P-51 Mustang 60 ARF
Assembly Manual

Specifications

Wingspan: 65 in (1653mm)
Length: 57 in (1448mm)
Wing Area: 743 sq in (47.9 sq dm)
Weight: 9.25–10.0 lb (4.2–4.5 kg)
Wing Loading: 29–31 oz per sq ft
Radio: 6-channel w/6–7 standard servos, 2 retract servos
Engine: .60–1.20 2-stroke; .91–1.25 4-stroke; E-Power 60–90
# Contents of Kit and Parts Layout

<table>
<thead>
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<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage with hatch</td>
<td>Right wing with flap, aileron, servo covers, and gear door</td>
<td>1</td>
<td>3/16-inch (5mm) dowel screws</td>
</tr>
<tr>
<td>Right wing with flap, aileron, servo covers, and gear door</td>
<td>Left stabilizer with elevator</td>
<td>1</td>
<td>#8 silver flat washer</td>
</tr>
<tr>
<td>Left stabilizer with elevator</td>
<td>Retract servo</td>
<td>1</td>
<td>wing attachment</td>
</tr>
<tr>
<td>Retract servo</td>
<td>Rudder</td>
<td>1</td>
<td>1 1/2-inch (38mm) wire wheel</td>
</tr>
<tr>
<td>Rudder</td>
<td>Elevator and rudder</td>
<td>1</td>
<td>3/4-inch (19mm) mast head bolt</td>
</tr>
<tr>
<td>Elevator and rudder</td>
<td>Tail wheel doors</td>
<td>2</td>
<td>3/16-inch (1mm) dowel screws</td>
</tr>
<tr>
<td>Tail wheel doors</td>
<td>1/4 x 77/8-inch anodized stabilizer tube</td>
<td>1</td>
<td>#8 silver flat washer</td>
</tr>
<tr>
<td>1/4 x 77/8-inch anodized stabilizer tube</td>
<td>#2 x 3/8-inch self-tapping screw</td>
<td>41</td>
<td>wing attachment</td>
</tr>
<tr>
<td>#2 x 3/8-inch self-tapping screw</td>
<td>3mm x 12mm button head</td>
<td>6</td>
<td>bolt, 3mm x 12mm metal screw</td>
</tr>
<tr>
<td>3mm x 12mm button head</td>
<td>Cowl and canopy</td>
<td>1</td>
<td>1 inch x 11/16-inch anodized bolt</td>
</tr>
</tbody>
</table>
**Radio Equipment Requirements - 7-Channel Receiver**

The following items are recommended when installing the 7-Channel AR700 receiver (ARSP700) in your aircraft.

DS821 Digital Sport Servo (7)  JRPS821

Retracts: RT88 Retract Servo (2)  JRP0088

3-inch Extension (connected to servo) (2)  JRP0030

12-inch Extension (connected to servo) (2)  JRP0012

Ailerons: DS821 Servo (2)  JRPS821

3-inch Extension (connected to servo) (2)  JRP0030

Rudder: DS821 Servo  JRPS821

Elevator: DS821 Servo  JRPS821

**Radio Equipment Requirements - 9-Channel Receiver**

The following items are recommended when installing the 9-Channel AR9000 receiver (ARSP9000) in your aircraft:

DS821 Digital Sport Servo (7)  JRPS821

Retracts: RT88 Retract Servo (2)  JRP0088

3-inch Extension (connected to servo) (2)  JRP0030

12-inch Extension (connected to servo) (2)  JRP0012

Ailerons: DS821 Servo (2)  JRPS821

3-inch Extension (connected to servo) (2)  JRP0030

Rudder: DS821 Servo  JRPS821

Elevator: DS821 Servo  JRPS821

**Optional Accessories**

- 1/8 US WWII Pilot (HANS207)
- Decal Sheet Power Ninet (HAN2427)
- Decal Sheet, Pete Dit: P-61 Blue Air NADF4227
- Decal Sheet, Escalator: P-61 Blue Air NADF4228

**Recommended Setup–2-Stroke Glow**

- Engine: FG-20 4-Stroke Gas Engine (SAIEG20)
- 60-Amp Speed Control (EVOAP000)
- Li-Po Battery, 5000mAh 4-Cell/4S 14.8V (2)  HAN2430
- 2-Cycle Sport Plug (EVOGP1)
- Fuel (15% recommended)
- Oil: Blue Block After Run Oil (EVOX1001)
- Fuel Dot (HAN115)
- Li-Po Battery, 6000mAh 6-Cell/6S 22.2V (2)  HAN2430
- 12V 7Ah Sealed Battery (HAN102)
- Power Panel (HAN136)
- Blue Black After Run Oil (EVOP01)

**Optional Equipment**

- Retracts: HANS2008              HANS4010

- Self-stick weights, 6 oz (HAN3626)
- PowerPro 12V Starter (HAN161)
- PowerPro 60 (EP) (HANS3000)
- PowerPro 120 (EP) (HANS3005)
- 20mm Spacer for Power 90 (HAN242030)
- 85-Amp Speed Control (CSEPHX85HV)
- Evolution Propeller 15 x 10 (EVO15010)
- Li-Po Battery, 5000mAh 6-Cell/6S 22.2V
- 12V 7Ah Sealed Battery (HAN102)
- Power Panel (HAN136)
- Blue Black After Run Oil (EVOP01)

- Cleaners and testers

- Decal Sheet Power Ninet (HAN2427)
- Decal Sheet Pete Dit: P-61 Blue Air NADF4227
- Decal Sheet, Escalator: P-61 Blue Air NADF4228

- Optional Setup–3-Stroke Glow

- Engine: FG-20 4-Stroke Gas Engine (SAIEG20)
- 60-Amp Speed Control (EVOAP000)
- Li-Po Battery, 5000mAh 6-Cell/6S 22.2V (2)  HAN2430
- 2-Cycle Sport Plug (EVOGP1)
- Fuel (15% recommended)
- Oil: Blue Block After Run Oil (EVOX1001)
- Fuel Dot (HAN115)
- Li-Po Battery, 6000mAh 6-Cell/6S 22.2V (2)  HAN2430
- 12V 7Ah Sealed Battery (HAN102)
- Power Panel (HAN136)
- Blue Black After Run Oil (EVOP01)

- Additional Required Tools

- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 5/32-inch (3mm), 7/32-inch (5.5mm), 1/4-inch (6mm)
- Box end or open end wrench: 12mm, 11/32-inch
- Phillips screwdriver: #1, #2
- Side cutters
- Hobby knife with #11 blade
- Medium grit sandpaper
- Hobby scissors
- Side cutters
- Low-Tack Tape (MMM209034)
- Paper towels
- Rubbing alcohol
- Mixing sticks
- Mixing cups
- String/dental floss
- T-pins
- Hook and loop tape
- Hook and loop strap
- Pencil
- Water pump pliers
- Tie wrap, 8-inch (200mm)
- Tie wrap, 12-inch (300mm)
- 12-inch (300mm)
- 1/4-inch (6mm)
- 3/8-inch (10mm)
- 1/2-inch (13mm)
- Hook and loop strap
- Pencil
- Water pump pliers
- Two-sided tape
- Small clamps
- Medium grit sandpaper
- Phillips screwdriver: #1, #2
- Hook and loop strap
- Pencil
- Water pump pliers
- Two-sided tape
- Small clamps
- Medium grit sandpaper
- Phillips screwdriver: #1, #2
- Hook and loop strap
- Pencil

- If you have an interest in the Hangar 9 P-51 Mustang, you can purchase this product directly from Hangar 9 or authorized distributors worldwide. For more information, visit our website at www.hangar9.com.
Step 1
Locate the stabilizer and elevator assemblies. Note the direction and location of the elevator control horn in relationship to the stabilizer. It is suggested to use a small piece of low-tack tape to mark one of the assemblies so the elevator and stablizer can be returned to their pairing.

Step 2
Separate the elevator and stabilizer. Remove the elevator control horn and three hinges. Set the stabilizer and hinges aside in a safe place.

Step 3
Use a piece of sandpaper to roughen the wire from the elevator control horn where it contacts the elevator. This provides a better surface for the epoxy to adhere to when glued in position. Use a paper towel and rubbing alcohol to remove any oils or debris from the wire after sanding.

Step 4
Thread the rudder horn on the wire so it is flush with the end of the wire and facing the opposite direction of the portion of the wire that will go into the elevator.

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Step 5
Mix a small amount of 30-minute epoxy. Apply the epoxy to the notch and into the hole in the elevator, as well as to the portion of the wire that will contact the elevator.

Note: Make sure to use enough epoxy to glue the torque rods. If the epoxy does not ooze out between the torque rod and elevator, you have not used enough epoxy.

Step 6
Insert the wire into the hole in the elevator. Wrap a piece of low-tack tape around the elevator to keep the wire secure until the epoxy fully cures. While the epoxy cures we can continue the hinging process then hinge the elevator last.

Step 7
Locate three hinges. Apply a small amount of petroleum jelly to each hinge where it bends to prevent it from accidentally being glued and preventing it from operating correctly.

Step 8
Insert the hinges into the control surface. Moving the hinge over 90 degrees and pressing the hinge into the surface will set the correct depth for the hinge, as the hinge point will be recessed slightly in the control surface so it operates properly.

Note: In addition to setting the correct depth of the hinge, this will guarantee that the hinge has been installed in the correct direction. Rotating the hinge could cause the surface to bind, increasing the load on the servo and draining the receiver battery prematurely.

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Step 9
In addition to setting the correct depth of the hinge, this will guarantee that the hinge has been installed in the correct direction. Rotating the hinge could cause the surface to bind, increasing the load on the servo and draining the receiver battery prematurely.

Hinging the Control Surfaces

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

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- Fuselage
- Hinge (3)
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Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
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- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.

Required Parts
- Fuselage
- Hinge (3)
- Wing panel with aileron and flap (right and left)
- Stabilizer and elevator (right and left)
- Elevator torque rod (right and left)

Tools and Adhesives
- Hinge glue
- 30-minute epoxy
- Sandpaper
- Mixing stick
- Low-tack tape
- Paper towel
- Rubbing alcohol
- Petroleum jelly

Note: You can perform the following steps for both elevator halves with one batch of epoxy. Read through the steps to familiarize yourself with the procedure before mixing any epoxy.
**Step 10**
Apply hinge glue to the holes in the elevator as shown. Make sure to read the instructions on the glue before beginning the hinging process.

**Step 11**
Insert the hinges into the holes in the elevator so the hinge point is set back as described in Steps 8 and 9. Make sure to install the hinges correctly. Allow the hinge glue to fully cure before proceeding to gluing the hinges to the fixed surface. This will prevent them from being moved accidentally. Remove any excess glue using a damp paper towel.

**Step 12**
Apply hinge glue to the holes in the stabilizer. Slide the hinges into the holes and use a damp paper towel to remove any excess glue. Check that the elevator can move up and down freely. Set the assembly aside to allow the glue to fully cure.

**Step 13**
Repeat Steps 1 through 12 to prepare the remaining half of the stabilizer and elevator.

**Step 14**
Hinging the rudder follows the same procedures as the elevators. Again, make sure to prepare the hinges and check the operation of the rudder before the hinge glue begins to cure.

**Step 15**
Apply a small piece of low-tack tape at the tip of the wing to hold the aileron in position. This will help when the flaps are being installed.

**Step 16**
Hinging the flaps will take a little finesse as the hinges will be exposed and you will need to adjust the flap so it aligns in the correct position. First, fit the flap in position using the hinges. Adjust the flap so it is in alignment with the aileron on one end and the wing at the other. You will need to adjust the position of the flap and hinges to accomplish this.

**Step 17**
Turn the wing over and check that the flap is flush with the top of the wing. Hint: Tape a piece of balsa flat to the surface to help aid in the alignment of the flap to the surface of the wing skin.

**Step 18**
Hinging the flaps will take a little finesse as the hinges will be exposed and you will need to adjust the flap so it aligns in the correct position. First, fit the flap in position using the hinges. Adjust the flap so it is in alignment with the aileron on one end and the wing at the other. You will need to adjust the position of the flap and hinges to accomplish this.

**Important**: Each aileron has a hard point installed in the bottom side of the aileron for mounting the control horn. Make sure to install the aileron so this hard point is located toward the bottom of the wing. Setting the aileron control horn in the wrong place in the aileron could cause the loss of aileron control of your model.

**Hint**: Use a small piece of low-tack tape at the tip of the wing to hold the aileron in place. This will help when the flaps are being installed.

**Step 19**
Hinging the rudder follows the same procedures as the elevators. Again, make sure to prepare the hinges and check the operation of the rudder before the hinge glue begins to cure.

**Step 20**
Apply a small piece of low-tack tape at the tip of the wing to hold the aileron in position. This will help when the flaps are being installed.

**Step 21**
Hinging the flaps will take a little finesse as the hinges will be exposed and you will need to adjust the flap so it aligns in the correct position. First, fit the flap in position using the hinges. Adjust the flap so it is in alignment with the aileron on one end and the wing at the other. You will need to adjust the position of the flap and hinges to accomplish this.
Once you have test fit the flap without glue, you can now
remove the flap and use hinge glue to secure the flap to the
wing panel. Use small pieces of low-tack tape to hold the
flap in position until the hinge glue fully cures.

Step 18

Step 19

Repeat Steps 13 through 18 to hinge the remaining flap and
aileron of the opposite wing panel.

Aileron Servo Installation

Required Parts

Wing panel (right and left)
Servo mounting block (4)
#2 x 3/8-inch sheet metal screw (16)
Control horn with backlash (2)
2-inch (52mm) safety tubing
6-inch (152mm) threaded pushrod (2)
12-inch (305mm) servo extension (2)
Pushrod keeper (2)
Control horn with backplate (2)
Servo (2)
Receiver
Transmitter
Receiver battery

Tools and Adhesives

30-minute epoxy
Mixing stick
Covering iron
Clamp (2)
Drill
Ruler
Side cutter
Pliers
Felt-tipped pen
Hobby knife with #11 blade
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)
Rotary tool and cutoff wheel

Step 1

Remove the aileron servo cover from the wing. Make sure
to remove all the tape that was holding the cover in position.

Step 2

Use a hobby knife with a new #11 blade to remove the
covering from the slot in the aileron servo cover.

Step 3

Use the radio system to center the servo for the aileron.
Remove the original arm from the aileron servo and install
a 180-degree arm so it is perpendicular to the center line of
the servo. You will be connecting the linkage to a hole that
is 9/16-inch (14mm) from the center of the servo arm, so
make sure your servo arm meets these requirements.

Step 4

Position the servo on the bottom side of the servo cover
so the servo arm is centered in the opening in the cover as
shown. The servo must also be parallel to the opening so the
arm can move freely through its entire range of movement.

Step 5

Use a pencil to mark the servo cover for the position of the
servo mounting blocks on the aileron servo cover. Make the
mark behind the brass eyelets and alongside the servo. Make
sure to mark for both blocks without allowing the servo to
move on the cover.

Step 6

Use medium grit sandpaper to scuff the ends of two servo
mounting blocks as shown.

Step 7

Once you have test fit the flap without glue, you can now
remove the flap and use hinge glue to secure the flap to the
wing panel. Use small pieces of low-tack tape to hold the
flap in position until the hinge glue fully cures.

Step 8

Repeat Steps 13 through 18 to hinge the remaining flap and
aileron of the opposite wing panel.

Aileron Servo Installation

Required Parts

Wing panel (right and left)
Servo mounting block (4)
#2 x 3/8-inch sheet metal screw (16)
Control horn with backlash (2)
2-inch (52mm) safety tubing
6-inch (152mm) threaded pushrod (2)
12-inch (305mm) servo extension (2)
Pushrod keeper (2)
Control horn with backplate (2)
Servo (2)
Receiver
Transmitter
Receiver battery

Tools and Adhesives

30-minute epoxy
Mixing stick
Covering iron
Clamp (2)
Drill
Ruler
Side cutter
Pliers
Felt-tipped pen
Hobby knife with #11 blade
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)
Rotary tool and cutoff wheel

Step 1

Remove the aileron servo cover from the wing. Make sure
to remove all the tape that was holding the cover in position.

Step 2

Use a hobby knife with a new #11 blade to remove the
covering from the slot in the aileron servo cover.

Step 3

Use the radio system to center the servo for the aileron.
Remove the original arm from the aileron servo and install
a 180-degree arm so it is perpendicular to the center line of
the servo. You will be connecting the linkage to a hole that
is 9/16-inch (14mm) from the center of the servo arm, so
make sure your servo arm meets these requirements.

Step 4

Position the servo on the bottom side of the servo cover
so the servo arm is centered in the opening in the cover as
shown. The servo must also be parallel to the opening so the
arm can move freely through its entire range of movement.

Step 5

Use a pencil to mark the servo cover for the position of the
servo mounting blocks on the aileron servo cover. Make the
mark behind the brass eyelets and alongside the servo. Make
sure to mark for both blocks without allowing the servo to
move on the cover.

Step 6

Use medium grit sandpaper to scuff the ends of two servo
mounting blocks as shown.
Step 7 Mix a small amount of 30-minute epoxy. Apply the epoxy to the end of the blocks that were sanded in the previous step. Position the blocks on the servo cover using the marks made previously. Use small clamps to hold the blocks tightly against the servo cover until the epoxy fully cures.

Step 8 Position the servo between the blocks. Leave a small gap of 1/32-inch (.5mm) between the servo cover and servo to prevent vibrations from the airframe from being transferred directly to the servo. Use a pencil to mark the blocks for the servo mounting screws.

Hint: Place a 1/32-inch (.5mm) spacer between the servo and the servo-hatch cover before marking the mounting holes.

Step 9 Remove the servo. Use a drill and 1/16-inch (1.5mm) drill bit to drill the four holes for the servo mounting blocks. Use a #1 Phillips screwdriver to tighten the servo mounting screws.

Step 10 Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 11 Use the screws provided with the servo to secure it to the servo mounting blocks. Use a #1 Phillips screwdriver to tighten the servo mounting screws.

Step 12 Secure a 12-inch (305mm) servo extension to the aileron servo lead. Use string, dental floss or a commercially available connector to keep the two from unplugging inside the wing.

Hint: Place a 1/32-inch (.5mm) spacer between the servo and the servo-hatch cover before marking the mounting holes.

Step 13 Use side cutters to remove the portion of the servo arm that does not go through the servo cover.

Step 14 Use a pin drill and 5/64-inch (2mm) drill bit to enlarge the hole that is 9/16-inch (14mm) from the center of the servo horn.

Step 15 Remove the tape that holds the string in the aileron servo opening. Tie the string to the end of the aileron servo extension. Use care not to accidentally pull the string out of the wing.

Step 16 Remove the flap servo cover. Use the string to pull the aileron servo lead to the opening for the flap servo.

Step 17 Use a T-pin to poke through the four holes in the covering in the aileron servo cover. Position the servo cover in the wing and use a 1/16-inch (1.5mm) drill bit to drill the four holes for the servo cover mounting holes. Use caution or you could accidentally drill through the top of the wing.
Step 20
Use a ruler to measure in 2 15/16-inch (75mm) from the inside edge of the aileron. Use a pencil to make a small mark on the aileron.

Step 21
Use side cutters to remove the servo horn backplate from a control horn.

Step 22
Position the control horn on the aileron so the center of the horn is aligned with the mark made in the previous step. When positioning the control horn, align the front edge of the horn with the edge of the fixed surface as shown to minimize any differential of the control surface. Use a pencil to transfer the location for the three mounting screws on the aileron.

Step 23
Use a drill and 1/16-inch (1.5mm) drill bit to drill start holes for the aileron control horn. Only drill about 1/4-inch (6mm) into the aileron to avoid drilling through the top of the aileron. There is a hard point in the wing so you will need to be careful when drilling.

Step 24
Use a #1 Phillips screwdriver to start the three #2 x 3/8-inch sheet metal screws in each hole. Leave about 1/16-inch (1.5mm) of the screw exposed when threading them into the aileron.

Step 25
After threading the screws into the holes, you will need to apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed. Skipping this step may not provide a secure mounting of the aileron control horn, which could cause it to fail in flight.

Step 26
Once the CA has cured, you can attach the control horn to the aileron using three #2 x 3/8-inch sheet metal screws, tightening them with a #1 Phillips screwdriver.

Step 27
Use a hobby knife with a #11 blade to cut a 1/4-inch (6mm) piece of tubing from the 2-inch (52mm) safety tubing included with the kit. Slide the tubing on a clevis, and then thread the clevis 10-turns on a 6-inch (152mm) threaded pushrod.

Step 28
Connect the clevis to the center hole of the aileron control horn. Slide the safety tubing onto the clevis so it won’t open accidentally in flight.
Required Parts
- Wing panel (right and left)
- Retract assembly (2)
- Retract strut (right and left)
- #8 washer (8)
- Retract servo (2)
- Receiver
- Transmitter
- Receiver battery
- 2mm x 12mm retract screw (8)
- 2mm washer (8)
- 6-inch servo extension (2)
- #2 x 3/8 screw (4)
- 8-32 x 3/4-inch socket head screw (8)
- 3/8-inch (9mm) wheel (2)
- 2mm x 8mm machine screw (4)

Tools and Adhesives
- Side cutters
- Threadlock
- String or dental floss
- T-pin
- Medium CA
- Pin drill
- String or dental floss
- Thin CA
- Phillips screwdriver: #1, #2
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 1/8-inch (3mm)
- Hex wrench or ball driver: 1.5mm, 3/32-inch, 3mm

Step 1
Prepare the retract servo by installing the grommets and brass eyelets. Note the eyelets are on the top-side of the servo as shown. Remove the servo horn from the servo at this time as well.

Step 2
Select a servo arm that has a hole located 11/32-inch (9mm) from the center of the horn. Remove any arms that will not be used using side cutters, leaving only the arm with the hole as described. It is best to trim the arm down as small as possible to fit into the retract mechanism without binding.

Step 3
Install the arm on the retract servo, using the radio system to cycle the retract servo for this procedure.

Step 4
Place the servo horn on the retract servo so it moves equally from the center position. You will need to use the radio system to cycle the retract servo for this procedure.

Step 29
With the aileron aligned with the wing tip and aileron servo centered, use a felt-tipped pen to mark the pushrod wire where it crosses the hole in the servo arm. Make sure the radio is on and the aileron servo centered during this process.
Step 5
Check to make sure you are installing the servo on the correct side of the retract mechanism. The servo will face to the trailing edge when installed.

Note: The next steps will check the operation of the retract mechanism. Do not secure the servo as poor positioning of the linkage or servo could cause the servo to bind causing stress on the radio battery or even damage the servo gear.

Step 6
With the retract mechanism and servo in the “up” position, check the fit of the servo in the retract frame. The mounting holes of the servo must align with the holes in the frame for mounting the servo. It may be necessary to adjust the length of the linkage to get the mounting holes to align.

Step 7
Hold the servo in position against the retract frame. Check the operation of the retract using the radio system. When the retract mechanism is in the “down” position the mounting holes should still be aligned. If not, the linkage may need some more minor adjustments in length.

Step 8
Once the retract is operating without binding and locking in both the “up” and “down” positions, use four 2mm x 12mm machine screws and four 2mm washers to secure the retract to the retract frame. Use a 1.5mm hex wrench to tighten these screws.

Step 9
Secure a 6-inch (152mm) servo extension to the retract servo using string, dental floss or a commercially available fastener.

Step 10
Pass the extension through the hole in the wing behind the opening for the retract mechanism.

Step 11
Position the retract mechanism into the wing. Use four 8-32 x 3/4-inch socket head screws and four #8 washers to secure the retract mechanism in the wing. Tighten the screws using a 9/64-inch hex wrench or ball driver. Make sure to use threadlock on all four screws so they do not vibrate loose in flight.

Step 12
Use a T-pin to poke through the covering of the retract servo cover so the holes can be located from the top-side of the cover.

Step 13
Position the retract servo cover over the retract servo. Slide the cover back snug against the wing. Use a drill and 1/16-inch (1.5mm) drill bit to drill the two holes for the cover mounting screws. Use care not to drill through the top of the wing when drilling these holes.

Step 14
Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 15
Secure the cover to the wing using two #2 x 3/8-inch sheet metal screws. Tighten the screws using a #1 Phillips screwdriver.

Note: The next steps will check the operation of the retract mechanism. Do not secure the servo as poor positioning of the linkage or servo could cause the servo to bind causing stress on the radio battery or even damage the servo gear.

Step 6
With the retract mechanism and servo in the “up” position, check the fit of the servo in the retract frame. The mounting holes of the servo must align with the holes in the frame for mounting the servo. It may be necessary to adjust the length of the linkage to get the mounting holes to align.

Step 7
Hold the servo in position against the retract frame. Check the operation of the retract using the radio system. When the retract mechanism is in the “down” position the mounting holes should still be aligned. If not, the linkage may need some more minor adjustments in length.

Step 8
Once the retract is operating without binding and locking in both the “up” and “down” positions, use four 2mm x 12mm machine screws and four 2mm washers to secure the retract to the retract frame. Use a 1.5mm hex wrench to tighten these screws.

Step 9
Secure a 6-inch (152mm) servo extension to the retract servo using string, dental floss or a commercially available fastener.

Step 10
Pass the extension through the hole in the wing behind the opening for the retract mechanism.

Step 11
Position the retract mechanism into the wing. Use four 8-32 x 3/4-inch socket head screws and four #8 washers to secure the retract mechanism in the wing. Tighten the screws using a 9/64-inch hex wrench or ball driver. Make sure to use threadlock on all four screws so they do not vibrate loose in flight.

Step 12
Use a T-pin to poke through the covering of the retract servo cover so the holes can be located from the top-side of the cover.

Step 13
Position the retract servo cover over the retract servo. Slide the cover back snug against the wing. Use a drill and 1/16-inch (1.5mm) drill bit to drill the two holes for the cover mounting screws. Use care not to drill through the top of the wing when drilling these holes.

Step 14
Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 15
Secure the cover to the wing using two #2 x 3/8-inch sheet metal screws. Tighten the screws using a #1 Phillips screwdriver.
Step 16
Remove the wheel cover from one of the main wheels.

Step 17
Check to make sure you have selected the correct strut for your particular wing panel. The scissor mechanism will face to the rear of the aircraft and the flat area on the gear door mount faces out away from the wheel well.

Step 18
Use a 1.5mm hex wrench or ball driver to loosen the setscrew that secures the axle to the retract strut. Remove the axle from the strut assembly.

Step 19
Slide the wheel collar from the axle. The axle will now fit into the hole in the wheel. Make sure to install the axle into the side of the wheel with the deeper recess that does not have the screws that hold the wheel assembly together.

Hint: Apply a small drop of machine oil on the axle to allow the wheel to rotate smoothly.

Step 20
Snap the wheel collar on the axle. Secure the collar using a 2mm setscrew. Make sure to use threadlock on the setscrew to prevent it from vibrating loose.

Step 21
Slide the axle back in the retract strut. Note that the wheel will face opposite the flat area on the gear door mount. Use a 1.5mm hex wrench or ball driver to secure the axle in position. Make sure to use threadlock on the setscrew to prevent it from vibrating loose in flight.

Step 22
Snap the wheel cover back on the wheel at this time.

Step 23
Use the radio system to move the gear to the “down” position. Insert the strut into the retract mechanism and secure it by tightening the screw using a 3mm hex wrench or ball driver. There is a flat area the screw secures to. This will align the strut so the aircraft tracks straight on the runway without excessive wandering.

Step 24
Use the radio system to move the retract mechanism to the “up” position. Check that the wheel is centered in the wheel well. It may be necessary to adjust the position of the strut in the retract mechanism slightly so the wheel is centered.

Step 25
Position the gear door as shown in the photo. Use a small drop of medium CA to temporarily tack glue the gear door to the gear door mount. Make sure not to get any CA into the threads of the gear door mount. The CA only needs to hold the gear door in position so it can be marked to drill the two holes for the gear door mounting screws.

Step 26
Use a pencil to trace the outline of the gear door mount on the gear door.

Step 27
Carefully remove the gear door from the gear door mount. Use a pencil to draw a center line through the tracing of the mount as shown.

Step 28
Measure in 1/8-inch (3mm) from each edge of the gear door mount outline and draw a line as shown. The distance between the two lines will be 19/32-inch (15mm) if done correctly.

Step 16
Remove the wheel cover from one of the main wheels.

Step 17
Check to make sure you have selected the correct strut for your particular wing panel. The scissor mechanism will face to the rear of the aircraft and the flat area on the gear door mount faces out away from the wheel well.

Step 18
Use a 1.5mm hex wrench or ball driver to loosen the setscrew that secures the axle to the retract strut. Remove the axle from the strut assembly.

Step 19
Slide the wheel collar from the axle. The axle will now fit into the hole in the wheel. Make sure to install the axle into the side of the wheel with the deeper recess that does not have the screws that hold the wheel assembly together.

Hint: Apply a small drop of machine oil on the axle to allow the wheel to rotate smoothly.

Step 20
Snap the wheel collar on the axle. Secure the collar using a 2mm setscrew. Make sure to use threadlock on the setscrew to prevent it from vibrating loose.

Step 21
Slide the axle back in the retract strut. Note that the wheel will face opposite the flat area on the gear door mount. Use a 1.5mm hex wrench or ball driver to secure the axle in position. Make sure to use threadlock on the setscrew to prevent it from vibrating loose in flight.

Step 22
Snap the wheel cover back on the wheel at this time.

Step 23
Use the radio system to move the gear to the “down” position. Insert the strut into the retract mechanism and secure it by tightening the screw using a 3mm hex wrench or ball driver. There is a flat area the screw secures to. This will align the strut so the aircraft tracks straight on the runway without excessive wandering.

Step 24
Use the radio system to move the retract mechanism to the “up” position. Check that the wheel is centered in the wheel well. It may be necessary to adjust the position of the strut in the retract mechanism slightly so the wheel is centered.

Step 25
Position the gear door as shown in the photo. Use a small drop of medium CA to temporarily tack glue the gear door to the gear door mount. Make sure not to get any CA into the threads of the gear door mount. The CA only needs to hold the gear door in position so it can be marked to drill the two holes for the gear door mounting screws.

Step 26
Use a pencil to trace the outline of the gear door mount on the gear door.

Step 27
Carefully remove the gear door from the gear door mount. Use a pencil to draw a center line through the tracing of the mount as shown.

Step 28
Measure in 1/8-inch (3mm) from each edge of the gear door mount outline and draw a line as shown. The distance between the two lines will be 19/32-inch (15mm) if done correctly.
Step 1
Remove the cover and transfer the marks to the bottom side of the cover. Draw a line that connects the two marks. This will be used in aligning the position of the servo.

Step 2
Use a #1 Phillips screwdriver to remove the servo horn from the servo. Position the servo on the cover. Use the lines for aligning the position of the servo.

Step 3
Measure 15/16-inch (23mm) from the edge that was toward the trailing edge of the cover. Draw a line that is perpendicular to the first as shown.

Step 4
Use a #1 Phillips screwdriver to remove the servo horn from the servo. Position the servo on the cover. Use the lines for aligning the position of the servo.

Step 5
Use a pencil to mark the position for the second servo mounting block on the servo cover.

Step 6
Mix a small amount of 30-minute epoxy. Apply the epoxy to the end of the blocks that were sanded in the previous step. Position the blocks on the servo cover using the marks made previously. Use small clamps to hold the blocks tightly against the servo cover until the epoxy fully cures.

Step 7
Use medium grit sandpaper to scuff the ends of two servo mounting blocks as shown.

Step 8
Use a drill and 1/8-inch (3mm) drill bit to drill two holes through the gear door as shown. Use care not to tear the covering when drilling through the gear door.

Step 29
Use a drill and 1/8-inch (3mm) drill bit to drill two holes through the gear door as shown. Use care not to tear the covering when drilling through the gear door.

Step 30
With the gear in the “up” position, attach the gear door to the gear door mount using two 3mm x 8mm machine screws and two 3mm washers. Use a #2 Phillips screwdriver and threadlock to install the screws.

Step 31
Repeat Steps 1 through 30 to install the retract mechanism in the remaining wing panel.
Step 10
Use a 5/64-inch (2mm) drill bit and pin drill to enlarge the hole in the flap servo horn.

Step 11
Position the servos between the blocks. Leave a small gap of 1/32-inch (.5mm) between the servo cover and servo to prevent vibrations from the airframe from being transferred directly to the servo. Use a pencil to mark the blocks for the four servo mounting screws.

Hint: Place a 1/32-inch (.5mm) spacer between the servo and the servo hatch cover before marking the mounting holes.

Step 12
Use a drill and 1/16-inch (.15mm) drill bit to drill the four holes for the servo mounting screws. Use a #1 Phillips screwdriver to tighten the servo mounting screws.

Step 13
Apply 2-3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Hint: Place a 1/32-inch (.5mm) spacer between the servo and the servo hatch cover before marking the mounting holes.

Step 14
Use the screws provided with the servo to secure it to the servo mounting blocks. Use a #1 Phillips screwdriver to tighten the servo mounting screws.

Step 15
Prepare the flap pushrod by making a 90-degree bend that is 2 1/8-inch (60mm) from the threaded end of the pushrod. Measure 3/8-inch (10mm) from the bend and use side cutters to trim the pushrod wire.

Step 16
Use a hobby knife with a #11 blade to cut a 1/4-inch (6mm) piece of tubing from the 2-inch (52mm) safety tubing included with the kit. Slide the tubing on a clevis, and then thread the clevis 10 turns on the flap pushrod.

Step 17
Slide the flap pushrod into the wing, bent end first. Connect the clevis to the outer hole of the flap control horn. Slide the safety tubing on the clevis so it won’t accidentally open in flight.

Hint: If you have a short extension or Y-harness handy, you may want to attach it temporarily to the flap servo lead as it will make it easier to connect the flap servo to the receiver while the servo installation is being finalized.

Step 18
At this time you will want to mark the leads for the aileron, retract and flap servos so each can be identified as they are going to be hidden inside the wing. Tie the string around all three leads and carefully pull them through the wing and out through the hole.

Step 19
Use a pushrod keeper to connect the flap pushrod to the flap servo horn.

Step 20
If you have a three-position flap switch, it is recommended to set the endpoint to 0%. This will make installing the flap much easier.

Step 21
Place the flap servo in position and check the measurement for the mid-flap setting. You may need to adjust the length of the pushrod to achieve the correct measurement.

Note: If you have a two-position switch, you will not need to make this measurement. You will only be setting the “up” and “down” flap positions.

Important: Do not operate the flap using the radio system at this time. If the throws are too great, it could damage the servo if the servo moves more than the flap can. Setting the throws to 0% at your radio as a starting point is the best method for installing the flap servo. If you have not set the throws to 0%, simply lift the flap servo cover from the wing BEFORE operating the flap servo from the radio system to make sure the servo does not bind when operated.
Hangar 9 P-51 Mustang 60 ARF Assembly Manual

Receiver, Rudder Servo and Tail Wheel Installation

**Required Parts**
- Fuselage tail gear wire with wheel
- Tail gear steering arm
- 1.5mm washer
- 2.5mm wheel collar (2)
- 3mm setscrew (3)
- C-clip
- 2.5mm servo connector
- Clevis
- Clevis safety tubing
- Servo: Receiver
- Transmitter: Receiver battery
- Pushrod keeper: Switch harness
- Control horn with backplate
- 2mm x 32mm machine screw (3)
- #2 x 3/8-inch sheet metal screw (4)
- Pushrod wire, 301/2-inch (775mm)

**Tools and Adhesives**
- Hook and loop strap
- Pin drill
- Felt-tipped pen
- 1/4-inch (6mm) foam
- Pliers
- Rubbing alcohol
- Side cutter
- Paper towel
- Phillips screwdriver: #1
- Threadlock
- Rotary tool with cutoff wheel
- T-pin
- Hobby knife with #11 blade
- Hex wrench: 1.5mm (included)
- 6-inch (152mm) servo extension (4)
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)

**Extensions for 7-Channel Receiver Installation**
- 3-inch (76mm) servo extension (2)

**Extensions for 8-Channel Receiver Installation**
- 3-inch (76mm) servo extension (6)

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**Step 22**

After setting the throws to 0%, move the switch on the radio to the “up” position. Adjust the throw at the radio until the flap is aligned with the trailing edge of the wing.

**Step 23**

Move the switch on the radio to the “down” position. Adjust the throw at the radio until the flap is set at the measurement listed under “Control Throws” for down flap.

**Step 24**

Move the switch on the radio to the “center” position. Adjust the throws to 0%.

**Step 25**

Use a #1 Phillips screwdriver and two #2 x 3/8-inch sheet metal screws to secure the servo cover to the wing.

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**Step 1**

Remove the fuselage hatch from the fuselage by lifting it up at the rear to release the magnets. Slide the hatch back to the rear of the fuselage to release the pegs at the front and set it aside.

**Step 2**

Remove the access cover for the rudder servo and tail wheel from the fuselage. Set it aside with the fuselage hatch.

**Step 3**

Use a hobby knife to remove the balsa from the side of the fuselage for mounting your particular switch. The plywood will have the correct cutout for the most common switches available.

**Step 4**

Place your switch harness and receiver battery for glow-powered models. If you are mounting your model for electric power, you can skip to Step 7 and mount the receiver.
Step 5
If you will be using sheet metal screws to mount your switch, place 2–3 drops of thin CA in each hole to harden the surrounding wood.

Step 6
Wrap the receiver battery in 1/4-inch (6mm) foam. Use a hook and loop strap (not included) to secure the receiver battery to the bottom of the forward radio tray. Plug the receiver battery into the switch harness at this time.

Step 7A
Electric Power Receiver: Use hook and loop tape to mount the receiver on the top side of the forward servo tray. The remote receiver is then mounted on the inside of the fuselage with hook and loop tape as far as possible from the main receiver as shown. Plug in any necessary extensions for the flaps, retracts and ailerons at this time as well.

Step 7B
Glow Power Receiver: Use hook and loop tape to mount the receiver on the top side of the forward servo tray. The remote receiver is then mounted on the inside of the fuselage with hook and loop tape as far as possible from the main receiver as shown. Plug in any necessary extensions for the flaps, retracts and ailerons at this time as well.

Note: We used two 3-inch (76mm) extensions for ailerons and two 3-inch (76mm) extensions for retracts. These channels were mixed using a computer radio.

Step 8
Place the rudder servo in the rear servo tray. The servo is installed from the bottom of the tray with the output shaft facing to the front of the fuselage. Use a pencil to mark the locations for the servo mounting screws through the grommets and on the servo tray.

Step 9
Remove the servo. Use a drill and 1/16-inch (1.5mm) drill bit to drill the four holes for the servo mounting screws.

Step 10
Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 11
Use the screws provided with the servo to secure it to the servo mounting blocks. Use a #1 Phillips screwdriver to tighten the servo mounting screws. Plug the rudder servo into the receiver at this time.

Step 12
Use a hobby knife with a #11 blade to remove the covering for the tail gear doors and tail gear wire from the bottom of the fuselage.

Step 13
Use a pin drill and 5/64-inch (2mm) drill bit to enlarge the hole in the tail gear shimming arm. Note the position of the arm and location of the set screw when enlarging the hole.

Step 14
Insert the pushrod connector in the hole as shown. Use a C-clip and 1.5mm washer to secure the connector to the steering arm.
Step 20
Loosen the setscrew on the wheel collar installed in Step 18. Slide it down so it is resting against the tail gear bracket and tighten the 3mm setscrew. You may need to use a ball driver to tighten this particular setscrew since you will be at an angle accessing it through the slots for the tail gear doors from the outside of the fuselage to do so. Make sure the pushrod operates smoothly without any binding.

Step 21
Use a pencil to mark the rudder where the pushrod crosses. This will be used to center the horn vertically on the rudder.

Step 22
Use a hobby knife with a #11 blade to cut a 1/4-inch (6mm) piece of tubing from the 2-inch (52mm) safety tubing included with the kit. Slide the tubing on a clevis, and then thread the clevis onto the rudder pushrod.

Step 23
Center the rudder so it is in alignment with the fuselage. When positioning the control horn, align the front edge of the horn with the edge of the fixed surface as shown to minimize any differential of the control surface. Locate the centerline of the control horn vertically on the mark made in Step 21. Use a pencil to transfer the locations for the three control horn mounting screws onto the rudder.

Step 24
Center the rudder so it is in alignment with the fuselage. When positioning the control horn, align the front edge of the horn with the edge of the fixed surface as shown to minimize any differential of the control surface. Locate the centerline of the control horn vertically on the mark made in Step 21. Use a pencil to transfer the locations for the three control horn mounting screws onto the rudder.
Step 25
Use a pin drill and 5/64-inch (2mm) drill bit to drill the three holes through the rudder to mount the control horn. Use care to drill the holes parallel in the rudder so the backplate can be installed on the opposite side of the rudder.

Step 26
Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 27
Once the CA has cured, you can attach the control horn to the rudder using three 2mm x 32mm machine screws and the control horn backplate. Use a #1 Phillips screwdriver to tighten the screws.

Step 28
Use side cutters to trim the length of the screws down. Use a flat file to remove any sharp edges from the screws so they don’t accidentally damage anything during the transport of your aircraft.

Step 29
Use the radio system to center the servo for the rudder. Remove the original arm from the rudder servo and install a 180-degree arm so it is perpendicular to the center line of the servo. You will be connecting the linkage to a hole that is 9/16-inch (14mm) from the center of the servo horn, so make sure your servo horn meets these requirements. Use side cutters to remove any unused arms from the servo horn that may interfere with the operation of the servo.

Step 30
Use a 5/64-inch (2mm) drill and pin drill to enlarge the hole that is 9/16-inch (15mm) from the center of the servo arm.

Step 31
Make sure the rudder and rudder servo are centered. Use a felt-tipped pen to mark the pushrod where it crosses the hole in the servo arm enlarged in the previous step.

Step 32
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.

Step 33
Use side cutters to trim the pushrod wire so only 3/8-inch (10mm) of the wire remains beyond the bend.

Step 34
Use a pushrod keeper to secure the pushrod wire to the servo horn.

Step 35
It is now time to secure the connector at the tail gear wire to the pushrod. You will need to deflect the rudder slightly so the setscrew can be accessed. Use a 1.5mm hex wrench to tighten the setscrew that secures the connector to the pushrod wire. Make sure that when the rudder is centered, the tail wheel is centered as well. It may take a try or two to get it correct. You will want to make sure to use threadlock on this setscrew as accessing in the future will be difficult. Hint: Use a file to make a flat spot on the pushrod wire for the setscrew. This will make the connection between the wire and setscrew more secure and less likely to slip.

Step 36
Use a 5/64-inch (2mm) drill and pin drill to enlarge the hole that is 9/16-inch (15mm) from the center of the servo horn.

Step 37
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.

Step 38
Use a pushrod keeper to secure the pushrod wire to the servo horn.

Step 39
Make sure the rudder and rudder servo are centered. Use a felt-tipped pen to mark the pushrod where it crosses the hole in the servo arm enlarged in the previous step.

Step 40
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.

Step 41
Use a pushrod keeper to secure the pushrod wire to the servo horn.

Step 42
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.

Step 43
Use a pushrod keeper to secure the pushrod wire to the servo horn.

Step 44
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.

Step 45
Use a pushrod keeper to secure the pushrod wire to the servo horn.

Step 46
Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step.
Elevator/Stabilizer Installation

Required Parts

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<th>Part</th>
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<td>Stabilizer tube (short)</td>
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<td>Clevis (2)</td>
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<td>Transmitter</td>
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<td>Wheel collar, 4mm (2)</td>
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<td>Pushrod keeper</td>
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<td>3mm x 3mm setscrew (2)</td>
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<td>Servo with hardware</td>
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<td>Stabilizer assembly (right and left)</td>
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<td>#2 x 3/8-inch sheet metal screw</td>
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<td>Pushrod wire, 30”/inch (775mm)</td>
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Tools and Adhesives

<table>
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<th>Tool</th>
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<td>Rubbing alcohol</td>
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<td>30-minute epoxy</td>
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<td>Pin drill</td>
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<td></td>
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<tr>
<td>Rotary tool with cutoff wheel</td>
<td></td>
</tr>
<tr>
<td>Pliers</td>
<td></td>
</tr>
<tr>
<td>Drill bit: 1/16-inch (1.5mm), 5/64-inch (3mm)</td>
<td></td>
</tr>
<tr>
<td>Threadlock</td>
<td></td>
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<tr>
<td>Hex wrench: 1.5mm</td>
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<tr>
<td>Thin CA</td>
<td></td>
</tr>
</tbody>
</table>

Step 1

Apply 2–3 drops of thin CA to each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 2

Remove the access cover from the side of the fuselage. Set it aside for the time being.

Step 3

Use a hobby knife with a #11 blade to remove the covering from the linkage slot above the access hole on the side of fuselage.

Step 4

Repeat Steps 1 through 3 for the opposite side of the fuselage.

Step 5

Slide the long and short stabilizer tubes into the stabilizer half. Note the longer tube is in the hole toward the leading edge of the stabilizer (front) and the shorter tube toward the elevator (rear).

Step 6

Secure the cover to the fuselage using four #2 x 3/8-inch sheet metal screws. Use a #1 Phillips screwdriver to tighten the four screws. The screws need to be tight enough to secure the cover; don’t tighten them too much and crush the wood of the cover.

Step 7

Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This will harden the wood and help it hold up to the pressure of the screws over time.
Step 6
Slide the tubes into the fuselage. Use a felt-tipped pen to trace the outline of the stabilizer on the side of the fuselage.

Step 7
Use a hobby knife with a #11 blade to remove the covering from the fuselage. Trim 3/32-inch (2mm) inside the lines drawn when cutting the covering.

Step 8
Repeat Steps 5 through 7 to prepare the opposite side of the fuselage for the stabilizer.

Step 9
Mix a small amount of 30-minute epoxy. Brush a thin coat of epoxy on the exposed wood of the fuselage as well as to the bare wood of the stabilizer.

Step 10
Slide the stabilizer into position. Use low-tack tape to keep the stabilizer tight against the fuselage.

Caution: Make sure to keep the hinge line of the stabilizer perpendicular to the hinge line of the vertical fin when applying the tape. It is possible to have too much tension on the top or bottom and pull the stabilizer out of alignment.

Step 11
Repeat Steps 9 and 10 to install the remaining stabilizer half before the epoxy begins to cure.

Step 12
Place the elevator servo in the rear servo tray. The servo is installed from the bottom of the tray with the output shaft facing to the front of the fuselage. Use a pencil to mark the locations for the servo mounting screws through the grommets and on the servo tray.

Step 13
Remove the servo. Use a drill and 1/16-inch (1.5mm) drill bit to drill four holes for the servo mounting screws.

Step 14
Apply 2–3 drops of thin CA into each hole to harden the surrounding wood. This provides a harder surface for the screws making them more secure when installed.

Step 15
Apply the screws provided with the servo to secure it to the servo mounting blocks. Use a #1 Phillips screwdriver to tighten the servo mounting screws. Plug the elevator servo into the elevator port of the receiver.
Step 16
Slide one of the 30½-inch (775mm) pushrods, threaded end first, into the elevator pushrod tube closest to the center line of the fuselage inside of the fuselage.

Step 17
Cut a 1/4-inch (6mm) piece from the clevis safety tubing and slide it over the clevis. Thread the clevis 10 turns on the pushrod wire. Connect the clevis to the elevator control horn. Slide the tubing over the clevis so it will not accidentally open in flight.

Step 18
Use the radio system to center the servo for the elevator. Remove the original arm from the elevator servo and install a 180-degree arm so it is perpendicular to the center line of the servo. You will be connecting the linkage to a hole that is 9/16-inch (14mm) from the center of the servo horn. Make sure your servo horn meets these requirements. Use side cutters to remove any unused arms from the servo horn that may interfere with the operation of the servo.

Step 19
You will need to make two slight bends in one elevator pushrod to align it with the elevator servo horn as shown. Make sure the bend is at least 1-inch (25mm) forward of the pushrod tube so the bend does not bind in the tube when operating the elevator.

Step 20
With the radio system on and the elevator centered, use a felt-tipped pen to mark the pushrod wire where it crosses the hole of the servo horn previously enlarged.

Step 21
Slide two 4mm wheel collars on the pushrod wire.

Step 22
Use pliers to bend the pushrod wire 90 degrees at the mark made in the previous step. Trim the wire 3/8-inch (10mm) above the bend using side cutters or a rotary tool. Insert the wire into the hole in the servo arm. Slide the pushrod keeper onto the wire, then rotate it and snap it on the wire to secure the pushrod wire to the servo horn.

Step 23
Step 24
Repeat Steps 16 and 17 to install the remaining 30½-inch (775mm) pushrod wire.
Step 24
You will need to make two slight bends in the elevator pushrod to align it with the first elevator pushrod wire shown. Make sure the bend is at least 1-inch (25mm) forward of the pushrod tube so the bend does not bind in the tube when operating the elevator.

Step 25
Use a rotary tool and cut off wheel or side cutters to trim the pushrod wire so it almost touches the pushrod keeper. Slide the wheel collars forward. Slide the bent pushrod wire into the wheel collars.

Step 25
Use two 3mm x 3mm setscrews and a 1.5mm hex wrench to secure the collars that link the two pushrods together. Make absolutely sure to use threadlock on these screws so they don’t vibrate loose.

Step 26
Place the access cover back in place on the fuselage. Check to make sure the trim scheme matches and that you are not installing the cover on the wrong side of the aircraft. Use a pin drill and 1/16-inch (1.5mm) drill bit to drill four holes through the cover and into the fuselage. Make sure to position the holes so they are roughly 3/32-inch (2mm) from the edges of the cover.

Houston 9 P-51 Mustang 60 ARF Assembly Manual

Houston 9 P-51 Mustang 60 ARF Assembly Manual
Step 2

Using a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular engine.

Step 3

Remove the template from the firewall. Use a drill and 7/32-inch (5.5mm) drill bit to enlarge the holes in the firewall.

Step 4

Use four 8-32 x 3/4-inch socket head bolts, four #8 washers and four 8-32 blind nuts to secure the mount rails to the firewall. Tighten the screws using a 9/64-inch hex wrench or ball driver.

Important: Make sure to use threadlock on all metal-to-metal fasteners.

Step 5

Slide the engine into position between the engine mount rails. Use a pencil to mark the location for the throttle pushrod wire on the firewall.

Note: If you are using a regular four-stroke, make sure the carburetor arm is facing the same direction as shown in the photo above.

Step 6

Remove the engine from the rails. Use a drill and 5/32-inch (4mm) drill bit to drill a hole through the firewall for the throttle pushrod tube.

Step 7

Use a hobby knife with a #11 blade to cut the throttle pushrod to a length of 5 1/2 inches (140mm).
Step 8
Use medium grit sandpaper to roughen the first 1-inch (25mm) of the tube on each end.

Step 9
Slide the pushrod tube in the hole in the firewall. Use medium CA to glue the tube to the firewall so it is flush with the front of the firewall.

Step 10
Position the throttle servo on the same side of the fuselage as the pushrod tube with the output facing to the rear of the fuselage. Use a pencil to mark the locations for the four servo mounting screws.

Step 11
Remove the servo and use a drill with a 1/16-inch (1.5mm) drill bit to drill the holes necessary for the servo mounting screws.

Step 12
Place 2–3 drops of thin CA in each hole to harden the surrounding wood.

Step 13
Use the screws provided with the servo and a #1 Phillips screwdriver to secure the throttle servo in the fuselage. Make sure to plug the throttle servo into the throttle channel of the receiver at this time.

Step 14
Use the radio system to center the throttle servo. With the throttle stick and trim centered, the arm should be positioned as shown in the previous photo. This will provide an equal amount of travel to both full and closed throttle.

Step 15
Use four 8-32 x 1 ½-inch (13mm) socket head bolts, four #8 washers and four 8-32 lock nuts to secure the engine. Make sure the engine is positioned so the driver washer is 5/16-inches (13mm) forward of the firewall. A 9/64-inch hex wrench or ball driver and a 1/16-inch nut driver or socket will make tightening the bolts quick work.

Hint: You can loosen the mounts on the firewall to make it easier to install the engine. Just make sure the mounts are tight before tightening the engine mounting bolts.

Step 16
Remove the arms from the throttle servo that will not be used so they don't interfere with the operation of the servo. Use an arm that has a hole that is 1/2-inch (13mm) from the center of the servo horn.

Step 17
Thread a clevis on the 13/4-inch (335mm) pushrod wire. Make sure to slide a piece of safety tubing on the clevis.

Step 18
Remove the arms from the throttle servo that will not be used so they don't interfere with the operation of the servo. Use an arm that has a hole that is 1/2-inch (13mm) from the center of the servo horn.
Step 23
Slide the wire into the pushrod tube from the front of the fuselage. Connect the Z-bend to the carburetor arm.

Hint: You may need to remove the carburetor arm from the carburetor. If so, make sure it is installed to provide equal throw from open to closed.

Step 24
Thread the clevis back on the wire and connect it to the servo arm in the hole that worked best for your throttle operation. Slide the safety tubing over the clevis to prevent it from opening accidentally. Use medium CA to glue the plywood pushrod support to the fuselage in a position that will provide smooth movement of the throttle pushrod.

Note: If you are installing a glow-powered 4-stroke you can skip to the section on installing the cowling.

Saito FG-20 Ignition Component Installation

Required Parts
Fuselage assembly
Ignition module
Ignition battery
Switch harness
Tie wrap, 12-inch (305mm) (4) (not included)
1/4-inch (6mm) foam (not included)

Tools and Adhesives
Drill
Hobby knife with #11 blade
Drill bit: 1/4-inch (6mm)

Step 1
Prepare the top of the radio box by using your battery as a guide and drilling four holes in the box using a drill and 1/4-inch (6mm) drill bit. You will also need to make a slot to pass the lead from the battery through as well.

Step 2
Wrap the ignition battery in 1/4-inch (6mm) foam. Secure the battery to the top of the radio box using two 12-inch (305mm) tie wraps.

Step 3
Mount the switch for the ignition on the side of the fuselage opposite that of the radio switch. Mounting the switch follows the same procedure as the radio switch.

Step 20
Use the radio system to move the throttle servo to the closed position. Physically close the carburetor on the engine. Make sure the direction of the servo and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod wire in the outer hole of the carburetor arm.

Step 21
Use the radio system to move the throttle servo to the full throttle position. Physically close the carburetor on the engine. Make sure the direction of the servo and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod wire in the outer hole of the carburetor arm.

Step 22
Remove the pushrod and take the clevis off the wire. Use Z-bend pliers to make a Z-bend in the pushrod wire where the mark was made in the previous steps. You can use regular pliers, but Z-bend pliers will provide the best results.

Hint: It may be necessary to use side cutters to trim the length of the pushrod as it doesn't interfere with the engine. Make sure to leave the pushrod wire long enough so a bend can be placed in the wire to attach it to the carburetor arm.

Step 23
Insert the pushrod tube into the pushrod tube from the inside of the fuselage. Attach the clevis to the servo arm.

Step 24
Use the radio system to move the throttle servo to the full throttle position. Physically close the carburetor on the engine. Make sure the direction of the servo and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod wire in the outer hole of the carburetor arm.

Hint: It may be necessary to use side cutters to trim the length of the pushrod as it doesn't interfere with the engine. Make sure to leave the pushrod wire long enough so a bend can be placed in the wire to attach it to the carburetor arm.

Step 25
Use the radio system to move the throttle servo to the closed position. Physically close the carburetor on the engine. Make sure the direction of the servo and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod wire in the outer hole of the carburetor arm.

Hint: It may be necessary to use side cutters to trim the length of the pushrod as it doesn't interfere with the engine. Make sure to leave the pushrod wire long enough so a bend can be placed in the wire to attach it to the carburetor arm.

Step 26
Thread the clevis back on the wire and connect it to the servo arm in the hole that worked best for your throttle operation. Slide the safety tubing over the clevis to prevent it from opening accidentally. Use medium CA to glue the plywood pushrod support to the fuselage in a position that will provide smooth movement of the throttle pushrod.

Note: If you are installing a glow-powered 4-stroke you can skip to the section on installing the cowling.
Step 2

Using a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular engine.

Step 3

Remove the template from the firewall. Use a drill and 7/32-inch (5.5mm) drill bit to enlarge the holes in the firewall.

Step 4

Use four 8-32 x 3/4-inch socket head bolts, four #8 washers and four 8-32 blind nuts to secure the mount rails to the firewall. Tighten the screws using a 9/64-inch hex wrench or ball driver.

Important: Make sure to use threadlock on all metal-to-metal fasteners.

Step 5

Slide the engine into position between the engine mount rails. Use a pencil to mark the location for the throttle pushrod wire on the firewall.

Step 6

Remove the engine from the rails. Use a drill and 5/32-inch (4mm) drill bit to drill a hole through the firewall for the throttle pushrod tube.

Important: Make sure not to install the tie wraps over the throttle pushrod tube. This could cause the pushrod to bind and cause the throttle servo to run the receiver battery down prematurely.

Step 7

Make all the connections between the ignition battery, switch and module according to the instructions provided with the engine. Make sure to secure any loose wires so they do not interfere with the operation of the engine or radio system.

Required Parts

- Fuselage assembly
- Firewall template
- #8 washer (8)
- Safety tubing
- Throttle servo with hardware
- 8-32 blind nut (4)
- 8-32 x 3/4-inch socket head bolt (4)
- Pushrod tube, 81/8-inch (206mm)
- Pushrod wire, 3/32-inch (3.0mm)

Tools and Adhesives

- Low-tack tape
- Side cutters
- Hobby knife with #11 blade
- Phillips screwdriver: #1, #2
- Pliers
- Hex wrench or ball driver: 5/64-inch
- Nut driver or socket: 11/32-inch
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 5/32-inch (4mm), 7/32-inch (5.5mm)

Engine Installation: 2-Stroke

Step 1

Locate the firewall template. Use low-tack tape to secure it to the engine box. A paper copy of the engine template is located on Page 71 of this manual.

Step 6

Use a drill and 1/4-inch (6mm) drill bit to drill four holes in the bottom of the engine mounting box so the ignition module can be secured to the fuselage.

Step 5

Place a piece of 1/4-inch (6mm) foam between the ignition module and firewall. Use two 1/4-inch (305mm) tie wraps to secure the module to the fuselage.

Important: Make sure not to install the tie wraps over the throttle pushrod tube. This could cause the pushrod to bind and cause the throttle servo to run the receiver battery down prematurely.
Step 8

Slide the pushrod tube in the hole in the firewall. Position the tube so 2 1/16-inch (67mm) is exposed forward of the firewall. Use medium CA to glue the tube to the firewall.

Step 9

Position the throttle servo on the same side of the fuselage as the pushrod tube and the output of the servo facing the rear of the fuselage. Use a pencil to mark the locations for the four servo mounting screws.

Step 10

Remove the servo and use a drill with a 1/16-inch (1.5mm) drill bit to drill the holes necessary for the servo mounting screws.

Step 11

Place 3–4 drops of thin CA in each hole to harden the surrounding wood.

Step 12

Use the screws provided with the servo and a #1 Phillips screwdriver to secure the throttle servo in the fuselage. Make sure to plug the throttle servo into the throttle channel of the receiver at this time.

Step 13

Use the radio system to center the throttle servo. With the throttle stick and trim centered, the arm should be positioned as shown in the previous photo. This will provide an equal amount of travel to both full and closed throttle.

Step 14

Use four 8-32 x 1 3/4-inch socket head bolts, four #8 washers and four 8-32 lock nuts to secure the engine. Make sure the engine is positioned so the driver washer is 5 9/16-inches (138mm) forward of the firewall. A 9/64-inch hex wrench or ball driver and a 11/32-inch nut driver or socket will make tightening the bolts quick work.

Step 15

Remove the arms from the throttle servo that will not be used so they don’t interfere with the operation of the servo. Use an arm that has a hole that is 1/2-inch (13mm) from the center of the servo horn.

Step 16

Slide the plywood pushrod support on the pushrod at this time. Do not glue the support until instructed to do so.

Step 17

Thread a clevis on the 13 1/4-inch (335mm) pushrod wire. Make sure to slide a piece of safety tubing on the clevis.

Step 18

Insert the pushrod tube into the hole in the firewall. Position the tube so 2 1/8-inch (67mm) is exposed forward of the firewall. Use medium CA to glue the tube to the firewall.

Important: A plywood spacer has been included if your engine is too short to achieve the correct distance between the drive washer and firewall. The spacer must be secured to the firewall with epoxy and placed between the mount and firewall. You will also need to purchase four 8-32 x 1 1/4-inch bolts to attach the mount to the firewall spacer.

Hint: You can loosen the mounts on the firewall to make it easier to install the engine. Just make sure the mounts are tight before tightening the engine mounting bolts.

Hint: You can loosen the mounts on the firewall to make it easier to install the engine. Just make sure the mounts are tight before tightening the engine mounting bolts.
Step 19
Use the radio system to move the throttle servo to the closed position. Physically close the carburetor on the engine. Make sure the direction of the servos and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod where it crosses the outside hole of the servo arm.

Step 20
Use the radio system to move the throttle servo to the full throttle position. Move the carburetor to the full throttle position. Check that the mark on the pushrod wire aligns with the outer hole of the carburetor arm. If it is not only a slight amount, you can use the KTV function of your radio to correct. If the line is too far forward, attach the clevis to a hole on the servo arm that is closer to the center of the servo. If it doesn’t move far enough, use a servo arm that allows you to position the clevis farther from the center of the servo. Repeat the previous steps if necessary to achieve the correct amount of throw to operate the throttle on your engine.

Step 21
Use pliers to make a 90 degree bend in the pushrod wire where the mark was made in the previous steps.

Step 22
Enlarge the hole in the servo arm that works properly for the operation of your throttle with a pin drill and 5/64-inch (2mm) drill bit. Secure the throttle pushrod in the servo horn using a pushrod keeper. Use medium CA to glue the plywood pushrod support to the fuselage in a position that will provide smooth movement of the throttle pushrod.

Fuel Tank Installation

Required Parts
- Fuselage assembly
- Fuel tank 1/4-inch (6mm) foam

Tools and Adhesives
- Medium CA

Step 1
Inspect the fuel tank so the lines inside the tank can be identified. Note that the vent line in the tank will face to the top of the fuselage when the fuel tank is installed.

Step 2
Slide the fuel tank in the fuselage. Make sure to guide the tubes through the hole in the firewall.

Step 3
Cut the brace to length so it fits in the fuselage behind the tank. Place a small piece of 1/4-inch (6mm) foam between the brace and tank. Use medium CA to glue the brace in position.

Electric Motor Installation

Required Parts
- Fuselage assembly
- Firewall template
- #8 washer (8)
- Motor with hardware
- Electronic speed control
- Aluminum motor standoff, 13/4-inch (44.5mm) (4)
- Tie wrap, 8-inch (205mm) (2)
- 8-32 x 3/4-inch socket head bolt (8)

Tools and Adhesives
- Low-tack tape
- Drill
- Two-sided tape
- Threadlock
- Hex wrench or ball driver: 9/64-inch
- Hobby knife with #11 blade
- Hex wrench or ball driver: 2.5mm, 9/64-inch
- Drill bit: 1/16-inch (1.5mm), 5/32-inch (4mm)

Note: The motor shown installed in this section is the Power 60. Installation of the Power 90 follows the same procedure, but requires drilling the template in the correct locations and the use of the 20mm Power 90 adapter placed between the firewall and the aluminum standoffs.

Step 1
Use a hobby knife with a #11 blade to remove the plywood filler pieces from the sides, top and bottom of the engine box. This will allow air to flow into the fuselage to cool the batteries.

Step 2
Use the radio system to move the throttle servo to the closed position. Physically close the carburetor on the engine. Make sure the direction of the servos and carburetor arm are working in unison. Use a felt-tipped pen to mark the pushrod where it crosses the outside hole of the servo arm.

Step 20
Use the radio system to move the throttle servo to the full throttle position. Move the carburetor to the full throttle position. Check that the mark on the pushrod wire aligns with the outer hole of the carburetor arm. If it is not only a slight amount, you can use the KTV function of your radio to correct. If the line is too far forward, attach the clevis to a hole on the servo arm that is closer to the center of the servo. If it doesn’t move far enough, use a servo arm that allows you to position the clevis farther from the center of the servo. Repeat the previous steps if necessary to achieve the correct amount of throw to operate the throttle on your engine.
Step 7
Secure the electronic speed control to the bottom of the motor box using two-sided tape and tie wraps.

Step 8
Connect the leads between the speed control and motor. Use tie wraps to secure the wiring so it will not get entangled in the moving parts of the motor.

Hint: Drill a 5/32-inch (4mm) hole through the firewall so a tie wrap can be used to secure the wiring to the firewall as shown.

Step 9
Plug the lead from the speed control into the throttle channel of the receiver at this time.

Step 10
The batteries are mounted in the fuselage from the top side. Use hook and loop straps to secure them in the fuselage. It may be necessary to use hook and loop tape to keep the batteries from sliding on the battery tray in the fuselage.

Note: The second photo shows the dual battery configuration for the Power 90.

Step 11
At this time check the operation of the motor using the radio system. It should rotate counterclockwise when viewed from the front of the fuselage. If it does not, refer to the instructions included with the speed control to correct the direction of rotation.

Cowling and Spinner Installation - Electric Version

Required Parts
- Fuselage assembly
- Cowling
- Spinner assembly
- Propeller adapter
- Propeller
- Propeller nut
- Spinner backplate spacer
- 3mm x 15mm socket head machine screw (4)

Tools and Adhesives
- Rotary tool with sanding drum
- Hobby knife with #11 blade
- Hobby scissors
- Box or open end wrench: 12mm
- Hex wrench or ball driver: 2.5mm, 5/32-inch

Step 1
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 2
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 3
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 4
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 5
Use a 2.5mm hex wrench or ball driver to attach the X-mount to the motor using the screws provided with the motor. Make sure to use threadlock on these screws as well.

Important: Make sure to use threadlock on all metal-to-metal fasteners to prevent them from vibrating loose.

Step 6
Use four 8-32 x 3/4-inch socket head bolts and four #8 washers to secure the aluminum motor standoffs to the firewall. Use a 5/32-inch hex wrench or ball driver to tighten the bolts.

Step 7
Secure the electronic speed control to the bottom of the motor box using two-sided tape and tie wraps.

Step 8
Connect the leads between the speed control and motor. Use tie wraps to secure the wiring so it will not get entangled in the moving parts of the motor.

Hint: Drill a 5/32-inch (4mm) hole through the firewall so a tie wrap can be used to secure the wiring to the firewall as shown.

Step 9
Plug the lead from the speed control into the throttle channel of the receiver at this time.

Step 10
The batteries are mounted in the fuselage from the top side. Use hook and loop straps to secure them in the fuselage. It may be necessary to use hook and loop tape to keep the batteries from sliding on the battery tray in the fuselage.

Note: The second photo shows the dual battery configuration for the Power 90.

Step 11
At this time check the operation of the motor using the radio system. It should rotate counterclockwise when viewed from the front of the fuselage. If it does not, refer to the instructions included with the speed control to correct the direction of rotation.

Cowling and Spinner Installation - Electric Version

Required Parts
- Fuselage assembly
- Cowling
- Spinner assembly
- Propeller adapter
- Propeller
- Propeller nut
- Spinner backplate spacer
- 3mm x 15mm socket head machine screw (4)

Tools and Adhesives
- Rotary tool with sanding drum
- Hobby knife with #11 blade
- Hobby scissors
- Box or open end wrench: 12mm
- Hex wrench or ball driver: 2.5mm, 5/32-inch

Step 1
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 2
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 3
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 4
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 5
Use a 2.5mm hex wrench or ball driver to attach the X-mount to the motor using the screws provided with the motor. Make sure to use threadlock on these screws as well.

Important: Make sure to use threadlock on all metal-to-metal fasteners to prevent them from vibrating loose.

Step 6
Use four 8-32 x 3/4-inch socket head bolts and four #8 washers to secure the aluminum motor standoffs to the firewall. Use a 5/32-inch hex wrench or ball driver to tighten the bolts.

Step 7
Secure the electronic speed control to the bottom of the motor box using two-sided tape and tie wraps.

Step 8
Connect the leads between the speed control and motor. Use tie wraps to secure the wiring so it will not get entangled in the moving parts of the motor.

Hint: Drill a 5/32-inch (4mm) hole through the firewall so a tie wrap can be used to secure the wiring to the firewall as shown.

Step 9
Plug the lead from the speed control into the throttle channel of the receiver at this time.

Step 10
The batteries are mounted in the fuselage from the top side. Use hook and loop straps to secure them in the fuselage. It may be necessary to use hook and loop tape to keep the batteries from sliding on the battery tray in the fuselage.

Note: The second photo shows the dual battery configuration for the Power 90.

Step 11
At this time check the operation of the motor using the radio system. It should rotate counterclockwise when viewed from the front of the fuselage. If it does not, refer to the instructions included with the speed control to correct the direction of rotation.

Cowling and Spinner Installation - Electric Version

Required Parts
- Fuselage assembly
- Cowling
- Spinner assembly
- Propeller adapter
- Propeller
- Propeller nut
- Spinner backplate spacer
- 3mm x 15mm socket head machine screw (4)

Tools and Adhesives
- Rotary tool with sanding drum
- Hobby knife with #11 blade
- Hobby scissors
- Box or open end wrench: 12mm
- Hex wrench or ball driver: 2.5mm, 5/32-inch

Step 1
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 2
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 3
Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Note: Both motor options (Power 60 and Power 90) have been tested and only require the opening in the front of the cowling to allow cooling air to pass through the cowling. Use a rotary tool with a sanding drum to clean up any rough edges left from the hobby scissors.

Step 4
Locate the firewall template. Use low-tack tape to secure it to the engine box. Use a drill and 1/16-inch (1.5mm) drill bit, drill through the template and through the firewall for the mount that fits your particular motor. A paper copy of the engine template is located on Page 71 of this manual.

Step 5
Use a 2.5mm hex wrench or ball driver to attach the X-mount to the motor using the screws provided with the motor. Make sure to use threadlock on these screws as well.

Important: Make sure to use threadlock on all metal-to-metal fasteners to prevent them from vibrating loose.

Step 6
Use four 8-32 x 3/4-inch socket head bolts and four #8 washers to secure the aluminum motor standoffs to the firewall. Use a 5/32-inch hex wrench or ball driver to tighten the bolts.

Step 7
Secure the electronic speed control to the bottom of the motor box using two-sided tape and tie wraps.

Step 8
Connect the leads between the speed control and motor. Use tie wraps to secure the wiring so it will not get entangled in the moving parts of the motor.

Hint: Drill a 5/32-inch (4mm) hole through the firewall so a tie wrap can be used to secure the wiring to the firewall as shown.

Step 9
Plug the lead from the speed control into the throttle channel of the receiver at this time.

Step 10
The batteries are mounted in the fuselage from the top side. Use hook and loop straps to secure them in the fuselage. It may be necessary to use hook and loop tape to keep the batteries from sliding on the battery tray in the fuselage.

Note: The second photo shows the dual battery configuration for the Power 90.

Step 11
At this time check the operation of the motor using the radio system. It should rotate counterclockwise when viewed from the front of the fuselage. If it does not, refer to the instructions included with the speed control to correct the direction of rotation.
Cowling and Spinner Installation - Glow Version

Required Parts

- Fuselage assembly
- Cowling
- Spinner assembly
- Propeller
- Propeller nut
- Backplate
- 2-stroke in-cowl muffler (not included)
- Fuel filler dot (not included)
- 3mm x 15mm socket head bolt (4)

Tools and Adhesives

- Rotary tool with sanding drum
- Hobby knife with #11 blade
- Hobby scissors
- Hex wrench or ball driver: 2.5mm, 5/32-inch

Step 1

Attach the muffler to the engine using the hardware provided with the muffler.

Note: We used a fuel filler dot to allow for fueling the engine from the outside of the cowling. This makes fueling the engine much easier than removing the cowling before each flight.

Step 2

Connect the lines from the fuel tank to the engine and muffler. Make sure the vent line goes to the muffler, and the line from the clamp to the carburetor.

Step 3

Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling.

Step 4

Use hobby scissors and a hobby knife with a #11 blade to trim the cowling to fit your particular engine and muffler combination. Make sure to leave enough gap between the cowl and engine components so they do not chafe or cause cracking to the cowling. Use a rotary tool with a sanding drum to smooth any rough edges left from the trimming process.

Step 5

Slide the spinner backplate on the propeller shaft. The hole may be larger than the adapter shaft, so a spacer has been included to take up any space if the shaft and hole in the backplate are different sizes.

Step 6

Use the included spinner bolt to secure the spinner cone in position. Use a 5/32-inch hex wrench or ball driver to tighten the bolt to secure the spinner cone.

Step 7

Position the spinner backplate on the propeller adapter. The hole may be larger than the adapter shaft, so a spacer has been included to take up any space if the shaft and hole in the backplate are different sizes.

Step 8

Connect the lines from the fuel tank to the engine and muffler. Make sure the vent line goes to the muffler, and the line from the clamp to the carburetor.

Step 9

Carefully cut the opening in the front of the cowling to allow cooling air to pass through the cowling.

Step 10

Use a rotary tool with a sanding drum to smooth any rough edges left from the trimming process.

Step 11

Position the spinner backplate on the propeller adapter. The hole may be larger than the adapter shaft, so a spacer has been included to take up any space if the shaft and hole in the backplate are different sizes.
Step 6
Slide the propeller on the engine crankshaft. Make sure it is facing the correct direction to operate properly.

Step 7
Use the propeller nut included with your P-51 Mustang to secure the propeller and spinner backplate to the motor. Make sure to leave a slight gap of 3/32-inch (2mm) between the backplate and front of the cowling so the backplate does not rub the cowling. Tighten the propeller nut using a 12mm box or open end wrench.

Step 8
Use the included spinner screw to secure the spinner cone in position. Use a 5/32-inch hex wrench or ball driver to tighten the bolt to secure the spinner cone.

Note: You will need to use an L-bent piece of wire to make an extension so the high-speed needle can be adjusted from outside the cowling.

Step 1
Use hobby scissors and a hobby knife with a #11 blade to trim the excess material from the exhaust stacks.

Hint: The guns can be individually cut out for a more scale look.

Step 2
Use canopy glue to secure the exhaust stacks to the sides of the cowling. Use the photo below and those on the box to aid in correctly positioning the exhaust stacks, aligning the top of the exhaust stack with the seam between the hatch and fairening. Use low-tack tape to keep the exhaust stacks in position until the glue fully cures.

Step 3
Use medium CA to glue the tail gear doors to the bottom of the fuselage.

Step 4
Use canopy glue to secure the exhaust stacks to the sides of the cowling. Use the photo below and those on the box to aid in correctly positioning the exhaust stacks, aligning the top of the exhaust stack with the seam between the hatch and fairening. Use low-tack tape to keep the exhaust stacks in position until the glue fully cures.

Step 5
Use the included spinner screw to secure the spinner cone in position. Use a 5/32-inch hex wrench or ball driver to tighten the bolt to secure the spinner cone.

The following images show the installation of the four-stroke engine option. Make sure to cut clearance for the muffler, rocker covers and 90 degree exhaust manifold.

Scale Accessory Installation

Required Parts
- Fuselage assembly
- Tail gear door (2)
- Exhaust stacks (right and left)
- Gun fairing (2)
- Antenna mast
- Antenna mast mount
- Radiator exhaust
- Radiator exhaust template
- #2 x 3/8-inch sheet metal screw (3)
- Wing assembly (right and left)

Tools and Adhesives
- Low-tack tape
- Medium CA
- Hobby scissors
- Phillips screwdriver: #1
- Hobby knife with #11 blade
- Canopy glue
- Felt-tipped pen

Note: You will need to use an L-bent piece of wire to make an extension so the high-speed needle can be adjusted from outside the cowling.
COOLING EXHAUST FOR ELECTRIC VERSION

Note: The following steps are required to install the radiator exhaust for the electric version of your aircraft. This will allow air to pass through the fuselage to provide cooling for the batteries. You can still install the exhaust for a glow-powered aircraft, but it is not necessary to do so.

Step 6 Use hobby scissors and a hobby knife with a #11 blade to remove the center from the radiator scoop template.

Step 7 Use a felt-tipped pen to trace the outline of the cutout of the template on the bottom of the fuselage.

Step 8 Place the radiator exhaust template on the bottom of the fuselage. It is shaped to fit snugly on the fuselage. Use low-tack tape to secure the template to the bottom of the fuselage.

Step 9 Test fit the radiator exhaust into the opening made in the previous step. You may need to trim the opening to fit the scoop perfectly. Once fit, use medium CA to glue the scoop to the fuselage.

Step 10 Use a left-handed pen to trace the outline of the cutout of the template on the bottom of the fuselage.

Step 11 Remove the template from the fuselage. Using a hobby knife with a new #11 blade, carefully cut along the lines drawn in the previous step. It is better to trim inside the lines and fit the exhaust, rather than to cut too large and not have the exhaust fit into the opening.

Step 12 Use a hobby knife with a #11 blade to remove the covering at the leading edge of the wing for the wing dowel.

Wing and Belly Pan Installation

Required Parts

- Fuselage assembly
- Wing dowel (2)
- 1/4-20 blind nut (2)
- Wing tube
- 1/4-inch washer (2)
- Wing bolt plate (2)
- Radiator scoop
- #6 x 21/4-inch wood screw (2)
- Wing assembly (right and left)
- 1/4-20 x 11/2-inch socket head machine bolt (2)

Tools and Adhesives

- Hobby knife with #11 blade
- Medium CA
- Channel lock pliers
- Thin CA
- Phillips screwdriver: #2
- Ruler
- Pencil
- Hex wrench or ball driver: 3/16-inch

Step 1 Use a hobby knife with a #11 blade to remove the covering at the leading edge of the wing for the wing dowel.
Step 2
Use a ruler and pencil to mark the wing dowel 3/8-inch (10mm) from one end as shown. This is the amount the wing dowel will protrude from the leading edge of the wing.

Step 3
Use medium CA to glue the wing dowel in the leading edge of the wing. Make sure to use the reference line made in the previous step so the dowel extends 3/8-inch (10mm) from the leading edge of the wing.

Step 4
Use a hobby knife with a #11 blade to remove the covering to expose the hole for the wing mounting bolts.

Step 5
Repeat Steps 1 through 4 for the remaining wing panel.

Step 6
Use channel lock pliers to install the two 1/4-20 blind nuts in the fuselage. Make sure the nut is installed from the inside of the fuselage as shown in this step and the following step.

Step 7
Place 2-3 drops of thin CA on each of the bolts of the blind nut to keep it from coming loose inside the fuselage. Make sure not to get any CA in the threads or it will be difficult to install the wing bolts.

Step 8
Slide the wing tube into one of the wing panels. It will only go in so far, so don’t force it farther than it will easily slide.

Step 9
Slide the remaining wing panel on the tube and tightly against the opposite wing panel. Make sure not to get any of the servo wiring between the panels or they will not fit together.

Step 10
Mount the wing to the fuselage by sliding the wing dowels into the holes in the fuselage at the front of the wing. The wing is held securely to the fuselage using two wing bolt plates, two 1/4-inch washers and two 1/4-20 x 1 1/2-inch socket head machine bolts. Before using a 3/16-inch hex wrench or ball driver to tighten the bolts, note the orientation of the wing bolt plates in relationship to the wing in the second photo.

Step 11
Position the radiator scoop on the bottom of the wing. If the wing bolts' plates are not oriented correctly the scoop will not fit tightly to the fuselage.

Step 12
The radiator scoop is held in position by two #6 x 2 1/4-inch wood screws. The screws will self-thread into the bottom of the wing. Use a #2 Phillips screwdriver to tighten the screws.

Step 13
Turn the airframe upright and connect the leads from the wing to the extensions from the receiver.
**Cockpit Details and Installation**

**Required Parts**
- Cockpit hatch
- Instrument panel decal
- Scale radio
- Scale pilot (optional)
- Clear canopy
- 3mm x 15mm socket head machine screw (2)

**Tools and Adhesives**
- Hobby scissors
- Canopy glue
- Low-tack tape
- Thin CA
- Medium CA
- Pencil
- Hex wrench or ball driver: 2.5mm
- Hobby knife with #11 blade

**Step 1**
Remove the instrument panel from the decal sheet. Apply the decal as shown.

*Hint*: Wait a few minutes before proceeding to make sure the decal is going to adhere to the cockpit. If it does not, apply a thin bead of thin CA around the edge of the decal to keep it from peeling away from the cockpit.

**Step 2**
Use hobby scissors to trim the excess material from the scale radio. Make sure to leave a small flange so the scale radio can be glued in the cockpit.

**Step 3**
Position the scale radio in the cockpit area. Use medium CA to glue the scale radio to the cockpit floor as shown.

**Step 4**
The scale backrest is then installed right in front of the scale radio. Use medium CA to glue the scale backrest in position.

**Step 5**
At this time you will need to decide if you want to install the optional scale pilot. Use the photos on the box to determine the correct location for the pilot. Use medium CA to glue the pilot in position in the cockpit.

**Step 6**
Use medium grit sandpaper to lightly sand the inside edge of the canopy where it contacts the canopy hatch. Use a paper towel and rubbing alcohol to remove any debris or oils after sanding. Apply a thin bead of canopy glue around the bottom inside edge of the canopy. Position the canopy on the cockpit hatch so the rear edge of the frame around the canopy is 9/8-inch (240mm) behind the front edge of the hatch. Use low-tack tape to hold the canopy in position until the glue fully cures.

**Step 7**
Position the canopy hatch back on the fuselage. Remember to insert the pins at the front first.

**Step 8**
There are two holes in the fuselage at the rear of the canopy hatch. Use a hobby knife and #11 blade to remove the covering. The canopy is secured using two 3mm x 15mm socket head machine screws that are tightened using a 2.5mm hex wrench or ball driver.

**Step 9**
A pencil can be used to draw the scale panels lines and rivets on the cowling. Use a flexible ruler to help in aligning the panels lines to those you will be drawing on the cowling. For more details visit www.horizonhobby.com.

**Step 10**
If you have purchased one of the optional decal sheets, use the box or go to the Horizon Hobby website (http://www.horizonhobby.com/Products/Default.aspx?ProdID=HAN2420) for the P-51 Mustang to assist in locating each of the decals. Mix a drop of dish washing detergent in a spray bottle and lightly mist the area where the decal will be placed so it can be slid on the airframe. Use a paper towel to squeegee the decal and remove the majority of the liquid from under the decal. Allow the decal to set overnight to remove the remaining liquid and bubbles.
Control Thrusts

<table>
<thead>
<tr>
<th>Aircraft High Rate</th>
<th>Down</th>
<th>1/8 inch (19mm)</th>
<th>35 degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude Low Rate</td>
<td>Down</td>
<td>1/12 inch (16mm)</td>
<td>35 degrees</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>1/12 inch (16mm)</td>
<td>35 degrees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevator High Rate</th>
<th>Down</th>
<th>5/8 inch (16mm)</th>
<th>15 degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevator Low Rate</td>
<td>Down</td>
<td>5/8 inch (16mm)</td>
<td>15 degrees</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>5/8 inch (16mm)</td>
<td>15 degrees</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rudder High Rate</th>
<th>Left</th>
<th>1 inch (25mm)</th>
<th>15 degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rudder Low Rate</td>
<td>Right</td>
<td>1 inch (25mm)</td>
<td>15 degrees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flap Positions</th>
<th>Adjusted with wing moving edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flap 4.5° to 6°</td>
<td>1/8 inch (16mm) 22 degrees</td>
</tr>
<tr>
<td>Flap 6° to 7°</td>
<td>1/8 inch (16mm) 24 degrees</td>
</tr>
</tbody>
</table>

| Note: Measurements are taken at the pivotal point on the control surface. These are general guidelines measured from our own flight tests. You can experiment with higher or lower rates to match your preferred style of flying. |

Flight Preparation

Flight preparations must be checked each time you prepare to fly the field. For your model, you must consider the various situations in which it is kept on the various components of your model to keep it in the best flying condition.

Checking the Frequency

When using a Spectrum radio system, follow the guidelines for use of S/NMM radio systems at your particular field. The oil in the S/NMM tank is not filtered.

Checking the Controls

Before starting your engine, check to make sure the controls and their connections are secure. Also check the radio and other controls to make sure they are secure and not about to come loose or fail in flight.

Feeling your Model

Feel the tail in the same way you would in a racing car. Adjust the control surfaces on the model to match the feel of the car or truck. This will help you to get the feel of the model and make adjustments to the radio to improve the stability in flight.

Note: It is very important to recorrect the lines to the correct lengths. If the control surfaces are not in the correct position, the engine will not work properly.

Leasing

You will find that the P-51 will slightly blip out or pitch up as you fly higher in the field. This is normal behavior. If you allow the model to slow down prior to lowering the flaps, the oil will be used up and the model will fall down. You will notice that the P-51 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 speed of gravity. So be sure to adjust the down elevator properly for each flight.

To begin the landing approach you will need to first lower the throttle and reduce your flight speed. We recommend the P-51 should be lowered to a speed of around 5000 rpm. Allow the P-51 to begin a slow downward descent and gradually apply the amount of up elevator needed to keep the model in the atmosphere. As you pass over the field, reduce the throttle and get ready to land. You will now be able to control the model accurately and maintain your altitude by keeping the nose down in the line. As you begin your landing, apply full throttle to maintain your altitude.

Hangar 9 P-51 Mustang Manual 60 ABP Aircraft Manual
Checking the Control Horns
Inspect the control horns to make sure they have not crashed the wood of the control surface. If so, remove the control horn screws to remove the horn. Place 2-3 drops of thin CA into each of the screw holes. In addition, apply a 2.5mm hex wrench to tighten the screws. It is suggested that you check the control horns to remove any cracks, nicks, or deformations. Then, secure the control horns back into position. Use a 2.5mm hex wrench to tighten them again. If you have any doubts, the control horns should be replaced.

Checking the Wheel Collars
Check the wheel collars on the main and tail wheel to make sure they are not loose. Use a 1.5mm hex wrench to tighten the wheel collars. If it is suggested that they be replaced, do so. Then remove the propeller from the prop hub, and then remove the wheel collars from the prop hub. If the collar is not tightly secured to the prop hub, the wheel will move freely in both directions.

Checking the Muffler Balls
Locate the muffler balls. Use a 2.5mm hex wrench (Evolution 2-stroke) or box wrench (Saito 4-stroke) to make sure the hardware holding the muffler balls is secured in the list for this purpose.

Checking the Engine Mounts
Remove the spinner and propeller from the engine. Remove the exhaust stacks from the exhaust, and then remove the engine. Remove the propeller from the engine, and then use a Phillips screwdriver to make sure the rear bushings securing the engine to the mount are tight.

Dual Rate Recommendations
We recommend that the rudder dual rate be set to Low for takeoff to help minimize overcorrection during the transition from flying speed to taxi speeds. This will allow the rudder to move freely in both directions.

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 8-cells to power the transmitter. If you are using a JR or Spektrum transmitter that uses 4-cells to power the transmitter, then the receiver pack is at 4.7V. Do not to coin a crash aircraft.

Step 2
Check all hardware (links, screws, nuts, and bolts) prior to takeoff. Be sure that the hardware does not come off and that all parts are properly secured.

Step 3
Ensure that all surfaces are moving in the proper manner.

Step 4
Perform a ground 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 all trim levers 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.

Safety Do’s and Don’ts for Pilots
• 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.

• Do not point the transmitter antenna directly toward the receiver. Use an optional support equipment (chargers, rechargeable battery packs, etc.) that you use.

• 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 8-cells to power the transmitter. If you are using a JR or Spektrum transmitter that uses 4-cells to power the transmitter, then the receiver pack is at 4.7V. Do not to coin a crash aircraft.

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 other 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 other electronic devices, other aircraft, and other objects. This interference can cause momentary loss of control so it is necessary to always keep a safe distance in all directions around you. In addition, strong winds can cause similar problems. This model is inherently low.

Your aircraft. Strong winds can cause disorientation and loss of control of your aircraft.

Ensure that your batteries have been properly charged prior to each day’s flight. Be sure that binding does not occur and that all parts are properly secured.

Always operate your model in an open area away from cars, traffic or people.

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 other 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 other electronic devices, other aircraft, and other objects. This interference can cause momentary loss of control so it is necessary to always keep a safe distance in all directions around you. In addition, strong winds can cause similar problems. This model is inherently low.

Do not fly by yourself. The transmitter alarm will warn you at this time.

Do not fly at low altitudes. Keep all chemicals, small parts and anything electrical out of the reach of children. No smoking is permitted in any aircraft or near any fuel source. Do not smoke around any fuel source. Do not smoke around any fuel source. Do not smoke around any fuel source.

Do not fly over roads or into the street. Do not fly if you can never be taken lightly.

Do not fly near any spectator areas. Do not fly if the problem has been ascertained and corrected. Safety is inherently low.

Do not fly in strong winds. Strong winds can cause similar problems. This model is inherently low.

Do not fly near any spectator areas. Do not fly if the problem has been ascertained and corrected. Safety is inherently low.

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Do not fly near any spectator areas. Do not fly if the problem has been ascertained and corrected. Safety is inherently low.
This is a sophisticated hobby Product and not a toy. It must not be used for purposes other than those for which it was designed. The Product is intended for use by children without direct adult supervision. If you as the Purchaser or user are not prepared to accept the responsibility for these decisions, you must return this Product immediately for a full refund. These Terms are governed by Illinois law (without giving effect to any choice of law or conflict of law provisions). If you as the Purchaser or user are not prepared to accept all resulting liability, you must return this Product immediately for a full refund. Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup or assembly, the user accepts all resulting liability. If you as the Purchaser or user are not prepared to accept the responsibility for these decisions, you must return this Product immediately for a full refund.
6. I will not knowingly operate my model aircraft within three (3) miles of any preexisting flying site without a frequency-management agreement. A frequency-management agreement may be an allocation of frequencies for each site, a day-use agreement between sites, or testing which determines that no interference exists. A frequency-management agreement may exist between two or more AMA chartered clubs, AMA clubs and individual AMA members, or individual AMA members. Frequency-management agreements, including an interference test report if the agreement indicates no interference exists, will be signed by all parties and copies provided to AMA Headquarters.

7. With the exception of events flown under official AMA rules, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and located at the 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.