P-51D Mustang Sport 40 ARF

Assembly Manual

HANGAR 9®

Fly First Class™

Specifications

Wingspan:	*58.25 in (1480mm)*
Length:	*50.4 in (1281mm)*
Wing Area:	*626 sq in (40.39 sq dm)*
Weight:	*6.5–7 lb (2.9–3.2 kg)*
Radio:	*4- to 6-channel w/5-8 servos*
Engine:	*.40–.46 2-stroke, Power 46*

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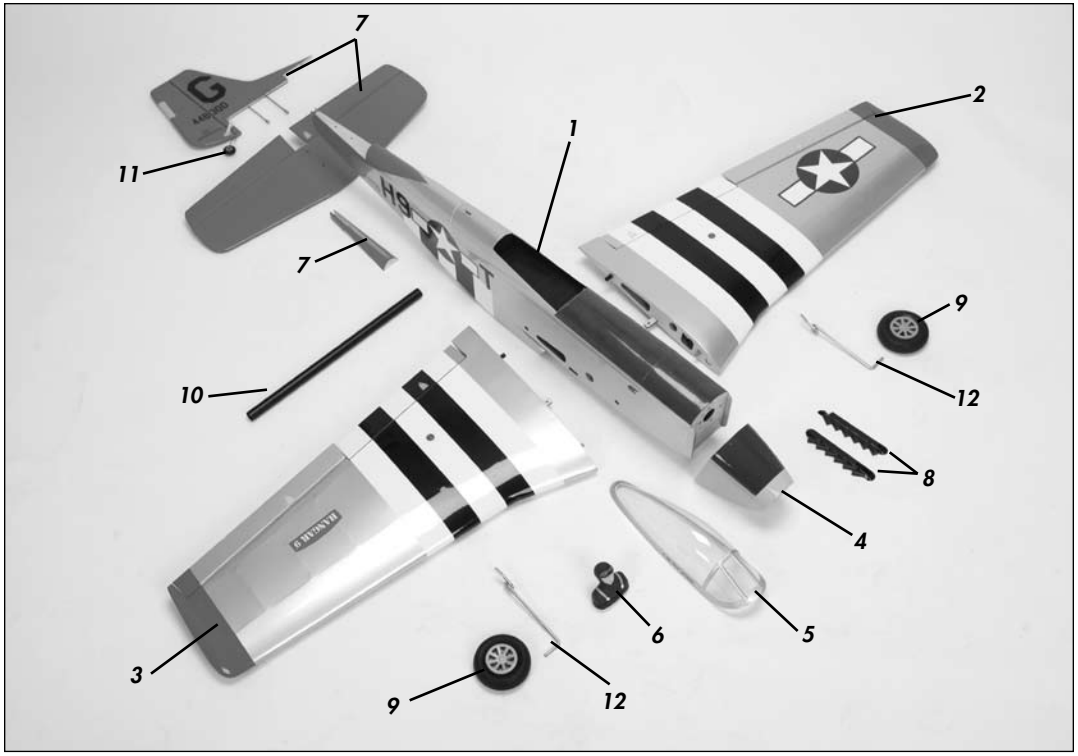

Contents of Kit and Parts Layout

Replacement Parts

1.	HAN4426	Fuselage with Hatch and Canopy
2.	HAN444002	Left Wing
3.	HAN444003	Right Wing
4.	HAN444004	Painted Cowl
5.	HAN2830	Canopy with Painted Frame
6.	HAN4435	Pilot Bust
7.	HAN4429	Tail Set with Tail Wheel
8.	HAN4437	Exhaust
9.	HAN4438	3 1/2-inch (90mm) Wheels (pr)
10.	HAN4432	Wing Tube
11.	HAN4709	Tail Wheel
12.	HAN444005	Fixed Landing Gear without Wheels (Includes mounting blocks, not shown)

Items not shown

HAN444010	Flap Stays
HAN4434	Pushrod Set
HAN4436	Decal Set
HAN40M	Engine Mount
HAN2479	11 oz Fuel Tank
HAN444006	Retract Wood Trays and Templates
HAN444007	Landing Gear Doors, Left and Right

Included Parts Listing

PACKAGED IN KIT

Fuselage with hatch	1	
Left wing with flap and aileron	1	
Right wing with flap and aileron	1	
Horizontal stabilizer with elevator	1	
Vertical fin and rudder with tail wheel	1	
Fin fairing block	1	
Fiberglass cowl	1	
Clear cowl template	1	
Canopy	1	
Anodized aluminum wing tube	1	
Exhaust stack (left and right) ea.	1	
11 oz fuel tank	1	
Painted pilot	1	

FUSELAGE

#2 x 3/8 silver self-tapping screw	4	cowl
#2 x 5/16 black self-tapping screw	4	exhaust
Receiver plywood cover	1	
Fuel tank plywood brace	1	
Foam cushion	5	receiver and receiver battery
4-40 x 5/8 socket head cap screw	2	fuel tank brace
#4 washer	2	fuel tank brace
#2 x 3/8 self-tapping screw	4	receiver cover
Hook and loop straps	2	EP battery
Throttle pushrod plywood support	1	4-stroke
Throttle pushrod housing	1	4-stroke

WINGS

Nylon clevis	4	ailerons and flaps
$2\frac{5}{8}$inch (67mm) pushrod	2	aileron
3-inch (76mm) pushrod	2	flap
#2 x 5/16 black self-tapping screw	16	aileron and flap hatch
Wood servo blocks	8	aileron and flap servos
4-40 x 3/4 socket head cap screw	2	wing attachment
#4 flat washer	2	wing attachment
#4 lock washer	2	wing attachment

RUDDER & ELEVATOR

Nylon clevis	2	rudder and elevator
Safety tubing	2	rudder and elevator
$23\frac{1}{4}$-inch (590mm) pushrod	1	elevator
26-inch (660mm) pushrod	1	rudder

ENGINE & MOTOR

Metal engine mount with hardware	1	
Nylon clevis	1	throttle
Safety tubing	2	throttle
$15\frac{5}{8}$-inch (397mm) pushrod	1	throttle
Brass pushrod connector with hardware	1	throttle
40mm EP standoff	4	EP motor
8-32 x 1/4 machine bolt	4	EP mounts
8-32 blind nut	4	EP mounts
#8 flat washer	4	EP mounts
#8 lock washer	4	EP mounts

LANDING GEAR

Fixed gear wire struts	2	landing gear
Fixed gear mounting block	2	landing gear
$3\frac{1}{2}$-inch (90mm) main wheel	2	landing gear
6-32 x 1/2 socket head cap screw	8	landing gear
#6 flat washer	8	landing gear
Threadlock	1	
Allen wrenches	2	landing gear
5mm wheel collar with setscrew	4	landing gear
#2 x 3/8 silver self-tapping screw	4	retract servo tray
Nylon clevis	1	retracts
$1\frac{1}{4}$-inch (32mm) pushrod	1	retracts
Retract servo wood tray	1	retracts
Air cylinder support tray	1	retracts
Wood template	1	retracts
Gear door (left and right)	2	
Wire tie	4	gear doors

Important Information Regarding Warranty

Please read our Warranty and Liability Limitations section on page 49 before building this product. 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.

Recommended Setup–2-Stroke Glow

- Evolution® .46NX with Muffler (EVOE0461)
- Evolution Propeller 11 x 5 (EVO10050) or 10 x 6 (EVO11060)
- $2^3/_4$-inch 2-blade Spinner, Red (DUB292)
- Exhaust Diverter (DUB697) (Optional)

Recommended Setup–4-Stroke Glow

- Saito 82 (SAIE082aGK)
- 13 x 8 propeller (EVOE13080)
- $2^3/_4$-inch 2-blade Spinner, Red (DUB292)

Recommended Setup–Electric Power (EP)

- E-flite® Power 46 BL Outrunner Motor (EFLM4046A)
- 60-Amp Pro Switch-Mode BEC Brushless ESC (EFLA1060)
- Thunder Power 4S 3850–4500mAh Li-Po Battery Pack
- APC Propeller 13x6.5-inch (APC13065E) or 14x7 (APC14070E)
- $2^3/_4$-inch 2-blade Spinner, Red (DUB292)

Transmitter Requirements

The P-51D Mustang requires a minimum of a 6-channel radio to operate all the functions of your aircraft. We suggest the following radio systems available through Horizon Hobby or your local hobby distributor.

Spektrum DX6i	SPM6600
Spektrum DX7	SPM2710
JR Systems X9303 2.4GHz	JRP2915
JR Systems 12X 2.4GHz	JRP1200

Radio Equipment Requirements - 6-Channel Receiver

The following items are recommended when installing the 6-Channel AR6200 receiver (SPMAR6200) in your aircraft:

DS821 Digital Sport Servo (5–8) (Note: One less servo required for EP version)	JRPS821
3-inch Servo Extension (Retract)	JSP98100
6-inch Servo Extension (ESC)	JSP98020
9-inch Servo Extension (2) (Ailerons)	JRPA097
Y-harness (2)	JSP98020
Receiver Battery, 6-volt, 2700mAh	JRPB5008
JR Chargeswitch	JRPA004 or
JR Switch	JRPA005

Ailerons: DS821 Servo (2)

- Y-harness (plugged into receiver)
- 9-inch Extension (connected to servo) (2)

Elevator: DS821 Servo

Rudder: DS821 Servo

Throttle: DS821 Servo

Note: ESC will require a 6-inch extension plugged into the receiver

Optional Flaps: DS821 Servo (2)

- Y-harness (plugged into receiver)

Optional Retracts: DS821 Servo

- 3-inch Extension (plugged into receiver)

Note: Retracts can also use an MN48 servo (JSP20040) when using the included plywood servo adapter.

Radio Equipment Requirements - 7-Channel Receiver

The following items are recommended when installing the 7-Channel AR7000 receiver (SPM6070) in your aircraft:

DS821 Digital Sport Servo (5–8) (Note: One less servo required for EP version)	JRPS821
3-inch Servo Extension (Retract)	JSP98100
6-inch Servo Extension (3) (ESC, Ailerons)	JSP98020
9-inch Servo Extension (2) (Ailerons)	JRPA097
Y-harness	JSP98020
Receiver Battery, 6-volt, 2700mAh	JRPB5008
JR Chargeswitch	JRPA004 or
JR Switch	JRPA005

Ailerons: DS821 Servo (2)

- 6-inch Extension (plugged into receiver) (2)
- 9-inch Extension (connected to servo) (2)

Elevator: DS821 Servo

Rudder: DS821 Servo

Throttle: DS821 Servo

Note: ESC will require a 6-inch extension plugged into the receiver

Optional Flaps: DS821 Servo (2)

- Y-harness (plugged into receiver)

Optional Retracts: DS821 Servo

- 3-inch Extension (plugged into receiver)

Note: Retracts can also use an MN48 servo (JSP20040) when using the included plywood servo adapter.

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Radio Equipment Requirements - 9-Channel Receiver

The following items are recommended when installing the 9-Channel AR9000 receiver (SPMAR9000) in your aircraft:

DS821 Digital Sport Servo (5–8) (Note: One less servo required for EP version)	JRPS821
3-inch Servo Extension (Retract)	JSP98100
6-inch Servo Extension (5) (ESC, Ailerons)	JSP98020
9-inch Servo Extension (2) (Ailerons)	JRPA097
Receiver Battery, 6-volt, 2700mAh	JRPB5008
JR Chargeswitch	JRPA004 or
JR Switch	JRPA005

Ailerons: DS821 Servo (2)

- 6-inch Extension (plugged into receiver) (2)
- 9-inch Extension (connected to servo) (2)

Elevator: DS821 Servo

Rudder: DS821 Servo

Throttle: DS821 Servo

Note: ESC will require a 6-inch extension plugged into the receiver

Optional Flaps: DS821 Servo (2)

- 6-inch Extension (plugged into receiver) (2)

Optional Retracts: DS821 Servo

- 3-inch Extension (plugged into receiver)

Note: Retracts can also use an MN48 servo (JSP20040) when using the included plywood servo adapter.

Optional Retracts

Robart Spring Down includes prebent struts and air installation kit (HANP51)

23/4-inch (70mm) Main Wheels (HAN305)

Robart Air Pump (ROB164G)

DS821 Digital Sport Servo (JRPS821) or

MN48 Mini Servo (JSP20040)

Field Equipment Required

- Fuel (15% recommended)
- Long Reach Glow Plug Wrench (HAN2510)
- Metered Glow Driver with Ni-Cd & Charger (HAN7101)
- 2-Cycle Sport Plug (EVOGP1)
- Manual Fuel Pump (HAN118)

Optional Field Equipment

- Self-stick weights, 6 oz (HAN3626)
- PowerPro 12V Starter (HAN161)
- 12V 7Ah Sealed Battery (HAN102)
- Power Panel (HAN106)
- Blue Block After Run Oil (EVOX1001)
- Cleaner and towels

Additional Required Tools

Drill	File
Pin vise	Pliers
Ruler	Hobby scissors
Side cutters	Epoxy brushes
Felt-tipped pen	Rotary tool
Sanding drum	String/dental floss
Mixing sticks	Mixing cups
Paper towels	Rubbing alcohol
Covering iron	Small clamps
Hook and loop tape	Pencil
Hobby knife with #11 blade	Medium grit sandpaper

Phillips screwdriver: #1, #2

Low-Tack Tape (MMM209034)

Box end or open end wrench: 12mm

Hex wrench or ball driver: 3/32-inch

Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 13/64-inch (5mm)

Additional Required Adhesives

Canopy Glue	(PAAPT56)
Medium CA	(PAAPT02)
Thin CA	(PAAPT08)
Threadlock	(PAAPT42)
30-Minute Epoxy, 8 oz	(PAAPT39)
Hinge Glue	(PAAPT55)

UltraCote® Covering Colors

• Black	HANU874
• White	HANU870
• Silver	HANU881
• Cub Yellow	HANU884
• True Red	HANU866
• Olive Drab	HANU904

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.

Before Starting Assembly

Before beginning the assembly of your model, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder 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 covering iron to remove them. Use caution while working around areas where the colors overlap to prevent separating the colors.

HAN100 – Heat Gun

HAN150 – Covering Glove

HAN101 – Sealing Iron

HAN141 – Sealing Iron Sock

Preparing the Fuselage for Electric Power

Required Parts

Fuselage

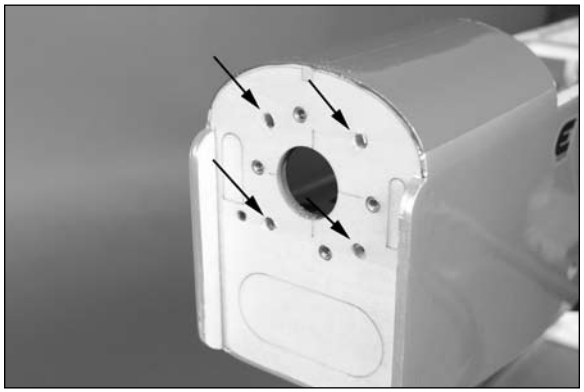
Required Tools and Adhesives

Drill bit: 7/32-inch (5.5mm) Drill
Hobby knife with #11 blade
Rotary tool with sanding drum

Before beginning the assembly of your model you should decide if you will be installing an electric or glow power system. If you opt to install the electric system, you will need to prepare the firewall at this time to provide cooling for the speed control and battery, and drill the holes for the blind nuts to mount the electric motor.

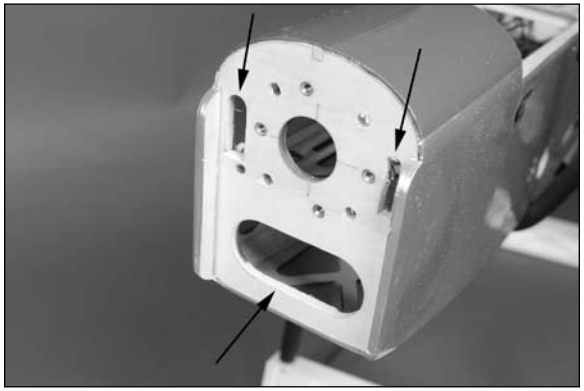
☐ Step 1

Use a drill and 7/32-inch (5.5mm) drill bit to drill the four holes in the firewall for the blind nuts. The location has been etched in the firewall.



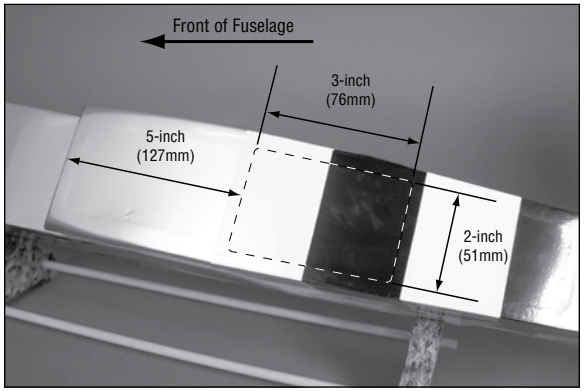
☐ Step 2

Use a hobby knife and rotary tool with a sanding drum to remove the three areas on the firewall to allow cooling air to pass into the fuselage for cooling.



☐ Step 3

It may be necessary to remove the covering from the bottom of the fuselage to allow cooling air to exit the fuselage when using older batteries. If you are using the new Thunder Power Generation 2 batteries or equivalent then the cooling hole is not mandatory.



Installing the Main Radio System

Required Parts

Fuselage Foam: 1/4-inch (6mm)
Plywood receiver hatch Pre-cut foam (thin) (2)
Pre-cut foam (thick) (2) Pre-cut foam for receiver
Servo with hardware (2) (3 for glow engine installations)
Switch harness Receiver battery
#2 x 3/8-inch self-tapping screws (4)

Required Tools and Adhesives

Phillips screwdriver: #1 Thin CA
Hook and loop tape

Servo Extension Options

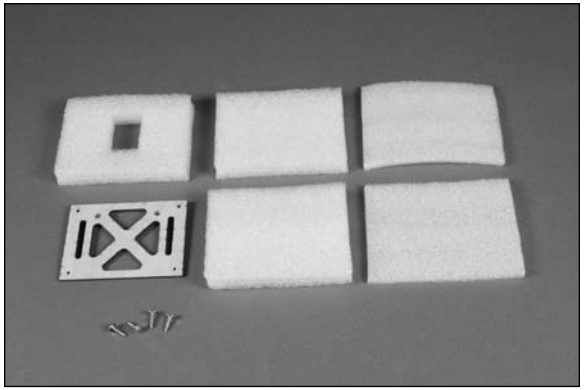
6-Channel receiver:
- Y-harness (ailerons)
- Y-harness (flaps)
- 3-inch (76mm) extension (retracts)
- 6-inch (152mm) extension (electronic speed control)

7-Channel receiver
- 6-inch (152mm) (2) (ailerons)
- Y-harness (flaps)
- 3-inch (76mm) extension (retracts)
- 6-inch (152mm) extension (electronic speed control)

9-Channel receiver
- 6-inch (152mm) (2) (ailerons)
- 6-inch (152mm) (2) (flaps)
- 3-inch (76mm) extension (retracts)
- 6-inch (152mm) extension (electronic speed control)

☐ **Step 1**

Locate the items necessary to install the receiver battery and receiver in the fuselage.



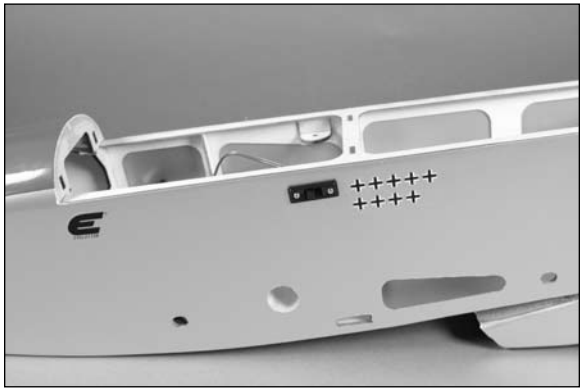
☐ **Step 2**

Remove the canopy hatch from the fuselage by sliding the hatch pin forward. Lift the hatch from the rear and slide rearward to remove.

Hint: Place a drop of light oil in the hatch pin from the inside of the canopy hatch so it will operate smoothly.

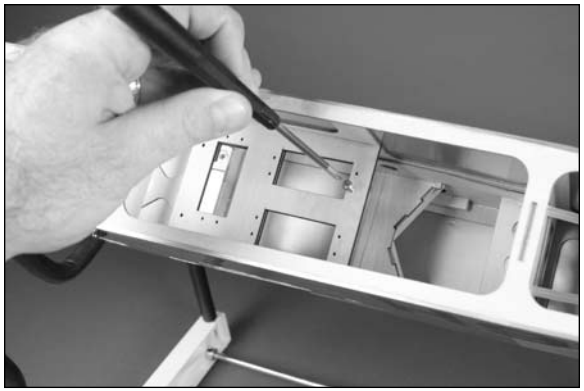
☐ **Step 3**

Mount the switch to the side of the fuselage using the hardware provided with the switch. Use a #1 Phillips screwdriver to tighten the screws.



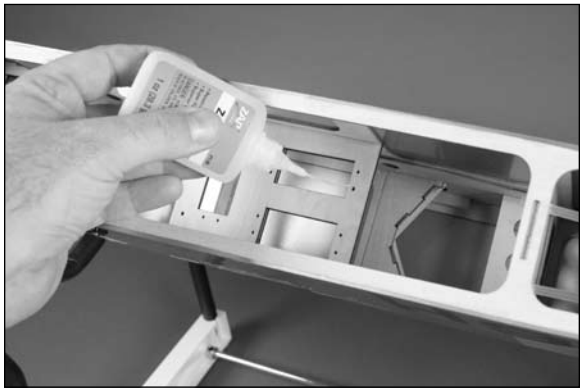
☐ **Step 4**

Use a #1 Phillips screwdriver to thread one of the servo mounting screws into the holes in the radio tray as shown. This will cut threads in the plywood for the next step.



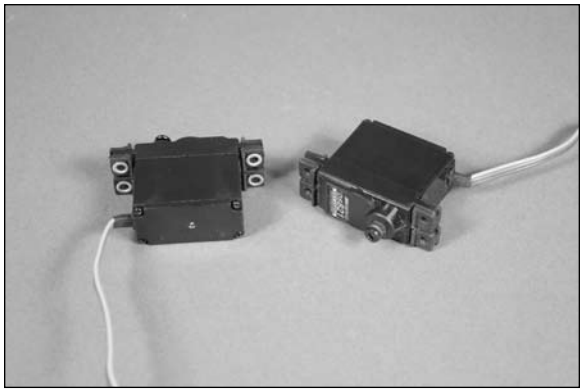
☐ **Step 5**

Apply 2–3 drops of thin CA in each hole to harden the threads. This and the previous step prepares the plywood for the screws so they will have a lower chance of vibrating loose.



☐ **Step 6**

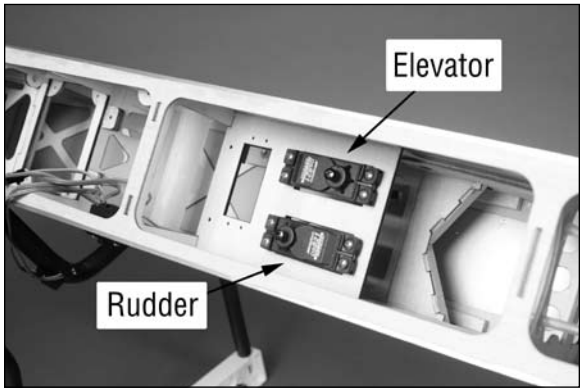
Prepare the rudder and elevator servos by removing the stock servo horns from the servos using a #1 Phillips screwdriver. Install the grommets and brass eyelets in the servos according to the instructions provided with the servos or your radio system.



Hint: If you are installing a glow engine, prepare a third servo for use as the throttle servo.

☐ **Step 7**

Secure the servos in the radio tray using the screws provided with the servos. Tighten the screws using a #1 Phillips screwdriver. Orient the output of the rudder and elevator servos as shown in the photo below.

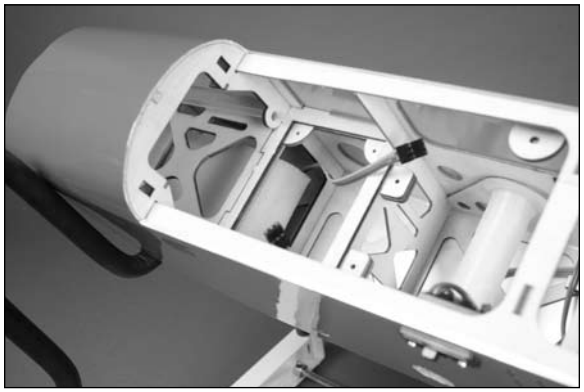


☐ **Step 8**

If you are installing a glow engine, install the throttle servo at this time.

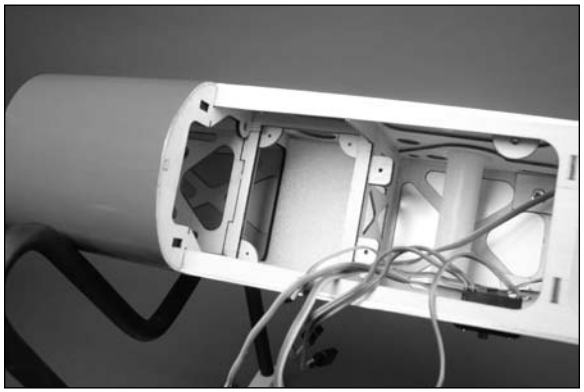
☐ **Step 9**

Wrap the receiver battery in foam. Slide the receiver battery into the fuselage under the fuel tank/battery tray. Make sure the battery can not move by using more foam to secure its position in the fuselage. Connect the lead from the battery to the receiver at this time as well.



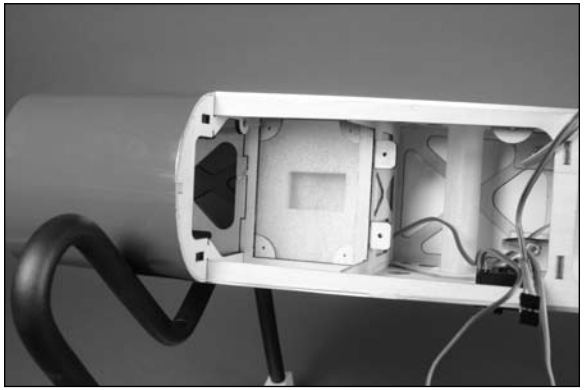
☐ **Step 10**

Place the thicker piece of pre-cut foam included with your model in the area for the receiver.



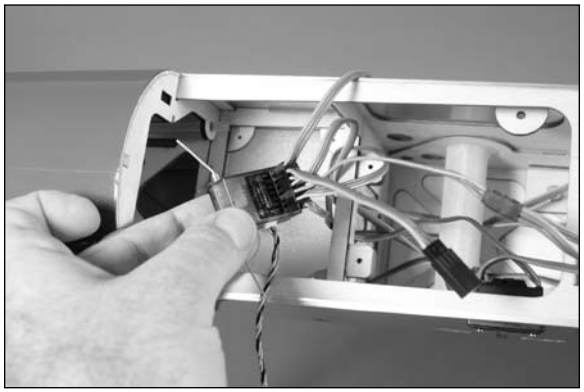
☐ **Step 11**

Next, place the pre-cut foam with the opening for the receiver in the receiver area.



☐ **Step 12**

Plug the battery, rudder, elevator and throttle servo leads in the appropriate ports of the receiver.



Note 1: If you are using a computer radio, you can mix the ailerons (and flap channels) and use four 6-inch (152mm) extensions plugged into the aileron, flap and auxiliary ports of the receiver. If not, you can also use two Y-harnesses (flap and aileron) at this time.

Note 2: If you are installing retracts, plug a 3-inch (76mm) extension in the gear/retract port of the receiver.

Note 3: If you are building your model for use with an electric power system, plug a 6-inch (152mm) extension in the throttle port of the receiver.

☐ **Step 13**

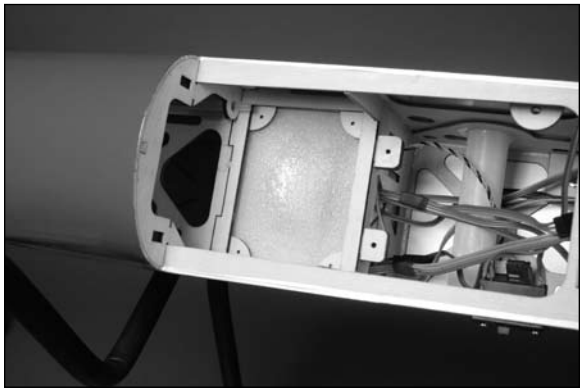
Place the receiver in the opening in the foam. Make sure the antennas on the receiver are straight to allow for the best reception of radio signals. Tuck the servo leads neatly in the fuselage.

Note 1: Some receivers may require the foam to be cut to fit properly.

Note 2: If you are using a 2.4GHz radio system, it is recommended to bind the receiver to the transmitter at this time and check the operation of the servos that are plugged into the receiver. Follow the instructions provided with your radio for the procedure to bind the receiver to the transmitter if necessary.

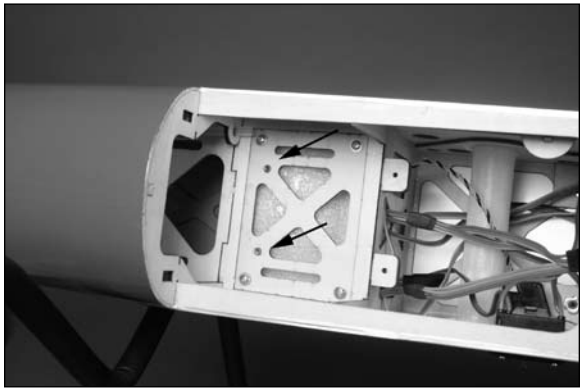
☐ **Step 14**

Place the remaining pre-cut foam over the receiver to fill the receiver area. The amount of foam will be dependant on your choice of receiver.



☐ **Step 15**

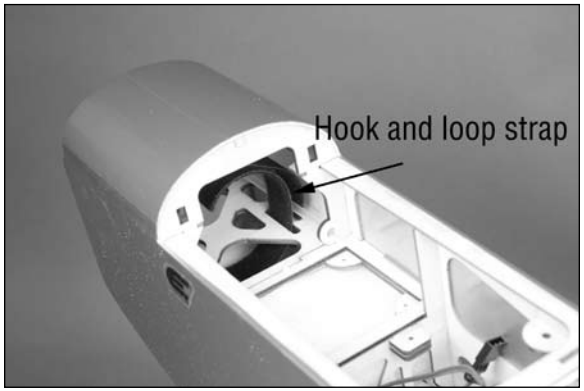
Secure the receiver hatch in place using four #2 x 3/8-inch self-tapping screws and a #1 Phillips screwdriver. Note the location of the blind nuts in the receiver hatch in the photo.



NOTE: SPECIAL CONSIDERATION FOR ELECTRIC MODELS

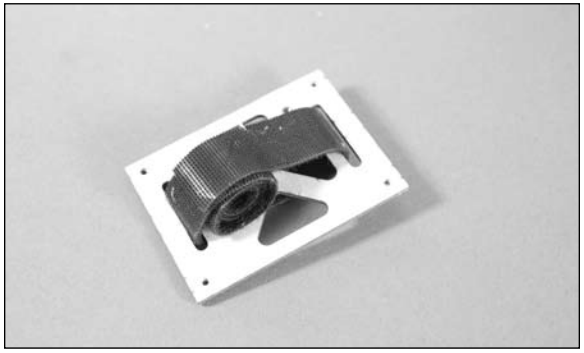
☐ **EP Step A**

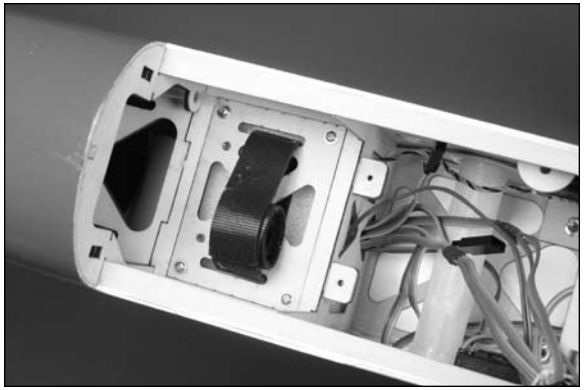
When installing an electric power system you must install the hook and loop straps that secure the motor battery. The first strap is placed in the forward of the fuselage as shown.



☐ **EP Step B**

The second strap is installed in the receiver hatch before it is placed in the fuselage.





☐ **Step 16**

Mount the remote receiver inside the fuselage using hook and loop material. Note the direction of the antenna on the receiver.

Installing the Rudder and Elevator Pushrods

Required Parts

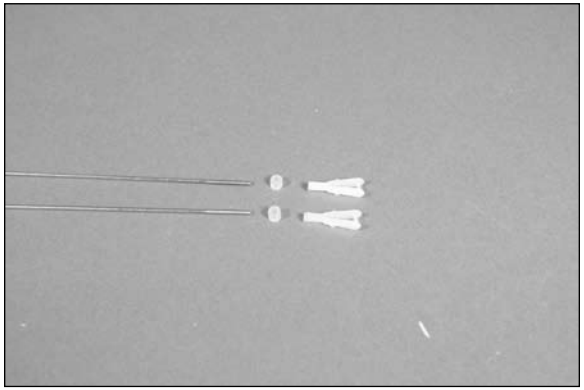
Fuselage assembly	Clevis (2)
Clevis retrainer (2)	
23 1/4-inch (590mm) elevator pushrod	
26-inch (660mm) rudder pushrod	
Servo horn, 180-degree (2)	

Required Tools and Adhesives

Drill bit: 5/64-inch (2mm)	Pin vise
Phillips screwdriver: #1	Side cutter

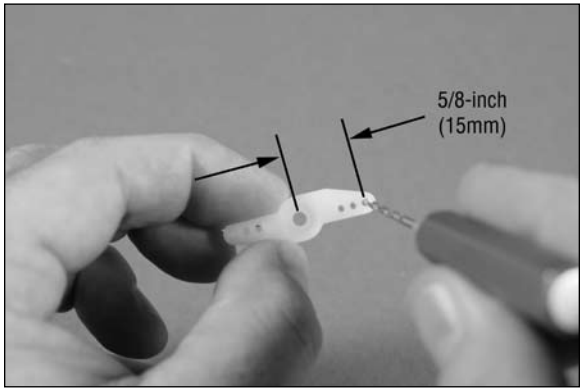
☐ Step 1

Locate the items necessary to install the rudder and elevator pushrods in your model.



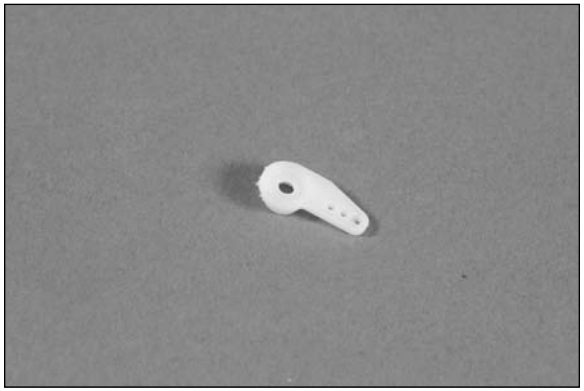
☐☐ Step 2

Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in the servo horn that is 5/8-inch (15mm) from the center of the horn as shown.



☐☐ Step 3

Use side cutters to remove the remaining arm from the servo horn so it doesn't interfere with the operation of the servos.

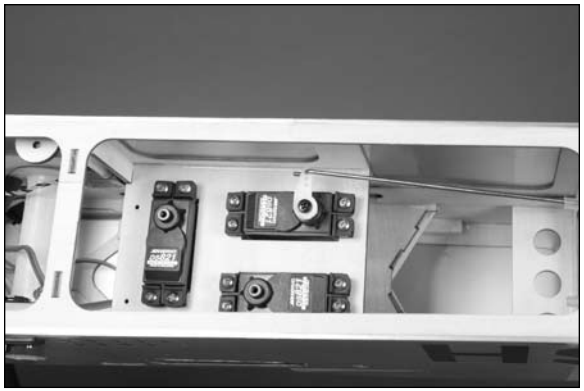


☐☐ Step 4

Slide the 23 1/4-inch (590mm) elevator pushrod into the tube in the fuselage.

☐☐ Step 5

Insert the bend in the pushrod wire through the hole in the servo horn. With the radio on and the elevator servo centered, secure the servo horn to the elevator servo using the screw from the servo and a #1 Phillips screwdriver.

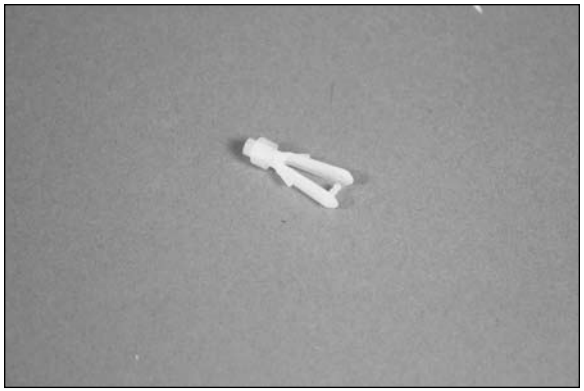


☐ **Step 6**

Repeat Steps 2 through 5 to install and connect the 26-inch (660mm) rudder pushrod.

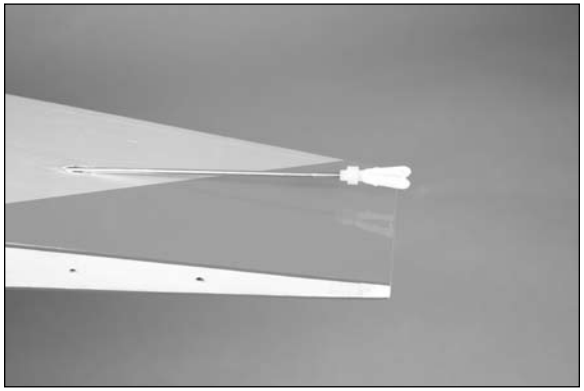
☐ **Step 7**

Slide a clevis retainer on one of the nylon clevises.



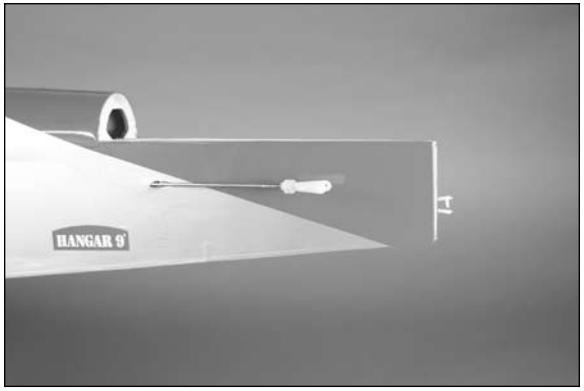
☐ **Step 8**

Thread the clevis 12-turns on the rudder pushrod. The exact position of the clevis will be adjusted once the tail has been bolted to the fuselage.



☐ **Step 9**

Thread the clevis 12-turns on the elevator pushrod. The exact position of the clevis will be adjusted once the tail has been bolted to the fuselage.



Installing the Tail Surfaces

Required Parts

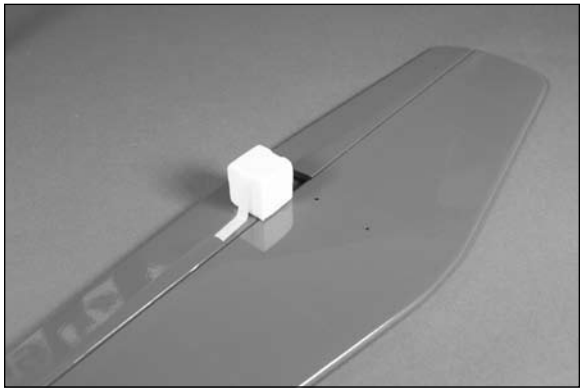
Fuselage assembly	Stabilizer/elevator
Rudder/fin	Fin fairing block

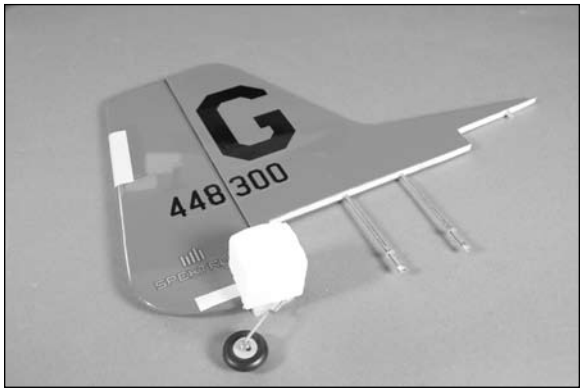
Required Tools and Adhesives

Nut driver: 7/32-inch or adjustable wrench
Ruler

☐ **Step 1**

Remove the foam that protects the airframe from damage on the rudder and elevator.

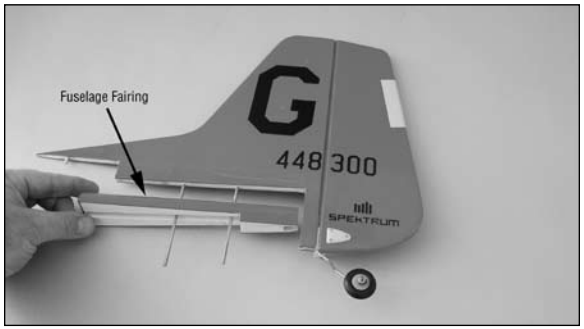




☐ **Step 2**

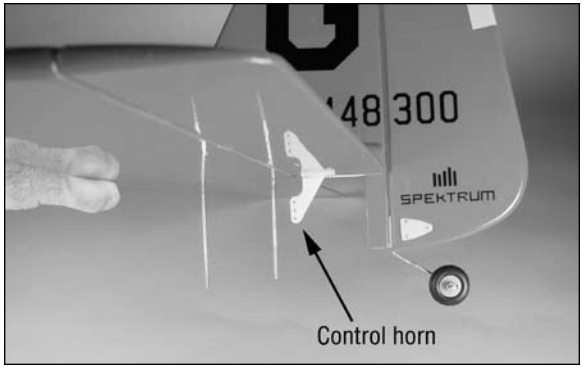
Locate the rudder/fin assembly. Use a 7/32-inch nut driver to remove the nuts and washers from the threaded rods on the bottom of the fin. Slide the fuselage fairing on the bottom of the fin as shown.

Note: The fuselage fairing is not glued in place. Make sure to keep the fairing in position when installing the stabilizer.



☐ **Step 3**

Position the stabilizer/elevator assembly so the control horn will face down, away from the fin. The threaded rods from the rudder/fin assembly will slide into the two holes in the stabilizer.

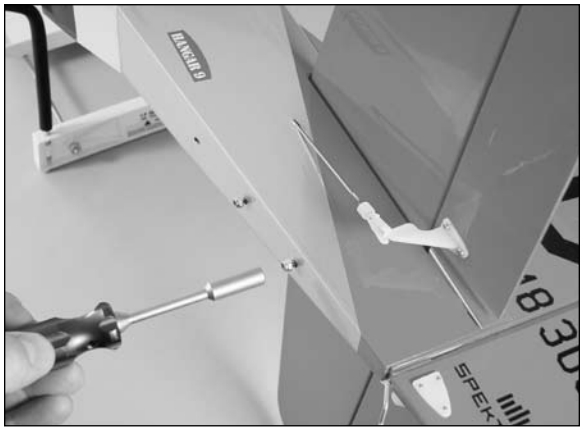


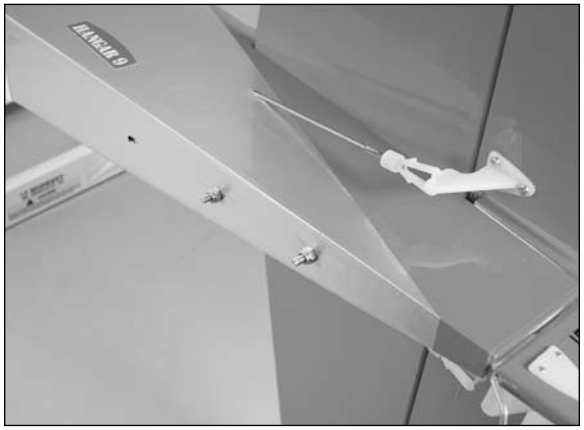
☐ **Step 4**

Slide the stabilizer/fin assembly into position on the fuselage. The stabilizer will rest tightly against the fuselage, and the fin will rest snug against the top of the stabilizer.

☐ **Step 5**

Place the washers then thread the nuts on the rods. Tighten the nuts snugly against the bottom of the fuselage using a nut driver or an adjustable wrench. Do not over-tighten the nuts.

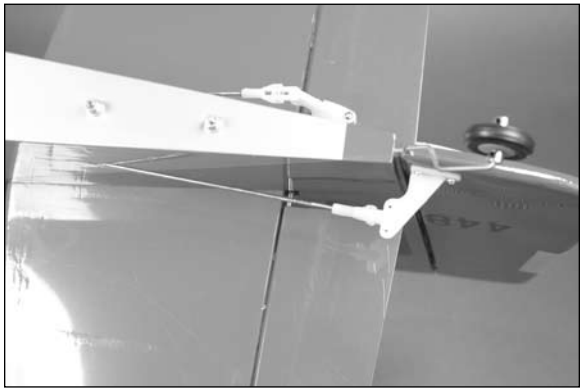


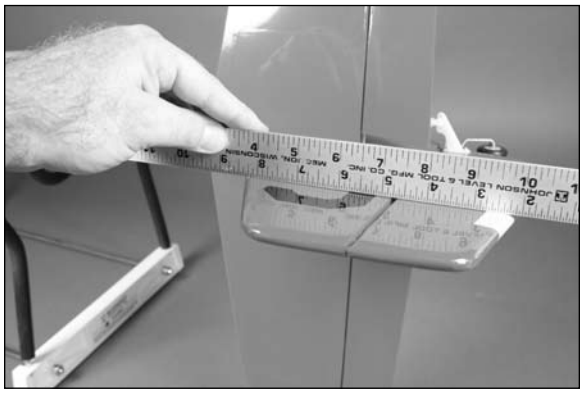


Note: The nuts should be sufficiently tight enough to not allow for rotation of the stab under slight force. Avoid over-tightening the nuts and damaging the fuselage.

☐ Step 6

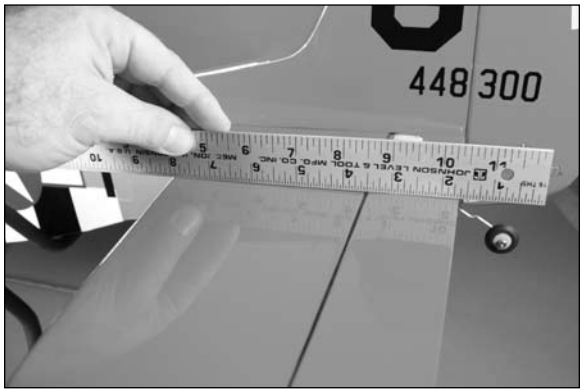
Connect the clevis to the center hole of the rudder control horn. With the radio system on and the rudder servo centered, use a straight edge to make sure the rudder is aligned with the fin. Thread the clevis in or out until the rudder and fin are aligned.





☐ Step 7

Connect the clevis to the center hole of the elevator control horn. With the radio system on and the elevator servo centered, use a straight edge to make sure the elevator is aligned with the stabilizer. Thread the clevis in or out until the stabilizer and elevator are aligned.



Note: Once the rudder and elevator are adjusted, slide the clevis retainer over the forks of the clevis so it does not open accidentally.

Installing the Glow Engine

Required Parts

Fuselage assembly	Engine mount
Engine mount strap (2)	8-32 locknut (4)
#8 washer (4)	Clevis
Clevis retainer	3mm setscrew
Brass pushrod connector	Connector backplate
Engine	Servo horn, 180-degree

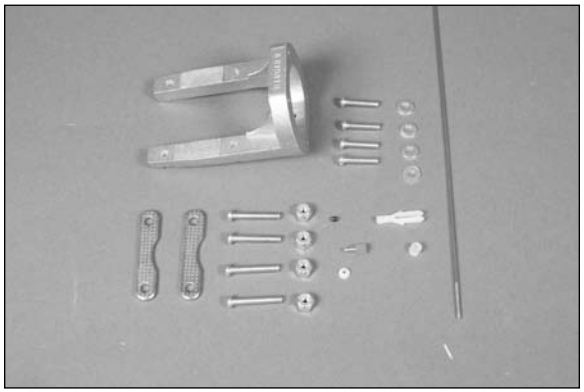
$15^{5}/_{8}$-inch (397mm) throttle pushrod
8-32 x 3/4-inch machine screw (4)
8-32 x 1-inch machine screw (4)

Required Tools and Adhesives

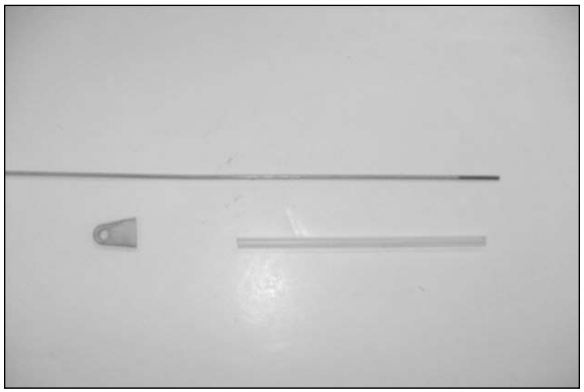
Threadlock	Phillips screwdriver: #2
Drill bit: 5/64-inch (2mm)	Pin vise
Pliers	Ruler
Side cutter	
1.5mm hex wrench (included)	

☐ Step 1

Locate the items necessary to attach the engine to the fuselage.



If you are installing a four-stroke in your model you will also need to locate the following items.

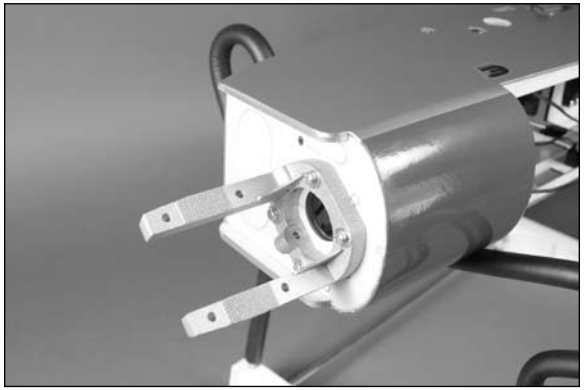


☐ **Step 2**

Cut the tip from the included threadlock vial. Slide a #8 washer on a 8-32 x 4/3-inch machine screw. Apply a drop of threadlock on the threads of the screw. Prepare four screws at this time.

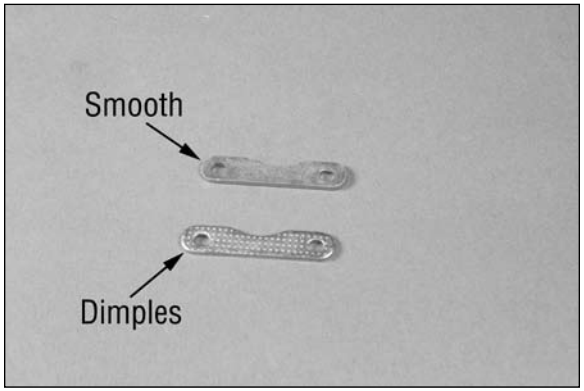
☐ **Step 3**

Attach the engine mount to the fuselage using the four screws prepared in the previous step.



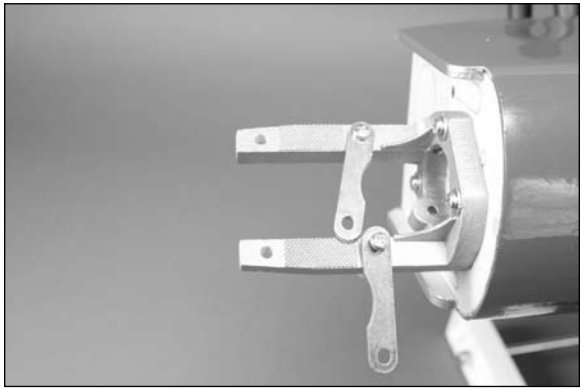
☐ **Step 4**

Locate the engine mount straps. Note that one side is smooth, while the other side has dimples. The smooth side will face up and away from the engine when installed.



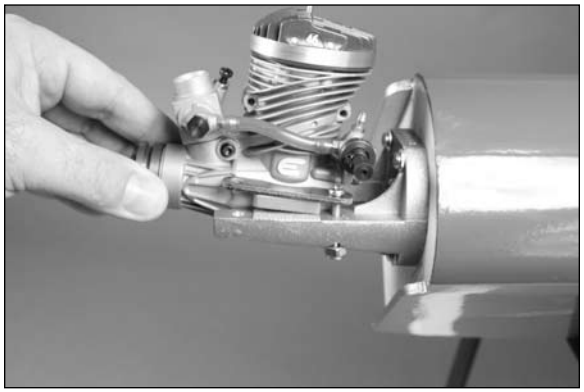
☐ **Step 5**

Slide a 8-32 x 1-inch machine screw through the engine mount strap from the smooth side. The screw then goes through the rear hole of the engine mount. Thread a 8-32 locknut on the screw from the underside of the engine mount. Install both engine mount straps at this time.



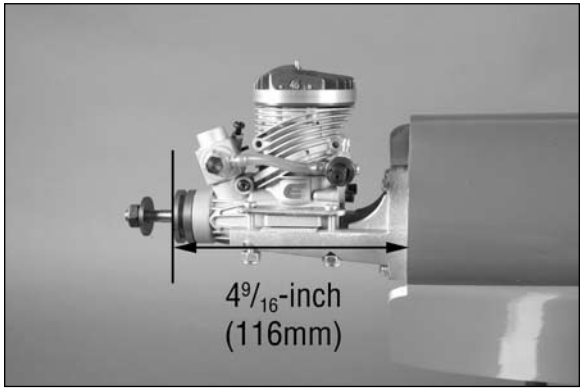
☐ **Step 6**

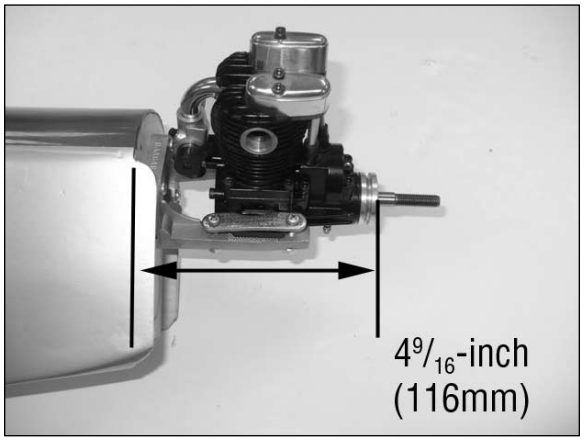
Slide the engine into position. The engine mount straps will be on the top of the engine mount lugs as shown.



☐ **Step 7**

Install an 8-32 x 1-inch machine screw through the mount and engine mount rail at the front of the mount. Thread an 8-32 locknut on the screw from the underneath of the engine mount. Position the engine so the drive washer is $4^{9}/_{16}$ inches (116mm) forward of the firewall.

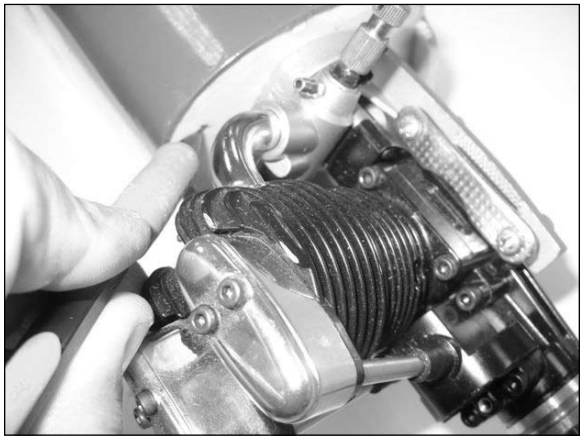




SPECIAL CONSIDERATION FOR FOUR-STROKE INSTALLATION

☐ **Step A**

You will need to drill the firewall to install the pushrod tube for the four-stroke throttle linkage. Use a pencil to mark the firewall in a location that aligns with the carburetor arm of your engine.

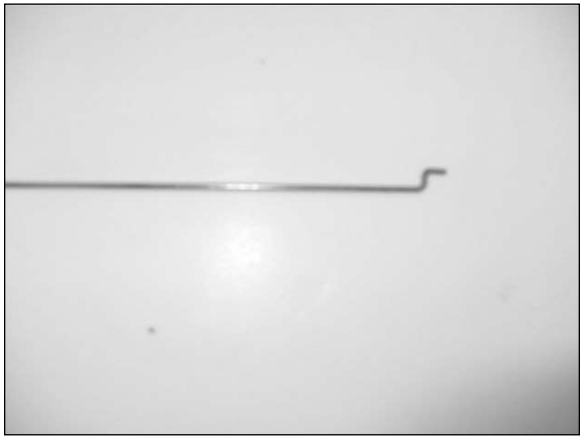


☐ **Step B**

Remove the engine from the mount and drill a 5/32-inch (4mm) hole in the firewall at the mark made in the previous step. Use medium grit sandpaper to roughen the ends of the pushrod tube. Slide the pushrod tube into the hole so it is flush with the firewall. Use medium CA to glue the pushrod in position.

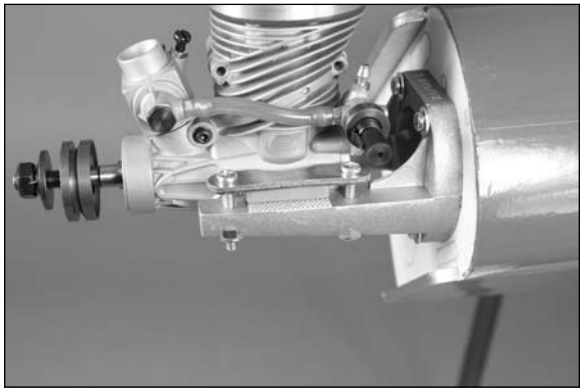
☐ **Step C**

Cut the threaded end off the $15^{5}/_{8}$-inch (397mm) threaded pushrod. Use Z-bend pliers to make a Z-bend in the end where the threads were.



☐ **Step 8**

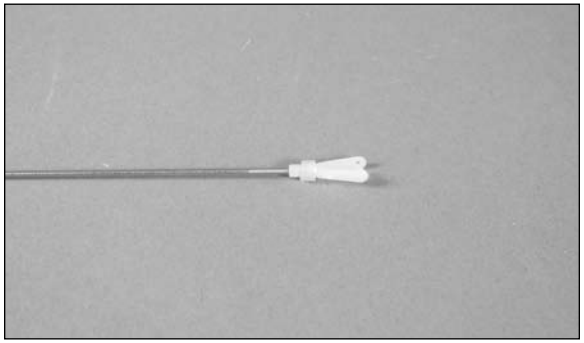
Use a #2 Phillips screwdriver to tighten the screws evenly to secure the engine in the mount.



Note: Skip Step 9 if you are installing a four-stroke engine.

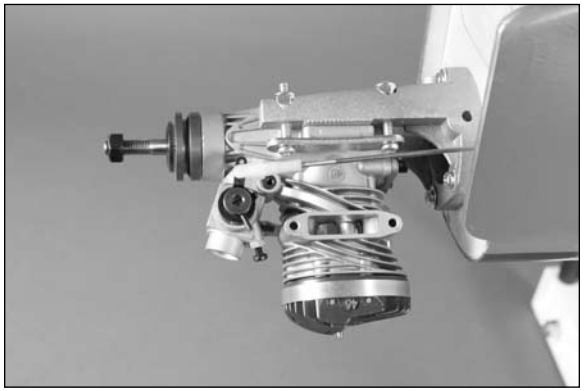
☐ Step 9

Slide a clevis retainer on one of the nylon clevises. Thread the clevis 12-turns on the $15^{5}/_{8}$-inch (397mm) threaded pushrod.



☐ Step 10

Slide the pushrod into the pushrod tube in the firewall. Connect the clevis to the outer hole of the carburetor arm. Slide the clevis retainer over the forks of the clevis to keep it from opening accidentally.



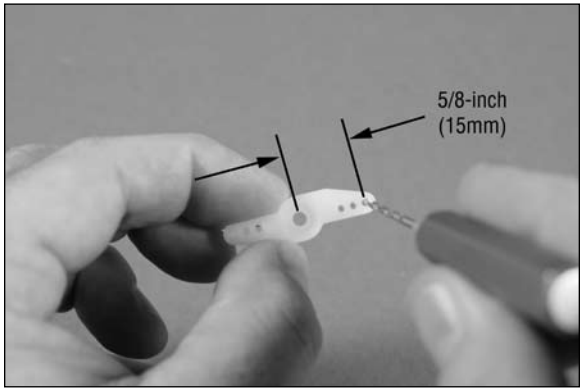
NOTE: SPECIAL CONSIDERATION FOR FOUR-STROKE INSTALLATION

☐ Step 10a

Insert the Z-bend made in the throttle pushrod in the outside hole of the carburetor arm. You may need to remove the carburetor arm or engine to slide the pushrod wire into the tube inside the fuselage.

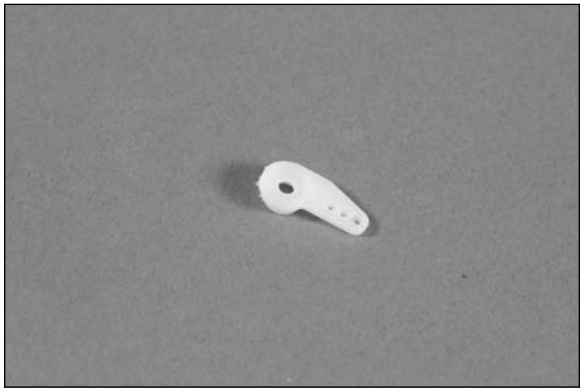
☐ Step 11

Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in the servo horn that is 5/8-inch (15mm) from the center of the horn as shown.



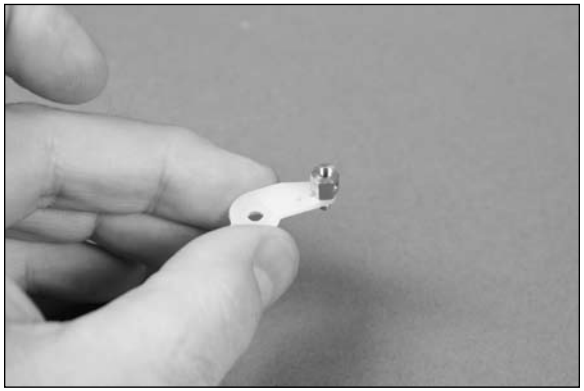
☐ Step 12

Use side cutters to remove the remaining arm from the servo horn so it doesn't interfere with the operation of the servos.



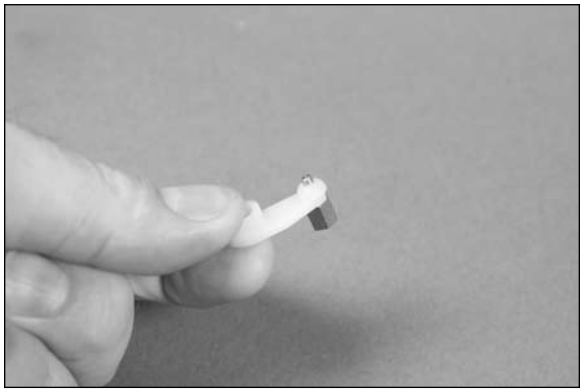
☐ **Step 13**

Insert the brass pushrod connector in the hole made previously.



☐ **Step 14**

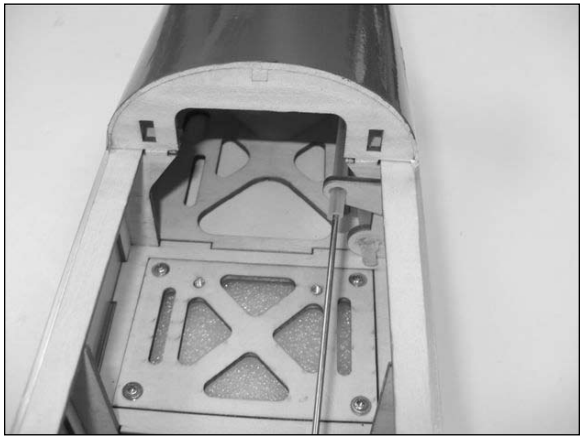
Secure the pushrod connector using the nylon backplate. Use pliers to press the backplate into position.



NOTE: SPECIAL CONSIDERATION FOR FOUR-STROKE INSTALLATION

☐ **Step 14a**

Slide the plywood pushrod guide on the throttle pushrod. Position the guide so it is placed as shown in the photo. Do not glue the guide at this time.

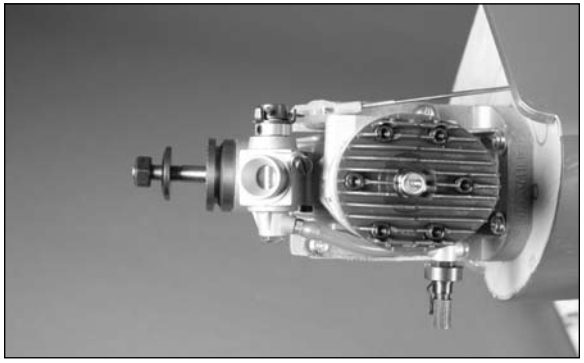


☐ **Step 15**

Turn on the transmitter and receiver. Center the throttle stick and trim. Install the servo horn parallel to the servo center line as shown. This will provide equal travel from low to full throttle.

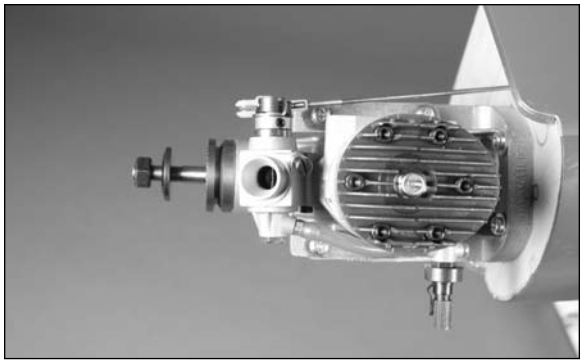
☐ **Step 16**

Use the transmitter to move the servo to low throttle. Close the carburetor on the engine and use a 3mm x 3mm setscrew and 1.5mm hex wrench (included) to secure the pushrod to the pushrod connector.



☐ **Step 17**

Use the transmitter to check that the carburetor will fully open. You may need to fine-tune the endpoints at the radio if it doesn't open fully, or if the servo binds at full throttle.



Installing the Fuel Tank, Cowling and Spinner for Glow Installations

Required Parts

Fuselage assembly	Fuel tank
Spinner assembly (optional)	#4 washer (2)
Fuel tank stay	Muffler
Cowling (painted)	Cowling (clear)

4-40 x 5/8-inch socket head screw (2)
#2 x 3/8-inch self-tapping screw (8)
Exhaust stack (right and left)
Exhaust diverter (optional)

Required Tools and Adhesives

Drill bit: 5/64-inch (2mm)	Pin vise
Phillips screwdriver: #1	Box wrench: 7/16-inch

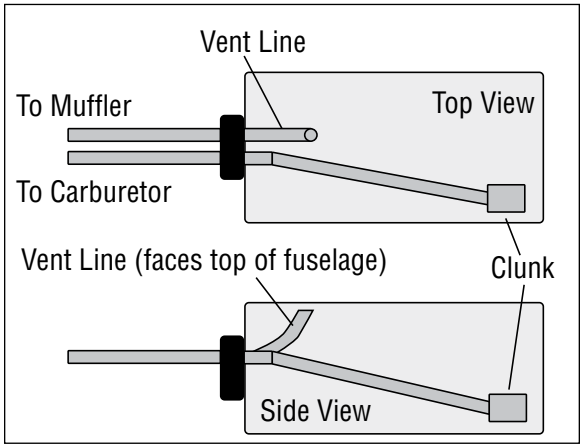
Hex wrench: 3/32-inch, 7/64-inch

☐ Step 1

Locate the items to install the cowl and fuel tank for your model.

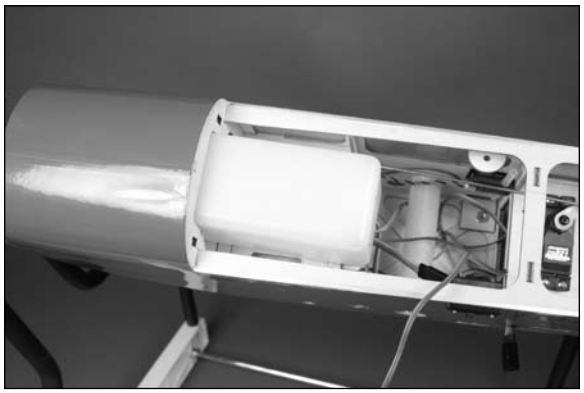
☐ Step 2

Inspect the fuel tank according to the following drawing to determine the vent and clunk lines on the tank. The vent line must face up when installing the tank or the engine will not operate properly.



☐ Step 3

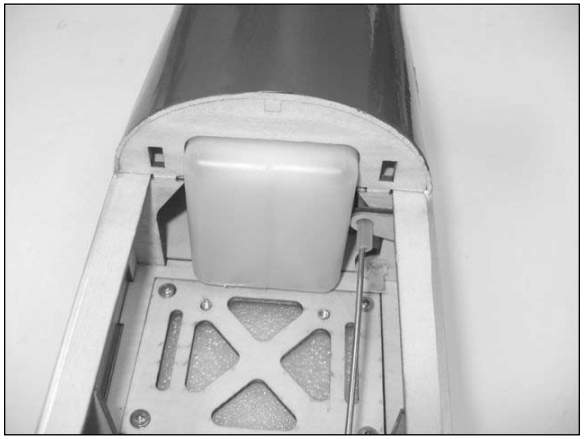
Slide the fuel tank into the fuselage. Make sure the vent line faces to the top as described in the previous step.



NOTE: SPECIAL CONSIDERATION FOR FOUR-STROKE INSTALLATION

☐ Step 3a

Use medium CA to glue the throttle pushrod guide to the former as shown. Make sure the throttle linkage does not bind when gluing the pushrod guide.

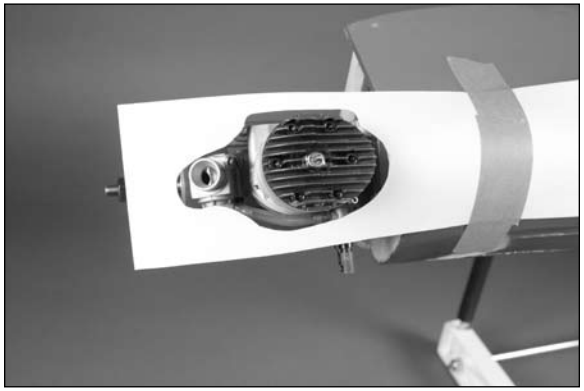


☐ Step 4

Secure the tank in the fuselage using two 4-40 x 5/8-inch socket head screws and two #4 washers and the fuel tank stay. Tighten the screws using a 3/32-inch hex wrench or ball driver.

☐ **Step 2**

Use cardstock to make template indicating the needle valve, engine head and muffler, as well as any other items that may protrude through the cowling.



☐ **Step 3**

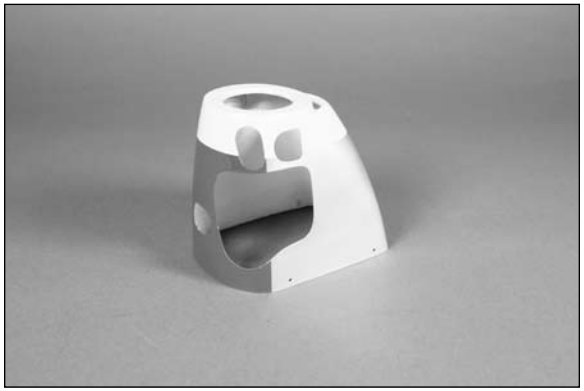
Remove the engine from the firewall and position the clear cowling on the front of the fuselage. Use the templates and a felt-tipped pen to transfer the locations to the clear cowling.

☐ **Step 5**

Use the clear cowl as a template tor the painted cowl. Trim the clear cowl to fit your particular engine. Remember to leave enough room to install the muffler.

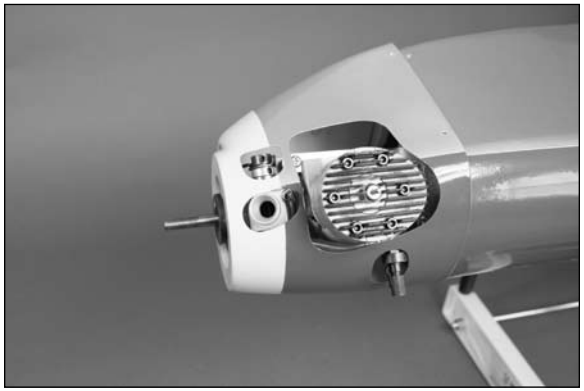
☐ **Step 5**

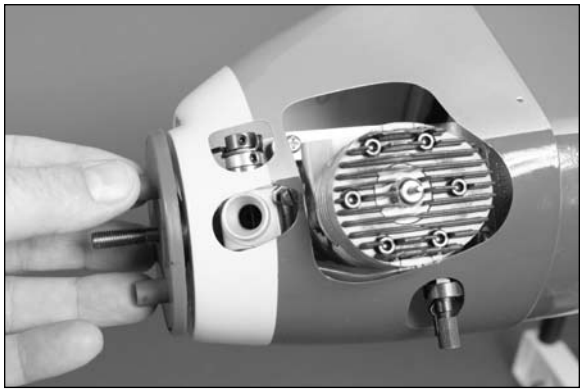
Use hobby scissors and a rotary tool with a sanding drum to neatly trim the painted cowl.



☐ **Step 6**

Slide the cowling on the fuselage. The spinner backplate will then be slid on the propeller shaft. Make sure the drive washer on the engine in positioned correctly and the spinner backplate is tight against the drive washer.





Note: The Dubro spinner will include adapters to fit a variety of engine shafts. Make sure to select the correct adapter for your application.

Note: The spinner is not included and will need to be purchased separately.

☐ **Step 7**

Position the cowl so there is a 3/32-inch (2mm) gap between the cowl and spinner backplate. Use a pin drill and 1/16-inch (1.5mm) drill bit to drill through the mounting holes in the cowling and into the fuselage.

☐ **Step 8**

Slide the cowling forward to expose the holes in the fuselage. Place 2–3 drops of thin CA in each of the four holes to harden the surrounding wood. This will help prevent the screws from vibrating loose.

☐ **Step 9**

Use a #1 Phillips screwdriver to install the four #2 x 3/8-inch self-tapping screws that secure the cowling to the fuselage.

☐ **Step 10**

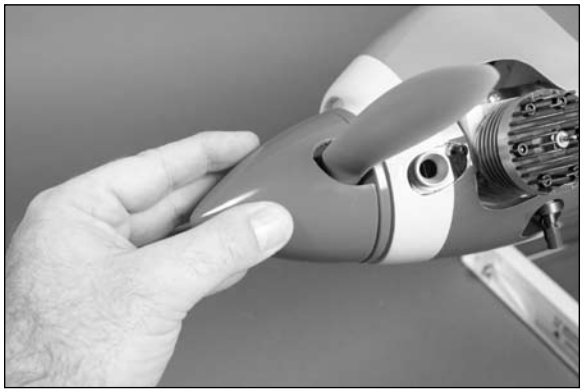
Slide the propeller into position.

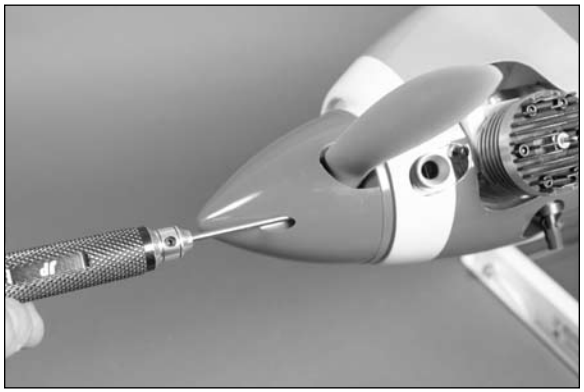
☐ **Step 11**

Slide the washer and thread the nut onto the engine shaft. Rotate the propeller clockwise so it is resting against the lugs of the spinner backplate. Use a 7/16-inch box end wrench to tighten the propeller nut. Never use pliers, as the nut will not be tight enough, and could come loose.

☐ **Step 12**

Locate the four 6-32 x 1/2-inch self-tapping socket head screws. Position the spinner cone onto the spinner backplate, making sure it keys into the backplate. Use the screws and a 7/64-inch ball driver or hex wrench to secure the spinner cone to the backplate.





☐ **Step 13**

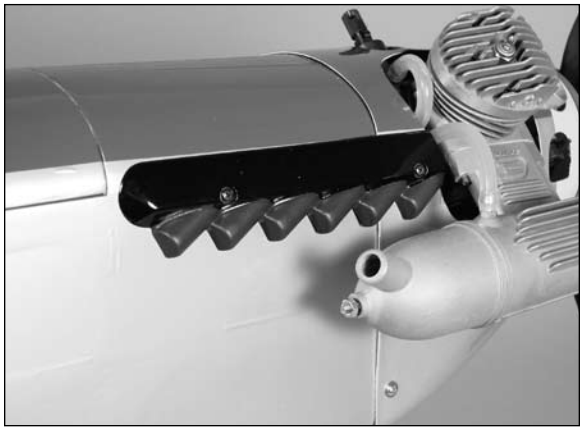
Attach the muffler to the engine using the hardware provided with the engine. We also installed an exhaust diverter (optional) to direct the engine exhaust away from the fuselage.

☐ **Step 14**

Use a #1 Phillips screwdriver to attach the exhaust stacks to the fuselage using the four #2 x 5/16-inch wood screws.

Note: The exhaust stack for the right side of the model is shorter than the left. This is necessary to clear the muffler.

Hint: Starting the screw partially in the exhaust stack will help in getting the screw started in the pre-drilled holes in the cowling and fuselage.



Installing the Electric Motor

Required Parts

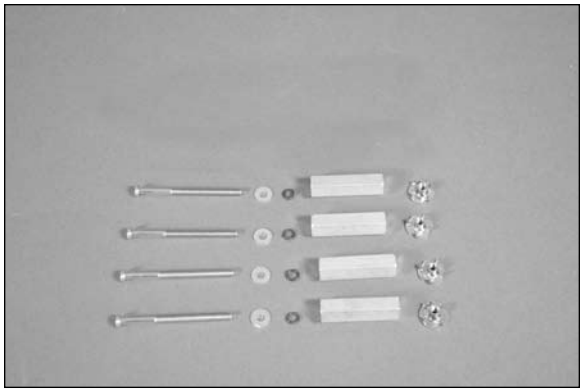
Fuselage assembly	Motor with hardware
#8 washer (4)	#8 lockwasher (4)
Electronic speed control	Motor battery
40mm motor standoff (4)	8-32 blind nut (4)
8-32 x 2 1/4-inch machine screw (4)	

Required Tools and Adhesives

Threadlock	Phillips screwdriver: #2
Hook and loop tape	

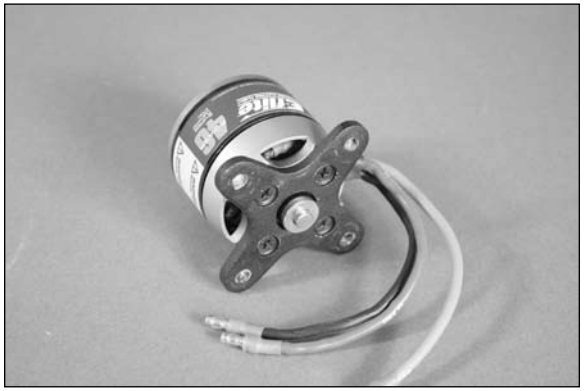
☐ Step 1

Locate the items to install the electric motor on the fuselage.



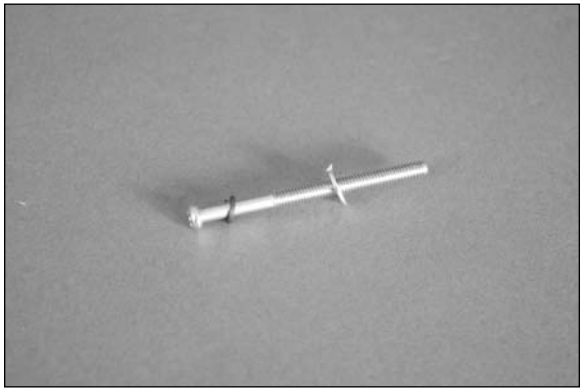
☐ Step 2

Secure the X-mount to the motor using the hardware provided with the motor. Be sure to use threadlock on the screws to prevent them from vibrating loose.



☐ Step 3

Slide a #8 lockwasher and #8 washer on the 8-32 x 2 1/4-inch machine screw. Prepare four screws at this time.



☐ Step 4

Secure the motor using the four screws prepared in the previous step and four 40mm motor standoffs. You will need to install the four 8-32 blind nuts behind the firewall for the screws.

☐ Step 5

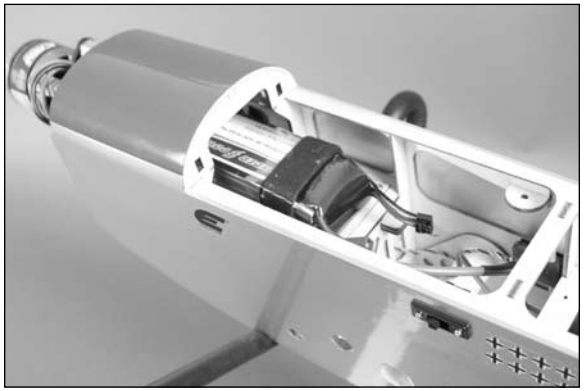
Secure the speed control inside the fuselage as shown. Pass the leads for the motor through the narrow slot made in the firewall at the beginning of this manual.

☐ **Step 5**

Connect the leads from the motor to the leads from the speed control. If you are using an E-flite motor and speed control the colors of the leads will match up and the motor will operate in the correct rotation.

☐ **Step 6**

Install the motor battery in the fuselage.



☐ **Step 7**

Use the radio system to check the operation of the motor at this time. It should rotate counterclockwise when viewed from the front of the fuselage. If it does not, read through the instructions for the speed control to correct the direction of rotation.

Installing the Cowling and Spinner for Electric Motor Installations

Required Parts

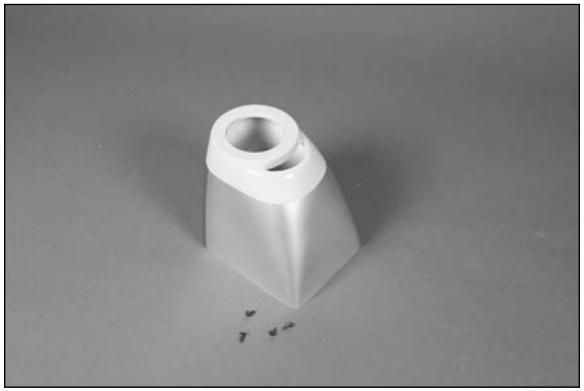
Fuselage assembly	Propeller
Spinner assembly (optional)	
Exhaust stack (right and left)	
#2 x 3/8-inch self-tapping screw (8)	

Required Tools and Adhesives

Phillips screwdriver: #1	Thin CA
Drill bit: 1/16-inch (1.5mm)	Pin vise
Hex wrench: 7/64-inch	

☐ **Step 1**

Locate the items to install the cowl and fuel tank for your model.



☐ **Step 2**

Slide the cowling on the fuselage. The spinner backplate will then be slid on the propeller shaft. Make sure the drive washer on the engine in positioned correctly and the spinner backplate is tight against the drive washer.

Note: The Dubro spinner will include adapters to fit a variety of engine shafts. Make sure to select the correct adapter for your application.

☐ **Step 3**

Position the cowl so there is a 3/32-inch (2mm) gap between the cowl and spinner backplate. Use a pin drill and 1/16-inch (1.5mm) drill bit to drill through the mounting holes in the cowling and into the fuselage.

☐ **Step 4**

Slide the cowling forward to expose the holes in the fuselage. Place 2–3 drops of thin CA in each of the four holes to harden the surrounding wood. This will help prevent the screws from vibrating loose.

☐ **Step 5**

Use a #1 Phillips screwdriver to install the four #2 x 3/8-inch self-tapping screws that secure the cowling to the fuselage.

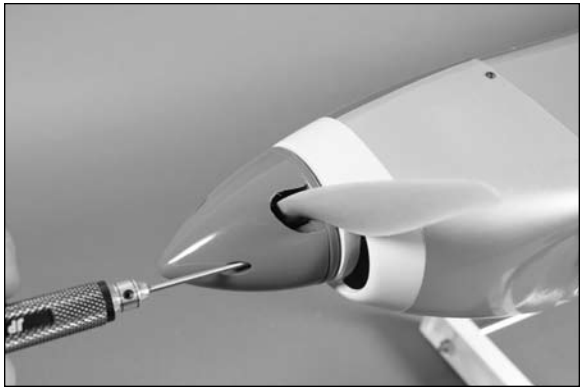
☐ **Step 6**

Slide the propeller into position. Tighten the adapter nut using a hex wrench that fits through the hole in the adapter nut.

☐ **Step 7**

Locate the four 6-32 x 1/2-inch self-tapping socket head screws. Position the spinner cone onto the spinner backplate, making sure it keys into the backplate. Use the screws and a 7/64-inch ball driver or hex wrench to secure the spinner cone to the backplate.

Note: The spinner is not included and will need to be purchased separately.

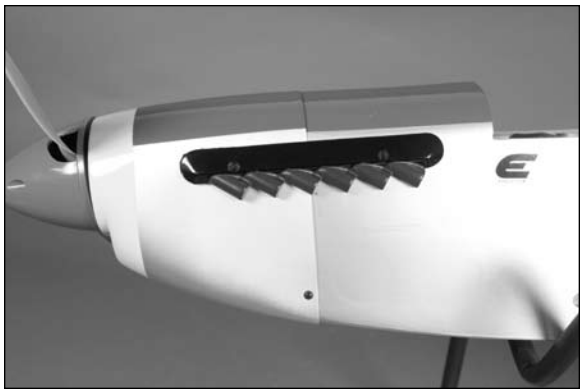


☐ **Step 8**

Use a #1 Phillips screwdriver to attach the exhaust stacks to the fuselage using the four #2 x 5/16-inch wood screws.

Note: The exhaust stack for the right side of the model is shorter than the left.

Hint: Starting the screw partially in the exhaust stack will help in getting the screw started in the pre-drilled holes in the cowling and fuselage.



Installing the Pilot and Canopy

Required Parts

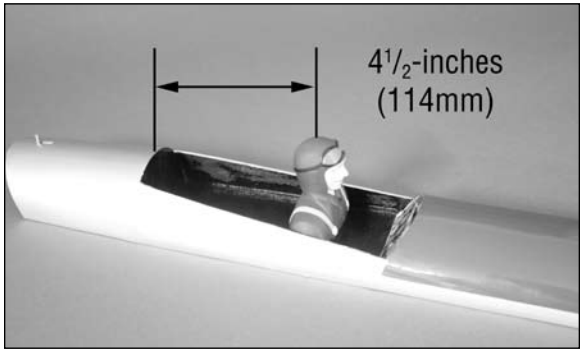
Canopy	Canopy hatch
Pilot figurine	

Required Tools and Adhesives

30-minute epoxy	Canopy glue
Sandpaper: medium grit	Rubbing alcohol
Paper towel	Low-tack tape

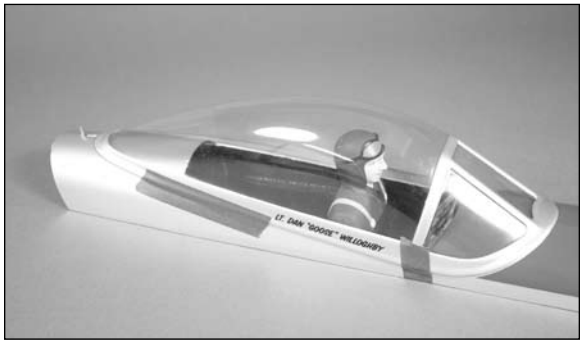
☐ **Step 1**

Use 30-minute epoxy to glue the pilot in the cockpit. Position the pilot so it is $4^1/_2$-inches (114mm) forward of the rear edge of the cockpit as shown.



☐ **Step 2**

Lightly sand the inside edge of the canopy using medium grit sandpaper. Apply a bead of canopy glue to the canopy and position it on the canopy hatch. Use low-tack tape to keep the canopy in position until the glue fully cures.



Installing the Aileron Servos

Required Parts

Wing panel (right and left)	180 servo horn (2)
Servo mounting block (4)	Servo with hardware (2)
Clevis retainer (2)	Clevis (2)

$2^5/_8$-inch (67mm) aileron pushrod (2)
#2 x 3/8-inch self-tapping screw (8)
Servo extension, 9-inch (228mm)

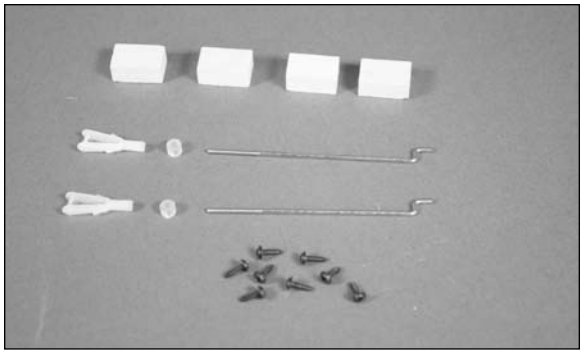
Required Tools and Adhesives

Pencil	30-minute epoxy
Drill	Sandpaper
Phillips screwdriver: #1	Thin CA
Mixing cups	Mixing sticks
Side cutter	String or dental floss

Pin vise
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)

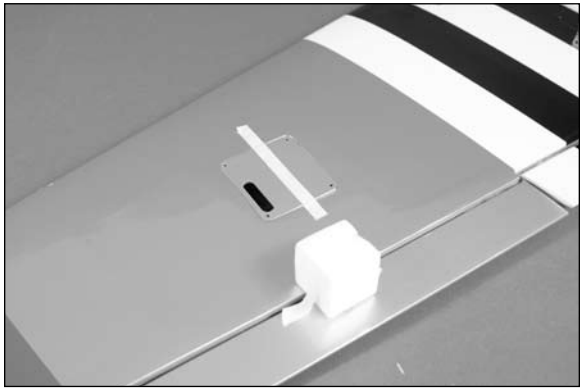
☐ **Step 1**

Locate the items necessary to install the aileron servos.



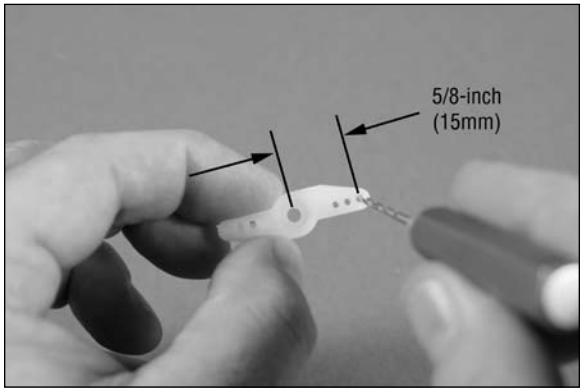
☐☐ **Step 2**

Remove the foam shipping blocks protecting the airframe from damage.



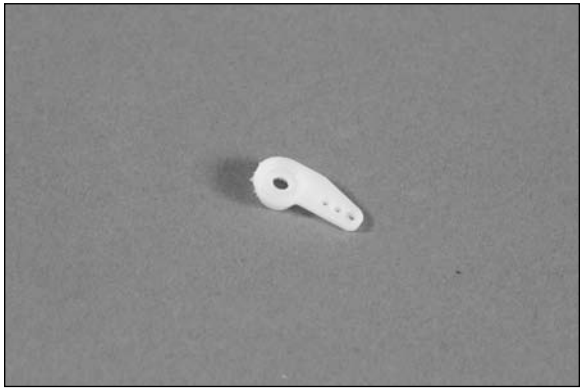
☐☐ **Step 3**

Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in a 180-degree servo horn that is 5/8-inch (15mm) from the center of the arm.



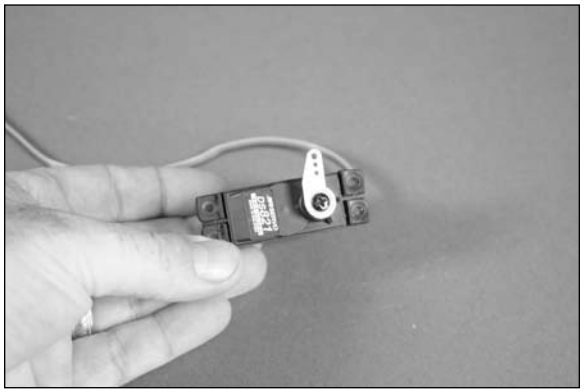
☐☐ **Step 4**

Use side cutters to remove the excess arm from the horn so it does not interfere with the operation of the servo.



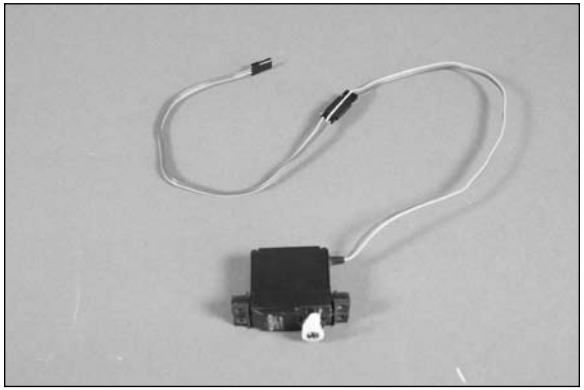
☐☐ **Step 5**

Use the radio system to center the aileron servo. Install the arm so it is perpendicular to the servo center line as shown.



☐☐ **Step 6**

Secure a 9-inch (228mm) servo extension to the servo lead using dental floss, string or a commercially available fastener.



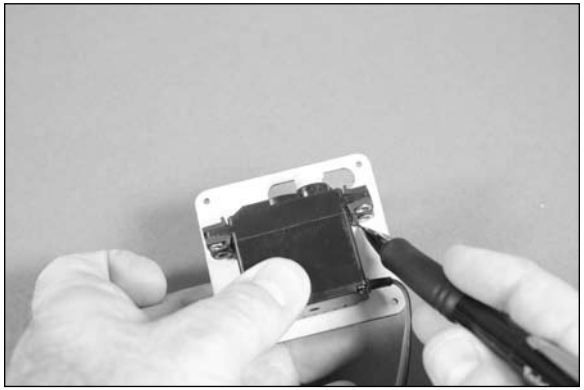
☐☐ **Step 7**

Remove the servo cover from the wing. Position the servo on the cover so the servo horn is centered in the slot in the cover as shown.

Note: The right and left servos will have the servo arm facing different directions. If the servo does not rest fully on the cover, you may need to rotate the servo horn 180-degrees.

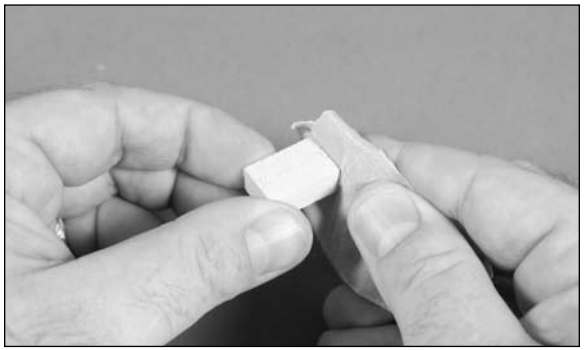
☐☐ Step 8

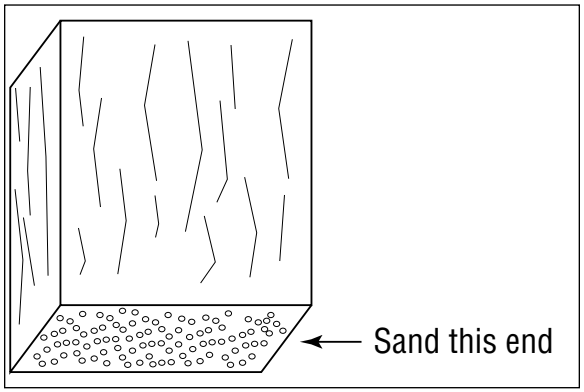
Use a pencil to mark the position of the servo mounting tabs on the cover.



☐☐ Step 9

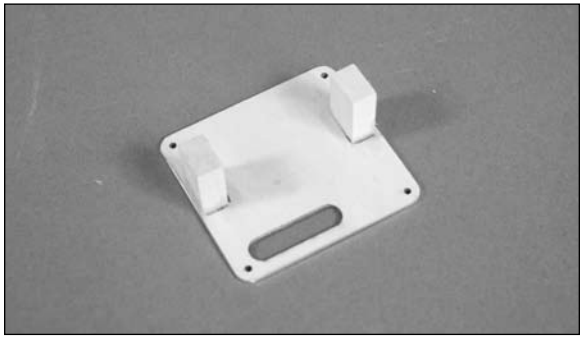
Use medium grit sandpaper to lightly sand the end of the block that will rest against the servo cover.





☐☐ Step 10

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

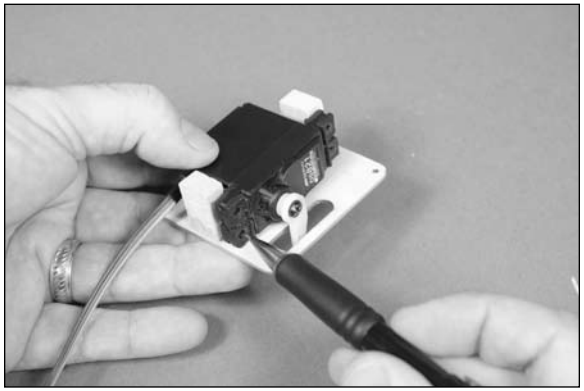


☐ Step 11

Repeat Steps 2 through 10 to prepare the remaining servo cover for the servo.

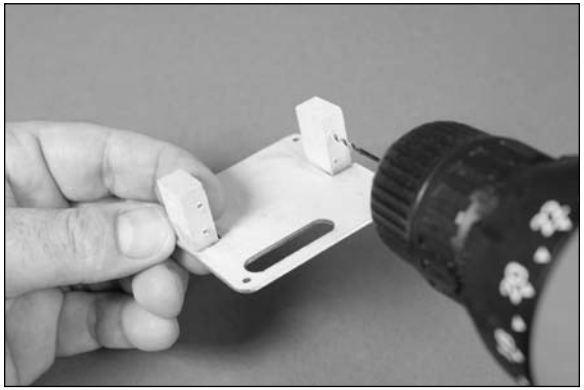
☐☐ Step 12

Position the servo between the servo mounting blocks. Use a pencil to transfer the positions for the screws to the mounting blocks.



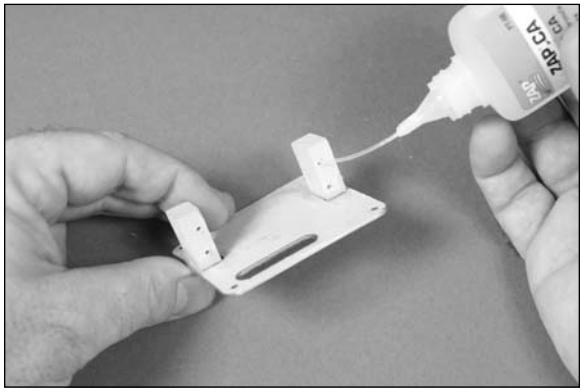
☐☐ Step 13

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



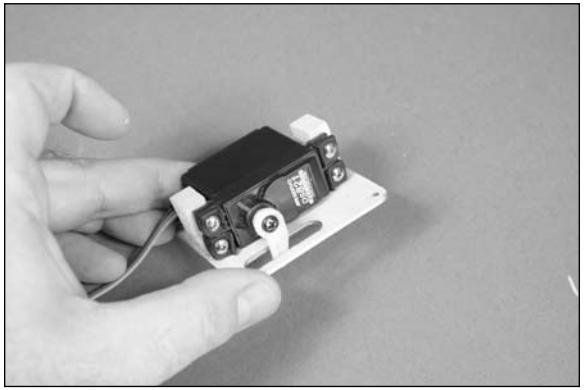
☐☐ Step 14

Apply 2–3 drops of thin CA in each hole to harden the surrounding wood. This will help in preventing the screws from vibrating loose.



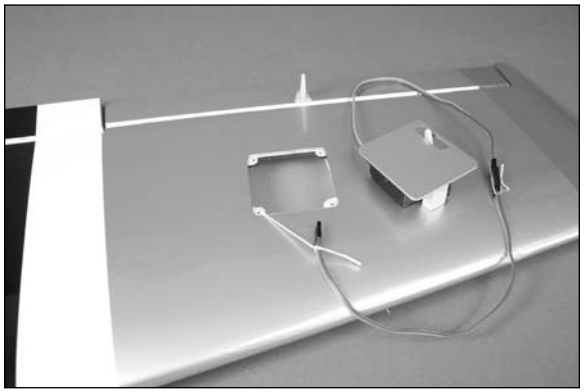
☐☐ Step 15

Secure the servo to the blocks using the screws provided with the servo and a #1 Phillips screwdriver.



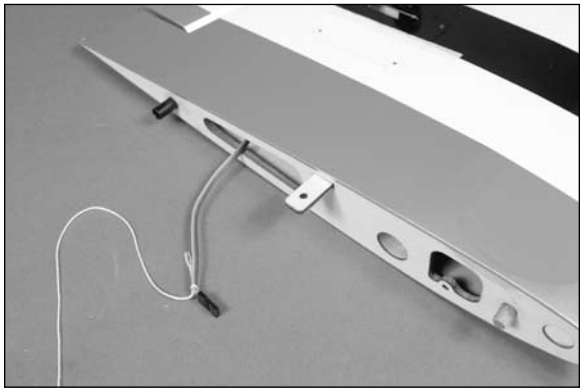
☐☐ Step 16

Tie the string located in the wing to the servo extension for the servo.



☐☐ Step 17

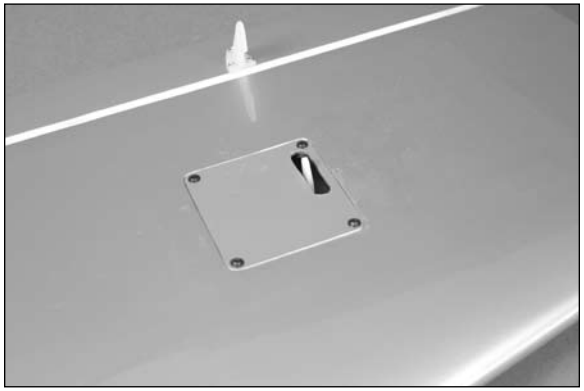
Use the string to pull the servo lead through the wing.



Hint: If you are installing operational flaps, leave a loop of string around the lead so it can be differentiated from the flap servo lead.

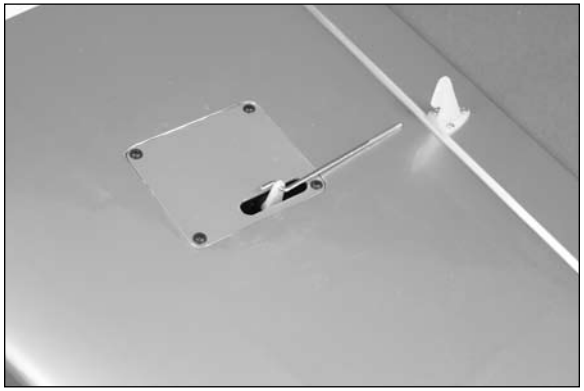
☐☐ Step 18

Secure the servo cover to the wing using four #2 x 3/8-inch self-tapping screws and a #1 Phillips screwdriver.



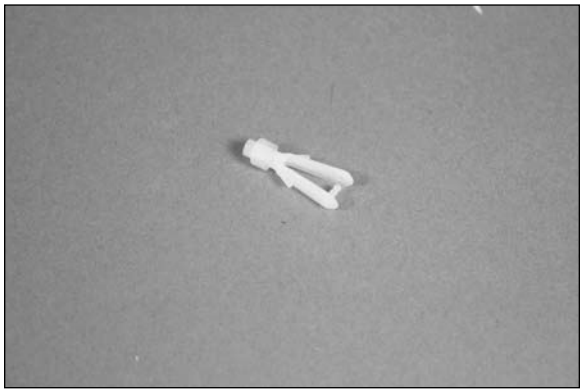
☐☐ Step 19

Insert the bend in the $2^{5}/_{8}$-inch (67mm) aileron pushrod through the hole in the servo horn that was enlarged back in Step 3.



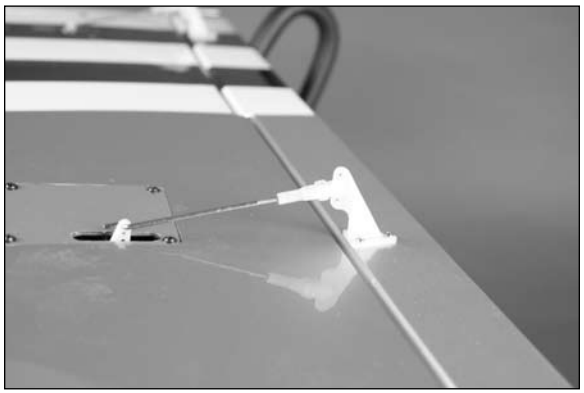
☐☐ Step 20

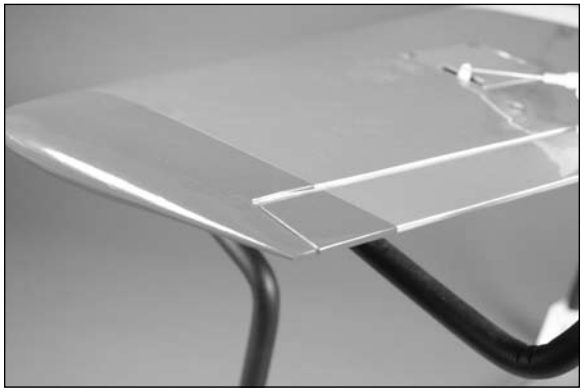
Slide a clevis retainer on a nylon clevis.



☐☐ **Step 21**

Attach the clevis to the center hole on the aileron control horn. With the servo centered, thread the clevis on the linkage wire. Adjust the clevis so the control surface is centered as shown in the second photo. Once centered, slide the clevis retainer over the forks of the clevis to prevent it from opening accidentally.





☐ **Step 22**

Repeat Steps 11 through 21 to complete the servo installation.

Installing the Fixed Flaps

The P-51D Mustang is a special trainer plane in that it will allow you to go from learning the basics of flight all the way up to performing aerobatics without upgrading or purchasing a new plane. As you learn to fly and become ready for a little more challenge, the P-51D Mustang will grow with you.

If you plan on installing the operational flaps you can skip this section of the manual.

Required Parts

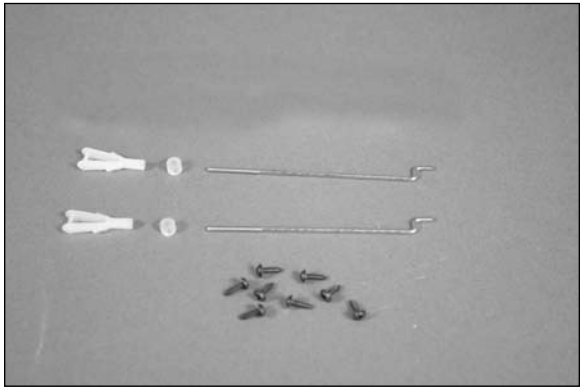
Wing panel (right and left)
Flap stay (black and white)
Clevis retainer (2)
Clevis (2)
3-inch (76mm) flap pushrod (2)
#2 x 3/8-inch self-tapping screw (8)

Required Tools and Adhesives

30-minute epoxy
Phillips screwdriver: #1

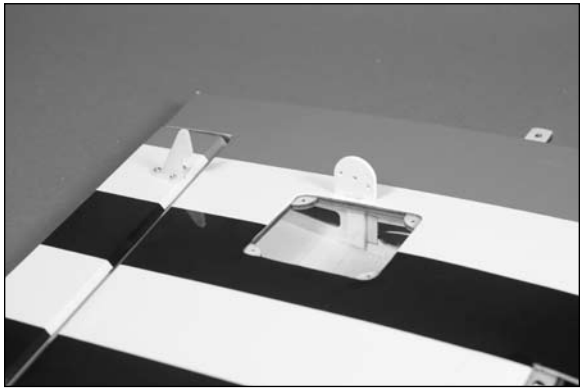
☐ **Step 1**

Locate the items necessary to install the aileron servos.



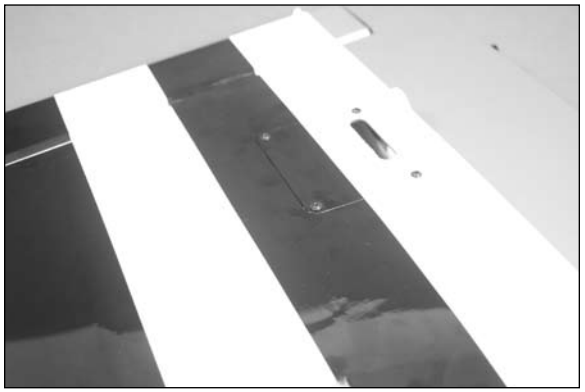
☐☐ **Step 2**

Use 30-minute epoxy to glue the flap stay in the wing. Note the position of the holes in relationship to the wing.



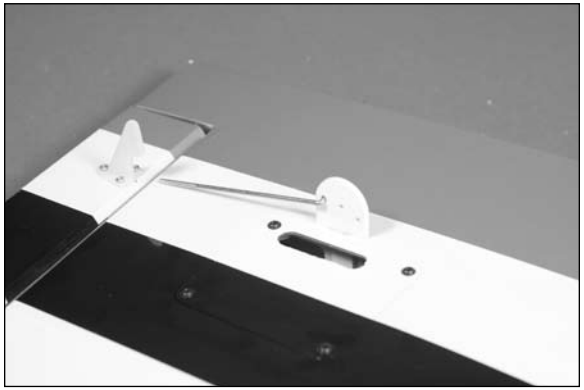
☐☐ **Step 3**

Use four #2 x 3/8-inch self-tapping screws to secure the flap servo cover to the wing.



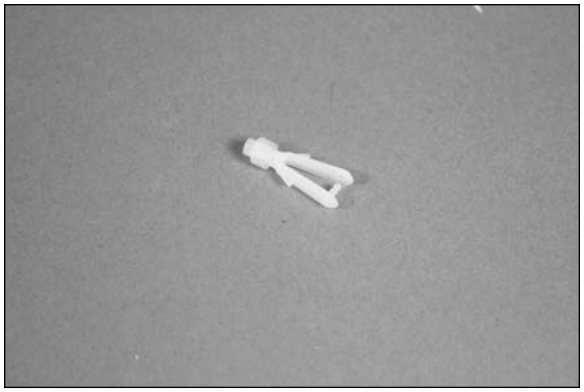
☐☐ **Step 4**

Insert the bend of the 3-inch (76mm) linkage in the rear hole of the flap stay.



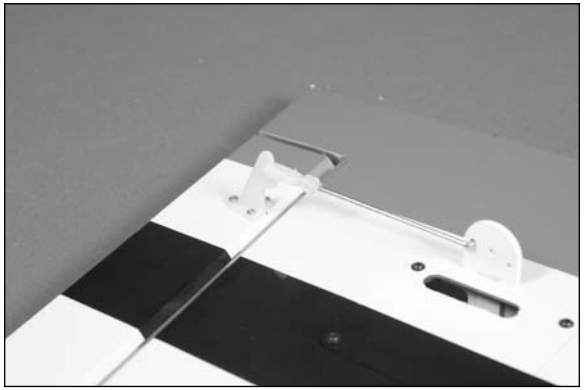
☐☐ **Step 5**

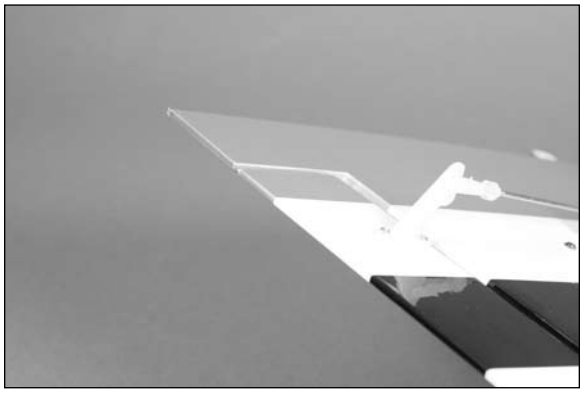
Slide a clevis retainer on a nylon clevis.



☐☐ **Step 6**

Thread the clevis on the linkage. Attach the linkage to the center hole of the control horn. Adjust the clevis so the flap is aligned with the trailing edge of the wing. Slide the clevis retainer over the forks of the clevis to keep the clevis from opening accidentally.





☐ **Step 7**

Repeat Steps 1 through 6 to install the remaining flap linkage. Make sure to adjust the flap on both the left and right wing panels or you may have difficulty trimming the roll (aileron) of your P-51D Mustang.

Installing the Optional Flap Servos

Required Parts

Wing panel (right and left)	180 servo horn (2)
Servo mounting block (4)	Servo with /hardware (2)
Clevis retainer (2)	Clevis (2)

3-inch (76mm) aileron pushrod (2)
#2 x 3/8-inch self-tapping screw (8)
Servo extension, 9-inch (228mm)

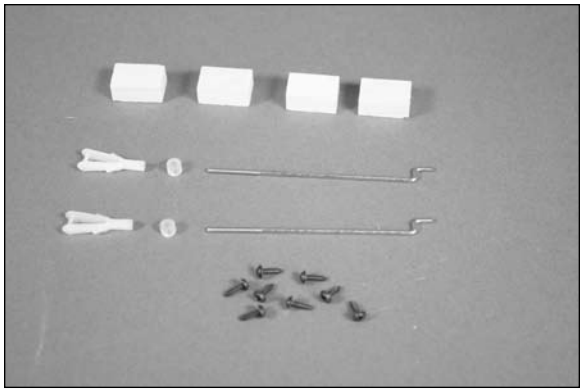
Required Tools and Adhesives

Pencil	30-minute epoxy
Drill	Sandpaper
Phillips screwdriver: #1	Thin CA
Mixing cups	Mixing sticks
Side cutter	String or dental floss

Pin vise
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)

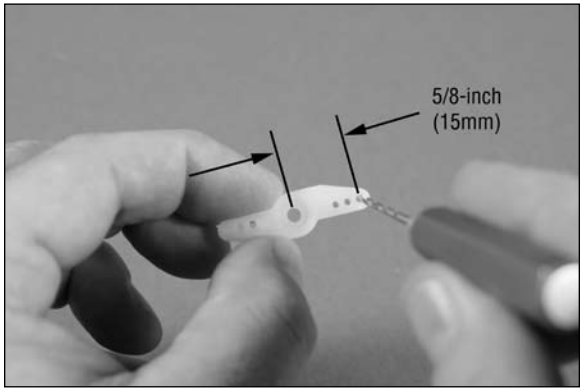
☐ **Step 1**

Locate the items necessary to install the flap servos.



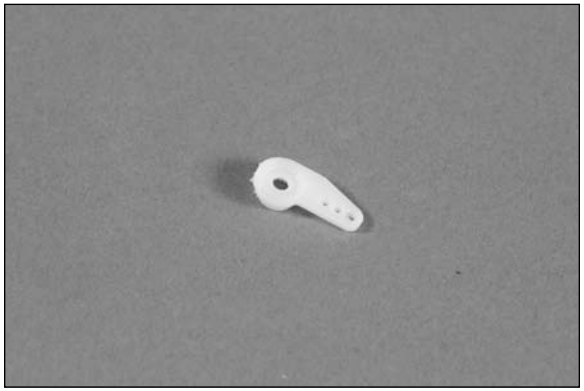
☐☐ **Step 2**

Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in a 180-degree servo horn that is 5/8-inch (15mm) from the center of the arm.



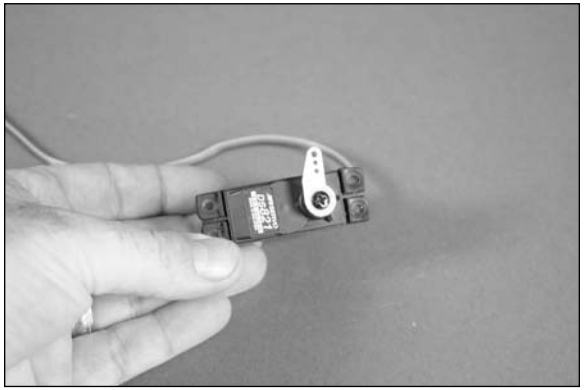
☐☐ **Step 3**

Use side cutters to remove the excess arm from the horn so it does not interfere with the operation of the servo.



☐☐ **Step 4**

Use the radio system to center the flap servo. Install the arm so it is perpendicular to the servo center line as shown.

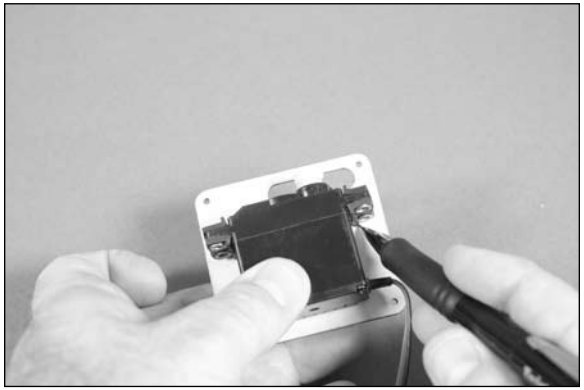


☐☐ **Step 5**

Remove the servo cover from the wing. Position the servo on the cover so the servo horn is centered in the slot in the cover as shown.

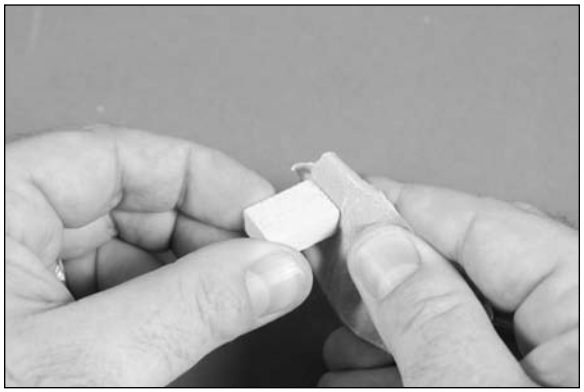
☐☐ **Step 6**

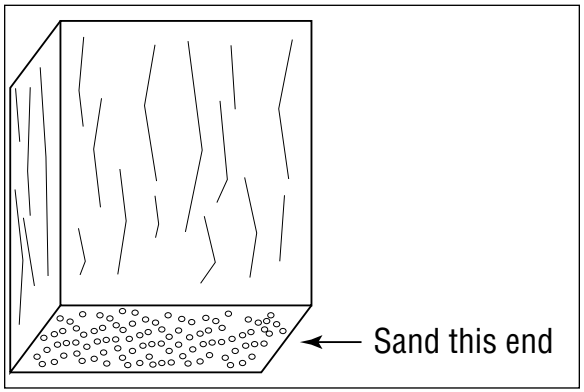
Use a pencil to mark the position of the servo mounting tabs on the cover.



☐☐ **Step 7**

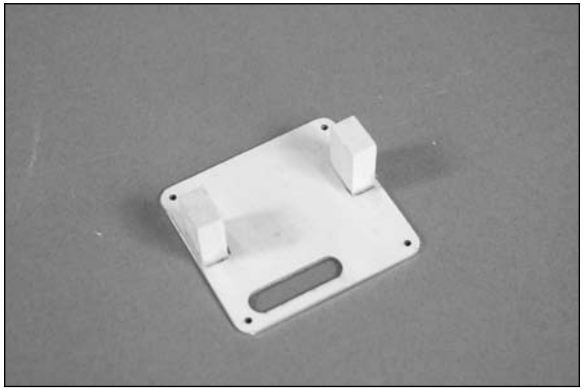
Use medium grit sandpaper to lightly sand the end of the block that will rest against the servo cover.





☐☐ Step 8

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

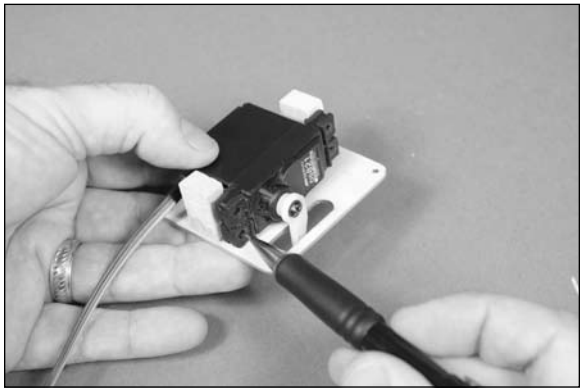


☐ Step 9

Repeat Steps 2 through 8 to prepare the remaining servo cover for the servo.

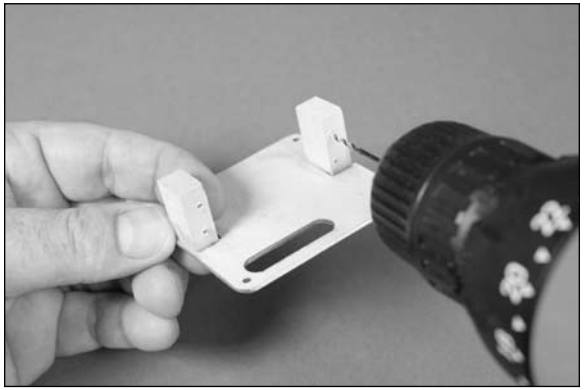
☐☐ Step 10

Position the servo between the servo mounting blocks. Use a pencil to transfer the positions for the screws to the mounting blocks.



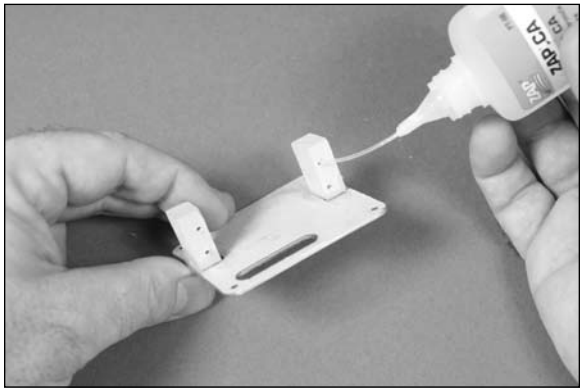
☐☐ Step 11

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



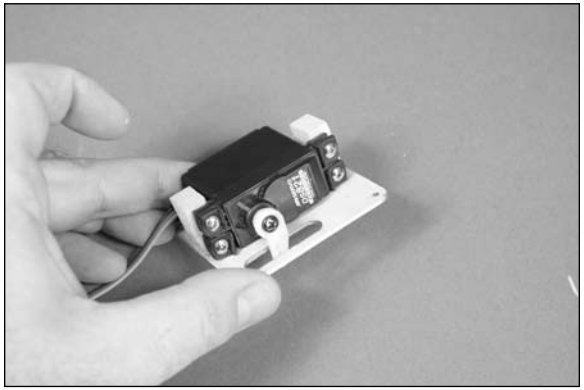
☐☐ Step 12

Apply 2–3 drops of thin CA in each hole to harden the surrounding wood. This will help in preventing the screws from vibrating loose.



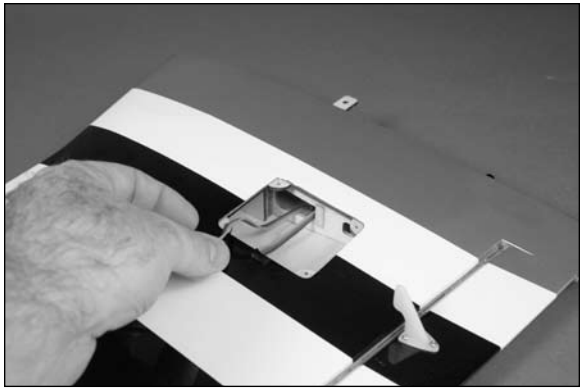
☐☐ Step 13

Secure the servo to the blocks using the screws provided with the servo and a #1 Phillips screwdriver.



☐☐ Step 14

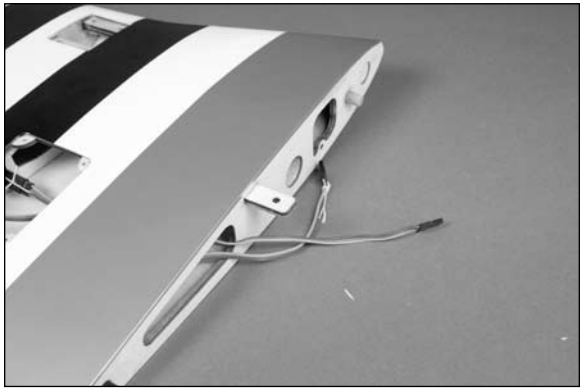
Pass the servo lead through the holes in the wing ribs.



Note: If you have installed the fixed flaps and are now installing the optional flaps, you will need to remove the flap stay. This can easily be done by scoring the stay near the wing and bending it slightly, which will break the flap stay where it was scored.

☐☐ Step 15

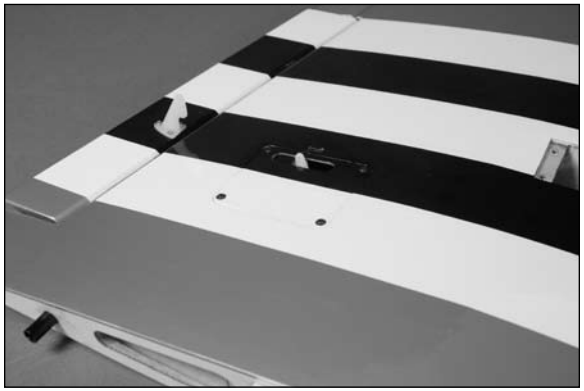
The servo lead will exit the same hole in the wing root as the aileron servo lead.



Hint: If you are installing operational flaps, leave a loop of string around the lead so it can be differentiated from the flap servo lead.

☐☐ Step 16

Secure the servo cover to the wing using four #2 x 3/8-inch self-tapping screws and a #1 Phillips screwdriver.

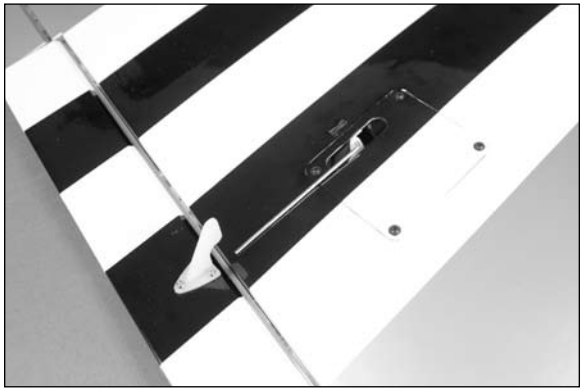


☐☐ Step 17

The best way to set the flaps is to set the endpoints for the flap travel to 0. You can then adjust the travel to achieve the correct up and down flap settings using your radio.

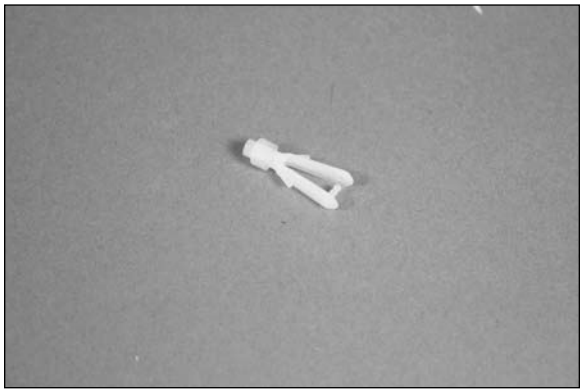
☐☐ Step 18

Insert the bend in the 3-inch (76mm) aileron pushrod through the hole in the servo horn that was enlarged back in Step 2.



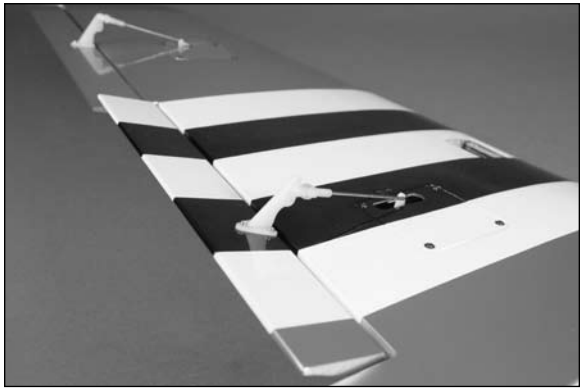
☐☐ Step 19

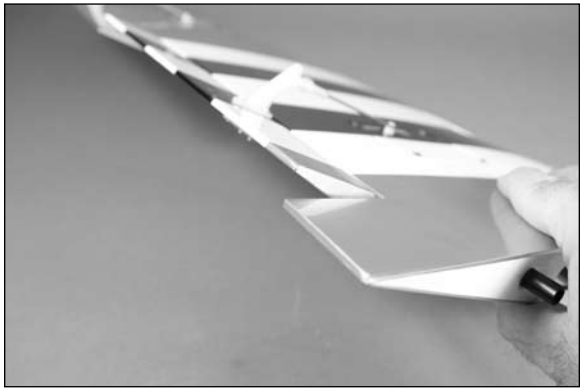
Slide a clevis retainer on a nylon clevis.



☐☐ Step 20

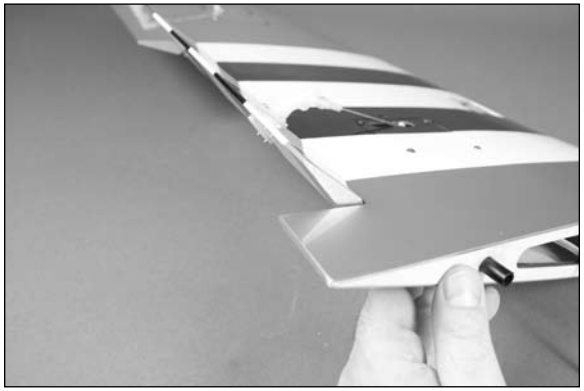
With the servo centered, thread the clevis on the linkage wire. Turn the radio on and set the flap switch on the radio to the half-flap (middle) position. Connect the clevis to the middle hole on the flap control horn and adjust the clevis so the control surface is set to the half-flap position of 1/2-inch (13mm). If your radio only has two positions you can adjust the clevis in either the up or down positions if you have set the endpoints to 0.





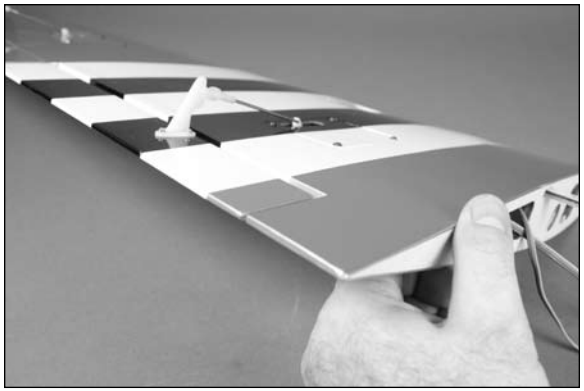
☐☐ **Step 21**

Set the flap switch on the radio to the down flap position. Use the endpoint travel to set the down flap position to 1-inch (25mm)



☐☐ **Step 22**

Set the flap switch on the radio to the up flap position. Use the endpoint travel to set the flap so it is aligned with the trailing edge of the wing.



☐ **Step 23**

Repeat Steps 10 through 22 to complete the servo installation.

Installing the Fixed Landing Gear

Required Parts

Wing panel (right and left)	Main gear (right and left)
Strut mount (2)	3mm x 4mm setscrew (2)
#6 washer (8)	Tie-wrap (4)

Landing gear door (right and left)

6-32 x 1/2-inch socket head screw (8)

Required Tools and Adhesives

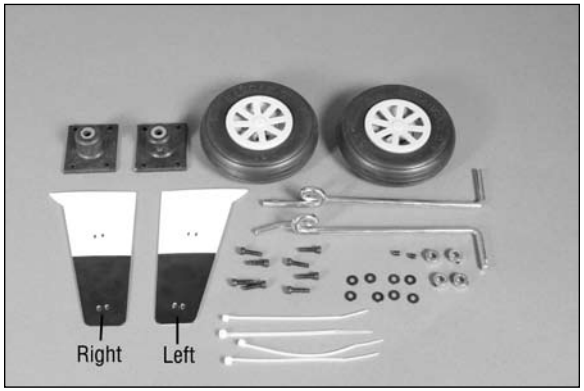
Threadlock	Silicone adhesive

Hex wrench: 1.5mm, 9/64-inch (included)

If you are planning on installing retracts in your model, you can skip the Fixed Gear Installation and move to the next section, Installing the Retracts.

☐ **Step 1**

Locate the items necessary to install the fixed landing gear for your model.

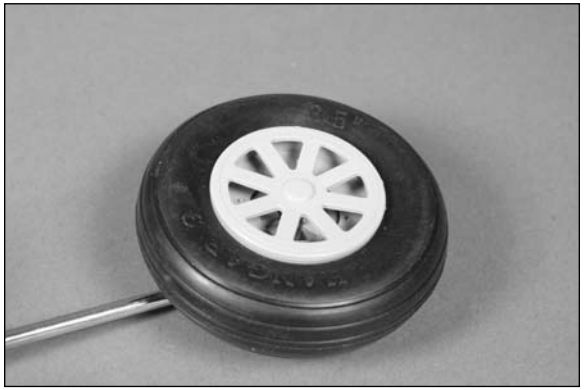


☐☐ **Step 2**

Attach the $3^1/_2$-inch (89mm) wheel to the main gear strut using two 5mm wheel collars. Place a drop of light machine oil on the axle so the wheel can rotate freely.

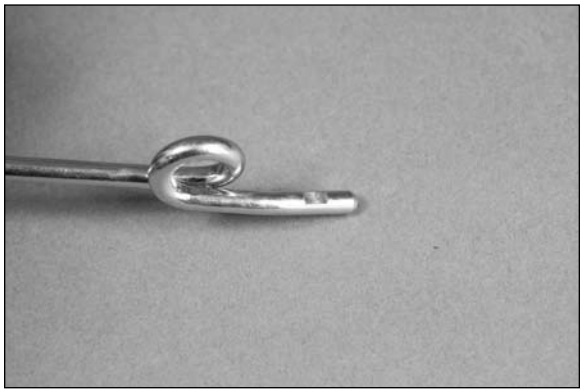
☐☐ Step 3

Snap the wheel cover on the wheel to complete the wheel installation.



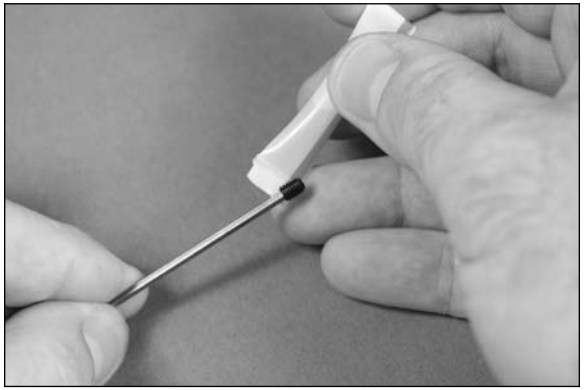
☐☐ Step 4

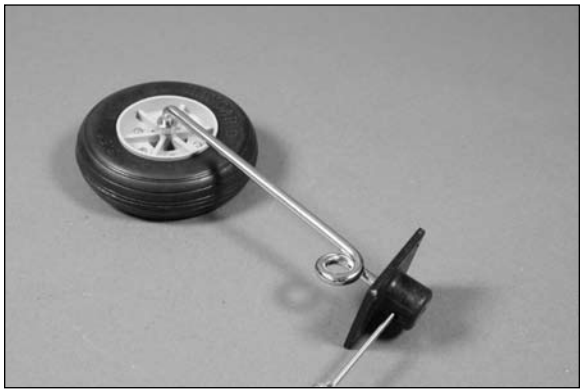
Note there is a flat area on the main gear strut. This will align with the hole in the mount for the setscrew.



☐☐ Step 5

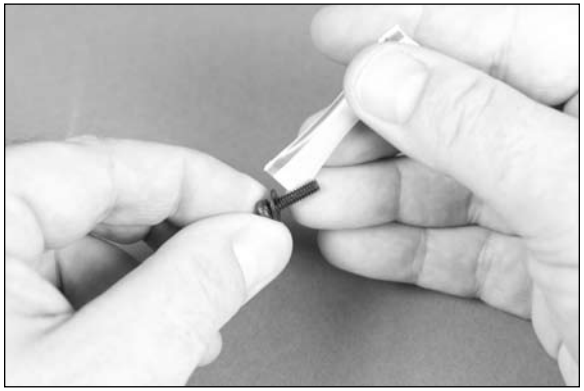
Use scissors to trim the end of the vial containing the threadlock included with your model. Insert the gear in the mount with the flat on the gear aligned with the hole for the setscrew. Apply a drop of threadlock on the 3mm x 4mm setscrew. Tighten the setscrew using a 1.5mm hex wrench.

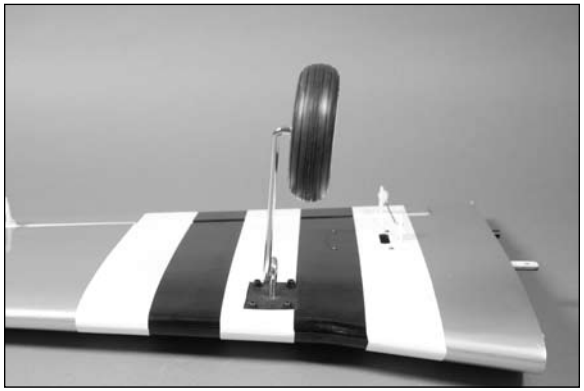




☐☐ Step 6

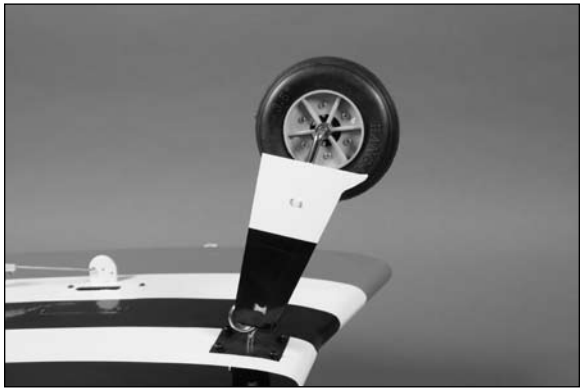
Slide a #6 washer on the 6-32 x 1/2-inch socket head screw. Apply a drop of threadlock on the threads of the screw. Use four screws and washers to secure the mount to the wing. Note the positioning of the wheel in relationship to the wing. The gear should be angled as shown. If not, you will need to use the other main landing gear assembly.

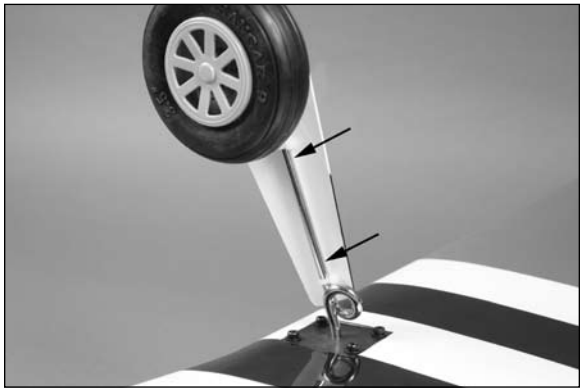




☐☐ **Step 7**

Secure the landing gear door to the strut using two tie-wraps. Use two small dots of silicone adhesive on the gear door and strut to keep the gear door from sliding on the strut.





☐☐ **Step 8**

Repeat Steps 2 through 7 to attach the remaining main landing gear to the wing.

Optional
Installing the Retract Actuator

Required Parts

- Wing panel (right and left)
- Servo with hardware
- Clevis
- Retract valve
- T-fitting (2)
- Air tank mount
- Plywood mini servo adapter
- #2 x 3/8-inch self-tapping screw (4)
- Retract servo tray
- Retract valve pushrod
- Clevis retainer
- Filler valve
- Air line connector (2)
- Air tank

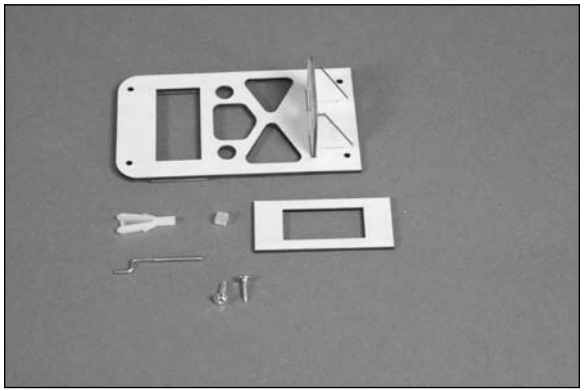
Required Tools and Adhesives

- Thin CA
- Medium CA
- Hobby knife with #11 blade
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)
- 30-minute epoxy (optional mini servo)
- Drill
- Phillips screwdriver: #1

The next two sections cover the installation of the HANP51 retracts. If you are not installing retracts you can skip the next two sections and proceed with Attaching the Wing.

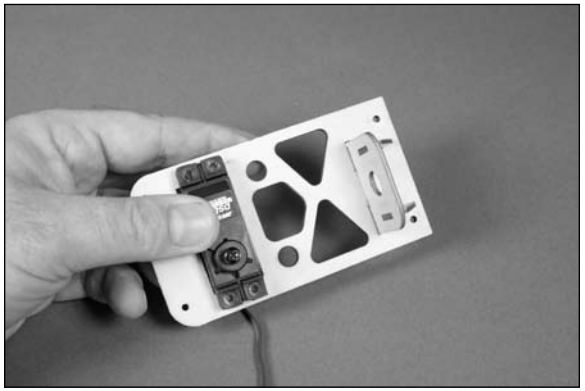
☐ **Step 1**

Locate the necessary items to install the retract servo and actuator valve in the fuselage.



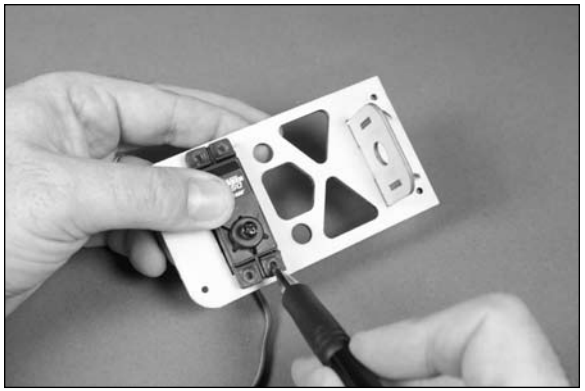
☐ **Step 2**

Place the servo in the tray as shown.



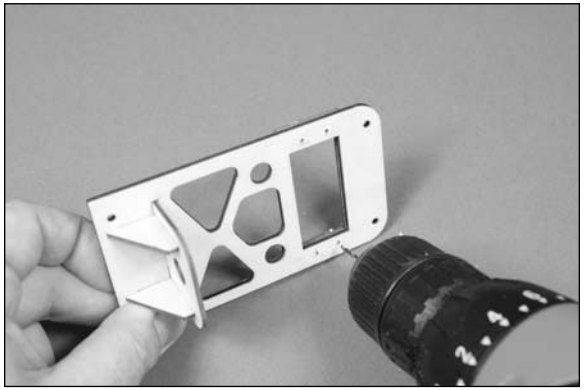
☐ **Step 3**

Use a pencil to transfer the locations for the servo mounting screws on the tray.



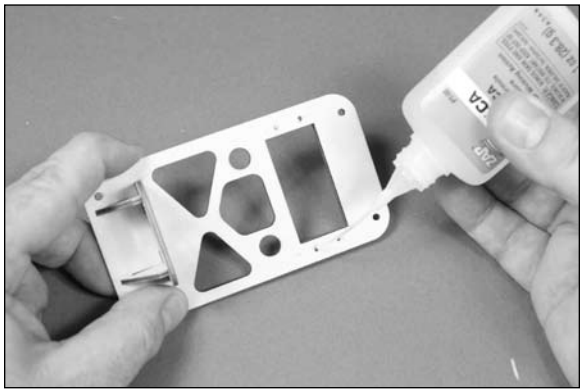
☐ **Step 4**

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



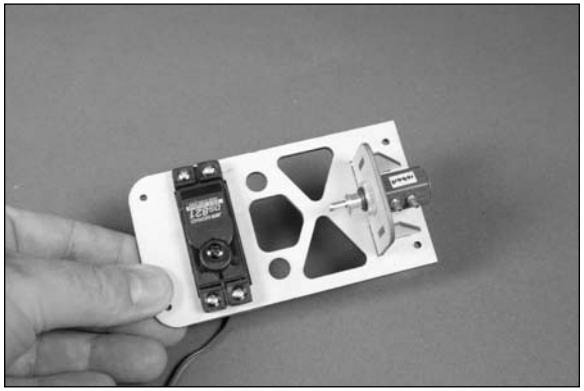
☐ **Step 5**

Place 2–3 drops of thin CA in each of the holes to harden the surrounding wood.



☐ **Step 6**

Secure the servo in the tray using the screws provided with the servo and a #1 Phillips screwdriver. Attach the retract valve to the tray at this time as well.

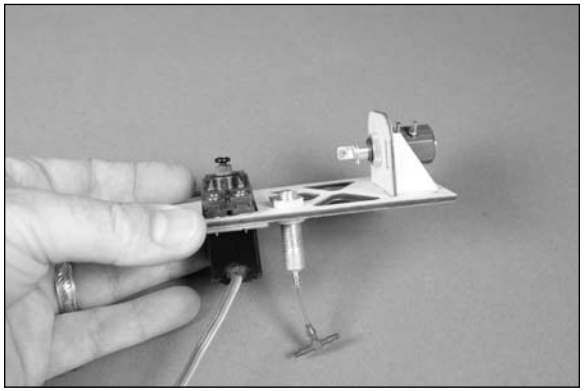


☐ **Step 7**

Cut a 1-inch (25mm) piece of air line and attach it to the filler valve. Place a T-fitting on the opposite end of the air line.

☐ **Step 8**

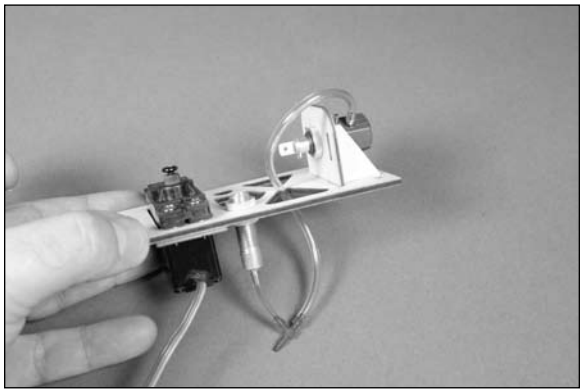
Secure the filler valve to the tray as shown.



Note: You can leave the filler valve loose in the fuselage as well. You will have to use a longer piece of tubing on the valve to do so.

☐ **Step 9**

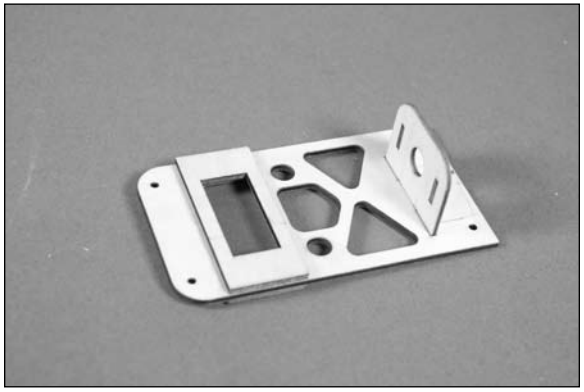
Cut a 3-inch (76mm) piece of air line to connect the actuator valve to the T-fitting as shown.



NOTE: SPECIAL CONSIDERATION WHEN USING A MINI SERVO

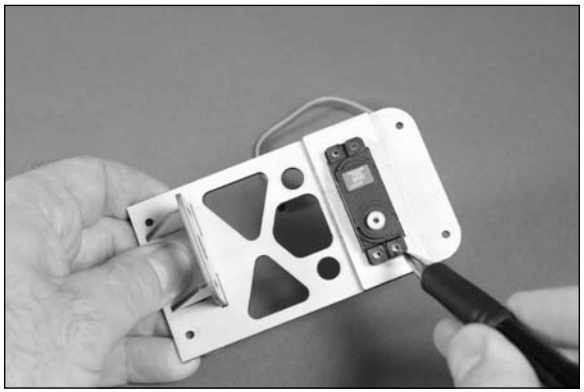
☐ **Step A**

Before installing the servo you will need to use medium CA to glue the servo adapter to the tray as shown. Allow the epoxy to fully cure before proceeding.



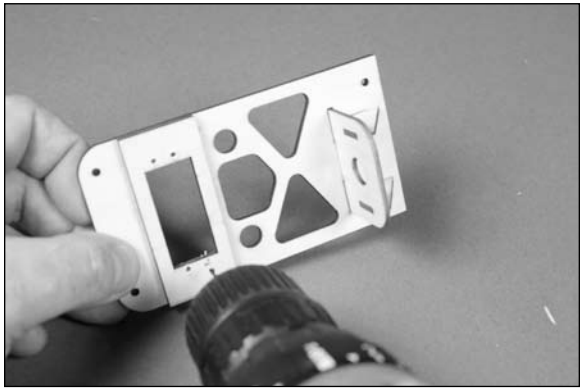
☐ **Step B**

Place the servo in the tray as shown. Use a pencil to tansfer the locations for the servo mounting screws on the tray.



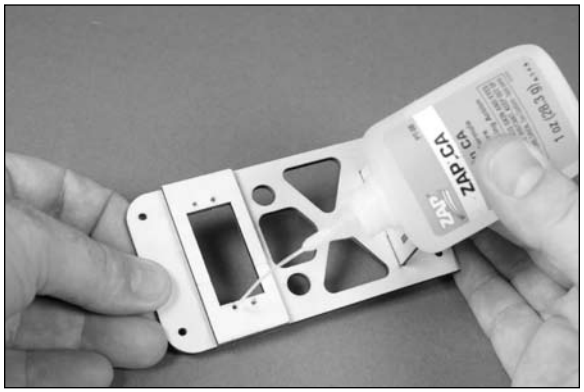
☐ **Step C**

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



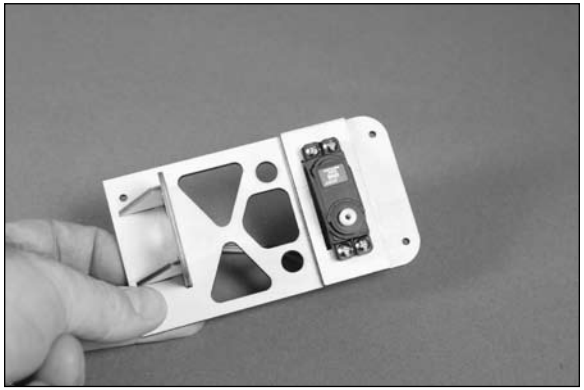
☐ **Step D**

Place 2–3 drops of thin CA in each of the holes to harden the surrounding wood.



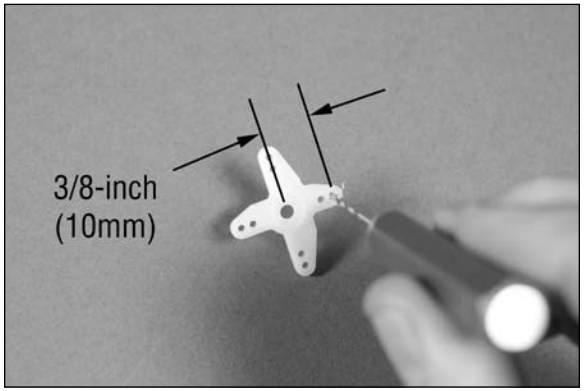
☐ **Step E**

Secure the servo in the tray using the screws provided with the servo and a #1 Phillips screwdriver.



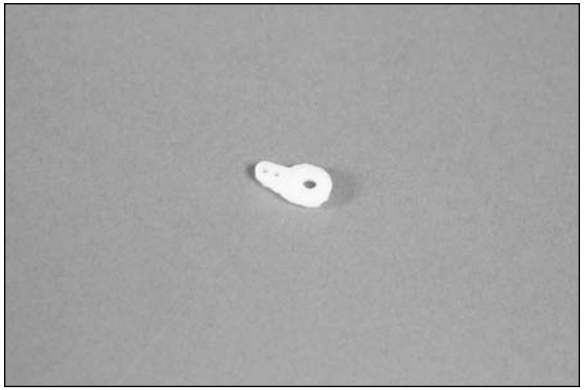
☐ **Step 10**

Use a pin vise and 5/64-inch (2mm) drill bit to enlarge a hole in the servo horn that is 3/8-inch (10mm) from the center of the servo horn.



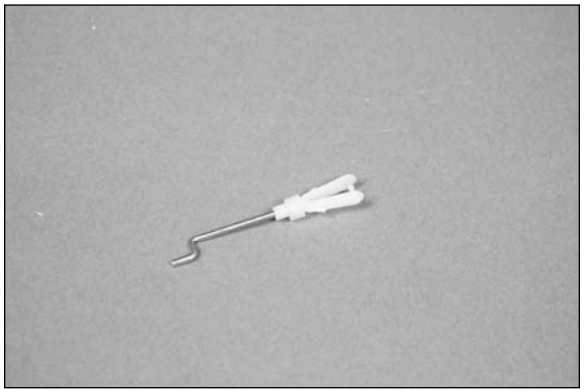
☐ **Step 11**

Use side cutters to remove any excess from the servo horn so it doesn't interfere with the operation of the retract servo.



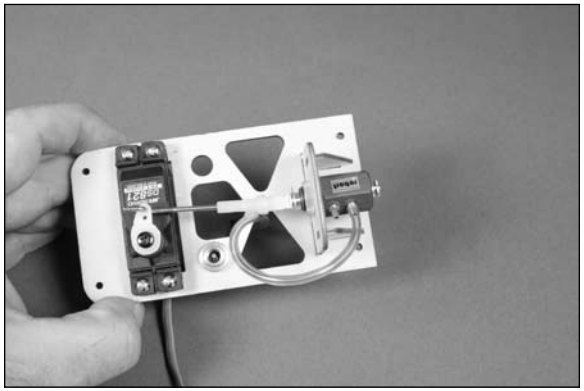
☐ **Step 12**

Slide a clevis retainer on a clevis. Thread the clevis 12-turns on the retract servo linkage.



☐ **Step 13**

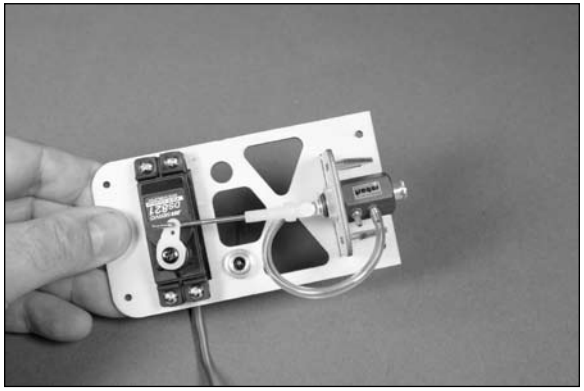
With the radio system on, set the endpoints to 0 for both the UP and DOWN positions. Install the servo horn and linkage as shown. The valve should be in the middle of the throw, so adjust the clevis as necessary to center the valve throw.

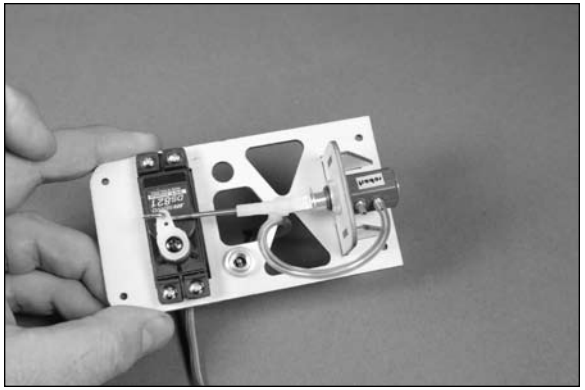


Important: The pin in the clevis must be positioned vertically as shown in the photos. If the pin is not vertical it will cause premature wear on the valve and it will begin to leak and not operate correctly.

☐ **Step 14**

Use the endpoints of the radio to set the throw of the servo. Slowly increase the throw from 0 until the throw is correct. Make sure to set both the up and down throws for the servo.

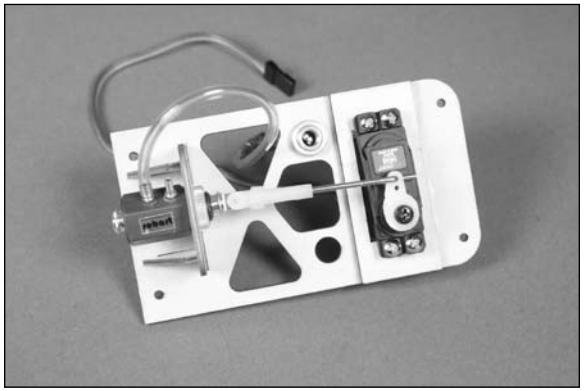




LINKAGE INSTALLATION AND ADJUSTMENT FOR MINI SERVO

☐ **Step F**

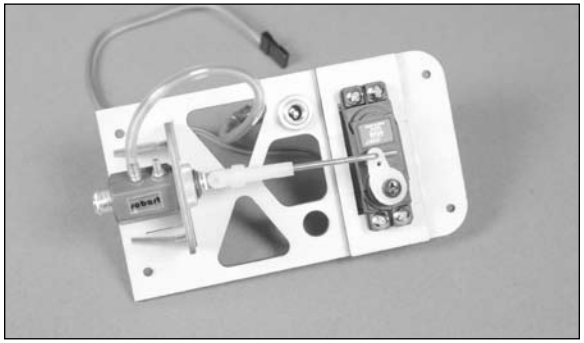
With the radio system on, set the endpoints to 0 for both the UP and DOWN positions. Install the servo horn and linkage as shown. The valve should be in the middle of the throw, so adjust the clevis as necessary to center the valve throw.

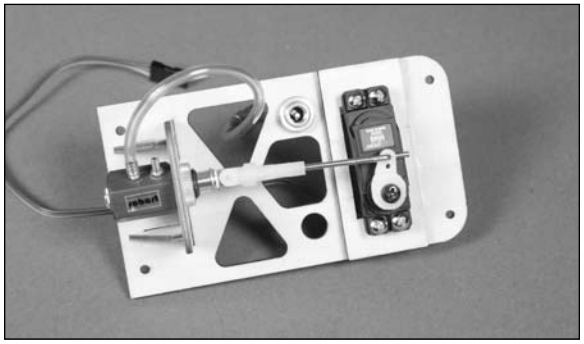


Important: The pin in the clevis must be positioned vertically as shown in the photos. If the pin is not vertical it will cause premature wear on the valve and it will begin to leak and not operate correctly.

☐ **Step G**

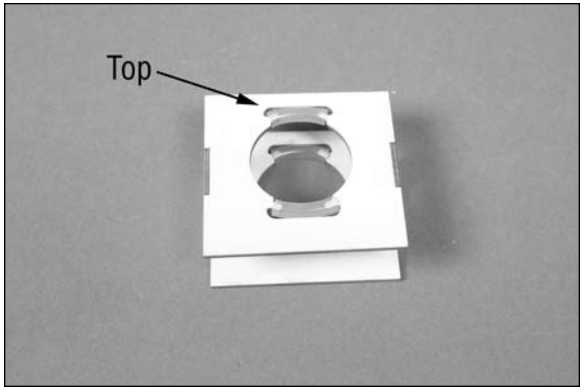
Use the endpoints of the radio to set the throw of the servo. Slowly increase the throw from 0 until the throw is correct. Make sure to set both the up and down throws for the servo.





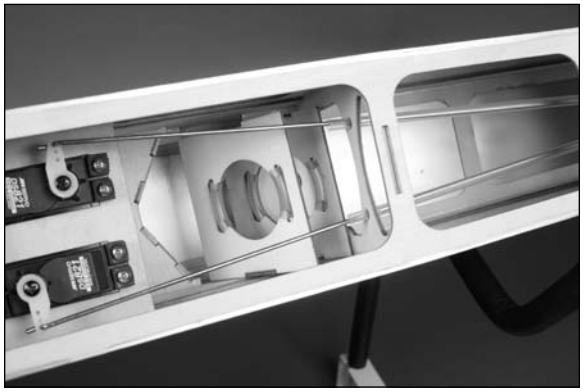
☐ **Step 16**

Locate the air tank mount. Note the narrow side of the mount as the top of the mount.



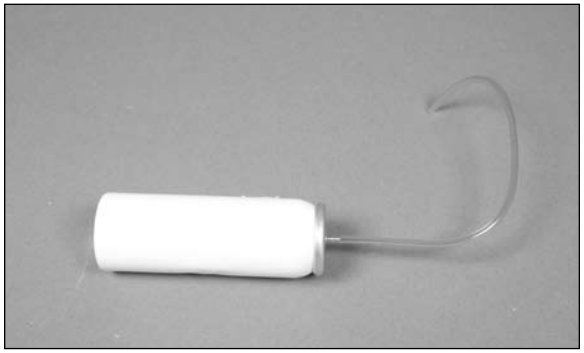
☐ **Step 17**

Place the mount in the fuselage. Pass it between the pushrod linkages and turn it as shown in the photos. Do not glue the mount in the fuselage.



☐ **Step 19**

Cut a 6-inch (152mm) piece of air line and attach it to the air tank.



☐ **Step 20**

Slide the air tank into the mount. It will take a little finesse to get the tank fully in the mount.

☐ **Step 21**

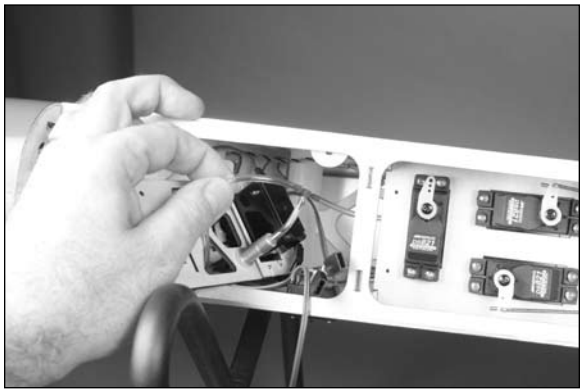
Use a small amount of medium CA to glue the tank mount in the fuselage.

☐ **Step 22**

Pass the air line from the tank under the servos in the fuselage as shown.

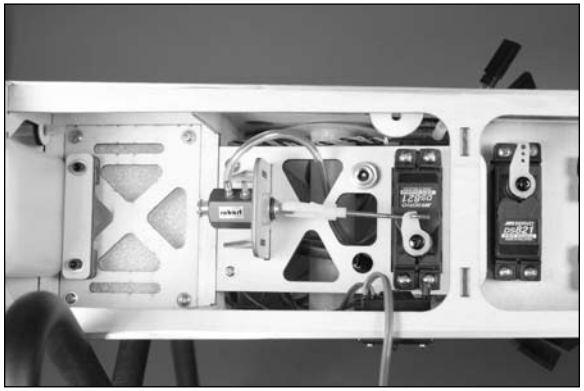
☐ **Step 23**

Connect the air line from the tank to the T-fitting on the filler valve.



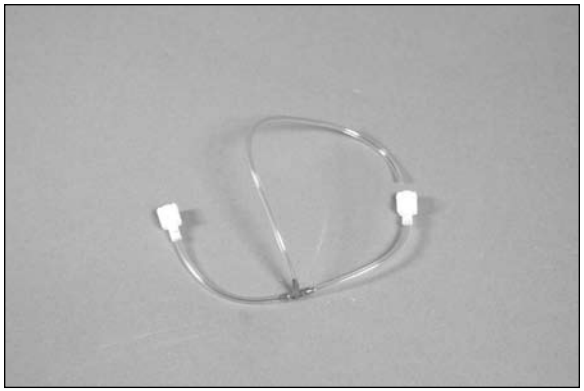
☐ **Step 24**

Plug the retract servo into the extension coming from the receiver. Use four #2 x 3/8-inch self-tapping screws to secure the tray inside the tank.



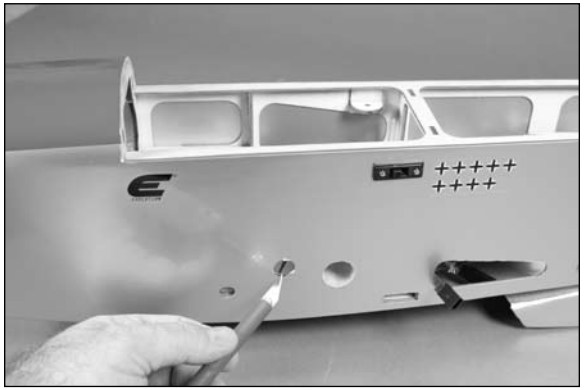
☐ **Step 25**

Cut three 3-inch (76mm) pieces of air line. Assemble the connector as shown below using the three pieces of air line, two connectors and a T-fitting.



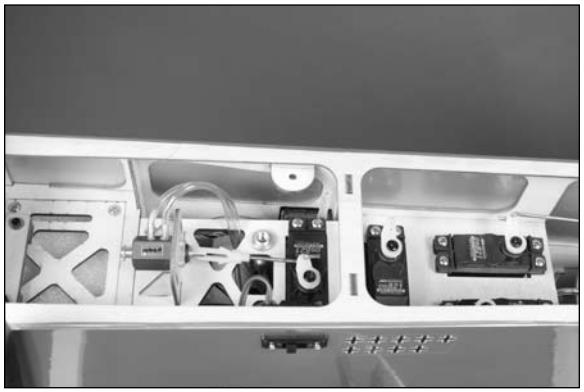
☐ **Step 26**

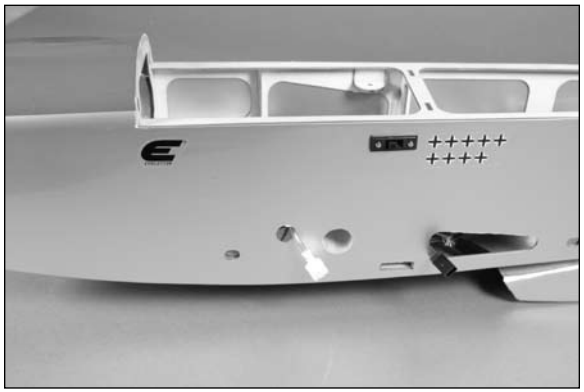
Use a hobby knife and #11 blade to remove the covering from the fuselage sides for the retract connectors.



☐ **Step 27**

Attach the air line to the retract valve. Pass the connectors out through the holes in the sides of the fuselage as shown.





Optional
Installing the Retract Mechanism

Required Parts

Wing panel (right and left)	Retract assembly (2)
#6 washer (8)	Tie-wrap (4)
Air line	Air line connector
$2^{3}/_{4}$-inch (70mm) wheel (2)	Retract strut template

5mm wheel collar with setscrew (4)
Landing gear door (right and left)
6-32 x 1/2-inch socket head screw (8)

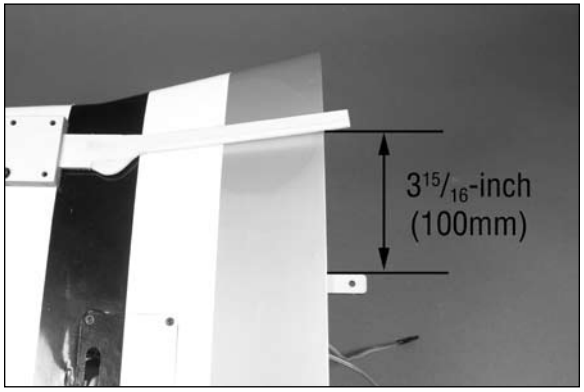
Required Tools and Adhesives

Drill bit: 13/64-inch (5mm)	Drill
Threadlock	Silicone adhesive
Ruler	Pencil
Felt-tipped pen	Trim seal tool

Hobby knife with #11 blade
Hex wrench: 1.5mm, 9/64-inch (included)

☐☐☐☐ Step 1

Locate the retract strut template. Use one of the 6-32 x 1/2-inch socket head screws and #6 washers to hold the template in position. Adjust the position of the template so the rear edge of the template is $3^{15}/_{16}$-inch (100mm) from the front edge of the wing mounting tab as shown.

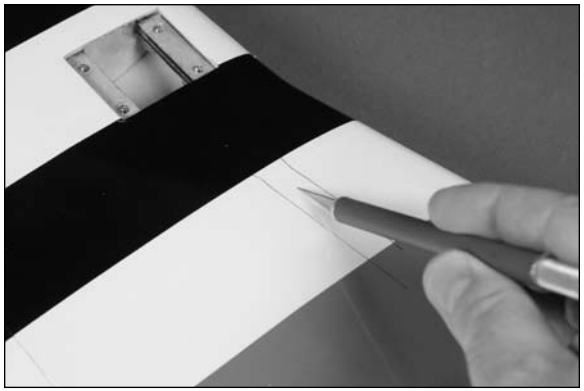


☐☐ Step 2

Use a felt-tipped pen to track the outline of the template on the covering of the wing.

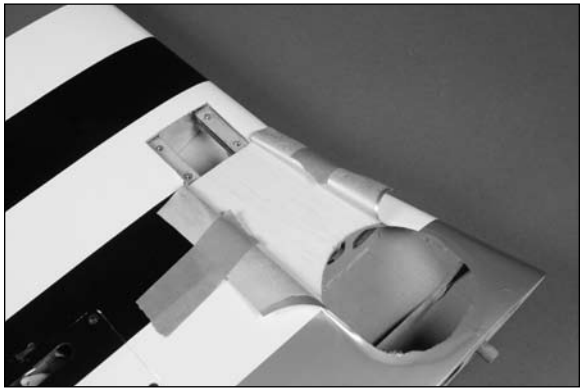
☐☐ Step 3

Remove the template from the wing. Use a hobby knife with a new #11 blade to cut the covering as close to center between the lines drawn on the wing. Also cut the covering 1/8-inch (3mm) inside of the wheel well at this time.



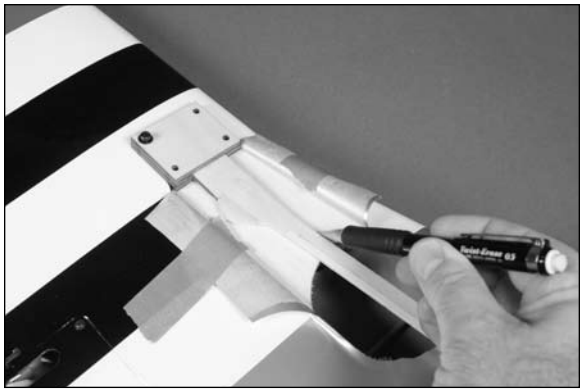
☐☐ Step 4

Pull the covering back and use low-tack tape to keep it away from the area where you will be cutting the balsa for the retract strut.



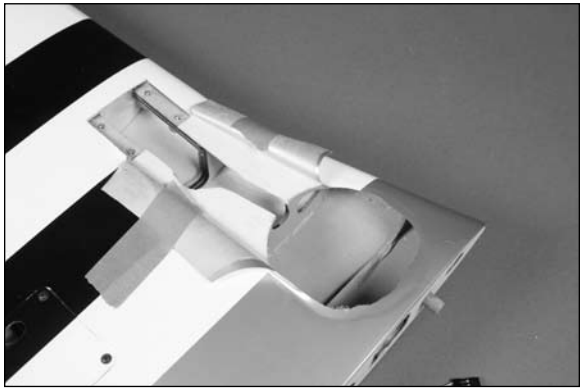
☐☐ Step 5

Repeat Step 1 to place the template back in position on the wing. Use a pencil to trace the outline of the template on the balsa as shown.



☐☐ **Step 6**

Use a hobby knife with a #11 blade to remove the balsa for the retract strut.

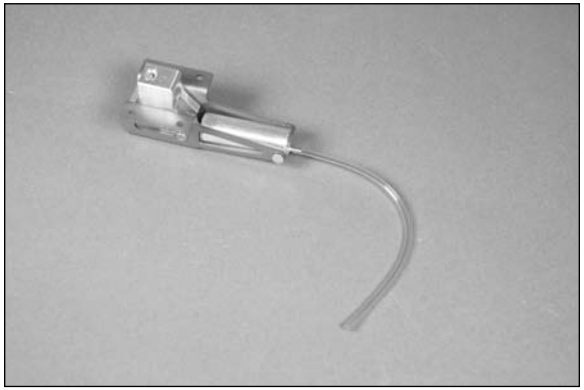


☐☐ **Step 7**

At this time you will need to fuel-proof the area in the wing for the retract. Use either a mixture of 30-minute epoxy thinned with isopropyl alcohol or a fuel-proof gray model paint to do so. Once everything has cured, use a trim seal tool to neatly iron the covering back on the wing and into the wheel well as shown.

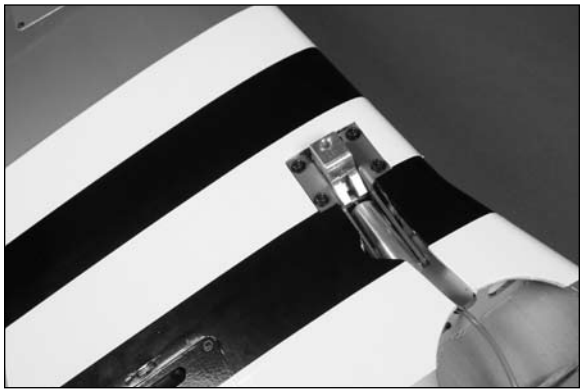
☐☐ **Step 8**

Cut a 6-inch (152mm) piece of air line and attach it to the retract air cylinder as shown.



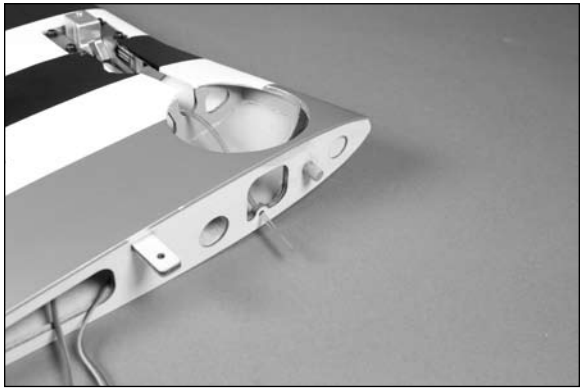
☐☐ **Step 9**

Install the retract mechanism in the wing using four 6-32 x 1/2-inch socket head screws and four #6 washers. Tighten the screws using a 9/64-inch hex wrench or ball driver. Make sure to use threadlock on the screws so they don't vibrate loose in flight.



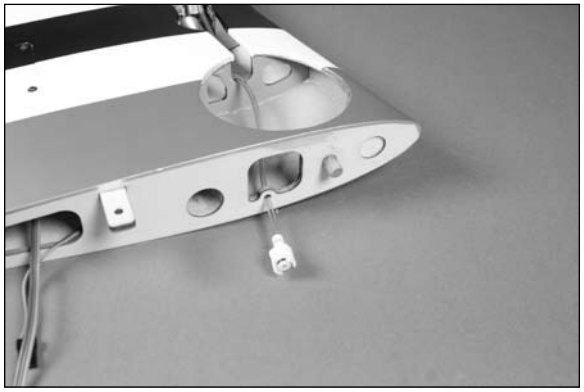
☐☐ **Step 10**

The air line will now go through the small hole at the root of the wing.



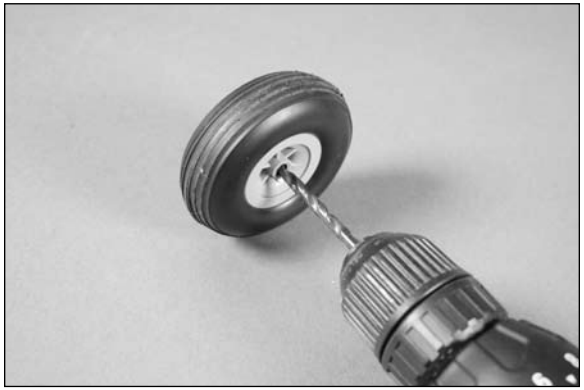
☐☐ **Step 11**

Install an air line connector on the air line. Make sure this connector will mate to the one at the fuselage as they are difficult to remove once pressed on the air line.



☐☐ **Step 12**

Use a drill and 13/64-inch (5mm) drill bit to enlarge the hole in the wheel.

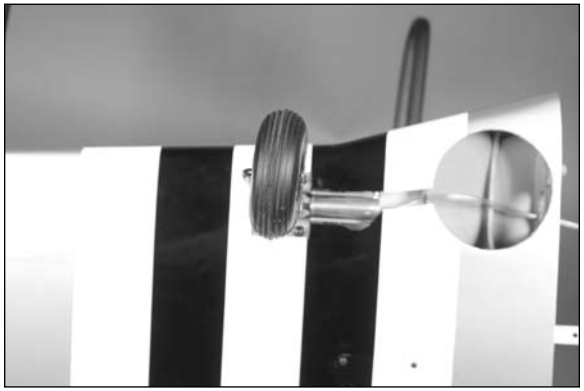


☐☐ **Step 12**

Attach the $2^{3}/_{4}$-inch (70mm) wheel to the retract strut using two 5mm wheel collars. Place a drop of light machine oil on the axle so the wheel can rotate freely.

☐☐ **Step 14**

Position the strut in the retract mechanism. There should be a slight amount of toe-in to help the ground tracking of your model during taxi, take-off and landing.

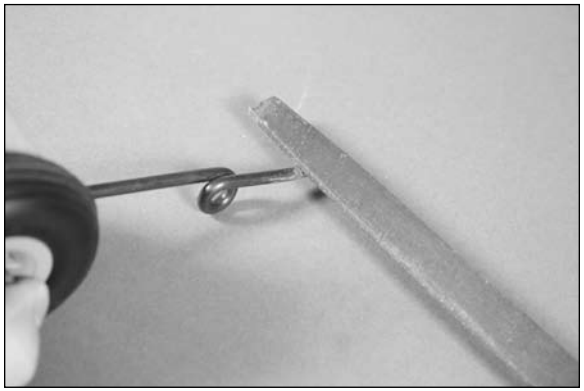


☐☐ **Step 15**

Also check that the wheel is centered in the wheel well.

☐☐ **Step 16**

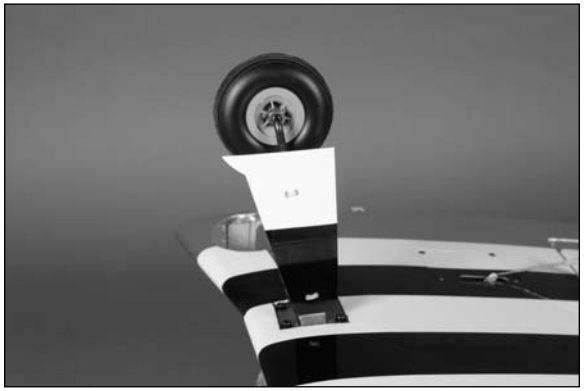
Tighten the setscrews in the retract mechanism to leave indentations on the strut. Remove the strut and use a flat file to create a flat area on the strut where the setscrews will rest so the strut won't rotate in the mechanism.



Note: One retract will have the setscrews to the front, and one to the rear. Make sure to check that you are placing the flat on the correct side for each wing panel.

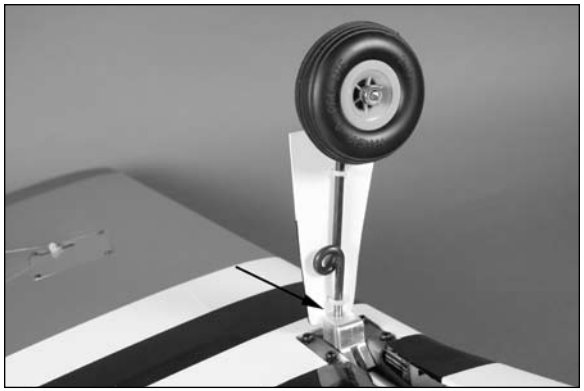
☐☐ **Step 17**

Place the strut in the retract mechanism and tighten the setscrews. Use two tie-wraps to attach the gear door to the retract strut as shown.



☐☐ **Step 18**

Place a drop of silicone adhesive to the gear door where it rests on the retract. This will keep the door from sliding down the strut in flight.



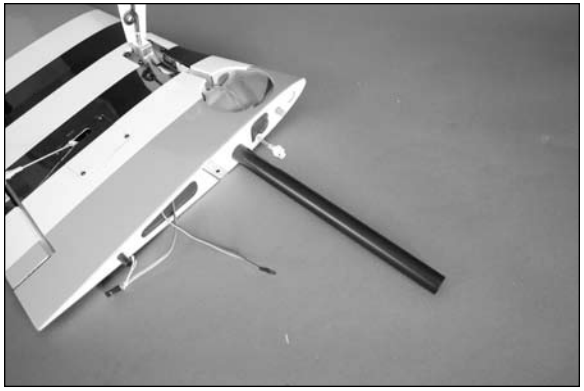
Attaching the Wing

Items required

- Wing panel (right and left)
- Fuselage assembly
- #4 washer (2)
- 4-40 x 3/4-inch socket head screw (2)
- Hex wrench: 3/32-inch
- Wing tube
- #4 lock washer (2)

☐ **Step 1**

Locate the aluminum wing tube. Slide the wing tube into the wing tube socket in one of the wing panels. There is a stop inside the wing, so don't force the tube further into the wing than it will easily slide.

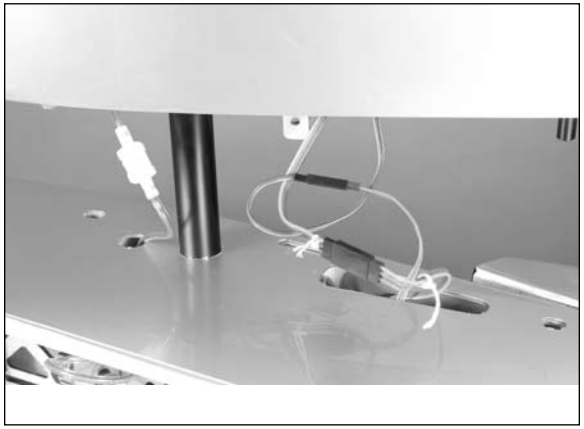


☐ **Step 2**

Locate the aileron Y-harness inside the fuselage. Make sure one end of the harness exits the right side of the fuselage and one exits the left side of the fuselage.

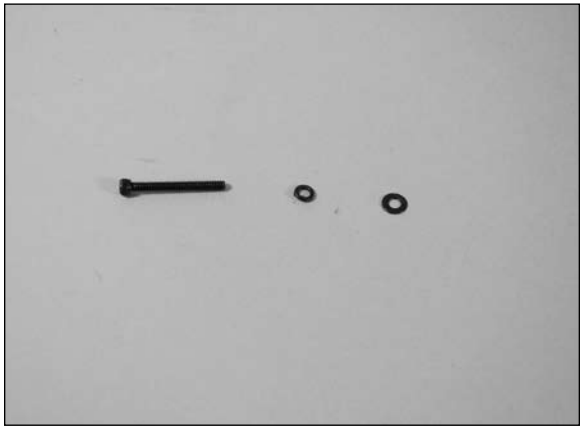
☐ **Step 3**

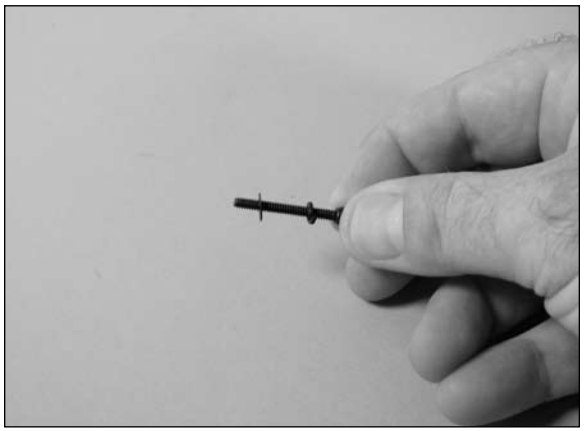
Slide the wing tube and wing panel into the socket in the fuselage. Plug the lead for the aileron servo in the wing into the extension extending out of the fuselage. Guide the alignment pins in the wing into the holes in the fuselage, then slide the wing panel tightly against the fuselage.



☐☐ Step 4

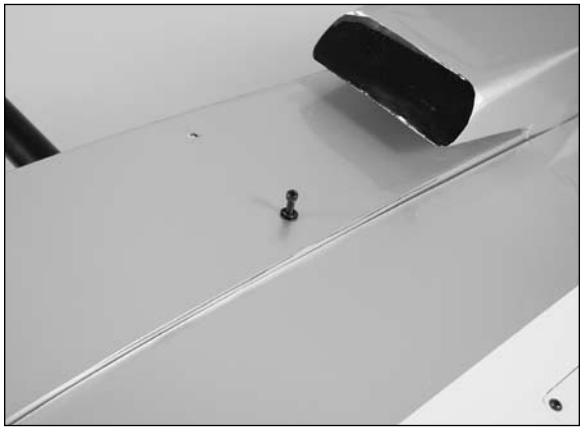
Locate the 4-40 x 3/4-inch socket head screw, #4 washer and #4 lock washer. Slide the lock washer onto the screw, then slide the washer onto the screw.





☐☐ Step 5

Use the screws and a 3/32-inch ball driver or hex wrench to secure the wing to the fuselage. If the screw does not go in easily, you may need to double-check that the wing is tight against the fuselage.



☐ Step 6

You can now slide the remaining wing panel onto the wing tube. Plug the aileron extension from the aileron servo into the Y-harness in the fuselage, then slide the wing tight against the fuselage. Repeat Steps 5 and 6 to secure the wing panel to the fuselage.

Center of Gravity

An important part of preparing the aircraft for flight is properly balancing the model.

Caution: Do not inadvertently skip this step!

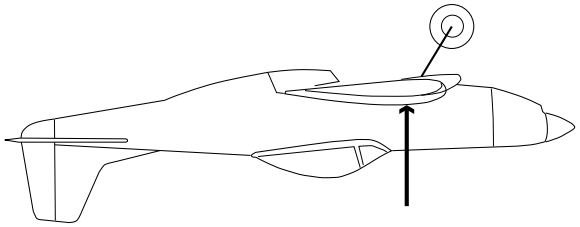
The recommended Center of Gravity (CG) location for the model is $3^{3}/_{4}$-inch (95mm) behind the leading edge of the wing against the fuselage. The CG range for your model is $3^{1}/_{2}$ to $3^{7}/_{8}$ inches (89mm to 98mm) from the leading edge of the wing.

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 shop and work well for this purpose.

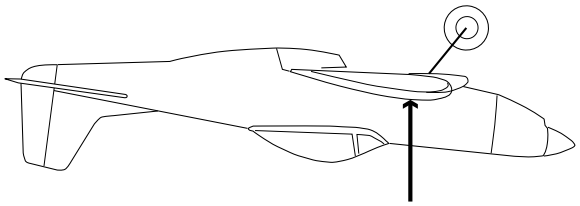
When balancing your model, support the plane inverted at the marks made on the wing with your fingers or a commercially available balancing stand. This is the correct balance point for your model. You might find you may be required to add a small amount of weight to either the front or back of the fuselage to achieve the correct balance.

Lifting the Model and Observations

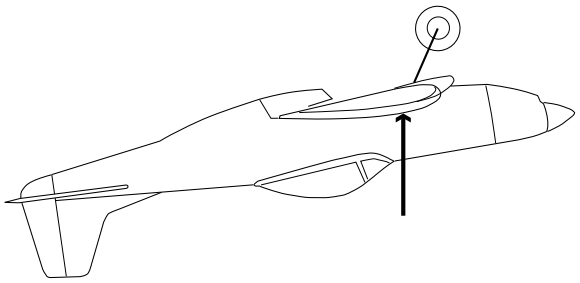
The P-51D Mustang is balanced using either your fingers or a balancing stand. Place or lift the airplane so it is supported at the marks made in the previous step. The plane will rest level when balanced correctly. If not, self stick weights must be added to correct any balancing problems.



Balanced Correctly



Nose Heavy – Add Weight to Tail



Tail Heavy – Add Weight to Nose

After the first flights, the CG position can be adjusted for your personal preference.

Control Throws

☐ **Step 1**

Turn on the transmitter and receiver of your model. Check the movement of the rudder using the transmitter. When the stick is moved right, the rudder should also move right. Reverse the direction of the servo at the transmitter if necessary.

☐ **Step 2**

Check the movement of the elevator with the radio system. Moving the elevator stick toward the bottom of the transmitter will make the airplane elevator move up.

☐ **Step 3**

Check the movement of the ailerons with the radio system. Moving the aileron stick right will make the right aileron move up and the left aileron move down.

☐ **Step 4**

Use a ruler to adjust the throw of the elevator, ailerons and rudder.

Aileron High Rate

Up	7/16-inch	(11mm)
Down	7/16-inch	(11mm)

Aileron Low Rate

Up	5/16-inch	(8mm)
Down	5/16-inch	(8mm)

Elevator High Rate

Up	1/2-inch	(13mm)
Down	1/2-inch	(13mm)

Elevator Low Rate

Up	3/8-inch	(9mm)
Down	3/8-inch	(9mm)

Rudder High Rate

Left	$1^{1}/_{8}$-inch	(28mm)
Right	$1^{1}/_{8}$-inch	(28mm)

Rudder Low Rate

Left	7/8-inch	(22mm)
Right	7/8-inch	(22mm)

Flap Positions

Up	Aligned with wing trailing edge	
Mid	1/2-inch	(13mm)
Down	1-inch	(25mm)

Note: Measurements are taken at the inner or widest point on the control surface.

These are general guidelines measured from our own flight tests. You can experiment with higher rates to match your preferred style of flying.

Note: Travel Adjust, Sub-Trim and Dual Rates are not listed and should be adjusted according to each individual model and preference.

Safety Do's and Don'ts for Pilots

- Ensure that your batteries have been properly charged prior to your initial flight.
- Keep track of the time the system is turned on so you will know how long you can safely operate your system.
- Perform a ground range check prior to the initial flight of the day. See the "Daily Flight Checks Section" for information.
- Check all control surfaces prior to each takeoff.
- Do not fly your model near spectators, parking areas or any other area that could result in injury to people or damage of property.
- Do not fly during adverse weather conditions. Poor visibility can cause disorientation and loss of control of your aircraft. Strong winds can cause similar problems.
- Do not point the transmitter antenna directly toward the model. The radiation pattern from the tip of the antenna is inherently low.
- Do not take chances. If at any time during flight you observe any erratic or abnormal operation, land immediately and do not resume flight until the cause of the problem has been ascertained and corrected. Safety can never be taken lightly.

Dual Rate Recommendations

- We recommend that the rudder dual rate be set to Low for takeoff to help minimize overcorrection during the takeoff roll.
- We recommend the rudder dual rate be set to High for landing to help maintain heading as the model transitions from flying speed to taxi speeds.
- Elevator and Aileron dual rates should be adjusted for personal feel and also if there is any unusual wind conditions.

Flight Preparations

Flight preparations must be checked each time you travel to the flying field. Because the P-51D Mustang will encounter a variety of situations, it is best to keep an eye on the various components of your model to keep it in the best flying condition.

☐ Checking the Frequency

When using a Spektrum radio system, follow the guidelines for use of DSM radio systems at your particular field.

☐ Checking the Controls

Before starting your engine, check to make sure the controls are operating in the correct directions and the linkages and surfaces are not binding anywhere. Also look at the clevises and clevis retainers to make sure they are secure and will not come loose or fail in flight.

☐ Fueling the P-51D Mustang

Fill the fuel tank with the proper fuel. Fill the tank by connecting the fuel pump to the line going to the needle valve. Disconnect the fuel line attached to the pressure fitting of the muffler; your tank is full when fuel begins to run out of the pressure line. Reconnect the fuel lines to the needle valve assembly and muffler.

Note: It is very important to reconnect the lines to the correct place. If they are reconnected incorrectly, the engine will not run properly.

Daily Flight Checks

☐ Step 1

Check the battery voltage on both the transmitter and the receiver battery packs. Do not fly below 4.3V on the transmitter if you are using a Spektrum transmitter that uses 4-cells to power the transmitter. Do not fly below 9.5V on the transmitter if you are using a JR or Spektrum transmitter that uses 8-cells to power the transmitter. Do not fly if the receiver pack is at or below 4.7V. To do so can crash your aircraft.

Note: When you check these batteries, ensure that you have the polarities correct on your expanded-scale voltmeter.

☐ Step 2

Check all hardware (linkages, screws, nuts, and bolts) prior to each day's flight. Be sure that binding does not occur and that all parts are properly secured.

☐ Step 3

Ensure that all surfaces are moving in the proper manner.

☐ Step 4

Perform a ground range check before each day's flying session.

☐ Step 5

Prior to starting your aircraft, turn off your transmitter, then turn it back on. Do this each time you start your aircraft. If any critical switches are on without your knowledge, the transmitter alarm will warn you at this time.

☐ Step 6

Check that all trim levers are in the proper location.

☐ Step 7

All servo pigtails and switch harness plugs should be secured in the receiver. Make sure that the switch harness moves freely in both directions.

Flying Your P-51 Mustang

Take Off

Prior to your first flight, we recommend that you do some low-speed taxi tests. Use these tests to center the tail 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; 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.

Once you have the P-51D 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 P-51D and practice flying the model at a safe height using both the mid and full flap positions. Be sure to reduce the throttle and allow the P-51D to slow a bit prior to lowering the flaps into the first or mid position. Then lower the flaps to the full position and adjust the power to maintain straight and level flight.

Landing

You will find that the P-51D will slightly balloon or pitch up as you deploy full flaps.

If you allow the model to slow prior to lowering the flaps, this balloon or pitch up will be minimized. You will find that the P-51D benefits from a small amount of down elevator mixed with the flaps when the flaps are extended to the full down position. The amount of down elevator needed varies and is based upon your final center of gravity. So begin with a small amount of down elevator (around 2%) mixed to the flaps and then adjust as needed from there.

To begin the landing approach you will need to first lower the throttle and reduce your flight speed. We recommend this take place on the downwind leg of your flight and that you have the flaps in the full down position prior to beginning your turn to the base leg. Allow the P-51D to begin a slow downward descent and gradually allow the airspeed to bleed off. The idea is to lose altitude and maintain airspeed by keeping the nose down in the turn. As you begin your upwind approach, use the throttle to maintain your sink rate. As you pass over the end of the runway, reduce the throttle to idle and begin to add up elevator and begin your flare to landing. Should you overshoot the landing, then gradually add power and use the rudders to keep the P-51D on track. Keep the flaps in the full down position and begin to set up for a second attempt.

Many safe and happy landings,

The Hangar 9 Team

Maintaining Your P-51D Mustang

The following is a check list that you should follow every time you have completed a flying session with your P-51D Mustang. Doing so will keep your aircraft in the best flying condition.

Clean Up

After a long flying session with your P-51D Mustang, you will want to clean it up before loading it into your vehicle to head home. Use a spray cleaner and a paper towel to wipe down the exterior of your plane, removing the fuel residue. Remember, a clean plane will last longer since the fuel won't be allowed to soak into any exposed wood.

Checking the Propeller

Check to make sure the propeller is tightly secured to the engine. If not, remove the spinner and use a crescent wrench to tighten it back down. If you have had any not-so-great landings, you will want to inspect the propeller for any damage. Small nicks and scratches can quickly become fractures, causing the propeller to be unsafe for flight. Always carry a few spare propellers so a damaged propeller can be replaced at the field, increasing your flying time per trip to the field.

Checking the Clevises

Inspect the aileron, elevator and rudder clevises to make sure they are connected and in good working order. If you find a clevis that is showing signs of wear or is broken, replace it with a new clevis. Also check the nylon connectors at the servo for any wear or damage. If they look worn or in bad shape, replace them as well.

Checking the Control Horns

Inspect the control horns to make sure they have not crushed the wood of the control surface. If so, remove the control horn screws to remove the control horn. Place 2–3 drops of thin CA into each of the screw holes. In addition, use a T-pin to poke small holes in the covering in the area where the control horn mounts, then saturate the area with thin CA. This will harden the wood and give the control horns a solid surface to be mounted to.

Checking the Wheel Collars

Check the setscrews on the wheel collars for the main and tail wheel to make sure they are not loose. Use a 1.5mm hex wrench to tighten the setscrews. It is suggested if they loosen frequently to remove them, apply threadlock to the setscrews, then secure the wheel collars back into position. The threadlock and hex wrench are included in the kit for this purpose.

Check the Muffler Bolts

Check to make sure the bolts holding the muffler onto the engine are tight and have not vibrated loose during flight.

Check the Engine Mount Bolts

Remove the spinner and propeller from the engine. Remove the exhaust stacks from the fuselage, and then remove the cowling from the fuselage. Remove the muffler from the engine, and then use a Phillips screwdriver to make sure the four bolts securing the engine to the mount are tight.

Glossary of Terms

- ***Ailerons***: Each side of this airplane has a hinged control surface (aileron), located on the trailing edge of the wing. Move the aileron stick on the transmitter left, the left aileron moves up and the right aileron moves down. Moving the left aileron up causes more drag and less lift, causing the left wing to drop down. When the right aileron moves down, more lift is created, causing the right wing to rise. This interaction causes the airplane to turn or roll to the left. Perform the opposite actions, and the airplane will roll to the right.
- ***Clevis***: The clevis connects the wire end of the pushrod to the control horn of the control surface. A small clip, the clevis has fine threads so that you can adjust the length of the pushrod.
- ***Control Horn***: This arm connects the control surface to the clevis and pushrod.
- ***Dihedral***: The degree of angle (V-shaped bend) at which the wings intersect the fuselage is called dihedral. More dihedral gives an airplane more aerodynamic stability. Some sailplanes and trainer planes with large dihedral dispense with ailerons and use only the rudder to control the roll and yaw.
- ***Elevator***: The hinged control surface on the back of the stabilizer that moves to control the airplane's pitch axis. Pulling the transmitter's control stick toward the bottom of the transmitter moves the elevator upward, and the airplane begins to climb. Push the control stick forward, and the airplane begins to dive.
- ***Fuselage***: The main body of an airplane.
- ***Hinge***: Flexible pieces used to connect the control surface to the flying surface. All hinges must be glued properly and securely to prevent the airplane from crashing.
- ***Horizontal Stabilizer***: The horizontal flying surface of the tail gives the airplane stability while in flight.
- ***Leading Edge***: The front of a flying surface.
- ***Main Landing Gear***: The wheel and gear assembly the airplane uses to land. It is attached to the bottom of the fuselage.
- ***Pitch Axis***: The horizontal plane on which the airplane's nose is raised or lowered. By moving the elevator, you can raise the airplane's nose above the pitch axis (climb) or lower it below the pitch axis (dive).
- ***Pushrod***: The rigid mechanism that transfers movement from the servo to the control surface.
- ***Roll Axis***: The horizontal plane on which the airplane's wings are raised or lowered. By adjusting the ailerons, you can drop a wing tip below the roll axis and cause the airplane to bank or roll.
- ***Rudder***: The hinged control surface on the vertical stabilizer that controls the airplane's yaw. Moving the rudder to the left causes the airplane to yaw left; moving the rudder to the right causes it to yaw right.
- ***Servo***: The servo transforms your transmitter commands into physical adjustments of the airplane.
- ***Servo Output Arm***: A removable arm or wheel that connects the servo to the pushrod (also called servo horn).
- ***Spinner***: Term describing the nose cone that covers the propeller hub.
- ***Threadlock***: A liquid that solidifies; used to prevent screws from loosening due to vibration.
- ***Torque Rods***: Inserted into the ailerons, these rigid wire rods run along the wing's trailing edge, then bend downward and connect to the pushrod.
- ***Vertical Stabilizer***: The vertical flying surface of the tail gives an airplane stability while in flight.
- ***Wheel Collar***: The round retaining piece that anchors wheels in place on the wheel axle.
- ***Wing***: The lifting surface of an airplane.
- ***Yaw Axis***: The vertical plane through which the airplane's nose rotates as it yaws to the left or to the right. The rudder controls the yaw axis.

Age Requirements

Age Recommendation: 14 years or over. This is not a toy. This product is not intended for use by children without direct adult supervision.

Safety, Precautions and Warnings

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.

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 necessary 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 out 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.

Warranty Information

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 1/2 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.

United States:

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

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822
USA

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

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822
USA

Please call 877-504-0233 or e-mail us at productsupport@horizonhobby.com with any questions or concerns regarding this product or warranty.

United Kingdom:

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

Horizon Hobby UK
Units 1-4 Ployters Rd
Staple Tye
Harlow, Essex
CM18 7NS
United Kingdom

Please call +44 (0) 1279 641 097 or e-mail us at sales@horizonhobby.co.uk with any questions or concerns regarding this product or warranty.

Germany:

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

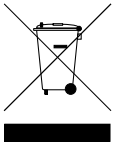
Horizon Technischer Service
Hamburger Strasse 10
25335 Elmshorn
Germany

Please call +49 4121 46199 66 or e-mail us at service@horizonhobby.de with any questions or concerns regarding this product or warranty.

Compliance Information for the European Union

INSTRUCTIONS FOR DISPOSAL OF WEEE BY USERS IN THE EUROPEAN UNION

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



2009 Official Academy of Model Aeronautics 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.

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 frequencymanagement 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 flightline.
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™

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