

## INSTRUCTION MANUAL



- 90% prebuilt
- Great sport scale appearance
- Factory installed retracts
- Precovered in genuine UltraCote®
- Prepainted fiberglass cowl



### Specifications

Wingspan: .....	65.5 in (1663.7 mm)
Fuselage Length: .....	55.75 in (1416 mm)
Wing Area: .....	745 sq in (48.1 sq dm)
Weight (Approx.): .....	7–8.5 lb (3.2–3.9 kg)
Recommended Engines: .....	2-cycle: .60–.78
	4-cycle: .72–1.00

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# Introduction

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Congratulations on your purchase of the Hangar 9 P-51 Mustang ARF. This sport scale model warbird is intended for the modeler wanting to experience the thrill of being a Fighter Ace in the European Theater during WW-II. The Hangar 9 P-51 is a low-wing, high-performance plane. If this is your first attempt at flying this type of aircraft, please consult a more experienced pilot to help in the setup and initial flights. Although this is an ARF (Almost Ready-to-Fly) kit, it does have some construction features that can be challenging to the less experienced modeler. If you encounter difficulty in any construction sequence, please feel free to contact one of our technicians—we stand ready to provide any assistance we can concerning the construction of your Hangar 9 P-51 .60-Size ARF. You can contact us at:

Horizon Hobby, Inc.  
4105 Fieldstone Road  
Champaign, Illinois 61822  
(217) 355-9511  
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## Warning

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An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably at AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio and engine.

# Additional Required Equipment (not included)

## Radio Equipment

- 5-channel radio system (minimum)
- 5 standard servos (JRPS537 recommended or equivalent)
- 1 low-profile retract servo (JRPS703)



JR 8103



JR 10X

## Recommended JR™ Systems

- JR XF652
- JR XP783
- JR XP8103
- PCM 10X

## Engine Requirements

- .60–.78 2-cycle engines
- .72–1.00 4-cycle engines

## Recommended 2-Cycle Engines:

- MDS™ .68 FS Pro
- MDS .78 FS Pro



MDS .68  
(MDSE06800)



MDS .78  
(MDSE07800)

## Recommended 4-Cycle Engines:

- Saito™ .72–1.00



Saito .72  
(SAIE072)



Saito 1.00  
(SAIE100)

## Parts

- 3.5" Red P-51 Spinner (CBA5073)
- Propeller (consult your engines instruction manual)
- 18" servo extension (JRPA099) (4)
- Large servo arm (JRPA212) (1 pk)

## Tools and Adhesives

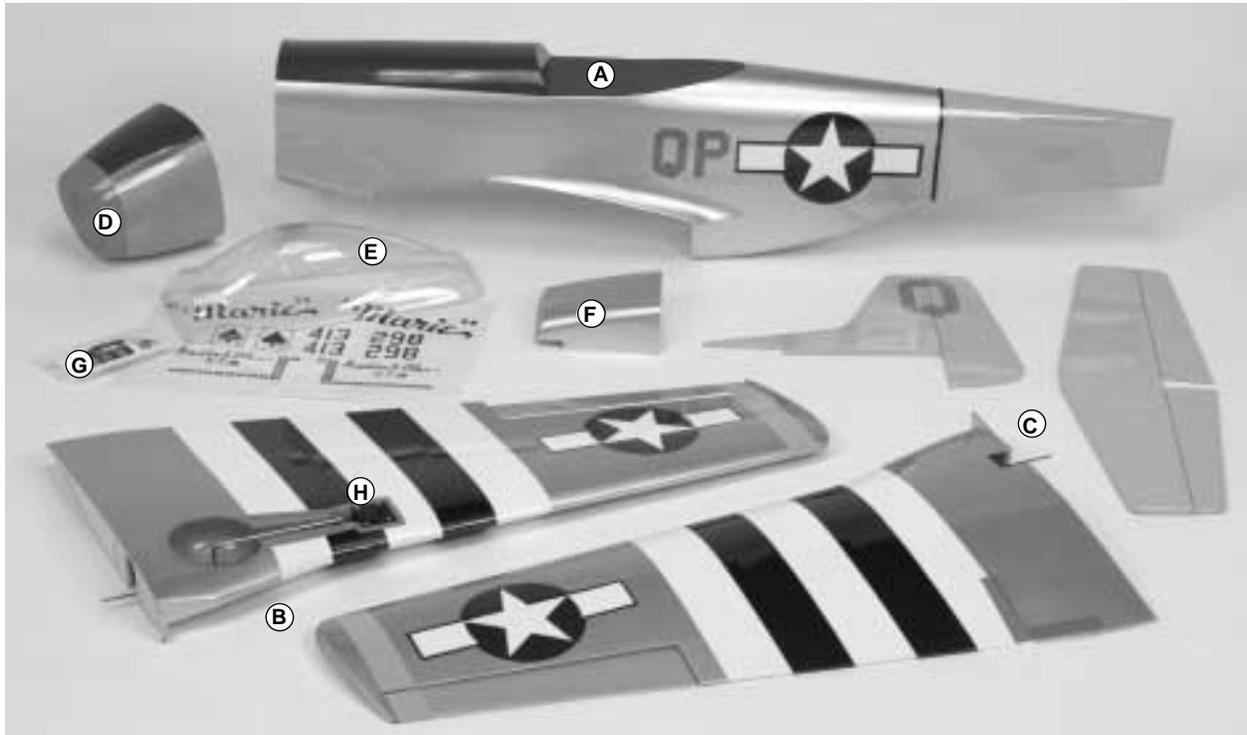
### Tools/Supplies

- |                                       |                             |
|---------------------------------------|-----------------------------|
| Drill                                 | Measuring device            |
| Drill Bits: 1/16", 1/8", 3/32", 5/32" | (e.g., ruler, tape measure) |
| Hobby knife with #11 blade            | Wax paper                   |
| Pliers                                | Rubbing alcohol             |
| Side Cutters                          | Paper towels                |
| Phillips screwdriver (small, medium)  | T-pins                      |
| Felt-tipped pen or pencil             | Radio packing foam          |
| Canopy scissors                       | Epoxy brushes               |
| Moto-tool w/cut-off wheel             | Mixing sticks for epoxy     |
| Masking tape                          | 90-degree triangle          |
| (3M blue recommended)                 | Adjustable wrench           |
| Straight edge                         | Hex wrench                  |

### Adhesives

- Thin CA (cyanoacrylate) glue
- Thick CA (cyanoacrylate) glue
- CA remover/debonder
- 6-minute epoxy
- 30-minute epoxy
- Pacer Z-42 Threadlock
- Canopy glue (RC-56)

# Contents of Kit

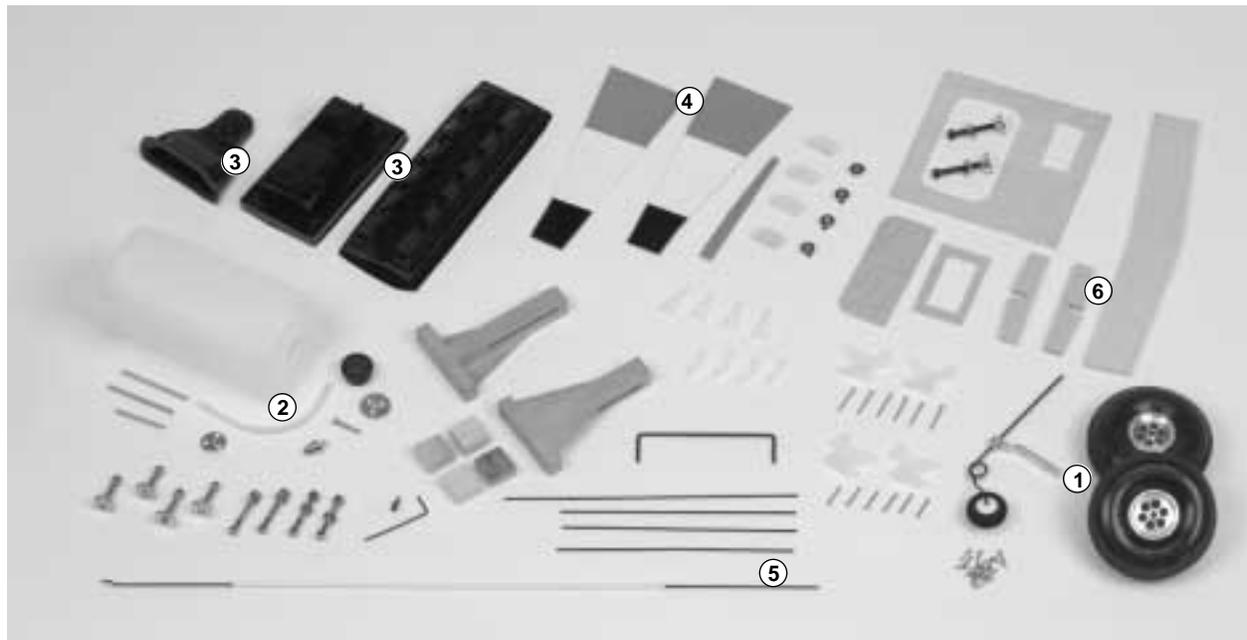


## Main Parts

- A. Fuselage (HAN2377)
- B. Wing Set w/Joiner (HAN2376) (retract not included)
- C. Tail Set (HAN2378)
- D. Fiberglass Cowl (HAN2380)
- E. Canopy (HAN2381)
- F. Belly Air Scoop (HAN2379)
- G. Decal Set
- H. Mechanical Retracts (HAN2382)

## Other Parts

- 1. Main and tail wheels
- 2. Fuel tank
- 3. Scale details
- 4. Landing gear fairings
- 5. Pushrods
- 6. Wood parts



# Section 1

## Hinging the Ailerons

### Part Needed

Right and left wing panels

### Tools and Adhesives Needed

Instant thin CA glue  
CA remover/debonder  
Paper towels  
T-pins (one for each hinge)

**Caution:** The control surfaces, including the ailerons, elevators, and rudder come with the hinges installed, but the hinges are not glued in place. The hinge is constructed of a special material that allows the thin CA to “wick” (penetrate) and distribute throughout the hinge, securely bonding them to the wood structure. It is imperative that you properly secure the hinges in place per these instructions using high-quality thin CA glue.

**Step 1.** Carefully remove the aileron from one of the wing panels, noting the position of the hinges. The P-51 comes with high-quality CA-type hinges.

**Step 2.** Remove each hinge from the wing panel and place a T-pin in the center of each hinge as shown. Slide each hinge into the wing panel until the T-pin is snug against the trailing edge of the wing panel.



**Step 3.** Slide the aileron onto the wing until there is only a slight gap between the wing panel and aileron. The hinge is now centered in the wing panel and the aileron. You can now remove the T-pins and snug the aileron up against the wing panel.

### Step 3 photo



**Step 4.** Deflect the aileron and completely saturate the hinge with thin CA glue. Be sure not to deflect the aileron too far; the top of the aileron should just touch the top of the wing trailing edge. When the hinge is glued in place, there should be no more than a 1/32" gap maintained throughout the length of the aileron.



# Section 1

## Hinging the Ailerons

**CONTINUED**

**Step 5.** Turn the wing panel over, deflect the aileron in the opposite direction, and apply thin CA to the other side of the hinges as in the previous step. Make sure the thin CA penetrates completely into both the aileron and wing panel.



**Step 6.** Using CA remover/debonder and a paper towel, remove any excess CA glue that has accumulated on the wing or aileron surface.

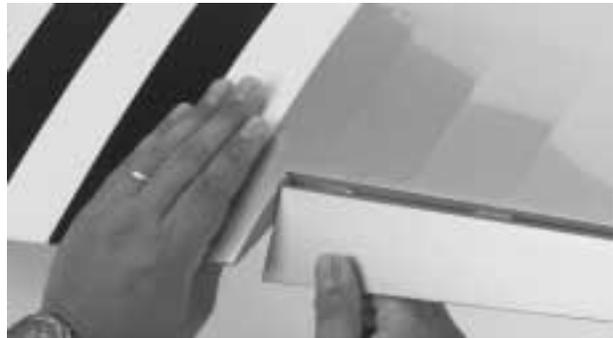


**Step 7.** Repeat Steps 1-6 for the opposite wing and aileron.

**Step 8.** Allowing time for both ailerons to completely dry, firmly grasp the wing and aileron and applying medium pressure check that they are securely attached and cannot be pulled apart. Use caution when gripping the wing and aileron as not to crush the structure.



**Step 9.** Work the aileron up and down several times to “work in” the hinges and check for proper movement.



## Section 2

# Joining the Wing Halves

### Parts Needed

Right wing panel assembly  
Left wing panel assembly  
Wing joiner

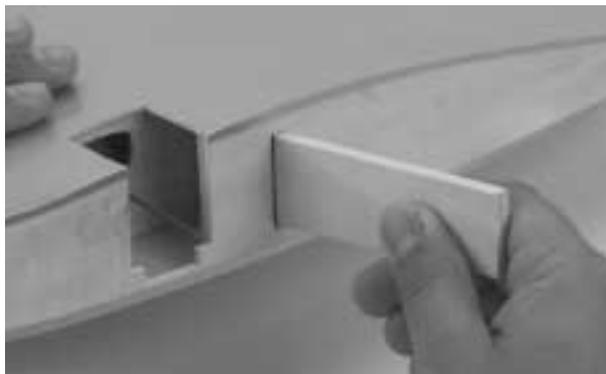
### Tools and Adhesives Needed

Ruler  
Masking tape  
30-minute epoxy  
Rubbing alcohol  
Paper towels

**Step 1.** Locate the wing joiner. Using a ruler and felt-tipped pen or pencil, measure and mark the exact center of the joiner as shown.



**Step 2.** Trial fit the wing joiner into one of the wing panels. It should insert smoothly up to the line marked in Step 1. Now slide the other wing panel onto the joiner until the two panels meet. If the fit is too tight, it may be necessary to lightly sand the wing joiner.



### Step 2 photo



**Step 3.** Check for correct dihedral angle. Place the wing on a large flat surface with one wing panel resting flat on the surface the opposite wing panel should be  $5\frac{1}{4}$ " from the flat surface (see illustration below). If necessary, sand the wing joiner until the proper dihedral is achieved. There should be no gap at the wing center joint. Once you are satisfied with the fit, separate the wing panels and remove the wing joiner.



**Note:** Read through the remaining steps of this section before proceeding to epoxy the wing panels together.

**Hint:** It is extremely important to use plenty of epoxy when joining the wing panels together. It will also be helpful to use wax paper under the wing center joint to avoid gluing the wing to your worktop.

## Section 2

# Joining the Wing Halves

CONTINUED

**Step 4.** Mix approximately 1 ounce of 30-minute epoxy. Using an epoxy brush, apply a generous amount of epoxy to the wing joiner cavity of one wing panel.



**Step 5.** Completely coat one half of the wing joiner with epoxy up to the centerline made in Step 1. Insert the epoxy-coated side of the joiner into the wing joiner cavity up to the mark on the joiner.

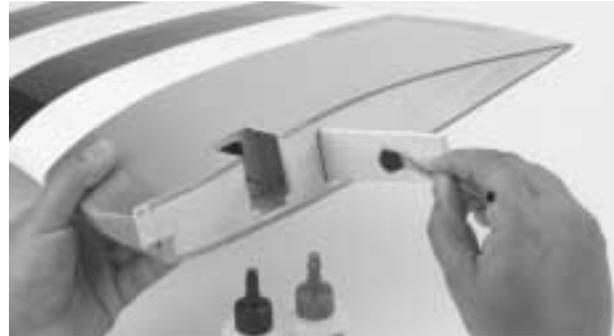


**Step 6.** Apply a generous amount of epoxy to the other wing panel joiner cavity.

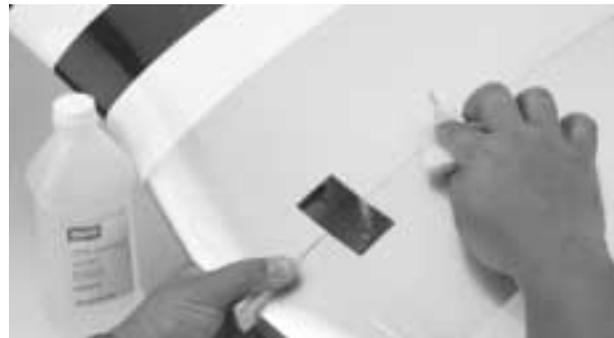


**Step 7.** Apply epoxy to the exposed portion of the wing joiner and to both wing roots.

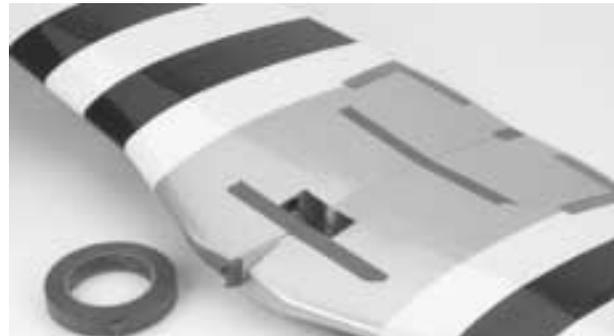
**Step 7 photo**



**Step 8.** Carefully slide both wing panels together. Firmly press both halves together, allowing the epoxy to run out. Use alcohol and paper towels wipe off the excess epoxy. Check to make sure there are no visible gaps between the two wing panels.



**Step 9.** Use masking tape to securely hold both wing halves together. Place the wing assembly back onto the flat work surface (covered with wax paper), and check the dihedral again as in Step 3.



**Step 10.** Double-check the wing center joint for any gaps and allow the epoxy to cure overnight.

## Section 3

# Installing the Aileron Servos

### Parts Needed

Wing assembly  
Aileron servos w/mounting hardware (2)  
Servo hatch screws (#2 x 3/8") (8)  
18" servo wire extension (JRPA099) (2)  
Large Servo Arm (JRPA212) (1 pkg.)

### Tools and Adhesives Needed

Phillips screwdriver  
Thin CA  
Thick CA

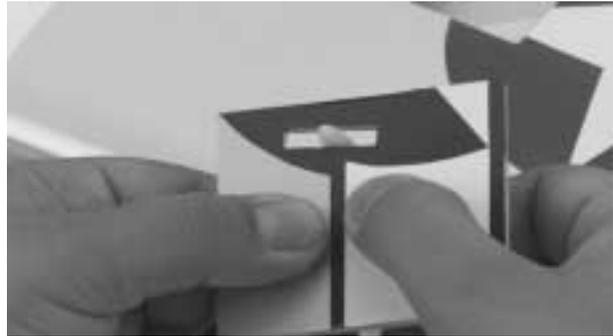
**Step 1.** Locate the aileron hatch on the underside of the wing panel. Using a sharp hobby knife carefully cut along the edges of the hatch, then remove the hatch from the wing panel. Also cut out the slot for the servo arm at this time. Locate the servo lead extension exit holes on the top of the inboard portion of the wing. Using a sharp hobby knife carefully cut away the covering over the hole.

**Note:** The aileron servo will be mounted to the hatch.



**Step 2.** Install the recommended servo hardware (grommets and eyelets) supplied with your radio system onto the aileron servo. Temporarily install a long half servo arm (JRPA212) onto the servo and test fit the servo to the hatch. The servo output shaft and control arm should be centered in the slot of the hatch. Once satisfied, mark the location for the servo mounting blocks.

### Step 2 photos



**Step 3.** Locate the servo mounting blocks. Using a few drops of thin CA, tack glue them in place on the marks made in the previous step. Check the fit of the servo between the mounting blocks. When satisfied with the fit, permanently glue the mounting blocks in place by first wicking thin CA between the mounting blocks and the hatch, and then using thick CA create a fillet around the base. Let the CA completely dry before proceeding to the next step.



## Section 3

# Installing the Aileron Servos

CONTINUED

**Step 4.** Place the aileron servo between the mounting blocks and using a felt-tipped pen mark the location of the four servo mounting screws. Note that the servo must not touch the hatch in order to isolate engine vibration.



### Step 5.

**Note:** Before mounting the servo, we suggest that you electronically center the aileron servos and install the servo arm to avoid having to remove the servo to mount the servo arm in subsequent steps.

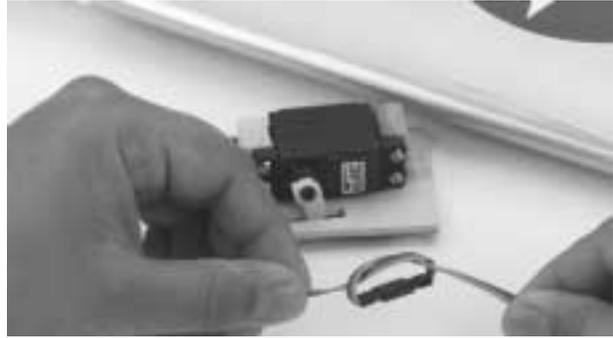
Remove the servo and using a 1/16" drill bit, drill the four servo mount screw holes marked in the previous step. Using the screws supplied with your radio system, mount the servo to the mounting blocks.



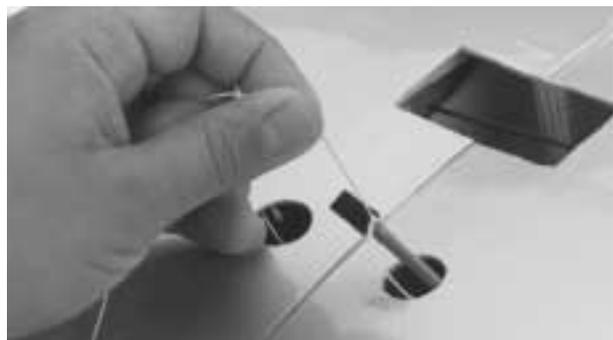
**Step 6.** Locate the aileron servo lead extension (18") (JRPA099) and connect it to the aileron servo lead. Secure the connectors by tying them in a knot or use a commercial connector that prevents the servo lead connections from becoming disconnected.

**Hint:** It is always a good idea to secure the servo connectors and servo extension together to prevent the wires from becoming unplugged inside the wing.

### Step 6 photo



**Step 7.** Locate the preinstalled string in the servo hatch opening and tie it to the servo lead extension connector. Locate the other end of the string in the exit hole you uncovered in Step 1 and carefully fish the servo lead and extension through the wing.



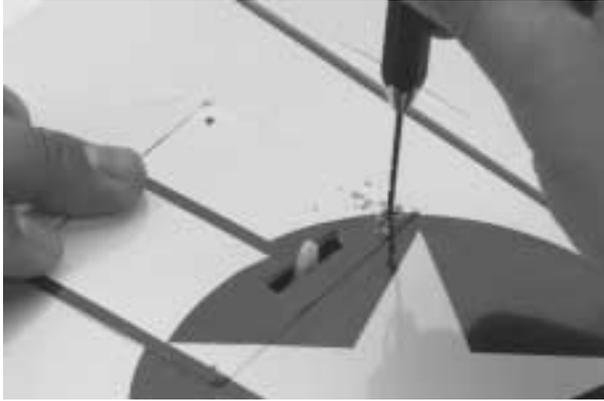
**Note:** Tape the servo extension connector to the topside of the wing to prevent the connector from slipping back into the wing structure.

## Section 3

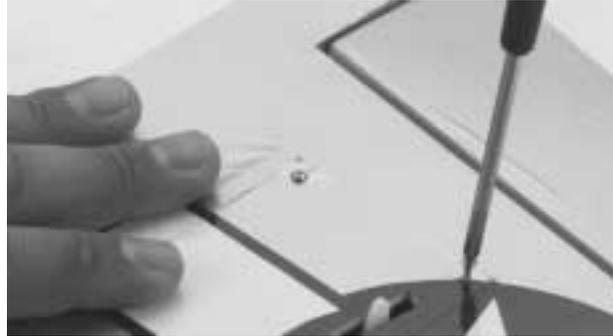
# Installing the Aileron Servos

**CONTINUED**

**Step 8.** Place the servo hatch assembly back into the opening and check the fit. Once satisfied with the fit, measure in from each corner 1/4" and using a 1/16" drill bit, drill the four mounting screw holes through the hatch and plywood tab underneath.



**Step 9.** Locate four #2 x 3/8" wood screws and using a Phillips screwdriver secure the hatch to the wing.



**Step 11.** Repeat Steps 1 through 10 for the opposite aileron servo.

## Section 4

# Installing the Aileron Control Horns & Linkages

### Parts Needed

Wing assembly  
Control horn (2)  
Horn back plate (2)  
Mounting screws (6)  
Aileron control wire (6" threaded on one end) (2)  
Clevis (2)  
Clevis keeper (2)  
Wire keeper (2)

### Tools and Adhesives Needed

Drill  
Drill Bit: 1/16"  
Pliers  
Side cutters  
Felt-tipped pen or pencil  
Phillips screwdriver (small)  
Triangle  
Masking tape

**Step 1.** Locate the aileron control horn, back plate, and three mounting screws.



**Step 2.** Place wing assembly upside down on a flat work surface. Place a triangle on the aileron hinge line and slide it up against the servo control arm as shown. Using a felt-tipped pen or pencil, mark the leading edge of the aileron. This will be the location for the center of the control horn.



**Step 3.** Place the aileron control horn on the mark made in the previous step, aligning the center of the control horn on the mark. Also align the clevis holes in the horn with the aileron hinge line as show below and mark the location of the three mounting screws.



**Step 4.** With the mounting hole locations marked, drill the holes for the mounting screws using a 1/16" drill bit. Be sure to drill straight through the aileron at a 90-degree angle to the flat work surface not to the surface of the aileron.



## Section 4

# Installing the Aileron Control Horns & Linkages

CONTINUED

**Step 5.** Using a small Phillips screwdriver, attach the control horn using the provided hardware.



**Step 6.** Locate the aileron control wire (6" threaded on one end) and thread on a clevis a minimum of 12 turns. Attach the clevis to the middle hole in the control horn. To hold the aileron at the neutral position, place a piece of masking tape on the aileron to secure it to the wing trailing edge. With the aileron at neutral and aileron servo electronically centered mark the wire where it crosses the aileron servo arm.



**Step 7.** Remove the clevis and wire from the control horn and make a 90-degree bend at the mark made in the previous step. Cut off the excess wire leaving 5/16" remaining after the 90-degree bend.



**Step 8.** Re-attach the clevis securing it to the horn using a clevis keeper. Slide the other end of the wire through the aileron servo arms outer most hole and secure it with a wire keeper as shown.



**Step 9.** Repeat Steps 1 – 8 for the opposite aileron control horn and linkage.

## Section 5

# Installing the Retract Servo

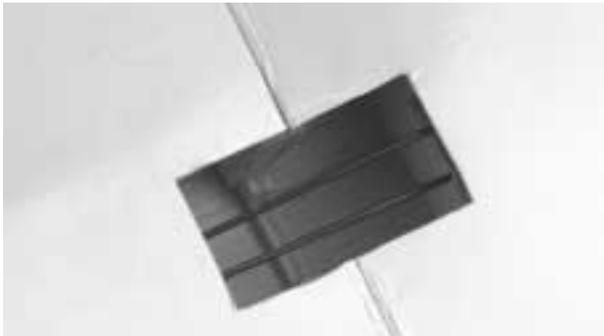
### Parts Needed

Wing assembly  
Retract servo-mounting plate  
Balsa retract servo rails (2)  
Retract servo w/hardware  
(rubber grommets and eyelets mounting screws)  
Easy connector (2)

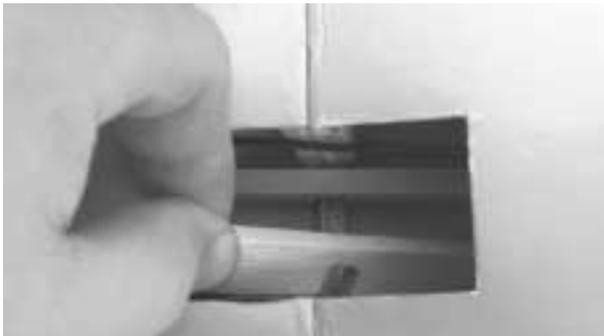
### Tools and Adhesives Needed

6-minute epoxy  
Drill  
Drill Bit: 1/16"  
Side cutters  
Phillips screwdriver  
Felt-tipped pen  
Hobby knife

**Note:** The retract mechanism and retract control wires for the P-51 come preinstalled from Hanger 9™.



**Step 1.** Locate the two balsa servo mounting rails. Trial fit these into the wing center section as shown. It may be necessary to open up the center notch in the rails to fit over the center root ribs, trim away the balsa with a sharp hobby knife until the desired fit is achieved. Do not glue in the rails at this time.



**Step 2.** Install the servo mounting hardware included with your retract servo, (rubber grommets and eyelets). Locate the retract servo mounting plate included with your kit and trial fit the servo into the mounting plate.

**Note:** The Hangar 9 P-51 retract system is designed to use a low-profile retract servo such as the JR NES703.



**Step 3.** Mark the location for the servo mounting screws using a felt-tipped pen or pencil. Remove the retract servo from the mounting plate and using a 1/16" drill bit, drill the holes for the servo mounting screws. Temporarily mount the retract servo to the mounting plate using the screws supplied with the servo.



## Section 5

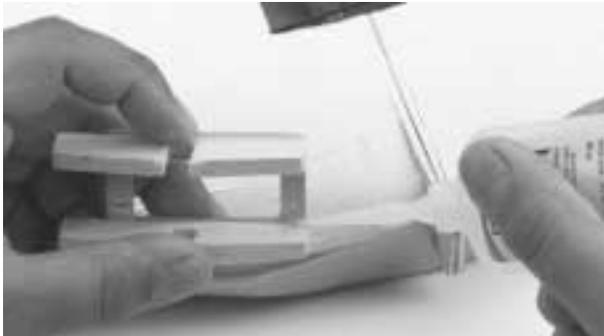
# Installing the Retract Servo

CONTINUED

**Step 4.** Trail fit the retract servo and mounting plate to the retract servo rails temporarily installed in the wing assembly. Position the servo output shaft as close to the center of the wing as shown. Mark the location of the plate on the servo rails using a felt-tipped pen or pencil. Remove the retract servo and plate assembly and also remove the rails from the wing noting the orientation of the rails in the wing.



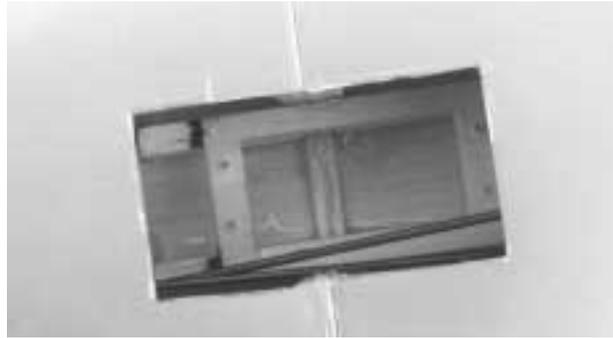
**Step 5.** Remove the retract servo from the mounting plate. Use thick CA and carefully glue the retract servo mounting plate to the servo rails. Align the plate with the marks you made on the rails. Allow the CA to fully dry before mounting to the wing assembly.



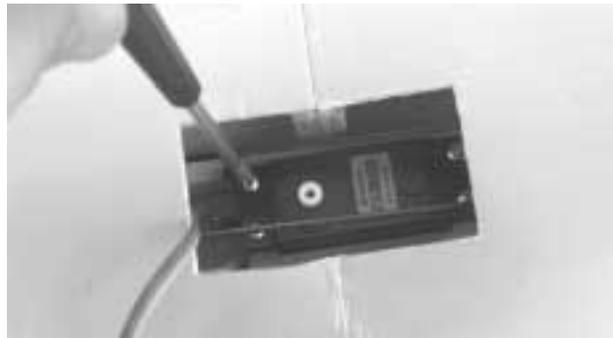
**Step 6.** Mix approximately 1/2 ounce of 6-minute epoxy and carefully glue in the retract servo mount assembly to the wing assembly. Be sure to position the rails with the proper orientation as noted in the previous step. Allow the epoxy to cure completely before proceeding to the next step.



**Step 6 photo**



**Step 7.** Permanently mount the retract servo to the mounting plate using the screws provided with your retract servo.



**Step 8.** If you have not already done so, remove the servo wheel from the servo. Locate the two quick connects supplied in the kit and mount them to the servo wheel as shown.

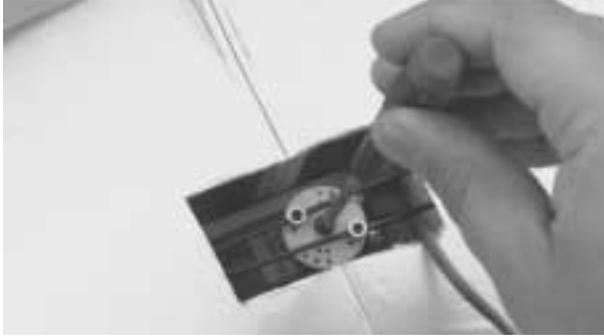


## Section 5

# Installing the Retract Servo

CONTINUED

**Step 9.** Connect the retract servo to your radio system and electronically move the servo to the extend position. Slide the retract control wires through the quick connects as shown and mount the servo wheel to the retract servo.



**Step 10.** With the retract servo in the extended gear position, pull on the retract wires to manually extend the landing gear. Tighten the set screws on the quick connects and clip off the excess wire.

**Step 10 photo**



**Step 11.** Cycle the retract system several times and check to make sure there is no binding, also check that the landing gear locks in both the retracted and extended position.

## Section 6

# Installing the Main Landing Gear Wheels and Fairings

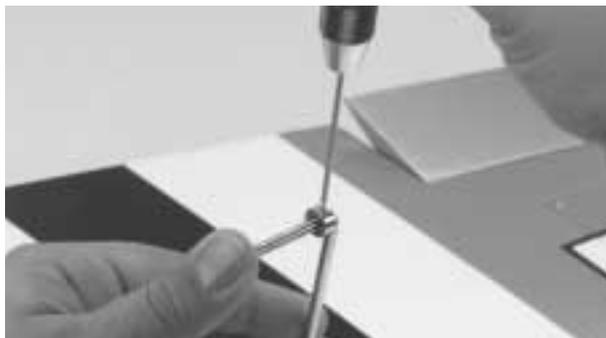
### Parts Needed

Wing assembly  
Main landing gear wheels (2)  
Large wheel collars and set screws (4)  
Landing gear fairing (2)  
Fairing mounting straps (4)  
Small screws (8)  
Small nuts (8)

### Tools and Adhesives Needed

Flat screwdriver (small)  
Hobby knife  
Drill  
Drill Bit: 3/32"  
Ruler  
Felt-tipped pen or pencil  
Threadlock (Locktite Z-42)  
Hex wrench

**Step 1.** Locate the large wheel collars and slide one onto the landing gear wire as shown. Using threadlock on the setscrew, secure the wheel collar in place.



**Step 2.** Slide the main landing gear wheel onto the wire and secure the wheel in place with another wheel collar.



**Step 3.** Repeat Steps 1 and 2 for the other main landing gear wheel.

**Step 4.** With both main wheels installed on the landing gear check to make sure there is no binding of the wheels in the wheel wells. This is best checked by hooking up the retract servo to your radio system and operating the servo via the transmitter.

**Note:** If there is binding, it may be necessary to slightly bend the main landing gear wire to free up the wheel. Two pairs of pliers works well for this, using one pair to hold the base of the wire without putting any pressure on the retract mechanism.



**Step 5.** Locate the landing gear fairing, two mounting straps, mounting screws, and nuts. Note that there is a left and right fairing. The outside of the fairing has white and black trim that matches the strips on the bottom of the wing.



## Section 6

# Installing the Main Landing Gear Wheels and Fairings

CONTINUED

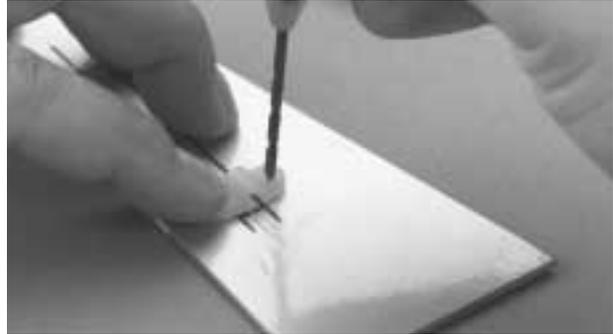
**Step 6.** With the landing gear retracted, fit the fairing to the bottom of the wing as shown, lining up the trim colors on the bottom of the wing. Secure the fairing in place with masking tape and extend the landing gear. Use a felt-tipped pen to mark the location of the wire on the fairing.



**Step 7.** Turn the fairing over and draw a line from the top to the bottom. Measure in 2" from both the top and the bottom and mark the location for the mounting straps.



**Step 8.** Position the mounting straps on their locations and use a 3/32" drill bit to drill through the mounting block and fairing as shown.



**Step 9.** With the landing gear extended, mount the fairing to the landing gear using the mounting straps, #2 wood screws, and nuts.



## Section 7

# Mounting the Wing to the Fuselage

### Parts Needed

Fuselage  
Wing assembly  
Radiator scoop  
Wing bolt plate  
8-32 wing mounting bolts (2)  
8-32 blind nuts (2)  
Medium fuel tubing (1/2")

### Tools and Adhesives Needed

6-minute epoxy  
Thin CA  
Masking tape  
Felt-tipped pen or pencil  
Hobby knife  
9/64" hex driver  
Slip-joint pliers

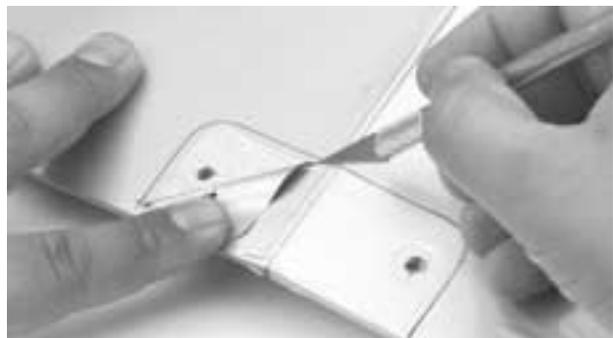
**Step 1.** Locate the predrilled holes in the fuselage wing mount plate and install the blind nuts into these holes. Use a pair of slip-joint pliers and a scrap piece of plywood as shown to press in the blind nuts. Once the blind nuts are securely pressed in, use a few drops of thin CA to glue them into place. Be sure not to get any CA in the treads of the blind nuts.



**Step 2.** Locate the predrilled holes in the wing trailing edge and use a sharp hobby knife to remove the covering as shown.



**Step 3.** Locate the plywood wing mounting plate. Align the plate with the trailing edge of the wing and the center joint as shown and mark the outline of the plate with a felt-tipped pen/pencil. Use a sharp hobby knife to trim away the covering 1/16" inside the lines you just drew.



## Section 7

# Mounting the Wing to the Fuselage

CONTINUED

**Step 4.** Mix 1/2 ounce of 6-minute epoxy and coat both the wing and plywood plate. The groove cut into the plywood plate should be facing up to allow the plate to conform to the dihedral of the wing. Align the plate and clamp in place. Wipe away any excess epoxy with rubbing alcohol and paper towels. Allow the epoxy to fully cure.

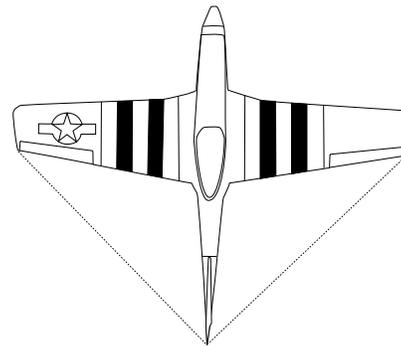
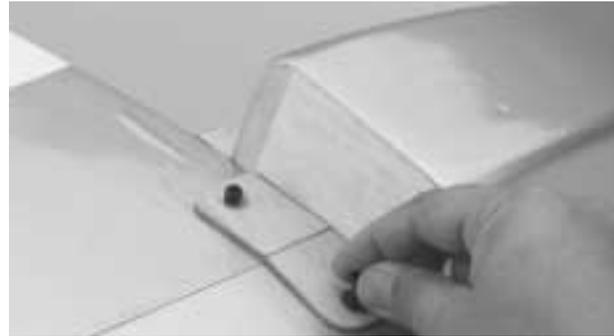
**Caution:** Use scrap plywood under the clamps to prevent damage to the balsa wing structure.



**Step 5.** Once the epoxy has fully cured, use a drill and 5/32" drill bit to drill through the plywood plate. Use the predrilled holes in the wing as a guide.



**Step 6.** Mount the wing to the fuselage using the two provided mounting bolts and washers. Tighten the bolts finger tight and align the wing to the fuselage by measuring from the wing tips to the center rear of the fuselage as shown. The measurements should be equal on both sides. It may be necessary to enlarge the holes in the mounting plate to get the proper alignment.



**Step 7.** Once the wing is properly aligned, locate the radiator scoop and use a sharp hobby knife to cut away the covering over the two wing bolt access holes. Trial fit the scoop to the wing, aligning it with the fuselage as shown.



## Section 7

# Mounting the Wing to the Fuselage

CONTINUED

Step 9 photo



**Step 8.** With the radiator scoop properly positioned, use a pencil to trace the outline onto the wing. Use only enough pressure to make a slight indentation in the covering. Use a sharp hobby knife to cut away the covering 1/16" inside the line you just made.



**Step 9.** Remove the wing and place a piece of wax paper or plastic wrap on the wing saddle where the radiator scoop contacts the fuselage. Remount the wing. Mix at least 1/2 ounce of 6-minute epoxy and coat both the radiator scoop and the wing. Align the radiator scoop with the fuselage and the bare wood exposed in Step 9. Secure the scoop in place using masking tape and wipe away any excess epoxy with rubbing alcohol and paper towels.

Step 9 photos



**Step 10.** Once the epoxy has cured remove the wing and use a 1/4" piece of fuel tubing over the mounting bolts to keep them from falling out.



## Section 8

# Installing the Tail Group (Horizontal and Vertical Fin)

### Parts Needed

Fuselage assembly  
Wing assembly  
Horizontal stabilizer  
Elevator joiner wire (U-shaped)  
Vertical fin

### Tools and Adhesives Needed

30-minute epoxy  
Sharp hobby knife  
Long ruler  
Rubbing alcohol  
Paper towels  
Felt-tipped pen or pencil  
T-pin

**Step 1.** The slots for the horizontal and vertical stabilizer are located in the rear of the fuselage. Using a sharp hobby knife carefully remove the covering over the slots.



**Step 2.** Locate the horizontal stabilizer and elevator assembly and remove the elevators and hinges. Use a felt-tipped pen or pencil and ruler to mark the center of the stabilizer at the trailing edge as shown.



**Step 3.** Mark the center of the stabilizer saddle at the trailing edge of the saddle. You can hold the ruler at the back portion of the stab opening and use a pen or pencil to mark the center location through the opening of the vertical fin as shown.



**Note:** The horizontal stabilizer is positioned all the way forward in the saddle area to allow room for the elevator joiner wire. The wire will be inserted through the saddle area before the horizontal stabilizer is glued in place.

**Step 4.** Slide the horizontal stabilizer through the saddle opening and align the marks you made in the two previous steps. Once you are satisfied with the alignment, carefully place a T-pin through the stabilizer and the saddle at the trailing edge. This will keep the horizontal stabilizer in place during alignment.

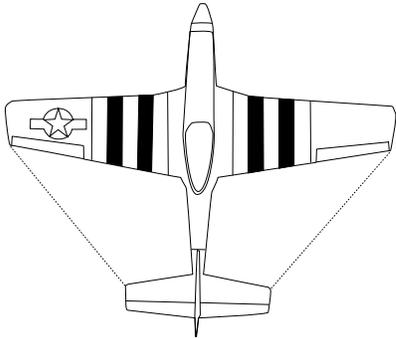


## Section 8

# Installing the Tail Group (Horizontal and Vertical Fin)

CONTINUED

**Step 5.** Mount the wing to the fuselage and measure the distance from the wing tip to the tip of the horizontal stabilizers as shown in the illustration below. Carefully adjust the horizontal stabilizer until the measurement is equal on both sides making sure to keep the marks on the stabilizer and saddle aligned.



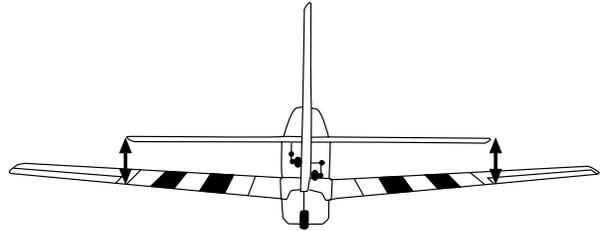
**Step 6.** With the horizontal stabilizer properly aligned, carefully mark the stabilizer with a felt-tipped pen or pencil where it meets the fuselage. Mark both the top and bottom of the horizontal stabilizer.



**Step 7.** Remove the stabilizer and use a sharp hobby knife to carefully remove the covering from the center of the stabilizer, cutting 1/16" inside the lines you marked in the previous step. Use only enough pressure to cut the covering and not the wood underneath, as doing so will severely weaken the structure of the horizontal stabilizer.



**Step 8.** Re-install the stabilizer into the fuselage. Use the lines drawn in Step 6 to reposition the stab correctly. Looking from behind the plane, check to make sure the horizontal stabilizer is parallel to the wing as shown in the illustration below. If any adjustments are required, lightly sand the stabilizer saddle to bring the horizontal stabilizer into alignment with the wing.



**Step 9.** Locate the vertical fin and rudder assembly and remove the rudder and hinges from the fin. Trial fit the fin into the fuselage as shown, making sure to align the trailing edge of the rudder with the fuselage. Use a felt-tipped pen or pencil to mark both the fin and fuselage where they come together.



## Section 8

# Installing the Tail Group (Horizontal and Vertical Fin)

CONTINUED

**Step 10.** Remove the fin and use a sharp hobby knife to remove the covering where the fin inserts into the fuselage, cutting 1/16" inside the lines you drew in the previous step. Also cut away the covering on top of the fuselage 1/16" inside the lines you drew. Use only enough pressure to cut the covering not the wood underneath.



**Step 11.** Re-install the fin into the fuselage to check the fit.



**Note:** Read through the remaining steps of this section before proceeding to Step 12 and have all your supplies and parts laid out ready to install.

**Step 12.** Remove the horizontal stabilizer and vertical fin from the fuselage. Mix 1 ounce of 30-minute epoxy and coat the horizontal stabilizer saddle and then coat both sides of the stabilizer center section.



**Step 13.** Slide the elevator joiner wire through the saddle area before inserting the stabilizer. Insert the stabilizer into the fuselage and align with the wing. Wipe off the excess epoxy using rubbing alcohol and paper towels.

**Hint:** Coat the center of the elevator joiner wire with petroleum jelly to keep the epoxy from setting up on the wire.



## Section 8

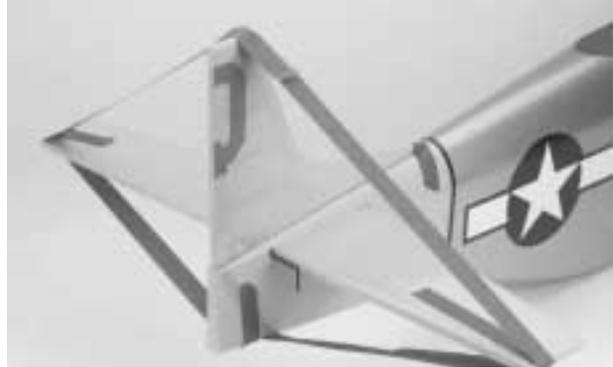
# Installing the Tail Group (Horizontal and Vertical Fin)

CONTINUED

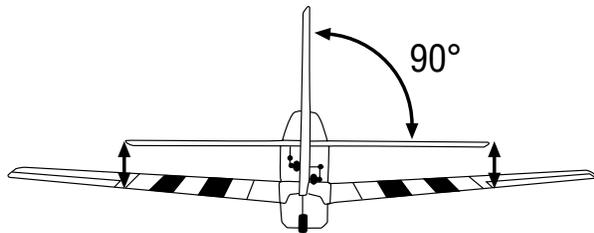
**Step 14.** Use the remaining epoxy coat the bottom of the vertical fin and the slot in the fuselage for the fin. Try to keep the epoxy away from the joiner wire. Insert the fin into the fuselage and make sure it is fully seated in the slot. Wipe away any excess epoxy with rubbing alcohol and paper towels.



Step 15 photo



**Step 15.** Double-check the alignment of the horizontal stabilizer and vertical fin and use masking tape to secure it in place. Use rubbing alcohol and paper towels to clean the epoxy off of the elevator joiner wire. Allow the epoxy to fully cure.



## Section 9

# Hinging the Elevators

### Parts Needed

Fuselage assembly  
Left and right elevator halves  
Hinges (6)

### Tools and Adhesives Needed

Thin CA  
CA remover/debonder  
6-minute epoxy  
Drill  
Drill Bit: 3/32"  
T-pins  
Rubbing alcohol  
Paper towels

**Note:** The elevator halves are joined together with the U-shaped wire supplied with the kit. This wire will be used to drive both elevator halves and is epoxied into place.

**Caution:** The hinges included with the P-51 are made of a special material that allows the thin CA to "wick" (penetrate) and distribute throughout the hinge, securely bonding them to the wood structure. It is imperative that you properly secure the hinges in place using high quality thin CA glue.

**Step 1.** Locate the left and right elevator halves and temporarily install the elevators to the horizontal stabilizer. Center the elevator joiner wire in the tail of the fuselage and use a felt-tipped pen or pencil to mark the outline of the wire onto the elevators.

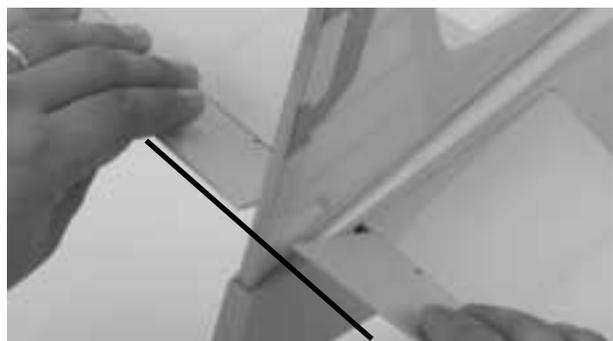


**Step 2.** Remove the elevators. Using a 3/32" drill bit, carefully drill the holes into the elevators using the marks you made in the previous step as a guide. Drill directly down the center of the elevator and only as far as needed.

**Hint:** Use a piece of masking tape on the drill bit as a depth gauge.



**Step 3.** Temporarily install the elevators back onto the horizontal stabilizer and check for fit. The elevator halves should be equal to each other and move freely up and down. If the elevators are not equal, you can remove them and carefully bend the joiner wire until they come into alignment. Once satisfied with the fit, remove the elevator halves.



## Section 9

# Hinging the Elevators

CONTINUED

**Step 4.** Place a T-pin in the center of each hinge and slide the hinges into the horizontal stabilizer until the T-pin is snug against the trailing edge as shown.



**Note:** In the following steps you will permanently install the elevators. Do not glue the hinges in place until the joiner wire epoxy has cured.

**Step 5.** Mix at least 1/4 ounce of 6-minute epoxy. Using a toothpick as an applicator, coat the inside of the joiner wire holes and the wire where it inserts into the elevators.



**Step 6.** Install each elevator onto the hinges and the joiner wire. Remove the T-pins and push the elevators close to the stabilizer until there is only a slight gap (1/32" or less) at the hinge line. Wipe away any excess epoxy with rubbing alcohol and paper towels. Use masking tape to hold the elevators in place and allow the epoxy to cure completely before moving to the next step.



**Step 7.** Once the epoxy has cured, deflect the elevators down and use a high-quality thin CA to completely saturate each hinge.



**Step 8.** Turn the fuselage over and repeat the hinge gluing process by deflecting the elevators in the opposite direction and again completely saturating each hinge with thin CA. Wipe away any excess CA using CA Remover/Debonder and a paper towel. Allow the CA to completely dry.



**Step 9.** Once the CA has dried, check the hinges for security by trying to pull the elevators from the stabilizer. Use only slight pressure and be sure not to crush the wood structure of the stabilizer or elevator.



## Section 10

# Installing the Rudder and Tail Wheel Assembly

CONTINUED

### Parts Needed

Fuselage assembly  
Rudder  
Hinges  
Tail wheel assembly

### Tools and Adhesives Needed

Thin CA  
CA remover/debonder  
6-minute epoxy  
Sharp hobby knife  
Drill  
Drill Bit: 3/32", 1/16"  
Pliers  
Rubbing alcohol  
Paper towels

**Step 1.** Locate the tail wheel assembly and use pliers to make a 90-degree bend 1" up from the bushing as shown. Measure over 1" from the bend and trim off the excess wire. This portion of the wire will be inserted into the rudder.

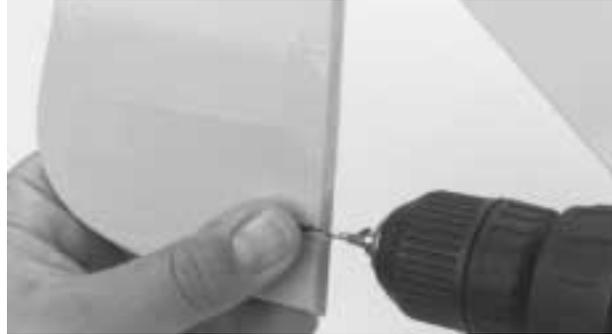


**Step 2.** Temporarily install the rudder using the hinges provided; do not glue the hinges at this time. Hold the tail wheel assembly up to the fuselage as shown and mark the location where the wire will insert into the rudder. Remove the rudder.



**Step 3.** Using a 3/32" drill bit, drill the rudder following the marks you made in the previous step. Make sure to drill straight into the rudder.

**Hint:** Use a piece of masking tape on the drill bit as a depth gauge to avoid drilling too deep.



**Step 4.** Use a sharp hobby knife to make a notch in the bottom portion of the rudder to accept the tail wheel wire and allow the rudder to seat properly against the vertical fin. Tests fit the rudder and tail wheel assembly to the vertical fin and make adjustments until there is only a slight gap (1/32" or less) at the hinge line.



## Section 10

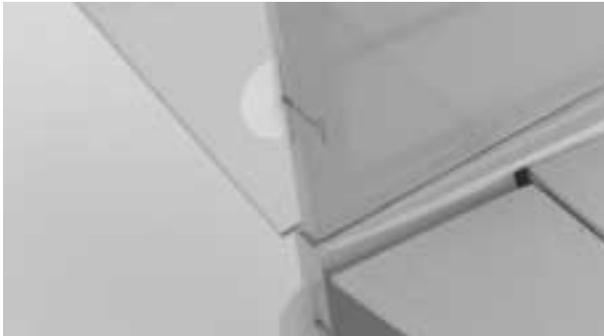
# Installing the Rudder and Tail Wheel Assembly

CONTINUED

**Step 5.** Align the tail wheel assembly bracket with the center of the fuselage and drill the screw mounting holes using a 1/16" drill bit. Using the two provided screws, mount the bracket to the fuselage as shown.



**Step 6.** Install the rudder hinges placing a T-pin through the center of each hinge to keep it centered while installing the rudder.



**Step 7.** Mix at least 1/4 ounce of 6-minute epoxy and use a tooth pick to coat the inside of the hole you drilled in the rudder. Also coat the wire that inserts into the rudder. Use caution not to get epoxy into the tail wheel assembly bushing.



**Step 8.** Install the rudder and wipe away excess epoxy using rubbing alcohol and paper towels. Remove the T-pins and move the rudder against fin until there is only a slight gap (1/32" or less). Use masking tape to secure the rudder to the fin and allow the epoxy to cure.



## Section 10

# Installing the Rudder and Tail Wheel Assembly

CONTINUED

**Step 9.** Once the epoxy has cured, deflect the rudder fully in one direction and saturate each hinge with thin CA. Deflect the rudder in the opposite direction and saturate each hinge again with thin CA. Allow the CA to dry. Use CA remover/debonder to wipe off any excess CA on the rudder hinge line.



**Step 10.** Once the CA has completely dried, check the rudder for security by trying to pull the rudder from the fuselage. Use only enough pressure to test for security and be careful not to damage the wood structure of the rudder or fin.



## Section 11

# Installing the Elevator and Rudder Control Horns

### Parts Needed

Control horn w/backplate (2)  
Control horn screws (6)  
Fuselage  
Wing

### Tools and Adhesives Needed

Drill  
Drill Bit: 1/16"  
Felt-tipped pen or pencil  
Phillips screwdriver (medium)  
Ruler

**Important:** When installing the control horns, the holes in the control horns where the pushrod attaches must be directly in line with the control surface hinge line.

**Step 1.** To locate the elevator control horn position, measure over 3/4" on the bottom left side of the horizontal stabilizer along the fuselage. Mark the elevator as shown with a felt-tipped pen or pencil. This mark will be the center of the elevator control horn location.



**Step 2.** Place the center of the control horn on the elevator at the mark made in the previous step. Mark the hole positions of the control horn with a felt-tipped pen or pencil.



**Step 3.** Remove the control horn and drill 1/16" holes through the elevator as marked. Make sure to drill these holes parallel to each other to allow the back plate of the horn to fit properly.



**Step 4.** Using the provided screws and backplate, attach the elevator control horn and fasten in place with a Phillips screwdriver.



**Step 5.** Measure 1 1/2" up from the bottom of the rudder on the left side of the rudder. Mark the location with a felt-tipped pen or pencil. This mark will serve as the center for the rudder control horn.



## Section 11

# Installing the Elevator and Rudder Control Horns

**CONTINUED**

**Step 6.** Center the control horn over the mark you've just made. Make sure the horn is positioned over the hinge line, just like you did for the elevator. Using a felt-tipped pen or pencil, mark the mounting screw hole locations on the rudder.



**Step 7.** Drill these holes with a 1/16" drill bit and install the rudder control horn, using the screws and backplate provided.



# Section 12

## Assembling the Fuel Tank

### Parts Needed

Metal tubes (1 short, 1 long)  
Clunk (fuel pickup)  
Fuel pickup tubing  
Fuel tank  
Metal caps (2)  
Rubber stopper  
3mm screw

### Tools and Adhesives Needed

Hobby knife  
Screwdriver (medium)

**Step 1.** Locate the tank parts.



**Note:** The stopper provided with the P-51 has three holes that are not bored completely through the stopper. You will only be using two holes: one for the fuel pickup and one for the fuel vent. Make sure not to open the third hole, as this will cause a fuel leak.

**Step 2.** Locate the rubber stopper. Insert the shorter brass fuel tube into one of the holes in the stopper so that an equal amount of tube extends from each side of the stopper. This tube will be the fuel tank pickup that provides fuel to the engine.



**Step 3.** Slide the smaller of the two caps over the tube on the smaller end of the rubber stopper. The small end will be inserted into the fuel tank. The larger cap is placed on the other side of the rubber stopper that makes the cap. Loosely install the 3mm screw through the stopper.



**Step 4.** Locate the other brass fuel tube and bend it carefully using your fingers. This will be the fuel tank vent tube.



**Step 5.** Slide the vent tube into one of the two remaining holes in the stopper from the tank (small cap) side.



## Section 12

# Assembling the Fuel Tank

**CONTINUED**

**Step 6.** Locate the short piece of silicone fuel tubing and the fuel tank clunk. Install the clunk onto one end of the silicone tubing and the other end onto the fuel tank pickup tube (straight tube) in the stopper.



**Step 7.** Carefully insert the assembly into the fuel tank. Note the position of the vent tube; it must be at the top portion of the fuel tank to function properly. Also, it may be necessary to shorten the length of the fuel pickup tubing to make sure the clunk does not rub against the back of the fuel tank. You should be able to turn the tank upside down, which allows the clunk to freely drop to the top of the tank.



**Step 8.** Tighten the 3mm screw carefully—do not over tighten. This allows the rubber stopper to form a seal by being slightly compressed, thus sealing the fuel tank opening.



**Important:** Be sure to differentiate between the vent and the fuel pick-up tube. Once the tank is mounted inside the fuselage, it will be difficult to tell the tubes apart.

**Note:** The fuel tank will be installed in the next section.

# Section 13

## Mounting the Engine

### Parts Needed

Fuselage assembly  
Engine mount  
Engine mounting hardware:  
8-32 x 1 $\frac{1}{4}$ " bolt (4)  
8-32 x 1" bolt (4)  
8-32 blind nut (4)  
8-32 lock nut (4)  
#8 washer (8)  
Assembled fuel tank  
RC foam (not included)

### Tools and Adhesives Needed

Hex wrench: 9/64"  
Drill  
Drill Bit: 1/8"  
Hobby knife  
Measuring device  
Felt-tipped pen or pencil  
Adjustable wrench

**Note:** The P-51 comes with oval shaped holes cut out in the firewall to accept the 8-32 blind nuts for mounting the engine mount rails. This allows for different sized engines to be used.

**Step 1.** Locate the engine mounting rails and associated hardware.

**Step 2.** Temporarily install the engine to the rails using four 8-32 bolts, washers, and lock nuts. Hold the mount up to the firewall and mark the locations for the blind nuts. Remove the engine from the rails.



**Step 3.** Install the 8-32 blind nuts from inside the fuselage and mount the rails to firewall. Seat the blind nuts by tightening the bolts. Remove the bolts and carefully glue the blind nuts in place with Thin CA, be sure not to get any CA on the threads of the blind nuts.

### Step 3 photos



**Step 4.** Install the engine mount rails using threadlock and the 9/64" hex wrench. Loosely mount the engine to the rails and measure 5 $\frac{1}{4}$ " from the firewall to the prop drive washer of the engine. Tighten the mounting hardware and mark the location of the engine on to the mount. Use these marks to properly position the engine if it needs to be removed in the future.



# Section 13

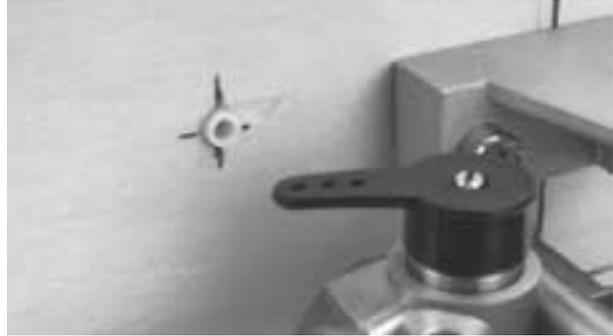
## Mounting the Engine

CONTINUED

Step 4 photo



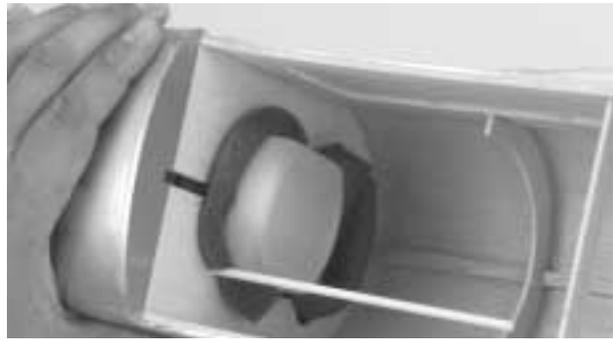
Step 6 photo



**Step 5.** Determine the proper location for the throttle pushrod. Mark the location with a felt-tipped pen or pencil and drill the firewall for the pushrod tube using a drill and 1/8" drill bit. Remove the engine if necessary.



**Step 7.** Once the epoxy has cured, install the fuel tank into the front of the fuselage. The stopper and fuel tubes should come through the round hole cut in the firewall. Use RC foam to hold the tank in place and protect against vibration.



**Step 6.** Test fit the throttle pushrod tube through the firewall and into the fuselage. Once satisfied with the fit, mix 1/4 ounce of 6-minute epoxy and glue the pushrod into the firewall. Allow the epoxy to cure.

**Hint:** If you removed the engine to install the throttle pushrod tube, reinstall it at this time while the epoxy cures.



# Section 14

## Installing the Radio System

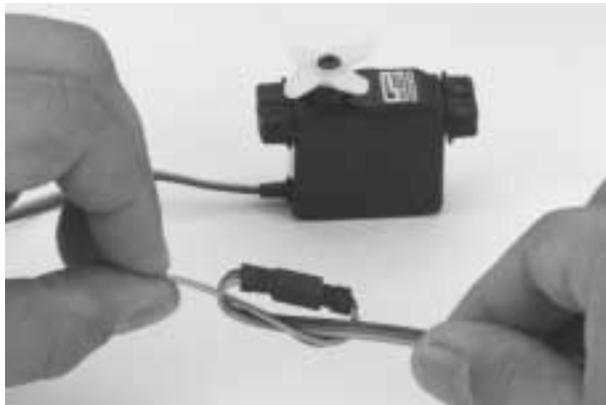
### Parts Needed

Fuselage assembly  
Servo (3) (not included)  
Servo lead extension (2) (24") (not included)  
Receiver (not included)  
Battery pack (not included)  
RC foam (not included)  
Antenna tube (optional)

### Tools and Adhesives Needed

Hobby knife  
Drill  
Drill Bit: 1/16"  
Thin CA  
Masking tape  
Rubber bands

**Step 1.** Install the recommended servo hardware (grommets and eyelets) supplied with your radio system onto three servos (elevator, rudder, throttle). Install the servo lead extensions (24") onto the rudder and elevator servo and secure the connectors by tying them in a knot or use a commercial connector that prevents the servo lead and extension from becoming disconnected.



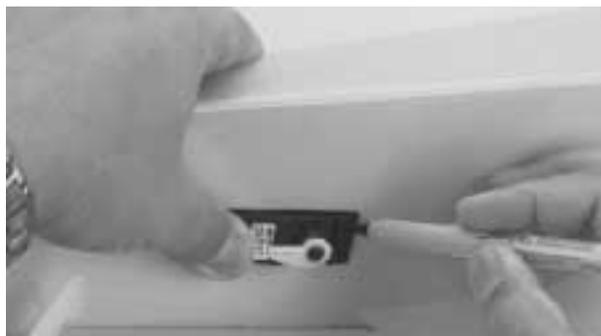
**Step 2.** Locate the elevator and rudder servo openings in the rear of the fuselage. Using a sharp hobby knife, carefully cut away the covering over the servo openings.

### Step 2 photo



**Step 3.** Temporarily install the servos into the openings and mark the location of the servo mounting screws. Remove the servos and drill the holes for the servo mounting screws using a 1/16" drill bit.

**Hint:** Place a drop of thin CA onto each screw hole to harden the wood around the hole. Allow the CA to completely dry before installing the servos.



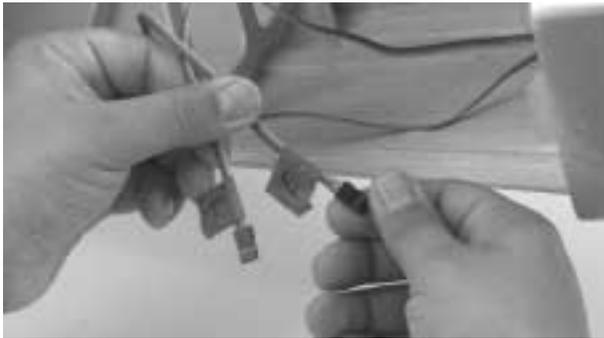
# Section 14

## Installing the Radio System

CONTINUED

**Step 4.** Install the elevator and rudder servos by feeding the servo lead and extensions through the fuselage. Secure the servos using the screws supplied with your radio system.

**Hint:** Use masking tape to identify the elevator and rudder servo leads.



**Step 5.** Using thick CA, glue in the plywood servo tray, oriented as shown. Note the throttle servo opening should be towards the side of the fuselage where the pushrod tube is located.



**Step 6.** Temporarily install the throttle servo as shown with the output shaft to the side of the fuselage where the pushrod is located. Mark the mounting screw hole locations with a felt-tipped pen or pencil.



**Step 7.** Remove the throttle servo and drill the screw holes you just marked with a 1/16" drill bit.



**Step 8.** Mount the throttle servo using the screws provided with your radio system. The throttle linkage will be installed later in this manual.



## Section 15

# Installing the Rudder, Elevator, and Throttle Linkage

### Parts Needed

Fuselage assembly  
6" linkage wire (2)  
EZ connector (1)  
Nylon clevis w/keeper (2)  
Wire keeper (2)

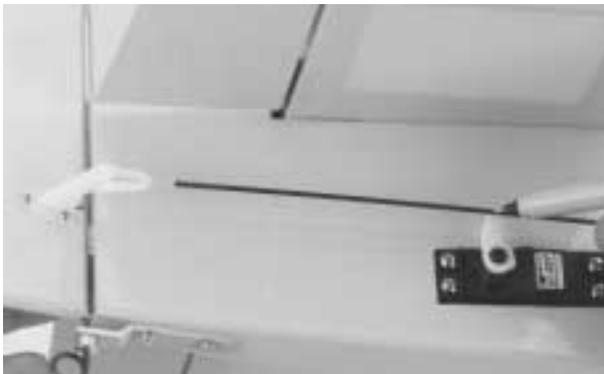
### Tools and Adhesives Needed

Needle-nose pliers  
Z-bend pliers

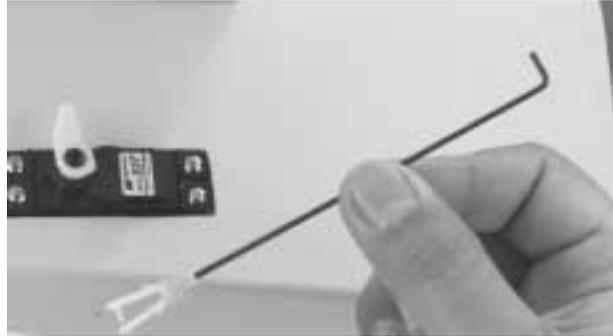
**Step 1.** Locate the 6" wires threaded on one end and thread a clevis onto each wire 12 turns minimum. One for the rudder and one for the elevator control linkage.



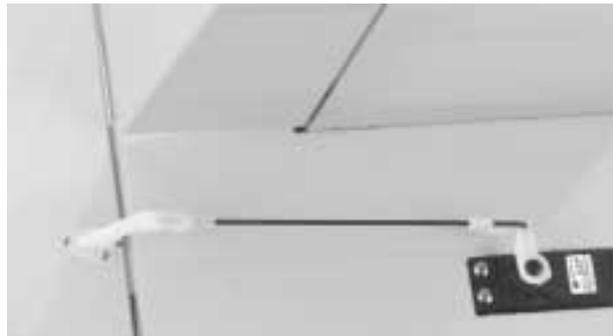
**Step 2.** Attach one clevis to the rudder control horn and, with the rudder centered and the servo electrically centered, mark the wire where it passes over the outermost hole on the servo arm.



**Step 3.** Remove the control wire and use a pair of pliers to make a 90-degree bend at the mark made in the previous step. Trim down the wire behind the 90-degree bend leaving 5/16" as shown.



**Step 4.** Install the rudder control linkage and secure with a wire keeper and clevis keeper.



**Step 5.** Repeat the Steps 2–4 for the elevator control linkage.



## Section 15

# Installing the Rudder, Elevator, and Throttle Linkage

**CONTINUED**

**Step 6.** Locate the throttle control wire with the Z-bend at one end. Slide the wire into the pushrod tube (previous installed) from the firewall into the fuselage as shown.



**Step 7.** Connect the Z-bend to your engines throttle arm. It may be necessary to remove the throttle arm to connect the throttle control wire.



**Step 8.** Mount the EZ connector to the servo arm supplied with your radio system as shown. Connect the throttle servo to your radio system and center the throttle stick. Slide the EZ connector through the wire and mount the arm to the servo.



**Step 9.** With the throttle stick centered move the throttle arm on your engine to the center of its throw (1/2 throttle) and tighten the setscrew on the EZ connector. Trim off the excess wire.



Check the throttle movement and adjust the end points if using a computer radio. If using a non-computer radio, adjust the end points by moving the connection of the wire either closer or further away from the center of the servo or throttle arm.

# Section 16

## Attaching the Cowl

### Parts Needed

- Fuselage assembly
- Cowl
- Mounting screws (4)
- 3.5" P-51 spinner (CBA5073)

### Tools and Supplies Needed

- Moto-tool with cut-off wheel and sanding drum
- Hobby knife
- Felt-tipped pen or pencil
- Masking tape

**Step 1.** Trial fit the cowl to the fuselage, noting where the engine cylinder head hits the cowl. Use a moto-tool to carefully trim away the fiberglass to allow the cowl to slide on to the fuselage. Also cut out the scoop portion under the spinner area to allow more cooling air to the engine. Remove the cowl.



**Step 2.** Looking at the firewall, notice the plywood doubler on both sides of the fuselage. Measure 1/2" from the top and bottom of the doubler and mark with a felt-tipped pen, marking both sides of the fuselage. Measure 3/8" back from the firewall at the four marks you just made and make a mark. These are the cowl mounting screw locations.



### Step 2 photo



**Step 3.** To transfer these locations to the cowl, tape a piece of paper to the side of the fuselage as shown. Transfer the screw locations to the paper and fold back along the tape line.



## Section 16

# Attaching the Cowl

CONTINUED

**Step 4.** Slide the cowl back into place and align the cowl as shown and tape in place using the spinner back plate (not included) and the trim colors on top of the fuselage as a guide.



**Step 5.** Lay the paper back over onto the cowl and mark the screw locations.



**Step 6.** Using a 1/16" drill bit, carefully drill the four cowl mounting screw locations. Drill through the cowl and into the plywood fuselage doubler (approximately 1/2").

**Caution:** Do not drill any deeper than this, as doing so may hit the fuel tank and cause a fuel leak.



**Step 7.** Mount the cowl using the #2 wood screws provided.



## Section 17

# Application of Decals and Scale Detailing

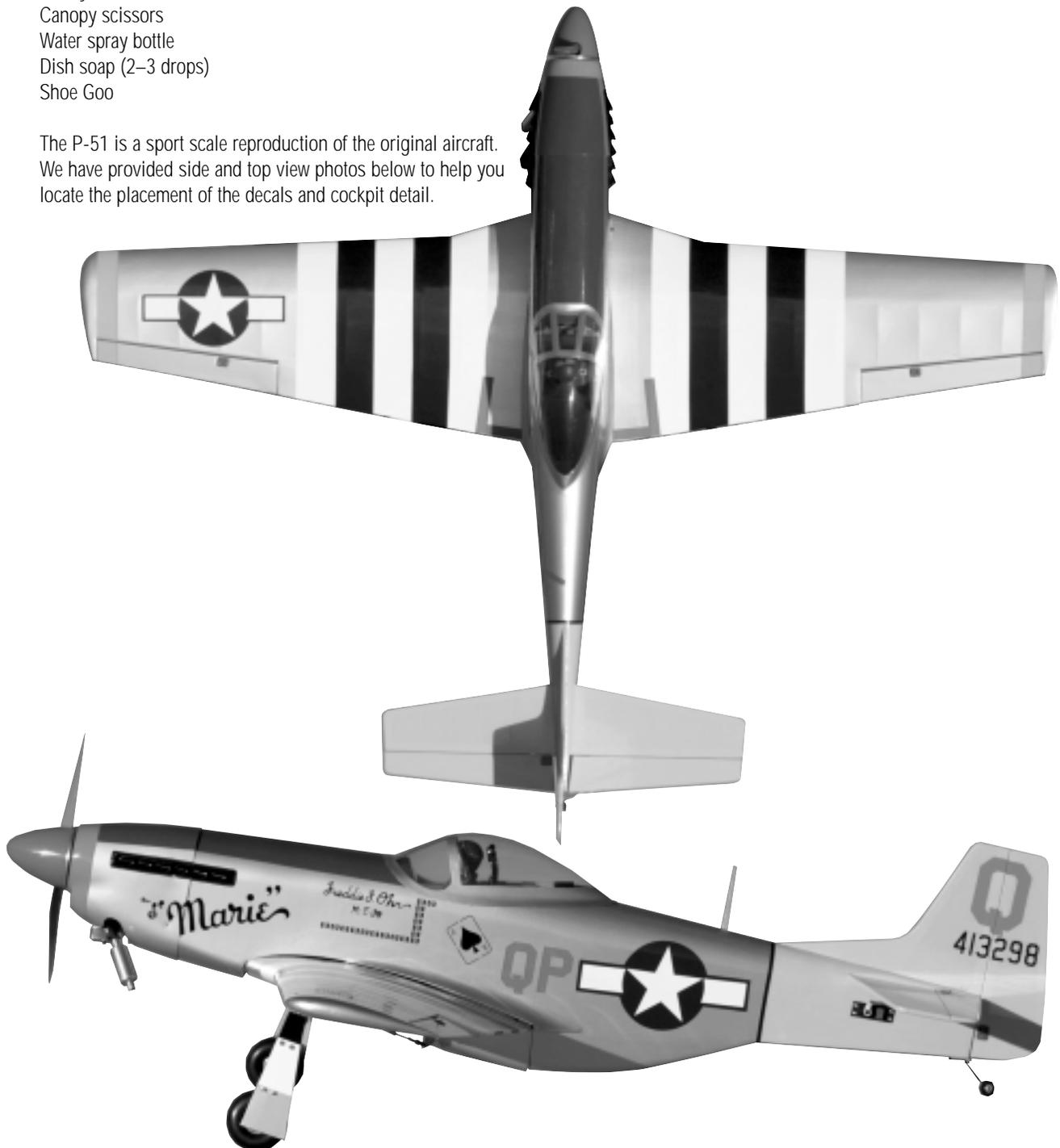
### Parts Needed

Fuselage  
Plastic cockpit detail  
Plastic exhaust detail  
Decal sheet

### Tools and Adhesives Needed

Hobby knife  
Canopy scissors  
Water spray bottle  
Dish soap (2–3 drops)  
Shoe Goo

The P-51 is a sport scale reproduction of the original aircraft. We have provided side and top view photos below to help you locate the placement of the decals and cockpit detail.



## Section 17

# Application of Decals and Scale Detailing

CONTINUED

**Step 1.** Using a pair of canopy scissors, cut out and trim the cockpit and exhaust detail.



**Step 2.** Using the detail drawings, glue the cockpit detail to the fuselage using Shoe Goo or similar type adhesive. Secure the parts with tape until the glue has dried.



**Step 3.** Using the drawings, locate the position of the scale exhaust. It will be necessary to cut the exhaust pieces and glue one part to the fuselage and the other to the cowl. If necessary, cut an access hole for the cowl mounting screw before gluing on the exhaust.



**Step 4.** Locate the decal sheet and cut out the decals for the P-51 using a sharp hobby knife and scissors.



**Step 5.** Use the drawings to locate the position of the decals on the P-51. Use a water spray bottle with 2-3 drops of dish soap added to the water and spray both the fuselage and sticky side of the decal. This will allow you to reposition the decal if necessary. Once satisfied with the position use a paper towel to squeegee out the water. Allow the decal to dry over night.



**Note:** There may be some clouding under the decal, but this will go away as the decal dries.

## Section 18

# Attaching the Canopy

### Parts Needed

Fuselage assembly  
Canopy

**Note:** The P-51 canopy comes prepainted from Hangar 9™.

### Tools and Adhesives Needed

Canopy scissors  
Canopy glue (RC560)

**Step 1.** Carefully cut out the canopy following the outline.



**Step 2.** Glue the canopy to the fuselage using RC560 canopy glue. Tape the canopy in place using masking tape and allow the glue to dry over night.



## Section 18

# Balancing and Control Throw Recommendations

The following control throws offer a good place to start with your first flights. We recommend only one rate setting for the P-51. As you become more familiar with the handling of your model, you may wish to add a second rate setting.

### Recommended Control Throws

Aileron	9/16" up	1/2" down
Elevator	1 1/16" up	1 1/16" down
Rudder	1 1/4" right and left	

### Recommended CG Location

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

**Caution:** Do not inadvertently skip this step!!

The recommended Center of Gravity (C.G.) location for the P-51 60 is 4 3/4" behind 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.

# Preflight at the Field

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## Range Test Your Radio

**Step 1.** Before each flying session, range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane. With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions. If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

**Step 2.** Double-check that all controls (aileron, elevator, throttle, rudder) move in the correct direction.

**Step 3.** Before you fly, be sure that your batteries are fully charged per the instructions included with your radio.

## Adjusting Your Engine

**Step 1.** Completely read the instructions included with your engine and follow the recommended break-in procedure.

**Step 2.** At the field, adjust the engine to a slightly rich setting at full throttle and adjust the idle and low speed needle so that a consistent idle is achieved.

**Step 3.** Before you fly be sure that your engine idles reliably, transitions, and runs at all throttle settings. Only when this is achieved should any plane be considered ready for flight.

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# AMA Safety Code

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1994 Official AMA National Model Aircraft Safety Code  
Effective January 1, 1999  
Model flying MUST be in accordance with this Code in order for AMA Liability Protection to apply.

## General

**1.** I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.

**2.** I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft.

Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

**3.** Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a care-less, reckless and/or dangerous manner.

**4.** At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators.

Only personnel involved with flying the aircraft are allowed in front of the flight line. Flying over the spectator side of the line

is prohibited, unless beyond the control of the pilot(s). In any case, the maximum permissible takeoff weight of the models is 55 pounds.

**5.** At air shows or model flying demonstrations a single straight line must be established, one side of which is for flying, with the other side for spectators. Only those persons accredited by the contest director or other appropriate official as necessary for flight operations or as having duties or functions relating to the conduct of the show or demonstration are to be permitted on the flying side of the line. The only exceptions which may be permitted to the single straight line requirements, under special circumstances involving consideration of site conditions and model size, weight, speed, and power, must be jointly approved by the AMA President and the Executive Director.

**6.** Under all circumstances, if my model weighs over 20 pounds, I will fly it in accordance with paragraph 5 of this section of the AMA Safety Code.

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

**Note:** This does not apply to models flown indoors.

**8.** I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

**9.** I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor.

**Note:** A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.

**10.** I will not operate any turbo jet engine (axial or centrifugal flow) unless I have obtained a special waiver for such specific operations from the AMA President and Executive Director and I will abide by any restriction (as) imposed for such operation by them. (Note: This does not apply to ducted fan models using piston engines or electric motors.)

**11.** I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

## Radio Control

**1.** I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.

**2.** I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

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

**4.** I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

**5.** I will not knowingly operate an R/C system within 3 miles of a pre-existing model club-flying site without a frequency sharing agreement with that club.

**6.** I will not fly my model aircraft in any racing competition, which allows models over 20 pounds unless that competition event is AMA sanctioned. (For the purpose of this paragraph, competition is defined as any situation where a winner is determined.)

**7.** Every organization racing event requires that all officials, callers, and contestants must properly wear helmets, which are OSHA, DOT, ANSL, SNELL, NOCSAE or comparable standard while on the racecourse. In addition, all officials occupying safety cages must wear protective eyewear.