARATE FROM THE RADIO SWITCH AND ENSURE THAT IT IS IN THE "OFF" POSITION WHEN THE MODEL IS NOT BEING FLOWN.

AMA SAFETY CODE (EXCERPTS)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to Model Aviation magazine, the AMA web site or the Code that came with your AMA license.

General

1) I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
2) I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. Note: This does not apply to models while being flown indoors.
7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

Radio Control

1) I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.
2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.
5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** [in the complete AMA Safety Code].
9) Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing.**

CHECK LIST

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

- ❏ 1. Fuelproof all areas exposed to fuel or exhaust residue such as the firewall, wing tube openings, wing and stab root ribs, etc.
- ❏ 2. Achieve 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.
- ❏ 5. Balance your model *laterally* as explained in the instructions.
- ❏ 6. Use threadlocking compound to secure critical fasteners such as the set screws that hold the wheel axles to the struts, screws that hold the carburetor arm (if applicable), screw-lock pushrod connectors, etc.
- ❏ 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 and that the hinge points have been oiled.
- ❏ 9. Reinforce holes for sheetmetal screws with thin CA where appropriate (servo 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. Tighten all jam nuts against their associated clevises. Be sure to also check that all your control horn cotter pins are in place and secure.
- ❏ 12. Secure connections between servo wires and Y-connectors or servo extensions, and the connection between your battery packs and the on/off switch with 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. Make sure that they are safetied in place using plastic cable ties.

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

❏ 17. Tighten the propeller screws/nut and spinner.

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

❏ 19. Cycle your receiver battery pack and assure that it can make its rated capacity. Use a voltmeter at the field to check the state of charge before each flight. Do it when you fuel your plane.

❏ 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

Fuel Mixture Adjustments

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

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

Takeoff

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

Remember to takeoff into the wind. When you're ready, point the model straight down the runway, hold a bit of up elevator to keep the tail on the ground to maintain tail wheel steering, then gradually advance the throttle. As the model gains speed, decrease the up elevator, allowing the tail to come off the ground. One of the most important things to remember with a tail dragger is to always be ready to apply **right** rudder to counteract engine torque. Gain as much speed as your runway and flying site will practically allow before gently applying up elevator, lifting the model into the air. At this moment it is likely that you will need to apply more right rudder to counteract engine torque. Be smooth on the elevator stick, allowing the model to establish a gentle climb to a safe altitude before turning into the traffic pattern.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff, most models fly more smoothly at reduced speeds.

Take it easy with the Great Planes Giant Matt Chapman Eagle 580 ARF for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of fuel, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the runway

(into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is a foot or so off the deck, smoothly increase up elevator until it gently touches down. Once the model is on the runway and has lost flying speed, hold up elevator to place the tail on the ground, regaining tail wheel control.

One final note about flying your model: Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, practicing a competition sequence, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills (though it is never a bad idea!), but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to try your first blender, check your altitude, mind the wind direction, remind yourself of the proper procedure to exit, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think**.

GOOD LUCK AND GREAT FLYING!

DA-85 Mounting Template