HANGAR 9®

Fly First Class™

B-25 Mitchell ARF

ASSEMBLY MANUAL

Specifications

Wingspan.....80.7 in (2050mm)	Engine Size.....32–.40 2-stroke glow engine
Overall Length.....63.0 in (1600mm)	Motor Size ..... Power 46 BL outrunner motor
Wing Area .....851 sq in (54.9 sq dm)	Radio.....6 channels or more
Flying Weight..... 13.5–15.5 lb (6.1 kg–7.0 kg)	Servos.... 10 servos (11 for glow version w/retracts)
.....(glow 2-stroke or electric)	.....(8 servos, 9 for electric version w/retracts)

Table of Contents

Using the Manual

This manual is divided into sections to help make assembly easier to understand, and to provide breaks between each major section. In addition, check boxes have been placed next to each step to keep track of each step completed. Steps with a single box (☐) are performed once, while steps with two boxes (☐ ☐) indicate that the step will require repeating, such as for a right or left wing panel, two servos, etc. Remember to take your time and follow the directions.

Required Tools and Adhesives

Tools

- Felt-tipped pen or pencil
- Adjustable wrench
- Hobby knife
- Phillips screwdriver (large)
- Ruler
- Soldering iron
- Flat screwdriver
- Drill
- Masking tape
- Phillips screwdriver (small)
- Sandpaper
- Solder
- Hex wrench: 3/32-inch, 2mm, 9/64, 3/16, (1.5mm included with kit)
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 7/64-inch (3mm), 9/64-inch (3.5mm), 5/32-inch (4mm), 7/32-inch (5.5mm), 1/4-inch (6mm)

Adhesives

- Formula 560 Canopy Glue (PAAPT56)
- Thin CA (cyanoacrylate) Glue (PAAPT07)
- 30-minute epoxy (HAN8002)
- Pacer Z-42 Threadlock (PAAPT42)
- CA Remover/Debonder (PAAPT16)

UltraCote Covering Colors

- Olive Drab HANU904
- White HANU870
- Dark Yellow HANU889
- Light Gray HANU882
- Sky Blue HANU875

Before Starting Assembly

Before beginning the assembly of the B-25 Mitchell, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudders, and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

If you find any wrinkles in the covering, use a heat gun or sealing iron to remove them. Use caution while working around areas where the colors overlap to prevent separating the colors.

HAN101 – Sealing Iron

HAN141 – Sealing Iron Sock

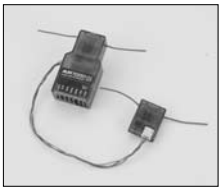
HAN100 – Heat Gun

HAN150 – Covering Glove

Radio and Power Systems Requirements

- JR Charge Switch (JRPA004)
- 2400mAh Ni-Cd 5 cell (JRPB4470)*
  *The additional weight of this Sub C battery pack will help in achieving the correct CG balance of the B-25 model

Required Servo Extensions



7-Channel Radio Setup:

Channel	Function	Extension	Notes
1 and 7	Throttle	18-inch (JSP98120) (2), 6-inch (JSP98110) (2)	
2	Aileron	18-inch (JSP98120) (2), "Y" harness (JSP98020)	
3	Elevator	None	
4	Rudder/Nose wheel	"Y" harness (JSP98020) (2), 24-inch (JSP98040)	Reverse servo required for nose wheel
5	Retracts	None	
6	Flaps	"Y" harness (JSP98020), 12-inch (JSP98030)	One reverse servo required

9-Channel Radio Setup:

Channel	Function	Extension	Notes
1	Throttle (right)	18-inch (JSP98120), 6-inch (JSP98110)	
2	Aileron	18-inch (JSP98120) (2), "Y" harness (JSP98020)	
3	Elevator	None	
4	Rudder	"Y" harness (JSP98020), 24-inch (JSP98040)	
5	Retracts	None	
6	Flap (right)	12-inch(JSP98030), 6-inch(JSP98110)	
7	Flap (left)	12-inch(JSP98030), 6-inch(JSP98110)	
8	Throttle (left)	18-inch (JSP98120), 6-inch (JSP98110)	
9	Nose wheel	6-inch (JSP98110)	

Recommended JR, JR SPORT and Spektrum Systems

- 10X
- XP9303
- XP7202
- DX7
- XP6102
- XS600

JR XP9303

Spektrum DX7

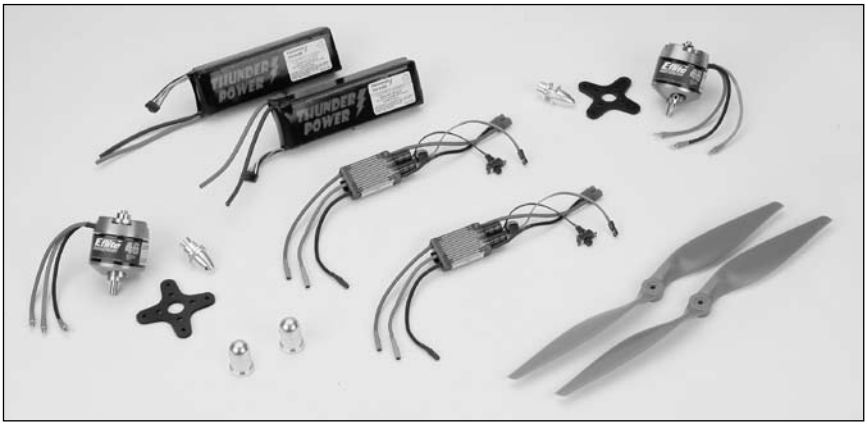
JR XP7202

Recommended Setup–Glow

- Evolution .36NT 2-Stroke Glow Engine with Muffler (EVOE0360) (2)
- 6-channel or more radio system
- 8 JR Digital Sport Hi-Torque DS821 Servos or JR SPORT High-Torque ST126MG Servos
- 2 JR 331 Micro Servos (JRPS331) (3 if adding optional retracts)
- 3/4" Spinner Nut (TRU7A140 1/4-28 Threads) (2)
- 10.5x4 3-Blade Propeller (EVOE100P) to 11 x 4 2-Blade Propeller (APC11040) (2)

Recommended Setup–Electric

- Power 46 BL outrunner motor (EFLM4046A) (2)
- 60 amp ESC (EFLM1060) (2)
- Thunder Power 4S 14.8V 3850mAh to 4200mAh Li-Po (2 required)
- 6-channel or more radio system
- 6 JR Digital Sport Hi-Torque DS821 Servos or JR SPORT High-Torque ST126MG Servos
- 2 JR 331 Micro Servos (JRPS331) (3 if adding optional retracts)
- 3/4" Spinner Nut (TRU7C516 5/16-24 Threads) (2)
- 13x8E Propeller (APC13080E) (2)



FS One (Precision Flight Simulator) w/Mode 2 Controller

With FS One® you get more than photorealistic fields, gorgeous skies and realistic-looking aircraft. You get incredibly advanced aerodynamic modeling that simulates every possible aspect of real-world flight.

HANS2000

Field Equipment

- Propeller
- Glow Plug Wrench (HAN2510)
- Glow Plug (EVOGP1)
- Fuel
- Glow Plug Igniter w/Charger(HAN7101)
- Manual Fuel Pump (HAN118)

Optional Retracts

Hangar 9 offers two versions of Robart retractable landing gear for the B-25 Mitchell:

HANB25 (Includes the following parts)

- Robart tricycle retracts
- Retract valve
- Filler valve
- Quick disconnects
- Robostruts*
- Air Tubing
- "T" fittings
- Air Tank

*The Robostruts are factory cut to the correct length.

HANB25S (Includes the following parts)

- Robart tricycle retracts
- Robostruts*

*The Robostruts are factory cut to the correct length.

In addition, you are required to supply:

- ROB164G Robart air pump to fill the air tank

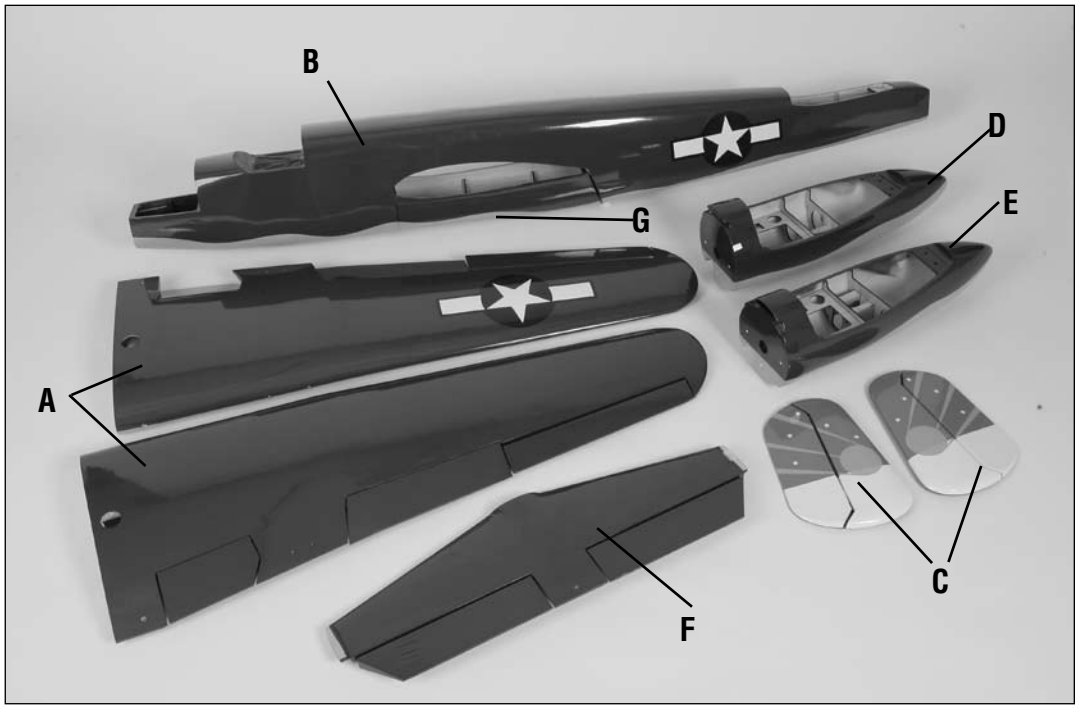
Hardware needed to complete optional installation of Robart retracts

- 4-40 x 1-inch socket head bolts (12)
- 4-40 blind nuts (12)
- #4 washers (12)
- #10 washers for axle spacers (6)
- 2mm x 2-56 Ball Link (HAN3618) (2)
- Material to fabricate the mount for the retract valve.

Contents of Kit and Replacement Parts

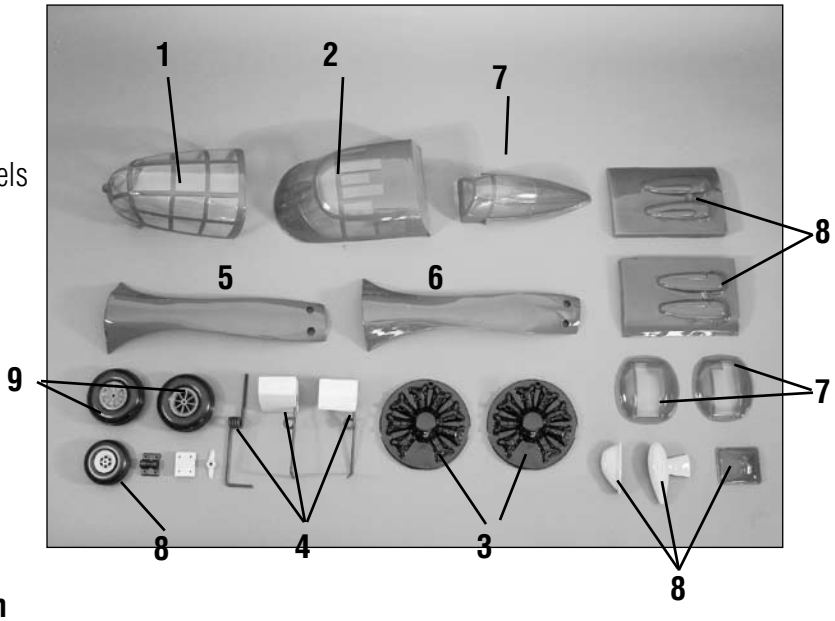
Replacement Large Parts

A.	HAN4452	Wings w/ Flaps & Ailerons	B.	HAN4451	Fuselage
C.	HAN4453	Rudders (pr.)	D.	HAN4455	Left Nacelle
E.	HAN4456	Right Nacelle	F.	HAN4454	Stabilizer & Elevator
G.	HAN4461	Fuselage Bottom Hatch			



Replacement Small Parts

1.	HAN4463	Front Greenhouse Canopy
2.	HAN4464	Main Cockpit Canopy
3.	HAN4468	Dummy Radial Engine (ea)
4.	HAN4458	Fixed Landing Gear w/o Wheels
5.	HAN4466	Right Nacelle Top Cover
6.	HAN4465	Left Nacelle Top Cover
7.	HAN4459	Canopy Set and Gun Turrets
8.	HAN4460	Guns & Radiators



Items not shown

HAN4462	Push Rod Set
HAN4467	Decal Sheet (Nose Art)
HAN4457	Cowl (ea.)

The following Hangar 9 Pro-Lite™ wheels can be used as replacements for the B-25:

8.	HAN304	Nose wheel $2\frac{1}{2}$-inch (63mm)
9.	HAN307	Main wheel $3\frac{1}{4}$-inch (83mm)

Warranty Period

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warranties that the Products purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

Limited Warranty

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

Damage Limits

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

Safety Precautions

This is a sophisticated hobby Product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the Product or other property. This Product is not intended for use by children without direct adult supervision. The Product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

Questions, Assistance, and Repairs

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to productsupport@horizonhobby.com, or call 877.504.0233 toll free to speak to a service technician.

Inspection or Repairs

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as **Horizon is not responsible for merchandise until it arrives and is accepted at our facility**. A Service Repair Request is available at www.horizonhobby.com on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

Warranty Inspection and Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

Non-Warranty Repairs

Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. **Please note: non-warranty repair is only available on electronics and model engines**.

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822

All other Products requiring warranty inspection or repair should be shipped to the following address:

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822

Please call 877-504-0233 with any questions or concerns regarding this product or warranty.

Safety, Precautions, and Warnings

This model is controlled by a radio signal that is subject to interference from many sources outside your control. This interference can cause momentary loss of control so it is advisable to always keep a safe distance in all directions around your model, as this margin will help to avoid collisions or injury.

- Always operate your model in an open area away from cars, traffic, or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model into the street or populated areas for any reason.
- Never operate your model with low transmitter batteries.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.

Section 1: Hinging the Flaps and Ailerons

Required Parts

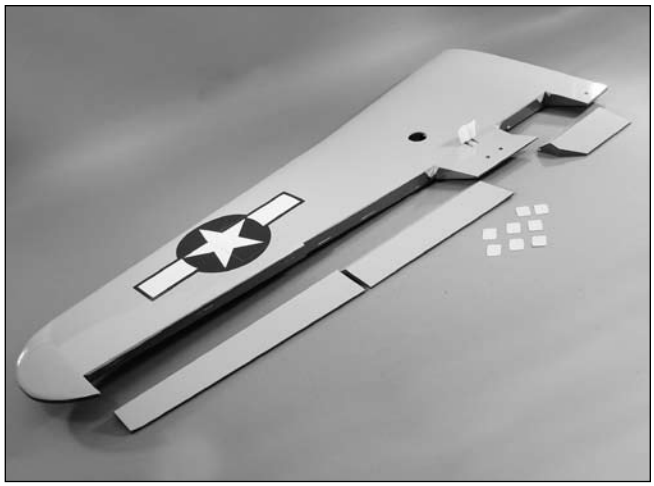
- Wing panel w/ailerons & flaps (right and left)

Required Tools and Adhesives

- Rotary tool
- Drill bit: 1/16-inch (1.5mm)
- 30-minute epoxy
- Mixing cup
- T-pins
- Thin CA
- Mixing stick

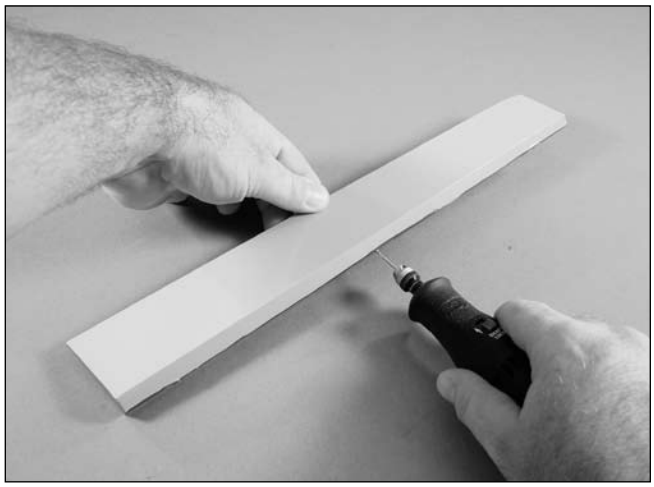
☐ ☐ Step 1

Remove the flaps and aileron from the wing panel and set aside the CA hinges.



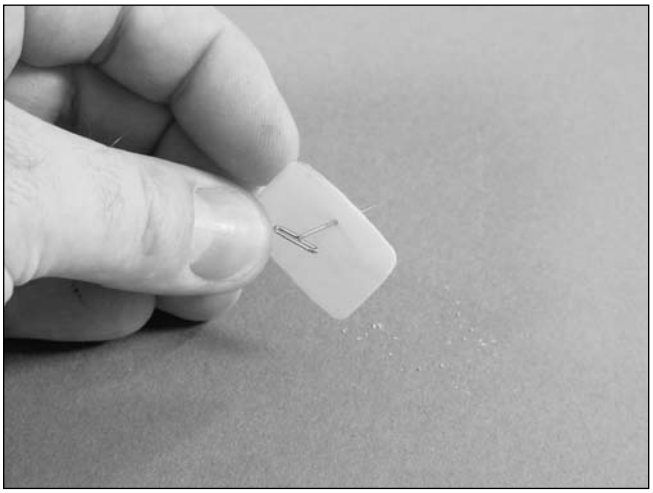
☐ ☐ Step 2

Use a rotary tool and 1/16-inch (1.5mm) drill bit to drill a 1/2-inch (12mm) deep hole in the center of each hinge slot. This provides a tunnel allowing the glue used to secure the hinges to fully penetrate the hinge.



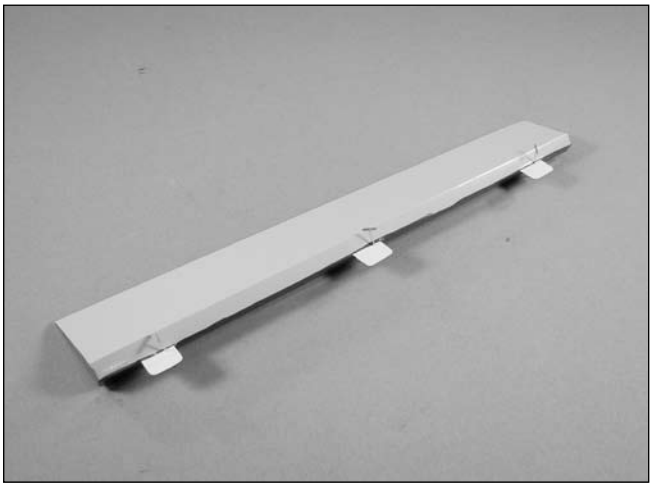
☐ ☐ Step 3

Place a T-pin in the center of each of the eight hinges removed in Step 1.



☐ ☐ Step 4

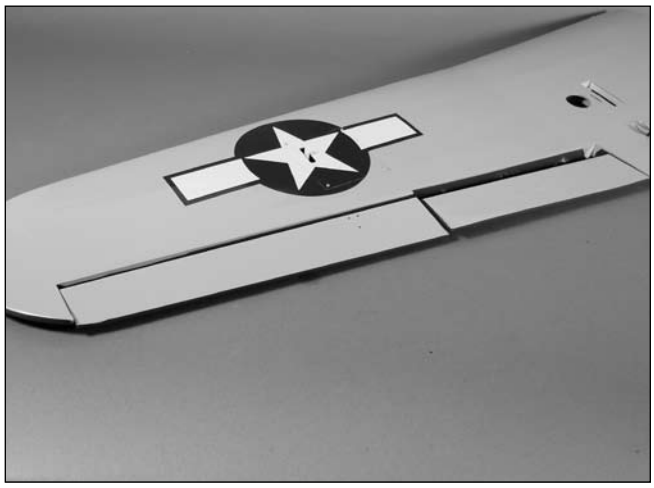
Slide the hinges back into the aileron. The T-pin will keep the hinge centered evenly in the aileron and wing when the aileron is installed.



Section 1: Hinging the Flaps and Ailerons

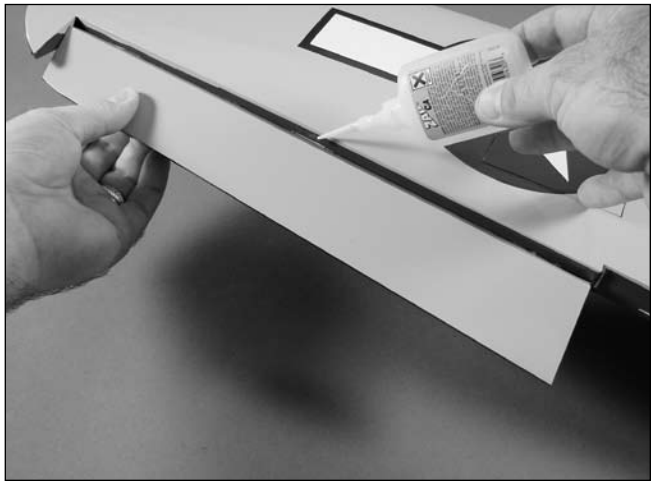
☐ ☐ Step 5

Slide the aileron and outer flap into position on the wing. Make sure the inboard edge of the flap near the center of the wing, and the outer tip of the aileron near the wing tip do not bind against the wing. Also make sure the flap and aileron do not bind against each other.



☐ ☐ Step 6

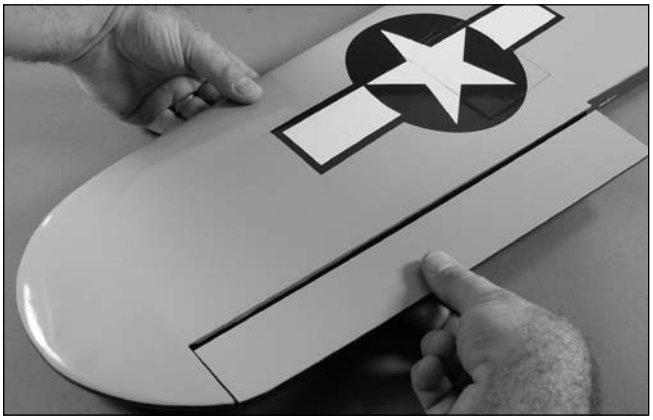
Remove the T-pins from the hinge and push the aileron tight against the wing. Flex the aileron and apply enough thin CA to fully penetrate the hinge. Apply CA to both the top and bottom of the hinge.



Important: Do not use accelerator when hinging. The CA must be allowed to soak into the hinge for the best possible bond between the hinge and surrounding wood.

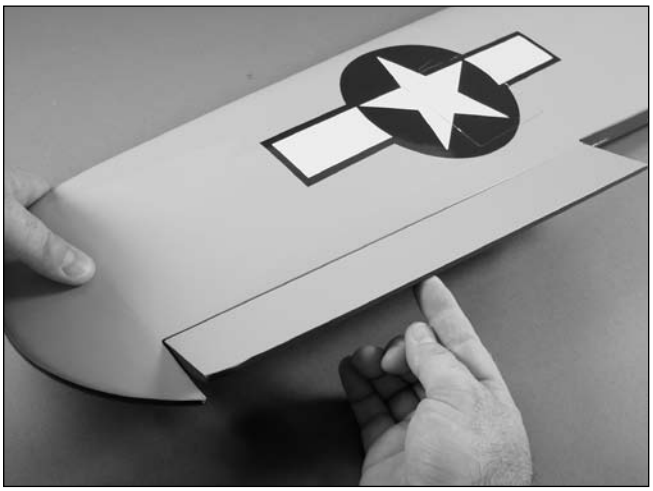
☐ ☐ Step 7

After the CA has fully cured, gently pull on the wing and aileron to make sure the hinges are secure. If not, re-glue the hinges.



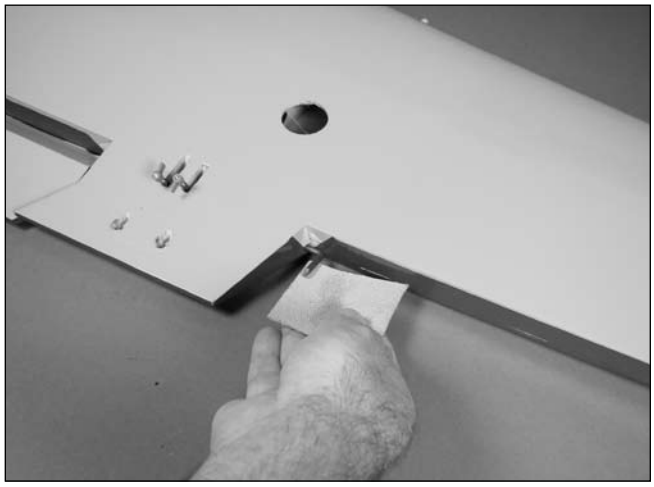
☐ ☐ Step 8

To break in the hinges, you will need to flex the aileron up and down a number of times.



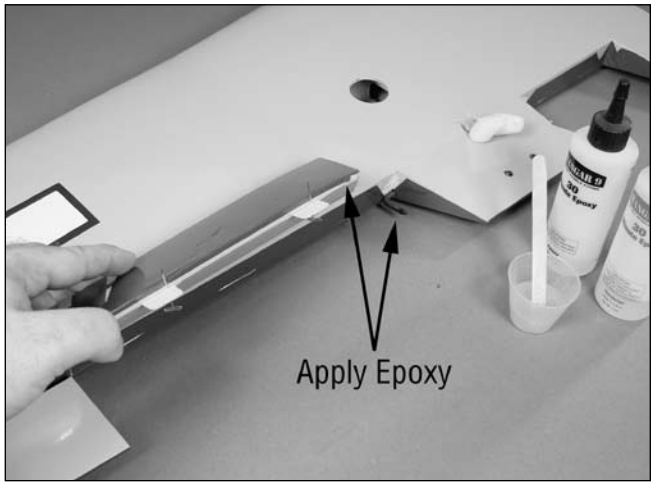
☐ ☐ **Step 9**

Use medium grit sandpaper to sand the flap torque rods. Use rubbing alcohol and a paper towel to remove any debris from the torque rod. This will aid in strengthening the bond between the flap torque rod and flap.



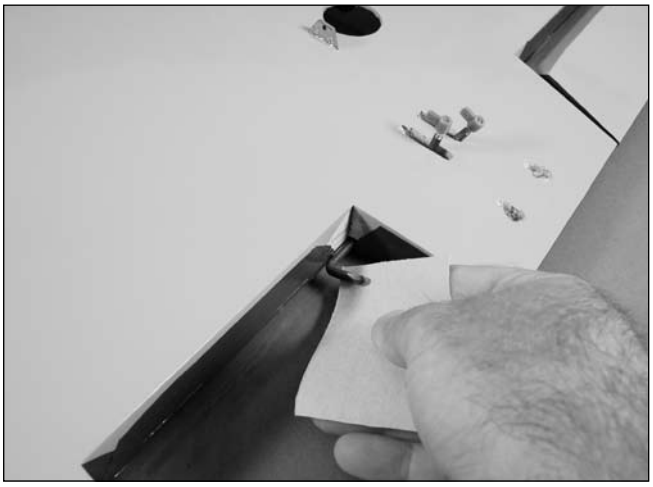
☐ ☐ **Step 10**

Hinging the flaps follows the same procedure as the ailerons, except you will need to apply 30-minute epoxy to the torque rods that enter the flaps.



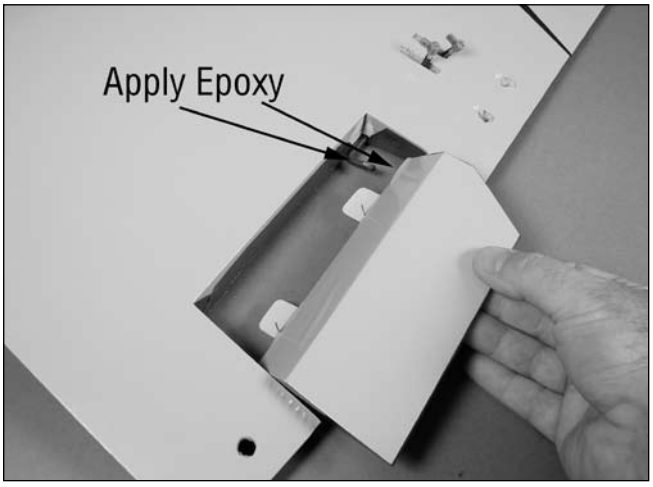
☐ ☐ **Step 11**

Use medium grit sandpaper to sand the flap torque rods. Use rubbing alcohol and a paper towel to remove any debris from the torque rod. This will aid in strengthening the bond between the flap torque rod and flap.



☐ ☐ **Step 12**

Hinging the flaps follows the same procedure as the ailerons, except you will need to apply 30-minute epoxy to the torque rods that enter the flaps.



☐ **Step 13**

Repeat Steps 1 though 12 for the remaining wing panel.

Section 2: Aileron Servo Installation

Required Parts

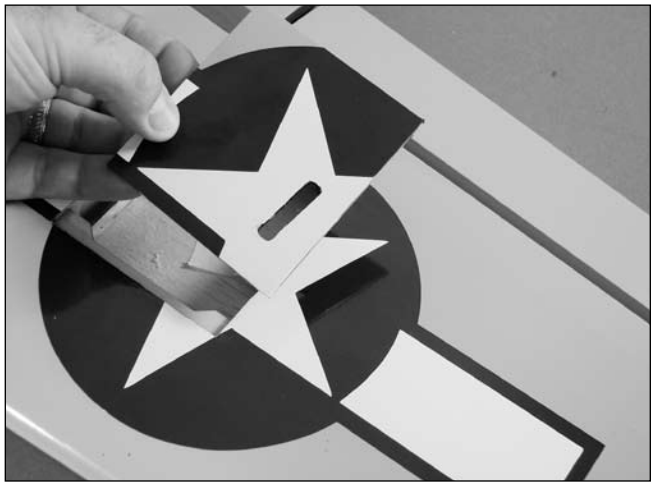
- Assembled wing panel (right and left)
- Servo w/hardware (2)
- Control horn (2)
- Pushrod connector (2)
- Nylon clevis (2)
- Servo mounting block (4)
- 6-inch (152mm) pushrod wire (2)
- 2-56 x 7/8-inch machine screw (6)
- #2 x 3/8-inch sheet metal screw (8)
- 1/4-inch (6mm) heat shrink tubing
- 18-inch (457mm) servo extension (2)
- $1\,{}^{1}/_{8}$ x 1/4-inch (28mm x 6mm) dowel
- $1\,{}^{1}/_{8}$ x 5/16-inch (28mm x 8mm) dowel (2)

Required Tools and Adhesives

- Drill
- Thin CA
- Phillips screwdriver
- Long servo arm
- 30-minute epoxy
- Hobby knife
- Pencil
- Felt-tipped pen
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (2mm)

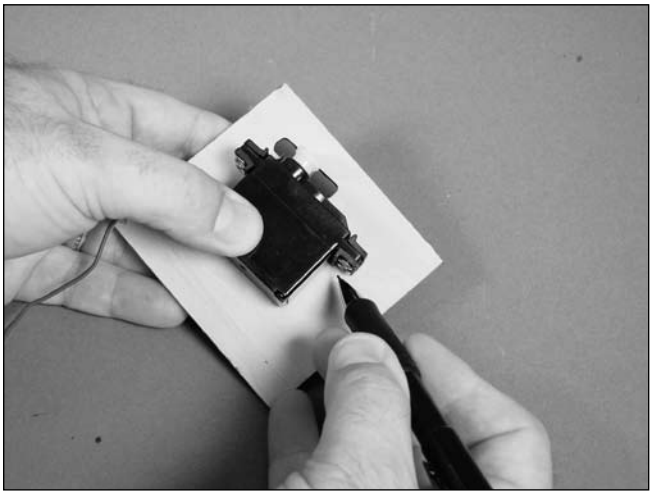
☐ ☐ Step 1

Remove the servo cover from the wing. Use a sharp hobby knife to remove the covering from the opening in the cover so the servo arm can extend outside the cover.



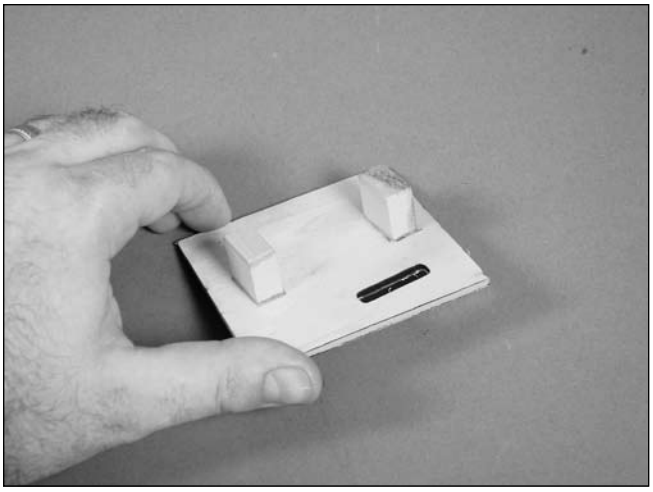
☐ ☐ Step 2

Position the aileron servo on the cover with the servo arm centered in the opening. Use a pencil to mark the cover where the flap servo is positioned.



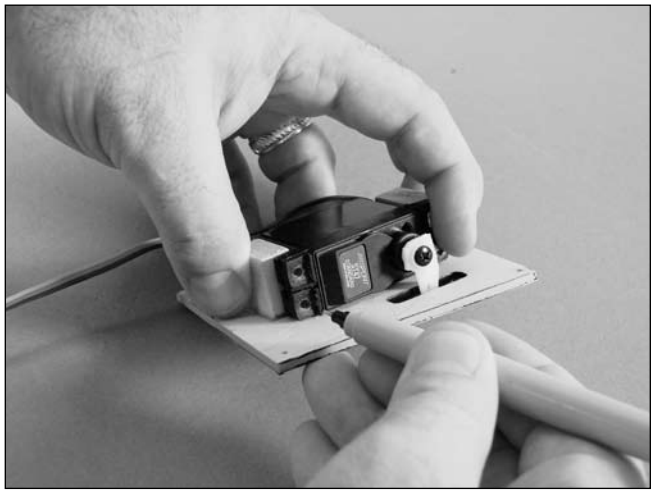
☐ ☐ Step 3

Use 30-minute epoxy to glue the servo mounting blocks to the servo cover. Allow the epoxy to fully cure before proceeding.



☐ ☐ Step 4

Position the servo between the servo mounting blocks. Make sure the servo is not resting on the servo cover, which will transfer vibrations to the servo. Use a felt-tipped pen to mark the locations for the servo mounting screws.

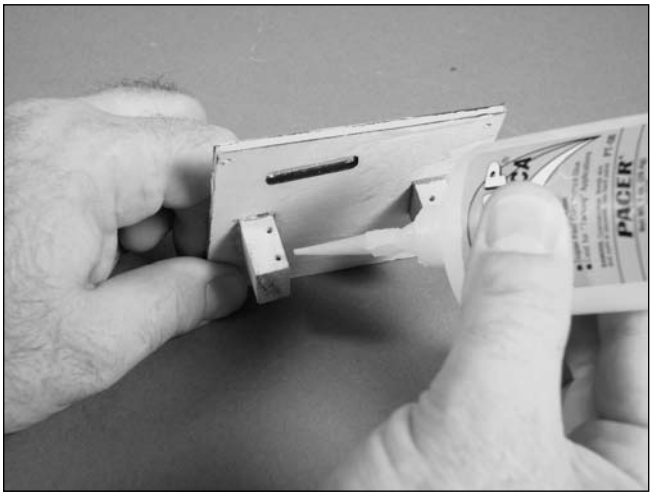


☐ ☐ Step 5

Use a drill and 1/16-inch (1.5mm) drill bit to drill the four holes for the servo mounting screws.

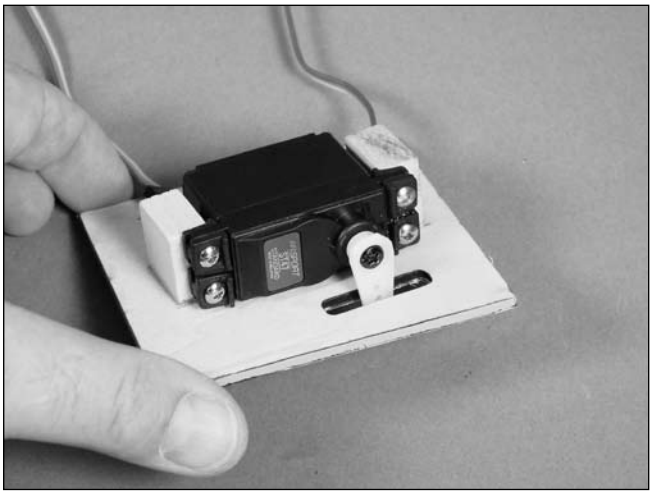
☐ ☐ Step 6

Apply a few drops of thin CA into each of the holes to harden the surrounding wood to provide a stronger surface for the screws to bite into.



☐ ☐ Step 7

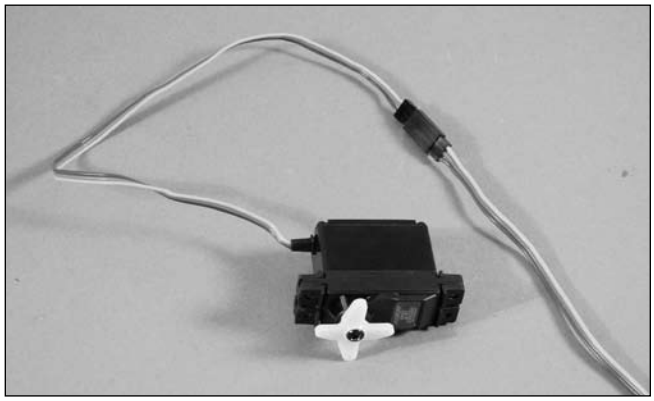
Mount the servo to the blocks using the hardware provided with the servo.



Section 2: Aileron Servo Installation

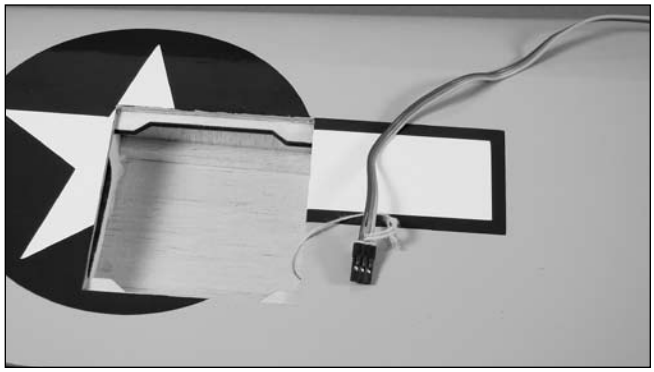
☐ ☐ Step 8

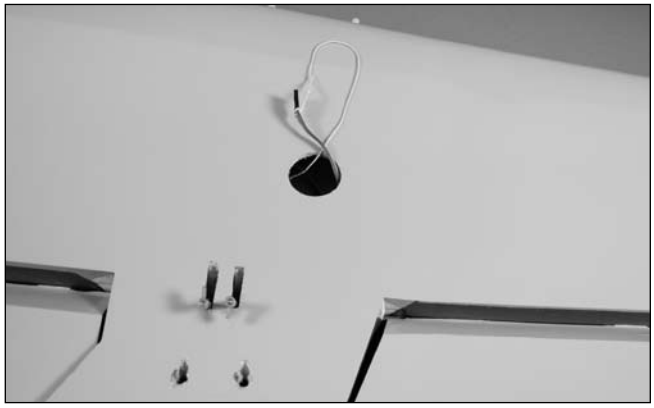
Secure an 18-inch (457mm) servo extension to the servo lead for the aileron. Make sure to secure the servo lead to the extension using string or a commercially available connector to prevent them from becoming disconnected inside the wing.



☐ ☐ Step 9

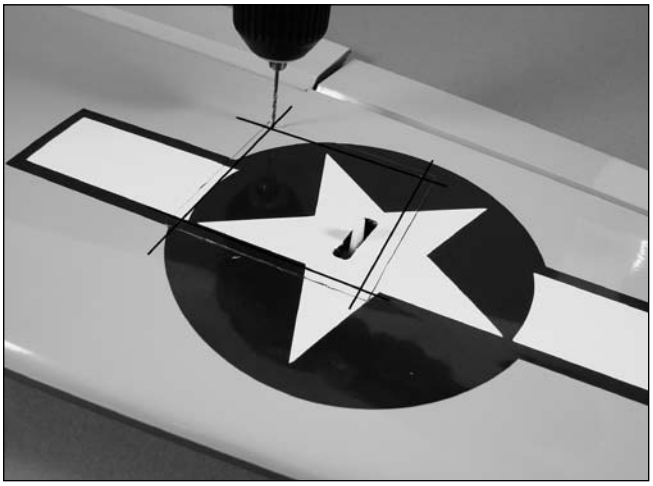
Tie the string that has been installed inside the wing to the servo extension. Use the string to pull the servo leads through the wing and to the opening of the wing panel near the flap servo. You will pull the flap servo leads and the throttle servo leads with this same pull string.





☐ ☐ Step 10

Use a drill and 1/16-inch (1.5mm) drill bit to drill four holes, approximately 1/8-inch (3mm) from the corners of the servo cover.

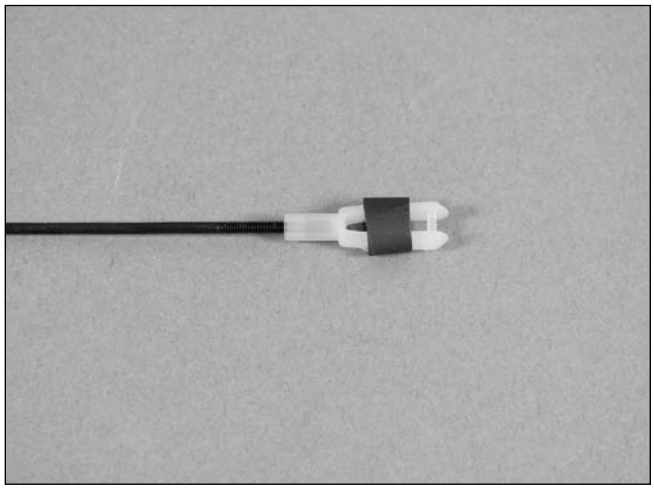


☐ ☐ Step 11

Use four #2 x 3/8-inch sheet metal screws to secure the servo cover to the wing.

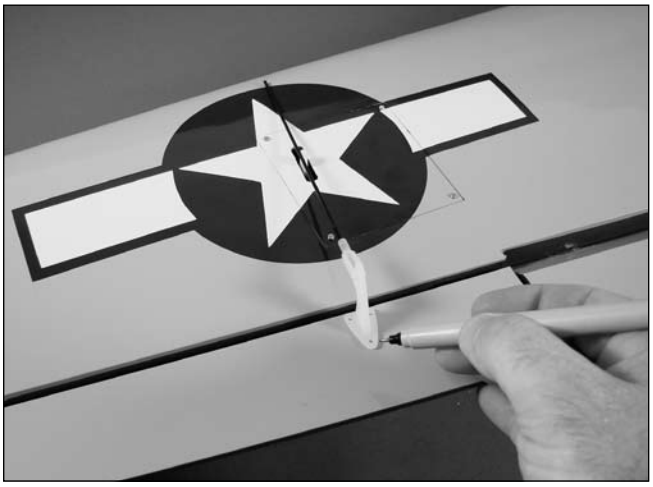
☐ ☐ Step 12

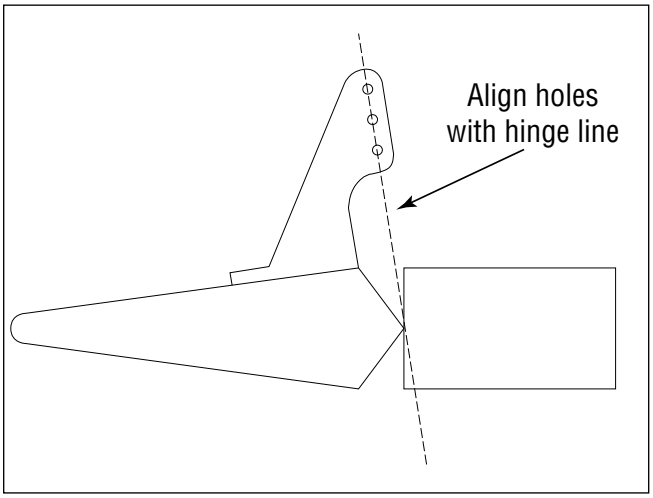
Cut two 1/4-inch (4mm) long pieces from the heat shrink tubing and slide it onto each of the clevises. Thread a nylon clevis onto the 6-inch (152mm) aileron pushrod wire.



☐ ☐ Step 13

Remove the backplate from a control horn. Connect the clevis to the horn and position the horn so the pushrod is parallel to the servo horn. Align the holes in the horn with the hinge line. Use a felt-tipped pen to transfer the locations for the mounting screws on the aileron.

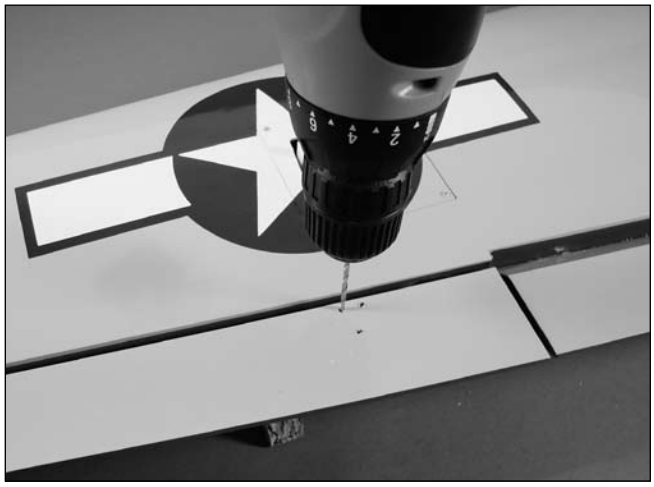




Section 2: Aileron Servo Installation

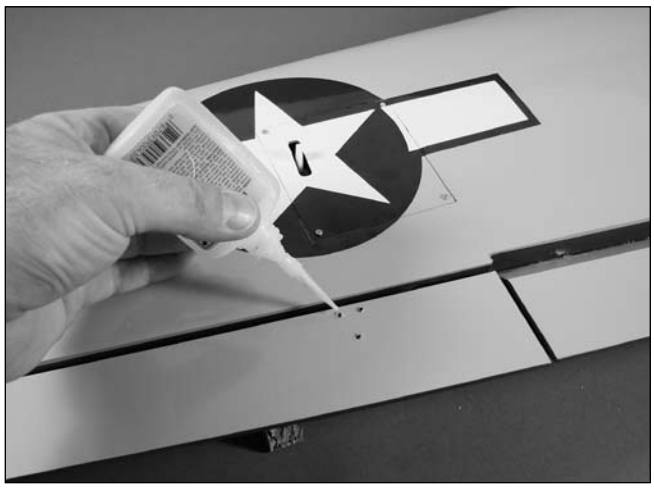
☐ ☐ Step 14

Use a drill and 5/32-inch (2mm) drill bit to drill the three mounting holes through the aileron.



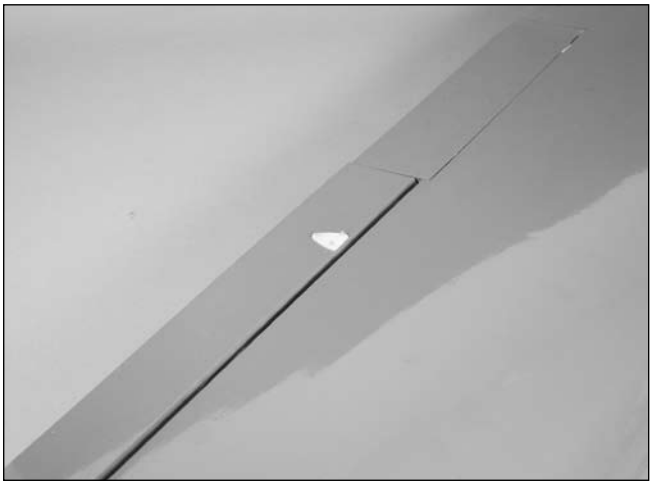
☐ ☐ Step 15

Apply a few drops of thin CA into each hole to harden the surrounding wood. You may need to run the drill bit back through the holes after applying the CA.



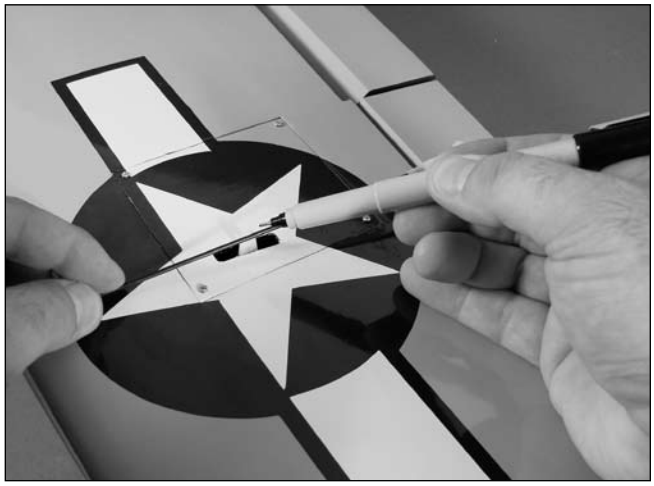
☐ ☐ Step 16

Attach the control horn to the aileron using three 2-56 x 7/8-inch machine screws and the control horn backplate.



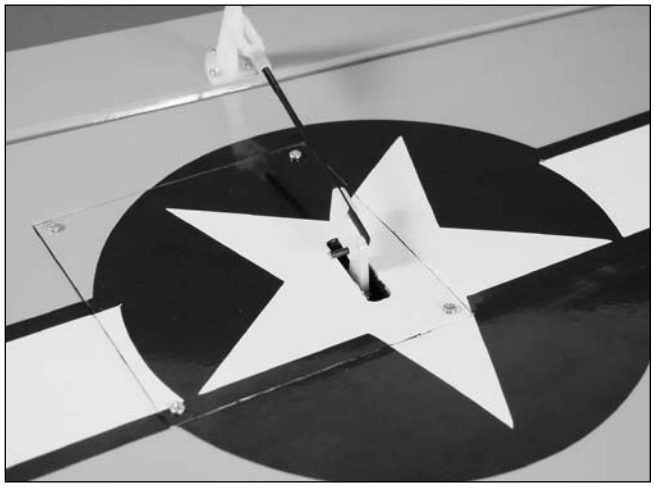
☐ ☐ Step 17

Hold the aileron so it is aligned in the centered position. With the servo centered, use a felt-tipped pen to mark where the pushrod crosses the servo arm.



☐ ☐ Step 18

Bend the pushrod wire 90 degrees at the mark made in the previous step. Use a pushrod connector to secure the pushrod to the servo arm. Use side cutters to remove any excess wire extending beyond the connector.



☐ ☐ Step 19

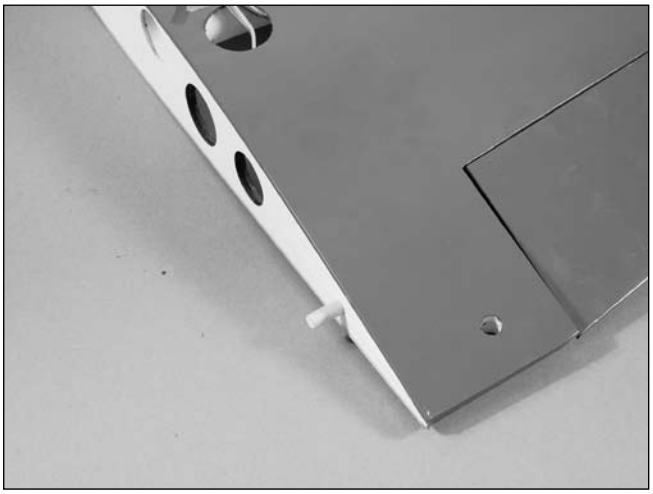
Use 30-minute epoxy to glue the $1\,^1/_8$ x 5/16-inch (28mm x 8mm) wing dowel in the wing. Press the dowel into the wing and clean any excess epoxy from the dowel and wing.

☐ Step 20

Repeat Steps 1 though 19 for the remaining wing panel.

☐ Step 21

Use 30-minute epoxy to glue the $1\,^1/_8$ x 1/4-inch (28mm x 6mm) wing dowel in the wing. Press the dowel into the wing and clean any excess epoxy from the dowel and wing.



Section 3: Fixed Flap Linkage Installation

Required Parts

- Assembled wing panel (right and left)
- Fixed flap stay (2)
- Flap linkage (2)
- Pushrod connector (2)
- Nylon clevis (4)
- 1/4-inch (4mm) heat shrink tubing

Required Tools and Adhesives

- 30-minute epoxy
- Hobby knife
- Heat gun

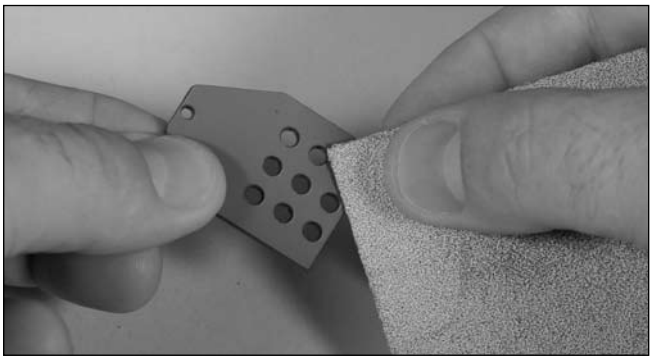
Note: The following steps cover the installation of fixed flaps on your B-25 Mitchell. You can skip to "Section 4: Operational Flap Linkage Installtion" if you are installing operational flaps.

☐ ☐ Step 1

Remove the covering from the wing slot to insert the fixed flap stay in the wing.

☐ ☐ Step 2

Sand the flap stay using medium grit sandpaper. Use rubbing alcohol and a paper towel to remove any dirt and debris from the flap stay. This will help in strengthening the bond between the flap stay and wing rib.

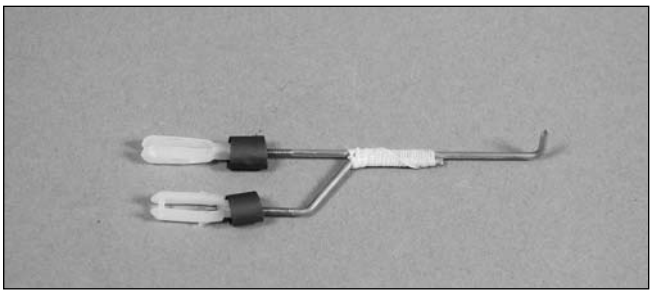


☐ ☐ Step 3

Use 30-minute epoxy to glue the flap stay in the wing.

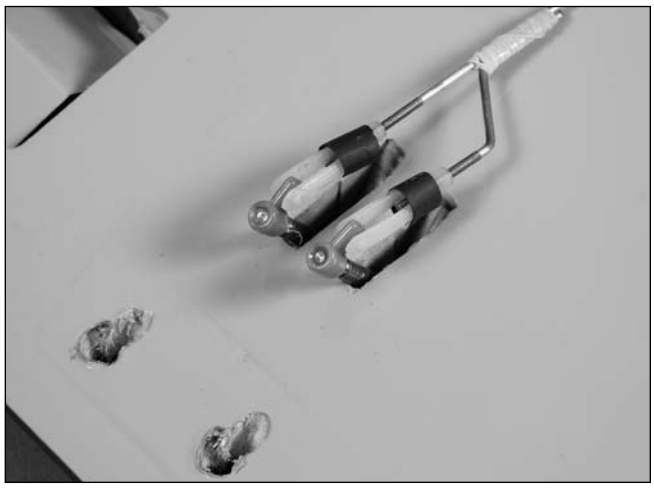
☐ ☐ Step 4

Cut two 1/4-inch (4mm) long pieces from the heat shrink tubing and slide it onto each of the clevises. Thread the clevises onto the flap linkage.



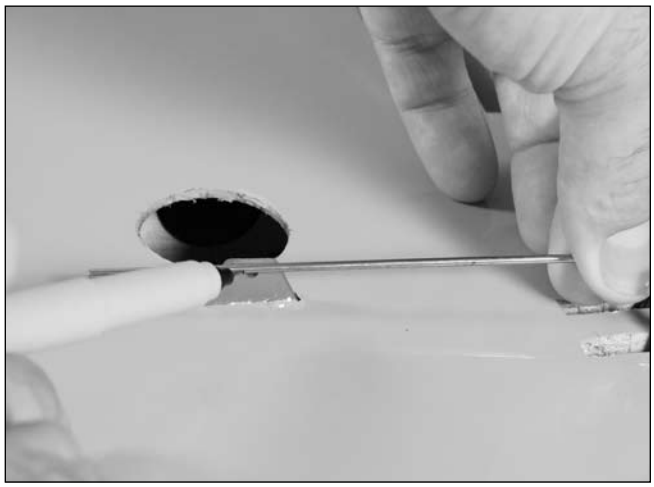
☐ ☐ Step 5

Attach the clevises to the flap control horns.



☐ ☐ Step 6

Hold the flap so it is aligned in the centered position. Use a felt-tipped pen to mark where the pushrod crosses the flap stay.



☐ ☐ Step 7

Bend the pushrod wire 90 degrees at the mark made in the previous step.

☐ ☐ Step 8

Use the pushrod connector to secure the linkage to the flap stay. Adjust the position of the clevises to center the flaps in the up position. Use a heat gun to shrink the heat shrink tubing to secure the clevis closed.

☐ Step 9

Repeat Steps 1 though 8 for the remaining wing panel.

Section 4: Operation Flap Linkage Installation

Required Parts

- Assembled wing panel (right and left)
- Servo w/hardware (2)
- Flap linkage (2)
- Pushrod connector (2)
- Nylon clevis (4)
- 1/4-inch (4mm) heat shrink tubing
- Y-harness
  or
  12-inch (305mm) servo extenstion (2)

Required Tools and Adhesives

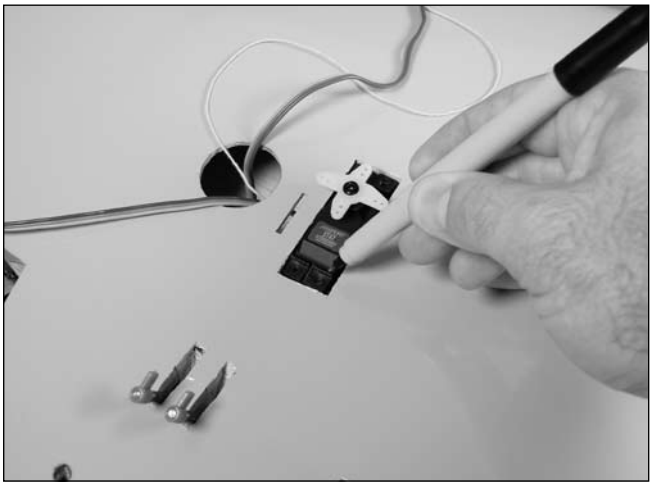
- Hobby knife
- Phillips screwdriver
- Drill bit: 1/16-inch (1.5mm)
- Thin CA
- Drill

☐ ☐ Step 1

Use a sharp hobby knife to remove the covering for the flap servo from the wing.

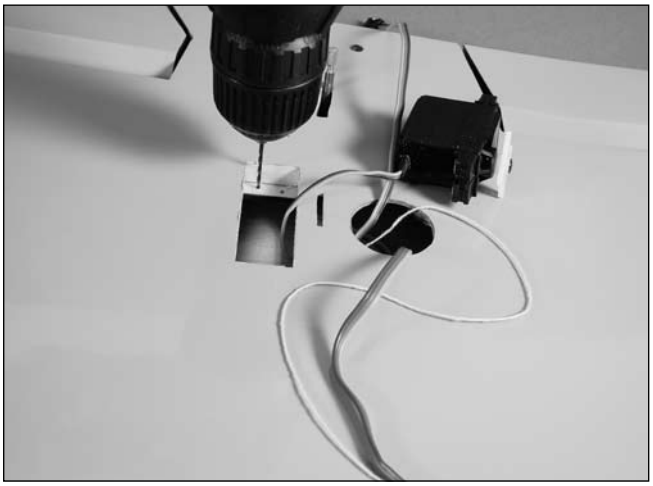
☐ ☐ Step 2

Position the flap servo in the opening. Route the servo lead out of the opening where the aileron extension is located. The horn on the servo will be toward the leading edge of the wing. Use a felt-tipped pen to mark the locations for the servo mounting screws.



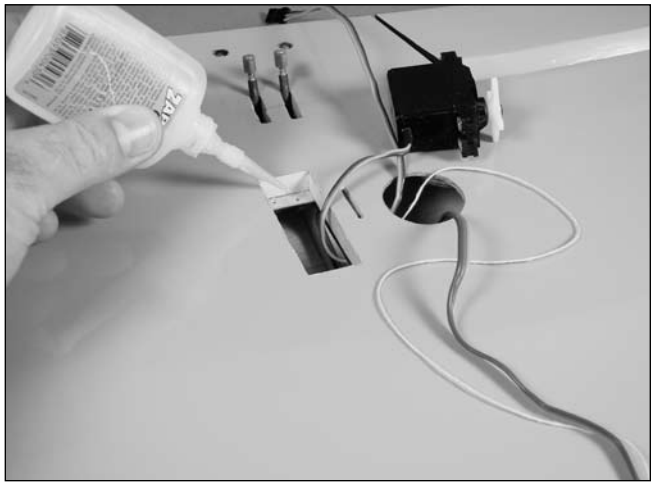
☐ ☐ Step 3

Use a drill and 1/16-inch (1.5mm) drill bit to drill the locations for the servo mounting screws.



☐ ☐ Step 4

Apply a few drops of thin CA to each of the holes drilled in the previous step. This will help harden the wood, making the screws more secure in their placement.

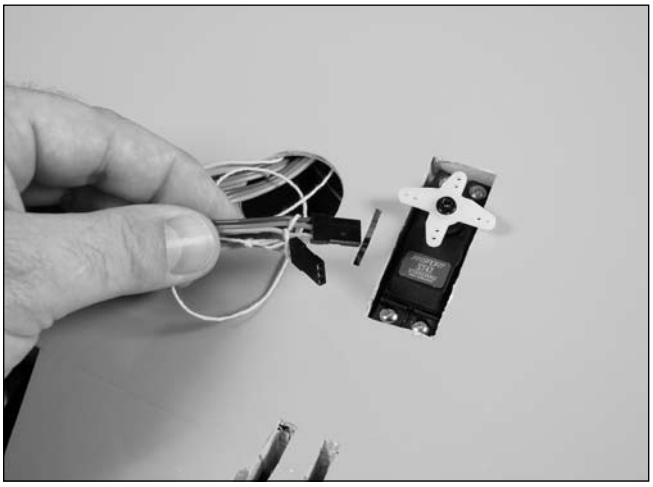


☐ ☐ Step 5

Secure the flap servo in the wing using the hardware provided with the servo.

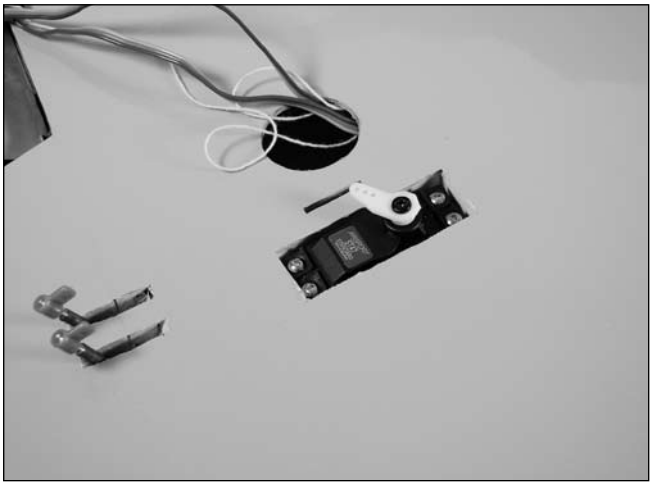
☐ ☐ Step 6

The string will now be attached to the flap servo lead and to the aileron extension.



☐ ☐ Step 7

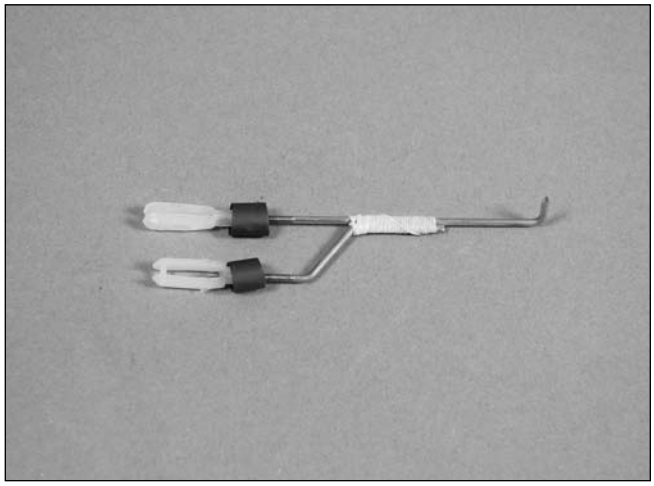
Remove the standard servo arm from your servo and install the longer 180-degree servo arm included with the servo. With the flap servo plugged into the receiver, use the radio system to operate the flap servo. After determining the up and down positions, set the flap servo into the up position.



Section 4: Operation Flap Linkage Installation

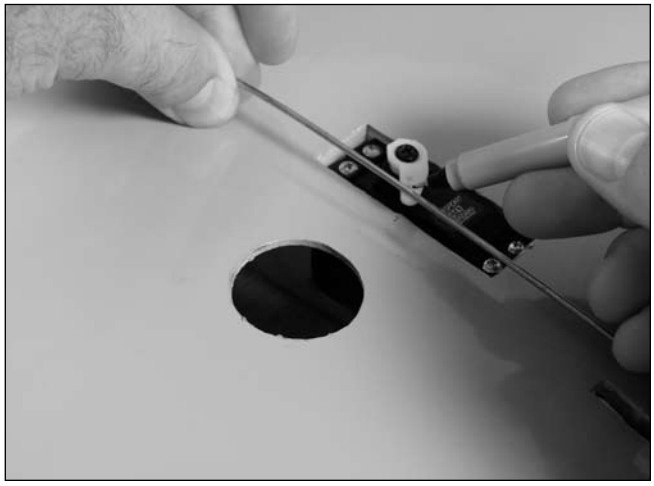
☐ ☐ Step 8

Cut two 1/4-inch (4mm) long pieces from the heat shrink tubing and slide it onto each of the clevises. Thread the clevises onto the flap linkage.



☐ ☐ Step 9

Hold the flap so it is aligned in the centered position. Use a felt-tipped pen to mark where the pushrod crosses the servo arm.

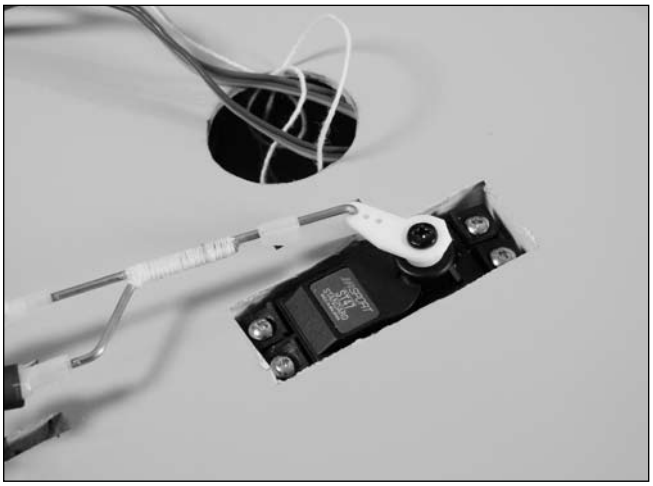


☐ ☐ Step 10

Bend the pushrod wire 90 degrees at the mark made in the previous step.

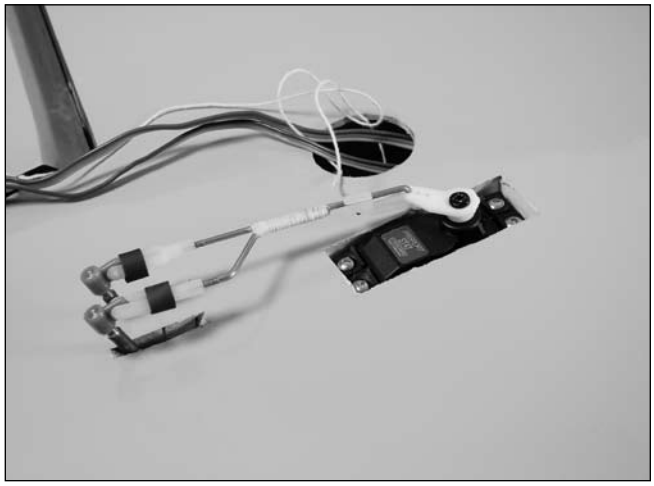
☐ ☐ Step 11

Leave the radio system on to prevent the servo from changing position. Use a 5/64-inch (2mm) drill bit to enlarge the outer hole in the servo arm. Attach the linkage to the servo arm using a pushrod connector.



☐ ☐ Step 12

Adjust the position of the clevises so the flaps are aligned with the trailing edge of the wing when the flap servo is in the up position. Use the heat shrink tubing and heat gun to make sure the clevises will not become disconnected from the flap control horns. Be careful not to damage the covering.



☐ Step 13

Repeat Steps 1 though 10 for the remaining flap linkage.

Section 5: Electric Motor Installation

Required Parts

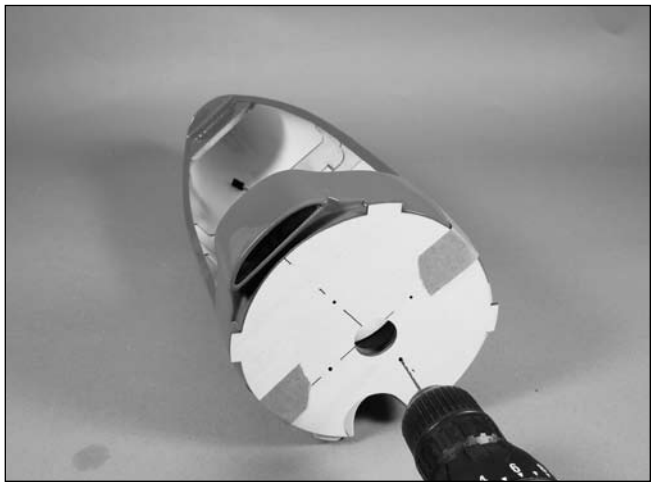
- Engine nacelle (right and left)
- Mounting template (right and left)
- Dummy radial engine (2)
- Motor w/hardware (2)
- #2 x 3/8-inch sheet metal screw (8)
- $1\frac{3}{4}$-inch (45mm) motor standoff (2)
- 8-32 x 3/4-inch socket head screw (8)
- Speed control (2)
- #8 washer (4)
- Cowl (2)

Required Tools and Adhesives

- Drill
- Phillips screwdriver
- Card stock
- 30-minute epoxy
- Rotary tool
- Thin CA
- Long servo arm
- Masking tape
- Hobby knife
- Sanding drum
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (4mm)

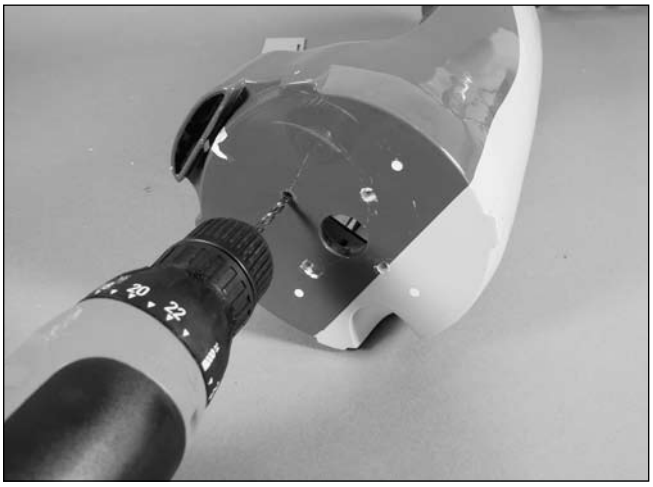
☐ ☐ Step 1

Tape the appropriate template to the front of the engine nacelle. Use a drill and a 1/16-inch (1.5mm) drill bit to drill the four locations for the motor standoffs.



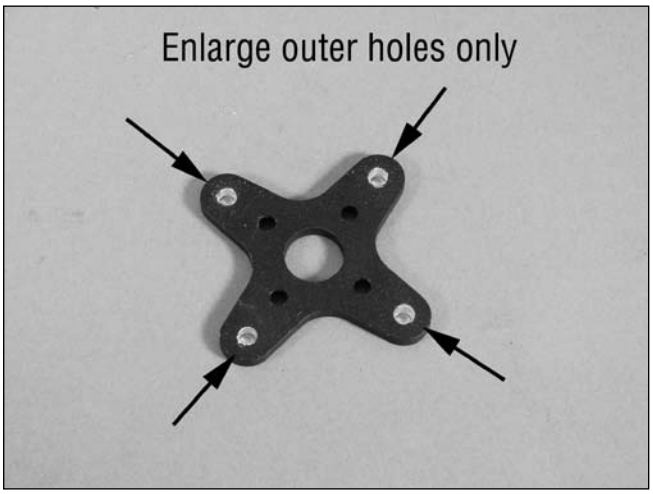
☐ ☐ Step 2

Enlarge the holes for the motor standoff screws using a drill and 5/32-inch (4mm) drill bit.



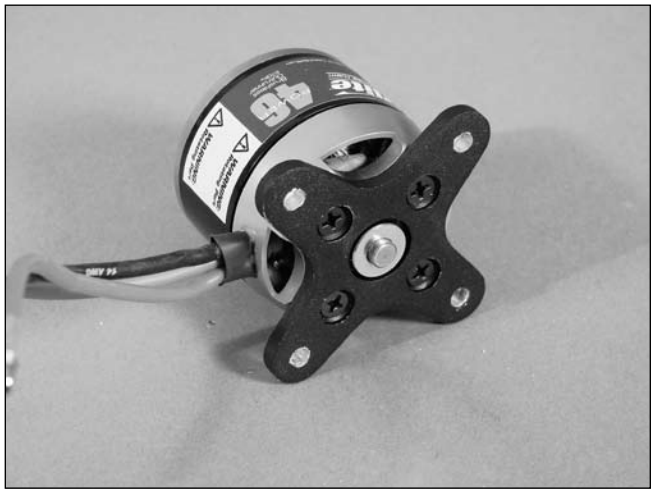
☐ ☐ Step 3

Use a drill and a 5/32-inch (4mm) drill bit to enlarge the outer mounting holes in the X-mount for your motor.



☐ ☐ Step 4

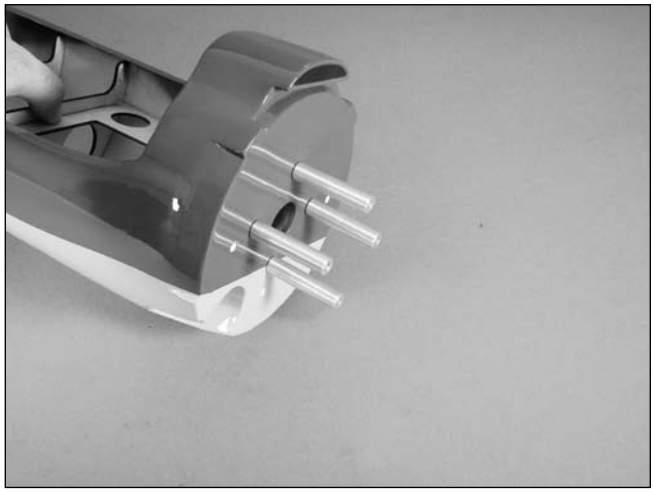
Attach the X-mount to the motor using the hardware supplied with the motor.



Important: Use threadlock on any metal-to-metal fasteners.

☐ ☐ Step 5

Attach the four $1\frac{3}{4}$-inch (45mm) motor standoffs to the firewall to the engine nacelle using four 8-32 x 3/4-inch socket head screws and four #8 washers. Leave the screws slightly loose in case the standoffs need to be moved slightly.



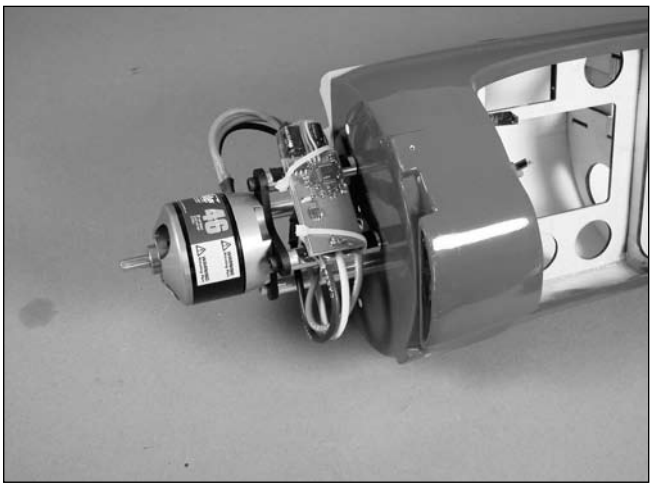
☐ ☐ Step 6

Attach the motor to the standoffs using four 8-32 x 3/4-inch socket head screws. Tighten all the screws at this time.

Note: Use threadlock on all eight of the 8-32 screws required to mount the motor.

☐ ☐ Step 7

Solder any necessary connector to the speed control. Connect the leads between the motor and speed control. Secure the speed controller to the motor standoffs using double-sided tape and tie wraps. Route the power lead and servo lead through the hole in the center of the firewall.



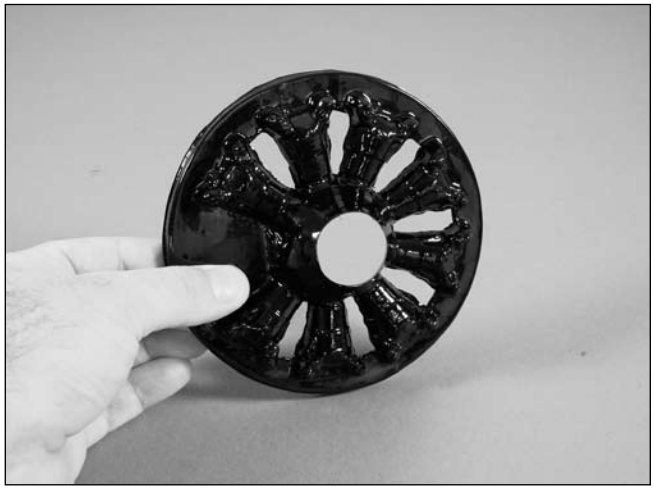
Section 5: Electric Motor Installation

☐ ☐ Step 8

Use hobby scissors and a rotary tool with a small sanding drum to make a round opening in the dummy engine for the motor shaft.

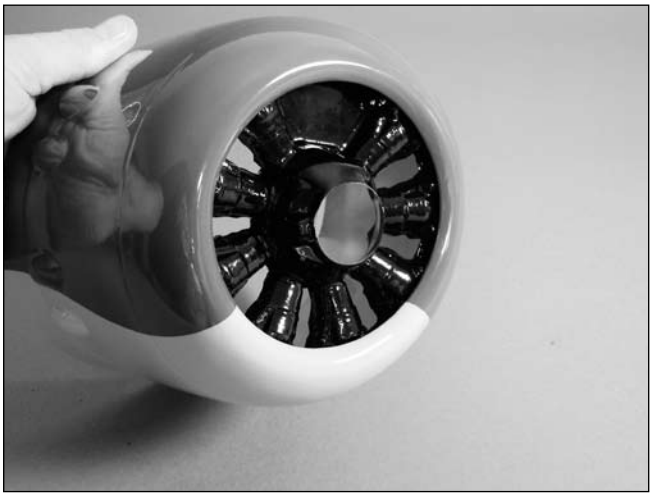
☐ ☐ Step 9

Use a sharp hobby knife to remove the material between the dummy cylinder heads to allow cooling air to pass through the dummy engine and over the motor.



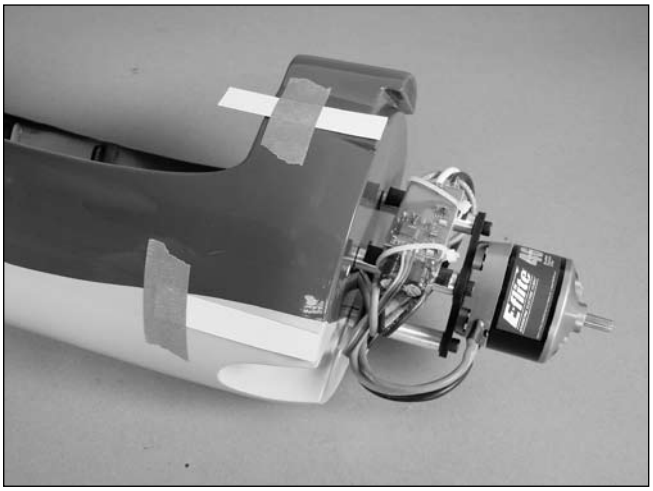
☐ ☐ Step 10

Use 30-minute epoxy to glue the dummy engine inside the cowling.



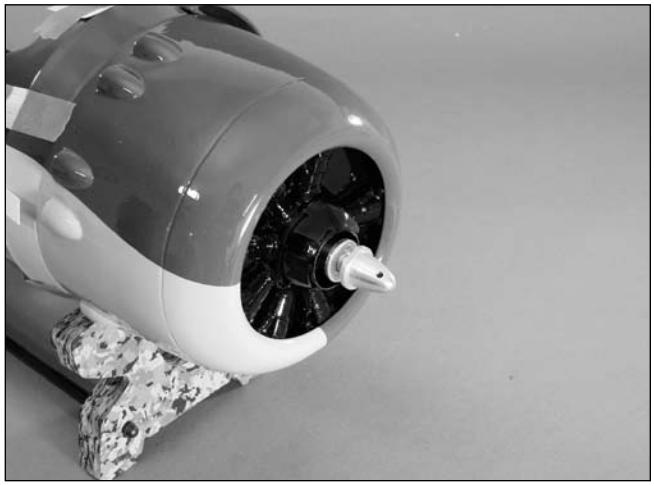
☐ ☐ Step 11

Tape four pieces of card stock to the engine nacelle. Align the card stock so the ends align with the front edge of the firewall. Align the sides of the card stock so they are centered on the raised areas of the nacelle.



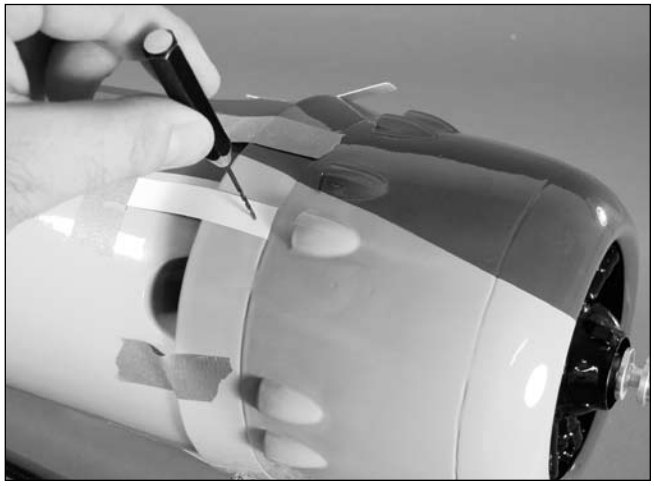
☐ ☐ **Step 12**

Slide the cowling onto the nacelle and align the opening in the dummy engine with the propeller adapter of the motor. Temporarily tape the cowl into place.



☐ ☐ **Step 13**

Drill four locations for the mounting screws using a 1/16-inch (1.5mm) drill bit. Drill the holes centered in the card stock and approximately 1/8-inch (3mm) back from the end of the template to guarantee drilling into the hardwoood positioned behind the raised areas of the nacelle.

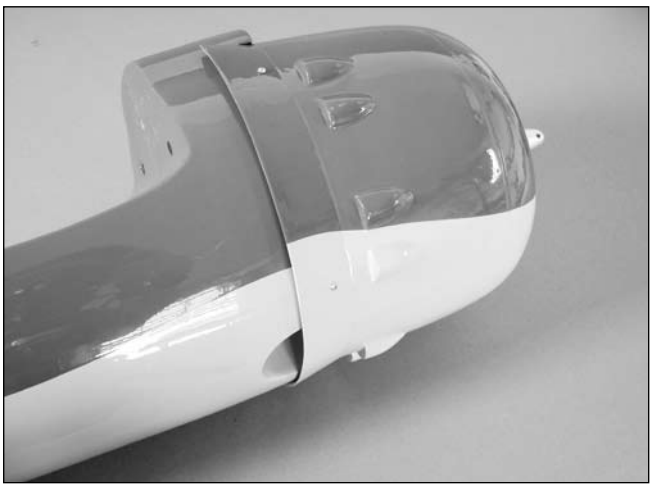


☐ ☐ **Step 14**

Apply a few drops of thin CA to each of the holes drilled in the previous step. This will help harden the wood, making the screws more secure in their placement.

☐ ☐ **Step 15**

Secure the cowling to the engine nacelle using four #2 x 1/2-inch sheet metal screws.



☐ **Step 16**

Repeat Steps 1 through 14 for the remaining motor installation.

Section 6: Glow Engine Installation

Required Parts

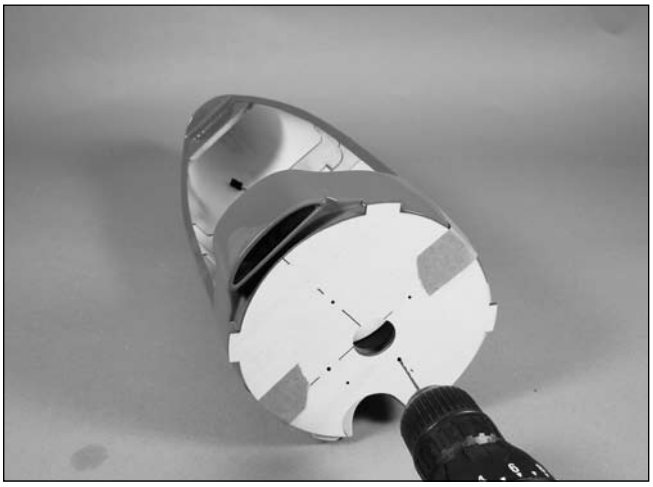
- Engine nacelle (right and left)
- #8 washer (4)
- Fuel tank (2)
- 4-40 locknut (8)
- Servo w/hardware (2)
- 2mm washer (2)
- 2mm setscrew (2)
- Dummy radial engine (2)
- Fuel Dot Filler (HAN115) (2)
- Mounting template (right and left)
- 4-40 x 1-inch socket head bolt (8)
- Pushrod tube, 6-inch (152mm) (2)
- #2 x 3/8-inch sheet metal screw (8)
- 8-32 x $1\frac{1}{4}$-inch socket head screw (8)
- Throttle pushrod, $9\frac{1}{2}$-inch (241mm) (2)
- Engine (2)
- Cowl (2)
- 8-32 blind nut (2)
- #4 washer (8)
- EZ link (2)
- C-clip (2)

Required Tools and Adhesives

- Drill
- Phillips screwdriver
- Card stock
- 30-minute epoxy
- Rotary tool
- Threadlock
- Ball driver: 9/64-inch
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (4mm), 7/32-inch (5.5mm)
- Medium CA
- Long servo arm
- Masking tape
- Hobby knife
- Sanding drum

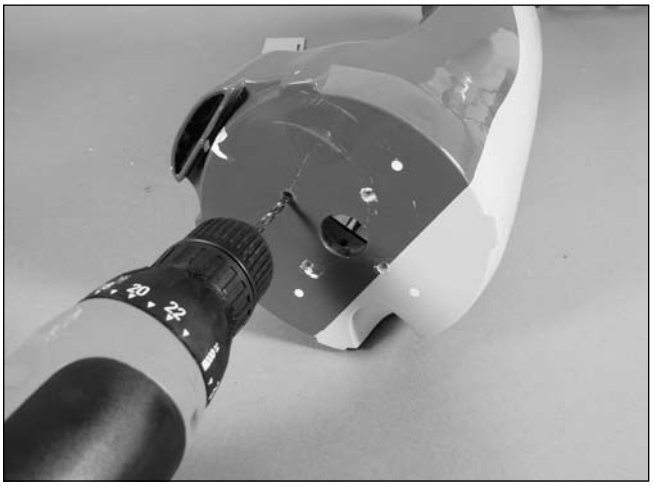
☐ ☐ Step 1

Tape the appropriate template to the front of the engine nacelle. Use a drill and a 1/16-inch (1.5mm) drill bit to drill the four locations for the motor mount blind nuts. and also drill the hole for the throttle pushrod. The throttle pushrod hole is included on the engine template.



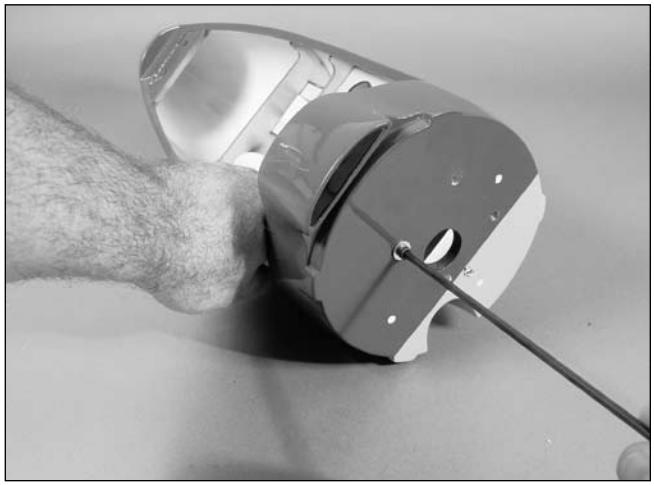
☐ ☐ Step 2

Enlarge the holes for the motor standoff screws using a drill and 7/32-inch (4mm) drill bit.



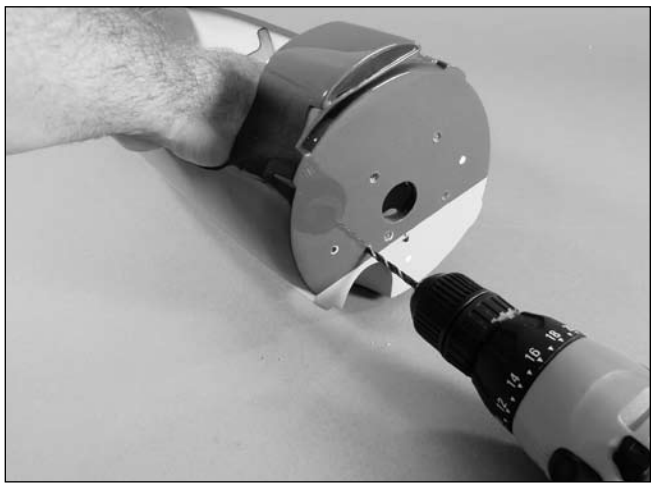
☐ ☐ Step 3

Use a short 8-32 socket head bolt and 9-64-inch ball driver to draw the 8-32 blind nuts into the back side of the firewall.



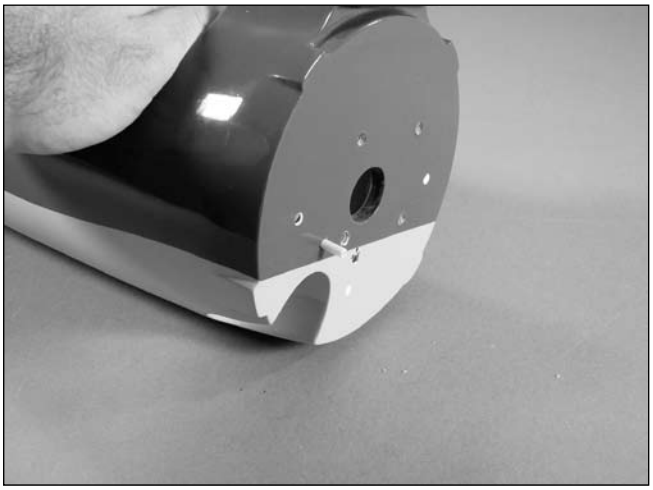
☐ ☐ Step 4

Use a drill and 5/32-inch (4mm) drill bit to enlarge the hole for the throttle pushrod.



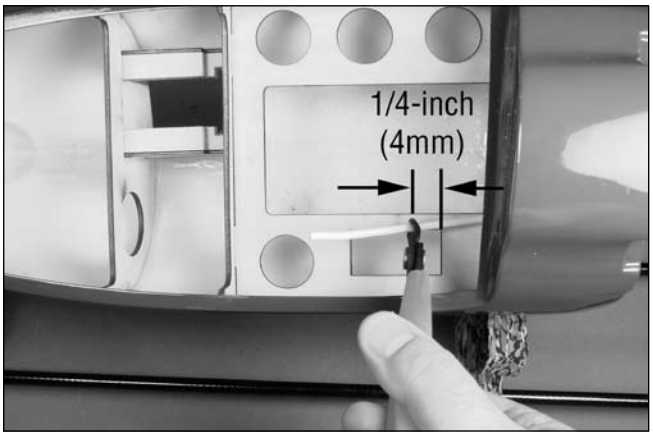
☐ ☐ Step 5

Use medium CA to glue the pushrod housing into the firewall.



☐ ☐ Step 6

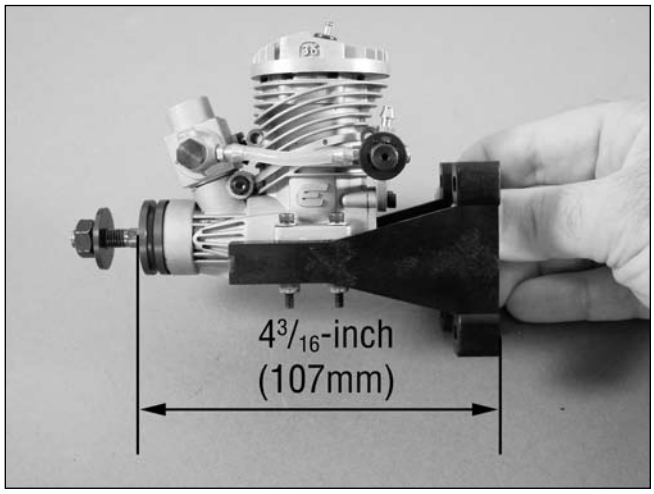
Use side cutters to cut the pushrod tube 1/4-inch (4mm) behind the forward edge of the opening for the throttle servo.



Section 6: Glow Engine Installation

☐ ☐ Step 7

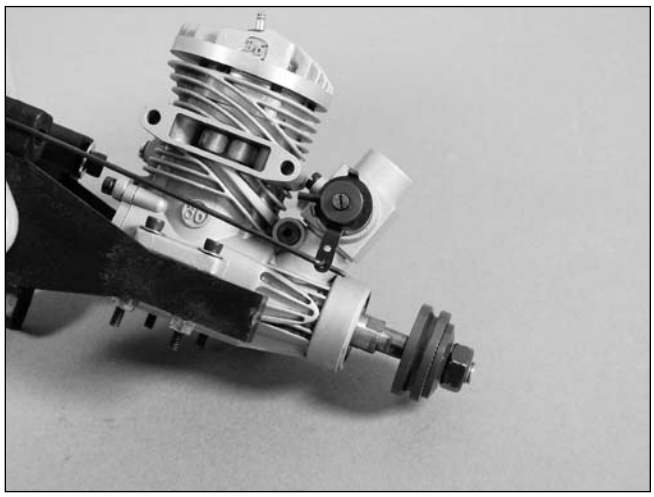
Attach the engine to the engine mount using four 4-40 x 1-inch socket head screws, four #4 washers and four 4-40 locknuts. The included engine mount is drilled for the Evolution 36NT.



Note: The distance from the rear of the mount to the front edge of the drive washer will be $4\,^{3}/_{16}$-inch (107mm). Using an engine other than the Evolution engine may required drilling new holes in the mount for the engine mounting screws.

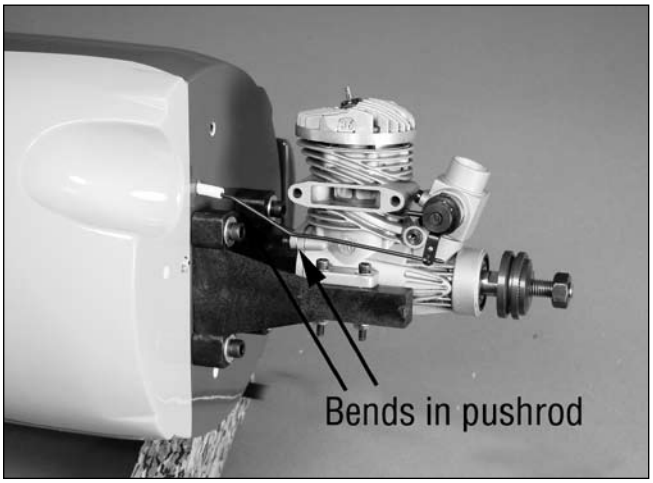
☐ ☐ Step 8

Pass the Z-bend of the throttle pushrod into the carburetor arm.



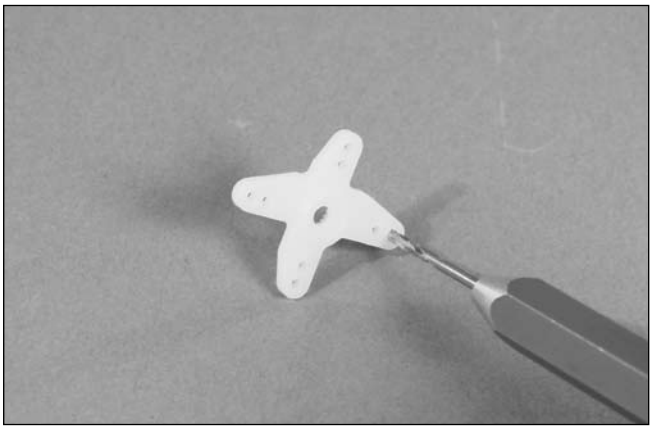
☐ ☐ Step 9

Slide the pushrod into the pushrod tube. Secure the engine mount to the firewall using four 8-32 x $1\,^{1}/_{4}$-inch socket head bolts and four #8 washers. Bend the pushrod wire slightly so it moves freely inside the pushrod tube and will clear the muffler.



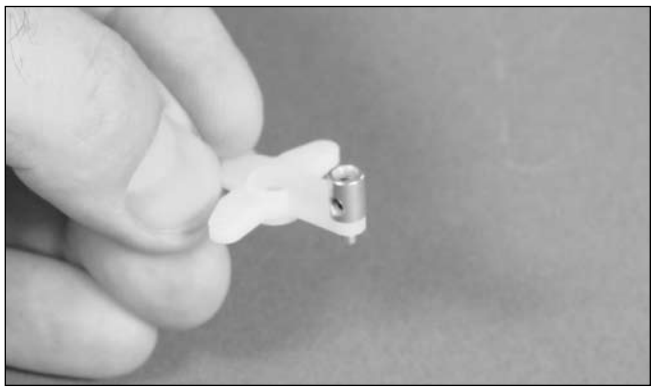
☐ ☐ Step 10

Use a pin drill and 5/64-inch (2mm) drill bit to enlarge the hole in the throttle servo arm.



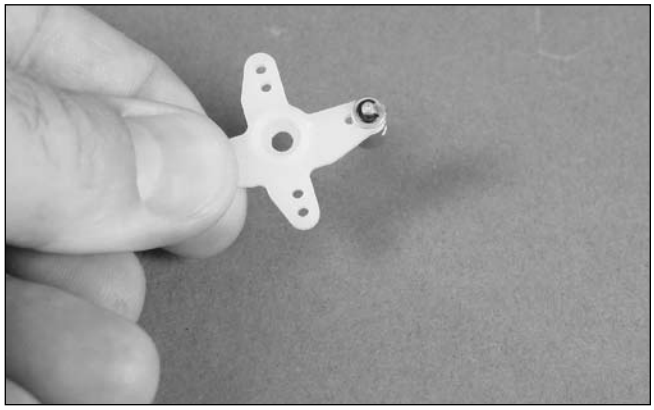
☐ ☐ Step 11

Slide the pushrod connector into the hole.



☐ ☐ Step 12

Secure the connector using a 2mm washer and C-clip.



☐ ☐ Step 13

Remove the excess arms from the servo horn. Center the throttle servo and attach the arm to the servo.

☐ ☐ Step 14

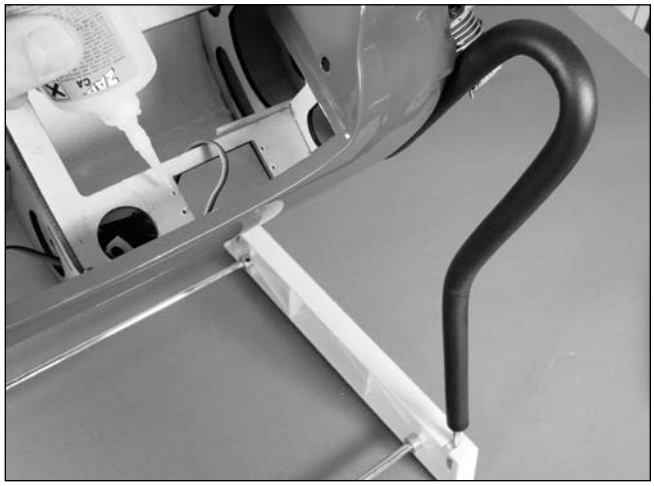
Position the servo in the opening with the servo arm facing the rear of the necelle. Mark the locations for the servo mounting screws using a felt-tipped pen.

☐ ☐ Step 15

Use a drill and 1/16-inch (1.5mm) drill bit to drill the locations for the servo mounting screws.

☐ ☐ Step 16

Apply a few drops of thin CA into each hole to harden the surrounding wood. You may need to run the drill bit back through the holes after applying the CA.



☐ ☐ Step 17

Mount the servo in the engine nacelle as shown.

☐ ☐ Step 18

Electronically move the throttle servo to low, and physically close the carburetor. Secure the position of the wire using a 2mm setscrew and the included 1.5mm hex wrench.

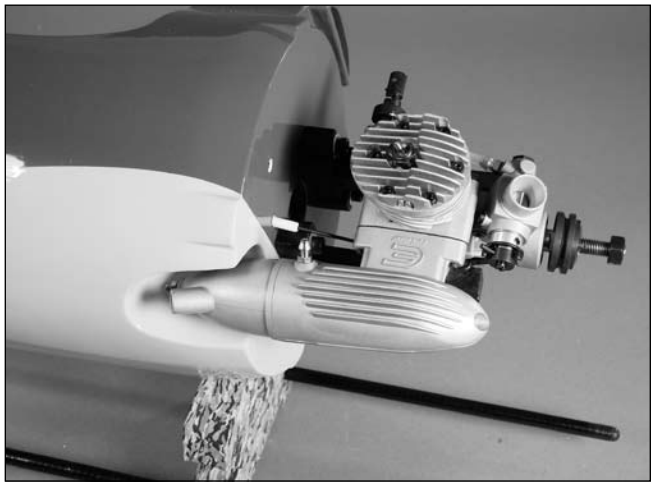
Note: Use threadlock on the setscrew to prevent it from vibrating loose.

☐ ☐ Step 19

Use side cutters to trim the pushrod wire so only 1/2-inch (12mm) extends beyond the rear of the pushrod connector.

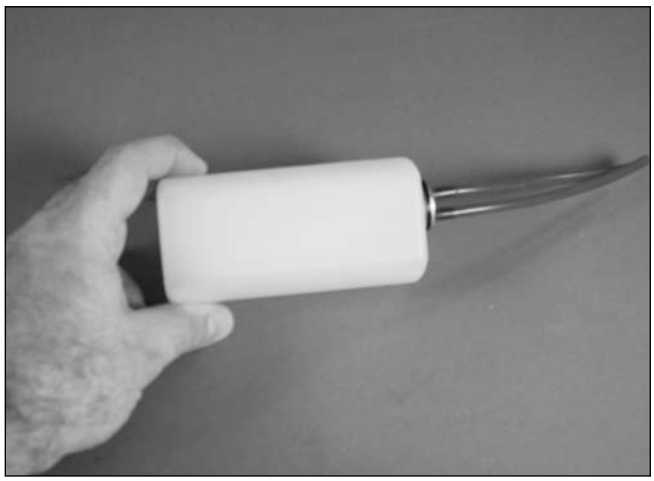
☐ ☐ Step 20

Attach the muffler to the engine following the instructions provided with the engine.



☐ ☐ Step 21

Carefully inspect the fuel tank to determine which tube is attached to the clunk and which is attached to the vent. The vent will face toward the top of the tank.

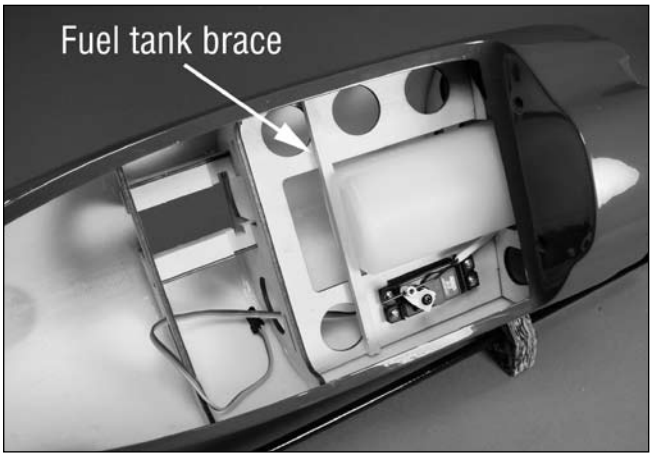


☐ ☐ Step 22

Insert the tank into the fuselage, guiding the tubes though the opening in the center of the firewall.

☐ ☐ Step 23

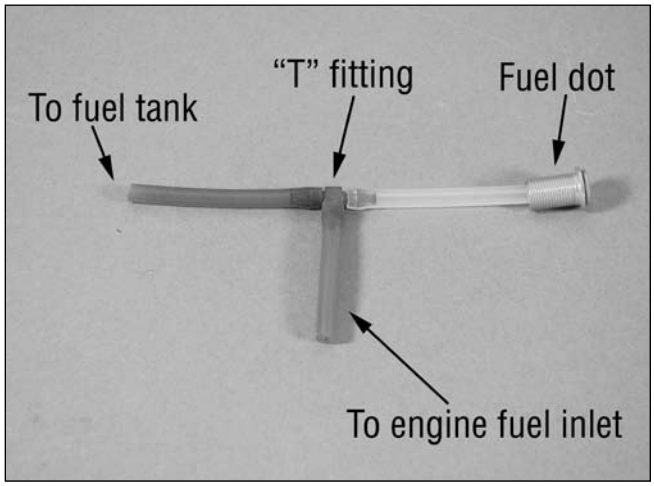
Secure the tank using the 1/4 x 1/4-inch stick provided with the model. Cut the stick in half so you have a piece for both fuel tanks.



Section 6: Glow Engine Installation

☐ ☐ Step 24

We used a fuel dot on the line to the needle valve that will mount to the cowling, making fueling the engine much easier when the cowl has been installed. When using a fuel dot you will need to splice a "T" fitting between the tank and the carburetor as shown.



☐ ☐ Step 25

Connect the lines from the tank to the engine.

☐ ☐ Step 26

Use hobby scissors and a rotary tool with a small sanding drum to make a round opening in the dummy engine for the motor shaft.

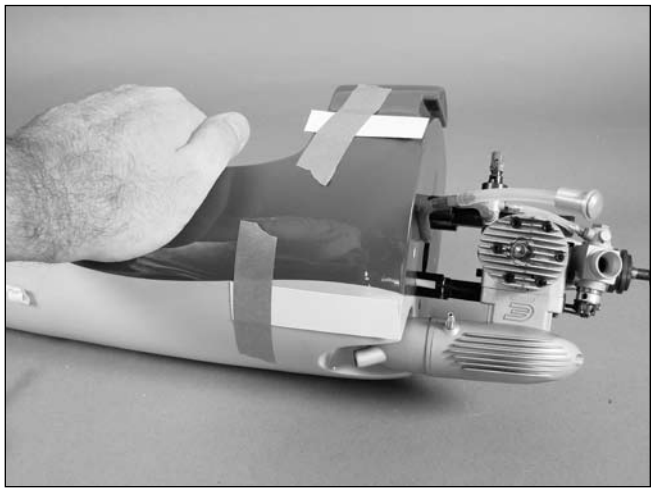
☐ ☐ Step 27

Use a sharp hobby knife to remove the material between the dummy cylinder heads to allow cooling air to pass through the dummy engine and over the motor. Use 30-minute epoxy to glue the dummy engine inside the cowling.

Note: Do not remove the area between all of the dummy cylinder heads. You need to only remove the area in front of and next to the glow engine. This will help maintain airflow over the engine cylinder head and help to promote proper engine cooling.

☐ ☐ Step 28

Tape four pieces of card stock to the engine nacelle. Align the card stock so the ends align with the front edge of the firewall. Align the length so it is aligned with the raised areas of the nacelle.



☐ ☐ Step 29

Slide the cowling onto the nacelle and align the opening in the dummy engine with the propeller adapter of the engine.

☐ ☐ Step 30

Drill four locations for the mounting screws using a 1/16-inch (1.5mm) drill bit. Drill the holes centered in the card stock and roughly 1/8-inch (3mm) back from the end of the template to guarantee drilling into the hardwoood positioned behind the raised areas of the nacelle.

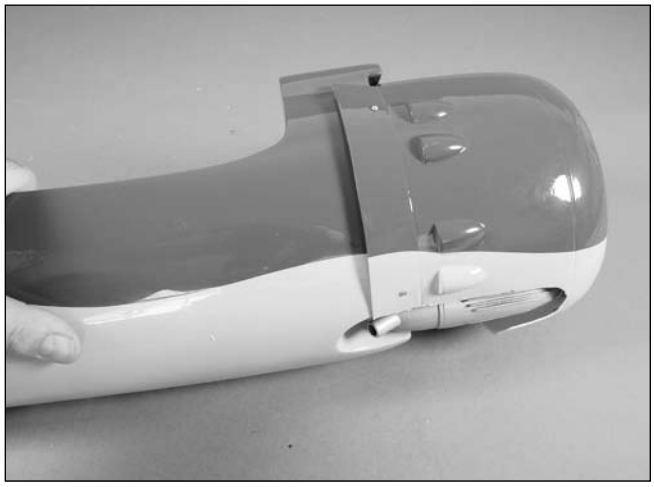
☐ ☐ Step 31

Apply a few drops of thin CA to each of the holes drilled in the previous step. This will help harden the wood, making the screws more secure in their placement.

Section 6: Glow Engine Installation

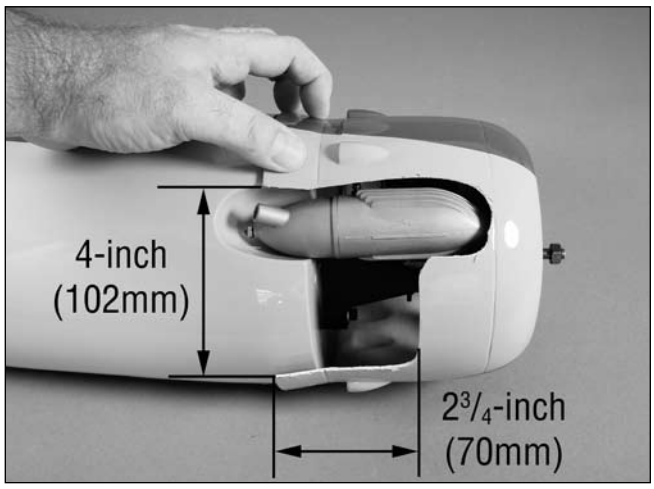
☐ ☐ Step 32

Secure the cowling to the engine nacelle using four #2 x 1/2-inch sheet metal screws.



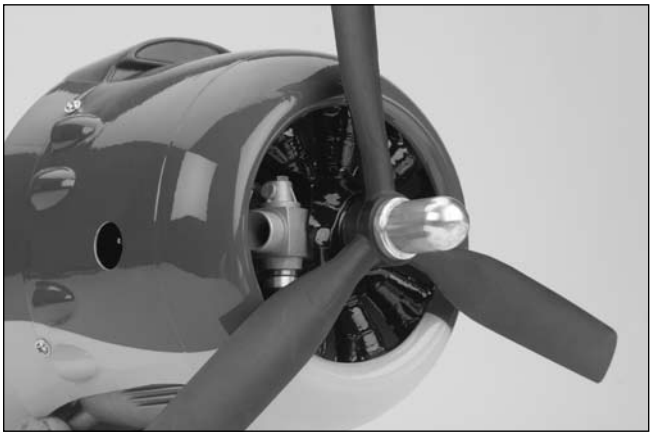
☐ ☐ Step 33

Cut an opening in the bottom of the cowling to the dimensions shown to allow for cooling air to pass through the cowl and over the engine.



☐ ☐ Step 34

Cut the necessary openings in the cowling for the muffler, glow plug and fuel dot. Attach the propeller using a scale propeller nut.



☐ Step 35

Repeat Steps 1 through 34 for the remaining engine installation.

Section 7: Fixed Landing Gear Installation

Required Parts

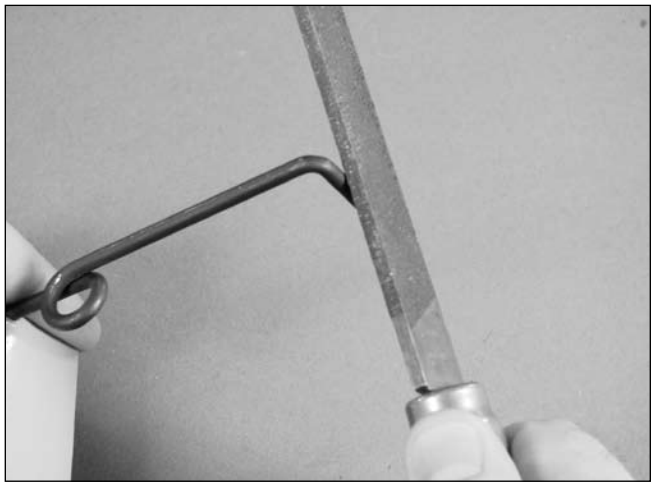
- Assembled engine nacelle (right and left)
- Main landing gear (right and left)
- Steering arm
- 3mm setscrew (8)
- 3mm washer (8)
- Servo
- Crimp (4)
- Tapered nose gear block
- 5/32 wheel collar (7)
- Nose gear mount
- 3mm nut (4)
- Pull-pull cable
- Nylon clevis (2)
- Nose gear
- Rigging coupler, Z-bend (2)
- Rigging coupler, threaded (2)
- Nose wheel, $2\,^1/_2$-inch (63mm)
- 3mm x 25mm machine screw (4)
- #4 x 1-inch sheet metal screw (8)
- Main wheel, $3\,^1/_4$-inch (82mm) (2)
- #2 x 3/8-inch sheet metal screw (8)

Required Tools and Adhesives

- Flat file
- Drill
- Crimping pliers
- Hex wrench: 1.5mm (included)
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 7/64-inch (3mm)
- Threadlock
- Felt-tipped pen
- Side cutters

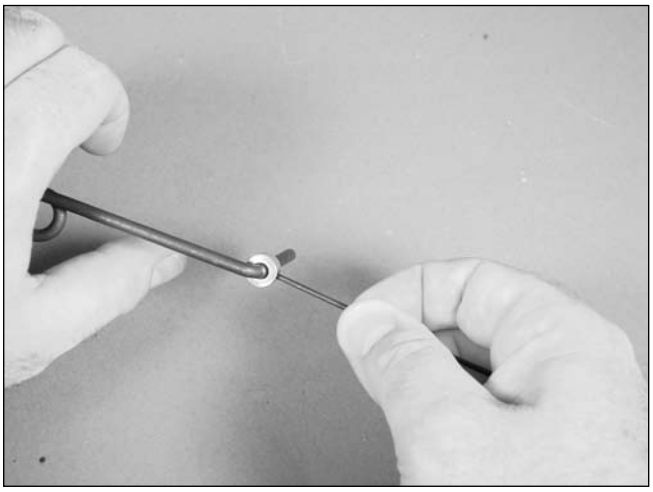
☐ ☐ Step 1

Use a file to create a flat area on the main and nose gear wires for the wheel collar setscrews. This helps in keeping them secure on the landing gear.



☐ ☐ Step 2

Attach the 5/32-inch wheel collar to the landing gear using a 3mm setscrew and the included 1.5mm hex wrench. Use threadlock on the setscrew to prevent it from vibrating loose.



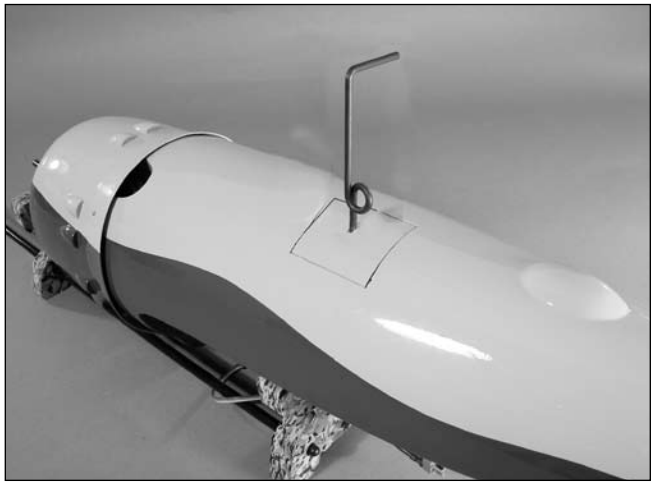
☐ ☐ Step 3

Slide the wheel onto the gear and secure it with a final wheel collar and setscrew.

Important: Use threadlock on any metal-to-metal fasteners.

☐ ☐ Step 4

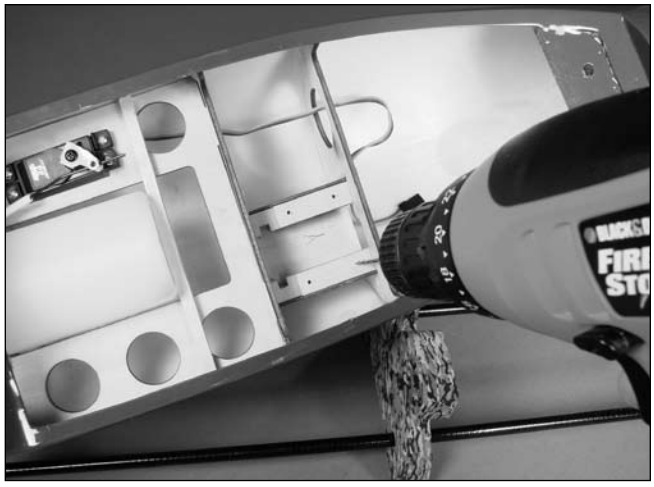
Slide the main gear into the engine nacelle.



Note: Wheel not shown for clarity.

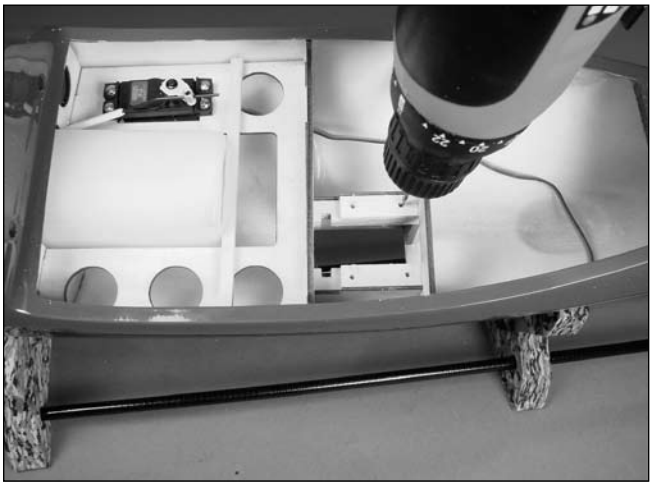
☐ ☐ Step 5

Use a drill and 5/64-inch (2mm) drill bit to drill four holes through the mounting rails and into the gear block. these holes are to be drilled 1/2-inch (13mm) and then $1\,^1/_2$-inch (38mm) from the front of the rear bulkhead. The holes are to be centered on the rails. By doing this you can later use the same holes to install the optional retracts.



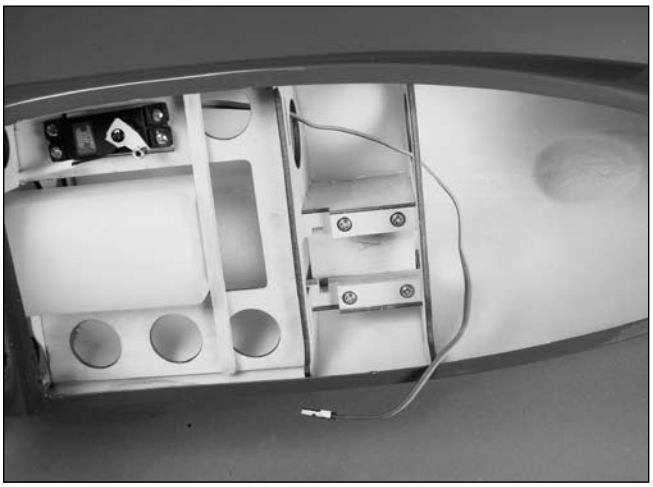
☐ ☐ Step 6

Enlarge the holes in the gear rails ONLY using a 7/64-inch (3mm) drill bit.



☐ ☐ Step 7

Secure the main gear in the engine nacelle using four #4 x 1-inch sheet metal screws.

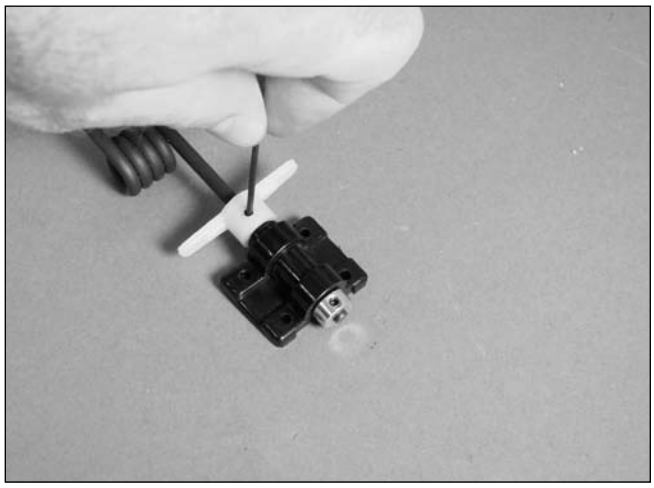


☐ Step 8

Repeat Steps 1 through 7 to install the remaining main gear in the engine nacelle.

☐ Step 9

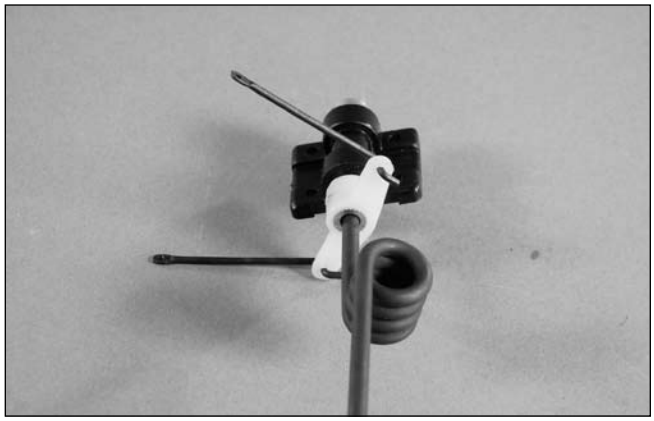
Slide the steering arm onto the nose gear wire. Next, slide the mount on the wire, then a wheel collar. The steering arm and wheel collar have setscrews that will tighten onto the flat areas that have been pre-ground on the nose gear wire.



Note: Make sure to use threadlock on the setscrews for the steering arm and wheel collar.

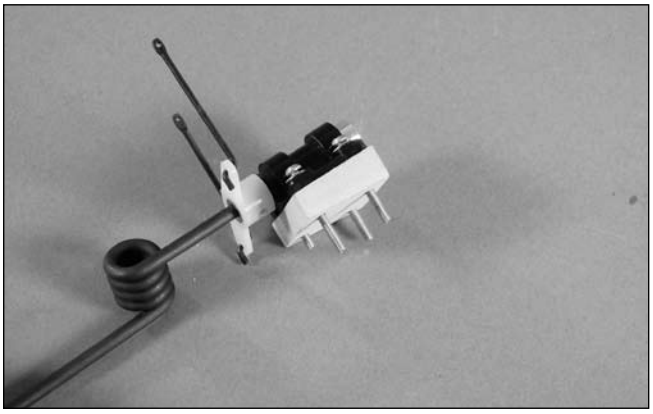
☐ Step 10

Install the rigging coupler in the steering arm as shown.



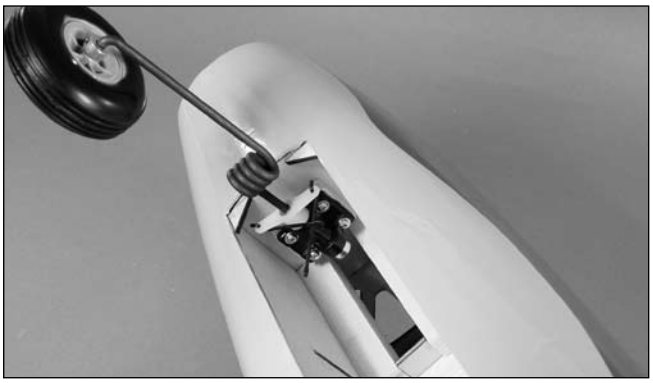
☐ Step 11

Prepare four 3mm x 25mm machine screws by sliding a 3mm washer on each screw. Slide the screws through the nose gear mount, then slide the tapered block onto the screws. The wider section of the block will be away from the steering arm. This tapered block creates the forward 105-degree rake of the nose gear.



☐ Step 12

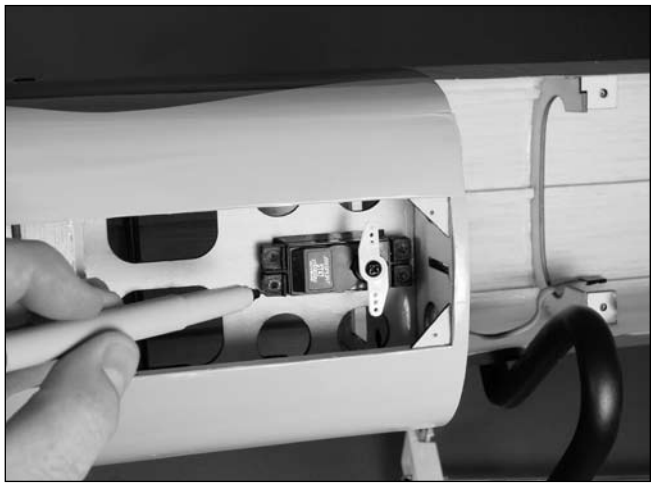
Position the nose gear assembly in the fuselage and use four 3mm washers and 3mm nuts to secure the nose gear in the fuselage.



Note: Use threadlock on all four of the 3mm nuts to prevent vibrations from loosening them.

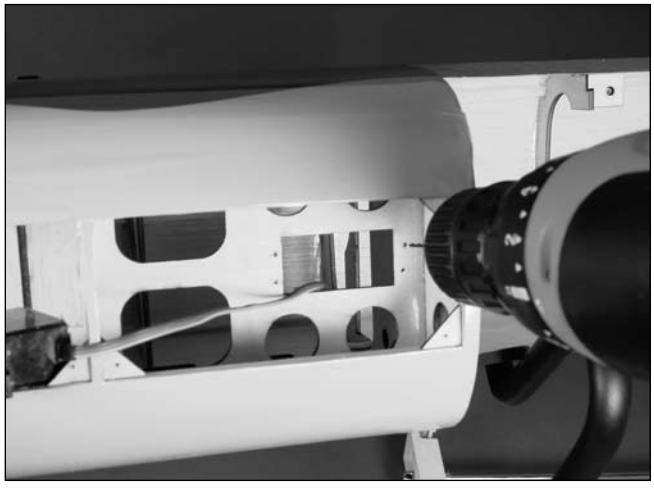
☐ Step 13

Remove the standard servo arm and attach a large 180-degree standard arm on the servo. Position the servo in the opening with the servo arm facing the rear of the fuselage. Mark the locations for the servo mounting screws using a felt-tipped pen.



☐ Step 14

Use a drill and 1/16-inch (1.5mm) drill bit to drill the locations for the servo mounting screws.



☐ Step 15

Apply a few drops of thin CA into each hole to harden the surrounding wood. You may need to run the drill bit back through the holes after applying the CA.

☐ Step 16

Use the servo hardware to secure the steering servo in the fuselage.

☐ Step 17

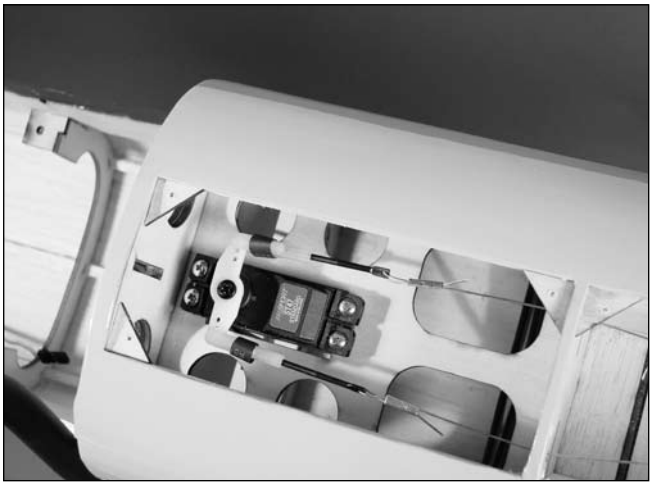
Connect the pull-pull cable to the steering arm using two crimps. Pass the cable through a crimp, through the fasteners then back through the crimp. Use crimping pliers to secure the crimps on the wire.

☐ Step 18

Center the nose gear and steering servo. Thread a clevis on the threaded rigging couplers and attach them to the steering servo arm. Make sure to cut a 1/4-inch (4mm) piece of heat shrink tubing for each of the clevises and slide them into position. Mark where the cable crosses the hole in the fastener.

☐ Step 19

Repeat the crimping process, aligning the marks made on the cable with the hole in the fastener. Cut any excess cable using side cutters.



☐ Step 20

Place the doors in position and drill a 1/16-inch (1.5mm) hole 1/8-inch (3mm) from the corners of the steering servo and nose gear doors. Remove doors and apply a few drops of thin CA into each hole of the doors and the mounting tabs in the fuselage to harden the surrounding wood.

☐ Step 21

Secure the doors over the steering servo and nose gear with eight #2 x 3/8-inch sheet metal screws at each corner of the doors.

Section 8: Retractable Landing Gear Installation

The following instructions will show you the installation of the optional Robart retractable landing gear.

Hangar 9 offers two types of optional of Robart retractable landing gear for the B-25 Mitchell.

HANB25 Includes the following parts:

- Robart tricycle retracts
- Retract valve
- Filler valve
- Quick disconnects
- Robostruts*
- Air Tubing
- "T" fittings
- Air Tank

*The Robostruts are factory cut to the correct length.

HANB25S Includes the following parts:

- Robart tricycle retracts
- Robostruts*

*The Robostruts are factory cut to the correct length.

In addition, you are required to supply:

- ROB164G Robart air pump to fill the air tank

Hardware needed to complete optional installation of Robart retracts

- 4-40 x 1-inch socket head bolts (12)
- 4-40 blind nuts (12)
- #4 washers (12)
- #10 washers for axle spacers (6)
- Material to fabricate the mount for the retract valve.
- 2-56 ball end (2)

Nose Gear Installation

☐ **Step 1**

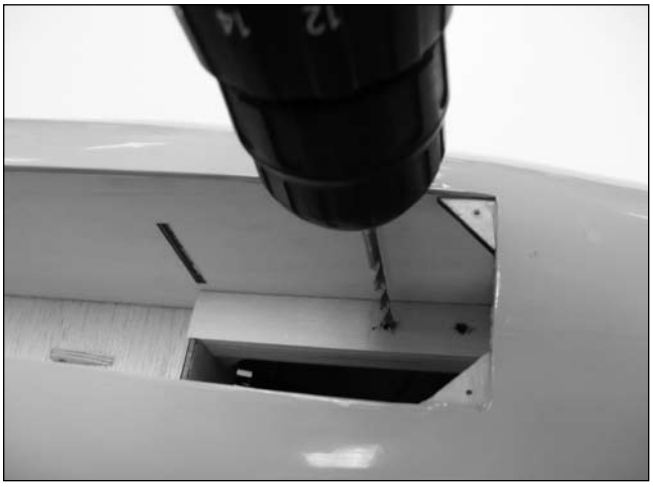
Drill two 1/8-inch (3mm) holes in the rear bulkhead in the nose gear wheel well to accept the air lines.

☐ **Step 2**

Set the nose gear unit onto the mounting rails with the retract placed up against the front firewall and mark the mounting hole locations.

☐ **Step 3**

Remove the retract unit from the mounting rails and drill a 9/64-inch (4mm) hole on each of the marks.

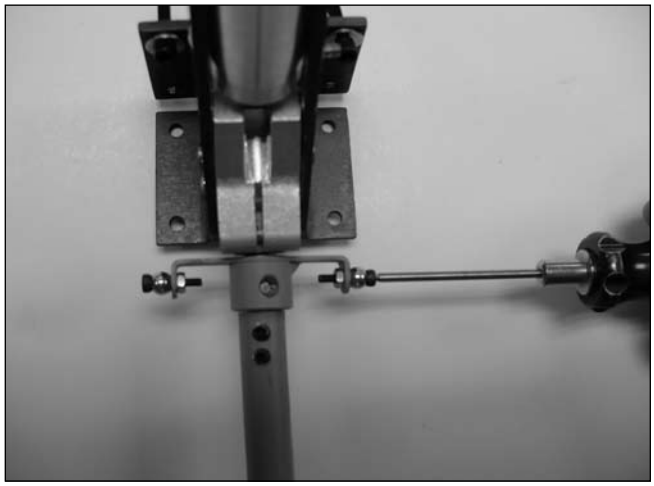


☐ Step 4

From the back side of the mounting rails, insert the four 4-40 blind nuts and use a 4-40 bolt with a washer to draw each blind nut into each one of the four holes you just drilled.

☐ Step 5

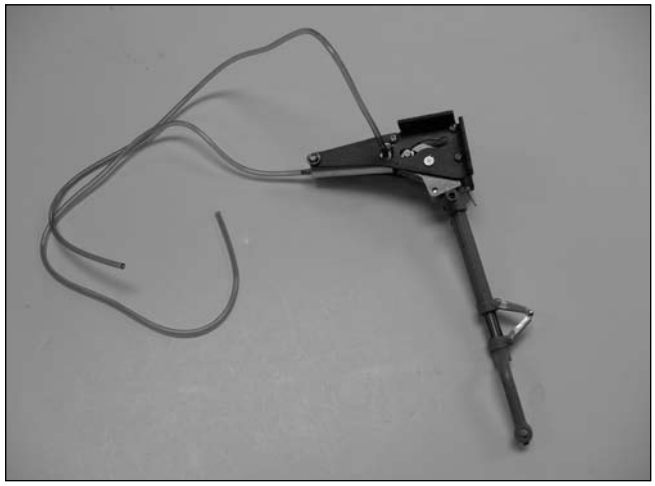
Install the recommended ball link studs onto the nose wheel steering arms. The pull-pull cables will be hooked up to these ball links in a later step.



Note: Be sure and use threadlock on all metal-to-metal fasteners.

☐ Step 6

Install 16 inches (406mm) of each color of air line onto each of the air cylinder inlets on the landing gear. Feed the two air lines through the two 1/8-inch (3mm) holes and into the radio compartment. These air lines will be hooked up later using the Robart air line diagram which we have included on page 73 of this manual)



Section 8: Retractable Landing Gear Installation

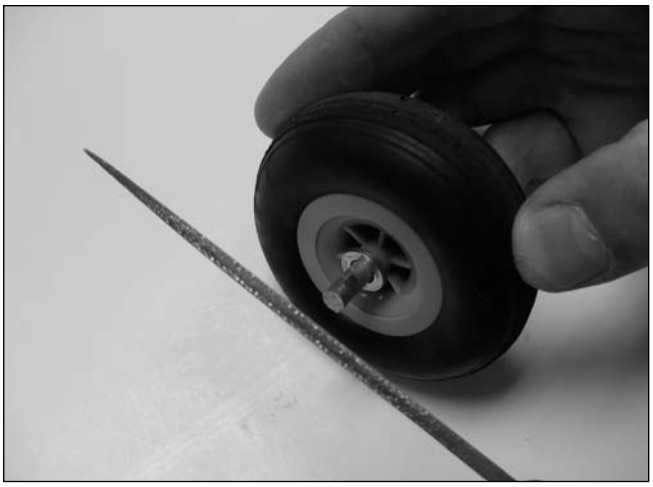
☐ Step 7

Set the nose gear retract onto the mounting rails. Place a # 4 washer onto each of the four 4-40 x 1-inch socket head bolts, then securely fasten the retract to the mounting rails with these four 4-40 x 1-inch bolts

☐ Step 8

Install the nose wheel onto a wheel axle and then install two #10 washers onto the axle before inserting the wheel and axle into the strut. The washers act as spacers to keep the wheel from rubbing against the strut leg. Temporarily tighten the setscrew and then cut off the excess axle using a rotary tool and cutoff wheel. File a flat area on the axle for the wheel strut setscrew and then install the wheel and axle to the nose wheel strut. We used a couple of washers between the wheel and the strut to keep the wheel from rubbing on the strut.

Important: Use threadlock on any metal-to-metal fasteners.

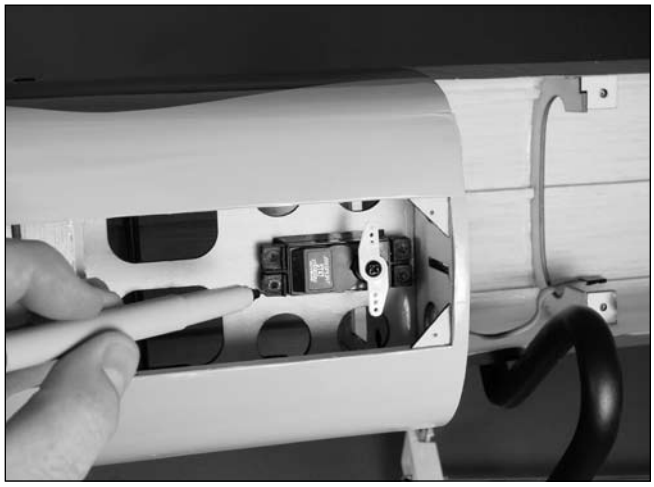


☐ Step 9

Cut two 12-inch (305mm) lengths of pull-pull wire for the steering. Connect the pull-pull cable to the steering arm using two crimps. Pass the cable through a crimp, through the fasteners then back through the crimp. Use crimping pliers to secure the crimps on the wire.

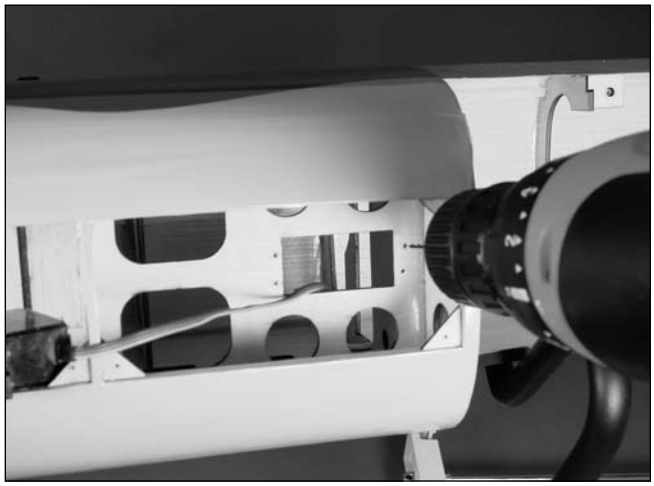
☐ Step 10

Remove the standard servo arm and attach a large 180-degree standard arm on the servo. Position the servo in the opening with the servo arm facing the rear of the fuselage. Mark the locations for the servo mounting screws using a felt-tipped pen.



☐ Step 11

Use a drill and 1/16-inch (1.5mm) drill bit to drill the locations for the servo mounting screws.



☐ Step 12

Apply a few drops of thin CA into each hole to harden the surrounding wood. You may need to run the drill bit back through the holes after applying the CA.

☐ Step 13

Use the servo hardware that came with your servo to secure the steering servo in the fuselage.

☐ Step 14

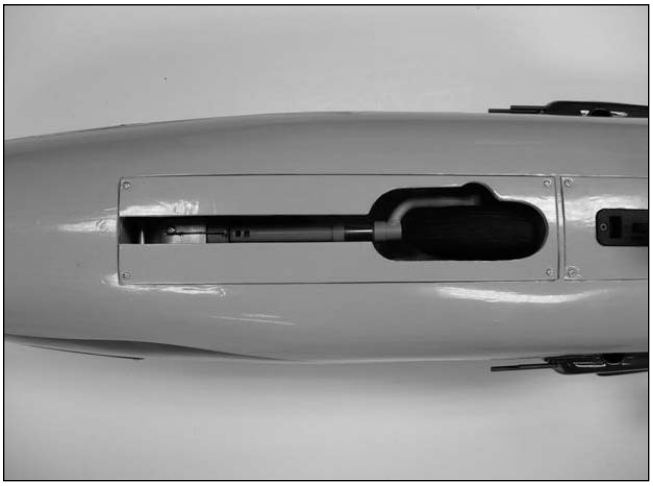
Center the nose gear and steering servo. Thread a clevis on the threaded rigging couplers and attach them to the steering servo arm. Make sure to cut a 1/4-inch (4mm) piece of heat shrink tubing for each of the clevises and slide them into position. Mark where the cable crosses the hole in the fastener.

☐ Step 15

Repeat the crimping process, aligning the marks made on the cable with the hole in the fastener. Cut any excess cable using side cutters.

☐ Step 16

Use a rotary tool and sanding drum to remove the area of the nose gear cover to allow the nose wheel strut and wheel to pass through.

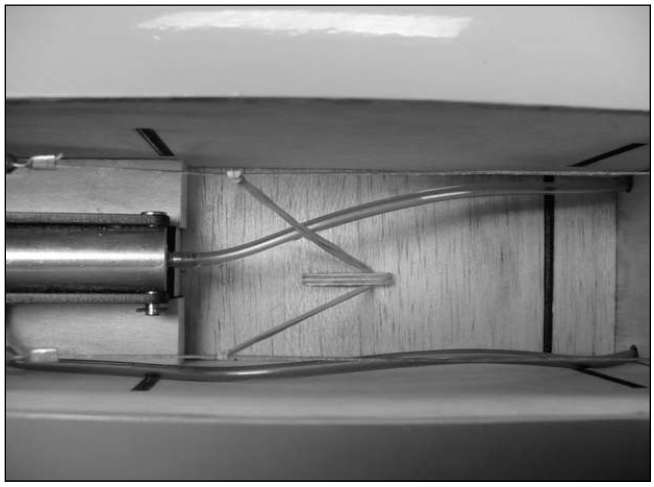


Note: Use the same color air line for up and then use the same other color for down on each of the three retract units. This will allow you to follow the included air line diagram from Robart.

Note: Use threadlock on all screws to keep them from coming loose during flight.

☐ Step 17

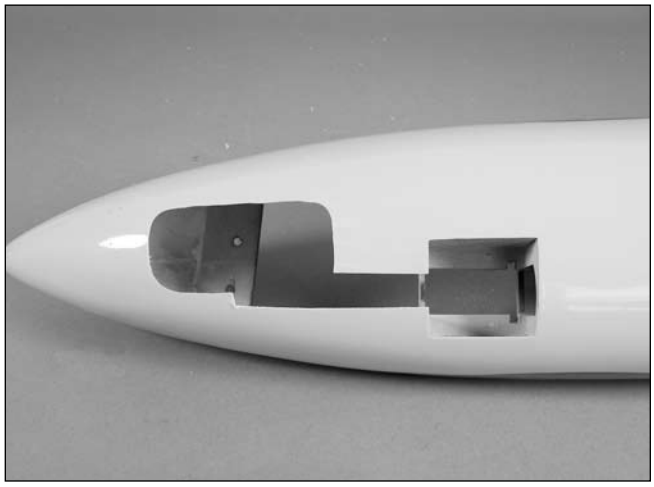
We installed a rubber band to help hold the pull/pull cables clear of the nose wheel and strut when it is retracted/extended. Make a small plywood bracket with a small opening in the end for the rubber band and glue the bracket to the floor of the retract wheel well.



Main Gear Installation

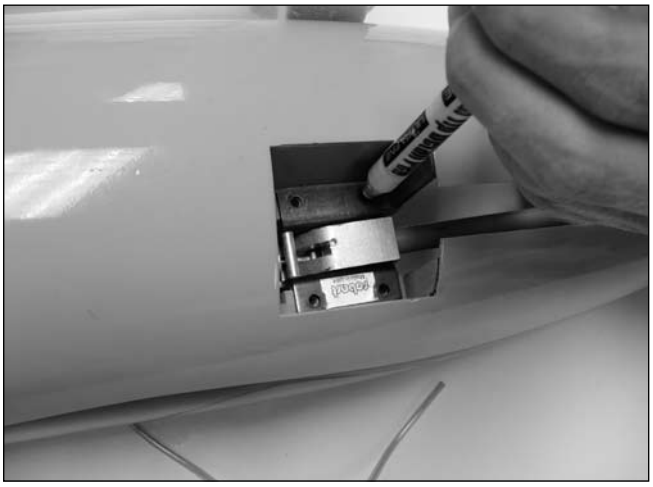
☐ ☐ Step 18

The nacelles have an outline on them showing the area that needs to be removed to allow the struts to retract up into the nacelle. Use a rotary tool and a sanding drum to remove this area to allow the retract strut and wheel to pass through.



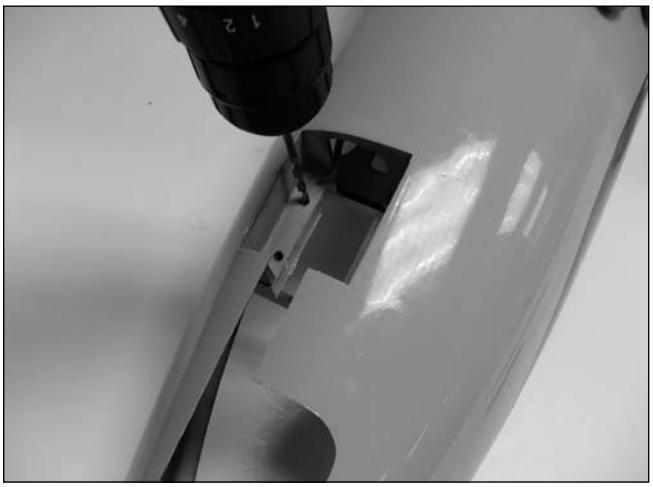
☐ ☐ Step 19

Set the main gear onto the mounting rails and mark the mounting hole locations.



☐ ☐ Step 20

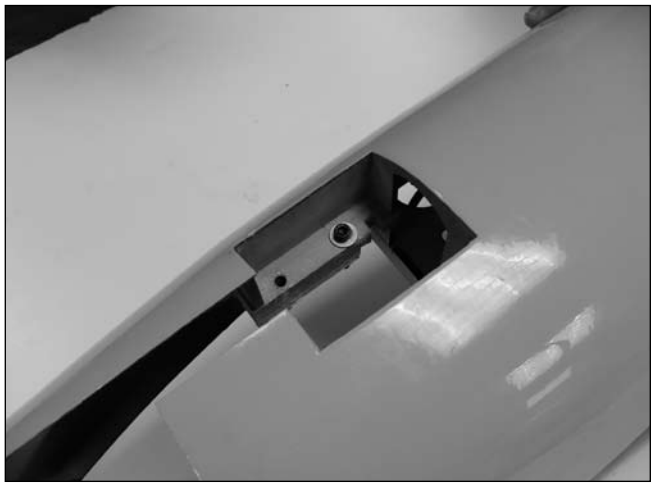
Remove the retract unit from the mounting rails and drill a 9/64-inch (4mm) hole on each of the marks.



Section 8: Retractable Landing Gear Installation

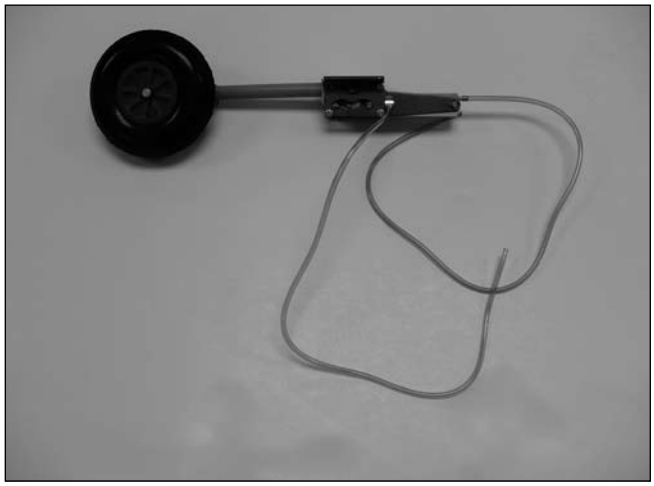
☐ ☐ Step 21

From the back side of the mounting rails, insert the four 4-40 blind nuts and use a 4-40 bolt with a washer to draw each blind nut into each one of the four holes just drilled.



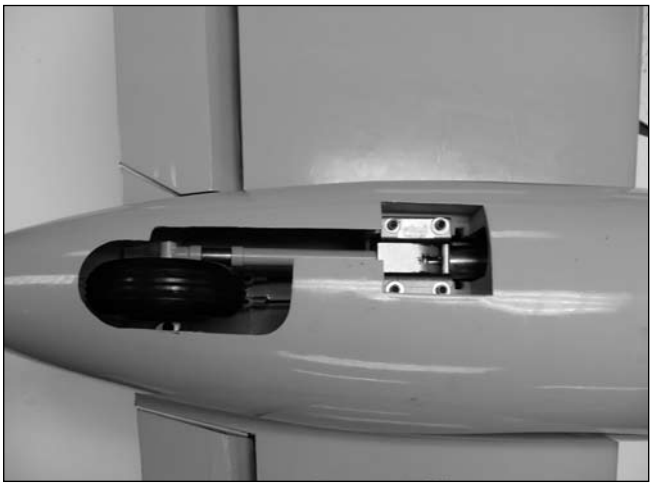
☐ ☐ Step 22

Install 20-inch (508mm) of each color of air line onto each air cylinder inlet on the main landing gear. These air lines will be pulled later through the same holes in the wing that the throttle servo leads are pulled through. Be certain to follow the included Robart air line diagram for the correct hook-up of the colored air lines.



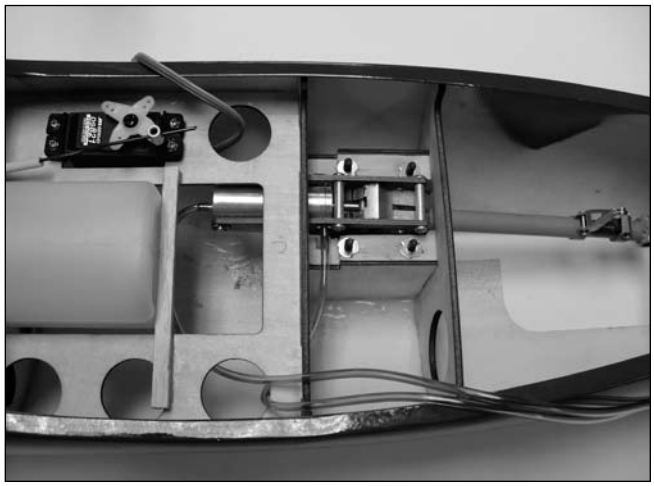
☐ ☐ Step 23

Set the main gear retract onto the mounting rails. Place a # 4 washer onto each of the four 4-40 x 1-inch socket head bolts, then securely fasten the retract to the mounting rails with these four 4-40 x 1-inch bolts.



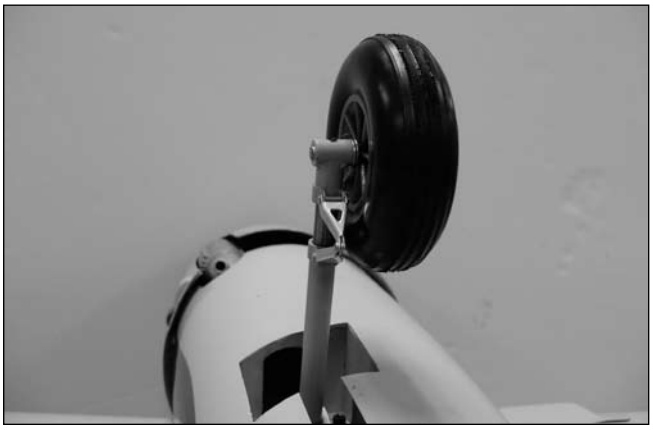
☐ ☐ Step 24

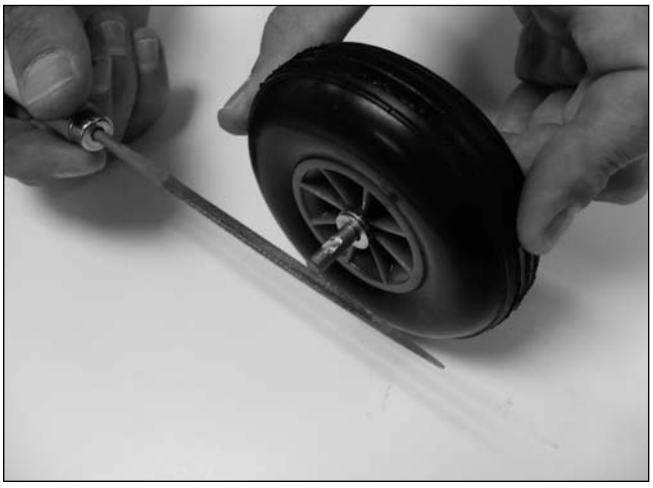
Route the air lines from the retract unit through the nacelle loosely. If you are installing the retracts and the wing extensions are already in place, then you will need to use a string and a weight to fish the air lines through the wing. Both sets of these air lines will be hooked up later using the Robart air installation diagram which we have included on page 73 of this manual)



☐ ☐ Step 25

Install the main wheel onto a wheel axle and then install two #10 washers onto the axle before inserting the wheel and axle into the strut. The washers act as spacers to keep the wheel from rubbing against the strut leg. Temporarily tighten the setscrew and then cut off the excess axle using a rotary tool and cutoff wheel. File a flat area on the axle for the wheel strut setscrew and then install the wheel and axle to the main wheel strut.





☐ Step 26

Repeat Steps 17 through 25 for the remaining main gear.

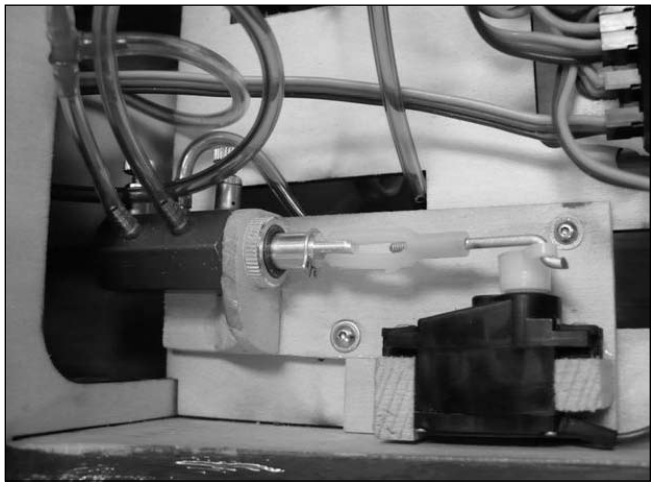
> **Note**: Use threadlock on all screws to keep them from coming loose during flight.

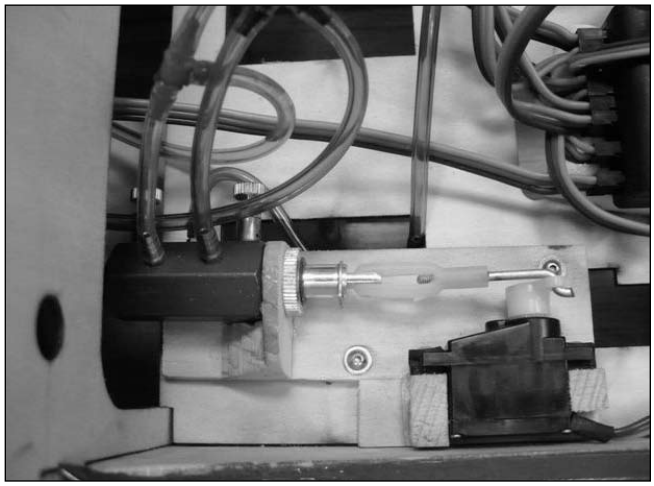
Section 9: Retract Valve and Hardware

All pushrod hardware and mounting plates are supplied by the modeler.

☐ Step 1

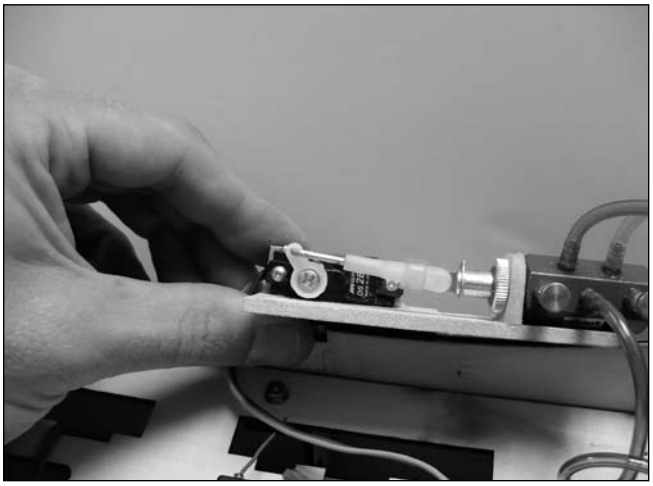
You will need to fabricate a plywood plate to mount the servo and the retract valve on. We made our mount from lightweight plywood and a small piece of triangle stock.





☐ Step 2

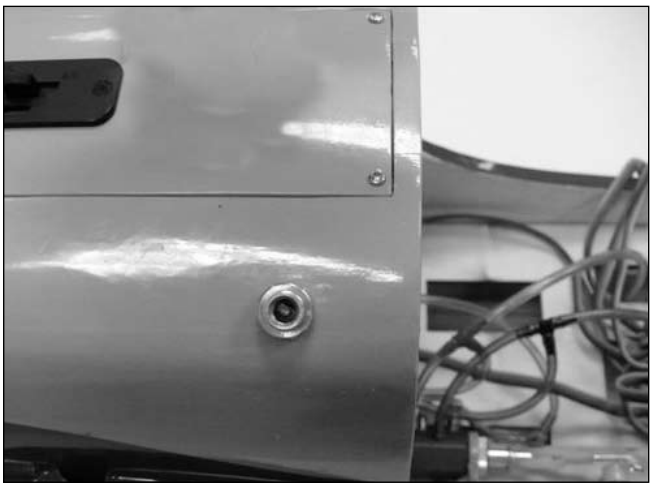
We use a plastic 2-56 clevis to attach a 2-56 pushrod to the retract valve and then make a "Z" bend on the other end of the pushrod where it attaches to the servo arm. The pushrod should be placed on the servo arm a distance of approximately 1/2-inch (13mm) out from center of the servo arm.



Note: Use travel volume on your radio to allow a maximum 1/4-inch (6mm) of travel on the pushrod. Be sure to not over-throw the pushrod.

☐ Step 3

Mount the air fill valve on the fuselage so that you have easy access to make the connection. The filler valve will be less noticeable if mounted towards the bottom of the fuselage. We chose to mount the valve just forward of the leading edge of the wing next to the steering servo access hatch.



☐ Step 4

Install the air tank in the pre-cut position below the radio tray. Follow the installation diagram instructions from Robart to hook up the remaining air lines. We have included enough extra air tubing with the optional air kit to allow for ease of connection. Use approximately 6 inches of air line between all "T' fittings. Add a few drops of medium CA at the arrow to secure the tank in place.

☐ Step 5

You will need to make a decision at this time about transporting the model. If you plan on taking the two wings halves apart for transport, then you will need to purchase two additional quick disconnects (1 pkg.) and place one quick disconnect in each of the main retract lines just before the "T" fittings used to connect the main retract lines together. If you will be leaving the wing together, then you will only need to install the two included quick disconnects inline so the wing can be removed for transport.

☐ Step 6

Pump the retracts up to approximately 100 PSI so you can test how long the gear will hold air. Both the up and down positions must not leak, but obviously the most critical is when the gear are retracted for flight. The gear should maintain pressure and only lose a few PSI (less than 10 PSI) in 30 minutes. If the retracts will not hold air this long, then please refer to the Robart troubleshooting instructions on our web-site at the following URL: http://www.hangar-9.com/Content/RT.pdf

Section 10: Engine Nacelle Installation

Required Parts

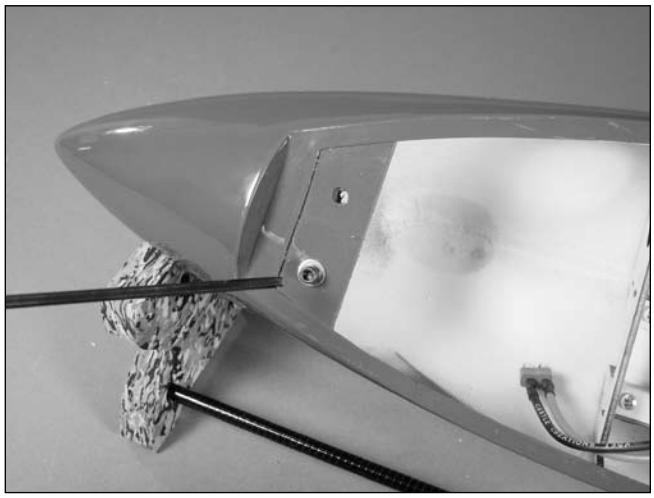
- Assembled wing panel (right and left)
- Assembled engine nacelle (right and left)
- 8-32 blind nut (4)
- #8 washer (4)
- Nacelle support plate (2)
- Nacelle cover (right and left)
- 8-32 x 1-inch socket head screw (4)
- $1\,{}^{1}/_{8}$ x 1/4-inch (28mm x 4mm) dowel (4)

Required Tools and Adhesives

- 30-minute epoxy
- Hobby knife
- Masking tape
- Ball driver: 9/64-inch

☐ ☐ Step 1

Use a short 8-32 socket head bolt and 9/64-inch ball driver to draw the two blind nuts up into the engine nacelle mounting plate.



☐ ☐ Step 2

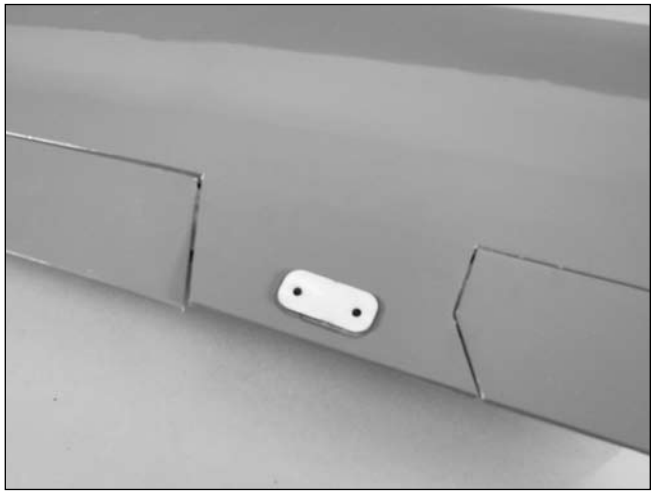
Place the nacelle support plate over the holes in the trailing edge of the wing and trace the outline of the plate onto the wing.

☐ ☐ Step 3

Use a sharp hobby knife to remove the covering where the plate will be secured to the wing.

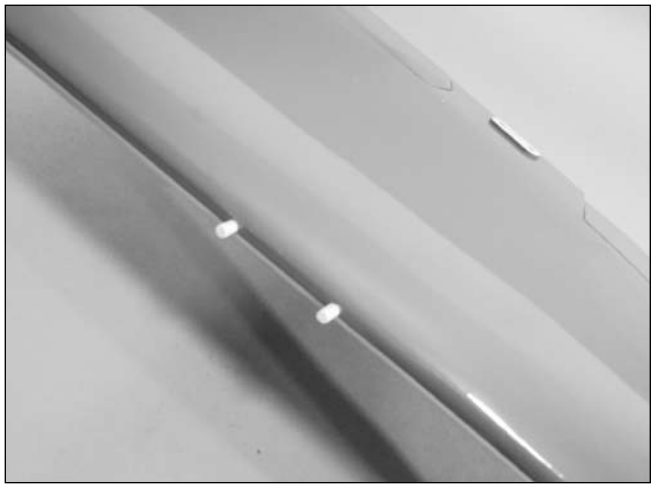
☐ ☐ Step 4

Use 30-minute epoxy to glue the plate on the wing.



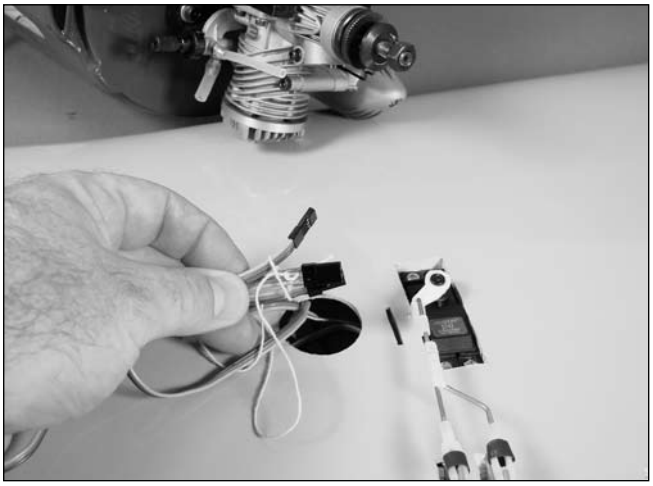
☐ ☐ Step 5

Use 30-minute epoxy to glue the two $1\frac{1}{8}$ x 1/4-inch (28mm x 4mm) dowels into the hole in the leading edge of the wing for the engine nacelle.



☐ ☐ Step 6

Secure a 12-inch (305mm) servo extension to the throttle (or speed control) lead. Tie the string around the end of the extension as shown.



Note: If you have installed retracts, you will need to tie the string to the air lines as well in this step.

☐ ☐ Step 7

Carefully pull the servo extensions through the wing using the string. The engine nacelle will need to be close to the wing for the extension from the throttle servo (speed control) to reach the opening in the wing. Once the extensions have been pulled through the wing, use tape to keep them from falling back into the wing.

Section 10: Engine Nacelle Installation

☐ ☐ Step 8

Attach the engine nacelle to the wing using two 8-32 x 1-inch socket head bolts and two #8 washers.

Note: Use threadlock on all screws to keep them from coming loose during flight.

☐ ☐ Step 9

Position the nacelle top cover on the wing, aligning it with the front and rear of the engine nacelle. Trace the outline of the nacelle top cover on the wing with a felt-tipped pen.

☐ ☐ Step 10

Use a sharp hobby knife to remove a 1/8-inch (3mm) wide strip to the inside of the line drawn in the previous step.

☐ ☐ Step 11

Use 30-minute epoxy to glue the nacelle top cover to the wing. Use tape to hold the nacelle cover while the epoxy cures.

☐ ☐ Step 12

Repeat Steps 1 through 11 to install the remaining engine nacelle and nacelle top cover on the wing.

Section 11: Wing Installation

Required Parts

- Assembled wing panel (right and left)
- Wing tube
- Wing bolt plate
- 1/4-inch washer (2)
- Battery tray (electric only)
- Hook and loop strap (electrtic only)
- 1/4-20 x $1\frac{1}{2}$-inch socket head bolt (2)

Required Tools and Adhesives

- Felt-tipped pen
- Drill
- Ball driver: 3/16-inch
- Drill bit: 1/4-inch (6mm)

☐ Step 1

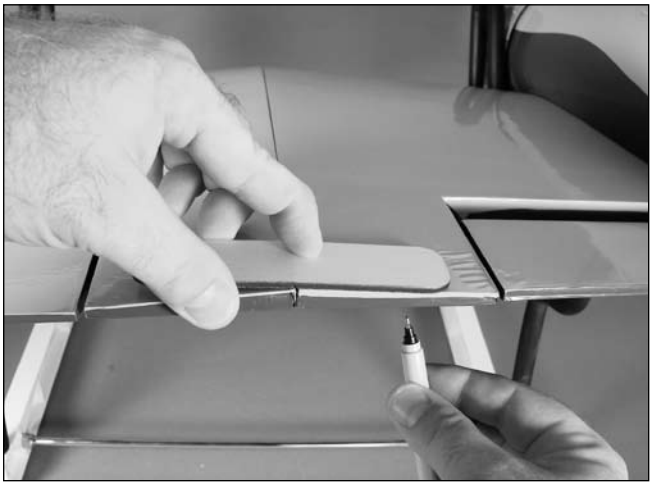
Slide the wing tube into one of the wing panels.

☐ Step 2

Slide the remaining panel onto the wing tube. The panels should fit tight against each other.

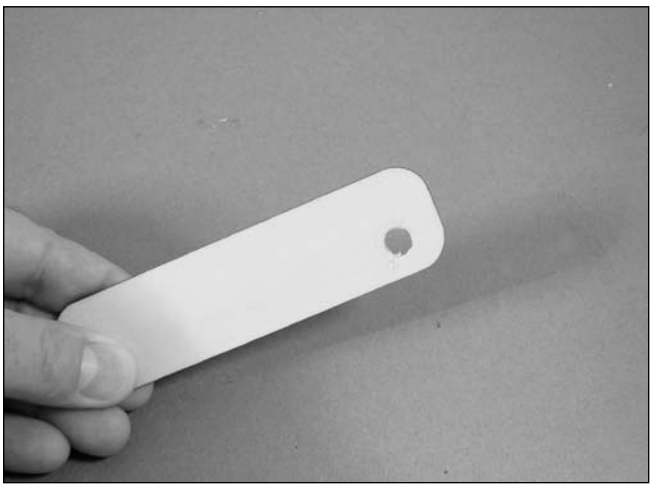
☐ Step 3

Hold the wing bolt plate centered on the wing center section. Use a felt-tipped pen to mark the location for one of the holes in the plate.



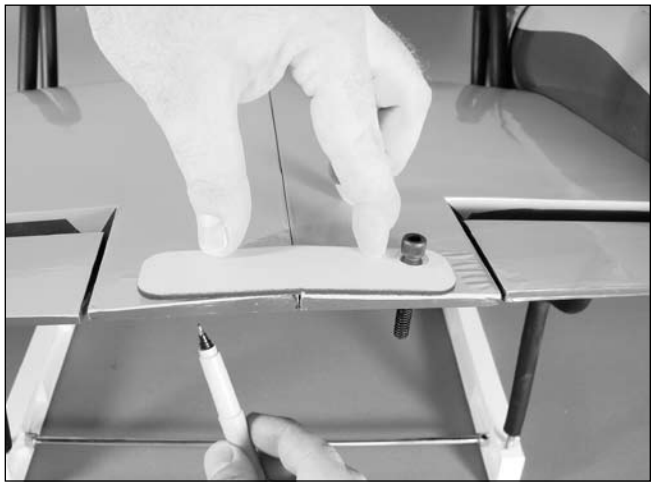
☐ Step 4

Use a 1/4-inch (6mm) drill bit to make a hole in the plate. Position the plate back on the wing.



☐ Step 5

Use a wing bolt to keep the plate aligned at the first hole and mark the location for the second hole on the plate.



☐ Step 6

Attach the wing using the wing bolt plate and two 1/4-20 x 1 1/2-inch socket head bolts and two 1/4-inch washers. Use a 3/16-inch ball driver to tighten the wing bolts.

Note: The Step 7 is for the EP version only. Skip to Step 8 when building the glow powered version.

☐ Step 7

When building an EP version of your B-25, attach the batteries to the battery tray with hook and loop straps. The tray keys into the former at the front, and is secured at the rear using the wing bolts, with the wing bolt plate between the wing and plate.

☐ Step 8

Fasten the belly hatch in position.

Section 12: Rudder and Servo Installation

Required Parts

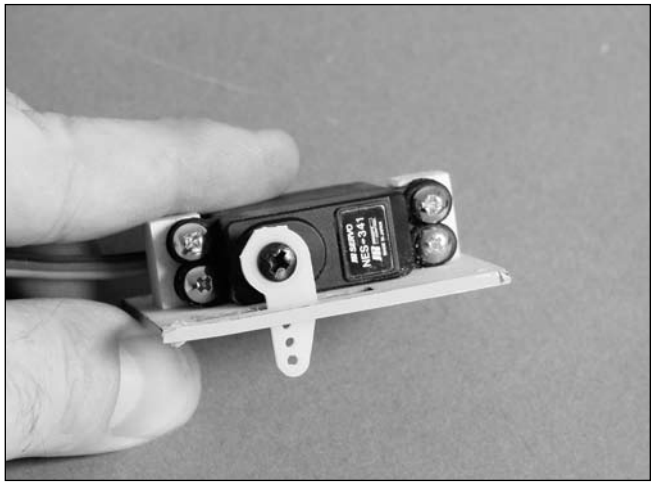
- Stabilizer
- Pushrod connector (2)
- Servo w/hardware (2)
- Rudder (right and left)
- Nylon clevis (2)
- Control horn (2)
- Rudder linkage, 2-inch (51mm) (2)
- 2-56 x 7/8-inch machine screw (6)
- #2 x 3/8-inch sheet metal screw (8)

Required Tools and Adhesives

- Drill
- Phillips screwdriver
- Hobby knife
- Pliers
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (2mm)
- Thin CA
- Long servo arm
- Felt-tipped pen

☐ ☐ Step 1

Mounting the rudder servo follows the same procedure as mounting the aileron servo (Section 2: Aileron Servo Installation, Steps 1 through 7.) Use a 180 degree servo arm and remove the excess arm using side cutters. Simply follow those steps to mount the rudder servo to the rudder servo cover.

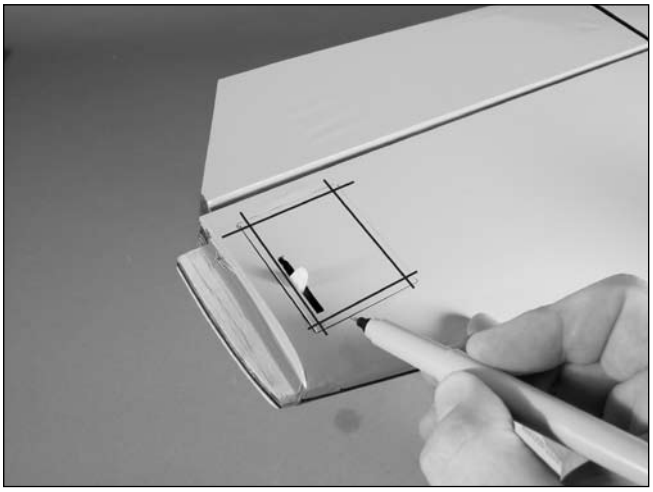


☐ ☐ Step 2

Route the servo lead to the nearest hole in the center of the stabilizer using the installed string. Position the cover so the servo arm is toward the tip of the stabilizer.

☐ ☐ Step 3

Use a drill and 1/16-inch (1.5mm) drill bit to drill four holes, approximately 1/8-inch (3mm) from the corners of the servo cover.



☐ ☐ Step 4

Apply a few drops of thin CA to each of the holes to harden the surrounding wood.

Section 12: Rudder and Servo Installation

☐ ☐ Step 5

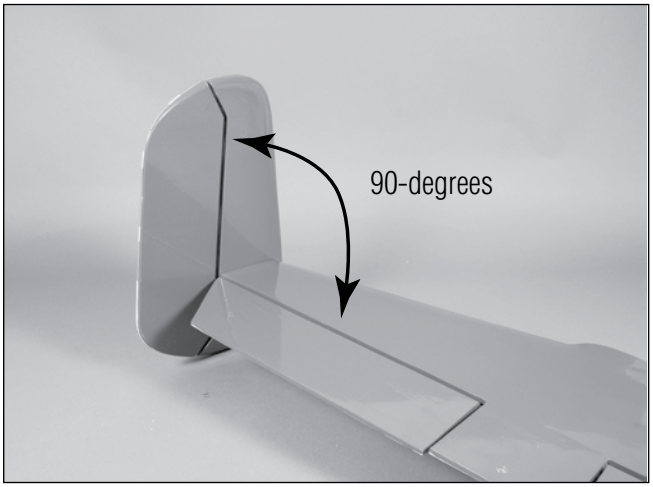
Mount the servo cover using four #2 x 3/8-inch sheet metal screws.

☐ ☐ Step 6

Use a sharp hobby knife to remove the covering from the fin where the tab from the stabilizer will be inserted.

☐ ☐ Step 7

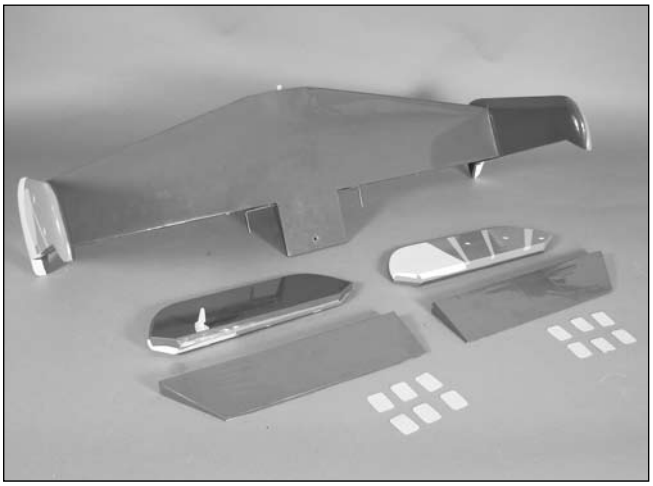
Use 30-minute epoxy to attach the fin to the stabilizer.



Note: Make sure the vertical fins remain in alignment while the epoxy cures.

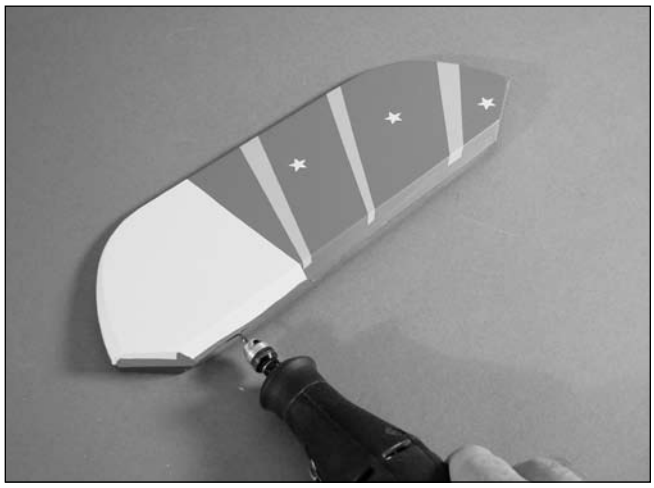
☐ ☐ Step 8

Remove the elevators and rudders from the stabilizer and fins and set aside the CA hinges.



☐ ☐ Step 9

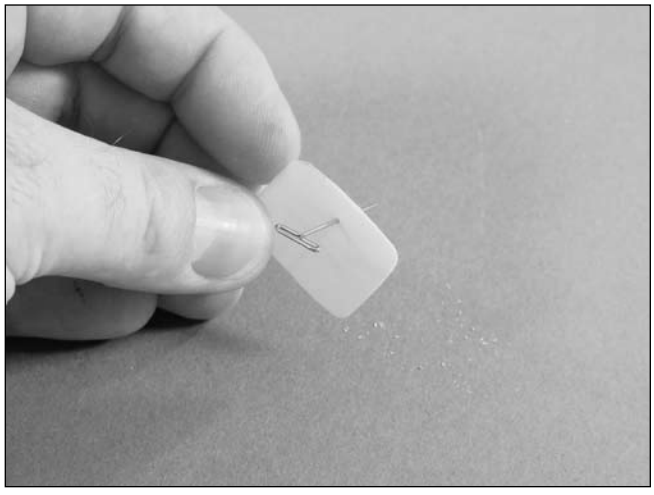
Use a rotary tool and 1/16-inch (1.5mm) drill bit to drill a 1/2-inch (12mm) deep hole in the center of each hinge slot for the rudders and fins. This provides a tunnel allowing the glue used to secure the hinges to fully penetrate the hinge.



Note: Drill the holes in the hinge slots for the elevators and stabilizer at this time as well.

☐ ☐ Step 10

Place a T-pin in the center of each of the twelve hinges.

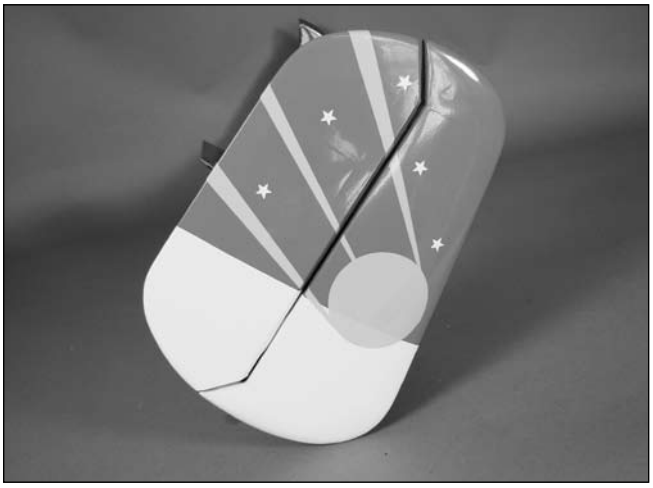


☐ ☐ Step 11

Slide the hinges back into the rudder. The T-pin will keep the hinge centered evenly in the rudder and fin when the rudder is installed.

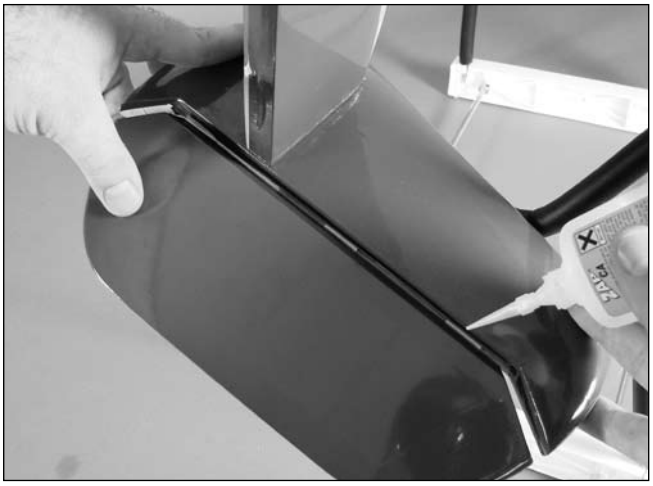
☐ ☐ Step 12

Slide the rudder into position on the fin. Make sure the rudder can move without binding against the fin at the top and bottom.



☐ ☐ Step 13

Remove the T-pins from the hinge and push the rudder tight against the fin. Flex the rudder and apply enough thin CA to fully penetrate the hinge. Apply CA to both sides of the hinge.

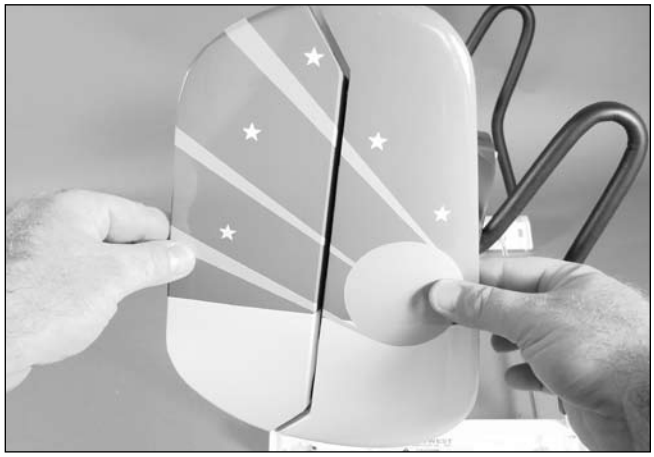


Important: Do not use accelerator when hinging. The CA must be allowed to soak into the hinge for the best possible bond between the hinge and surrounding wood.

Section 12: Rudder and Servo Installation

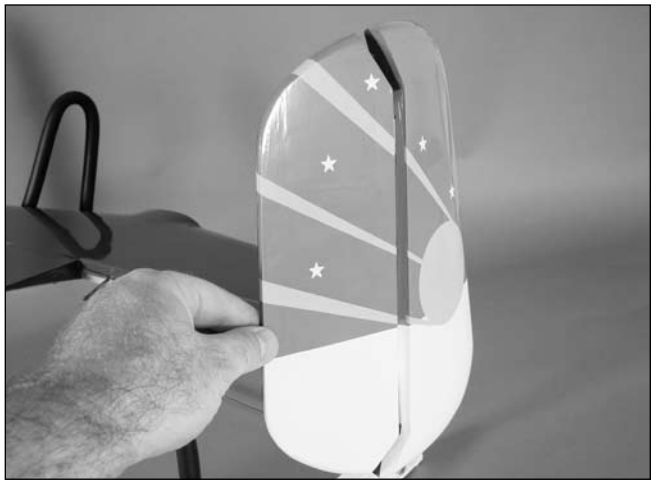
☐ ☐ Step 14

After the CA has fully cured, gently pull on the rudder and fin to make sure the hinges are secure. If not, re-glue the hinges.



☐ ☐ Step 15

To break in the hinges, you will need to flex the rudder back and forth a number of times.

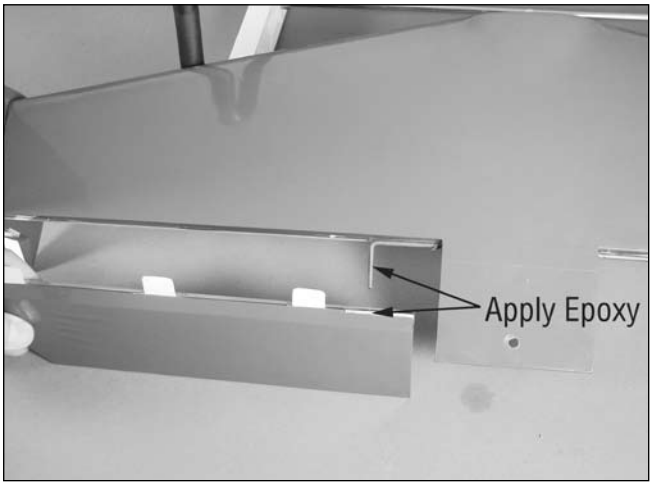


☐ ☐ Step 16

Use medium grit sandpaper to sand the evevator torque rods. Use rubbing alcohol and a paper towel to remove any dirt and debris from the torque rod. This will aid in strengthening the bond between the elevator, torque rod and epoxy.

☐ ☐ Step 17

Hinging the elevator follows the same procedure as the rudder, except you will need to apply 30-minute epoxy to the torque rods that enter the elevator.

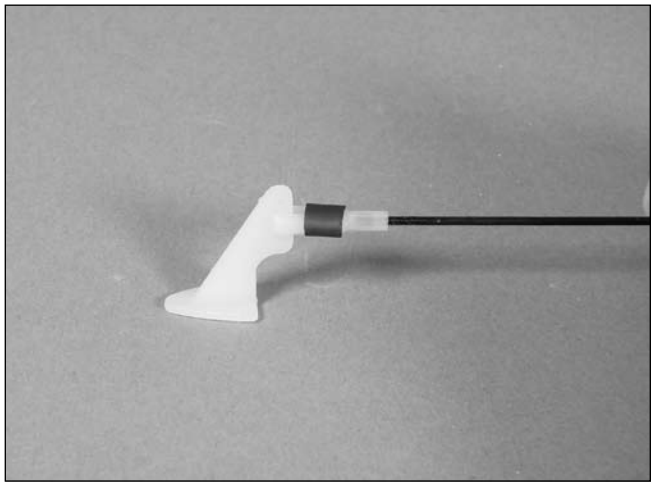


☐ Step 18

Repeat Steps 1 through 17 for the remaining rudder and elevator.

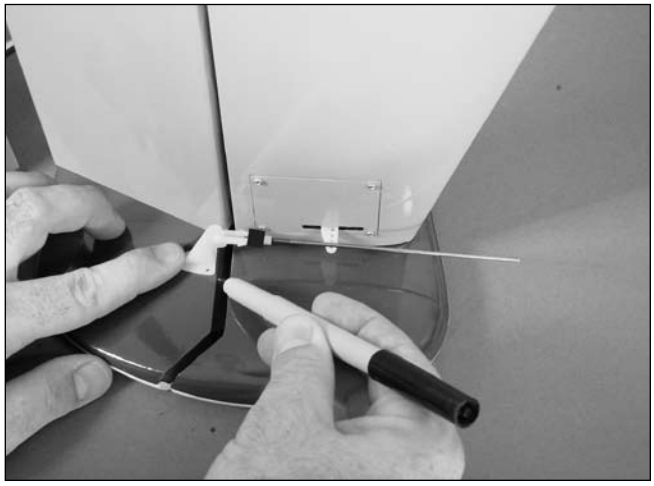
☐ ☐ Step 19

Remove the backplate from a control horn. Thread a clevis onto the 2-inch (51mm) rudder pushrod and attach the clevis to the control horn. Make sure to cut a 1/4-inch (4mm) piece of tubing to slide onto the clevis before attaching it to the control horn.



☐ ☐ Step 20

Position the control horn on the fin so it won't interfere with the elevator, and so it is in alignment with the rudder servo arm. Mark the location for the three mounting screws on the rudder.



☐ ☐ Step 21

Drill the three holes for the control horn mounting screw and harden the surrounding wood with thin CA. Mount the control horn using three 2-56 x 7/8-inch machine screws and the control horn backplate. Mark the pushrod where it crosses the outer hole of the rudder servo arm using a felt-tipped pen.

☐ ☐ Step 22

Bend the pushrod 90 degrees at the mark and secure it to the rudder servo arm. You will need to cut the pushrod wire using side cutters so it will not interfere with the rudder when operated.

☐ ☐ Step 23

Repeat Steps 19 through 21 to install the remaining rudder and rudder servo.

Section 13: Tail Section Installation

Required Parts

- Tail assembly
- Clevis1
- Servo w/hardware
- 8-32 blind nut
- 8-32 x 1-inch socket head bolt
- 24-inch (610mm) servo extension
- $1\,^{1}/_{8}$ x 1/4-inch (28mm x 4mm) dowel
- Elevator pushrod wire, 36-inch (915mm)
- Pushrod connector
- Y-harness
- #8 washer

Required Tools and Adhesives

- Drill
- 30-minute epoxy
- Hex driver: 9/64-inch
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (2mm)
- Thin CA

☐ Step 1

Use 30-minute epoxy to glue the $1\,^{1}/_{8}$ x 1/4-inch (28mm x 4mm) dowel into the hole in the leading edge of the stabilizer.

☐ Step 2

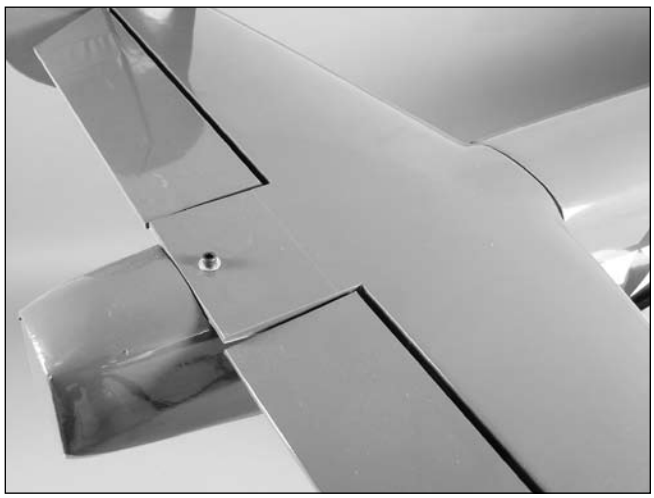
Use a short 8-32 socket head bolt, 9/64-inch hex driver and washer to draw the blind nut into the fuselage as shown.

☐ Step 3

Connect the Y-harness and 24-inch (610mm) servo extension to the rudder servos and pass them into the radio compartment. Make sure to secure all connections so they will not become unplugged inside the fuselage. Cut a 1/4-inch (4mm) piece of heat shrink tubing and slide it onto a clevis. Thread the clevis onto the elevator pushrod wire and attach the clevis to the elevator control horn. The pushrod then goes into the pushrod tube pre-installed in the fuselage.

☐ Step 4

Secure the stabilizer using a 9/64-inch hex driver, 8-32 x 1-inch socket head screw and #8 washer.

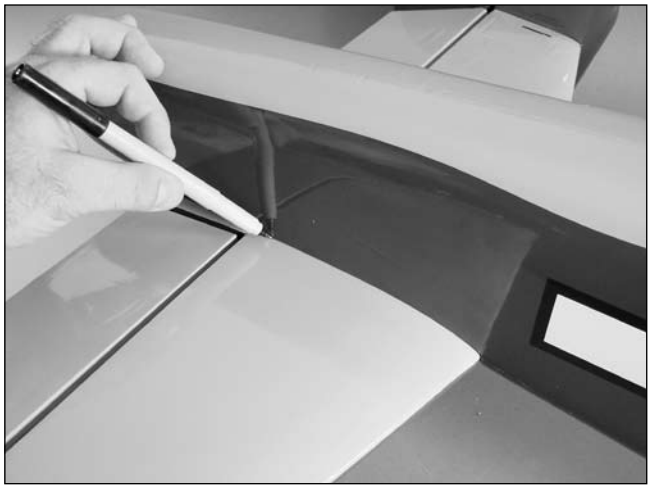


Note: You must use threadlock on the bolt holding the stabilizer to the fuselage. It must be secure so it will not vibrate loose in flight.

Important: Steps 5 through 7 cover how to use epoxy to glue the stabilizer to the fuselage. Using epoxy to glue the stabilizer is optional but recommended if you will not have a need to remove the stabilizer for transportation.

☐ Step 5

Use a felt-tipped pen to trace the outline of the fuselage onto the stabilizer.



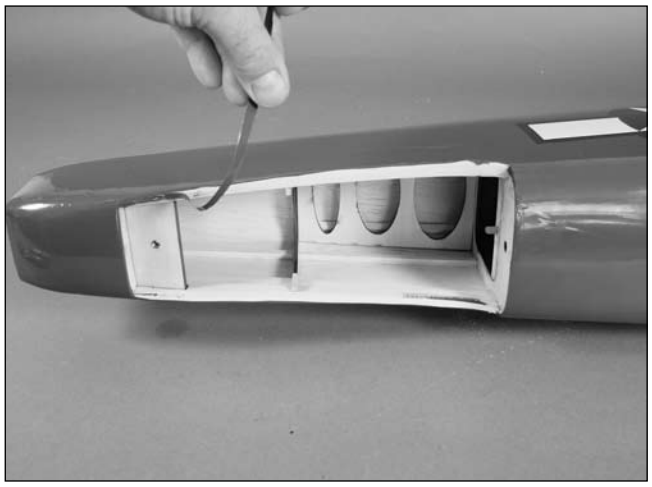
☐ Step 6

Use a hobby knife with a new #11 blade to remove a 3/8-inch (10mm) wide section of covering inside the lines drawn in the previous step. Use care not to cut into the underlying wood of the stabilizer.

Note: You can also use a soldering iron or hot knife to help in preventing cutting into the underlying wood and weakening the stabilizer.

☐ Step 7

Remove the covering from the stabilizer saddle on the fuselage.



Section 13: Tail Section Installation

☐ Step 8

Mix up 1/2-ounce (15Ml) of 30-minute epoxy. Apply the epoxy to the exposed wood of the stabilizer. The stabilizer should then be bolted into place. Refer to Step 4 for details Use paper towels and rubbing alcohol to remove any excess epoxy from the fuselage and stabilizer. Allow the epoxy to fully cure before proceeding.

☐ Step 9

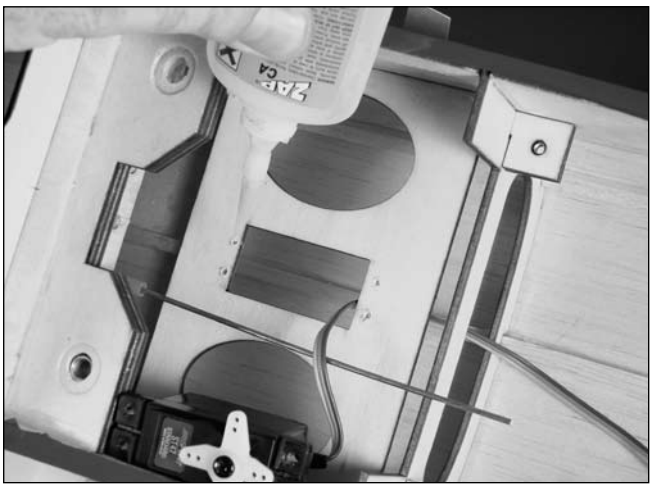
Position the servo in the opening with the servo arm facing the front of the fuselage. Mark the locations for the servo mounting screws using a felt-tipped pen.

☐ Step 10

Use a drill and 1/16-inch (1.5mm) drill bit to drill the locations for the servo mounting screws.

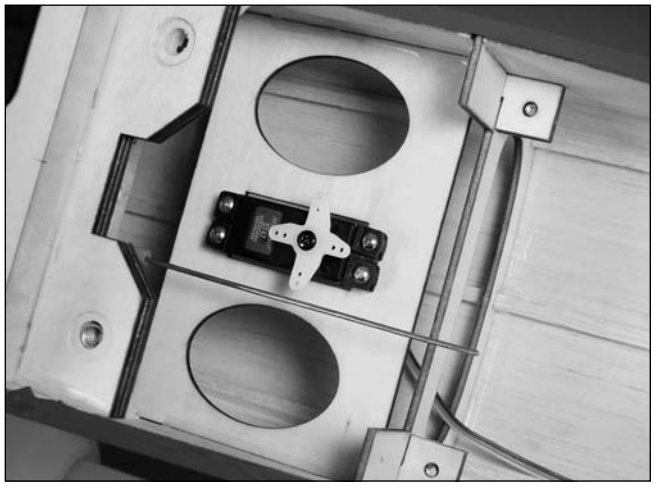
☐ Step 11

Apply a few drops of thin CA to each of the holes drilled in the previous step. This will help harden the wood, making the screws more secure in their placement.



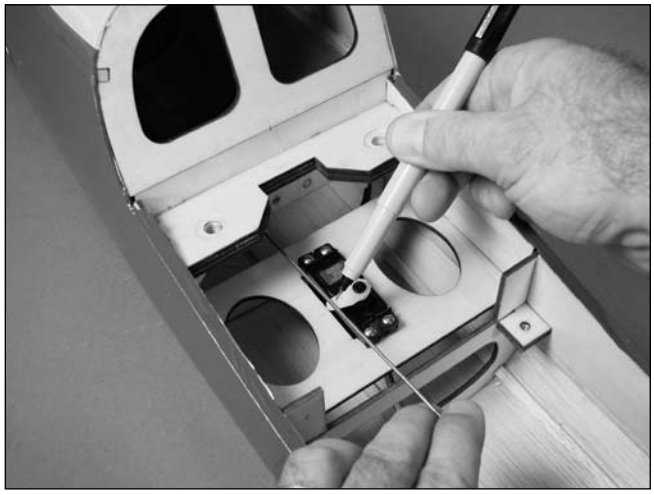
☐ Step 12

Secure the elevator servo in the fuselage using the hardware provided with the servo.



☐ Step 13

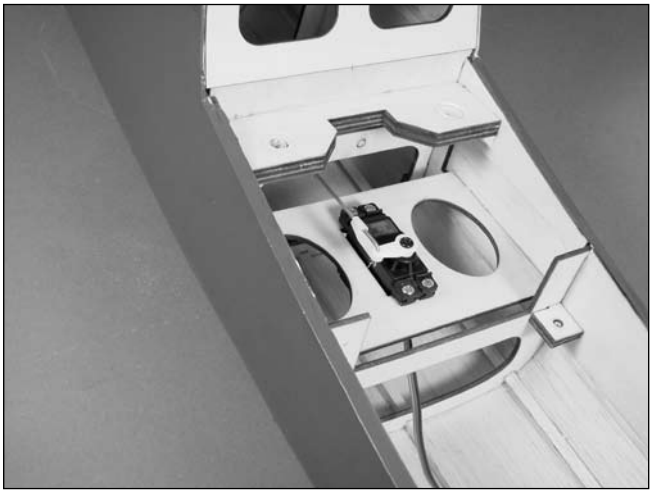
Remove the supplied servo arm from the servo. Cut one arm from a medium-length servo arm so it won't interfere with the operation of the elevator. Secure the arm to the output of the elevator servo. Use a felt-tipped pen to mark the pushrod where it crosses the outer hole of the servo arm.



Note: It may be necessary to bend the elevator pushrod slightly to align with the servo arm.

☐ Step 14

Connect the pushrod to the servo arm as shown.



Section 14: Receiver, Battery and Scale Accessories

Required Parts

- Assembled fuselage
- Radio tray
- Receiver
- Receiver battery
- Foam padding
- Receiver cover
- 3mm washer (4)
- Canopy (nose)
- Canopy (main)
- Canopy (rear)
- Tail gun mount
- Side gun mount (2)
- Side gun pod (2)
- Guns (12)
- Top turret
- Radar dome
- Tail blister
- Decal sheet
- Hook and loop strap
- Hex wrench: 2.5mm
- 3mm x 12mm machine screw (4)
- 128mmx 45mm x 3mm battery tray
- #2 x 3/8-inch sheet metal screw (4)

The quantity of the following two items will depend on receiver used.

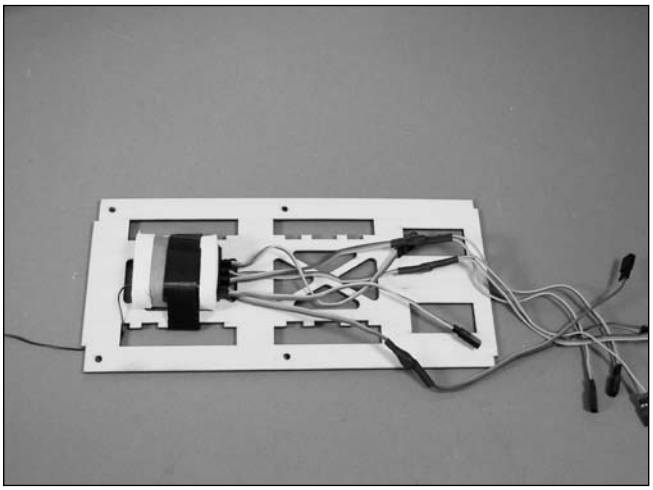
- Y-harness (2)
- 6-inch (153mm) servo extension (2)

Required Tools and Adhesives

- Drill
- RC-56 canopy glue
- Phillips screwdriver
- Masking tape
- Drill bit: 1/16-inch (1.5mm)
- 30-minute epoxy
- 1/4-inch (4mm) foam

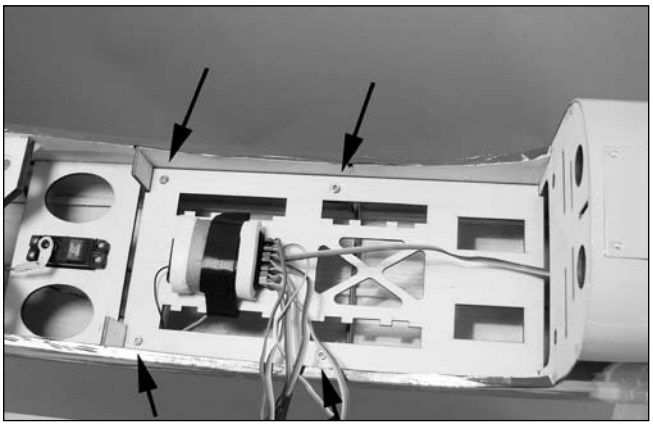
☐ Step 1

Wrap the receiver in foam and plug any necessary extensions and Y-harnesses into the appropriate channels. Secure the receiver to the radio plate using a hook and loop strap.



☐ Step 2

Secure the radio plate in the fuselage using four 3mm x 12mm machine screws and four 3mm washers. Plug the elevator and steering servos into the receiver at this time as well.



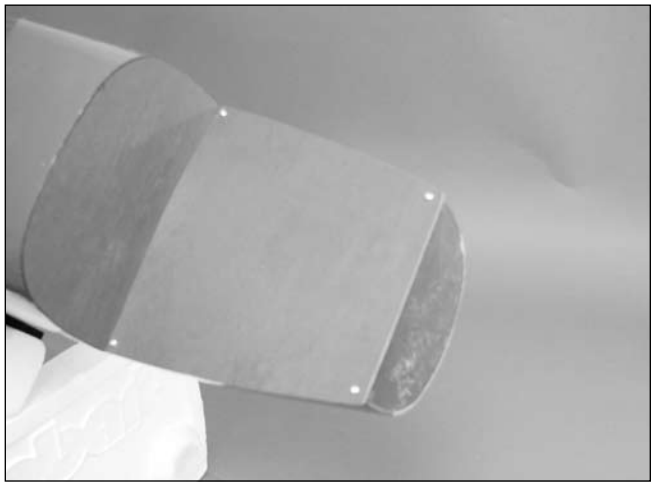
Note: Apply threadlock to the 3mm x 12mm machine screws so they will not vibrate loose in flight.

☐ Step 3

Glue the 128mm x 45mm x 3mm battery tray into the front of the fuselage using 30-minute epoxy. Wrap the receiver battery in 1/4-inch (4mm) foam. Use hook and loop straps to secure the battery to the battery tray. Connect a switch harness between the battery and receiver; install the switch under the fuselage. We chose to install the switch in the steering servo access hatch.

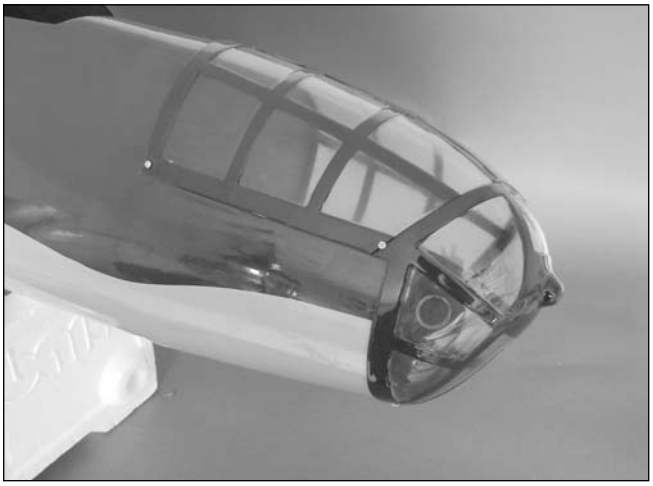
☐ Step 4

Measure in 1/8-inch (3mm) from all sides of the cover. Use a drill and 1/16-inch (1.5mm) drill bit to drill the four holes for the battery cover screws. Apply a few drops of thin CA to each of the holes to harden the surrounding wood. The battery cover is secured to the fuselage using four #2 x 3/8-inch sheet metal screws.



☐ Step 5

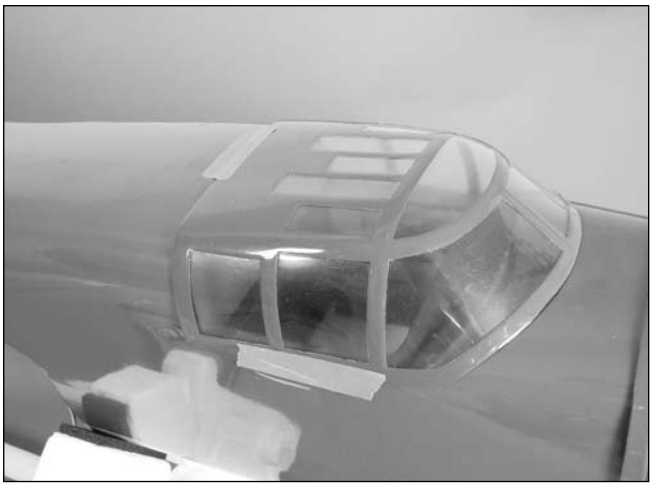
Use five #2 x 3/8-inch sheet metal screws to attach the front greenhouse canopy to the fuselage. There are two screws on each side, and one positioned in the bottom center of the canopy underneath the fuselage. Apply a few drops of thin CA to each of the holes to harden the surrounding wood.



Note: Make sure to pre-drill for the screws using a drill and 1/16-inch (1.5mm) drill bit to prevent damaging the canopy.

☐ Step 6

Use RC-56 canopy glue to attach the canopy to the fuselage. Use tape to hold the canopy in position until the glue fully cures.



☐ Step 7

Use five #2 x 3/8-inch sheet metal screws to attach the rear canopy to the fuselage and stabilizer. There are two screws on either side of the fuselage, two on each side that go into the stabilizer, and one positioned at the front of the canopy (as referenced from the fuselage). Apply a few drops of thin CA to each of the holes to harden the surrounding wood.

Note: Make sure to pre-drill for the screws using a drill and 1/16-inch (1.5mm) drill bit to prevent damaging the canopy.

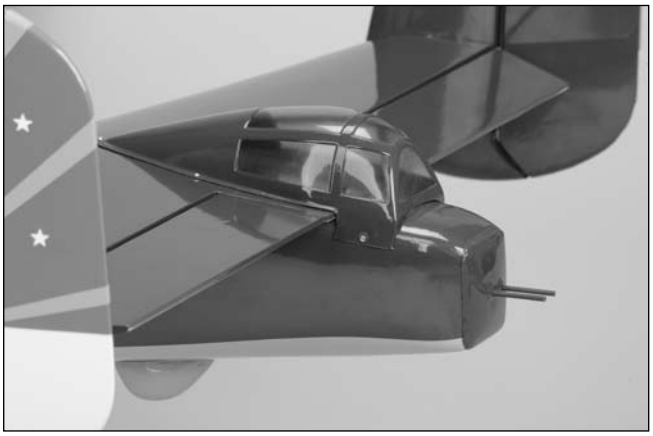
Note: If you chose to permanently glue the horizontal stabilizer to the fuselage, then the rear canopy can be glued in place using R/C 56 canopy glue

☐ Step 8

Use hobby scissors to trim the rear gun mount. Use RC-56 canopy glue to secure the mount to the end of the fuselage. Use tape to hold the mount in position until the glue fully cures.

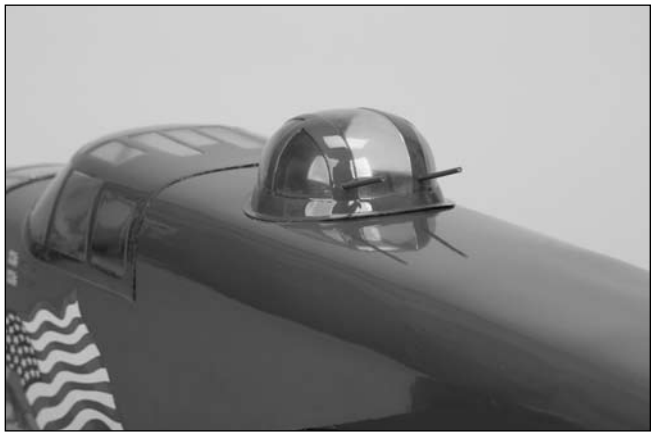
☐ Step 9

Install the guns by drilling holes in the appropriate locations. Glue the guns using RC-56 canopy glue.



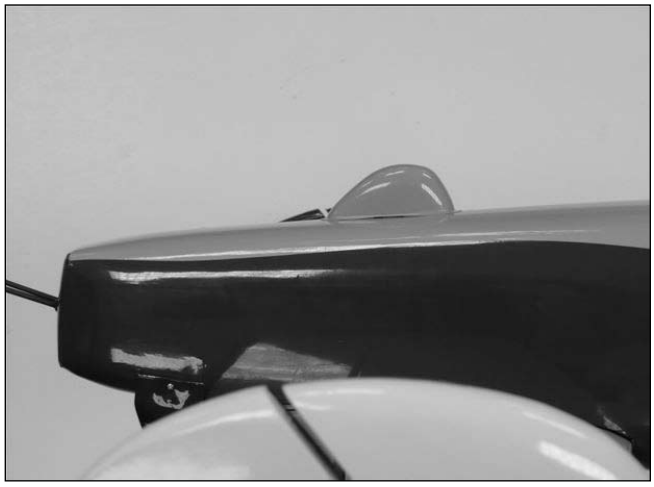
☐ Step 10

Glue the turret and guns following the procedure you have followed in previous steps.



☐ Step 11

Attach the tailskid to the lower rear of the fuselage using RC-56 canopy glue.

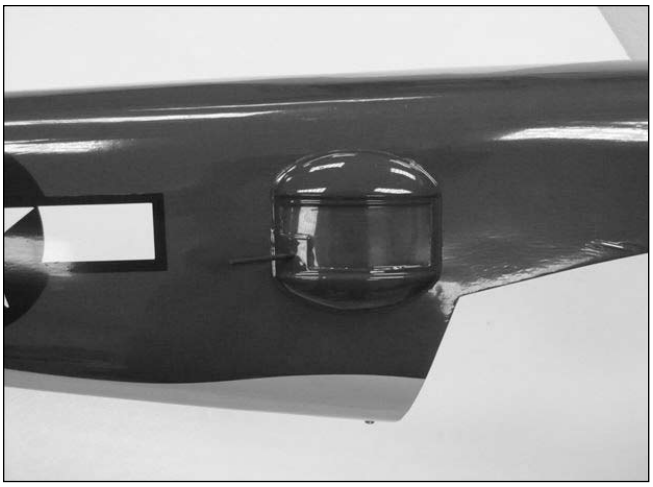


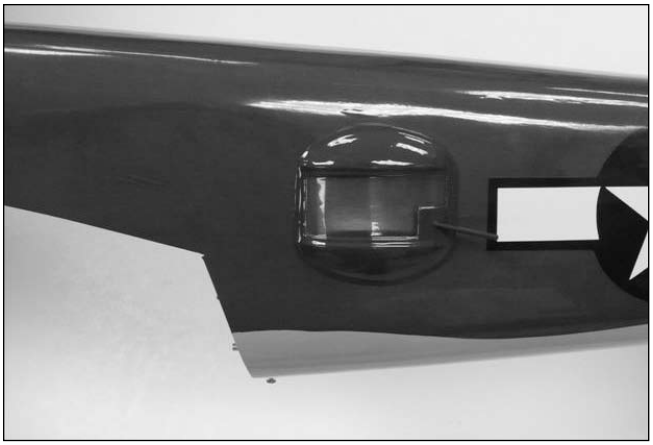
☐ Step 12

Use 30-minute epoxy to glue the radio antenna to the nose wheel steering servo access hatch.

☐ Step 13

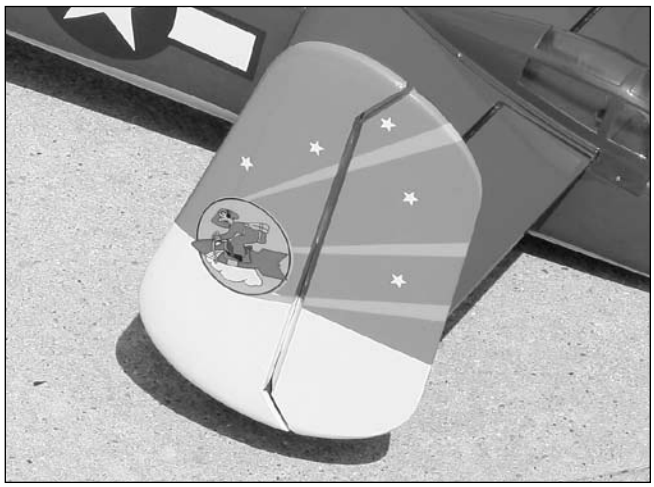
Attach the side guns behind the wing as shown. Note that the side gun blisters are not symmetrical when installed on the fuselage. The left gun turret is positioned further aft of the wing when compared to the right gun turret. (Study the photos.)





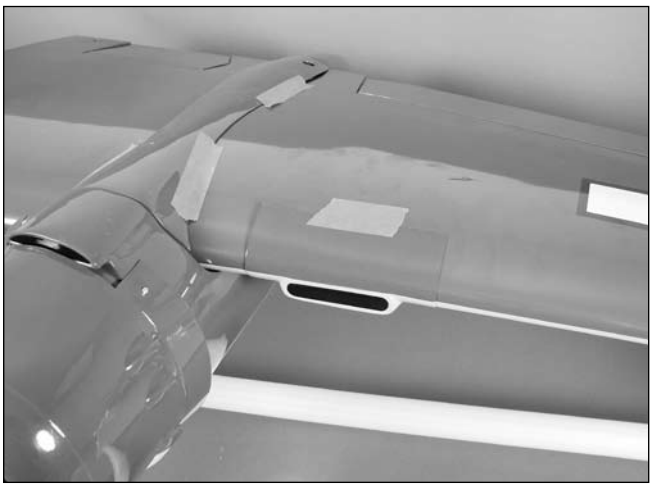
☐ ☐ **Step 14**

All decals will be factory installed.



☐ ☐ **Step 15**

Use RC-56 canopy glue to attach the radiators to the wing.



☐ ☐ **Step 16**

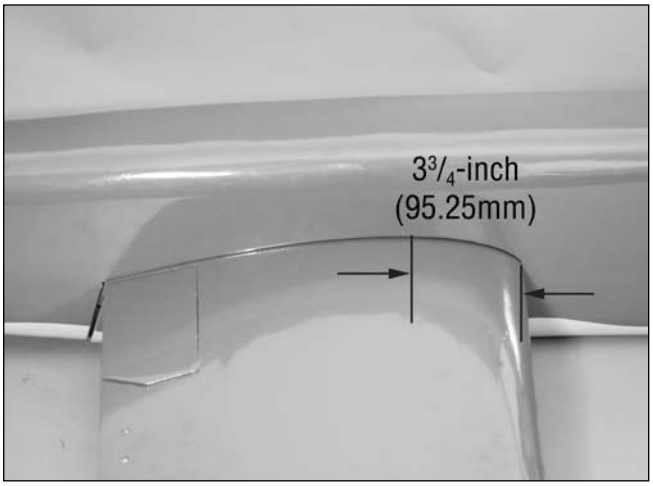
Repeat Steps 13 though 15 to install the remaining accessories, as there is a right and left to these accessories.

Recommended Center of Gravity (CG)

An important part of preparing the aircraft for flight is properly balancing the model. This is especially important when various engines are mounted.

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for the B-25 Mitchell is $3\,^3/_4$-in (95.25mm) behind the leading edge of the wing against the fuselage. Mark the location of the CG on the bottom of the wing as shown. Turn the airframe upright to balance. If necessary, move the battery pack or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby store and work well for this purpose.



Control Throws

The amount of control throw should be adjusted as closely as possible using mechanical means, rather than making large changes electronically at the radio. By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of control throw of the control surface. Moving it toward the control surface will increase the amount of throw. Moving the pushrod wire at the servo arm will have the opposite effect: Moving it closer to center will decrease throw, and away from center will increase throw. Work with a combination of the two to achieve the closest or exact control throws listed.

Elevator Low Rate

7 degrees, 3/8-inch or 8.5mm up/down

Elevator High Rate

13 degrees, 5/8-inch or 16mm up/down

> **Note**: Elevator throw is measured at inboard end of elevator.

Rudder Low Rate

10 degrees, 1/2-inch or 13mm right/left

Rudder High Rate

16 degrees, 13/16-inch or 21mm right/left

> **Note**: Rudder throw is measured at the widest part of the rudder.

Aileron Low Rate

10 degrees, 3/8-inch or 9.5mm up/down

Aileron High Rate

15 degrees, 9/16-inch or 14mm up/down

> **Note**: Aileron throw is measured at inboard end of aileron.

Half Flap Position

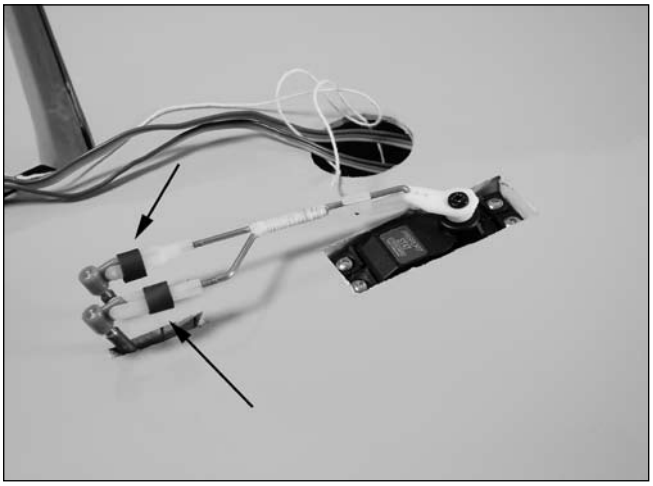
20 degrees,1-inch or 26mm down

Full Flap Position

40 degrees, $1\,{}^{15}/_{16}$-inch or 49mm down

> **Note**: Flap throw is measured at end of flap against the fuselage.

Once the control throws have been set, slide the clevis retainers over the clevis to prevent them from opening during flight.

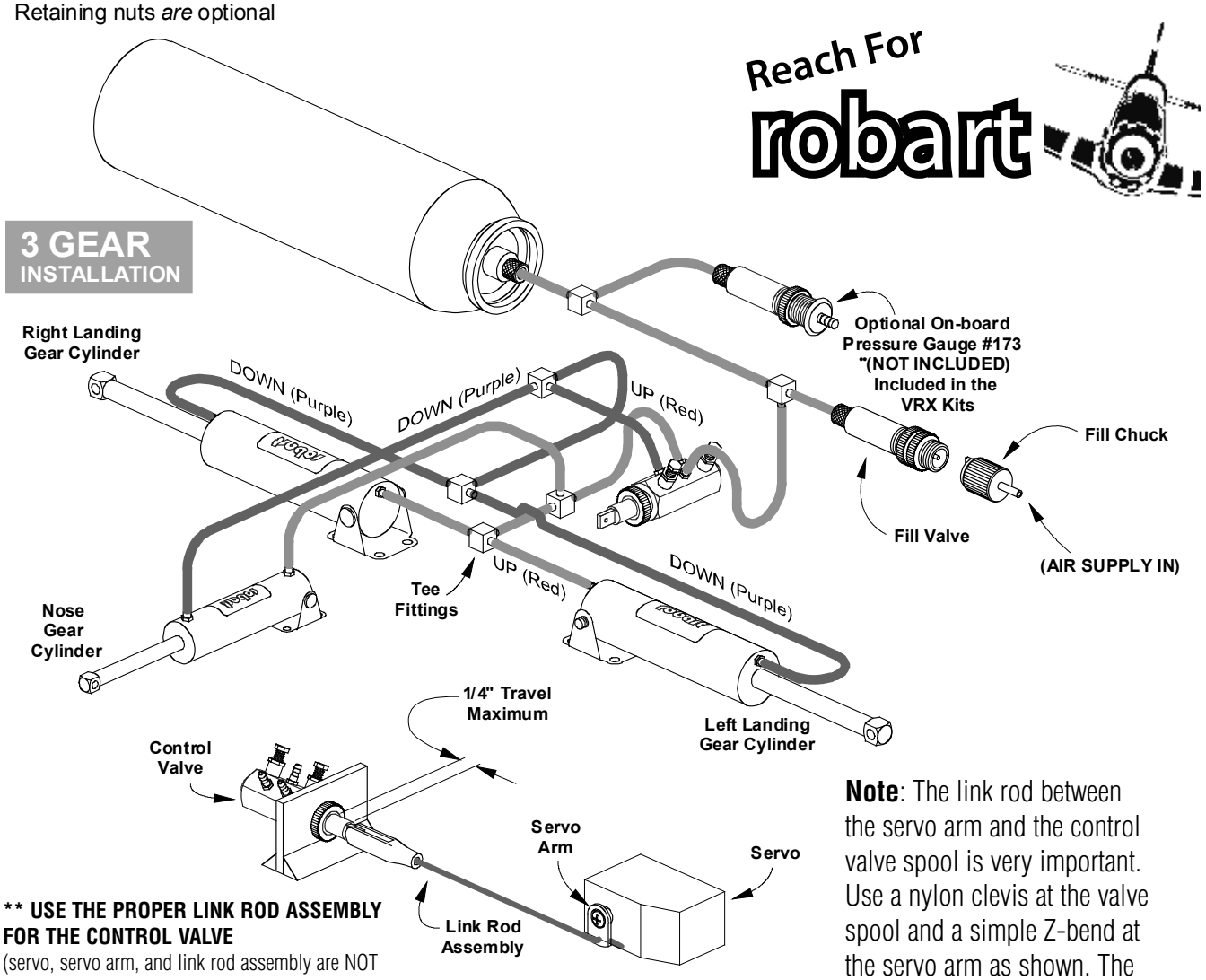


Range Test Your Radio

Range check your radio system before each flying session. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane. With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions. If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

Retract Air line Routing Diagram

Retaining nuts *are* optional



**** USE THE PROPER LINK ROD ASSEMBLY FOR THE CONTROL VALVE**
(servo, servo arm, and link rod assembly are NOT included in kit)

Note: The link rod between the servo arm and the control valve spool is very important. Use a nylon clevis at the valve spool and a simple Z-bend at the servo arm as shown. The throw on the servo arm should allow for approximately 1/4-inch (4mm) of travel. This will keep any excessive side loads on the valve spool minimal and, in turn, prevent any leakage around the valve spool seals.

Pre-Flight

Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases, the radio should be charged the night before going out flying.

Check the radio installation and make sure all the control surfaces are moving correctly (i.e. the correct direction and with the recommended throws). Test run the engine and make sure it transitions smoothly from idle to full throttle and back. Also ensure the engine is tuned according to the manufacturer's instructions, and it will run consistently and constantly at full throttle when adjusted.

Check all the control horns, servo horns and clevises to make sure they are secure and in good condition. Replace any items that would be considered questionable. Failure of any of these components in flight would mean the loss of your aircraft.

Engine Run-In Instructions

The importance of having both engines run through the entire flight is typically the most important aspect of flying a twin engine model. We strongly recommend following these pre flight engine break-in and tuning instructions.

1) Before you attempt to fly your B-25 Mitchell we suggest that you do a proper and thorough break-in of your engines. Start by removing the fiberglass cowls to allow easy adjustment of the engine carburetors. We suggest running 1–2 tanks of fuel through each engine separately following the engine manufacturer's break-in procedure. It is important that the engines each have a reliable idle and a smooth transition thru the mid range up to full throttle. Adjust the low & high speed needles as necessary following the instructions that came with your engine.

2) When you are satisfied with the idle and the transition from idle to full throttle of both engines you are now ready to start and run both engines simultaneously. Start both engines and let them idle for a few seconds allowing the idle to stabilize on both engines. Using a tachometer to check the rpm of both engines is recommended. The two engines should have rpm readings within a couple hundred rpm of each other, but not necessarily identical. Do not change any of your low speed needle settings to try and obtain identical idle rpm readings for both engines. Advance the engines to full throttle paying attention to the transition. Both engines should transition in a similar pattern and once they reach full throttle should have the same or similar Rpm reading. Again both engines should be within a couple hundred Rpm of each other. If the rpm readings are not with in a couple of hundred rpm, then do not try to lean or richen the high speed needle. We would recommend that you either electronically or mechanically adjust the throttle linkage to bring the higher rpm engine down to match the other engine. The majority of your flight will take place with the engines at or near half power.

3) Once you are satisfied with the idle, transition, and full powers settings of your engine you need to replace the cowls and again run the engines. A fully cowled engine can run at a higher temperature than an un-cowled engine so it is important to again check these parameters with the engine cowls installed. Remember that it is better to run the engines slightly rich for better cooling. Never run the engines at peak rpm, but rather a couple hundred rpm below maximum.

Takeoff

Prior to your first flight we recommend that you do some low speed taxi tests. Use these tests to center the nose wheel steering to allow for a takeoff straight down the runway. Once you have finished this be sure and take a minute to refuel the tanks and take one last look at the airframe to be sure all screws and control linkages are secure.

The flaps are not needed if you are taking off from a hard packed runaway such as asphalt and even fields with short grass do not require the use of flaps. If you are taking off from a grass field that is rough or has not been mowed recently, then we recommend that you use the half flap position and allow a little extra takeoff roll before gradually feeding in up elevator. Once you have the B-25 airborne maintain a shallow rate of climb and allow the model to gain speed prior to making the first turn. The flaps should be retracted at this point and you should be entering into the normal traffic pattern. If you are using retracts then we suggest that you retract the landing gear prior to retracting the flaps.

Familiarize yourself with the flight characteristics of the B-25 and practice flying the model at a safe height using both the mid and full flap positions. Be sure and reduce the throttles and allow the B-25 to slow a bit prior to lowering the flaps to the first or mid position. Then lower the flaps to the full position and adjust power to maintain straight and level flight. You will find that the B-25 does not balloon or pitch up if you allow the model to slow prior to dropping the flaps. We have found that if you follow this procedure, then you will not need to mix in any down elevator compensation.

Landing

To begin the landing approach you will need to first lower the throttles and reduce your flight speed. We recommend this take place on the downwind leg and that you have the flaps in the full down position prior to beginning your turn to the base leg. Allow the B-25 to begin a slow downward decent and gradually allow the airspeed to bleed off. The idea is to loose altitude and maintain airspeed by keeping the nose down in the turn. As you begin your upwind approach use the throttles to maintain your sink rate and as you pass over the end of the runway reduce the throttles to idle and begin to add up elevator and begin your flare to landing. Should you overshoot the landing the gradually add power and use the rudders to keep the B-25 on track. Keep the flaps in the full down position and begin to set up for a second attempt.

Engine Out

A concern that most pilots have when flying a twin is what to do if and when an engine quits. We have found that the B-25 will not do anything sudden or abrupt if one engine should quit while in straight and level flight. The first thing that needs to occur should an engine quit is to recognize the situation and then determine which engine is out. You then will need to determine if you should shut the other engine down and glide back to the runway or continue to fly on one engine and enter into the landing pattern. The B-25 will fly on one engine and will maintain altitude, but does not have sufficient power to gain altitude. The key thing to remember when flying with one engine is to use the rudder to make your turns and then use ailerons to keep the wings level. You can turn towards the dead engine if you fly a large gradual turn, but as with all multi-engine aircraft, turning into the running engine is safer and should always be done if there is an option. Remember to maintain airspeed and the flaps are not needed for an engine out landing.

Remember you do not have enough power to climb out from a missed landing, so plan your approach the best you can.

Enjoy flying your Hangar 9 B-25 Mitchell. The model is very predictable and will surely give you many hours of enjoyment.

2007 Official AMA National Model Aircraft Safety Code

GENERAL

1. A model aircraft shall be defined as a non-human-carrying device capable of sustained flight in the atmosphere. It shall not exceed limitations established in this code and is intended to be used exclusively for recreational or competition activity.
2. The maximum takeoff weight of a model aircraft, including fuel, is 55 pounds, except for those flown under the AMA Experimental Aircraft Rules.
3. I will abide by this Safety Code and all rules established for the flying site I use. I will not willfully fly my model aircraft in a reckless and/or dangerous manner.
4. I will not fly my model aircraft in sanctioned events, air shows, or model demonstrations until it has been proven airworthy.
5. I will not fly my model aircraft higher than approximately 400 feet above ground level, when within three (3) miles of an airport without notifying the airport operator. I will yield the right-of-way and avoid flying in the proximity of full-scale aircraft, utilizing a spotter when appropriate.
6. I will not fly my model aircraft unless it is identified with my name and address, or AMA number, inside or affixed to the outside of the model aircraft. This does not apply to model aircraft flown indoors.
7. I will not operate model aircraft with metal-blade propellers or with gaseous boosts (other than air), nor will I operate model aircraft with fuels containing tetranitromethane or hydrazine.
8. I will not operate model aircraft carrying pyrotechnic devices which explode burn, or propel a projectile of any kind. Exceptions include Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight. Rocket motors up to a G-series size may be used, provided they remain firmly attached to the model aircraft during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code; however, they may not be launched from model aircraft. Officially designated AMAAir Show Teams (AST) are authorized to use devices and practices as defined within the Air Show Advisory Committee Document.
9. I will not operate my model aircraft while under the influence of alcohol or within eight (8) hours of having consumed alcohol.
10. I will not operate my model aircraft while using any drug which could adversely affect my ability to safely control my model aircraft.
11. Children under six (6) years old are only allowed on a flightline or in a flight area as a pilot or while under flight instruction.
12. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

2007 Official AMA National Model Aircraft Safety Code

Radio Control

1. All model flying shall be conducted in a manner to avoid over flight of unprotected people.
2. I will have completed a successful radio equipment ground-range check before the first flight of a new or repaired model aircraft.
3. I will not fly my model aircraft in the presence of spectators until I become a proficient flier, unless I am assisted by an experienced pilot.
4. At all flying sites a line must be established, in front of which all flying takes place. Only personnel associated with flying the model aircraft are allowed at or in front of the line. In the case of airshows demonstrations straight line must be established. An area away from the line must be maintained for spectators. Intentional flying behind the line is prohibited.
5. I will operate my model aircraft using only radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
6. I will not knowingly operate my model aircraft within three (3) miles of any preexisting flying site without a frequency-management agreement. A frequency-management agreement may be an allocation of frequencies for each site, a day-use agreement between sites, or testing which determines that no interference exists. A frequency-management agreement may exist between two or more AMA chartered clubs, AMA clubs and individual AMA members, or individual AMA members. Frequency-management agreements, including an interference test report if the agreement indicates no interference exists, will be signed by all parties and copies provided to AMA Headquarters.
7. With the exception of events flown under official AMA rules, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and located at the flight line.
8. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual.
9. Radio-controlled night flying is limited to low-performance model aircraft (less than 100 mph). The model aircraft must be equipped with a lighting system which clearly defines the aircraft's attitude and direction at all times.
10. The operator of a radio-controlled model aircraft shall control it during the entire flight, maintaining visual contact without enhancement other than by corrective lenses that are prescribed for the pilot. No model aircraft shall be equipped with devices which allow it to be flown to a selected location which is beyond the visual range of the pilot.

HANGAR 9®

Fly First Class™

HORIZON HOBBY

4105 Fieldstone Road
Champaign, Illinois 61822
(877) 504-0233
horizonhobby.com

10839