

P-40B Warhawk 50 ARF

Assembly Manual



HANGAR 9®

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, Inc. For up-to-date product literature, visit <http://www.horizonhobby.com> and click on the support tab for this product.

Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.



WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product and NOT a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not attempt disassembly, use with incompatible components or augment product in any way without the approval of Horizon Hobby, Inc. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

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Introduction

The Hangar 9 P-40B Warhawks 50 ARF is a unique take on this warbird icon. It's modeled after the Warhawks flown by two U.S. Army Air Corps pilots in the attack on Pearl Harbor. Along with its authentic trim scheme and decals, it includes an impressive list of scale details usually only available on more expensive kits. Its also been designed with a low parts count so assembly is simple. You even have the choice of equipping it with glow or electric power; hardware for either option is included.

In the air, the P-40B Warhawk 50 possesses all the best characteristics of a spirited sport plane. Whether you're flying aerobatics or strafing the runway, its smooth, precise control response makes you feel like you're flying on rails.

Product Support

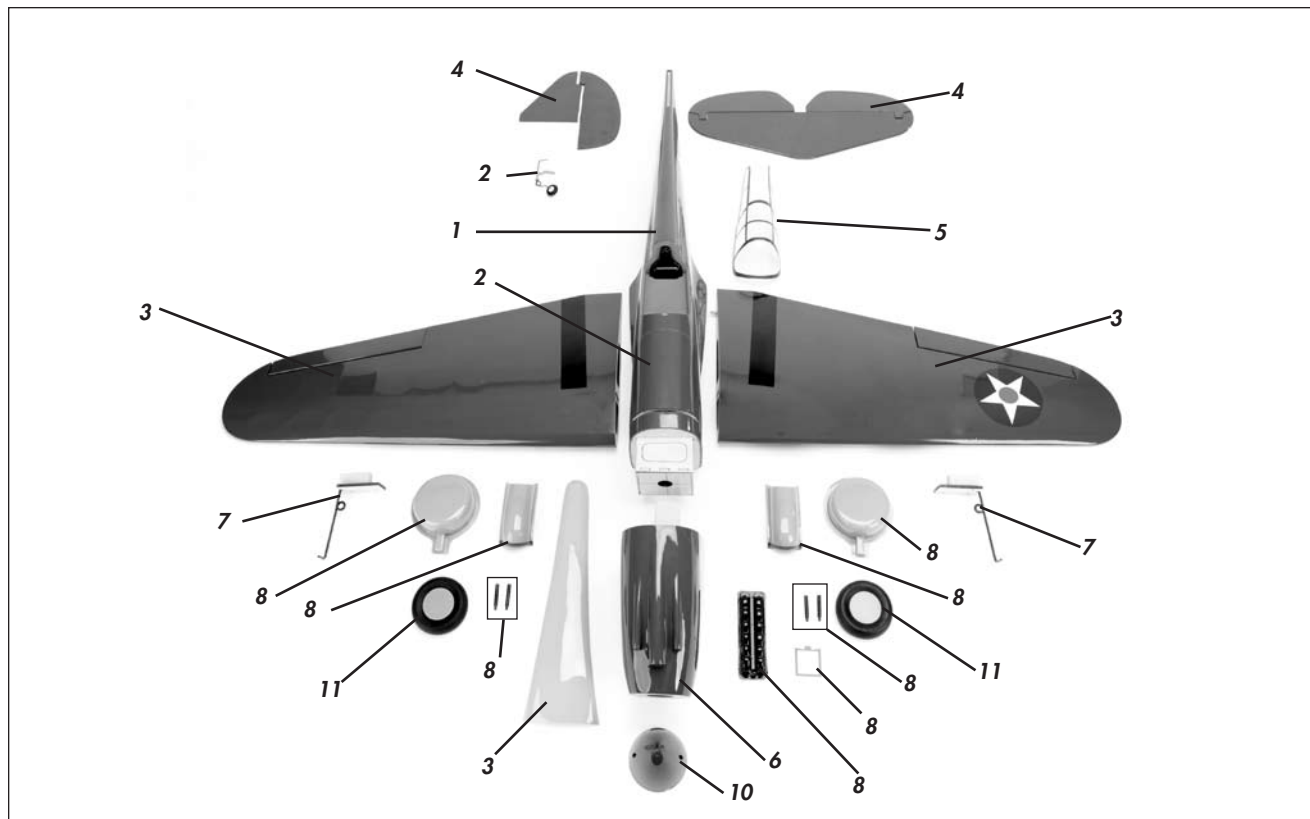
For technical assistance with this product, please contact the appropriate Horizon Product Support office. This information is located in the back of this manual.

Specifications

Wingspan	55.5 in (141cm)
Wing Area	530 sq in (34.2 sq dm)
Fuselage Length	47.8 in (121cm)
Weight Range	6.75 lb–8.00 lb (3.10–3.60 kg)
Engine/Motor Size	2-stroke .46-.55 4-stroke .72-.82 Electric: Power 52
Radio	4+ channel with 5 servos (4 servos for EP)

Included Parts Listing

QUANTITY USAGE			WING			PUSHRODS		
FUSELAGE								
3mm short plywood plate	1	Fuel tank servo and receiver tray	M4 x 45 socket head cap screw	2	Wing attachment	2mm x 655mm	1	Rudder
3mm long plywood plate	1	EP battery tray	M4 flat washer	2	Wing attachment	2mm x 645mm	1	Elevator
3mm plywood support	1	Fuel tank top support	2mm plywood screw doubler	1	Wing attachment	2mm x 57mm	2	Aileron
62mm wood standoff box	1	EP Motor mounts	M4 blind nut	2	Wing attachment	2mm x 270mm	1	Throttle
Engine template	3	EP, glow, and 4-stroke gas	Landing gear plastic cover	2		200mm pushrod housing	1	Throttle
Nylon engine mount	2		Plastic wheel well	2		MISCELLANEOUS		
6-32 x 3/4 socket head cap screw	4	EP standoff and engine mount to firewall	Retract wheel well template	1	Main wheel placement	Spinner with hardware and adapter	1	
#6 flat washer	4	Engine/EP stand off to firewall	6mm x 30mm wood dowel	2	Wing attachment	3mm wire joiner	1	Elevator joiner
6-32 blind nuts	4	Engine/EP mount to the firewall	17mm x 19mm x 10mm hardwood block	4	Aileron servo mount	Black seat	1	
4-40 x 1-inch socket head cap screw	4	Engine to engine mounts	M2 x 10 washer head screw	8	Aileron servo hatch	3 1/2-inch scale wheel	2	Main wheels
4-40 locknuts	4	Engine to engine mount	M1.8 x 10 wood screw	6	Control horn attachment	Black plastic exhaust	2	
#4 flat washer	4	Engine mount	M1.8 x 10 wood screw	12	Landing gear blisters	Plastic sheet with green framing	1	Scale bullet proof glass
Assembled tank, 260cc	1	Glow fuel tank	6mm x 40mm painted plastic tube	4	Machine guns			
Pushrod connector with hardware	1	Throttle	6mm x 155mm plywood	1	Wing joiner			
M3 x 10 black washer head screw	4	Cowl	NYLON PARTS					
M3 x 12 socket head screw	1	Servo tray	Control horn	4	Aileron (2) elevator (1) rudder (1)			
M3 flat washer	1	Servo tray	1.5 x 14mm control horn screw	6	Rudder and elevator			
M2.5 x 8 socket head wood screw	2	Fuel tank support former	Safety tubing	1				
M1.8 x 10 wood screw	2	Tail wheel bracket to fuselage	2mm nylon clevis	5	Aileron (2) elevator (1) rudder (1) throttle (1)			
3mm plywood adapter plate	1	Ignition switch	M1.5 x 14 screw	6	Control horn attachment: rudder (3), elevator (3)			
4mm x 20mm painted plastic tube	2	Cowl guns	LANDING GEAR					
Hook and loop straps	2	Receiver and battery	Fixed landing gear without wheels	2	Left and right			
9mm x 50mm plywood block	1	EP battery spacer	4mm wheel collars with setscrew	4	Main wheel			
Plastic sheet with green framing	1	Scale bullet proof glass	1.5mm hex wrench	1				
20mm x 20mm plywood plate	1	Fuel line holder	2.0mm hex wrench	1				
62mm x 103mm plywood tray	1	Optional battery tray	M3 x 20 wood screw	8	Fixed and retract landing gear			
			2mm assembled wire with 1-inch wheel	1				
			Hardwood angled spacer	4	Small (2), Large (2)			



Contents of Kit and Parts Listing

Replacement Parts

- | | |
|---------------|------------------------------|
| 1. HAN259501 | Fuselage with Hatch |
| 2. HAN259502 | Fuselage Hatch |
| 3. HAN259503 | Complete Wing Assembly |
| 4. HAN259504 | Tail Set |
| 5. HAN259505 | Canopy |
| 6. HAN259506 | Cowl |
| 7. HAN259507 | Fixed Landing Gear Struts |
| 8. HAN259508 | Scale Detail Parts |
| 9. HAN259509 | Tail Wheel Assembly |
| 10. HAN259515 | Spinner, 86mm |
| 11. HAN259516 | Wheel Set, 3 1/2-inch (89mm) |

Items Not Shown

- | | |
|-----------|---------------------------------|
| HAN259510 | Pushrod Set |
| HAN259511 | Decal Set |
| HAN259512 | EP Mount |
| HAN259513 | Engine Templates and Wood Trays |
| HAN259514 | Hardware Package |
| HAN259017 | Engine Mount |
| HAN4855 | Fuel Tank |

Safety Precautions and Warnings

Read and follow all instructions and safety precautions before use. Improper use can result in fire, serious injury and damage to property.

Age Recommendation: Not for children under 14 years. This is not a toy.

COMPONENTS

Use only with compatible components. Should any compatibility questions exist, please refer to the product instructions, the component instructions or contact Horizon Hobby, Inc.

FLIGHT

Fly only in open areas to ensure safety. It is recommended flying be done at AMA (Academy of Model Aeronautics) approved flying sites. Consult local ordinances before choosing a flying location.

PROPELLER

Keep loose items that can get entangled in the propeller away from the prop, including loose clothing or other objects such as pencils and screwdrivers. Especially keep your hands away from the propeller as injury can occur.

BATTERIES

Notes on Lithium Polymer Batteries

When used improperly, lithium polymer batteries are significantly more volatile than alkaline or Ni-Cd/Ni-MH batteries used in RC applications. Always follow the manufacturer's instructions when using and disposing of any batteries. Mishandling of Li-Po batteries can result in fire causing serious injury and damage.

SMALL PARTS

This kit includes small parts and should not be left unattended near children as choking and serious injury could result.

Safe Operating Recommendations

- Inspect your model before every flight to ensure it is airworthy.
- Be aware of any other radio frequency user who may present an interference problem.
- Always be courteous and respectful of other users in your selected flight area.
- Choose an area clear of obstacles and large enough to safely accommodate your flying activity.
- Make sure this area is clear of friends and spectators prior to launching your aircraft.
- Be aware of other activities in the vicinity of your flight path that could cause potential conflict.
- Carefully plan your flight path prior to launch.
- Abide by any and all established AMA National Model Aircraft Safety Code.

Important Information Regarding Warranty

Please read our Warranty and Liability Limitations in the back of this manual before building this product. If you as the purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Using the Manual

This manual is divided into sections to help make assembly easier to understand and to provide breaks between each major section. In addition, check boxes have been placed next to each step to keep track of each step completed. Steps with a single box (□) are performed once, while steps with two or more boxes (□□) indicate 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.

UltraCote® Covering Colors

Olive Drab	HANU0904
Gray	HANU882
Black	HANU874

Recommended Power Setups

4-STROKE GLOW

Saito 82GK	SAIE082BGK
or	
Saito 82	SAIE082B
Propeller: 14 x 6	EVO14060
90 degree manifold	SAI65163
Diverter	DUB697
Fuel Filler with "T" and Overflow Fitting	HAN116

2-STROKE GLOW

Evolution 52NX	EVOE0520
Propeller: 11 x 6	EVO11060
Muffler	BIS04046
Fuel Filler with "T" and Overflow Fitting	HAN116

ELECTRIC

Power 52 Brushless Outrunner	EFLM4052A
Propeller: 15 x 7, electric	APC15070E
Battery	EFLB50005S30
80-amp ESC	EFLA1080B
6-inch (152mm) Servo Extension	SPMA3051

Transmitter Requirements

This model requires a minimum of a 4-channel radio to operate all the functions of your aircraft. We suggest the following radio systems available through Horizon Hobby or your local hobby distributor.

Spektrum DX6i	SPM6610
Spektrum DX8	SPM8800
JR® DSM2™ or DSMX® Systems	

Radio Equipment Requirements

The following items are recommended when installing the 8-Channel AR8000 (SPMAR8000).

AR8000 8-Channel DSMX Receiver	SPMAR8000
Receiver Pack 2500mAh, 6V Ni-MH	JRPB5006
JR Chargeswitch	JRPA004
A6060 Standard Digital Servo (4)	SPMSA6060
A6050 Standard Aircraft Servo	SPMSA6050
6-inch (152mm) Servo Extension (4)	SPMA3051

Servo Placement and Extensions:

Aileron:	A6060 Standard Digital Servo (2) 6-inch (152mm) (2) receiver to 6-inch (152mm) (2) aileron servo
Rudder:	A6060 Standard Digital Servo
Elevator:	A6060 Standard Digital Servo
Throttle:	A6050 Standard Aircraft Servo (not required for EP installations)

Optional Equipment

Telemetry for the DX8	SPM9548
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Optional Retracts

25–46 100 Deg Rotating Retracts	EFLG320
6-inch (152mm) Servo Extension	SPMA3051

Optional Pilot

1/9 Pilot, Military with Goggles	HAN9108
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Field Equipment Required

Fuel (15% recommended)	
Saito Glow Plug	SAIP400S
Long Reach Glow Plug Wrench	HAN2510
Metered Glow Driver XL with Charger	HAN7115
2-Cycle Sport Plug	EVOGP1
Ultra Fuel Pump (gas and glow)	HAN155

Optional Field Equipment

PowerPro™ 12V Starter	HAN161
12V 7Ah Sealed Battery	HAN102
Power Panel	HAN106
Blue Block After Run Oil	EVOX1001
Self-stick weights, 6 oz	HAN3626
Charger	EFL3025
Spray cleaner	
Paper towels	

Required Adhesives

<input type="checkbox"/> Thin CA	PAAPT08
<input type="checkbox"/> Medium CA	PAAPT02
<input type="checkbox"/> 30-minute Epoxy	PAAPT39
<input type="checkbox"/> Canopy Glue	PAAPT56
<input type="checkbox"/> Threadlock	PAAPT42
<input type="checkbox"/> CA Accelerator	PAAPT50
<input type="checkbox"/> Silicone adhesive	DEVS250

Hardware/Accessory Sizes

Main wheel diameter	3½ inches
Tail wheel diameter	1 inch
Spinner diameter	3⅝ inches (86mm)
Fuel tank size	9 ounces (260cc)

Required Tools

- ☐ Card stock
- ☐ Covering iron
- ☐ Cut-off wheel
- ☐ Dental floss
- ☐ Dish washing detergent
- ☐ Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 9/64-inch (3.5mm), 5/32-inch (4mm), 3/16-inch (4.5mm)
- ☐ Epoxy brushes
- ☐ Felt-tipped pen
- ☐ Flat blade screwdriver: small
- ☐ Flat file
- ☐ Hemostat
- ☐ Hex wrench: 1.5mm, 2.5mm, 7/64-inch, 3mm
- ☐ Hobby knife with #11 blade
- ☐ Hobby scissors
- ☐ Hook and loop tape
- ☐ Isopropyl alcohol
- ☐ Light machine oil
- ☐ Low-tack tape
- ☐ Medium grit sandpaper
- ☐ Mixing cups
- ☐ Mixing sticks
- ☐ Paper towels
- ☐ Pencil
- ☐ Phillips screwdriver: #1, #2
- ☐ Pin vise
- ☐ Pliers
- ☐ Razor saw
- ☐ Reamer
- ☐ Rotary tool
- ☐ Ruler
- ☐ Sanding drum
- ☐ Scissors
- ☐ Side cutters
- ☐ Spray bottle
- ☐ Square
- ☐ Straight edge
- ☐ T-pins
- ☐ Tie-wraps
- ☐ Toothpicks
- ☐ Vise grips
- ☐ Needle nose pliers

Before Starting Assembly

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

If you find any wrinkles in the covering, use a heat gun (HAN100) and covering glove (HAN150) or covering iron (HAN101) with a sealing iron sock (HAN141) to remove them. Use caution while working around areas where the colors overlap to prevent separating the colors.

Binding the Radio System

Before starting the assembly of your model, we recommend preparing your radio system for installation. This includes charging the transmitter and receiver batteries, as well as centering the trims and sticks on your transmitter. If using a computer radio, make sure to reset a model memory and name it for this particular model. We also recommend binding the transmitter and receiver at this time, following the instructions provided with your radio system.

➔ *We highly recommend re-binding the radio system once all the control throws are set. This will keep the servos from moving to their endpoints until the transmitter and receiver connect.*

Aileron Servo Installation

Required Parts

Wing panel with ailerons and six hinges (right and left)
Nylon clevis (2) Safety tubing
Transmitter Nylon control horn (2)
Receiver Receiver battery
Servo with hardware (2) M1.8 x 10 wood screw (6)
6-inch (152mm) servo extension (2)
M2 x 10 washer head screw (8)
17mm x 19mm x 10mm hardwood block (4)
2mm x 57mm aileron pushrod (2)

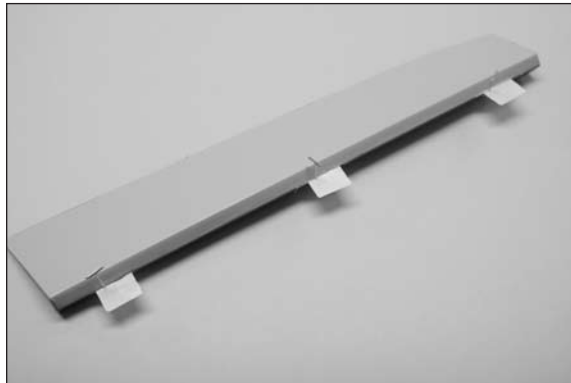
- ☐ 1. Locate the items for this section of the manual.



- ☐ 2. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill a hole in the center of each hinge slot. This creates a tunnel for the CA to wick into, creating a better bond between the hinge and surrounding wood. Prepare both the slots in the aileron and wing panel at this time.



- ☐ 3. Place a T-pin in the center of three hinges. Insert the hinges into the aileron as shown. The hinges have a slot in them and must be installed so the slot is perpendicular to the hinge line of the control surface.



- ☐ 4. Check the fit of the aileron to the wing panel. The aileron should fit tightly against the wing panel. Remove the T-pins from the hinges. Position the aileron so there is an equal gap between the ends of the aileron and wing panel.

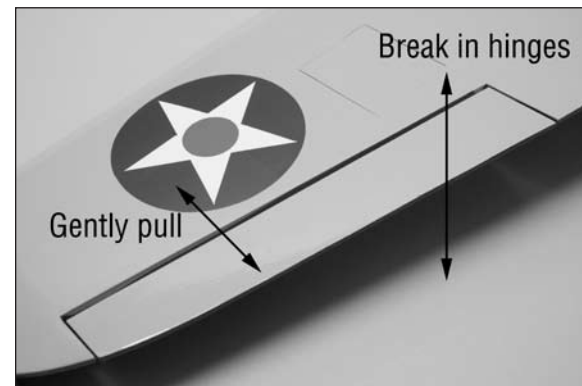


- ☐ 5. Saturate each of the three hinges on both the top and bottom of the hinge. Set the assembly aside to cure.

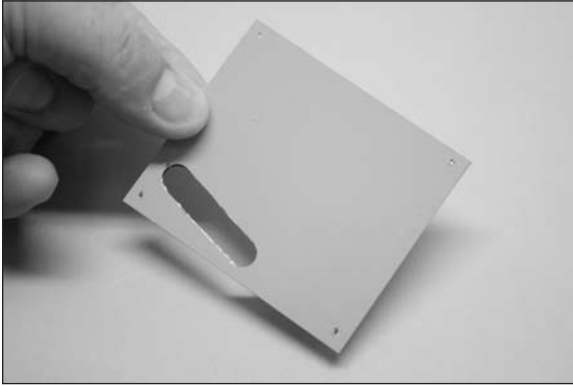


➔ *Allow the CA to cure WITHOUT using CA accelerator. This is necessary to allow the CA to soak into the hinge, creating the best bond between the hinge and surrounding wood.*

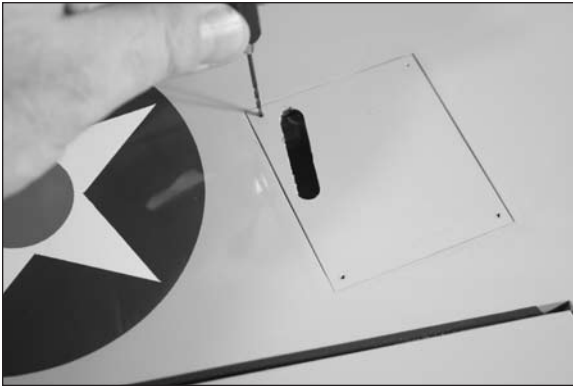
- ☐ 6. Once the CA has cured, check that all the hinges are secure by gently trying to separate the aileron from the wing panel. If any hinges are loose, re-apply CA to the loose hinges. Break in the hinges by working the aileron up and down a number of times.



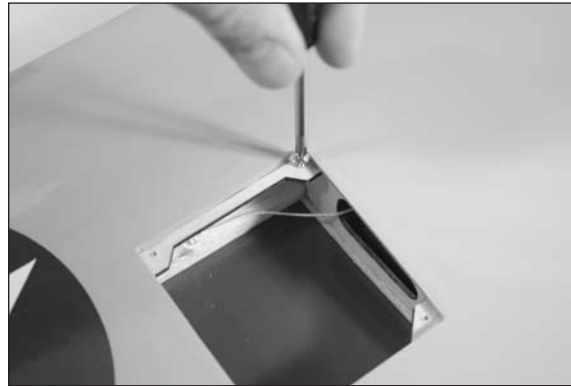
□□ 7. Remove the servo cover from the wing by removing the tape holding it in position on the wing. Use a hobby knife with a #11 blade to remove the covering for the servo horn to pass through the servo cover. Use a T-pin to poke the covering in the locations for the four servo cover mounting screws.



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



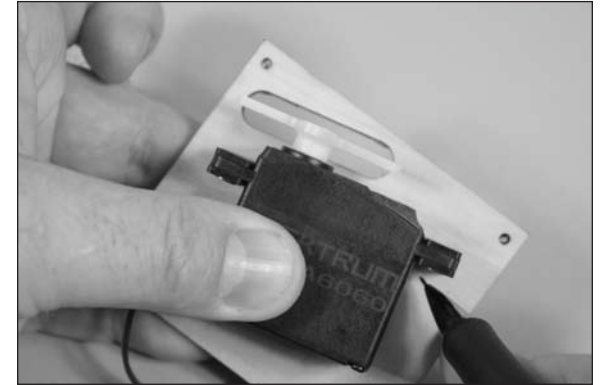
□□ 9. Use a #1 Phillips screwdriver to run an M2 x 10 washer head screw in each of the four holes. Make sure to remove the screw before proceeding to the next step.



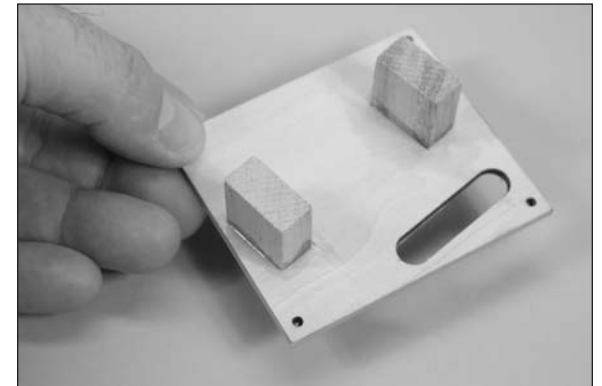
□□ 10. Apply 1–2 drops of thin CA in each of the holes that will accept the servo cover mounting screws.

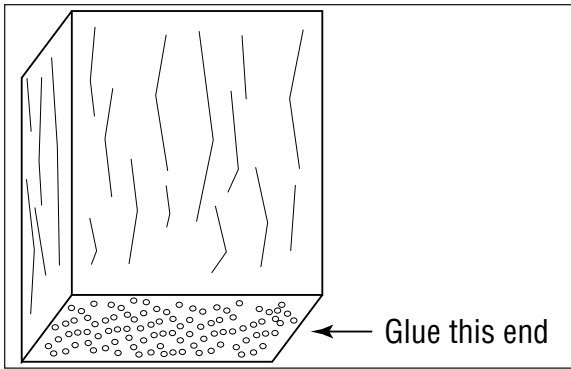


□□ 11. Prepare the aileron servo by installing the rubber grommets and brass eyelets as shown in the radio or servo instructions. Center the aileron servo using the radio system and place a servo horn on the servo. Place the servo on the cover, centering the servo horn in the opening. Use a pencil to mark the locations for the servo mounting blocks on the servo cover.

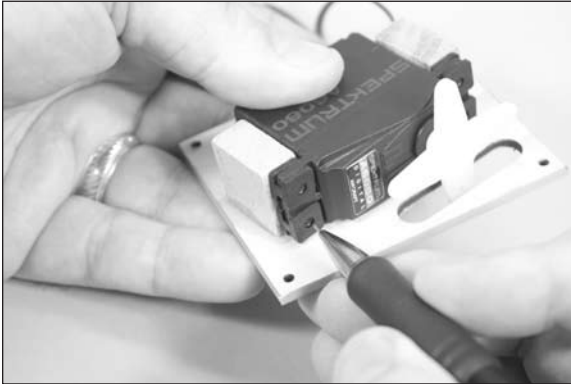


□□ 12. Use 30-minute epoxy to glue the 17mm x 19mm x 10mm hardwood blocks to the servo cover with the end grain contacting the servo cover. Allow the epoxy to fully cure before proceeding.

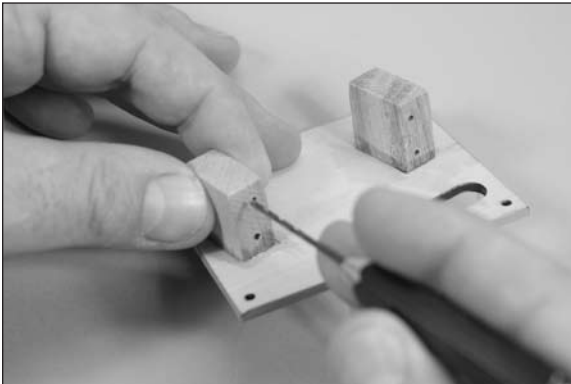




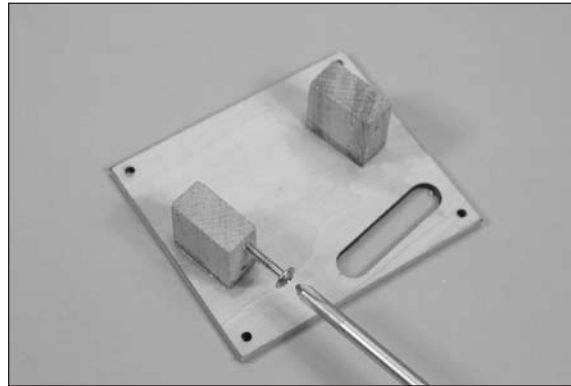
□□ 13. Position the aileron servo between the mounting blocks. Space the servo so it is not resting directly on the servo cover as this will cause vibrations from the airframe to be transferred to the servo. Use a pencil to mark the location for the screws that will secure the servo to the mounting blocks.



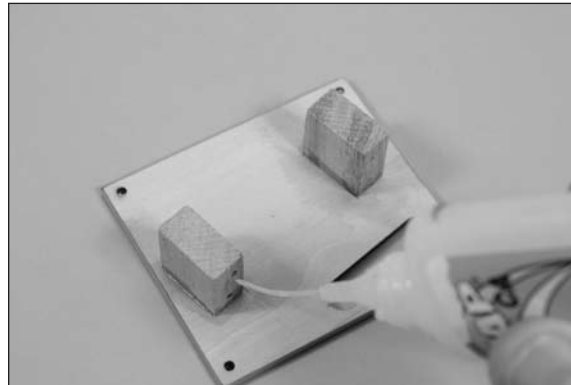
□□ 14. Use a drill and 5/64-inch (2mm) drill bit to drill the holes for the four mounting screws.



□□ 15. Use a #1 Phillips screwdriver to run a servo mounting screw in each of the four holes. Make sure to remove the screw before proceeding to the next step.

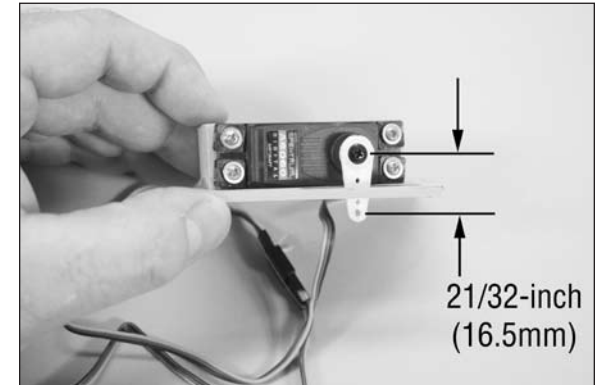


□□ 16. Apply 1–2 drops of thin CA in each hole drilled. This will harden the surrounding wood, making the screws more secure when installed.

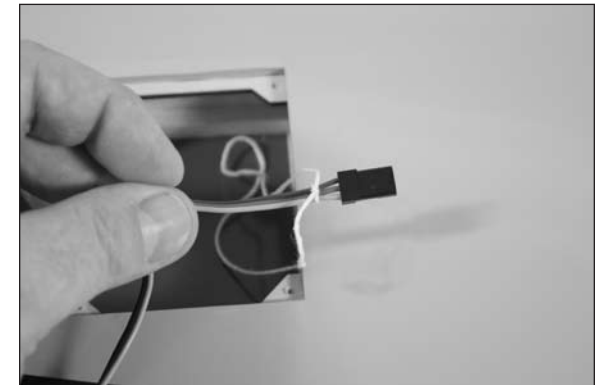


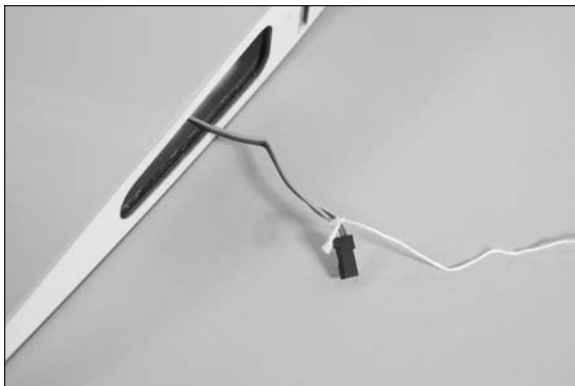
→ Do not use a CA accelerator. Using an accelerator will not allow the CA to soak into the fibers of the wood, hardening the blocks.

□□ 17. Secure a 6-inch (152mm) servo extension to the aileron servo lead using string or a commercially available connector. Enlarge the hole in the servo arm using a pin vise and 5/64-inch (2mm) drill bit that is 21/32-inch (16.5mm) from the center of the servo horn. Use side cutters to remove any arms from the horn that may interfere with the operation of the servo. Use the screws provided with the servo and a #1 Phillips screwdriver to attach the servo to the mounting blocks.

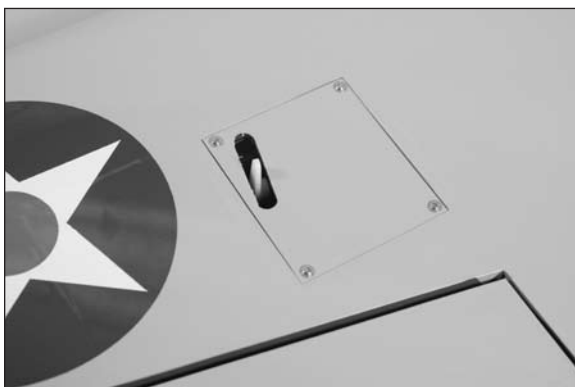


□□ 18. Tie the string inside the wing to the end of the extension. The string will be used to pull the extension through the wing.

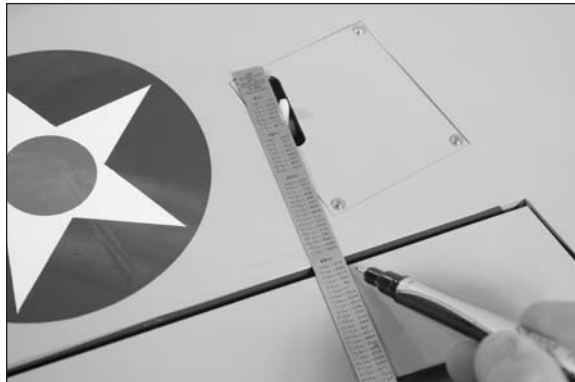




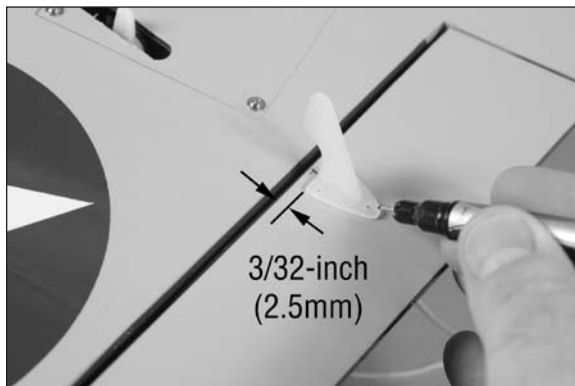
- 19. Use four 2mm x 10mm washer head screws and a #1 Phillips screwdriver to secure the cover to the wing.



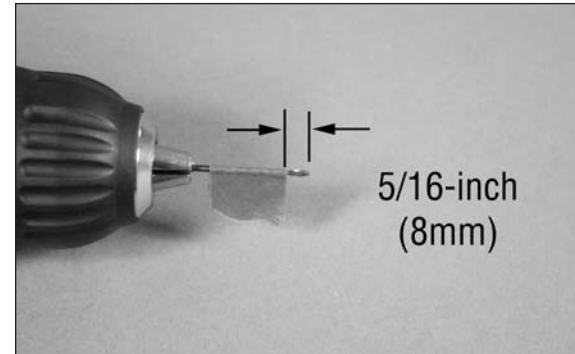
- 20. Use a ruler and a felt-tipped pen to make a small mark on the aileron used for positioning the aileron control horn. Align the ruler so it is resting against the outside edge of the servo horn and is 90-degrees to the aileron hinge line.



- 21. Use a hobby knife with a #11 blade to remove the backplate from the control horn. Center the control horn on the mark made in the previous step. Set the front edge of the horn back 3/32-inch (2.5mm) from the edge of the bevel to guarantee the horn is positioned on the hardwood block located in the aileron. Use a felt-tipped pen to mark the locations for the three mounting screws on the aileron.



- 22. Place a 1/16-inch (1.5mm) drill bit in the drill. Wrap a piece of tape around the drill bit 5/16-inch (8mm) from the end of the drill bit to prevent accidentally drilling through the top of the aileron.



- 23. Use a drill and a 1/16-inch (1.5mm) drill bit to drill the holes for the control horn mounting screws. Use a #1 Phillips screwdriver to run a 2mm x 10mm wood screw in each of the holes. Make sure to remove the screw before proceeding to the next step. Apply 1-2 drops of thin CA in each of the holes that will accept the servo cover mounting screws.



□□ 24. Use three 2mm x 10mm wood screws to secure the control horn to the aileron. Use a #1 Phillips screwdriver to tighten the screws. Be careful not to crush the underlying wood when installing the control horn.



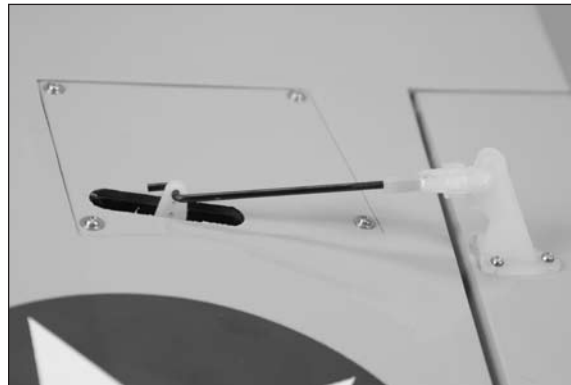
□□ 25. Use a hobby knife with a #11 blade to cut a 1/4-inch (6mm) piece from the safety tubing.



□□ 26. Slide the safety tubing on the nylon clevis. Thread the clevis on the 2mm x 57mm aileron pushrod. The length will be adjusted in the following step.



□□ 27. Insert the Z-bend of the 2mm x 57mm pushrod in the hole of the servo arm that was enlarged in the previous section of this manual. Turn on the radio system and center the aileron stick and trim. This will center the aileron servo. Thread the nylon clevis on the pushrod. Thread the clevis on enough so the aileron is centered when the clevis is connected to the center hole of the control horn shown below. Once set, slide the safety tubing over the forks of the clevis to keep the clevis from opening accidentally.



□ 28. Repeat Steps 2 through 27 to install the remaining aileron servo. Make sure you install the servo so you have a right and left servo installation.

Joining the Wing Panels

Required Parts

Wing panel (right and left)
6mm x 155mm plywood wing joiner
6mm x 30mm wood dowel (2)
2mm plywood screw doubler

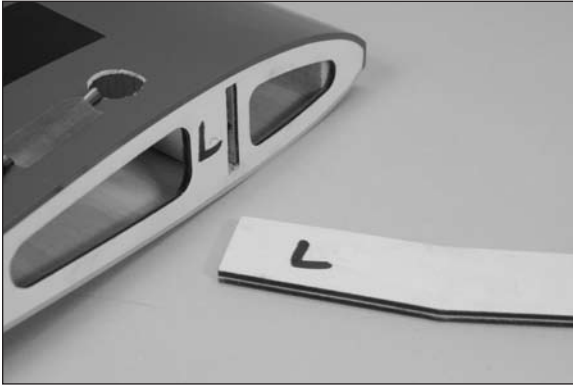
□ 1. Locate the items for this section of the manual.



□ 2. Use a hobby knife with a #11 blade to remove the covering for the aileron (and retract) servo extension. Use low-tack tape to secure the aileron servo leads to the top of the wing so they don't interfere with the joining of the wing.



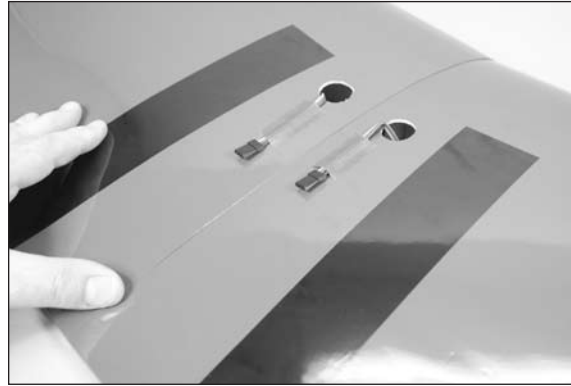
□ 3. Mark the wing joiner and wing panel using a felt-tipped pen. This is done so you can orient the joiner correctly in this section of the manual.



□ 4. Slide the joiner into the wing panel and use a pencil to mark the joiner against the wing. Remove the joiner and slide it into the opposite wing panel and make sure it slides in up to the line, or slightly past. If not, lightly sand the joiner so it fits equally in both wing panels.

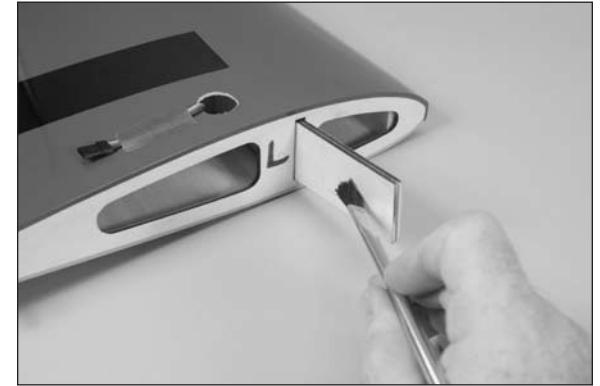
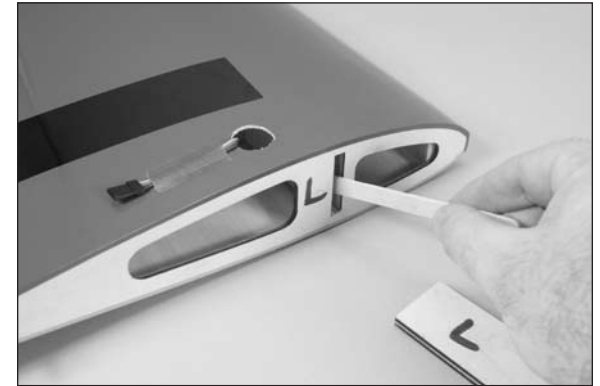
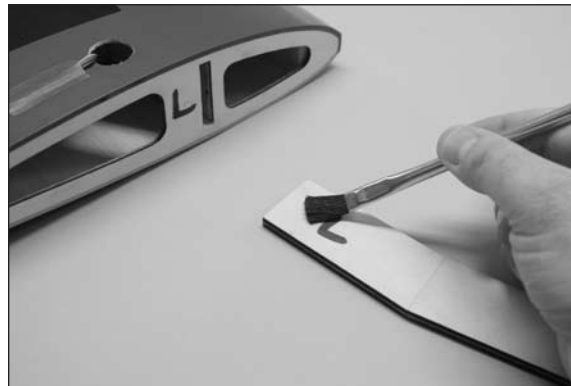


□ 5. Make sure the wing panels fit tightly together.



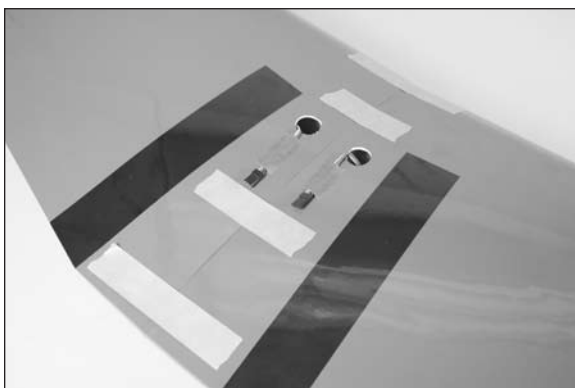
➔ *The wing panels must be joined and taped before the epoxy begins to cure.*

□ 6. Use 30-minute epoxy to glue the joiner into the wing panels. Apply epoxy in the joiner pocket and all sides of the joiner, including the top and bottom edges. Also coat the exposed wood on the root rib with epoxy. Start with one panel, insert the joiner, then the opposite panel. Make sure the wing panels fit tightly together. Clean any epoxy using a paper towel and rubbing alcohol. Use low-tack tape to keep the panels tightly together while the epoxy cures.





- 7. Use low-tack tape to hold both wing panels tightly together until the epoxy fully cures.

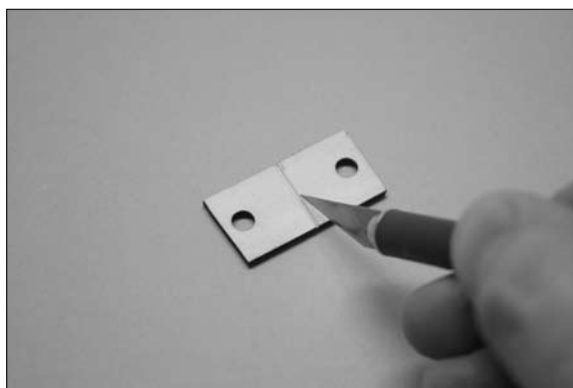


➔ *Make sure the leading edge and trailing edges of the wing at the joint are aligned with each other.*

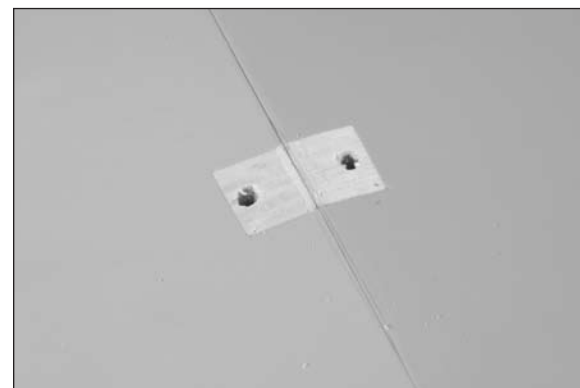
- 8. Use a hobby knife to remove the covering from the bolt holes in the wing panel. Make sure to remove the covering from both the top and bottom of the wing.



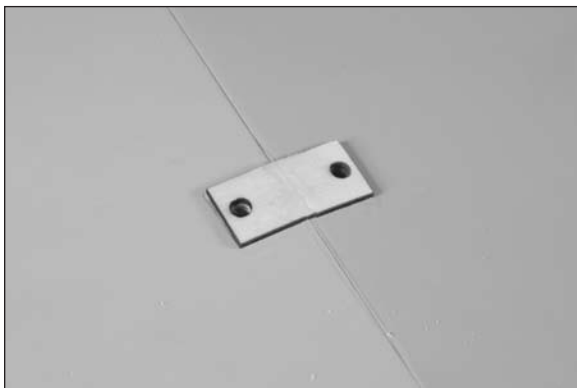
- 9. Lightly score the wing doubler along the center using a hobby knife and a new #11 blade. An indentation in the plate has been made to guide the blade during scoring. This will allow it to be bent to conform to the dihedral angle of the wing. Use care not to cut too deep into the plate or it could break during installation.



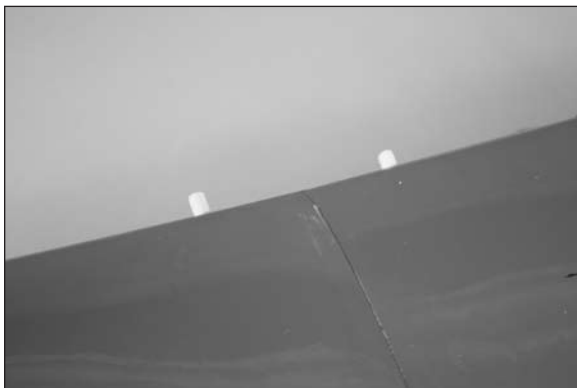
- 10. Position the wing bolt plate on the wing with the scored side facing the wing, aligning the holes in the plate with those in the wing. Trace the outline of the plate onto the wing using a felt-tipped pen. Use a hobby knife and #11 blade to trim the covering from the wing 1/16-inch (1.5mm) inside the line drawn.



- ☐ 11. Use medium CA to glue the wing bolt plate to the wing.



- ☐ 12. Use a hobby knife and a #11 blade to remove the covering from the wing dowel holes in the leading edge of the wing. Use medium CA to glue the wing dowels in the leading edge of the wing. Position them so they protrude 1/2-inch (13mm) from the leading edge.



Fixed Gear Installation

Required Parts

Wing assembly	Landing gear plastic cover (2)
M3 x 20 wood screw (8)	4mm wheel collar (4)
M3 x 3 setscrew (4)	M1.8 x 10 wood screw (12)
3 1/2-inch scale wheel (2)	
Fixed landing gear (left and right)	

- ☐ 1. Locate the items for this section of the manual.



- ☐ 2. Test fit the main gear into the wing. There is a left and right, and the axle will point toward the wing tip when installed. Use a pencil to transfer the locations for the mounting screws onto the landing gear rails inside the wing.



- ☐ 3. Remove the gear from the wing. Use a drill and 5/64-inch (2mm) drill bit to drill the holes in the landing gear rails for the landing gear mounting screws.



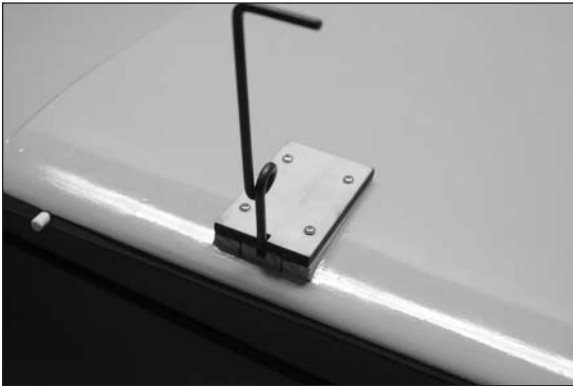
- ☐ 4. Use a #2 Phillips screwdriver to thread an M3 x 20 wood screw into each of the four holes drilled in the previous step. This will cut threads into the surrounding wood. Remove the screw before proceeding to the next step.



□□ 5. Apply 1–2 drops of thin CA in each of the holes to harden the surrounding wood. This will make the screws more secure and help prevent them from vibrating loose.



□□ 6. Attach the main landing gear using four M3 x 20 wood screws. Use a #2 Phillips screwdriver to tighten the screws.



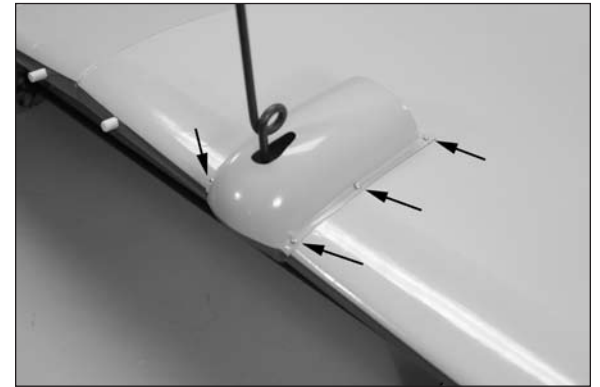
□□ 7. Use a hobby knife and #11 blade and a rotary tool with a sanding drum to make a hole suitable to fit the cover on the landing gear wire and over the coil spring.



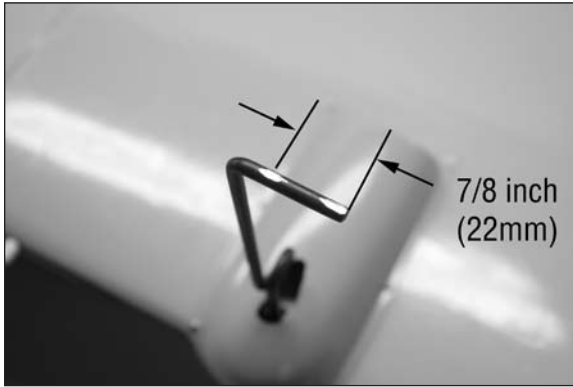
□□ 8. Tape the top edge of the blister down to the wing and then just slightly warm with a heat gun on low to allow the blister to adapt to the wing contour. Be careful not to heat the blister too much as you could distort the plastic.



□□ 9. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill six holes (three on each side) to secure the cover to the wing. Space the holes evenly as shown. Prepare the holes by threading the screws into the holes, then hardening the holes using thin CA. Secure the cover to the wing using six M1.8 x 10 wood screws and a #1 Phillips screwdriver.



□□ 10. Use a flat file to file two 1/4-inch (6mm) wide flat spots on the main landing gear. The first is located at the end of the wire, the second is centered 7/8-inch (22mm) from the end of the axle. Make the flat on the bottom so it can be accessed when the landing gear has been attached to the wing.



□□ 11. Slide a wheel collar on the axle. Place a drop of light machine oil on the axle.



□□ 12. Remove the hub cap from the main wheel. Slide the wheel on the landing gear wire with the side of the wheel that had the hub cap toward the wing tip.



□□ 13. Attach the wheel collar to the axle to keep the wheel on the gear. The edge of the wheel collar will be flush with the end of the axle. Use a 1.5mm hex wrench (included) to tighten the setscrew. Slide the wheel collar installed in step 10 against the wheel, but not so tight as it prevents the wheel from rotating smoothly. Use a 1.5mm hex wrench (included) to tighten the setscrew. Remember to use threadlock on the setscrews to prevent these from vibrating loose.



□□ 14. Snap the hub cap back into position on the wheel.



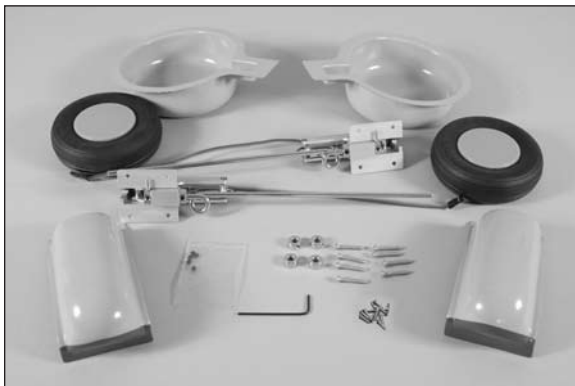
□□ 15. Repeat steps 2 through 14 to install the remaining landing gear assembly and wheel.

Optional Retract Installation

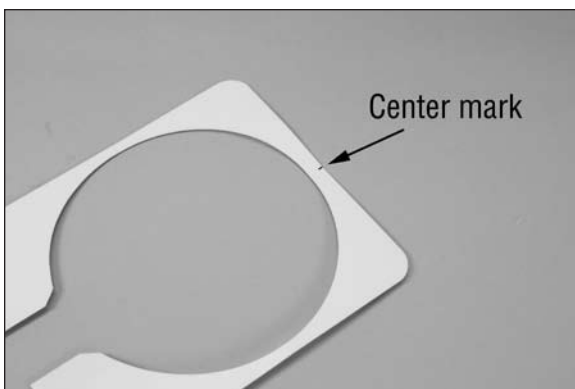
Required Parts

Wing assembly	Landing gear plastic cover (2)
M3 x 20 wood screw (8)	4mm wheel collar (4)
M3 x 3 setscrew (4)	M1.8 x 10 wood screw (12)
Plastic wheel well (2)	3 1/2-inch scale wheel (2)
Transmitter	Receiver
Receiver battery	Retract wheel well template
Retract assembly (right and left)	

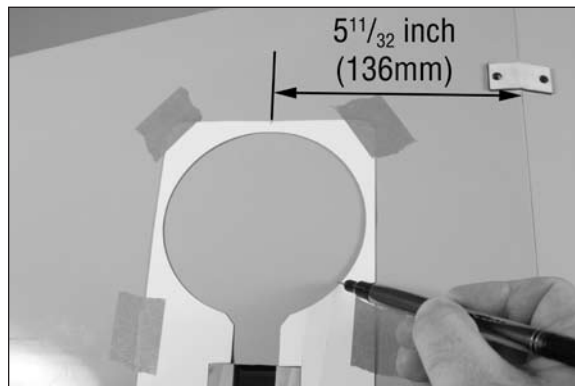
- 1. Locate the items for this section of the manual.



- 2. Use a pencil to mark the template, locating the center of the template.



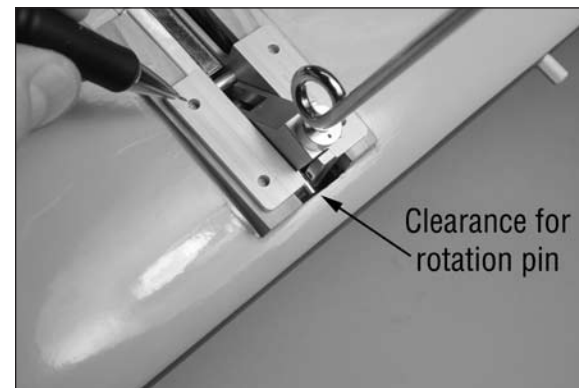
- 3. Place the template on the wing. The front will fit tightly to the landing gear mounting blocks. Position the rear of the template so the center mark made in the previous step is $5\frac{11}{32}$ inch (136mm) from the center of the wing. Use a felt-tipped pen to transfer the position for the wheel well on the wing.



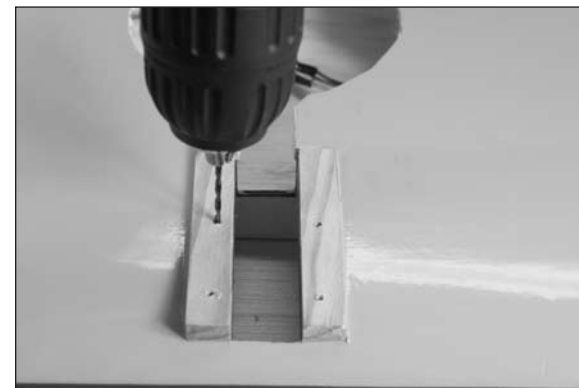
- 4. Use a hobby knife with a new #11 blade to carefully trim the opening for the wheel well in the bottom of the wing. Work slowly to avoid any mistakes.



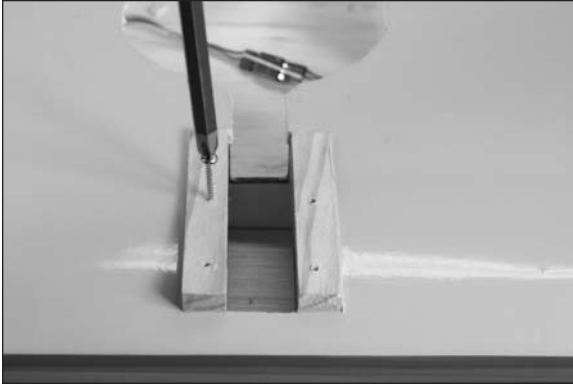
- 5. Use the radio system to move the gear to the DOWN position. Test fit the main gear retract into the wing, making sure there is clearance at the front for the rotation pin on the retract to clear during the operation of the retract. There is a left and right, and the coil spring will point toward the center of the wing when the gear is retracted. Use a pencil to transfer the locations for the mounting screws onto the landing gear rails inside the wing.



- 6. Remove the gear from the wing. Use a drill and 5/64-inch (2mm) drill bit to drill the holes in the landing gear rails for the landing gear mounting screws.



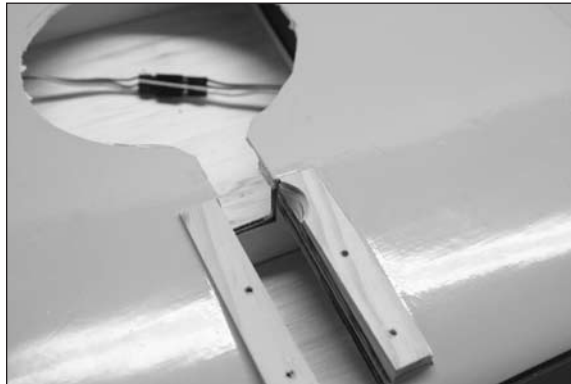
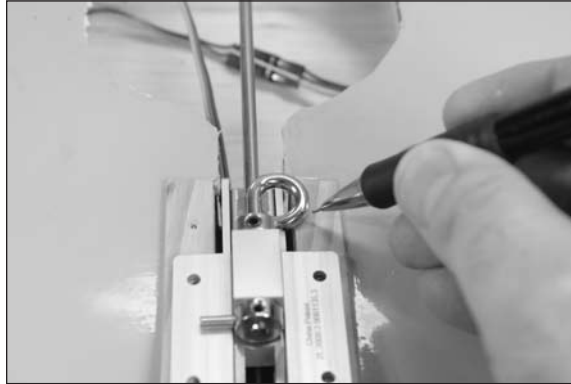
□□ 7. Use a #2 Phillips screwdriver to thread an M3 x 20 wood screw into each of the four holes drilled in the previous step. This will cut threads into the surrounding wood. Remove the screw before proceeding to the next step.



□□ 8. Apply 1–2 drops of thin CA in each of the holes to harden the surrounding wood. This will make the screws more secure and help prevent them from vibrating loose.



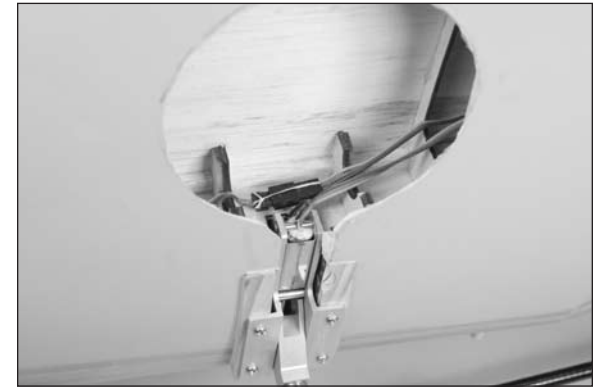
□□ 9. Use the radio system to move the gear to the UP position. Position the retract, aligning the mounting holes to the holes in the mount. If the coil spring is not allowing the retract to fit against the mounts, you will need to remove a small amount of material from the mounts to clear the spring. Use a pencil to mark the location of the spring, then use a rotary tool and sanding drum to remove enough material to provide clearance for the coil.



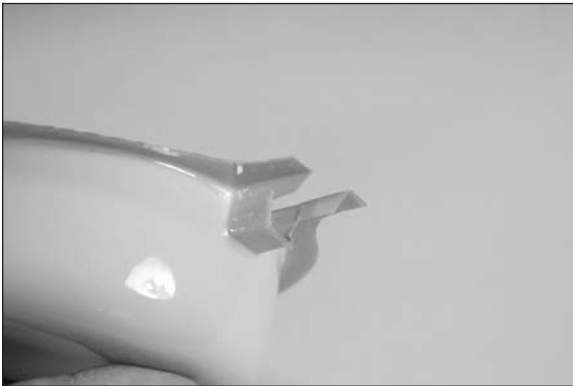
□□ 10. Attach the main landing gear using four M3 x 20 wood screws. Use a #2 Phillips screwdriver to tighten the screws.



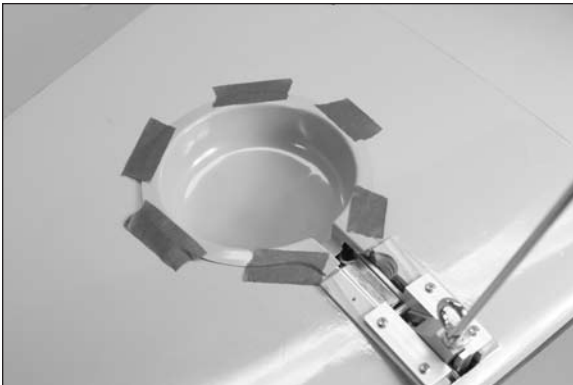
□□ 11. Check that the aileron and retract leads are tucked neatly against the spar, and that the leads are not being bent at an angle that will cause them to fail over time.



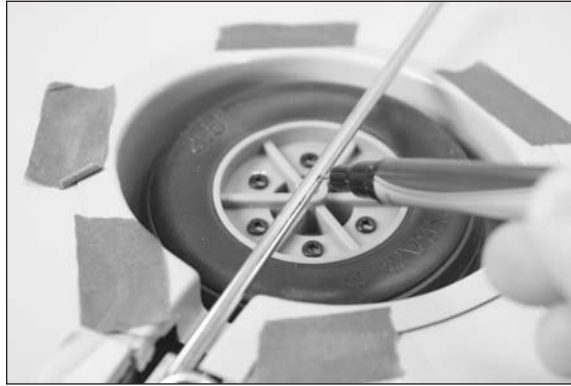
□□ 12. Trim the wheel well as necessary to clear the retract. Tape the well in position while fitting so it can be viewed for clearance.



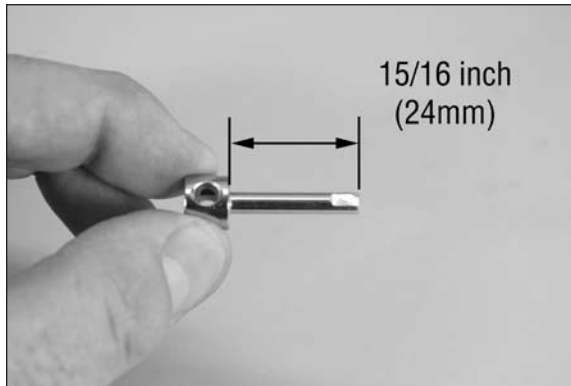
□□ 13. Use canopy glue to secure the wheel well to the wing. Use low-tack tape to hold the well in position until the glue fully cures.



□□ 14. Place the wheel in the center of the wheel well and move the gear to the UP position. Make a temporary mark where the center of the wheel and landing gear strut cross.



□□ 15. Use a rotary tool and cutoff wheel to trim the length of the axle to 15/16 inch (24mm). Use a flat file to remove any burrs left from trimming the axle. Use a flat file to make a 1/4-inch (6mm) wide flat at the end of the axle.



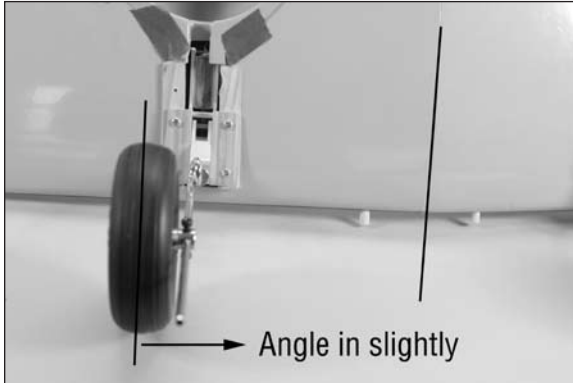
□□ 16. Slide the wheel and wheel collar included with the retract on the axle. Use a 1.5mm hex wrench to tighten the setscrew onto the axle.



□□ 17. Attach the included wheel collar to the axle to keep the wheel on the gear. Position the collar against the wheel, making sure the wheel can rotate freely on the axle. Use a 1.5mm hex wrench (included) to tighten the setscrew. Make sure to use threadlock on the setscrew to prevent it from vibrating loose.



□□ 18. Slide the axle on the retract strut, centering it at the mark made in step 14. Retract the gear, guiding the wheel into the wheel well. With the wheel centered in the well, tighten the screws on the axle to secure the wheel to the strut. Move the gear to the DOWN position and check that the wheel is angled in slightly, using the joint between the wing panels as a reference.



□□ 19. Use a felt-tipped pen to mark the edge of the axle on the retract strut.



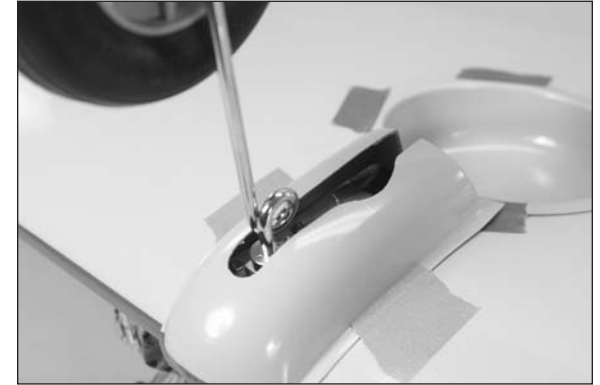
□□ 20. Tighten the screws on the axle so they leave indentations on the wire strut. Remove the axle then use a flat file to make flat areas for the screws so the axle does not rotate on the gear wire. Use a rotary tool and cutoff wheel to trim the length of the strut. Replace the axle and tighten the screws using a 2.5mm hex wrench. Make sure to use threadlock on the screws to prevent them from vibrating loose.



□□ 21. Snap the hub cap back into position on the wheel.



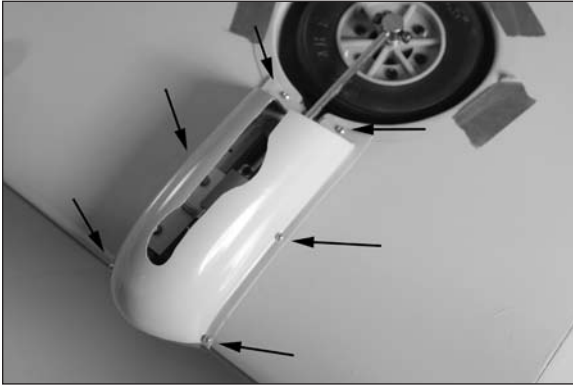
□□ 22. Use a hobby knife and #11 blade and a rotary tool with a sanding drum to make a slot along the prescribed lines in the cover to clear the retract strut. Use low-tack tape to hold the cover while cycling the gear to check for clearance. Make sure the front edge conforms to the leading edge of the wing.



□□ 23. Tape the top edge of the blister down to the wing and then just slightly warm with a heat gun on low to allow the blister to adapt to the wings contour. Be careful not to heat the blister too much as you could distort the plastic.



□□ 24. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill six holes (three on each side) to secure the cover to the wing. Space the holes evenly as shown. Prepare the holes by threading the screws into the holes, then hardening the holes using thin CA. Secure the cover to the wing using six M1.8 x 10 wood screws and a #1 Phillips screwdriver.



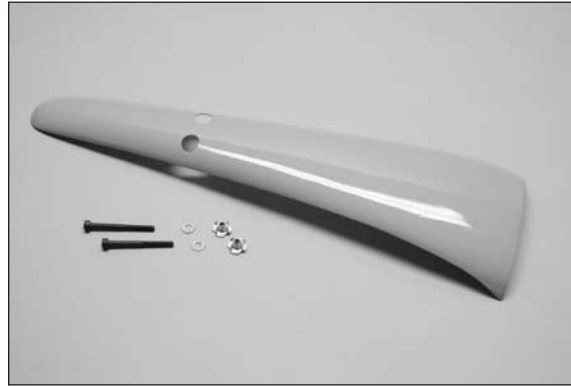
□ 25. Repeat steps 2 through 24 to install the remaining retract assembly.

Wing and Belly Pan Installation

Required Parts

Wing assembly	M4 blind nut (2)
M4 washer (2)	Fiberglass belly pan
Fuselage assembly	
M4 x 45 socket head cap screw (2)	

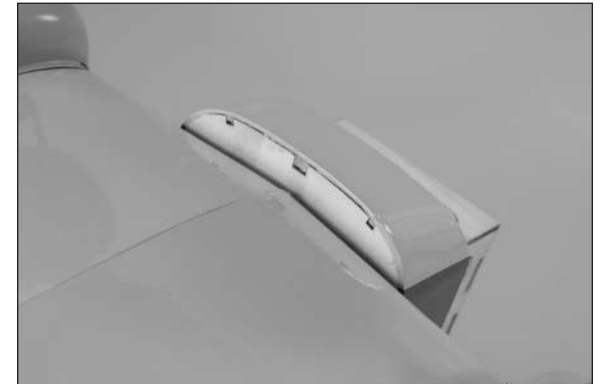
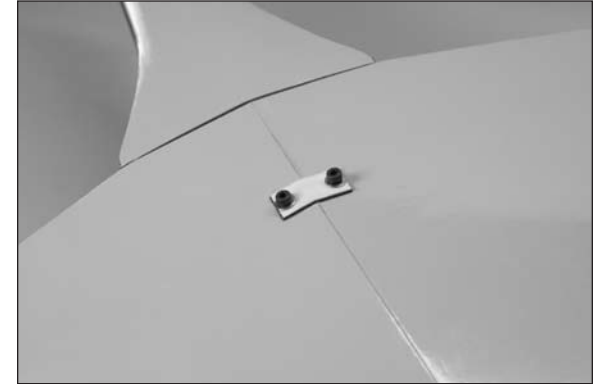
□ 1. Locate the items for this section of the manual.



□ 2. Use a small C-clamp to press the two M4 blind nuts into position from the inside of the fuselage. Use a small amount of 30-minute epoxy to each of the prongs to secure the blind nut in the wood. Use care not to get any epoxy into the threads of the blind nut.



□ 3. Tape a piece of waxed paper at the front and rear of the wing saddle. Attach the wing to the fuselage using two M4 x 45 socket head cap screws and two 4mm washers. Use a 3mm hex wrench to tighten the screws.



□ 4. Position the fiberglass belly pan on the bottom of the wing, aligning it with the contour of the fuselage at the front, and centering the back with the wing bolts and the center of the fuselage at the trailing edge. Use a felt-tipped pen to trace the outline of the belly pan onto the wing.



□ 5. Set the belly pan aside and use a hobby knife with a #11 blade to trim a 1/4-inch (6mm) wide strip of covering 1/16-inch (1.5mm) inside the outline of the belly pan on the bottom of the wing. Apply low-tack tape outside the line drawn in step 9. This will help prevent CA from getting all over the wing when gluing the belly pan into position.



➔ *Make sure to use a new #11 blade and use light pressure to trim only the covering. Avoid cutting into the underlying wood, which could weaken the structure of your model.*

□ 6. Use medium CA to glue the fiberglass belly pan to the wing. Hold the belly pan in position until the CA fully cures.

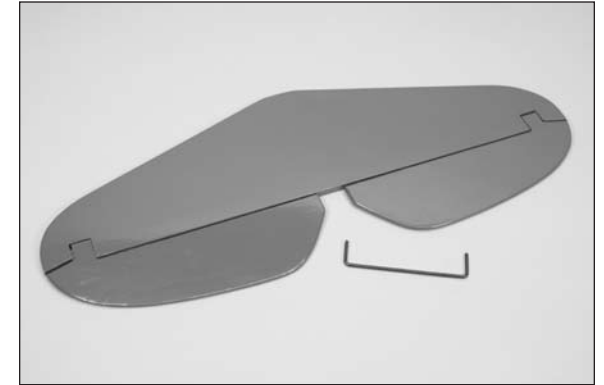


Stabilizer and Elevator Installation

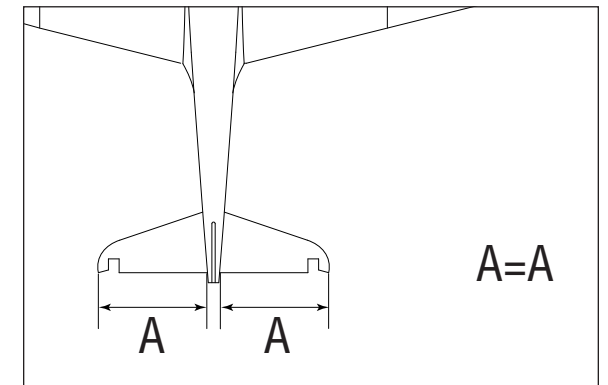
Required Parts

Airframe assembly	Stabilizer
Elevator (right and left)	Elevator joiner
CA hinge (4)	

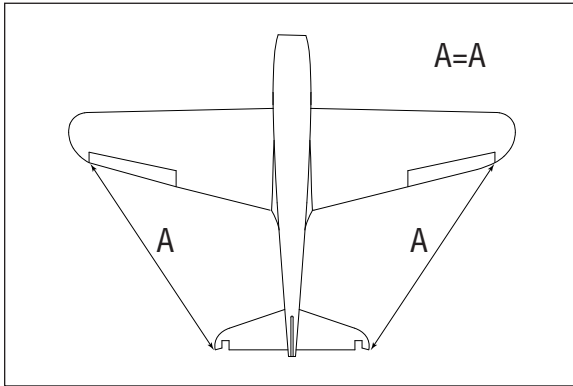
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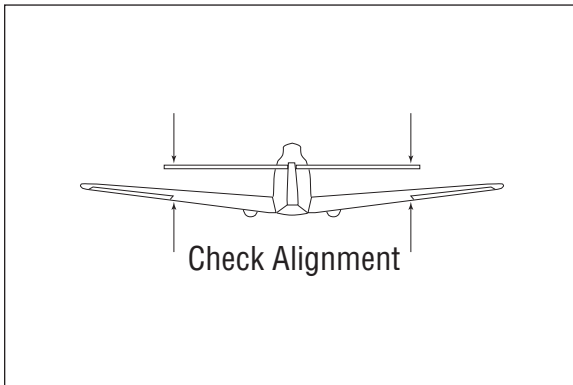
□ 2. Slide the stabilizer into the slot in the fuselage with the olive drab side to the top of the fuselage. Slide stabilizer as far forward in the slot as possible. Measure from the fuselage to each tip. Center the stabilizer so the measurements are the same.



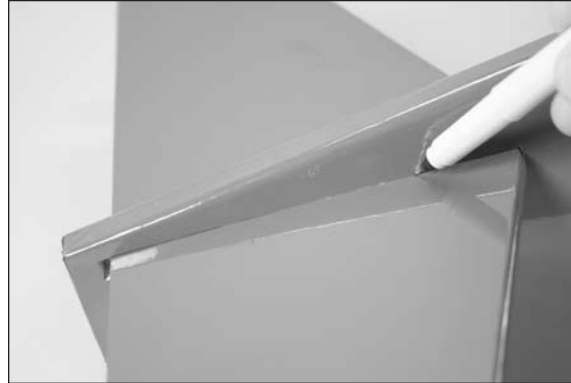
☐ 3. Measure from stabilizer tip to the wing tip on both the left and right side of the airframe. The measurement must match exactly to align the stabilizer with the wing.



☐ 4. Stand back 8–10 feet (1–2 meters) and view the aircraft from the rear. The wing and stabilizer must be an equal distance from each other to be in alignment. If not, use medium grit sandpaper to lightly sand the opening in the fuselage to correct any alignment issues.



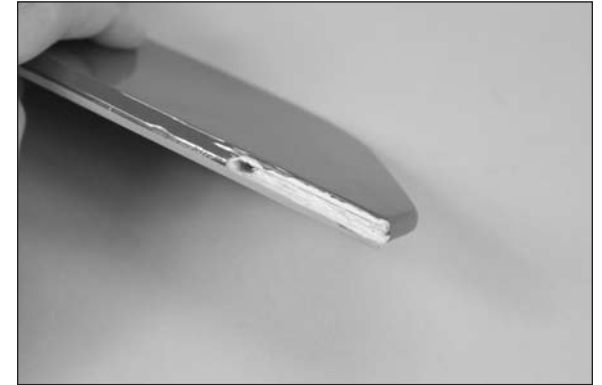
☐ 5. Double check the alignment of the stabilizer as described in steps 2 through 4. Once set, use a felt-tipped pen to trace the outline of the fuselage on the top and bottom of the stabilizer.



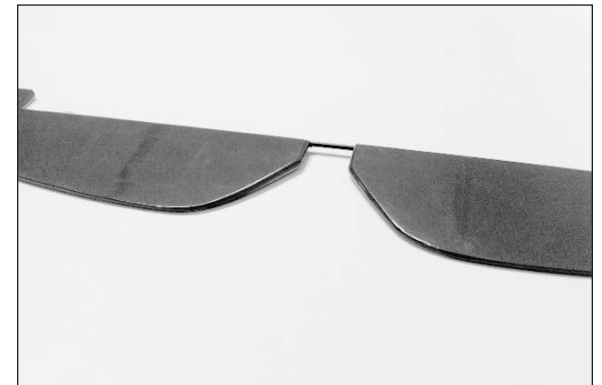
☐ 6. Remove the stabilizer from the fuselage. Use a hobby knife and a new #11 blade to trim the covering 1/16-inch (1.5mm) inside the lines drawn in the previous step. Remove the covering, exposing the wood at the center of the stabilizer.



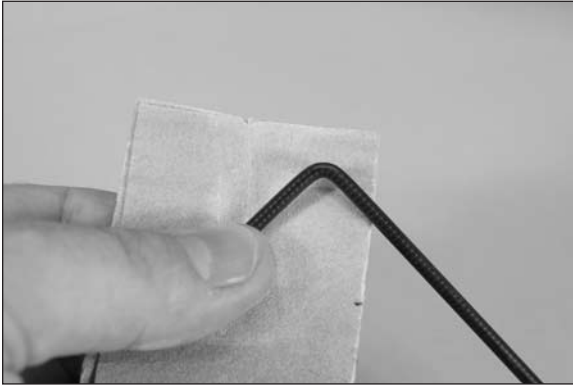
☐ 7. Use a hobby knife with a #11 blade to remove the covering from the elevators for the 3mm metal joiner rod.



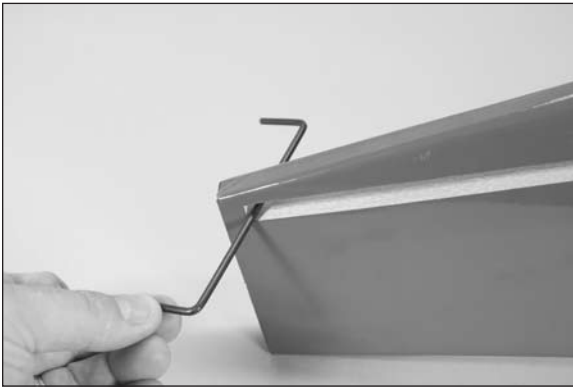
☐ 8. Fit the joiner wire into the elevators. Check to make sure the elevators are in alignment with each other by placing the assembly on a flat surface. It may be necessary to bend the joiner wire slightly to align both elevator halves. Make sure to mark the elevators and joiner wire so they can be oriented later in this section of the manual.



□ 9. Remove the joiner wire from the elevators. Use medium grit sandpaper to roughen the 3mm metal joiner rod where it will contact the elevators.



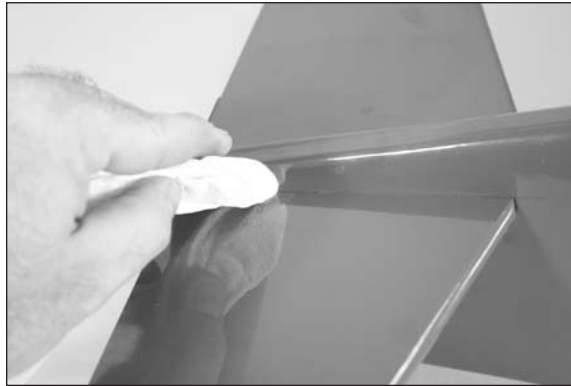
□ 10. Place the joiner wire in the slot for the stabilizer. The joiner wire must be in position before gluing the stabilizer; it cannot be inserted after the stabilizer is in position.



□ 11. Slide the stabilizer into the slot in the fuselage. Apply 30-minute epoxy to the exposed wood at the center of the stabilizer. Make sure to apply epoxy on both the top and bottom of the stabilizer.



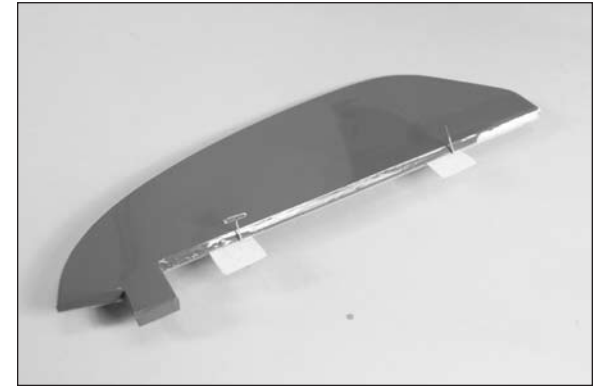
□ 12. Position the stabilizer following steps 5 through 7. Remove any excess epoxy from the stabilizer and fuselage using denatured alcohol and a paper towel.



□□ 13. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill a hole in the center of each hinge slot. This creates a tunnel for the CA to wick into, creating a better bond between the hinge and surrounding wood. Drill holes in both the elevator and stabilizer hinge slots.

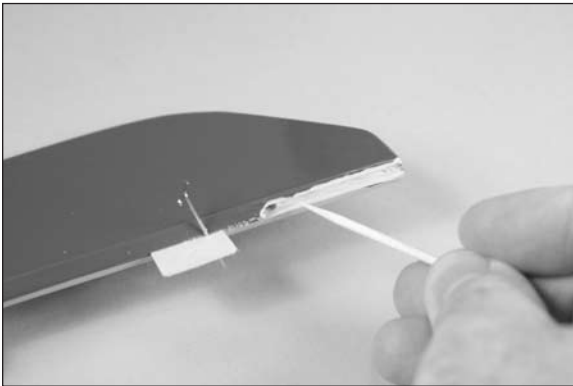
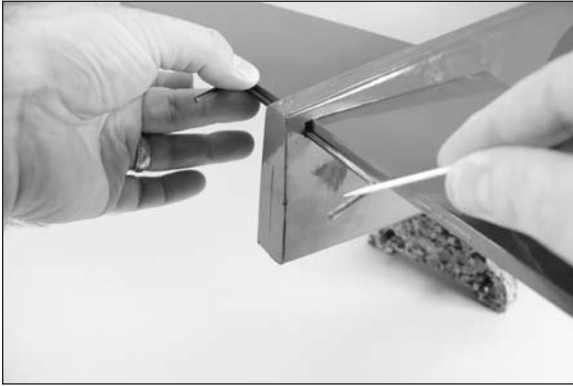


□□ 14. Place a T-pin in the center of two hinges. Insert the hinges into the elevator as shown.



□□ 15. Repeat steps 11 through 14 to prepare the remaining elevator.

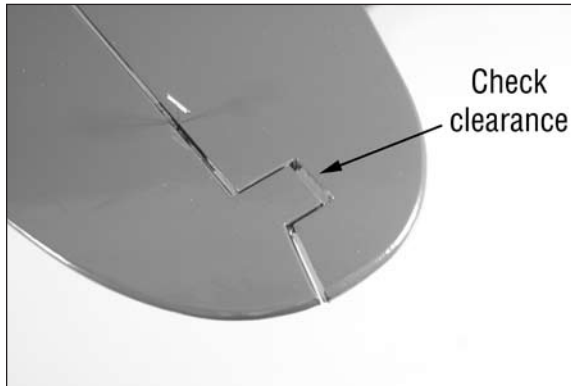
□ 16. Mix a small amount of 30-minute epoxy and apply it to the joiner wire and into the hole and slot in the elevator using a toothpick.



□ 17. Place both elevators into position once epoxy has been applied. Use a paper towel and rubbing alcohol to remove any excess epoxy before it begins to cure. Make sure to check the alignment of the elevators to make sure they are in alignment with each other while the epoxy cures.



□ 18. Remove the T-pins from the hinges. Position the elevators so there is an equal gap between the tips of the balance tabs on the elevator and stabilizer.

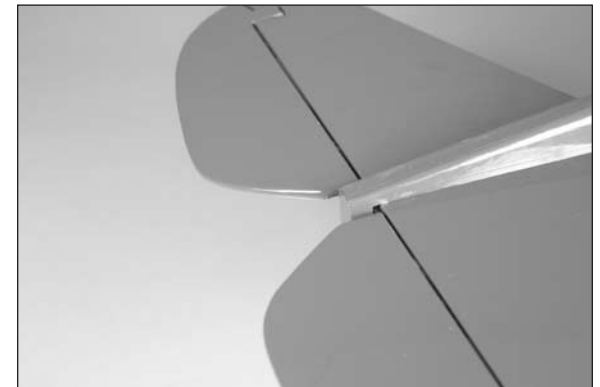


□ 19. Saturate each of the hinges with thin CA on both the top and bottom of the hinge. Set the assembly aside to cure.



➔ *Allow the CA to cure WITHOUT using CA accelerator. This is necessary to allow the CA to soak into the hinge, creating the best bond between the hinge and surrounding wood.*

□ 20. Once the CA and epoxy has cured, check that all the hinges are secure by gently trying to separate the elevators from the stabilizer. If any hinges are loose, re-apply CA to the loose hinges. Break in the hinges by working the stabilizer up and down a number of times.



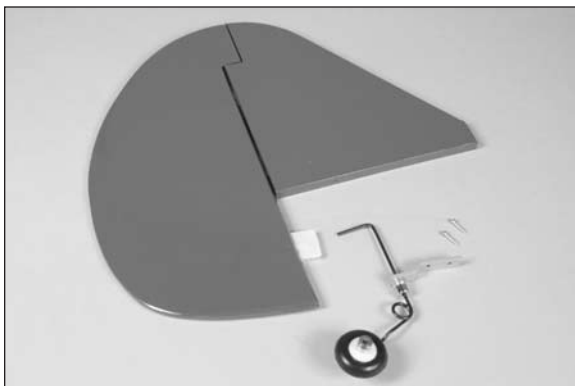
□ 21. Once the stabilizer and elevators have been installed and the glue has fully cured, remove the wing from the fuselage and set it aside in a safe location.

Rudder and Fin Installation

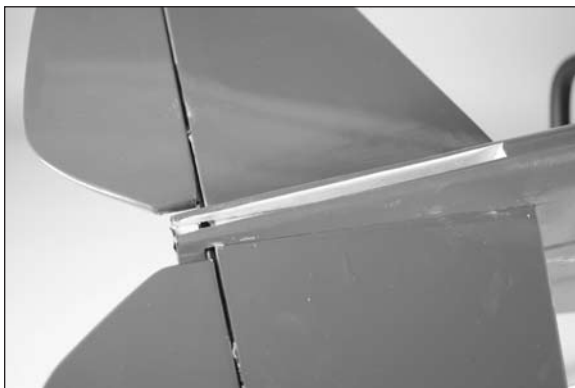
Required Parts

Fuselage assembly	Rudder
CA hinge (3)	Fin
Tail gear assembly	M1.8 x 10 wood screw (2)

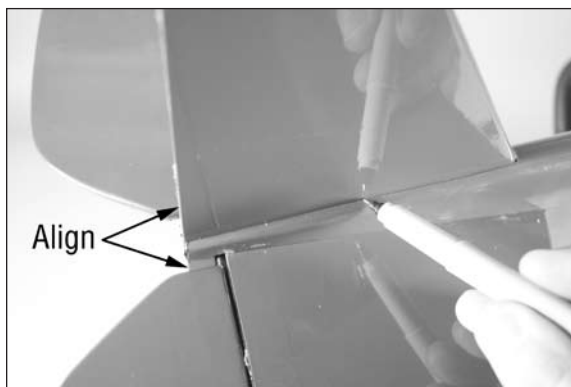
- ☐ 1. Locate the items for this section of the manual.



- ☐ 2. Use a hobby knife with a #11 blade to remove the covering at the rear of the fuselage to expose the slot for the fin.



- ☐ 3. Remove the rudder and hinges from the fin. Slide the fin into position on the fuselage. Use a straight edge to align the fin with the rear of the fuselage. Use a felt-tipped pen to trace the outline of the fuselage on both sides of the fin.

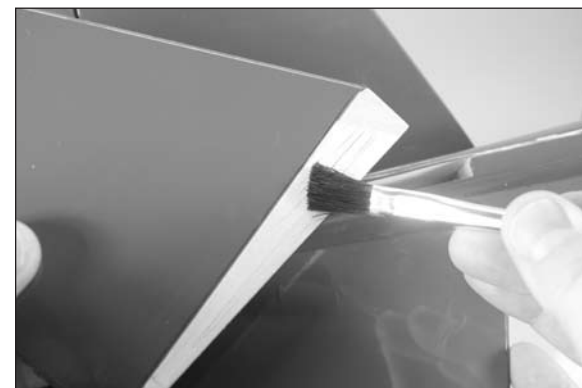


- ☐ 4. Remove the fin from the fuselage. Use a hobby knife and a new #11 blade to trim the covering 1/16 inch (1.5mm) below the lines drawn in the previous step. Remove the covering, exposing the wood at the bottom of the fin. Use a paper towel and denatured alcohol to remove the pen lines from the fin and fuselage.



➔ *Make sure to use a new #11 blade and use light pressure to trim only the covering. Avoid cutting into the underlying wood, which could weaken the structure of your model.*

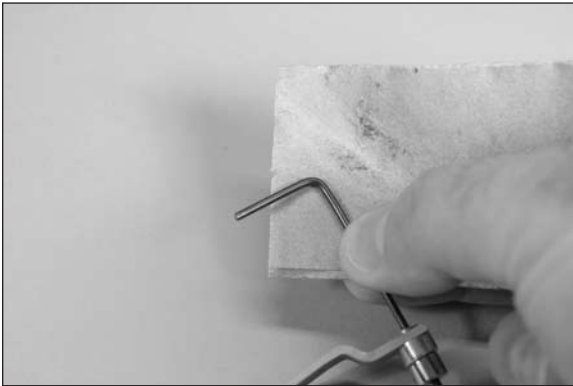
- ☐ 5. Mix 1/2 ounce (15mL) of 30-minute epoxy. Apply epoxy to the exposed wood on the bottom of the fin and into the slot in the fuselage. Place the fin into position and remove any excess epoxy with a paper towel and rubbing alcohol. Use a straight edge to align the trailing edge of the fin with the fuselage as shown in step 3. Use care not to use too much epoxy, as it could accidentally get into the area of the elevator joiner wire.



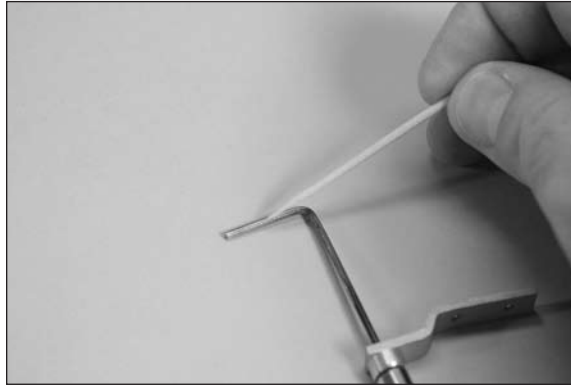
- 6. Use a hobby knife with a #11 blade to remove the covering from the rudder for the tail gear assembly.



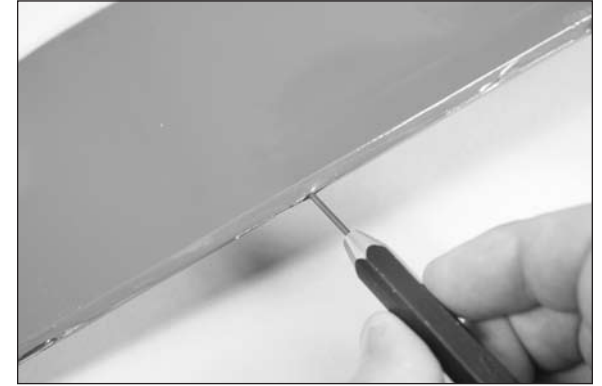
- 7. Use medium grit sandpaper to roughen the wire where it contacts the rudder. This will allow the epoxy to adhere to the wire when it is glued into position.



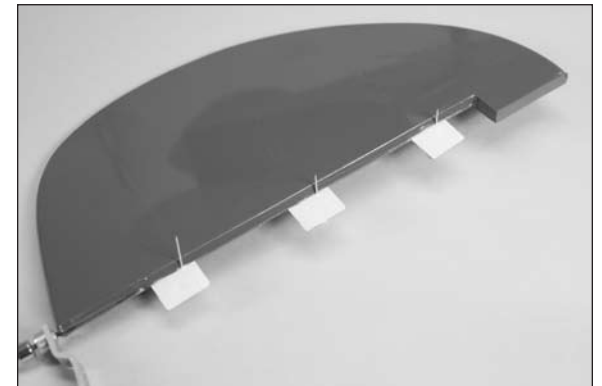
- 8. Mix a small amount of 30-minute epoxy. Use a toothpick to apply the epoxy to the wire and into the hole in the rudder where they contact each other. Insert the tail wheel wire into the rudder. Use a paper towel and rubbing alcohol to remove any excess epoxy before it can cure. Use low-tack tape to hold the wire in position until the epoxy has fully cured.



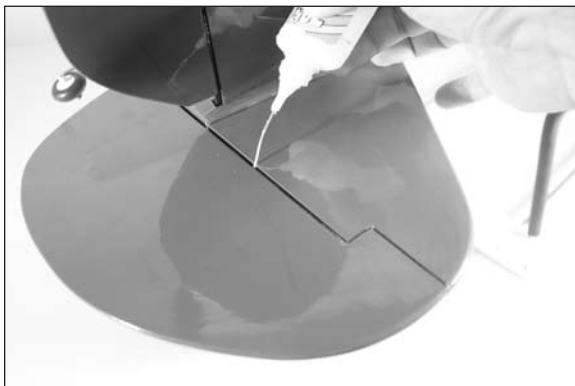
- 9. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill a hole in the center of each hinge slot. This creates a tunnel for the CA to wick into, creating a better bond between the hinge and surrounding wood. Drill holes in both the rudder and fin hinge slots.



- 10. Place a T-pin in the center of three hinges. Insert the hinges into the rudder as shown.



□ 11. Place the rudder into position. Remove the T-pins from the hinges. Position the rudder so it can move freely at the balance tabs on the top of the fin.



□ 12. Use a felt-tipped pen to mark the locations on the bottom of the fuselage for the tail gear mounting plate screws. Move the aluminum plate out of the way of the fuselage. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill two holes in the bottom of the fuselage for the aluminum plate mounting screws. Use a #2 Phillips screwdriver to thread an M1.8 x 10 wood screw into each of the holes. Remove the screw before proceeding to the next step. Apply 1–2 drops of thin CA in each of the holes to harden the surrounding wood. Allow the CA to cure without the use of an accelerator for the best results.



□ 13. Attach the aluminum plate using two M1.8 x 10 wood screws. Use a #2 Phillips screwdriver to tighten the screws. Remove the setscrews on the wheel collars using a 1.5mm hex wrench for the tail wheel and mounting plate and apply threadlock to the setscrews. Tighten the setscrews to secure their positions.

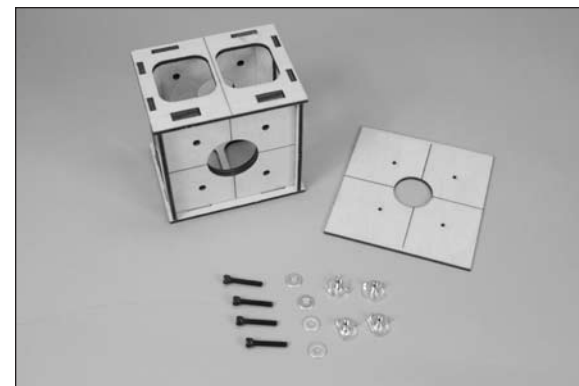


Electric Motor and Speed Control Installation

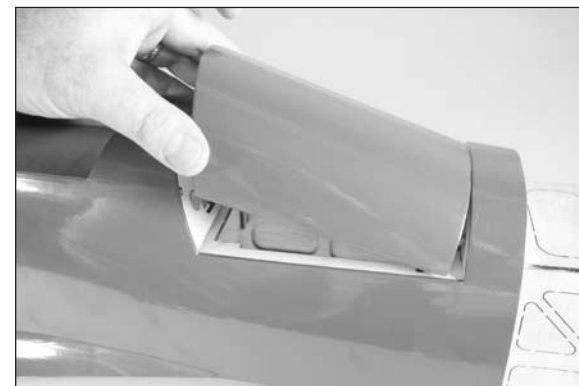
Required Parts

Fuselage assembly	Motor with hardware
Electronic speed control	Two-sided tape (not included)
6-32 blind nut (2)	6-32 blind nut, trimmed (2)
#6 washer (4)	Tie-wrap (not included)
Hook and loop tape (not included)	
Engine mount template, Power 52	
6-32 x 3/4-inch socket head bolt (4)	

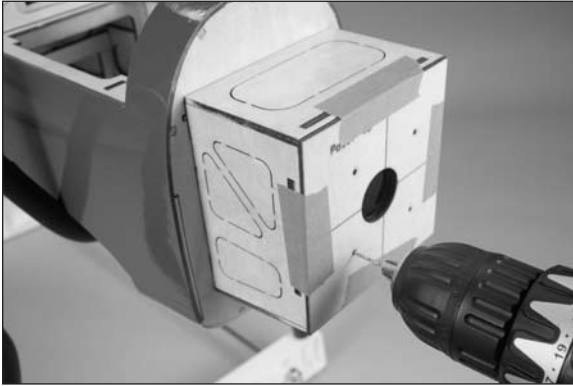
□ 1. Locate the items for this section of the manual.



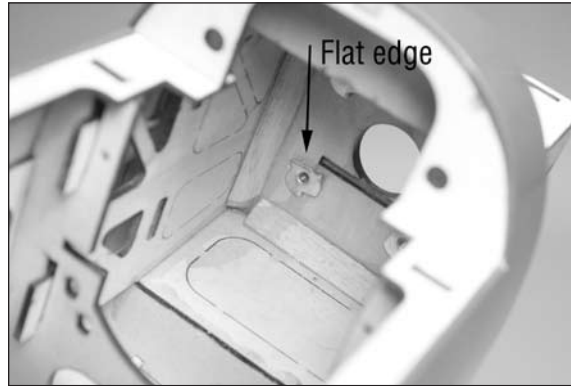
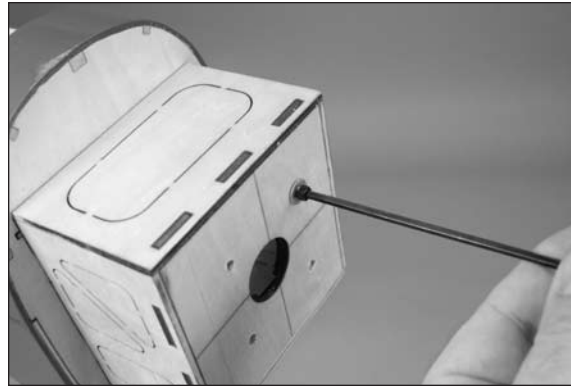
□ 2. Remove the hatch from the fuselage by sliding it forward, then lifting it at the rear. Set the hatch aside.



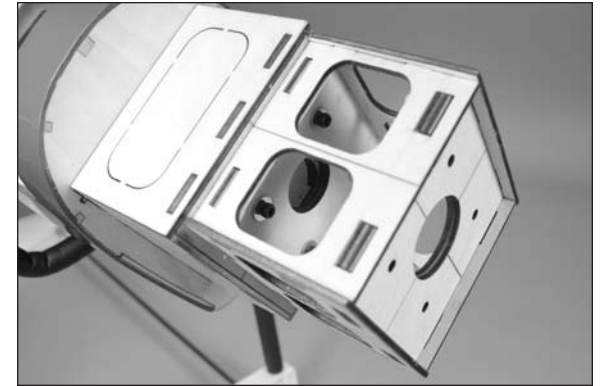
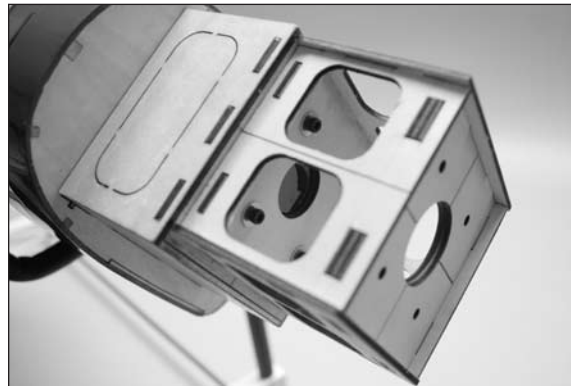
□ 3. Use low-tack tape to secure the engine mounting template for the Power 52 installation to the fuselage. Use the center hole in the firewall and template for alignment. Use a drill and 1/16-inch (1.5mm) drill bit to drill the pilot holes for the engine mount into the firewall. Remove the template and use a 3/16-inch drill bit to enlarge the holes.



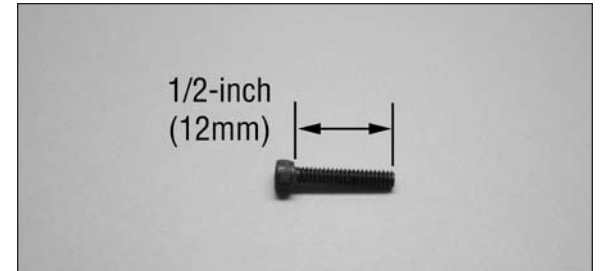
□ 4. Use a 6-32 x 3/4-inch socket head cap screw and #6 washer to draw the four 6-32 blind nuts into the firewall from the inside of the fuselage. Use a 7/64-inch hex wrench to tighten the bolts. Remove the bolt once all the blind nuts are installed. Note that two blind nuts have been trimmed to clear the notch in the rear of the firewall for the radio tray.



□ 5. Use four 6-32 x 3/4-inch socket head cap screws and four #6 washers to attach the preassembled plywood motor mount box to the firewall. Make sure the smaller hole in the motor mount box aligns with the hole in the firewall, and that the center lines on the box align with those on the firewall. Make sure to use threadlock on the screws to prevent them from vibrating loose.



⚠ CAUTION: Cut the bottom two 6-32 x 3/4-inch socket head caps screws down in length so they do not protrude through the firewall. Failure to do so could cause the battery to be punctured by the bolt, in the event of a crash and the battery moving forward.



□ 6. The motor shaft must be reversed prior to installing the X-mount and propeller adapter. Refer to the instructions provided with the motor to do this. Once the shaft has been repositioned, attach the propeller adapter on the motor using the hardware provided with the adapter.



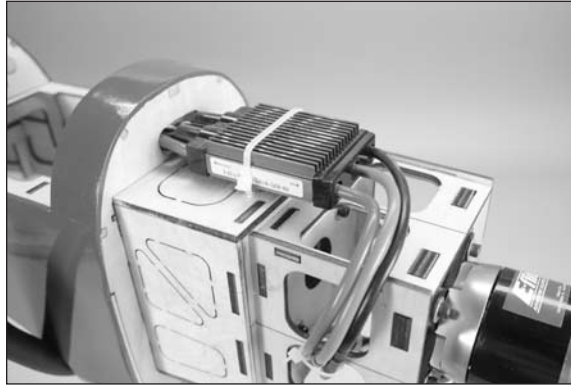
□ 7. Secure the X-mount to the motor using the hardware provided with the motor and a #2 Phillips screwdriver. Make sure to use threadlock on the screws to prevent them from vibrating loose.



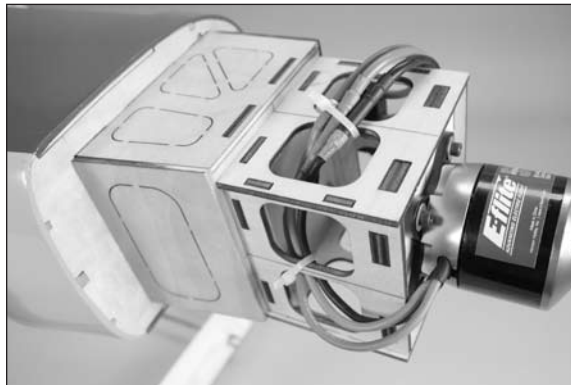
□ 8. Attach the motor to the motor box using the hardware included with the motor. Make sure to use threadlock on the screws to prevent them from vibrating loose.



□ 9. Use hook and loop tape (not included) to secure the ESC to the top of the motor box. Use a hobby knife with a #11 blade and a rotary tool with a sanding drum to make a hole to pass the battery lead, servo lead and switch into the fuselage. Use a tie-wrap (not included) to secure the ESC so it does not move from position. Secure a 6-inch (152mm) servo extension to the receiver lead of the ESC. Pass the leads for the receiver, battery and switch harness through the opening made in the previous step.

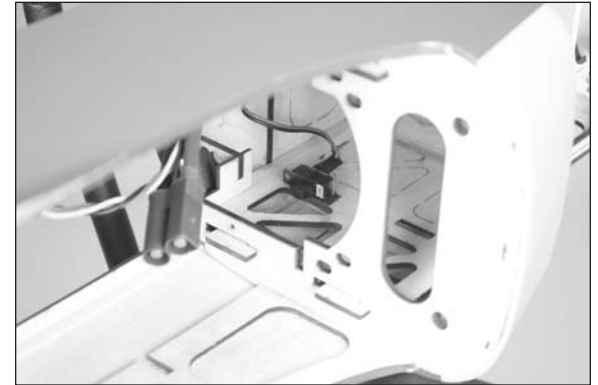


□ 10. Connect the motor leads. Make sure they won't interfere with the operation of the motor. Tie-wrap the motor leads to the motor box if necessary.



➔ *If you are installing an E-flite motor and speed control, you can match the colors from the motor and ESC. This will result in the motor rotating the correct direction for your model.*

□ 11. Use two-sided tape (not included) to secure the switch in the fuselage.

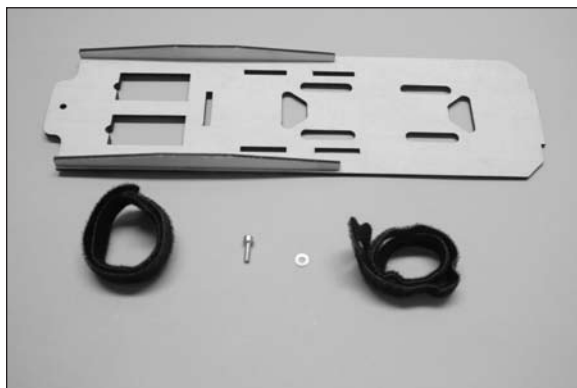


Electric-Powered Radio Tray, Receiver and Motor Battery Installation

Required Parts

Fuselage assembly	Radio tray, electric powered
Hook and loop strap	M3 washer
M3 x 12 socket head cap screw	

- 1. Locate the items for this section of the manual.

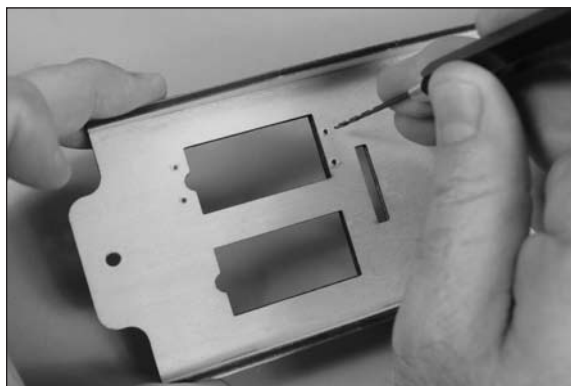


- 2. Prepare the rudder and elevator servos by installing the brass eyelets and rubber grommets.

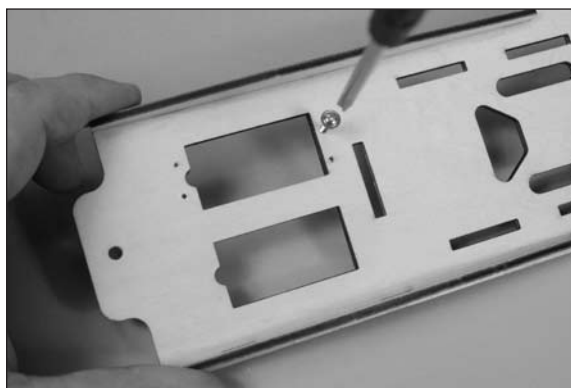
- 3. Place the rudder servo in the opening inside the fuselage with the output shaft to the rear of the fuselage. The servo will be centered in the opening to prevent vibrations from the airframe to be transferred to the servo. Use a pencil to mark the location for the screws that will secure the servo to the servo tray.



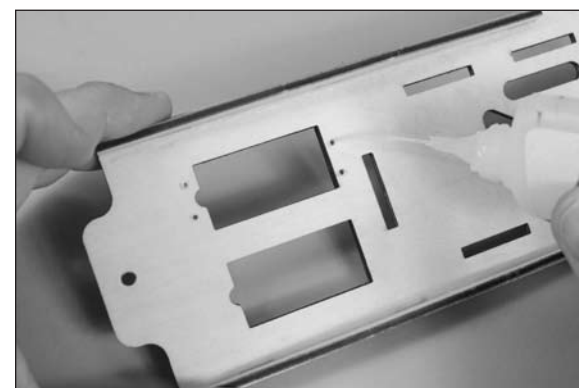
- 4. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill the holes for the four mounting screws.



- 5. Use a #1 Phillips screwdriver to run a servo mounting screw in each of the four holes. Make sure to remove the screw before proceeding to the next step.



- 6. Apply 1–2 drops of thin CA in each hole drilled. This will harden the surrounding wood, making the screws more secure when installed.



- 7. Use the screws provided with the servo and a #1 Phillips screwdriver to secure the servo to the servo tray. Secure the receiver to the radio tray using hook and loop tape (not included) and a hook and loop strap. Repeat steps 2 through 6 to install the remaining servo in the radio tray.



□ 8. Place the hook and loop strap through the 3mm plywood battery tray as shown. Note the position of the tab at the front of the tray in relationship to the top view of the tray. We also placed a piece of hook and loop tape (not included) on the tray to keep the battery from sliding on the tray when it is installed.



□ 9. Slide the radio tray into the fuselage and use an M3 x 10 socket head cap screw and M3 washer to secure the tray in the fuselage. Use threadlock on the screw to prevent it from vibrating loose. Mount the remote receiver in the airframe using hook and loop tape. Make sure the antennas on the remote receiver are 90-degrees in relationship to the main receiver antenna. Place the remote receiver as far away from the main receiver as possible for the best radio reception.



□ 10. The battery is secured in the fuselage using the hook and loop strap. We placed a piece of hook and loop tape on the battery to keep the battery from moving inside the fuselage.

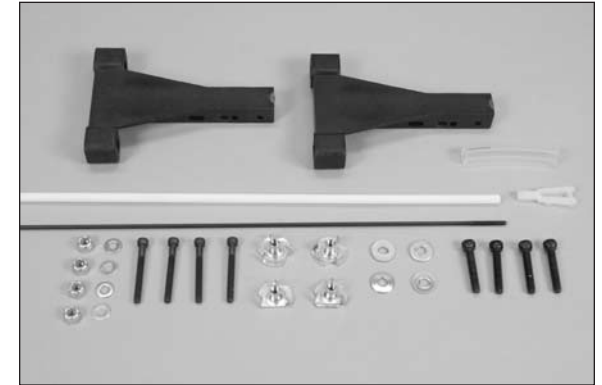


Glow Engine Installation

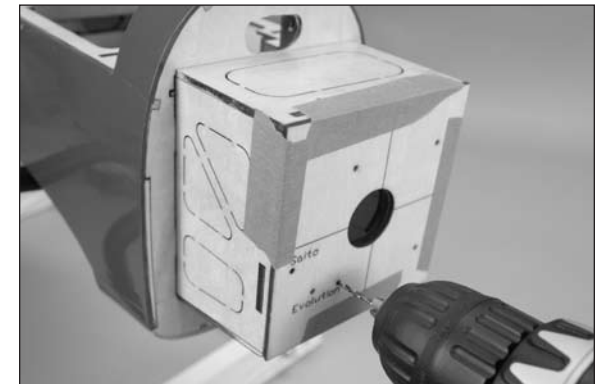
Required Parts

Fuselage assembly	Throttle pushrod, 290mm
Pushrod tube, 200mm	Engine mount (right and left)
6-32 blind nut (2)	6-32 blind nut, trimmed (2)
Nylon clevis	Silicone tube
#4 washer (4)	4-40 lock nut (4)
#6 washer (4)	
Plywood template, Saito/Evolution	
4-40 x 1-inch socket head cap screw (4)	
6-32 x 3/4-inch socket head cap screw (4)	

□ 1. Locate the items for this section of the manual.



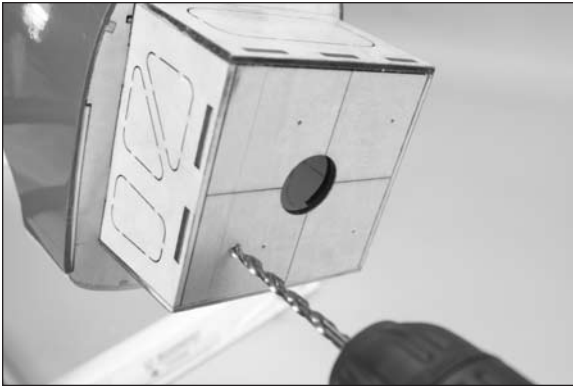
□ 2. Use low-tack tape to secure the engine mounting template for the Saito/Evolution installation to the fuselage. Use a drill and 1/16-inch (1.5mm) drill bit to drill the pilot holes for the engine mount and throttle pushrod into the firewall.



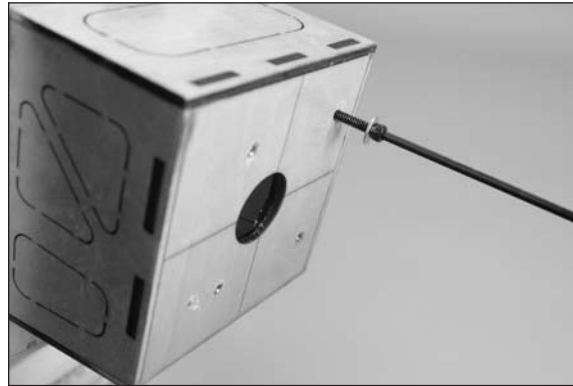
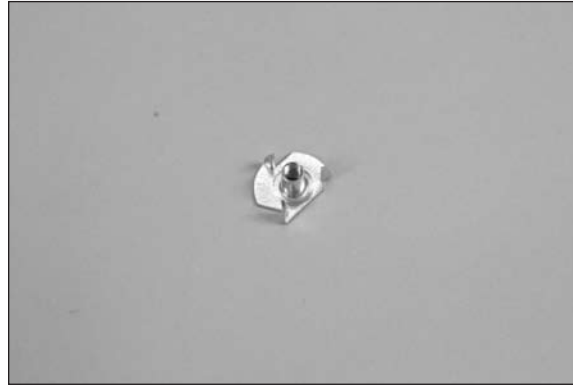
- 3. Remove the template and use a 3/16-inch drill bit to enlarge the engine mounting holes.



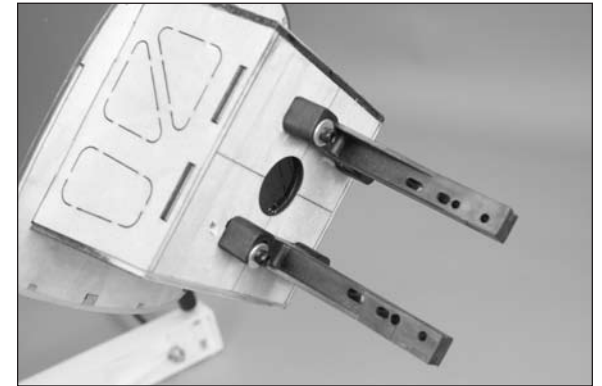
- 4. Use a 5/32-inch (4mm) drill bit to enlarge the hole for the throttle pushrod tube.



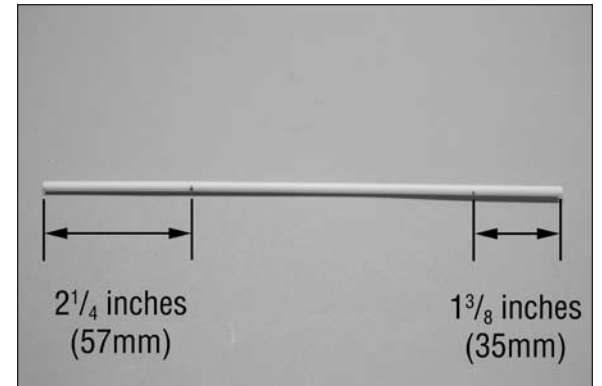
- 5. Use a 6-32 x 3/4-inch socket head cap screw and #6 washer to draw the four 6-32 blind nuts into the firewall from the inside of the fuselage. Use a 7/64-inch hex wrench to tighten the bolts. Remove the bolt once all the blind nuts are installed. Note that two blind nuts have been trimmed to clear the triangle stock on the left side of the firewall inside the fuselage.



- 6. Use four 6-32 x 3/4-inch socket head cap screws and four #6 washers to attach the two nylon engine mounts to the firewall. Do not fully tighten the screws at this time.

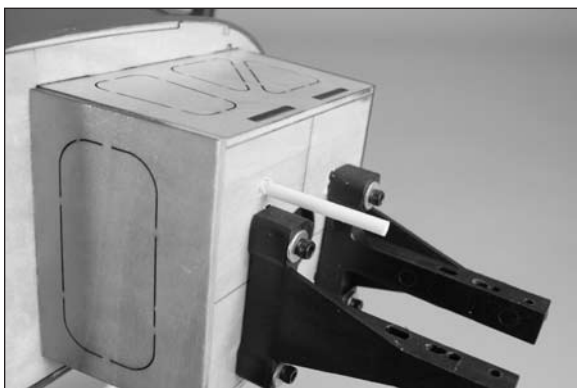


- 7. Locate the 8-inch (200mm) pushrod housing. Use medium grit sandpaper to roughen two 1/2 inch (13mm) wide areas located 1 3/8 inches (35mm) and 2 1/4 inches (57mm) from the ends of the tube.



➔ If you are installing a four-stroke engine, cut the tube to a length of 6 5/8 inches (168mm). Sand the first 1/4 inch (6mm) and the opposite end 2 1/4 inches (57mm).

□ 8a. (Two-stroke) Slide the tube into the fuselage. Position the tube so $1\frac{3}{8}$ inches (35mm) extends forward of the firewall. Use medium CA to glue the tube in the fuselage.



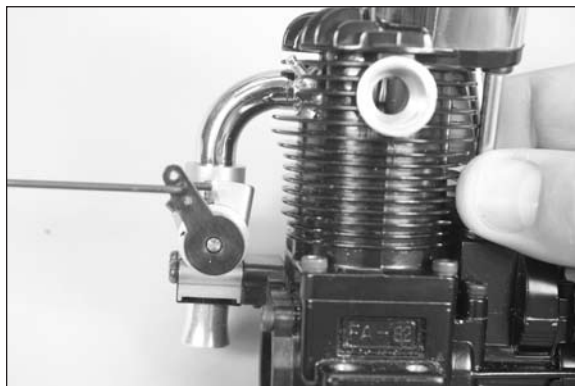
□ 8b. (Four-stroke) Slide the tube into the fuselage. Position the tube flush with the firewall. Use medium CA to glue the tube in the fuselage.



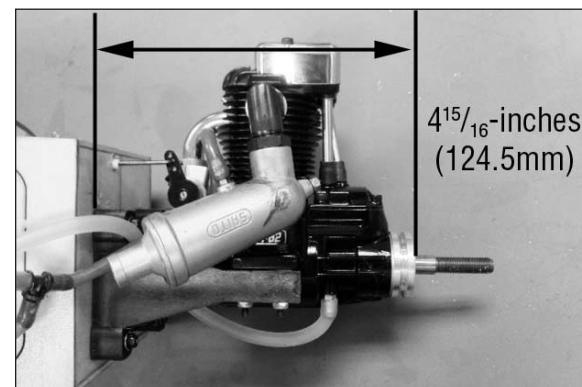
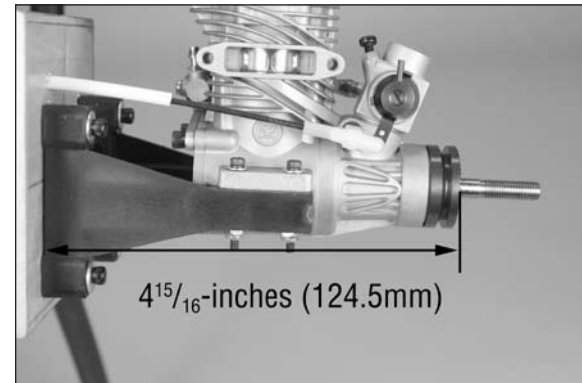
□ 9a. (Two-stroke) Use a hobby knife with a #11 blade to cut a $\frac{1}{4}$ inch (6mm) piece of safety tubing. Slide the safety tubing over the nylon clevis. Thread the clevis on the $1\frac{7}{16}$ inch (290mm) pushrod and attach it to the outside hole of the carburetor arm. Use side cutters to remove ONLY the Z-bend from the pushrod wire.



□ 9b. (Four-stroke throttle pushrod) When installing a four-stroke engine, the Z-bend in the pushrod will connect to the carburetor arm. Remove and rotate the carburetor as shown so the carburetor arm is on the side shown.



□ 10. Attach the engine to the nylon engine mount using four 4-40 x 1-inch socket head cap screws, four #4 washers and four 4-40 lock nuts. Place the washer on the bolt before passing it through the engine mounting lug. The forward bolt is located in the hole closest to the end of the mount, while the rear bolt is in the first oval hole. Use a $\frac{3}{32}$ -inch hex wrench and $\frac{1}{4}$ -inch nut driver to tighten the hardware. Check that the holes in the mount set the drive washer $4\frac{15}{16}$ -inches (124.5mm) forward of the firewall as shown. Use a $\frac{7}{64}$ -inch hex wrench to tighten the screws securing the mount to the firewall.



Glow-Powered Radio Tray and Fuel Tank Installation

Required Parts

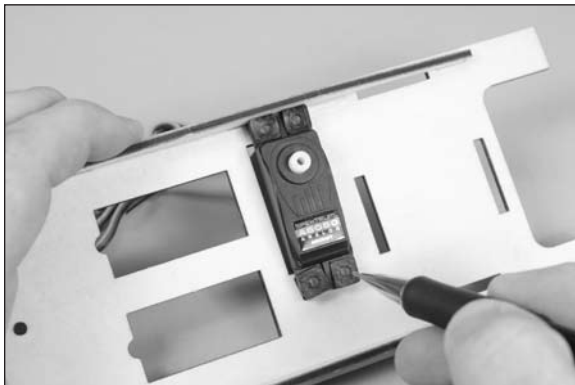
Fuselage assembly	Radio tray, glow powered
Hook and loop strap	M3 washer
Fuel tank	
M3 x 8 socket head wood screw (2)	
M3 x 12 socket head cap screw	

- 1. Locate the items for this section of the manual.

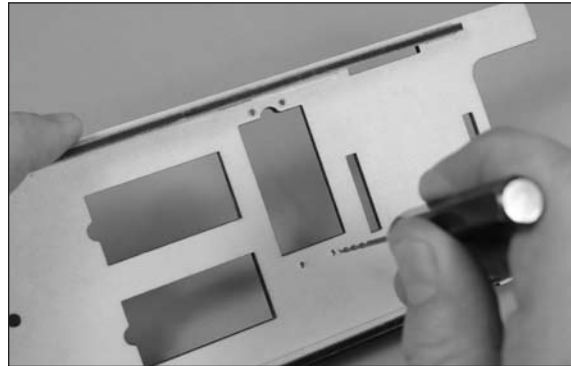


- 2. Prepare the rudder and elevator servos by installing the brass eyelets and rubber grommets.

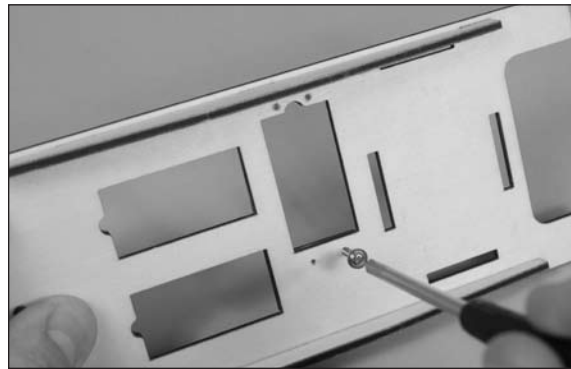
- 3. Place the throttle servo in the opening inside the fuselage with the output shaft to the side as shown. The servo will be centered in the opening to prevent vibrations from the airframe from being transferred to the servo. Use a pencil to mark the location for the screws that will secure the servo to the servo tray.



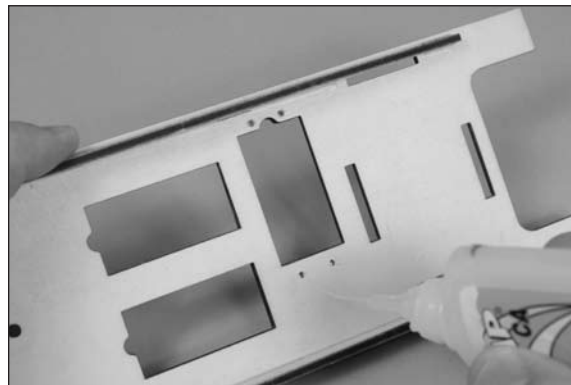
- 4. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill the holes for the four mounting screws.



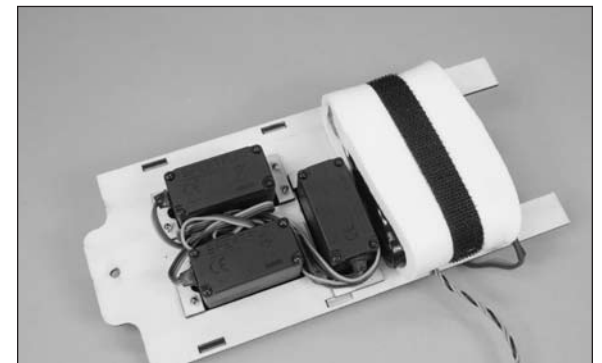
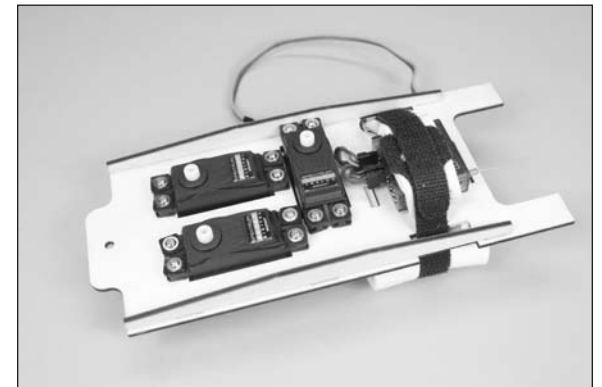
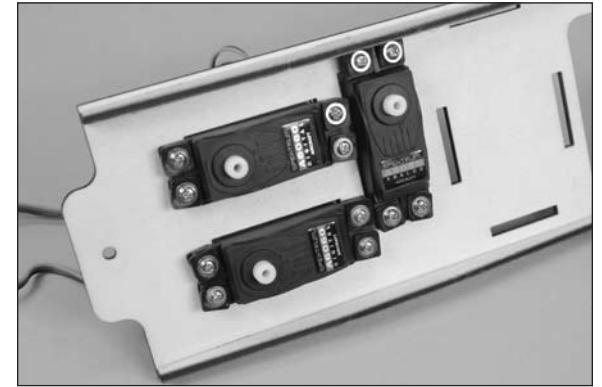
- 5. Use a #1 Phillips screwdriver to run a servo mounting screw in each of the four holes. Make sure to remove the screw before proceeding to the next step.



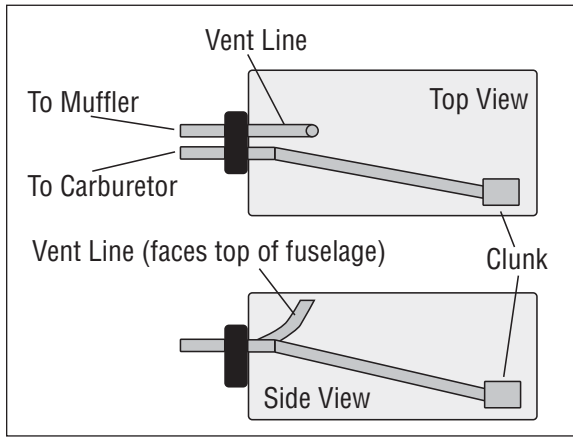
- 6. Apply 1–2 drops of thin CA in each hole drilled. This will harden the surrounding wood, making the screws more secure when installed.



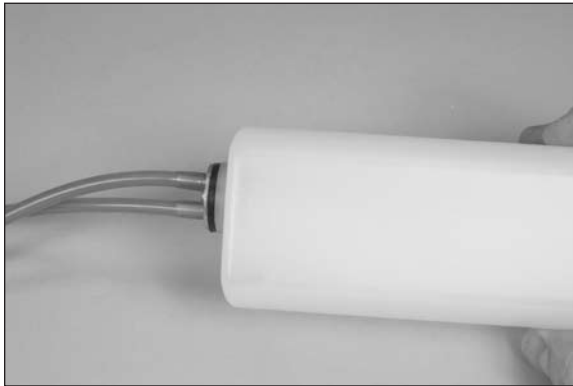
- 7. Use the screws provided with the servo and a #1 Phillips screwdriver to secure the servo to the servo tray. Secure the receiver and receiver battery to the radio tray using hook and loop tape (not included) and a hook and loop strap. Repeat steps 2 through 6 for all the servos.



- 8. Inspect the fuel tank to determine the location of the lines that will connect to the muffler and carburetor. Also note the orientation of the vent line inside the tank.



➔ *The fuel stopper and the fuel tubing are not gasoline compatible and need to be changed if installing the FG-14B.*



- 9. Place the fuel tank into the fuselage. Use two M2.8 x 8 socket head wood screws and a 2mm hex wrench to secure the tank in the fuselage.



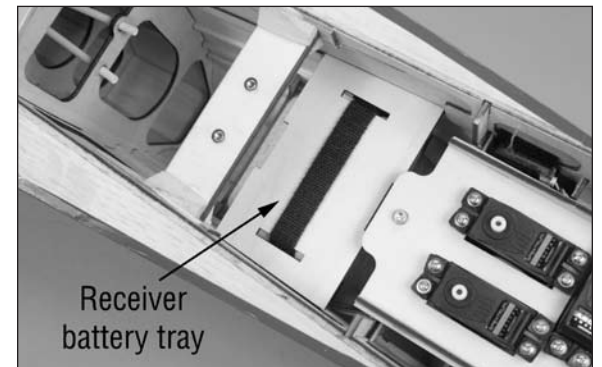
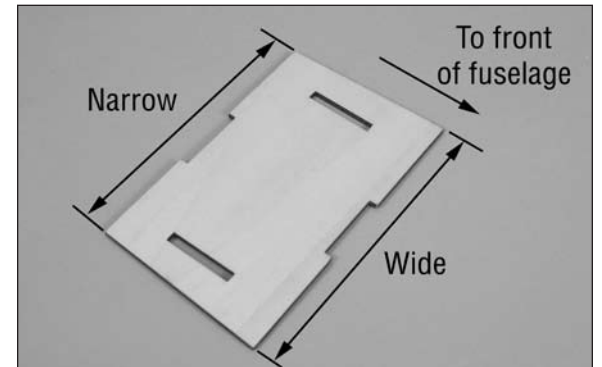
- 10. Mount the receiver switch harness in the fuselage using the hardware provided with the switch. Use a pin vise and 5/64-inch (2mm) drill bit to drill through the backing plate located behind the pilot holes for the switch. There are multiple locations for the switch, so choose the one that best suits your application.



- 11. Slide the radio tray into position. Use an M3 x 10 socket head screw and M3 washer to secure the tray in the fuselage. Connect the switch harness to the receiver and receiver battery. Use hook and loop tape to secure the remote receiver inside the receiver. Use threadlock on the screw to prevent it from vibrating loose.



- 12. (Optional gas battery installation) When installing a heavier engine such as the Saito FG14B, we have provided an additional tray to mount the receiver battery so the aircraft will balance correctly.

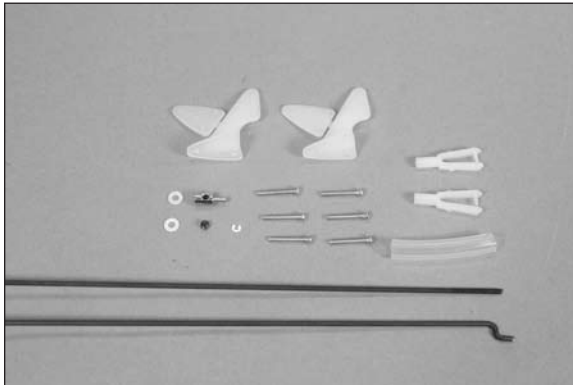


Rudder, Elevator and Throttle Pushrod Installation

Required Parts

Fuselage assembly	Nylon clevis (2)
Silicone tubing	M1.5 x 14 screw (6)
655mm pushrod, rudder	645mm pushrod, elevator
Pushrod connector with hardware	
Control horn with backplate (2)	

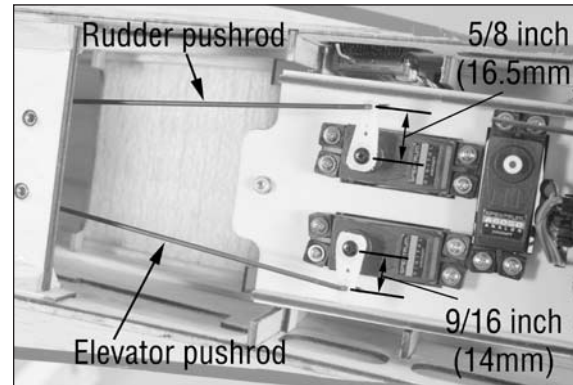
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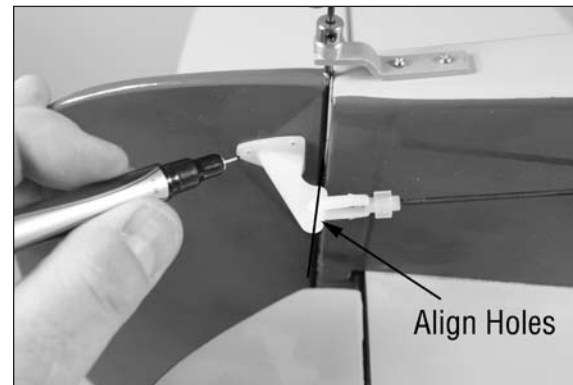
- 2. Place the servo horns on the rudder and elevator servos. Remove any unused arms using side cutters to avoid interference.



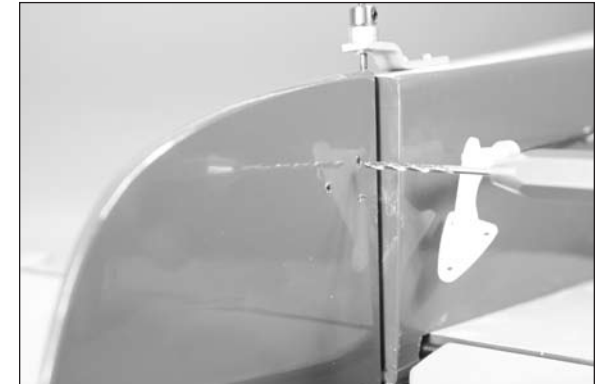
- 3. Slide the pushrod into their associated pushrod tubes. You will need to remove the covering at the rear of the fuselage so the pushrod can exit. The Z-bend from the 655mm rudder pushrod connects to the servo 5/8 inch (16.5mm) from the center of the horn, and the 645mm elevator pushrod connects to the horn 9/16 inch (14mm) from the center of the arm. Secure the arms using the screws from the servos and a #1 Phillips screwdriver.



- 4. Use a hobby knife and #11 blade to cut a 1/4 inch (6mm) piece of silicone tubing. Slide the tubing on a nylon clevis, then thread the clevis on the rudder pushrod. Remove the backplate from the control horn, then connect the clevis to the middle hole of the control horn. Align the holes in the control horn with the rudder hinge line. Use a felt-tipped pen to mark the locations for the control horn mounting screws.



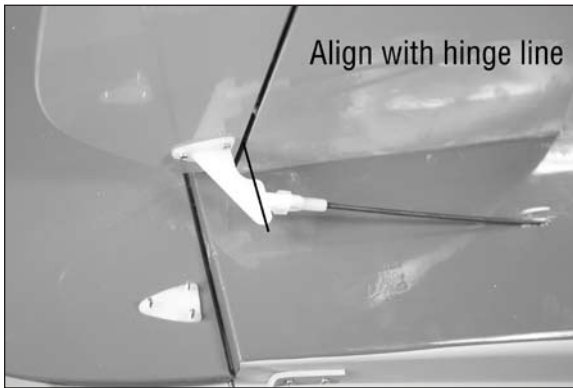
- 5. Use a pin vise and a 5/64-inch (2mm) drill bit to drill the holes through the elevator for the mounting screws. Place 1–2 drops of thin CA in each hole to harden the surrounding wood.



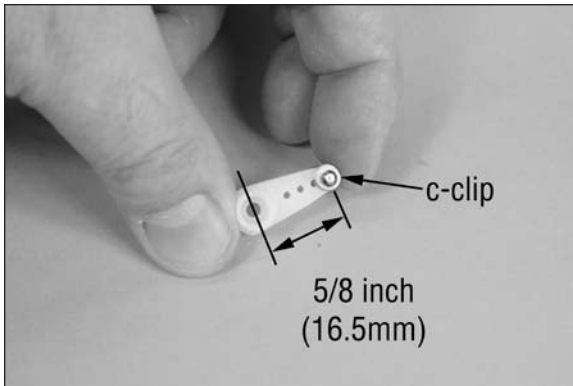
- 6. Attach the control horn to the rudder using three M1.4 x 14 screws and the control horn backplate.



□ 7. Repeat steps 4 through 6 to install the elevator control horn. The holes in the elevator control horn must align with the hinge line when positioning the horn.



□ 8. Use a pin vise and 5/64 -inch (2mm) drill bit to enlarge the hole in the servo horn that is 5/8-inch (16.5mm) from the center of the horn. Attach the pushrod connector using the C-clip included with the connector.

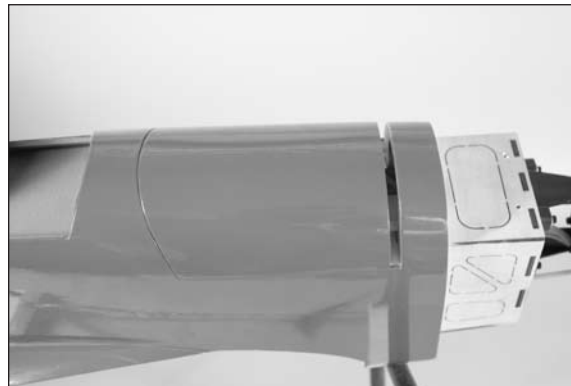


➔ *Two M2 washers have been provided with the connector. Use these to set the spacing between the clip and servo horn so the connector fits tightly without any excess movement.*

□ 9. Center the throttle servo using the radio system. Install the throttle servo horn perpendicular to the servo centerline (as seen in step 3 for the rudder and elevator servos) and secure it using a #1 Phillips screwdriver and the screw provided with the servo. Use the radio to move the servo to low throttle, and move the pushrod to close the throttle. Use a 1.5mm hex wrench to tighten the setscrew, securing the pushrod in the connector. Check the operation of the throttle. The carburetor should be open slightly when the trim is centered, but closed if the trim is set to close the throttle. It may be necessary to adjust the throw at the radio slightly to operate the throttle from fully open to fully closed. Once set, make sure to use threadlock on the setscrew to prevent it from vibrating loose.



□ 10. Once the linkages have been set, turn off the receiver and transmitter. Place the hatch back on the fuselage.

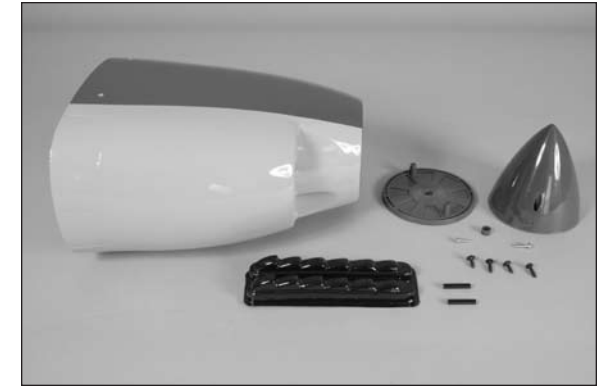


Cowl Preparation and Installation

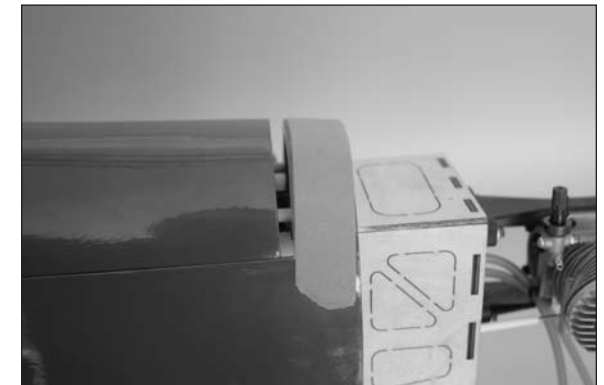
Required Parts

Fuselage assembly	Spinner cone
Spinner backplate	Spinner adapter
M3 x 10 wood screw (2)	
Exhaust stack (right and left)	
4mm x 20mm plastic tube, black (2)	
M3 x 10 black washer head screw (4)	

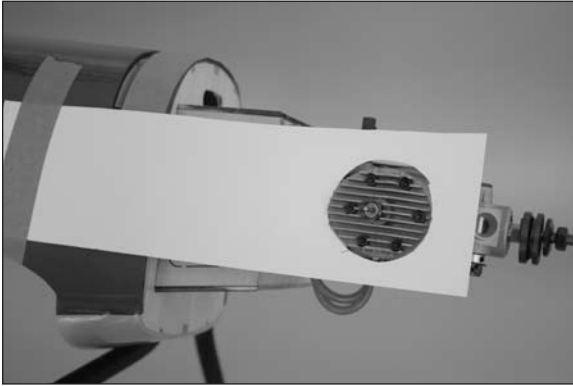
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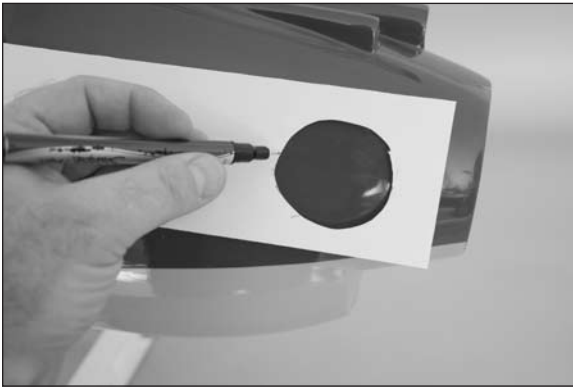
□ 2. Place three layers of low-tack tape on the front of the fuselage to set the spacing for the cowl. This will also allow the removal of the hatch without interfering with the cowl.



- 3. Use card stock to locate any items that may protrude from the cowling. This includes items such as the needle valve and cylinder head of the engine.



- 4. Slide the cowling onto the fuselage. Use the card stock and a felt-tipped pen to mark the cowling for any necessary openings.

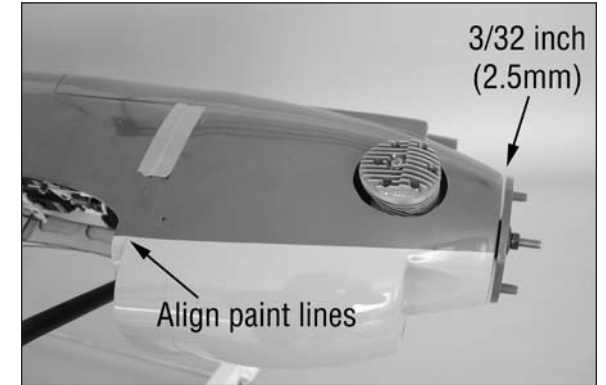


➔ We removed the engine from the fuselage to slide the cowling into position. Make sure to verify the cowling is positioned so the front of the cowling is $4\frac{15}{16}$ inch (124.5mm) from the firewall when marking the cowling.

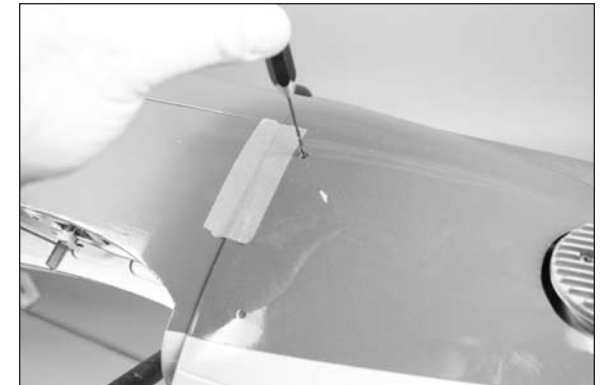
- 5. Use hobby scissors as well as a rotary tool with a sanding drum to make a notch in the cowl to clear the propeller shaft. This will make installing the cowl easier.



- 6. Remove the cowl and make any necessary openings using hobby scissors and a rotary tool with a sanding drum. (You may need to install the engine at this time.) Slide the cowl into position, then the spinner backplate. Use the spinner adapter if the backplate fits loosely on the engine shaft. With the spacing between the spinner backplate and cowling set at $\frac{3}{32}$ inch (2.5mm), tape the cowling to the fuselage, aligning the paint lines on the cowl to the fuselage.



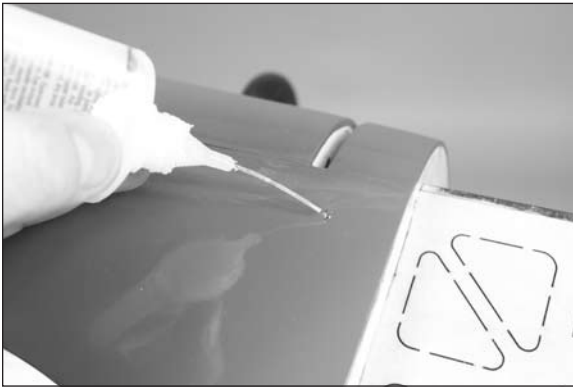
- 7. Use a pin vise and $\frac{1}{16}$ -inch (1.5mm) drill bit to drill the four holes for the cowl mounting screws.



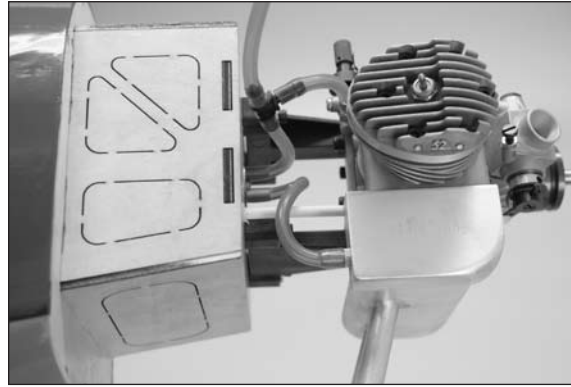
□ 8. Use a #1 Phillips screwdriver to run an M3 x 10 wood screw in each of the four holes. Make sure to remove the screw before proceeding to the next step.



□ 9. Apply 1–2 drops of thin CA in each hole drilled. This will harden the surrounding wood, making the screws more secure when installed.



□ 10. Attach the muffler to the engine. Connect the line from the vent to the fitting on the muffler. When connecting the line from the clunk to the carburetor, we installed a fuel filler dot to allow fueling the engine from outside the cowl.



□ 11. Fit the cowl to the fuselage. Use hobby scissors and a rotary tool with a sanding drum to remove the material necessary on the cowl to clear the muffler. Secure the cowl to the fuselage using the four M3 x 10 black washer head screws and a #1 Phillips screwdriver.



➔ *When installing the fuel filler in the cowl, make sure to position it lower on the cowl so it will not interfere with the installation of the exhaust stacks.*

□ 12. Secure the Spinner backplate and propeller using the hardware provided with the engine. Use a box wrench when tightening the propeller nut to avoid rounding the corners of the nut.



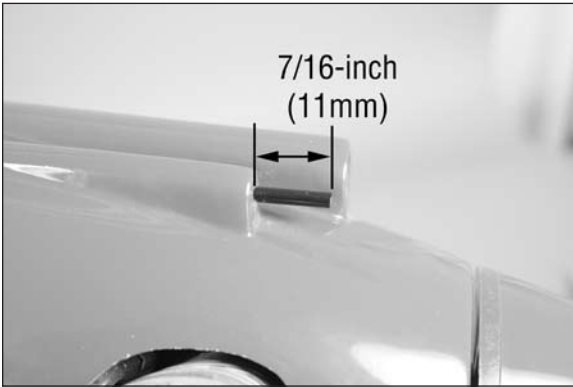
□ 13. The spinner provided has only one opening for the propeller. Multiple locations have been molded in for two- or three-bladed propellers. Use a rotary tool and a sanding drum to remove the material necessary to fit your particular propeller selection.



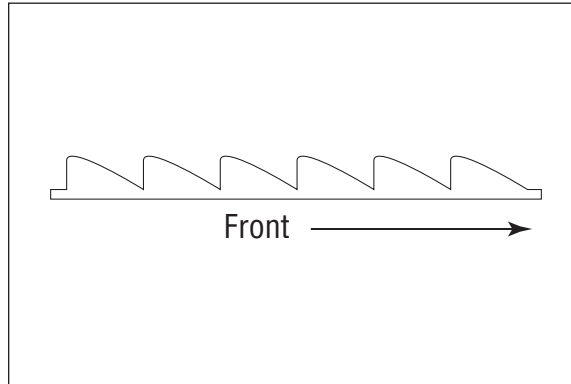
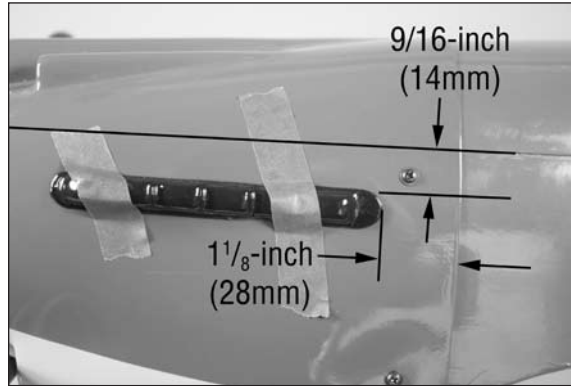
☐ 14. Secure the spinner using two M3 x 10 wood screws and a #1 Phillips screwdriver. Make sure the blades of the propeller do not touch the cut-outs of the spinner.



☐ 15. Use a drill and 9/32-inch (7mm) drill bit to drill the two holes for the cowl-mounted machine guns. Use a small amount of silicone adhesive to glue the guns into position.



☐ 16. Use hobby scissors and medium grit sandpaper to trim the exhaust stacks. Project a line parallel from the fuselage hatch onto the cowling. The exhaust stack is placed 9/16-inch (14mm) below the line, and 1 1/8-inch (18mm) forward of the rear edge of the cowl. Use a small amount of silicone adhesive to glue the exhaust stacks to the cowling. Use low-tack tape to hold the exhaust stacks in position until the glue fully cures.

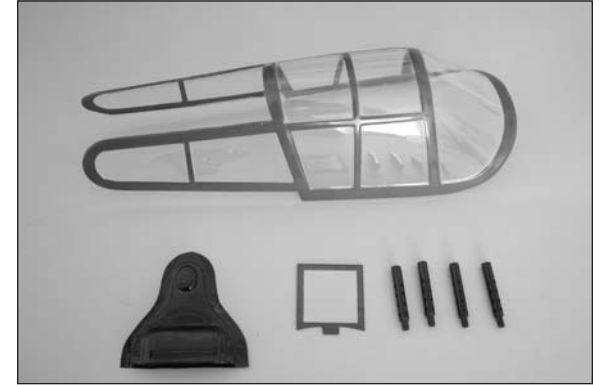


Canopy and Machine Gun Installation

Required Parts

Fuselage assembly	Wing assembly
Canopy	Black seat
Decal sheet	Black wing machine gun (4)
Plastic sheet with green framing	

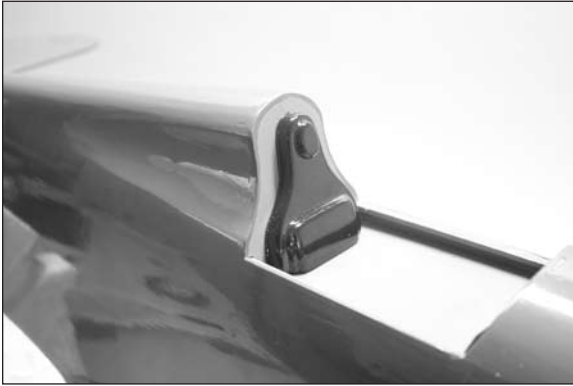
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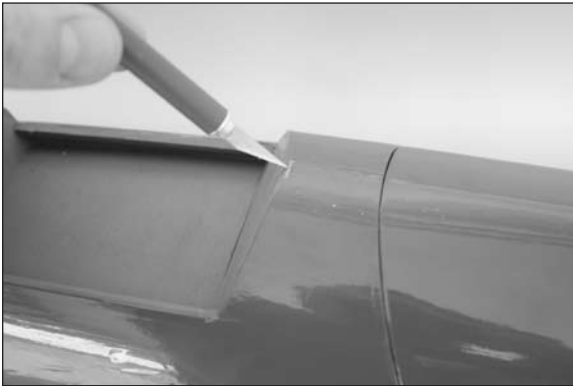
☐ 2. Use a hobby knife with a #11 blade to trim the instrument panel from the decal sheet. Apply the instrument panel decal in the cockpit as shown.



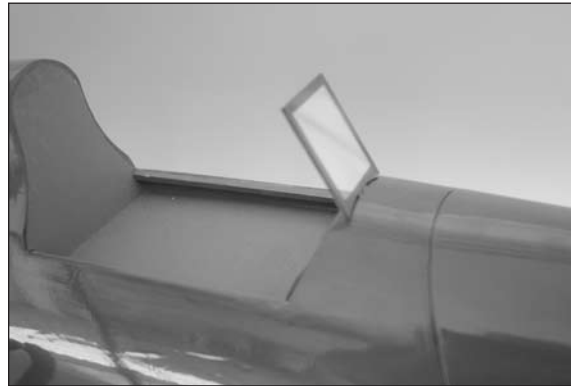
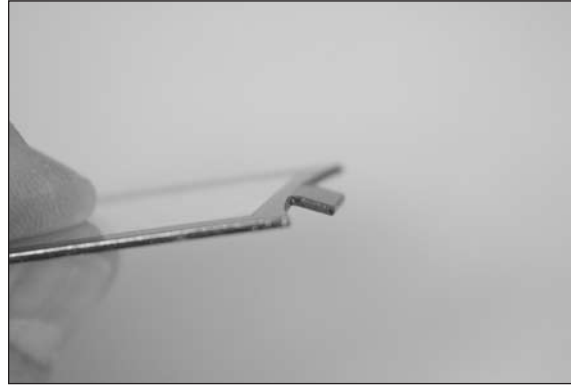
□ 3. Use hobby scissors to remove the flashing from the outside of the headrest. Use medium CA to glue the headrest in the cockpit.



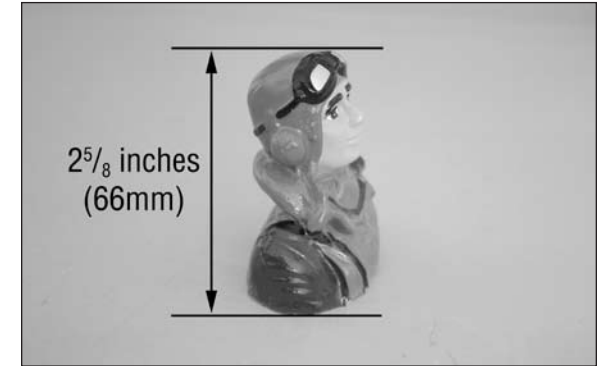
□ 4. Use a hobby knife and #11 blade to remove the covering for the plastic sheet with green fairing installation.



□ 5. Use pliers to slightly bend the tab on the plastic sheet with green fairing so it will clear the canopy. Insert the plastic sheet, then check the clearance between the plastic sheet and canopy. Once it fits without interference, use canopy glue to glue the plastic sheet into position.



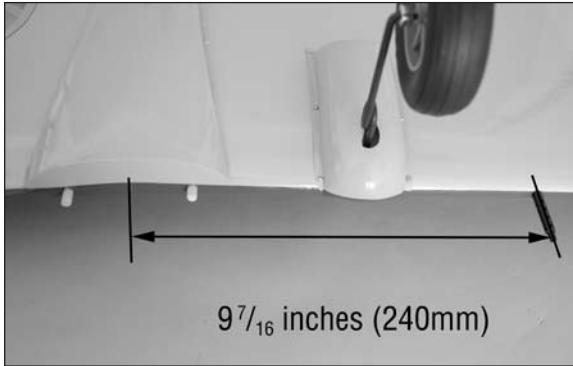
□ 6. (Optional) Trim the bottom of the pilot using a hobby knife with a #11 blade and razor saw. The overall height of the pilot will be $2\frac{5}{8}$ inches (66mm). Use 30-minute epoxy to secure the pilot figure in the cockpit.



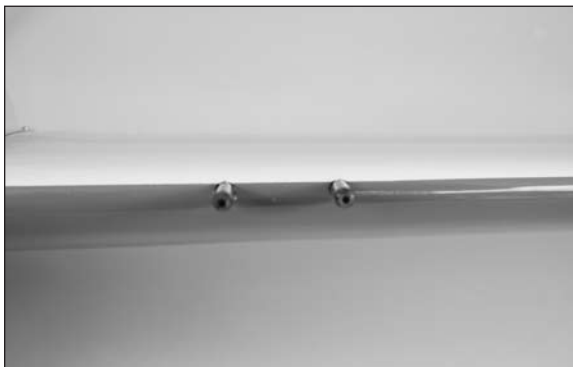
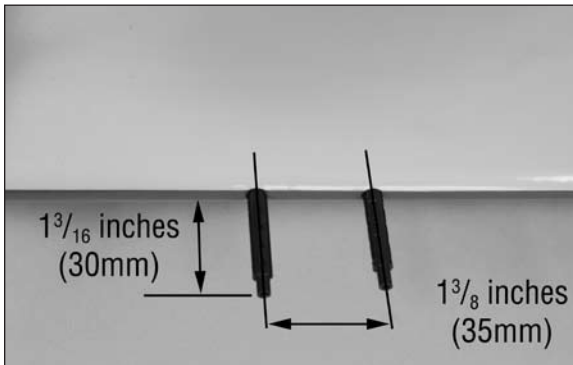
□ 7. Use canopy glue to glue the canopy to the fuselage. Make sure the canopy does not overlap onto the fuselage hatch. Use low-tack tape to hold the canopy in position until the glue fully cures.



- 8. Measure $9\frac{7}{16}$ inches (240mm) from the wing center. Use a $\frac{7}{32}$ -inch (5.5mm) brass tube to make the hole for the inboard machine gun. Note the position of the gun in reference to the leading edge in the photos and on the box.



- 9. The second machine gun is mounted $1\frac{3}{8}$ inches (35mm) toward the wing tip from the inboard machine gun. Align the guns, and set their distance from the leading edge as shown. Use silicone adhesive to glue the guns in the leading edge of the wing.



Decal Installation

Required Parts

Fuselage assembly Wing assembly
Decal sheet

- 1. Apply the decals to your model using the photos located in this section of the manual and the box art from your model. Use a spray bottle and a drop of dish washing liquid sprayed onto the model in the location of the decal to allow repositioning. Use a paper towel as a squeegee to remove excess water from under the decal. Allow the model to rest overnight so the remaining water can evaporate.

Use the following photos as a reference when installing the decals. Two different trim schemes have been provided.



Center of Gravity

Required Parts

Assembled model

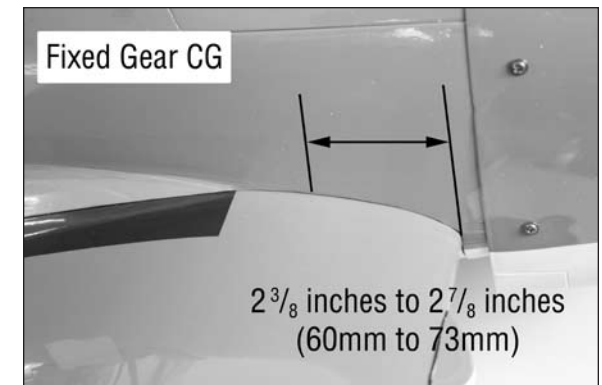
An important part of preparing the aircraft for flight is properly balancing the model.

⚠ CAUTION: Do not inadvertently skip this step!

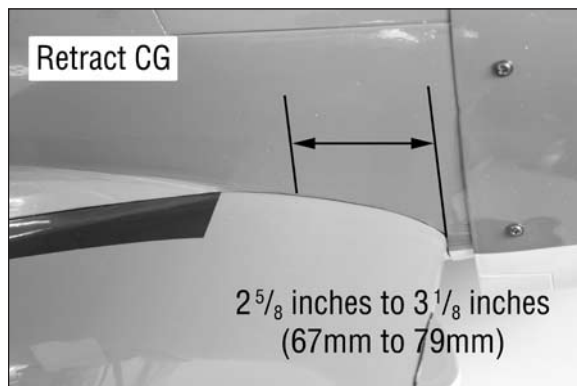
- 1. Attach the wing to the fuselage. Make sure to connect all the leads from the wing to the appropriate leads from the receiver.

The C/G range for your model will vary depending on which type of landing gear you have installed. The C/G for the fixed gear will be further forward than the C/G for the model when using the rotating retractable landing gear. This difference in C/G location is to aid in the ground handling and landing aspects of the model. Balance the model using the following recommendations for the type of landing gear you have installed.

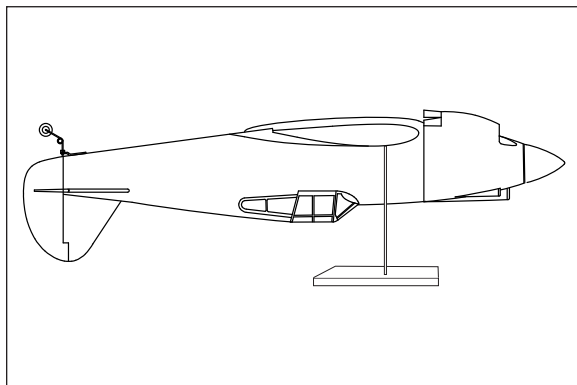
- 2. (Fixed Gear CG) When flying your model with fixed gear, the recommended Center of Gravity (CG) location is $2\frac{3}{8}$ inches to $2\frac{7}{8}$ inches (60mm to 73mm) back from the leading edge on the top of the wing against the fuselage.



□ 3. (Retracts CG) When flying with retracts, balance your model with the landing gear UP measuring $2\frac{5}{8}$ inches to $3\frac{1}{8}$ inches (67mm to 79mm) back from the leading edge. Mark the location of the CG on the top of the wing with a felt-tipped pen.



□ 4. When balancing your model, make sure it is assembled and ready for flight. Support the plane inverted at the marks made on the wing with your fingers, or use a commercially available balancing stand. This is the correct balance point for your model.



□ 5. You should find the CG to be very close with the components installed as shown in this manual. If the nose of your aircraft hangs low, add weight to the rear of the aircraft. If the tail hangs low, add weight to the nose of the aircraft. Self-stick weights (HAN3626) are available at your local hobby store and work well for this purpose.

Control Throws

- 1. Turn on the transmitter and receiver of your model. Check the movement of the rudder using the transmitter. When the stick is moved to the right, the rudder should also move right. Reverse the direction of the servo at the transmitter if necessary.
- 2. Check the movement of the elevator with the radio system. Moving the elevator stick toward the bottom of the transmitter will make the airplane elevator move up.
- 3. Check the movement of the ailerons with the radio system. Moving the aileron stick to the right will make the right aileron move up and the left aileron move down.
- 4. Use a ruler to adjust the throw of the elevator, ailerons and rudder.

Aileron:

High Rate:

Up:	13/16 inches	20 mm
Down:	11/16 inches	17 mm

Low Rate:

Up:	7/16 inches	10 mm
Down:	9/32 inches	7 mm

Elevator:

High Rate:

Up:	11/16 inches	18 mm
Down:	11/16 inches	18 mm

Low Rate:

Up:	7/16 inches	11 mm
Down:	7/16 inches	11 mm

Rudder:

High Rate:

Right:	2 inches	51 mm
Left:	2 inches	51 mm

Low Rate:

Right:	$1\frac{3}{16}$ inches	30 mm
Left:	$1\frac{3}{16}$ inches	30 mm

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

➔ *Travel Adjust and Sub-Trims are not listed and should be adjusted according to each individual model and preference. Always install the control horns 90 degrees to the servo centerline. Use sub-trim as a last resort to center the servos.*

➔ *We highly recommend re-binding the radio system once all the control throws are set. This will keep the servos from moving to their endpoints until the transmitter and receiver connect.*

Preflight Checklist

- Charge the radio system the night before each flying session.
- Charge transmitter and receiver batteries using only included or manufacturer-recommended chargers. Follow all manufacturer's instructions for your electronic components.
- Check the radio installation and make sure all control surfaces (aileron, elevator, rudder and throttle) move correctly (i.e., the correct direction and with the recommended throws).
- Check all the hardware (control horns, servo horns, and clevises) to make sure they are secure and in good condition.
- Prior to each flying session (and especially with a new model), perform a range check of your radio system. See your radio manual for the recommended range and instructions for your particular radio system.
- Run the motor. With the model securely anchored, repeat the range check procedure. The range should not be significantly affected. If it is, do not attempt to fly! Remove the radio equipment and have it inspected by the manufacturer.

Safety Do's and Don'ts for Pilots

- Consult local laws and ordinances before choosing a location to fly your aircraft.
- Check all control surfaces prior to each takeoff.
- Do not fly your model near spectators, parking areas or any other area that could result in injury to people or damage of property.
- Do not fly during adverse weather conditions. Poor visibility can cause disorientation and loss of control of your aircraft. Strong winds can cause similar problems.
- Do not take chances. If at any time during flight you observe any erratic or abnormal operation, land immediately and do not resume flight until the cause of the problem has been ascertained and corrected. Safety can never be taken lightly.
- Do not fly near power lines.

Daily Flight Checks

- 1. Check the battery voltage of the transmitter battery. Do not fly below the manufacturer's recommended voltage. To do so can crash your aircraft.

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

- 2. Check all hardware (linkages, screws, nuts, and bolts) prior to each day's flight. Ensure that binding does not occur and that all parts are properly secured.
- 3. Ensure all surfaces are moving in the proper manner.
- 4. Perform a ground range check before each day's flying session.
- 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 sound a warning.
- 6. Check that all trim levers are in the proper location.
- 7. All servo pigtails and switch harness plugs should be secured in the receiver. Make sure the switch harness moves freely in both directions.

Limited Warranty

WHAT THIS WARRANTY COVERS

Horizon Hobby, Inc. ("Horizon") warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase.

WHAT IS NOT COVERED

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, or (v) Products not purchased from an authorized Horizon dealer.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

PURCHASER'S REMEDY

Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

LIMITATION OF LIABILITY

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

LAW

These terms are governed by Illinois law (without regard to conflict of law principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

Warranty Services

QUESTIONS, ASSISTANCE, AND SERVICES

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

INSPECTION OR SERVICES

If this Product needs to be inspected or serviced, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at <http://www.horizonhobby.com> under the Support tab. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

Notice: Do not ship LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

WARRANTY REQUIREMENTS

For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

NON-WARRANTY SERVICE

Should your service not be covered by warranty service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website <http://www.horizonhobby.com/Service/Request>.

UNITED STATES

(Electronics and engines)
Horizon Service Center
4105 Fieldstone Rd
Champaign, Illinois
61822 USA
productsupport@horizonhobby.com
877-504-0233
Online Repair Request visit:
www.horizonhobby.com/service

(All other products)
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Compliance Information for the European Union



INSTRUCTIONS FOR DISPOSAL OF WEEE BY USERS IN THE EUROPEAN UNION

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

Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2011

A. GENERAL

A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.

1. Model aircraft will not be flown:
 - (a) In a careless or reckless manner.
 - (b) At a location where model aircraft activities are prohibited.
2. Model aircraft pilots will:
 - (a) Yield the right of way to all man carrying aircraft.
 - (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D-See and Avoid Guidance.)
 - (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport, without notifying the airport operator.
 - (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
 - (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Aircraft program. (AMA Document 520-A)
 - (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors).
 - (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
 - (h) Not operate model aircraft while under the influence of alcohol or while using any drug which could adversely affect the pilot's ability to safely control the model.
 - (i) Not operate model aircraft carrying pyrotechnic devices which explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

Exceptions:

- Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.

- Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
- Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document (AMA Document #718).
 - (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A).
- 3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
 - (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
 - (b) An inexperienced pilot is assisted by an experienced pilot.
- 4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. RADIO CONTROL (RC)

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place (AMA Document #706-Recommended Field Layout):
 - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
 - (b) At air shows or demonstrations, a straight safety line must be established.
 - (c) An area away from the safety line must be maintained for spectators.
 - (d) Intentional flying behind the safety line is prohibited.
4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
5. RC model aircraft will not operate within three (3) miles of any pre-existing flying site without a frequency-management agreement (AMA Documents #922- Testing for RF Interference; #923- Frequency Management Agreement)

6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flight line.
7. 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. This does not apply to model aircraft flown indoors.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times.
9. The pilot of a RC model aircraft shall:
 - (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
 - (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.

C. FREE FLIGHT

1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed its function.

D. CONTROL LINE

1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line Precision Aerobatics.
4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 feet to any above-ground electric utility lines.
5. The flying area must be clear of all nonessential participants and spectators before the engine is started.



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