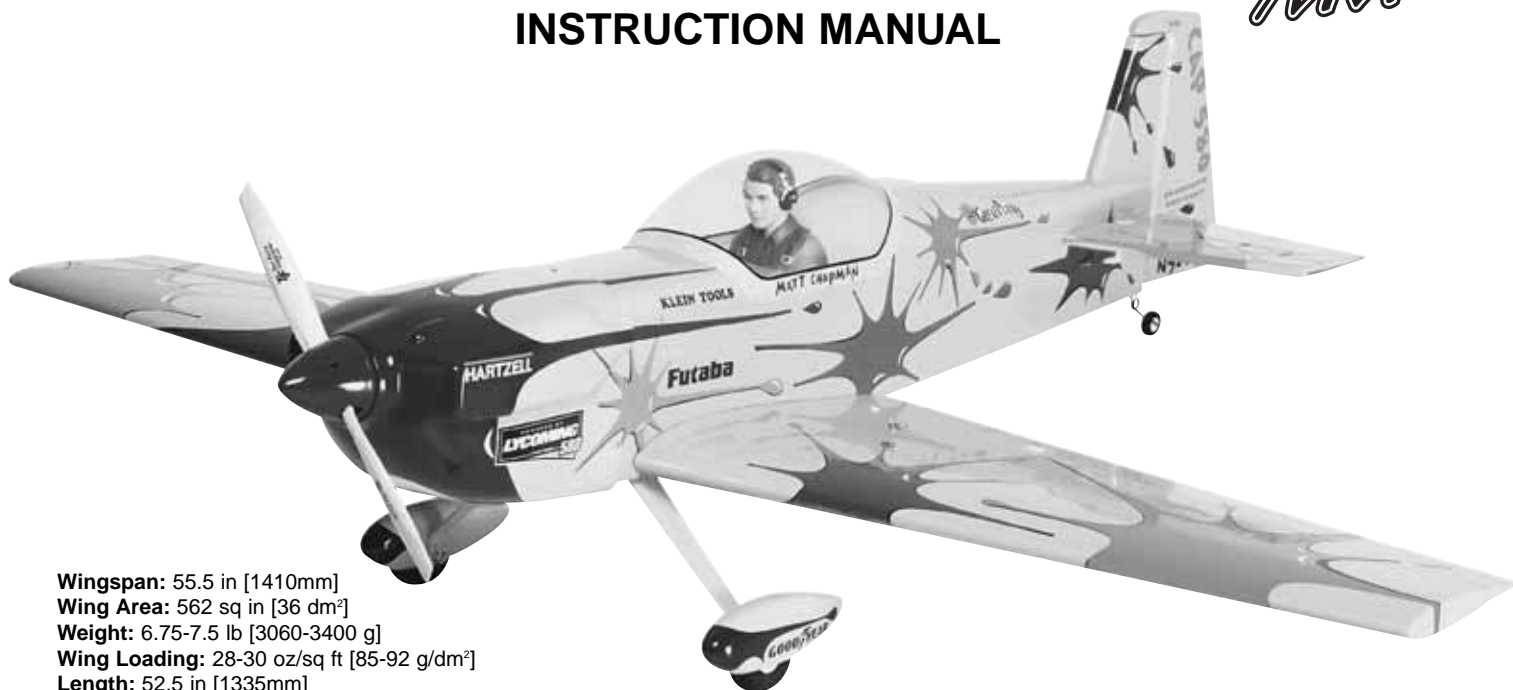


MATT CHAPMAN

CAP 580

ARF

INSTRUCTION MANUAL



Wingspan: 55.5 in [1410mm]
Wing Area: 562 sq in [36 dm²]
Weight: 6.75-7.5 lb [3060-3400 g]
Wing Loading: 28-30 oz/sq ft [85-92 g/dm²]
Length: 52.5 in [1335mm]
Radio: 4-channel, five servos
Engine: .46-.61 cu in [7.5-10cc] two-stroke,
.52-.70 cu in [8.5-11.5cc] four-stroke

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 WARNINGS AND INSTRUCTIONS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.



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

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INTRODUCTION

Congratulations on your purchase of the Great Planes CAP 580. We have painstakingly reproduced the airplane which has been flown in shows throughout the U.S.A. by aerobatic champion Matt Chapman. We think you will enjoy the way it flies as well as the compliments you get every time you bring it to the flying field.

For the latest technical updates or manual corrections to the CAP 580 .40 -.70 ARF visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the CAP 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

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below:



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.

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

1. Your CAP 580 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 CAP 580, 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 an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

8. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as racing, or if an engine larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

9. **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.

ADDITIONAL ITEMS REQUIRED

Hardware and Accessories

- Four channel radio
- Four 54 oz-in servos and one 30 oz-in servo
- One 6" [150mm] servo extension (HCAM2701 for Futaba®)
- Y-harness (HCAM2751 for Futaba)
- 500 mAh battery or greater
- Propeller

Engine

The recommended engine size range for the CAP 580 is 46 - .61 cu in [7.5 - 10cc] two-stroke or .52 - .70 cu in [8.5 - 11.5cc] four-stroke. If an engine in the upper end of the size range is used, remember that this is a scale model that is intended to fly at scale-like speeds, so throttle management should be practiced.

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 CAP 580 .40 - .70 ARF. **Great Planes Pro™ CA and Epoxy glue are recommended.**

- 1/2 oz. [15g] Thin Pro CA (GPMR6001)
- 1 oz. [30g] Medium Pro CA+ (GPMR6008)
- Pro 30-Minute Epoxy (GPMR6047)
- Drill bits: 1/16" [1.6mm], 5/64" [2mm], 7/64" [2.8mm], 3/16" [4.8mm].
- #11 Blades (5-pack, HCAR0211)
- R/C Foam Rubber (1/4" [6mm] - HCAQ1000)
- 3' [900mm] Standard Silicone Fuel Tubing (GPMQ4131)
- CA Applicator Tips (HCAR3780)

Optional Supplies and Tools

Here is a list of optional tools mentioned in the manual that will help you build the CAP 580.

- 2 oz. [57g] Spray CA Activator (GPMR6035)
- R/C-56 Canopy Glue (JOZR5007)
- CA Debonder (GPMR6039)
- Pro 6-Minute Epoxy (GPMR6045)
- Epoxy Brushes (6, GPMR8060)
- Mixing Sticks (50, GPMR8055)
- Mixing Cups (GPMR8056)
- Builder's Triangle Set (HCAR0480)
- Curved-Tip Canopy Scissors for Trimming Plastic Parts (HCAR0667)

- Hobbico Duster™ Compressed Air (HCAR5500)
- Masking Tape (TOPR8018)
- Threadlocker Thread Locking Cement (GPMR6060)
- Denatured Alcohol (for epoxy clean up)
- Rotary Tool such as Dremel
- Rotary Tool Reinforced Cut-Off Wheel (GPMR8200)
- Servo Horn Drill (HCAR0698)
- Dead Center™ Engine Mount Hole Locator (GPMR8130)
- AccuThrow™ Deflection Gauge (GPMR2405)
- CG Machine™ (GPMR2400)

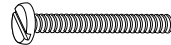
IMPORTANT BUILDING NOTES

- 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" [19mm] is a number six screw that is 3/4" [19mm] long.



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

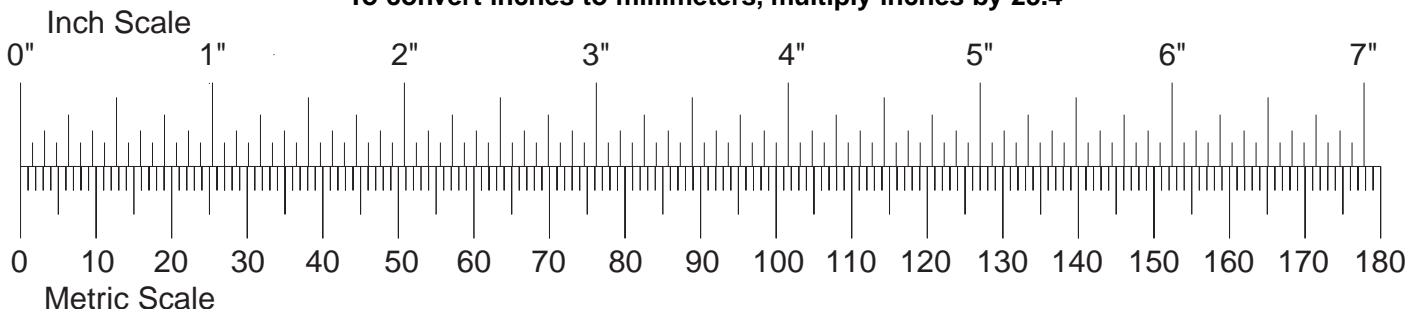
Red	TOPQ0201
Orange	TOPQ0202
Jet White	TOPQ0204
Sky Blue	TOPQ0206
Forest Green	TOPQ0214
Cub Yellow	TOPQ0220
Medium Purple	TOPQ0225
Sapphire Blue	TOPQ0227
Black	TOPQ0208

- 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.

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

To convert inches to millimeters, multiply inches by 25.4

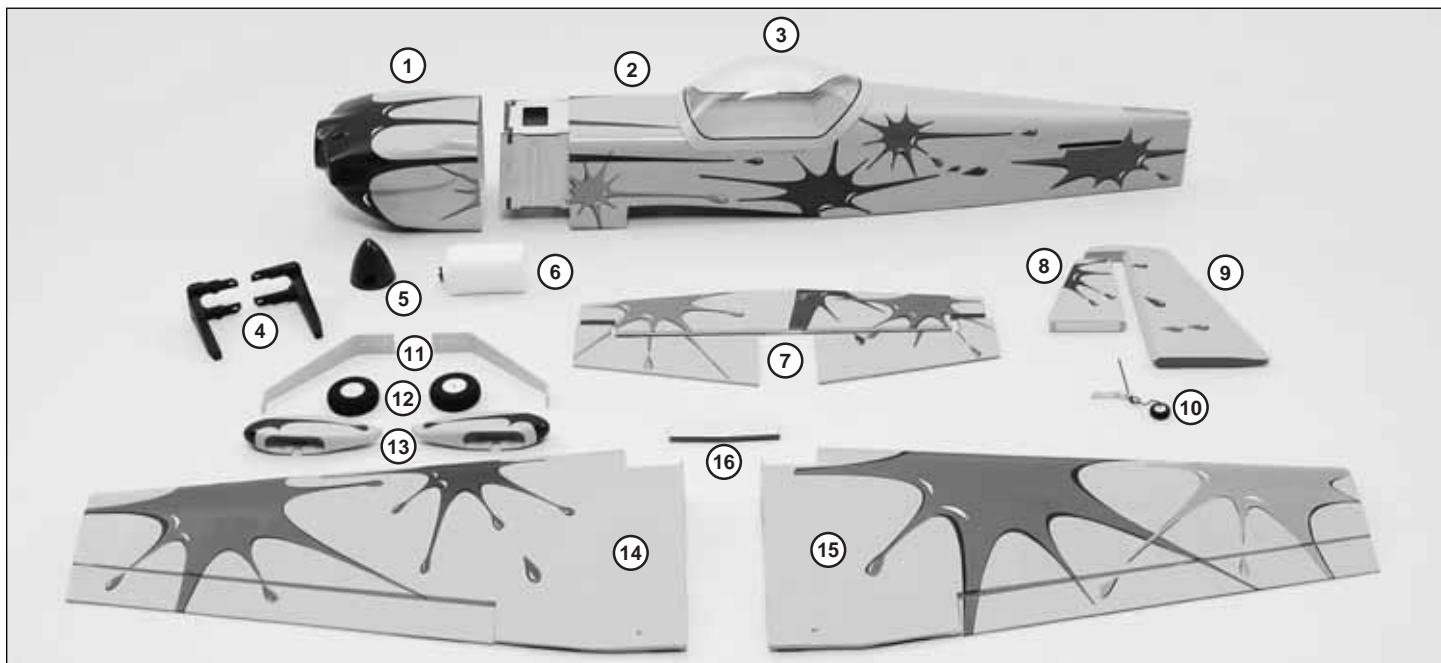


KIT INSPECTION

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

Great Planes Product Support:
3002 N Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970, ext. 5
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com

KIT CONTENTS



Kit Contents (Photographed)

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 1 Cowl 2 Fuselage 3 Canopy 4 Engine Mount 5 Spinner 6 Fuel Tank | <ul style="list-style-type: none"> 7 Stabilizer with Elevators 8 Fin 9 Rudder 10 Tailwheel Assembly 11 Landing Gear 12 Wheels | <ul style="list-style-type: none"> 13 Wheel Pants 14 Left Wing with Aileron 15 Right Wing with Aileron 16 Wing Joiners |
|--|---|--|

Kit Contents (Not Photographed)

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 5/32 x 1-1/4" Axles (2) Brass EZ Connector (2) 4-40 Blind Nuts (4) 6-32 Blind Nuts (4) 8-32 Blind Nuts (4) Axle Nuts (2) 1/4-20 Blind Nuts (2) 1/4-20 Wing Bolt (2) Large Nylon Control Horn (5) Nylon Clevis (5) Nylon Retainer (2) Hinge Material (1) Faslink (4) 24" Gray Outer Plastic Pushrod Tube (4) Silicone Clevis Keeper (5) | <ul style="list-style-type: none"> 2-56 x 5/8" Machine Screw (4) 6-32 Set Screw (2) 6-32 x 1/4" SHCS (2) 4-40 Set Screw (1) #2x3/8" SMS (6) 4-40 x 3/8 MS (4) 6-32x5/8" SHCS (4) 2-56 x 3/4" SHCS (4) 6-32 x 1" SHCS (4) 8-32 x 1" SHCS (4) 4-40 x 1/8" SHCS (2) 3/32" Wheel Collar (1) 5-32" Wheel Collar (4) .074 x 17.5" Wire (1) .074x36" Pushrod Wire (3) | <ul style="list-style-type: none"> .074 x 6" Pushrod Wire (2) 4-40 Lock Washer (4) #6 Flat Washer (8) #6 Lock Washer (4) #4 Flat Washer (4) #2 Flat Washer (2) #8 Lock Washer (4) #8 Flat Washer (4) Aluminum Wheel Spacers (2) Wing Alignment Pin (Wood Dowel) (1) M2.5 x 10 Washer-Head Screw (9) Velcro® (Hook and Loop) 20x180mm (2) 6x13x25mm Hardwood Cowl Mnt Blocks (5) Pilot Figure (1) |
|--|---|--|

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Cap 580 .40 - .70 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" at the bottom of 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. If a hobby shop is not available, replacement parts may also be ordered from Tower Hobbies at www.towerhobbies.com, or by calling toll free (800) 637-6050.

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

Mail parts orders and payments by personal check to:

Hobby Services
3002 N Apollo Drive, Suite 1
Champaign IL 61822

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

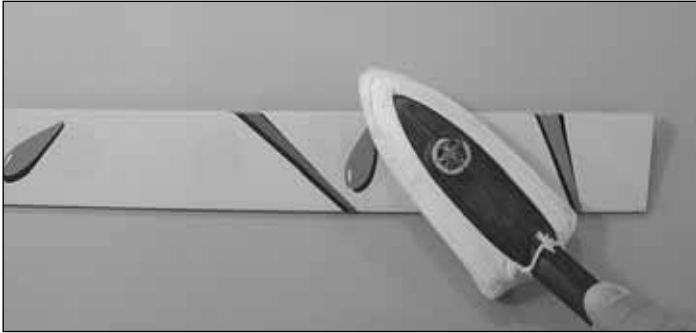
If additional assistance is required for any reason contact Product Support by e-mail at productsupport@greatplanes.com, or by telephone at (217) 398-8970.

Replacement Parts List

<u>Order Number</u>	<u>Description</u>	<u>How to Purchase</u>
	Missing pieces	Contact Product Support
	Instruction manual.....	Contact Product Support
	Full-size plans	Not available
	Kit parts listed below.....	Hobby Supplier
GPMA2680.....	Wing Kit	
GPMA2681.....	Fuselage Kit	
GPMA2682.....	Tail Surface Set	
GPMA2683.....	Cowl	
GPMA2684.....	Landing Gear	
GPMA2685.....	Wheel Pants	
GPMA2686.....	Decal	
GPMA2687.....	Spinner	
GPMA2688.....	Canopy	

PREPARATIONS

- ❑ 1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support at the address or telephone number listed in the "Kit Inspection" section on page 5.

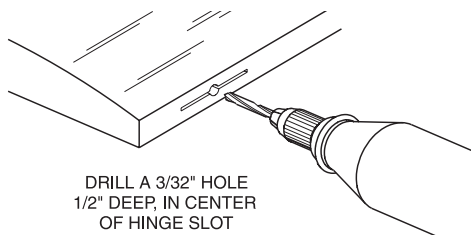


- ❑ 2. Remove the tape and separate the ailerons from the wing and the elevators from the stab. Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

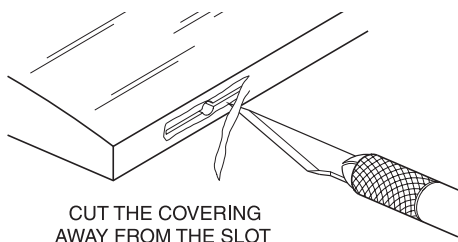
ASSEMBLE THE WING

Install the Ailerons

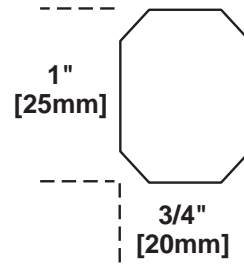
Do the right wing first so your work matches the photos the first time through. You can do one wing at a time, or work on them together.



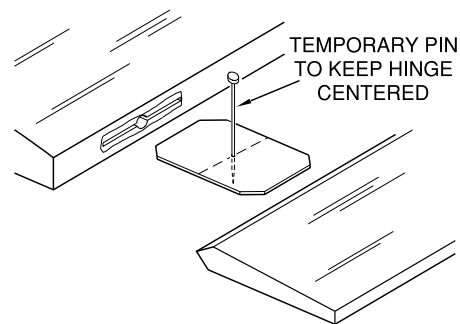
- ❑ ❑ 1. Drill a 3/32" hole, 1/2" deep in the center of each hinge slot to allow the CA to "wick" in. Follow-up with a #11 blade to clean out the slots. **Hint:** If you have one, use a high-speed rotary tool to drill the holes.



- ❑ ❑ 2. Use a sharp #11 blade to cut a strip of covering from the hinge slots in the wing and aileron.

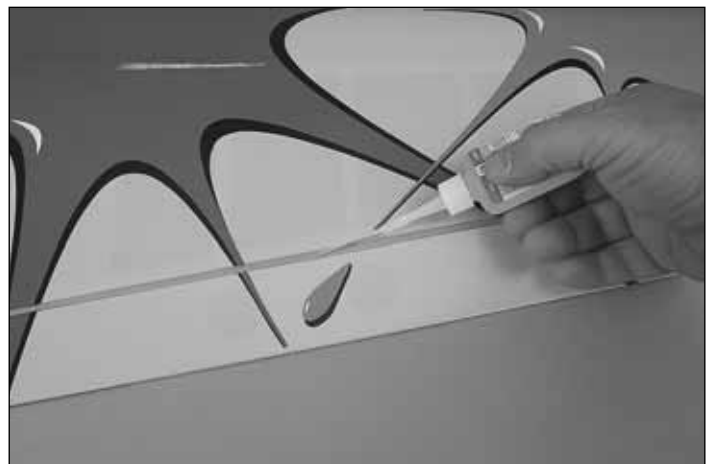


- ❑ ❑ 3. Cut eight 3/4" x 1" [19mm x 25mm] **hinges** from the **CA hinge strip**. Snip off the corners so they go in easier.



- ❑ ❑ 4. Test fit the **ailerons** to the **wing** with the hinges. If the hinges don't remain centered, stick a pin through the middle of the hinge to hold it in position.

- ❑ ❑ 5. Remove any pins you may have inserted into the hinges. Adjust the aileron so there is a small gap between the LE of the aileron and the wing. The gap should be small, just enough to see light through or to slip a piece of paper through.



- ❑ ❑ 6. Apply six drops of thin CA to the top and bottom of each hinge, waiting a few seconds between drops to allow the CA to soak in. Do not use CA accelerator. After the CA has fully hardened, test the hinges by pulling on the aileron.

- ❑ 7. Repeat steps 1- 6 for the left wing panel.

Install the Aileron Servos and Pushrods

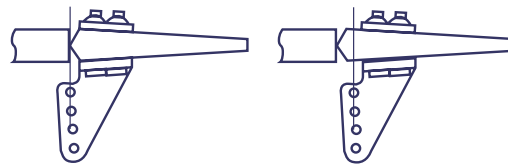
1. For the servo installation a Y-harness connector is required and is used to allow the aileron servos to plug into one slot in your receiver. You may have a computer radio that allows you to plug the servos into separate slots and mix them together through the radio transmitter. If you choose to mix them with the radio rather than the Y-harness, refer to the instructions with your particular brand of radio.



2. Located in the wing in the aileron servo compartment, a string is taped to the wing skin. Tie the string to the end of the servo wire. Pull the servo wire through the wing with the string. Feed the servo wire out the hole in the top of the wing center section. Tape the servo wire to the wing to prevent it from falling back into the wing.



3. Install the servo into the servo opening. Drill through the servo mounting holes with a 1/16" [1.6mm] drill bit. Remove the servo from the servo opening. Install and then remove a servo mounting screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has hardened install the servo into the servo opening using the hardware included with your servo. Center the servo, then install a servo arm pointing towards the wingtip.



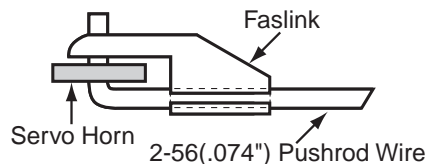
Correct

Incorrect

4. Position a large nylon control horn on the aileron, positioning it as shown in the sketch and aligning it with the servo. Mark the location for the screw holes. Drill through the marks you made with a 1/16" [1.6mm] drill bit, drilling through the aileron. Secure the control horn to the aileron with two 2-56 x 3/4" [19mm] socket head cap screws and the nylon mounting plate.

5. Locate a .074" x 6" [1.9mm x 152mm] pushrod wire threaded on one end. Screw a nylon clevis onto the threaded end of the wire 20 full turns. Install a silicone clevis keeper onto the clevis and then install the clevis in the second hole from the end of the aileron control horn.

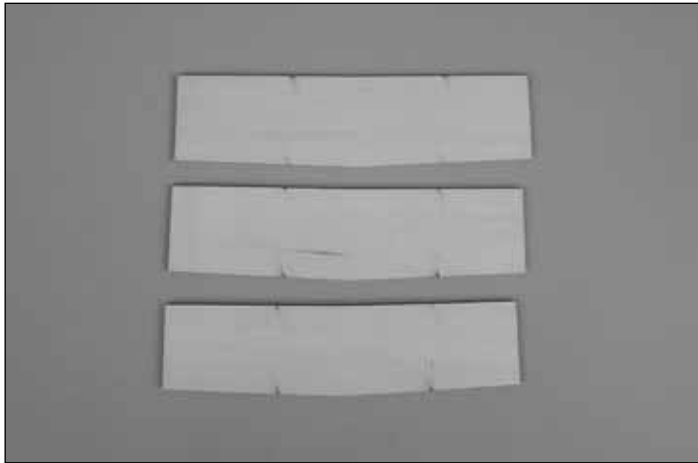
6. Be sure the aileron servo is centered. Enlarge the first hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit). Center the aileron and align the wire pushrod with the hole in the end of the servo arm. Using a marker, mark the location where the wire aligns with the hole in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm], then cut off the excess pushrod wire.



7. Install the wire into the hole in the servo arm using a nylon FasLink as shown in the sketch.

8. Repeat steps 1-7 for the left wing panel.

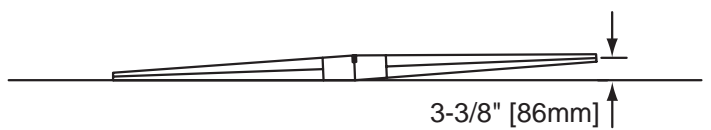
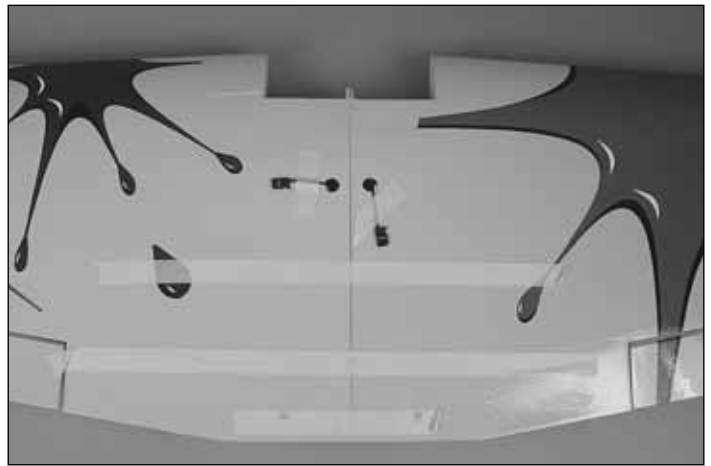
Join the Wing



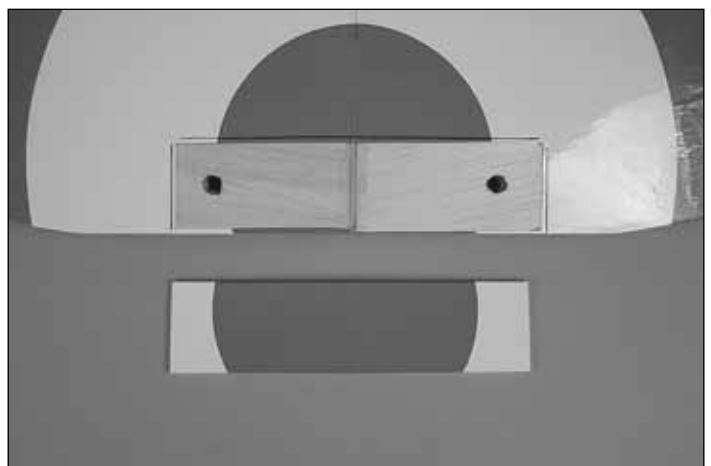
❑ 1. Locate three plywood wing joiners. Glue them together with epoxy, forming one plywood wing joiner. Set them aside until the glue hardens.



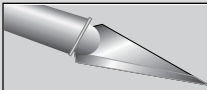
❑ 2. Locate the 3/16" x 3/4" [4.8 x 19mm] dowel. Glue it into the hole at the rear of the root rib of one wing, positioning one half of the dowel into the hole.



❑ 3. Apply 30-minute epoxy to all sides of the wing joiner, the joiner pocket in both wing panels and the root rib of each wing panel. Insert the wing joiner, push the wing panels together and hold them in place with masking tape. Before the glue hardens, set the wing flat on your bench and measure the dihedral. The distance from the top of the bench to the center of the wing as measured at the wing tip should be approximately 3-3/8" [86mm]. Block the wing tip up while the glue hardens. **Note:** Due to production techniques there may be some variance in the actual dihedral of each model. Our prototypes flew well with the dihedral anywhere between 3" and 4" [76mm and 102mm].



❑ 4. Place the plywood **wing bolt mounting plate** in position on the bottom of the wing, over the wing bolt holes. Using a fine-tip marker, trace the outline of the plate onto the wing. Use a sharp #11 hobby knife or use the **Expert Tip** that follows to cut the covering from the wing along the lines you have marked. Use care to cut **only into the covering** and **not** into the wood.



EXPERT TIP

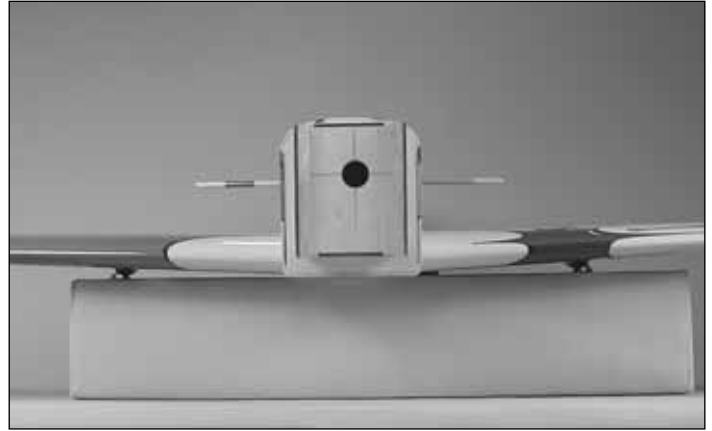
HOW TO CUT COVERING FROM Balsa



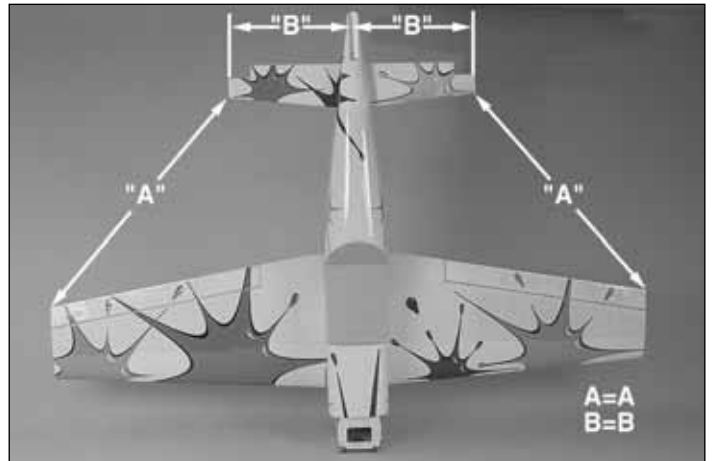
Use a soldering iron to cut the covering from the stab. The tip of the soldering iron doesn't have to be sharp, but a fine tip does work best. Allow the iron to heat fully. Use a straightedge to guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut.

ASSEMBLE THE FUSELAGE

Install the Stab, Elevators and Rudder



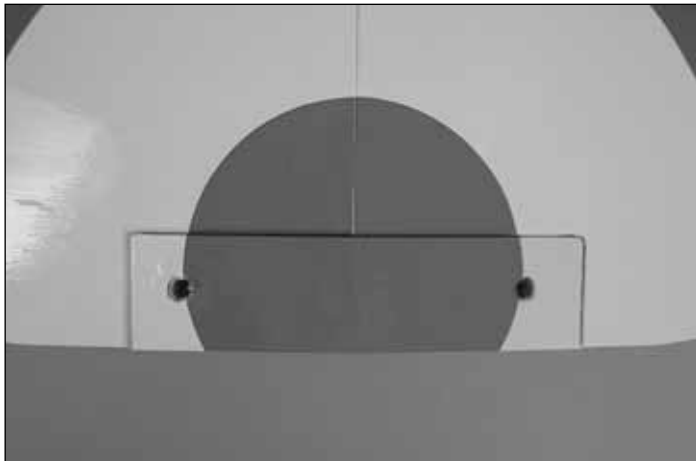
1. Test fit the stab into the opening in the back of the fuselage. Stand back and look at the stab in relation to the wing. The stab should be parallel with the wing. If not, sand the stab saddle until the stab and wing are aligned.



2. Measure the distance from the tip of the stab to the tip of each wing. Adjust the position of the stab until both are equal.

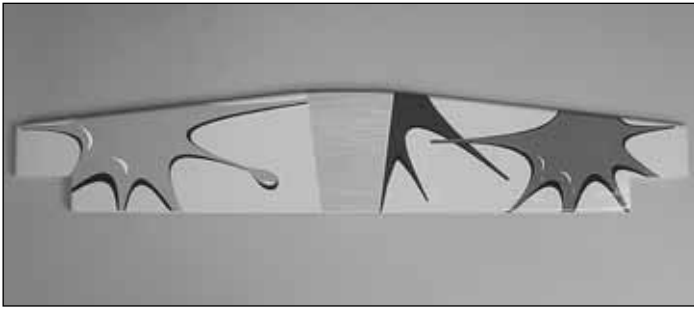


3. Trace the outline of the fuselage onto the stab. Do this on both the top and bottom of the stab.



5. Glue the plywood wing bolt plate to the wing, and allow the glue to harden. Using a 1/4" [6mm] drill bit, drill from the top of the wing through the wing bolt holes, drilling through the wing bolt plate.

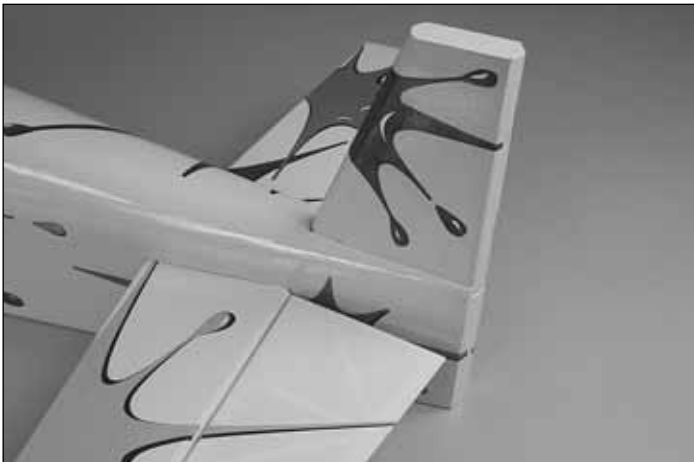
6. Mount the wing to the fuselage with two 1/4 - 20 nylon wing bolts.



❑ 4. Cut the covering from the center section of the stab, being careful not to cut into the wood structure. Use the same technique used for cutting the covering for the wing bolt plate.

❑ 5. When satisfied with the fit of the stab glue the stab to the fuselage. Set it aside until the glue hardens.

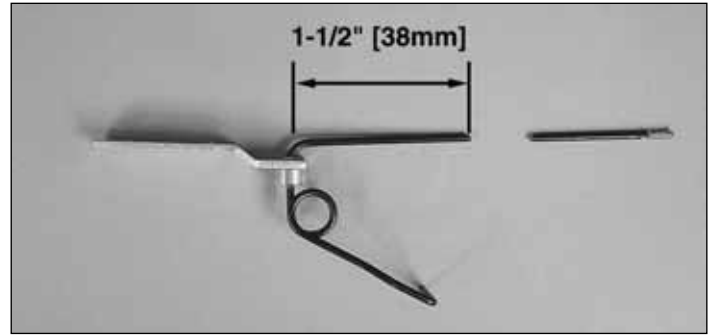
❑ 6. Cut six hinges from the hinge material. Install the two elevator halves using the same method used for the ailerons. Once you are satisfied with the positioning of the elevators, glue them in place with thin CA the same as was done on the ailerons.



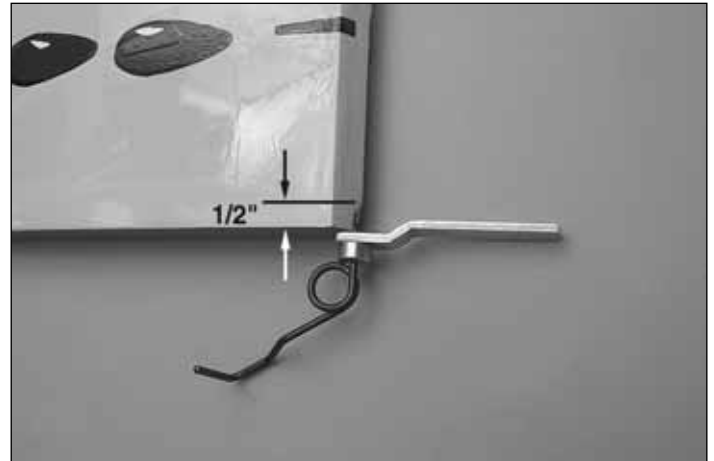
❑ 7. Test fit the fin into the slot in the fuselage. Mark the outline of the fuselage onto the fin. Cut the covering from the fin using the same method used for the stab. Once you are satisfied with the fit, glue the stab to the fuselage. Make sure it is perpendicular to the stab.



❑ 8. Locate the **tail wheel wire assembly**. Insert the wire into the tail wheel bracket as shown.

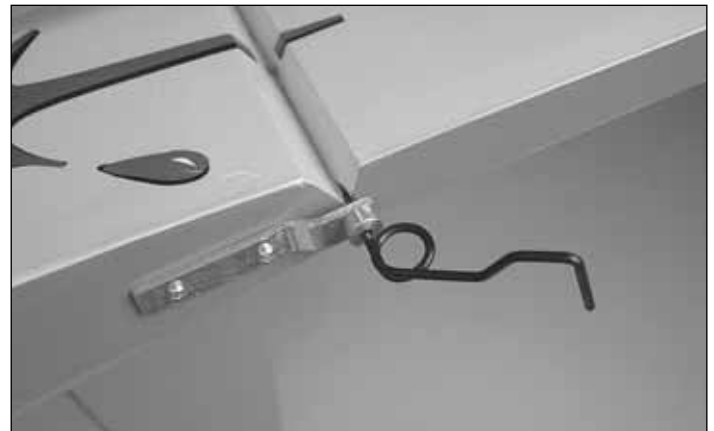


❑ 9. Bend the wire 90 degrees. Once the wire is bent, cut the wire to extend 1-1/2" [38mm] beyond the bend.



❑ 10. Measure up from the bottom of the fin on the hinge line 1/2" [13mm] and make a mark. On the mark drill a 1/16" [1.6mm] hole 1-1/2" [38mm] into the fin. Insert the tail wheel wire into the fin.

❑ 11. Cut three more hinges and insert them into the rudder.



❑ 12. Insert the rudder onto the fin. Align the tail wheel bracket on the bottom of the fuselage. Drill a 1/16" [1.6mm] hole into the fuselage through the mounting holes. Install and remove a #2 x 3/8" [9.5mm] sheet metal screw into each of the holes you drilled. Put a couple of drops of thin CA into each of the holes and allow the glue to harden. Re-install the screws, mounting the bracket to the fuselage.

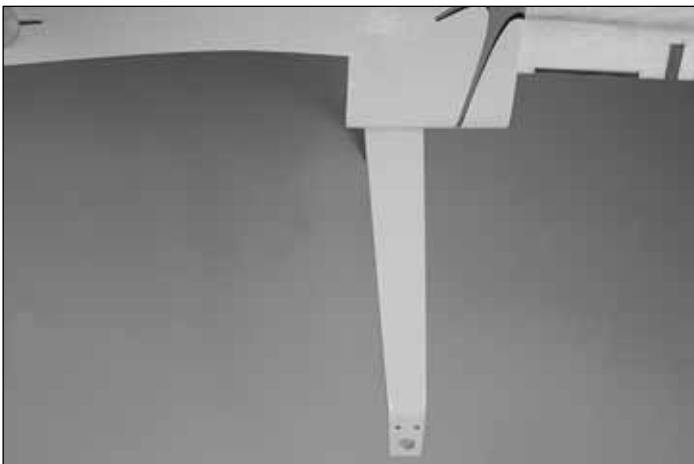
❑ 13. Apply thin CA to the hinges in the same manner you did the other control surfaces.



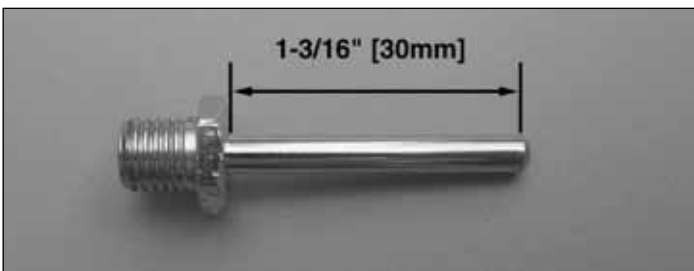
- ❑ 14. Mount the tail wheel onto the tail wheel wire. Secure it to the wire with a 3/32" [2.4mm] wheel collar and a 4-40 set screw with a drop of threadlocker.

This completes the installation of the tail surfaces. You will finish the installation of the control horns and pushrods when you do the radio installation.

Install the Landing Gear and Wheel Pants



- ❑ 1. Cut the covering from the mounting holes for the landing gear. Bolt the landing gear to the fuselage with four 6-32 x 5/8" [16mm] socket head cap screws, #6 lock washers and #6 flat washers. Apply a drop of threadlock to the threads before screwing them into the fuselage. When installing the gear, the taper should be to the back of the fuselage.

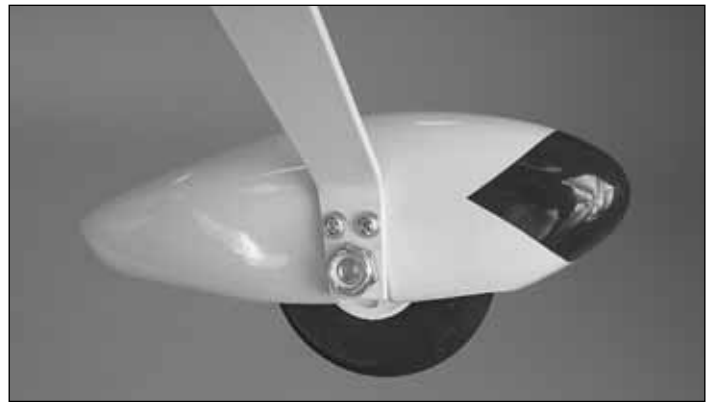


- ❑ 2. Cut the landing gear axles to a length of 1-3/16" [30mm].



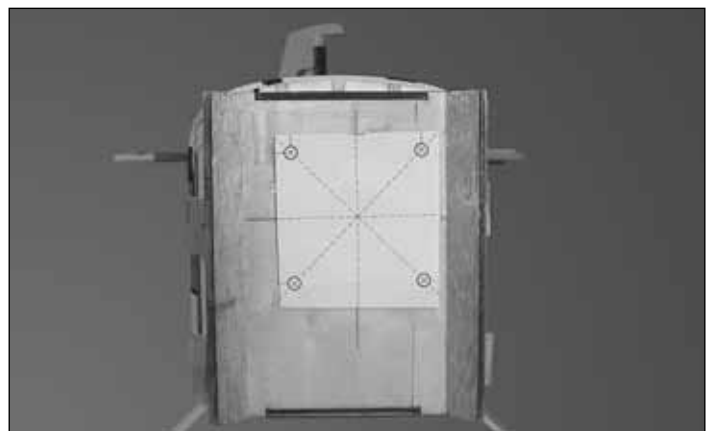
- ❑ 3. File a flat spot on the end of the axles. (A high speed rotary tool works well for this also).

- ❑ 4. Install an aluminum spacer (it looks just like a wheel collar without the hole for the set screw) followed by a wheel and then a 5/32" [4mm] wheel collar. Secure the wheel collar by tightening a 6-32 set screw onto the flat spot on the axle. Do this for both wheels.



- ❑ 5. Slide the **wheel pants** over the wheels. Attach the wheel pant to the landing gear with two 4-40 x 3/8" [9.5mm] machine screws, #4 flat washers and #4 lock washers.

Install the Engine, Fuel Tank and Throttle Servo

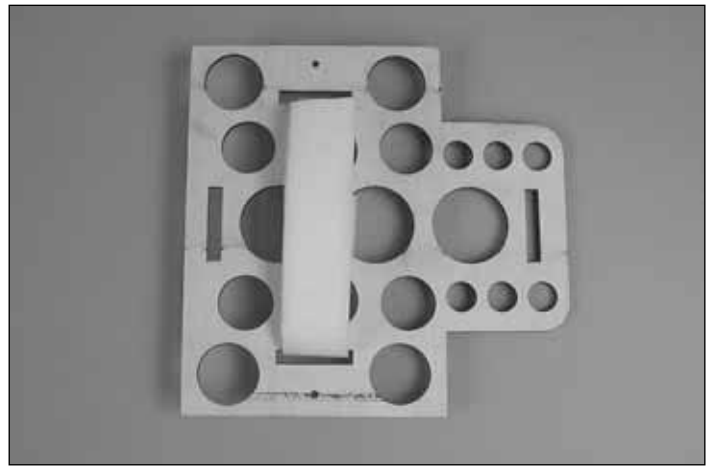


- ❑ 1. Cut out the engine mounting pattern on page 23 of this manual. Tape it on the firewall, aligning the lines on the pattern with the lines on the firewall.

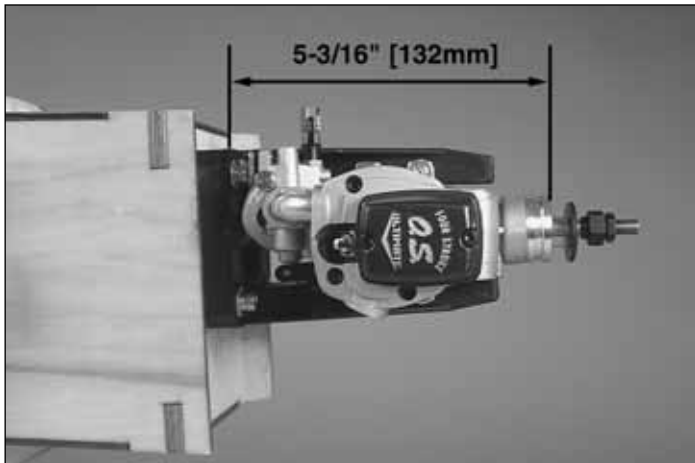
❑ 2. Use a 3/16" [4.8mm] bit to drill through the firewall at the marks on the engine mounting pattern.

❑ 3. Install four 8/32 blind nuts into the backside of the firewall.

❑ 4. Install the engine mount to the firewall using four each, 8/32 x 1" [25mm] socket head cap screws, #8 flat washers and #8 lock washers. When installing the mount, use your engine to determine the spacing needed for the mounting rails.

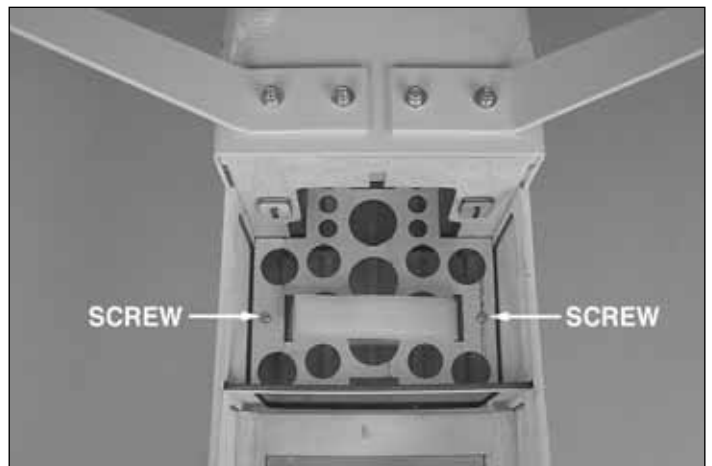


❑ 8. Locate the plywood **receiver tray** and Velcro. Install the Velcro into the slots.



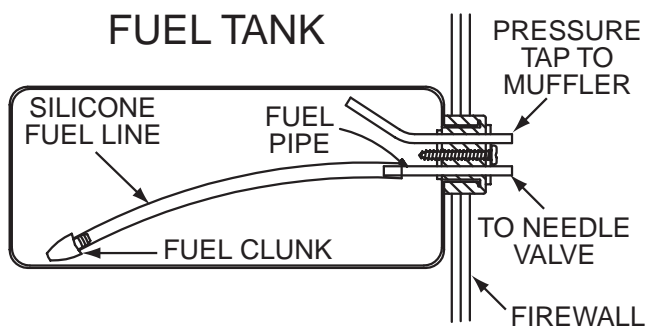
❑ 5. Position the engine in the mount so the distance from the front of the firewall to the front of the thrust washer measures 5-3/16" [132mm]. Mark the location of the engine on the mount. The Great Planes® Dead Center™ Hole Locator (GPMR8130) works well for this. Drill through the marks you have made on the engine mount with a #36 or 7/64" [2.5mm] drill bit. Tap each of the holes with a 6-32 tap.

❑ 6. Mount the engine onto the mount with four each, 6-32 x 1" [25mm] socket head cap screws, #6 flat washers and # 6 lock washers.



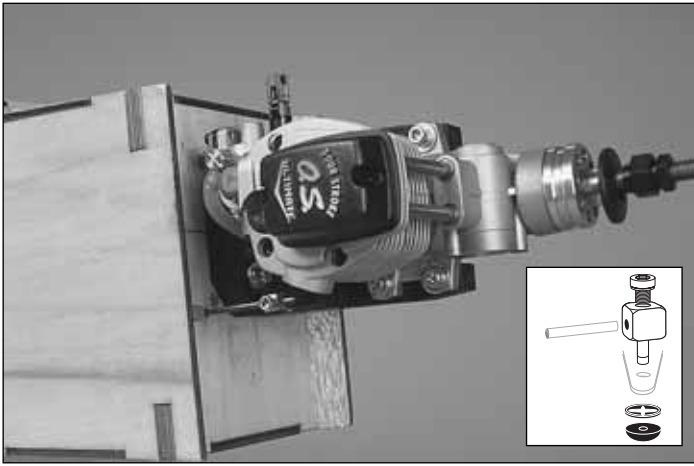
❑ 9. Place the tray into the fuselage. The front tongue on the tray extends forward to hold the fuel tank in position. Drill a 1/16" [1.6mm] hole through the holes on each side of the tray. Then screw a #2 x 3/8" [9.5mm] sheet metal screw and a #2 flat washer into the mounting rails to secure it in place.

❑ 10. Install the fuel line onto the tubes extending from the fuel tank. The vent line can be attached later when the muffler is permanently installed. If you will be using a fuel valve (not included) for filling the tank rather than filling the tank by removing the line from the carburetor, install it in the fuel line following the instructions included with the valve.



❑ 7. Assemble the **fuel tank** as shown. Insert the tank into the formers in the front of the fuselage.

❑ 11. Mark the location on the firewall where the throttle pushrod will pass through. Drill a 3/16" [4.8mm] hole on that mark. Locate the 24" [610mm] gray plastic pushrod tube. Cut it to a length of 12" [305mm]. Roughen one end of the tube with 220-grit sandpaper. Install the smooth end of the pushrod tube into the front of the firewall through the hole you drilled in the firewall and through the hole inside the fuselage, in the fuselage former. Apply CA to the roughened end of the plastic tube gluing it into the firewall.



12. Locate a .074 x 17.5" [445mm] pushrod wire. Cut the threaded end from the wire. Insert the wire into the plastic tube you installed for the throttle. Install a brass screw lock connector into the throttle arm, locking it to the arm with a nylon retainer. Insert this wire into the screw lock connector and the plastic tube you installed for the throttle. Lock the wire to the connector with a 6-32 x 1/4" [6mm] socket head cap screw.

Refer to this photograph for the steps 13-15.

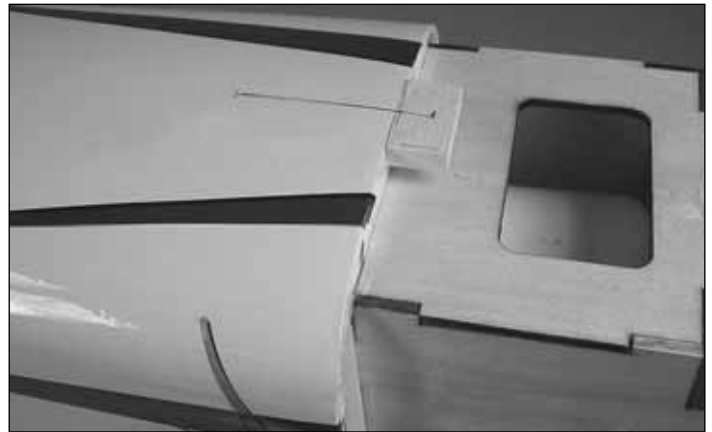
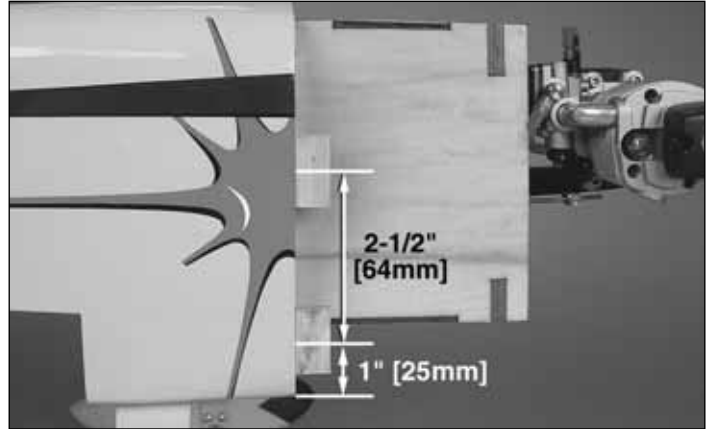


13. Locate the plywood pushrod **support**. Slide the support over the gray plastic pushrod you have installed in the fuselage.

14. Install the throttle servo into the tray in the fuselage. Drill a 1/16" [1.6mm] hole through each of the mounting holes in the servo. Install and then remove a servo mounting screw into each of the holes you have drilled. Apply a couple of drops of thin CA into the holes to harden the threads. After the glue has cured, install your servo.

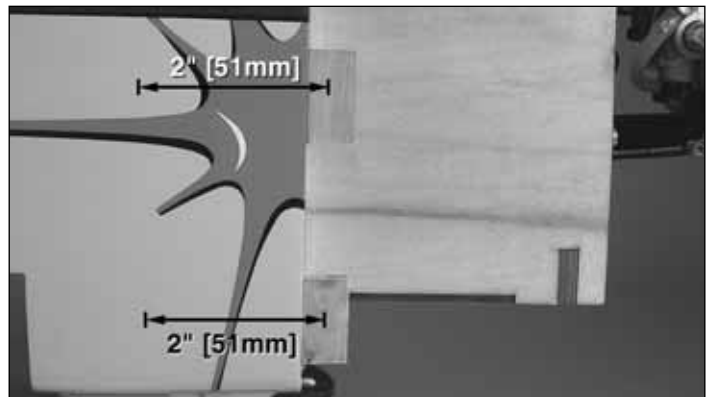
15. Install a brass-screw lock connector and nylon retainer to the servo arm. Slide it onto the pushrod wire, center the servo, and install the servo arm onto the servo. Then, install the servo screw into the servo and a 6-32 x 1/4" [6mm] socket head cap screw into the screw-lock connector. Glue the plywood pushrod support to the former.

Install the Cowl



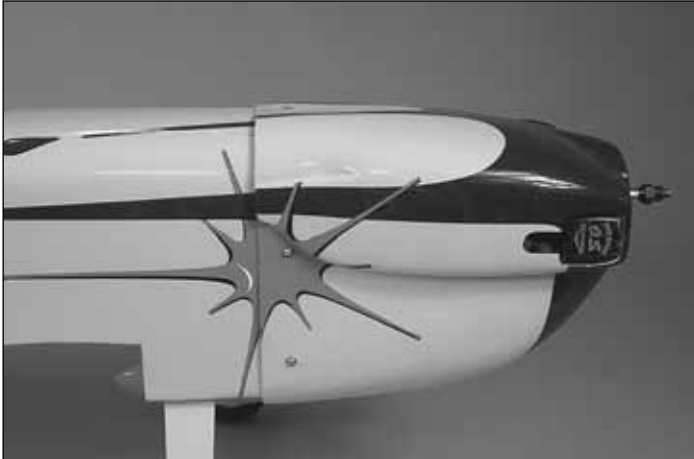
1. Measure up from the bottom of the fuselage 1" [25mm] and make a mark. From that mark measure up 2-1/2" [64mm] and make another mark. Epoxy a 1/4" x 1/2" x 1" [6x13x25mm] hardwood block to the fuselage, centering the blocks on the marks you have made. Do this on both sides of the fuselage. Install a block at the top center of the fuselage.

2. Install the cowl over the engine. Cut the cowl as needed to fit the cowl to the fuselage. Final cutting of the cowl can be done once the cowl is bolted to the fuselage. Once the cowl will fit without any obstruction from any part of the engine, remove the cowl from the fuselage.



3. From the center of each of the cowl mounting blocks measure back 2" [51mm]. Mark a line on the fuselage with a fine-point felt-tip marker.

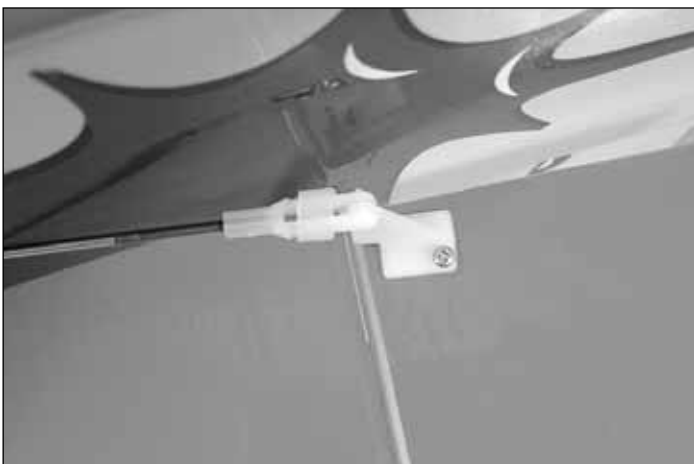
- ❑ 4. For this step you will find that a helper will be an asset. Position the cowl onto the fuselage, aligning the paint lines on the fuselage and the cowl as well as centering the engine in the opening in the front of the cowl. From the marks you made on the sides of the fuselage measure forward 2" [51mm]. Drill through the cowl and the mounting blocks with a 5/64" [2mm] drill. Install the cowl to the fuselage with five 2.5 x 10mm washer head screws.



- ❑ 5. Make all of the final cuts to the cowl to accommodate the glow driver, muffler, needle valve, etc.

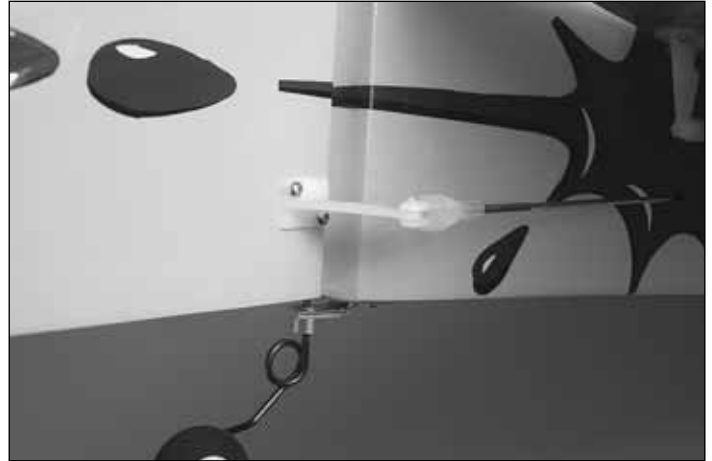
Install the Radio System

- ❑ 1. Locate three .074" x 36" [1.9 x 914mm] pushrod wires threaded on one end. Screw a nylon clevis onto the threaded end of the wires 20 full turns. Install a silicone clevis keeper onto the clevises.
- ❑ 2. Slide two of the wires with clevises attached into the openings closest to the back of the fuselage on both sides of the fuselage.

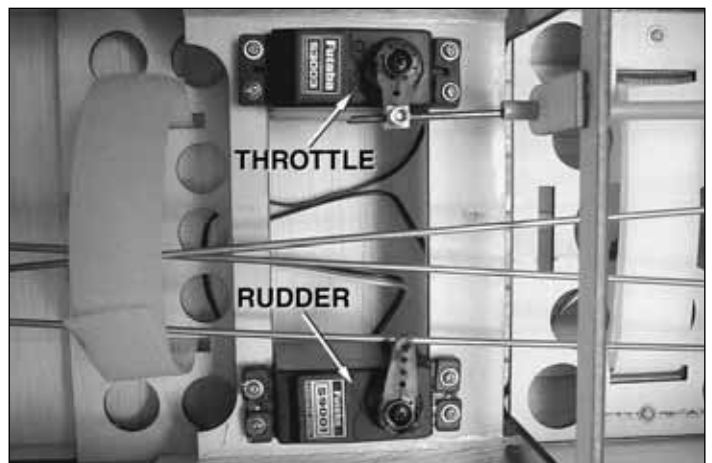


- ❑ 3. Connect a nylon control horn onto each of the two clevises. Position the control horn on the elevators, positioning it the same way as you did with the ailerons. Mark the location for the screw holes. Drill through the marks you made with a

1/16" [1.6mm] drill bit, drilling through the elevator. Secure the control horn to the aileron with two 2-56 x 5/8" [16mm] machine screws and the nylon mounting plate.



- ❑ 4. Insert the third rod into the remaining opening in the fuselage. Connect the control horn to the clevis. Mark the location for the control horn onto the rudder. Drill a 1/16" [1.6mm] hole on each of the marks drilling through the plywood plate **but do not drill through the rudder!** Install and then remove a #2 x 3/8" [9mm] screw into each of the holes. Apply a couple of drops of thin CA to harden the threads. Once the glue has hardened mount the control horn to the rudder with the #2 screws.



- ❑ 5. Install the rudder servo into the servo tray at the position shown. Mark the location for the servo mounting screws. Drill a 1/16" [1.6mm] hole through the marks, drilling through the plywood tray. Insert and then remove one of the servo mounting screws supplied with your radio into each of the four holes you have drilled. Apply a couple of drops of thin CA to each of the holes to harden the threads. After the glue has hardened permanently mount the servo.



❑ 6. Be sure the rudder servo is centered. Enlarge the first hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit). Center the rudder and align the wire pushrod with the hole in the end of the servo arm. Use a fine-point felt-tip pen to mark the wire where it crosses the holes in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm] and then cut off the excess pushrod wire. Install a nylon Faslink to the wire and servo arm.

❑ 7. Install the elevator servo into the servo tray. Position it in line with the elevator pushrods. Mount the servo using the same procedure used for the rudder servo.

Refer to this photograph for steps 8-10.



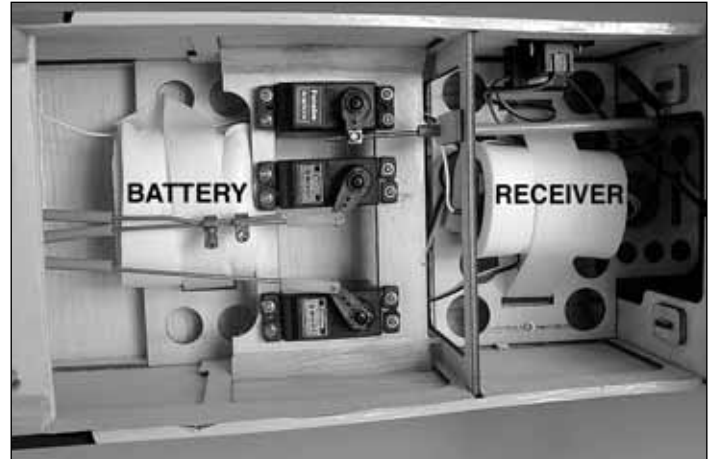
❑ 8. Make a bend in one of the elevator pushrod wires as shown.

❑ 9. Screw a 6-32 x 1/4" [6mm] socket head cap screw with a small amount of threadlocker into two 5-32" [4mm] wheel collars. Slide the wheel collars onto the wires. Align the elevators. Tighten the set screws against the wires. Cut the excess wire.

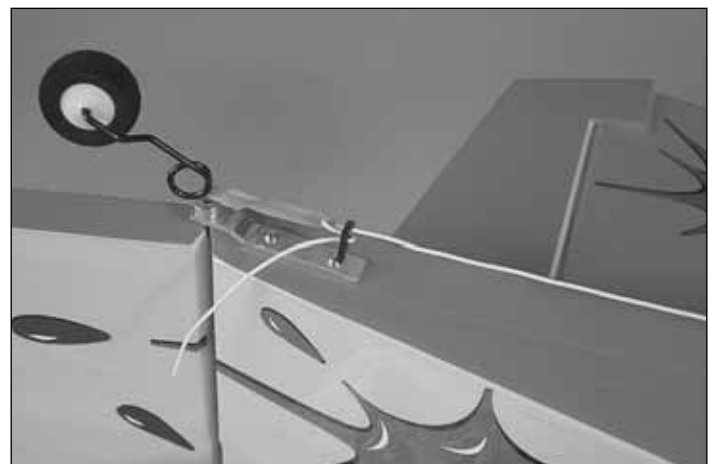
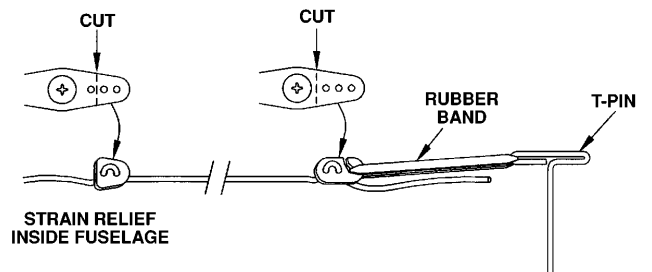
❑ 10. Be sure the elevator servo is centered. Enlarge the first hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit). Center the elevators and align the wire pushrod with the hole in the end of the servo arm. Using a marker, mark the location where the wire aligns

with the hole in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm] and then cut off the excess pushrod wire. Install a nylon Faslink to the wire and servo arm.

❑ 11. Install the switch and charge jack that came with your radio on the side of the fuselage opposite the muffler. We used the Ernst Charge receptacle (ERNM3001) for mounting the charge jack.



❑ 12. Install the battery and receiver as shown. Wrap 1/4" thick foam around the receiver and battery, holding it in place with the Velcro material included with the kit. **Note:** You can switch the position of the receiver and battery as needed for balancing purposes.



❑ 13. Use an arm cut from a servo arm to make an antenna strain relief as shown. Insert the receiver antenna into the white antenna tube. Hold it to the fuselage by placing a small rubber band around the tail wheel and the end of the antenna.

FINAL TOUCHES

Install the Pilot and Canopy

1. Cut the pilot to shorten it to fit into the cockpit. Glue it in place.
2. Install the instrument panel decal to the front of the cockpit.



3. Trim the canopy on the molded cut lines. Glue the canopy in place with RC 56 canopy glue or other aliphatic glue.
4. Install the propeller that is best suited to your engine and the spinner included in the kit.

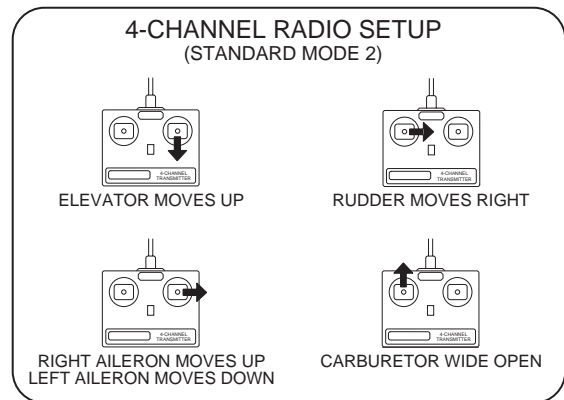
Apply the Decals

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. Submerge the decal in the soap and water and peel off the paper backing. **Note:** Even though the decals have a “sticky-back” and are not the water transfer type, submersing them in soap & water allows accurate positioning and reduces air bubbles underneath.
3. Position decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.
4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

GET THE MODEL READY TO FLY

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:

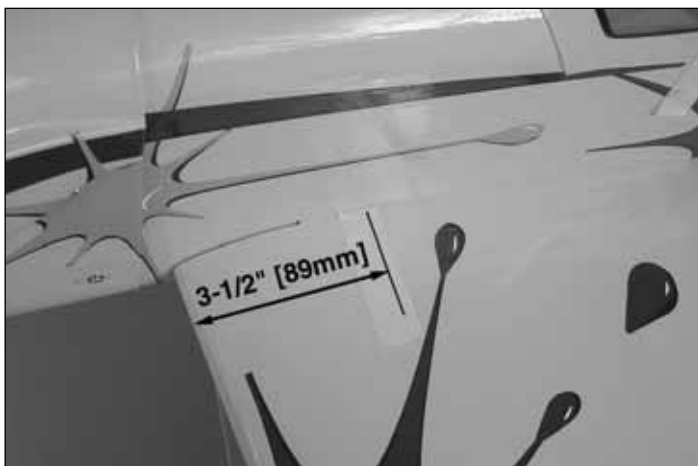
	High Rate	Low Rate
ELEVATOR:	1/2" [13mm] up 3/4" [19mm] down	3/8" [9.5mm] up 5/8" [16mm] down
RUDDER:	3" [76mm] right 3" [76mm] left	1-3/4" [44mm] right 1-3/4" [44mm] left
AILERONS:	5/8" [16mm] up 5/8" [16mm] down	1/2" [13mm] up 1/2" [13mm] down

IMPORTANT: The Cap 580 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 Cap 580 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.)

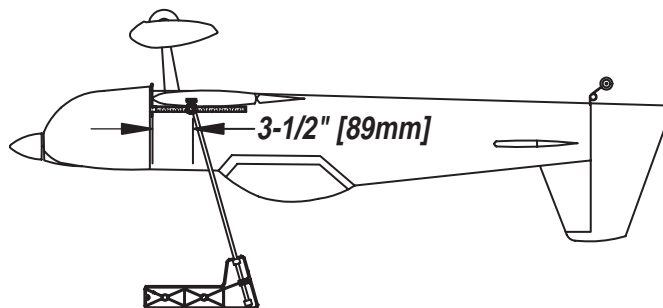
More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that 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" [3mm]-wide tape to accurately mark the C.G. on the top of the wing at both sides of the fuselage. The C.G. is located 3-1/2" [89mm] back from the leading edge of the wing measured at the side of 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" [13mm] forward or 3/8" [9.5mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



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

3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using a "spinner weight" (GPMQ4645 for the 1 oz. [28g] weight, or GPMQ4646 for the 2 oz. [57g] weight). If spinner weight is not practical or is not enough, use Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is to the firewall (don't attach weight to the cowl—it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the bottom of the fuse over the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside.

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

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

Balance the Model Laterally

1. With the wing level, have an assistant help you lift the model by the engine propeller shaft and the bottom of the fuse under the TE of the fin. Do this several times.
2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

PREFLIGHT

Identify Your Model

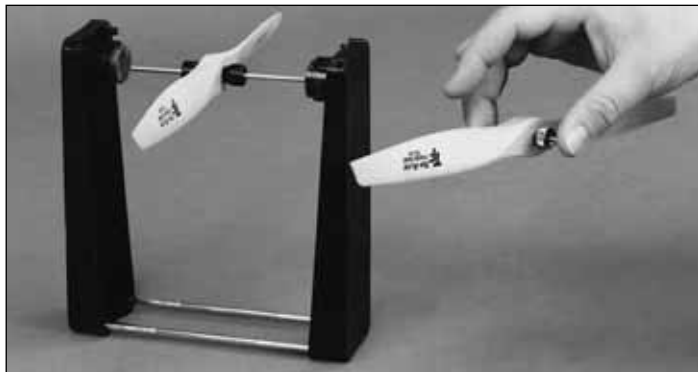
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification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

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

Balance Propellers



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

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

Ground Check

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 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 (EXCERPTS)

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

General

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

Radio Control

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

CHECKLIST

1. Fuelproof all areas exposed to fuel or exhaust residue such as the cowl mounting blocks, wing saddle area, etc.
2. Check the C.G. according to the measurements provided in the manual.
3. Be certain the battery and receiver are securely mounted in the fuse. Simply stuffing them into place with foam rubber is not sufficient.

- 4. 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.
- 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. Make sure the fuel lines are connected and are not kinked.
- 15. Balance your propeller (and spare propellers).
- 16. Tighten the propeller nut and spinner.
- 17. Place your name, address, AMA number and telephone number on or inside your model.
- 18. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- 19. If you wish to photograph your model, do so before your first flight.
- 20. Range check your radio when you get to the flying field.

FLYING

The Cap 580 is a great-flying model that flies smoothly and predictably. The Cap 580 does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

Fuel Mixture Adjustments

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

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

Takeoff

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

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

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff, The Cap 580 does not require full throttle for anything other than vertical maneuvers. You will find that it will perform rolls, snaps, inverted flight, knife edge and level flight at approximately half throttle

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

Landing

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

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

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

Have a ball!

But always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!

ALSO AVAILABLE FROM GREAT PLANES



Futaba® 4YF 4-Channel FM Radio FUTJ40**

First in affordability and features.

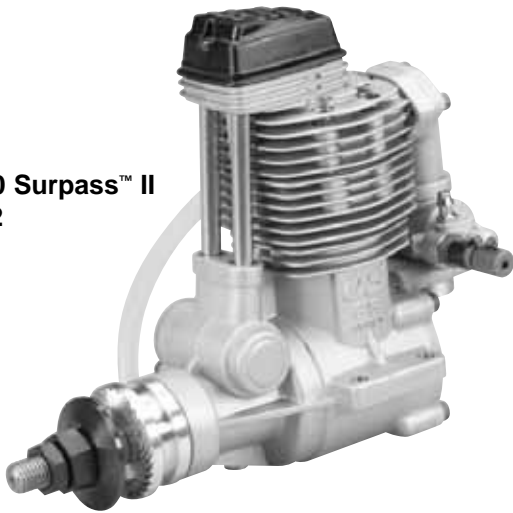
Look at the price, the features and the performance of the 4YF, and you'll see why it's the most popular 4-channel around for flight and surface use. Its FM technology is complemented with NiCds, a charger, easy access trims and a dual-conversion, 7-channel R127DF receiver. Two LEDs instantly show battery power status. The trainer system features a spring-loaded toggle switch instead of a button, so it's easy to hold "on", and automatically turns "off" when you release it. The trainer jack features a micro-pin connector port, for less clutter with the optional cord. Includes four S3004 servos. 1-year warranty. 72 & 75MHz.



Top Flite® Power Point® Propellers

Top Flite Power Point Propellers give you a visible power boost, no matter what your aircraft application may be. Strict manufacturing quality controls and tight tolerances in design and tooling give Power Point props true, constant pitch throughout the entire blade diameter. This, combined with lower rotational mass, provides greater thrust at any rpm and less overall engine wear. Stiffer than nylon, lighter than maple, these fuelproofed beechwood props also feature a swept tip design which reduces prop "howl" for quieter flying.

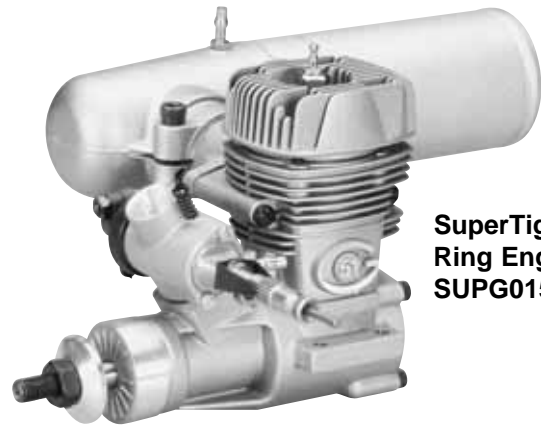
O.S.® FS-70 Surpass™ II OSMG0872



Displacement: 0.70 cu in (11.50cc)
Bore: 1.02 in (25.8mm)
Stroke: 0.866 in (22.0mm)

Output: 1.1hp @ 11,000 rpm
Practical rpm range: 2,000-12,000 rpm
Weight w/muffler: 20.65 oz (585.4g)

Improve your fuel economy and increase your power with the FS-70 Surpass II. It puts out an impressive 1.1 horsepower at 11,000 rpm -- with all the power you need to execute big maneuvers. Its Type 60R carb provides more precise fuel flow control and smoother throttle control than the original FS-70 Surpass. The FS-70 Surpass II also features easier installation, adjustment and maintenance. Muffler and glow plug included. Two-year warranty.

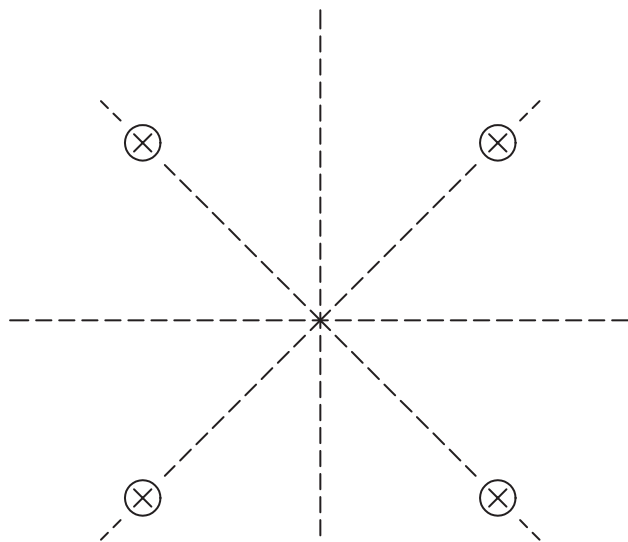


SuperTigre® G-51 Ring Engine SUPG0154

Displacement: 0.51 cu in (8.3cc)
Bore: 0.905 in (23mm)
Stroke: 0.787 in (20mm)
Output: 1.48 bhp @ 15,500 rpm

RPM Range: 2,500-15,500
Weight (without muffler): 12.73 oz (363g)
Recommended Props: 9.5x6, 10x6, 11x5

Give your Great Planes Matt Chapman CAP 580 extra punch for impressive, airshow-worthy climbs, loops, and snaps! The G-51 mounts in the same space as a .40 engine, but is bored out for higher displacement and greater output - which also reduces engine weight to further improve flight performance. The engine features Schnuerle porting and dual ball bearings, and comes with muffler and glow plug.



EM6012 BOLT PATTERN
 IT WILL USE 8-32 BOLTS
 AND BLIND NUTS IN A
 TYPICAL INSTALLATION

This model belongs to:	Name
	Address
	City, State Zip
	Phone number
	AMA number

