

Phoenix 7 ARF

Assembly Manual



HANGAR 9[®]

Fly First Class[™]

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 small or null 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 likely probability of physical property damage AND may lead to a dangerous condition or cause death or serious injury to the user, OR procedures, which if not followed, create the 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 disassemble, 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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Intro

Designed by RC icon Don Lowe, the Phoenix 7 is one of the most potent pattern ships of the 1970s. Seventh in the Phoenix series, this Don Lowe creation dominated the pattern circuit in the mid to late 1970s, won the US Nationals and earned top placements for the US F3A World Championship team at the 1977 World Championships in Springfield, Ohio.

We at Hangar 9 are honored to have had the opportunity to work with Don Lowe to bring an accurate recreation of one of the most popular and contest-winning pattern designs of all time. Finished in Mark Radcliff's famous trim scheme from the Phoenix 7 that earned him a spot on the 1977 US World Championship team, the Hangar 9 Phoenix 7 is a reminder of the smooth, arrow-like performance of yesterday's pattern ships.

Product Support

For technical assistance with this product, please contact the appropriate Horizon Product Support office. See page 40.

Specifications

Wingspan	63.0 in (160cm)
Length	56.0 in (142cm)
Wing Area	690 sq in (44.5 sq dm)
Weight	7.50–8.25 lb (3.40–3.80 kg)
Radio	4-channel (or greater) with 5 servos (6 servos with retracts)
Engine	.52–.61 2-stroke

Included Parts Listing

PACKAGED IN KIT

Fuselage with hinged rudder	1
Right horizontal stabilizer with hinged elevator	1
Left horizontal stabilizer with hinged elevator	1
Wing with hinged aileron	1

ENGINE MOUNT

Black nylon motor mount	2	Mount engine to firewall
8-32 x 3/4-inch Phillips head machine screw	4	Mount to firewall
8-32 blind-nuts	4	Mount to firewall
#8 silver flat washer	4	Mount to firewall
#6 x 3/4-inch socket head wood screw	4	Engine to mount

LANDING GEAR

Fixed landing gear mounts	3	Fixed gear
Nose wheel metal steering arm	1	Nose wheel steering
#6 X 3/4 inch Phillips wood screw	12	Fixed gear/ retract mounting screws
EZ Connectors	3	Nose gear steering/ throttle
Nylon EZ connector backplate	3	Nose gear steering (2) Throttle (1)
4mm wheel collar	7	Main gear (4) Nose gear (3)
3mm x 3mm setscrew (small)	8	Landing gear/ nose wheel steering
3mm x 5mm setscrew (large)	3	Landing gear struts to mounts
3mm x 5mm Phillips head setscrew	3	EZ connectors
Plywood pushrod support steering	4	Throttle/ Nose gear
38-inch thin braded cable	1	Nose gear steering
Copper crimp	4	Nose gear steering
Hex wrench: 1.5mm	1	
19mm x 13mm x 40mm hardwood block	2	Nose wheel spacers

NYLON PARTS

Nylon clevis	5	Elevator (2) Rudder (1) Aileron (2)
Silicone clevis keeper	6	Elevator (2) Rudder (1) Throttle (1) Aileron (2)
90-degree snap link	4	Elevator (1) Rudder (1) Aileron (2)
1/4-20 x 2-inch nylon wing bolt	4	Wing to fuselage

WHEELS & STRUTS

2.5-inch (64mm) H9 Pro-lite wheel	2	Main gear
2-inch (51mm) H9 Pro-lite wheel	1	Nose gear
4mm x 136mm nose gear wire strut	1	Fixed nose gear
4mm x 142mm main gear wire strut	2	Fixed main gear
2 1/4-inch (57mm) white nylon spinner	1	
2.5mm x 12mm self-tapping wood screw	2	Spinner to backplate

PUSHRODS

2-56 x 30-inch pre-bent pushrod	1	Rudder pushrod
Wood dowel "Y" pushrod with 2-56 threaded end	1	Elevator pushrod
36-inch clear pushrod guide tube	2	Nose gear steering/ elevator guide tubes
13-inch clear pushrod guide tube	1	Throttle linkage wire
18-inch braided throttle cable w/ metal clevis	1	Throttle linkage wire
2-56 x 3 1/2-inch pre-bent pushrod	2	Aileron pushrods

PACKAGED SEPARATELY

5/8-inch RX foam	2	RX/ fuel tank
5/8-inch RX foam with RX and battery cut-out	1	RX/ battery mount
9-inch hook and loop straps	2	RX/ battery mount
5/16-inch x 11 1/4-inch aluminum anodized blk tube	1	Stab joiner tube
17oz (500cc) pre-assembled fuel tank	1	Engine



Contents of Kit and Parts Layout

Replacement Parts

- | | |
|--------------|-----------------------------------|
| 1. HAN475501 | Fuselage with Rudder |
| 2. HAN475502 | Wing Complete with Belly Pan |
| 3. HAN475503 | Right and Left Stabilizer Set |
| 4. HAN475504 | Rudder |
| 5. HAN475505 | Stabilizer Aluminum Tube |
| 6. HAN475506 | Fixed Landing Gear without Wheels |
| 7. HAN475507 | Pushrods |
| 8. HAN475512 | Fuel Tank 17 oz (500cc) |
| 9. HAN4049 | 2 1/4-inch Spinner (White) |
| 10. HAN304 | Wheel, Main 2 1/2-inch (63mm) |
| 11. HAN302 | Wheel, Nose 2-inch (51mm) |

Items Not Shown

- | | |
|-----------|----------------------------|
| HAN475508 | Nose Wheel Steering Cables |
| HAN475510 | Decals |
| HAN475511 | Wheel Well Liners |
| HAN475513 | Engine Mount |
| HAN475509 | Hardware Package |

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.

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.

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

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 and explosion 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.

Phoenix 7 Safe Operating Recommendations

- Inspect your model before every flight to make certain 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 of your selected flight area.
- Choose an area clear of obstacles and large enough to safely accommodate your flying activity.
- Make certain 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 section on page 39 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 boxes (□□) indicate that the step will require repeating, such as for a right or left wing panel, two servos, etc. Remember to take your time and follow the directions.

UltraCote® Covering Colors

• White	HANU870
• True Red	HANU866
• Deep Blue	HANU873

Recommended Setup—2-Stroke Glow

- Evolution® .60NX with Muffler (EVOE0600)
- Evolution Propeller 11 x 7 (EVO11070)
- Exhaust Diverter (DUB697) (Optional)

Optional Tuned Pipe Installation

If you are installing the optional tuned pipe, the following items will be required:

• Header Long EVO 40/46	(MAC2591)
• Muffled Tuned Pipe 8.5cc: .45-.60	(MAC1250)
• Hush Clamp .40	(DAV1060)
• Pressure fitting 8-32	(MAC9021)
• Super Plug	(HAN3011)

Transmitter Requirements

The Phoenix 7 requires a minimum of a 6-channel radio to operate all the functions of your aircraft. We suggest the following radio systems available through Horizon Hobby or your local hobby distributor.

Spektrum DX6i	SPM6600
Spektrum DX7	SPM2710
JR Systems X9503 2.4GHz	JRP2930
JR Systems 12X 2.4GHz	JRP1200

Radio Equipment Requirements

The following items are recommended when installing the 7-Channel AR7000 (SPM6070) or 9-Channel AR9000 receiver (SPMAR9000) in your aircraft:

DS821 Digital Sport Servo (5–6)	JRPS821
6-inch Servo Extension (2) (Ailerons)	JRPA095
9-inch Servo Extension (Ailerons)	JRPA097
Receiver Pack 2300mAh 6V Ni-MH	JRPB5006
Deluxe Charge Jack Assembly	JRPA025
Spektrum 3-Wire Switch Harness	SPM9530

Ailerons: DS821 Servo (2)

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

Elevator: DS821 Servo

Rudder: DS821 Servo

Throttle: DS821 Servo

Optional Receiver Battery

The following receiver battery and regulator can be used instead of the JRPB5006 receiver battery.

Li-Po Receiver Pack 2000mAh	SPMB2000LP
High-Output Li-Po Regulator without Switch	LOS9609

Note: You will not be able to bind the receiver when it is installed in the fuselage using the optional receiver battery. It must be bound before installation.

Optional Retracts

Robart Spring Down Retracts with Air Installation Kit (HAN500)
Robart Air Pump (ROB164G)
DS821 Digital Sport Servo (JRPS821)

Field Equipment Required

- Fuel (15% recommended)
- Long Reach Glow Plug Wrench (HAN2510)
- Metered Glow Driver with Ni-Cd & Charger (HAN7101)
- 2-Cycle Sport Plug (HAN3011)
- Manual Fuel Pump (HAN118)

Optional Field Equipment

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

Additional Required Tools

Clamp (2)	Clear tape
Crimping tool	Cut-off wheel
Drill	Epoxy brush
Felt-tipped pen	Flat blade screwdriver
Hex wrench: 1.5mm, 1/8-inch	Flat file
Hobby knife with #11 blade	Hobby scissors
Low-tack tape (MMM209034)	Mixing cup
Mixing stick	Paper towel
Pencil	PFM or Zap-A-Dap-A-Goo
Phillips screwdriver: #1, #2	Pin vise
Rotary tool	Rubbing alcohol
Ruler	Sanding Drum
Medium grit sandpaper	Side cutter
Small clamp (2)	Square
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 3/32-inch (2.5mm), 3/16-inch (5mm)	

Optional

- Long drill bit: 11/64-inch (4.5mm)

Additional Required Adhesives

Medium CA	(PAAPT02)
Thin CA	(PAAPT08)
Threadlock	(PAAPT42)
30-Minute Epoxy, 8 oz	(PAAPT39)

Before Starting Assembly

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

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



HAN100 – Heat Gun



HAN150 – Covering Glove

HAN101 – Sealing Iron

HAN141 – Sealing Iron Sock

Aileron Servo Installation

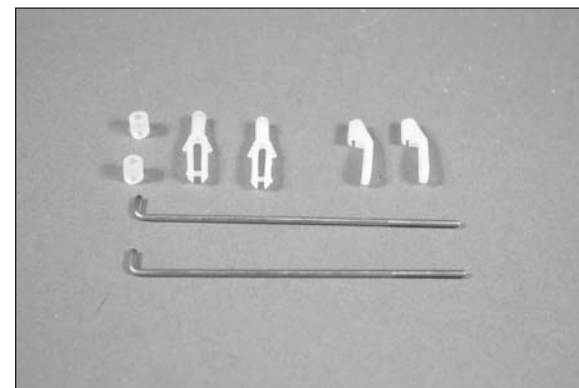
Required Parts

Wing panel	Servo with hardware (2)
Nylon clevis (2)	Silicone clevis keeper (2)
Nylon pushrod keeper (2)	
6-inch (152mm) servo extension (2)	
3 1/2-inch (89mm) aileron pushrod wire (2)	

Required Tools and Adhesives

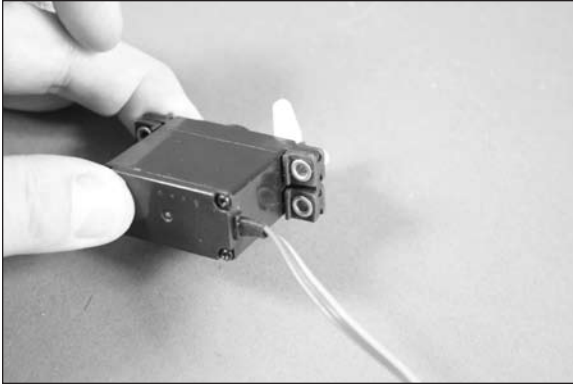
Pin vise	Pencil
Thin CA	Phillips screwdriver: #1
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)	

□ 1. Locate the items necessary to install the aileron servos. You will also need to have two servos with associated hardware as well as the wing.

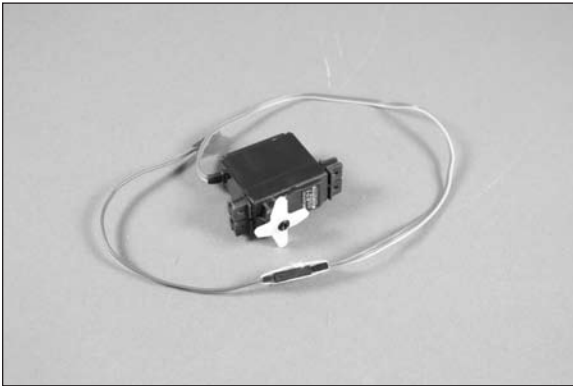


□ 2. Prepare the aileron servo by installing the rubber grommets and brass eyelets following the instructions provided with the servo.

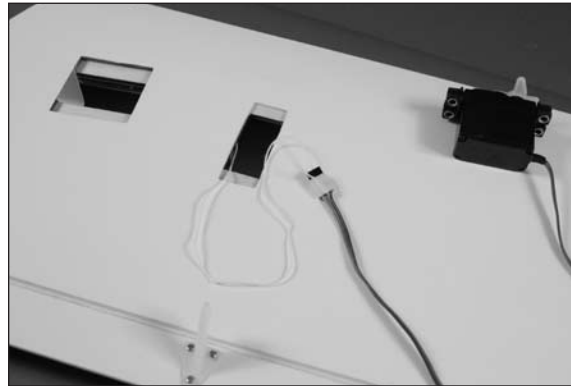
Hint: Prepare all the servos for your model at this time. Don't forget to prepare the retract servo as well if you are installing the optional retracts.



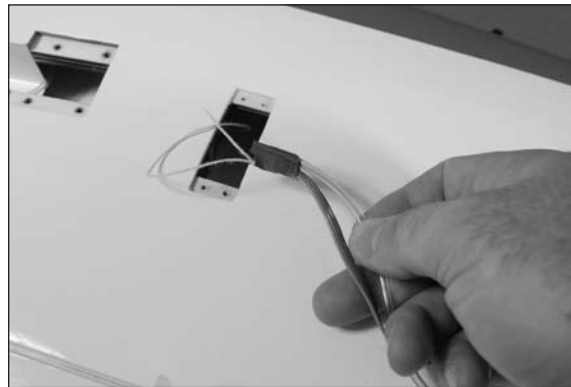
□□ 3. Secure a 6-inch (152mm) servo extension to the aileron servo lead using string or a commercially available connector. This will prevent the extension from accidentally disconnecting inside the wing.



□□ 4. A string has been installed in the wing to pull the aileron servo extension through the wing. Tie or tape the string to the end of the extension.

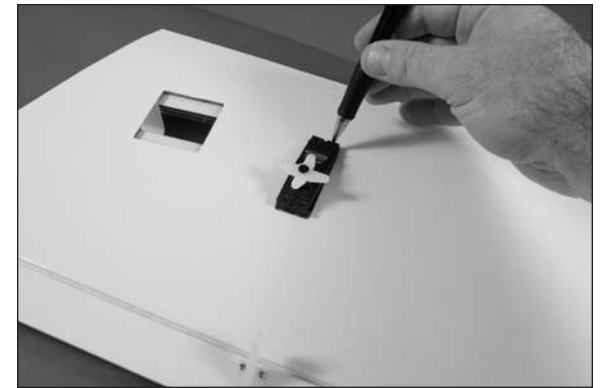


Note: If you are installing retracts, you will need to pull the retract air line through the wing at this time as well. Cut a 14-inch (350mm) piece of airline and tape it to the servo lead so it can be pulled through the wing at this time. Once through, guide the end of the air line out through the opening for the landing gear mount.

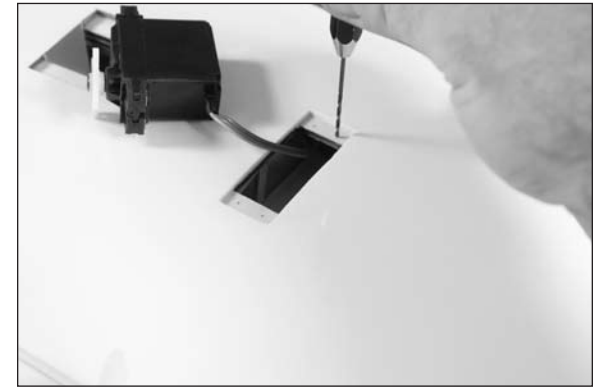


□□ 5. Use the string to pull the extension through the wing and out of the hole located in the top center of the wing.

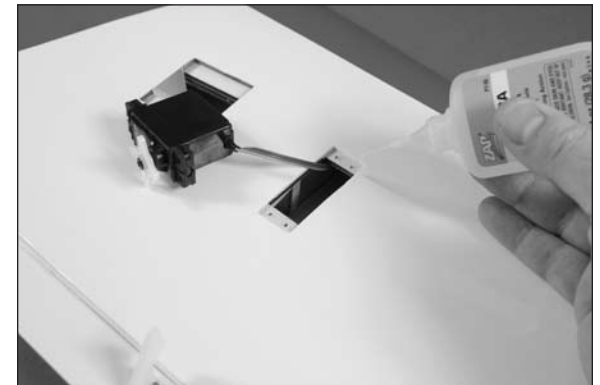
□□ 6. Place the aileron servo in the opening in the wing with the output of the servo facing the aileron. Use a pencil to transfer the locations for the four mounting screws onto the servo mounts in the wing.



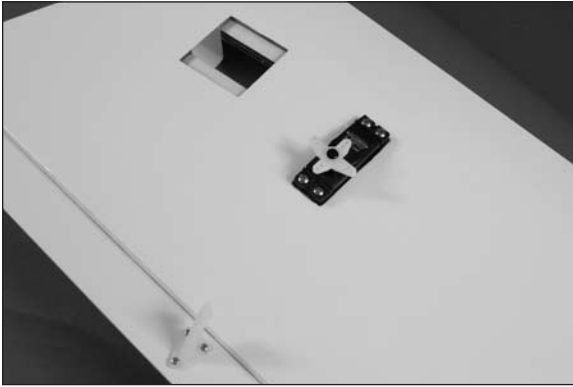
□□ 7. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill the four holes for the servo mounting screws.



□□ 8. Place 2–3 drops of thin CA in each of the holes to harden the surrounding wood. This creates a hard surface for the screws and will help in preventing them from vibrating loose.

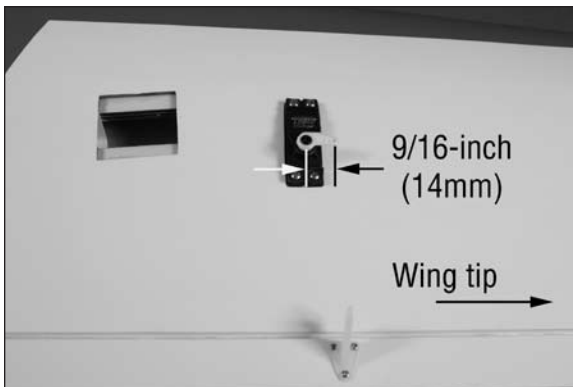


□□ 9. Use the screws provided with the servo and a #1 Phillips screwdriver to secure the aileron servo in the wing.

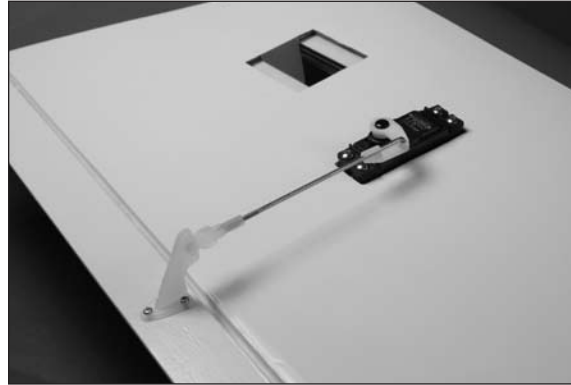


□□ 10. Remove the standard servo horn from the aileron servo. Use the radio system to center the aileron servo. Place a 180-degree servo horn on the servo, making sure it is parallel to the aileron hinge line. Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in the servo arm that is 9/16-inch (14mm) from the center of the servo horn. Make sure to drill the hole on the side toward the wing tip. Use side cutters to remove the arm from the servo horn that will not be used to prevent it from interfering with the operation of the servo. Secure the horn to the aileron servo using the screw included with the servo and a #1 Phillips screwdriver.

Note: The servo has an odd number of splines. You may need to rotate the horn 180-degrees so it aligns with the hinge line. Try not to use the sub-trim function when installing the servo horn.



□□ 11 Attach the 3 1/2-inch (89mm) pushrod wire to the servo horn using a nylon pushrod keeper. You may need to use pliers to snap the keeper on the wire. Slide a silicone clevis keeper on a clevis. Thread the clevis on the pushrod wire. With the servo centered, connect the clevis to the center hole of the control horn. Make sure the aileron is centered when the clevis is connected. Slide the silicone clevis keeper over the forks of the clevis to keep it from opening accidentally in flight.



□ 12. Repeat Steps 3 through 11 to install the remaining aileron servo.

Main Gear Installation-Fixed

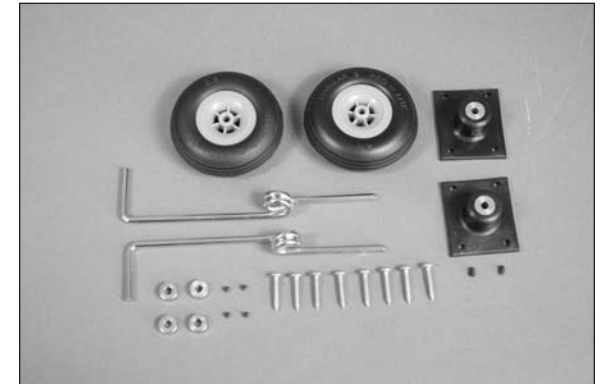
Required Parts

Wing panel	Landing gear block (2)
3mm x 3mm setscrew (4)	4mm wheel collar (4)
3mm x 5mm setscrew (2)	
Main gear wire (right and left)	
Main wheels, 2 1/2-inch (64mm)	
#6 x 3/4-inch sheet metal screw (8)	

Required Tools and Adhesives

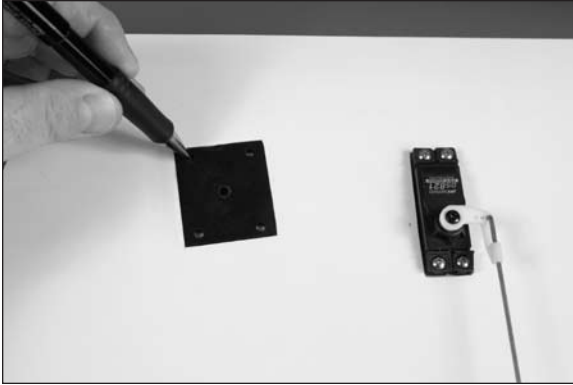
Drill bit: 3/32-inch (2.5mm)	Drill
Thin CA	Phillips screwdriver: #2
Hex wrench: 1.5mm)	Flat file

□ 1. Locate the items necessary to install the fixed main gear in the wing. You will also need the wing in addition to the items shown in the photo.

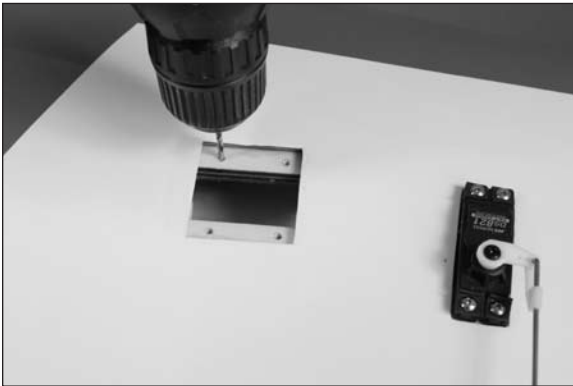


□□ 2. Place the landing gear block in the wing. Use a pencil to transfer the locations for the mounting screws onto the landing gear rails.

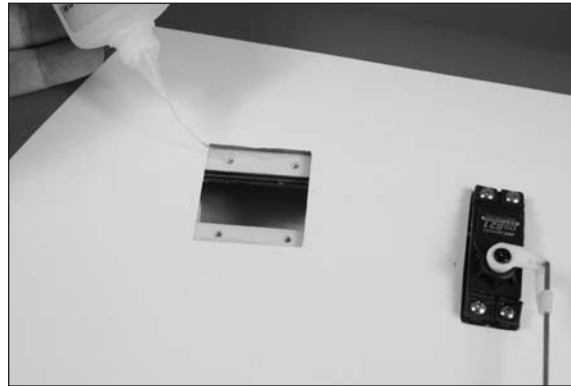
Note: The landing gear block and our suggested retracts use the same mounting location to make the installation of retracts at a later date easier.



□□ 3. Remove the block from the wing. Use a drill and 3/32-inch (2.5mm) drill bit to drill the holes for the mounting screws. Make sure to place the drill bit as far as possible in the drill chuck to help prevent drilling through the top of the wing.

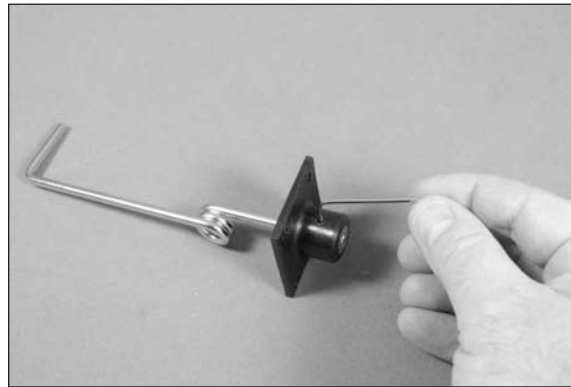


□□ 4. Place 2–3 drops of thin CA in each of the holes to harden the surrounding wood. This will help prevent the screws from vibrating loose.

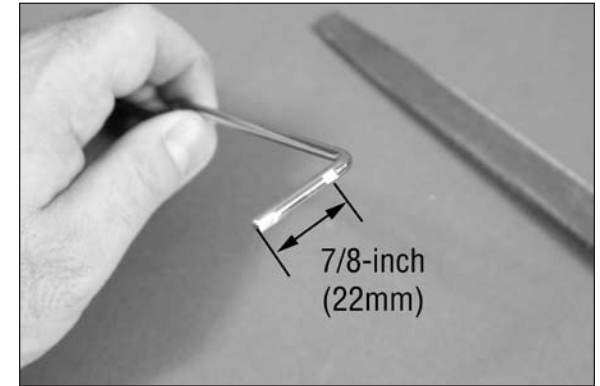


□□ 5. Repeat Steps 2 through 4 to prepare the remaining landing gear mount for the landing gear block.

□□ 6. Use a 3mm x 5mm setscrew to secure the main landing gear wire in the landing gear block. Make sure to use threadlock on the setscrew to prevent it from vibrating loose. Use the included 1.5mm hex wrench to tighten the setscrew on the flat that has been pre-ground on the landing gear wire. Assemble both the left and right assemblies at this time.



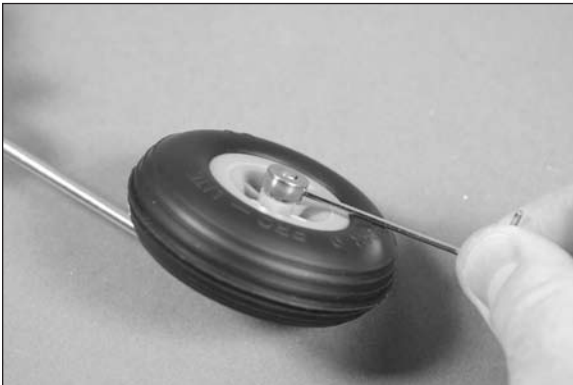
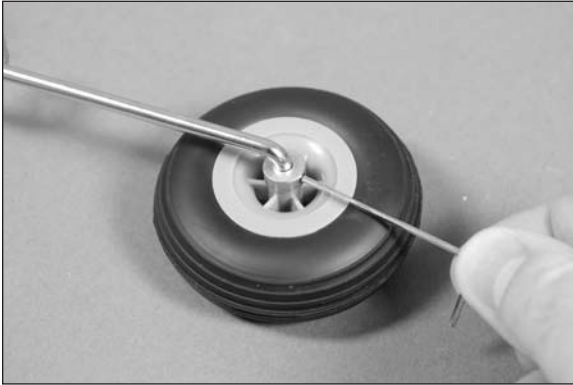
□□ 7. Use a flat file to make a 1/4-inch (6mm) wide flat area on the end of the landing gear wire. Create a second flat on the wire that is 7/8-inch (22mm) from the end of the wire.



□□ 8. Place a drop of light machine oil on the axle so the wheel can roll freely.

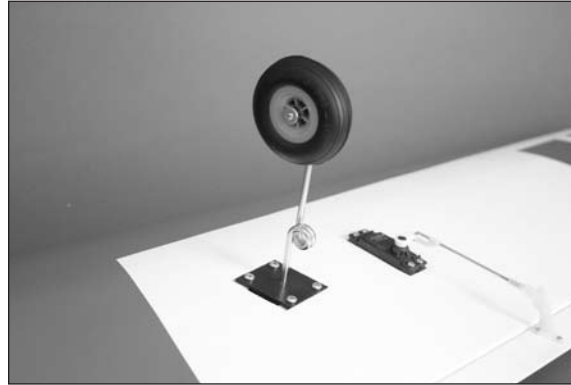


□□ 9. Slide one of the 4mm wheel collars onto the wire. Tighten the setscrew on the flat made next to the bend in the wire. Next, slide the wheel into position. The last wheel collar can now be placed on the landing gear wire. Position the collar flush with the end of the wire and use a 3mm x 3mm setscrew to secure the outer wheel collar. Check that the wheel can rotate freely. If not, reposition the collars until the wheel rolls with little resistance. Make sure to use threadlock on the setscrew to prevent it from vibrating loose.



□ 10. Repeat Steps 7 through 9 to assemble the remaining main landing gear.

□ 11. There is a right and left main landing gear. Place the gear in the wing and check that the coil faces the trailing edge of the wing and that the wheel faces to the center of the wing. Use four #6 x 3/4-inch sheet metal screws to attach landing gear in the wing. Install the left and right main gear at this time.



Main Gear Installation-Retracts

Required Parts

Wing panel	Retracts with hardware
#6 x 3/4-inch sheet metal screw (8)	
4mm wheel collar Main Wheels, 2 1/2-inch (64mm) (2)	

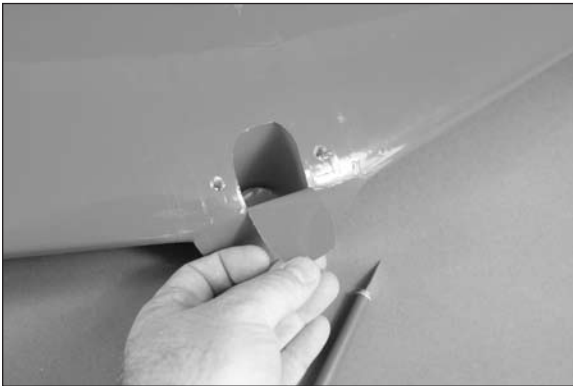
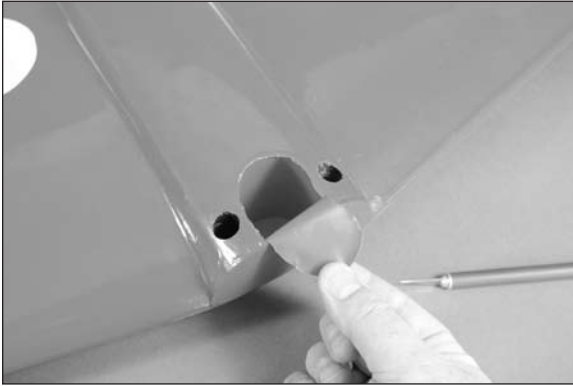
Required Tools and Adhesives

Drill	Felt-tipped pen
Thin CA	Phillips screwdriver: #2
Rotary tool	Cut-off wheel
Flat file	Pencil
Medium grit sandpaper	Razor saw
Trim seal tool	
Hex wrench: 1.5mm, 5/64-inch	
Drill bit: 3/32-inch (2.5mm), 3/16-inch (5mm)	

□ 1. Locate the items included with your model to install the main landing gear. You will also need the retract mechanisms as well as the associated hardware for those retracts.



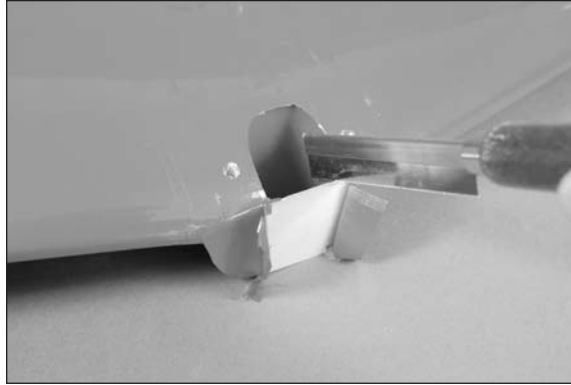
- 2. Use a hobby knife and #11 blade to remove the covering on the top and bottom of the wing for the nose gear retract.



- 3. Use a hobby knife and #11 blade to cut the covering down the center at the leading edge of the wing. Carefully peel the covering away to expose the cover plate at the leading edge of the wing.



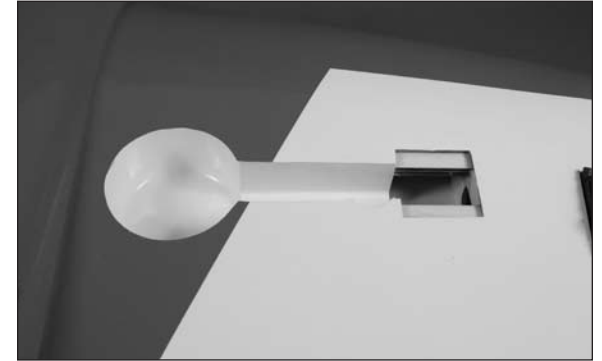
- 4. Use a hobby knife and #11 blade or razor saw to trim the plate to the edges of the notch in the leading edge. Use medium grit sandpaper to smooth the edges where the plate was cut.



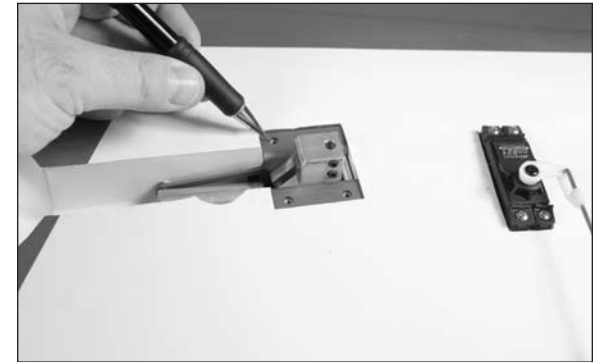
- 5. Use a covering iron or trim seal tool to iron the covering into the notch to finish the opening for the nose wheel in the leading edge of the wing.



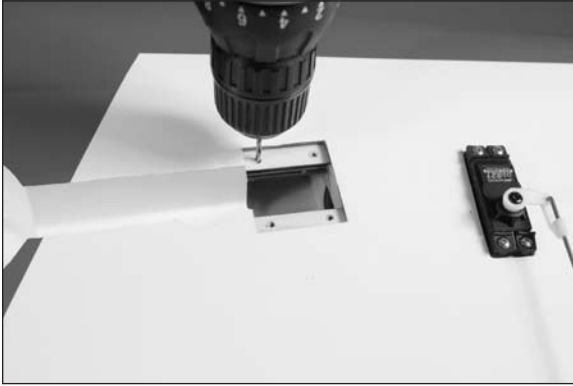
- 6. Use a hobby knife with a #11 blade to remove the covering from the wheel well. Use a covering iron to seal the edges down in the wheel well and leading edge of the wing.



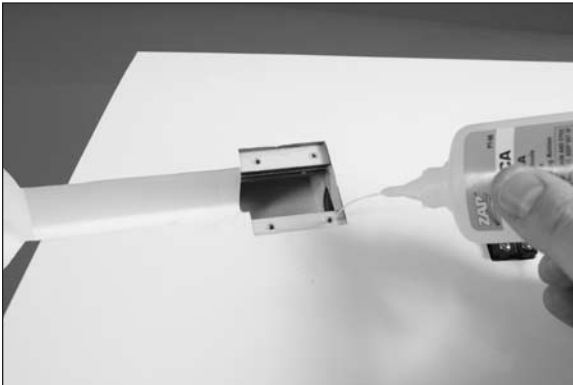
- 7. Place the retract mechanism in the wing. Use a pencil to transfer the locations for the mounting screws onto the landing gear rails.



□□ 8. Remove the retract from the wing. Use a drill and 3/32-inch (2.5mm) drill bit to drill the holes for the mounting screws. Make sure to place the drill bit as far as possible in the drill chuck to help prevent drilling through the top of the wing.



□□ 9. Place 2–3 drops of thin CA in each of the holes to harden the surrounding wood. This will help prevent the screws from vibrating loose.



□ 10. Repeat Steps 6 through 9 to prepare the remaining landing gear mount for the landing gear block.

□ 11. Connect the two air lines to a T-fitting. Cut a short 2-inch (52mm) section of air line to attach to the T-fitting. Attach a quick disconnect to the opposite end of the short 2-inch (52mm) piece of air line.

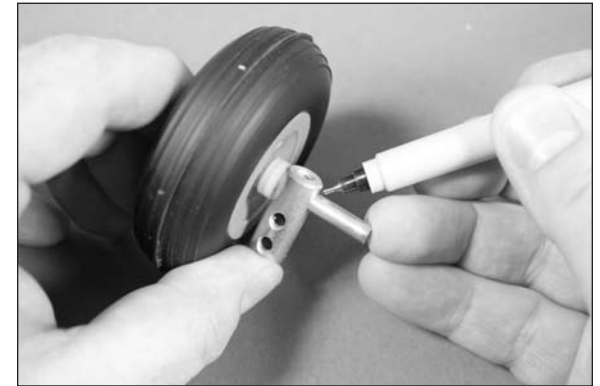


□□ 12. Use a drill and 3/16-inch (5mm) drill bit to enlarge the hole in the wheel.

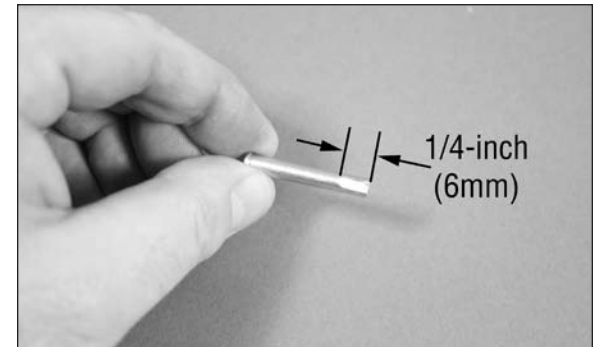


Hint: Using a drill press for drilling these holes is recommended so they are drilled straight through the wheel.

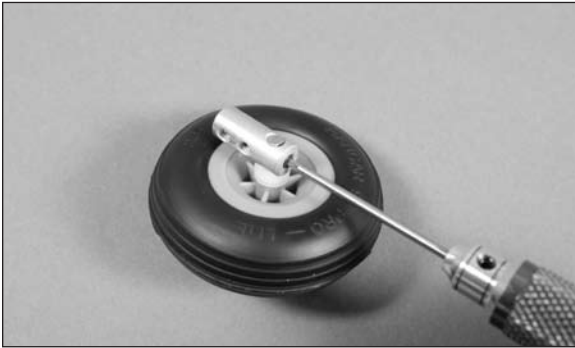
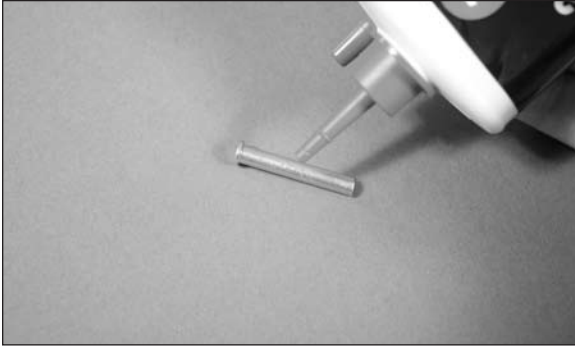
□□ 13. Slide the axle through the wheel. Slide two nylon washers on the axle, then slide the axle into the adapter. Use a felt-tipped pen to mark the axle where it will be cut.



□□ 14. Use a rotary tool and cut-off wheel to cut the axle at the mark made in the previous step. Use a flat file to make a flat area on the first 1/4-inch (6mm) of the axle for the setscrew to tighten onto.

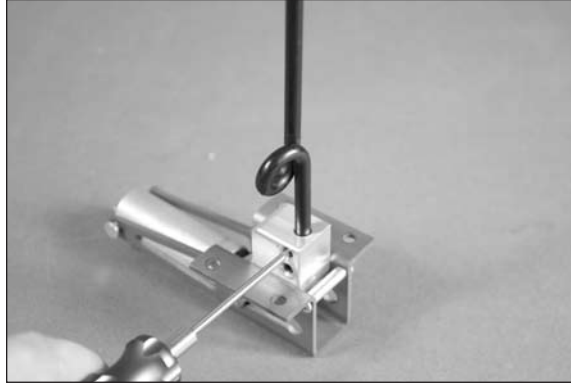


□□ 15. Place a drop of light machine oil on the axle. Assemble the wheel and axle as described in Step 18. Use a setscrew to secure the axle to the mount. Make sure to use threadlock on the setscrew to prevent it from vibrating loose.

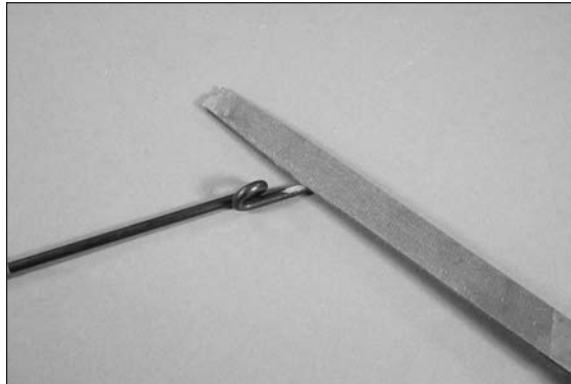


□□ 16. Repeat Steps 12 through 15 to prepare the remaining wheel assembly.

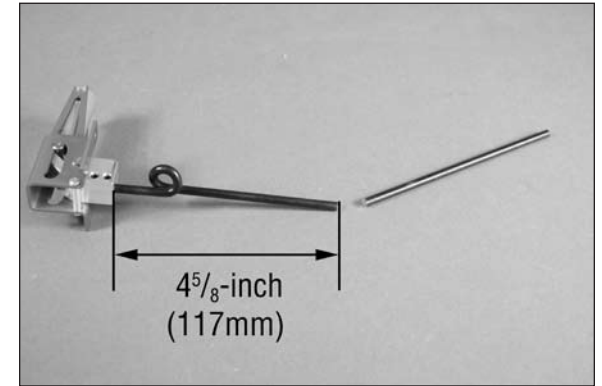
□□ 17. Slide the strut into the retract mechanism. Note the position of the strut in relationship to the retract mechanism. The wire below the coil will be toward the air cylinder and the coil facing as shown in the photo. The coil will be perpendicular to the air cylinder. Use a 5/64-inch hex wrench to tighten the setscrews so they leave a mark on the retract strut.



□□ 18. Remove the strut from the retract mechanism. Use a flat file to file a flat on the strut for the setscrews. Place the strut back in the retract and tighten the setscrews.



□□ 19. Measure 4⁵/₈-inch (117mm) from the edge of the trunion block as shown. Use a rotary tool and cutoff wheel to trim the length of the strut.



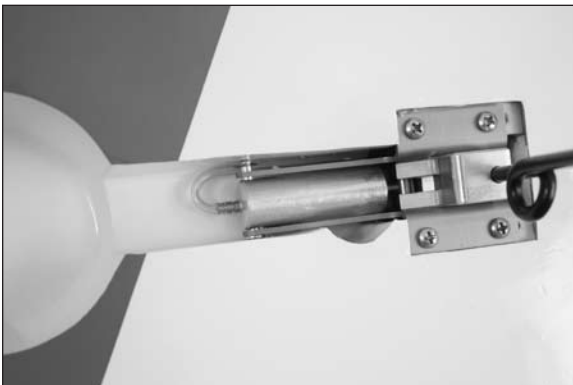
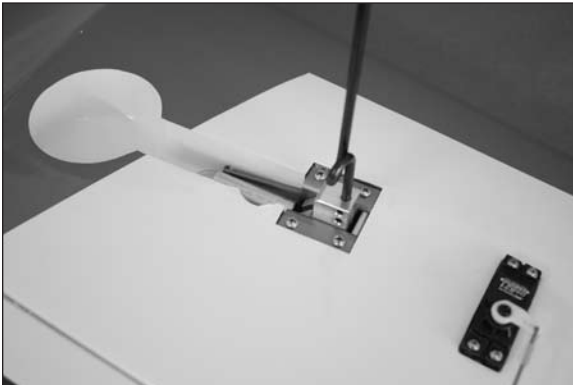
□□ 20. Repeat Steps 17 through 19 to prepare the opposite retract mechanism and strut. Again, note the position of the strut in relationship to the retract mechanism. We have shown the retracts with the struts next to each other so they can be easily compared for positioning.



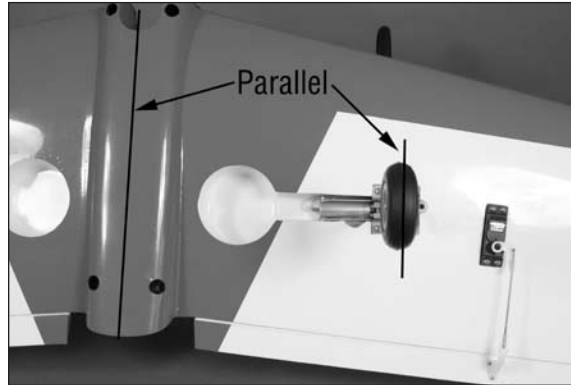
□□ 21. Pull the previously installed air line out of the wing near the retract opening and connect the airline to the retract air cylinder fitting on the retract.



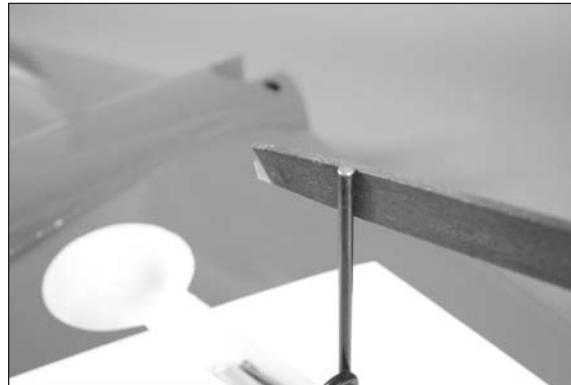
□□ 22. Mount the retract in the wing using four #6 x 3/4-inch sheet metal screws. Make sure to route the airline back into the wing from where it connects to the retract air cylinder. Make sure the loop is not too tight, as it could kink and damage the airline.



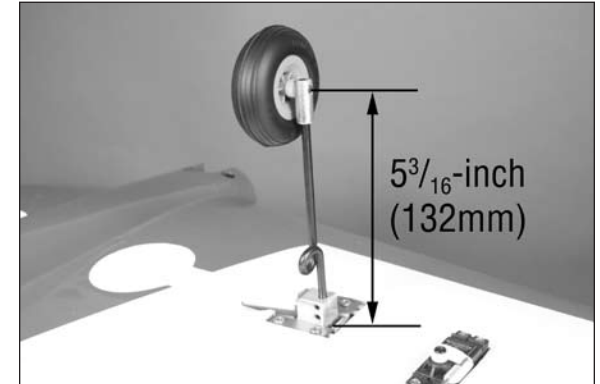
□□ 23. Slide the wheel assembly on the strut. Check that the wheel is pointing straight ahead and parallel to the fuselage centerline. Tighten the setscrews on the axle mount to leave marks on the wire strut.



□□ 27. File a flat on the wire strut for the setscrews on the axle mount to secure to.



□□ 28. Place the wheel assembly back on the strut. The distance between the wing and center of the axle will measure 5³/₁₆-inch (132mm). Tighten the setscrews to secure the wheel and axle to the strut. Make sure to use threadlock on the setscrews to prevent them from vibrating loose.



□ 29. Repeat Steps 16 through 28 for the remaining retract strut and wheel.

Stabilizer Installation

Required Parts

Fuselage	Carbon stabilizer tube
Stabilizer assembly (right and left)	

Required Tools and Adhesives

Medium grit sandpaper	30-minute epoxy
Mixing cup	Mixing stick
Epoxy brush	Paper towel
Rubbing alcohol	Low-tack tape

- ☐ 1. Locate the left and right stabilizer halves and carbon stabilizer tube. You will also need to have the fuselage for the stabilizer installation.



- ☐ 2. Use low-tack tape to outline inside the raised area 1/8-inch (3mm) on the fuselage where the stabilizer will rest. This will help prevent accidentally sanding the fuselage.



- ☐ 3. Use sandpaper to scuff the area of the fuselage for the stabilizer. You don't need to sand through to the fiberglass; only enough to roughen the surface for the epoxy to adhere to.



- ☐ 4. Remove the tape and use a paper towel and rubbing alcohol to remove any dust or debris from the area sanded.

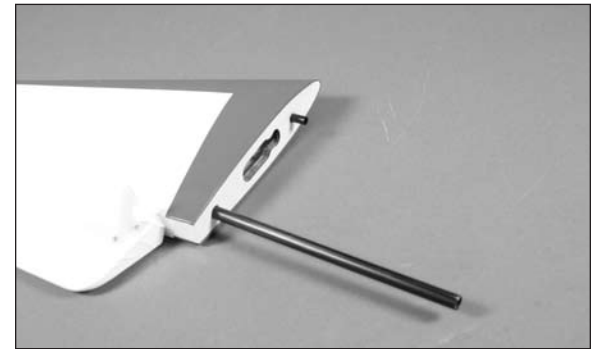


- ☐ 5. Repeat Steps 2 through 4 to prepare the opposite side of the fuselage.

- ☐ 6. Use sandpaper to lightly sand the outside of the carbon stabilizer tube. Use a paper towel and rubbing alcohol to remove any oils, dust or debris from the outside of the tube.



- ☐ 7. Slide the tube into one of the stabilizer halves. The tube will slide easily into the stabilizer, so don't force it farther than it will easily slide.

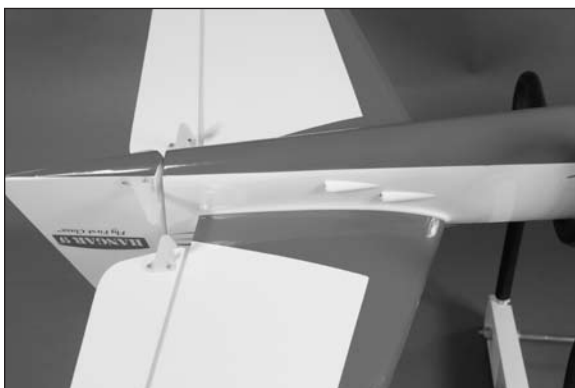


- ☐ 8. Slide the tube and stabilizer into the hole in the fuselage. The stabilizer will fit tightly against the fuselage.





- 9. Slide the remaining stabilizer into position. At this time both stabilizers should be pressed tightly against the fuselage.



- 10. After checking the fit of the stabilizers, remove them from the fuselage.

- 11. Mix 1/2 ounce (15ml) of 30-minute epoxy. Place a small amount of epoxy in the hole for the stabilizer tube in one stabilizer half. Brush a light coat of epoxy on one half of the stabilizer tube at this time as well.



- 12. Slide the stabilizer tube into the stabilizer. Brush a thin coat of epoxy on the exposed wood of the stabilizer where it fits against the fuselage.



- 13. Brush a thin layer of epoxy on the fuselage where the stabilizer fits. Slide the stabilizer in position and tight against the fuselage. Use a paper towel and rubbing alcohol to remove any excess epoxy.



- 14. Brush a thin layer of epoxy on the fuselage and stabilizer tube for the remaining stabilizer.



- 15. Brush a thin layer of epoxy on the exposed wood of the remaining stabilizer. Make sure to apply a small amount of epoxy in the hole for the stabilizer tube as well.

- 16. Slide the remaining stabilizer into position. After checking that both stabilizers are tight against the fuselage, use a paper towel and rubbing alcohol to remove any excess epoxy from the fuselage and stabilizers.



Rudder and Elevator Linkage Installation

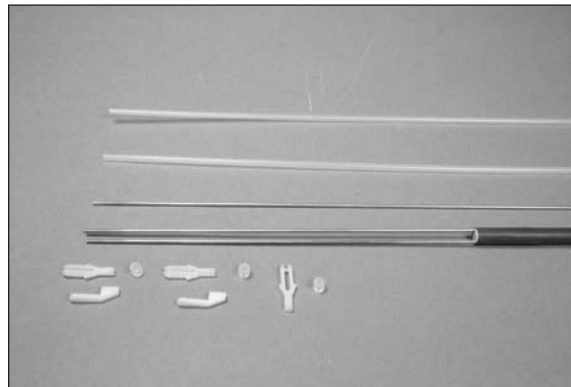
Required Parts

Fuselage	Elevator pushrod
Nylon clevis (3)	Silicone clevis keeper (3)
Nylon pushrod keeper (2)	Servo with hardware (2)
Transmitter	Receiver
Clear pushrod guide, 36-inch (915mm) (2)	
Rudder pushrod, 30-inch (762mm)	

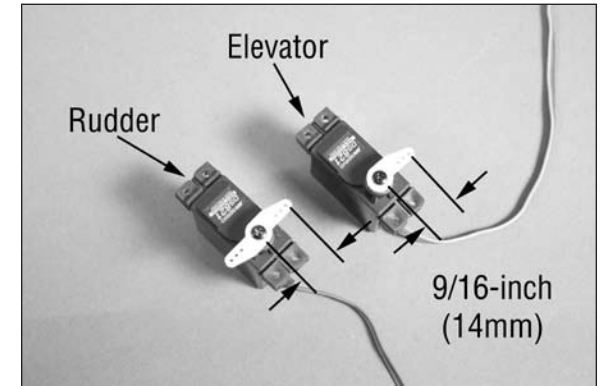
Required Tools and Adhesives

Pin vise	Pencil
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)	
Phillips screwdriver: #1	Thin CA

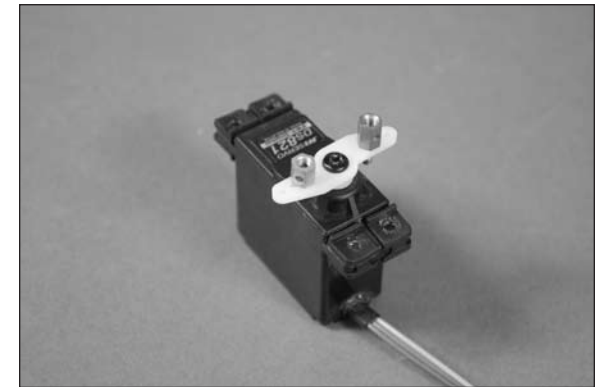
- 1. Locate the items necessary to install the rudder and elevator servo and associated linkages. You will also need to have the fuselage for this section of the manual.



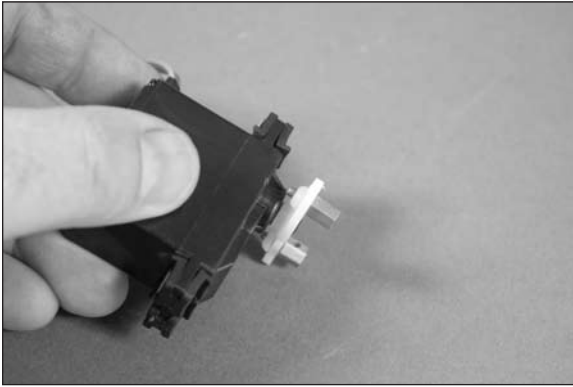
- 2. Prepare the rudder and elevator servos by using a pin vise with a 5/64-inch (2mm) drill bit to enlarge the hole in the arm that is 9/16-inch (14mm) from the center of the servo horn. Use side cutters to remove the unused arm from the elevator servo horn only so it won't interfere with the operation of the servos.



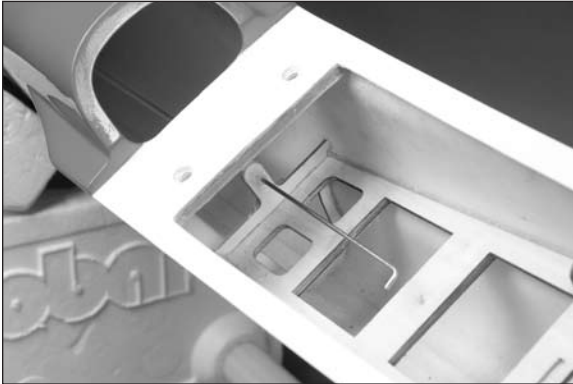
- 4. (Fixed Gear Only) Use a 5/64-inch (2mm) drill bit to enlarge the inner holes on the rudder servo horn. Insert a brass pushrod connector in each hole as shown. This is necessary as the cable connecting to the fixed gear will be secured directly to the steering arm. The retracts will have the connectors at the steering arm and will not need this adjustment at the rudder servo.



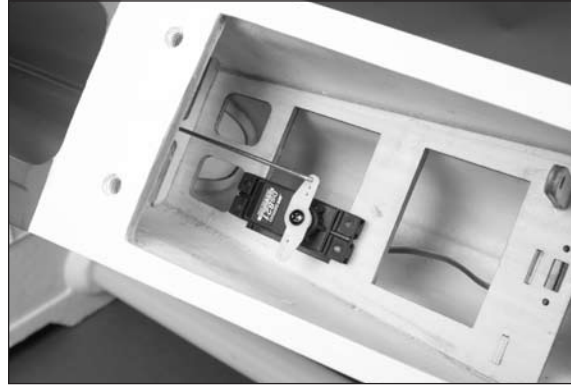
- 5. (Fixed Gear Only) Use a nylon pushrod connector backplate to secure both of the connectors to the servo arm.



- 6. Slide the rudder pushrod into the tube in the fuselage.



- 7. Place the rudder servo in the fuselage. Insert the bend in the pushrod in the hole of the servo arm as shown. The rudder servo could contact the side of the fuselage if not positioned correctly. This will align the servo correctly for the next step.



- 8. Use a pencil to mark the locations for the servo mounting screws on the servo tray.



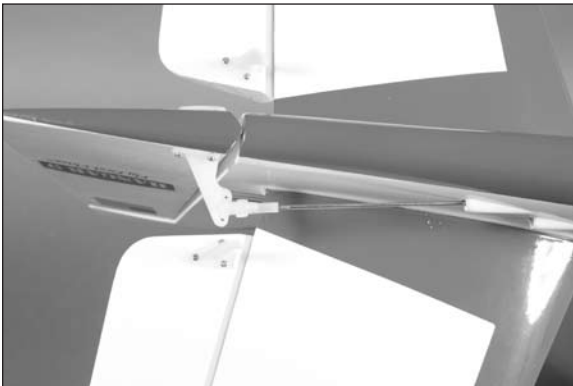
- 9. Remove the servo and use a pin vise and 1/16-inch (1.5mm) drill bit to drill the holes for the servo mounting screws. Place 2–3 drops of thin CA in each hole to harden the surrounding wood. This will help prevent the screws from vibrating loose.



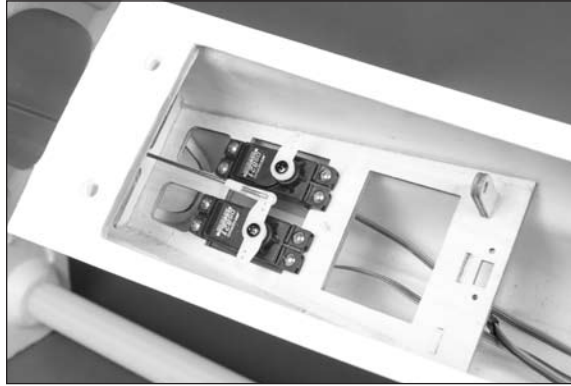
□ 10. Place the rudder servo back in the fuselage. Connect the pushrod to the servo horn using a nylon pushrod connector. Secure the servo using the hardware included with the servo and a #1 Phillips screwdriver.



□ 11. Slide a silicone clevis keeper on a nylon clevis. Thread the clevis on the rudder pushrod and connect it to the middle hole of the rudder control horn. Use the radio system to center the rudder servo and check that the rudder is centered. Adjust the position of the clevis if necessary. Once centered, slide the silicone clevis keeper over the forks of the clevis to prevent it from opening accidentally in flight.



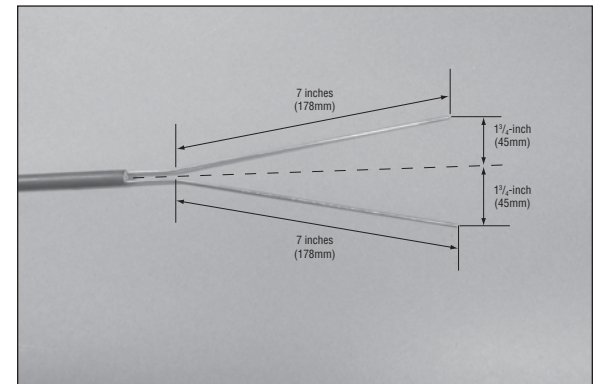
□ 12. Repeat Steps 4 through 6 to mount the elevator servo in the fuselage. The position of the elevator servo should be as close to the side of the fuselage as possible without the bottom of the servo case hitting the fuselage underneath the servo.



□ 13. Slide the clear pushrod guides into the fuselage from the openings for the elevator pushrod. Guide the tube toward the elevator servo. Make sure the tubes are on the same side of the rudder pushrod tube inside the fuselage.



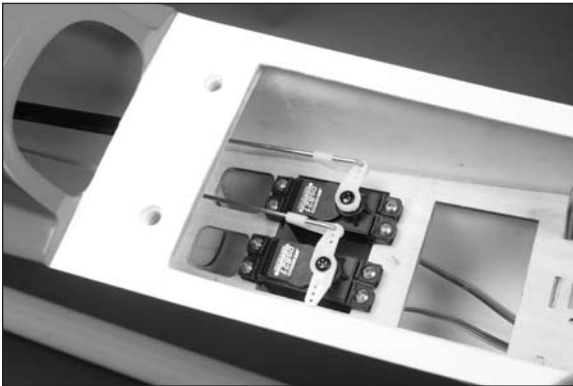
□ 14. Make a slight bend in pushrod wires on the elevator pushrod. They need to be bent away from the center line of the pushrod wire $1\frac{3}{4}$ -inch (45mm) from the center line of the pushrod at a point 7 inches (178mm) from the end of the pushrod. This will line the wires up with the elevator control horns.



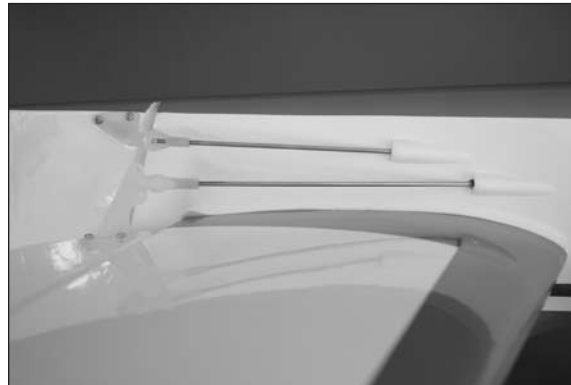
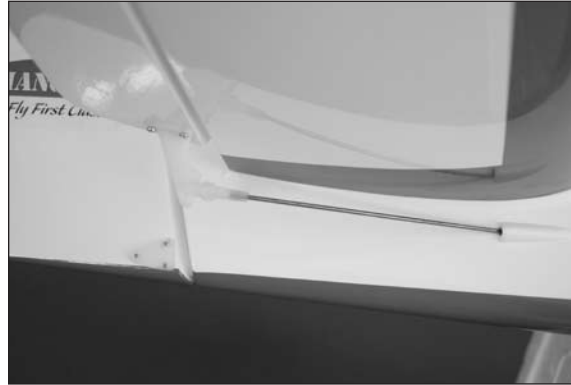
□ 15. Slide the ends of the elevator pushrod into the tubes. Use a small piece of low-tack tape to keep the tubes from slipping off the wires. Pay attention to the bend in the opposite end of the elevator pushrod. It will face down when installed in the elevator servo horn as shown in the following steps.



□ 16. Slide the elevator pushrod into the fuselage and out of the pushrod exits. Use a nylon pushrod connector to secure the pushrod wire to the elevator servo horn.



□ 17. Use the radio system to center the elevator servo. Center the elevator, aligning it with the stabilizer tip. Slide a silicone clevis keeper on a nylon clevis. Thread the clevis on the elevator pushrod and connect it to the middle hole of the elevator control horn. Slide the silicone clevis keeper over the forks of the clevis to prevent it from opening accidentally in flight. Install both clevises and make sure both elevator halves are centered when the servo is centered.



Engine Installation

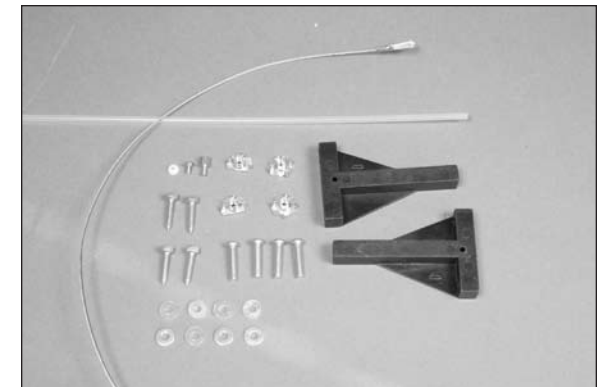
Required Parts

Fuselage	Engine
#8 washer (8)	8-32 blind nut (4)
Nylon engine mount (2)	Brass pushrod connector
Transmitter	Receiver
Servo with hardware	
3mm x 5mm machine screw	
8-32 x 3/4-inch machine screw (4)	
Pushrod connector backplate	
#6 x 3/4-inch socket head sheet metal screw (4)	
Pushrod guide tube, 13-inch (330mm)	
Braided pushrod cable with clevis, 18-inch (457mm)	
Engine template (front and rear)	

Required Tools and Adhesives

Medium CA	Hex wrench: 1/8-inch
Hobby knife with #11 blade	Felt-tipped pen
Hobby scissors	Ruler
Clear tape	Low-tack tape
Small clamp (2)	Square
Pin vise	Box wrench
Phillips screwdriver: #1, #2	Thin CA
Rotary tool with sanding drum	
Drill bit: 1/16-inch (1.5mm), 9/64-inch (3.5mm), 11/64-inch (4.5mm), 7/32-inch (5.5mm)	

□ 1. Locate the items necessary to install the engine in your model. You will also need the fuselage for this installation.



- 2. Remove the front and rear engine templates from page 46 and 47 of the manual. Trim the templates on the solid lines using a hobby knife with a #11 blade and hobby scissors.



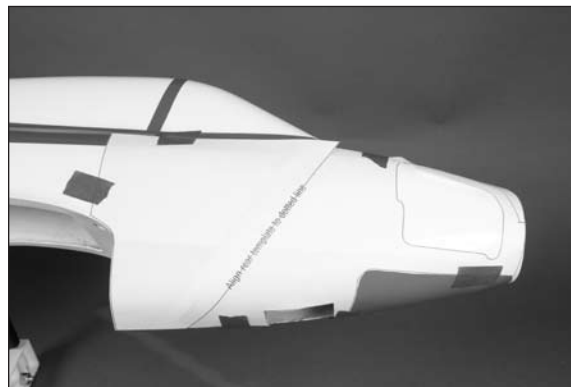
- 3. Use clear tape to join the front and rear templates.



IMPORTANT

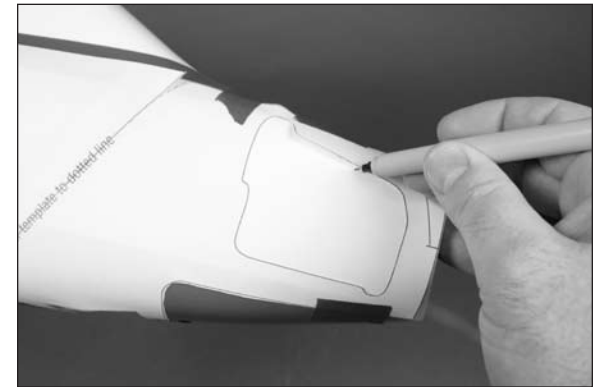
The template for locating the engine cutout has been left intentionally smaller than necessary. This will leave material so you can fit the opening in the fuselage to your specific engine application. This template will fit the recommended Evolution engine after enlarging the opening roughly 1/8-inch (3mm).

- 4. Use low-tack tape to position the template on the fuselage. Start by aligning the template at the wing saddle and at the opening for the landing gear. The spinner centerline is used as a guide as there is not a definite location for this marking.



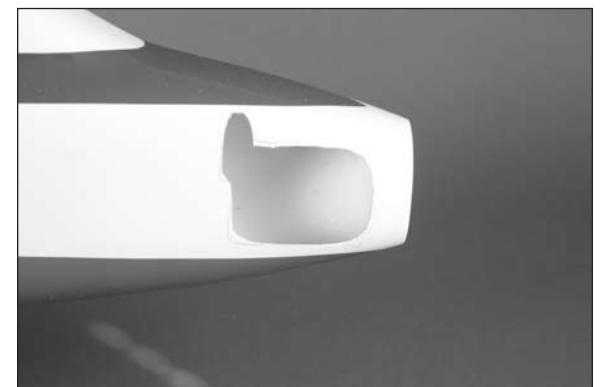
- 5. Use a felt-tipped pen to transfer the outline for the engine cutout on the fuselage. The cutout has been left intentionally small to accommodate a variety of engines and to account for any alignment issues that may occur.

Note: If you feel you are using a smaller than normal engine trace the lines even smaller so the opening can be enlarged to fit your particular engine choice. You can always remove material as necessary.

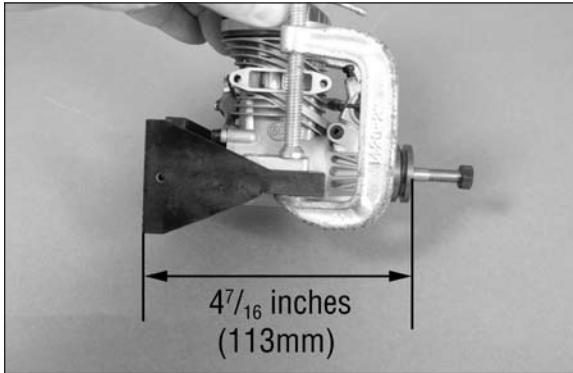


- 6. Remove the template from the fuselage. Use a hobby knife and #11 blade and hobby scissors to rough out the opening for the engine. The final size and shape for the opening will be determined once the engine is installed in the fuselage.

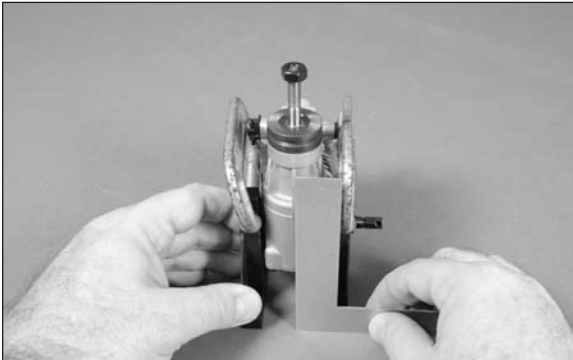
Note: The next two steps for aligning the engine may take time, but are necessary to make sure the engine is positioned correctly in the mounts.



- 7. Use small clamps to hold the engine mounts in position on the engine. Measure the distance from your work surface to the engine drive washer. Position the mounts so the drive washer is $4\frac{7}{16}$ inches (113mm) from the work surface.



- 8. Check that the engine is square when resting on your work surface. Also check that the engine mount rails are square to the work surface. Work between Steps 7 and 8 to correctly position the engine in the mounts.



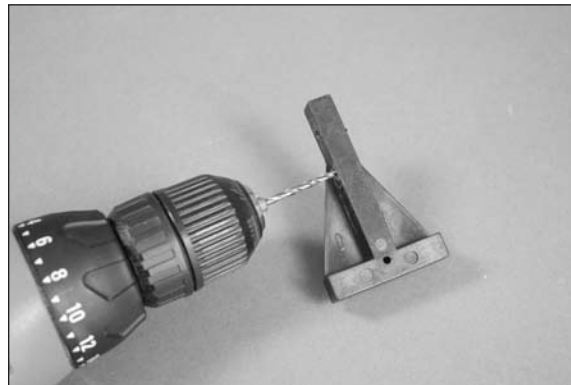
- 9. Use a pencil to mark the locations for the engine mounting screws on the engine mount rails.

Hint: If your clamps are getting in the way, just wick a small amount of thin CA between the rails and engine mount lugs to glue the rails in place and remove the clamps.

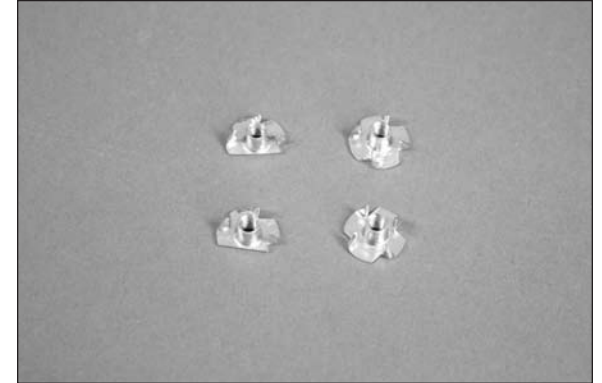


- 10. Use a drill and 7/32-inch (5.5mm) drill bit to drill the holes in the engine mount rails.

Hint: Using a drill press for drilling these holes is recommended so they are drilled straight through the mount.



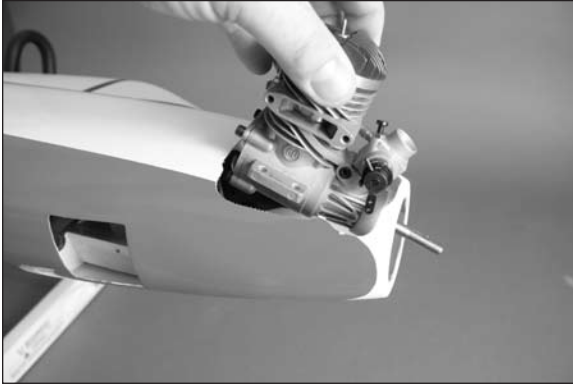
- 11. Locate the four 8-32 blind nuts for mounting the engine mount rails to the firewall. Note that two blind nuts have been trimmed so they can be installed next to the nose gear rails.



- 12. Mount the engine rails in the fuselage using the four 8-32 blind nuts, 8-32 x 3/4-inch machine screws and four #8 washers. This is necessary so the rails can be positioned for the engine.



□ 13. Fit the engine into the fuselage. You will need to remove material from the fuselage to fit your engine. Work slowly, removing only small amounts at a time. Once fit, use a sanding drum to smooth the edges.



□ 14. Slide the spinner backplate onto the engine shaft. Position the mounts so the spinner backplate is aligned with the fuselage. Tighten the screws that secure the engine mount rails to the firewall. Remember to use threadlock on the screws so they don't vibrate loose.



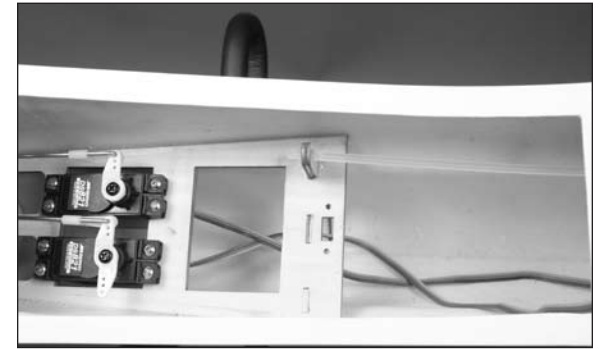
□ 15. Use a drill and 11/64-inch (4.5mm) drill bit to drill a hole for the throttle pushrod. The locations of the pushrod tube will be based on your particular engine. Make sure you will clear the landing gear rails before drilling.



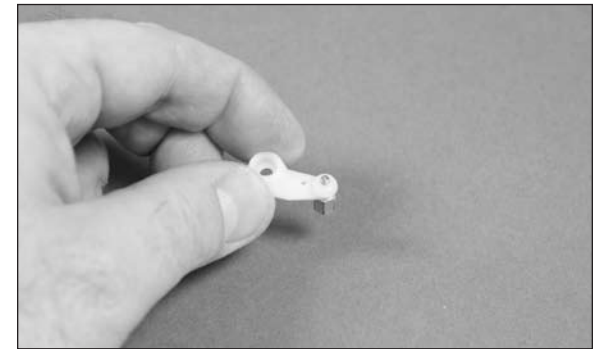
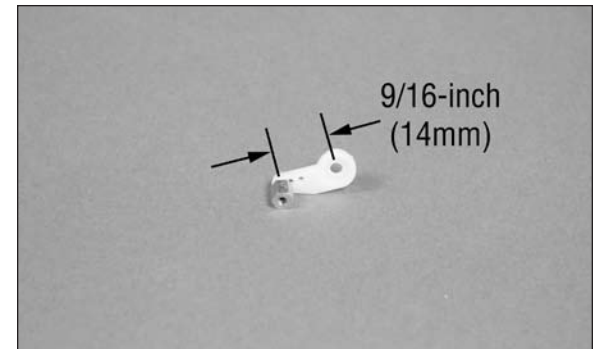
□ 16. Slide the pushrod tube into the hole in the fuselage and through the standoff on the servo tray. Leave 1/8-inch (3mm) of the pushrod tube forward of the firewall. Use medium CA to glue the tube to the firewall and standoff.



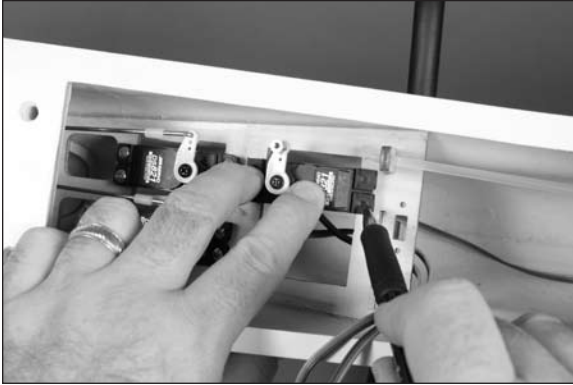
□ 17. Once the pushrod tube has been glued, use side cutters to trim the pushrod rod 1/8-inch (3mm) after it passes through the standoff.



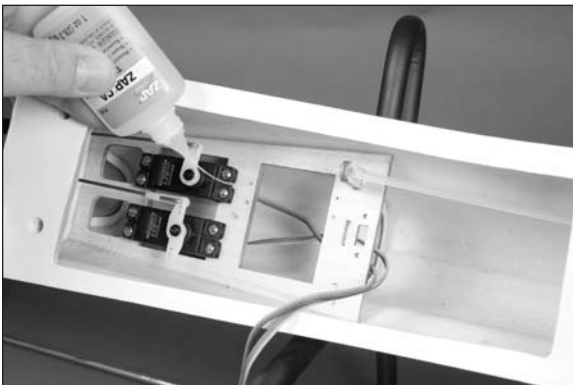
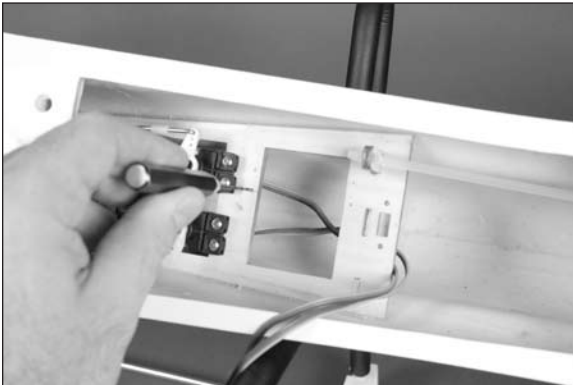
□ 18. Use a pin vise and 5/64-inch (2mm) drill bit to enlarge the hole in a servo arm that is 9/16-inch (14mm) from the center of the arm. Insert the brass pushrod connector in the hole, then use pliers to secure the connector using a pushrod connector backplate.



□ 19. Center the throttle servo and install the arm. Place the servo in the servo tray, aligning the connector to the pushrod tube. Use a pencil to mark the locations for the servo mounting screws on the servo tray.



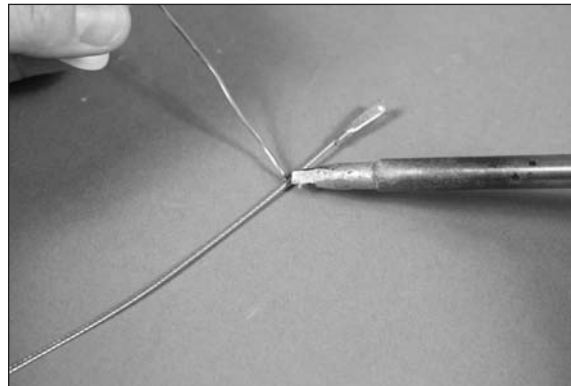
□ 20. Remove the servo from the servo tray. Use a pin vise and 1/16-inch (1.5mm) drill bit to drill the holes into the servo tray for the mounting screws. Apply 2–3 drops of thin CA in each hole to harden the surrounding wood.



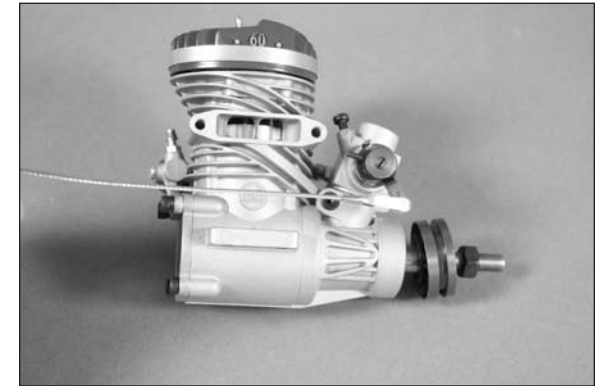
□ 21. Mount the throttle servo in the fuselage with the output facing the rear of the fuselage. Use the screws provided with the servo and a #1 Phillips screwdriver to secure the position of the throttle servo.



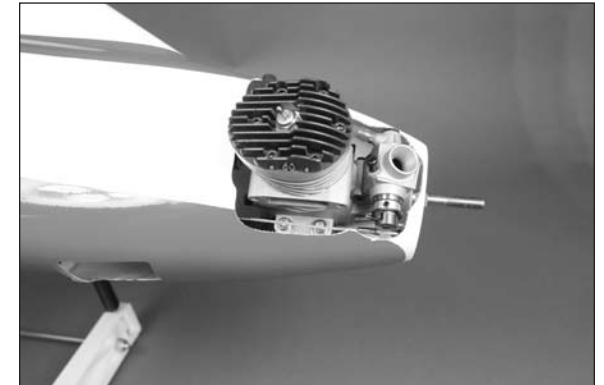
□ 22. To keep the pushrod from flexing, use ea soldering iron and solder to stiffen the area of the wire between the clevis and where it enters the pushrod tube. The first 3-inches (76mm) of the wire behind the clevis will need to be stiffened.



□ 23. Slide a silicone keeper over the clevis on the throttle pushrod. Connect the clevis to the carburetor arm, then slide the keeper over the clevis.



□ 24. Slide the pushrod wire into the tube, then fit the engine into the fuselage. The engine is secured to the mounting rails using four #6 x 3/4-inch socket head sheet metal screws. Tighten the screws that secure the engine to the rails using a 1/8-inch hex wrench.



□ 25. Install the propeller and spinner. Make sure to use an open end or box wrench to tighten the propeller nut to avoid rounding the corners of the nut. The spinner will require a #1 Phillips screwdriver to tighten the screws that secure the cone to the backplate.



□ 26. Use a 3mm x 5mm machine screw to secure the throttle pushrod wire into the brass connector. Check the operation of the throttle using the radio system to make sure it moves from fully closed to open without binding the servo. Use the endpoint adjustments at the radio as necessary. Make sure to use threadlock on the screw to keep it from vibrating loose.



Nose Gear Installation-Fixed Gear

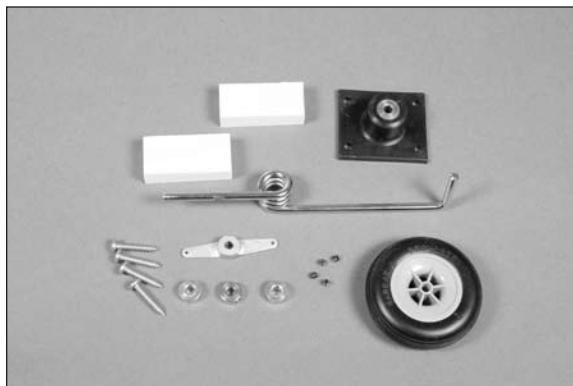
Required Parts

Fuselage	Nose gear strut
Nose wheel, 2-inch (51mm)	Nose wheel steering arm
3mm x 3mm setscrew (4)	4mm wheel collar (3)
Landing gear block	
1/2 x 7/8 x 1 9/16-inch (22mm x 13mm x 40mm)	
hardwood block (2)	
#6 x 3/4-inch sheet metal screw (4)	

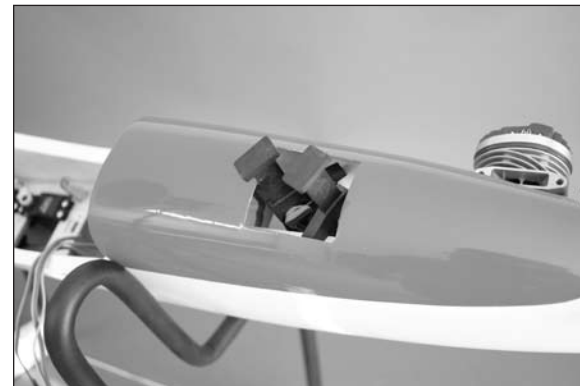
Required Tools and Adhesives

30-minute epoxy	Mixing stick
Epoxy brush	Mixing cup
Drill bit: 3/32-inch (2.5mm)	Drill
Thin CA	Phillips screwdriver: #2
Hex wrench: 1.5mm	Flat file
Pencil	Clamp (2)

□ 1. Locate the items necessary to install the fixed nose gear for your model. You will also need the fuselage for this installation.



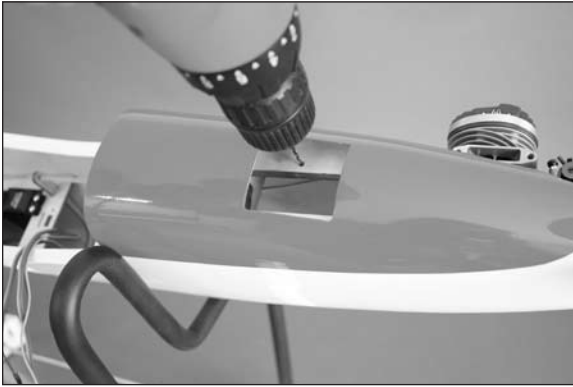
□ 2. Use 30-minute epoxy to glue the two 1/2 x 7/8 x 1 9/16-inch (22mm x 13mm x 40mm) hardwood blocks to the landing gear rails. Allow the epoxy to fully cure before proceeding. Make sure to slide the hardwood blocks as far forward as possible in the fuselage to allow for the steering arm to clear the spacer blocks when in the retracted position.



□ 3. Place the landing gear block on the retract rails. The block is not square, so make sure the block is positioned so the wider part of the block straddles the rails. Make sure to position the block evenly on both rails. With the block slid as far forward as possible, use a pencil to transfer the locations for the mounting screws onto the rails.



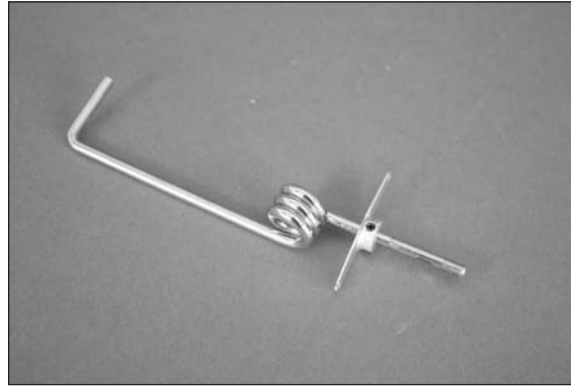
- 4. Use a drill and 3/32-inch (2.5mm) drill bit to drill the holes for the mounting screws.



- 5. Place 2–3 drops of thin CA in each hole to harden the surrounding wood. This will provide a harder surface for the screws to bite into and help prevent them from vibrating loose.



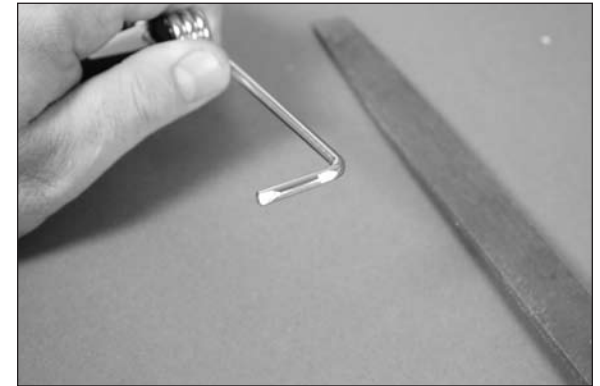
- 6. Slide the nose wheel steering arm on the nose gear strut.



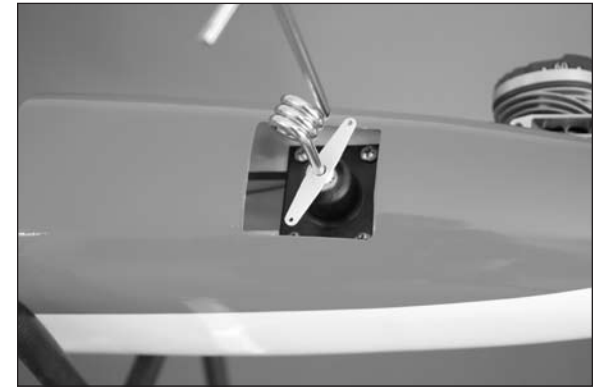
- 7. Slide the landing gear block on the nose gear wire. Use a 4mm wheel collar and 3mm x 3mm setscrew to secure the nose gear wire. The setscrew on the wheel collar will tighten onto the flat near the top of the gear. There will be 3/32-inch (2mm) of wire above the wheel collar as shown. Make sure to use threadlock on the setscrew to prevent it from vibrating loose. Once the top collar is installed, tighten the 3mm x 3mm setscrew to secure the steering arm. Check that the gear can move freely in the block. If not, reposition the steering arm lower to remove any binding.



- 8. Use a flat file to make a 1/4-inch (6mm) wide flat area on the end of the landing gear wire. Create a second flat on the wire that is 5/8-inch (16mm) from the end of the wire.



- 9. Secure the nose gear assembly into the fuselage using four #6 x 3/4-inch sheet metal screws. Tighten the screws using a #2 Phillips screwdriver.



□ 10. Place a drop of light machine oil on the nose gear wire where the nose wheel will rotate. Use two wheel collars to attach the nose wheel to the nose gear. Use a 1.5mm hex wrench to tighten the 3mm x 3mm setscrews after applying threadlock to the setscrews.



Nose Gear Installation-Retracts

Required Parts

Fuselage	Nose gear strut
Nose wheel, 2-inch (51mm)	Nose wheel steering arm
3mm x 3mm setscrew (4)	4mm wheel collar (3)
Retract mechanism	Airline
#6 x 3/4-inch sheet metal screw (4)	
1/2 x 3/4 x 1 ⁹ / ₁₆ -inch (19mm x 13mm x 40mm) hardwood block (2)	

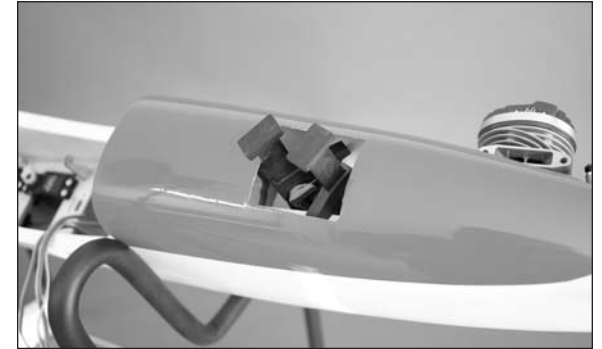
Required Tools and Adhesives

30-minute epoxy	Mixing stick
Epoxy brush	Mixing cup
Drill	Pencil
Thin CA	Phillips screwdriver: #1
Hex wrench: 1.5mm, 5/64-inch	
Rotary tool	Cut-off wheel
Felt-tipped pen	
Hobby knife with #11 blade	Flat file
Drill bit: 3/32-inch (2.5mm), 3/16-inch (4.5mm)	

□ 1. Locate the items necessary to install the fixed nose gear for your model. You will also need the retract mechanisms as well as the associated hardware for those retracts. You will also need the fuselage for this installation.



□ 2. Use 30-minute epoxy to glue the two 1/2 x 3/4 x 1⁹/₁₆-inch (19mm x 13mm x 40mm) hardwood blocks to the landing gear rails. Allow the epoxy to fully cure before proceeding. Make sure to slide the hardwood blocks as far forward as possible in the fuselage.



□ 3. Place the retract mechanism on the retract rails. Make sure to position the retract evenly on both rails. With the retract slid as far forward as possible, use a pencil to transfer the locations for the mounting screws onto the rails.



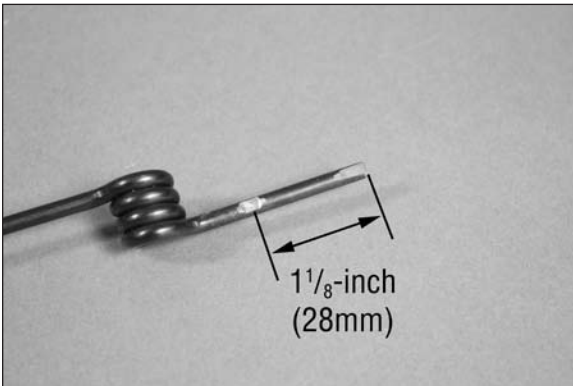
□ 4. Use a drill and 3/32-inch (2.5mm) drill bit to drill the holes for the mounting screws.



- 5. Place 2–3 drops of thin CA in each hole to harden the surrounding wood. This will provide a harder surface for the screws to bite into and help prevent them from vibrating loose.



- 6. With a flat file, make two flat areas on the nose gear wire for the steering arm and wheel collar setscrews. The first is at the end of the wire, the second is $1\frac{1}{8}$ -inch (28mm) from the end of the wire. Make each flat $\frac{1}{4}$ -inch (6mm) wide.



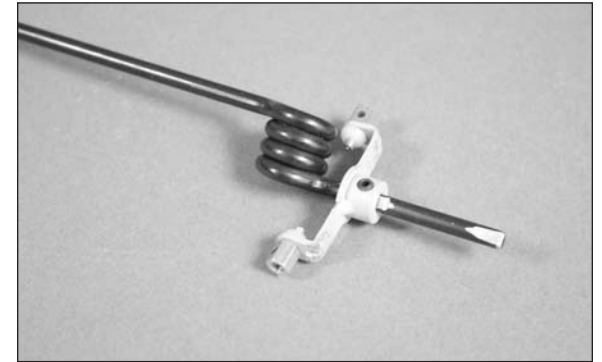
- 7. Use a drill and $\frac{3}{32}$ -inch (2.5mm) drill bit to enlarge the holes in the steering arm. Hold the steering arm with pliers or vise grips to prevent it from being pulled from your hand while drilling. Use a hobby knife with a #11 blade to deburr the hole.



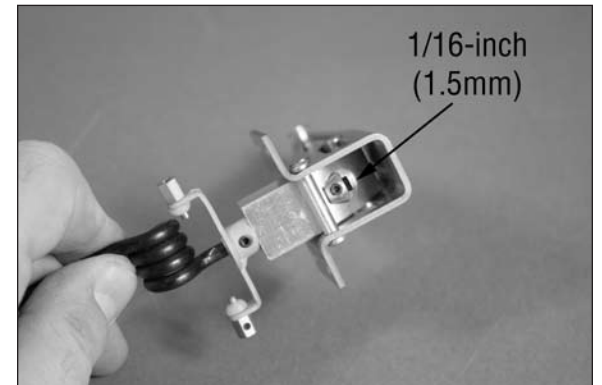
- 8. Insert a brass pushrod connector in the hole of the steering arm. Use the nylon backplate to secure the connector. Install both connectors at this time.



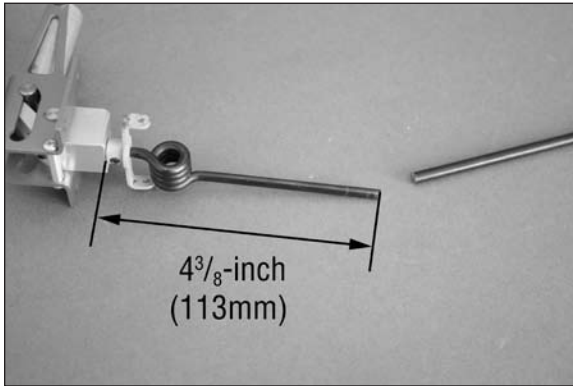
- 9. Slide the steering arm on the nose gear wire with the connector facing to the coil spring on the wire.



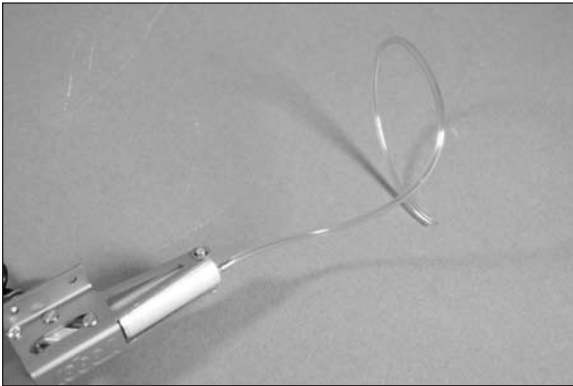
- 10. Insert the nose gear wire into the retract mechanism. Slide the wheel collar on the nose gear. Position the collar against the retract mechanism, then position the retract wire strut so it extends $\frac{1}{16}$ -inch (1.5mm) beyond the collar. Use the wheel collar and setscrew included with the retract set to secure the wire. Tighten the setscrew on the steering arm and check that the gear steers without binding.



- 11. Measure $4\frac{3}{8}$ -inch (113mm) from the edge of the trunion block as shown. Use a rotary tool and cutoff wheel to trim the length of the strut.



- 12. Cut a 12-inch (304mm) piece of airline and attach it to the fitting on the retract air cylinder.



Note: We have used the brass pushrod connectors to minimize the cables from stopping the gear from extending due to the loop hanging up on the steering arm during the operation of the nose gear retract.

- 13. Secure the nose gear assembly into the fuselage using four #6 x 3/4-inch sheet metal screws. Tighten the screws using a #2 Phillips screwdriver.

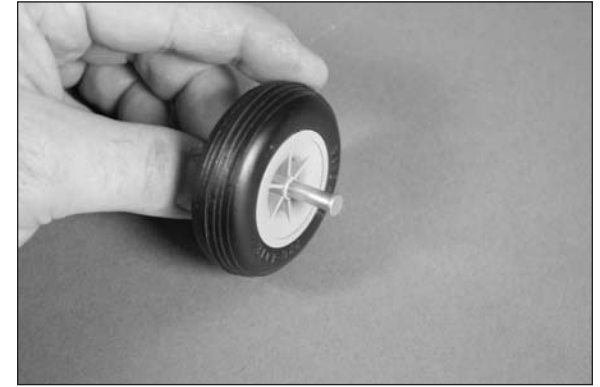


- 14. Use a drill and 3/16-inch (5mm) drill bit to enlarge the hole in the wheel.



Hint: Using a drill press for drilling these holes is recommended so they are drilled straight through the wheel.

- 15. Slide the axle through the hole in the wheel. Slide a nylon spacer on the axle from the opposite side.



- 16. Slide the adapter on the axle. Use a felt-tipped pen to mark the location for the setscrew and the outside edge where the axle will need trimmed.





- 17. Use a rotary tool and cutoff wheel to trim the length of the axle. Use a flat file to make a 1/4-inch (6mm) wide flat where the setscrew from the adapter will rest.



- 18. Assemble the nose wheel assembly as shown. Use threadlock on the setscrew before tightening it on the flat area made in the previous step.

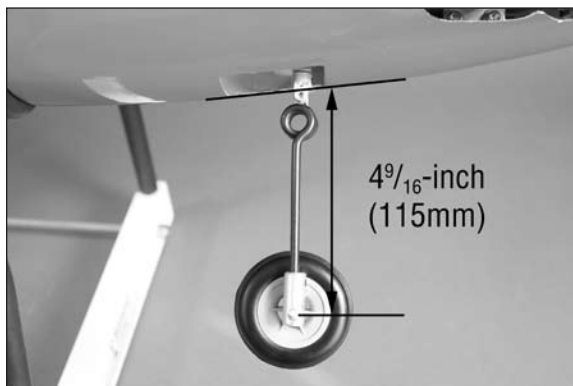
Hint: Place a drop of light machine oil on the axle before sliding it into the wheel so it rolls smoothly during takeoff and landing.



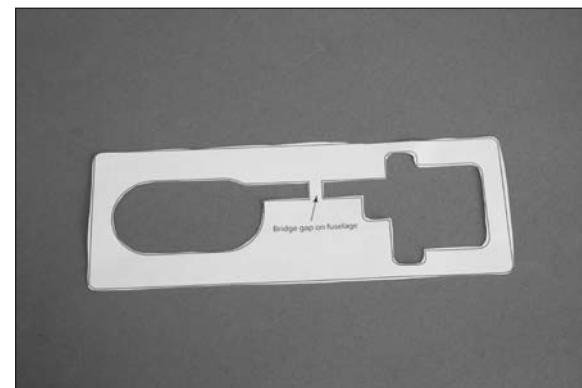
- 19. Before attaching the nose wheel assembly to the nose gear wire, use a flat file to make flats for the setscrews on the nose gear wire for the adapter. Use the setscrews included with your retracts and threadlock to secure the adapter to the nose gear wire.



- 20. Check the length of the nose gear as shown in the photo. The center of the wheel will be 4⁹/₁₆-inch (115mm) as shown in the second photo.

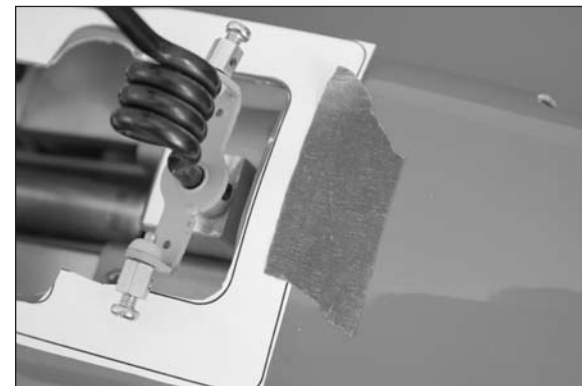


- 21. Trim the template for the nose gear from page 43 of the manual. Use scissors and a hobby knife to trim the template.

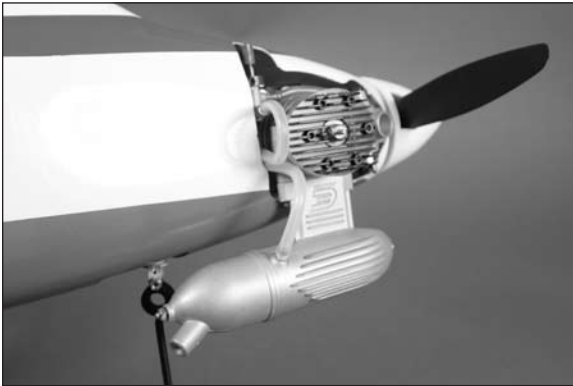


Note: The template has a small amount of material connecting the front and rear of the opening. This is necessary to keep the template from distorting when taped to the fuselage. The material on the fuselage will be removed to allow the retract to operate.

- 22. Use low-tack tape to attach the template to the fuselage. Use the opening for the fixed gear and the notch in the wing for alignment.



- 5. Attach the muffler or header to the engine. Connect the lines from the tank to the carburetor and muffler.



Note: A pressure fitting may be required on your header. If so, install the fitting before attaching the header to the engine.

Steering Linkage Installation- Fixed Gear

Required Parts

Fuselage	Copper crimp (4)
Plywood pushrod support	
38-inch (964mm) braided cable	
Pushrod tube, 36-inch (914mm)	

Required Tools and Adhesives

Medium CA	Crimping tool
Side cutter	

Optional Tools and Adhesives

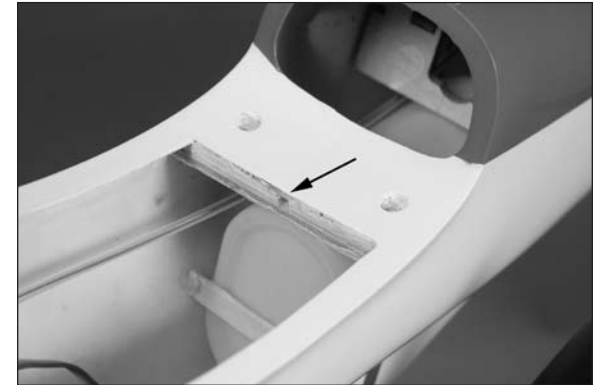
Drill
Long drill bit: 1/8-inch (3mm)

Note: If you have access to a dremel with a angle head then a standard length drill bit will work. The long bit is needed due to having to drill from the bottom of the fuselage

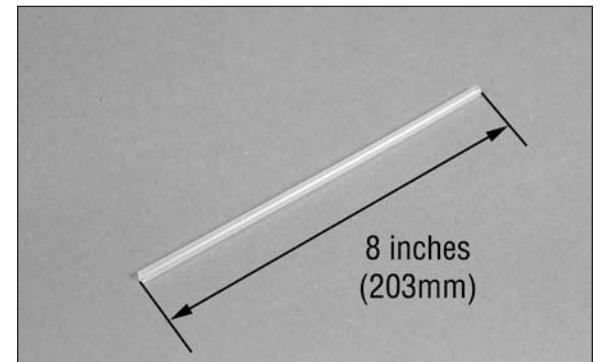
- 1. Locate the items necessary to install the steering cables for the nose gear. You will also need to have the fuselage at this time.



- 2. (Optional) Use a long 1/8-inch (3mm) drill bit to drill a hole through the front wing bolt plate for the pushrod tube. This will align the pushrod tube with the steering, but is optional as it requires a long drill bit.



- 3. Cut the pushrod tube to a length of 8 inches (203mm). Slide the pushrod tube in the fuselage. If you have not drilled the hole in the front wing bolt plate, the tube will rest on the top of the plate. The plywood pushrod support is then placed on the tube near the rudder servo as shown.



□ 4. Cut the braided cable into two 16-inch (482mm) pieces. Slide the cables into the pushrod tube. Use two copper crimps to secure the cables to the steering arm using a crimping tool.



□ 5. Slide the cables into the pushrod connectors on the rudder servo. Use a #2 Phillips screwdriver to tighten the 3mm x 5mm machine screws that secure the wire. Use the radio system to check that the steering is operating in the correct direction and in unison with the rudder. If not, switch the cables at the rudder servo. Once checked, use a small amount of threadlock on the screws to prevent them from vibrating loose.



Retract Servo and Valve Installation

Required Parts

Fuselage	Airline
Air tank	Servo with hardware
Retract air valve	T-fitting (2)

Required Parts (not included)

2-56 x 1 ³ / ₄ -inch pushrod	Clevis
Silicone clevis keeper	

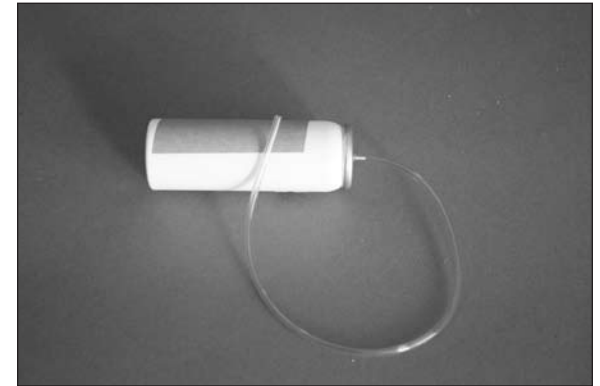
Required Tools and Adhesives

Pin vise	Thin CA
Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm)	
Phillips screwdriver: #1	
Flexible adhesive (PFM or Zap-A-Dap-A-Goo)	

□ 1. Position the retract servo in the fuselage as close to the fuselage side as possible. Use a pencil to mark the locations for the servo mounting screws. Use a 1/16-inch drill bit and a pin vise to drill the holes for the screws. Place 2–3 drops of thin CA in each hole to harden the surrounding wood. Place the retract servo in the fuselage with the output of the servo facing the rear of the fuselage. Use the screws provided with the servo and a #1 Phillips screwdriver to secure the servo.



□ 2. Cut a 12-inch (305mm) piece of airline and attach it to the air tank. Place a strip of low-tack tape along the tank as shown.

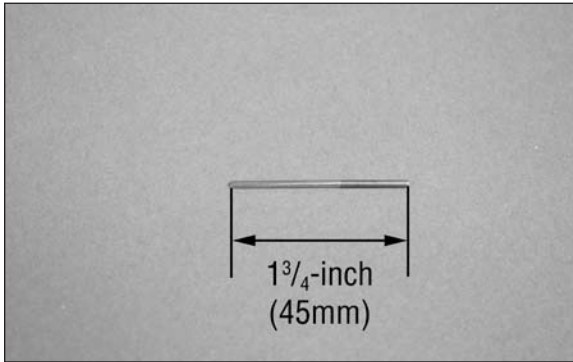


Note: The low-tack tape will allow you to easily remove the tank if the need arises.

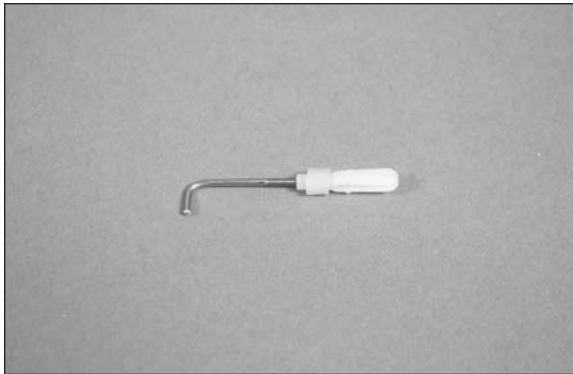
□ 3. Use a flexible adhesive to glue the air tank in the fuselage as shown. Apply the adhesive to the tape so the tank can be removed in the future if necessary. Make sure the air tank is far enough back in the fuselage so the airline does not get kinked when the wing is installed.



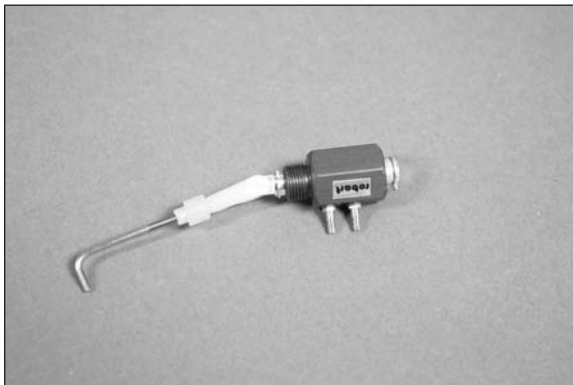
- 4. Cut a piece of threaded rod (not included) to a length of $1\frac{3}{4}$ -inch (45mm) to be used as the pushrod for the retract air valve.



- 5. Use pliers to bend the last 1/4-inch (6mm) 90-degrees. Slide a silicone clevis keeper (not included) on a nylon clevis (not included). Thread a clevis on the pushrod until the end of the pushrod is visible between the forks of the clevis.



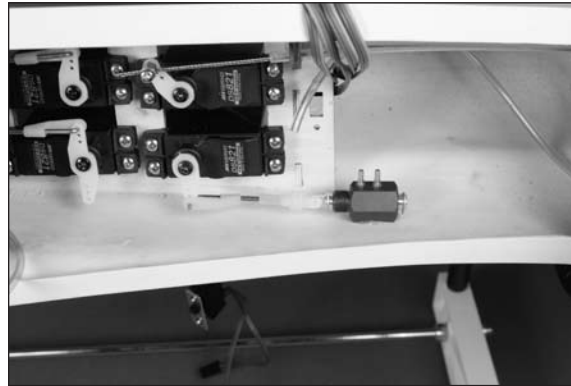
- 6. Attach the clevis to the retract valve.



- 7. Center the retract servo using the radio system by setting the ATV (or endpoint) values to 0%.

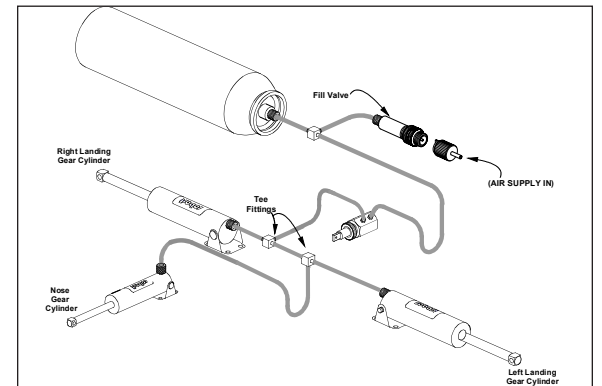
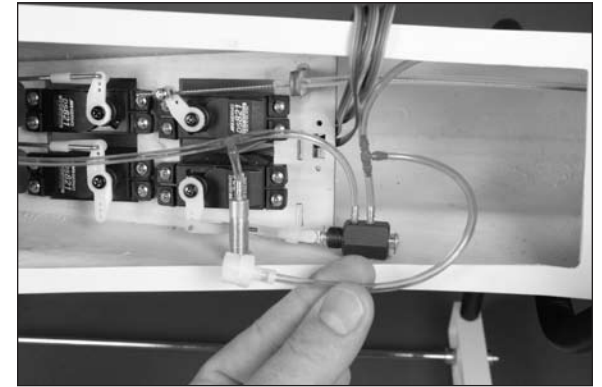
- 8. Select a servo arm that will allow the linkage to be in-line with the retract valve centerline. Having the linkage offset will prematurely wear the seals in the valve, causing it to leak. Enlarge the hole in the arm using a 5/64-inch (2mm) drill bit and pin vise. Connect the linkage to the horn using a nylon pushrod keeper. Use a flexible adhesive to secure the valve to the side of the fuselage.

Hint: Position the valve in the fuselage so the actuator is centered in its range of throw. You will use the radio system to set the endpoints to correctly operate the valve once the adhesive has fully cured.



- 9. Use the ATV (or endpoints) in the programming of your radio system to properly operate the retract valve. It will only take a few percent in both directions to operate the valve.

- 10. Mount the air fitting to the side of the fuselage. Connect the lines necessary to operate the retracts, keeping them as short and neat as possible. Use a longer line for the connector to the wing. Use the supplied drawing to route the lines for the retracts.



Steering Linkage Installation- Retract Gear

Required Parts

Fuselage
Plywood pushrod support
38-inch (964mm) braided cable
Pushrod tube, 36-inch (914mm)
Copper crimp (2)

Required Tools and Adhesives

Medium CA
Side cutter
Crimping tool

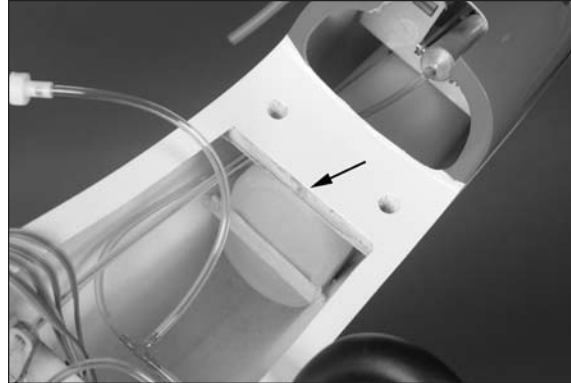
Optional Tools and Adhesives

Drill
Long drill bit: 11/64-inch (4.5mm)

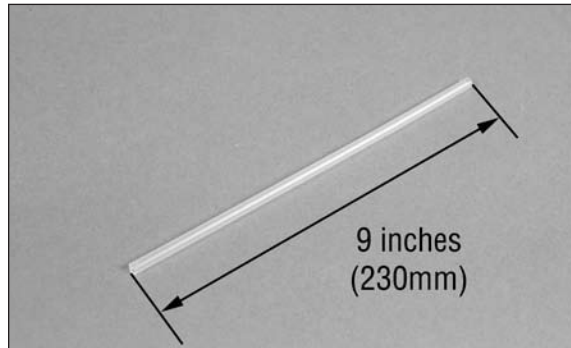
□ 1. Locate the items necessary to install the steering cables for the nose gear. You will also need to have the fuselage at this time.



□ 2. (Optional) Use a long 1/8-inch (3mm) drill bit to drill a hole through the front wing bolt plate for the pushrod tube. This will align the pushrod tube with the steering, but is optional as it requires a long drill bit.



□ 3. Cut the pushrod tube to a length of 9 inches (230mm). Slide the pushrod tube in the fuselage. The plywood pushrod support is then placed on the tube near the rudder servo as shown. If you have not drilled the hole in the front wing bolt plate, the guide tube will rest on the top of the plate.



□ 4. Cut the braided cable into two 16-inch (482mm) pieces. Slide the cables into the pushrod tube. Use two copper crimps to secure the cables to the steering servo arm using a crimping tool.



□ 5. Slide the cable through the holes on the pushrod connectors at the steering arm. After checking that the cables are oriented so the nose wheel moves in the correct direction, use a 3mm x 5mm machine screw to secure the cables in the connectors. A #1 Phillips screwdriver will be required to tighten the screw. Trim the excess cable using side cutters.



□ 6. Use medium CA to glue the pushrod tube where it crosses the front wing bolt plate. Glue the plywood standoff to the servo tray, and the pushrod tube to the standoff using medium CA.

Receiver and Receiver Battery Installation

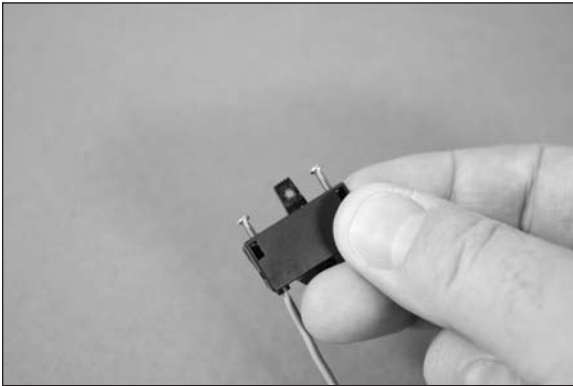
Required Parts

Fuselage Switch harness

Required Tools and Adhesives

Drill bit: 1/16-inch (1.5mm) Drill
Music wire, .050-inch (not included)
Flexible adhesive (PFM or Zap-A-Dap-A-Goo)

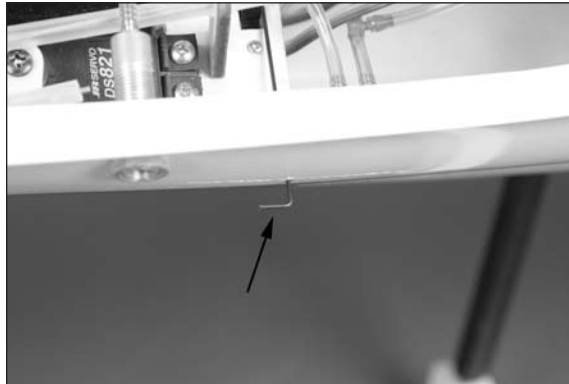
- ☐ 1. Check to see if your switch has a hole. If not, use a drill and 1/16-inch (1.5mm) drill bit to drill a hole through the switch as shown.



Note: The mounting plate from the switch will not be used when installing the switch.

- ☐ 2. Mount the switch in the fuselage using the hardware provided with the switch. A #1 Phillips screwdriver will be necessary to tighten the screws on the switch harness.

- ☐ 3. Bend a short piece of .050 music wire (not included) to actuate the switch from the outside of the fuselage. Drill a small hole in the fuselage using a 1/16-inch (1.5mm) drill bit and pin vise for the wire to pass through.

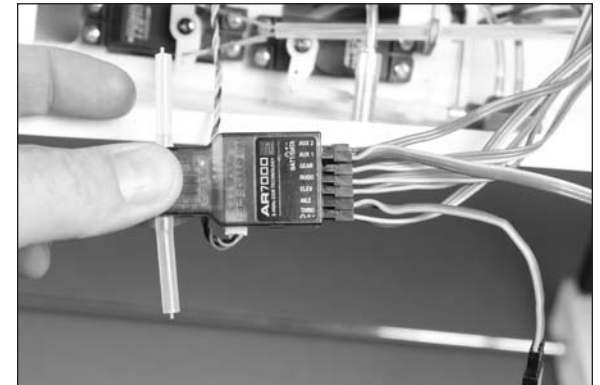


- ☐ 4. Mount a JR Deluxe Charge Jack (not included) to the side of the fuselage. This will allow you to bind the receiver and check the receiver battery voltage without removing the wing from the aircraft.



- ☐ 5. Make the connections between the servos and receiver at this time. Also plug the correct lead from the switch harness in the battery port of the receiver. Use two 3-inch (76mm) extensions for the aileron servo connections to the receiver.

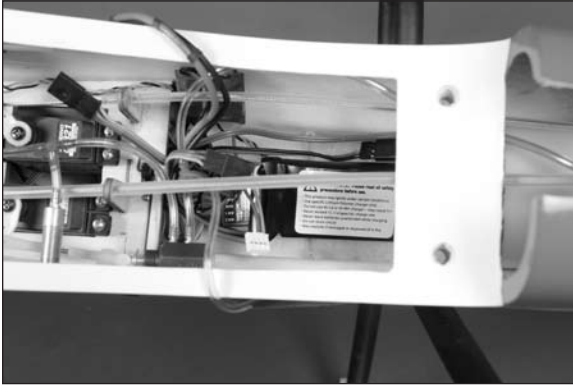
Hint: We used small pieces of fuel tubing on the receiver antenna to keep them from getting bent when the receiver is installed in the fuselage.



- ☐ 6. Place a piece of radio foam in the fuselage. The receiver and receiver battery will rest in the foam as shown.

Note: If using a Li-Po receiver pack, make sure to use a regulator. Read the instructions for the regulator to make sure it is installed correctly.

□ 7. Place the receiver and receiver battery in the fuselage. Make sure they are insulated from each other using foam. Secure the regulator (if necessary) to the side of the fuselage. Mount the remote receiver using hook and loop tape near the throttle servo.



□ 8. Place a piece of foam over the receiver and receiver battery. Use a flexible adhesive to secure supports to keep the radio components from moving in the fuselage.



Wing Installation

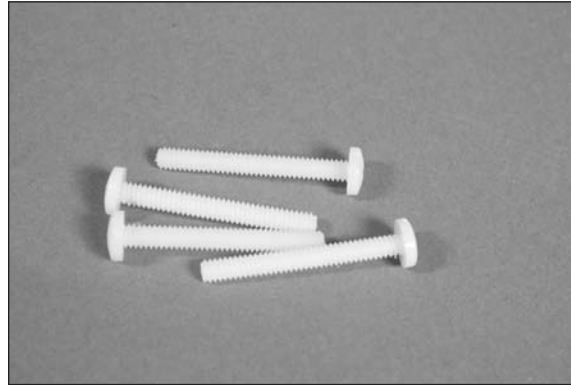
Required Parts

Fuselage
Wing
Tuned pipe mount with hardware (optional)
1/4-20 x 2-inch nylon wing bolt (4)

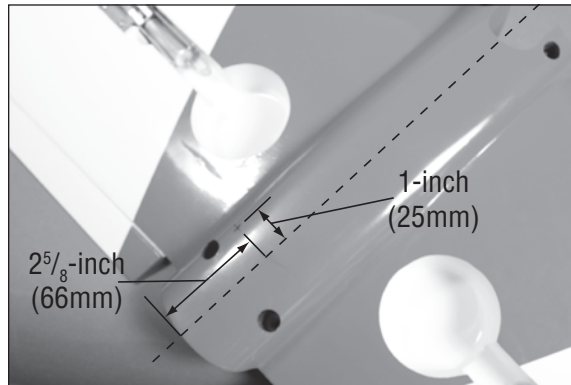
Required Tools and Adhesives

Flat blade screwdriver
Felt-tipped pen

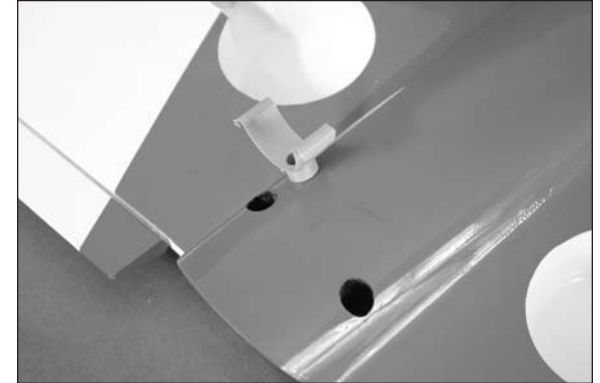
□ 1. Locate the wing bolts to attach the wing to the fuselage. You will also need the wing and fuselage at this time.



□ 2. (optional for tuned pipe installation) Use a felt-tipped pen to mark the location for the tuned pipe mount. The mark will be $2\frac{5}{8}$ -inch (66mm) forward of the rear edge of the wing, and offset 1-inch (25mm) from the centerline of the wing. This is where the hard point for the tuned pipe mount is located.



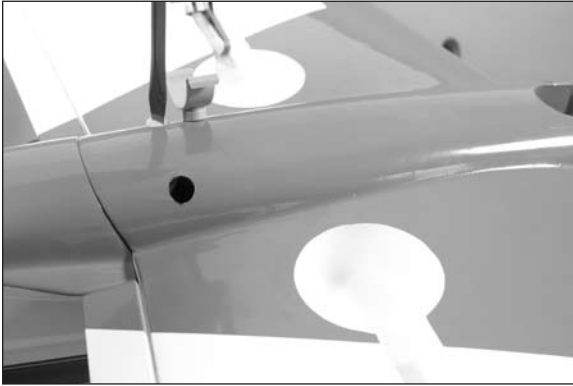
□ 3. (optional for tuned pipe installation) Use a 3/32-inch 2.5mm drill bit to drill a pilot hole for the tuned pipe screw. Attach the tuned pipe mount to the bottom of the wing using the hardware provided with the mount.



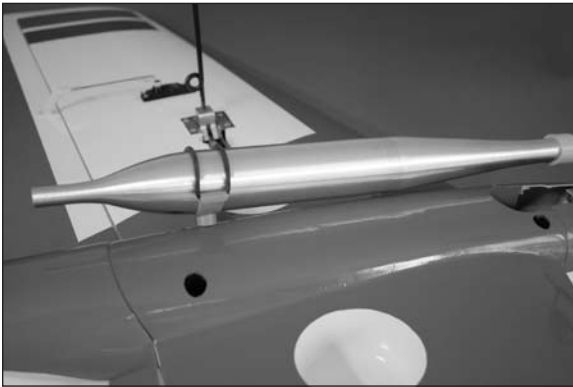
□ 4. Position the wing near the fuselage. Connect the aileron servos and retract lines at this time.



- ☐ 5. Attach the wing to the fuselage using the four 1/4-20 x 2-inch nylon wing bolts. Tighten the bolts using a flat blade screwdriver.



- ☐ 6. (optional for tuned pipe) Attach the pipe to the header and secure it in the tuned pipe mount near the rear of the wing.



Center of Gravity

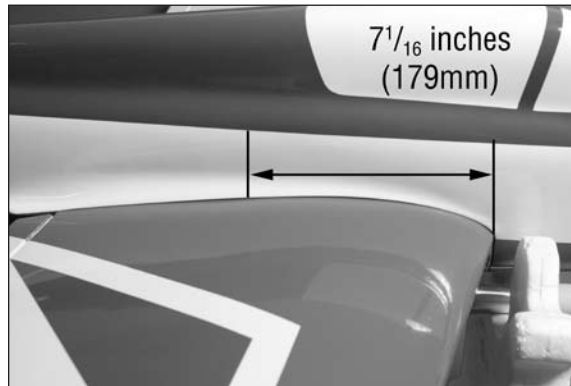
An important part of preparing the aircraft for flight is properly balancing the model.

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for your model is $7\frac{1}{16}$ inches (179mm) back from the leading edge of the wing as shown with the battery pack installed. Mark the location of the CG on the top of the wing with a felt-tipped pen.

When balancing your model, support the plane inverted at the marks made on the wing with your fingers or a commercially available balancing stand. This is the correct balance point for your model. Make sure your model is assembled and ready for flight before balancing.

Adjust the motor battery as necessary so the model is level or slightly nose down. This is the correct balance point for your model. You should find the CG to be very close with the battery installed as shown in this manual. Mark the location of the battery on the battery tray using a felt-tipped pen so it can be returned to this position if it is removed from your model.



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

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 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 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:	7/16-inches	11.5mm	24 degrees
Down:	3/8-inches	9.0mm	19 degrees

Low Rate:

Up:	1/4-inches	6.5mm	13.3 degrees
Down:	3/16-inches	5.0mm	10.3 degrees

Elevator:

High Rate:

Up:	5/8-inches	15.5mm	14.5 degrees
Down:	1/2-inches	13.0mm	16.5 degrees

Low Rate:

Up:	5/16-inches	8.0mm	8.5 degrees
Down:	3/8-inches	10.0mm	11 degrees

Rudder:

High Rate:

Right:	2-inches	51mm	29 degrees
Left:	2-inches	51mm	29 degrees

Low Rate:

Right:	13/16-inches	30mm	17 degrees
Left:	13/16-inches	30mm	17 degrees

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

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

Preflight

Check Your Radio

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

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

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

Check the radio installation and make sure all the control surfaces are moving correctly (i.e., the correct direction and with the recommended throws).

Check all the control horns, servo horns, and clevises to make sure they are secure and in good condition.

Range Test Your Radio

Before each flying session, and especially with a new model, it is important to perform a range check. It is helpful to have another person available to assist during the range check. If you are using a Spektrum transmitter, please refer to your transmitter's manual for detailed instructions on the range check process.

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. Be sure 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 at this time.
- 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.

Warranty and Repair Policy

WARRANTY PERIOD

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warrants that the Products purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

LIMITED WARRANTY

Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

DAMAGE LIMITS

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

Warranty Services

QUESTIONS, ASSISTANCE, AND REPAIRS

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

INSPECTION OR REPAIRS

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. A Service Repair Request is available at www.horizonhobby.com on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

WARRANTY INSPECTION AND REPAIRS

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

NON-WARRANTY REPAIRS

Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of 1/2 hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. Please note: non-warranty repair is only available on electronics and model engines.

United States:

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

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822
USA

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

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822
USA

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

United Kingdom:

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

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

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

Germany:

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

Horizon Technischer Service
Hamburger Strasse 10
25335 Elmshorn
Germany

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

France:

Horizon Hobby SAS
14 Rue Gustave Eiffel
Zone d'Activité du
Réveil Matin
91230 Montgeron

Please call +33 (0) 1 60 47 44 70 with any questions or concerns regarding this product or warranty.

Compliance Information for the European Union



INSTRUCTIONS FOR DISPOSAL OF WEEE BY USERS IN THE EUROPEAN UNION

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

Age Recommendation: 14 years or over. Not a toy. Not intended for use by children without direct adult supervision.

2010 Official Academy of Model Aeronautics Safety Code

GENERAL

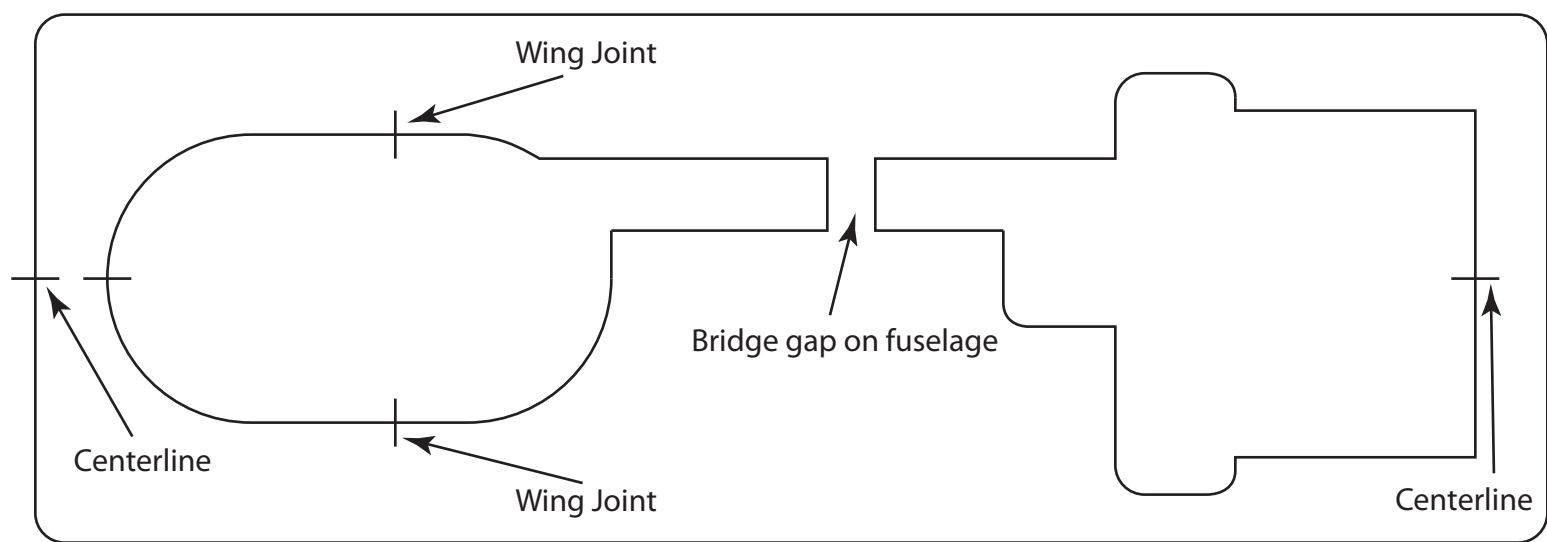
1. A model aircraft shall be defined as a non-human-carrying device capable of sustained flight in the atmosphere. It shall not exceed limitations established in this code and is intended to be used exclusively for recreational or competition activity.
2. The maximum takeoff weight of a model aircraft, including fuel, is 55 pounds, except for those flown under the AMA Experimental Aircraft Rules.
3. I will abide by this Safety Code and all rules established for the flying site I use. I will not willfully fly my model aircraft in a reckless and/or dangerous manner.
4. I will not fly my model aircraft in sanctioned events, air shows, or model demonstrations until it has been proven airworthy.
5. I will not fly my model aircraft higher than approximately 400 feet above ground level, when within three (3) miles of an airport without notifying the airport operator. I will yield the right-of-way and avoid flying in the proximity of full-scale aircraft, utilizing a spotter when appropriate.
6. I will not fly my model aircraft unless it is identified with my name and address, or AMA number, inside or affixed to the outside of the model aircraft. This does not apply to model aircraft flown indoors.
7. I will not operate model aircraft with metal-blade propellers or with gaseous boosts (other than air), nor will I operate model aircraft with fuels containing tetranitromethane or hydrazine.

8. I will not operate model aircraft carrying pyrotechnic devices which explode burn, or propel a projectile of any kind. Exceptions include Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight. Rocket motors up to a G-series size may be used, provided they remain firmly attached to the model aircraft during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code; however, they may not be launched from model aircraft. Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Air Show Advisory Committee Document.
9. I will not operate my model aircraft while under the influence of alcohol or within eight (8) hours of having consumed alcohol.
10. I will not operate my model aircraft while using any drug which could adversely affect my ability to safely control my model aircraft.
11. Children under six (6) years old are only allowed on a flightline or in a flight area as a pilot or while under flight instruction.
12. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

RADIO CONTROL

1. All model flying shall be conducted in a manner to avoid over flight of unprotected people.
2. I will have completed a successful radio equipment ground-range check before the first flight of a new or repaired model aircraft.
3. I will not fly my model aircraft in the presence of spectators until I become a proficient flier, unless I am assisted by an experienced pilot.
4. At all flying sites a line must be established, in front of which all flying takes place. Only personnel associated with flying the model aircraft are allowed at or in front of the line. In the case of airshows demonstrations straight line must be established. An area away from the line must be maintained for spectators. Intentional flying behind the line is prohibited.

5. I will operate my model aircraft using only radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
6. I will not knowingly operate my model aircraft within three (3) miles of any preexisting flying site without a frequency-management agreement. A frequency management agreement may be an allocation of frequencies for each site, a day-use agreement between sites, or testing which determines that no interference exists. A frequency-management agreement may exist between two or more AMA chartered clubs, AMA clubs and individual AMA members, or individual AMA members. Frequency-management agreements, including an interference test report if the agreement indicates no interference exists, will be signed by all parties and copies provided to AMA Headquarters.
7. With the exception of events flown under official AMA rules, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and located at the flightline.
8. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual.
9. Radio-controlled night flying is limited to low-performance model aircraft (less than 100 mph). The model aircraft must be equipped with a lighting system which clearly defines the aircraft's attitude and direction at all times.
10. The operator of a radio-controlled model aircraft shall control it during the entire flight, maintaining visual contact without enhancement other than by corrective lenses that are prescribed for the pilot. No model aircraft shall be equipped with devices which allow it to be flown to a selected location which is beyond the visual range of the pilot.

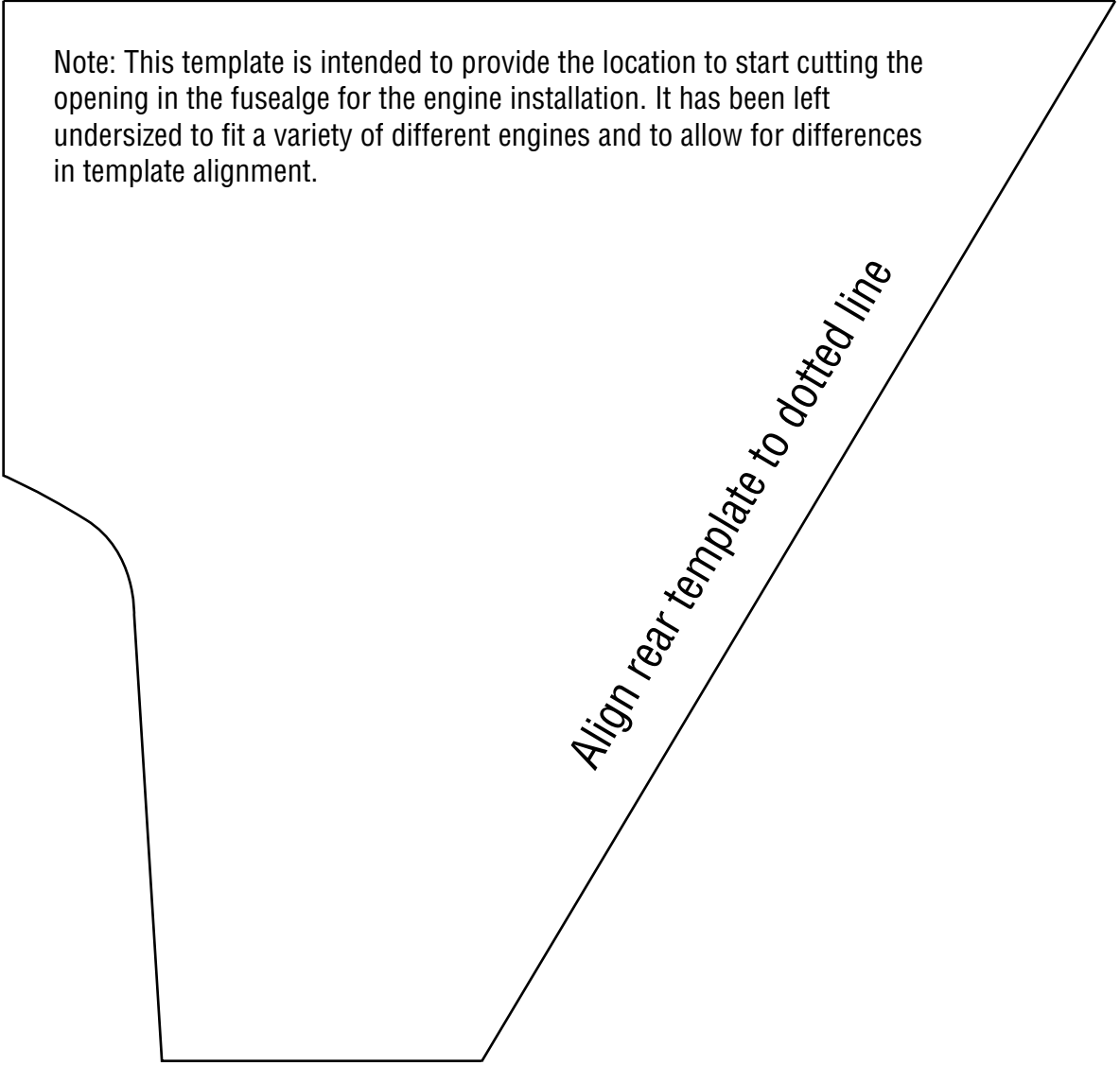


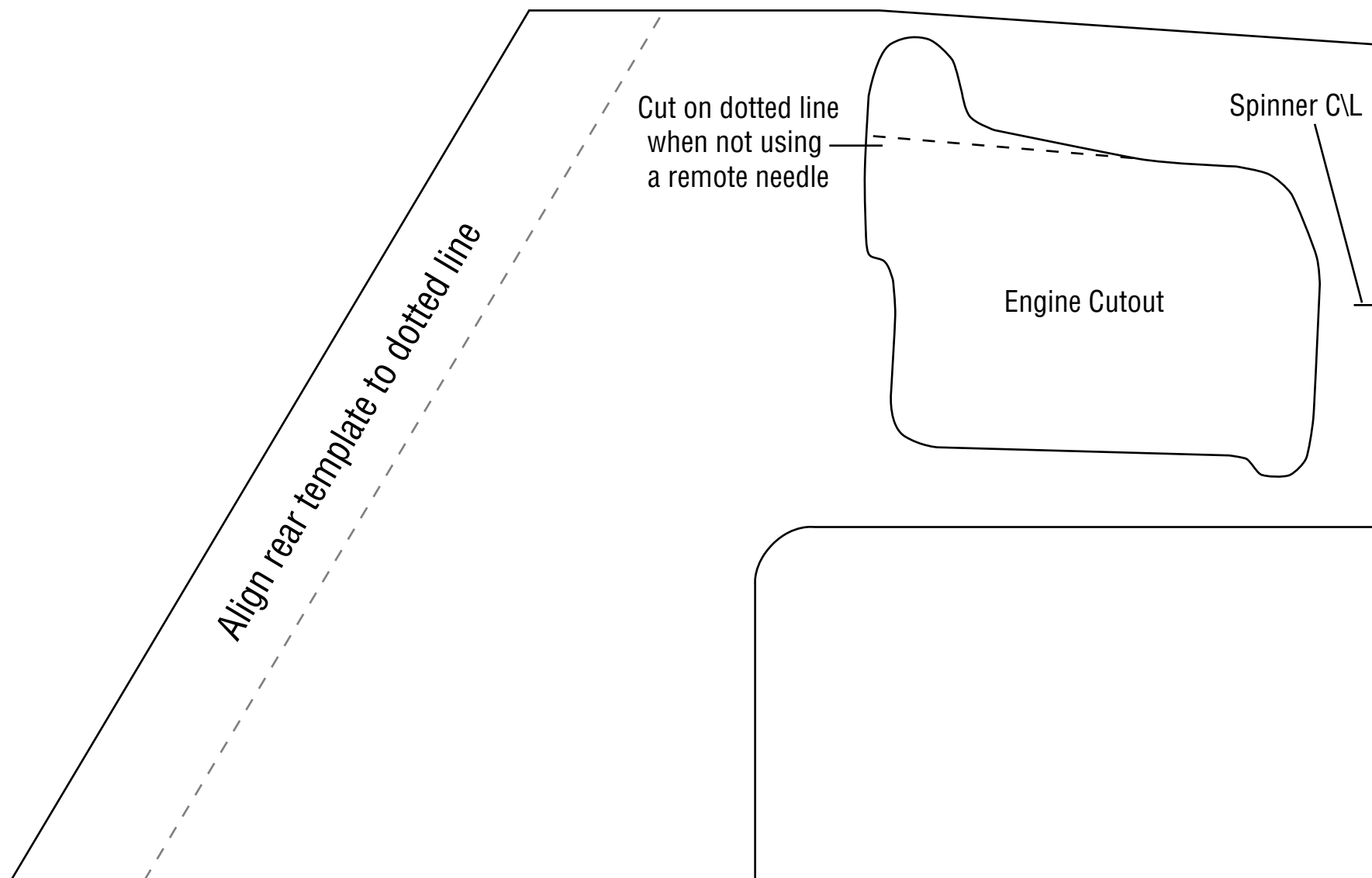
This page was intentionally left blank as the back for the nose gear retract template

This page was intentionally left blank as the back for the rear section of the engine template

Note: This template is intended to provide the location to start cutting the opening in the fuselage for the engine installation. It has been left undersized to fit a variety of different engines and to allow for differences in template alignment.

Align rear template to dotted line







Fly First Class™



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