HANGAR 9

P-47 Thunderbolt

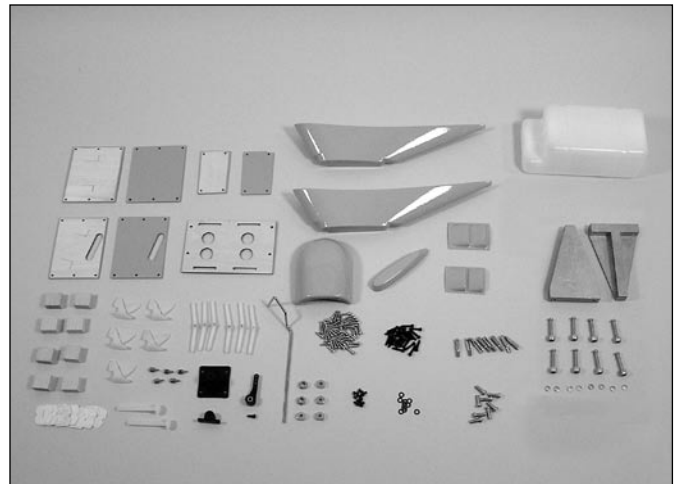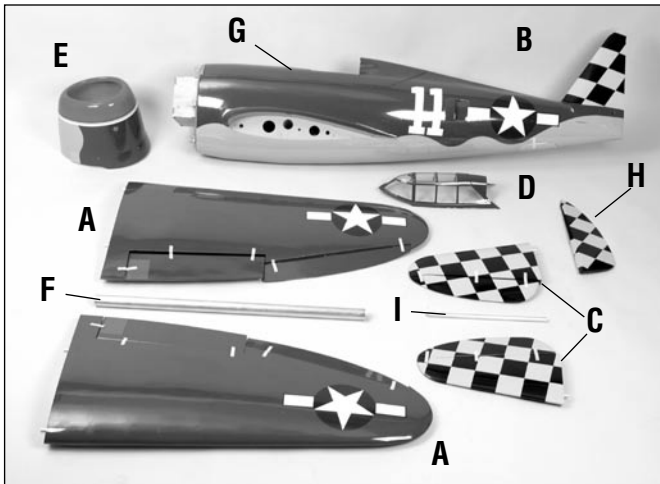## ASSEMBLY MANUAL

Specifications

Wingspan:	81.25 in (206.4 cm)	Weight:	15.5–17 lb (7.1–7.7 kg)
Wing Area:	1164 sq in (75.09 sq dm)	Radio:	6-channel w/10 servos
Length:	71 in (180.3 cm)	Recommended Engines:	1.20-2.20 4-stroke
			1.20-2.10 2-stroke
			23cc-26cc gas

Table of Contents

Contents of Kit

Large Parts:

A.	Wing Set	HAN2702
B.	Fuselage	HAN2701
C.	Stabilizer Set w/Elevators	HAN2703
D.	Canopy	HAN2706
E.	Cowling	HAN2705
F.	Wing Tube	HAN2707
G.	Canopy Hatch	HAN2708
H.	Rudder	HAN2704
I.	Stabilizer Tube Set	HAN2709

Small Parts:

Tail Wheel Assembly	HAN2711

Items Not Shown:

Decal Set	HAN2713
Pushrod Set	HAN2710
Plastic Scale Detail Set	HAN2712
Landing Gear Doors	HAN2714
Retract Set	HAN2715
Scale Bombs	HAN2716
Scale Fuel Tank	HAN2717
Scale Propeller	HAN2718

Required Radio and Engine

Radio Equipment

- 6-channel radio system (minimum)
- 8 standard high-torque servos (JRPS811 recommended or equivalent)
- Low-Profile Retract Servo (JRPS791) (2)
- 6" Servo Extension (JRPA095) (2)
- 12" Servo Extension (JRPA098) (4)
- 24" Servo Extension (JRPA102) (2)
- Large Servo Arms w/Screw (JRPA215) (4)
- Radio Switch (JRPA003)
- 900mAh receiver battery (minimum)

Recommended Engines

- 1.80 4-stroke
- Zenoah G26 Gas

Saito™ 1.80 4-stroke
SAIE180

Recommended JR Systems

- XP6102
- XP662
- X-378
- XP9303
- 10X

JR® XP6102

Zenoah® G26 (25.4cc)
ZENE26A

JR XP9303

Additional Required Tools and Adhesives

Tools
- Adjustable wrench
- Hobby scissors
- Drill
- Drill bits: 1/16", #43, 1/8", 7/64"
- Felt-tipped pen
- Flat blade screwdriver
- Foam: 1/4"
- Hex wrench: 9/64", 3/16"
- Hobby knife
- Phillips screwdriver (small)
- Pliers
- Sandpaper
- Side cutters
- Socket wrench: 11/32"
- Square
- Tap handle
- 4-40 tap
- T-pins

Adhesives
- 6-Minute Epoxy (HAN8000)
- 30-Minute Epoxy (HAN8002)
- Thin CA (PAAPT07)
- Shoe Goo
- CA Remover/Debonder (PAAPT16)
- Masking Tape (MMM20901)
- Canopy glue (Formula 560)
- Threadlocking compound

Other Required Items
- Dish soap
- Epoxy Brushes (DUB345)
- Fuel tubing
- Mixing Sticks for Epoxy (DUB346)
- Paper towels
- Petroleum jelly
- Rotary tool w/sanding drum
- Rubbing alcohol
- Ruler
- Spray bottle
- String
- Wax paper

Warning

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

Covering Colors

- Olive Drab   HANU904
- Light Gray   HANU882
- 2" Squares (Yellow/Black)   HANU943

Before Starting Assembly

Before beginning the assembly of your P-47 Thunderbolt, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder, and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

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

HAN100 – Heat Gun

HAN150 – Covering Glove

HAN101 – Covering Iron

HAN141 – Sealing Iron Sock

Using the Manual

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

Warranty Information

Horizon Hobby, Inc. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any parts damage by use or modification. In no case shall Horizon Hobby's liability exceed the original cost of the purchased kit. Further, Horizon Hobby reserves the right to change or modify this warranty without notice.

In that Horizon Hobby has no control over the final assembly or material used for the final assembly, no liability shall be assumed nor accepted for any damage of the final user-assembled product. By the act of using the product, the user accepts all resulting liability.

Once assembly of the model has been started, you must contact Horizon Hobby, Inc. directly regarding any warranty question that you have. Please do not contact your local hobby store regarding warranty issues, even if that is where you purchased it. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

Horizon Hobby
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Champaign, Illinois 61822
(877) 504-0233
horizonhobby.com

Section 1 – Aileron Installation

Required Parts

- Right and left wing panels w/ailerons
- CA hinges (6)

Required Tools and Adhesives

- Thin CA
- Paper towel
- Drill bit: 1/16"
- CA remover/debonder
- T-pins
- Drill

☐ ☐ Step 1

Carefully remove the tape holding the aileron and flap to the wing. Use a 1/16" drill bit to drill into the wing and aileron. This allows the CA to wick farther into the surfaces for better hinge installation.

☐ ☐ Step 2

Locate three CA hinges and place a T-pin in the center of the hinge as shown. Slide each of the three hinges into the aileron so the T-pin is resting against the leading edge of the aileron. The slot in the hinge aligns with the hole drilled in Step 1.
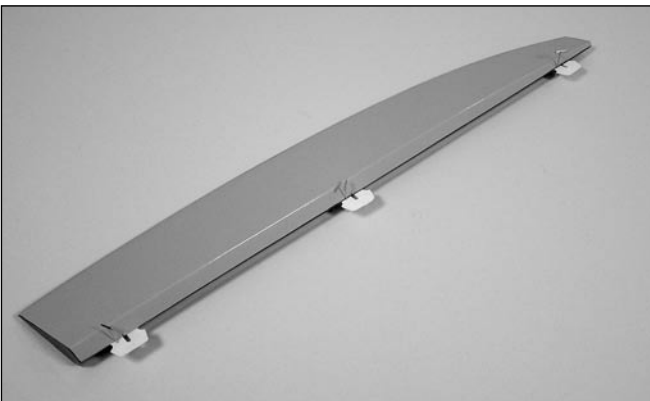
☐ ☐ Step 3

Slide the aileron onto the wing until there is only a slight gap between the aileron and wing panel. Remove the T-pins and snug the aileron against the wing panel. Slide the aileron towards the wing tip until there is only a 1/32" gap between the end of the aileron and wing tip.

Note: Do not use CA accelerator during the hinging process. The CA must be allowed to soak into the hinge to provide the best bond. Using accelerator will not provide enough time for this process.

☐ ☐ Step 4

Deflect the aileron and apply thin CA to the hinge. Apply enough CA to completely saturate the hinge. Use care not to deflect the aileron so it pulls away from the wing. When the hinge is glued in place, there should be no more than a 1/64" hinge gap maintained throughout the length of the aileron.

☐ ☐ Step 5

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

☐ ☐ Step 6

Use CA remover/debonder and a paper towel to remove any excess CA accumulated on the wing or aileron surface. Allow time for the CA to completely cure before moving to the next step.

☐ ☐ Step 7

Firmly grasp the wing and aileron and gently pull on the aileron to ensure the hinges are secure and cannot be pulled apart. Use caution when gripping the wing and aileron to avoid crushing the structure.

☐ ☐ Step 8

Work the aileron up and down several times to work in the hinges and check for proper movement.

☐ Step 9

Repeat Steps 1 through 8 for the remaining aileron.

Section 2 – Aileron Servo Installation

Required Parts

- Wing assembly
- Control horn (2)
- Metal clevis (4)
- 4-40 nuts (4)
- Mounting screws (6)
- Clevis keeper (4)
- #2 x 1/2" screws (6)
- 7/16" x 13/16" x 3/4" servo mounting blocks (4)
- Aileron servos w/mounting hardware (2)
- #2 x 1/2" servo hatch screws (12)
- Large Servo Arm (JRPA212) (1 pkg)
- 24" Servo Lead Extension (JRPA102)
- Aileron servo hatch (2)
- 4-40 x 2" threaded rod (2)

Required Tools and Adhesives

- Phillips screwdriver
- String/dental floss
- Drill bit: 1/16", 1/8"
- 6-minute epoxy
- Felt-tipped pen
- Ruler
- Drill
- Thin CA

☐ ☐ Step 1

Locate the aileron hatch. Note the position of the slot in the hatch, as the left and right hatches are different.


Note: The aileron servo is mounted directly to the hatch.

☐ ☐ Step 2

Install the recommended servo hardware (grommets and eyelets) supplied with the servo. Install a long half servo arm (JRPA212) onto the servo.
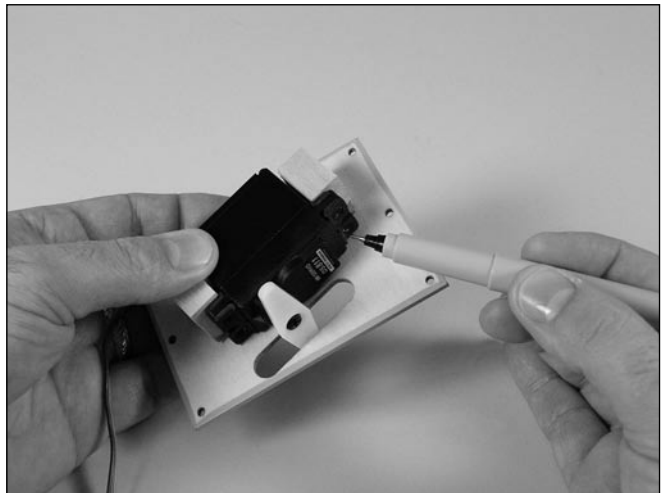
☐ ☐ Step 3

Locate the servo mounting blocks. Use 6-minute epoxy to glue them in place on the marks made on the hatch. The blocks are positioned so the tallest edge is upright. Let the epoxy fully cure before proceeding to the next step.
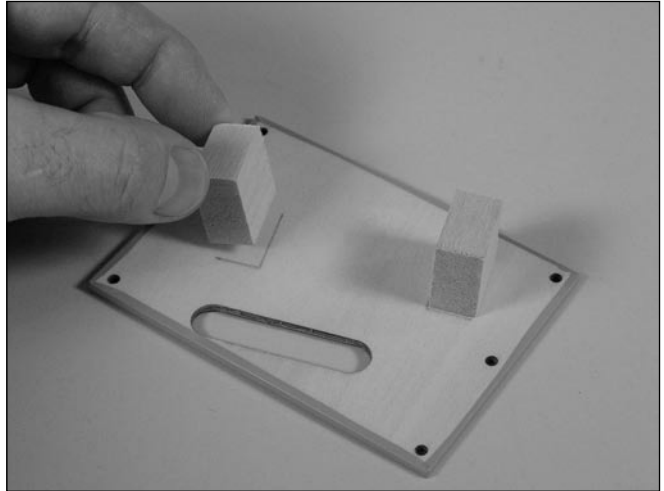
☐ ☐ Step 4

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

Note: Before mounting the servo, it is suggested to electronically center the servo using the transmitter, then install the servo arm to avoid having to remove the servo and center the arm later. It may be necessary to slightly trim one of the servo mounting blocks to clear the servo wire.

☐ ☐ **Step 5**

Remove the servo and use a 1/16" drill bit to pre-drill the holes for the servo mounting screws marked in the previous step. Use the screws supplied with the servo to mount it to the servo mounting blocks. Remove the portion of the arm not extending out of the hatch.
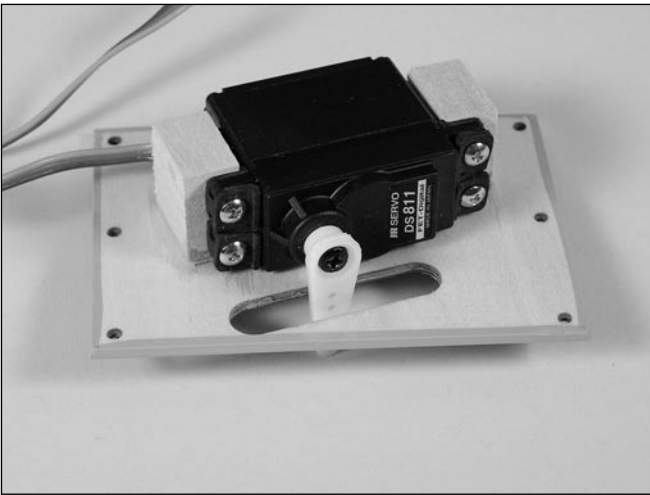

☐ ☐ **Step 6**

Connect a 24" Servo Lead extension (JRPA212) to the servo lead. Secure the connectors by tying them in a knot using dental floss (as shown) or by using a commercially available connector clamp to prevent the servo leads from becoming disconnected.
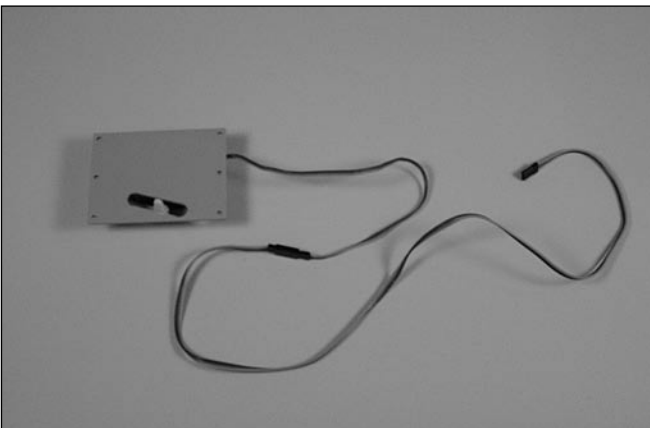
Note: It is always a good idea to secure the servo connector and servo extension together to prevent the wires from becoming unplugged inside the wing.
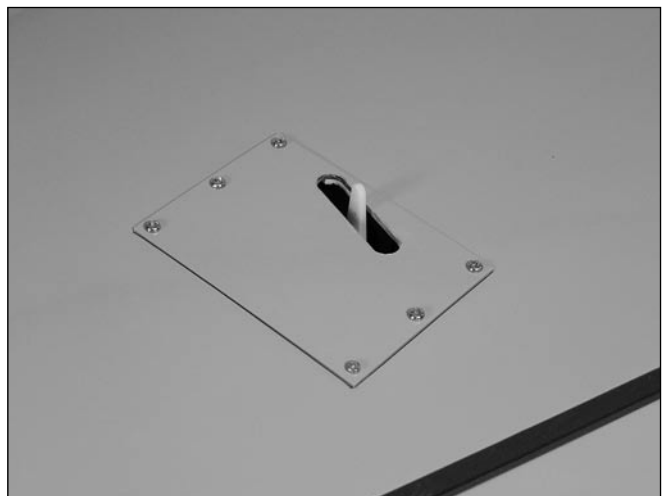
☐ ☐ **Step 7**

Slide the servo lead through the tube in the wing. The lead will exit in the opening for the flap servo.
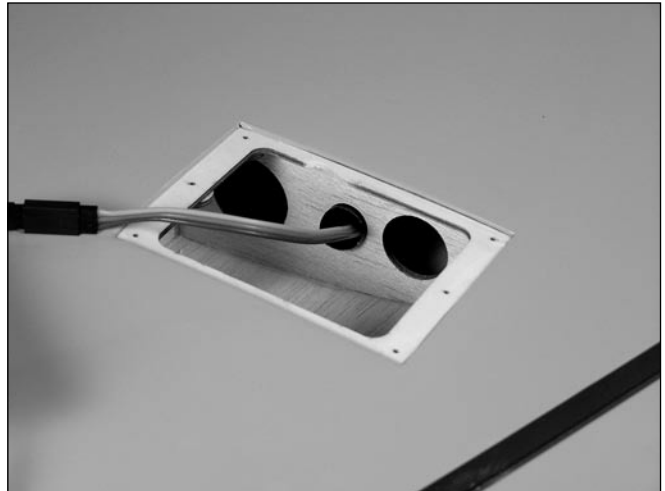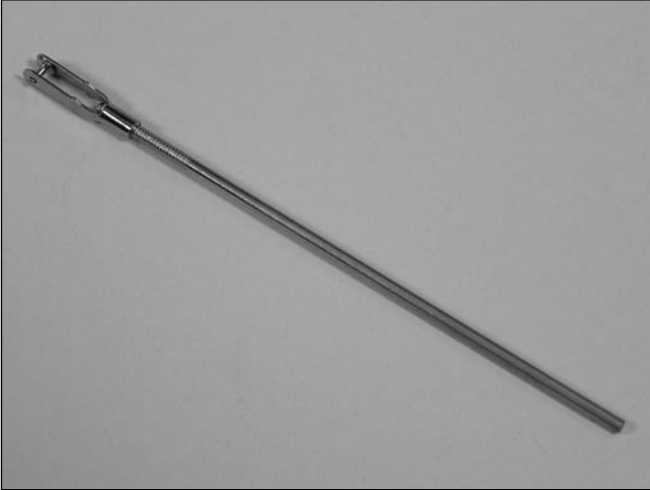

☐ ☐ **Step 8**

Place the hatch in position on the wing. Secure the hatch using six #2 x 1/2" screws.

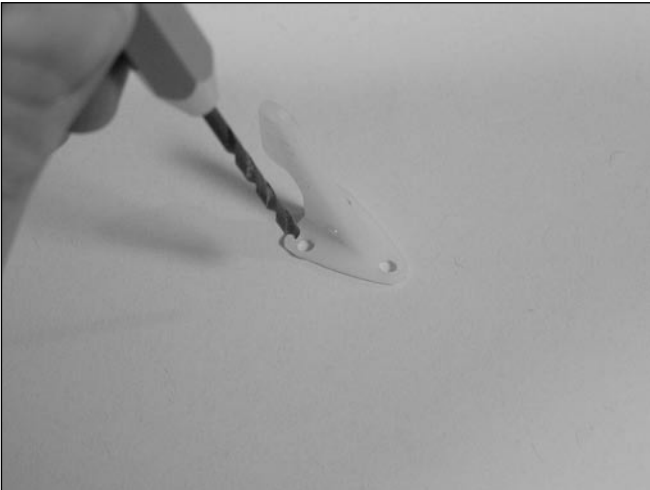# Section 2 – Aileron Servo Installation

☐ ☐ Step 9

Thread a clevis onto the end of the threaded rod. The threaded rod should just be visible between the forks of the clevis.
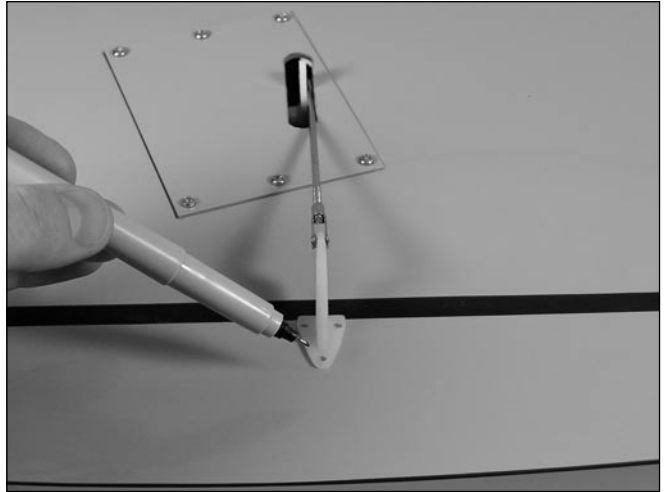

☐ ☐ Step 10

Remove the back plate from the control horn using side cutters or a sharp hobby knife. Use a 1/8" drill bit to drill out the mounting holes in the control horn.

☐ ☐ Step 11

Attach the clevis to the control horn. Position the control on the aileron by aligning the linkage with the servo arm slot and aligning the holes of the control horn with the hinge line of the aileron. Use a felt-tipped pen to mark the locations for the horn screws.

Hint: Wrap a piece of tape around your drill bit to drill the holes the correct depth.
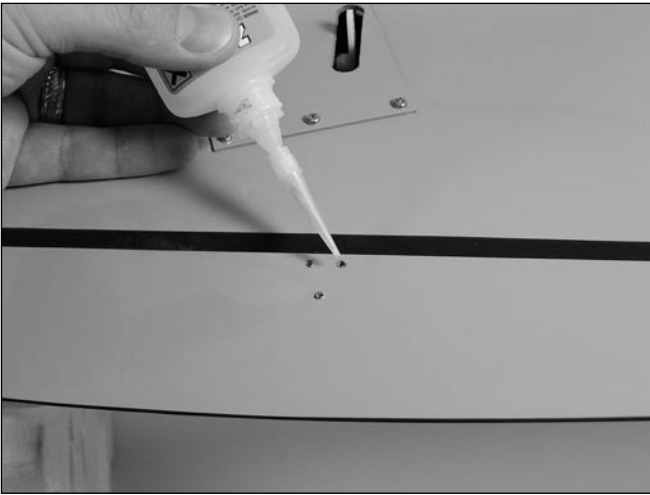
☐ ☐ Step 12

Drill three 1/16" holes at the locations marked in the previous step. The holes only need to be 7/16" deep; don't drill through the top of the aileron.

☐ ☐ **Step 13**

Install one of the #2 x 1/2" screws into a hole drilled, then remove it. Place 2–3 drops of thin CA into the hole to harden the wood. This will eliminate the potential of the screw pulling out of the wood. Repeat this for each of the three holes.
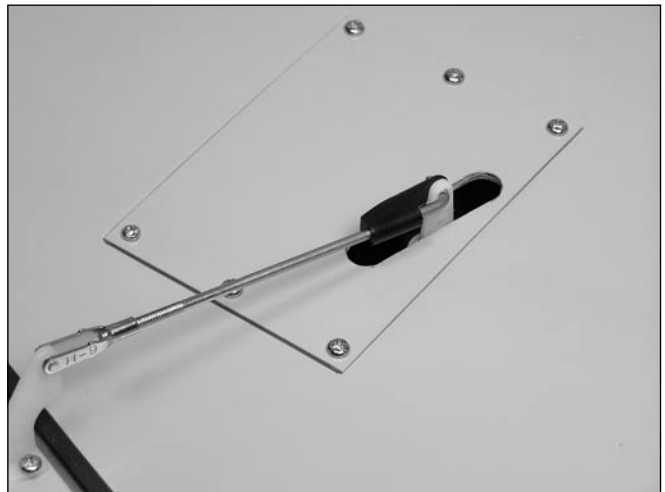

☐ ☐ **Step 14**

Attach the control horn using three #2 x 1/2" screws.

☐ ☐ **Step 15**

Mark the pushrod where it crosses the servo arm. Bend the wire 90-degrees with the smallest radius as possible without damaging the wire. Slide the wire through the servo arm and snap the keeper onto the wire to complete the procedure.

> **Note**: The servo arm will need to be drilled out using a 7/64" drill bit to accept the control rod.

☐ **Step 16**

Repeat Steps 1 through 15 for the remaining aileron servo linkage.

Section 3 – Flap Installation

Required Parts
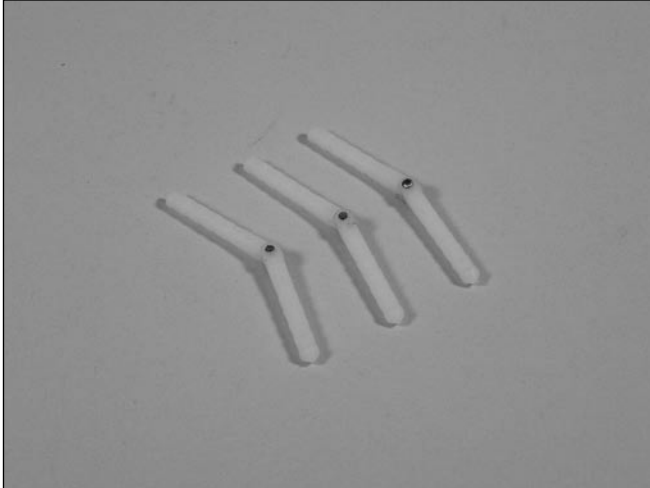- Wing assembly
- Nylon flap hinges (6)

Required Tools and Adhesives
- 30-minute epoxy
- Paper towels
- Rubbing alcohol
- Petroleum jelly

Note: Using two standard rotation servos and a standard Y-harness for the flaps will result in them moving in opposite directions instead of the same direction. As such, the flap servo installation will either require the use of a one reversed rotation servo and one standard rotation servo or a reversing Y-harness. It is highly recommended to use a computer radio or a JR® MatchBox™ to link the two flap servos to operate properly.

☐ ☐ Step 1
Locate three of the nylon flap hinges. Apply a small amount of petroleum jelly to the hinge joint to prevent the epoxy from preventing movement of the hinge.
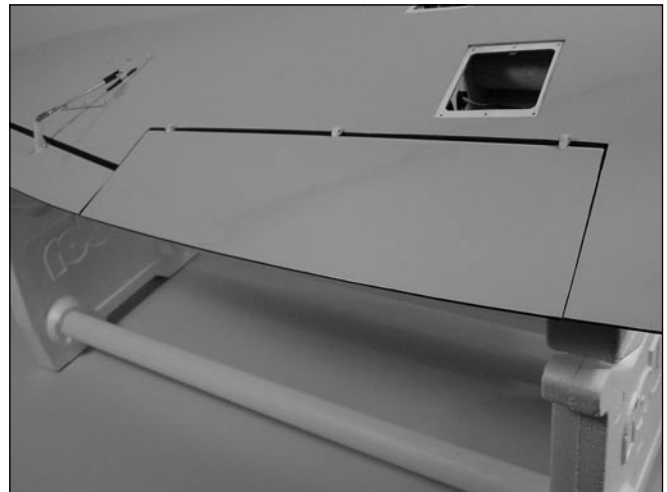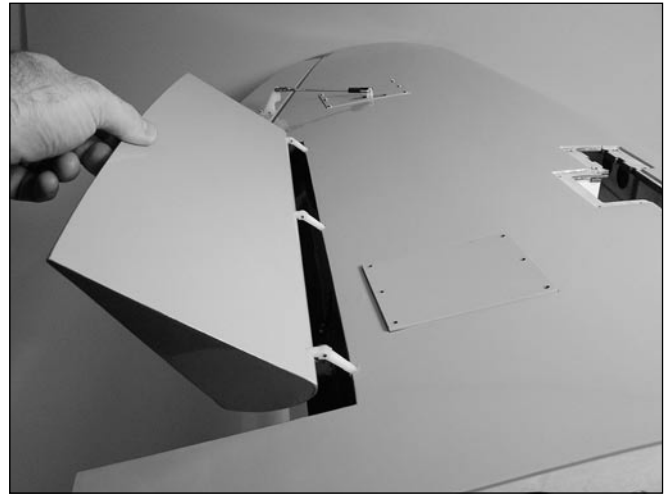

☐ ☐ Step 2
Locate the holes in the wing and flap for the flap hinges. Remove the covering if necessary from each hole. There will be a total of three holes each in the wing and flap.

☐ ☐ Step 3
Install the hinges in the flap and slide the flap into position. Check to make sure the flap aligns with both the aileron and wing trailing edge. If it does not, move the hinges in or out until the flap is in alignment.

☐ ☐ **Step 4**

Use 30-minute epoxy to install the hinges. Apply epoxy to both the holes in the flap and wing using a toothpick. Apply a light coat of epoxy to the hinge. Slide the flap into position, and move it up and down to make sure the hinges are aligned. Use tape around the division between the flap and wing, as well as the flap and aileron, to hold the flap until the epoxy fully cures.

Note: Pacer hinge glue can be used instead of epoxy for gluing the flap hinges.

☐ **Step 5**

Repeat Steps 1 through 4 for the remaining flap.

Section 4 – Flap Servo Installation

Required Parts

- Wing assembly
- Flap servo hatch (2)
- Servo mounting blocks (4)
- Servo hatch screws (#2 x 1/2") (6)
- Large Servo Arm (JRPA212) (1 pkg)
- 6" Servo Lead Extension (JRPA094) (2)
- Flap linkage (2)
- Wire keeper (2)
- 4-40 clevis (2)

Required Tools and Adhesives

- 6-minute epoxy
- Phillips screwdriver
- Drill bit: 1/16"
- String/dental floss
- Felt-tipped pen
- Drill

☐ ☐ Step 1

Install the recommended servo hardware (grommets and eyelets) supplied with the servo.

☐ ☐ Step 2

Locate the servo mounting blocks. Use 6-minute epoxy to glue them in place on the marks on the flap servo hatch. Let the epoxy fully cure before proceeding to the next step.
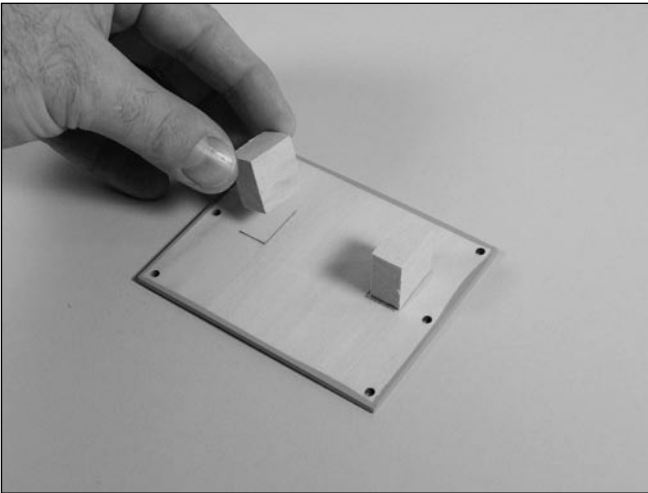
☐ ☐ Step 3

Place the flap servo between the mounting blocks so the output spline will be towards the leading edge of the wing. Center the servo using the radio. Install the servo arm so it is angled forward around 30 degrees. Use a felt-tipped pen to mark the location of the four mounting screws.
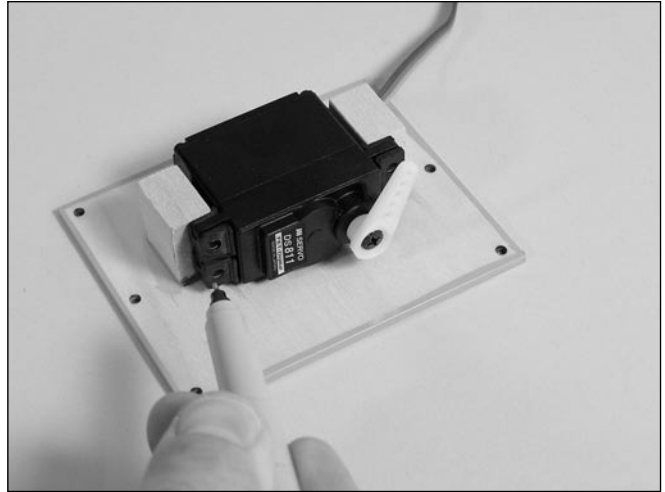
Note: The servo must not touch the hatch in order to isolate it from engine vibration.

☐ ☐ Step 4

Remove the servo and use a 1/16" drill bit to predrill the holes for the servo mounting screws marked in the previous step. Use the screws supplied with the servo to mount it to the servo mounting blocks.

☐ ☐ Step 5

Connect a 6" Servo Lead extension (JRPA094) to the servo lead. Secure the connectors by tying them in a knot using dental floss (as shown) or by using a commercially available connector clamp to prevent the servo leads from becoming disconnected.

Note: It is always a good idea to secure the servo connector and servo extension together to prevent the wires from becoming unplugged inside the wing.
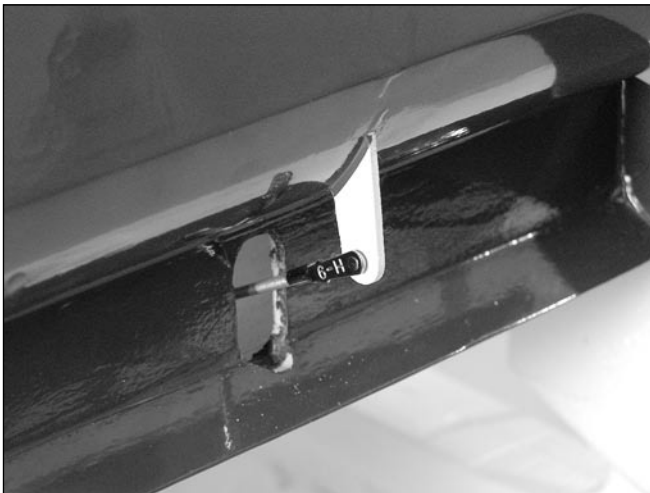
☐ ☐ **Step 6**

Prepare the flap linkage by threading a 4-40 clevis onto the pushrod. Bend the rod at a 90-degree angle $3\frac{3}{8}$" from the end of the rod as shown.
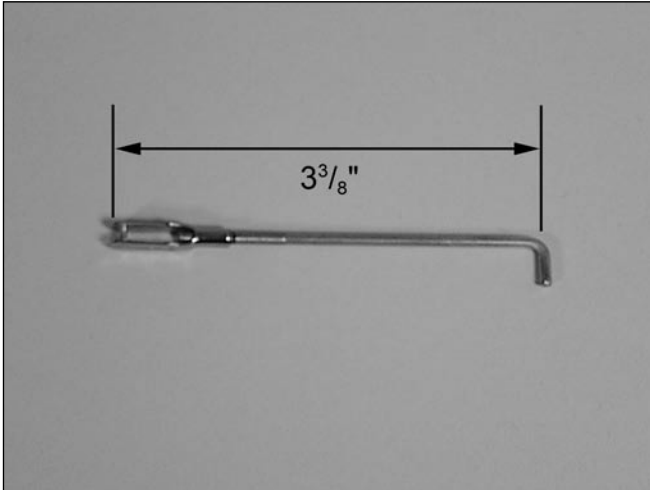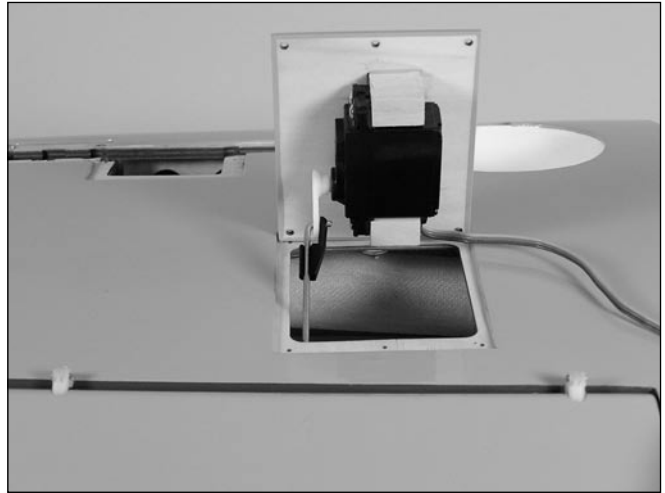

☐ ☐ **Step 7**

Attach the clevis to the flap control horn.


☐ ☐ **Step 8**

Attach the flap linkage to the servo arm using the wire keeper.

Note: The servo arm will need to be drilled out using a 7/64" drill bit to accept the control rod.

☐ ☐ **Step 9**

Tape the aileron servo lead down so it won't interfere with the flap servo operation. Pass the servo lead for the flap and aileron servos outside the wing. Place the hatch into position, and connect the servo to the receiver. With the radio on, adjust the linkage so the flap is in neutral. Once adjusted, secure the hatch using six #2 x 1/2" screws.
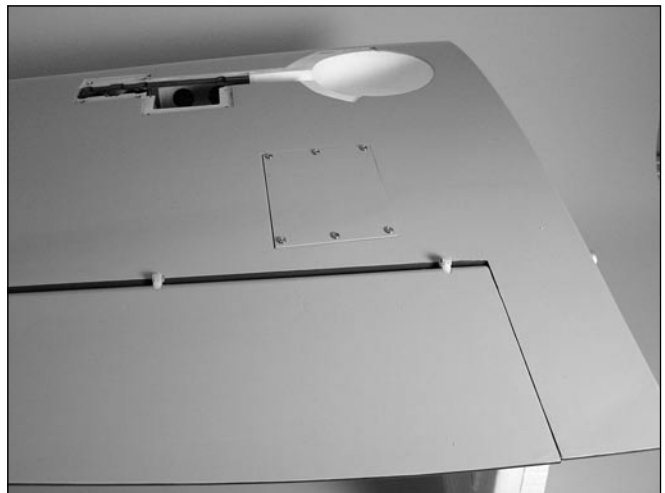
☐ **Step 10**

Repeat Steps 1 through 9 for the remaining flap servo linkage.

Section 5 – Retract Installation

Required Parts

- Right and left wing panels
- 4-40 x 1/4" screw (2)   • Metal clevis (2)
- Clevis keeper (2)   • 4-40 nut (2)
- Retract servo with hardware (2) (JRPS791)
- Easy connector (2)
- Connector back plate (2)
- 1/2" aluminum servo arm (2)

Required Tools and Adhesives

- Threadlocking compound   • Felt-tipped pen
- Drill bit: 1/16", 7/64"   • Drill
- Phillips screwdriver   • 3/32" hex wrench
- Hobby knife   • Side cutters
- 4-40 tap

Note: The P-47 retract system is designed to use low profile retract servos, such as the JRPS791. All adjustments to the retracts are made before the final installation.

☐ ☐ Step 1

Position the retract mechanism over the wing to determine on which side to mount the retract servo. Use a 4-40 tap to tap the appropriate holes in the mounting plate.

☐ ☐ Step 2

Mount the retract servo to the mounting plate using four 4-40 socket head screws. It may be necessary to install the spacer plates depending on the servo selected.
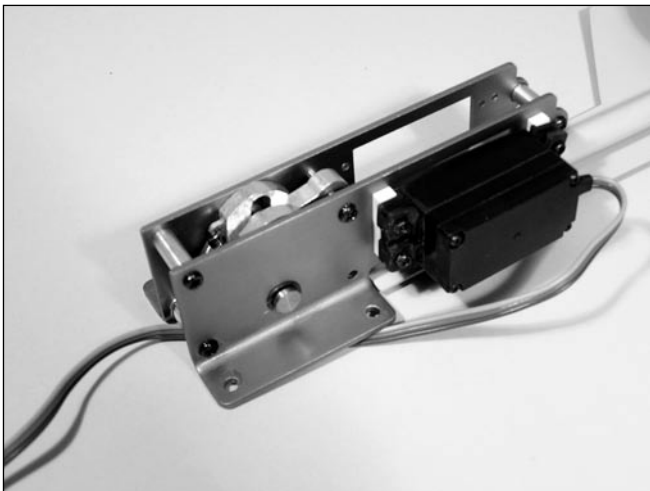
☐ ☐ Step 3

Attach the servo horn to the retract servo. It is positioned so the arm moves from one end of the mechanism to the other.
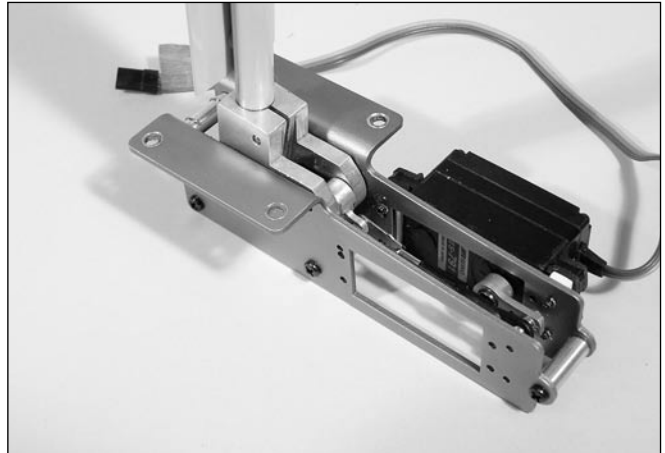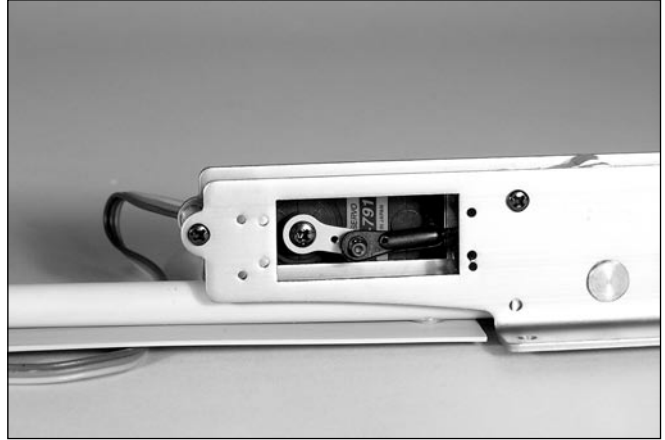
☐ ☐ Step 4

Assemble and install the linkage. Attach the clevis to the retract actuator, and use a 4-40 screw to attach the ball-link to the servo arm.

☐ ☐ **Step 5**

Check that the retract fully locks at both up and down positions without stalling the servo. Adjust the length of the linkage and the position of the linkage at the servo until both up and down locked positions are achieved.
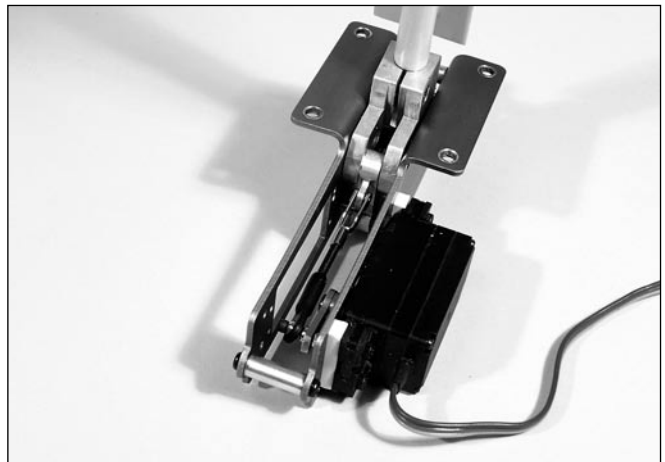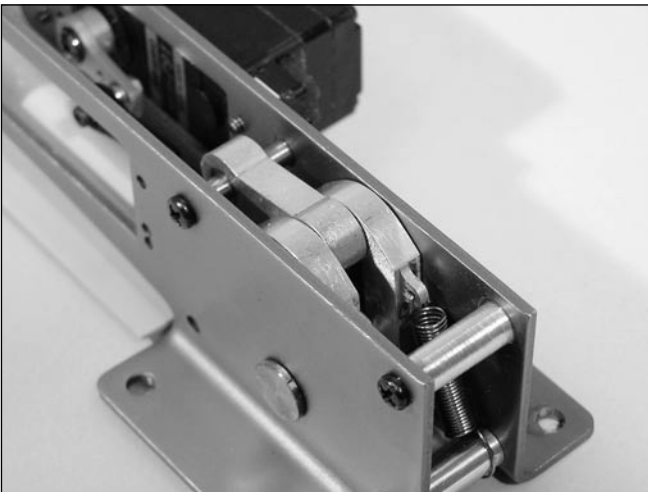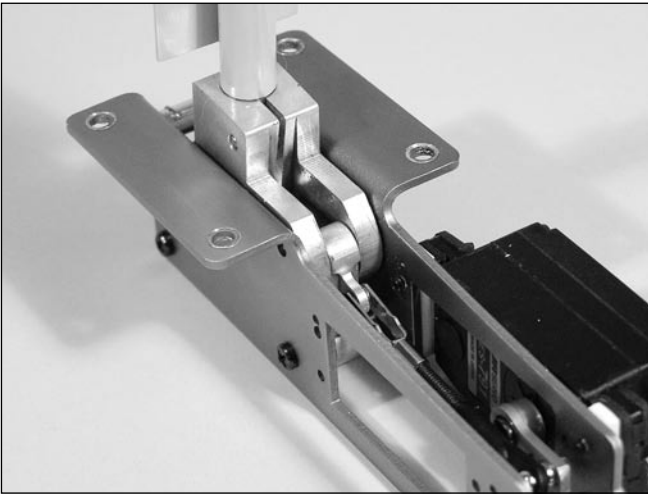

☐ ☐ **Step 6**

Once the retracts are fully adjusted, install them into the wing and secure their position using four 6-32 x 1/2" screws.
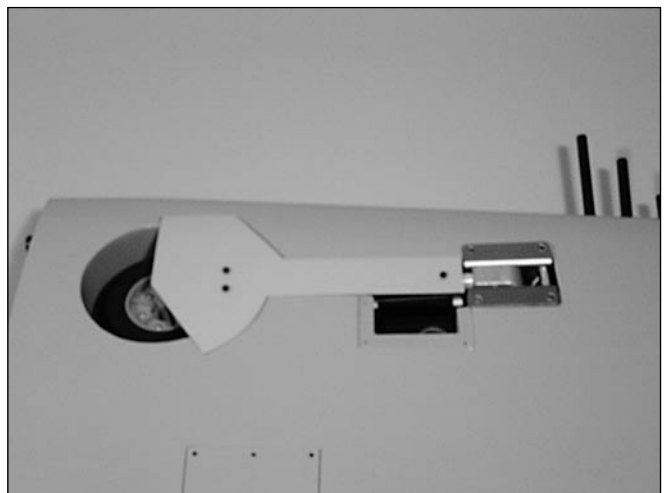
☐ ☐ **Step 7**

Attach the retract servo hatches using four #2 X 1/2" sheet metal screws.

☐ **Step 8**

Repeat Steps 1 through 7 for the remaining retract.

Section 6 – Hinging the Elevators

Required Parts

- Stabilizer
- Elevator (right and left)
- CA hinges (6)

Required Tools and Adhesives

- T-pins
- Paper towels
- Drill bit: 1/16"
- Thin CA
- CA remover/debonder
- Drill

☐ ☐ Step 1

Locate four CA hinges and place a T-pin in the center of the hinge as shown. Drill 1/16" holes at each hinge location on the elevator and stabilizer. Slide each of the three hinges into the elevator so the T-pin is resting against the leading edge of the elevator.

☐ ☐ Step 2

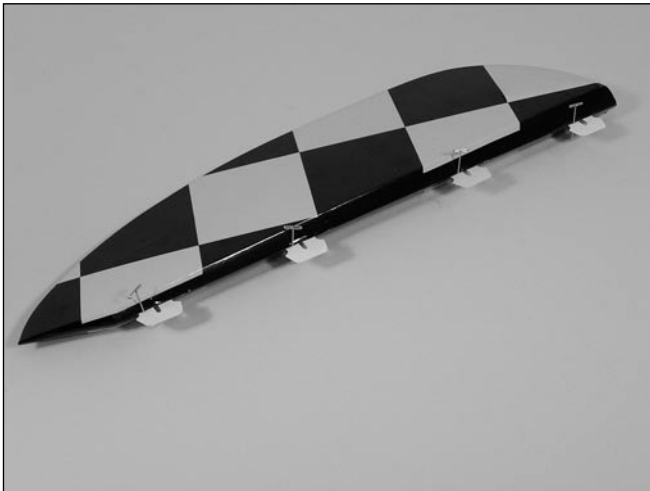Slide the elevator onto the stabilizer until there is only a slight gap between the stabilizer and elevator. Remove the T-pins and snug the elevator against the stabilizer. Position the elevator so the tip aligns with the tip of the stabilizer.

> **Note**: Do not use CA accelerator during the hinging process. The CA must be allowed to soak into the hinge to provide the best bond. Using accelerator will not provide enough time for this process.

☐ ☐ Step 3

Deflect the elevator and apply thin CA to the hinge. Apply enough CA to completely saturate both the top and bottom of the hinge. Use care not to deflect the elevator so it pulls away from the stabilizer. When the hinge is glued in place, there should be no more than a 1/32" hinge gap maintained throughout the length of the elevator.

☐ ☐ Step 4

Use CA remover/debonder and a paper towel to remove any excess CA accumulated on the stabilizer or elevator surface. Allow time for the CA to completely cure before moving to the next step.

☐ ☐ Step 5

Firmly grasp the elevator and stabilizer and gently pull them apart to ensure the hinges are secure and cannot be pulled apart. Use caution when gripping them to avoid crushing the structure.

☐ ☐ Step 6

Work the elevator up and down several times to work in the hinges and check for proper movement.

☐ Step 7

Repeat Steps 1 through 6 for the remaining elevator.

Section 7 – Rudder Installation

Required Parts
- Fuselage assembly
- Rudder
- CA hinges (3)

Required Tools and Adhesives
- T-pins
- Thin CA
- Paper towels
- CA remover/debonder
- Drill bit: 1/16"
- Drill

Note: Hinging the rudder follows the same procedure as hinging the ailerons and elevators, condensed below into just a few steps.

☐ Step 1
Locate three CA hinges and place a T-pin in the center of each hinge. Use a 1/16" drill bit to drill holes into the rudder and fin for each hinge location. Slide the hinges into the rudder.
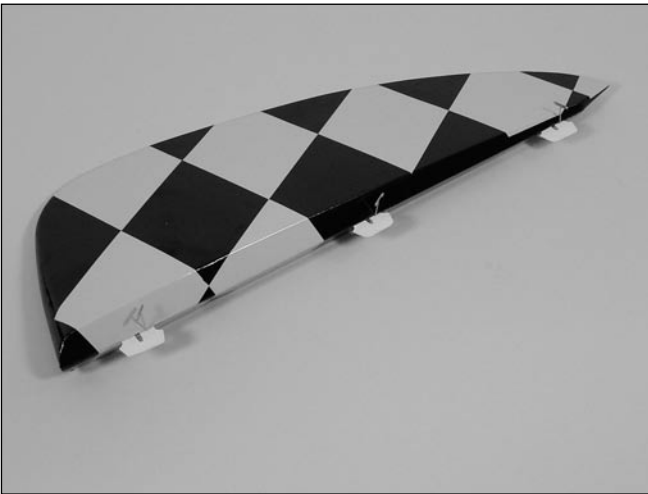
☐ Step 2
Slide the rudder onto the fin. Align the top of the rudder with the top of the fin. Remove the T-pins and use thin CA to glue the hinges into position. Apply CA to both sides of the hinges.

Note: Do not use CA accelerator during the hinging process. The CA must be allowed to soak into the hinge to provide the best bond. Using accelerator will not provide enough time for this process.

☐ Step 3
Clean up any excess CA using CA remover/debonder. Once the CA has fully cured, gently pull on the rudder to ensure the hinges are secure. Flex the rudder a few times to work in the hinges.

Section 8 – Wing and Stabilizer Installation

Required Parts

- Wing panels
- Wing tube
- Tap handle
- Drill
- 1/4-20 x 2" nylon bolt (2)
- 4-40 x 1/2" socket head screw (2)

- Fuselage
- Stabilizer tube
- 4-40 tap
- Drill bit: #43

Required Tools and Adhesives

- Flat screwdriver w/short handle

☐ Step 1

Remove the four 4-40 x1/2" screws securing the hatch to the fuselage. Remove the hatch and store it in a safe place until later.

☐ Step 2

Locate the wing tube and carefully slide it into one wing panel. Slide the wing (with tube) into the wing tube opening in the fuselage. Make sure the wing panel alignment pins slide into the holes provided in the fuselage. Be sure the alignment pins are secure in the wing halves before installing the wings. If they are not, remove the pin and apply a small amount of thin CA into the tube socket and reinstall the alignment pin.

☐ Step 3

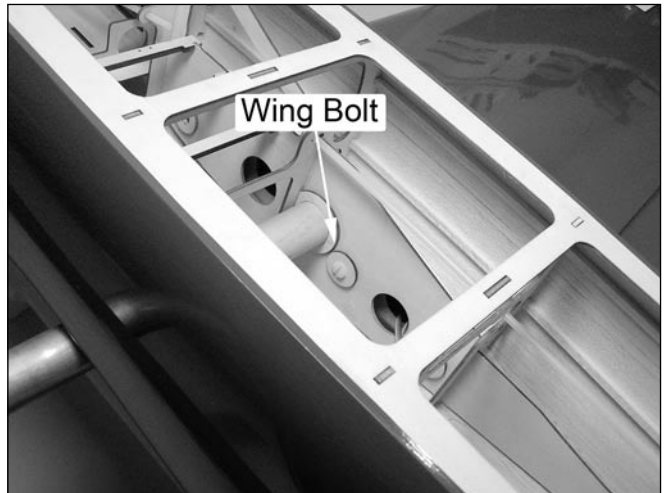Carefully slide the remaining wing panel onto the wing tube that projects from the fuselage. The fit may be tight; use caution when inserting the wing panels onto the wing tube and fuselage.
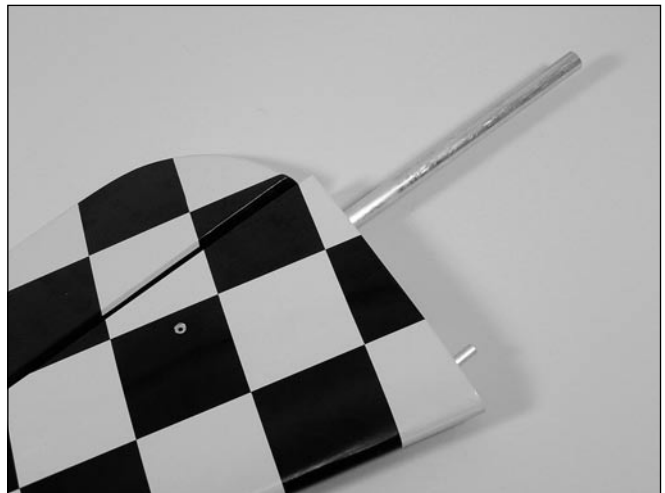
☐ Step 4

Secure the wing panels using the 1/4-20 x 2" nylon wing bolts.

Wing Bolt

☐ Step 5

Insert the stabilizer tube into one of the stabilizer halves. Remove the covering to expose the hole for the stabilizer tube bolt.

☐ Step 6

Drill through the hole into the stabilizer and tap for a 4-40 bolt. Install a 4-40 x 1/2" bolt to secure the tube in the stabilizer.

> **Warning**: Use caution when drilling through the stabilizer tube. Only drill through one wall of the tube.
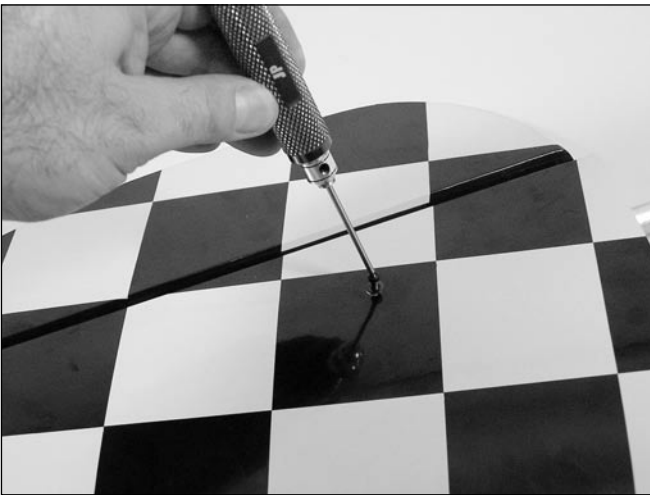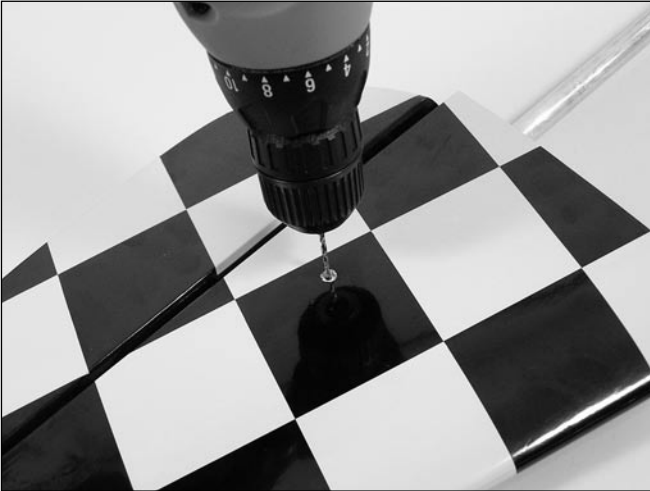
☐ Step 7

Slide the assembly into the fuselage. Slide the remaining stab half onto the tube and drill and tap the location for the 4-40 retaining bolt. Install the bolt to complete the procedure.

> **Hint**: When removing the stabilizer for storage, remove only one bolt, leaving the tube secured in the remaining stabilizer. Trying to install the tube without the aid of an alignment guide can be frustrating.
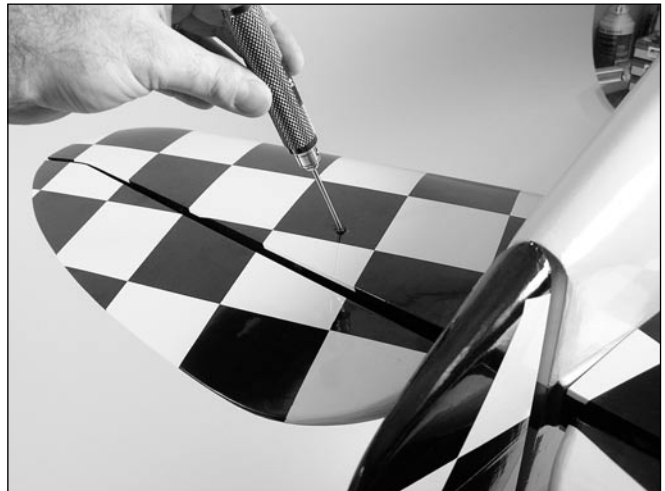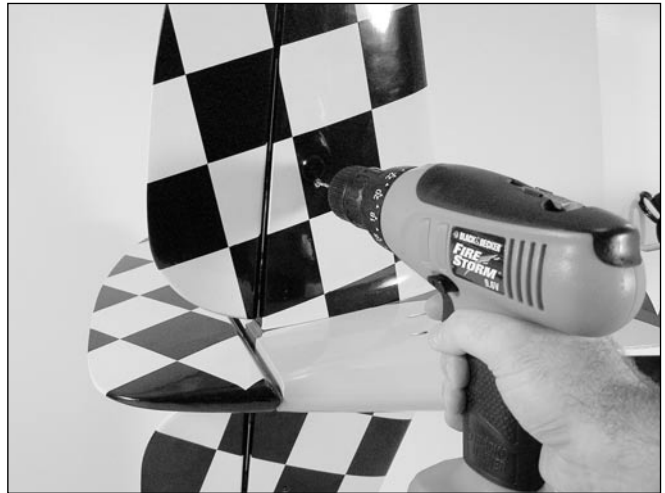
Section 9 – Tail Wheel Installation

Required Parts

- Tail gear wire
- Tail gear mount
- 1/8" wheel collar (3)
- Threadlock
- Brass connector
- 3mm x 8mm screw
- 4-40 x 1/2" socket head screw (6)

- Tail gear steering arm
- Tail gear support
- 3mm set screw (3)
- Tail wheel ($1\,^3/_4$")
- Connector backplate

Required Tools and Adhesives

- Pliers
- Threadlocking compound

- 1.5mm hex wrench

☐ Step 1

Prepare the tail gear assembly by installing the tail gear support, steering arm and tail gear mount onto the tail gear wire. Complete the assembly by installing a 1/8" wheel collar using a 3mm setscrew.
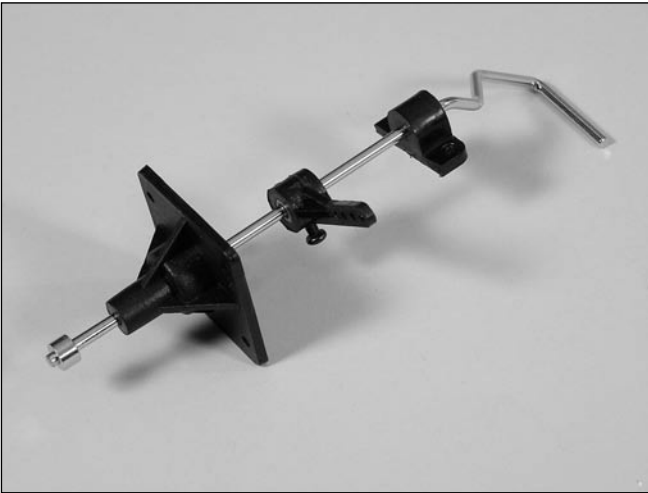
Note: The steering arm faces the same direction as the wheel support wire, and the setscrew on the steering arm is also facing towards the wheel wire. Use threadlock on the setscrew to prevent the screw from loosening during flight.

☐ Step 2

Attach the brass connector to the inside hole of the steering arm using the connector backplate.
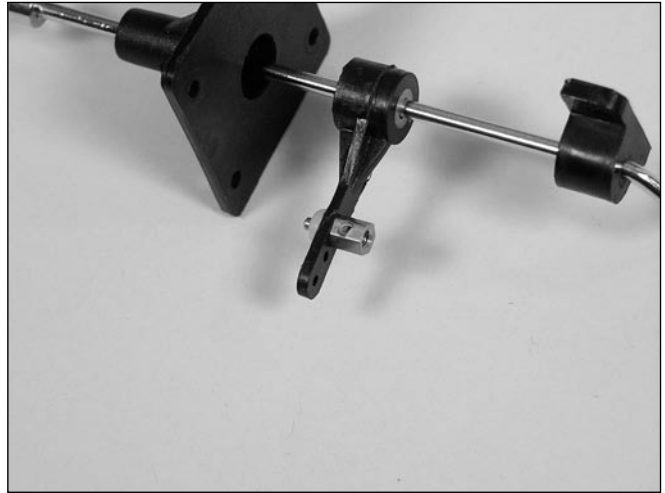
☐ Step 3

Slide the steering arm against the mount. Secure the arm using a 3mm x 8mm screw. Use threadlock on the screw here as well.

☐ Step 4

Position the mount inside the fuselage. The mount will only fit in one direction. Once placed, secure the mount using four 4-40 x 1/2" socket head screws.

☐ Step 5

Secure the tail gear support using two 4-40 x 1/2" socket head screws.

☐ Step 6

Use two 1/8" wheel collars and two 3mm set screws to secure the tail wheel.

Section 10A – Saito™ Engine Installation

Required Parts

- Fuselage
- #8 lock washers (8)
- Brass connector
- 8-32 nylon lock nuts (4)
- Engine mount (2)
- Engine
- Connector backplate
- 8-32 x 1" screws (8)

Required Tools and Adhesives

- Phillips screwdriver
- Adjustable wrench
- Measuring device
- 11/32" socket wrench

Note: There are two engine installations in this instruction manual (Section 10A and Section 10B). Section 10A covers the installation of the Saito™ 1.80. Section 10B covers the installation of the Zenoah® G-26.

Note: The P-47 comes with the blind nuts preinstalled in the firewall. They are located for the installation of the Saito 1.80-size four-strokes. If you plan on using another engine, you may need to remove the blind nuts and drill new holes in the firewall for your particular engine.

☐ Step 1

Locate the engine mount and the associated hardware. Attach the mount to the firewall using four 8-32 x 1" screws and four #8 lock washers.
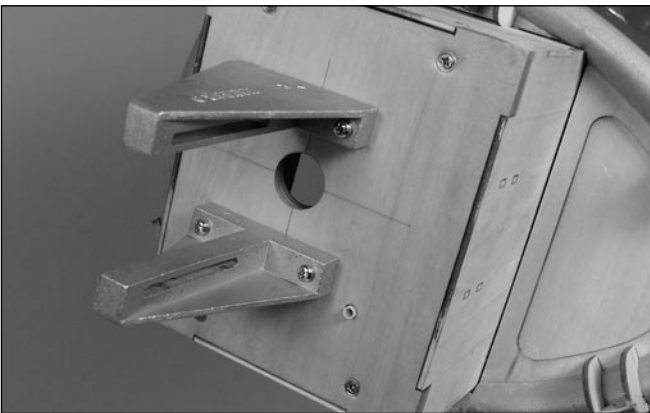
☐ Step 2

Temporarily install the engine to the rails using four 8-32 bolts, four #8 lock washers and four lock nuts. Leave the bolts loose enough to allow the engine to slide on the engine mount.

Note: The engine mount is embossed with the correct orientation for the mounts.

☐ Step 3

Position the engine so the distance from the firewall to the drive washer is $5\frac{1}{2}$". Tighten the screws holding the engine to the mount. An 11/32" socket wrench will make this task a lot easier.
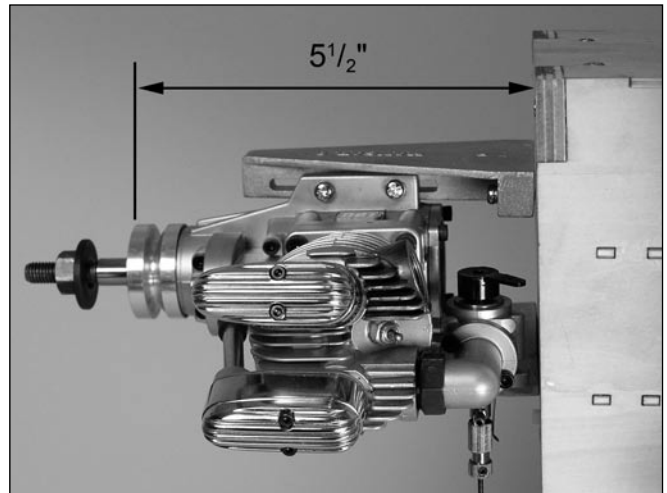
☐ Step 4

Attach a brass connector to the throttle arm using the connector backplane. Assemble the throttle pushrod using a 4-40 clevis and $12\frac{3}{4}$" 4-40 pushrod. Slide the pushrod through the installed tube from inside the fuselage and through the connector.
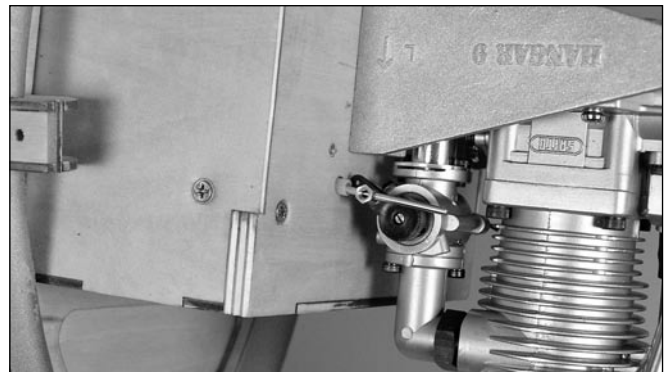
Note: The carburetor will have to have the throttle arm facing away from the engine centerline and towards the engine mount.

Note: Do not install the screw in the brass connector at this time.

Section 10B – Zenoah® Engine Installation

Required Parts

- Fuselage
- 8-32 x 1$\frac{1}{4}$" screws (4)
- #8 washers (4)
- Associated engine mount
- Engine
- Felt-tipped pen

Required Tools and Adhesives

- Phillips screwdriver
- Socket Wrench: 11/32"
- Drill
- Adjustable wrench
- Measuring device
- Drill bit: 5/32"

☐ Step 1

Use a square to accurately mark the centerlines on the engine adapter. Hold the adapter on the firewall so the centerlines are aligned. Mark the locations for the bolts using a felt-tipped pen.
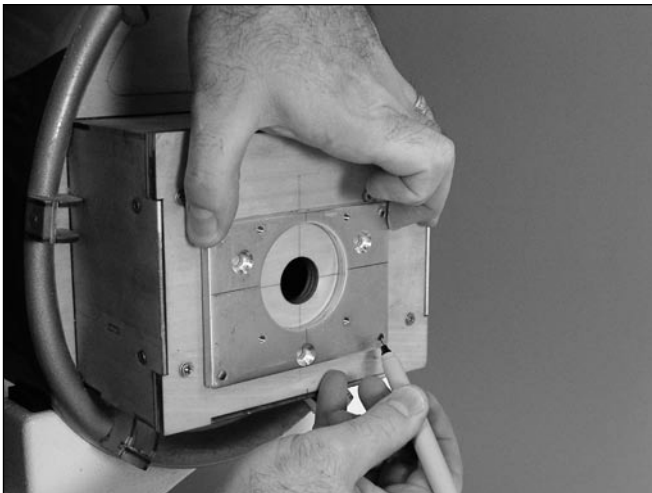
☐ Step 2

Use a 5/32" drill bit to drill the locations marked in the previous step.

☐ Step 3

Attach the backplate to the engine. Attach the engine and backplate to the firewall using four 8-32 x 1" screws, #8 washers and lock nuts.
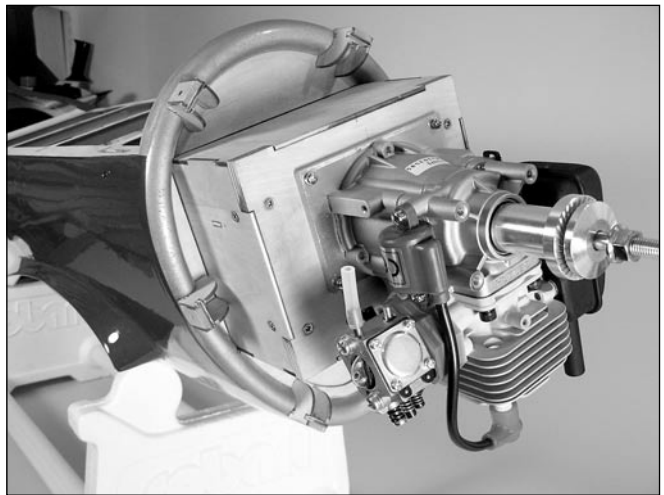
☐ Step 4

Measure and mark the location for the throttle pushrod. Drill a 5/32" hole at the location. Remove the original pushrod tube from the firewall and install it in the new location. Assemble the throttle pushrod using a 4-40 clevis and 12$\frac{3}{4}$" 4-40 pushrod. Slide the pushrod through the installed tube and attach the clevis to the throttle arm.

Section 11 – Fuel Tank Installation

Required Parts

- Assembled Fuel Tank
- Fuselage

Required Tools and Adhesives

- Hobby knife
- Phillips screwdriver

☐ Step 1

Attach the two fuel lines to the tank.
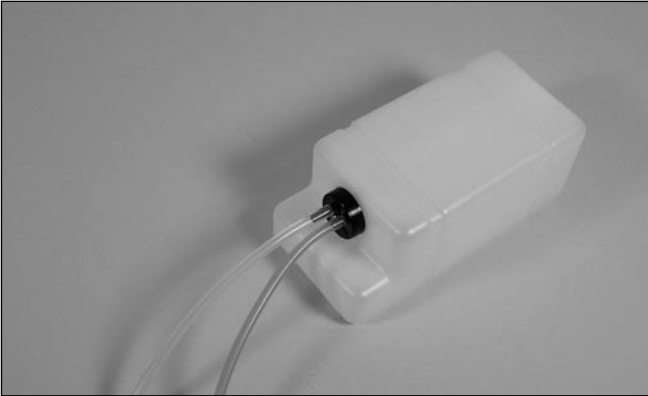
> **Important**: Be sure to differentiate between the vent and fuel pickup tube. Once the tank is mounted inside the fuselage, it will be difficult to tell the tubes apart.

☐ Step 2

Position the tank inside the fuselage. The tank rests securely in the mounts inside the fuselage.

☐ Step 3

Route the fuel lines through the firewall. Attach the appropriate lines to the carburetor and muffler.
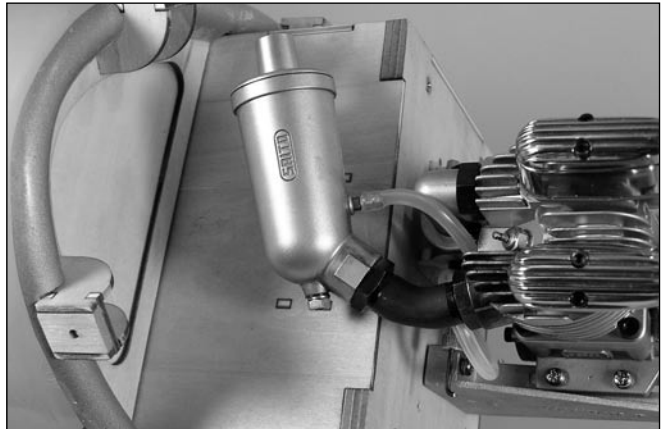
> **Note**: If using the G-26, you will have to drill two 1/4" holes in the firewall for the fuel lines to pass through.

Section 12 – Radio Installation

Required Parts

- Fuselage assembly
- Receiver
- Switch harness
- Servos (4) (not included)
- 4-40 x 1/2" socket head screw (4)
- 1/4" foam
- Receiver battery

Required Tools and Adhesives

- Thin CA
- Hobby knife

☐ Step 1

Install the recommended servo hardware (grommets and eyelets) supplied with your radio system onto four servos (elevator (2), rudder and throttle). Install the servos as shown. Secure the servos using the screws provided with the servos.
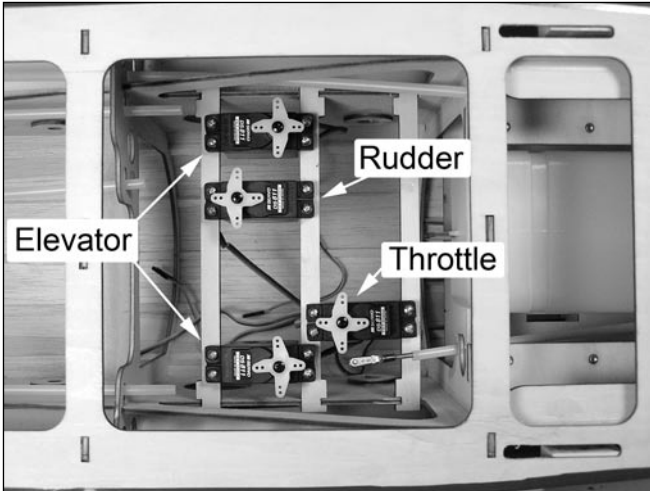
☐ Step 2

Mount the radio switch in the side of the fuselage. Glue small scraps of plywood to the balsa sheeting inside the fuselage to give the screws something to bite into.

☐ Step 3

Wrap the receiver and receiver battery in 1/4" foam. Attach the receiver and battery to the radio tray using hook and loop material.
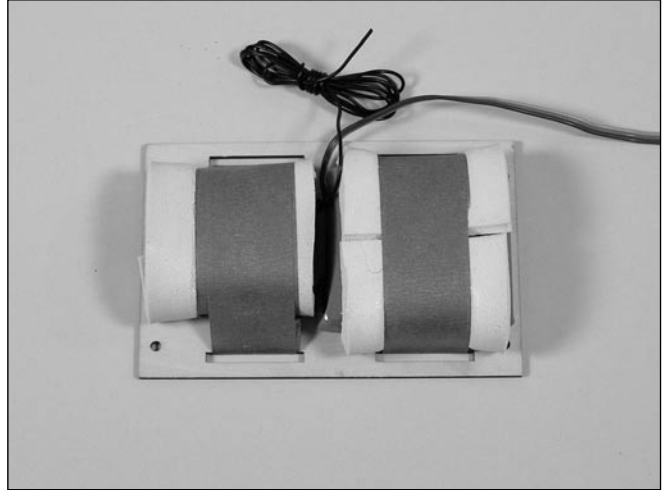
☐ Step 4

Plug in the servos and extensions for the aileron and flaps. Place a 1/2" piece of foam (two 1/4" pieces) on top of the fuel tank. Secure the radio tray into position using four 4-40 x 1/2" socket head screws.
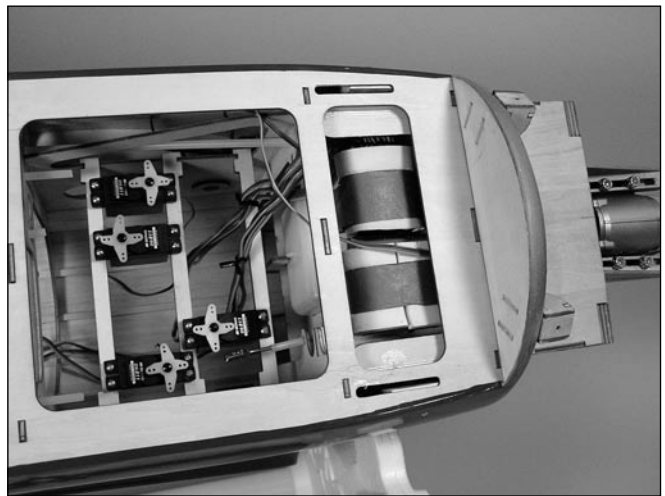
☐ Step 5

Insert the antenna into the antenna tube provided in the fuselage. Make sure the antenna wire is fully extended down this tube.

Section 13 – Linkage Installation

Required Parts

- Fuselage assembly
- Nylon clevis (3)
- Nylon wire keepers (4)
- #2 nuts (6)
- #2 x 1$\frac{5}{8}$" threaded rods (3)
- 3mm x 6mm screw (2)
- Pushrod wires (3)
- Clevis keeper (3)
- Control horns (3)
- #2 x 1/2" screw (12)
- Tail wheel hatch cover

Required Tools and Adhesives

- Drill
- Hobby knife
- Threadlocking compound
- Drill bit: 1/16", 1/8"
- Thin CA
- Felt-tipped pen

☐ Step 1

Slide the rudder and elevator pushrod wires into the tube in the fuselage. Make sure the threaded portion of the wires is on the outside of the plane near the tail group. The rudder pushrod will pass through the brass connector on the tail wheel steering arm.

☐ Step 2

Thread the clevis onto the wire a minimum of 10 turns. Repeat this step for both elevator linkages and the rudder linkage.

☐ ☐ ☐ Step 3

Remove the back plate from a control horn using side cutters or a sharp hobby knife. Use a 1/8" drill bit to drill out the mounting holes in the control horn.

☐ ☐ ☐ Step 4

Attach the clevis to the control horn. Position the control horn on the elevator so the control rod is straight, and the holes in the control horn aligns with the hinge line of the elevator. Mark the position for the mounting holes using a felt-tipped pen.

☐ ☐ ☐ Step 5

Drill three 1/16" holes at the locations marked in the previous step. The holes only need to be 7/16" deep: don't drill through the top of the elevator.

☐ ☐ ☐ **Step 6**

Install one of the #2 x 1/2" screws in a hole drilled, and then remove it. Place 2–3 drops of thin CA into the hole to harden the wood. This will eliminate the potential of the screw pulling out of the wood. Repeat this for each of the three holes.

☐ ☐ ☐ **Step 7**

Attach the control horn using three #2 x 1/2" screws.

☐ ☐ ☐ **Step 8**

Center the elevator servo electronically using the radio system. Install a servo arm onto one of the elevator servos. Physically place the elevator control surface in neutral. Mark the pushrod where it crosses the holes in the servo arm.
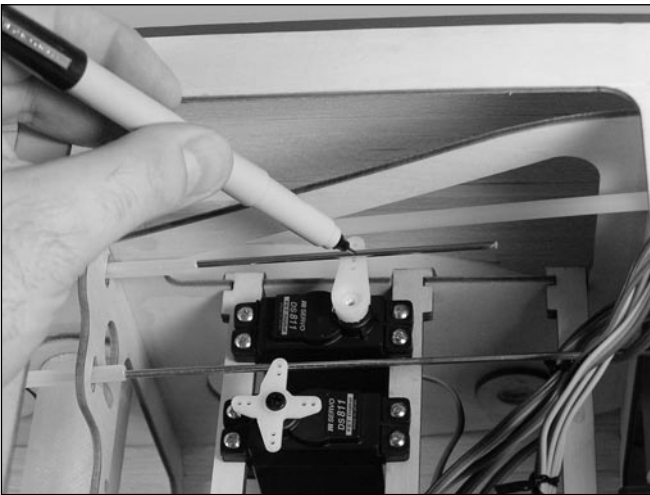
☐ ☐ ☐ **Step 9**

Bend the wire 90 degrees at the mark made in the previous step. Cut the wire 1/2" above the bend.

☐ ☐ ☐ **Step 10**

Slide the wire through the outer hole in the elevator servo arm. Secure the wire using a nylon wire keeper.

> **Note**: The servo arm will need to be drilled out using a 7/64" drill bit to accept the control rod.

☐ ☐ **Step 11**

Repeat Steps 3 through 10 for the remaining elevator half and rudder.
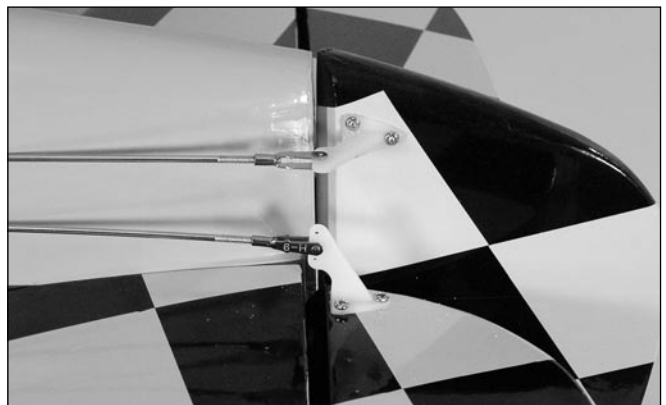
Section 13 – Linkage Installation

☐ Step 12

Center the tail wheel. Use a 3mm x 6mm screw to secure the brass connector to the rudder wire.

☐ Step 13

Attach the tail wheel cover to the fuselage using three #2 x 1/2" screws.

☐ Step 14

Center the throttle stick and trim with both the receiver and transmitter on. Install the throttle servo arm in the neutral position as shown. Attach the clevis to the throttle servo arm.

☐ Step 15

Move the throttle stick and trim to low. Check to make sure the carburetor will move to the low position when operating the servo. Install a 3mm x 6mm screw to secure the easy connector to the throttle pushrod. Check the movement of the throttle to verify there is no binding at either low or high throttle. If there is, make the necessary adjustment to eliminate any binding. Install the throttle servo arm screw when complete.
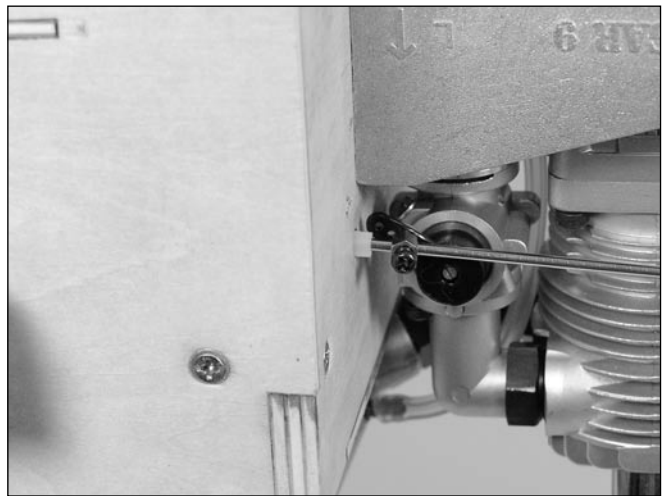
Section 14 – Final Assembly

Required Parts

- Fuselage assembly
- Cowl
- Decal sheet
- Painted canopy
- 4-40 x 1/2" socket head screws (10)
- #4 washers (6)
- Bomb assembly (2)
- Bomb pylon (2)
- Drop tank
- Drop tank screw (2)
- Drop tank fairing

Required Tools and Adhesives

- Felt-tipped pen
- Hobby knife
- Canopy scissors
- Shoe Goo
- 6-minute epoxy
- Canopy glue (RC560)
- Paper towel
- Spray bottle
- 2–3 drops dish soap
- 3/32" ball wrench
- Drill
- Drill bit: 5/64"
- Phillips screwdriver
- Moto-tool w/cut-off wheel and sanding drum

☐ Step 1

Mount the cowl using six 4-40 x 1/2" socket head screws and six #4 washers. Use small pieces of fuel tubing on the screws to keep them from vibrating loose. Make the appropriate cutouts in the cowl for the muffler exhaust and engine cooling.

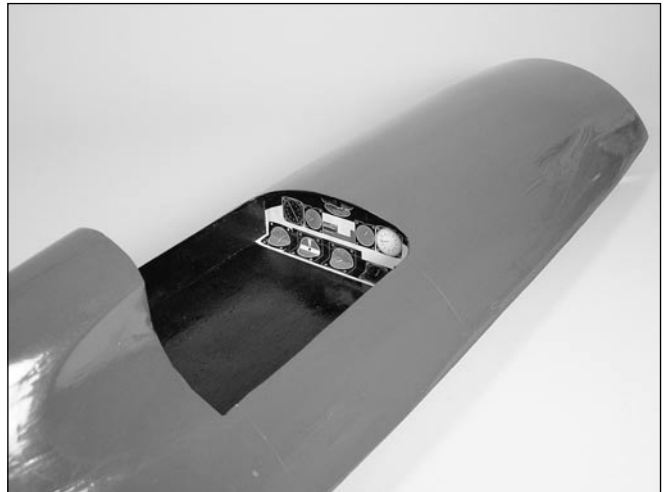## ☐ Step 2

Install the propeller and spinner.

Note: The scale propeller is shown in the photo. Do not attempt to fly the aircraft with this propeller as it is for display only.

☐ Step 3

Cut out the instrument panel decal and apply.

Section 14 – Final Assembly

☐ **Step 4**

Glue the canopy to the fuselage using RC560 canopy glue. Tape the canopy in place with masking tape and allow the glue to cure overnight.
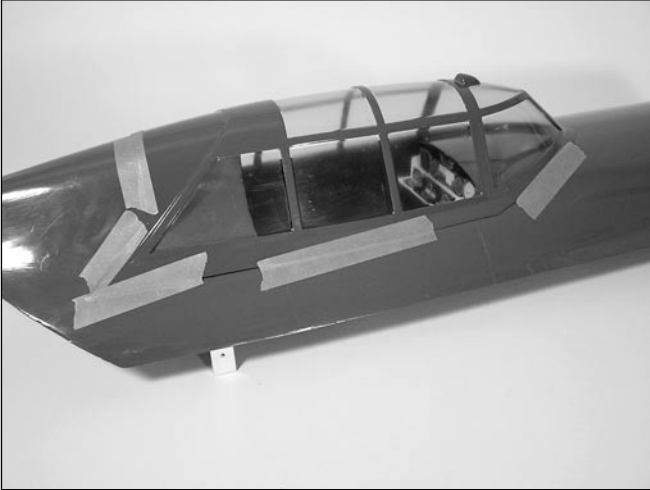
☐ **Step 5**

Locate the decal sheet and cut out the decals for the P-47 using a sharp hobby knife and scissors.

☐ **Step 6**

Use the photos on the box to locate the decals.
Use a spray bottle with 2–3 drops of dish soap added to the water and spray both the fuselage and sticky side of the decal. This will allow you to reposition the decal if necessary. Once satisfied with the position, use a paper towel to squeegee out the water. Allow the decal to dry overnight.

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

☐ **Step 7**

Use Shoo Goo to glue the scale engine inside the cowling.

☐ **Step 8**

Locate the positions for the pylon mounting screws on the bottom of the wing. This is done by gently pressing onthe covering with your indix finger in the areas shown in the photo.
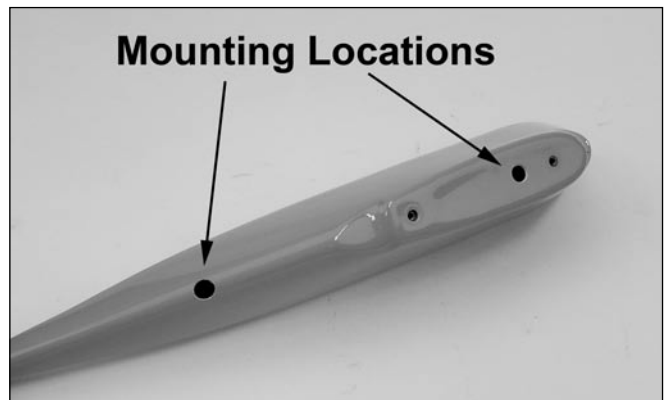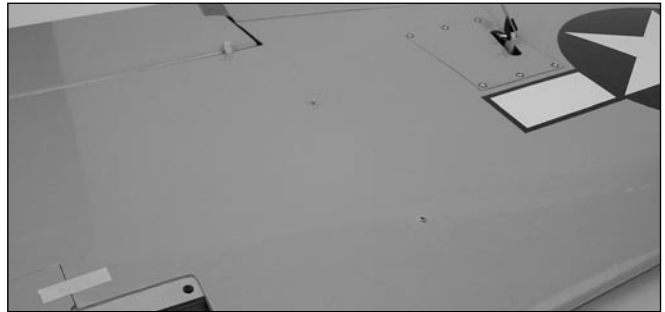
☐ **Step 9**

Place the 4-40 screws into the pylon. Use fuel tubing to prevent the screws from falling out when removing the pylon in the future.

☐ Step 10

Attach the bomb/pylon assembly to the wing using the two screws.
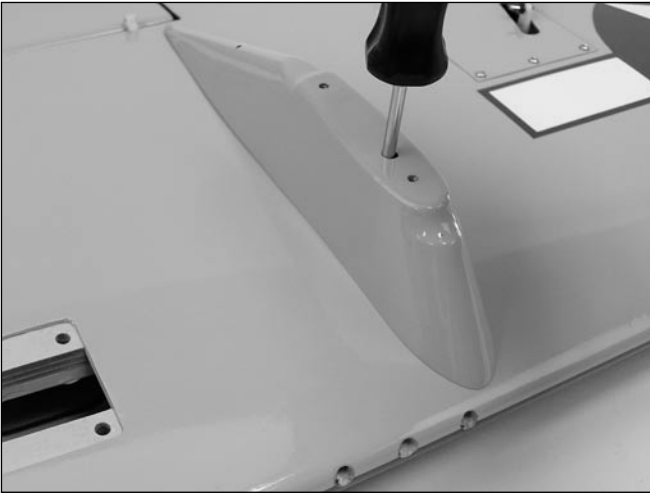
☐ Step 11

lide the two 4-40 x 1/2" socket head screws into the bomb through the guide tubes. Use fuel tubing on the outside of the bomb to keep the screws from falling out and to act as a washer between the bomb and pylon.

☐ Step 12

Attach the bomb to the wing using the screws.
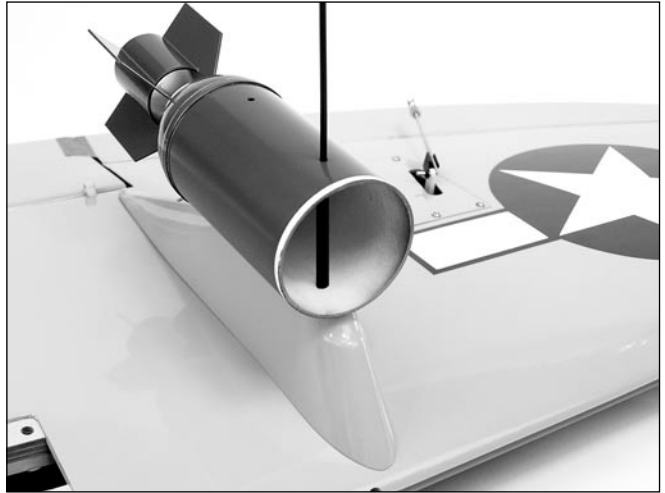
☐ Step 13

Glue the cap on the end of the bomb.
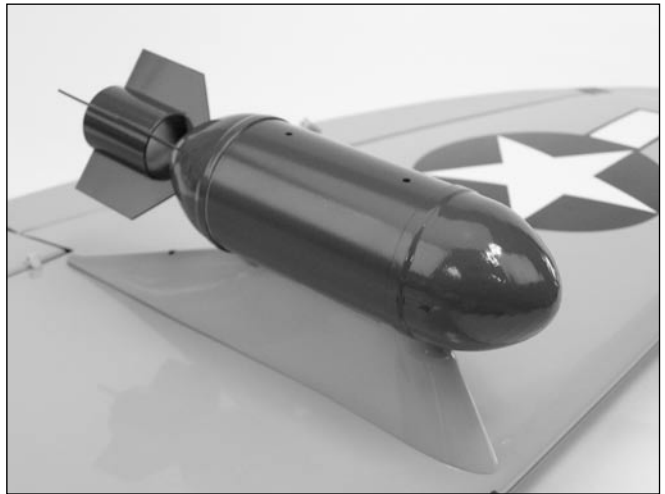
Section 14 – Final Assembly

☐ Step 14

Locate the mounting holes for the drop tank and remove the covering. The drop tank is positioned as shown.
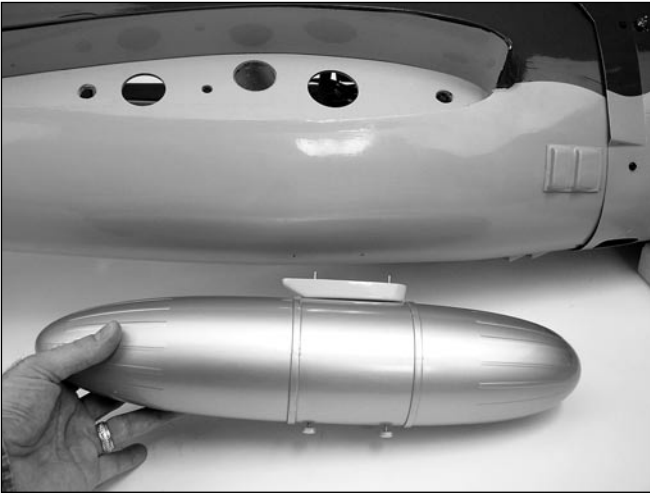
☐ Step 15

Secure the tank to the fuselage using the two drop tank screws and drop tank fairing.
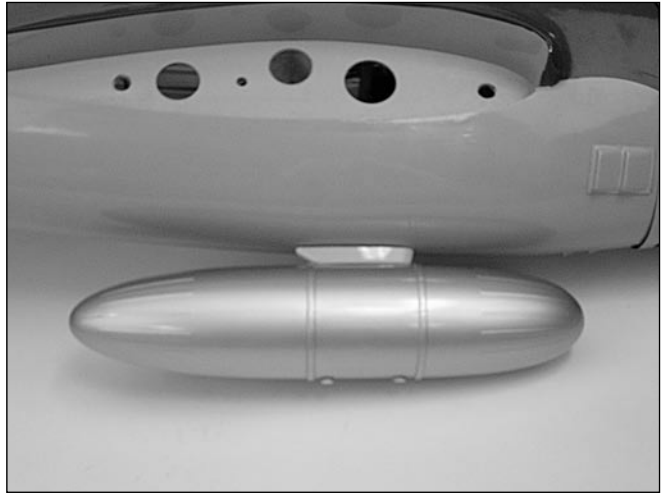
Control Throws

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

Aileron	High Rate	Low Rate
	7/8" (22°) Up	5/8" (16°) Up
	7/8" (22°) Down	5/8" (16°) Down

Elevator	High Rate	Low Rate
	$1\frac{1}{8}$" (18°) Up	1" (15°) Up
	$1\frac{1}{8}$" (18°) Down	1" (15°) Down

Rudder	High Rate	Low Rate
	$1\frac{1}{2}$" (20°) Right	Same as High
	$1\frac{1}{2}$" (20°) Left	Same as High

Flaps	High Rate	Low Rate
	$3\frac{3}{4}$" (40°) Down	2" (20°) Down

Note: Control throws are measured at the widest part of the elevator, rudder, aileron, and flap unless noted otherwise.

Adjusting the Engine

☐ Step 1

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

☐ Step 2

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

☐ Step 3

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

Recommended CG

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

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for the P-47 is $6\frac{1}{8}$" behind the leading edge of the wing against the fuselage. Make sure the gear is retracted when checking the CG, as the CG will change depending on the gear position. If necessary, move the battery pack or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby shop and work well for this purpose.

Preflight at the Field

Range Test Your Radio

☐ Step 1

Before going to the field, be sure that your batteries are fully charged, per the instructions included with your radio. Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases the radio should be charged the night before going out flying.

☐ Step 2

Before each flying session, be sure to range check your radio. See your radio manual for the recommended range and instructions for your radio system. Each radio manufacturer specifies different procedures for their radio systems. If using a gasoline engine, check the range first with the engine not running and note the distance. Next, start the engine. With the model securely anchored, check the range again. The range test should not be significantly affected. If it is, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

☐ Step 3

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

☐ Step 4

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

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

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GENERAL

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

2) I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

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

4) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules.

5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. (This does not apply to models while being flown indoors.)

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

7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), or ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. (A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.)

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

9) Children under 6 years old are only allowed on the flight line as a pilot or while receiving flight instruction.

RADIO CONTROL

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

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

3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.

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

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5) Flying sites separated by three miles or more are considered safe from site-to site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement, which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters. Documents of agreement and reports may exist between (1) two or more AMA Chartered Clubs, (2) AMA clubs and individual AMA members not associated with AMA Clubs, or (3) two or more individual AMA members.

6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.

7) At air shows or model flying demonstrations, a single straight line must be established, one side of which is for flying, with the other side for spectators.

8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.

9) Under no circumstances may a pilot or other person touch a powered model in flight.

Organized RC Racing Event

10) An RC racing event, whether or not an AMA Rule Book event, is one in which model aircraft compete in flight over a prescribed course with the objective of finishing the course faster to determine the winner.

A. In every organized racing event in which contestants, callers and officials are on the course:

1. All officials, callers and contestants must properly wear helmets, which are OSHA, DOT, ANSI, SNELL or NOCSAE approved or comparable standard while on the racecourse.

2. All officials will be off the course except for the starter and their assistant.

3."On the course" is defined to mean any area beyond the pilot/staging area where actual flying takes place.

B. I will not fly my model aircraft in any organized racing event which does not comply with paragraph A above or which allows models over 20 pounds unless that competition event is AMA sanctioned.

C. Distance from the pylon to the nearest spectator (line) will be in accordance with the current Competition Regulations under the RC Pylon Racing section for the specific event pending two or three pylon course layout.

11) RC night flying is limited to low-performance models (less than 100 mph). The models must be equipped with a lighting system that clearly defines the aircraft's attitude at all times.

HANGAR 9

HORIZON
HOBBY